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**TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH  
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR  
EXPANSION OF CENTURY HEIGHTS DRINKING WATER  
SYSTEM  
ENVIRONMENTAL SCREENING REPORT**

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January 31, 2024

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Appendix D – Consultation Materials

## List of Acroynms

ACW	Ashfield-Colborne-Wawanosh
ADF	Average Day Flow
ANSI	Area of Natural and Scientific Interest
ATRIS	Aboriginal and Treaty Rights Information System
BMROSS	B.M. Ross and Associates Limited
CBO	Chief Building Official
CHER	Cultural Heritage Evaluation Report
COTTFN	Chippewas of the Thames First Nation
DFO	Department of Fisheries and Oceans
DNAPLs	Dense non-aqueous phase liquids
EA Act	Environmental Assessment Act of Ontario
ECA	Environmental Compliance Approvals
ESA	Endangered Species Act
ESR	Environmental Study Report
GUDI	Groundwater under the Direct Influence of Surface Water
HIA	Heritage Impact Assessment
MCEA	Municipal Class Environmental Assessment
MCM	Ministry of Citizenship and Multiculturalism
MDF	Maximum Day Flow
MECP	Ministry of Environment, Conservation and Parks
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MNRF	Ministry of Natural Resources and Forestry
MVCA	Maitland Valley Conservation Authority
NDMNRF	Ministry of Northern Development, Mines, Natural Resources and Forestry
NHIC	Natural Heritage Information Centre
ODWQS	Ontario Drinking Water Quality Standards
OP	Official Plan
PIC	Public Information Centre
PPS	Provincial Policy Statement
PTTW	Permit to Take Water
SARA	Species at Risk Act
SGRA	Significant Groundwater Recharge Area
SON	Saugeen Ojibway Nation
WHPA	Wellhead Protection Area

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## **1.0 INTRODUCTION**

### **1.1 Introduction**

The Township of Ashfield-Colborne-Wawanosh (ACW) initiated a Municipal Class Environmental Assessment (MCEA) study in March 2022 to investigate expanding the Century Heights Drinking Water System in the community of Saltford. The study process followed the procedures set out in the Municipal Class Environmental Assessment document, dated June 2000, as amended in 2007, 2011 and 2015 (Municipal Engineers Association, 2000). B. M. Ross and Associates Limited (BMROSS) was engaged to conduct the MCEA investigation on behalf of the Township.

The current system (Century Heights Water System) services 84 properties from a groundwater supply. An expansion of the existing drinking water system is required to accommodate future development within the urban settlement area. The MCEA will investigate options with respect to increasing the existing drinking water supply and expanding the distribution system. The purpose of this report is to document the MCEA planning and design process followed for this project. The report includes the following major components:

- An overview of the general project area.
- A summary of the deficiencies associated with the existing structure.
- A description of the alternative solutions considered for resolving the defined problem(s).
- A synopsis of the decision-making process conducted to select a preferred alternative.
- A detailed description of the preferred alternative.

## 1.2 Municipal Class Environmental Assessment (MCEA) Process

Municipalities must adhere to the Environmental Assessment Act of Ontario (EA Act) when completing road, sewer or waterworks activities. The Act allows the use of the Municipal Class Environmental Assessment process for most types of municipal infrastructure projects. A MCEA is an approved planning document which describes the process that proponents must follow in order to meet the requirements of the EA Act. The MCEA approach allows for the evaluation of alternatives to a project, and alternative methods of carrying out a project, and identifies potential environmental impacts. The process involves mandatory requirements for consultation. MCEA studies are a method of dealing with projects that include the following common characteristics:

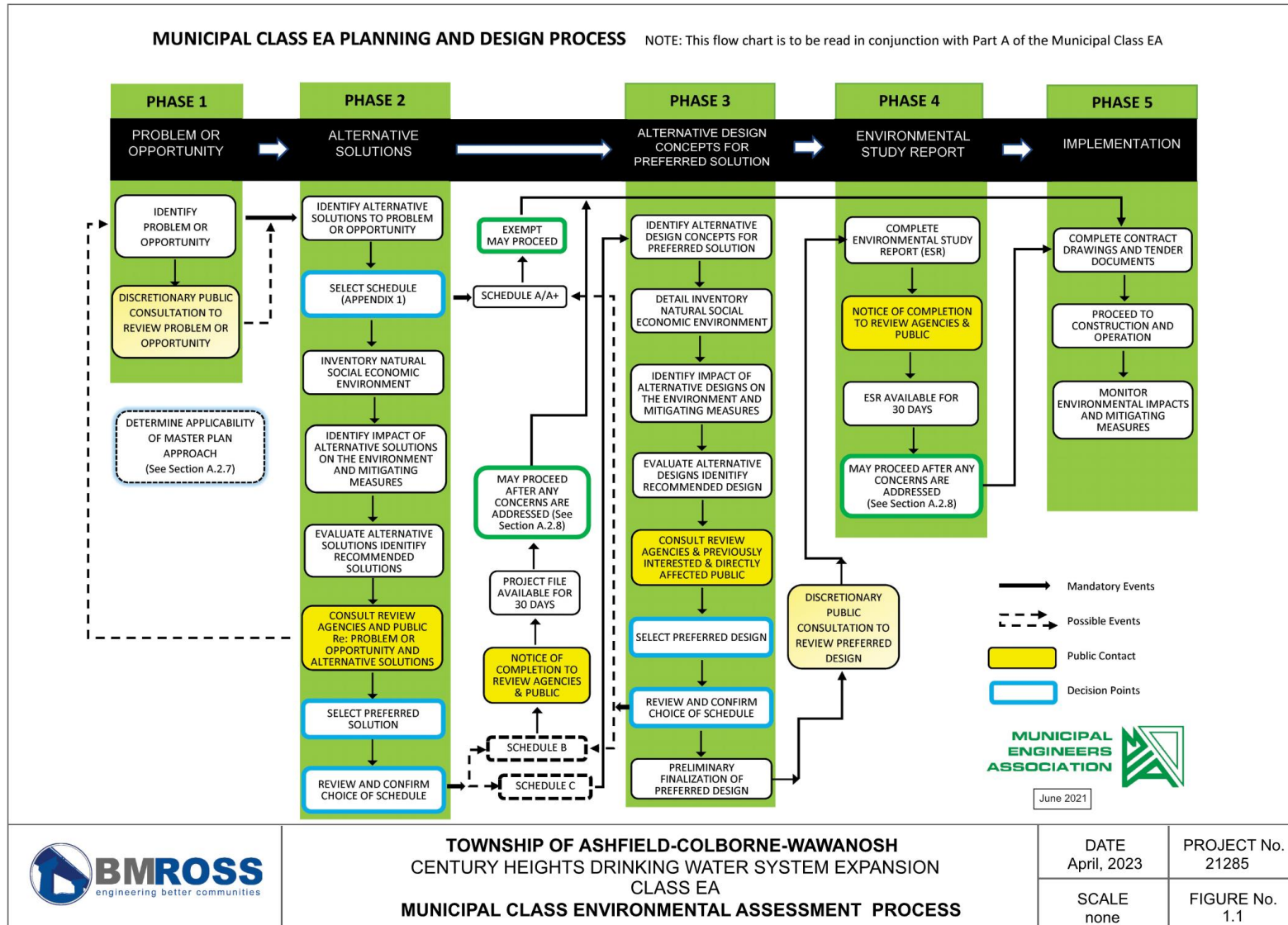
- They are recurring.
- They are usually similar in nature.
- They are usually limited in scale.
- They have a predictable range of environmental effects.
- They are responsive to mitigating measures.

If a MCEA planning process is followed, a proponent does not have to apply for formal approval under the EA Act. The development of this investigation has followed the procedures set out in the MCEA. Figure 1.1 presents a graphical outline of the procedures. The MCEA planning process is divided into the following phases:

- Phase 1 – Problem identification.
- Phase 2 – Evaluation of alternative solutions to the defined problems and selection of the preferred solution.
- Phase 3 – Identification and evaluation of alternative design concepts and selection of a preferred design concept.
- Phase 4 – Preparation and submission of an Environmental Study Report (ESR) for public and government agency review.
- Phase 5 – Implementation of the preferred alternative and monitoring of any impacts.

Throughout the MCEA process, proponents are responsible for having regard for these principles of environmental planning:

**Figure 1.1 Municipal Class Environmental Assessment Process**



- Consultation with affected parties throughout the process.
- Examination of a reasonable range of alternatives.
- Consideration of effects on all aspects of the environment.
- Application of a systematic methodology for evaluating alternatives.
- Clear documentation of the decision-making process to permit traceability.

### **1.3 Classification of Project Schedules**

Projects are classified into different project schedules according to the potential complexity and the degree of environmental impacts that could be associated with the project. The following schedules are included in the MCEA process:

- Exempt and exempt following completion of the archaeological potential screening and/or collector road screening.
- Schedule B – Projects that are approved following the completion of a screening process that incorporates Phase 1 and 2 of the MCEA process as a minimum.
- Schedule C – Projects that are approved subject to following the full MCEA process.

The MCEA process is self-regulating, and municipalities are expected to identify the appropriate level of environmental assessment based upon the project and alternatives they are considering.

### **1.4 Mechanism to Request a Higher Level of Environmental Assessment**

Under the terms of the MCEA, the requirements to prepare an Individual Environmental Assessment for approval is waived. However, if it is found that a project going through the MCEA process has associated with it significant environmental impacts, a person/party may request that the proponent voluntarily elevate the project to a higher level of environmental assessment. A request may be made to the Ministry of Environment, Conservation and Parks (MECP) for an order requiring a higher level of study, or that a condition be imposed on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on Aboriginal and treaty rights. Requests made to the Ministry on other grounds will not be considered.

## **2.0 BACKGROUND REVIEW**

### **2.1 Methodology**

A background review was carried out to obtain a general characterization of the project study area and to identify factors that could influence the selection of alternative solutions to the defined problem.

The background review for this MCEA process incorporated the following activities:

- Assembly of information on the existing infrastructure and the environmental setting.
- Identification of infrastructure deficiencies at the site.
- Preliminary assessment of the defined deficiencies and potential remediation.

A desktop analysis of the project setting was completed as part of the background review process. The following represents the key sources of information for this analysis:

- Huron County GIS Mapping Services (Huron County, 2022).
- Government of Canada, Species at Risk Public Registry website (Government of Canada, 2017).
- Ministry of Natural Resources and Forestry, Natural Heritage Information Centre website (Ministry of Northern Development, Mines, Natural Resources and Forestry, 2017).
- Atlas of Breeding Birds of Ontario website (Bird Studies Canada, 2009).
- Maitland Valley Source Protection Area, Maitland Valley Source Protection Area Assessment Report (Maitland Valley Source Protection Area, 2019).
- County of Huron, Official Plan (OP) and Zoning By-Law.
- Township of Ashfield-Colborne-Wawanosh, Official Plan (OP) and Zoning By-Law.

## **2.2 EA Framework**

### **2.2.1 General MCEA Approach**

The Township of Ashfield-Colborne-Wawanosh initiated a formal MCEA process in March 2022 to investigate the expansion of the Century Heights Drinking Water System in the community of Saltford. It was identified at the outset of the MCEA process that the proposed project may include components which would categorize the work as a Schedule B activity (e.g., establish a well at a new municipal well site, or install new wells or deepen existing wells or increase pump capacity of existing wells at an existing municipal well site where the existing rated yield will be exceeded). The assessment followed the environmental screening process prescribed for Schedule B projects in the MCEA document. The Schedule B screening process incorporates the following primary components:

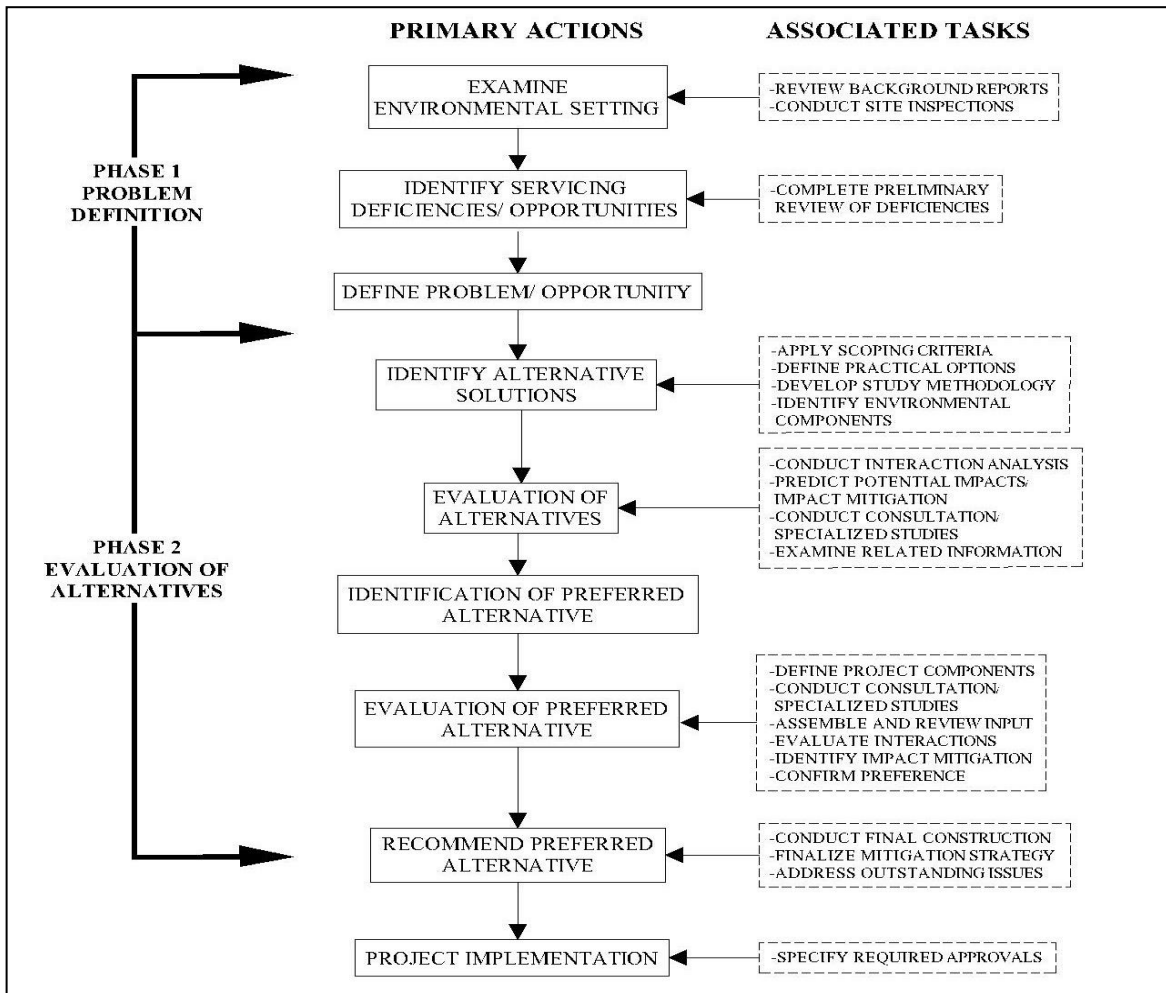
- Background review.
- Problem/opportunity definition.



- Identification of practical solutions.
- Evaluation of alternative solutions.
- Selection of a preferred alternative solution and implementation.

Figure 2.1 illustrates the general tasks associated with the screening process. The following section of this report document the findings associated with each stage of the assessment.

**Figure 2.1 MCEA Process and Tasks for Schedule B Activities**



### 2.3 General Description of the Study Area

The Township of ACW is located within the northwestern portion of the County of Huron. The Township shares a boundary with the Town of Goderich to the south as well as the Municipality of Central Huron. The Municipality of North Huron is located to the east. The northern boundary is shared with the Township of Huron-Kinloss, which is located in Bruce County. To the west of the Township is Lake Huron. The Township is comprised mainly of agricultural lands with a number of small villages and hamlet. These

communities include Saltford, Port Albert, Benmiller, Dungannon and Nile. In 2021, the Township had a population of approximately 5,885 people. The community of Saltford is located at the southwest corner of the Township, bordered by the Maitland River and Goderich to the south and west.

Figure 2.2 illustrates the location of the Township of ACW and Saltford.

## **2.4 Project Study Area Description**

Saltford is a semi-urban community located northeast of Goderich. The Saltford urban area includes properties along Saltford Road (County Road 31), Bisset's Hill, Dunlop Drive, Westmount Line, Maitland Ave, Fern Drive and Colborne Place. There is a large amount of land within Saltford that is planned for future residential development on the west and east sides of Westmount Drive.

The Maitland River is south of Saltford and forms the boundary with Goderich. Moving north from the river, the land rises from approximately 185 m above sea level to 235 m at Westmount Drive. Saltford Road generally runs parallel to the bluff associated with the river valley.

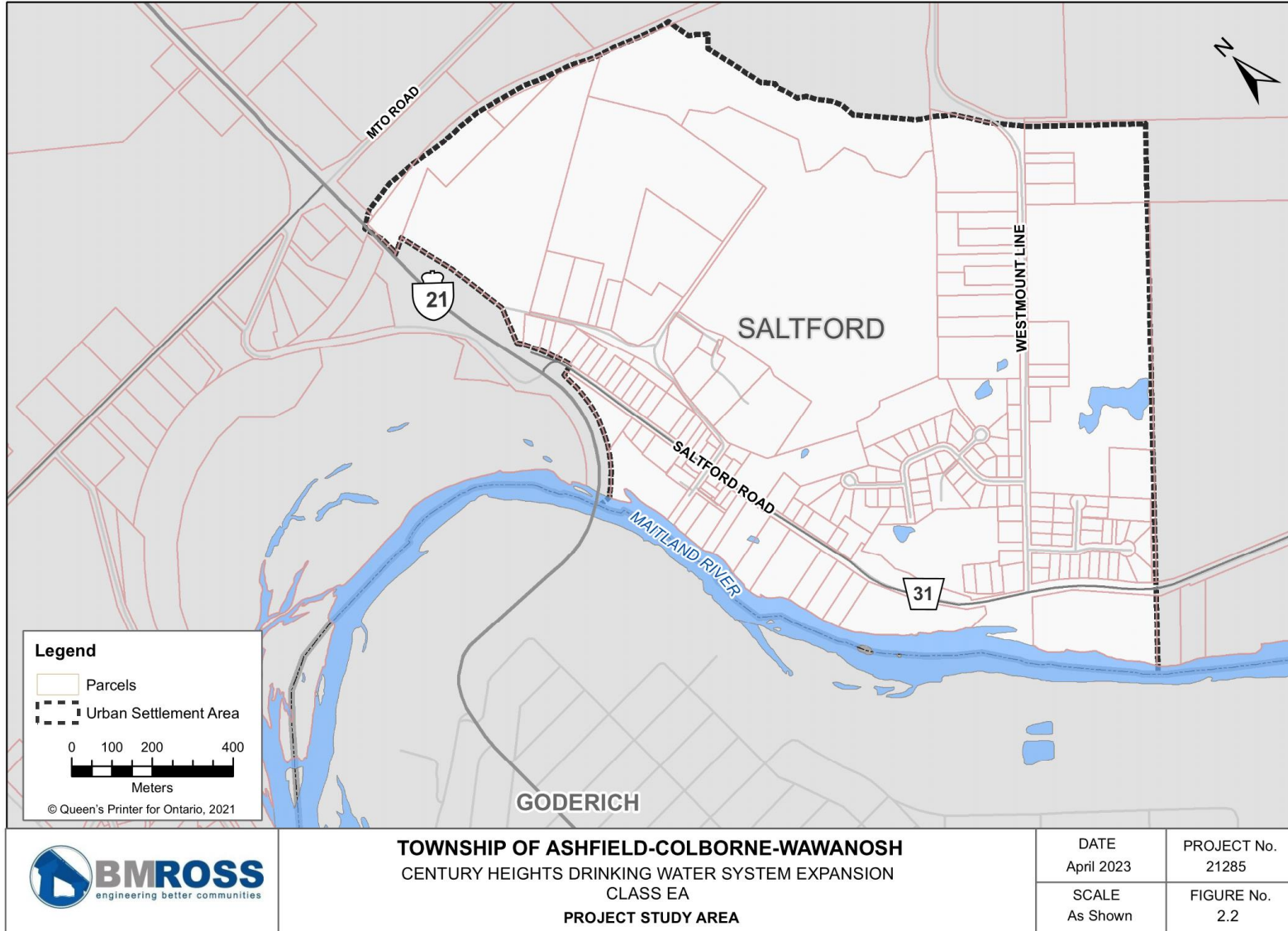
The Century Heights Drinking Water System supplies water to approximately 85 residential houses and 250 residents. The system consists of two 150 mm wells drilled to a depth of 66 metres. Well #1 was installed in 1976 and well #2 in 2005. Both wells are located at a pumphouse at 81270 Pump House Lane. Water from both wells is sourced from bedrock.

## **2.5 Environmental Setting**

### **2.5.1 Significant Natural Areas**

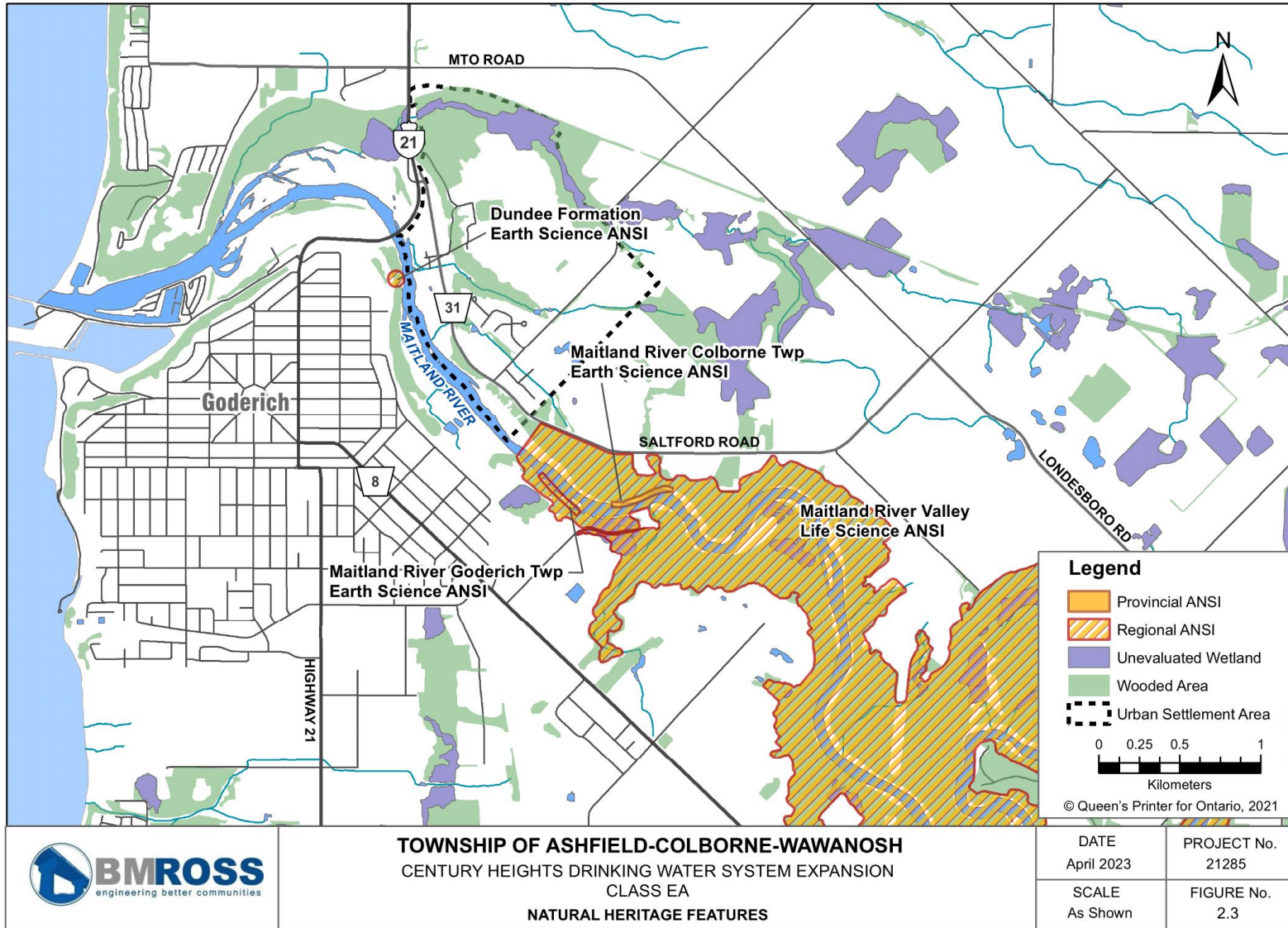
The study area is situated north of Goderich and the Maitland River. A review of sensitive natural heritage features in the vicinity of the project area was carried out through the course of the MCEA process. The Ontario Ministry of Natural Resources and Forestry's (MNR) Natural Heritage Information Centre (NHIC) database was consulted to verify the current status of significant features in the general vicinity of the intersection. From this database, four significant natural areas were identified within a 2 km radius of the site (Ministry of Natural Resources and Forestry, 2021). Figure 2.3 illustrates the natural features located within the vicinity of the site.

**Figure 2.2 General Study Area Location**



**Figure 2.3 Natural Heritage Features in the Vicinity of the Study Area**

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## **2.5.2 Areas of Natural and Scientific Interest (ANSI)**

The MNR has identified significant natural features that are representative of significant terrestrial and geologic features within the landscape, such as wetlands, woodlands and geologic formations. There are four ANSI features located within 2 km of the site including:

- Maitland River Valley is a regionally significant life science ANSI located adjacent to the study area. The Maitland River Valley contains multiple wildlife concentration areas including colonial waterbird nesting areas and provides habitat to aquatic and terrestrial life.
- Dundee Formation is a regionally significant earth science ANSI located 670 metres northwest of the study area.
- Maitland River Goderich Township is a regionally significant earth science ANSI located 1 km southeast of the study area.
- Maitland River Colborne Township is a provincially significant earth science ANSI located 1.4 km southeast of the study area.

## **2.5.3 Aquatic Habitat**

The project study area is located within the Lower Maitland River watershed, which is managed by the Maitland River Conservation Authority (MVCA). The Maitland River is home to many aquatic species at risk including the Black Redhorse, Northern Sunfish, Wavy-rayed Lampmussel and the Rainbow mussel. The Shortnose Cisco, a provincially and federally endangered fish species, is present within Lake Huron and potentially utilizes deep water areas at the mouth of the Maitland River. Impacts to the Maitland River and surrounding aquatic environments will be assessed later during the evaluation of alternatives.

## **2.6 Species at Risk**

A desktop evaluation of the presence of significant species and their associated habitats within the area of the intersection has been incorporated into the project planning process. The protection for species at risk and their associated habitats is directed by the following federal and provincial legislation:

- The Federal Species at Risk Act, 2002 (SARA) provides for the recovery and legal protection of listed wildlife species and associated critical habitats that are extirpated, endangered, threatened or of special concern and secures the necessary actions for their recovery on lands that are federally owned. Only aquatic species and bird species included in the Migratory Bird Convention Act (1994) are legally protected on lands not federally owned; and
- The provincial Endangered Species Act, 2007 (ESA) provides legal protection of endangered and threatened species and their associated habitat in Ontario. Under this legislation, measures to support their recovery are also defined.

A number of sources were consulted for information related to the occurrence of species at risk and their associated habitats. The sources are listed below. A summary of federally and provincially recognized species with the potential to be present within the project study area are listed in Table 2.1.

- Ministry of Natural Resources and Forestry, Species at Risk by Area.
- Natural Heritage Information Centre, Make a Natural Heritage Map.
  - The 1 km NHIC square corresponding with the study area is 17MJ4443 and 17MJ4444.
- Environment Canada, Species at Risk Public Registry. SARA Schedule 1 Species List (Government of Canada, 2017).
- Ontario Reptiles and Amphibian Atlas (Ontario Nature, 2020).
  - The 10 km square corresponding with the study area is Square 17MJ44.
- Ontario Breeding Bird Atlas (Birds Canada, 2001-2005).
  - The 10 km square corresponding with the study area is Square 17MJ44.
- Ontario Butterfly Atlas (Toronto Entomologist Associate, 2018).
  - The 10 km square corresponding with the study area is Square 17MJ44.
- Atlas of the Mammals of Ontario (Federation of Ontario Naturalists, 1994).
- iNaturalist
  - Observations in the Saltford Area

**Table 2.1 Species at Risk Within General Study Area**

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status	Likelihood of Presence or Impact to Habitat
Bird	Bank Swallow	<i>Riparia riparia</i>	Threatened	Threatened	Low
Bird	Barn Swallow	<i>Hirundo rustica</i>	Threatened	Threatened	Low
Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	Threatened	Low
Bird	Canada Warbler	<i>Cardellina canadensis</i>	Threatened	Special Concern	Low
Bird	Chimney Swift	<i>Chaetura pelagica</i>	Threatened	Threatened	Low

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status	Likelihood of Presence or Impact to Habitat
Bird	Common Nighthawk	<i>Chordeiles minor</i>	Threatened	Special Concern	Low
Bird	Eastern Meadowlark	<i>Sturnella magna</i>	Threatened	Threatened	Low
Bird	Eastern Wood-Pewee	<i>Contopus virens</i>	Special Concern	Special Concern	Low
Bird	Grasshopper Sparrow	<i>Ammodramus savannarum pratensis</i>	Special Concern	Special Concern	Low
Bird	Henslow's Sparrow	<i>Ammodramus henslowii</i>	Endangered	Endangered	Potential
Bird	Wood Thrush	<i>Hylocichla mustelina</i>	Threatened	Special Concern	Low
Insect	Monarch	<i>Danaus plexippus</i>	Special Concern	Special Concern	Low
Mammal	Eastern Small-footed Myotis	<i>Myotis leibii</i>	-	Endangered	Low
Mammal	Little Brown Myotis	<i>Myotis lucifugus</i>	Endangered	Endangered	Low
Mammal	Northern Myotis	<i>Myotis septentrionalis</i>	Endangered	Endangered	Low
Mammal	Tri-coloured Bat	<i>Perimyotis subflavus</i>	Endangered	Endangered	Low
Plant	Butternut	<i>Juglans cinerea</i>	Endangered	Endangered	Potential
Plant	Green Dragon	<i>Arisaema dracontium</i>	-	Special Concern	Potential
Plant	Hairy Valerian	<i>Valeriana edulis</i>	-	Threatened	Potential
Plant	Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	Special Concern	Special Concern	Potential



Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status	Likelihood of Presence or Impact to Habitat
Reptile	Eastern Hog-nosed Snake	<i>Heterodon platirhinos</i>	Threatened	Threatened	Low
Reptile	Eastern Milksnake	<i>Lampropeltis triangulum</i>	-	Special Concern	Low
Reptile	Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	Special Concern	Special Concern	Low
Reptile	Midland Painted Turtle	<i>Chrysemys picta marginata</i>	-	Special Concern	Low
Reptile	Northern Map Turtle	<i>Graptemys geographica</i>	Special Concern	Special Concern	Low
Reptile	Queensnake	<i>Regina septemvittata</i>	Endangered	Endangered	Low
Reptile	Snapping Turtle	<i>Chelydra serpentina</i>	Special Concern	Special Concern	Potential

The above table is based on potential habitat and occurrences throughout the general study area. This large area includes a wide variety of environs that include terrestrial and aquatic habitat. The bolded species have been recorded within 1 km of the site. Vegetation removal within forested or open areas and along watercourses could potentially impact species. Impacts to the natural environment will be assessed later during the evaluation of alternatives on a site-specific basis. Depending on the selected option, mitigation measures to avoid or minimize harm may need to be implemented to avoid impacts to the listed species.

## 2.7 Breeding Birds

The Atlas of Breeding Birds of Ontario (2001-2005) was consulted to identify the bird species with confirmed, probable and possible breeding habitat in proximity to the study area. The study area lies within the 100 km<sup>2</sup> area covered in the Atlas as Square 17MJ44, in Region 6: Huron-Perth. Within the square, a total of 51 birds are confirmed to be breeding within the area, including species at risk such as: Canada Warbler, Bank Swallow, Chimney Swift and Barn Swallow. An additional 34 species were categorized as having probable breeding status and 22 are considered to have possible breeding status in the area (Bird Studies Canada, 2009).



The survey area includes key habitat for identified species, such as forest (in all stages of growth), riverine areas, agricultural areas, wetlands and shoreline areas. The project area forms a very small portion of this region and habitat opportunities are limited based on the location of the site. Impacts to breeding birds are not anticipated.

## **2.8 Source Water Protection**

The project study area is located within the Maitland Valley Source Protection Area (Maitland Valley Source Protection Area, 2019). The Saltford area is currently serviced by the Century Heights Drinking Water System that consists of two wells located at a single well site. The project study area is located within Well Head Protection Areas (WHPA) of the existing wells within zones A, B and E. WHPA-A is defined as the 100 metre buffer around the wellhead. WHPA-B is defined as the surrounding area where groundwater could reach the well within 2 years. WHPA-E is applicable when the well is defined as a GUDI well. GUDI wells (groundwater under the direct influence of surface water) are directly impacted by surface water inputs and surface water in this area can reach the well rapidly (within 2 hours). The WHPA-A has a vulnerability score of 10, WHPA-B has a vulnerability score of 6 and WHPA-E has a vulnerability score of 7.2. The project study area is also located within a Significant Groundwater Recharge Area (SGRA) (low vulnerability score). A highly vulnerable aquifer is located northwest of the project study area.

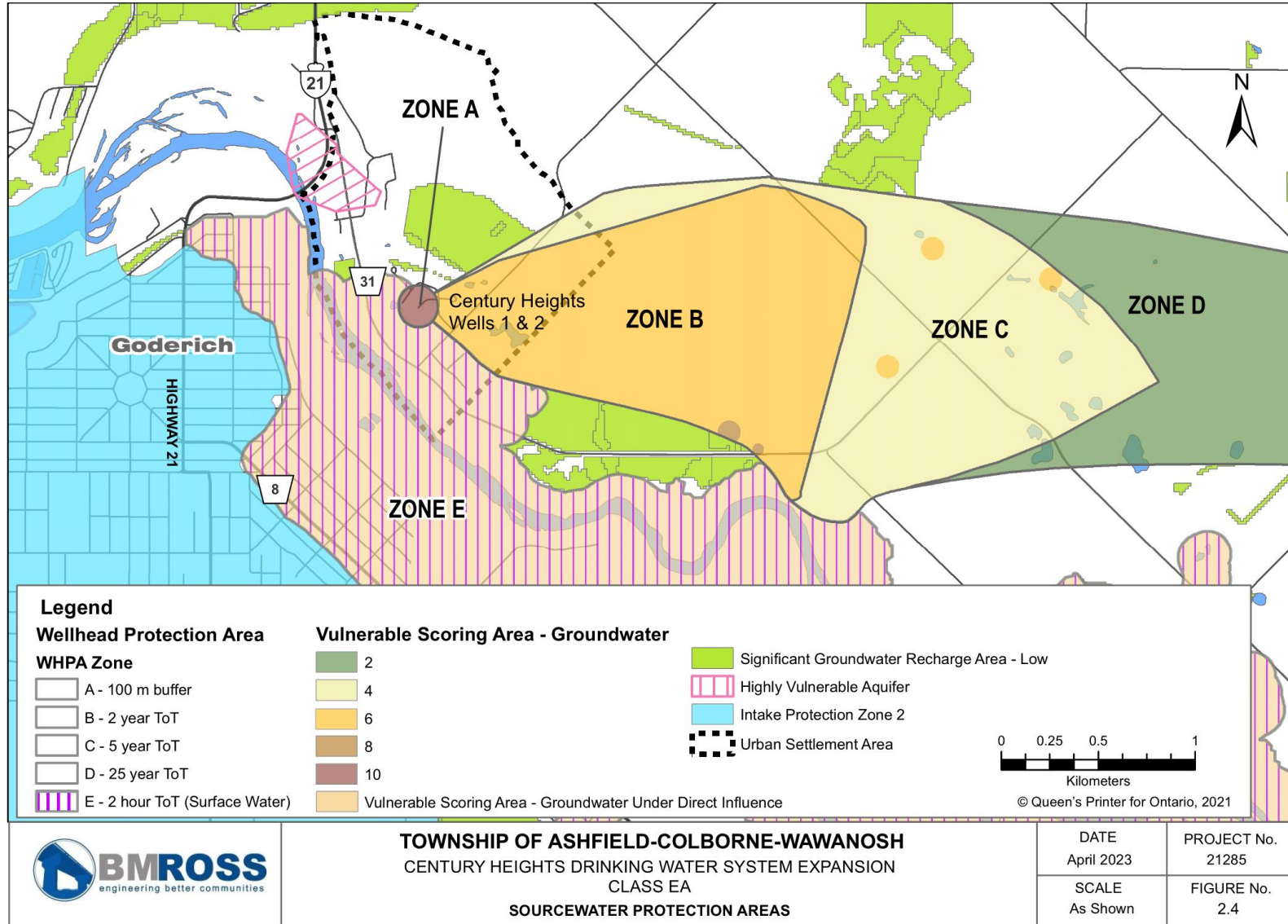
Revisions to existing WHPAs associated with the existing wells may be required depending on the preferred option selected (i.e. supply increases at the existing well sites or new well installation). Consultation and approval from appropriate agencies (MECP, Drinking Water Source Protection Committee) will be required if revisions to the existing WHPA are proposed. Figure 2.4 illustrates the source water protection areas within the project study area.

## **2.9 Climate Change**

As part of the MCEA process, the impacts associated with climate change need to be evaluated. Some of the phenomena associated with climate change that will need to be considered include:

- Changes in frequency, intensity and duration of precipitation, wind and heat events.
- Changes in soil moisture.
- Changes in sea/lake levels.
- Shifts in plant growth and growing seasons.
- Changes in the geographic extent of species ranges and habitat.

Figure 2.4 Source Water Protection Areas in Vicinity of Study Area



There are two approaches that can be utilized to address climate change in project planning. These are as follows:

- I. Climate Change Mitigation – reducing a project’s impact on climate change. Strategies may include:
  - a. Reducing impact of greenhouse gas emissions related to the project.
  - b. Alternative method to completing the project that would reduce adverse contributions to climate change.
- II. Climate Change Adaption – increasing the projects and local ecosystems resilience to climate change. Strategies may include:
  - a. Reducing vulnerability to climate-related severe weather events.
  - b. Alternative methods of carrying out the project that would reduce negative impacts associated with climate change.

Through the evaluation of alternatives of the MCEA process, a consideration of each of these approaches is included and considered in the final determination of the preferred approach to completing a project.

## **2.10 Adjacent Land Uses**

The project study area is composed primarily of semi-urban, residential properties. Other current land uses within the Salford settlement area include agricultural and natural areas. The bluff associated with the river valley is treed and there are agricultural fields to the east and west of Westmount Line. There are two draft approved residential developments for 81316 Westmount Line and 81321 Westmount Line, and it is expected these developments will proceed.

## **2.11 Planning Policies**

### **2.11.1 Provincial Planning Policy**

The Provincial Policy Statement, 2020 (PPS) provides policy direction related to land use planning and development across the province. Local planning policies and land use decisions must conform with the policies of the PPS. The intent of the PPS is to promote the long-term prosperity, environmental health, public safety and social wellbeing through efficient land use and development patterns (Ministry of Municipal Affairs and Housing, 2020).

With respect to municipal infrastructure projects, there are a number of policies within the PPS that need considered. The first section of the PPS identifies policies directing land use to achieve efficient and resilient development and land use patterns. Policy 1.1 outlines the goal of healthy, liveable and safe communities that are sustained by: 1.1 g) necessary infrastructure and public service facilities to meet current and projected needs and i) preparing for the regional and local impacts of a changing climate.

Section 1.6 of the PPS is dedicated to infrastructure and public services facilities. The policies in this section of the PPS promotes the efficient provision of public infrastructure and service facilities that are prepared for the impacts of climate change, and will accommodate future needs. Planned infrastructure is to be financially viable over their life cycle and sufficient to meet existing and future needs. Additionally, per Section 1.6.4, infrastructure should support the effective and efficient delivery of emergency services and ensure the protection of public health and safety.

With respect to sewage, storm and stormwater systems, the PPS promotes the efficient use and optimization of municipal water services (Section 1.6.6.1). They are to be provided in a manner that can be sustained by available water resources, considers the impacts of climate change, are feasible and financially viable and protects human health and safety and the environment. The PPS promotes systems that allow for water conservation and water use efficiency. The PPS supports the intensification and redevelopment of existing municipal water services in settlement areas when required (Section 1.6.6.2).

With respect to water resources, the PPS supports the restriction of development if it will impact municipal drinking water supplies, designated vulnerable areas and sensitive surface water and groundwater features (Section 2.2.1). The implementation of mitigation measures and/or development of alternatives may be required to mitigate impacts. The use of water resources should be done in an efficient and sustainable manner that will conserve water and sustain water quality.

### **2.11.2 Land Use Planning**

The Township of ACW Official Plan (OP) and Zoning By-Law were consulted to determine land use designations within the project study area and related planning policies.

The Official Plan for ACW outlines a number of goals related to community facilities and infrastructure, including: ensuring appropriate and adequate servicing and recognizing infrastructure uses as public and required throughout the Township. Settlement area, including villages, are intended for development with the provision of appropriate and adequate services.

Under the Township of ACW OP, land use designations within the study area include Village, Village with Flood, and Natural Environment. The primary use within villages is single detached dwellings. Natural Environment areas are generally protected against development.

Within the Township of ACW OP, it is stated that public infrastructure, including facilities for water utilities, are permitted in any land use designation but must be located in an area that will provide for community function while minimizing disturbances to adjacent land uses and natural environment.

In the Township of ACW Zoning By-law, it is stated that public services and utilities such as pump stations and watermains can be installed in any land use, as long as the Township is in approval, approval has been obtained through the Environmental Assessment Act and the land has been rezoned to Communication & Utilities (U) Zone. The zoning in the project area includes: Village Residential 1, Open Space, and Future Development.

## **2.12 Cultural Heritage Environment**

An assessment of potential impacts to archaeological resources, built heritage resources and cultural heritage landscapes must be undertaken in conjunction with the MCEA process. To aid in the determination of potential for cultural heritage landscapes and archaeological and built heritage resources, the Ministry of Citizenship and Multiculturalism (MCM) provides screening checklists. The checklists were completed and are included in Appendix A.

### **2.12.1 Archaeological Resources**

The MCM Criteria for Evaluating Archaeological Potential was completed for the potential new well site and is included in Appendix A. The potential for archaeological resources is low based on the outcome of the checklist.

### **2.12.2 Built Heritage Resources**

The project study area does not contain potential cultural heritage value based on the MCM Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes. Therefore, a Cultural Heritage Evaluation Report (CHER) and Heritage Impact Assessment (HIA) are not required. A copy of the MCM Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes can be found in Appendix A.

## **2.13 Air Quality, Dust and Noise**

The study area includes residences, which are considered sensitive receptors. The existing well sites are located within a residential area and are not considered to be an existing source of noise, air quality or dust emissions. The expansion of the Century Heights Drinking Water System is not expected to result in an increase in noise or dust emissions or a decrease in air quality. There may be temporary impacts related to construction, which will be evaluated as part of the evaluation of alternative and potential mitigation measures.

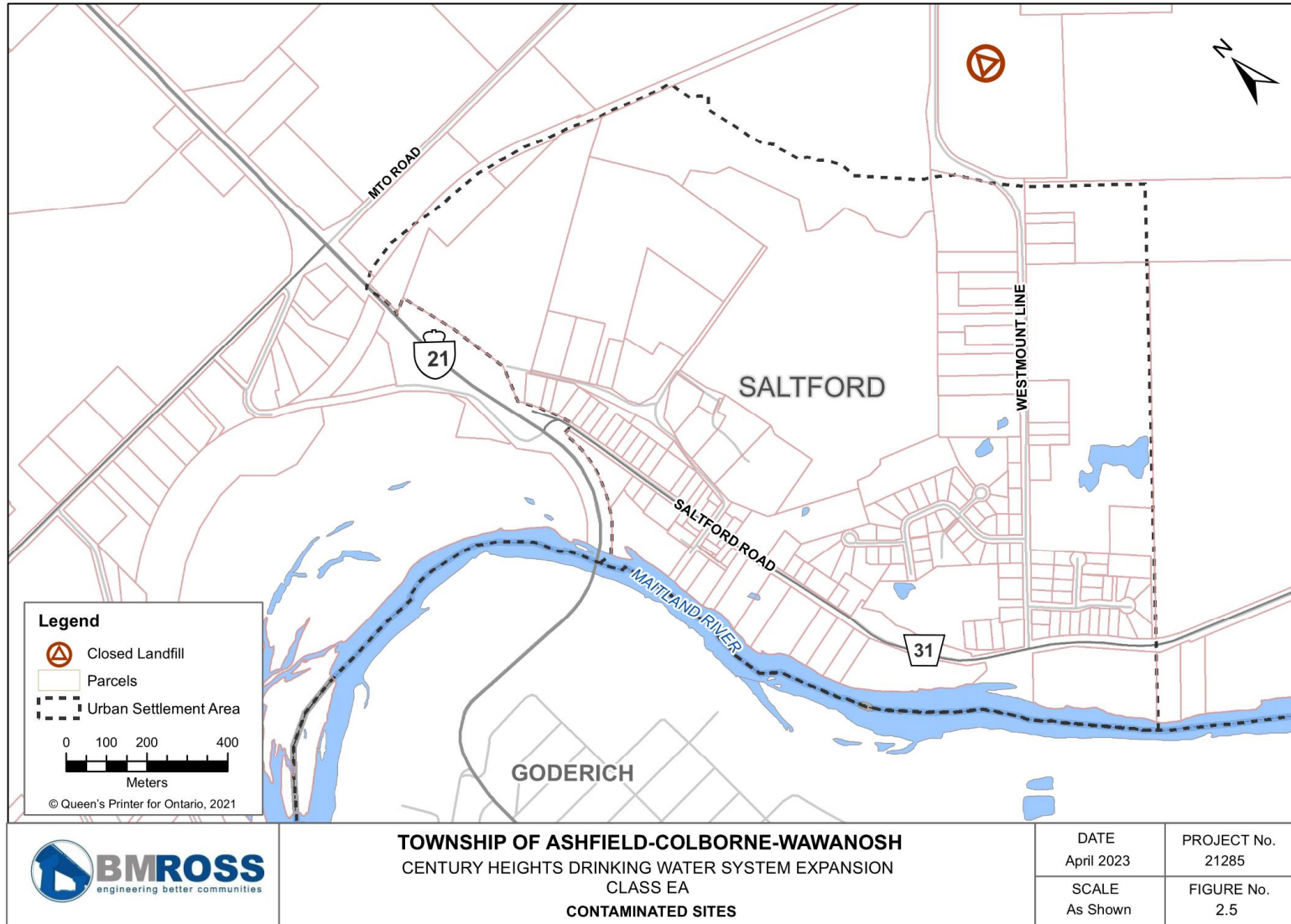
## **2.14 Contaminated Sites**

There is one closed landfill located within 1 km of the study area. The location of the closed landfill is shown in Figure 2.5.

## **2.15 Servicing, Utilities and Facilities**

In the study area, water is provided by Century Heights Drinking Water System as well as by private wells. Sewage servicing is provided by private, on-site sewage systems. Within the study area, electrical service is provided utilizing overhead lines. Internet/cable/telephone services are located within the road allowances in the study area. Natural gas utilities are also located within the road allowances.

Figure 2.5 Contaminated Sites in Vicinity of Study Area



### **3.0 TECHNICAL REVIEW**

#### **3.1 Existing Century Heights Well System**

The existing Century Heights Well System consists of two groundwater supply wells, located at 81270 Pumphouse Lane. Well 1 is 66 m deep and is rated for 4.2 L/s. Well 2 is 86 m deep and rated for 4.3 L/s. Together, the wells provide 8.5 L/s of capacity. The treatment and pumping equipment located at the common wellhouse is similarly rated for 8.5 L/s. The existing Average Day Flow (ADF) and Max Day Flow (MDF) are 104 m<sup>3</sup>/day and 382 m<sup>3</sup>/day respectively.

These wells are considered GUDI. The system is currently not designed to provide fire protection or water storage. The existing system, including wells and distribution system are shown in Figure 3.1. The system currently services approximately 85 customers or 225 people. At this time, the estimated reserve capacity is 15 customers.

#### **3.2 Future Demand**

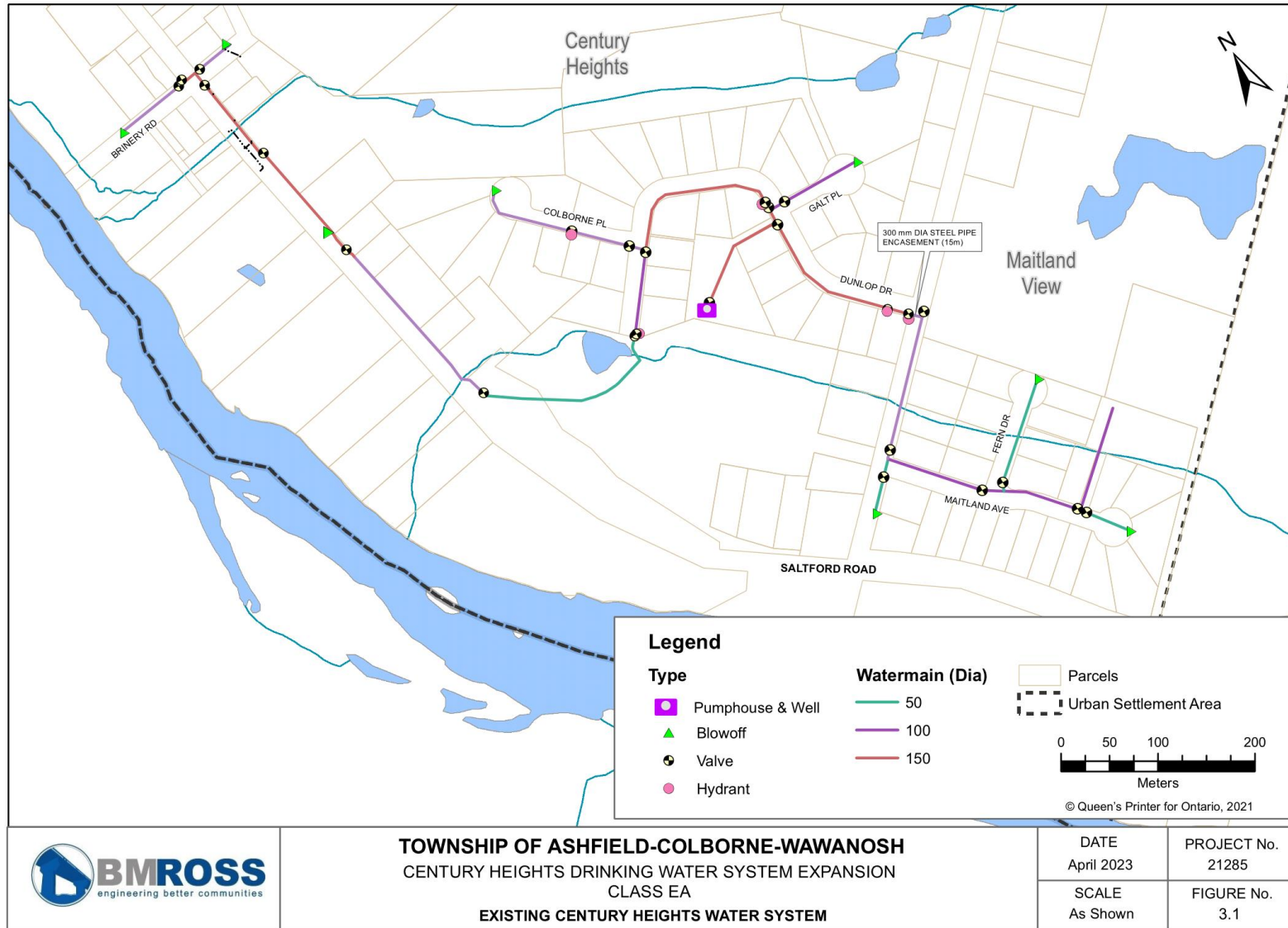
The Township of ACW recently approved two Plans of Subdivision within the study area, equating to 96 additional properties requiring municipal water. Additionally, there are other future development lands with the potential for an additional 60 units. Given this, the anticipated future demand based on available lands for development is an additional 156 customers. At the time of this report, Council directed BMROSS not to consider existing unserviced properties within the study area. It is anticipated that these properties will continue to be serviced by private wells.

Anticipated demands for future development are expected to be similar to existing demands on a per capita basis. The projected maximum day flows to service future growth are 1,084 m<sup>3</sup>/day or 12.5 L/s and the peak day flows are 1,752 m<sup>3</sup>/day or 20.3 L/s.



### Figure 3.1 Existing Century Heights Water System

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## 4.0 MCEA PROCESS

### 4.1 Phase 1 - Identification of the Problem/Opportunity

The first phase of the MCEA process is the identification and definition of the problem or opportunity to be addressed. The problem/opportunity statement is the framework for identifying practical and feasible alternative solutions.

The capacity of the existing Century Heights water system to supply additional customers is limited. It is anticipated that there are approximately 156 future customers within the Saltford settlement area that will require municipal water servicing. Given this, the Municipality has identified the need to investigate options to expand the water supply.

For the purposes of this MCEA, the following problem statement has been identified based on the above-noted needs.

**The Century Heights Drinking Water System does not have sufficient water supply to service anticipated future developments.**

### 4.2 Phase 2 – Identification of Practical Alternatives

The second phase of the MCEA process involves the identification and evaluation of feasible and practical alternative solutions to the defined problem. Once the feasible and practical alternatives are identified, the technical, economic, and environmental impacts associated with implementation of each are evaluated. Mitigation measures that could lessen environmental impacts are also defined. A preferred solution or solutions is then selected.

#### 4.2.1 Initial List of Alternative Solutions

Initially, a long list of alternatives is generated as part of Phase 2 of the MCEA process. These alternatives are evaluated in terms of practicality and feasibility to produce a short list of practical alternatives for a more detailed evaluation and review. The long list of alternatives and their evaluation is summarized in Table 4.1.

**Table 4.1 Long List of Alternative Solutions**

Alternative	Initial Evaluation	Carried Forward for Further Evaluation (Yes or No)
1 - Do Nothing	<ul style="list-style-type: none"><li>• Considered if impacts of other alternatives are too great or cannot be mitigated.</li><li>• Does not address the need for additional supply.</li><li>• Limits future growth opportunities.</li><li>• Will be used as the benchmark for comparison of other alternatives.</li></ul>	Yes – must always be considered – Carry forward as Alternative 1.

Alternative	Initial Evaluation	Carried Forward for Further Evaluation (Yes or No)
2 – Construct a New Well and treatment building	<ul style="list-style-type: none"> <li>• Addresses the need for additional water supply.</li> <li>• Alternative locations can be considered.</li> <li>• Potential to secure sufficient water supply for current and future needs.</li> <li>• Can connect to existing water distribution system.</li> <li>• Will require drilling of test well.</li> <li>• Will change Source Water Protection areas.</li> </ul>	Yes – carry forward for further evaluation.
3 – Expand Existing Well	<ul style="list-style-type: none"> <li>• There is a physical limitation on the repairs that can be done to the existing casing.</li> <li>• Drawdown of existing wells could impact adjacent wells and expose the upper water bearing zones.</li> <li>• Would require major upgrades to existing treatment plant.</li> <li>• Increase in pumping rate could change Source Water Protection areas.</li> </ul>	No – given the limitations of the existing wells, this is not considered practical or feasible.
4 – Connect to Goderich Drinking Water System	<ul style="list-style-type: none"> <li>• Would involve a connection to the Goderich Drinking Water System.</li> <li>• Would have significant capital costs.</li> <li>• Would require watermain crossing the Maitland River.</li> </ul>	No – not considered practical or feasible given the capital costs associated with this option.
5 – Replace groundwater well with surface water (Lake Huron) supply.	<ul style="list-style-type: none"> <li>• Would involve installing a surface water intake in Lake Huron and constructing transmission main to Century Heights.</li> <li>• Would require significant changes to treatment processes.</li> <li>• Significant costs and potential impacts associated with constructing a new surface water intake in Lake Huron.</li> </ul>	No – not considered practical or feasible given capital costs associated with this option.

From the preliminary analysis of the long list of alternatives, there are two alternatives to carry forward for further evaluation:

- Alternative 1 – Do Nothing
- Alternative 2 – Construction of a New Well

Alternatives 3, 4 and 5 are not being carried forward for further investigation. This is primarily because these alternatives are not practical or feasible to implement. Rehabilitation of the existing well (Alternative 3) is not considered practical given the condition of the well and that the small site limits the ability to undertake repairs. Alternatives 4 and 5 would require significant capital expenditure to implement and given the size of the water system and number of users, these alternatives are not considered practical from a fiscal perspective.

The alternatives carried forward for further evaluation are described in additional details in the following subsections.

#### 4.2.2 Alternative 1 – Do Nothing

The Do Nothing would maintain status quo, i.e., the water system would continue to operate as it currently operates. A consequence of this alternative is that future development within Century Heights will be restricted once capacity of the existing wells is reached.

This alternative is carried forward through the MCEA process as it may be implemented should the other alternatives have impacts that are too great (e.g., capital costs) or cannot be sufficiently mitigated.

#### 4.2.3 Alternative 2 – Construction of a New Well and Treatment Building

This alternative involves drilling a new municipal groundwater well to supply the Century Heights water system. In considering this alternative, three potential options for a siting of the new well were identified and further evaluated: the Maitland Well Site (Site 1), a site in the Salford Estates development (Site 2), and a site in the Salford Heights development (Site 3). Site 1 is owned by the Township, whereas the other sites are located on private property. The sites are shown in Figure 4.1.

##### 4.2.3 (a) Comparison of Alternative Sites

There are three sites considered for a new well supply for the Century Heights Drinking Water System: 1) the Maitland well site, 2) a site at the Salford Estates development, and 3) a site at the Salford Heights development. A comparison of the three sites is summarized in Table 4.2.

**Table 4.2 Summary of Comparison of Alternative Well Sites**

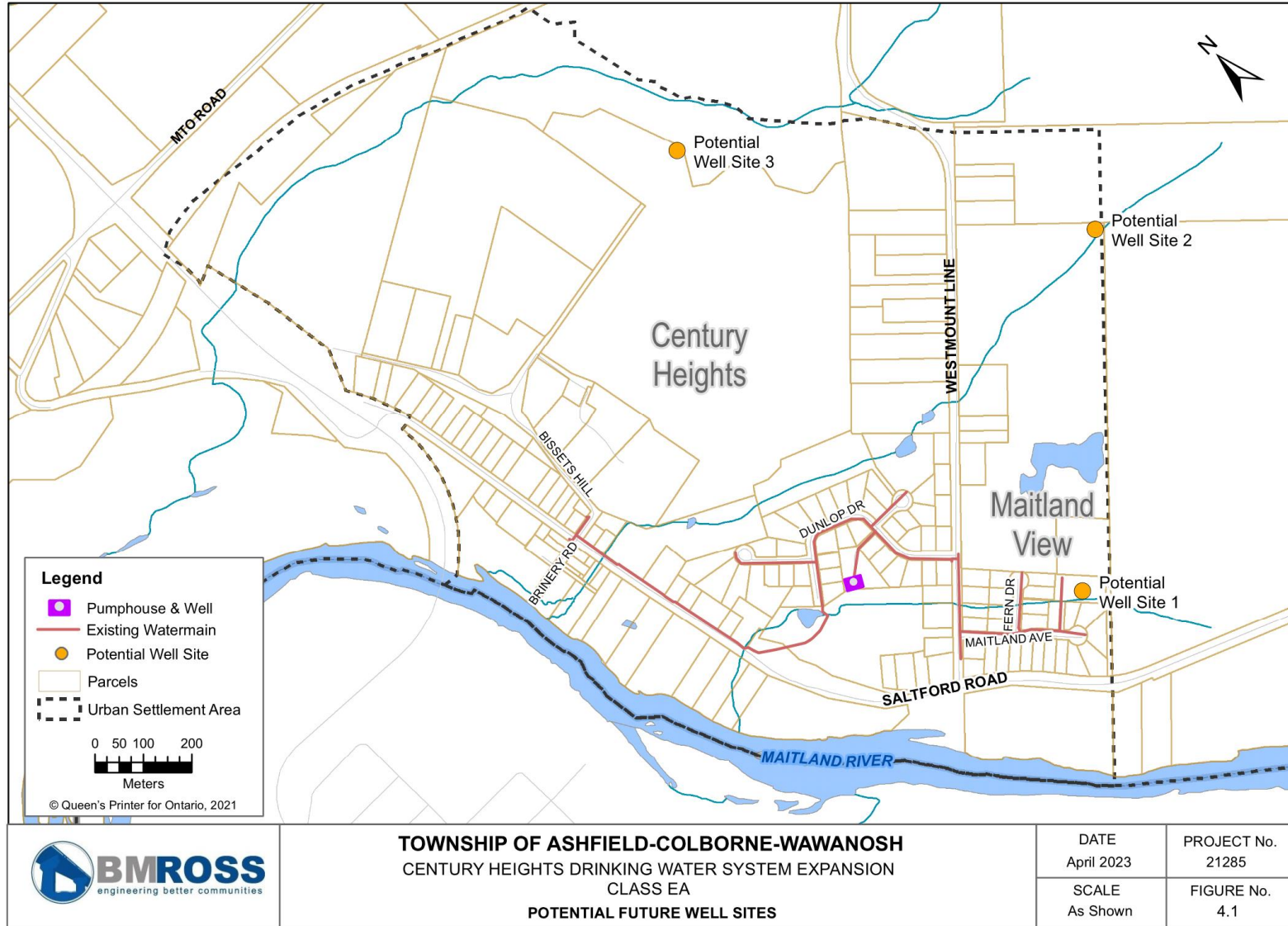
Site	Advantages	Disadvantages
Site 1 – Maitland Well Site	<ul style="list-style-type: none"> <li>Former well at this site (decommissioned in 2008) had capacity ranging from 13 to 22 gpm/ft.</li> <li>Greater potential to secure needed yields.</li> <li>Less impacts to future development areas.</li> </ul>	<ul style="list-style-type: none"> <li>Any properties within 100 m of the well with septic systems will require inspection under Source Water policy.</li> <li>Potential for GUDI conditions.</li> </ul>

Site	Advantages	Disadvantages
	<ul style="list-style-type: none"> <li>• Near a connection point to existing system.</li> <li>• Site is municipally owned.</li> </ul>	<ul style="list-style-type: none"> <li>• May require upgrades to existing watermain to supply development areas.</li> </ul>
Site 2 – Salford Estates	<ul style="list-style-type: none"> <li>• Remote from existing well.</li> <li>• Less potential for GUDI conditions.</li> <li>• Site is at a relatively high elevation.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential yield suspected to decline away from the Maitland River.</li> <li>• Per the Source Protection Policy Plan new lots cannot be established within 100 m of the proposed well – will impact development.</li> <li>• Will require easement/driveway to access site.</li> <li>• Site is privately owned.</li> </ul>
Site 3 – Salford Heights	<ul style="list-style-type: none"> <li>• Less potential for GUDI conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Per the Source Protection Policy Plan new lots cannot be established within 100 m of the proposed well – will impact development.</li> <li>• Potential yield suspected to decline away from the Maitland River.</li> <li>• Will require easement/driveway to access site.</li> <li>• Site is privately owned.</li> <li>• Most remote from existing well/distribution system.</li> </ul>

Based on the evaluation of the advantages and disadvantages of the three sites, Site 1 (the Maitland well site) is preferred. Site 1 is municipally-owned, is advantageous in providing a near-connection point to the treatment and storage facility, is easily accessed and not constrained for space. This site is also expected to have the greatest potential to achieve the required yield. Given this, Site 1 is the only site considered for further evaluation.

### Figure 4.1 Potential Future Well Sites

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The general location and surroundings of Site 1 are shown in Figure 4.2. The area is currently open space, with vegetation mostly limited to grass that is regularly mowed by the Township. The area is currently utilized by local residents as parkland. Given the absence of significant natural features and potential habitat, this site is considered to have low potential for species at risk and a site-specific natural heritage assessment was not undertaken.

**Figure 4.2 Well Site 1 (Maitland Well Site) – Looking West**



### **4.3 Technical Evaluation of Well Site 1**

Following the identification of Site 1 (Maitland Well Site) as the preferred site associated with Alternative 2, a test well was drilled to evaluate the water quality and quantity. The technical evaluation of the test well included a 72-hour pump test. The technical evaluation of Well 3 was completed by Ian D. Wilson Associates Limited and is summarized in the following subsections. The report by Ian D. Wilson Associates Limited is included as Appendix B.

#### **4.3.1 Well 3 Construction Details**

A test well was drilled in September 2022 at 36604 Maitland Avenue (see Figure 4.2), approximately 450 m southeast of the existing Century Heights wells. The test well was constructed to a depth of 76.2 m into the limestone bedrock. The steel well casing

extends from 0.6 m above grade to 35.7 m below grade. A bedrock liner was required in the test well due to unstable bedrock fracturing below 54.3 m.

The well record associated with the test well is A328704.

#### **4.3.2 Well 3 Water Quantity**

Well 3 was pumped for a 72-hour period at a rate of 560 L/min, 700 L/min, and 850 L/min from October 3 to October 6. Water levels in Century Heights Well 1, and four off-site wells were monitored during the pumping test. The following summarizes the findings of the pumping test:

- Final Specific Capacity (L/min/m) = 237.4
- Static Water Level (m below grade) = 35.95
- Final Drawdown (m) = 3.58
- Final Pumping Level (M below grade) = 39.53
- Safe Yield (L/min) = 850

Based on the pumping test, the well is consistent with confined aquifer conditions and is not suspected to be Groundwater Under Direct Influence (GUDI). Additionally, with the depth and character of the overburden, the aquifer is considered locally secure and impacts to local surface water resources are not anticipated. The function of the monitored adjacent wells were also not adversely impacted during the pump test of Well 3. A copy of the report on the pump test is included in Appendix B.

#### **4.3.3 Well 3 – Water Quality**

Water samples were collected throughout the pumping test for water quality testing. The analysis included all parameters included in the Ontario Drinking Water Quality Objectives.

There were no detectable total coliform, E.coli, or fecal coliform found within the samples. The water from Well 3 is considered bacteriologically secure.

Well 3 is moderately hard, with values ranging from 270 mg/L to 210 mg/L. The fluoride level in the water ranged from 2.2 to 2.3 mg/L. This requires notification of the local Medical Officer of Health, but is below the maximum acceptable level of 2.4 mg/L. The elevated fluoride level is a result of the natural conditions in the bedrock aquifer. All other water quality parameters were below the Ontario Drinking Water Quality Standards (ODWQS). The water from Well 3 is also considered distinct in terms of chemical properties from water sourced from the Maitland River.

#### **4.3.4 Wellhead Protection Area Modeling**

Under the Safe Drinking Water Act, municipalities are required to work with source water protection authorities to include changes to municipal drinking water systems (including



new wells) in source protection plans. O. Reg. 205/18 under the Clean Water Act specifies that municipalities are responsible to identify vulnerable areas and vulnerability scores in accordance with the technical rules set out in the Clean Water Act. This information must be shared with the source protection authority so it can provide a confirmation notice necessary when submitting a new or amended Drinking Water Works Permit (DWWP). The regulation also specifies that drinking water cannot be supplied from the new well until the necessary amendments to the source protection plan have been approved.

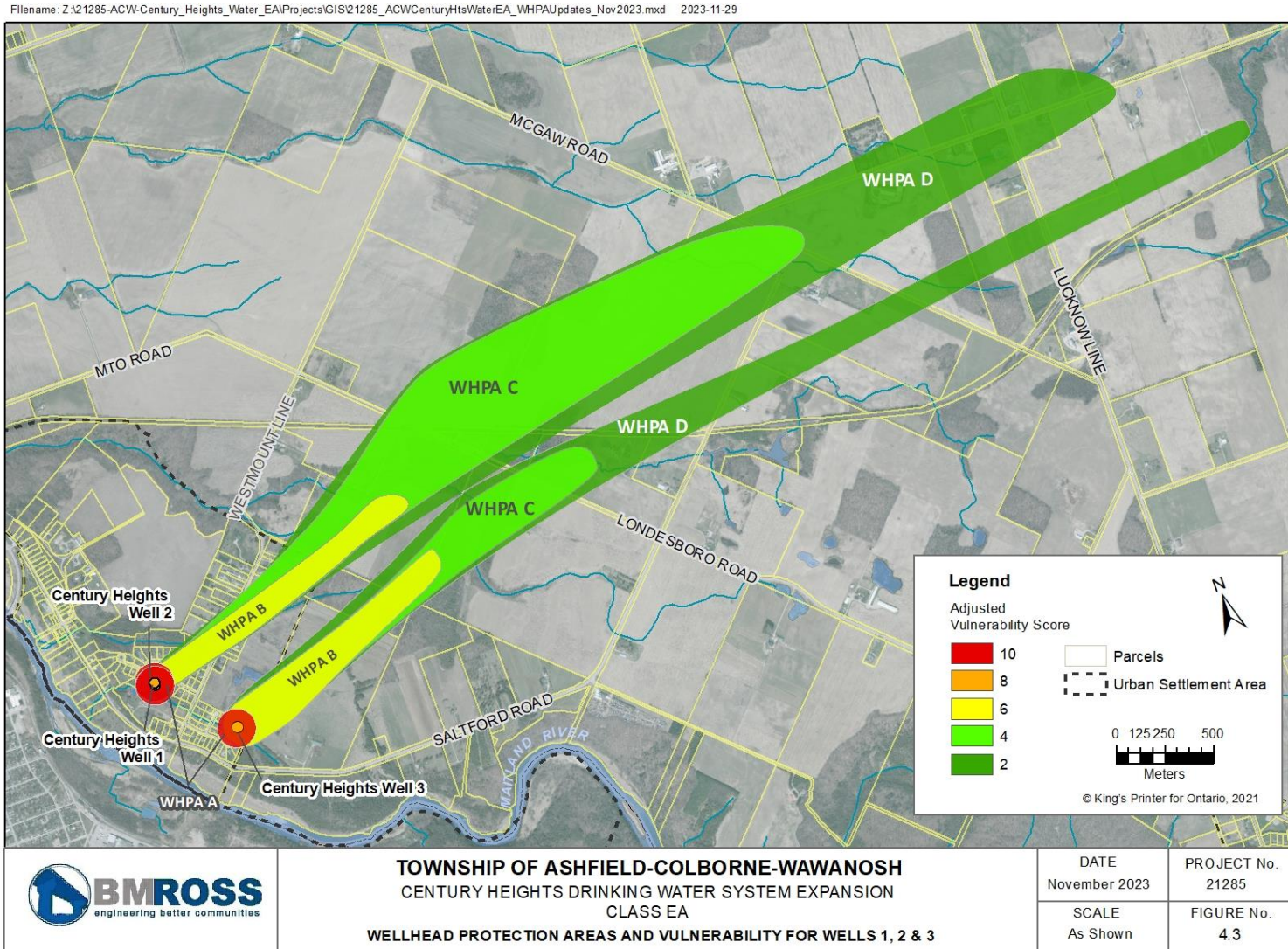
Matrix Engineering was contracted to undertake modeling of the vulnerable areas associated with the Century Height wells. A local-scale groundwater model was developed based on local and regional characterization work previously completed in 2010 by Waterloo Numerical Modelling Corp, as well as current MECP data sets. Vulnerability scoring was based on existing groundwater vulnerability mapping sourced from Maitland Valley Conservation Authority and Ausable Bayfield Conservation Authority.

The local groundwater model developed for this study extended 17 km east of Lake Huron and 10 km in total from north to south. BMROSS provided the projected future pumping rates, anticipating that Well 3 will supply the additional 156 customers and the number of customers supplied by Wells 1 and 2 will be reduced from 85 to 58 (the 27 customers will be serviced by Well 3 instead). It is anticipated that Well 3 will operate independently at a different pressure than Wells 1 and 2, and that pumping from either system will not have to increase to support the other. Given this, the pumping rates utilized in the modeling are: 35 m<sup>3</sup>/day for Well 1, 35 m<sup>3</sup>/day for Well 2, and 147 m<sup>3</sup>/day for Well 3.

Backwards particle tracking was used in the Visual MODFLOW model to identify the 2 year, 5 year and 25 year time of travel areas for the wells, which are the basis for WHPA B, C, and D areas. WHPA A consists of the area within a 100 m radius of the well. The WHPAs were overlain on existing vulnerability mapping to determine the vulnerability scores. The WHPA A areas have a vulnerability score of 10, WHPA B has a score of 6, C has a score of 4 and D has a score of 2. The WHPAs and vulnerability scores are shown in Figure 4.3.

The report regarding the modeling of the WHPAs and vulnerability scores from Matrix Engineering is included as Appendix C.

**Figure 4.3 Wellhead Protection Areas and Vulnerable Scores for Wells 1, 2 and 3**



## **4.4 Evaluation of Alternatives**

Following the identification of practical and feasible alternative solutions, the alternatives are evaluated. The purpose of this is to examine the potential environmental impacts associated with the proposed works and to examine potential mitigation measures for any identified impacts. The evaluation stage generally involved the following activities:

- Evaluation of environmental impacts.
- Preliminary selection of a preferred alternative.
- Consultation with the general public and review agencies.
- Final selection of the preferred alternative.

### **4.4.1 Evaluation Methodology and Procedure**

The evaluation of alternatives was carried out using a comparative assessment methodology, designed to predict the nature and magnitude of environmental impacts resulting from each defined option and to assess the relative merits of the alternative solutions. The evaluation methodology involved the following principal tasks:

- Identification of existing environmental conditions (baseline conditions, inventories).
- Assessment of existing land use activities, infrastructure, natural features, and socioeconomic characteristics.
- Review of proposed alternatives and related works.
- Determination of the level of complexity required to complete the impact assessment.
- Identification of environmental components and subcomponents that may be affected by the defined alternative (i.e., define evaluation criteria).
- Prediction of the environmental impacts (positive, negative) resulting from the construction and operation of the defined options.
- Identification and evaluation of measures to mitigate adverse effects.

Selection of a preferred alternative following a comparative analysis of the relative merits of each option.

### **4.4.2 Environmental Evaluation Methodology**

The second phase of the MCEA process includes the evaluation of impacts associated with the alternative solutions. During the evaluation process, it is necessary to determine what effect or impact the practical alternatives will have on the environment and what measures can be taken to mitigate the impact. The intent of this exercise is to:

- Minimize or avoid adverse environmental effects associated with the project.
- Incorporate environmental factors into the decision-making process.

Under the terms of the EA Act, the environment is divided into five general components:

- Natural environment.
- Social environment.
- Cultural environment.
- Economic environment.
- Technical environment.

Each environmental component can be further subdivided into specific elements that have the potential to be affected by the implementation of a solution. Table 4.4 provides an overview of the preliminary environmental components being considered as part of this investigation.

The environmental effects of each alternative on the specific components are generally determined through an assessment of various impact predictors (i.e., impact criteria). Given the works associated with the alternative solutions, the following key impact criteria were examined during the course of the assessment:

- Nature (direct, indirect or cumulative).
- Magnitude (including the scale, intensity, geographic scope, frequency and duration of potential impacts).
- Technical complexity.
- Mitigation potential (which considers avoidance, compensation and degree of reversibility).
- Public perception.
- Scarcity and uniqueness of affected components.
- Compliance with the applicable regulations and public policy objectives.

**Table 4.3 Environmental Components Being Evaluated**

Environmental Component	Sub-Component
Natural Environment	<ul style="list-style-type: none"> <li>• Significant natural features</li> <li>• Species at Risk</li> <li>• Wildlife</li> <li>• Vegetation</li> <li>• Surface water quality and quantity</li> <li>• Groundwater resources</li> </ul>

<b>Environmental Component</b>	<b>Sub-Component</b>
	<ul style="list-style-type: none"> <li>• Air quality, dust and noise</li> <li>• Physiographic features and soils</li> <li>• Drainage characteristics</li> <li>• Climate change</li> <li>• Excess soil</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Property access</li> <li>• Source Water Protection</li> <li>• Local disruptions</li> <li>• Health and safety</li> <li>• Construction impacts</li> <li>• Future development</li> </ul>
Cultural	<ul style="list-style-type: none"> <li>• Archaeological and cultural heritage resources</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Capital and operating costs</li> </ul>
Technical	<ul style="list-style-type: none"> <li>• Water quality and quantity</li> <li>• Impacts to existing infrastructure</li> <li>• Source Water Protection</li> </ul>

Using the above criteria, the potential impacts of each practical alternative were systematically evaluated. The significance of the potential impacts posed by each alternative were evaluated, considering the anticipated severity of the following:

- Direct changes occurring at the time of project completion.
- Indirect effects following project completion.
- Induced changes resulting from the project.

For the purposes of this MCEA, impact determination criteria developed by Natural Resources Canada have been applied to predict the magnitude of environmental effects resulting from the implementation of the project. Table 4.4 summarizes the impact criteria.

**Table 4.4 Level of Impact Effects and Criteria**

<b>Level of Effect</b>	<b>General Criteria</b>
High	Implementation of the project could threaten sustainability of the feature and should be considered a management concern. Additional remediation, monitoring and research may be required to reduce impact potential.
Moderate	Implementation of the project could result in a resource decline below baseline, but impact levels should stabilize following project completion and into the foreseeable future. Additional management actions may be required for mitigation purposes.
Low	Implementation of the project could have a limited impact upon the resource during the lifespan of the project. Research, monitoring and/or recovery initiatives may be required for mitigation purposes.

Level of Effect	General Criteria
Minimal	Implementation of the project could impact upon the resources during the construction phase of the project but would have negligible impact on the resource during the operation phase.

Given the criteria defined above, the significance of adverse effects is predicted on the following assumptions:

- Impacts from a proposed alternative assessed as having a Moderate or High level of effect on a given feature would be considered significant and;
- Impacts from a proposed alternative assessed as having a Minimal to Low level of effect on a given feature would not be considered significant.

#### 4.5 Environmental Evaluation

The potential interactions between the identified alternatives and environmental features are examined as part of the second phase of the MCEA process. The purpose of this analysis is to determine, in relative terms, the environmental effects of constructing and operating each identified option on the defined environmental component and subcomponents. Table 4.6 summarizes the preliminary evaluation of alternatives. The following symbols are used to indicate:

- Minimal Impact
- ◐ Low Impact
- ◑ Moderate Impact
- High Impact

**Table 4.5 Evaluation of Alternative Solutions**

<b>Component</b>	<b>Alternative 1 – Do Nothing</b>	<b>Alternative 2 – New Supply Well at Maitland Well Site</b>
<b>Natural – Significant Natural features</b>	<ul style="list-style-type: none"> <li>○ No significant natural features within the vicinity of or adjacent to the existing wells.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>○ Well site is in area cleared for parkland and former municipal well site.</li> <li>○ Area is adjacent to Scott’s Point Life ANSI. Drilling of well and operation will not impact the ANSI.</li> <li>○ Site is approximately 230 m north of Maitland River Valley ANSI. Drilling of well and operation are not expected to impact the ANSI.</li> <li>○ Well site is approximately 230 m north of the Maitland River. Pumping and water quality test of well indicated the aquifer is secure and not associated with the river.</li> <li>○ Minimal level of impact.</li> </ul>
<b>Natural – Species at risk</b>	<ul style="list-style-type: none"> <li>○ No change in impacts.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● Site has small footprint within a previously disturbed area (cleared for parkland). No species at risk present at site.</li> <li>● Operation of well not expected to impact any Species at Risk or their habitat.</li> <li>● Low level of impact.</li> </ul>
<b>Natural – Wildlife</b>	<ul style="list-style-type: none"> <li>○ No change in impacts.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>○ Site has small footprint within a previously disturbed area (cleared for parkland).</li> <li>○ Operation of well not expected to impact any wildlife or their habitat.</li> <li>○ Minimal level of impact.</li> </ul>

Component	Alternative 1 – Do Nothing	Alternative 2 – New Supply Well at Maitland Well Site
<b>Natural – Vegetation</b>	<ul style="list-style-type: none"> <li>○ No change in impacts.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● Site has small footprint within a previously disturbed area (cleared for parkland).</li> <li>● Vegetation at site is primarily grass that is regularly mowed.</li> <li>○ Operation or drilling of well is not expected to impact trees or vegetation adjacent to well site.</li> <li>● Low level of impact.</li> </ul>
<b>Natural – Surface water quantity and quality</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>○ Pump test identified low risk to function of local surface water bodies.</li> <li>● Water from well pumping tests will be discharged to adjacent ditch.</li> <li>● Low level of impact.</li> </ul>
<b>Natural – Groundwater quantity and quality</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● Drilling of well has potential to impact water levels in local wells utilizing the same aquifer.</li> <li>● There are 11 reported wells within 500 m of the test well site.</li> <li>● Neighbouring properties were notified of the pumping test and levels in 5 adjacent wells were monitored.</li> <li>● Long-term operation of the well is not expected to impact local aquifer quantity as the pumping test and assessment showed acceptable water level recovery and 10-year water level above the upper water-bearing zone.</li> <li>● Low level of impact.</li> </ul>



Component	Alternative 1 – Do Nothing	Alternative 2 – New Supply Well at Maitland Well Site
<b>Natural – Air quality, dust and noise</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Drilling of well will increase noise locally during drilling activities.</li> <li>☉ Normal operation of well not expected to create additional noise, dust or air quality impacts.</li> <li>☉ A diesel generator will be installed at site for use emergency power outages. No new impacts associated with back up generator.</li> <li>☉ Low level of impact.</li> </ul>
<b>Natural - Physiographic features and soils</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Soil and materials excavated during drilling will be disposed of appropriately.</li> <li>☉ Operation of well not expected to have any impacts on physiographic features or soil conditions.</li> <li>☉ Low level of impact.</li> </ul>
<b>Natural – Drainage characteristics</b>	<ul style="list-style-type: none"> <li>○ No change in current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Not expected to impact or change local drainage characteristics.</li> <li>☉ Low level of impact.</li> </ul>
<b>Natural – Climate change</b>	<ul style="list-style-type: none"> <li>○ No change to current conditions.</li> <li>☉ Back up diesel generator will be utilized during emergency power outages.</li> <li>☉ Low level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Construction will require heavy equipment that will release Greenhouse Gases (GHG) as emissions. Impacts related to construction may be reduced through equipment and materials selection.</li> <li>☉ Back up diesel generator will be utilized during emergency power outages.</li> <li>☉ Low level of impact.</li> </ul>
<b>Natural – Excess soil</b>	<ul style="list-style-type: none"> <li>○ No change to current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Excess soil from construction of well and treatment building will be disposed of in accordance with O.Reg 406/19. Excess soil is not expected to be contaminated.</li> <li>☉ Low level of impact.</li> </ul>

Component	Alternative 1 – Do Nothing	Alternative 2 – New Supply Well at Maitland Well Site
<b>Social – property access</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● Portion of the site will be closed for public access during construction of the well and treatment building.</li> <li>● Once construction is complete, site will have full public access restored.</li> <li>● Low level of impact.</li> </ul>
<b>Social – Source Water Protection</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● New well will have new WHPA areas.</li> <li>● Residents within WHPA A or WHPA B with vulnerability score of 10 will be required to have their septic systems inspected on a 5-year basis.</li> <li>● No new lots serviced by septic systems will be permitted within highly vulnerable area around well.</li> <li>● Residents will be impacted by Source Protection policies in WHPAs around new well.</li> <li>● Moderate level of impact.</li> </ul>
<b>Social – local disruptions</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● Construction of treatment building will result in temporary noise and construction disruptions for adjacent property owners.</li> <li>● Public access will be restricted during construction of the treatment building.</li> <li>● Moderate level of impact.</li> </ul>
<b>Social – health and safety</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● Will provide a secure water supply. Pump test identified sufficient water supply at site.</li> <li>● Water quality similar to existing well.</li> <li>● Low level of impact.</li> </ul>

Component	Alternative 1 – Do Nothing	Alternative 2 – New Supply Well at Maitland Well Site
<b>Social – future development</b>	<ul style="list-style-type: none"> <li>● Opportunity for future residential development will be restricted under this scenario due to limited capacity in existing wells.</li> <li>● High level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>○ Will provide a secure water supply. Pump test identified sufficient water supply at site.</li> <li>○ Water quality similar to existing well.</li> <li>○ Minimal level of impact.</li> </ul>
<b>Cultural – Archaeological and cultural heritage resources</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Checklist indicated low potential for cultural heritage landscape and built heritage resources.</li> <li>☉ Low level of impact.</li> </ul>
<b>Economic – capital cost and operating costs</b>	<ul style="list-style-type: none"> <li>○ No capital costs associated with this alternative.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>○ No additional land acquisition required.</li> <li>● Preliminary probable cost for new well is: \$105,000 + HST. There will be additional costs associated with construction of a wellhouse building.</li> <li>☉ Expected to be paid through existing rates, reserves and development charges. Minimal costs expected to be attributed to existing residents.</li> <li>☉ Similar operating costs to existing well.</li> <li>● Moderate level of impact.</li> </ul>
<b>Technical – water quality and quantity</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Water quality and quantity are similar to existing well (see Section 4.3).</li> <li>☉ Test well showed non-GUDI conditions and sufficient water quantity to meet anticipated needs.</li> <li>☉ Low level of impact.</li> </ul>
<b>Technical – impacts to existing infrastructure</b>	<ul style="list-style-type: none"> <li>● Limited redundancy in system</li> <li>● Moderate level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>☉ Will result in increased redundancy for the system. Beneficial if repairs or rehabilitation of other wells is required in the future.</li> <li>☉ Low level of impact.</li> </ul>

Component	Alternative 1 – Do Nothing	Alternative 2 – New Supply Well at Maitland Well Site
<b>Technical – Source Water Protection</b>	<ul style="list-style-type: none"> <li>○ No change from current conditions.</li> <li>○ Minimal level of impact.</li> </ul>	<ul style="list-style-type: none"> <li>● Requires modeling of new WHPAs and determination of vulnerability scores.</li> <li>● Moderate level of impact.</li> </ul>

## **4.6 Evaluation Summary**

The evaluation completed in the previous section identified the potential impacts associated with the two alternative solutions. The evaluation process included a consideration of natural, social, economic, cultural and technical criteria.

The Do Nothing alternative (Alternative 1) has minimal impacts associated with the natural environment and is the most economical option, as there are no capital costs associated with it. This alternative does not address the need for additional supply capacity to service approved future development. Given that this alternative does not address the identified problem/opportunity, it should only be considered should the other alternatives be considered completely unfeasible.

The second alternative is the installation of a new well (Well 3) at the site of the former Maitland well site. From an environmental perspective, the impacts of a new well are expected to be minimal, as the site is already cleared and has previously been used for municipal infrastructure. The installation of a new well will have temporary impacts related to noise and limited public access to the site. The new well will require the construction of a treatment building. A new well at this site will result in new WHPAs, which will encompass different property owners compared to the WHPAs associated with the existing well. The estimated capital costs associated with this alternative are: \$105,000 + HST. Additional costs will be associated with construction of the wellhouse building.

## **4.7 Selection of Preferred Alternative**

From the evaluation of alternatives, a preferred solution was identified. The installation of a new supply well at the Maitland well site is considered the preferred alternative. Expansion of the existing wells is not considered practical or feasible alternatives, given the physical limitations of the wells and associated aquifer. The installation of a new well at the Maitland well site makes use of a public site with good access to the existing water distribution system. Drilling a new well at the treatment site will also allow for continued operation of the existing wells while the new well is constructed and minimal interruptions to supply.

The alternatives considered and preferred solution were presented to the public at a Public Information Centre (PIC) to obtain feedback and input.

During consultation with adjacent property owners, stakeholders and the public, concerns and questions were raised regarding continued use of the proposed site as parkland, location of the test well, and impacts related to source water protection.

This option does not require any purchasing of private land to accommodate the new well and associated infrastructure. This significantly reduces the economic impacts associated with this option.

## 5.0 CONSULTATION PROGRAM

### 5.1 General

Consultation is an integral component of the MCEA process. Consultation allows for an exchange of information which assists the proponent in making informed decisions during the evaluation of alternative solutions. During Phases 1 and 2 of the study process, consultation was undertaken to obtain input from the general public, review agencies, and stakeholders that might have an interest in the project.

The components of the consultation program employed during the initial MCEA study are summarized in this section of the Screening Report and documented in Appendix D.

### 5.2 Initial Notice

Contents: General study area description, summary of proposed works

Issued: March 9, 2022

Placed in: Goderich Signal Star, ACW website

Circulated to: 129 adjacent property owners, 8 review agencies

Input period: April 8, 2022

Comments received from the public as a result of the Notice are include within Table 5.1.

**Table 5.1 Summary of Initial Public Comments**

Member of Public	Comments	Action/Response
Property Owner March 16, 2022 (via email)	- Requested further information regarding the project and Class EA process.	- Provided an overview of the project and Class EA process.
Eight Property Owners March 28, 2022 (via email)	- Inquired if adjacent properties to the proposed subdivisions would be required to connect to municipal well or water systems. If so, they request that associated costs be charged to the subdivision developers. - Requested information regarding impacts from the installation of new septic systems, groundwater, drainage and stormwater management once MVCA has peer reviewed plans. - Requested additional information regarding recommended best practices to protect and manage SGRA.	- Provision of municipal water to the proposed developments associated is being considered as part of this EA. - Comments shared with County Planning Department.
Five property owners April 4, 2022	- Requested information regarding impacts from the installation of new septic systems, groundwater, drainage and stormwater	- Provision of municipal water to the proposed

<b>Member of Public</b>	<b>Comments</b>	<b>Action/Response</b>
(via email)	<p>management once MVCA has peer reviewed plans.</p> <ul style="list-style-type: none"> <li>- Requested additional information regarding recommended best practices to protect and manage SGRA.</li> <li>- Requested that written communication stating that existing property owners will not be required to connect to any municipal well or water system as a result of the proposed and future development to retain quality and autonomy of existing wells. States that some wells have been installed recently (within the last 2 years). If they are required to connect to the municipal well or water system, they request that associated cost be charged to the subdivision developer.</li> <li>- Requested that written communication stating that appropriate and effective mitigation of stormwater and drainage infrastructure is installed to prevent potential flooding into adjacent properties, especially where a swale existing adjacent to 81280 Westmount Line and 81286 Westmount Line.</li> <li>- Requested that written communication stating that groundwater vulnerable scores will be updated to ensure that they remain in a safe range as a result of the increased water intake from the proposed development.</li> <li>- Requested a more in-depth study be completed at the gravel pit site to determine impacts to wildlife species including species at risk, natural habitats, and microhabitats.</li> <li>- Inquired how the gravel pit contributes to the existing groundwater and drainage issues within the field located behind the existing houses or the location of the proposed new subdivision.</li> <li>- Inquires if this study considers the proposed 66 detached residential subdivision west of Westmount Line and the 25-30 home subdivision on the east side of Westmount Line.</li> </ul>	<p>developments associated is being considered as part of this EA.</p> <ul style="list-style-type: none"> <li>- Comments shared with County Planning Department.</li> </ul>
Property Owner March 15, 2022 (via email)	<ul style="list-style-type: none"> <li>- Inquired how it is determined that there is sufficient water to expand the system.</li> <li>- Inquired if costs associated with the proposed expansion will be apportioned to the existing users.</li> </ul>	<ul style="list-style-type: none"> <li>- Will be examining capacity of existing wells and forecasting future demands. A digital model will also be</li> </ul>

Member of Public	Comments	Action/Response
		<p>examined to look at pressures and flows.</p> <ul style="list-style-type: none"> <li>- If components of the expansion benefit existing users, there may be costs apportioned to users. These costs may be paid from existing reserves or rates.</li> </ul>
<p>Property Owner, March 30, 2022 (via email)</p>	<ul style="list-style-type: none"> <li>- Asked if the project will result in an expense to those already on the water system.</li> </ul>	<ul style="list-style-type: none"> <li>- At this time it is not known if the expansion will include any upgrades or improvements that would benefit the existing users. If an upgrade or improvement that benefits existing users, often those costs are paid through reserves or user fees.</li> </ul>

### 5.3 Government Review Agencies

Input into the MCEA process was solicited from government review agencies by way of email correspondence. Agencies that might have an interest in the project were initially sent a letter describing the nature of the project and a copy of the Notice of Study Commencement. Appendix D contains a copy of the information circulated to the review agencies and a list of the agencies requested to comment on the project. Formal written correspondence from the agencies is also provided. A summary of the comments received can be found in Table 5.2.

**Table 5.2 Summary of Review Agency Comments**

Review Agency	Comments	Action Taken
<p>Patrick Huber-Kidby, MVCA March 16, 2022 (via email)</p>	<ul style="list-style-type: none"> <li>• Offered to provide mapping related to regulated areas around Saltford.</li> <li>• Acknowledged that a Hydrogeological investigation is being completed by Ian D. Wilson &amp; Associates Limited.</li> </ul>	<ul style="list-style-type: none"> <li>• Information noted and filed.</li> </ul>



<b>Review Agency</b>	<b>Comments</b>	<b>Action Taken</b>
	<ul style="list-style-type: none"> <li>No further comment at this time but look forward to discussing details of the project.</li> </ul>	
<p>Joseph Harvey, Heritage Planner, MHSTCI April 1, 2022 (via email)</p>	<ul style="list-style-type: none"> <li>Stated that under the Class EA process, impacts from project on known and potential cultural heritage resources need to be identified.</li> <li>Provided screening checklists to identify the potential for archaeological resources, built heritage resources and cultural heritage landscapes within the project site.</li> <li>Engagement with Indigenous communities about potential cultural heritage resources of value to them is required.</li> <li>Recommendations from technical cultural heritage studies need to be addressed and incorporated into the project.</li> <li>Provide all technical cultural heritage studies to the MHSTCI before issuing a Notice of Completion or commencing work on the site.</li> </ul>	<ul style="list-style-type: none"> <li>Information noted and filed.</li> </ul>
<p>Mark Badali, Regional Environmental Planner – Southwest Region, MECP March 30, 2022 (via email)</p>	<ul style="list-style-type: none"> <li>Acknowledged that the ACW is following the approved environmental planning process for a Schedule B project under the Municipal Class EA.</li> <li>Attached an “Area of Interest” document that provides guidance from the Ministry regarding the Class EA process. All areas of interest are required to be addressed during the process.</li> <li>Consultation with Aboriginal communities is required during the MCEA process. Resources are attached regarding steps required during Aboriginal consultation.</li> <li>Stated that the Director of Environmental Assessment Branch must be contacted under circumstances stated in the letter.</li> <li>Stated that a draft report must be sent directly to contact prior to filing of a final report. A copy of the final notice needs to be sent to the Ministry’s Southwest Region EA notification email address after the draft report has been reviewed and finalized.</li> </ul>	<ul style="list-style-type: none"> <li>Information noted and filed.</li> </ul>

Review Agency	Comments	Action Taken
<p>Karina Černiavskaja, District Planner, NDMNRF March 11, 2022 (via email)</p>	<ul style="list-style-type: none"> <li>• Stated that screening for natural heritage or other resource values for this project was not completed.</li> <li>• Provided information regarding: Natural Heritage and Endangered Species Act, Petroleum Wells and Oil, Gas and Salt Resources Act, Public Lands Act and Lakes and Rivers Improvement Act</li> </ul>	<ul style="list-style-type: none"> <li>• Information noted and filed.</li> </ul>
<p>Donna Clarkson, Co-DWSP Program Supervisor, August 24, 2022 (via telephone)</p>	<ul style="list-style-type: none"> <li>• Discussed modeling of future WHPA. Donna provided information regarding former Maitland View Estate well.</li> </ul>	<ul style="list-style-type: none"> <li>• Information noted and filed.</li> </ul>
<p>Mark Badali, Regional Environmental Planner – Southwest Region, MECP January 12, 2024 (via email)</p>	<ul style="list-style-type: none"> <li>• Provided the following comments on the draft Screening Report:</li> <li>• Add names of Appendix A-D in the Table of Contents.</li> <li>• Include “Groundwater resources” in Table 4.5</li> <li>• Ensure Notice of Completion is published in 2 separate issues of same newspaper in order to meet mandatory minimum requirements.</li> <li>• Continue to engage with Indigenous communities.</li> <li>• Suggested additional assessment work may be warranted to evaluated GUDI status of Well 3.</li> <li>• A Permit to take Water will be required prior to the well being put into service.</li> <li>• The report should identify potential threats to drinking water associated with project work.</li> <li>• Proponent should determine is other types of drinking water systems could be affected during construction or operation of Well 3.</li> <li>• Provided information on regulatory requirements under Safe Drinking Water Act and Clean Water Act.</li> <li>• Not clear whether any natural heritage site assessment was completed for the site.</li> <li>• Please include comments in project documentation.</li> </ul>	<ul style="list-style-type: none"> <li>• Response provided to MECP staff, dated January 25, 2024.</li> <li>• Report updated to address comments.</li> <li>• Township will undertake a further desktop assessment by a hydrogeologist regarding Well 3’s GUDI status.</li> </ul>

Throughout the EA process, BMROSS staff were in contact with local Source Water Protection staff, regarding the review of WHPA modeling efforts and report. Comments were received from Source Water Protection staff on the draft WHPA delineation and vulnerability scoring report and incorporated into the final report (see Appendix C).

## 5.4 Aboriginal Consultation

### 5.4.1 Aboriginal Consultation Process

The Crown has a duty to consult with First Nation and Métis communities if there is a potential to impact on Aboriginal or treaty rights. This requirement is delegated to project proponents as part of the MCEA process, therefore, the project proponent has a responsibility to conduct adequate and thorough consultation with Aboriginal communities as part of the MCEA consultation process.

### 5.4.2 Background Review

In order to identify Aboriginal Communities potentially impacted by the project the Aboriginal and Treaty Rights Information System (ATRIS) was consulted. A search was conducted for Aboriginal Communities, including their traditional territories that would lie within a 50 km radius of the project study area. Utilizing this process and feedback received from the MECP, eleven aboriginal communities/organizations were identified in conjunction with this project including: Chippewas of Kettle and Stony Point First Nations, Chippewas of Nawash Unceded First Nation, Chippewas of Saugeen First Nation, Saugeen Ojibway Nation (SON), Aamjiwnaang First Nations, Chippewas of the Thames First Nations, Oneida Nation of the Thames, Métis Nation of Ontario, Walpole Island First Nation (Bkejwanong Territory), Great Lakes Métis Council, and Historic Saugeen Métis. Correspondence was subsequently forwarded to each community/ organization detailing the proposed project and asking for input.

### 5.4.3 Aboriginal Consultation Log

A response to the initial letter and Notice of Study Commencement was received from the Chippewas of the Thames First Nation. All the First Nation and Métis communities identified were circulated a copy of the Notice of Commencement in addition to a letter outlining the project. A summary of the comments received are included below in Table 5.3.

**Table 5.3 Summary of First Nation and Métis Community Comments**

To	From	Comments	Action Taken/Response
SON Environmental Office (via email) – Emily Martin and Juanita Meekins, March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope, and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response</li> </ul>

<b>To</b>	<b>From</b>	<b>Comments</b>	<b>Action Taken/Response</b>
Chief Anoquot, Chippewas of Saugeen First Nation (via email), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response</li> </ul>
Chief Nadjiwon, Chippewas of Nawash Unceded First Nation (via email), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response.</li> </ul>
Chief Jason Henry (cc: Valeria George) Chippewas of Kettle and Stony Point First Nation (via email), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response.</li> </ul>
Aamjiwnaang First Nation Administration Office (via email), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response.</li> </ul>
Walpole Island First Nation, Bkejwanong Territory (via email), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response.</li> </ul>
Oneida of the Thames (via email)	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response.</li> </ul>
Great Lakes Métis Council (via email), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response.</li> </ul>
Historic Saugeen Métis (HSM) (via email), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response</li> </ul>
Chippewas of the Thames First Nation (via NationsConnect.ca), March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• Response received April 6, 2022</li> </ul>
Métis Nation of Ontario (via email) – March 9, 2022	BMROSS	<ul style="list-style-type: none"> <li>• Provided letter outlining project scope and map of project area.</li> </ul>	<ul style="list-style-type: none"> <li>• No response.</li> </ul>

<b>To</b>	<b>From</b>	<b>Comments</b>	<b>Action Taken/Response</b>
BMROSS	Fallon Burch, Consultation Coordinator, Chippewa of the Thames First Nation (via email) April 6, 2022	<ul style="list-style-type: none"> <li>• Acknowledged the proposed project.</li> <li>• Stated that the project is located within the Chippewas of the Thames First Nation (COTTFN) Big Bear Creek Additions to Reserve land selection area and COTTFN's traditional territory.</li> <li>• No concerns were identified with the proposed project.</li> <li>• Requested notification if any changes are made to the proposed project.</li> <li>• Requested consultation with First Nation communities in close proximity to the proposed project.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted.</li> </ul>
SON Environmental Office (via email, April 27, 2022)	BMROSS	<ul style="list-style-type: none"> <li>• Follow up email regarding Notice of Commencement</li> </ul>	<ul style="list-style-type: none"> <li>• Response received May 4</li> </ul>
ACW (via email August 16, 2022)	SON Environmental Office	<ul style="list-style-type: none"> <li>• Provided a Letter of Agreement for review of Class EA</li> </ul>	<ul style="list-style-type: none"> <li>• Signed Letter of Agreement returned to SON.</li> </ul>
SON Environmental Office (via email, December 6, 2023)	BMROSS	<ul style="list-style-type: none"> <li>• Provided draft Screening Report</li> </ul>	<ul style="list-style-type: none"> <li>• Response received December 7, 2023</li> </ul>
BMROSS (via email, December 8, 2023)	SON Environmental Office	<ul style="list-style-type: none"> <li>• Asked about timing for comments on Screening Report</li> </ul>	<ul style="list-style-type: none"> <li>• BMROSS December 8, 2024 - responded that comments would be appreciated by end of January.</li> </ul>

To	From	Comments	Action Taken/Response
BMROSS (via email, January 30, 2024)	SON Environmental Office	<ul style="list-style-type: none"> <li>• SON Environmental Office conducted a peer review of the Screening Report, Evaluation of Well 3 by Ian D. Wilson Associates Ltd, and Preliminary WHPA Delineation and Vulnerability Scoring.</li> <li>• Hydrogeological Technical Review – the reviewed reports are sufficiently detailed to serve as technical foundation for assessing the capture zone and to determine potential groundwater/surface water linkages. There are no expected impacts on any groundwater related function to the ecological units from the pumping of Well 3.</li> <li>• Based on assessment, we conclude there will be no impacts from the pumping of the proposed Well 3 on the Maitland River and surficial ecological units.</li> <li>• SON Environmental Office has determined the proposed Project may be approved and does not have any recommendations at this time.</li> </ul>	<ul style="list-style-type: none"> <li>• Acknowledge receipt of comments. BMROSS will provide copy of Notice of Completion and final Screening Report.</li> </ul>

**5.5 Public Information Centre**

A Public Information Centre (PIC) was held on December 1, 2022 at the Benmiller Community Hall from 6:30-8:30 PM. A Notice of Public Information Centre was mailed to each property owner within the Salford urban settlement area and placed on the Township’s website. Residents that had previously submitted comments were also emailed a copy of the Notice. The format of the meeting included an open house component with display boards as well as a formal presentation with a question and answer period. Representatives from BMROSS and the Township of ACW were in attendance. The meeting was arranged to serve several purposes:

- Provide local residents and other stakeholders with additional details on the MCEA process and a forum to express their views.

- Provide area residents with an overview of the alternatives being considered and potential impacts associated with each.
- Provide residents with an opportunity to ask questions.
- Identify the preliminary preferred alternative.

There were approximately 20 residents in attendance. A copy of the presentation materials is included in Appendix D. The questions and comments received during and following the PIC are summarized in Table 5.4.

**Table 5.4 Comments and Questions from PIC**

<b>Question/Comment</b>	<b>Response</b>
Will residents who have private wells be forced to connect to the municipal system?	At this time Council has not required mandatory connections to the water system.
How was the site for the test well chosen?	The location of the test well was chosen to try and reduce potential impacts related to source water on future development lands, access to the water distribution system, and use of the land for other purposes (e.g. passive recreation).
Who is paying for this new well? Will there be a cost to residents who are already connected to the system?	Future development will pay for majority of costs through development charges. If there are upgrades that benefit existing users, those costs will be recovered through rates and reserves.
What impacts will there be to residents next to the new well site?	Property owners within WHPA A and WHPA B where the vulnerability score is 10 will be required to have their septic systems inspected on a 5-year basis, a risk management plan for large quantities of fuel stored and may be subject to other Source Protection policies.
If a septic system is inspected near the well and there are issues, will the property owner be required to fix or replace the system?	Under the Building Code Act, the CBO can require repairs or replacement of septic systems.
Will another well be drilled to use as the supply well?	Currently it is anticipated the test well will be utilized for a supply well.
The site with the test well previously had a municipal well on it. Why was the original abandoned?	The well was abandoned following the connection of the Century Heights and Maitland Estates water systems and construction of a second well at the Century Heights well site. At the time, the Maitland Estates well was not needed and there was little anticipated future growth. The well was decommissioned to avoid contamination of the aquifer.

## **6.0 IDENTIFICATION OF POTENTIAL IMPACTS AND MITIGATION MEASURES**

### **6.1 Framework of Analysis**

Following the selection of Alternative 2 as the preliminary preferred solution, a study framework was developed to further evaluate the potential impacts of implementing this project. For reference, Figure 6.1 illustrates the preferred solution. The purpose of this review was to assess the environmental interactions resulting from the construction and operation of the proposed works, and to determine if the identified interactions that would generate potential environmental impacts.

The assessment of the preferred alternative incorporated these activities:

- Preliminary assessment of potential design options.
- Assessment of the construction and operational requirements of the proposed works.
- Consultation with the public, stakeholder groups and government agencies.
- Reviewing engineering methodologies associated with the construction of a new well and associated facilities.
- Prediction of the environmental interactions between the proposed works and the identified environmental components.
- Evaluation of the potential impacts of the project on the environmental features, including residual effects following mitigation.



**Figure 6.1 Preferred Solution (New Well Site)**

Filename: Z:\21285-ACW-Century\_Heights\_Water\_EA\Projects\GIS\EAReport\21285\_ACWCenturyHtsWaterEA\_PrefWellSite\_Apr2023.mxd 2023-04-26



**TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH**  
 CENTURY HEIGHTS DRINKING WATER SYSTEM EXPANSION  
 CLASS EA  
**PREFERRED SOLUTION - NEW WELL SITE**

DATE April 2023	PROJECT No. 21285
SCALE As Shown	FIGURE No. 6.1

## **6.2 General Project Scope**

The works summarized below and illustrated conceptually in Figure 6.1 represent the scope of construction planned for this project. It is expected that the test well will be utilized as the new supply well. The project is expected to involve the following general components:

- Municipality applies for Drinking Water Works Permit amendment and new Permit to Take Water.
- Wellhead modeling and technical information forwarded to Source Water Protection Authority.
- Contractor mobilization to the site.
- Well pump and riser piping installed in new well.
- New watermain and power conduits/cables installed from well to new treatment building.
- Construct new treatment building.
- Construct watermain from new treatment building to the existing water distribution system.

## **6.3 Site restoration (seeding/topsoil)**

## **6.4 Impact Assessment and Mitigation Measures**

### **6.4.1 Assessment of Impacts**

In reviewing the various criteria identified in Section 4.3 of this report and additional comments received during the consultation program, a number of specific environmental elements were identified which could be adversely affected by the implementation of the preferred alternative. The potential impacts are associated with the following environmental or project components:

- Source Water Protection
- Local Disruptions
- Capital and Operating Costs
- Construction-Related Impacts

## 6.5 Discussion of Potential Impacts

### 6.5.1 Source Water Protection

#### During Construction

Section 6.2 summarizes the activities associated with construction of the new well. The activities that will take place on-site include:

- Installation of a well pump and riser piping.
- Construction of water treatment building and watermain to connect to the existing system.
- Site restoration.

These activities will require heavy equipment to be brought to site, construction materials and supplies, ground disturbance for construction of the treatment building foundation and trench for the watermain. A portable toilet will also be required on site during construction. Given these activities, the potential for the following low, moderate and significant drinking water threats were identified and summarized in Table 6.1.

**Table 6.1 Low, Moderate and Significant Drinking Water Threats Associated with Construction**

Activity	Threat Category	Mitigation Proposed
Operation of heavy equipment - Utilize fuel, hydraulic fluid, and other liquids	<ul style="list-style-type: none"><li>- Handling and storage of fuel</li><li>- Handling and storage of DNAPLs</li></ul>	<ul style="list-style-type: none"><li>- Store fuel off site and only bring enough fuel as needed for equipment.</li><li>- Ensure fuel containers are structurally sound and do not leak. Consider secondary containment for storage.</li><li>- Refuel away from the proposed well site.</li><li>- Ensure an emergency spill kit is available.</li><li>- Ensure equipment is in good working order and regularly inspect for leaks.</li><li>- If on-site, overnight storage of vehicles is required, store as far as possible from the well site.</li></ul>

Activity	Threat Category	Mitigation Proposed
Construction of facilities - Construction may involve use of epoxies, adhesives, etc.	- Handling and storage of DNAPLs - Handling and storage of organic solvents	- Ensure secondary containment/storage of epoxies, adhesives and other chemicals. - Store off-site as much as possible. - Ensure an emergency spill kit is available.
On-site Sewage Works - Portable toilet facility	- Onsite Sewage Works	- Place facility as far from well as possible. - Ensure facility is cleaned on a regular basis or as needed. - Remove facility promptly when on-site construction is completed.

## Post-construction

The construction of a new well at a new site will result in new WHPA areas. Properties within the WHPAs will be subject to source protection policies. The modeled WHPAs for the existing wells and new well site are shown in Figure 4.3.

The WHPAs for the existing wells and new well extend northeast from the well sites. The modeled pumping rate for Wells 1 and 2 has significantly decreased from the rate used in 2010, which was 160 m<sup>3</sup>/day compared to 35 m<sup>3</sup>/day. The decrease in pumping rate, as a result of reduced demand from the well (see Section 4.3.4), resulted in smaller WHPA areas for Wells 1 and 2 compared to the 2010 WHPA areas.

The WHPAs for Wells 1 and 2, which overlap given the close proximity of the wells, extend slightly beyond the intersection of School Road and Lucknow Line. The WHPAs for Well 3 extend in a similar direction, crossing Lucknow Line. For Wells 1 and 2, the WHPA A to D intersect with 57 properties: 14 in WHPA A, 33 in WHPA B, 48 in WHPA C and 57 in WHPA D. Note, the property counts include all properties that intersect with that particular WHPA and a number of properties intersect with multiple WHPAs so the property counts represent cumulative totals. Within WHPA A, land uses include: residential, forested lands, and the municipal well site. In WHPA B, similar to WHPA A, there are residential land uses, and agricultural uses. The agricultural uses are limited to cropping operations. In WHPA C, the land uses are agricultural and residential. In WHPA D, the land uses are primarily agricultural, including livestock operations and fields.

For Well 3, the WHPAs intersect with 29 properties: 12 in WHPA A, 16 in WHPA B, 18 in WHPA C and 29 in WHPA D. In WHPA A, the land uses are primarily residential, including an area of future residential development. WHPA B includes agricultural and wooded areas. WHPA C includes wooded areas and agricultural lands. WHPA D

includes primarily agricultural lands, including a livestock barn. The total area within the delineated WHPAs for each well are summarized in Table 6.2.

**Table 6.2 Land Area within Well 1-2 and 3 WHPAs**

<b>WHPA</b>	<b>Well 1 and 2</b>	<b>Well 3</b>
A	3.14 ha	3.14 ha
B	21.5 ha	26.1 ha
C	144.02 ha	51.3 ha
D	251.9 ha	128.7 ha

For the WHPAs, a desktop analysis of potential and future significant drinking water threats was undertaken. The threats were based on the circumstances established in the 2021 Technical Rules, previous threat assessment work completed by the Source Protection Authority, the WHPAs, vulnerability scores and potential activities as determined from aerial photography and zoning designations. The threat categories and number of properties with potential of significant drinking water threats are summarized in Table 6.3.

**Table 6.3 Century Heights WHPAs: Enumeration of Potential Significant Threats**

<b>Threat</b>	<b>Chemicals</b>	<b>Pathogens</b>	<b>DNAPL</b>
1. Waste Disposal Site			
2. Sewage System		20	
3. Agricultural Source Material Application			
4. Agricultural Source Material Storage			
5. Agricultural Source Material – Aquaculture			
6. Non-agricultural Source Material Application			
7. Non-agricultural Source Material Handling/Storage			
8. Commercial Fertilizer Application			
9. Commercial Fertilizer Handling/Storage			
10. Pesticide Application			
11. Pesticide Handling/Storage			
12. Application of Road Salt			

<b>Threat</b>	<b>Chemicals</b>	<b>Pathogens</b>	<b>DNAPL</b>
13. Handling and Storage of Road Salt			
14. Storage of Snow			
15. Fuel Handling/Storage			
16. Dense Non-Aqueous Phase Liquid Handling/Storage			2
17. Handling and Storage of Organic Solvents			
18. Management of Runoff from Aircraft Deicing			
21. Grazing/Pasturing Livestock			
22. Establishment/Operation of Pipelines			
<b>Total</b>	<b>0</b>	<b>20</b>	<b>2</b>

From the enumeration of potential significant threats, there are 9 additional significant threats associated with Well 3. The significant threats for Well 1 and 2 remain unchanged from previous enumerations. The threats are associated with the existing septic systems located in the vicinity of the well. There were no other significant threats identified in WHPA A for Well 3 given the current uses (residential). In WHPAs B to D, there were no significant threats identified as a result of the vulnerability score and land uses.

The Source Protection Policy was reviewed to identify policies that have the potential to impact residents and property owners within the WHPAs associated with the new well. Table 6.1 summarizes the policy and potential impact for property owners. There are policies in place relating to grazing, pasturing and confinement areas, sewage works, waste disposal sites, organic solvents, salt handling, storage and application, and application, handling and storage of agricultural source materials, non-agricultural source material, pesticides and commercial fertilizer, and snow storage; however, given the existing residential land uses and low likelihood of such activities taking place as a result of the limited land for such activities within WHPA A, they are excluded from Table 6.4.



**Table 6.4 Source Water Policies that may Impact Property Owners**

<b>WHPA Areas and Scores where policies apply</b>	<b>Policy</b>	<b>Impact to Property Owners</b>
A (10)	R.1.1 – Planning Prohibition of Future Septic Systems	New lots will only be permitted where serviced by municipal sewers or septic systems are located outside of the vulnerable area.
A (10)	R.1.3 Specific Action for Future Septic Systems	Future lots that will include a septic system will require a hydrogeological assessment to determine an appropriate development density
A (10)	R.1.4 Planning Policy Regarding Location of Future/Replacement Septic Systems	Future and replacement septic systems need to be located as far as practically possible from the wellhead.
A (10)	R.1.9 Specific Action for Existing and Future Septic Systems	Septic systems within areas with a vulnerability score of 10 are required to be inspected on a 5-year basis.
A (10)	R.2.1 Prohibition of Future Fuel Handling and Storage	Prohibits the storage of more than 250 L of liquid fuel.
A (10)	R.2.2 Risk Management Plan for Existing Fuel Handling and Storage	A Risk Management Plan is required for existing liquid fuel storage and handling over 250 L.
A, B, C, D	R.6.1 Prohibition for Future DNAPL Handling and Storage	Handling and storage of over 25 L of DNAPLs is prohibited.
A, B, C, D	R.6.2. Risk Management for Existing DNAPL Handling and Storage	A Risk Management Plan is required to existing DNAPL handling and storage over 25 L.

Most of the Source Water Protection policies will apply to properties located within WHPA A or within 100 m of the proposed well. The policies that are expected to have the greatest impact on residential property owners is the requirement for mandatory septic inspections. Currently, the Township of ACW has a septic inspection program for other properties around municipal wells. It is expected that the properties around the new well would be included in that program. Residents are not charged for inspections; however, if repairs or replacement are identified as needed, the property owner will be responsible for those costs.

The Township will be required to include updated WHPAs and vulnerable areas within the Official Plan and Zoning Bylaw. The Salt Management Plan and Emergency Response Plan will also need to be updated to reflect the new WHPAs and well site.

A diesel-powered generator will be located at the new well site to provide power in the event of an interruption of electrical service to the site. A double-walled above ground fuel storage tank will be located with the generator. Under current Source Water Protection

policy, a risk management plan will be required for the storage of fuel in WHPA A. The Township will coordinate with the local Risk Management Official to complete a risk management plan. Fuel storage will also be located more than 15 m from the well, per O. Reg. 903.

There are a number of privately owned drilled, dug and sandpoint wells within the Century Heights area. The properties immediately adjacent to the proposed new well are connected to the existing municipal water system. During construction of the test well, water levels were monitored in five local wells (including one of the existing municipal wells). From the pumping tests and subsequent analysis (see Appendix B), operation of Well 3 does not represent a significant risk to local wells utilizing the bedrock aquifer. Shallow wells constructed in the upper overburden should not be impacted by the operation of Well 3 based on the hydraulic isolation (see Appendix B). It is also noted that no complaints were received during the pumping tests for Well 3. Construction activities associated with Well 3 are not expected to impact any local wells, given the nature of the activities and distance (approximately 270 m) from the Well 3 and nearest known well.

### **6.5.2 Local Disruptions**

Bringing the new well into service will require a contractor to mobilize to the site, install a pump, treatment building, and install a new watermain connection from the new well and water treatment building to the distribution system. Should the water supply need to be interrupted, the Township will endeavour to provide notice to residents in a timely manner.

Much of the construction will be within the Maitland well site. Public access to the property will be restricted during construction and the site will be fenced.

Adjacent property owners will experience temporary and short-term increases in noise and local activity associated with the construction of the treatment building. These impacts are expected to be minimal in length and will cease once construction is completed.

### **6.5.3 Capital and Operating Costs**

The cost of the new well will be paid primarily through development charges, as the project is driven by growth needs. Should there be improvements that benefit the existing customers, those costs will be recovered through the water system rates and reserves.

### **6.5.4 Construction-Related Impacts**

Construction-related activities associated with project implementation have the potential to impact upon existing environmental features, the general public, and construction workers. The Contractor will therefore be responsible for carrying out these activities in accordance with industry safety standards and all applicable legislation. Mitigation



measures will also be incorporated into the construction specifications to ensure that operations are conducted in a manner that limits detrimental effects to the environment.

Table 6.5 outlines a series of mitigation measures that are typically incorporated into construction specifications. For this project, contract specifications may need to be modified depending on the nature of the construction activities and any additional requirements of the regulatory agencies.

**Table 6.5 Summary of Mitigation Measures for Construction Activities**

<b>Construction Activity</b>	<b>Planned Mitigation</b>
Refuelling and Maintenance	<ul style="list-style-type: none"> <li>• Identify suitable locations for designated refueling and maintenance areas outside of WHPA A.</li> <li>• Restrict refuelling or maintaining equipment near watercourses.</li> <li>• Avoid cleaning equipment in watercourses and in locations where debris can gain access to sewers or watercourses.</li> <li>• Prepare to intercept, clean-up, and dispose of any spillage which may occur (whether on land or water).</li> </ul>
Traffic Control	<ul style="list-style-type: none"> <li>• The Contractor shall prepare and submit a traffic plan to the Project Engineer for review and acceptance. If it is necessary to detour traffic, the Contractor will co-ordinate the routing and provide adequate signage and barricades.</li> <li>• Traffic flow for private access should generally be maintained at all times during construction. If access to a private driveway has to be restricted for a period of time the property owner will be notified and access would be restored by the end of each working day.</li> <li>• A minimum of one lane of traffic, controlled by barricades, delineators, etc. shall be maintained for emergency vehicles to access the road.</li> <li>• Provide adequate signage and barricades.</li> </ul>
Disposal	<ul style="list-style-type: none"> <li>• Dispose of all construction debris in approved locations.</li> <li>• Avoid emptying fuel, lubricants or pesticides into sewers or watercourses.</li> </ul>
Silt Control	<ul style="list-style-type: none"> <li>• Silt fences shall be installed and maintained down slope from any stockpile locations.</li> </ul>
Work in Sensitive Areas	<ul style="list-style-type: none"> <li>• All work will occur in dry conditions.</li> <li>• Any slopes disturbed by the construction will be stabilized upon completion of the work</li> </ul>

<b>Construction Activity</b>	<b>Planned Mitigation</b>
Drainage and Water Control	<ul style="list-style-type: none"> <li>• All portions of the work should be properly and efficiently drained during construction.</li> <li>• Provide temporary drainage and pumping to keep excavation and site free from water.</li> <li>• Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with approval agency requirements.</li> <li>• Provide settling ponds and sediment basins as required.</li> <li>• Do not direct water flow over pavements, except through approved pipes/troughs.</li> </ul>
Dust Control	<ul style="list-style-type: none"> <li>• Cover or wet down dry materials and rubbish to prevent blowing dust or debris.</li> <li>• Avoid the use of chemical dust control products.</li> </ul>
Site Clearing	<ul style="list-style-type: none"> <li>• Protective measures shall be taken to safeguard trees from construction operations.</li> <li>• Equipment or vehicles shall not be parked, repaired or refuelled near the dropline area of any tree not designated for removal.</li> <li>• Minimize stripping of topsoil and vegetation.</li> <li>• Soils excavated from the site are to be re-used on site if possible or disposed of in accordance with Excess Soil regulations.</li> </ul>
Sedimentation and Erosion Control	<ul style="list-style-type: none"> <li>• Erect sediment fencing to control excess sediment loss during construction period.</li> <li>• Protect ditches from sediment intrusion.</li> <li>• Complete restoration works following construction.</li> </ul>
Noise Control	<ul style="list-style-type: none"> <li>• Site procedures should be established to minimize noise levels in accordance with local bylaws.</li> <li>• Employ devices to minimize noise levels in the construction area (as practical).</li> <li>• Nighttime or Sunday work shall not be permitted, except in emergency situations.</li> </ul>

**6.5.5 Operational Phase**

All waterworks facilities are operated and maintained by the Township of ACW, or their agent, in accordance with MECP guidelines and current provincial water regulations. The Municipality currently has all required approvals for the existing Century Heights Drinking Water System and uses an accredited operating authority.

**6.5.6 Health and Safety**

The planned works involve construction work that has the potential to adversely impact the health and safety of the workers and the general public. A series of measures will be set out in the construction contract documentation to minimize the risk posed by construction in a manner consistent with health and safety regulations. These

specifications may need to be altered depending upon the nature of the construction activity and requirements of regulatory agencies.

## **7.0 APPROVALS AND ENVIRONMENTAL COMMITMENTS**

### **7.1 General**

Implementation of the recommended solution is subject to the receipt of all necessary approvals. Following a review of the existing framework of legislation, it was determined a number of approvals are required prior to implementation of the preferred solution. This section of the report identifies the applicable legislation and summarizes the intent of the associated approvals process.

### **7.2 Environmental Assessment Act**

The recommended solution is considered a Schedule B project under the terms of the MCEA document, as the project involves the construction of a new municipal well. This project is considered approved under the requirements of the MCEA and Environmental Assessment Act following the completion of an environmental screening process.

The following activities are required in order to complete the formal MCEA screening process:

- Complete the 30-day review period, defined in the Notice of Completion.
- Address any outstanding issues.
- Finalize the Screening Report.
- Advise the Township and MECP when the MCEA study process is complete.

### **7.3 Safe Drinking Water Act**

Modifications to the water system require an amendment to the Township's Municipal Drinking Water License and Drinking Water Works Permit, issued under the Safe Drinking Water Act. Furthermore, O. Reg 205/18 requires submission of a notice from the local source protection authority identifying satisfactory completion of technical work associated with new vulnerable areas and vulnerability scores.

### **7.4 Ontario Heritage Act**

If archaeological resources are impacted by EA project work, please notify MCM at [archaeology@ontario.ca](mailto:archaeology@ontario.ca). All activities impacting archaeological resources must cease immediately, and a licensed archaeologist will carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately, and the local police and coroner notified. In situations where human remains are associated with

archaeological resources, MCM should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

## **7.5 Ontario Water Resources Act**

The Ontario Water Resources Act and Environmental Protection Act require a Permit to Take Water (PTTW) prior to any water extractions over 50,000 L/day. A PTTW will be required for the new well. Data from the test well pumping will be provided to the MECP in support of the PTTW application.

## **8.0 CONCLUSIONS AND PROJECT IMPLEMENTATION**

### **8.1 Selection of a Preferred Alternative**

Given the foregoing, Alternative 2 – Installation of New Well is identified as the preferred solution to the identified problem. The test well installed at this site would be converted to a supply well, and the existing well will be decommissioned. Figure 6.1 illustrates the location of the preferred solution.

### **8.2 Impact Mitigation**

Based upon a review of the current environmental setting, there were no impacts associated with the implementation of the preferred alternative that could not be mitigated. Therefore, the implementation of the proposed preferred alternative is appropriate for the identified problem and is not expected to result in any significant impacts to the natural, social, economic, cultural, or technical environment. The merits of this option were also seen to substantially outweigh those identified for the other alternative solution considered in this process.

### **8.3 Final Public Consultation**

A Notice of Completion will be circulated to local residents, stakeholders, government review agencies and Indigenous communities. The Notice will identify the preferred alternative and provide the process for providing comments and submitting a Section 16 Order request to the Minister of Environment, Conservation and Parks.

### **8.4 Environmental Commitments**

As an outcome of the MCEA process, the Township is committed to carrying out the following measures to mitigate potential environmental impacts related to project implementation:

- Implementation of standard construction mitigation measures (e.g., sediment and erosion control, site restoration) as presented in Table 6.5, where appropriate, during the construction phase of the project to minimize constructed-related impacts to the natural and social environments.

- Construction area should be fenced to prevent wildlife from entering the disturbed area. The active construction area should be inspected for wildlife before heavy equipment is moved within the project area. The Contract will include provisions requiring the Contractor not to harm, feed or unnecessarily harass wildlife.
- Wildlife encountered during construction activities should be allowed to exit the site on their own, via safe routes. Removal of wildlife should be done by a qualified wildlife service provider.
- Any activities occurring as a result of the construction that result in the management of excess soil will be completed in accordance with Ontario Regulation 406/19, On-Site and Excess Soil Management, and current guidance documents entitled Management of Excess Soil – A Guide for Best Management Practices.
- Submission of relevant applications for required approvals, as well as implementation of all conditions issued in association with the subsequent approvals.
- Adjacent property owners will be advised in advance of the construction.

## **9.0 SUMMARY**

This report documents the Municipal Class Environmental Assessment process conducted to investigate expanding the Century Heights Drinking Water System. Additional supply is required to accommodate approved future residential growth within the study area.

The MCEA process considered several options to address the identified problem – expansion of the existing wells, a new supply well, connection to the Goderich Drinking Water System, conversion to a surface supply, and do nothing. Expansion of the existing wells, connecting to the Goderich Drinking Water System and conversion to a surface supply were not considered practical or feasible solutions given costs, aquifer limitations, and distance from connection points. A test well was constructed at the former Maitland well site. A pump test confirmed a suitable quantity and quality of water from the test well. The WHPAs and vulnerability scores that would be created by the new well were modeled.

Following the receipt of input from agencies, First Nation and Métis communities and adjacent property owners, a new well and water treatment building at 36604 Maitland Avenue was identified as the preferred solution. This represents the most practical approach to resolving the defined problem.

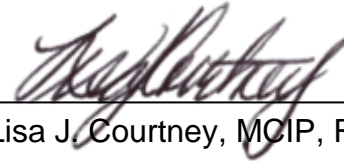
The proposed project is a Schedule B activity under the terms of the MCEA and is approved subject to the completion of a screening process. The Township of Ashfield-Colborne-Wawanosh intends to proceed with implementation of this project upon completion of the MCEA investigation and after receipt of all necessary approvals.

All of which is respectively submitted.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per

A handwritten signature in cursive script, appearing to read "Lisa J. Courtney", written over a horizontal line.

Lisa J. Courtney, MCIP, RPP

Environmental Planner

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## Appendix A

### Built Heritage and Archaeological Checklists



The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

**Processes covered** under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

### Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

**Note:** By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

### What to do if you:

- **find an archaeological resource**

If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

### Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name  
MCEA for Expansion of Century Heights Drinking Water System

Project or Property Location (upper and lower or single tier municipality)  
Township of Ashfield-Colborne-Wawanosh, County of Huron

Proponent Name  
Township of Ashfield-Colborne-Wawanosh

Proponent Contact Information  
Brett Pollock, Chief Building Official, 519-524-4669 ext. 208, cbo@acwtownship.ca

### Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes**, please follow the pre-approved screening checklist, methodology or process.

**If No**, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes**, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

**If No**, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
7. Has the property (or project area) been recognized for its cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes** to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

**If No**, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes** to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

**If No**, continue to question 9.

9. Are there present or past water sources within 300 metres of the property (or project area)? Yes  No

**If Yes**, an archaeological assessment is required.

10. Is there evidence of two or more of the following on the property (or project area)? Yes  No

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

**If Yes**, an archaeological assessment is required.

**If No**, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act*, *Planning Act* processes
- maintained by the property owner, proponent or approval authority

## Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

### 1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's [Standards & Guidelines for Conservation of Provincial Heritage Properties](#) [s. B.2.]

### 2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at [archaeology@ontario.ca](mailto:archaeology@ontario.ca)

### 3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at [archaeology@ontario.ca](mailto:archaeology@ontario.ca).

### 4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- [local heritage organizations and historical societies](#)
- local museums
- [municipal heritage committee](#)
- published local histories

## 5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- [local heritage organizations and historical societies](#)
- local museums
- [municipal heritage committee](#)
- published local histories

## 6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for [database of registered cemeteries](#)
- Ontario Genealogical Society (OGS) – to [locate records of Ontario cemeteries](#), both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to [locate early cemeteries](#)

In this context, ‘adjacent’ means ‘contiguous’, or as otherwise defined in a municipal official plan.

## 7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA ), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government’s list of provincial heritage properties
  - Federal government’s list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

## Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check [Regulation 875](#) and [Ontario Regulation 11/06](#).

### 8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note:** this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

#### Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

### 9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

#### Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

## Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale [Ontario Base Maps](#) - or [equally detailed and scaled maps](#).

## 10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

### • **Elevated topography**

Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

Find out if your property or project area has elevated topography, through:

- site inspection
- aerial photographs
- [topographical maps](#)

### • **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

Find out if your property or project area has sandy soil through:

- site inspection
- [soil survey reports](#)

- **Distinctive land formations**

Distinctive land formations include – but are not limited to:

- waterfalls
- rock outcrops
- rock faces
- caverns
- mounds, etc.

They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

- burials
- structures
- offerings
- rock paintings or carvings

Find out if your property or project areas has a distinctive land formation through:

- a site visit
- aerial photographs
- 1:10,000 scale [Ontario Base Maps](#) - or [equally detailed and scaled maps](#).

- **Resource extraction areas**

The following resources were collected in these extraction areas:

- food or medicinal plants e.g., migratory routes, spawning areas, prairie
- scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
- resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

Early Euro-Canadian settlement include – but are not limited to:

- early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
- early wharf or dock complexes
- pioneers churches and early cemeteries

For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

For more information, see:

- historical maps and/or historical atlases
  - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
  - [Archives of Ontario](#) holds a large collection of historical maps and historical atlases
  - digital versions of historic atlases are available on the [Canadian County Atlas Digital Project](#)
- commemorative markers or plaques such as local, [provincial](#) or [federal](#) agencies
- [municipal heritage committee](#) or other [local heritage organizations](#)
  - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
  - for information on commemorative markers or plaques



The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
  - is a recognized heritage property
  - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

**Processes covered** under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

### **Cultural Heritage Evaluation Report (CHER)**

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

### **Other checklists**

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name

ACW - Expansion of Century Heights Water System

Project or Property Location (upper and lower or single tier municipality)

Township of Ashfield-Colborne-Wawanosh, Huron County

Proponent Name

Township of Ashfield-Colborne-Wawanosh

Proponent Contact Information

Brett Pollock, Township of ACW

### Screening Questions

	<b>Yes</b>	<b>No</b>
1. Is there a pre-approved screening checklist, methodology or process in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

### Part A: Screening for known (or recognized) Cultural Heritage Value

	<b>Yes</b>	<b>No</b>
2. Has the property (or project area) been evaluated before and found <b>not</b> to be of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	<b>Yes</b>	<b>No</b>
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the <i>Ontario Heritage Act</i> as being of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. a National Historic Site (or part of)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. designated under the <i>Heritage Railway Stations Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. designated under the <i>Heritage Lighthouse Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

## Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has or is adjacent to a known burial site and/or cemetery?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. is in a Canadian Heritage River watershed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. contains buildings or structures that are 40 or more years old?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has a special association with a community, person or historical event?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. contains or is part of a cultural heritage landscape?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes** to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

**If No** to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act*, *Planning Act* processes
- maintained by the property owner, proponent or approval authority

Appendix B

Well 3 Report

**EVALUATION OF WELL 3  
CENTURY HEIGHTS DRINKING WATER SYSTEM  
TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH (COLBORNE)**

**Prepared For:  
Township of Ashfield-Colborne-Wawanosh**

Project 2022-14  
November 21, 2022

**IAN D. WILSON ASSOCIATES LIMITED**  
*CONSULTING HYDROGEOLOGISTS*

Clinton, Ontario

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**EVALUATION OF WELL 3  
CENTURY HEIGHTS DRINKING WATER SYSTEM  
TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH (COLBORNE)**

**1.0 INTRODUCTION**

The Century Heights Drinking Water System is a small municipal drinking water system that serves approximately 250 people and 85 residences atop the uplands of the community of Salford. Century Heights Wells 1 and 2 are located at 81270 Pump House Lane, and were drilled ca. 1979 and 2003. To upgrade the water supply for the system, Century Heights Well 3 was drilled at 36604 Maitland Avenue during September 2022. Well 3 is located approximately 450m southeast of Wells 1 and 2. Figure 1 shows the location of Wells 1, 2 and 3.

A small-diameter municipal supply well, known as the Maitland Well, was historically located at the same property as new Well 3, but was abandoned in 2008. The former Maitland Well was historically subjected to a 24-hour pumping test in 1988, which is summarized in the Wilson Associates report "Well Evaluation, Proposed Residential Development, Township of Colborne". Well 2 was subjected to a 48-hour pumping test in 2003, which is summarized in the September 2003 report "Aquifer Test and GUDI Assessment of the Century Heights Production Wells", prepared by Lotowater Geoscience Consultants Ltd.

A 72-hour pumping test of Well 3 was conducted October 3 to 6, 2022 to provide information in support of a future Category 3 Permit to Take Water application. This report provides a summary of Well 3 well construction details, pump test results and an analysis of impact of the proposed taking to groundwater resources and to the natural environment.

**2.0 SITE SETTING, GEOLOGY AND HYDROGEOLOGY**

The Well 3 site is situated within the eastern periphery of the developed portion of the Century Heights and Maitland subdivisions, atop the uplands of Salford. Lands surrounding the site are developed as residential lots to the south and west, with lands to the north and east mostly undeveloped, and partially in passive agricultural use.

The community of Salford is divided topographically by the steep,  $\pm 20\text{m}$  high bluff forming the eastern and northeastern slope of the Maitland River Valley, the bluff extending along the River from the shore of Lake Huron to the west. The crest of the bluff is located about 200m southwest of Well 3, and the Maitland River is located about 350m southwest of Well 3.

Well 3 is located within the Huron Slope physiographic region of southern Ontario, a clay plain situated between the Lake Huron shore bluff to the west and the Wyoming Moraine to the east. According to Ontario Geological Survey Map P.1232 "Quaternary Geology of the Goderich Area", upper soils in the vicinity of Well 3 are locally

characterized as glaciofluvial sand and gravel. According to local Ministry of the Environment, Conservation and Parks (MECP) water well records, the overburden in the vicinity of Well 3 ranges in depth between 30.2m and 41.7m, averaging 35.3m. The mapped upper granular deposits at Well 3 are reported to be 1.2m deep, with the balance of the overburden reported to consist fine-grained deposits (i.e. clay, hardpan, etc...).

The bedrock in the vicinity of the site consists of limestone, dolostone or shale of the Dundee Formation and the Detroit River Group.

The bedrock aquifer is the primary aquifer reported to be utilized in the vicinity of the Saltford. However, the mapped coarse-grained deposits (i.e. sand and gravel) locally reported is utilized by a small number of reported shallow wells. Shallow wells are often under-reported to the MECP, so more shallow wells may exist than have been reported.

According to Figure 3.9 of the Maitland Valley Source Protection Area Assessment Report (amended January 31, 2019), groundwater in the bedrock aquifer is interpreted to flow generally westwards towards Lake Huron.

According to the Huron County Mapping Portal, source water protection mapping indicates the following for the Well 3 area:

- The standard 100m radius Well Head Protection Area A (WHPA-A) surrounds Century Heights Wells 1 and 2, with Well Head Protection Areas WHPA-B, WHPA-C and WHPA-D extending in an easterly direction.
- A Highly Vulnerable Aquifer area is mapped within the portion of Saltford below the bluff.
- Significant Groundwater Recharge Areas are mapped in the vicinity of Well 3 above the bluff, and along much of Saltford below the bluff, both recharge areas assumed to be associated with mapped granular upper soils in these areas.
- A Groundwater Under Direct Influence of Surface Water (GUDI) Zone is mapped along most of the floor of the Maitland River, and is related to the exposed bedrock surface along portions of the floor of the valley.



### 3.0 REPORTED LOCAL WELLS

According to the Ministry of the Environment, Conservation and Parks (MECP) water well record database, there are eleven records for water wells within about 500m of Well 3. Copies of the eleven water well records are included in the appendix. Due to poor contractor's mapping, the locations of five recorded wells likely to be within 500m (based on Lot/Concession) are unknown. Known locations of recorded wells are shown on Figure 1. The following provides a summary of the water well record information:

Well #	Distance/ Direction from Well 3	Depth (m)	Aquifer	Reported Well Use
3004832 on-site	on-site	67.1	Bedrock	Former 1988 "Maitland Well" Abandoned (see record 7114784/Z86395).
3003809 Well 1	475m NW	65.8	Bedrock	Municipal Well 1
3007682 Well 2	480m NW	65.8	Bedrock	Municipal Well 2
3002835	330m S	53.6	Bedrock	Domestic
3004711	unknown	56.1	Bedrock	Domestic
3005597	unknown	51.5	Bedrock	Domestic
3005707	270m W	54.9	Bedrock	Domestic
3006006	450m NW	4.9	Upper Overburden	Domestic
3007255	unknown	62.5	Bedrock	Domestic
3007475	unknown	67.1	Bedrock	Domestic
3007516	unknwon	62.5	Bedrock	Domestic

#### 4.0 WELL CONSTRUCTION - Well 3

The following information was obtained from the water well record for Well 3 as supplied by the drilling contractor, W.D. Hopper & Sons Ltd. Figure 1 shows the location of the well. A copy of the water well record (A328704) is included in the appendix.

##### Contractor's Log of Formations Penetrated

<u>Depth (m)</u>	<u>Materials</u>
0 - 0.3	brown topsoil
0.3 - 1.2	brown stones with sand
1.2 - 4.6	brown clay
4.6 - 30.2	grey clay with stones
30.2 - 34.7	brown limestone, with clay layers
34.7 - 45.7	brown limestone
45.7 - 75.0	brown limestone, layered, fractured
75.0 - 76.2	brown limestone

Water was reported to have been encountered in the limestone bedrock at depths of 45.7m, 54.3m, 65.5m and 73.2m below grade.

##### Casing Record:

Setting:	0.6m above grade to 35.7 metres below grade
Length:	36.3 metres
Diameter:	20.96cm ID
Wall thickness:	0.64cm
Material:	steel
Bedrock liner:	17.8cm-diameter slotted (0.64cm) steel sleeve with set from 40.8m to 74.7m, suspended on a 16.8cm-diameter lead pipe set from 34.7m to 40.8m.
Bedrock open hole:	74.7m to 76.2m
Annular space:	Neat cement from grade to 35.7m below grade

The bedrock liner was required due to unstable bedrock fracturing below 54.3m.

## 5.0 **WELL 3 TESTING**

### 5.1 **Pumping Test - Well 3:**

The Well 3 pumping test was conducted under EASR registration No. R-011-6192292142. Copies of the registration confirmation, Pumping Test Design Report (September 27, 2022) and neighbour notification letter are included in the appendix.

Well 3 was pumped continuously for a 72 hour period at rates of 560L/min (0 - 20 minutes), 700L/min (20 - 40 minutes) and 850L/min (40 - 4,320 minutes) from October 3 to October 6, 2022, starting at 2:38pm, October 3, 2022. Water levels were observed on a regular basis in Well 3 using an electronic water level meter during pumping and for an 18 hour period of recovery after pumping ceased, initially observed using an electronic water level meter and subsequently a Solinst submersible pressure transducer (with on-site barometric compensation). Water levels were also observed on a regular basis during pumping in Century Heights Well 1 (OW1) and in four off-site wells (OW2, OW3, OW4 and OW5). Pumping rates were determined using a calibrated in-line digital flow meter. Water from Well 3 was discharged to the municipal ditch/drain which follows the site's southern property line.

More than 48 hours prior to the commencement of the pumping test, the Township circulated written notification of the pumping test to all privately-serviced properties within 500m of Well 3.

Figure 2 is a semi-logarithmic plot of the test results showing the drawdown of the water level in Well 3 versus the elapsed time from the start of each pumping rate, and residual drawdown versus the ratio of elapsed time from the start of pumping to the time since pumping ceased (ratio  $t/t'$ ).

The specific capacity of Well 3 remained relatively high after the 20 minute period of pumping at each successive pumping rate (295L/min/m at 560L/min, 277L/min/m at 700L/min and 267L/min/m at 850L/min).

The water level in Well 3 lowered 1.39m during the first minute of pumping at 560L/min and assumed a slowly moderating downward trend. After 20 minutes, the pumping rate was increased to 700L/min, and the water level lowered to a total drawdown of 2.24m, and assumed a shallow downward trend. After 40 minutes of pumping, the pumping rate was increased to 850L/min, with the water level in the well lowering to a total drawdown of 3.18m and assuming a shallow, slightly moderating downward trend. After about 300 minutes of pumping at 850L/min, the downward trend of the water level in Well 3 steepened slightly, this slightly steeper trend lasting the balance of the 72-hour pumping test.

The final water level in Well 3 was 39.53m below grade. Total water level drawdown was 3.58m, which represents about 37% of the available drawdown above the reported uppermost water-bearing zone in the bedrock (at 45.7m below grade), and about 9% of the total column of water in Well 3 (40.3m).

A total of about 3,663,200 litres of water were withdrawn from Well 3 during the pumping test.

The water level in Well 3 initially recovered at a moderate rate, recovering to 0.39m below the original static water level (89% recovery) within one hour of the conclusion of pumping. However, the rate of recovery slowed, with the water level in the well stabilizing at 0.21m below the original static water level (94% recovery) 14.2 hours after the conclusion of pumping. The water level in the well then lowered slightly, starting 16.5 hours after the conclusion of pumping. The on-site barologger indicated that atmospheric pressure varied upwards of 1.51kPa throughout the test period, which will have contributed to some static water level variance in the deep bedrock well.

## 5.2 Well Testing Summary and Analysis:

The following provides a summary of the pumping test data:

	Well 3
Dates of Test	October 3 to 6, 2022
Static Water Level (m below grade)	35.95
Final Drawdown (m)	3.58
Final Pumping Level (m below grade)	39.53
Pumping Rates (L/min)	560 (0 - 20 minutes) 700 (20 - 40 minutes) 850 (40 - 4,320 minutes)
Final Specific Capacity (L/min/m)	237.4
Available Drawdown Above Upper Waterbearing Zone (m)	9.75m
% Available Drawdown Used Above Upper Waterbearing Zone	37%
Extrapolated Water Level Drawdown after 10 Years (m)	4.23 (282 - 4,280 min. extrapolation)
% Avail. Drawdown Above Upper Water-Bearing Zone used @ 10 Years	43%
Coefficient of Transmissivity (m <sup>2</sup> /day)	1,600 (10 - 100 minutes) 1,120 (100 - 1,000 minutes)
Coefficient of Storage (dimensionless)	7x10 <sup>-4</sup> at OW2 5x10 <sup>-4</sup> at OW3
Safe Yield (L/min)	850

The coefficient of transmissivity and coefficient of storage were calculated using the Cooper and Jacob modified non-equilibrium methodology using a log-cycle drawdown of 0.14m (10-100 minutes (at 850L/min)) and of 0.20m (100 - 1,000 minutes), an estimated zero-drawdown intercept of 45 minutes at OW2 (400m away), and an estimated zero-drawdown intercept of 30 minutes at OW3 (395m away).

The safe yield of Well 3 is interpreted from acceptable water level recovery within 72 hours of test conclusion, as well as the 10-year extrapolated water level above the upper water-bearing zone in the bedrock.

Based on a well head (top of casing) elevation of 221.17m above sea level (masl) (per B. M. Ross and Associates Limited), the elevation of the static water level was 184.48masl, and the elevation of the final pumping level was 180.90masl. The approximate surface level of the Maitland River about 350m southwest of the Well 3 site is 182masl (based on available contour mapping and data from the 2003 Lotowater report). As such, the static level of Well 3 is about 2.5m above the approximate surface level of the River, and the final pumping water level of Well 3 is about 1.1m below the approximate surface level of the River.

As indicated in Section 2.0, according to Figure 3.9 of the Maitland Valley Source Protection Area Assessment Report (amended January 31, 2019), groundwater in the bedrock aquifer is interpreted to flow generally westwards towards Lake Huron. Figure 3.9 of the Maitland Valley Source Protection Area Assessment Report indicates an overall bedrock aquifer piezometric surface gradient in the range of  $7.4 \times 10^{-3}$ .

The approximate distance to Well 3's capture zone downgradient null point is estimated using the formula:

$$X_L = Q / (2\pi Ti)$$

Where  $X_L$  = distance to downgradient null point  
 Q = well yield  
 T = aquifer transmissivity  
 I = aquifer hydraulic conductivity

Assuming a well yield of 1,224m<sup>3</sup>/day (850L/min), a long-term transmissivity of 1,120m<sup>2</sup>/day (from later portions of the pumping test) and an aquifer hydraulic gradient of  $7.4 \times 10^{-3}$  (as above), the estimated distance to Well 3's capture zone's downgradient (i.e west) null point is about 24m.

The approximate width of Well 3's capture zone (north to south) is estimated using the formula:

$$Y_L = Q / (2Ti)$$

Where  $Y_L$  = width of capture zone  
 $Q$  = well yield  
 $T$  = aquifer transmissivity  
 $I$  = aquifer hydraulic conductivity

Assuming a well yield of 1,224m<sup>3</sup>/day (850L/min), a long-term transmissivity of 1,120m<sup>2</sup>/day (from later portions of the pumping test) and an aquifer hydraulic gradient of  $7.4 \times 10^{-3}$  (as above), the estimated width (i.e. north to south) of Well 3's capture zone is about 74m.

Aquifer response at Well 3 and the observed wells completed in the bedrock aquifer (i.e. OW2 and OW3), and the relatively low coefficient of storage ( $5 \times 10^{-4}$  to  $7 \times 10^{-4}$ ) is consistent with confined aquifer conditions. The above estimates of Well 3's capture zone downgradient null point distance and width suggest that Well 3 will not capture water from the Maitland River (even if the bedrock aquifer is exposed at the base of the River valley), situated about 350m south of Well 3.

### 5.3 Interference:

Water levels were observed on a regular basis during the Well 3 pumping test in Century Heights Well 1 (OW1,  $r = \pm 480\text{m}$ ) and in four off-site wells (OW2  $r = \pm 400\text{m}$ , OW3  $r = \pm 395\text{m}$ , OW4  $r = \pm 390\text{m}$  and OW5  $r = \pm 320\text{m}$ ). The water levels were observed in OW1, OW2, OW3 and OW4 using an electronic water level meter, and in OW5 using a Solinst datalogger with barologger (due to the heavy weight of the 0.9m diameter bored well concrete lid with no access port). OW1, OW2 and OW3 are drilled wells completed in the bedrock aquifer, and OW4 and OW5 are shallow bored wells completed in the upper overburden aquifer. Copies of the water well records for OW1 and the probable well record for OW5 (3006006) are included in the appendix. Due to poor contractor's well mapping, available well records cannot be correlated with OW2, OW3 and OW4.

A request from the well owner at 36584C Saltford Road (about 430m west of Well 3) to observe their deep drilled well during the pumping test could not be undertaken due to an obstruction in the well at approximately 38m below grade, above the water level in the well. Based on encountered conditions at Well 3, the obstruction in the well at 36584C Saltford Road is assumed to be collapsed bedrock.

Figures 3 to 7 are semi-logarithmic plots of the observation well data showing the water level or water level change versus the elapsed time from the start of pumping from Well 3. The observation data are included in the appendix (except the automated water level data for OW5, which can be made available upon request).

As Century Heights Well 2 was in use supplying the Century Heights Water System throughout the Well 3 pumping test, the water level in nearby (to Well 2) OW1 varied considerably with Well 2 use. The water level in OW1 variably lowered to maximum drawdown of 0.42m by 2,505 minutes, but rose to above the well's initial static level for all subsequent observations.

The pre-test static water level in OW2 could not be obtained, as the well owner withheld permission to observe the well until after the test start. Based on subsequent water level responses in OW2 and in OW3, it is estimated that the static water level of OW2 would have been in the range of 39.19m below top of casing. The water level in OW2 progressively lowered to an estimated maximum of 0.16m by the conclusion of the pumping test.

The water level in OW3 varied due to domestic well use, but progressively lowered to a maximum of 0.42m by the conclusion of the pumping test. A pump-operating maximum drawdown of 0.56m was observed at 271 minutes.

The water level in OW4, a shallow bored well, varied due to domestic use. The water level in OW4 was not obviously impacted by the pumping test, rising upwards of 0.12m during the test period.

The water level in OW5 was observed continuously during the pumping test with a datalogger due to the heavy concrete lid on the well. The water level in OW5 varied with well use, but lowered about 1cm by the conclusion of pumping, which is assumed to be due to typical recession associated with usage and precipitation patterns. Typical operating drawdown was about 6cm.

Observed potential interference in the observed deep drilled wells located more than about 395m from Well 3 ranged between 0.16m (estimated) to about 0.4m. This degree of drawdown in deep drilled wells completed in the bedrock is minor in relation to the depth of water in the wells.

The closest recorded well to Well 3 is MECP No. 3005707, located about 270m west of Well 3. The well record for No. 3005707 indicates a standing column of water of about 18m, an available drawdown of about 7m above the reported upper waterbearing zone, and a contractor's pumping test drawdown of 5.8m after 2 hours of pumping at 54.6L/min (6,552L withdrawal). As domestic well use will be far less than 6,552L, operating drawdown in this well will be far less than 5.8m. Interference potential of 0.4m to 1.0m (estimated, due to closer distance relative to OW2 and OW3) does not represent a significant risk to the function to Well No. 3005707.

There should be no risk to the function of shallow wells completed in the upper overburden resulting from the operation of Well 3, based on hydraulic isolation.

No complaints were reported during the pumping test period.

To calculate the long-term interference that could result from the operation of Well 3 , the following analysis uses the Cooper and Jacob modified non-equilibrium equation to assess the theoretical water level impact:

$$s = (0.183Q + T) \log ((2.25Tt) + (r^2S))$$

Where:      T = coefficient of transmissivity (1,120m<sup>2</sup>/day)  
              Q = daily rate of withdrawal (1,224m<sup>3</sup>)  
              s = water level drawdown  
              S = coefficient of storage (7x10<sup>-4</sup>)  
              t = elapsed time (180 days, to allow for aquifer recharge)  
              r = distance from Well 3 (270m to 3005707)

Theoretical water level impact after 180 days of continuous pumping at 1,224m<sup>3</sup>/day is 0.79m at a distance of 270m. As above, this degree of drawdown does not represent a significant risk to the function to Well No. 3005707 or any similarly-constructed well in the bedrock aquifer.

## 6.0 WATER QUALITY

Samples of water were collected from Well 3 after 1 hour, 24 hours, 48 hours and at test end for an analysis of bacteriological and general chemistry parameters. The test end sample also included an analysis for all parameters included in Ontario Regulation 170/03 Schedules 23 and 24. For comparison, a sample was also collected from the Maitland River for general chemistry analysis. All samples were collected in laboratory-supplied bottles, stored in an ice-packed cooler, and submitted to Bureau Veritas Laboratories under chain of custody for analysis.

The water from Well 3 contained no detectable total coliform or E. Coli bacteria in all collected samples. Background bacteria counts declined from 56 CFU/100mL in the 1 hour sample, to 3 CFU/100mL sample in the 24 hour sample, to non-detectable in the subsequent samples, which is common in newly-constructed wells. The water from Well 3 is bacteriologically secure.

The water from Well 3 is moderately hard, with hardness values lowering from 270mg/L as CaCO<sub>3</sub> in the 1 hour sample to between 210 and 220mg/L as CaCO<sub>3</sub> in all subsequent samples. The water is slightly alkaline, with a pH value of 7.96 to 8.07.

The fluoride content of the water from Well 3 at 2.2 to 2.3 mg/L is at a level which the Ontario Drinking Water Quality Standards (ODWQS) require that the local Medical Officer of Health be notified (1.5 mg/L), but slightly below the maximum acceptable level of 2.4mg/L. Elevated fluoride levels are naturally occurring, and common in groundwater from the bedrock aquifer in the region.

All other parameters determined were at acceptable levels under the ODWQS's.



Apart from some variance in the early 1-hour sample, the overall quality of water from Well 3 was generally stable throughout the pumping test. All typical indicators of surface water influence (i.e. dissolved organic carbon (DOC), nitrate, chloride, bacteria, etc...) were at non-detectable to low levels.

The quality of water from Well 3 is distinct from the quality of water from the Maitland River for many of the determined chemical parameters (i.e. carbonate alkalinity, ion balance, DOC, pH, sulphate, chloride, nitrate, and most metals).

## 7.0 **MONITORING PROGRAM AND CONTINGENCY PLAN**

The risk posed by pumping from Well 3 to off-site water supplies and surface water resources is indicated to be low. As such, a comprehensive monitoring program is not considered necessary. The recording of daily withdrawals from Well 3 and the weekly recording of the water level in Well 3 are considered adequate for monitoring purposes.

In the very unlikely event of adverse impact to an off-site water supply, it will most likely be a result of an inadequately deep pump setting. Pump lowering will be effective to restore impacted water supplies.

## 8.0 **AQUIFER SECURITY**

The information gathered during the Well 3 pumping test program indicates that Well 3 is secure from surface water influence, specifically the Maitland River, as follows;

- The water level response in Well 3, OW2 and OW3 indicates no "positive" aquifer boundary.
- The static water level in Well 3 is about 2.5m above the approximate surface level of the Maitland River.
- The low pumping level in Well 3 is about 1.1m below the approximate surface level of the Maitland River.
- Although the low pumping level is below the approximate surface level of the Maitland River, observed and calculated water level interference indicates that water levels within 270m of Well 3 will lower about 0.8m as a result of extended withdrawals. As the static level in the aquifer at Well 3 is about 2.5m higher than the approximate level of the River surface, interference of up to 0.8m will maintain the piezometric surface in the aquifer above the approximate River level between the River and Well 3. As such, potential to draw water from the River to Well 3 is minimized.
- The calculated capture zone of Well 3 extends about 24m downgradient (west) of Well 3, and laterally (north-south) about 74m. As such, the calculated capture zone is far less than the distance from Well 3 to the Maitland River, 350m to the south.

- The bacteriological quality of water from Well 3 is secure and stable.
- The chemical quality of water from Well 3 is stable and mostly distinct from the quality of water from the Maitland River.

## 9.0 **CONCLUSIONS**

1. Well 3 has a safe yield of 850L/min.
2. The risk of disruptive off-site water level interference resulting from the operation of Well 3 is considered low, for the reasons outlined in Section 5.3 of this report.
3. The bacteriological quality of the water from Well 3 is acceptable.
4. Apart from fluoride, the chemical quality of water from Well 3 is acceptable. The water from Well 3 contains naturally-occurring fluoride at a level requiring that the local Medical Officer of Health be notified.
5. Information gathered from the Well 3 testing program indicates that Well 3 is completed in a geologically-secure setting. Impacts from surface water are not anticipated.
6. The risk of impacts to the function of local surface water bodies is low.
7. A comprehensive monitoring program is not considered necessary. The recording of daily withdrawals from Well 3 and the weekly recording of the water level in Well 3 are considered adequate for monitoring purposes. In the very unlikely event of adverse impact to an off-site water supply, it will most likely be a result of an inadequately deep pump setting. Pump lowering will be effective to restore impacted water supplies.
8. A Category 3 Permit to Take Water is required before daily withdrawals exceeding 50,000 litres can occur from Well 3.

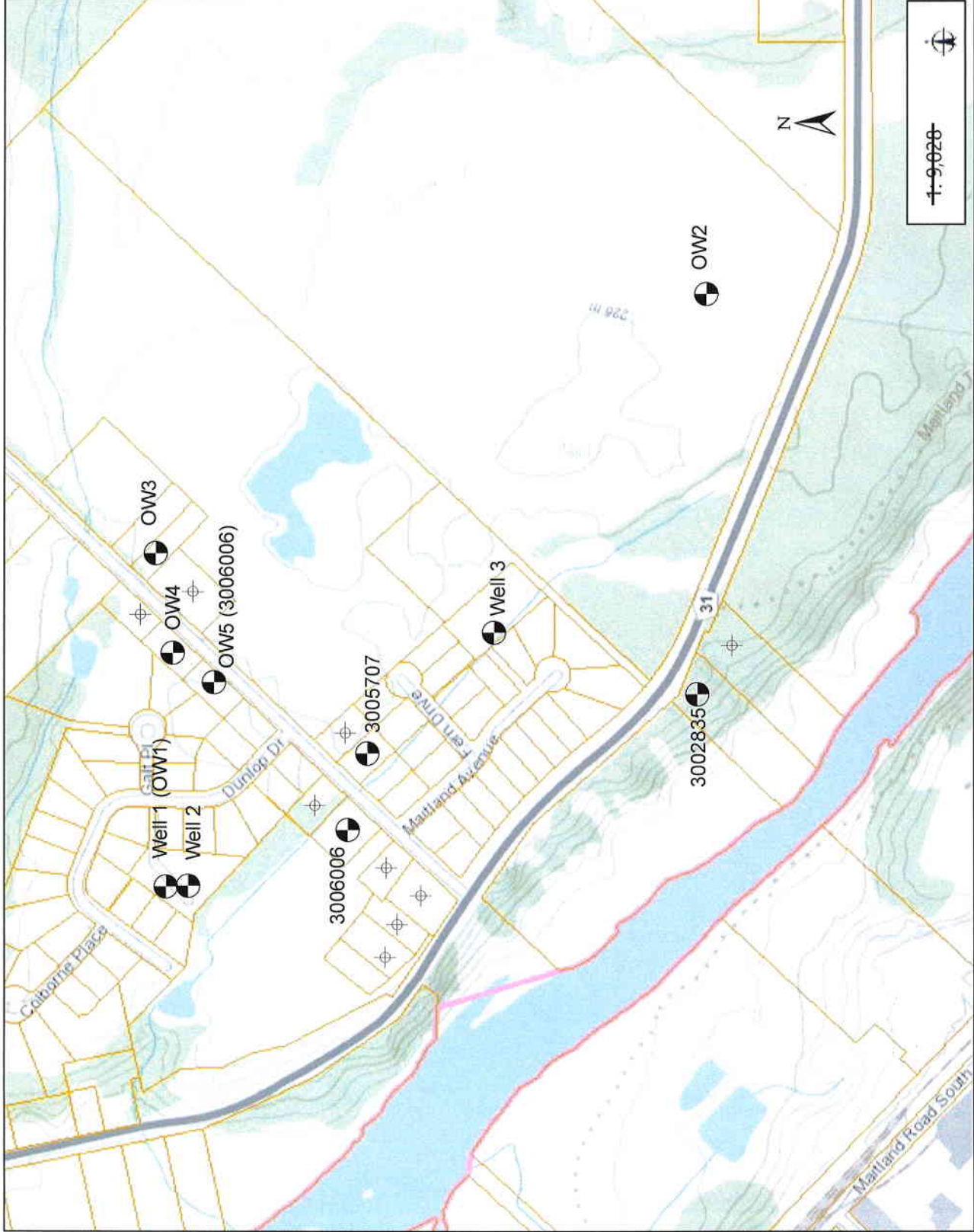
**IAN D. WILSON ASSOCIATES LIMITED**

  
Geoffrey Rether, P. Geo

November 21, 2022



## **FIGURES AND APPENDIX**



- Legend**
- Parcel Fabric
  - Municipal Boundary
  - County Boundary

Location of Well 3, Observation Wells, and Locations of Known and Probable Off-Site Wells Within 500m of Well 3

Figure 1

Scale: 1:6,900 (approx.)

- Probable Well
- Known Well

Notes

This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

**THIS MAP IS NOT TO BE USED FOR NAVIGATION**

# Century Heights Well 3 - Pumping Test

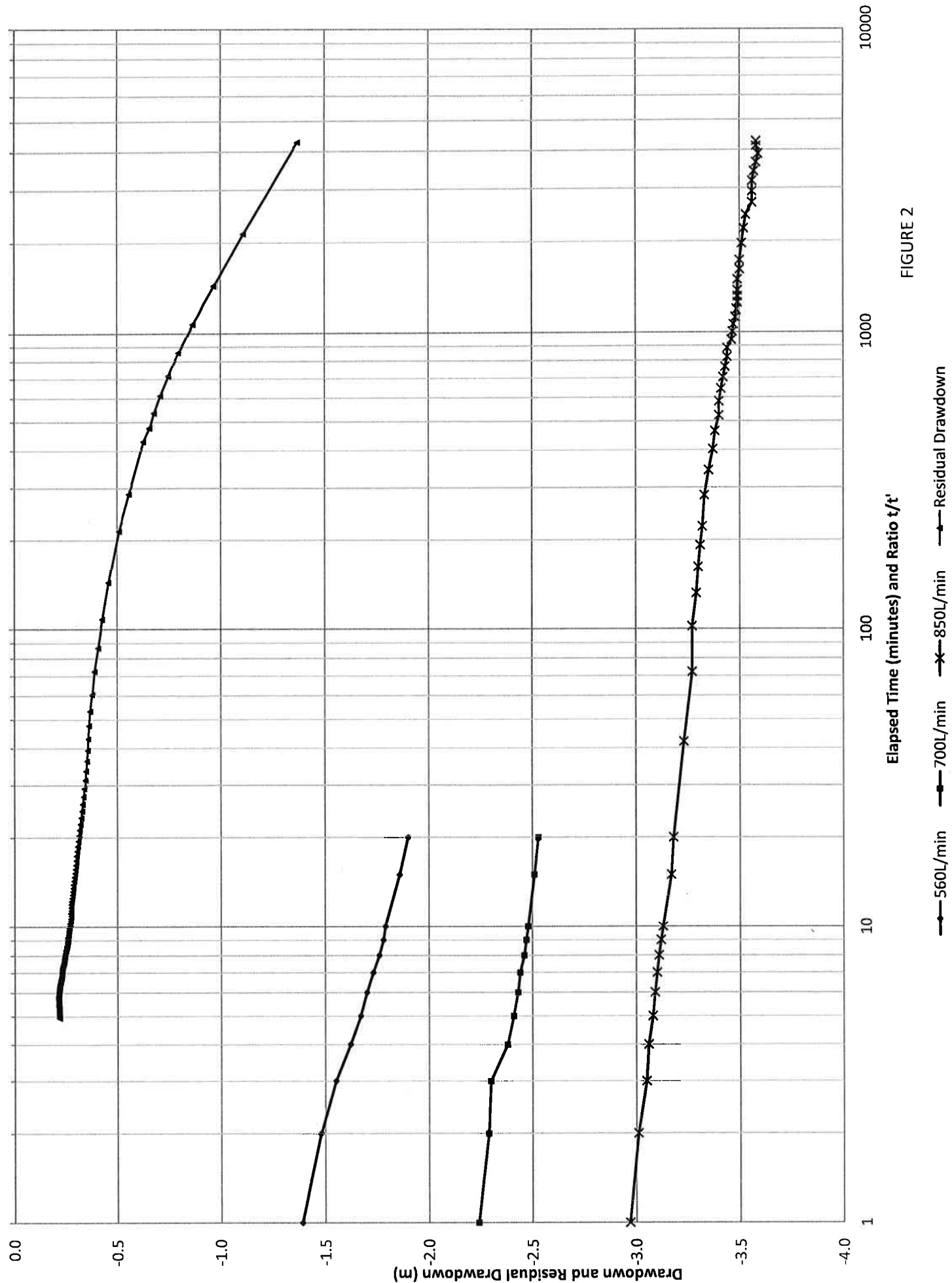
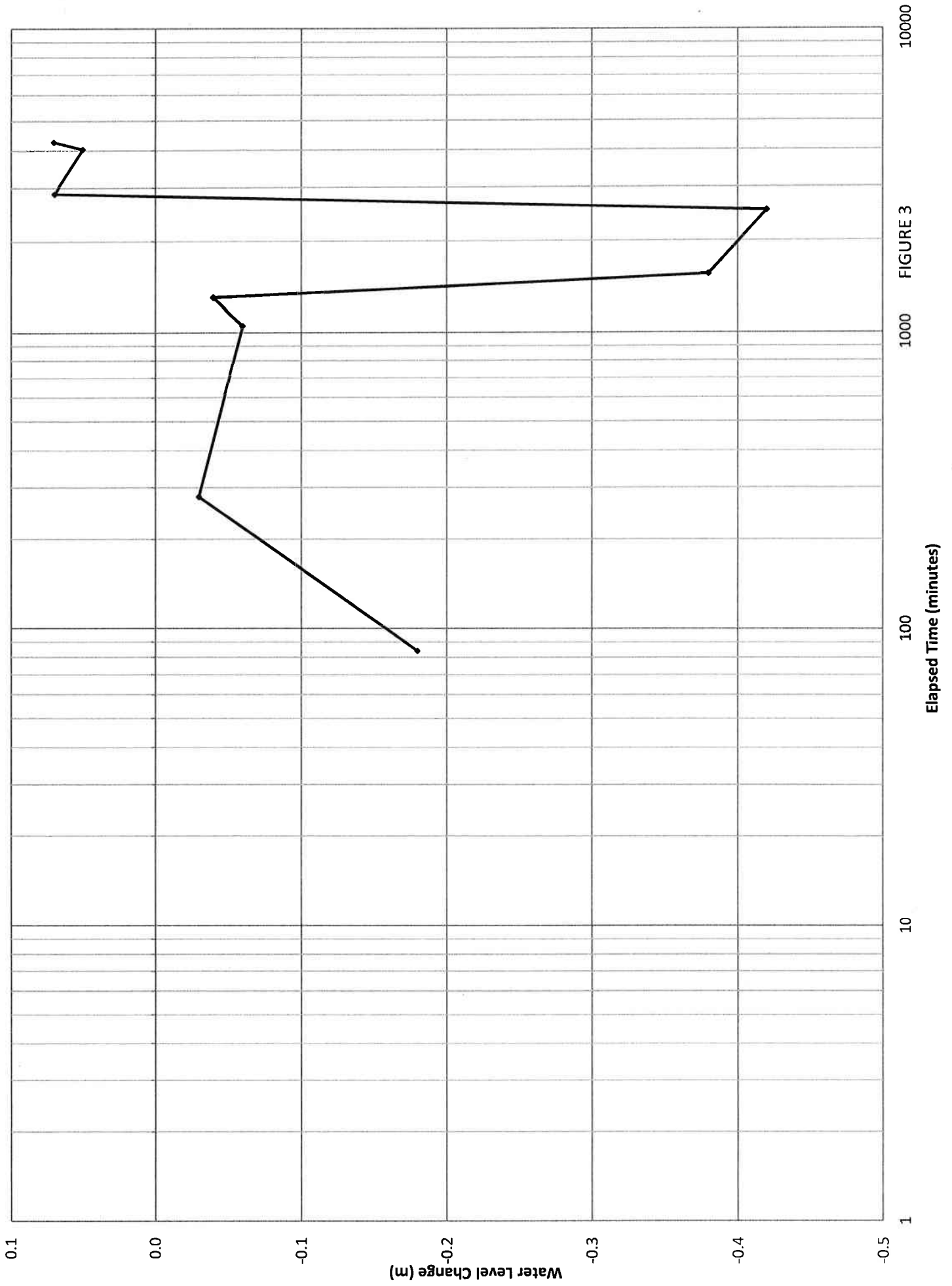


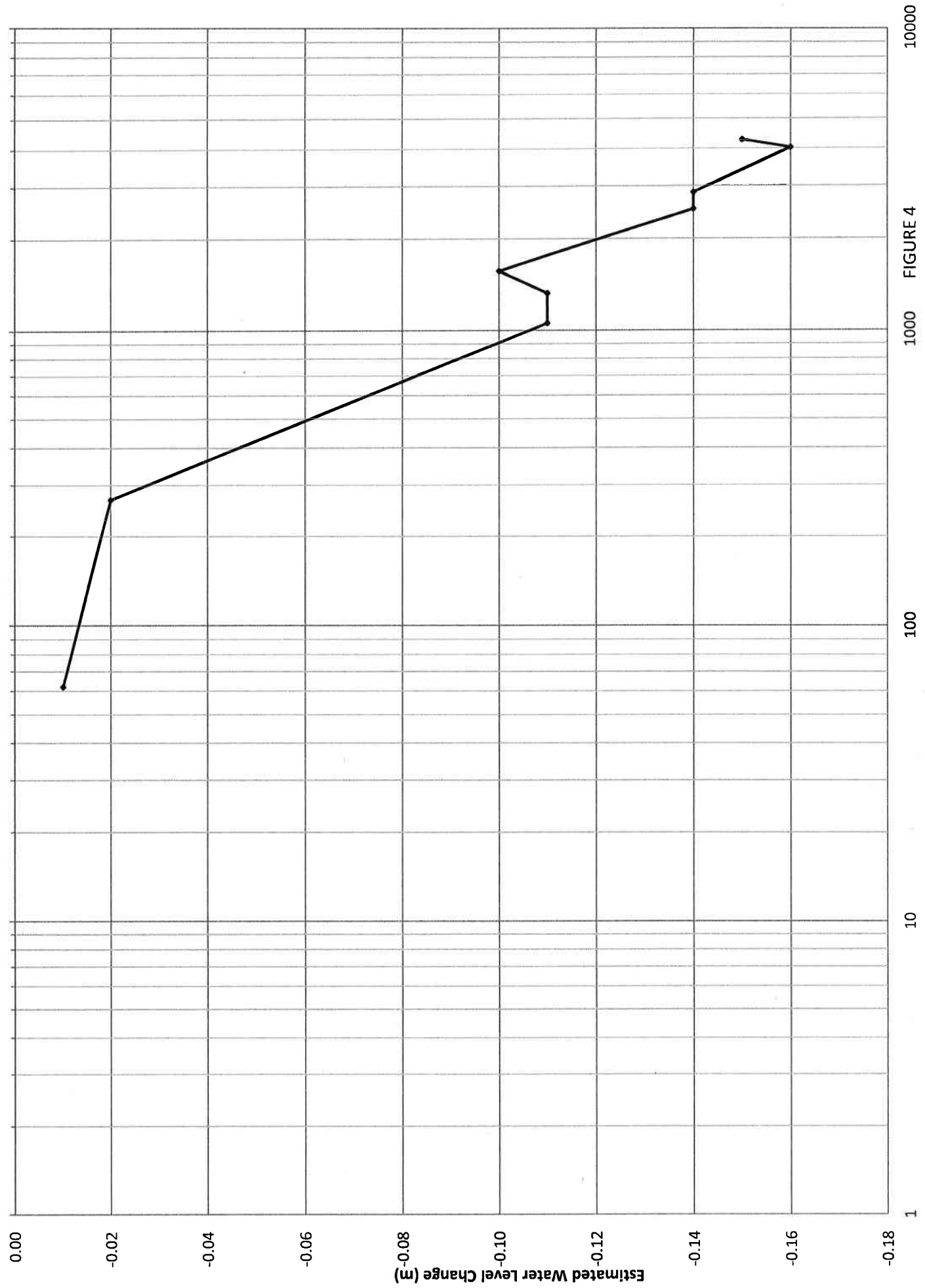
FIGURE 2

Century Heights Well 3 - OW1 (Century Heights Well 1) as Observation Well

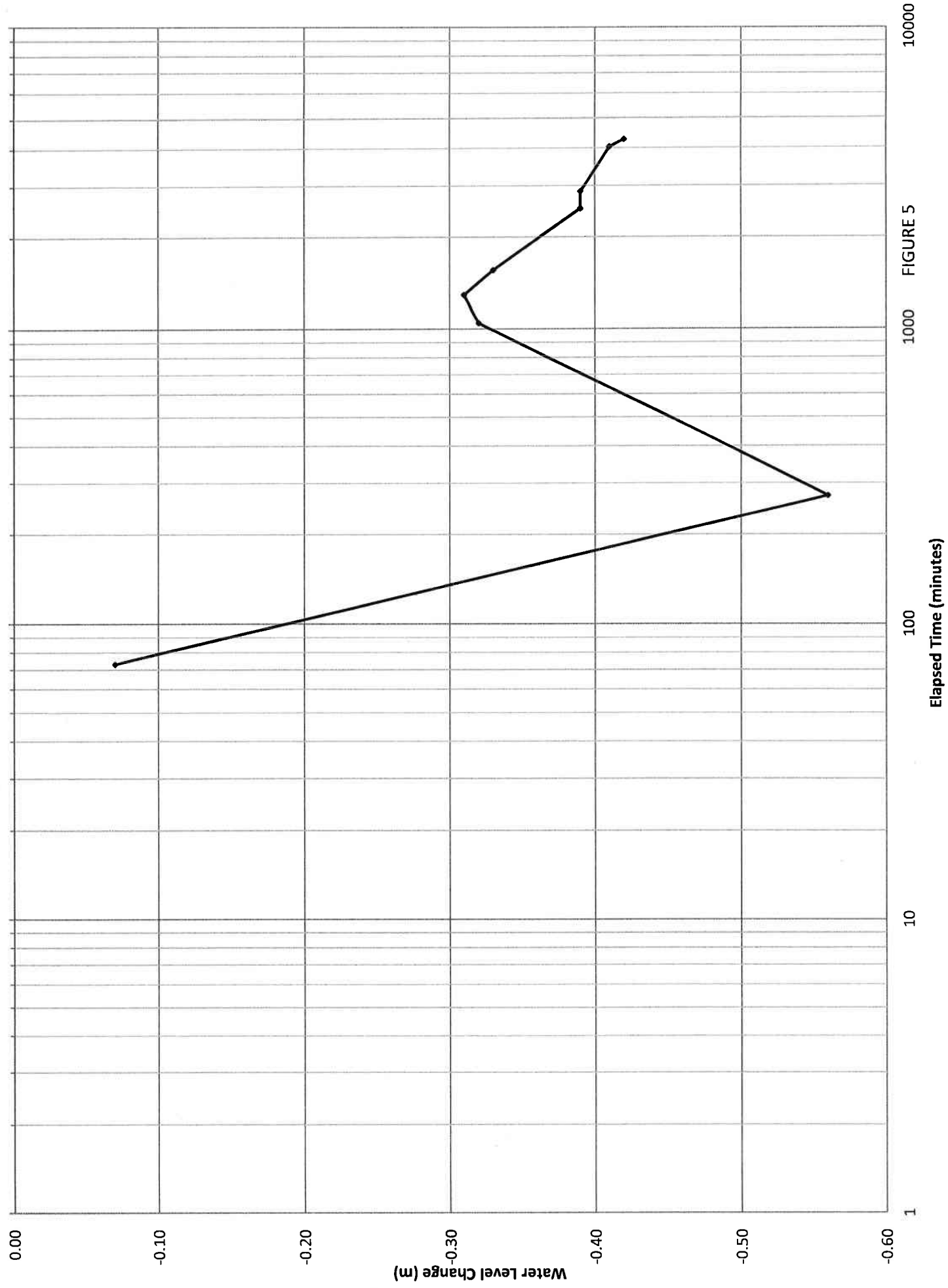




Century Heights Well 3 - OW2 as Observation Well

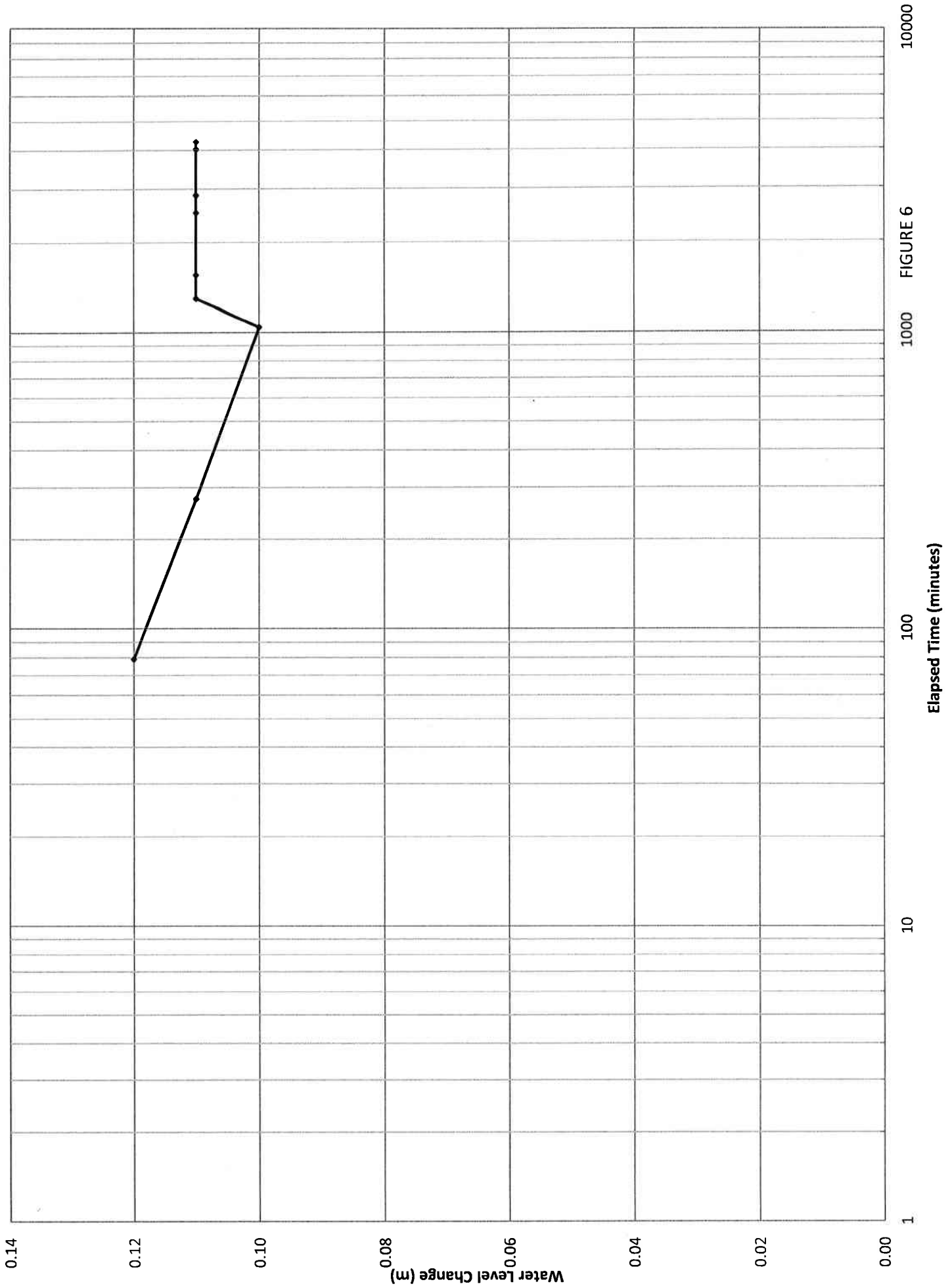


Century Heights Well 3 - OW3 as Observation Well

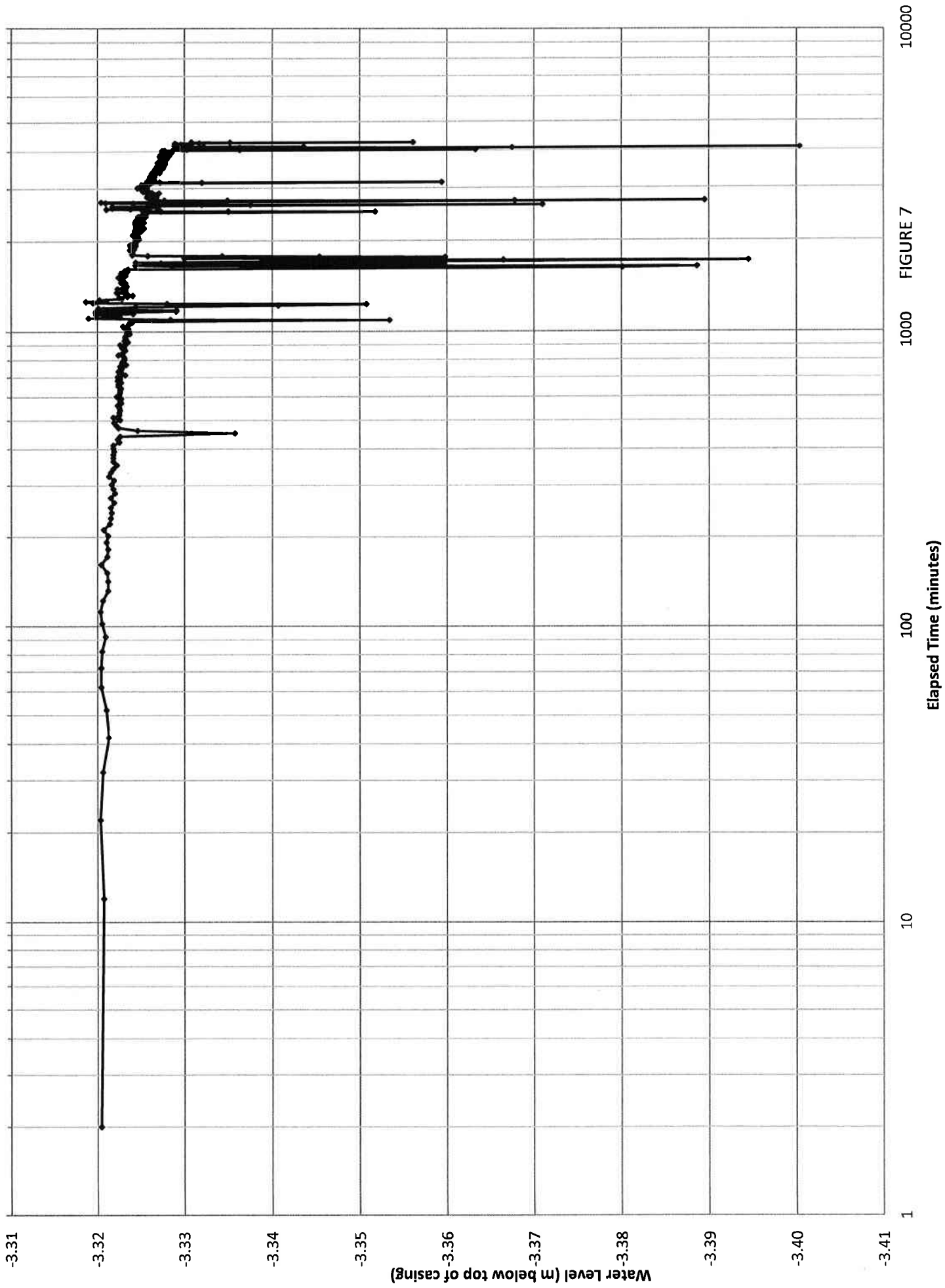




Century Heights Well 3 - OW4 as Observation Well



# Century Heights Well 3 - OW5 as Observation Well



**Pumping Test Data  
Century Heights Well 3**

Dates of Test: October 3 to 6, 2022  
 Static Water Level: 36.69m below top of casing (elevation 221.17masl)  
 Measuring Point Elevation: 0.74m (top of casing)  
 Pumping Rates:  
     560L/min (0-32 minutes)  
     700L/min (20 - 40 minutes)  
     850L/min (40 to 4320 minutes)

Note: \* Recovery shown as ratio t/t'

Elapsed Time (min.)*	Recovery Elapsed Time (min.)	560 L/min			700 L/min			850 L/min					
		Pumping Water Level (m btoc)	Water Level Drawdown (m)	Water Level	Pumping Water Level (m btoc)	Water Level Drawdown (m)	Water Level	Pumping Water Level (m btoc)	Water Level Drawdown (m)	Water Level			
0		36.69	0.00										
1		38.08	-1.39	38.93	-2.24		39.66	-2.97					
2		38.17	-1.48	38.98	-2.29		39.70	-3.01					
3		38.24	-1.55	38.99	-2.30		39.74	-3.05					
4		38.31	-1.62	39.07	-2.38		39.75	-3.06					
5		38.36	-1.67	39.10	-2.41		39.77	-3.08					
6		38.39	-1.70	39.12	-2.43		39.78	-3.09					
7		38.42	-1.73	39.13	-2.44		39.79	-3.10					
8		38.45	-1.76	39.15	-2.46		39.80	-3.11					
9		38.47	-1.78	39.16	-2.47		39.81	-3.12					
10		38.48	-1.79	39.17	-2.48		39.82	-3.13					
15		38.55	-1.86	39.20	-2.51		39.86	-3.17					
20		38.59	-1.90	39.22	-2.53		39.87	-3.18					
42							39.92	-3.23					
72							39.96	-3.27					
102							39.96	-3.27					
132							39.98	-3.29					
162							39.99	-3.30					
192							40.00	-3.31					
222							40.01	-3.32					
282							40.02	-3.33					
342							40.04	-3.35					
402							40.06	-3.37					
462							40.07	-3.38					







5.70	912	36.9026	-0.21
5.65	922	36.9031	-0.21
5.60	932	36.9033	-0.21
5.55	942	36.9034	-0.21
5.51	952	36.9033	-0.21
5.46	962	36.9031	-0.21
5.41	972	36.9031	-0.21
5.37	982	36.904	-0.21
5.32	992	36.9058	-0.22
5.28	1002	36.9057	-0.22
5.24	1012	36.9053	-0.22
5.20	1022	36.9053	-0.22
5.16	1032	36.9055	-0.22
5.12	1042	36.9056	-0.22
5.08	1052	36.9053	-0.22
5.04	1062	36.9061	-0.22
5.00	1072	36.9067	-0.22
4.96	1082	36.9065	-0.22
4.93	1092	36.9072	-0.22



**Observation Well Data  
Century Heights Well 3 Pumping Test**

<b>Century Heights Well 1 (OW1)</b>		
Elapsed	Pumping	Water Level
Time (min.)	Water Level	Change
	(m btoc)	(m)
-78	38.24	0
84	38.42	-0.18
279	38.27	-0.03
1052	38.3	-0.06
1307	38.28	-0.04
1555	38.62	-0.38
2505	38.66	-0.42
2870	38.17	0.07
4032	38.19	0.05
4264	38.17	0.07

<b>OW2 36654B Saltford Road*</b>		
Elapsed	Pumping	Water Level
Time (min.)	Water Level	Change
	(m btoc)	(m)
--	39.19	0.00
62	39.20	-0.01
267	39.21	-0.02
1057	39.30	-0.11
1317	39.30	-0.11
1561	39.29	-0.10
2515	39.33	-0.14
2854	39.33	-0.14
4017	39.35	-0.16
4270	39.34	-0.15

\* Permission to observe well withheld until after start of pumping test. Static Level estimate

<b>OW3 81280 Westmount Line</b>		
Elapsed	Pumping	Water Level
Time (min.)	Water Level	Change
	(m btoc)	(m)
-97	37.97	0
73	38.04	-0.07
271	38.53	-0.56
1045	38.29	-0.32
1286	38.28	-0.31
1548	38.3	-0.33
2498	38.36	-0.39
2861	38.36	-0.39
4025	38.38	-0.41
4257	38.39	-0.42

<b>OW4 81273 Westmount Line</b>		
Elapsed	Pumping	Water Level
Time (min.)	Water Level	Change
	(m btoc)	(m)
-108	3.32	0
79	3.2	0.12
274	3.21	0.11
1040	3.22	0.1
1292	3.21	0.11
1550	3.21	0.11
2500	3.21	0.11
2865	3.21	0.11
4028	3.21	0.11
4259	3.21	0.11



# **LABORATORY ANALYSES**



Site Location: SALT FORD  
Your C.O.C. #: 161970

**Attention: Geoff Rether**  
Ian D Wilson Associates Ltd  
PO Box 299  
76722 Airport Rd  
Clinton, ON  
CANADA NOM 1L0

**Report Date: 2022/10/14**  
Report #: R7341998  
Version: 2 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C2S7957**  
**Received: 2022/10/04, 16:00**

Sample Matrix: Water  
# Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	2	N/A	2022/10/12	CAM SOP-00448	SM 23 2320 B m
Alkalinity	1	N/A	2022/10/07	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	1	N/A	2022/10/07	CAM SOP-00102	APHA 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	2	N/A	2022/10/08	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	3	N/A	2022/10/11	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	3	N/A	2022/10/07	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2022/10/07	CAM SOP-00446	SM 23 5310 B m
Fluoride	3	2022/10/06	2022/10/07	CAM SOP-00449	SM 23 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2022/10/07	CAM SOP 00102/00408/00447	SM 2340 B
Metals Analysis by ICPMS (as received) (2)	3	N/A	2022/10/07	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2022/10/11		
Ion Balance (% Difference)	2	N/A	2022/10/12		
Anion and Cation Sum	1	N/A	2022/10/07		
Anion and Cation Sum	2	N/A	2022/10/08		
Total Coliforms/ E. coli, CFU/100mL	2	N/A	2022/10/05	CAM SOP-00551	
Total Ammonia-N	3	N/A	2022/10/14	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (3)	1	N/A	2022/10/11	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (3)	1	N/A	2022/10/12	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (3)	1	N/A	2022/10/13	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	3	2022/10/06	2022/10/07	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	3	N/A	2022/10/12	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2022/10/11		Auto Calc
Sat. pH and Langelier Index (@ 20C)	2	N/A	2022/10/12		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2022/10/11		Auto Calc
Sat. pH and Langelier Index (@ 4C)	2	N/A	2022/10/12		Auto Calc
Sulphate by Automated Colourimetry	3	N/A	2022/10/11	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	1	N/A	2022/10/11		Auto Calc
Total Dissolved Solids (TDS calc)	2	N/A	2022/10/12		Auto Calc



Site Location: SALT FORD  
Your C.O.C. #: 161970

**Attention: Geoff Rether**

Ian D Wilson Associates Ltd  
PO Box 299  
76722 Airport Rd  
Clinton, ON  
CANADA NOM 1L0

**Report Date: 2022/10/14**  
Report #: R7341998  
Version: 2 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C2S7957**

**Received: 2022/10/04, 16:00**

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

- (1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
- (2) Metals analysis was performed on the sample 'as received'.
- (3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**



Bureau Veritas  
14 Oct 2022 19:01:13

Please direct all questions regarding this Certificate of Analysis to your Project Manager.  
Archana Gothoskar, B.Sc., Project Manager  
Email: archana.gothoskar@bureauveritas.com  
Phone# (905) 817-5700

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU VERITAS

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

RCAP - COMPREHENSIVE (DRINKING WATER)

<b>Bureau Veritas ID</b>		TXP235		TXP236				TXP237			
<b>Sampling Date</b>		2022/10/03 15:28		2022/10/04 14:30				2022/10/04 14:00			
<b>COC Number</b>		161970		161970				161970			
	<b>UNITS</b>	<b>1 HOUR</b>	<b>QC Batch</b>	<b>24 HOURS</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>	<b>RIVER</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>											
Anion Sum	me/L	5.54	8263050	5.38	N/A	N/A	8263050	5.57	N/A	N/A	8263050
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	200	8262956	190	1.0	0.20	8262956	190	1.0	0.20	8262956
Calculated TDS	mg/L	300	8263048	290	1.0	0.20	8263048	300	1.0	0.20	8263048
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.2	8262956	1.6	1.0	0.20	8262956	6.1	1.0	0.20	8262956
Cation Sum	me/L	5.83	8263050	5.11	N/A	N/A	8263050	6.12	N/A	N/A	8263050
Hardness (CaCO3)	mg/L	260	8262635	220	1.0	1.0	8262635	270	1.0	1.0	8262635
Ion Balance (% Difference)	%	2.53	8263049	2.52	N/A	N/A	8263049	4.77	N/A	N/A	8263049
Langelier Index (@ 20C)	N/A	0.728	8263046	0.542			8263046	1.21			8263046
Langelier Index (@ 4C)	N/A	0.479	8263047	0.293			8263047	0.959			8263047
Saturation pH (@ 20C)	N/A	7.34	8263046	7.41			8263046	7.33			8263046
Saturation pH (@ 4C)	N/A	7.59	8263047	7.66			8263047	7.58			8263047

<b>Inorganics</b>											
Total Ammonia-N	mg/L	0.23	8271696	0.14	0.050	0.0080	8271696	ND	0.050	0.0080	8271696
Conductivity	umho/cm	520	8270475	520	1.0	0.20	8270464	520	1.0	0.20	8270475
Dissolved Organic Carbon	mg/L	0.68	8269292	0.73	0.40	0.070	8269292	4.7	0.40	0.070	8269292
Orthophosphate (P)	mg/L	ND	8270496	ND	0.010	0.0050	8270496	ND	0.010	0.0050	8270496
pH	pH	8.07	8270484	7.96			8270454	8.53			8270484
Dissolved Sulphate (SO4)	mg/L	67	8270477	67	1.0	0.10	8270477	32	1.0	0.10	8270477
Alkalinity (Total as CaCO3)	mg/L	200	8270472	190	1.0	0.20	8270451	200	1.0	0.20	8270472
Dissolved Chloride (Cl-)	mg/L	2.2	8270488	1.9	1.0	0.30	8270488	29	1.0	0.30	8270488
Nitrite (N)	mg/L	ND	8270443	ND	0.010	0.0020	8269684	ND	0.010	0.0020	8270443
Nitrate (N)	mg/L	ND	8270443	ND	0.10	0.010	8269684	2.19	0.10	0.010	8270443

<b>Metals</b>											
Aluminum (Al)	ug/L	79	8270952	7.9	4.9	1.0	8270952	18	4.9	1.0	8270952
Antimony (Sb)	ug/L	ND	8270952	ND	0.50	0.10	8270952	ND	0.50	0.10	8270952
Arsenic (As)	ug/L	3.5	8270952	3.7	1.0	0.20	8270952	ND	1.0	0.20	8270952
Barium (Ba)	ug/L	81	8270952	79	2.0	1.0	8270952	32	2.0	1.0	8270952
Beryllium (Be)	ug/L	ND	8270952	ND	0.40	0.10	8270952	ND	0.40	0.10	8270952
Boron (B)	ug/L	78	8270952	86	10	2.0	8270952	18	10	2.0	8270952
Cadmium (Cd)	ug/L	ND	8270952	ND	0.090	0.020	8270952	ND	0.090	0.020	8270952
Calcium (Ca)	ug/L	60000	8270952	53000	1000	200	8270952	63000	200	40	8270952
Chromium (Cr)	ug/L	ND	8270952	ND	5.0	1.0	8270952	ND	5.0	1.0	8270952
Cobalt (Co)	ug/L	ND	8270952	ND	0.50	0.10	8270952	ND	0.50	0.10	8270952

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 N/A = Not Applicable  
 ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

**RCAP - COMPREHENSIVE (DRINKING WATER)**

Bureau Veritas ID		TXP235		TXP236				TXP237			
Sampling Date		2022/10/03 15:28		2022/10/04 14:30				2022/10/04 14:00			
COC Number		161970		161970				161970			
	UNITS	1 HOUR	QC Batch	24 HOURS	RDL	MDL	QC Batch	RIVER	RDL	MDL	QC Batch
Copper (Cu)	ug/L	ND	8270952	ND	0.90	0.20	8270952	ND	0.90	0.20	8270952
Iron (Fe)	ug/L	210	8270952	130	100	20	8270952	ND	100	20	8270952
Lead (Pb)	ug/L	ND	8270952	ND	0.50	0.10	8270952	ND	0.50	0.10	8270952
Magnesium (Mg)	ug/L	26000	8270952	22000	50	10	8270952	26000	50	10	8270952
Manganese (Mn)	ug/L	4.8	8270952	3.2	2.0	0.40	8270952	2.6	2.0	0.40	8270952
Molybdenum (Mo)	ug/L	8.0	8270952	9.0	0.50	0.20	8270952	0.60	0.50	0.20	8270952
Nickel (Ni)	ug/L	1.5	8270952	1.3	1.0	0.20	8270952	ND	1.0	0.20	8270952
Phosphorus (P)	ug/L	ND	8270952	ND	100	20	8270952	ND	100	20	8270952
Potassium (K)	ug/L	940	8270952	930	200	40	8270952	2900	200	40	8270952
Selenium (Se)	ug/L	ND	8270952	ND	2.0	0.40	8270952	ND	2.0	0.40	8270952
Silicon (Si)	ug/L	5800	8270952	5900	50	10	8270952	230	50	10	8270952
Silver (Ag)	ug/L	ND	8270952	ND	0.090	0.020	8270952	ND	0.090	0.020	8270952
Sodium (Na)	ug/L	13000	8270952	14000	100	20	8270952	17000	100	20	8270952
Strontium (Sr)	ug/L	50000	8270952	50000	5.0	1.0	8270952	950	1.0	0.20	8270952
Thallium (Tl)	ug/L	0.065	8270952	0.050	0.050	0.010	8270952	ND	0.050	0.010	8270952
Titanium (Ti)	ug/L	ND	8270952	ND	5.0	1.0	8270952	ND	5.0	1.0	8270952
Uranium (U)	ug/L	1.3	8270952	1.2	0.10	0.020	8270952	1.3	0.10	0.020	8270952
Vanadium (V)	ug/L	ND	8270952	ND	0.50	0.20	8270952	ND	0.50	0.20	8270952
Zinc (Zn)	ug/L	60	8270952	34	5.0	1.0	8270952	ND	5.0	1.0	8270952

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



**BUREAU  
VERITAS**

Bureau Veritas Job #: C2S7957  
Report Date: 2022/10/14

Ian D Wilson Associates Ltd  
Site Location: SALT FORD

**RESULTS OF ANALYSES OF WATER**

<b>Bureau Veritas ID</b>		TXP235		TXP236		TXP237			
<b>Sampling Date</b>		2022/10/03 15:28		2022/10/04 14:30		2022/10/04 14:00			
<b>COC Number</b>		161970		161970		161970			
	<b>UNITS</b>	<b>1 HOUR</b>	<b>QC Batch</b>	<b>24 HOURS</b>	<b>QC Batch</b>	<b>RIVER</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>
<b>Inorganics</b>									
Fluoride (F-)	mg/L	2.2	8270479	2.2	8270467	0.28	0.10	0.020	8270479
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									



**BUREAU  
VERITAS**

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### MICROBIOLOGY (WATER)

<b>Bureau Veritas ID</b>		TXP235	TXP236		
<b>Sampling Date</b>		2022/10/03 15:28	2022/10/04 14:30		
<b>COC Number</b>		161970	161970		
	<b>UNITS</b>	<b>1 HOUR</b>	<b>24 HOURS</b>	<b>MDL</b>	<b>QC Batch</b>
<b>Microbiological</b>					
Background	CFU/100mL	56	3	N/A	8267810
Total Coliforms	CFU/100mL	0	0	N/A	8267810
Escherichia coli	CFU/100mL	0	0	N/A	8267810
QC Batch = Quality Control Batch					
N/A = Not Applicable					





**BUREAU  
VERITAS**

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### TEST SUMMARY

**Bureau Veritas ID:** TXP235  
**Sample ID:** 1 HOUR  
**Matrix:** Water

**Collected:** 2022/10/03  
**Shipped:**  
**Received:** 2022/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8270472	N/A	2022/10/12	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	8262956	N/A	2022/10/08	Automated Statchk
Chloride by Automated Colourimetry	KONE	8270488	N/A	2022/10/11	Alina Dobreanu
Conductivity	AT	8270475	N/A	2022/10/07	Kien Tran
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8269292	N/A	2022/10/07	Nimarta Singh
Fluoride	ISE	8270479	2022/10/06	2022/10/07	Kien Tran
Hardness (calculated as CaCO3)		8262635	N/A	2022/10/07	Automated Statchk
Metals Analysis by ICPMS (as received)	ICP/MS	8270952	N/A	2022/10/07	Arefa Dabhad
Ion Balance (% Difference)	CALC	8263049	N/A	2022/10/12	Automated Statchk
Anion and Cation Sum	CALC	8263050	N/A	2022/10/08	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	8267810	N/A	2022/10/05	Sonja Elavinamannil
Total Ammonia-N	LACH/NH4	8271696	N/A	2022/10/14	Anna-Kay Gooden
Nitrate & Nitrite as Nitrogen in Water	LACH	8270443	N/A	2022/10/12	Chandra Nandlal
pH	AT	8270484	2022/10/06	2022/10/07	Kien Tran
Orthophosphate	KONE	8270496	N/A	2022/10/12	Samuel Law
Sat. pH and Langelier Index (@ 20C)	CALC	8263046	N/A	2022/10/12	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8263047	N/A	2022/10/12	Automated Statchk
Sulphate by Automated Colourimetry	KONE	8270477	N/A	2022/10/11	Samuel Law
Total Dissolved Solids (TDS calc)	CALC	8263048	N/A	2022/10/12	Automated Statchk

**Bureau Veritas ID:** TXP236  
**Sample ID:** 24 HOURS  
**Matrix:** Water

**Collected:** 2022/10/04  
**Shipped:**  
**Received:** 2022/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8270451	N/A	2022/10/07	Kien Tran
Carbonate, Bicarbonate and Hydroxide	CALC	8262956	N/A	2022/10/07	Automated Statchk
Chloride by Automated Colourimetry	KONE	8270488	N/A	2022/10/11	Alina Dobreanu
Conductivity	AT	8270464	N/A	2022/10/07	Kien Tran
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8269292	N/A	2022/10/07	Nimarta Singh
Fluoride	ISE	8270467	2022/10/06	2022/10/07	Kien Tran
Hardness (calculated as CaCO3)		8262635	N/A	2022/10/07	Automated Statchk
Metals Analysis by ICPMS (as received)	ICP/MS	8270952	N/A	2022/10/07	Arefa Dabhad
Ion Balance (% Difference)	CALC	8263049	N/A	2022/10/11	Automated Statchk
Anion and Cation Sum	CALC	8263050	N/A	2022/10/07	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	8267810	N/A	2022/10/05	Sonja Elavinamannil
Total Ammonia-N	LACH/NH4	8271696	N/A	2022/10/14	Anna-Kay Gooden
Nitrate & Nitrite as Nitrogen in Water	LACH	8269684	N/A	2022/10/11	Chandra Nandlal
pH	AT	8270454	2022/10/06	2022/10/07	Kien Tran
Orthophosphate	KONE	8270496	N/A	2022/10/12	Samuel Law
Sat. pH and Langelier Index (@ 20C)	CALC	8263046	N/A	2022/10/11	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8263047	N/A	2022/10/11	Automated Statchk
Sulphate by Automated Colourimetry	KONE	8270477	N/A	2022/10/11	Samuel Law
Total Dissolved Solids (TDS calc)	CALC	8263048	N/A	2022/10/11	Automated Statchk





Bureau Veritas Job #: C2S7957  
 Report Date: 2022/10/14

Ian D Wilson Associates Ltd  
 Site Location: SALT FORD

### TEST SUMMARY

**Bureau Veritas ID:** TXP236 Dup  
**Sample ID:** 24 HOURS  
**Matrix:** Water

**Collected:** 2022/10/04  
**Shipped:**  
**Received:** 2022/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8270451	N/A	2022/10/07	Kien Tran
Conductivity	AT	8270464	N/A	2022/10/07	Kien Tran
Fluoride	ISE	8270467	2022/10/06	2022/10/07	Kien Tran
pH	AT	8270454	2022/10/06	2022/10/07	Kien Tran

**Bureau Veritas ID:** TXP237  
**Sample ID:** RIVER  
**Matrix:** Water

**Collected:** 2022/10/04  
**Shipped:**  
**Received:** 2022/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8270472	N/A	2022/10/12	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	8262956	N/A	2022/10/08	Automated Statchk
Chloride by Automated Colourimetry	KONE	8270488	N/A	2022/10/11	Alina Dobreanu
Conductivity	AT	8270475	N/A	2022/10/07	Kien Tran
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8269292	N/A	2022/10/07	Nimarta Singh
Fluoride	ISE	8270479	2022/10/06	2022/10/07	Kien Tran
Hardness (calculated as CaCO3)		8262635	N/A	2022/10/07	Automated Statchk
Metals Analysis by ICPMS (as received)	ICP/MS	8270952	N/A	2022/10/07	Arefa Dabhad
Ion Balance (% Difference)	CALC	8263049	N/A	2022/10/12	Automated Statchk
Anion and Cation Sum	CALC	8263050	N/A	2022/10/08	Automated Statchk
Total Ammonia-N	LACH/NH4	8271696	N/A	2022/10/14	Anna-Kay Gooden
Nitrate & Nitrite as Nitrogen in Water	LACH	8270443	N/A	2022/10/13	Chandra Nandlal
pH	AT	8270484	2022/10/06	2022/10/07	Kien Tran
Orthophosphate	KONE	8270496	N/A	2022/10/12	Samuel Law
Sat. pH and Langelier Index (@ 20C)	CALC	8263046	N/A	2022/10/12	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8263047	N/A	2022/10/12	Automated Statchk
Sulphate by Automated Colourimetry	KONE	8270477	N/A	2022/10/11	Samuel Law
Total Dissolved Solids (TDS calc)	CALC	8263048	N/A	2022/10/12	Automated Statchk



**BUREAU  
VERITAS**

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### GENERAL COMMENTS

**Results relate only to the items tested.**



BUREAU VERITAS

Bureau Veritas Job #: C257957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8269292	NS3	Matrix Spike	Dissolved Organic Carbon	2022/10/07		94	%	80 - 120
8269292	NS3	Spiked Blank	Dissolved Organic Carbon	2022/10/07		93	%	80 - 120
8269292	NS3	Method Blank	Dissolved Organic Carbon	2022/10/07	ND, RDL=0.40		mg/L	
8269292	NS3	RPD	Dissolved Organic Carbon	2022/10/07	0.63		%	20
8269684	C_N	Matrix Spike	Nitrite (N)	2022/10/11		113	%	80 - 120
			Nitrate (N)	2022/10/11		NC	%	80 - 120
8269684	C_N	Spiked Blank	Nitrite (N)	2022/10/11		109	%	80 - 120
			Nitrate (N)	2022/10/11		99	%	80 - 120
8269684	C_N	Method Blank	Nitrite (N)	2022/10/11	ND, RDL=0.010		mg/L	
			Nitrate (N)	2022/10/11	ND, RDL=0.10		mg/L	
8269684	C_N	RPD	Nitrite (N)	2022/10/11	3.3		%	20
			Nitrate (N)	2022/10/11	0.59		%	20
8270443	C_N	Matrix Spike	Nitrite (N)	2022/10/12		101	%	80 - 120
			Nitrate (N)	2022/10/12		89	%	80 - 120
8270443	C_N	Spiked Blank	Nitrite (N)	2022/10/12		107	%	80 - 120
			Nitrate (N)	2022/10/12		94	%	80 - 120
8270443	C_N	Method Blank	Nitrite (N)	2022/10/12	ND, RDL=0.010		mg/L	
			Nitrate (N)	2022/10/12	ND, RDL=0.10		mg/L	
8270443	C_N	RPD	Nitrate (N)	2022/10/12	2.0		%	20
8270451	KIT	Spiked Blank	Alkalinity (Total as CaCO3)	2022/10/07		93	%	85 - 115
8270451	KIT	Method Blank	Alkalinity (Total as CaCO3)	2022/10/07	ND, RDL=1.0		mg/L	
8270451	KIT	RPD [TXP236-01]	Alkalinity (Total as CaCO3)	2022/10/07	0.42		%	20
8270454	KIT	Spiked Blank	pH	2022/10/07		101	%	98 - 103
8270454	KIT	RPD [TXP236-01]	pH	2022/10/07	0.15		%	N/A
8270464	KIT	Spiked Blank	Conductivity	2022/10/07		101	%	85 - 115
8270464	KIT	Method Blank	Conductivity	2022/10/07	ND, RDL=1.0		umho/cm	
8270464	KIT	RPD [TXP236-01]	Conductivity	2022/10/07	0		%	25
8270467	KIT	Matrix Spike [TXP236-01]	Fluoride (F-)	2022/10/07		101	%	80 - 120
8270467	KIT	Spiked Blank	Fluoride (F-)	2022/10/07		103	%	80 - 120
8270467	KIT	Method Blank	Fluoride (F-)	2022/10/07	ND, RDL=0.10		mg/L	
8270467	KIT	RPD [TXP236-01]	Fluoride (F-)	2022/10/07	1.9		%	20
8270472	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2022/10/12		92	%	85 - 115
8270472	YPA	Method Blank	Alkalinity (Total as CaCO3)	2022/10/12	ND, RDL=1.0		mg/L	
8270472	YPA	RPD	Alkalinity (Total as CaCO3)	2022/10/12	1.4		%	20
8270475	KIT	Spiked Blank	Conductivity	2022/10/07		101	%	85 - 115
8270475	KIT	Method Blank	Conductivity	2022/10/07	ND, RDL=1.0		umho/cm	
8270475	KIT	RPD	Conductivity	2022/10/07	0.64		%	25
8270477	S1L	Matrix Spike	Dissolved Sulphate (SO4)	2022/10/11		104	%	75 - 125
8270477	S1L	Spiked Blank	Dissolved Sulphate (SO4)	2022/10/11		109	%	80 - 120
8270477	S1L	Method Blank	Dissolved Sulphate (SO4)	2022/10/11	ND, RDL=1.0		mg/L	
8270477	S1L	RPD	Dissolved Sulphate (SO4)	2022/10/11	0.20		%	20
8270479	KIT	Matrix Spike	Fluoride (F-)	2022/10/07		101	%	80 - 120
8270479	KIT	Spiked Blank	Fluoride (F-)	2022/10/07		108	%	80 - 120



BUREAU VERITAS

Bureau Veritas Job #: C257957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8270479	KIT	Method Blank	Fluoride (F-)	2022/10/07	ND, RDL=0.10		mg/L	
8270479	KIT	RPD	Fluoride (F-)	2022/10/07	6.1		%	20
8270484	KIT	Spiked Blank	pH	2022/10/07		101	%	98 - 103
8270484	KIT	RPD	pH	2022/10/07	0.32		%	N/A
8270488	ADB	Matrix Spike	Dissolved Chloride (Cl-)	2022/10/11		106	%	80 - 120
8270488	ADB	Spiked Blank	Dissolved Chloride (Cl-)	2022/10/11		104	%	80 - 120
8270488	ADB	Method Blank	Dissolved Chloride (Cl-)	2022/10/11	ND, RDL=1.0		mg/L	
8270488	ADB	RPD	Dissolved Chloride (Cl-)	2022/10/11	0.22		%	20
8270496	S1L	Matrix Spike	Orthophosphate (P)	2022/10/12		87	%	75 - 125
8270496	S1L	Spiked Blank	Orthophosphate (P)	2022/10/12		101	%	80 - 120
8270496	S1L	Method Blank	Orthophosphate (P)	2022/10/12	ND, RDL=0.010		mg/L	
8270496	S1L	RPD	Orthophosphate (P)	2022/10/12	0.30		%	25
8270952	ADA	Matrix Spike	Aluminum (Al)	2022/10/07		103	%	80 - 120
			Antimony (Sb)	2022/10/07		104	%	80 - 120
			Arsenic (As)	2022/10/07		98	%	80 - 120
			Barium (Ba)	2022/10/07		98	%	80 - 120
			Beryllium (Be)	2022/10/07		103	%	80 - 120
			Boron (B)	2022/10/07		104	%	80 - 120
			Cadmium (Cd)	2022/10/07		101	%	80 - 120
			Calcium (Ca)	2022/10/07		NC	%	80 - 120
			Chromium (Cr)	2022/10/07		92	%	80 - 120
			Cobalt (Co)	2022/10/07		96	%	80 - 120
			Copper (Cu)	2022/10/07		98	%	80 - 120
			Iron (Fe)	2022/10/07		98	%	80 - 120
			Lead (Pb)	2022/10/07		98	%	80 - 120
			Magnesium (Mg)	2022/10/07		99	%	80 - 120
			Manganese (Mn)	2022/10/07		96	%	80 - 120
			Molybdenum (Mo)	2022/10/07		100	%	80 - 120
			Nickel (Ni)	2022/10/07		95	%	80 - 120
			Phosphorus (P)	2022/10/07		98	%	80 - 120
			Potassium (K)	2022/10/07		102	%	80 - 120
			Selenium (Se)	2022/10/07		100	%	80 - 120
			Silicon (Si)	2022/10/07		102	%	80 - 120
			Silver (Ag)	2022/10/07		98	%	80 - 120
			Sodium (Na)	2022/10/07		95	%	80 - 120
			Strontium (Sr)	2022/10/07		93	%	80 - 120
			Thallium (Tl)	2022/10/07		100	%	80 - 120
			Titanium (Ti)	2022/10/07		99	%	80 - 120
			Uranium (U)	2022/10/07		100	%	80 - 120
			Vanadium (V)	2022/10/07		93	%	80 - 120
			Zinc (Zn)	2022/10/07		98	%	80 - 120
8270952	ADA	Spiked Blank	Aluminum (Al)	2022/10/07		102	%	80 - 120
			Antimony (Sb)	2022/10/07		100	%	80 - 120
			Arsenic (As)	2022/10/07		99	%	80 - 120
			Barium (Ba)	2022/10/07		100	%	80 - 120
			Beryllium (Be)	2022/10/07		106	%	80 - 120
			Boron (B)	2022/10/07		105	%	80 - 120
			Cadmium (Cd)	2022/10/07		98	%	80 - 120
			Calcium (Ca)	2022/10/07		99	%	80 - 120
			Chromium (Cr)	2022/10/07		93	%	80 - 120



BUREAU  
VERITAS

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Cobalt (Co)	2022/10/07		98	%	80 - 120
			Copper (Cu)	2022/10/07		99	%	80 - 120
			Iron (Fe)	2022/10/07		100	%	80 - 120
			Lead (Pb)	2022/10/07		99	%	80 - 120
			Magnesium (Mg)	2022/10/07		102	%	80 - 120
			Manganese (Mn)	2022/10/07		96	%	80 - 120
			Molybdenum (Mo)	2022/10/07		100	%	80 - 120
			Nickel (Ni)	2022/10/07		97	%	80 - 120
			Phosphorus (P)	2022/10/07		112	%	80 - 120
			Potassium (K)	2022/10/07		100	%	80 - 120
			Selenium (Se)	2022/10/07		100	%	80 - 120
			Silicon (Si)	2022/10/07		100	%	80 - 120
			Silver (Ag)	2022/10/07		96	%	80 - 120
			Sodium (Na)	2022/10/07		99	%	80 - 120
			Strontium (Sr)	2022/10/07		97	%	80 - 120
			Thallium (Tl)	2022/10/07		99	%	80 - 120
			Titanium (Ti)	2022/10/07		98	%	80 - 120
			Uranium (U)	2022/10/07		99	%	80 - 120
			Vanadium (V)	2022/10/07		94	%	80 - 120
			Zinc (Zn)	2022/10/07		98	%	80 - 120
8270952	ADA	Method Blank	Aluminum (Al)	2022/10/07	ND, RDL=4.9		ug/L	
			Antimony (Sb)	2022/10/07	ND, RDL=0.50		ug/L	
			Arsenic (As)	2022/10/07	ND, RDL=1.0		ug/L	
			Barium (Ba)	2022/10/07	ND, RDL=2.0		ug/L	
			Beryllium (Be)	2022/10/07	ND, RDL=0.40		ug/L	
			Boron (B)	2022/10/07	ND, RDL=10		ug/L	
			Cadmium (Cd)	2022/10/07	ND, RDL=0.090		ug/L	
			Calcium (Ca)	2022/10/07	ND, RDL=200		ug/L	
			Chromium (Cr)	2022/10/07	ND, RDL=5.0		ug/L	
			Cobalt (Co)	2022/10/07	ND, RDL=0.50		ug/L	
			Copper (Cu)	2022/10/07	ND, RDL=0.90		ug/L	
			Iron (Fe)	2022/10/07	ND, RDL=100		ug/L	
			Lead (Pb)	2022/10/07	ND, RDL=0.50		ug/L	
			Magnesium (Mg)	2022/10/07	ND, RDL=50		ug/L	
			Manganese (Mn)	2022/10/07	ND, RDL=2.0		ug/L	
			Molybdenum (Mo)	2022/10/07	ND, RDL=0.50		ug/L	
			Nickel (Ni)	2022/10/07	ND, RDL=1.0		ug/L	



BUREAU VERITAS

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Phosphorus (P)	2022/10/07	ND, RDL=100		ug/L	
			Potassium (K)	2022/10/07	ND, RDL=200		ug/L	
			Selenium (Se)	2022/10/07	ND, RDL=2.0		ug/L	
			Silicon (Si)	2022/10/07	ND, RDL=50		ug/L	
			Silver (Ag)	2022/10/07	ND, RDL=0.090		ug/L	
			Sodium (Na)	2022/10/07	ND, RDL=100		ug/L	
			Strontium (Sr)	2022/10/07	ND, RDL=1.0		ug/L	
			Thallium (Tl)	2022/10/07	ND, RDL=0.050		ug/L	
			Titanium (Ti)	2022/10/07	ND, RDL=5.0		ug/L	
			Uranium (U)	2022/10/07	ND, RDL=0.10		ug/L	
			Vanadium (V)	2022/10/07	ND, RDL=0.50		ug/L	
			Zinc (Zn)	2022/10/07	ND, RDL=5.0		ug/L	
8270952	ADA	RPD	Aluminum (Al)	2022/10/07	NC		%	20
			Calcium (Ca)	2022/10/07	1.2		%	20
			Copper (Cu)	2022/10/07	NC		%	20
			Iron (Fe)	2022/10/07	NC		%	20
			Magnesium (Mg)	2022/10/07	0.020		%	20
			Manganese (Mn)	2022/10/07	NC		%	20
			Potassium (K)	2022/10/07	0.86		%	20
			Sodium (Na)	2022/10/07	1.6		%	20
8271696	AGD	Matrix Spike	Total Ammonia-N	2022/10/14		NC	%	75 - 125
8271696	AGD	Spiked Blank	Total Ammonia-N	2022/10/14		103	%	80 - 120
8271696	AGD	Method Blank	Total Ammonia-N	2022/10/14	ND, RDL=0.050		mg/L	
8271696	AGD	RPD	Total Ammonia-N	2022/10/14	2.8		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).



BUREAU  
VERITAS

Bureau Veritas Job #: C2S7957

Report Date: 2022/10/14

Ian D Wilson Associates Ltd

Site Location: SALT FORD

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

---

Anastassia Hamanov, Scientific Specialist

---

Cristina Carriere, Senior Scientific Specialist

---

Sonja Elavinamanni, Master of Biochemistry, Team Lead

---

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Your Project #: Century Heights  
Your C.O.C. #: 900010-01-01

**Attention: Geoff Rether**

Ian D Wilson Associates Ltd  
PO Box 299  
76722 Airport Rd  
Clinton, ON  
CANADA N0M 1L0

**Report Date: 2022/10/18**  
Report #: R7346607  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C2T1405**

**Received: 2022/10/06, 16:01**

Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) Metals analysis was performed on the sample 'as received'.

(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**



Bureau Veritas  
18 Oct 2022 15:20:49

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Archana Gothoskar, B.Sc., Project Manager

Email: archana.gothoskar@bureauveritas.com

Phone# (905) 817-5700

=====

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**RCAP - COMPREHENSIVE (DRINKING WATER)**

<b>Bureau Veritas ID</b>		TYG965	TYG966			
<b>Sampling Date</b>		2022/10/05 14:30	2022/10/06 14:15			
<b>COC Number</b>		900010-01-01	900010-01-01			
	<b>UNITS</b>	<b>48 HOURS</b>	<b>72 HOURS</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>						
Anion Sum	me/L	5.72	5.71	N/A	N/A	8269552
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	210	200	1.0	0.20	8271552
Calculated TDS	mg/L	290	300	1.0	0.20	8269041
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.1	1.9	1.0	0.20	8271552
Cation Sum	me/L	4.87	5.04	N/A	N/A	8269552
Hardness (CaCO3)	mg/L	210	220	1.0	1.0	8270710
Ion Balance (% Difference)	%	8.04	6.29	N/A	N/A	8269551
Langelier Index (@ 20C)	N/A	0.621	0.619			8269554
Langelier Index (@ 4C)	N/A	0.372	0.370			8269555
Saturation pH (@ 20C)	N/A	7.41	7.38			8269554
Saturation pH (@ 4C)	N/A	7.65	7.63			8269555

<b>Inorganics</b>						
Total Ammonia-N	mg/L	0.14	0.13	0.050	0.0080	8280909
Conductivity	umho/cm	520	520	1.0	0.20	8273760
Dissolved Organic Carbon	mg/L	0.84	0.65	0.40	0.070	8273565
Orthophosphate (P)	mg/L	ND	ND	0.010	0.0050	8273863
pH	pH	8.03	8.00			8273758
Dissolved Sulphate (SO4)	mg/L	68	70	1.0	0.10	8273866
Alkalinity (Total as CaCO3)	mg/L	210	210	1.0	0.20	8273759
Dissolved Chloride (Cl-)	mg/L	1.7	1.4	1.0	0.30	8273865
Nitrite (N)	mg/L	ND	ND	0.010	0.0020	8273490
Nitrate (N)	mg/L	ND	ND	0.10	0.010	8273490

<b>Metals</b>						
Aluminum (Al)	ug/L	ND	8.2	4.9	1.0	8280304
Antimony (Sb)	ug/L	ND	ND	0.50	0.10	8280304
Arsenic (As)	ug/L	3.5	3.7	1.0	0.20	8280304
Barium (Ba)	ug/L	81	81	2.0	1.0	8280304
Beryllium (Be)	ug/L	ND	ND	0.40	0.10	8280304
Boron (B)	ug/L	77	79	10	2.0	8280304
Cadmium (Cd)	ug/L	ND	ND	0.090	0.020	8280304
Calcium (Ca)	ug/L	50000	53000	1000	200	8280304
Chromium (Cr)	ug/L	ND	ND	5.0	1.0	8280304

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 N/A = Not Applicable  
 ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



**BUREAU  
VERITAS**

Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

**RCAP - COMPREHENSIVE (DRINKING WATER)**

Bureau Veritas ID		TYG965	TYG966			
Sampling Date		2022/10/05 14:30	2022/10/06 14:15			
COC Number		900010-01-01	900010-01-01			
	UNITS	48 HOURS	72 HOURS	RDL	MDL	QC Batch
Cobalt (Co)	ug/L	ND	ND	0.50	0.10	8280304
Copper (Cu)	ug/L	ND	ND	0.90	0.20	8280304
Iron (Fe)	ug/L	130	130	100	20	8280304
Lead (Pb)	ug/L	ND	ND	0.50	0.10	8280304
Magnesium (Mg)	ug/L	21000	21000	50	10	8280304
Manganese (Mn)	ug/L	2.9	3.1	2.0	0.40	8280304
Molybdenum (Mo)	ug/L	8.8	8.6	0.50	0.20	8280304
Nickel (Ni)	ug/L	1.2	1.6	1.0	0.20	8280304
Phosphorus (P)	ug/L	ND	ND	100	20	8280304
Potassium (K)	ug/L	950	960	200	40	8280304
Selenium (Se)	ug/L	ND	ND	2.0	0.40	8280304
Silicon (Si)	ug/L	5700	6000	50	10	8280304
Silver (Ag)	ug/L	ND	ND	0.090	0.020	8280304
Sodium (Na)	ug/L	14000	14000	100	20	8280304
Strontium (Sr)	ug/L	53000	54000	5.0	1.0	8280304
Thallium (Tl)	ug/L	ND	ND	0.050	0.010	8280304
Titanium (Ti)	ug/L	ND	ND	5.0	1.0	8280304
Uranium (U)	ug/L	1.0	0.99	0.10	0.020	8280304
Vanadium (V)	ug/L	ND	ND	0.50	0.20	8280304
Zinc (Zn)	ug/L	25	23	5.0	1.0	8280304
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.						



BUREAU  
VERITAS

Bureau Veritas Job #: C2T1405

Report Date: 2022/10/18

Ian D Wilson Associates Ltd

Client Project #: Century Heights

Sampler Initials: GR

**REG 170, SCHEDULE 24 (NEW 2016)**

<b>Bureau Veritas ID</b>		TYG966			
<b>Sampling Date</b>		2022/10/06 14:15			
<b>COC Number</b>		900010-01-01			
	<b>UNITS</b>	<b>72 HOURS</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>
<b>Semivolatile Organics</b>					
2,3,4,6-Tetrachlorophenol	ug/L	ND	0.50	0.010	8276529
2,4,6-Trichlorophenol	ug/L	ND	0.50	0.011	8276529
2,4-D	ug/L	ND	1.0	0.013	8276529
2,4-Dichlorophenol	ug/L	ND	0.25	0.0090	8276529
Alachlor	ug/L	ND	0.50	0.078	8276529
Atrazine	ug/L	ND	0.50	0.020	8276529
Des-ethyl atrazine	ug/L	ND	0.50	0.011	8276529
Atrazine + Desethyl-atrazine	ug/L	ND	1.0	N/A	8276529
Bromoxynil	ug/L	ND	0.50	0.0080	8276529
Carbaryl	ug/L	ND	5.0	0.010	8276529
Carbofuran	ug/L	ND	5.0	0.015	8276529
Chlorpyrifos (Dursban)	ug/L	ND	1.0	0.021	8276529
Diazinon	ug/L	ND	1.0	0.021	8276529
Dicamba	ug/L	ND	1.0	0.018	8276529
Diclofop-methyl	ug/L	ND	0.90	0.050	8276529
Dimethoate	ug/L	ND	2.5	0.024	8276529
Malathion	ug/L	ND	5.0	0.018	8276529
MCPA	ug/L	ND	10	N/A	8276529
Metolachlor	ug/L	ND	0.50	0.025	8276529
Metribuzin (Sencor)	ug/L	ND	5.0	0.020	8276529
Pentachlorophenol	ug/L	ND	0.50	0.024	8276529
Phorate	ug/L	ND	0.50	0.011	8276529
Picloram	ug/L	ND	5.0	0.010	8276529
Prometryne	ug/L	ND	0.25	0.013	8276529
Simazine	ug/L	ND	1.0	0.012	8276529
Terbufos	ug/L	ND	0.50	0.011	8276529
Triallate	ug/L	ND	1.0	0.013	8276529
Trifluralin	ug/L	ND	1.0	0.010	8276529
Benzo(a)pyrene	ug/L	ND	0.0050	0.0010	8276529
<b>Volatile Organics</b>					
1,1-Dichloroethylene	ug/L	ND	0.10	N/A	8272148
1,2-Dichlorobenzene	ug/L	ND	0.20	N/A	8272148
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not Detected at a concentration equal or greater than the indicated Detection Limit. N/A = Not Applicable					



BUREAU  
VERITAS

Bureau Veritas Job #: C2T1405

Report Date: 2022/10/18

Ian D Wilson Associates Ltd

Client Project #: Century Heights

Sampler Initials: GR

**REG 170, SCHEDULE 24 (NEW 2016)**

Bureau Veritas ID		TYG966			
Sampling Date		2022/10/06 14:15			
COC Number		900010-01-01			
	UNITS	72 HOURS	RDL	MDL	QC Batch
1,2-Dichloroethane	ug/L	ND	0.20	N/A	8272148
1,4-Dichlorobenzene	ug/L	ND	0.20	N/A	8272148
Benzene	ug/L	ND	0.10	N/A	8272148
Carbon Tetrachloride	ug/L	ND	0.10	N/A	8272148
Chlorobenzene	ug/L	ND	0.10	N/A	8272148
Methylene Chloride(Dichloromethane)	ug/L	ND	0.50	N/A	8272148
Ethylbenzene	ug/L	ND	0.10	N/A	8272148
Tetrachloroethylene	ug/L	ND	0.10	N/A	8272148
Toluene	ug/L	ND	0.20	N/A	8272148
Trichloroethylene	ug/L	ND	0.10	N/A	8272148
Vinyl Chloride	ug/L	ND	0.20	N/A	8272148
o-Xylene	ug/L	ND	0.10	N/A	8272148
p+m-Xylene	ug/L	ND	0.10	N/A	8272148
Total Xylenes	ug/L	ND	0.10	N/A	8272148
<b>PCBs</b>					
Aroclor 1016	ug/L	ND	0.05	0.01	8281288
Aroclor 1221	ug/L	ND	0.05	0.01	8281288
Aroclor 1232	ug/L	ND	0.05	0.01	8281288
Aroclor 1242	ug/L	ND	0.05	0.01	8281288
Aroclor 1248	ug/L	ND	0.05	0.01	8281288
Aroclor 1254	ug/L	ND	0.05	0.01	8281288
Aroclor 1260	ug/L	ND	0.05	0.01	8281288
Total PCB	ug/L	ND	0.05	0.01	8281288
<b>Pesticides &amp; Herbicides</b>					
Glyphosate	ug/L	ND	10	0.65	8277260
Diquat	ug/L	ND	7.0	0.26	8276202
Diuron	ug/L	ND	10	0.049	8279315
Guthion (Azinphos-methyl)	ug/L	ND	2.0	0.059	8279315
Paraquat	ug/L	ND	1.0	0.15	8276202
<b>Surrogate Recovery (%)</b>					
2,4,6-Tribromophenol	%	82			8276529
2,4-Dichlorophenyl Acetic Acid	%	77			8276529
2-Fluorobiphenyl	%	69			8276529
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not Detected at a concentration equal or greater than the indicated Detection Limit. N/A = Not Applicable					



BUREAU  
VERITAS

Bureau Veritas Job #: C2T1405

Report Date: 2022/10/18

Ian D Wilson Associates Ltd

Client Project #: Century Heights

Sampler Initials: GR

**REG 170, SCHEDULE 24 (NEW 2016)**

<b>Bureau Veritas ID</b>		TYG966			
<b>Sampling Date</b>		2022/10/06 14:15			
<b>COC Number</b>		900010-01-01			
	<b>UNITS</b>	<b>72 HOURS</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>
D14-Terphenyl (FS)	%	92			8276529
D5-Nitrobenzene	%	82			8276529
Decachlorobiphenyl	%	89			8281288
4-Bromofluorobenzene	%	101			8272148
D4-1,2-Dichloroethane	%	108			8272148
D8-Toluene	%	96			8272148
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



BUREAU  
VERITAS

Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

**REG 170, SCHEDULE 23 (WATER)**

<b>Bureau Veritas ID</b>		TYG966			
<b>Sampling Date</b>		2022/10/06 14:15			
<b>COC Number</b>		900010-01-01			
	<b>UNITS</b>	<b>72 HOURS</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>
<b>Metals</b>					
Mercury (Hg)	mg/L	ND	0.00010	0.000050	8280843
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.					



BUREAU VERITAS

Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

### RESULTS OF ANALYSES OF WATER

<b>Bureau Veritas ID</b>		TYG965	TYG966			
<b>Sampling Date</b>		2022/10/05 14:30	2022/10/06 14:15			
<b>COC Number</b>		900010-01-01	900010-01-01			
	<b>UNITS</b>	<b>48 HOURS</b>	<b>72 HOURS</b>	<b>RDL</b>	<b>MDL</b>	<b>QC Batch</b>
<b>Inorganics</b>						
Fluoride (F-)	mg/L	2.3	2.3	0.10	0.020	8273757
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						



BUREAU  
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Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

### MICROBIOLOGY (WATER)

<b>Bureau Veritas ID</b>		TYG965	TYG966		
<b>Sampling Date</b>		2022/10/05 14:30	2022/10/06 14:15		
<b>COC Number</b>		900010-01-01	900010-01-01		
	<b>UNITS</b>	<b>48 HOURS</b>	<b>72 HOURS</b>	<b>MDL</b>	<b>QC Batch</b>
<b>Microbiological</b>					
Background	CFU/100mL	0	0	N/A	8273268
Total Coliforms	CFU/100mL	0	0	N/A	8273268
Escherichia coli	CFU/100mL	0	0	N/A	8273268
QC Batch = Quality Control Batch					
N/A = Not Applicable					





BUREAU  
VERITAS

Bureau Veritas Job #: C2T1405

Report Date: 2022/10/18

Ian D Wilson Associates Ltd

Client Project #: Century Heights

Sampler Initials: GR

### TEST SUMMARY

**Bureau Veritas ID:** TYG965  
**Sample ID:** 48 HOURS  
**Matrix:** Water

**Collected:** 2022/10/05  
**Shipped:**  
**Received:** 2022/10/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8273759	N/A	2022/10/11	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	8271552	N/A	2022/10/12	Automated Statchk
Chloride by Automated Colourimetry	KONE	8273865	N/A	2022/10/14	Alina Dobreanu
Conductivity	AT	8273760	N/A	2022/10/11	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8273565	N/A	2022/10/11	Nimarta Singh
Fluoride	ISE	8273757	2022/10/08	2022/10/11	Yogesh Patel
Hardness (calculated as CaCO3)		8270710	N/A	2022/10/17	Ewa Pranjic
Metals Analysis by ICPMS (as received)	ICP/MS	8280304	N/A	2022/10/17	Arefa Dabhad
Ion Balance (% Difference)	CALC	8269551	N/A	2022/10/17	Automated Statchk
Anion and Cation Sum	CALC	8269552	N/A	2022/10/17	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	8273268	N/A	2022/10/07	Soham Patel
Total Ammonia-N	LACH/NH4	8280909	N/A	2022/10/17	Anna-Kay Gooden
Nitrate & Nitrite as Nitrogen in Water	LACH	8273490	N/A	2022/10/11	Chandra Nandlal
pH	AT	8273758	2022/10/08	2022/10/11	Yogesh Patel
Orthophosphate	KONE	8273863	N/A	2022/10/12	Samuel Law
Sat. pH and Langelier Index (@ 20C)	CALC	8269554	N/A	2022/10/17	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8269555	N/A	2022/10/17	Automated Statchk
Sulphate by Automated Colourimetry	KONE	8273866	N/A	2022/10/17	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	8269041	N/A	2022/10/17	Automated Statchk

**Bureau Veritas ID:** TYG966  
**Sample ID:** 72 HOURS  
**Matrix:** Water

**Collected:** 2022/10/06  
**Shipped:**  
**Received:** 2022/10/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8273759	N/A	2022/10/11	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	8271552	N/A	2022/10/12	Automated Statchk
Chloride by Automated Colourimetry	KONE	8273865	N/A	2022/10/14	Alina Dobreanu
Conductivity	AT	8273760	N/A	2022/10/11	Yogesh Patel
Diuron, Guthion, Temephos	LC/UV	8279315	2022/10/12	2022/10/13	Furneesh Kumar
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8273565	N/A	2022/10/11	Nimarta Singh
Diquat / Paraquat	LC/UV	8276202	2022/10/11	2022/10/14	Furneesh Kumar
Fluoride	ISE	8273757	2022/10/08	2022/10/11	Yogesh Patel
Glyphosate	LC/FLU	8277260	2022/10/12	2022/10/12	Furneesh Kumar
Hardness (calculated as CaCO3)		8270710	N/A	2022/10/17	Ewa Pranjic
Mercury in Water by CVAA	CV/AA	8280843	2022/10/13	2022/10/13	Japneet Gill
Metals Analysis by ICPMS (as received)	ICP/MS	8280304	N/A	2022/10/17	Arefa Dabhad
Ion Balance (% Difference)	CALC	8269551	N/A	2022/10/17	Automated Statchk
Anion and Cation Sum	CALC	8269552	N/A	2022/10/17	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	8273268	N/A	2022/10/07	Soham Patel
Total Ammonia-N	LACH/NH4	8280909	N/A	2022/10/17	Anna-Kay Gooden
Nitrate & Nitrite as Nitrogen in Water	LACH	8273490	N/A	2022/10/11	Chandra Nandlal
ODWS - Semi-Volatiles	GC/MS	8276529	2022/10/11	2022/10/13	Wendy Zhao
Polychlorinated Biphenyl in Water	GC/ECD	8281288	2022/10/13	2022/10/14	Svitlana Shaula
pH	AT	8273758	2022/10/08	2022/10/11	Yogesh Patel



**BUREAU  
VERITAS**

Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

### TEST SUMMARY

**Bureau Veritas ID:** TYG966  
**Sample ID:** 72 HOURS  
**Matrix:** Water

**Collected:** 2022/10/06  
**Shipped:**  
**Received:** 2022/10/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Orthophosphate	KONE	8273863	N/A	2022/10/12	Samuel Law
Sat. pH and Langelier Index (@ 20C)	CALC	8269554	N/A	2022/10/17	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	8269555	N/A	2022/10/17	Automated Statchk
Sulphate by Automated Colourimetry	KONE	8273866	N/A	2022/10/17	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	8269041	N/A	2022/10/17	Automated Statchk
VOCs (Drinking Water)	P&T/MS	8272148	N/A	2022/10/12	Gabriella Morrone

**Bureau Veritas ID:** TYG966 Dup  
**Sample ID:** 72 HOURS  
**Matrix:** Water

**Collected:** 2022/10/06  
**Shipped:**  
**Received:** 2022/10/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	8273865	N/A	2022/10/14	Alina Dobreanu
Orthophosphate	KONE	8273863	N/A	2022/10/12	Samuel Law
Sulphate by Automated Colourimetry	KONE	8273866	N/A	2022/10/17	Alina Dobreanu



**BUREAU  
VERITAS**

Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

### GENERAL COMMENTS

**Results relate only to the items tested.**



BUREAU VERITAS

Bureau Veritas Job #: C2T1405

Report Date: 2022/10/18

Ian D Wilson Associates Ltd

Client Project #: Century Heights

Sampler Initials: GR

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	8272148	GMN	Matrix Spike	4-Bromofluorobenzene	2022/10/12		104	%	70 - 130
				D4-1,2-Dichloroethane	2022/10/12		100	%	70 - 130
				D8-Toluene	2022/10/12		100	%	70 - 130
				1,1-Dichloroethylene	2022/10/12		94	%	70 - 130
				1,2-Dichlorobenzene	2022/10/12		96	%	70 - 130
				1,2-Dichloroethane	2022/10/12		94	%	70 - 130
				1,4-Dichlorobenzene	2022/10/12		113	%	70 - 130
				Benzene	2022/10/12		92	%	70 - 130
				Carbon Tetrachloride	2022/10/12		103	%	70 - 130
				Chlorobenzene	2022/10/12		97	%	70 - 130
				Methylene Chloride(Dichloromethane)	2022/10/12		100	%	70 - 130
				Ethylbenzene	2022/10/12		94	%	70 - 130
				Tetrachloroethylene	2022/10/12		93	%	70 - 130
				Toluene	2022/10/12		94	%	70 - 130
				Trichloroethylene	2022/10/12		106	%	70 - 130
				Vinyl Chloride	2022/10/12		87	%	70 - 130
				o-Xylene	2022/10/12		95	%	70 - 130
				p+m-Xylene	2022/10/12		100	%	70 - 130
	8272148	GMN	Spiked Blank	4-Bromofluorobenzene	2022/10/12		107	%	70 - 130
				D4-1,2-Dichloroethane	2022/10/12		108	%	70 - 130
				D8-Toluene	2022/10/12		96	%	70 - 130
				1,1-Dichloroethylene	2022/10/12		91	%	70 - 130
				1,2-Dichlorobenzene	2022/10/12		99	%	70 - 130
				1,2-Dichloroethane	2022/10/12		103	%	70 - 130
				1,4-Dichlorobenzene	2022/10/12		113	%	70 - 130
				Benzene	2022/10/12		95	%	70 - 130
				Carbon Tetrachloride	2022/10/12		104	%	70 - 130
				Chlorobenzene	2022/10/12		100	%	70 - 130
				Methylene Chloride(Dichloromethane)	2022/10/12		103	%	70 - 130
				Ethylbenzene	2022/10/12		92	%	70 - 130
				Tetrachloroethylene	2022/10/12		90	%	70 - 130
				Toluene	2022/10/12		91	%	70 - 130
				Trichloroethylene	2022/10/12		103	%	70 - 130
				Vinyl Chloride	2022/10/12		84	%	70 - 130
				o-Xylene	2022/10/12		96	%	70 - 130
				p+m-Xylene	2022/10/12		98	%	70 - 130
	8272148	GMN	Method Blank	4-Bromofluorobenzene	2022/10/12		100	%	70 - 130
				D4-1,2-Dichloroethane	2022/10/12		106	%	70 - 130
				D8-Toluene	2022/10/12		95	%	70 - 130
				1,1-Dichloroethylene	2022/10/12	ND, RDL=0.10		ug/L	
				1,2-Dichlorobenzene	2022/10/12	ND, RDL=0.20		ug/L	
				1,2-Dichloroethane	2022/10/12	ND, RDL=0.20		ug/L	
				1,4-Dichlorobenzene	2022/10/12	ND, RDL=0.20		ug/L	
				Benzene	2022/10/12	ND, RDL=0.10		ug/L	
				Carbon Tetrachloride	2022/10/12	ND, RDL=0.10		ug/L	



BUREAU VERITAS

Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chlorobenzene	2022/10/12	ND, RDL=0.10		ug/L	
			Methylene Chloride(Dichloromethane)	2022/10/12	ND, RDL=0.50		ug/L	
			Ethylbenzene	2022/10/12	ND, RDL=0.10		ug/L	
			Tetrachloroethylene	2022/10/12	ND, RDL=0.10		ug/L	
			Toluene	2022/10/12	ND, RDL=0.20		ug/L	
			Trichloroethylene	2022/10/12	ND, RDL=0.10		ug/L	
			Vinyl Chloride	2022/10/12	ND, RDL=0.20		ug/L	
			o-Xylene	2022/10/12	ND, RDL=0.10		ug/L	
			p+m-Xylene	2022/10/12	ND, RDL=0.10		ug/L	
			Total Xylenes	2022/10/12	ND, RDL=0.10		ug/L	
8272148	GMN	RPD	1,1-Dichloroethylene	2022/10/12	NC		%	30
			1,2-Dichlorobenzene	2022/10/12	NC		%	30
			1,2-Dichloroethane	2022/10/12	NC		%	30
			1,4-Dichlorobenzene	2022/10/12	NC		%	30
			Benzene	2022/10/12	NC		%	30
			Carbon Tetrachloride	2022/10/12	NC		%	30
			Chlorobenzene	2022/10/12	NC		%	30
			Methylene Chloride(Dichloromethane)	2022/10/12	NC		%	30
			Ethylbenzene	2022/10/12	NC		%	30
			Tetrachloroethylene	2022/10/12	NC		%	30
			Toluene	2022/10/12	NC		%	30
			Trichloroethylene	2022/10/12	NC		%	30
			Vinyl Chloride	2022/10/12	NC		%	30
			o-Xylene	2022/10/12	NC		%	30
			p+m-Xylene	2022/10/12	NC		%	30
			Total Xylenes	2022/10/12	NC		%	30
8273490	C_N	Matrix Spike	Nitrite (N)	2022/10/11		108	%	80 - 120
			Nitrate (N)	2022/10/11		95	%	80 - 120
8273490	C_N	Spiked Blank	Nitrite (N)	2022/10/11		108	%	80 - 120
			Nitrate (N)	2022/10/11		94	%	80 - 120
8273490	C_N	Method Blank	Nitrite (N)	2022/10/11	ND, RDL=0.010		mg/L	
			Nitrate (N)	2022/10/11	ND, RDL=0.10		mg/L	
8273490	C_N	RPD	Nitrite (N)	2022/10/11	NC		%	20
			Nitrate (N)	2022/10/11	NC		%	20
8273565	NS3	Matrix Spike	Dissolved Organic Carbon	2022/10/11		95	%	80 - 120
8273565	NS3	Spiked Blank	Dissolved Organic Carbon	2022/10/11		96	%	80 - 120
8273565	NS3	Method Blank	Dissolved Organic Carbon	2022/10/11	ND, RDL=0.40		mg/L	
8273565	NS3	RPD	Dissolved Organic Carbon	2022/10/11	NC		%	20
8273757	YPA	Matrix Spike	Fluoride (F-)	2022/10/11		104	%	80 - 120
8273757	YPA	Spiked Blank	Fluoride (F-)	2022/10/11		101	%	80 - 120



BUREAU VERITAS

Bureau Veritas Job #: C2T1405

Report Date: 2022/10/18

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8273757	YPA	Method Blank	Fluoride (F-)	2022/10/11	ND, RDL=0.10		mg/L	
8273757	YPA	RPD	Fluoride (F-)	2022/10/11	0		%	20
8273758	YPA	Spiked Blank	pH	2022/10/11		101	%	98 - 103
8273758	YPA	RPD	pH	2022/10/11	0.20		%	N/A
8273759	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2022/10/11		96	%	85 - 115
8273759	YPA	Method Blank	Alkalinity (Total as CaCO3)	2022/10/11	ND, RDL=1.0		mg/L	
8273759	YPA	RPD	Alkalinity (Total as CaCO3)	2022/10/11	3.1		%	20
8273760	YPA	Spiked Blank	Conductivity	2022/10/11		102	%	85 - 115
8273760	YPA	Method Blank	Conductivity	2022/10/11	ND, RDL=1.0		umho/cm	
8273760	YPA	RPD	Conductivity	2022/10/11	0.79		%	25
8273863	S1L	Matrix Spike [TYG966-06]	Orthophosphate (P)	2022/10/12		109	%	75 - 125
8273863	S1L	Spiked Blank	Orthophosphate (P)	2022/10/12		102	%	80 - 120
8273863	S1L	Method Blank	Orthophosphate (P)	2022/10/12	ND, RDL=0.010		mg/L	
8273863	S1L	RPD [TYG966-06]	Orthophosphate (P)	2022/10/12	NC		%	25
8273865	ADB	Matrix Spike [TYG966-06]	Dissolved Chloride (Cl-)	2022/10/14		123 (1)	%	80 - 120
8273865	ADB	Spiked Blank	Dissolved Chloride (Cl-)	2022/10/14		103	%	80 - 120
8273865	ADB	Method Blank	Dissolved Chloride (Cl-)	2022/10/14	ND, RDL=1.0		mg/L	
8273865	ADB	RPD [TYG966-06]	Dissolved Chloride (Cl-)	2022/10/14	13		%	20
8273866	ADB	Matrix Spike [TYG966-06]	Dissolved Sulphate (SO4)	2022/10/17		NC	%	75 - 125
8273866	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2022/10/17		99	%	80 - 120
8273866	ADB	Method Blank	Dissolved Sulphate (SO4)	2022/10/17	ND, RDL=1.0		mg/L	
8273866	ADB	RPD [TYG966-06]	Dissolved Sulphate (SO4)	2022/10/17	0.12		%	20
8276202	FKU	Matrix Spike	Diquat	2022/10/14		114	%	50 - 130
			Paraquat	2022/10/14		99	%	50 - 130
8276202	FKU	Spiked Blank	Diquat	2022/10/14		102	%	50 - 130
			Paraquat	2022/10/14		87	%	50 - 130
8276202	FKU	Method Blank	Diquat	2022/10/14	ND, RDL=7.0		ug/L	
			Paraquat	2022/10/14	ND, RDL=1.0		ug/L	
8276202	FKU	RPD	Diquat	2022/10/14	NC		%	40
			Paraquat	2022/10/14	NC		%	40
8276529	WZ	Matrix Spike	2,4,6-Tribromophenol	2022/10/14		93	%	30 - 130
			2,4-Dichlorophenyl Acetic Acid	2022/10/14		91	%	30 - 130
			2-Fluorobiphenyl	2022/10/14		63	%	30 - 130
			D14-Terphenyl (FS)	2022/10/14		95	%	30 - 130
			D5-Nitrobenzene	2022/10/14		76	%	30 - 130
			2,3,4,6-Tetrachlorophenol	2022/10/14		115	%	30 - 130
			2,4,6-Trichlorophenol	2022/10/14		100	%	30 - 130
			2,4-D	2022/10/14		82	%	30 - 130
			2,4-Dichlorophenol	2022/10/14		82	%	30 - 130
			Alachlor	2022/10/14		108	%	40 - 130
			Atrazine	2022/10/14		103	%	30 - 130
			Des-ethyl atrazine	2022/10/14		38	%	30 - 130
			Atrazine + Desethyl-atrazine	2022/10/14		71	%	30 - 130
			Bromoxynil	2022/10/14		105	%	40 - 130
			Carbaryl	2022/10/14		109	%	40 - 130



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			Carbofuran	2022/10/14		122	%	40 - 130
			Chlorpyrifos (Dursban)	2022/10/14		109	%	40 - 130
			Diazinon	2022/10/14		110	%	40 - 130
			Dicamba	2022/10/14		82	%	30 - 130
			Diclofop-methyl	2022/10/14		104	%	40 - 130
			Dimethoate	2022/10/14		99	%	40 - 130
			Malathion	2022/10/14		101	%	40 - 130
			MCPA	2022/10/14		94	%	10 - 130
			Metolachlor	2022/10/14		108	%	40 - 130
			Metribuzin (Sencor)	2022/10/14		97	%	40 - 130
			Pentachlorophenol	2022/10/14		106	%	25 - 130
			Phorate	2022/10/14		89	%	40 - 130
			Picloram	2022/10/14		46	%	10 - 130
			Prometryne	2022/10/14		109	%	30 - 130
			Simazine	2022/10/14		82	%	40 - 130
			Terbufos	2022/10/14		89	%	40 - 130
			Triallate	2022/10/14		113	%	40 - 130
			Trifluralin	2022/10/14		104	%	40 - 130
8276529	WZ	Spiked Blank	Benzo(a)pyrene	2022/10/14		126	%	30 - 130
			2,4,6-Tribromophenol	2022/10/14		89	%	30 - 130
			2,4-Dichlorophenyl Acetic Acid	2022/10/14		89	%	30 - 130
			2-Fluorobiphenyl	2022/10/14		62	%	30 - 130
			D14-Terphenyl (FS)	2022/10/14		91	%	30 - 130
			D5-Nitrobenzene	2022/10/14		72	%	30 - 130
			2,3,4,6-Tetrachlorophenol	2022/10/14		108	%	30 - 130
			2,4,6-Trichlorophenol	2022/10/14		93	%	30 - 130
			2,4-D	2022/10/14		77	%	30 - 130
			2,4-Dichlorophenol	2022/10/14		78	%	30 - 130
			Alachlor	2022/10/14		102	%	40 - 130
			Atrazine	2022/10/14		95	%	30 - 130
			Des-ethyl atrazine	2022/10/14		34	%	30 - 130
			Atrazine + Desethyl-atrazine	2022/10/14		64	%	30 - 130
			Bromoxynil	2022/10/14		99	%	40 - 130
			Carbaryl	2022/10/14		104	%	40 - 130
			Carbofuran	2022/10/14		119	%	40 - 130
			Chlorpyrifos (Dursban)	2022/10/14		100	%	40 - 130
			Diazinon	2022/10/14		100	%	40 - 130
			Dicamba	2022/10/14		76	%	30 - 130
			Diclofop-methyl	2022/10/14		98	%	40 - 130
			Dimethoate	2022/10/14		96	%	40 - 130
			Malathion	2022/10/14		93	%	40 - 130
			MCPA	2022/10/14		89	%	10 - 130
			Metolachlor	2022/10/14		102	%	40 - 130
			Metribuzin (Sencor)	2022/10/14		88	%	40 - 130
			Pentachlorophenol	2022/10/14		100	%	25 - 130
			Phorate	2022/10/14		81	%	40 - 130
			Picloram	2022/10/14		43	%	10 - 130
			Prometryne	2022/10/14		103	%	30 - 130
			Simazine	2022/10/14		78	%	40 - 130
			Terbufos	2022/10/14		81	%	40 - 130
			Triallate	2022/10/14		104	%	40 - 130
			Trifluralin	2022/10/14		98	%	40 - 130



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8276529	WZ	RPD	Benzo(a)pyrene	2022/10/14		120	%	30 - 130
			2,3,4,6-Tetrachlorophenol	2022/10/14	1.7		%	40
			2,4,6-Trichlorophenol	2022/10/14	3.4		%	40
			2,4-D	2022/10/14	1.9		%	40
			2,4-Dichlorophenol	2022/10/14	5.4		%	40
			Alachlor	2022/10/14	0.73		%	40
			Atrazine	2022/10/14	1.8		%	40
			Des-ethyl atrazine	2022/10/14	3.0		%	40
			Atrazine + Desethyl-atrazine	2022/10/14	2.1		%	40
			Bromoxynil	2022/10/14	1.7		%	40
			Carbaryl	2022/10/14	5.1		%	40
			Carbofuran	2022/10/14	0.017		%	40
			Chlorpyrifos (Dursban)	2022/10/14	0.090		%	40
			Diazinon	2022/10/14	0.41		%	40
			Dicamba	2022/10/14	5.1		%	40
			Diclofop-methyl	2022/10/14	0.43		%	40
			Dimethoate	2022/10/14	3.7		%	40
			Malathion	2022/10/14	0.63		%	40
			MCPA	2022/10/14	0.71		%	40
			Metolachlor	2022/10/14	4.5		%	40
			Metribuzin (Sencor)	2022/10/14	3.5		%	40
			Pentachlorophenol	2022/10/14	2.3		%	40
			Phorate	2022/10/14	3.3		%	40
			Picloram	2022/10/14	14		%	40
			Prometryne	2022/10/14	6.9		%	40
			Simazine	2022/10/14	1.1		%	40
			Terbufos	2022/10/14	2.5		%	40
			Triallate	2022/10/14	0.067		%	40
Trifluralin	2022/10/14	4.3		%	40			
8276529	WZ	Method Blank	Benzo(a)pyrene	2022/10/14	5.9		%	40
			2,4,6-Tribromophenol	2022/10/13		80	%	30 - 130
			2,4-Dichlorophenyl Acetic Acid	2022/10/13		78	%	30 - 130
			2-Fluorobiphenyl	2022/10/13		57	%	30 - 130
			D14-Terphenyl (FS)	2022/10/13		83	%	30 - 130
			D5-Nitrobenzene	2022/10/13		73	%	30 - 130
			2,3,4,6-Tetrachlorophenol	2022/10/13	ND, RDL=0.50		ug/L	
			2,4,6-Trichlorophenol	2022/10/13	ND, RDL=0.50		ug/L	
			2,4-D	2022/10/13	ND, RDL=1.0		ug/L	
			2,4-Dichlorophenol	2022/10/13	ND, RDL=0.25		ug/L	
			Alachlor	2022/10/13	ND, RDL=0.50		ug/L	
			Atrazine	2022/10/13	ND, RDL=0.50		ug/L	
			Des-ethyl atrazine	2022/10/13	ND, RDL=0.50		ug/L	
			Atrazine + Desethyl-atrazine	2022/10/13	ND, RDL=1.0		ug/L	
			Bromoxynil	2022/10/13	ND, RDL=0.50		ug/L	





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			Carbaryl	2022/10/13	ND, RDL=5.0		ug/L	
			Carbofuran	2022/10/13	ND, RDL=5.0		ug/L	
			Chlorpyrifos (Dursban)	2022/10/13	ND, RDL=1.0		ug/L	
			Diazinon	2022/10/13	ND, RDL=1.0		ug/L	
			Dicamba	2022/10/13	ND, RDL=1.0		ug/L	
			Diclofop-methyl	2022/10/13	ND, RDL=0.90		ug/L	
			Dimethoate	2022/10/13	ND, RDL=2.5		ug/L	
			Malathion	2022/10/13	ND, RDL=5.0		ug/L	
			MCPA	2022/10/13	ND, RDL=10		ug/L	
			Metolachlor	2022/10/13	ND, RDL=0.50		ug/L	
			Metribuzin (Sencor)	2022/10/13	ND, RDL=5.0		ug/L	
			Pentachlorophenol	2022/10/13	ND, RDL=0.50		ug/L	
			Phorate	2022/10/13	ND, RDL=0.50		ug/L	
			Picloram	2022/10/13	ND, RDL=5.0		ug/L	
			Prometryne	2022/10/13	ND, RDL=0.25		ug/L	
			Simazine	2022/10/13	ND, RDL=1.0		ug/L	
			Terbufos	2022/10/13	ND, RDL=0.50		ug/L	
			Triallate	2022/10/13	ND, RDL=1.0		ug/L	
			Trifluralin	2022/10/13	ND, RDL=1.0		ug/L	
			Benzo(a)pyrene	2022/10/13	ND, RDL=0.0050		ug/L	
8277260	FKU	Matrix Spike	Glyphosate	2022/10/12		96	%	50 - 130
8277260	FKU	Spiked Blank	Glyphosate	2022/10/12		95	%	50 - 130
8277260	FKU	Method Blank	Glyphosate	2022/10/12	ND, RDL=10		ug/L	
8277260	FKU	RPD	Glyphosate	2022/10/12	NC		%	40
8279315	FKU	Matrix Spike	Diuron	2022/10/13		93	%	40 - 130
			Guthion (Azinphos-methyl)	2022/10/13		125	%	40 - 130
8279315	FKU	Spiked Blank	Diuron	2022/10/13		90	%	40 - 130
			Guthion (Azinphos-methyl)	2022/10/13		98	%	40 - 130
8279315	FKU	Method Blank	Diuron	2022/10/13	ND, RDL=10		ug/L	
			Guthion (Azinphos-methyl)	2022/10/13	ND, RDL=2.0		ug/L	



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	8279315	FKU	RPD	Diuron	2022/10/13	NC		%	40
				Guthion (Azinphos-methyl)	2022/10/13	NC		%	40
	8280304	ADA	Matrix Spike	Aluminum (Al)	2022/10/13		101	%	80 - 120
				Antimony (Sb)	2022/10/13		102	%	80 - 120
				Arsenic (As)	2022/10/13		100	%	80 - 120
				Barium (Ba)	2022/10/13		101	%	80 - 120
				Beryllium (Be)	2022/10/13		98	%	80 - 120
				Boron (B)	2022/10/13		91	%	80 - 120
				Cadmium (Cd)	2022/10/13		101	%	80 - 120
				Calcium (Ca)	2022/10/13		102	%	80 - 120
				Chromium (Cr)	2022/10/13		94	%	80 - 120
				Cobalt (Co)	2022/10/13		100	%	80 - 120
				Copper (Cu)	2022/10/13		104	%	80 - 120
				Iron (Fe)	2022/10/13		101	%	80 - 120
				Lead (Pb)	2022/10/13		96	%	80 - 120
				Magnesium (Mg)	2022/10/13		101	%	80 - 120
				Manganese (Mn)	2022/10/13		98	%	80 - 120
				Molybdenum (Mo)	2022/10/13		98	%	80 - 120
				Nickel (Ni)	2022/10/13		96	%	80 - 120
				Phosphorus (P)	2022/10/13		96	%	80 - 120
				Potassium (K)	2022/10/13		106	%	80 - 120
				Selenium (Se)	2022/10/13		96	%	80 - 120
				Silicon (Si)	2022/10/13		103	%	80 - 120
				Silver (Ag)	2022/10/13		99	%	80 - 120
				Sodium (Na)	2022/10/13		NC	%	80 - 120
				Strontium (Sr)	2022/10/13		97	%	80 - 120
				Thallium (Tl)	2022/10/13		101	%	80 - 120
				Titanium (Ti)	2022/10/13		100	%	80 - 120
				Uranium (U)	2022/10/13		95	%	80 - 120
				Vanadium (V)	2022/10/13		95	%	80 - 120
				Zinc (Zn)	2022/10/13		96	%	80 - 120
	8280304	ADA	Spiked Blank	Aluminum (Al)	2022/10/13		100	%	80 - 120
				Antimony (Sb)	2022/10/13		102	%	80 - 120
				Arsenic (As)	2022/10/13		99	%	80 - 120
				Barium (Ba)	2022/10/13		100	%	80 - 120
				Beryllium (Be)	2022/10/13		100	%	80 - 120
				Boron (B)	2022/10/13		95	%	80 - 120
				Cadmium (Cd)	2022/10/13		101	%	80 - 120
				Calcium (Ca)	2022/10/13		101	%	80 - 120
				Chromium (Cr)	2022/10/13		93	%	80 - 120
				Cobalt (Co)	2022/10/13		99	%	80 - 120
				Copper (Cu)	2022/10/13		103	%	80 - 120
				Iron (Fe)	2022/10/13		103	%	80 - 120
				Lead (Pb)	2022/10/13		98	%	80 - 120
				Magnesium (Mg)	2022/10/13		100	%	80 - 120
				Manganese (Mn)	2022/10/13		97	%	80 - 120
				Molybdenum (Mo)	2022/10/13		99	%	80 - 120
				Nickel (Ni)	2022/10/13		96	%	80 - 120
				Phosphorus (P)	2022/10/13		111	%	80 - 120
				Potassium (K)	2022/10/13		103	%	80 - 120
				Selenium (Se)	2022/10/13		95	%	80 - 120
				Silicon (Si)	2022/10/13		102	%	80 - 120



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			Silver (Ag)	2022/10/13		101	%	80 - 120
			Sodium (Na)	2022/10/13		96	%	80 - 120
			Strontium (Sr)	2022/10/13		96	%	80 - 120
			Thallium (Tl)	2022/10/13		101	%	80 - 120
			Titanium (Ti)	2022/10/13		99	%	80 - 120
			Uranium (U)	2022/10/13		95	%	80 - 120
			Vanadium (V)	2022/10/13		95	%	80 - 120
			Zinc (Zn)	2022/10/13		95	%	80 - 120
8280304	ADA	Method Blank	Aluminum (Al)	2022/10/13	ND, RDL=4.9		ug/L	
			Antimony (Sb)	2022/10/13	ND, RDL=0.50		ug/L	
			Arsenic (As)	2022/10/13	ND, RDL=1.0		ug/L	
			Barium (Ba)	2022/10/13	ND, RDL=2.0		ug/L	
			Beryllium (Be)	2022/10/13	ND, RDL=0.40		ug/L	
			Boron (B)	2022/10/13	ND, RDL=10		ug/L	
			Cadmium (Cd)	2022/10/13	ND, RDL=0.090		ug/L	
			Calcium (Ca)	2022/10/13	ND, RDL=200		ug/L	
			Chromium (Cr)	2022/10/13	ND, RDL=5.0		ug/L	
			Cobalt (Co)	2022/10/13	ND, RDL=0.50		ug/L	
			Copper (Cu)	2022/10/13	ND, RDL=0.90		ug/L	
			Iron (Fe)	2022/10/13	ND, RDL=100		ug/L	
			Lead (Pb)	2022/10/13	ND, RDL=0.50		ug/L	
			Magnesium (Mg)	2022/10/13	ND, RDL=50		ug/L	
			Manganese (Mn)	2022/10/13	ND, RDL=2.0		ug/L	
			Molybdenum (Mo)	2022/10/13	ND, RDL=0.50		ug/L	
			Nickel (Ni)	2022/10/13	ND, RDL=1.0		ug/L	
			Phosphorus (P)	2022/10/13	ND, RDL=100		ug/L	
			Potassium (K)	2022/10/13	ND, RDL=200		ug/L	
			Selenium (Se)	2022/10/13	ND, RDL=2.0		ug/L	
			Silicon (Si)	2022/10/13	ND, RDL=50		ug/L	
			Silver (Ag)	2022/10/13	ND, RDL=0.090		ug/L	



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			Sodium (Na)	2022/10/13	ND, RDL=100		ug/L	
			Strontium (Sr)	2022/10/13	ND, RDL=1.0		ug/L	
			Thallium (Tl)	2022/10/13	ND, RDL=0.050		ug/L	
			Titanium (Ti)	2022/10/13	ND, RDL=5.0		ug/L	
			Uranium (U)	2022/10/13	ND, RDL=0.10		ug/L	
			Vanadium (V)	2022/10/13	ND, RDL=0.50		ug/L	
			Zinc (Zn)	2022/10/13	ND, RDL=5.0		ug/L	
8280304	ADA	RPD	Aluminum (Al)	2022/10/13	1.6		%	20
			Antimony (Sb)	2022/10/13	NC		%	20
			Arsenic (As)	2022/10/13	NC		%	20
			Barium (Ba)	2022/10/13	1.9		%	20
			Boron (B)	2022/10/13	1.9		%	20
			Cadmium (Cd)	2022/10/13	NC		%	20
			Chromium (Cr)	2022/10/13	NC		%	20
			Copper (Cu)	2022/10/13	1.5		%	20
			Iron (Fe)	2022/10/13	NC		%	20
			Lead (Pb)	2022/10/13	NC		%	20
			Manganese (Mn)	2022/10/13	NC		%	20
			Selenium (Se)	2022/10/13	NC		%	20
			Sodium (Na)	2022/10/13	2.3		%	20
			Uranium (U)	2022/10/13	NC		%	20
			Zinc (Zn)	2022/10/13	0.30		%	20
8280843	JGC	Matrix Spike	Mercury (Hg)	2022/10/13		98	%	75 - 125
8280843	JGC	Spiked Blank	Mercury (Hg)	2022/10/13		99	%	80 - 120
8280843	JGC	Method Blank	Mercury (Hg)	2022/10/13	ND, RDL=0.00010		mg/L	
8280843	JGC	RPD	Mercury (Hg)	2022/10/13	NC		%	20
8280909	AGD	Matrix Spike	Total Ammonia-N	2022/10/17		100	%	75 - 125
8280909	AGD	Spiked Blank	Total Ammonia-N	2022/10/17		102	%	80 - 120
8280909	AGD	Method Blank	Total Ammonia-N	2022/10/17	ND, RDL=0.050		mg/L	
8280909	AGD	RPD	Total Ammonia-N	2022/10/17	NC		%	20
8281288	SVS	Matrix Spike [TYG966-04]	Decachlorobiphenyl	2022/10/14		81	%	60 - 130
			Aroclor 1260	2022/10/14		82	%	60 - 130
			Total PCB	2022/10/14		82	%	60 - 130
8281288	SVS	Spiked Blank	Decachlorobiphenyl	2022/10/14		81	%	60 - 130
			Aroclor 1260	2022/10/14		75	%	60 - 130
			Total PCB	2022/10/14		75	%	60 - 130
8281288	SVS	Method Blank	Decachlorobiphenyl	2022/10/14		72	%	60 - 130
			Aroclor 1016	2022/10/14	ND, RDL=0.05		ug/L	
			Aroclor 1221	2022/10/14	ND, RDL=0.05		ug/L	
			Aroclor 1232	2022/10/14	ND, RDL=0.05		ug/L	



BUREAU VERITAS

Bureau Veritas Job #: C2T1405

Report Date: 2022/10/18

Ian D Wilson Associates Ltd

Client Project #: Century Heights

Sampler Initials: GR

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aroclor 1242	2022/10/14	ND, RDL=0.05		ug/L	
			Aroclor 1248	2022/10/14	ND, RDL=0.05		ug/L	
			Aroclor 1254	2022/10/14	ND, RDL=0.05		ug/L	
			Aroclor 1260	2022/10/14	ND, RDL=0.05		ug/L	
			Total PCB	2022/10/14	ND, RDL=0.05		ug/L	
8281288	SVS	RPD	Aroclor 1242	2022/10/14	NC		%	30
			Aroclor 1248	2022/10/14	NC		%	30
			Aroclor 1254	2022/10/14	NC		%	30
			Aroclor 1260	2022/10/14	NC		%	30
			Total PCB	2022/10/14	15		%	40

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



BUREAU  
VERITAS

Bureau Veritas Job #: C2T1405  
Report Date: 2022/10/18

Ian D Wilson Associates Ltd  
Client Project #: Century Heights  
Sampler Initials: GR

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

\_\_\_\_\_  
Anastassia Hamanov, Scientific Specialist

\_\_\_\_\_  
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

\_\_\_\_\_  
Soham Patel, Senior Analyst

---

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**EASR REGISTRATION**



Ministry of the Environment, Conservation and Parks  
Environmental Assessment and Permissions Division

Confirmation of Registration

Registration Number: R-011-6192292142  
Version Number: 1.0  
Date Registration Filed: September 27, 2022 15:05:31  
Date Registration Updated: September 27, 2022 15:05:31

TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH

82133 Council Line  
Goderich  
ON  
N7A 3Y2

You have registered, in accordance with Section 20.21 (1) (a) of the Environmental Protection Act, for the taking of ground water from a well for the purposes of conducting a pumping test, as prescribed in O. Reg. 63/16.

36604 Maitland Avenue (ave)  
Ashfield-Colborne-Wawanosh ON N7A 3Y1

Ministry District Office: Owen Sound Area Office

Please note that the water taking for pumping tests are subject to the applicable provisions of O. Reg. 245/11 and O. Reg. 63/16. The activity related information provided during the registration process is included as part of the confirmation of registration as schedule 'A'.

Dated on September 27, 2022 15:05:31

Director  
Client Services and Permissions Branch  
Ministry of the Environment, Conservation and Parks  
135 St. Clair Avenue West, 1st Floor Toronto ON M4V 1P5

Any questions related to this registration and the Environmental Activity and the Sector Registry should be directed to:

Client Services and Permissions Branch  
Ministry of the Environment, Conservation and Parks  
Phone:(416) 314-8001  
Toll free: 1-800-461-6290  
Email: [enviopermissions@ontario.ca](mailto:enviopermissions@ontario.ca)



## Schedule 'A'

### Activity Information

### Registration Information

---

Will you be taking water for the purpose of conducting a pumping test from a well? Yes

Will you be taking more than 50,000 litres of water per day on any day? Yes

Is the site where the activity will occur a mine or is being used for mining exploration activities? No

Will you be taking water for seven or less days within a single 30-day period? Yes

Will the pumping test take water at a volume of 5,000,000 litres per day or less? Yes

Does the taking involve a transfer from a water basin described in subsection 34.3 (1) of the *Ontario Water Resources Act* or a transfer as defined in subsection 34.5 (1) of that Act? No

Please describe what the site is currently used for.  
Undeveloped vacant property

Has a Qualified Person (QP) prepared a pumping test design report? Yes

Please provide the Name(s) of the Qualified Person(s) and the date that the pumping test design report was prepared.

First Name	Last Name	Company Name	Licence Number(s)	Date Signed
Geoffrey	Rether	Ian D. Wilson Associates Limited	0426	2022-09-27

According to the pumping test design report, where is the water taken being discharged (select all that apply)?

Discharge to municipal storm sewer(s)

Please provide additional information if available.

Discharge to adjacent storm sewer, which eventually drains to the Maitland River. Capacity to handle pumping test discharge confirmed by Municipal Engineer.

Has the Qualified Person (QP) included one or more of the following as part of the pumping test design report? (select all that apply)

Monitoring of groundwater (flow, etc.)

Monitoring of discharge (flow, chemical parameters, etc.)

## Source Information

### Instructions:

On this page you will enter information about the pumping test. Please note that the source specified here will each be required to report daily water taking volumes on an annual basis.

36604 Maitland Avenue

Address

36604 Maitland AVE, ONTARIO, N7A 3Y1

Special Policy Area

### Well 3

---

### Source

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Source Type	Well
Water Taking Source(s)	Groundwater
Well Record	328704
What is the maximum estimated drawdown of the water table (in metres), if available?	20

### Geographic (GPS) Coordinates (to be provided in Datum NAD83)

---

Method of Collection	Accuracy Estimate	UTM Zone	UTM East (M)
Map	1-10 M(Map)	17	444539

UTM North (M)  
4843650

Watershed Name	Watershed Use - Annual	Watershed Use - Summer
Maitland River	N/A	N/A

### Source Protection Area

---

Source Protection Area (SPA)	Wellhead Protection Area Q1	Wellhead Protection Area Q1
Maitland Valley	No	Stress N/A

Intake Protection Zone Q1	Intake Protection Zone Q1 - Stress
No	N/A

## Well Related Information

Estimated start date of water taking \*

2022-10-03

Estimated end date of water taking \*

2022-10-06

### Water Taking Volumes (Units in Litres):

Descriptor (i.e. Nickname)	Purpose Category	Specific Purpose	Activity	Maximum rate per minute	Maximum number of hours of taking a day	Maximum volume per day	Typical volume per day	Maximum number of days of taking in a year	Earliest month of taking	Latest month of taking
Well 3	91 - Public administration	Pumping Test	Pumping Test	900	24	1296000	1166400	3	October	October

If the information for the following fields is not in the QP report or if you do not know the value of these fields, enter "0" in the field.

- Maximum rate per minute
- Maximum number of hours of taking a day
- Maximum volume per day
- Typical Volume per day

### Water Taking Summary

Descriptor (i.e. Nickname)	Purpose Category	Specific Purpose	Activity	Maximum rate per minute	Maximum number of hours of taking a day	Maximum volume per day	Typical volume per day	Maximum number of days of taking in a year	Earliest month of taking	Latest month of taking
Site Name: 36604 Maitland Avenue 36604 Maitland AVE, ONTARIO, N7A 3Y1							Special Policy Area:			
Source Name: Well 3					UTM: 17 / 444539 / 4843650					
Well 3	91 - Public administration	Pumping Test	Pumping Test	900	24	1296000	1166400	3	October	October
							Total Number of Well Intakes 1			

**Related Approvals**

**Water Taking Permissions Information:**

---

Do you have a Permit to Take Water for other water taking activities on the site that you are registering? No

Do you have another EASR registration for water taking activities at the site that you are registering? No

The fee for this registration is \$1916

# Wilson Associates

Consulting Hydrogeologists

September 26, 2022

To the Residents in the Vicinity of New Municipal Well:

Re: Notification of Water Well Pumping Test  
New Municipal Well, Century Heights Water Supply  
36604 Maitland Avenue, Township of Ashfield-Colborne-Wawanosh

---

As required by the Ministry of the Environment, Conservation and Parks (MECP), this letter is provided to notify residents of privately-serviced properties within 500 metres of the new Century Heights municipal well at 36604 Maitland Avenue of a water well pumping test planned for October 3 to 6, 2022.

The new well is completed in the deep bedrock aquifer to a depth of 75.0m. The purpose of the pumping test is to gather scientific information regarding the bedrock aquifer serving the area, and to identify off-site interference potential with neighbouring users of groundwater.

Weather permitting, the pumping test is planned to begin the morning of October 3, 2022 and proceed for a 72 hour period.

Should there be any questions, or should issues arise during the test, please contact W.D. Hopper & Sons at 519-522-1737, Ian D. Wilson Associates Limited at 519-440-6432 (or via email at grether@tcc.on.ca), or the Township at 519-524-4669.

Yours sincerely,  
**IAN D. WILSON ASSOCIATES LIMITED**



Geoffrey Rether, P.Geo.

September 27, 2022

Township of Ashfield-Colborne-Wawanosh  
821333 Council Road  
R.R. #5  
Goderich, ON  
N7A 3Y2

# Wilson Associates

Consulting Hydrogeologists

Re: Pumping Test Design Report - Century Heights Municipal Well 3  
36604 Maitland Avenue, Community of Salford, Ashfield-Colborne-Wawanosh

---

## Description:

New Century Heights Municipal Well 3 is located on the vacant parcel of land at 36604 Maitland Avenue, in the community of Salford. Well 3 was drilled during August and September, 2022 to a depth of 76.2m.

The well is located at UTM coordinates Zone 17, 444539E, 4843650N

A copy of the water well record for Well 3 is attached. A location map showing the location of Well 3, and all recorded and potential wells within 500m of Well 3 is attached.

A 72-hour pumping test of Well 3 is to be conducted to gather scientific information in support of a Category 3 Permit to Take Water (PTTW) application to the Ministry of the Environment, Conservation and Parks (MECP). It is anticipated that the pumping test will be conducted at a rate of up to 900L/min (237.8USgpm), and that the test will take place October 3 to 6, 2022.

## Site-Specific Impact Assessment (Groundwater):

The risk of impact of the pumping test to neighbouring users of groundwater is considered low for the following reasons:

- Available water level drawdown in wells completed in the bedrock aquifer is in excess of 20m.
- The closest known off-site wells completed in the bedrock aquifer are situated approximately 270m to the west and south. Interference potential at this distance is anticipated to be minor.
- Historical well testing programs completed for Century Heights Wells 1 and 2, and a historical test well located at the site of Well 3, is indicative of limited water level drawdown and low interference potential.

## Site-Specific Impact Assessment (Surface Water):

The risk of adverse impact of the pumping test to local surface water resources is considered low for the following reasons:

- The bedrock is confined by about 30m of overburden, and is hydraulically isolated from local (<500m) surface water resources.
- The deeply incised Maitland River is located about 500m south of Well 3. The River is locally likely to be flowing on the surface of the bedrock. The risk of interference potential at this distance is low, and the flow of the River will be substantially greater than the rate of withdrawal from Well 3. The proposed rate of withdrawal from Well 3 (up to 900L/min) represents about 0.5% of the recorded low flow in the Maitland River in 2021 (3.28m<sup>3</sup>/sec) at the Environment Canada upstream gauging station No. 02FE015.
- All water withdrawn during the pumping test will be directed to a municipal storm sewer. There is no potential for erosion or sedimentation in local surface water resources.

#### Notification Protocol:

All neighbours will be notified by hand-delivered letter of the pumping test at least 48 hours in advance. The letter will include:

- A description of where the taking is to occur.
- The dates on which the water is intended to be taken (anticipated to be October 3 to 6, 2022)
- The approximate time and duration that the water takings will occur (72 hours, anticipated to start the morning of October 3, 2022)
- The EASR registration number (to be determined)
- The name and telephone number of a person who can be contacted to report any concerns about interference with another water supply (W.D. Hopper & Sons at 519-522-1737, Ian D. Wilson Associates Limited at 519-440-6432 (or via email at grether@tcc.on.ca), or the Township at 519-524-4669).

#### Monitoring Plan:

The monitoring plan is as follows:

- Water levels observed in Well 3 at a standard pumping test frequency.
- Pumping rate to be determined using a calibrated in-line flow meter.
- Water levels observed at a frequency of 1 hour to 4 hours (to be determined, based on aquifer response) in one of existing Century Heights Wells 1 and 2.
- Water levels observed at a frequency of 1 hour to 4 hours (to be determined, based on aquifer response) in at least one off-site bedrock well (with permission to be obtained).



Discharge Plan:

The discharge plan is as follows:

- All water withdrawn during the pumping test will be directed to the existing municipal storm sewer on the adjacent property. The capacity of the storm sewer to accept the discharge water has been confirmed by the Township's engineer.

Contingency Plan:

The contingency plan is as follows:

- As detailed above, anticipated impacts to neighbouring users of groundwater are low.
- If a report of adverse impact is received during the test, the pumping test will be immediately halted and the impact assessed.
- It is anticipated that aquifer recovery will be rapid after pumping test shut-down. Bottled water will be delivered to impacted users, if needed.
- The MECP district office will be immediately notified of the complaint (Owen Sound, 519-376-4440).

Qualifications:

Ian D. Wilson Associates Limited is a full service hydrogeology consulting firm in continuous practice since 1974 and is a limited corporation. Wilson Associates has completed over 1,400 hydrogeology-related projects throughout Ontario for numerous government, municipal and private clientele. A significant number of the over 1,400 projects completed Provincially have necessarily incorporated some or all components of the proposed pumping test.

The primary staff involved with the hydrogeologic aspects of the project will be Mr. Geoffrey Rether, B.Sc., P.Ge., President of Ian D. Wilson Associates Limited since 1999. Mr. Rether is a licenced Professional Geoscientist, has been a hydrogeologist with Wilson Associates since 1990 and has been involved with all aspects of several hundred projects with the firm. Mr. Rether has overseen several hundred pumping tests.

All of which is respectfully submitted,  
**IAN D. WILSON ASSOCIATES LIMITED**

  
Geoffrey Rether, P.Ge.  
(PGO Licence No. 0426)



**WATER WELL RECORDS**

**Notice of Collection of Personal Information**

Personal information contained on this form is collected pursuant to sections 35-50 and 75(2) of the *Ontario Water Resources Act* and section 16.3 of the Wells Regulation. This information will be used for the purpose of maintaining a public record of wells in Ontario. This form and the information contained on the form will be stored in the Ministry's well record database and made publicly available. Questions about this collection should be directed to the Water Well Customer Service Representative at the Wells Help Desk, 125 Resources Road, Toronto Ontario M9P 3V6, at 1-888-396-9355 or [wellshelpdesk@ontario.ca](mailto:wellshelpdesk@ontario.ca).

Fields marked with an asterisk (\*) are mandatory.

Well Tag Number \*

A 328704

**Type \***

Construction     Abandonment

**Measurement recorded in: \***

Metric     Imperial

Century Heights Well 3

**1. Well Owner's Information**

Last Name and First Name, or Organization is mandatory. \*

Last Name		First Name	
Organization Township of Ashfield-Colborne-Wawanosh		Email Address	

**Current Address**

Unit Number	Street Number * 821333	Street Name * Council Rd., RR#5	City/Town/Village Goderich
Country	Province On	Postal Code N7A 3Y2	Telephone Number

**2. Well Location**

**Address of Well Location**

Unit Number	Street Number * 36604	Street Name * Maitland Ave	Township Colborne
Lot 1	Concession 1WD	County/District/Municipality Huron	
City/Town		Province Ontario	Postal Code
UTM Coordinates NAD 83	Zone * 17	Easting * 444539	Northing * 4843650
			Municipal Plan and Sublot Number <a href="#">Test UTM in Map</a>
Other			

**3. Overburden and Bedrock Material \***

Well Depth * 250	(ft)				
General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Topsoil			0	1
Brown	Stones	Sand		1	4
Brown	Clay			4	15
Grey	Clay	Stones		15	99
Brown	Limestone	Clay	Layered	99	114
Brown	Limestone			114	150
Brown	Limestone	Layered	Fractured	150	246
Brown	Limestone			246	250

**4. Annular Space \***

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	117	neet cement	35

**5. Method of Construction \***

- Cable Tool     Rotary (Conventional)     Rotary (Reverse)     Boring     Air percussion     Diamond  
 Jetting     Driving     Digging     Rotary (Air)     Augering     Direct Push  
 Other (specify) \_\_\_\_\_

**6. Well Use \***

- Public     Industrial     Cooling & Air Conditioning  
 Domestic     Commercial     Not Used  
 Livestock     Municipal     Monitoring  
 Irrigation     Test Hole     Dewatering  
 Other (specify) \_\_\_\_\_

**7. Status of Well \***

- Water Supply     Replacement Well     Test Hole  
 Recharge Well     Dewatering Well     Observation and/or Monitoring Hole  
 Alteration (Construction)     Abandoned, Insufficient Supply     Abandoned, Poor Water Quality  
 Abandoned, other (specify) \_\_\_\_\_  
 Other (specify) \_\_\_\_\_

**8. Construction Record - Casing** \* (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole or Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
8.25	Steel	0.25	-2	117
6.6	Steel	0.219	114	134
6	Open Hole		246	250

**9. Construction Record - Screen**

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
7	Steel	0.25	134	245

**10. Water Details**

Water found at Depth 150 (ft)	<input type="checkbox"/> Gas	Kind of water	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Untested	<input type="checkbox"/> Other
Water found at Depth 178	<input type="checkbox"/> Gas	Kind of water	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Untested	<input type="checkbox"/> Other
Water found at Depth 215	<input type="checkbox"/> Gas	Kind of water	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Untested	<input type="checkbox"/> Other
Water found at Depth 240	<input type="checkbox"/> Gas	Kind of water	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Untested	<input type="checkbox"/> Other

**11. Hole Diameter**

Depth From (ft)	Depth To (ft)	Diameter (in)
0	117	12
117	246	8
246	250	6

**12. Results of Well Yield Testing**

Pumping Discontinued

Explain \_\_\_\_\_

If flowing give rate

Flowing \_\_\_\_\_ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)	119													

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

Clear and sand free  Other (specify)

Pump intake set at <b>150</b> (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? * <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
---------------------------------------	-----------------------	----------------------------------	--	---

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)
<b>220</b>	<b>240</b>	<b>240</b>

### 13. Map of Well Location \*

Map 1. Please Click the map area below to import an image file to use as the map.

Make map area bigger



### 14. Information

Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
--	-------------------------------------	------------------------------------

Comments

Drilling completed Sept.12,2022, long term flow test yet to be conducted  
Scott Hopper tech #3085 also onsite  
The 7" sleeve has .25" slots

### 15. Well Contractor and Well Technician Information



Business Name of Well Contractor \*  
W.D.Hopper & Sons Ltd.

Well Contractor's License Number \*  
2604

**Business Address**

Unit Number	Street Number	Street Name *
	30	Harpurhey Rd.

City/Town/Village *	Province	Postal Code *
Seaforth	Ont.	N0K 1W0

Business Telephone Number	Business Email Address
519-522-1737	wdhopper@tcc.on.ca

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
Hopper	Allan	2576

**16. Declaration \***

I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
Hopper	Ron	wdhopper@tcc.on.ca

Signature	Date Submitted (yyyy/mm/dd)
-----------	-----------------------------

**17. Ministry Use Only**

Audit Number  
Incomplete Record

1. PRINT ONLY IN SPACES PROVIDED  
2. CHECK  CORRECT BOX WHERE APPLICABLE

COUNTY OR DISTRICT <b>HURON</b>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <b>COLBORNE</b>	CON. BLOCK, TRACT, SURVEY, ETC. <b>1</b>	W.D. <b>W.D.</b>	LOT <b>1</b>
OWNER (SURNAME FIRST) <b>ARMSTRONG &amp; STEPHENSON</b>		ADDRESS <b>RR #5 GUDERICH</b>		DATE COMPLETED DAY <b>APR</b> , MO <b>APR</b> , YR <b>88</b>

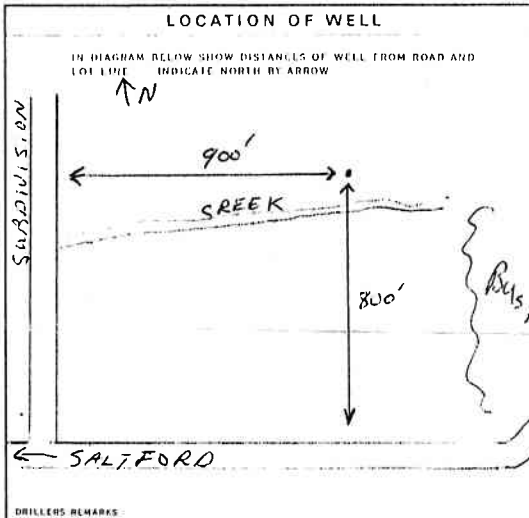
Historical Maitland Well

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	GRAVEL		LOOSE	0	11
GREY	SILTY CLAY		SOFT	11	30
BLUE	BLUE CLAY		SOFT	30	60
GREY	HARD PAN	STONES	MED.	60	100
GREY	GRAVEL	CEMENTED MARL	HARD	100	113
YEL	CLAY	WHITE CLAY	SOFT	113	115
BROWN	LIMESTONE	MARL	HARD	115	120
GREY	LIMESTONE		HARD	120	170
BROWN	LIMESTONE	GREY LIMESTONE		170	205
TAN	LIMESTONE		MED. HARD	205	220

WATER RECORD		CASING & OPEN HOLE RECORD				SCREEN	
WATER FOUND AT - FEET	KIND OF WATER	INNER DIA. INCHES	MATERIAL	WELL DEPTH IN FEET	DEPTH - FEET	DIAMETER INCHES	LENGTH FEET
150	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALT <input type="checkbox"/> SALT <input type="checkbox"/> MINERAL	6 1/2"	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE	188 + 1	120'		
170	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALT <input type="checkbox"/> SALT <input type="checkbox"/> MINERAL	6"	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE		120 220		
178-215	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALT <input type="checkbox"/> SALT <input type="checkbox"/> MINERAL		<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE				

PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET	DEPTH TO TOP OF SCREEN	MATERIAL AND TYPE	CEMENT GROUP LEAD PAPER 104.1
FROM	TO		

PUMPING TEST	PUMPING TEST METHOD <input checked="" type="checkbox"/> PUMP <input type="checkbox"/> BAILED		PUMPING RATE <b>60</b> GPM		DURATION OF PUMPING <b>24</b> HOURS	
	STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING PUMPING		RECOVERY	
	<b>124'</b>	<b>128 1/2'</b>	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
			<b>127'</b>	<b>127'</b>	<b>127 1/2'</b>	<b>127 1/2'</b>
IF FLOWING, GIVE RATE		PUMP INHALE AT AT		WATER AT END OF TEST		
GPM		<b>145'</b>		<input checked="" type="checkbox"/> CLEAR <input type="checkbox"/> CLOUDY		
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP		RECOMMENDED PUMP SETTING		RECOMMENDED PUMPING RATE <b>60</b> GPM		



FINAL STATUS OF WELL	<input checked="" type="checkbox"/> WATER SUPPLY <input type="checkbox"/> OBSERVATION WELL <input type="checkbox"/> TEST HOLE <input type="checkbox"/> RECHARGE WELL	<input type="checkbox"/> ABANDONED - INSUFFICIENT SUPPLY <input type="checkbox"/> ABANDONED - POOR QUALITY <input type="checkbox"/> UNFINISHED
WATER USE	<input type="checkbox"/> DOMESTIC <input type="checkbox"/> STOCK <input type="checkbox"/> IRRIGATION <input type="checkbox"/> INDUSTRIAL <input checked="" type="checkbox"/> OTHER	<input type="checkbox"/> COMMERCIAL <input type="checkbox"/> MUNICIPAL <input type="checkbox"/> PUBLIC SUPPLY <input type="checkbox"/> COOLING OR AIR CONDITIONING <input type="checkbox"/> NOT USED
METHOD OF DRILLING	<input type="checkbox"/> CABLE TOOL <input checked="" type="checkbox"/> ROTARY (CONVENTIONAL) <input type="checkbox"/> ROTARY (REVERSE) <input type="checkbox"/> ROTARY (AIR) <input type="checkbox"/> AIR PERCUSSION	<input type="checkbox"/> BORING <input type="checkbox"/> DIAMOND <input type="checkbox"/> SETTING <input type="checkbox"/> DRIVING

CONTRACTOR	NAME OF WELL CONTRACTOR <b>W.D. HOPPER &amp; SONS LTD.</b>	LICENCE NUMBER <b>2604</b>
	ADDRESS <b>RR #2 SEAFORTH ONT</b>	
	NAME OF DRILLER OR ROOPER <b>RON HOPPER</b>	LICENCE NUMBER <b>T-0135</b>
	SIGNATURE OF CONTRACTOR	SUBMISSION DATE DAY <b>14</b> MO <b>APR</b> YR <b>88</b>

OFFICE USE ONLY	

CONTRACTOR'S COPY





Measurements recorded in:  Metric  Imperial

Page 1 of 1

Well Owner's Information

First Name, Last Name / Organization, E-mail Address, TOWNSHIP OF ASHFIELD, COLBORE, WAWANSON, Mailing Address (Street Number/Name), Municipality, Province, Postal Code, Telephone No. (inc. area code)

Well Location

Address of Well Location (Street Number/Name), Township, Lot, Concession, County/District/Municipality, City/Town/Village, Province, Postal Code, UTM Coordinates

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

Table with columns: General Colour, Most Common Material, Other Materials, General Description, Depth (mft) From, To. Includes entry for DRILLED WELL 3004832.

Annular Space table with columns: Depth Set at (mft) From, To, Type of Sealant Used (Material and Type), Volume Placed (m<sup>3</sup>/ft<sup>3</sup>). Includes entries for NATIVE FILL, CEMENT, BENTOITE, GRAVEL.

Method of Construction and Well Use sections with checkboxes for Cable Tool, Rotary, Boring, etc.

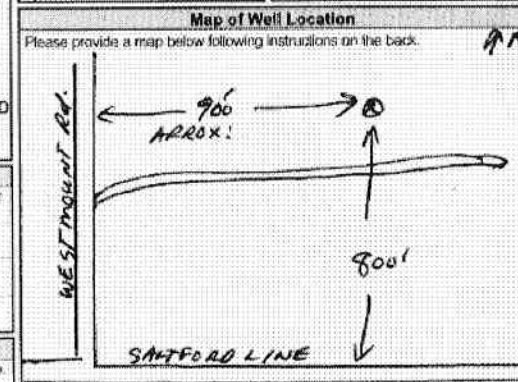
Construction Record - Casing table with columns: Inside Diameter (cm/in), Open Hole OR Material, Wall Thickness (mm/in), Depth (mft) From, To, Status of Well.

Construction Record - Screen table with columns: Outside Diameter (cm/in), Material, Slot No., Depth (mft) From, To, Status of Well.

Water Details and Hole Diameter sections with checkboxes for Fresh, Untested, Gas, etc.

Well Contractor and Well Technician Information section with fields for Business Name, License No., Address, etc.

Results of Well Yield Testing table with columns: Draw Down, Recovery, Time (min), Water Level (mft), etc.



Comments section

Bottom section with fields for Org., Bus. Telephone No., Name of Well Technician, Signature, Date Submitted, etc.

Ministry Use Only section with fields for Audit No., Date Work Completed, etc.

Historical Maitland Well Abandonment





Ministry of the Environment

The Ontario Water Resources Act

40P/12G

# WATER WELL RECORD

Ontario

1. PRINT ONLY IN SPACES PROVIDED  
2. CHECK  CORRECT BOX WHERE APPLICABLE

11 3003809 30003 WD 01

COUNTY OR DISTRICT: Huron  
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Colborne W.D.  
CON., BLOCK, TRACT, SURVEY ETC.: Con. 1 W.D.  
DATE COMPLETED: DAY 14 MO 02 YR 79  
LOG NO.: 001 Pt. 1  
Driller: Monestoga-Rovers & Associates, 1111 King St. N., Waterloo, Ontario  
ELEVATION: 437.00 5 072.5 5 22

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Grey	Clay	Stones	Hard	0	6
Sand	Gravel	Stones	Mixed	6	23
Blue	Clay		Hard	23	86
Grey	Hardpan	Stones		86	111
Lt. Bn.	Limestone	White Shale	Mixed, Hard	111	127
Dk. Bn.	Limestone	Blue Shale Streaks	Medium	127	135
Lt. Bn.	Limestone	White Shale	Medium Hard	135	164
Dk. Bn.	Limestone		Medium	164	181
Lt. Bn.	Limestone		Soft, Broken	181	188
Brown	Limestone		Medium Soft	188	216

31 000420572173 0025 2811112 008630573 011121112 0127215173 0135615173  
 32 0164615173 01811157865 01881158571 02161157865

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
22	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
184	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
06	STEEL	.188	0-113
06	STEEL		113-202
06	STEEL		202-37
06	STEEL		37-50

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER ETC.
10-12		
10-21		
26-29		

71 PUMPING TEST

PUMPING TEST METHOD:  PUMP  BAILEY

PUMPING RATE: 75 Imp. GPM

DURATION OF PUMPING: 24 HOURS

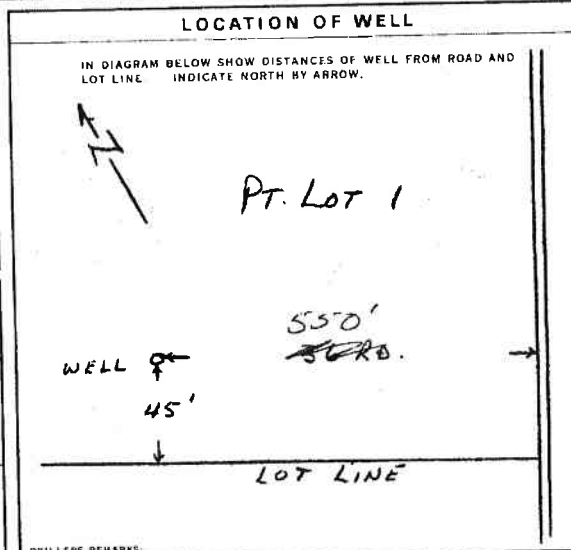
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
126	129	129.17, 129.37, 129.45, 129.49

PUMP INTAKE SET AT: 170 FEET

RECOMMENDED PUMP TYPE:  SHALLOW  DEEP

RECOMMENDED PUMP SETTING: 150 FEET

RECOMMENDED PUMPING RATE: 0075 GPM



FINAL STATUS OF WELL:  WATER SUPPLY

WATER USE: 07

METHOD OF DRILLING: 2

CONTRACTOR: Davidson Well Drilling Limited, Licence Number 1737

ADDRESS: P.O. Box 486, Wingham, Ontario

NAME OF DRILLER OR BORER: D. Casemore

SIGNATURE OF CONTRACTOR: [Signature]

SUBMISSION DATE: DAY 15 NO. 02 YR 79

OFFICE USE ONLY

DATA SOURCE: 1737

DATE OF INSPECTION: 2/5/80

CONTRACTOR: 080579

INSPECTOR: [Signature]

REMARKS: Pump A.P.L. P/P

CSS:88

Century Heights Well 1



Print only in spaces provided. Mark correct box with a checkmark, where applicable.

11

3007682

Municipality: 30002 W.D. Con. 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

County or District <b>Huron</b>	Township/Borough/City/Town/Village <b>Colborne Twp. W.D.</b>	Con. block tract survey, etc. <b>Con. 1</b>	Lot <b>Pt. 1</b>
Owner's surname <b>Township of Ashfield-Colborne-Wawanosh</b>	First Name <b>62 N. St. Goderich, Ont</b>	Address of Well Location <b>c/o B.M. Ross &amp; Assoc.</b>	
Date completed <b>5 June 03</b>		Day <b>5</b>	Month <b>June</b>

21

Zone Easting Northing RC Elevation RC Basin Code II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
<b>Re: Well For Century Heights Water Supply</b>					
Brown	Clay		Sandy	0	18
Grey	Clay	Stones		18	26
Grey	Clay			26	91
Grey	Clay	Stones		91	105
Lt. Brn.	Limestone			105	118
Brown	Limestone	Dk. Blue shale streaks		118	216

31

32

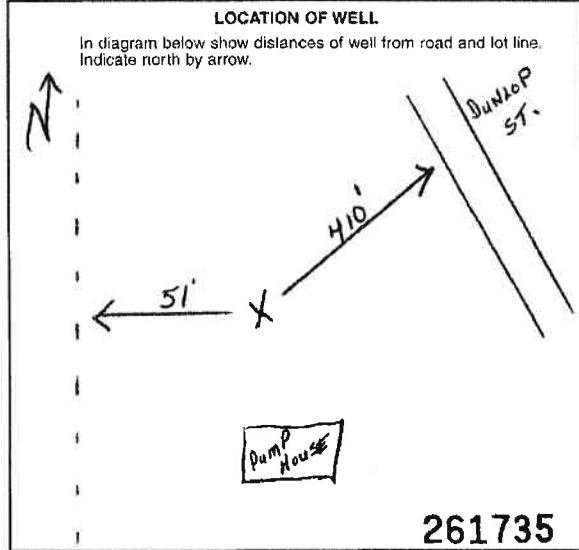
41 WATER RECORD			
Water found at - feet	Kind of water		
122-3	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
170	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas	
215-8	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas	

51 CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6	<input checked="" type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	.188	+2	118
6	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Open hole <input type="checkbox"/> Plastic		118	216

Sizes of opening (Slot No.)	Diameter inches	Length feet

61 PLUGGING & SEALING RECORD			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
118	0	Cement	

71 PUMPING TEST			
Pumping test method	Pumping rate	Duration of pumping	
<input checked="" type="checkbox"/> Pump	GPM	Hours	Minutes
Static level	Water level during	Water level end of pumping	
122 feet	15 minutes	30 minutes	45 minutes



FINAL STATUS OF WELL			
<input checked="" type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished	
<input type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Replacement well	
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)		
<input type="checkbox"/> Recharge well	<input type="checkbox"/> Dewatering		

Name of Well Contractor <b>Davidson Well Drilling Ltd.</b>	Well Contractor's Licence No. <b>1737</b>
Address <b>Box 486, Wingham, Ontario NOG 2W0</b>	
Name of Well Technician <b>K. Losch</b>	Well Technician's Licence No. <b>T0927</b>
Signature of Technician/Contractor <i>J.C. Davidson</i>	Submission date <b>28 July 03</b>

MINISTRY USE ONLY	Data source <b>1737</b>	Date received <b>DEC 05 2003</b>
	Date of inspection	Inspector
	Remarks	

Century Heights Well 2





MINISTRY OF THE ENVIRONMENT  
The Ontario Water Resources Act  
**WATER WELL RECORD**

40 P / 12 E

1. PRINT ONLY IN SPACES PROVIDED  
2. CHECK  CORRECT BOX WHERE APPLICABLE

11 | 3002835 | 30002 | W.D. | 101

COUNTY OR DISTRICT: Huron County | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Colborne Township | CON. BLOCK, TRACT, SURVEY, ETC.: Conc. 1, W. Division | LOT: 002

Warren St., Goderich, Ontario | DATE COMPLETED: DAY 07, MO. 06, YR. 74

NO. 43141 | RC. 14 | ELEVATION: 0710 | RC. 5 | BASIN CODE: 22

**LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)**

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Topsoil			0	1
	Gravel	Stones		1	21
Brown	Sand	Gravel Stones	Hard	21	35
Brown	Clay		Hard	35	60
Blue	Clay	Stones	Soft	60	76
Brown	Limestone		Hard	76	176

31 | 0001602 | 00011112 | 00356281112 | 0060605 | 007630512 | 0176615

**41 WATER RECORD**

WATER FOUND AT - FEET	KIND OF WATER
0174-28 176	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
18-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

**51 CASING & OPEN HOLE RECORD**

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
05	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	.258	0	176
05	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE			
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			

**SCREEN**

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

**61 PLUGGING & SEALING RECORD**

DEPTH SET AT - FEET	FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC.
10-18	14-17		
18-41	22-25		
28-29	30-33		

**71 PUMPING TEST**

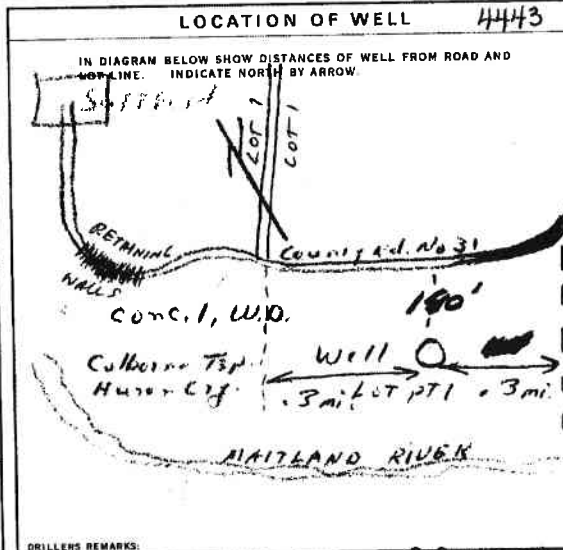
PUMPING TEST METHOD: 1  PUMP 2  BAILER | PUMPING RATE: 0010 GPM | DURATION OF PUMPING: 01 HOURS 45 MINS

STATIC LEVEL	WATER LEVELS DURING
119 FEET	15 MINUTES: 126 FEET 30 MINUTES: 126 FEET 45 MINUTES: 126 FEET 60 MINUTES: 126 FEET

IF FLOWING GIVE RATE: 170 FEET | PUMP INTAKE SET AT: 145 FEET | WATER AT END OF TEST: 43 FEET

RECOMMENDED PUMP TYPE: 1  SHALLOW 2  DEEP | RECOMMENDED PUMP SETTING: 145 FEET | RECOMMENDED PUMPING RATE: 0010 GPM

20-65: 001.4 GPM / FT SPECIFIC CAPACITY



**FINAL STATUS OF WELL**

1  WATER SUPPLY 6  ABANDONED, INSUFFICIENT SUPPLY  
2  OBSERVATION WELL 7  ABANDONED POOR QUALITY  
3  TEST HOLE 8  UNFINISHED  
4  RECHARGE WELL

**WATER USE** 01

1  DOMESTIC 6  COMMERCIAL  
2  STOCK 7  MUNICIPAL  
3  IRRIGATION 8  PUBLIC SUPPLY  
4  INDUSTRIAL 9  COOLING OR AIR CONDITIONING  
5  OTHER 10  NOT USED

**METHOD OF DRILLING** 2

1  CABLE TOOL 6  BORING  
2  ROTARY (CONVENTIONAL) 7  DIAMOND  
3  ROTARY (REVERSE) 8  JETTING  
4  ROTARY (AIR) 9  DRIVING  
5  AIR PERCUSSION

**CONTRACTOR**

NAME OF WELL CONTRACTOR: Davidson Well Drilling Limited | LICENCE NUMBER: 1737  
ADDRESS: Box 486, Wingham, Ontario  
NAME OF DRILLER OR BORER: Rick Jardine, Lucknow | LICENCE NUMBER:  
SIGNATURE OF CONTRACTOR: [Signature] | SUBMISSION DATE: 15 June 74

**OFFICE USE ONLY**

DATA SOURCE: 1 | CONTRACTOR: 1737 | DATE RECEIVED: 080774  
DATE OF INSPECTION: July 11/75 | INSPECTOR: [Signature]  
REMARKS: P.B.A., W.B.A.



Ministry  
of the  
Environment

Ontario

The Ontario Water Resources Act

40P/12E

# WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED  
2. CHECK  CORRECT BOX WHERE APPLICABLE

11

3004711

MUNICIPALITY 30002

W.D.

91

COUNTY OR DISTRICT: [REDACTED] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Colborne W.D. Twp. CON. BLOCK, TRACT, SURVEY, ETC: con. 1 LOT 25-27 Pt. 1

DATE COMPLETED: DAY 7 NO Aug. 87.

ELEVATION: 436.50 RC 80.0

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Sand	Gravel	Coarse	0	15
Brown	Clay	Gravel, Sand	Mixed	15	42
Grey	Clay	Stones	Hard	42	105
Brown	Limestone		Hard	105	112
Brown	Limestone		Medium soft	112	184

31  
32

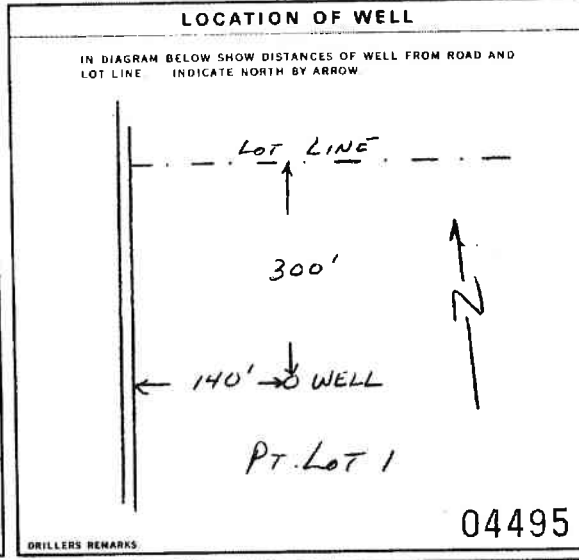
41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
174	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SULPHUR <input type="checkbox"/> SALTY <input type="checkbox"/> MINERAL
182	<input type="checkbox"/> FRESH <input type="checkbox"/> SULPHUR <input type="checkbox"/> SALTY <input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH <input type="checkbox"/> SULPHUR <input type="checkbox"/> SALTY <input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH <input type="checkbox"/> SULPHUR <input type="checkbox"/> SALTY <input type="checkbox"/> MINERAL
30-31	<input type="checkbox"/> FRESH <input type="checkbox"/> SULPHUR <input type="checkbox"/> SALTY <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
5	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE	.188	0	108-9
5	<input type="checkbox"/> STEEL <input checked="" type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> OPEN HOLE		108-9	184
	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE			

SCREEN	SIZE OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD		
DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GRAU, LEAD PACKER, ETC.
FROM	TO	
10-11		
18-17		
18-21		
22-25		
24-29		
30-33		

71 PUMPING TEST	
PUMPING TEST METHOD: <input checked="" type="checkbox"/> PUMP <input checked="" type="checkbox"/> DIALER	PUMPING RATE: 8 GPM
DURATION OF PUMPING: 2 HOURS	RECOVERY: <input checked="" type="checkbox"/>
STATIC LEVEL: 129 FEET	WATER LEVELS DURING:
WATER LEVEL END OF PUMPING: 135 FEET	15 MINUTES: 132 FEET
	30 MINUTES: 134 FEET
	45 MINUTES: 135 FEET
	60 MINUTES: 135 FEET
IF FLOWING, GIVE RATE: 165 GPM	PUMP INTAKE SET AT: 55 FEET
RECOMMENDED PUMP TYPE: <input checked="" type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: 55 FEET
	RECOMMENDED PUMPING RATE: 8 GPM



FINAL STATUS OF WELL	
<input checked="" type="checkbox"/> WATER SUPPLY	<input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
<input type="checkbox"/> OBSERVATION WELL	<input type="checkbox"/> ABANDONED POOR QUALITY
<input type="checkbox"/> TEST HOLE	<input type="checkbox"/> UNFINISHED
<input type="checkbox"/> RECHARGE WELL	

WATER USE	
<input checked="" type="checkbox"/> DOMESTIC	<input type="checkbox"/> COMMERCIAL
<input type="checkbox"/> STOCK	<input type="checkbox"/> MUNICIPAL
<input type="checkbox"/> IRRIGATION	<input type="checkbox"/> PUBLIC SUPPLY
<input type="checkbox"/> INDUSTRIAL	<input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	<input type="checkbox"/> NOT USED

METHOD OF DRILLING	
<input type="checkbox"/> CABLE TOOL	<input type="checkbox"/> BORING
<input checked="" type="checkbox"/> ROTARY (CONVENTIONAL)	<input type="checkbox"/> DIAMOND
<input type="checkbox"/> ROTARY (REVERSE)	<input type="checkbox"/> JETTING
<input type="checkbox"/> ROTARY (AIR)	<input type="checkbox"/> DRIVING
<input type="checkbox"/> AIR PERCUSSION	

CONTRACTOR	
NAME OF WELL CONTRACTOR: Davidon Well Drilling Limited	LICENCE NUMBER: 1737
ADDRESS: Box 486, Wingham, Ontario, N0G 2W0	
NAME OF DRILLER OR BORER: D. Casemore	LICENCE NUMBER: T0154
SIGNATURE OF CONTRACTOR: [Signature]	SUBMISSION DATE: DAY 12 NO Aug. 87

OFFICE USE ONLY	
DATA SOURCE	CONTRACTOR: 58 DATE RECEIVED: AUG 31 1987
DATE OF INSPECTION: 10/11/88	INSPECTOR: [Signature]
REMARKS	CSS.88



1. PRINT ONLY IN SPACES PROVIDED  
2. CHECK  CORRECT BOX WHERE APPLICABLE

11 3005597 300002 W.D. 01

COUNTY OR DISTRICT: **Halton** TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: **Colborne Twpp W.D.** CON. BLOCK, TRACT, SURVEY, ETC.: **Con. 1** LOT 25-27: **1**

DATE COMPLETED 25-53: **July 93** DAY: **5** MO: **July** YR: **93**

R. 4, Goderich Ontario. N7A 3Y1

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Clay	Stones	Soft	0	13
Brown	Sand		Soft	13	15
Grey	Clay		Soft	15	43
Grey	Clay		Hard	43	54
Grey	Clay	Stones	Hard	54	71
Brown	Hardpan	Stones	Hard	71	105
Brown	Limestone		Med. soft	105	134
Brown-Gry.	Limestone		MED.	134	169

31  
32

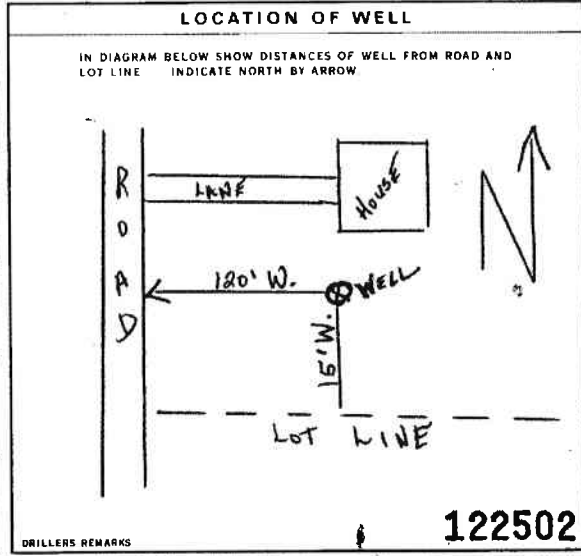
41 WATER RECORD			
WATER FOUND AT - FEET	KIND OF WATER		
158-163	<input checked="" type="checkbox"/> FRESH	<input checked="" type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR
163	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> MINERALS
169	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> GAS
20-23	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> SULPHUR
23-28	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> MINERALS
30-33	<input type="checkbox"/> FRESH	<input type="checkbox"/> SALTY	<input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD			
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11	<input checked="" type="checkbox"/> STEEL		0-13.16
6	<input type="checkbox"/> GALVANIZED	.188	0-109-0
6	<input type="checkbox"/> CONCRETE		109-0-169
17-18	<input type="checkbox"/> STEEL		30-23
24-25	<input type="checkbox"/> GALVANIZED		37-30

SIZE(S) OF OPENING - SLOT NO. 1	DIAMETER	LENGTH
	31-33	34-38

61 PLUGGING & SEALING RECORD		
DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER ETC. 1
10-12		14-17
18-21		22-25
24-28		30-33

71 PUMPING TEST METHOD		10 PUMPING RATE	11-14 DURATION OF PUMPING
<input checked="" type="checkbox"/> PUMP	<input type="checkbox"/> BAILER	18 GPM	4 HOURS 30 MIN.
19-21	22-24	18 MINUTES	30 MINUTES
125 FEET	129 FEET	129 FEET	127 FEET
126 FEET	125 FEET		
150 GPM	145 GPM		12 GPM



FINAL STATUS OF WELL:  WATER SUPPLY

WATER USE:  DOMESTIC

METHOD OF CONSTRUCTION:  ROTARY (CONVENTIONAL)

CONTRACTOR: **Davidson Well Drilling Limited**

WELL CONTRACTOR'S LICENCE NUMBER: **1737**

WELL TECHNICIAN'S LICENCE NUMBER: **T0154**

SUBMISSION DATE: **July 93**

OFFICE USE ONLY

CONTRACTOR: **1737** DATE RECEIVED: **AUG 31 1993**

INSPECTOR: **CSS.ES**



Ontario

Ministry of the Environment

# The Ontario Water Resources Act WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED  
2. CHECK  CORRECT BOX WHERE APPLICABLE

11

3005707

MUNICIP 30002

COR. WD

01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC.	LOT
	NE	01 WD	01
DATE COMPLETED			22-23
DAY			9/8/1994
YEAR			

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
GREY	GRAVEL	STONES		0	18
BLUE	SILT		SOFT	18	26
BLUE	CLAY			26	60
GREY	STONES	CLAY		60	90
GREY	HARDPAN		PACKED	90	105
YELLOW	CLAY	WHITE CLAY		105	113
YELLOW	CLAY	BROWN LIMESTONE	LAYERED	113	117
BROWN	LIMESTONE		MED	117	119
BROWN	LIMESTONE	GREY LIMESTONE	SOFT	119	165
BROWN	LIMESTONE	GREY LIMESTONE	MED	165	180

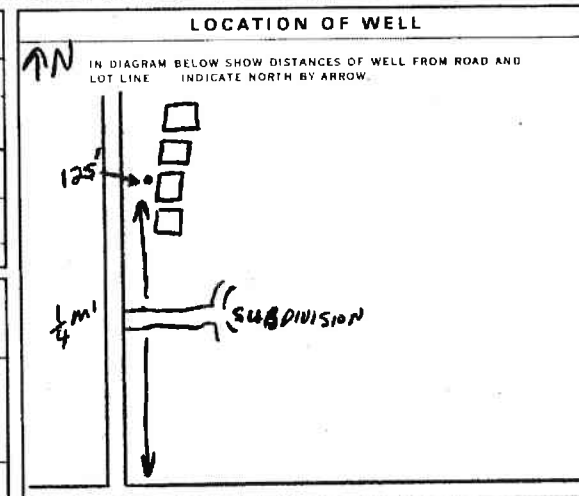
31	32
----	----

41 WATER RECORD			
WATER FOUND AT - FEET	KIND OF WATER		
144	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	14
156	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	19
176	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	24
	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	23
	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	34

51 CASING & OPEN HOLE RECORD			
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10 1/2	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	.188	1 119
10 1/2	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		119 180
10 1/2	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		27-30

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT	LEAD PACKER ETC.
10-13			
14-17			
18-21			
22-25			
26-29			
30-33			

71 PUMPING TEST	
PUMPING TEST METHOD 1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILEY	PUMPING RATE 12 GPM
DURATION OF PUMPING 2 HOURS	15-16 HOURS 17-18 MINS
STATIC LEVEL 121 FEET	WATER LEVELS DURING PUMPING 15 MINUTES: 125 FEET 30 MINUTES: 125 FEET 45 MINUTES: 125 FEET 60 MINUTES: 125 FEET
IF FLOWING, GIVE RATE 160 GPM	WATER AT END OF TEST 1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING 160 FEET
	RECOMMENDED PUMPING RATE 10 GPM



FINAL STATUS OF WELL	
1 <input checked="" type="checkbox"/> WATER SUPPLY 2 <input type="checkbox"/> OBSERVATION WELL 3 <input type="checkbox"/> TEST HOLE 4 <input type="checkbox"/> RECHARGE WELL	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY 6 <input type="checkbox"/> ABANDONED POOR QUALITY 7 <input type="checkbox"/> UNFINISHED 8 <input type="checkbox"/> DEWATERING
WATER USE	
1 <input type="checkbox"/> DOMESTIC 2 <input type="checkbox"/> STOCK 3 <input type="checkbox"/> IRRIGATION 4 <input type="checkbox"/> INDUSTRIAL 5 <input type="checkbox"/> OTHER	6 <input type="checkbox"/> COMMERCIAL 7 <input type="checkbox"/> MUNICIPAL 8 <input type="checkbox"/> PUBLIC SUPPLY 9 <input type="checkbox"/> COOLING OR AIR CONDITIONING 10 <input type="checkbox"/> NOT USED
METHOD OF CONSTRUCTION	
1 <input type="checkbox"/> CABLE TOOL 2 <input checked="" type="checkbox"/> ROTARY (CONVENTIONAL) 3 <input type="checkbox"/> ROTARY (REVERSE) 4 <input type="checkbox"/> ROTARY (AIR) 5 <input type="checkbox"/> AIR PERCUSSION	6 <input type="checkbox"/> BORING 7 <input type="checkbox"/> DIAMOND 8 <input type="checkbox"/> JETTING 9 <input type="checkbox"/> DRIVING 10 <input type="checkbox"/> DIGGING 11 <input type="checkbox"/> OTHER

PUMP BY W.D.HOPPER 132836

CONTRACTOR	NAME OF WELL CONTRACTOR W.D.HOPPER & SONS LTD.	WELL CONTRACTOR'S LICENCE NUMBER 2604
	ADDRESS RR#2 SEAFORTH ONT.	
	NAME OF WELL TECHNICIAN RON HOPPER	WELL TECHNICIAN'S LICENCE NUMBER T-0135
	SIGNATURE OF TECHNICIAN/CONTRACTOR <i>Ron Hopper</i>	SUBMISSION DATE 21/9/1994

OFFICE USE ONLY	DATA SOURCE 2604	CONTRACTOR 59-62	DATE RECEIVED OCT 17 1994
	DATE OF INSPECTION	INSPECTOR	
REMARKS CSS.ES			



Print only in spaces provided. Mark correct box with a checkmark, where applicable.

3006006 Municipality 30002 Con. WD

County or District: [Redacted] Township/Borough/City/Town/Village: COLBORNE Con block tract survey, etc. Lot 1  
 Address: R.R. #4 GODERICH Date completed 06 05 96  
 Northing RC Elevation RC Basin Code II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BLACK	TOPSOIL		LOOSE	0	1
BROWN	CLAY		PACKED	1	3
BROWN	GRAVEL	STONES	DRY	3	8
BROWN	FINE GRAVEL, COARSE SAND		WATER BEARING	8	15
GREY	CLAY		HARD PACKED	15	16

WATER RECORD

Water found at - feet	Kind of water
7	Fresh Slightly Salty
15	Fresh Slightly Salty
20	Fresh Slightly Salty
25	Fresh Slightly Salty
30	Fresh Slightly Salty

CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
36"	Steel	3"	0	12.5
30"	Galvanized	OPEN HOLE	12.5	15

SCREEN

Size of opening (Slot No)	Diameter	Length
	inches	feet

Material and type: FILTERSAND

PLUGGING & SEALING RECORD

Depth set at - feet	Material and type (Cement grout, bentonite, etc.)
0-8	HOLEPLUG 1 AND CLAY SLURRY

PUMPING TEST

Pumping test method: Pump

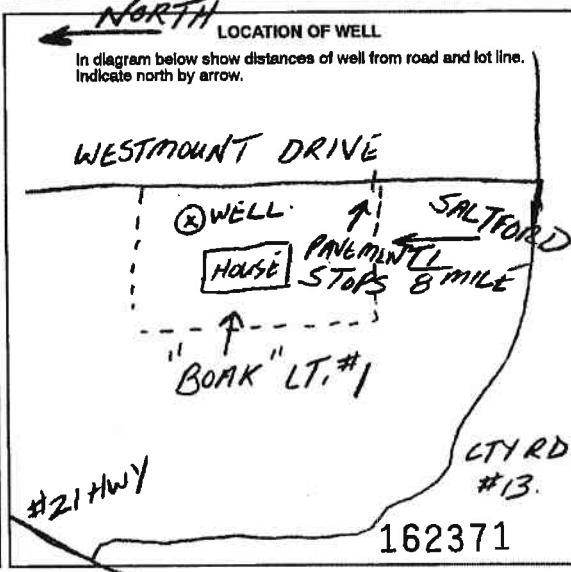
Pumping rate: 20 GPM Duration of pumping: 1 Hour

Static level	Water level end of pumping	Water levels during
7 feet	12 feet	15 minutes, 30 minutes, 45 minutes, 60 minutes

Recommended pump type: Shallow

Recommended pump setting: 12 feet

Recommended pump rate: 5 GPM



FINAL STATUS OF WELL

Water supply:  Water supply

Water use:  Domestic

Method of construction:  Rotary (conventional)

Name of Well Contractor: HAYDEN WATER WELLS 2552 Well Contractor's Licence No. 2552

Address: R.R. #1 LUCAN

Name of Well Technician: JAY HAYDEN Well Technician's Licence No. 71034

Signature of Technician: [Signature]

MINISTRY USE ONLY

Data source: 2552 Date received: MAR 04 1997

Date of inspection: Inspector: [Signature]

Remarks: [Signature]

CSS. S





Print only in spaces provided.  
Mark correct box with a checkmark, where applicable.

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3007255

Municipality: 30002 Con: W/O

County or District <b>MURRON</b>	Township/Borough/City/Town/Village <b>COLBORNE</b>	Con block tract survey, etc. <b>01</b>	Lot <b>01</b>
Address <b>RR# 4 GODERICH ONT.</b>		Date completed <b>10/7/2002</b> day month year	

21

Northings: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100

RC: 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Elevation: 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Basin Code: I, II, III, IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)				Depth - feet	
General colour	Most common material	Other materials	General description	From	To
				<b>BROWN</b>	<b>SAND</b>
<b>BROWN</b>	<b>CLAY</b>			<b>8</b>	<b>13</b>
<b>GREY</b>	<b>CLAY</b>			<b>13</b>	<b>70</b>
<b>GREY</b>	<b>CLAY</b>	<b>STONES</b>		<b>70</b>	<b>95</b>
<b>GREY</b>	<b>HARDPAN</b>		<b>PACKED</b>	<b>95</b>	<b>110</b>
<b>BROWN</b>	<b>LIMESTONE</b>		<b>SOFT</b>	<b>110</b>	<b>113</b>
<b>BROWN</b>	<b>LIMESTONE</b>		<b>MED.</b>	<b>113</b>	<b>205</b>

31

32

WATER RECORD			
Water found at - feet	Kind of water		
10-13	1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	14
10-13	2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals	14
10-13		5 <input type="checkbox"/> Gas	14
15-18	1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	19
15-18	2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals	19
15-18		5 <input type="checkbox"/> Gas	19
20-23	1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	24
20-23	2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals	24
20-23		5 <input type="checkbox"/> Gas	24
25-28	1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	29
25-28	2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals	29
25-28		5 <input type="checkbox"/> Gas	29
30-33	1 <input type="checkbox"/> Fresh	3 <input type="checkbox"/> Sulphur	34
30-33	2 <input type="checkbox"/> Salty	4 <input type="checkbox"/> Minerals	34
30-33		5 <input type="checkbox"/> Gas	34

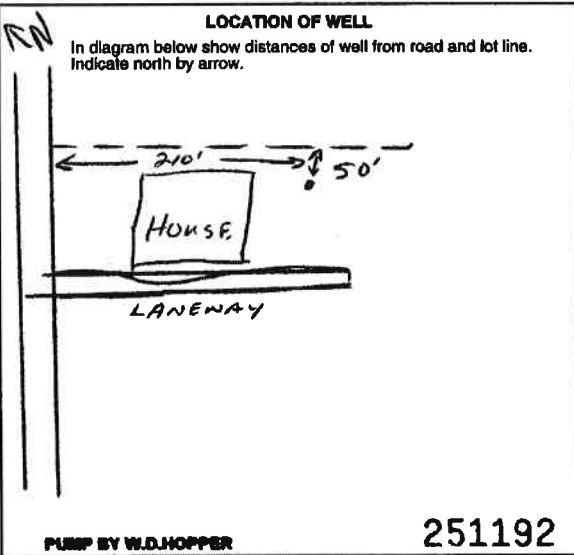
CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6"	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic	.188	0	114
6"	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic		114	205
	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic			27-30

SCREEN	Sizes of opening (Slot No.)		Diameter	Length
	From	To	inches	feet
Material and type				
				Depth at top of screen
				feet

PLUGGING & SEALING RECORD			
<input type="checkbox"/> Annular space <input type="checkbox"/> Abandonment			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
10-13	14-17		
18-21	22-25	<b>BENTONITE &amp; DRILL SLURRY</b>	
26-29	30-33		

PUMPING TEST		PUMPING RATE		DURATION OF PUMPING	
1 <input type="checkbox"/> Pump	2 <input type="checkbox"/> Bailer	GPM	Hours	Minutes	Seconds
147	100	151	190	190	101
If flowing give rate		Pump intake set at		Water at end of test	
GPM		feet		<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy	
Recommended pump type		Recommended pump setting		Recommended pump rate	
<input type="checkbox"/> Shallow <input type="checkbox"/> Deep		feet		GPM	



FINAL STATUS OF WELL			
1 <input type="checkbox"/> Water supply	5 <input type="checkbox"/> Abandoned, insufficient supply	9 <input type="checkbox"/> Unfinished	
2 <input type="checkbox"/> Observation well	6 <input type="checkbox"/> Abandoned, poor quality	10 <input type="checkbox"/> Replacement well	
3 <input type="checkbox"/> Test hole	7 <input type="checkbox"/> Abandoned (Other)		
4 <input type="checkbox"/> Recharge well	8 <input type="checkbox"/> Dewatering		

WATER USE			
1 <input type="checkbox"/> Domestic	5 <input type="checkbox"/> Commercial	9 <input type="checkbox"/> Not use	
2 <input type="checkbox"/> Stock	6 <input type="checkbox"/> Municipal	10 <input type="checkbox"/> Other	
3 <input type="checkbox"/> Irrigation	7 <input type="checkbox"/> Public supply		
4 <input type="checkbox"/> Industrial	8 <input type="checkbox"/> Cooling & air conditioning		

METHOD OF CONSTRUCTION			
1 <input type="checkbox"/> Cable tool	5 <input type="checkbox"/> Air percussion	9 <input type="checkbox"/> Driving	
2 <input type="checkbox"/> Rotary (conventional)	6 <input type="checkbox"/> Boring	10 <input type="checkbox"/> Digging	
3 <input type="checkbox"/> Rotary (reverse)	7 <input type="checkbox"/> Diamond	11 <input type="checkbox"/> Other	
4 <input type="checkbox"/> Rotary (air)	8 <input type="checkbox"/> Jetting		

Name of Well Contractor <b>W.D.HOPPER &amp; SONS LTD.</b>	Well Contractor's Licence No. <b>3004</b>
Address <b>RR# 2 BEAUFORT ONT.</b>	
Name of Well Technician <b>ALLAN HOPPER</b>	Well Technician's Licence No. <b>T-2576</b>
Signature of Technician/Contractor <i>[Signature]</i>	Submission date day <b>25</b> month <b>10</b> year <b>2002</b>

MINISTRY USE ONLY	Data source <b>2604</b>	Contractor <b>2604</b>	Date received <b>OCT 03 2002</b>
	Date of inspection	Inspector	
Remarks <b>000.532</b>			



Print only in spaces provided. Mark correct box with a checkmark, where applicable.

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3007475

Municipality 30002 Con. WD 01

County or District, Township/Borough/City/Town/Village, Con block tract survey, etc., Lot, Address of Well Location, Date completed 18/3/2003

Zone, Easting, Northing, RC, Elevation, RC, Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions) Table with columns: General colour, Most common material, Other materials, General description, Depth - feet (From, To)

31, 32

41 WATER RECORD Table with columns: Water found at - feet, Kind of water

61 CASING & OPEN HOLE RECORD Table with columns: Inside diam inches, Material, Wall thickness inches, Depth - feet (From, To)

SCREEN Table with columns: Sizes of opening (Slot No.), Diameter inches, Length feet, Material and type, Depth at top of screen feet

61 PLUGGING & SEALING RECORD Table with columns: Annular space, Abandonment, Depth set at - feet, Material and type (Cement grout, bentonite, etc.)

71 PUMPING TEST Table with columns: Pumping test method, Pumping rate, Duration of pumping, Static level, Water level end of pumping, Water levels during, Pumping, Recovery, If flowing give rate, Pump intake set at, Water at end of test, Recommended pump type, Recommended pump setting, Recommended pump rate

LOCATION OF WELL. In diagram below show distances of well from road and lot line. Indicate north by arrow. Includes a hand-drawn diagram showing a well location relative to a road and lot line, with dimensions 300' and 75'. Includes text: PUMP BY W.D.HOPPER 256894

FINAL STATUS OF WELL, WATER USE, METHOD OF CONSTRUCTION

Name of Well Contractor, Well Contractor's Licence No., Address, Name of Well Technician, Well Technician's Licence No., Signature of Technician/Contractor, Submission date

MINISTRY USE ONLY, Data source, Contractor, Date received, Date of inspection, Inspector, Remarks





Print only in spaces provided. Mark correct box with a checkmark, where applicable.

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3007516

Municipality 30002

Con. WD

01

County or District: [Redacted] Township/Borough/City/Town/Village: COLBORNE Con block, tract, survey, etc.: 01 Lot: 01

Address of Well Location: GODERICH ONT. Date completed: 28 5 / 2003

Zone: [Redacted] Easting: [Redacted] Northing: [Redacted] RC: [Redacted] Elevation: [Redacted] RC: [Redacted] Basin Code: [Redacted]

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)				Depth - feet	
General colour	Most common material	Other materials	General description	From	To
BROWN	SAND			0	4
BROWN	CLAY			4	16
GREY	CLAY			16	32
GREY	CLAY	STONES		32	35
GREY	CLAY			35	70
GREY	CLAY	STONES		70	100
BROWN	LIMESTONE		FRACTURED	100	113
BROWN	LIMESTONE		MED.	113	206

31 [Redacted] 32 [Redacted]

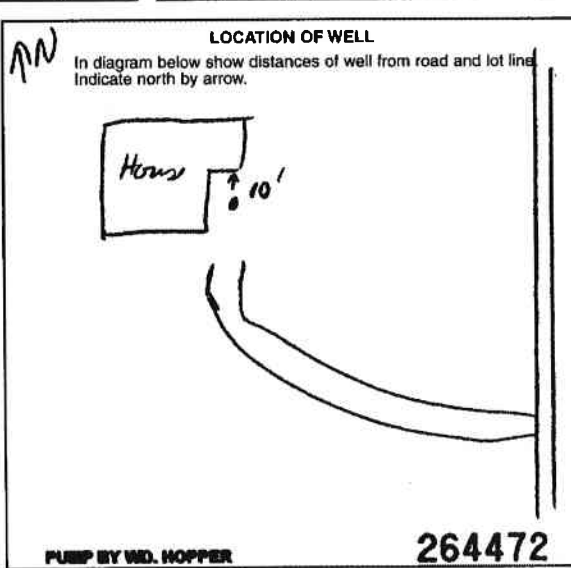
WATER RECORD			
Water found at - feet	Kind of water		
175	1 Fresh 2 Salty	3 Sulphur 4 Minerals 6 Gas	14
100-205	1 Fresh 2 Salty	3 Sulphur 4 Minerals 6 Gas	19
20-23	1 Fresh 2 Salty	3 Sulphur 4 Minerals 6 Gas	24
25-28	1 Fresh 2 Salty	3 Sulphur 4 Minerals 6 Gas	29
30-33	1 Fresh 2 Salty	3 Sulphur 4 Minerals 6 Gas	34

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6"	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic	.188	42	113
6"	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic		113	205
	1 Steel 2 Galvanized 3 Concrete 4 Open hole 5 Plastic			27-30

SIZES OF OPENING (Slot No.)	31-33	Diameter	34-39	Length	40-49
		inches		feet	
Material and type	Depth at top of screen		41-44		
	feet				

PLUGGING & SEALING RECORD			
Annular space		Abandonment	
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
10-13	14-17		
18-21	22-25	142 LIMESTONES	
26-29	30-33	80	

PUMPING TEST		Pumping rate		Duration of pumping	
1 Pump	2 Bailer	11-14 GPM	15-16 Hours	17-18 Mins	
Static level	Water level end of pumping	Water levels during	1 Pumping	2 Recovery	
19-21 feet	22-24 feet	15 minutes 25-28 feet	30 minutes 29-31 feet	45 minutes 32-34 feet	60 minutes 35-37 feet
137 feet	146 feet	138 feet	140 feet	142 feet	143 feet
If flowing give rate	Pump intake set at	Water at end of test			
GPM	feet				
Recommended pump type	Recommended pump setting	Recommended pump rate			
1 Shallow 2 Deep	feet	GPM			
	100 feet	42 GPM			



FINAL STATUS OF WELL

1 Water supply  
2 Observation well  
3 Test hole  
4 Recharge well

5 Abandoned, insufficient supply  
6 Abandoned, poor quality  
7 Abandoned (Other)  
8 Dewatering

9 Unfinished  
10 Replacement well

WATER USE

1 Domestic  
2 Stock  
3 Irrigation  
4 Industrial

5 Commercial  
6 Municipal  
7 Public supply  
8 Cooling & air conditioning

9 Not used  
10 Other

METHOD OF CONSTRUCTION

1 Cable tool  
2 Rotary (conventional)  
3 Rotary (reverse)  
4 Rotary (air)

5 Air percussion  
6 Boring  
7 Diamond  
8 Jetting

9 Driving  
10 Digging  
11 Other

Name of Well Contractor: W.D. HOPPER & SONS LTD. Well Contractor's Licence No.: 2004

Address: RM 2 SEAFORTH ONT.

Name of Well Technician: ALLAN HOPPER Well Technician's Licence No.: T-2576

Signature of Technician/Contractor: [Signature] Submission date: day 3 / month 7 / 2003

MINISTRY USE ONLY

Data source: 2604 Date received: JUL 09 2003

Date of inspection: Inspector:

Remarks:

## Appendix C

### Wellhead Protection Area Delineation and Vulnerability Scoring for Well 3, Matrix Report



**PRELIMINARY WELLHEAD PROTECTION AREA DELINEATION AND  
VULNERABILITY SCORING, CENTURY HEIGHTS WELL 3  
COMMUNITY OF SALT FORD, ONTARIO**

Prepared for:  
**TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH**

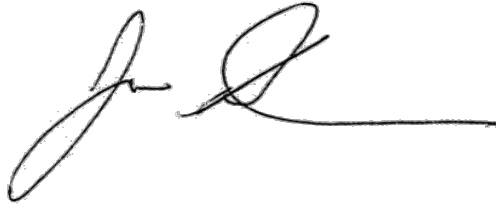
Prepared by:  
**MATRIX SOLUTIONS INC., A MONTROSE ENVIRONMENTAL COMPANY**

Version 1.0  
November 2023  
Guelph, Ontario

Unit 7B, 650 Woodlawn Rd. W  
Guelph, ON, Canada N1K 1B8  
T 519.772.3777 F 226.314.1908  
[www.matrix-solutions.com](http://www.matrix-solutions.com)

**PRELIMINARY WELLHEAD PROTECTION AREA DELINEATION  
AND VULNERABILITY SCORING, CENTURY HEIGHTS WELL 3  
COMMUNITY OF SALT FORD, ONTARIO**

Prepared for Township of Ashfield-Colborne-Wawanosh, November 2023



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**Jim Graham, M.A.Sc., P.Eng.  
Senior Hydrogeological Engineer**



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**reviewed by  
Dave Van Vliet, M.A.Sc., P.Eng.  
Senior Vice President, Technical Excellence  
& Innovation**

**CONTRIBUTORS**

Name	Job Title	Role
Jim Graham, M.A.Sc., P.Eng.	Senior Hydrogeological Engineer	Author and modelling
Henry Hecky, M.Sc., P.Geo.	Hydrogeologist	Project manager and GIS
Dave Van Vliet, M.A.Sc., P.Eng.	Senior Vice President, Technical Excellence & Innovation	Technical reviewer

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# 1 INTRODUCTION

In the fall of 2005, the Government of Ontario introduced Bill 43, the *Clean Water Act* (Government of Ontario 2021), to protect drinking water at the source as part of an overall commitment to human health and the environment. Protecting source water is the first step in a multibarrier approach to ensure that the quality and sustainability of our drinking water supplies are maintained for generations to come (Government of Ontario 2021). A focus of the government's legislation is the production of locally developed science-based Assessment Reports and Source Protection Plans. Assessment Reports are prepared by Source Protection Authorities and include a watershed characterization, water budget, groundwater and surface water vulnerability assessment, threats assessment and issues evaluation, and water quality and quantity risk assessment studies. Groundwater vulnerability assessments are a requirement of the *Clean Water Act* (Government of Ontario 2021). These assessments identify vulnerable areas (e.g., Wellhead Protection Areas [WHPAs]); characterize the relative vulnerability of the municipality's supply aquifers as high, moderate, or low; and assign vulnerability scores to zones within those vulnerable areas.

The Township of Ashfield-Colborne-Wawanosh (the Township) retained Matrix Solutions Inc., a Montrose Environmental company, to develop the draft preliminary WHPAs and complete vulnerability scoring for a new Century Heights well, located in the Century Heights subdivision in the community of Saltford, Ontario. In 2010, Waterloo Numerical Modelling Corp. (WNMC) completed the groundwater study for the Ausable Bayfield Conservation Authority (ABCA)/Maitland Valley Conservation Authority (MVCA; *ABCA/MVCA Groundwater Model Updates and Capture Zone Delineation*; WNMC 2010). A large regional numerical model built for that study extended from Lake Huron to east of Molesworth, Ontario, and south of Goderich, Ontario to north of Wingham, Ontario. The 2010 Visual MODFLOW numerical model was used previously to delineate WHPAs for the Century Heights subdivision but was not available for this study. The WNMC (2010) report was used to inform the local and regional characterization work along with current data sets (Ontario Ministry of the Environment, Conservation and Parks [MECP] water well records, surficial geology, bedrock geology, tile drain network, etc.).

## 1.1 Scope of Work

The *2021 Technical Rules under the Clean Water Act* (the Technical Rules; MECP 2021) document provides definitions of vulnerable areas and vulnerability scoring within vulnerable areas. The Government of Ontario released the *Groundwater Vulnerability Analysis* (Guidance Module 3; MOE 2006), and it recommends methods to delineate vulnerable areas. The methods documented in this report are consistent with the approaches laid out in Guidance Module 3 and the Technical Rules.

The main objectives for this current project include:

- developing a conceptual site model of the area surrounding the existing and planned Century Heights municipal wells

- developing a three-dimensional (3D) groundwater flow model of the area surrounding the existing and planned Century Heights municipal wells
- delineating the capture zones and draft WHPAs for a new single proposed municipal well in the Century Heights subdivision (Century Heights Well-3)
- completing vulnerability scoring within the draft WHPAs using existing aquifer vulnerability mapping

## 1.2 Background

Developing a groundwater flow model suitable for WHPA delineation relies on the physical characteristics of the groundwater and surface water flow systems on a local and regional scale. Technical studies have previously been completed throughout the area on a regional and local (wellfield) scale, with the goal of enhancing the understanding of the hydrogeology of the study area. The following subsections summarize the study area (Figure 1), municipal water supplies, and the hydrostratigraphy and introduce the concept of WHPAs, vulnerability, and vulnerability scoring. Further details on local and regional hydrogeology, bedrock hydrogeology, and physical characterization are provided in WMNC (2010).

### 1.2.1 Hydrostratigraphy

Hydrostratigraphic units refer to zones of similar geologic and hydrogeologic properties influencing groundwater flow. The delineation of hydrostratigraphic units is completed using knowledge of the regional and local understanding of the spatial distribution of stratigraphic units, relying on information provided in both geological mapping and borehole logs (i.e., water well records). The geologic cross-sections from the North Huron model (WNMC 2010) were used to form the basis of the conceptual model for this study, along with an understanding of the hydrostratigraphic setting on the eastern shore of Lake Huron. The hydrostratigraphy represented in the ACW model (WNMC 2010) was primarily developed from water well records (MECP 2023). Most of the domestic wells contributing to the Water Well Information System (WWIS; MECP 2022) record database are drilled to bedrock with primarily till or low permeability material reported in the overburden. As such, the model overburden layer was conceptualized as a single layer, defined from the digital elevation model (DEM) shown in Figure 2 to the top of bedrock shown in Figure 3. The top-of-bedrock surface was created by interpolating the topmost bedrock unit in the water well records, which was then clipped with the DEM to represent the bedrock surface in low-lying areas, especially around the rivers where the overburden has historically eroded away. The surficial geology of the area as mapped by the Ontario Geological Survey (Figure 4) was assigned to this overburden unit.

Century Heights Well-3 was completed as an open hole below the fractured bedrock from a depth of 32.0 m. Figure 5 illustrates the two uppermost regional bedrock units of the area: the Dundee Formation (west) and the Detroit River Group (east).

### 1.2.2 Wellhead Protection Areas

A WHPA is a term used to describe scientifically based capture zones delineated for water supply wells. A capture zone is the area of land surrounding a groundwater extraction well, where water (and contaminants, if they were to exist) located at and below the ground surface may travel toward that well within a defined period. The Technical Rules (MECP 2021) require that the following WHPAs for water quality be delineated for each municipal drinking water supply well:

- WHPA-A: the surface and subsurface area centred on the well with an outer boundary identified by a radius of 100 m.
- WHPA-B: the surface and subsurface areas within which the time-of-travel to the well is less than or equal to 2 years but excluding WHPA-A.
- WHPA-C: the surface and subsurface areas within which the time-of-travel to the well is greater than 2 years, but less than or equal to 5 years.
- WHPA-D: the surface and subsurface areas within which the time-of-travel to the well is greater than 5 years, but less than or equal to 25 years.

### 1.2.3 Vulnerability Scoring

Vulnerability is a relative indicator of where contamination may be more likely to reach an underlying aquifer if introduced at the ground surface. Aquifers that are unconfined or have little protective overburden cover are more susceptible to surface contamination, if a spill were to occur, than those that have a substantial amount of fine-grained overburden protection. Fine-grained overburden units as well as deep aquifers that are confined by thick layers of fine-grained material would be identified as having low vulnerability to surficial contaminants as compared to shallow sand and gravel aquifers.

Existing groundwater vulnerability mapping for the study area obtained from the MVCA and ABCA and relied upon for this study. This vulnerability mapping was overlain with the WHPA polygons delineated in this study, and a vulnerability score was applied to the intersecting polygon areas based on the WHPA type and vulnerability category (Table 1) as per the Technical Rules (MECP 2021).

**TABLE 1 Wellhead Protection Areas Vulnerability Scores**

Groundwater Vulnerability	Location Within a WHPA			
	WHPA A	WHPA B	WHPA C	WHPA D
High	10	10	8	6
Medium	10	8	6	4
Low	10	6	4	2

Notes:

WHPA - Wellhead Protection Area

## **2 CAPTURE ZONE AND WELLHEAD PROTECTION AREAS DELINEATION METHODOLOGY AND RESULTS**

### **2.1 Groundwater Flow Modelling**

Several technical studies were previously conducted for the purposes of groundwater protection in Huron County (WNMC 2010). Studies included the development of groundwater flow models to evaluate the long-term sustainability of municipal wells and to delineate capture zones around municipal pumping wells. As new wells are drilled, the understanding of the hydrogeology of the area can be refined with additional borehole data, and this may necessitate updates to a groundwater flow model. In addition, as new water supply wells are put into production, and other wells are taken offline, the capture zones, WHPAs, and vulnerability scores need to be updated.

A Visual MODFLOW model was previously developed for the area that included Huron County and the Township (WNMC 2010). The objectives of the 2010 study were to map regional groundwater conditions, inventory groundwater uses, identify groundwater quality threats, and conduct a contaminant source assessment. Regional groundwater modelling and WHPAs of the municipal wells in the municipality were delineated using the Visual MODFLOW model. The groundwater flow model developed for this study was unavailable for this project, which resulted in the requirement to develop a new local-scale model.

### **2.2 Groundwater Flow Model Development**

#### **2.2.1 Model Domain and Grid**

The numerical model developed for the current study was based on the reporting of the previous larger regional-scale groundwater flow model (WNMC 2010). The boundaries of the revised groundwater flow model are illustrated on Figure 6 and extend 17 km east from Lake Huron and 10 km from north to south. The model domain was selected based on the understanding of regional groundwater flow, extent of previous WHPA's, and natural flow boundaries. Regional and local horizontal groundwater flow direction is westward; flow from higher elevations in the east towards Lake Huron.

#### **2.2.2 Model Hydraulic Properties**

The mapped surficial geology (Figure 4) was used to define the uppermost layer in the model. Table 2 lists the model layers and the hydraulic conductivity values associated with the hydrostratigraphic units in those layers. The 2010 Visual MODFLOW model was used to inform the initial estimates of hydraulic conductivity. Figures 8 and 9 illustrate two hydrostratigraphic cross-sections extending west to east and north to south, respectively, through Century Heights Well-3. Layers 2 and 3 represents a 5 m thick weathered bedrock zone, with the top defined as the upper bedrock surface. Layers 4 to 7 represents the Dundee Bedrock Formation and Layers 8 to 10 represent the Detroit River Bedrock Group. Each bedrock unit has a uniform thickness of 100 m, resulting in a 200 m overall bedrock thickness.

Porosity was assumed to be 25% for the overburden layers and 5% for the bedrock layers, similar to the previous study (WNMC 2010).

**TABLE 2 Summary of Hydrostratigraphic Units in Study Area**

Model Layer	Geologic Unit	2010 Regional Model Hydraulic Conductivity (m/s)	Simulated Hydraulic Conductivity (m/s)	Simulated Porosity (%)
1	Clay or Peat	$1 \times 10^{-6}$ to $5 \times 10^{-6}$	$1 \times 10^{-6}$	25
1	Sand and Gravel	$1 \times 10^{-4}$	$1 \times 10^{-4}$	25
1	Silt Till	$1 \times 10^{-6}$ to $5 \times 10^{-6}$	$1 \times 10^{-6}$	25
2-3	Bedrock Contact Zone	$3 \times 10^{-5}$	$2 \times 10^{-4}$	5
4-7	Dundee Formation	$2 \times 10^{-5}$	$2 \times 10^{-5}$	5
8-10	Detroit River Group	$2 \times 10^{-5}$	$2 \times 10^{-5}$	5

### 2.2.3 Model Boundaries

Boundary conditions were applied in the model to represent different flow conditions (lateral flow in and out of the model, surface water features, recharge from precipitation, and water removal via permitted pumping wells). Water withdrawal from private wells is not considered to influence the groundwater system, as most water removed is replaced back via septic systems. The regional lateral boundaries are placed far enough away from the Century Heights municipal wells that they will not have a direct influence on the wells.

- **Western Boundary:** Layers 1 to 5 were assigned constant head boundaries to represent Lake Huron set at an elevation of 176 m above sea level (asl).
- **Eastern Boundary:** Layers 2 to 10 were assigned constant head boundaries to represent a bedrock groundwater contour of 274 m asl on the north side of the Maitland River and 275 m asl on the south side of the Maitland River.
- **Northern Boundary:** Layers 1 to 5 were assigned a no-flow boundary to represent groundwater flow parallel to the model edge (no groundwater flow across the model edge).
- **Southern Boundary:** South of the Maitland River, the model was assigned a no-flow boundary condition, as it is inferred that the groundwater flow originating south of the river will not contribute water to the area north of the river.
- **Recharge:** The surficial geology of the area is primarily low-permeability material. The study area is largely farmland, and agricultural tile drains have been installed to prevent ponding of precipitation. Where tile drains are mapped, the recharge was set to 5 mm/year, and where there were no mapped tile drains, the recharge was set to 50 mm/year.

- **Rivers and Streams:** The major rivers and streams were assigned river boundary conditions within the model domain based on the DEM and a conductance term that was adjusted during the calibration process.
- **Pumping:** Table 3 summarizes historical pumping of the Century Heights wells as provided by B.M. Ross and Associated Limited (Devries, R. pers. comm. March 29, 2023). B.M. Ross also estimated the projected pumping rates to generate the WHPAs for the three Century Heights wells. Projected pumping rates are based on estimated average day demand for anticipated build-out conditions over the next 15 years. It anticipated that the new Century Heights Well-3 will service the existing Maitland View Estates properties, along with the new development properties, for an estimated 156 customers. Century Heights Well-1 and -2 combined demand will be reduced from 85 customers to 58 customers, and the corresponding pumping rates are expected to drop as well. The pumping rates at Well-1 and Well-2 are estimated by halving the total remaining demand for the 58 customers. Due to their proximity, it is assumed that the total demand can be evenly distributed between the two wells even though exact pumping rates may fluctuate above and below the WHPA values. Although the two systems will be connected, they will operate independently at different pressures, and that pumping from either of the systems will not have to increase to support the other.
- The pumping rates represented at each of the other municipal wells in the model area were not updated for this study. The pumping rate at the Auburn Hall Well was maintained at 9 m<sup>3</sup>/day and Benmiller Well was maintained at 59 m<sup>3</sup>/day. These wells are sufficiently far away from the Century Heights wells that they will not interfere with the pumping at Century Heights.

**TABLE 3 Historic and Future Pumping Rates**

Well	2018 2021 Calibrated Model (m <sup>3</sup> /day)	2023 WHPA Model (m <sup>3</sup> /day)
Century Heights Well-1	52	35
Century Heights Well-2	52	35
Century Heights Well-3	0	147
Auburn Hall Well <sup>(1)</sup>	9	9
Benmiller Well <sup>(1)</sup>	59	59

Notes:

(1) Rates for Auburn Hall and Benmiller wells are assumed to be the same as the WNMC (2010, Table 2-1) study.

## 2.3 Model Calibration

Given the model updates described in the preceding section, and the availability of groundwater level data representing long-term average (steady-state) conditions, a calibration dataset consisting of observed groundwater elevations was compiled within the study area.

To maximize the number of data points available for calibration, WWIS data (MECP 2021), ranging from the year 1970 onward, were added to the existing model. The WWIS data are considered representative only of the time when the water level was collected, typically when it was drilled. These static water level observations offer the significant benefit of having a high number of model calibration targets that extend across the entire study area. However, there can be uncertainty associated with individual observations. Uncertainties arise due to errors in the reported location of the wells, measurement techniques that were not designed to provide reliable scientific information and variability in water levels over time at individual well locations. The water well records from WWIS were used as targets to calibrate the model and identify regional trends in observations; however, they were not considered to be accurate indicators of an exact water level at a specific location. In total, 176 calibration targets were used for the steady-state calibration.

### 2.3.1.1 Steady-state Model Calibration Results

The steady-state calibration to existing pumping conditions involved comparing simulated hydraulic heads against those reported in the WWIS wells for different hydrostratigraphic units. A scatter plot showing the match between simulated and observed values for these wells is presented on Figure 12 for the base case model.

The scatter plot (Figure 12) illustrates the goodness-of-fit for hydraulic head targets with model-simulated heads plotted on the vertical axis and observed hydraulic heads plotted on the horizontal axis. The 1:1 line corresponds to simulated head being equal to observed head, and the objective of the calibration effort is to have the points as close as possible to this line.

The scatter plots indicate that most of the calibration targets were within the 95% interval and were generally distributed both above and below 1:1 line. Table 4 summarizes the calibration statistics computed as measures of the goodness-of-fit between model-simulated and observed hydraulic heads for all 176 calibration targets for the base case: WHPA Scenario 1 and WHPA Scenario 2. WHPA scenarios 1 and 2 are discussed in Section 2.4. Each of these scenarios includes different model parameters that result in an acceptably calibrated model.

**TABLE 4 Steady-state Calibration Statistics**

Calibration Statistic	Calibrated Model	WHPA Base Case	WHPA Scenario 1	WHPA Scenario 2
Number of Calibration Targets	176	176	176	176
Mean Error (m)	3.01	3.00	3.04	3.2
Mean Absolute Error (m)	6.25	6.24	6.27	6.24
Root Mean Squared Error (m)	7.85	7.85	7.84	7.88
Normalized Root Mean Squared Error (%)	6.88	6.88	6.87	6.91

Notes:

WHPA - Wellhead Protection Area



The industry standard for model calibration is having a normalized root mean square error (NRMSE) below 10%. Based on these calibration results (NRMSE <10%), the model calibration is considered typical for the situation represented and reasonable for the purposes of draft WHPA delineation.

## 2.4 Model Uncertainty

Alternative combinations of model parameters may result in changes to WHPAs for the same pumping well when predictions are made with a groundwater model. Hence, two distinct scenarios were considered after calibrating the base case model. The scenarios involved a model simulation with an increased recharge rate (75 mm/year) and hydraulic conductivities doubled for WHPA Scenario 1, and a model simulation with decreased recharge rate (33 mm/year) and hydraulic conductivities halved for WHPA Scenario 2. The hydraulic conductivity values used are listed in Table 5.

Overburden and bedrock porosity does not affect the groundwater flow model results and was not adjusted for the model calibration step. Porosity is input into the model to compute groundwater velocity and affects the calculation of pathlines. Typical ranges of overburden and bedrock porosity are 20%-30% and 5%-10%, respectively. Smaller porosities result in higher velocities and longer pathlines. The porosity for the overburden units were increased and decreased by 5 % for WHPA scenarios 1 and 2, respectively. The porosity for the bedrock increased by a factor of 5% for WHPA Scenario 1 but did not decrease for WHPA Scenario 2, as the value of 5% is already at the lower range for bedrock porosity.

**TABLE 5 Model Uncertainty of Hydrostratigraphic Units**

Model Layer	Geologic Unit	Base Case		WHPA Scenario 1		WHPA Scenario 2	
		K (m/s)	Porosity	K (m/s)	Porosity	K (m/s)	Porosity
1	Clay or Peat	$1 \times 10^{-6}$	25	$2 \times 10^{-6}$	30	$5 \times 10^{-7}$	20
1	Sand and Gravel	$1 \times 10^{-4}$	25	$2 \times 10^{-4}$	30	$5 \times 10^{-5}$	20
1	Silt Till	$1 \times 10^{-6}$	25	$2 \times 10^{-6}$	30	$5 \times 10^{-7}$	20
2-3	Bedrock Contact Zone	$2 \times 10^{-4}$	5	$4 \times 10^{-4}$	10	$1 \times 10^{-4}$	5
4-7	Dundee Formation	$2 \times 10^{-5}$	5	$4 \times 10^{-5}$	10	$1 \times 10^{-5}$	5
8-10	Detroit River Group	$2 \times 10^{-5}$	5	$4 \times 10^{-5}$	10	$1 \times 10^{-5}$	5

Notes:

K – Hydraulic Conductivity

Base case recharge: 50 mm/year

WHPA Scenario 1 increased recharge: 75 mm/year

WHPA Scenario 2 decreased recharge: 33 mm/year

WHPA - Wellhead Protection Area

## 2.5 Capture Zone and Wellhead Protection Area Delineation

Capture zones represent the area of land surrounding a groundwater pumping well where water located at and below the ground surface may travel toward that well within a set period. A WHPA, in contrast, refers to an area of land derived from capture zones to manage and plan activities near municipal water

supply wells for the purposes of protecting drinking water quality. The following sections describe the methods used to delineate the capture zones and draft WHPAs for the new Century Heights Well 3 and the subsequent results.

## **2.5.1 Capture Zone Delineation Methodology**

Virtual particles can be released in a groundwater flow model and tracked forward or backward in time through the subsurface for set time intervals. The computed pathlines travelled by these particles are projected to the ground surface and plotted on a plan view map. Time-of-travel capture zones are subsequently created by drawing polygons around the well and the particle pathlines for specific time intervals.

### **2.5.1.1 Particle Tracking Methodology and Results**

Particle tracking was used in the Visual MODFLOW groundwater flow model to track the movement of hypothetical particles through the modelled steady-state flow domain. MODFLOW calculates a 3D velocity vector through each element. These velocities are then used to calculate the flow path of a particle of water from a specified starting location. Particles can be released anywhere in the model domain and tracked backward or forward in time through the subsurface until they reach the surface of the model or a model boundary condition.

Backward particle tracking was completed for the model, releasing a set of particles in a 10 m radius around the production well (i.e., Century Heights Well-3, at the top and bottom of the screened interval [and 10 m intervals in between the top and the bottom]). The particle tracks for each of the model runs are shown on Figure 13 (2-year time of travel), Figure 14 (5-year time of travel), and Figure 15 (25-year time of travel). As illustrated on these figures, the WHPAs are delineated at a relatively small distance from the particle paths, particularly along the north boundaries. Delineating the WHPAs at a small distance from the particle paths represents a conservative approach. The exact boundaries of a WHPA cannot be delineated exactly, and adding a buffer distance can be justified to account for seasonal variability and other uncertainties.

The backward tracks for the 2-, 5-, and 25-year times of travel, were overlaid in a GIS. The particle pathlines extend outward in the upgradient direction toward the east.

### **2.5.1.2 Capture Zones Results**

Composite capture zones for each of the Century Heights wells (Well-1 and -2 were merged due to their proximity) were delineated from the combined set of all particle pathlines from the base case model and the two-uncertainty analysis model runs (WHPA Scenario 1 and WHPA Scenario 2). The pathlines were overlain in the GIS, and Figure 16 illustrates the composite capture zones drawn around the outer limits of all particle pathlines of Century Heights Well-1,- 2, and -3. The resultant 2-, 5-, and 25-year time-of-travel capture zones were used as the basis for the delineation of the draft WHPA-B, WHPA-C,

and WHPA D polygons, respectively. The size and shape of the resulting capture zones depend on many factors, including well pumping rate, length of the well screen, geologic material in which the well is screened, and surrounding geologic units that the pathlines will pass through.

### **2.5.2 Draft Wellhead Protection Area Delineation Results**

The draft WHPAs for the wells were delineated from the capture zones with polygons that encompass the respective time of travel capture zones.

The following draft WHPAs were delineated for the Century Heights Well-1, -2, and -3 (Figure 16):

- WHPA-A was delineated as a 100 m fixed radius zone around the Century Heights Well-3, independent of the time-of-travel capture zone.
- WHPA-B was delineated as the area outside the WHPA-A, within which the time of travel to the well is less than or equal to 2 years.
- WHPA-C was delineated as the area outside WHPA-B, within which the time of travel to the well is greater than 2 years, but less than or equal to 5 years.
- WHPA D was delineated as the area outside WHPA-C, within which the time of travel to the well is greater than 5 years, but less than or equal to 25 years.

## **3 VULNERABILITY SCORING**

Aquifer vulnerability is a relative measure of the susceptibility of an aquifer to be impacted from contamination introduced at the ground surface. The aquifer vulnerability is categorized as high, medium/moderate, or low depending on the geologic and hydrogeologic properties overlying the municipal aquifer of interest.

### **3.1 Relative Vulnerability Mapping**

WNMC (2010) completed previous vulnerability assessments in the area to identify the vulnerability of the municipal groundwater resources to surficial sources of contamination. The vulnerability of the groundwater resources was evaluated using the Intrinsic Susceptibility Index, which is a calculated value estimating the susceptibility of groundwater resource to contamination at each WWIS well in the study area. The vulnerability mapping supplied by ABCA/MVCA (pers. comm. 2023) was used to provide a vulnerability scoring for the newly delineated WHPAs and is illustrated on Figure 17. In the study area, the vulnerability is mapped primarily as low due to the low permeability of the surficial sediments.

### 3.2 Draft Vulnerability Scoring

The draft WHPAs for the Century Heights Well-1, -2, and -3 were overlain on the existing vulnerability mapping. Vulnerability scores were assigned according to the vulnerability category and WHPA zones summarized in Table 1 (Section 1.2.2). Figure 18 illustrates the resultant draft vulnerability scoring for the draft WHPAs. Draft WHPA-A has a vulnerability score of 10, draft WHPA-B has a vulnerability score of 6, draft WHPA-C has a vulnerability score of 4, and draft WHPA-D has a vulnerability score of 2.

### 3.3 Vulnerability Uncertainty Assessment

As outlined in the Technical Rules (MECP 2021), an uncertainty rating of either “high” or “low” must be assigned to the assessment of vulnerability for each WHPA. The uncertainty rating applied should consider the uncertainty associated with quantity and quality of data used to assess the vulnerability, with delineating the time-of-travel capture zones, and with the assessment of the vulnerability of the WHPAs. If a high relative uncertainty rating is applied to a polygon for either assessment (time-of-travel delineation or vulnerability scoring), the uncertainty rating for that polygon is defined as “high.” Only if the uncertainty ratings associated with both the time-of-travel and the vulnerability rating were determined to be low would the resultant uncertainty score be defined as “low.”

The uncertainty analysis factors considered in this assessment follow Part I.4, Rule 14 of the Technical Rules (MECP 2021). Table 6 summarizes each factor.

**TABLE 6 Uncertainty Analysis Factors<sup>(1)</sup> and Uncertainty Ranking for the Wellhead Protection Areas and Vulnerability Scores**

Uncertainty Assessment Factors	Uncertainty Designation	Description
14(1) The distribution, variability, quality, and relevance of data used in the preparation of the Assessment Report	Low	Good coverage of MECP water well record data surrounding the study area, as well as high-quality water level data local to the well field.
14(2) The ability of the methods and models used to accurately reflect the flow processes in the hydrological system	Low	The groundwater flow model has been shown to reflect groundwater flow processes by representing water levels under long-term average and pumping conditions.
14(3) The quality assurance and quality control procedures applied	Low	Each step of the model development process relied on data that had been collected and/or reviewed by professional engineers or geoscientists. The development of the original model, which this current model is based upon, was fully documented (WNMC 2010) and that document was reviewed by leading academics and industry professionals for the purposes of fulfilling the requirements of the <i>Clean Water Act</i> .
14(4) The extent and level of calibration and validation achieved for models used or calculations or general assessments completed	Low	The groundwater model, including the model updates documented as part of this project, is a product of steady-state calibration efforts and the final parameters derived are both consistent with field observations and those that would be expected based on the conceptual model.
14(5) The accuracy to which the groundwater vulnerability categories effectively assess the relative vulnerability of the underlying hydrogeological features	Low	The groundwater vulnerability categories (i.e., low, medium, and high) were created and peer reviewed for the purposes of fulfilling the requirements of the <i>Clean Water Act</i> .

Note:

(1) MECP (2021)

MECP - Ontario Ministry of the Environment, Conservation and Parks

## 4 CONCLUSIONS AND RECOMMENDATIONS

The main objectives for this project included delineating draft WHPAs for the newly located Century Heights Well-3 in the community of Saltford, southeast of the existing Century Heights Well-1 and -2 and assigning draft vulnerability scores based on the existing vulnerability of the municipal groundwater aquifer.

This report describes the development of a new groundwater flow model that was based on the groundwater flow model originally developed for the Township in 2010 (WNMC 2010). Draft WHPAs were derived from groundwater capture zones delineated using this model and backward particle tracking

methods. These draft WHPAs were combined with existing aquifer vulnerability mapping to determine the draft groundwater vulnerability scoring for each draft WHPA.

The draft WHPAs and vulnerability scoring presented in this report are based on the latest numerical groundwater flow model for the area and existing vulnerability mapping.

## 5 REFERENCES

Government of Ontario (Government of Ontario). 2021. *Clean Water Act, 2006*. S.O. 2006, c. 22. Last amendment: 2021, c. 4, Sched. 6, s. 38. Current from June 1, 2021. 2021.

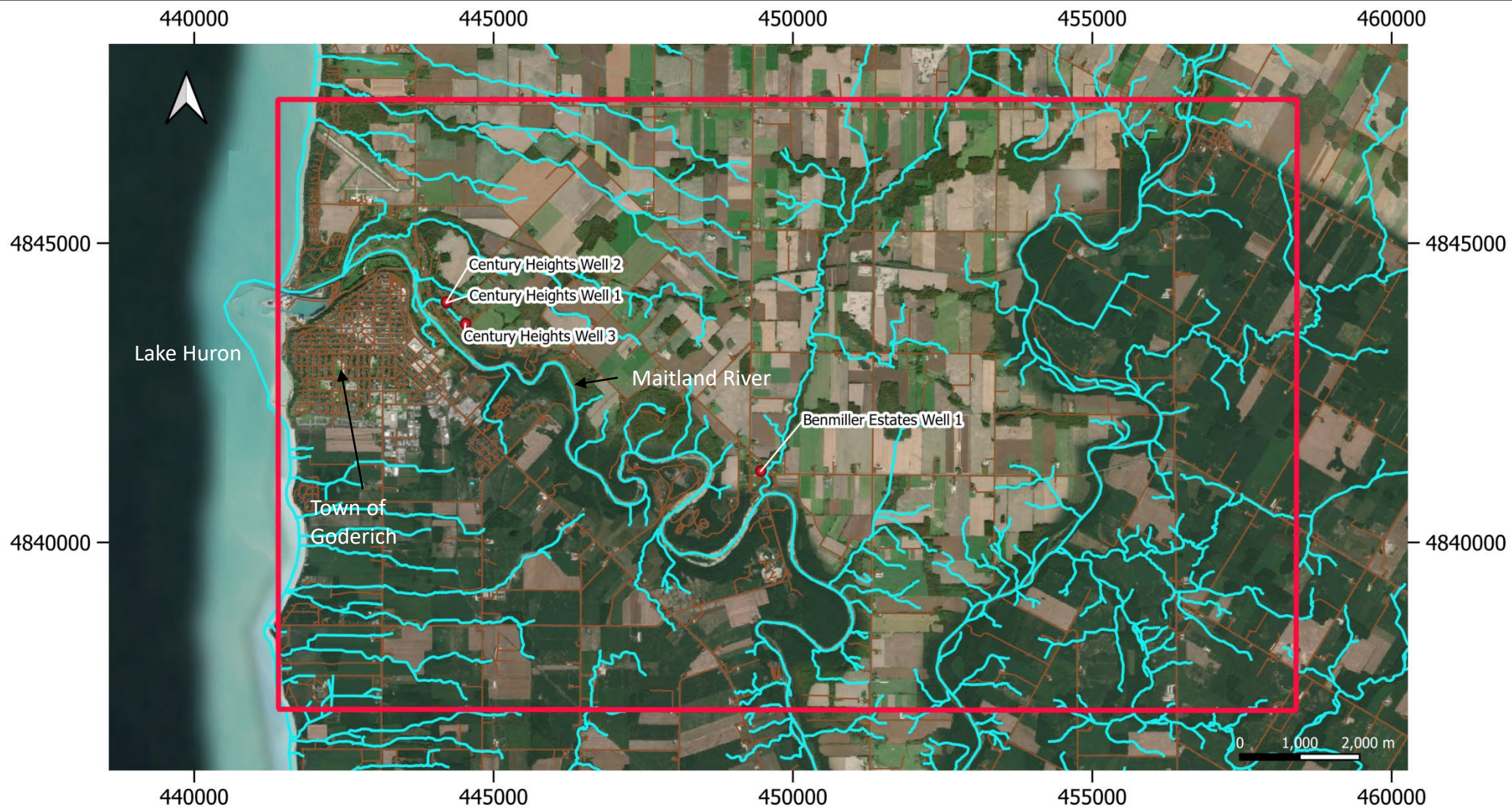
<https://www.ontario.ca/laws/statute/06c22>

Ontario Ministry of the Environment, Conservation and Parks (MECP). 2021. *2021 Technical Rules under the Clean Water Act*. December 3, 2021. <https://www.ontario.ca/page/2021-technical-rules-under-clean-water-act>

Ontario Ministry of the Environment (MOE). 2006. "Assessment Report: Draft Guidance Module 3, Groundwater Vulnerability Analysis." Draft. October 2006.

Waterloo Numerical Modelling Corp. (WNMC). 2010. *Final Report for Well Head Protection Area Delineation Project*. Prepared for Ausable Bayfield Conservation Authority. Cambridge, Ontario. October 2010. 2010.





- Pumping Wells
- Model Domain Boundary
- Watercourse
- Roads



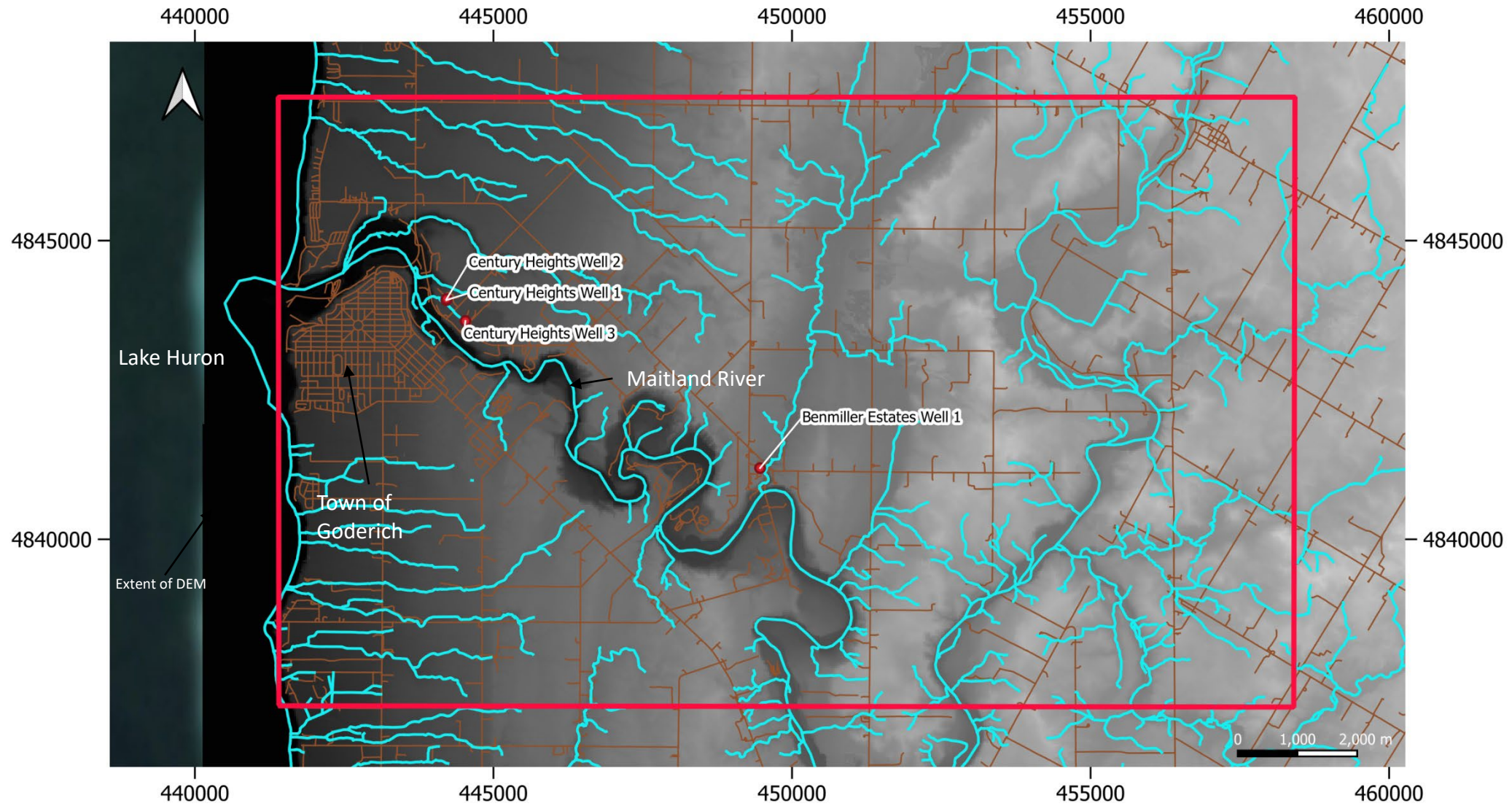
Century Heights Well 3  
WHPA Delineation

**Study Area**

Date:	November 2023	Project:	35869	Submitter:	H. Hecky	Reviewer:	D. Van Vliet
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- Pumping Wells
- Model Domain Boundary
- Watercourse
- Roads
- Digital Elevation Model - DEM (metres above sea level)
- 175
- 325



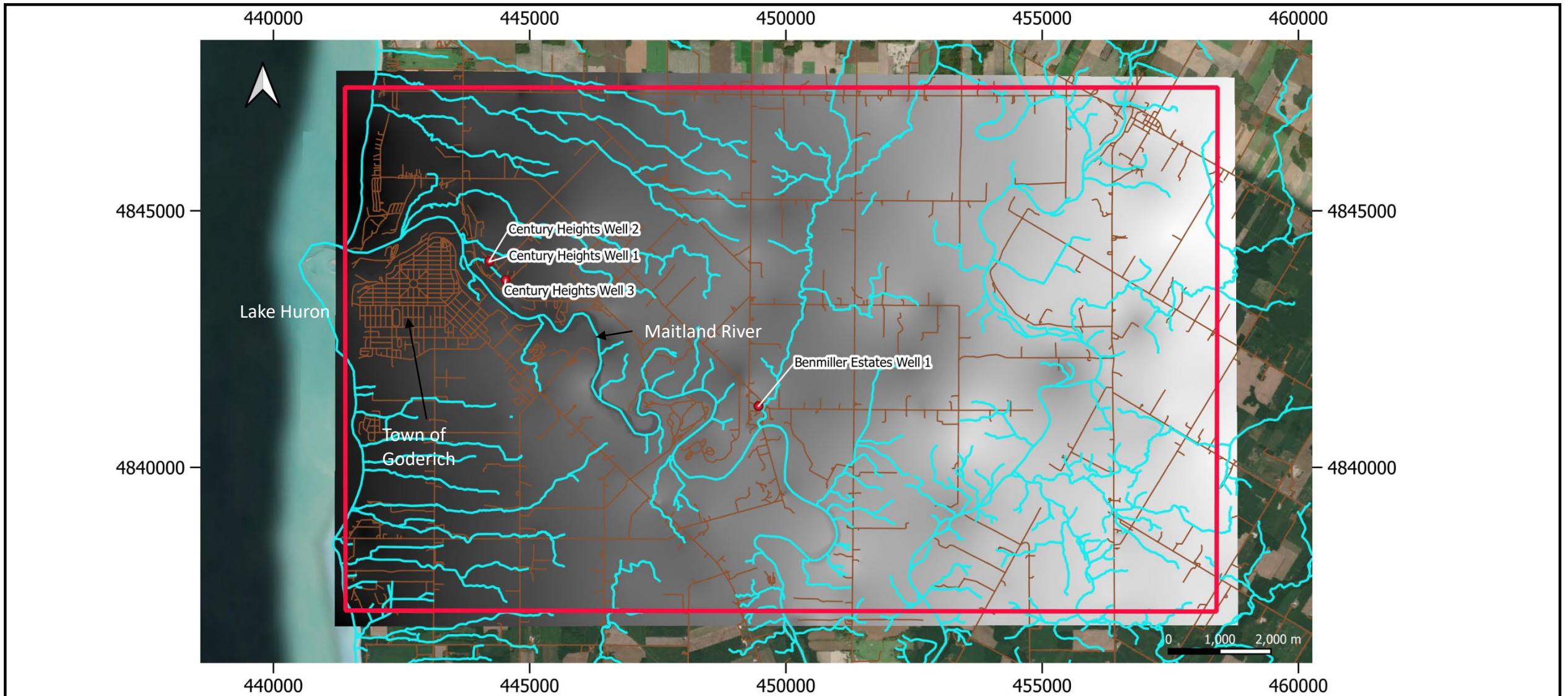
Century Heights Well 3  
WHPA Delineation

### Digital Elevation Model (DEM)

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- Pumping Wells
  - Model Domain Boundary
  - Watercourse
  - Roads
- Bedrock Topography (WWIS Bedrock Pick Interpolation - metres above sea level)
- 157
  - 278



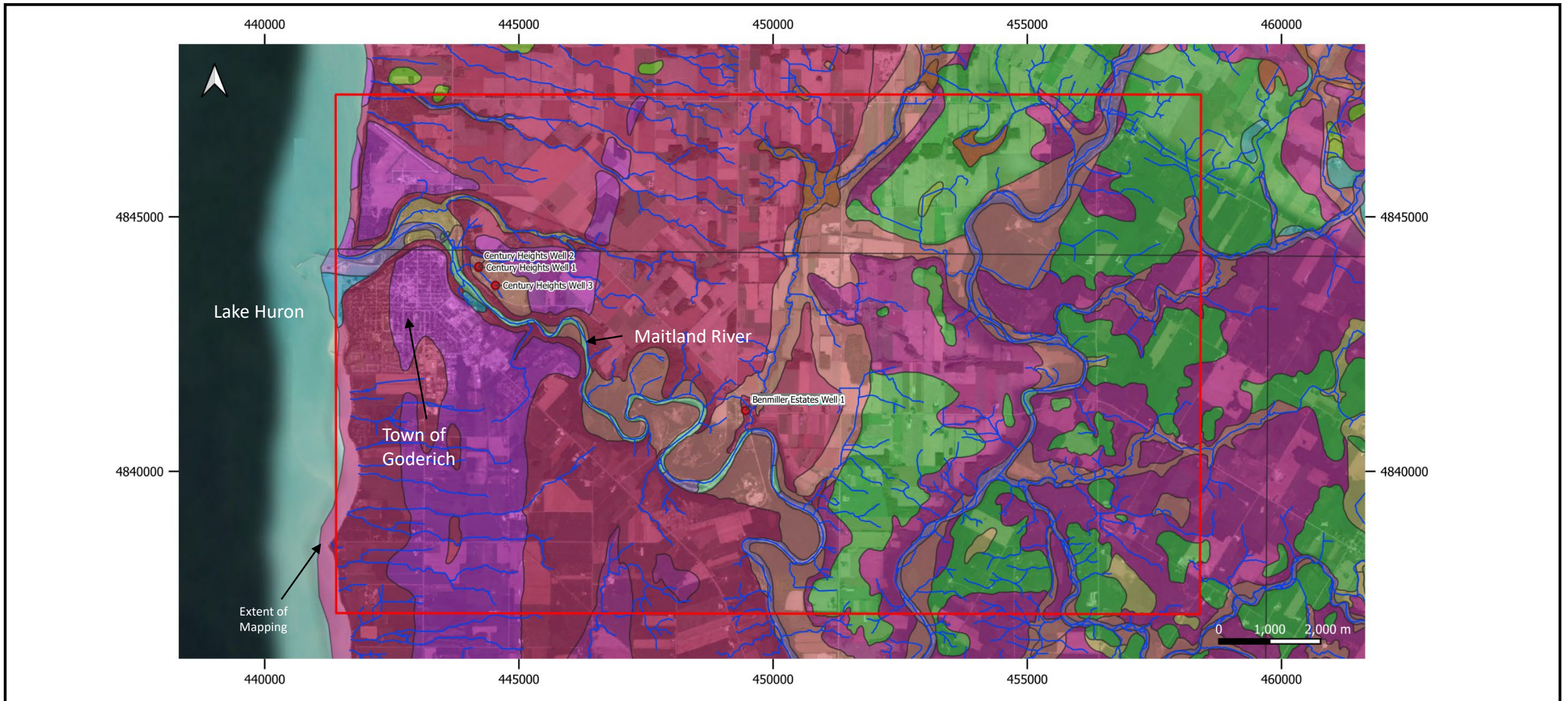
Century Heights Well 3  
WHPA Delineation

**Top of Bedrock Surface (WWIS Bedrock Pick Interpolation – m asl)**

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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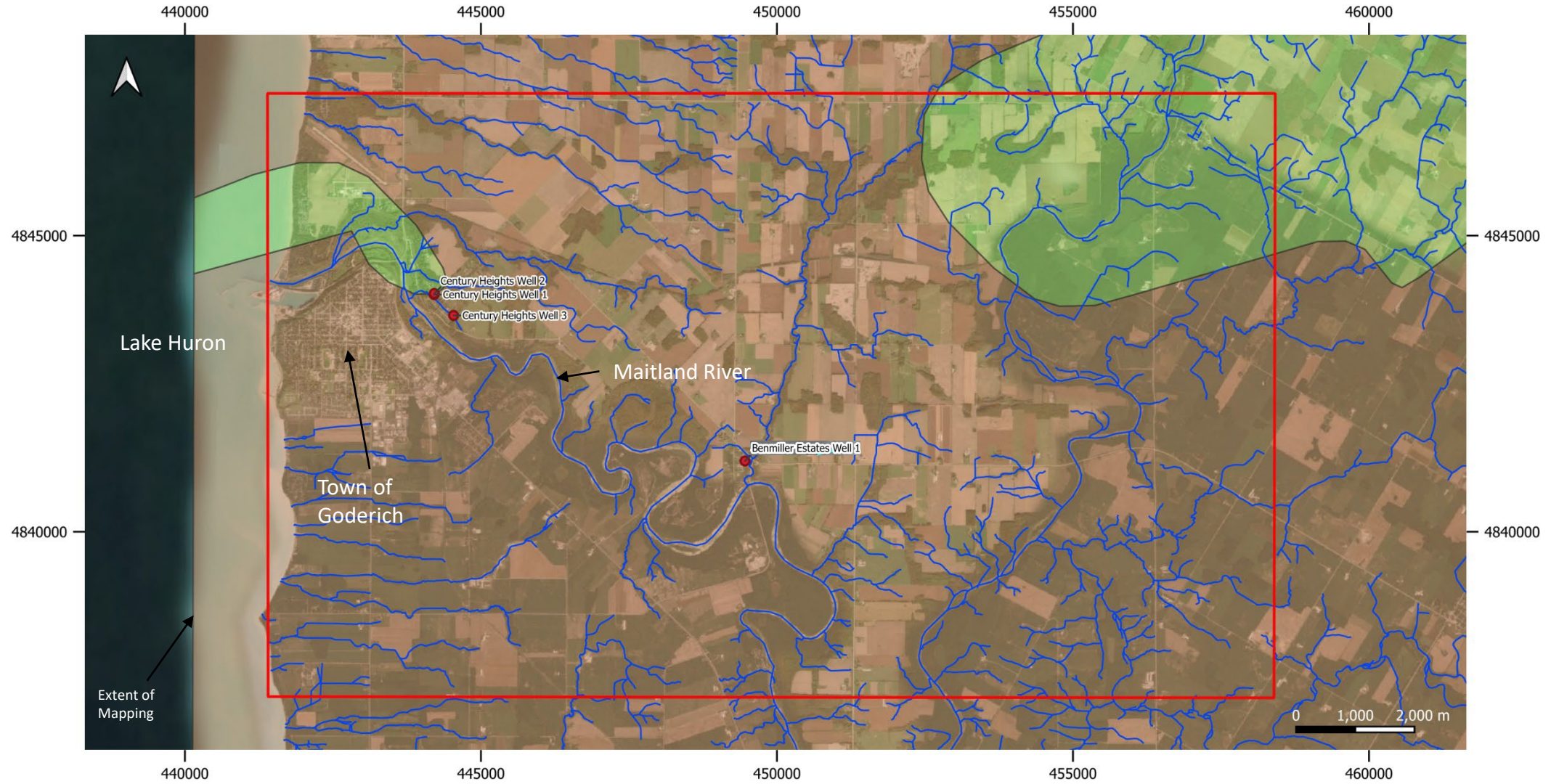


- Pumping Wells
- Model Domain Boundary
- Watercourse
- Mapped Surficial Geology (Ontario Geologic Survey)
- Anthropogenic deposits
- Bedrock
- Glaciolacustrine shallow water deposits
- Elma Till
- Glaciofluvial outwash deposits
- Glaciolacustrine deep water deposits
- Ice-contact stratified drift
- Lacustrine
- Modern alluvium
- Older alluvium
- Organic deposits
- Rannoch Till
- St. Joseph Till



Century Heights Well 3 WHPA Delineation			
<b>Mapped Surficial Geology (Ontario Geological Survey)</b>			
Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
<small>Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.</small>			<b>Figure 4</b>





● Pumping Wells

□ Model Domain Boundary

— Watercourse

Mapped Bedrock Surface Geology (OGS)

■ Detroit River Group; Onondaga Formation

■ Dundee Formation



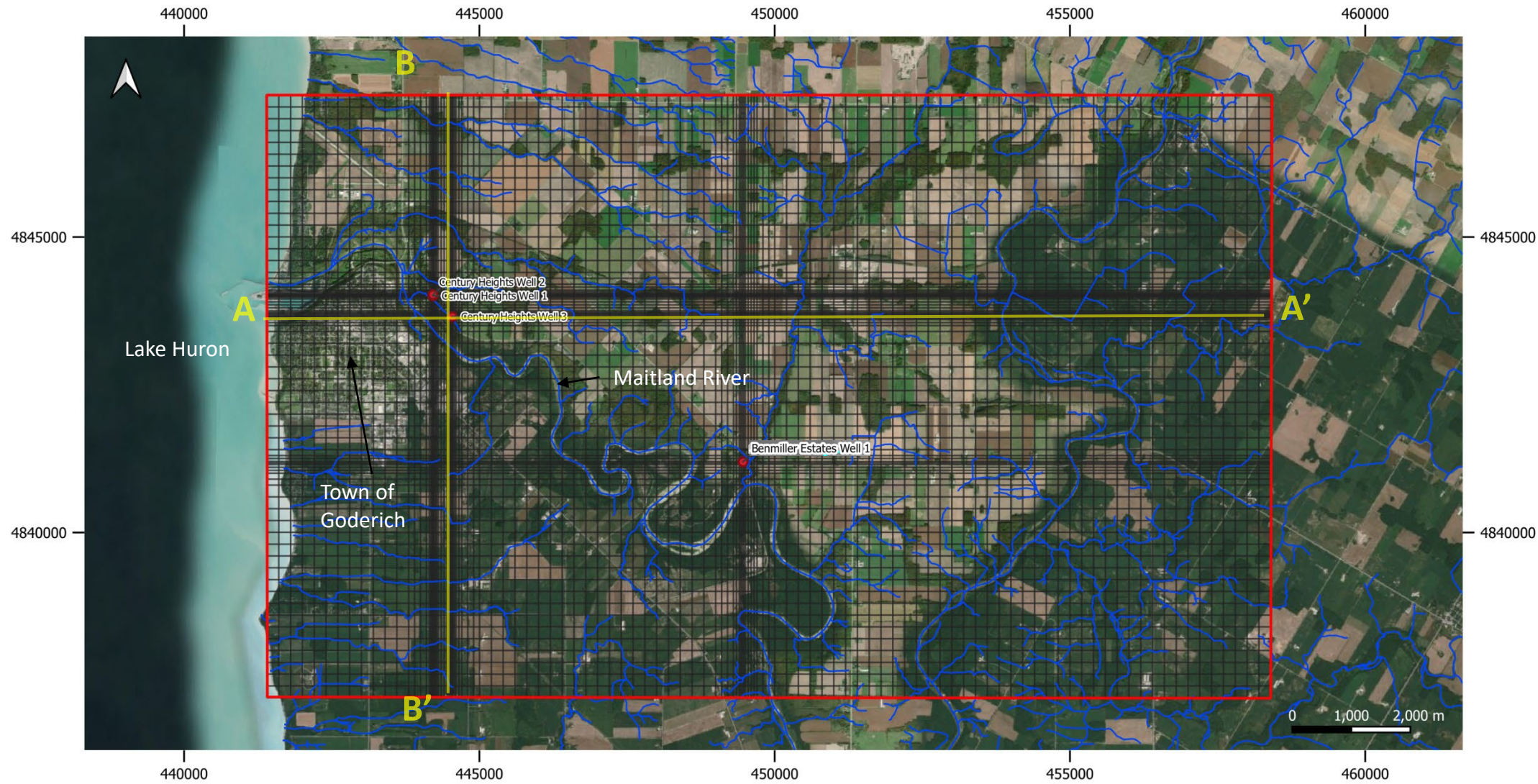
Century Heights Well 3  
WHPA Delineation

### Bedrock Surface Geology (Ontario Geological Survey)

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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- Pumping Wells
- ▭ Model Domain Boundary
- ▭ Model Grid from Visual MODFLOW
- Watercourse



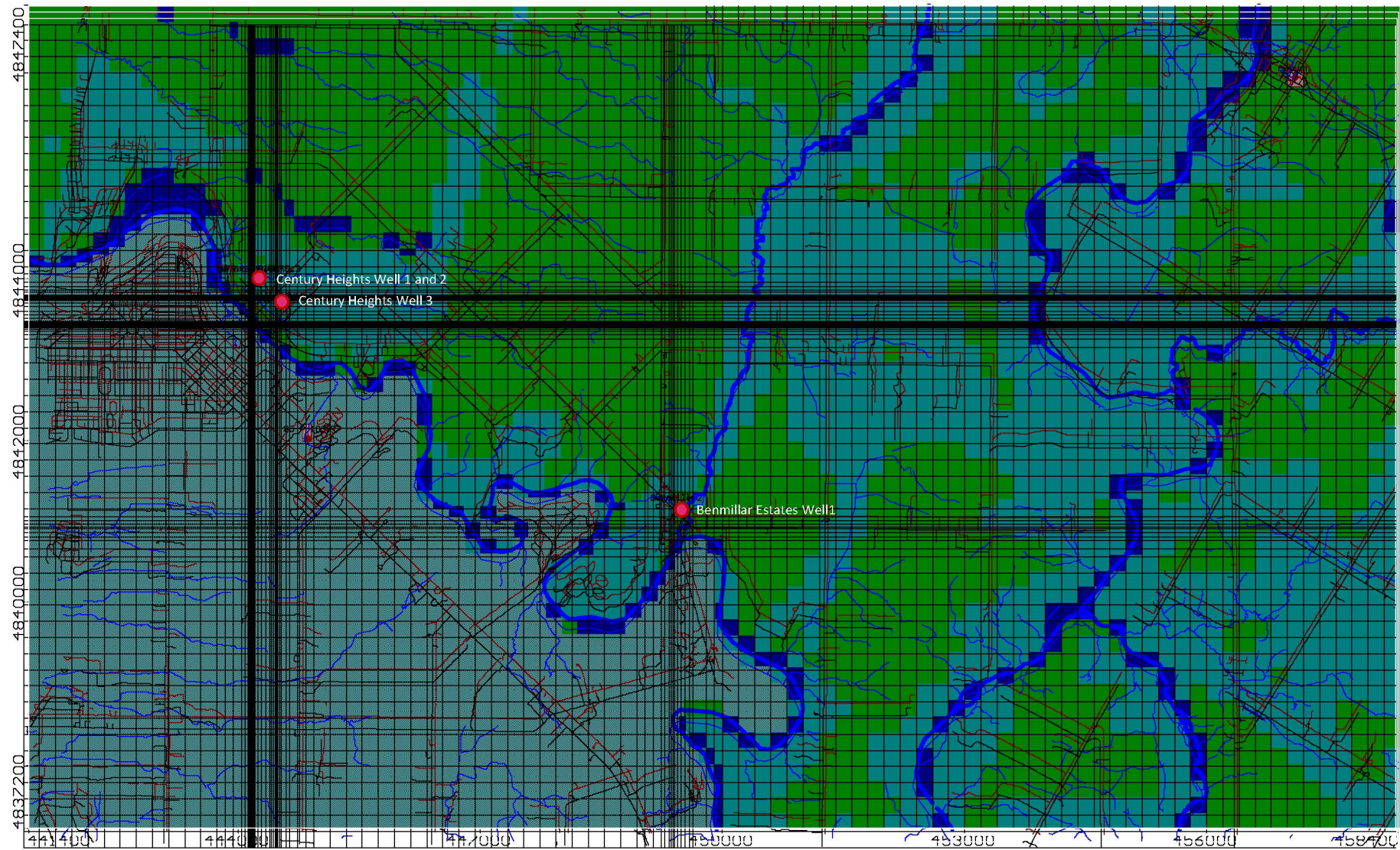
Century Heights Well 3  
WHPA Delineation

### Model Domain and Grid

Date:	November 2023	Project:	35869	Submitter:	H. Hecky	Reviewer:	D. Van Vliet
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- Clay or Peat
- Sand and Gravel
- Silt Till
- Bedrock Contact Zone
- Dundee Formation
- Detroit River Group



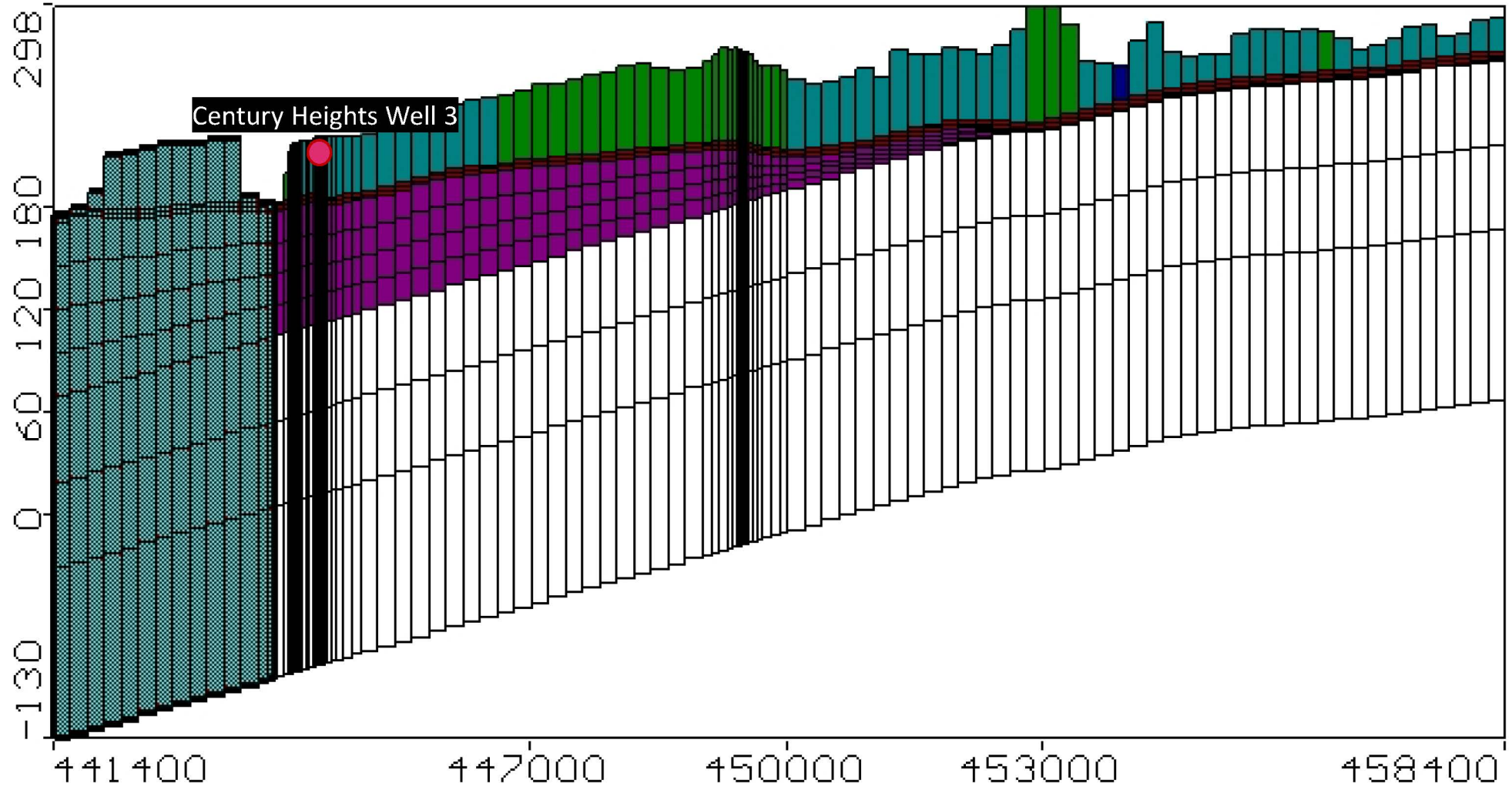
Century Heights Well 3  
WHPA Delineation

### Layer 1 Model Hydraulic Conductivity Zones

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- Clay or Peat
- Sand and Gravel
- Silt Till
- Bedrock Contact Zone
- Dundee Formation
- Detroit River Group

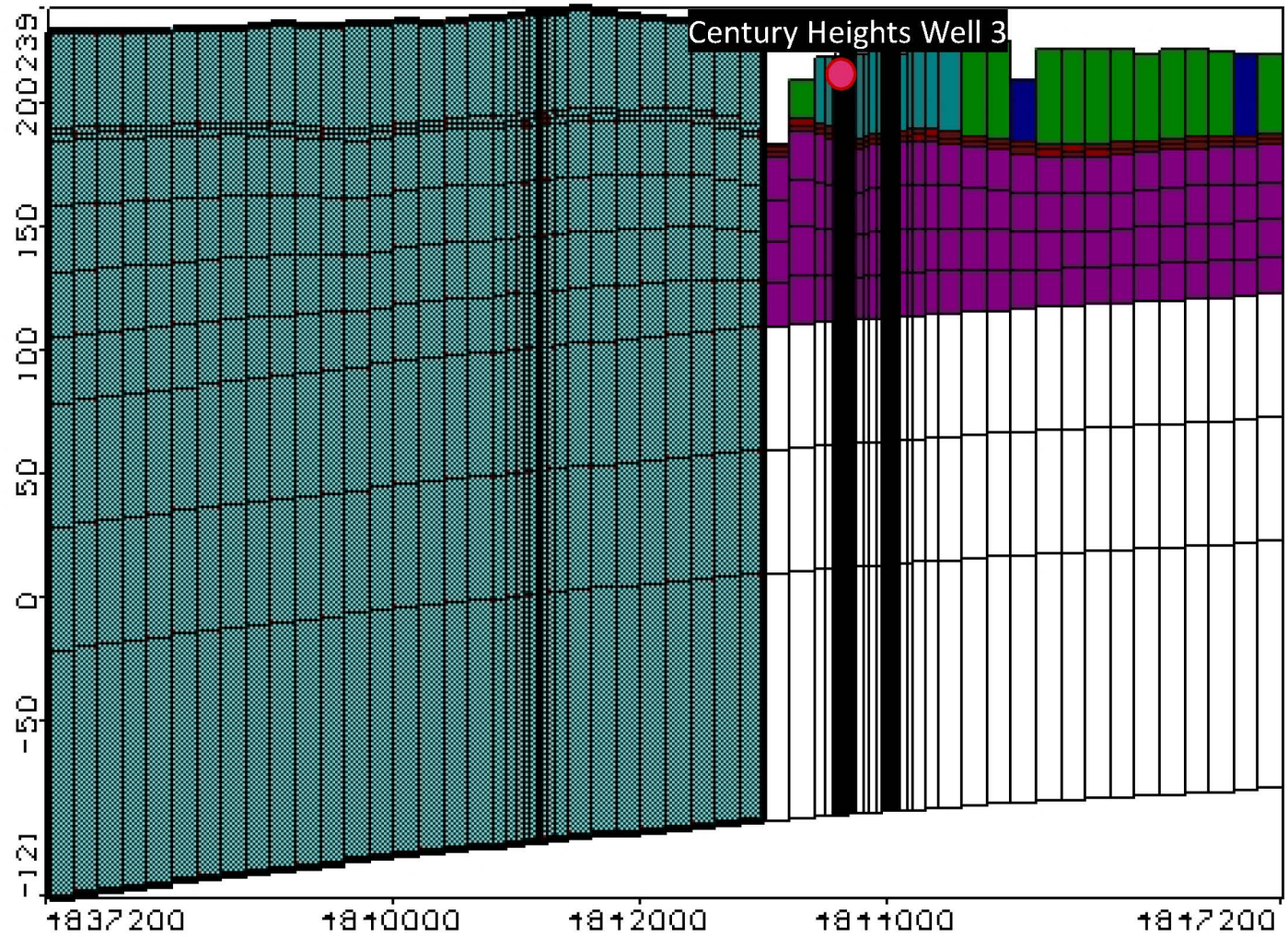


Century Heights Well 3  
WHPA Delineation

### Regional Cross-section A-A'

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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- Clay or Peat
- Sand and Gravel
- Silt Till
- Bedrock Contact Zone
- Dundee Formation
- Detroit River Group



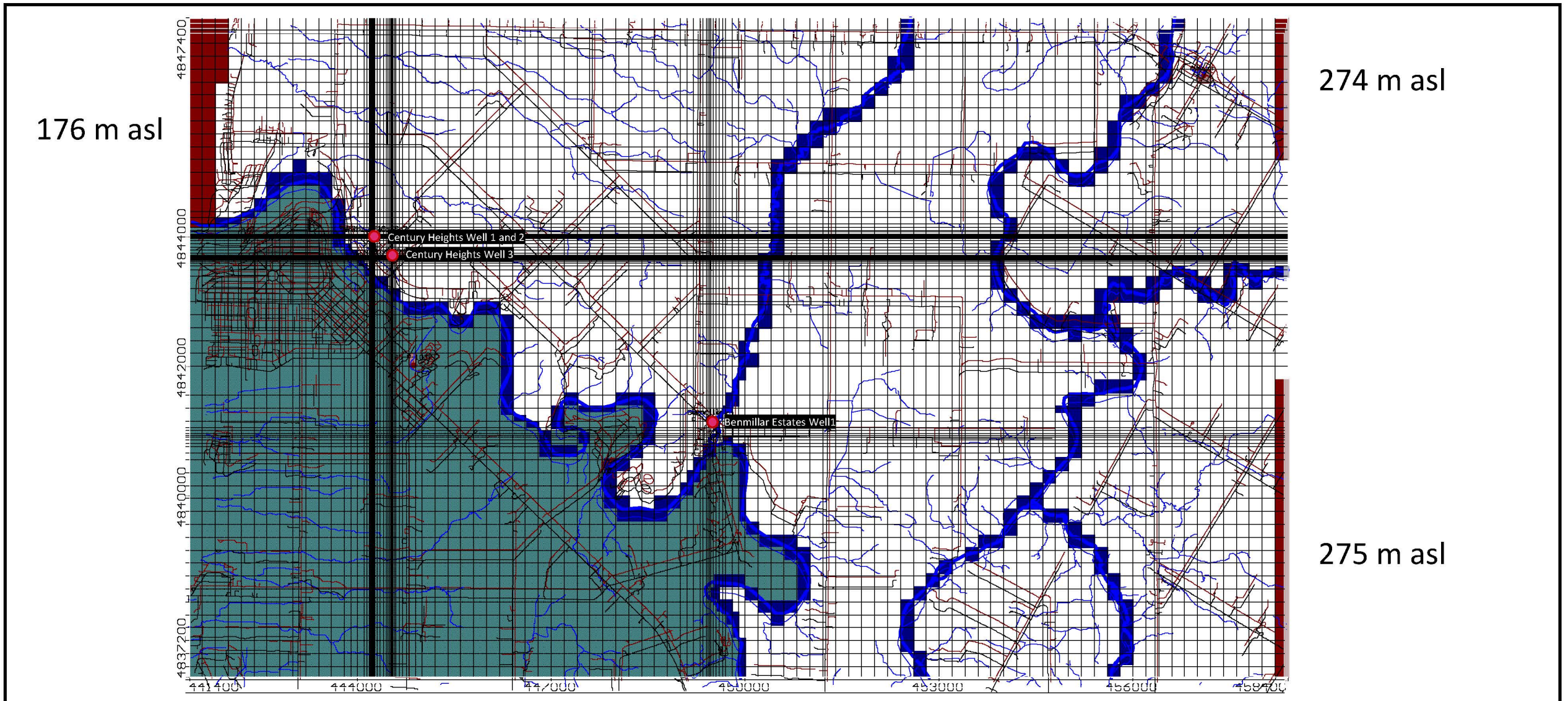
Century Heights Well 3  
VHPPA Delineation

### Regional Cross-section B-B'

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- No Flow Boundary
- River Boundary
- Constant Head Boundary



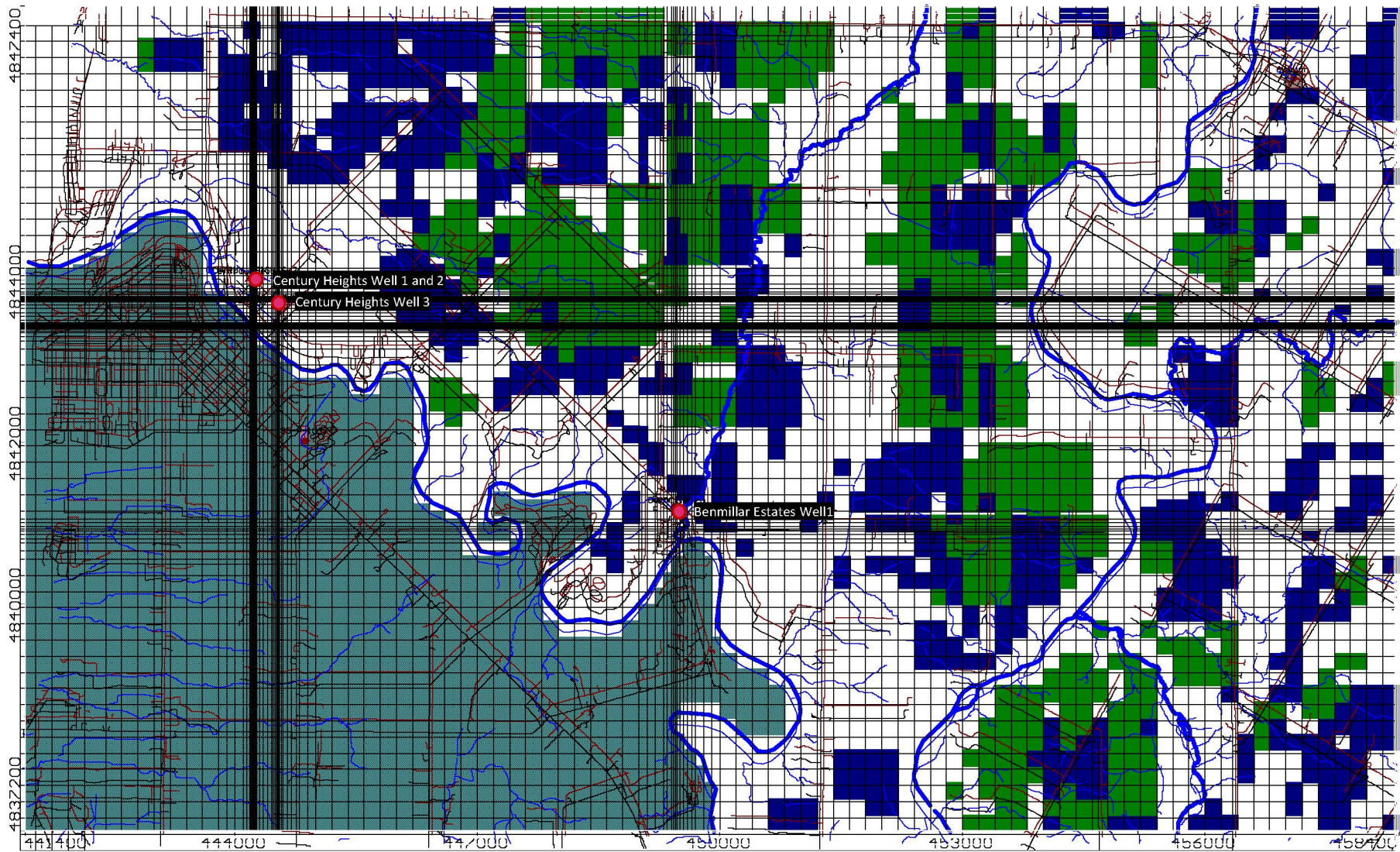
Century Heights Well 3  
WHPA Delineation

### Model Boundary Conditions

Date	November 2023	Project	35869	Submitter	H. Hecky	Reviewer	D. Van Vliet
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- 50 mm/year
- 5 mm /year (tile drains)
- 5 mm/year (organized tile drains)

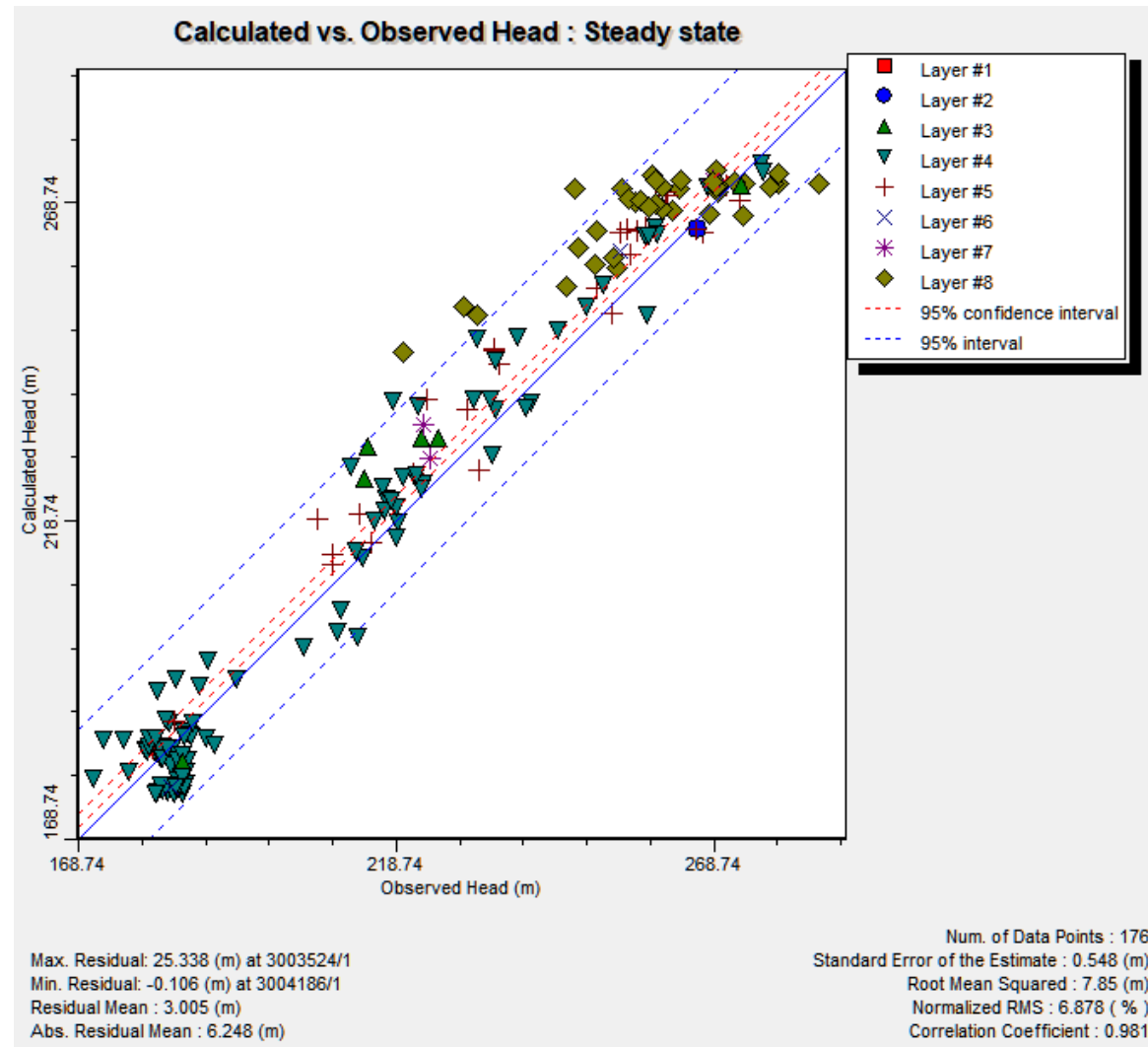


Century Heights Well 3  
WHPA Delineation

### Layer 1 Model Recharge Conditions

Date	November 2023	Project	35869	Submitter	H. Hecky	Reviewer	D. Van Vliet
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Century Heights Well 3  
WHPA Delineation

## Steady State Calibration Scatter Plot

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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- 2 Year Base Case Scenario
- 2 Year Uncertainty Scenario 1
- 2 Year Uncertainty Scenario 2
- WHPA-A: 100 m
- WHPA-B: 2 Year
- Century Heights pumping wells
- Roads
- Watercourse



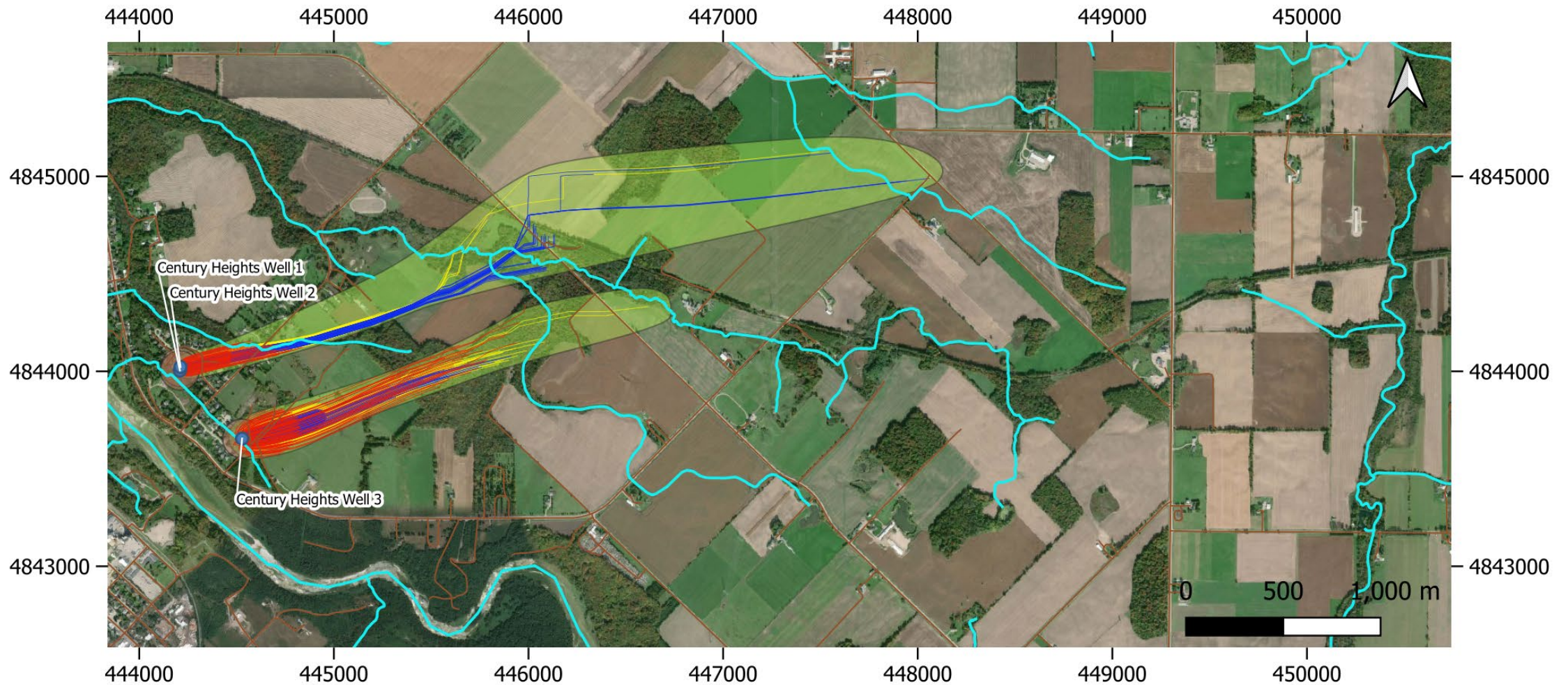
Century Heights Well 3  
WHPA Delineation

### 2-year Backwards Particle Tracks from Century Heights Wells

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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- 5 Year Base Case Scenario
- 5 Year Uncertainty Scenario 1
- 5 Year Uncertainty Scenario 2
- WHPA-A: 100 m
- WHPA-C: 5 Year
- Century Heights pumping wells
- Roads
- Watercourse



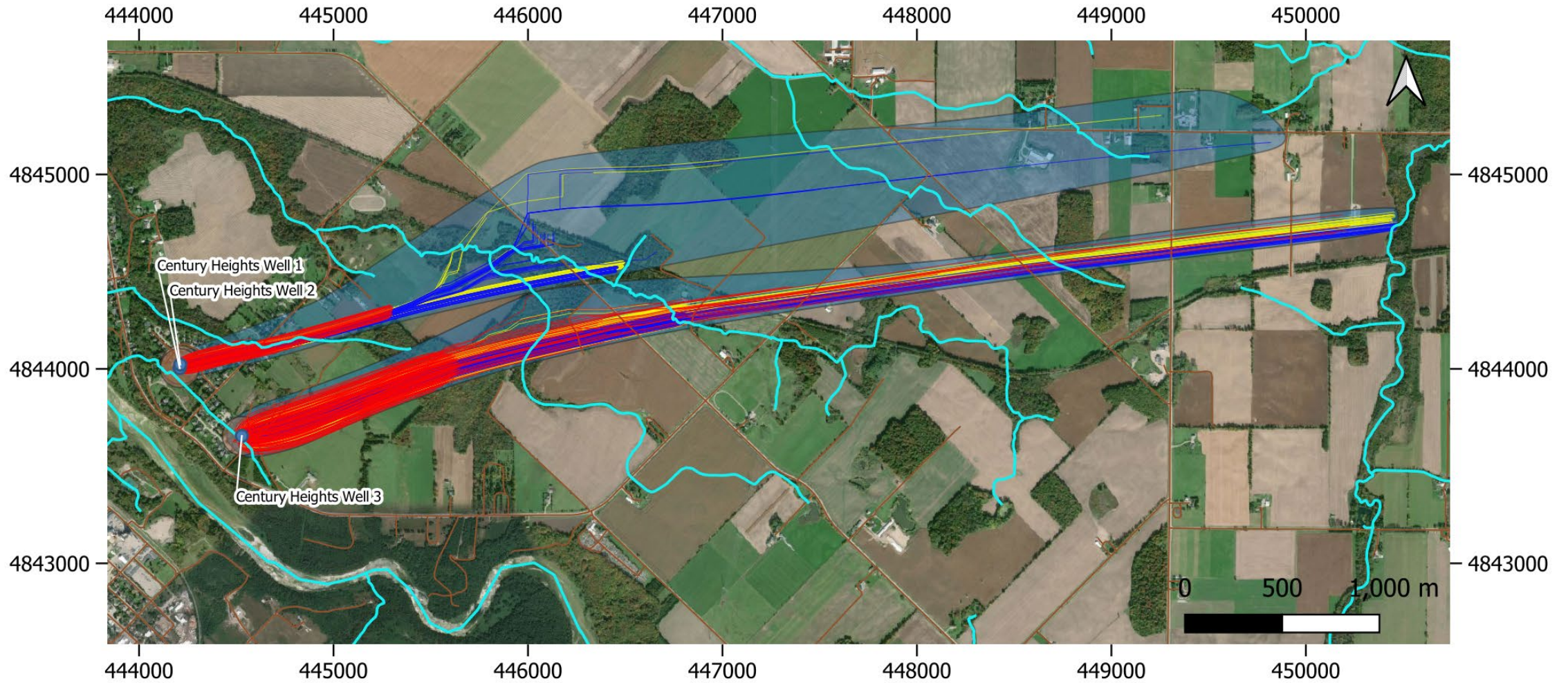
Century Heights Well 3  
WHPA Delineation

### 5-year Backwards Particle Tracks from Century Heights Wells

Date:	November 2023	Project:	35869	Submitter:	H. Hecky	Reviewer:	D. Van Vliet
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- 25 Year Base Case Scenario
- 25 Year Uncertainty Scenario 1
- 25 Year Uncertainty Scenario 2
- WHPA-A: 100 m
- WHPA-D: 25 Year
- Century Heights pumping wells
- Roads
- Watercourse



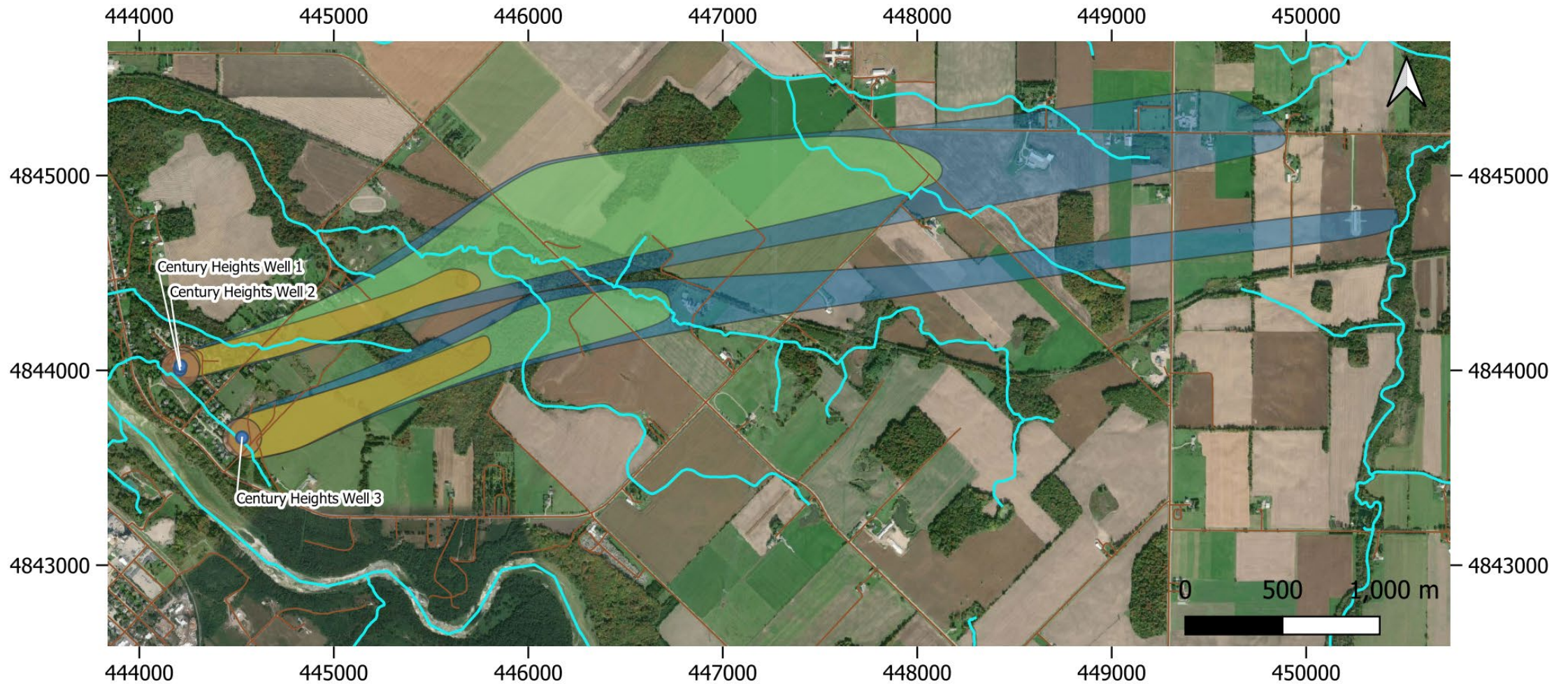
Century Heights Well 3  
WHPA Delineation

### 25-year Backwards Particle Tracks from Century Heights Wells

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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- WHPA-A: 100 m
- WHPA-B: 2 Year
- WHPA-C: 5 Year
- WHPA-D: 25 Year
- Century Heights pumping wells
- Roads
- Watercourse

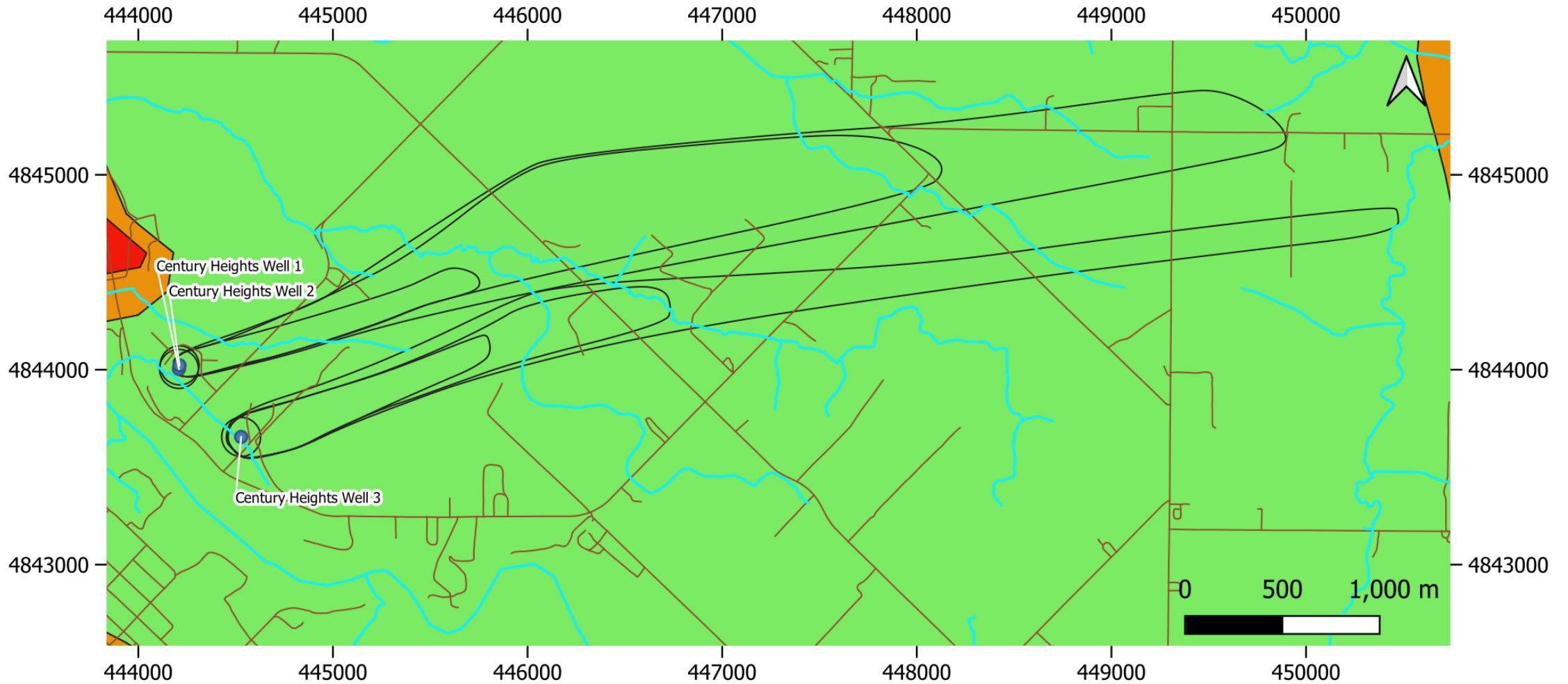









Century Heights Well 3  
WHPA Delineation

### Draft Wellhead Protection Areas

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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-  WHPAs
- Intrinsic Susceptibility Index**
-  High
-  Med
-  Low
-  Century Heights pumping wells
-  Roads
-  Watercourse



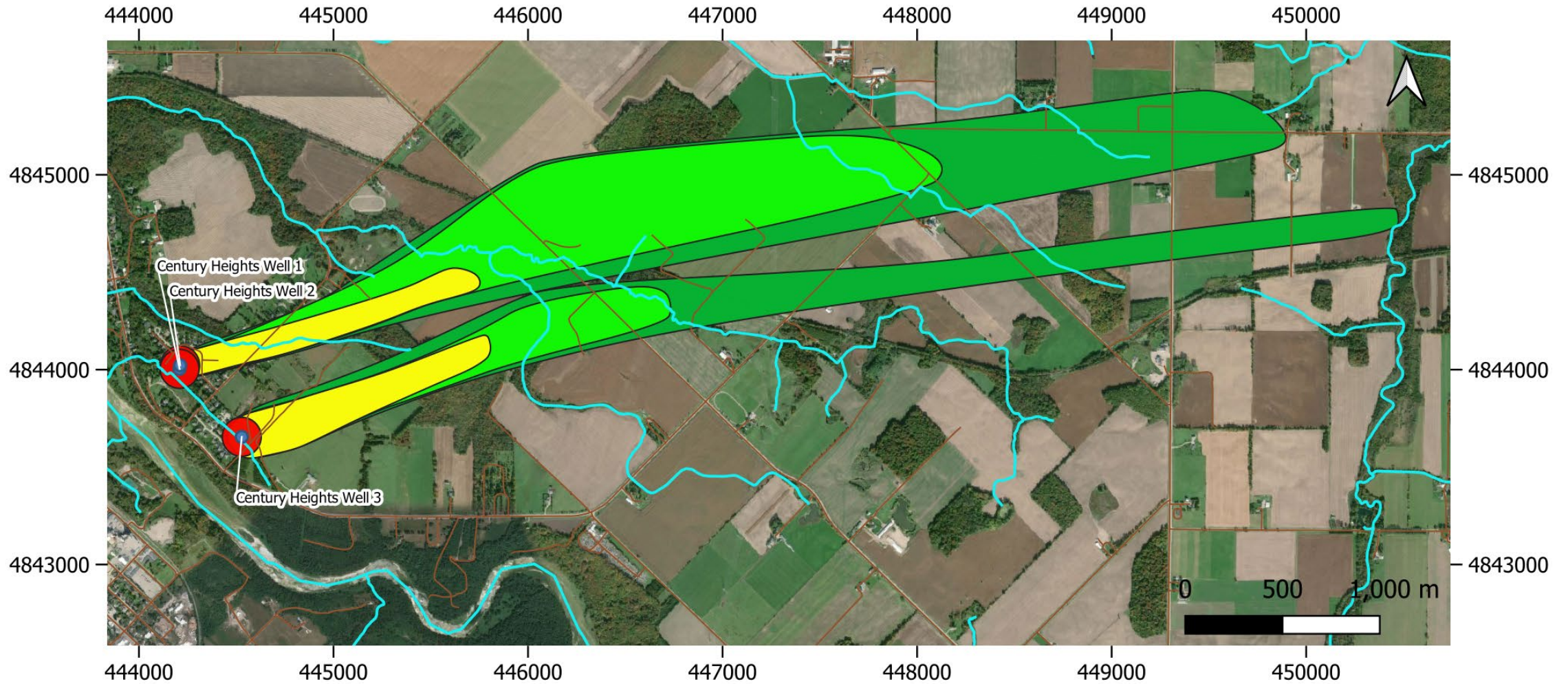
Century Heights Well 3  
WHPA Delineation

### Existing Aquifer Vulnerability

Date: November 2023	Project: 35869	Submitter: H. Hecky	Reviewer: D. Van Vliet
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**Adjusted Vulnerability Score**

- 10
- 8
- 6
- 4
- 2

- Century Heights pumping wells
- Roads
- Watercourse



Century Heights Well 3  
WHPA Delineation

**Draft Well Vulnerability Scoring**

Date:	November 2023	Project:	35869	Submitter:	H. Hecky	Reviewer:	D. Van Vliet
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Appendix D  
Consultation Materials

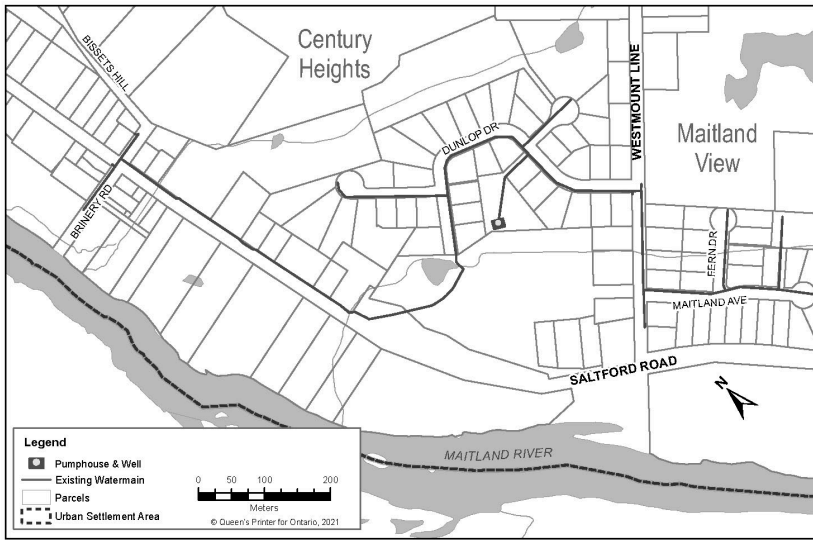


TOWNSHIP OF  
ASHFIELD-COLBORNE-WAWANOSH

# TOWNSHIP OF ASHFIELD-COLBORNE- WAWANOSH

## MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR EXPANSION OF THE CENTURY HEIGHTS DRINKING WATER SYSTEM

### NOTICE OF COMMENCEMENT



#### THE PROJECT:

The Township of Ashfield-Colborne-Wawanosh has initiated a Municipal Class Environmental Assessment (MCEA) process to investigate the expansion of the Century Heights Drinking Water System in the community of Salford (see attached key plan). The current system services 84 properties from a groundwater supply. The expansion of the existing drinking water system is required to accommodate future development within the urban settlement area. The MCEA will investigate options with respect to increasing the existing drinking water supply and expanding the distribution system.

#### THE ENVIRONMENTAL SCREENING PROCESS:

The planning for this project is following the environmental screening process set out for Schedule B activities under the MCEA process. The purpose of the screening process is to identify potential environmental impacts associated with the project and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, First Nation and Métis communities, and government review agencies.

#### PUBLIC INVOLVEMENT:

Public input and comments are invited for incorporation into the planning and design of this project. Initial comments are welcomed and will be received until **April 8, 2022**. Comments may be provided to the study team at B. M. Ross and Associates (contact information below). Any comments collected in conjunction with the study, will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.

For further information on this project, or to review the Municipal Class EA process, please contact the consulting engineers: B.M. Ross and Associates: 62 North Street, Goderich, Ontario, N7A 2T4. Telephone (519) 524-2641. Lisa Courtney, Environmental Planner (e-mail: [lcourtney@bmross.net](mailto:lcourtney@bmross.net)).

Brett Pollock, Chief Building Official  
Township of Ashfield-Colborne-Wawanosh

This Notice issued March 9, 2022

March 9, 2022

Review Agency  
(See attached list)

**RE: Township of Ashfield-Colborne-Wawanosh  
Municipal Class EA for Expansion of Century Heights Drinking Water  
System**

The Township of Ashfield-Colborne-Wawanosh has initiated a Municipal Class Environmental Assessment (MCEA) process to investigate the expansion of the Century Heights Drinking Water System in the community of Saltford (see attached key plan). The current system services 84 properties from a groundwater supply. The expansion of the existing drinking water system is required to accommodate future development within the urban settlement area. The MCEA will investigate options with respect to increasing the existing drinking water supply and expanding the distribution system.

The planning for this project is following the environmental screening process established for Schedule 'B' activities under the MCEA document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the Environmental Assessment process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, Aboriginal communities, and review agencies.

Your organization has been identified as possibly having an interest in the project and we are soliciting your input. Please forward your response to our office by April 8, 2022. If you have any questions or require further information, please contact the undersigned at [lcourtney@bmross.net](mailto:lcourtney@bmross.net) or by phone at 1-888-524-2641.

Yours very truly

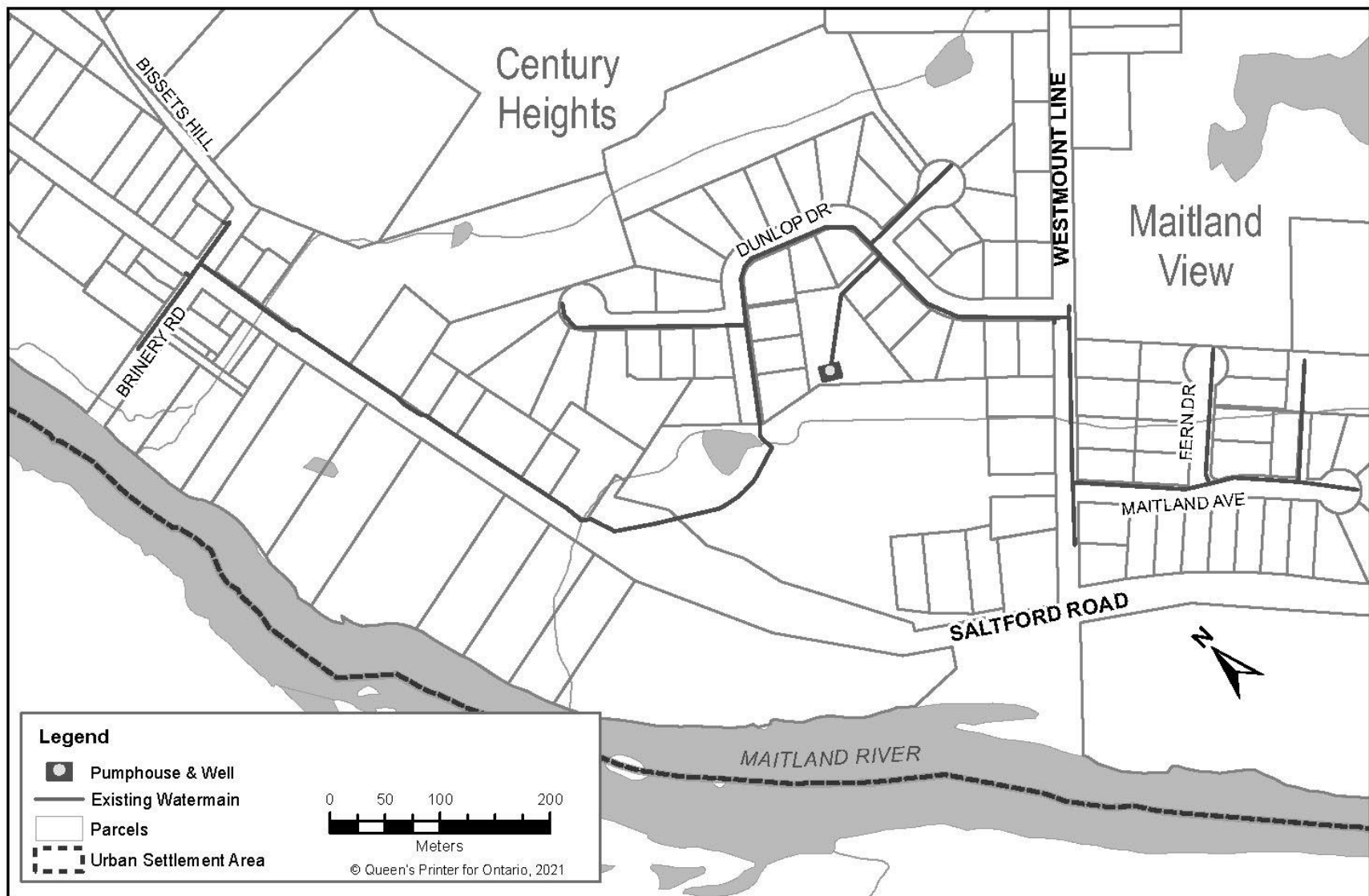
B. M. ROSS AND ASSOCIATES LIMITED

Per \_\_\_\_\_  
Lisa Courtney, MSc., MCIP, RPP  
Environmental Planner

cc. Brett Pollock, Township of Ashfield-Colborne-Wawanosh



Figure 1: Key Plan Showing Current Extent of Century Heights Water System



**TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH**

**CLASS ENVIRONMENTAL ASSESSMENT FOR  
EXPANSION OF CENTURY HEIGHTS DRINKING WATER SYSTEM  
REVIEW AGENCY CIRCULATION LIST**

<b>REVIEW AGENCY</b>	<b>CONTACT METHOD</b>	<b>ADDRESS &amp; EMAIL</b>	<b>INVOLVEMENT</b>
Ministry of Environment, Conservation and Parks	Email agency letter and site map.	Mark Badali, Regional Environmental Planner (REP)- Southwest Region Email: Mark.Badali1@ontario.ca  South West Region Ministry Regional Office Email: eanotification.swregion@ontario.ca	Mandatory Contact
Ministry of Natural Resources and Forestry Guelph	Email agency letter and site map.	Karina Cerniavskaja, District Planner Email: <a href="mailto:Karina.Cerniavskaja@ontario.ca">Karina.Cerniavskaja@ontario.ca</a>	Potential Impact on Natural Features
Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)	Email agency letter and site map.	Karla Barboza, Team Lead – Heritage (Acting) Email: <a href="mailto:karla.barboza@ontario.ca">karla.barboza@ontario.ca</a>	Potential Impacts on Heritage, Sport, Tourism and Culture
County of Huron - Administration Department,  - Planning & Development Department	Email agency letter and site map.	Administration and CAO's Office 1 Courthouse Square Goderich, ON N7A 1M2 <a href="mailto:huronadmin@huroncounty.ca">huronadmin@huroncounty.ca</a>  Planning 57 Napier Street, 2nd Floor Goderich, ON N7A 1W2 519.524.8394 ext. 3 <a href="mailto:planning@huroncounty.ca">planning@huroncounty.ca</a>	Project within County
Town of Goderich	Email agency letter and site map.	Administration Amanda Piskorski, Administrative Assistant to CAO and Clerk Email: <a href="mailto:apiskorski@goderich.ca">apiskorski@goderich.ca</a>	Adjacent to Township
Township of Ashfield-Colborne-Wawanosh	Email agency letter, agency list and site map.	Brett Pollock, Chief Building Official Email: cbo@acwtownship.ca	Proponent
Maitland Valley Conservation Authority	Email agency letter and site map.	Kirsten Snoek, Planning and Regulations Assistant Email: <a href="mailto:planningassistant@mvca.on.ca">planningassistant@mvca.on.ca</a>	Potential Impact on Natural Features
Ausable Bayfield Maitland Valley Source Protection	Email agency letter and site map	<a href="mailto:mmacdonald@abca.on.ca">mmacdonald@abca.on.ca</a> <a href="mailto:dclarkson@sourcewaterinfo.on.ca">dclarkson@sourcewaterinfo.on.ca</a>	Potential Impact on Source Water



March 9, 2022

Aboriginal Community  
(see attached list)

**RE: Township of Ashfield-Colborne-Wawanosh  
Class EA for Expansion of Century Heights Drinking Water System**

The Township of Ashfield-Colborne-Wawanosh has initiated a Municipal Class Environmental Assessment (MCEA) process to investigate the expansion of the Century Heights Drinking Water System in the community of Saltford (see attached key plan). The current system services 84 properties from a groundwater supply. The expansion of the existing drinking water system is required to accommodate future development within the urban settlement area. The MCEA will investigate options with respect to increasing the existing drinking water supply and expanding the distribution system.

The planning for this project is following the environmental screening process established for Schedule 'B' activities under the MCEA document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the Environmental Assessment process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, Aboriginal communities, and review agencies.

Your community has been identified as possibly having an interest in this project and we are seeking your input. Please forward your response to our office by April 25, 2022. If you have any questions or require further information, please contact the undersigned at [lcourtney@bmross.net](mailto:lcourtney@bmross.net) or by phone at 1-888-524-2641.

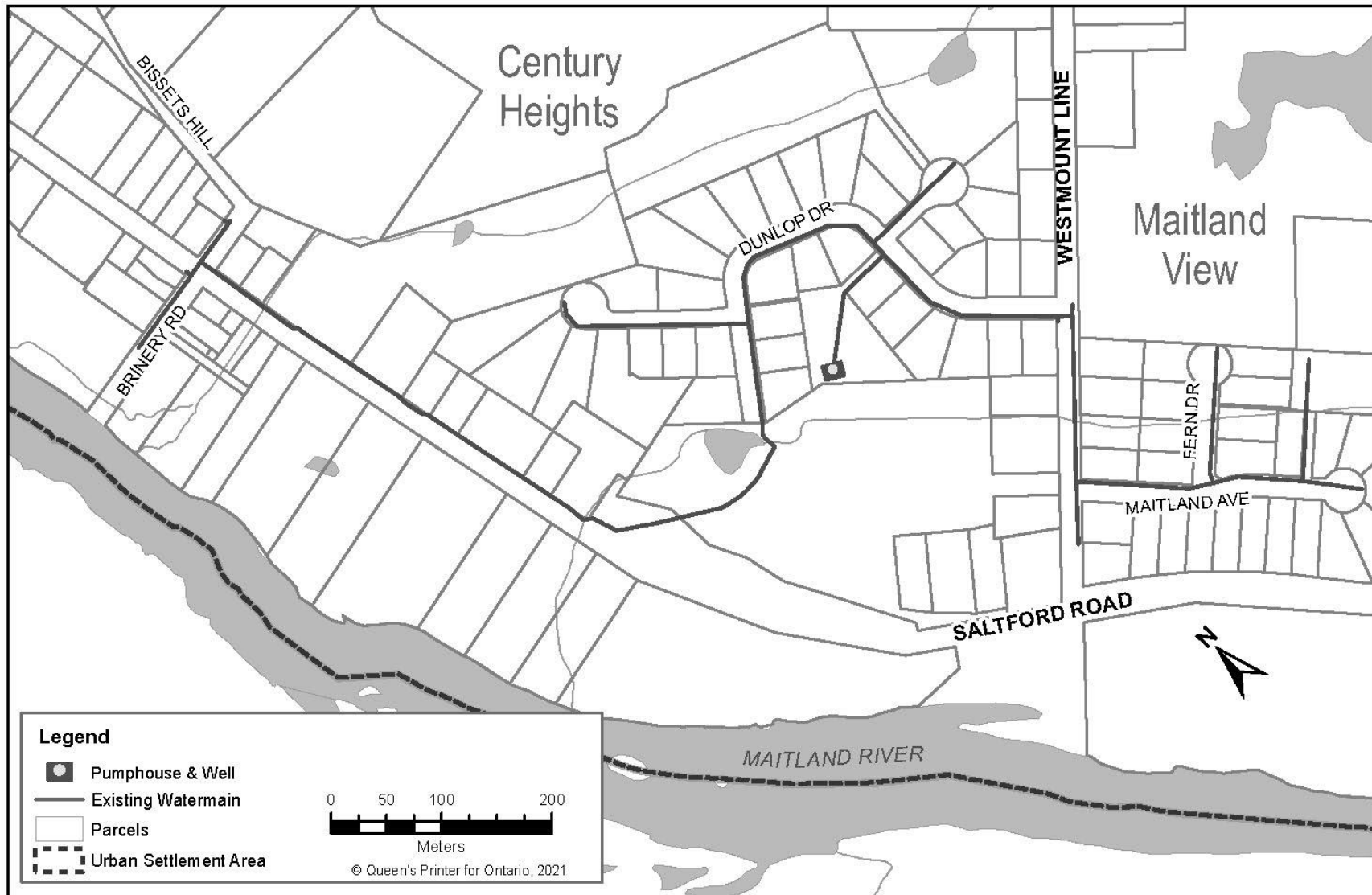
Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per \_\_\_\_\_  
Lisa Courtney, MSc., MCIP, RPP  
Environmental Planner

cc. Brett Pollock, Township of Ashfield-Colborne-Wawanosh

Figure 1: Key Plan Showing Current Extent of Century Heights Water System





**TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH**  
**CLASS ENVIRONMENTAL ASSESSMENT FOR**  
**EXPANSION OF CENTURY HEIGHTS DRINKING WATER SYSTEM**  
**FIRST NATION CIRCULATION LIST**

<b>COMMUNITY</b>	<b>CONTACT METHOD</b>	<b>ADDRESS &amp; EMAIL</b>
Chippewas of Kettle and Stony Point First Nation	Email Indigenous Community letter and location plan.	Chief Jason Henry Email: <a href="mailto:Jason.Henry@kettlepoint.org">Jason.Henry@kettlepoint.org</a> Valerie George Email: <a href="mailto:Valerie.George@kettlepoint.org">Valerie.George@kettlepoint.org</a> Address: 6247 Indian Lane Lambton Shores, ON N0N 1J2
Chippewas of Nawash Unceded First Nation	Email Indigenous Community letter and location plan.	Chief Veronica Smith Email: <a href="mailto:chief.veronica@nawash.ca">chief.veronica@nawash.ca</a> Address: 135 Lakeshore Blvd., Neyaashiinigiing, ON N0H 2T0
Chippewas of Saugeen First Nation	Email Indigenous Community letter and location plan.	Chief Lester Anoquot Email: <a href="mailto:sfn@saugeen.org">sfn@saugeen.org</a> Address: 6493 Highway 21, R.R. #1 Southampton, ON N0H 2L0
Saugeen Ojibway Nation (SON) – Chippewas of Saugeen & Chippewas of Nawash	Email Indigenous Community letter and location plan.	Emily Martin, Infrastructure and Resources Manager Email: <a href="mailto:emily.martin@saugeenojibwaynation.ca">emily.martin@saugeenojibwaynation.ca</a> Address: 25 Maadookii Subdivision Neyaashiinigiing, ON N0H 2T0
Historic Saugeen Métis	Email Indigenous Community letter and location plan.	Email: <a href="mailto:saugeenmetis@bmts.com">saugeenmetis@bmts.com</a> Chris Hachey Email: <a href="mailto:hsmlrcc@bmts.com">hsmlrcc@bmts.com</a> Address: 204 High Street Southampton, ON N0H 2L0
Métis Nation of Ontario	Email Indigenous Community letter and location plan.	Email: <a href="mailto:info@mnoregistry.ca">info@mnoregistry.ca</a> Address: Suite 1100 – 66 Slater Street Ottawa, ON K1P 5H1
Great Lakes Métis Council	Email Indigenous Community letter and location plan.	Peter Coture, President Email: <a href="mailto:peterc1908@hotmail.com">peterc1908@hotmail.com</a> Address: 380 9 <sup>th</sup> Street East Owen Sound, ON N4K 1P1
Aamjiwnaang First Nation Administration Office	Email Indigenous Community letter and location plan.	Sharilyn Johnston, Environmental Coordinator Email: <a href="mailto:sjohnston@aamjiwnaang.ca">sjohnston@aamjiwnaang.ca</a> Address: 978 Tashmoo Ave. Sarnia, ON N7T 7H5
Walpole Island First Nation, Bkejwanong Territory	Mail Indigenous Community letter and location plan.	Dean Jacobs, Consultation Manager Email: <a href="mailto:dean.jacobs@wifn.org">dean.jacobs@wifn.org</a> Address: 117 Tahgahoning Rd. Wallaceburg, ON N8A 4K9
Chippewas of the Thames	Online through NationsConnect.ca	
Oneida of the Thames	Mail Indigenous Community letter and location plan	2212 Elm Ave., Southwold, Ontario N0L 2G0

## Response Form

**Project Name:** Class EA for Expansion of Century Heights Drinking Water System

**Project Description:** The Township of Ashfield-Colborne-Wawanosh is investigating the expansion of the Century Heights Drinking Water System to accommodate new development.

**Project Location:** Salford, in the Township of Ashfield-Colborne-Wawanosh

**Please Detach and Return in Envelope Provided**

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**Name of Aboriginal Community:** \_\_\_\_\_

**Please check appropriate box:**

**Please send additional information on this project**

**We would like to meet with representatives of this project**

**We have no concerns with this project and do not wish to be consulted further**

**Project Name:** Class EA for Expansion of Century Heights Drinking Water System

**Location:** Township of Ashfield-Colborne-Wawanosh

## **Lisa Courtney**

---

**From:** Patrick Huber-Kidby <phuber-kidby@mvca.on.ca>  
**Sent:** March 16, 2022 10:22 AM  
**To:** lcourtney@bmross.net  
**Cc:** Celina Whaling-Rae; Anna Soleski; Kirsten Snoek  
**Subject:** Class EA - Century Heights Drinking Water System  
**Attachments:** 21285-2022-03-09-MVCA Let.pdf

Lisa,

At this time MVCA would be happy to provide mapping related to our regulated areas around Saltford. I understand a great deal of background Hydrogeological investigation is underway or has already been completed (Ian D. Wilson & Associates Ltd.) for the Township. Celina, please advise if I have not captured the previous work done accurately in this statement.

We have no other comments at this time but look forward to discussing the details of this project.

Sincerely,



***Patrick Huber-Kidby***

**Maitland Valley Conservation Authority**

**Phone:** (519) 335-3557 x 237      **Fax:** (519) 335-3516

**Mail:** 1093 Marietta St. Box 127, Wroxeter, ON. N0G 2X0



April 1, 2022

EMAIL ONLY

Lisa J. Courtney  
Environmental Planner  
B. M. Ross and Associates Limited  
Engineers and Planners  
62 North Street  
Goderich, ON N7A 2T4  
[lcourtney@bmross.net](mailto:lcourtney@bmross.net)

**MHSTCI File :** 0016172  
**Proponent :** Township of Ashfield-Colborne-Wawanosh  
**Subject :** Notice of Commencement – MCEA Schedule B  
**Project :** Expansion of Century Heights Drinking Water System  
**Location :** Township of Ashfield-Colborne-Wawanosh

---

Dear Lisa J. Courtney:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Commencement for the above-referenced project. MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources, including land and marine;
- built heritage resources, including bridges and monuments; and
- cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on known (previously recognized) and potential cultural heritage resources.

### **Project Summary**

The Township of Ashfield-Colborne-Wawanosh has initiated a Municipal Class Environmental Assessment (MCEA) process to investigate the expansion of the Century Heights Drinking Water System in the community of Saltford (see attached key plan). The current system services 84 properties from a groundwater supply. The planning for this project is following the environmental screening process established for Schedule 'B' activities under the MCEA document.

### **Identifying Cultural Heritage Resources**

While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation.

### **Archaeological Resources**

This EA project may impact archaeological resources and should be screened using the MHSTCI [Criteria for Evaluating Archaeological Potential](#) to determine if an archaeological assessment is needed. MHSTCI archaeological sites data are available at [archaeology@ontario.ca](mailto:archaeology@ontario.ca). If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *Ontario Heritage Act (OHA)*, who is responsible for submitting the report directly to MHSTCI for review.

### **Built Heritage Resources and Cultural Heritage Landscapes**

A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment will be undertaken for the entire study area during the planning phase and will be summarized in the EA Report. This study will:

1. Describe the existing baseline cultural heritage conditions within the study area by identifying all known or potential built heritage resources and cultural heritage landscapes, including a historical summary of the study area. MHSTCI has developed screening criteria that may assist with this exercise: [Criteria for Evaluating for Potential Built Heritage Resources and Cultural Heritage Landscapes](#).
2. Identify preliminary potential project-specific impacts on the known and potential built heritage resources and cultural heritage landscapes that have been identified. The report should include a description of the anticipated impact to each known or potential built heritage resource or cultural heritage landscape that has been identified.
3. Recommend measures to avoid or mitigate potential negative impacts to known or potential built heritage resources and cultural heritage landscapes. The proposed mitigation measures are to inform the next steps of project planning and design.

Given that this project covers a large study area, MHSTCI recommends that the Cultural Heritage Report is carried out so that step 1 described above is undertaken early in the planning process. Then, steps 2 and 3 can be undertaken once the preferred alternatives have been selected.

Cultural Heritage Reports will be undertaken by a qualified person who has expertise, recent experience, and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed.

Community input should be sought to identify locally recognized and potential cultural heritage resources. Sources include, but are not limited to, municipal heritage committees, historical societies and other local heritage organizations.

Cultural heritage resources are often of critical importance to Indigenous communities. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to them.

## Environmental Assessment Reporting

All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MHSTCI whether any technical cultural heritage studies will be completed for this EA project, and provide them to MHSTCI before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MHSTCI on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, do not hesitate to contact me.

Sincerely,

Joseph Harvey  
Heritage Planner  
[joseph.harvey@Ontario.ca](mailto:joseph.harvey@Ontario.ca)

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MHSTCI makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MHSTCI be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Please notify MHSTCI (at [archaeology@ontario.ca](mailto:archaeology@ontario.ca)) if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately, and the local police and coroner must be contacted. In situations where human remains are associated with archaeological resources, MHSTCI should also be notified (at [archaeology@ontario.ca](mailto:archaeology@ontario.ca)) to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

**Ministry of the Environment,  
Conservation and Parks**

**Ministère de l'Environnement,  
de la Protection de la nature  
et des Parcs**

Environmental Assessment  
Branch

Direction des évaluations  
environnementales

1<sup>st</sup> Floor  
135 St. Clair Avenue W  
Toronto ON M4V 1P5  
**Tel.:** 416 314-8001  
**Fax.:** 416 314-8452

Rez-de-chaussée  
135, avenue St. Clair Ouest  
Toronto ON M4V 1P5  
**Tél. :** 416 314-8001  
**Télééc. :** 416 314-8452

March 30, 2022

Brett Pollock  
Chief Building Official  
Township of Ashfield-Colborne-Wawanosh  
cbo@acwtownship.ca

**Re: Century Heights Drinking Water System  
Township of Ashfield-Colborne-Wawanosh  
Municipal Class EA  
Response to Notice of Commencement**

Dear Brett Pollock,

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the Township of Ashfield-Colborne-Wawanosh (proponent) has indicated that the study is following the approved environmental planning process for a Schedule B project under the Municipal Class Environmental Assessment (Class EA).

The **updated (February 2021)** attached “Areas of Interest” document provides guidance regarding the ministry’s interests with respect to the Class EA process. Please address all areas of interest in the EA documentation at an appropriate level for the EA study. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule. **Further information is provided at the end of the Areas of Interest document relating to recent changes to the Environmental Assessment Act through Bill 197, Covid-19 Economic Recovery Act 2020.**

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to the proposed project, **the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown's preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Aamjiwnaang First Nation;
- Bkejwanong (Walpole Island) First Nation;
- Chippewas of Kettle and Stony Point;
- Chippewas of the Thames First Nation;
- Chippewas of Nawash First Nation and Saugeen First Nation, which are represented by the Saugeen Ojibway Nation (SON) Environment Committee;
- Oneida Nation of the Thames;
- Métis Nation of Ontario- Lands and Resources Dept with a copy to Region 7 Councillor David Dusome

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the [“Code of Practice for Consultation in Ontario's Environmental Assessment Process”](#). Additional information related to Ontario's Environmental Assessment Act is available online at: [www.ontario.ca/environmentalassessments](http://www.ontario.ca/environmentalassessments).

**Please also refer to the attached document “A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities” for further information, including the MECP's expectations for EA report documentation related to consultation with communities.**

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances subsequent to initial discussions with the communities identified by the MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation with Indigenous communities or other stakeholders has reached an impasse
- A Part II Order request is expected on the basis of impacts to Aboriginal or treaty rights

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

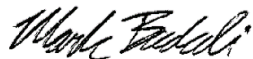
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**A draft copy of the report should be sent directly to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments.**

**Please also ensure a copy of the final notice is sent to the ministry's Southwest Region EA notification email account ([eanotification.swregion@ontario.ca](mailto:eanotification.swregion@ontario.ca)) after the draft report is reviewed and finalized.**

Should you or any members of your project team have any questions regarding the material above, please contact me at [mark.badali1@ontario.ca](mailto:mark.badali1@ontario.ca).

Yours truly,



Mark Badali  
Regional Environmental Planner – Southwest Region

Cc: John Ritchie, Manager, Owen Sound District Office, MECP  
Lisa Courtney, Environmental Planner, B.M. Ross and Associates

Encl. Areas of Interest  
A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities



## AREAS OF INTEREST (v. February 2021)

*It is suggested that you check off each section after you have considered / addressed it.*

### **Planning and Policy**

- Projects located in MECP Central Region are subject to [A Place to Grow: Growth Plan for the Greater Golden Horseshoe \(2020\)](#). Parts of the study area may also be subject to the [Oak Ridges Moraine Conservation Plan \(2017\)](#), [Niagara Escarpment Plan \(2017\)](#), [Greenbelt Plan \(2017\)](#) or [Lake Simcoe Protection Plan \(2014\)](#). Applicable plans and the applicable policies should be identified in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.
- The [Provincial Policy Statement \(2020\)](#) contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.
- In addition to the provincial planning and policy level, the report should also discuss the planning context at the municipal and federal levels, as appropriate.

### **Source Water Protection**

The *Clean Water Act, 2006 (CWA)* aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions,

Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**
  - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.
  - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.
- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.
- In order to determine if this project is occurring within a vulnerable area, proponents can use this mapping tool: <http://www.applications.ene.gov.on.ca/swp/en/index.php>. Note that various layers (including WHPAs, WHPA-Q1 and WHPA-Q2, IPZs, HVAs, SGRAs, EBAs, ICAs) can be turned on through the “Map Legend” bar on the left. The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.
- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results of that consultation within the report and include all communication documents/correspondence.**

### More Information

For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to [Conservation Ontario's website](#) where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in [section 1.1 of Ontario Regulation 287/07](#) made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

### **Climate Change**

The document "[Considering Climate Change in the Environmental Assessment Process](#)" (Guide) is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. Proponents should review this Guide in detail.

#### • **The MECP expects proponents of Class EA projects to:**

1. Consider during the assessment of alternative solutions and alternative designs, the following:
  - a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
  - b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "[Community Emissions Reduction Planning: A Guide for Municipalities](#)" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

## □ Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of this project, a quantitative air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for this project if not already advised.**
- If a quantitative Air Quality Impact Assessment is not required for the project, the MECP expects that the report contain a qualitative assessment which includes:
  - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
  - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
  - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
  - A discussion of potential mitigation measures.
- As a common practice, "air quality" should be used as an evaluation criterion for all road projects.
- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.
- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to [Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities](#) report prepared for Environment Canada. March 2005.
- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

## □ **Ecosystem Protection and Restoration**

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.
- Natural heritage and hydrologic features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
  - Key Natural Heritage Features: Habitat of endangered species and threatened species, fish habitat, wetlands, areas of natural and scientific interest (ANSIs), significant valleylands, significant woodlands; significant wildlife habitat (including habitat of special concern species); sand barrens, savannahs, and tallgrass prairies; and alvars.
  - Key Hydrologic Features: Permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.
  - Other natural heritage features and areas such as: vegetation communities, rare species of flora or fauna, Environmentally Sensitive Areas, Environmentally Sensitive Policy Areas, federal and provincial parks and conservation reserves, Greenland systems etc.

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, you may consider the provisions of the Rouge Park Management Plan if applicable.

## □ **Species at Risk**

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. Information, standards, guidelines, reference materials and technical resources to assist you are found at <https://www.ontario.ca/page/species-risk>.
- The Client's Guide to Preliminary Screening for Species at Risk (Draft May 2019) has been attached to the covering email for your reference and use. Please review this document for next steps.
- For any questions related to subsequent permit requirements, please contact [SAROntario@ontario.ca](mailto:SAROntario@ontario.ca).

## □ Surface Water

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.
- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's [Stormwater Management Planning and Design Manual \(2003\)](#) should be referenced in the report and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:
  - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
  - Watershed information, drainage conditions, and other relevant background information
  - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
  - Information on maintenance and monitoring commitments.
- Ontario Regulation 60/08 under the *Ontario Water Resources Act* (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.
- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the [Water Taking User Guide for EASR](#) for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.



## □ **Groundwater**

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.
- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.
- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.
- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the [Water Taking User Guide for EASR](#) for more information.
- Consultation with the railroad authorities is necessary wherever there is a plan to use construction dewatering in the vicinity of railroad lines or where the zone of influence of the construction dewatering potentially intercepts railroad lines.

## □ **Excess Materials Management**

- In December 2019, MECP released a new regulation under the Environmental Protection Act, titled “On-Site and Excess Soil Management” (O. Reg. 406/19) to support improved management of excess construction soil. This regulation is a key step to support proper management of excess soils, ensuring valuable resources don’t go to waste and to provide clear rules on managing and reusing excess soil. New risk-based standards referenced by this regulation help to facilitate local beneficial reuse which in turn will reduce greenhouse gas emissions from soil transportation, while ensuring strong protection of human health and the environment. The new regulation is being phased in over time, with the first phase

in effect on January 1, 2021. For more information, please visit <https://www.ontario.ca/page/handling-excess-soil>.

- The report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "[Management of Excess Soil – A Guide for Best Management Practices](#)" (2014).
- All waste generated during construction must be disposed of in accordance with ministry requirements

#### **Contaminated Sites**

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites. We recommend referring to the [MECP's D-4 guideline](#) for land use considerations near landfills and dumps.
  - Resources available may include regional/local municipal official plans and data; provincial data on [large landfill sites](#) and [small landfill sites](#); Environmental Compliance Approval information for waste disposal sites on [Access Environment](#).
- Other known contaminated sites (local, provincial, federal) in the study area should also be identified in the report (Note – information on federal contaminated sites is found on the Government of Canada's [website](#)).
- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.
- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

## **Servicing, Utilities and Facilities**

- The report should identify any above or underground utilities in the study area such as transmission lines, telephone/internet, oil/gas etc. The owners should be consulted to discuss impacts to this infrastructure, including potential spills.
- The report should identify any servicing infrastructure in the study area such as wastewater, water, stormwater that may potentially be impacted by the project.
- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with MECP's Environmental Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.
- We recommend referring to the ministry's [environmental land use planning guides](#) to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

## **Mitigation and Monitoring**

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.
- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.
- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

## **Consultation**

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout

the planning process. The report should also include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments (as directed by the Class EA to include full documentation).

- Please include the full stakeholder distribution/consultation list in the documentation.

□ **Class EA Process**

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. **The Master Plan should clearly indicate the selected approach for conducting the plan**, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the Environmental Assessment Act, although the plan itself would not be. **Please include a description of the approach being undertaken (use Appendix 4 as a reference).**
- If this project is a Master Plan: Any identified projects should also include information on the MCEA schedule associated with the project.
- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.
- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment (including planning, natural, social, cultural, economic, technical). The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments, cultural heritage assessments) such that all potential impacts can be identified, and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.
- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, MTO permits and approvals under the *Impact Assessment Act*, 2019.
- Ministry guidelines and other information related to the issues above are available at <http://www.ontario.ca/environment-and-energy/environment-and-energy>. We encourage you to review all the available guides and to reference any relevant information in the report.

### **Amendments to the EAA through the Covid-19 Economic Recovery Act, 2020**

Once the EA Report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the proponent. The Notice of Completion must be sent to the appropriate MECP Regional Office email address (for projects in MECP Southwest Region, the email is [eanotification.swregion@ontario.ca](mailto:eanotification.swregion@ontario.ca)).

The public has the ability to request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director (of the Environmental Assessment Branch) will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. Once the requested information has been received, the Minister will have 30 days within which to make a decision or impose conditions on your project.

Therefore, the proponent cannot proceed with the project until at least 30 days after the end of the comment period provided for in the Notice of Completion. Further, the proponent may not proceed after this time if:

- a Part II Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, or
- the Director has issued a Notice of Proposed order regarding the project.

Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Part II Order requests on those matters should be addressed in writing to:

Minister Jeff Yurek  
Ministry of Environment, Conservation and Parks  
777 Bay Street, 5th Floor  
Toronto ON M7A 2J3  
[minister.mecp@ontario.ca](mailto:minister.mecp@ontario.ca)

and

Director, Environmental Assessment Branch  
Ministry of Environment, Conservation and Parks  
135 St. Clair Ave. W, 1st Floor  
Toronto ON, M4V 1P5  
[EABDirector@ontario.ca](mailto:EABDirector@ontario.ca)

## A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

### DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

**Aboriginal communities** – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

**Consultation** – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

**Crown** – the Ontario Crown, acting through a particular ministry or ministries.

**Procedural aspects of consultation** – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

**Proponent** – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

### I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

### II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers



issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

### **III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS**

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;
- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

#### **IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS**

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

##### **a) What might a proponent be required to do in carrying out the procedural aspects of consultation?**

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;

- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

#### **b) What documentation and reporting does the Crown need from the proponent?**

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;
- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;

- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

**c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?**

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

**V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?**

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant documentation;

- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigate any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

## **VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?**

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

## Lisa Courtney

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**From:** MNRF Ayl Planners (NDMNRF) <MNRF.Ayl.Planners@ontario.ca>  
**Sent:** March 11, 2022 2:54 PM  
**To:** Lisa Courtney  
**Subject:** RE: 21285 - MCEA Initial Notice - Township of ACW Expansion of Century Heights Water System  
**Attachments:** 21285-2022-03-09-MNRF Let.pdf; NHGuide\_MNRF\_2019-04-01.pdf

Ministry of Northern Development,  
Mines, Natural Resources  
and Forestry

Ministère du Développement du Nord,  
des Mines, des Richesses naturelles  
et des Forêts



March 11, 2022

### **Subject: 21285 - MCEA Initial Notice - Township of ACW Expansion of Century Heights Water System**

The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) received the notice for the Township of ACW Expansion of Century Heights Water System project. Thank you for circulating this information to our office, however, please note that we have not completed a screening of natural heritage or other resource values for the project at this time. Please also note that it is your responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

This response provides information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation, and engaging with the Ministry for advice as needed.

#### **Natural Heritage & Endangered Species Act**

In order to provide the most efficient service possible, the attached Natural Heritage Information Request Guide has been developed to assist you with accessing natural heritage data and values from convenient online sources.

It remains the proponent's responsibility to complete a preliminary screening for each project, to obtain available information from multiple sources, to conduct any necessary field studies, and to consider any potential environmental impacts that may result from an activity. We wish to emphasize the need for the proponents of development activities to complete screenings prior to contacting the Ministry or other agencies for more detailed technical information and advice.

The Ministry continues to work on updating data housed by Land Information Ontario and the Natural Heritage Information Centre, and ensuring this information is accessible through online resources. Species at risk data is regularly being updated. To ensure access to reliable and up to date information, please contact the Ministry of the Environment, Conservation and Parks at [SAROntario@ontario.ca](mailto:SAROntario@ontario.ca).

#### **Petroleum Wells & Oil, Gas and Salt Resource Act**



There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website ([https://link.edgepilot.com/s/5b1e13f8/eDT8bf6lukq9tEYzByZ9\\_A?u=http://www.ogsrlibrary.com/](https://link.edgepilot.com/s/5b1e13f8/eDT8bf6lukq9tEYzByZ9_A?u=http://www.ogsrlibrary.com/)) for the best known data on any wells recorded by NDMNRF. Please reference the 'Definitions and Terminology Guide' listed in the publications on the Library website in order to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Gas and Salt Resource Act*, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at [POSRecords@ontario.ca](mailto:POSRecords@ontario.ca) or 519-873-4634.

### **Public Lands Act & Lakes and Rivers Improvement Act**

Some projects may be subject to the provisions of the *Public Lands Act* or the *Lakes and Rivers Improvement Act*. Please review the information on NDMNRF's web pages provided below regarding when an approval is required or not. Please note that many of the authorizations issued under the *Lakes and Rivers Improvement Act* are administered by the local Conservation Authority.

- For more information about the *Public Lands Act*:  
<https://link.edgepilot.com/s/0ed93a99/j46fshSYA0C-hplj5SCrtQ?u=https://www.ontario.ca/page/crown-land-work-permits>
- For more information about the *Lakes and Rivers Improvement Act*:  
<https://link.edgepilot.com/s/43b57603/-hnglYdr80yIPyqpv132XQ?u=https://www.ontario.ca/document/lakes-and-rivers-improvement-act-administrative-guide>

After reviewing the information provided, if you have not identified any of NDMNRF's interests stated above, there is no need to circulate any subsequent notices to our office.

If you have any questions or concerns, please feel free to contact me.

Sincerely,  
Karina

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**Karina Černiavskaja | District Planner**

Ministry of Northern Development, Mines, Natural Resources and Forestry  
[MNRf.Ayl.Planners@ontario.ca](mailto:MNRf.Ayl.Planners@ontario.ca)



As part of providing [accessible customer service](#), please let me know if you have any accommodation needs or require communication supports or alternate formats.

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**From:** Lisa Courtney <lcourtney@bmcross.net>  
**Sent:** March-10-22 1:38 PM

**To:** Cerniavskaja, Karina (NDMNRF) <Karina.Cerniavskaja@ontario.ca>

**Subject:** 21285 - MCEA Initial Notice - Township of ACW Expansion of Century Heights Water System

**CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.**

Hello,

The Township of Ashfield-Colborne-Wawanosh is initiating a Municipal Class Environmental Assessment to investigations related to expanding the Century Heights Drinking Water System that currently services the community of Saltford. Please find attached a letter outlining the project and project area. Should you have any questions or comments at this time, please do not hesitate to reach out.

Thanks and cheers,

*Lisa J. Courtney, MSc., MCIP, RPP*

*B. M. Ross and Associates Limited*

*Engineers and Planners*

*62 North Street*

*Goderich, ON N7A 2T4*

**Ph: (519) 524-2641**

[lcourtney@bmross.net](mailto:lcourtney@bmross.net)

[https://link.edgepilot.com/s/46331467/iLQmhNLuB0abkAt2k\\_UFoQ?u=http://www.bmross.net/](https://link.edgepilot.com/s/46331467/iLQmhNLuB0abkAt2k_UFoQ?u=http://www.bmross.net/)



# CHIPPEWAS OF THE THAMES FIRST NATION

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**Project Name:**

Municipal Class EA - Expansion of Saltford Water System

**FN Consultation ID:**

21285

**Consulting Org Contact:**

Lisa Courtney

**Consulting Organization:**

[B. M. Ross and Associates Limited](#)

**Date Received:**

Friday, April 1, 2022

April 6, 2022

Dear: Lisa,

We have received information concerning the Municipal Class EA - Expansion of Saltford Water System, submitted April 1st, 2022. The proposed project falls within Chippewas of the Thames First Nation's (COTTFN) big bear creek additions to reserve land selection area as well as COTTFN's traditional territory.

In our screening of your project, we have identified no concerns with your project or the information that you have presented to us at this time. We ask that if there are any changes to your project that are of a substantive nature that you keep us informed.

We recommend that you engage First Nations in closer proximity to the proposed project. e.g. Kettle & Stoney Point, Walpole Island First Nation, Aamjiwnaang First Nation.

We look forward to continuing this open line of communication. To implement meaningful consultation, COTTFN has developed its own protocol - a document and a process that will guide positive working relationships. As per 'Appendix D' of the Wiindmaagewin attached is invoice 0267.

Please feel free to contact me if you have any questions.

Sincerely,

---

Original Signed

Fallon Burch

Consultation Coordinator

Treaties, Lands & Environment Department

Chippewa of the Thames First Nation

[fburch@cottfn.com](mailto:fburch@cottfn.com)

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## Lisa Courtney

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**From:** Emily Martin <manager.ri@saugeenojibwaynation.ca>  
**Sent:** May 9, 2022 4:46 PM  
**To:** Lisa Courtney; Juanita Meekins  
**Subject:** Re: 21285 ACW Century Heights Water Expansion EA  
**Attachments:** ~WRD0126.jpg

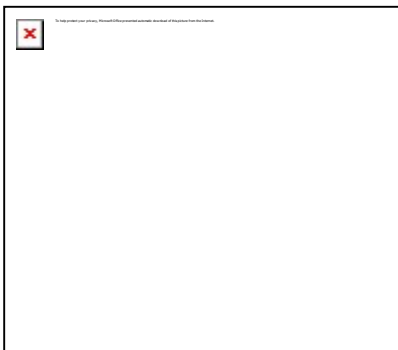
**Categories:** Archived

Thanks Lisa, Juanita see above for the LOA contact name.

Lisa we'll get back to you shortly.

**Emily Martin** (she/her)  
Resources and Infrastructure Manager  
[manager.ri@saugeenojibwaynation.ca](mailto:manager.ri@saugeenojibwaynation.ca)  
T: (519) 379-0849

*I am grateful to live, work, and benefit from the Territorial lands and waters of the Saugeen Ojibway Nation.*



10129 Hwy 6 Georgian Bluffs, ON  
N0H 2T0  
[saugeenojibwaynation.ca](http://saugeenojibwaynation.ca)

On Wed, May 4, 2022 at 2:58 PM Lisa Courtney <[lcourtney@bmross.net](mailto:lcourtney@bmross.net)> wrote:

Hi Emily,

Yes, Brett Pollock is the project contact at ACW.

Cheers,

**Lisa J. Courtney, MSc., MCIP, RPP**

**B. M. Ross and Associates Limited**

**Engineers and Planners**

62 North Street

Goderich, ON N7A 2T4

Ph: (519) 524-2641

[lcourtney@bmross.net](mailto:lcourtney@bmross.net)

[https://link.edgepilot.com/s/4284d027/Cipz9vgEpk\\_MjS6joDCH1A?u=http://www.bmross.net/](https://link.edgepilot.com/s/4284d027/Cipz9vgEpk_MjS6joDCH1A?u=http://www.bmross.net/)

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**From:** Emily Martin <[manager.ri@saugeenojibwaynation.ca](mailto:manager.ri@saugeenojibwaynation.ca)>  
**Sent:** May 4, 2022 2:56 PM  
**To:** Lisa Courtney <[lcourtney@bmross.net](mailto:lcourtney@bmross.net)>  
**Cc:** Emily Martin <[emily.martin@saugeenojibwaynation.ca](mailto:emily.martin@saugeenojibwaynation.ca)>; Juanita Meekins <[Juanita.meekins@saugeenojibwaynation.ca](mailto:Juanita.meekins@saugeenojibwaynation.ca)>  
**Subject:** Re: 21285 ACW Century Heights Water Expansion EA

Hi Lisa, thanks for reaching out we'll get back to you shortly.

Is Brett Pollock considered the proponent representative if we need to follow up about budget?

**Emily Martin** (she/her)  
Resources and Infrastructure Manager  
[manager.ri@saugeenojibwaynation.ca](mailto:manager.ri@saugeenojibwaynation.ca)  
T: (519) 379-0849

*I am grateful to live, work, and benefit from the Territorial lands and waters of the Saugeen Ojibway Nation.*



10129 Hwy 6 Georgian Bluffs, ON  
N0H 2T0  
[saugeenojibwaynation.ca](http://saugeenojibwaynation.ca)

On Wed, Apr 27, 2022 at 3:35 PM Lisa Courtney <[lcourtney@bmross.net](mailto:lcourtney@bmross.net)> wrote:

Good afternoon Emily and Juanita,

Hope everyone is keeping well (and you haven't gotten too much snow today). I am following up on our initial Notice regarding the Township of Ashfield Colborne Wawaonsh's MCEA looking at the expansion of the Century Heights (Saltford) water system. If you have any questions or comments, please let me know.

Thanks and cheers,

***Lisa J. Courtney, MSc., MCIP, RPP***

***B. M. Ross and Associates Limited***

***Engineers and Planners***

*62 North Street*

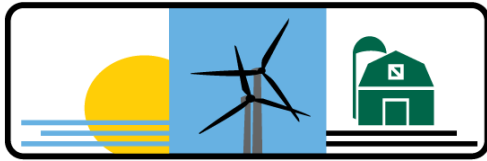
*Goderich, ON N7A 2T4*

**Ph: (519) 524-2641**

**[lcourtney@bmross.net](mailto:lcourtney@bmross.net)**

**<https://link.edgepilot.com/s/11ba11a2/9YV8rNdhNUmZjCspniR1ag?u=http://www.bmross.net/>**



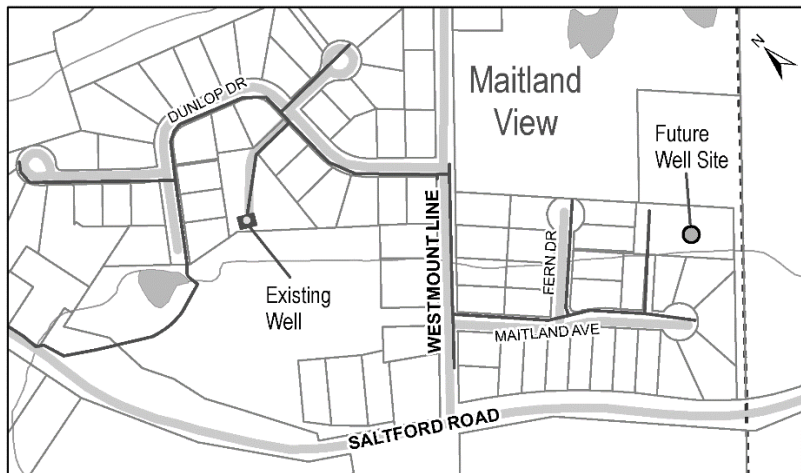


TOWNSHIP OF  
ASHFIELD-COLBORNE-WAWANOSH

# TOWNSHIP OF ASHFIELD-COLBORNE- WAWANOSH

## MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR EXPANSION OF THE CENTURY HEIGHTS DRINKING WATER SYSTEM

### NOTICE OF PUBLIC OPEN HOUSE



#### THE PROJECT:

The Township of Ashfield-Colborne-Wawanosh has initiated a Municipal Class Environmental Assessment (MCEA) process to investigate the expansion of the Century Heights Drinking Water System in the community of Salford. The current system services 84 properties from a groundwater supply. An additional well is required to accommodate future development within the urban settlement area. Through the MCEA process, a site for a new well has been identified and a test well has been drilled.

#### THE ENVIRONMENTAL SCREENING PROCESS:

The planning for this project is following the environmental screening process set out for Schedule B activities under the MCEA process. The purpose of the screening process is to identify potential environmental impacts associated with the project and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, First Nation and Métis communities, and government review agencies.

#### PUBLIC INVOLVEMENT:

Public consultation is a key component of this study. A public open house has been scheduled to provide an opportunity for the public and interested parties to learn about the proposed project, as well as provide input and feedback. The public open house will be held:

**Thursday, December 1, 2022 from 6:30-8:30 (presentation at 7 PM)  
Benmiller Community Hall 37015 Londesboro Rd, Goderich, ON N7A 3Y1**

Comments or questions may also be sent to the study team at B. M. Ross and Associates (contact information below). Any comments collected in conjunction with the study, will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.

For further information on this project, or to review the Municipal Class EA process, please contact the consulting engineers: B.M. Ross and Associates: 62 North Street, Goderich, Ontario, N7A 2T4. Telephone (519) 524-2641. Lisa Courtney, Environmental Planner (e-mail: [lcourtney@bmross.net](mailto:lcourtney@bmross.net)).

Brett Pollock, Chief Building Official  
Township of Ashfield-Colborne-Wawanosh

This Notice issued November 9, 2022



Township of  
Ashfield-Colborne-Wawanosh

Century Heights Water System  
Upgrades Municipal Class  
Environmental Assessment

PUBLIC OPEN HOUSE

DEC. 1<sup>ST</sup>, 2022

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## Agenda

- ▶ Introduction
- ▶ Municipal Class Environmental Assessments
- ▶ Existing Century Heights Water System
- ▶ Projected Demands
- ▶ Problem Development
- ▶ Alternative Solutions and Evaluations
- ▶ Next Steps

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# Introduction

- ▶ The purpose of this Municipal Class Environmental Assessment (MCEA) is to determine the best approach to upgrade the Century Heights Water System to ensure a safe and secure supply of water for the present and future.
- ▶ The steps we followed were:
  - ▶ Understanding what the existing water demands are.
  - ▶ Projecting future water demands.
  - ▶ Understanding the existing system and constraints.
  - ▶ Determining when and what will need to be addressed to ensure adequate pressure and flow throughout the system.

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# Municipal Class Environmental Assessments (MCEA)

- ▶ The MCEA is the planning and approval process for municipal road, water, wastewater and stormwater projects.
- ▶ Municipalities must follow the MCEA process to meet the requirements of the Environmental Assessment Act.
- ▶ Allows for the evaluation of feasible alternatives, identifies potential impacts and methods for mitigating impacts.
- ▶ Considers the impacts to the natural, socio-economic, cultural and technical environments.

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# Municipal Class EA Process

Schedule B EAs must complete Phase 1 and 2



Expansion of the Century Heights Drinking Water System is a Schedule B project.

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## Consultation

- ▶ Key component of MCEA process.
- ▶ Required to consult with:
  - ▶ Provincial and federal agencies (depending on project)
  - ▶ First Nation and Métis communities
  - ▶ Adjacent property owners
  - ▶ Stakeholders and the general public
- ▶ At least two mandatory points of contact
  - ▶ Initial Project Notice
  - ▶ Notice of Study Completion
- ▶ Depending on the level of interest or impacts associated with a project, one or multiple public meetings may be held.



6

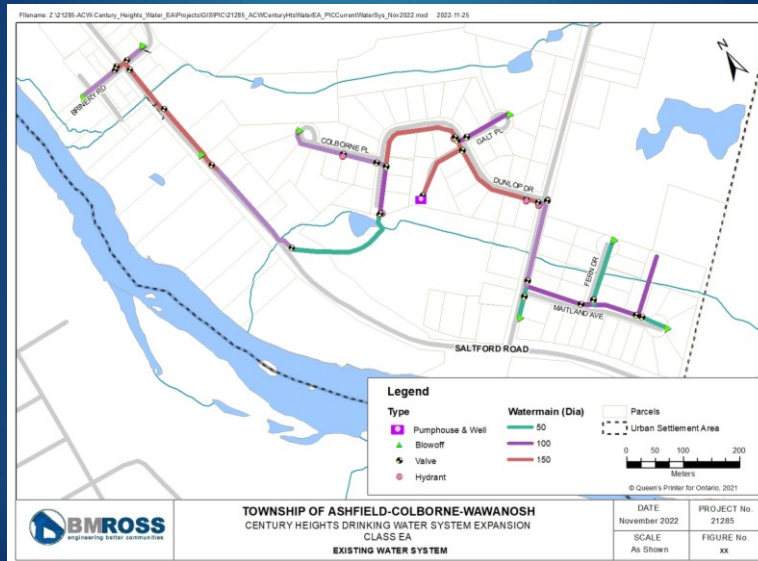
# Existing Century Heights Water System

- ▶ Well 1 (4.2 L/s) + Well 2 (4.3 L/s) = 8.5 L/s; currently no redundancy.
- ▶ Wells are GUDI (Groundwater Under Direct Influence).
- ▶ Treatment building at Well 1/2 site is also designed for 8.5 L/s.
- ▶ 85 properties are currently serviced ~ 225 people
- ▶ The existing Average Day Flow (ADF) and Max Day Flow (MDF) values were determined as **104** and **382 m<sup>3</sup>/day**, respectively.
- ▶ The system currently does not have any fire protection or water storage.



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# Existing Supply Cont'd



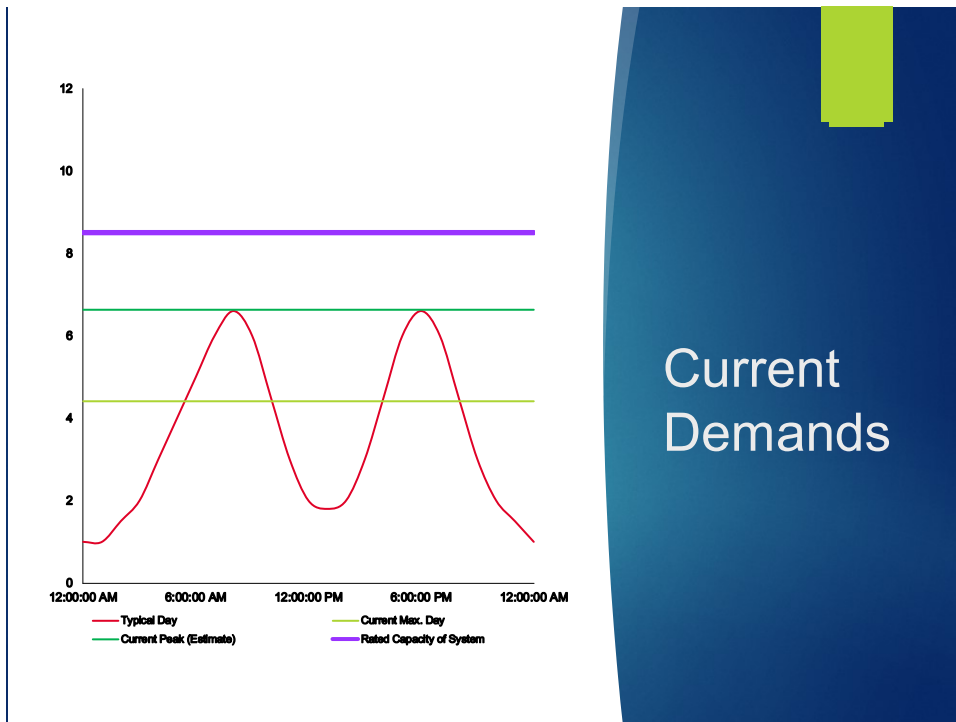
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# Projecting Growth

- ▶ There are 77 existing properties within the Official Plan boundary of Century Heights/Saltford that are not currently serviced by the water system ~ 204 people
- ▶ There are also a number of proposed developments and properties that are likely to be developed in the area, these include:

Development	# of Properties
Saltford Heights	66
Saltford Estates	30
Lamb property	60
Total	156

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## Projecting Demands


- ▶ Generally, the approach for determining future water demands was as follows:
  - ▶ Do not include any of the currently unserved properties.
  - ▶ New development properties to have similar demands as current customers.
    - ▶ Average day demand = 1.22 m<sup>3</sup>/d/customer
    - ▶ Maximum day demand = 4.5 m<sup>3</sup>/d/customer

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## Projecting Demands

- ▶ Adding 156 customers to the system will increase flows by:
  - ▶ Maximum day flow ~ 702 m<sup>3</sup>/d or 8.1 L/s
  - ▶ Peak day flow ~ 1140 m<sup>3</sup>/d or 13.2 L/s
- ▶ Therefore projected future flows are:
  - ▶ Maximum day flow ~ 1084 m<sup>3</sup>/d or 12.5 L/s
  - ▶ Peak day flow ~ 1752 m<sup>3</sup>/d or 20.3 L/s

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## Effect of Water Storage

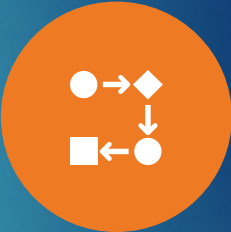
- ▶ Without storage, the current wells can support approximately 15 new customers.
- ▶ If storage was added to the system, the current wells could support approximately 75 new customers.
- ▶ Since  $75 < 156$ , storage alone is not enough and additional water supply is required.

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## Current System Deficiencies



Some customers have reported poor water pressures.



Some smaller watermain diameters will act as "bottlenecks"

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## Problem Development

- ▶ The low pressures and smaller diameter watermains can be improved by replacing certain watermain and by upgrading the well pumps. Provided these works are carried out on lands owned by the Township, they do not require a Class EA; rather, they are pre-approved through the Township's Drinking Water Works Permit.
- ▶ The main problem that remains is the water supply deficiency.

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## Problem Definition

- ▶ *The Century Heights Drinking Water System does not have sufficient water supply to service anticipated future developments.*

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## Alternative Solutions

1

Expand  
existing wells

2

Construct a  
new well

3

Do Nothing

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## Evaluation of Alternatives

1. Expand Existing Well
  - ▶ Existing casings have physical limitations
  - ▶ Drawdown of existing wells could impact adjacent wells and expose the upper water bearing zones
  - ▶ Would require major upgrades to existing treatment plant.
  - ▶ Not considered a practical or feasible solution.

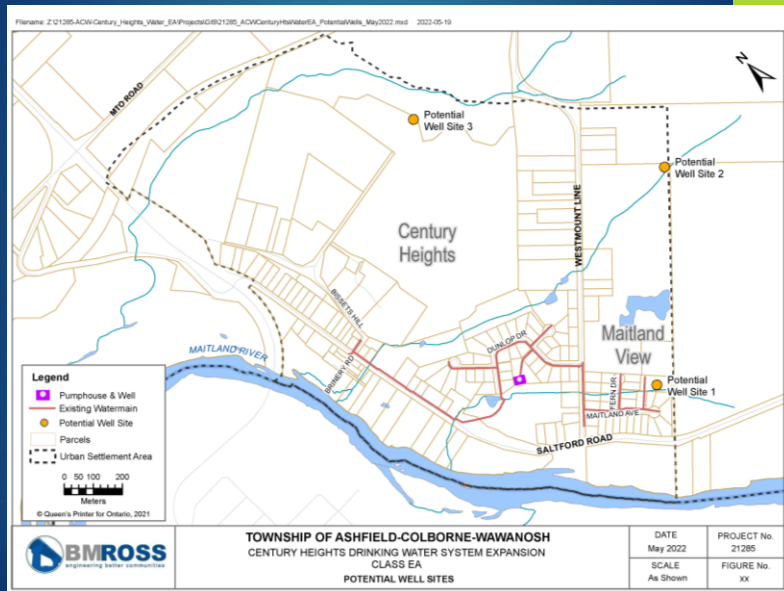
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# Alternative 2 – New Well Supply

- ▶ Construct a new well at a new site
  - ▶ Will require drilling a test well
- ▶ Considerations:
  - ▶ Potential for sufficient water supply
  - ▶ Ability to connect to existing system
  - ▶ Remote from existing wells provides some redundancy
  - ▶ Impacts related to Source Water Protection
  - ▶ Potential for GUDI well

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# New Well Supply



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# Evaluation of Well Sites

WELL SITE	ADVANTAGES	DISADVANTAGES
1	<ul style="list-style-type: none"> <li>Former well at this site had specific capacity values of 13 to 22 gpm/ft.</li> <li>Greater potential to secure needed yields.</li> <li>Less impactful to future development.</li> <li>Near connection point to existing system</li> <li>Site is municipally owned.</li> </ul>	<ul style="list-style-type: none"> <li>Any properties within 100 m of the well with septic systems will require inspection under Source Water policy.</li> <li>Potential for GUDI conditions</li> <li>May require upgrades to existing watermain to supply development areas.</li> </ul>
2	<ul style="list-style-type: none"> <li>Remote from existing well</li> <li>Less potential for GUDI conditions</li> <li>Site is at a relatively high elevation</li> </ul>	<ul style="list-style-type: none"> <li>Potential yield suspected to decline away from the Maitland River.</li> <li>Per the Source Policy Plan new lots cannot be established within 100 m of the proposed well – will impact development.</li> <li>Will require easement/ driveway to access site.</li> <li>Site is privately owned</li> </ul>
3	<ul style="list-style-type: none"> <li>Less potential for GUDI conditions</li> </ul>	<ul style="list-style-type: none"> <li>Per the Source Policy Plan new lots cannot be established within 100 m of the proposed well – will impact development.</li> <li>Potential yield suspected to decline away from the Maitland River.</li> <li>Will require easement/ driveway to access site.</li> <li>Site is privately owned.</li> <li>Too remote from existing well/distribution system</li> </ul>

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## Preferred Well Site

- ▶ Well Site 1 is preferred site for test well
  - ▶ Greatest potential for required yield
  - ▶ Is a municipally-owned site
  - ▶ Near an existing connection point to the system
  - ▶ Good site access

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## Test Well

- ▶ Proceeded with installing a new test well at Well Site 1
- ▶ Details of new well:
  - ▶ Total depth – 76.2m
  - ▶ Top 35.7m is cased into the bedrock.
  - ▶ Bottom (40.8 – 74.7m) had a slotted casing installed to protect against unstable bedrock.
- ▶ Well has a safe yield of 14.2 L/s
- ▶ Water quality is similar to Well 1/2
- ▶ Initial indication is non-GUDI

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## New Well Supply Cont'd

- ▶ Once treatment is constructed and a well pump installed, total system capacity will be:  $8.5 + 14.2 = 22.7$  L/s
  - ▶ I.e.  $22.7 \text{ L/s} > 20.3 \text{ L/s}$
- ▶ This would be sufficient for all development discussed earlier.
- ▶ If storage is added to Well 3 site, it alone would be sufficient and Well 1 and 2 site could be abandoned
  - ▶ I.e.  $14.2 \text{ L/s} > 12.5 \text{ L/s}$

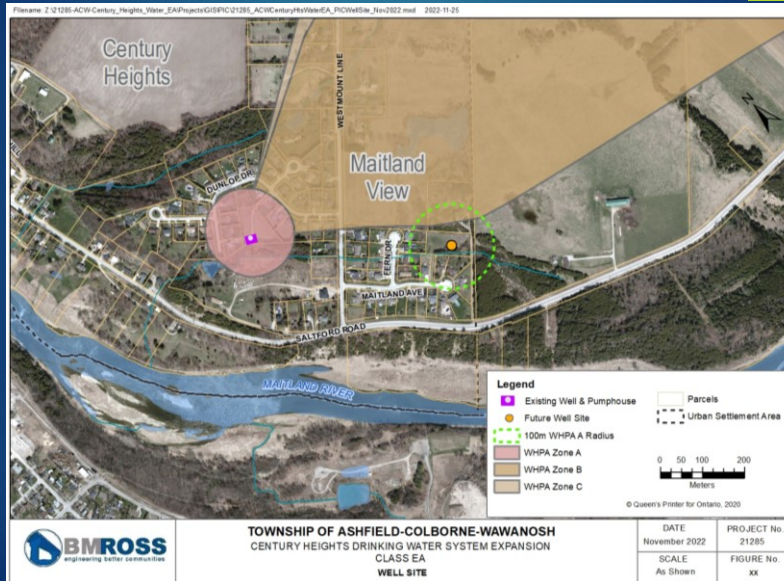
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# Source Water Protection

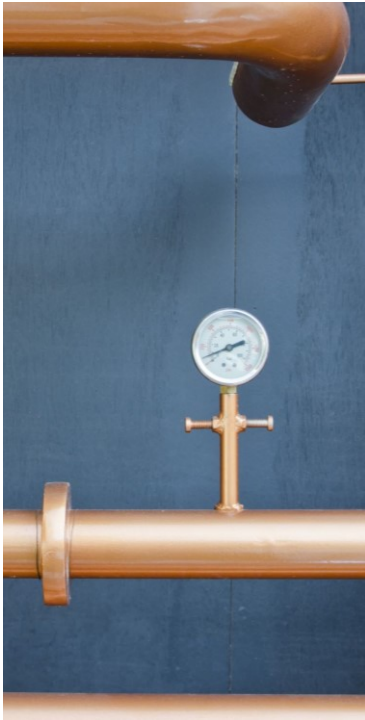
- ▶ Area is within Maitland Valley Source Protection Area
- ▶ Policies in place to protect municipal sources of drinking water.
- ▶ Potential impacts to existing properties within WHPAA (100 m radius from well).
  - ▶ Existing septic systems required to be inspected on a 5-year basis.
  - ▶ Where 250 L to 2500 L of fuel (furnace oil, diesel, gas) is stored, a Risk Management Plan will be required
  - ▶ Storage/handling of 25 L + of DNAPLS will require a Risk Management Plan.

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# Wellhead Protection Area 'A'



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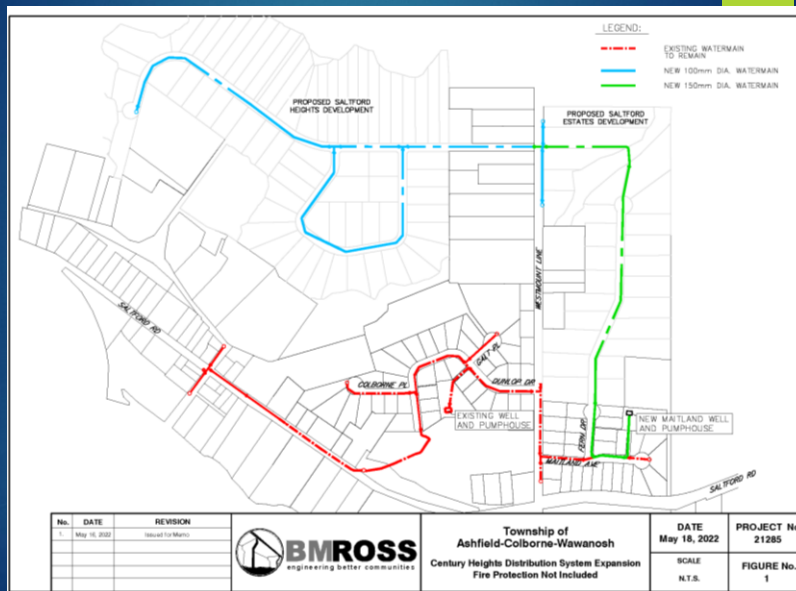


# Solutions

- ▶ The water system was modelled using WaterCAD to project future pressures and flows that will be available.
- ▶ Multiple alternatives were modelled to determine best watermain routing and options to increase pressure.
- ▶ A number of customers currently experience < 275 kPa pressure. MECP recommends >275 or ideally >480 kPa.
- ▶ By installing a larger pump in existing Wells 1 and 2, the overall system pressure could be increased so that all customers would have > 275 kPa and many would be > 400 kPa.

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# Solutions Cont'd



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## Costs and Timing

- ▶ Majority of project costs expected to be attributed to future development.
  - ▶ Costs will be paid through development charges
- ▶ If there are upgrades that benefit existing users, those costs are expected to be paid through rates and reserves.
- ▶ Following completion of the EA, design will occur in 2023 and construction in 2024.

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## Next Steps

- ▶ Collect and review input from the Public Meeting.
- ▶ Incorporate changes (if any) to the information provided earlier and re-evaluate alternatives if required.
- ▶ Complete Wellhead delineation and modeling work
- ▶ Final selection of a preferred alternative.
- ▶ Prepare a draft report and circulate to interested parties.
- ▶ Compile comments received.
- ▶ Incorporate comments into a final report.
- ▶ Provide notice of completion to review agencies and the public.
- ▶ Design, approvals (including Source Water amendments)

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## Questions?

Please submit any questions or comments by December 14, 2022 to Lisa Courtney at BMROSS [lcourtney@bmross.net](mailto:lcourtney@bmross.net)

519-524-2641

Thank you.

## Lisa Courtney

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**From:** [REDACTED]  
**Sent:** March 15, 2022 2:16 PM  
**To:** lcourtney@bmross.net  
**Subject:** ACW Century Heights Drinking Water

Lisa: Couple of questions..

- 1) How is it determined that there is sufficient water to expand the system?
- 2) Do ANY costs of a proposed expansion be apportioned to the existing users?

[REDACTED]



## Lisa Courtney

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**From:** [REDACTED]  
**Sent:** March 16, 2022 10:04 AM  
**To:** lcourtney@bmross.net  
**Subject:** ACW MCEA Process

Good Morning Lisa,

I received notification of the above process taking place for the possible expansion of the Century Heights Drinking Water System. I would like to receive further information and review the process. Would you please forward the information to me.

Thank you,

[REDACTED]  
Goderich, ON  
N7A 3Y1  
[REDACTED]

Sent from my iPad

**Lisa Courtney**

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**From:** [REDACTED]  
**Sent:** March 30, 2022 6:45 PM  
**To:** lcourtney@bmross.net  
**Subject:** Expansion of the Century Heights Drinking Water System

Hello Lisa,

I recently received the Notice of Commencement for the Assessment for expanding the Drinking Water System in Century Heights.

I am wondering, following the assessment will this result in an expense to those of us already on this water system? I am aware that there are multiple plans for development in our area and that those areas will require a solution, however I am looking for additional information on what this means for the homeowners on this system already.

I am happy to discuss this if that is easier for you. My number is [REDACTED]

Thank you.

March 28, 2022

Lisa Courtney, Environmental Planner  
B.M. Ross & Associates  
62 North Street  
Goderich, ON N7A 2T4

Delivered Via E-mail to:  
[lcourtney@bmross.net](mailto:lcourtney@bmross.net)

Re: MCEA – Century Heights Drinking Water System, Saltford, ACW Township

Dear Lisa:

We wish to thank-you for the opportunity to provide comments re: the above noted MCEA Process. Please be advised that the below comments relating to this process were formally submitted as part of a letter dated March 3, 2022 (from 7 neighbouring property owners) to ACW Township and the County of Huron as part of the public consultation re: Plan of Subdivision 40T21003, Ashfield-Colborne-Wawanosh and Zoning By-law Amendment No. Z10/2021:

*Condition of Support & Approval:* As a neighbour to two proposed subdivisions, we are requesting written confirmation that we will not be required to connect to any municipal well or water systems resulting from these subdivisions or any future housing developments in Saltford. This will ensure that we retain the quality and autonomy of our existing wells. Should this become a requirement, it shall be at the sole expense of the subdivision developer(s).

*Information Request:* It was understood from the Public Meeting that additional feedback and recommendations from MVCA following a hydrogeology peer review are pending. Once completed, we are requesting that more information be provided to neighbours regarding the impacts from 66 new septic systems, ground water, drainage and storm water management.

Additional information is also requested regarding the recommended best practices to protect and manage the 'Significant Groundwater Recharge Area (SGRA)' where the subdivision is being proposed.

Yours truly,

[Redacted signature block]

**Lisa Courtney**

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**From:** [REDACTED]  
**Sent:** April 4, 2022 10:17 AM  
**To:** lcourtney@bmross.net; cbo@acwtownship.ca  
**Cc:** gmcneil@acwtownship.ca; bvanstone@acwtownship.ca; [REDACTED]  
**Subject:** Notice of Commencement - Municipal Class Environmental Assessment (Century Heights)  
**Attachments:** Notice of Commencement - Century Heights (1).pdf

Good morning,

As residents of Century Heights, we are asked to write our concerns/suggestions regarding the NOTICE OF COMMENCEMENT - Municipal Class Environmental Assessment of Century Heights issued on March 9th, 2022 from Brett Pollock, Chief Building Official of ACW. The letter suggested public input and comments are invited before April 8th, 2022. Please find the attached document regarding these concerns or suggestions.

Thanks.

[REDACTED]

Deliver to Via Email to:

[lcourtney@bmross.net](mailto:lcourtney@bmross.net) (Environment Planner)

[cbo@acwtownship.ca](mailto:cbo@acwtownship.ca) (Brett Pollock *Chief Building Official*)

[gmceil@acwtownship.ca](mailto:gmceil@acwtownship.ca) (Glen McNeil - Mayor ACW)

[bvanstone@acwtownship.ca](mailto:bvanstone@acwtownship.ca) (Bill Vanstone - Councillor)

**Re: Municipal Class Environmental Assessment (MCEA) process (Century Heights Drinking Water System).**

As neighbours to the proposed NOTICE of COMMENCEMENT, we wish to provide comments/concerns regarding the investigation of the expansion of Century Heights Drinking Water System in the community of Saltford.

**Comments / Concerns:**

- *We are requesting more information to be provided to neighbours regarding the impacts from additional new septic systems, ground water, drainage and stormwater management. Additional information is also requested regarding the recommended best practices to protect and manage the 'Significant Groundwater Recharge Area (SGRA)' where the subdivision is being proposed.*
- *A written confirmation that we will not be required to connect to any municipal well or water systems resulting from these subdivisions or any future housing developments in Saltford. This will ensure that we retain the quality and autonomy of our existing wells. (In some cases, existing wells have been upgraded within the last 2 years). Should this become a requirement, it shall be at the sole expense of the subdivision developer(s).*
- *A written confirmation that appropriate and effective mitigation of storm water and drainage infrastructure is constructed that will prevent potential flooding into adjacent existing properties, especially between or behind house's [REDACTED] and [REDACTED] where a swale is located.*
- *A written confirmation of an updated ground water vulnerable score is conducted to ensure that it is within a safe range to build a subdivision in Saltford Heights.*
- The gravel pit is home to many wildlife species. A more in-depth study is requested to further study the impacts on the natural habitats, microhabitats and the possibility of endangered species located in the area (especially, when the gravel pit has been left untouched).
- *How does the gravel pit effect the existing ground water and drainage issues into the field area behind existing homes or where the subdivision is proposing to develop new lots?*
- Does this study recognize the addition of a 66 detached residential subdivision West of Westmount Line and the addition of a 25-30 home subdivision proposed for the east side of Westmount line?

[REDACTED]

[Type here]

Dec 1 / 22

I am writing this letter in regards to the planned land change -Conc 1 WD PT Lot Colborne ,Township of Ashfield-Colborne- Wawanosh (81316 Westmount Line)

My wife and I purchased our home at [REDACTED] in June of 2012.

Our water supply is from a shallow dug well approx. 12 feet deep (4-5 meters)

This well has supplied adequate volume of water for our family use since 2012 and to our knowledge several neighbours have similar wells.

If the construction of this new development interferes with the aquifers and disrupts our water supply who is responsible.

The water supply which is spring fed for many years and has been more than adequate

My wife and I are 75yrs old and are not very tech savvy.Hope this letter conveys our concerns

[REDACTED]  
[REDACTED]



**Ministry of the Environment,  
Conservation and Parks**

**Ministère de l'Environnement,  
de la Protection de la nature  
et des Parcs**

Environmental Assessment  
Branch

Direction des évaluations  
environnementales

1<sup>st</sup> Floor  
135 St. Clair Avenue W  
Toronto ON M4V 1P5  
**Tel.:** 416 314-8001  
**Fax.:** 416 314-8452

Rez-de-chaussée  
135, avenue St. Clair Ouest  
Toronto ON M4V 1P5  
**Tél. :** 416 314-8001  
**Télééc. :** 416 314-8452

*Via E-mail Only*

January 12, 2024

Lisa Courtney  
Environmental Planner  
B. M. Ross and Associates Limited  
lcourtney@bmross.net

**Re: Expansion of Century Heights Drinking Water System  
Township of Ashfield-Colborne-Wawanosh  
Municipal Class Environmental Assessment – Schedule B  
Project Review Unit Comments – Draft Project File Report**

Dear Lisa Courtney,

Thank you for providing the ministry with an opportunity to comment on the draft Project File Report (Report) for the above noted Class Environmental Assessment (EA) project. Our understanding is that in order to increase the existing drinking water supply and expand the distribution system, the Township of Ashfield-Colborne-Wawanosh (the proponent) has determined that the preferred alternative is to install a new supply well at the municipally-owned Maitland well site, including construction of a treatment building, allowing for continued operation of the existing wells while the new well is constructed. The Ministry of the Environment, Conservation and Parks (ministry) provides the following comments for your consideration.

**General**

- 1) The proponent could consider listing the names of Appendices A-D in the Table of Contents for the Report.

## **Evaluation of Alternatives**

- 2) Table 4.3 in Section 4.4.2 of the Report identifies "*Groundwater resources*" as a sub-component of the Natural Environment component, but this sub-component is not included in the Evaluation of Alternative Solutions in Table 4.5. If groundwater resources were considered as part of the evaluation of alternatives as indicated then Table 4.5 should be revised to clarify how this sub-component was analyzed.

## **Notice of Completion**

- 3) When the Project File Report is finalized please ensure that the Notice of Completion for the project is published in two (2) separate issues of the same newspaper in order to meet the mandatory minimum requirements for public consultation described in Section A.3.5 of the Municipal Class EA parent document.

## **Indigenous Engagement**

- 4) The proponent should continue to engage with all communities that have been engaged with to date as the Class EA process proceeds.

## **Groundwater**

- 5) Based on the results of the 72-hour constant rate pumping test carried out in October 2022, the ministry agrees that Well 3 can be expected to sustain a long-term yield of 850 L/min (14.2 L/s). Combined with water produced by the existing Wells 1 & 2 (maximum 8.5 L/s), the yield from proposed Well 3 is sufficient to meet the anticipated maximum peak flow for the Century Heights Drinking Water System (up to 20.3 L/s).
- 6) It is understood that Well 3 was determined to be not Groundwater Under Direct Influence of surface water (GUDI), based in part on a theoretical estimate of the groundwater capture zone for the well. In contrast, it is understood that a more conservative approach was used in the GUDI assessment for Wells 1 and 2, which considered the possibility that solution features and horizontal fractures in the upper limestone layers could rapidly transport river water to the wells. Given that all three wells are completed in a similar geological unit and located a similar distance from the Maitland River, the concerns identified for Wells 1 & 2 are also applicable to Well 3. Accordingly, additional assessment work may be warranted to evaluate the GUDI status of Well 3. Any additional assessments of Well 3 should also consider the potential for GUDI conditions to exist during seasonal high-water or flood events in the Maitland River.
- 7) Given that Well 3 is to be pumped at a rate greater than 50,000 L/day, a Permit to Take Water will be required prior to the well being put into service. As part of the Permit to Take Water application process, the ministry will complete a more detailed review of the pumping test results and assessment of potential impacts to other groundwater users and/or the environment. Any additional monitoring and/or reporting requirements will be evaluated at that time.

- 8) The proposed system expansion will be subject to the applicable legislation under the Ontario *Clean Water Act*, which will require an update of the assessment report and source protection plan to incorporate the new wellhead protection areas for Well 3. It is understood that the modelling report prepared by Matrix Engineering will undergo a detailed technical review during the approval process for the updated source protection plan documents.

### **Source Water Protection**

- 9) The project is located in the Maitland Valley Source Protection Area and may therefore be subject to applicable policies of the approved Maitland Valley Source Protection Plan. The new well has been potentially sited and the Maitland Well Site (Site 1) is preferred. The vulnerable areas of the preferred new well site include a Significant Groundwater Recharge Area (SGRA) and Wellhead Protection Area E (WHPA-E) with a score of 7.2. The expansion of the drinking water system itself is not a significant drinking water threat; however, other activities associated with the construction, maintenance, or operation of a new well may be moderate drinking water threats.

#### Activities that may be moderate low threats

##### WHPA-E (7.2)

- Handling/storage of fuel
- Handling/storage of DNAPL
- Application of road salt
- Handling/storage of road salt
- Stormwater infiltration and outfall
- Storage of snow

None of the identified threat activities trigger any source protection policies. Please visit the best practices for source water protection resource at [Ontario.ca](http://Ontario.ca) for further guidance.

- 10) The report discussed source water protection thoroughly and correctly identifies aspects of the Maitland Valley Source Protection Plan and the need to re-delineate vulnerable area and amend the source protection plan. However, the identification of potential drinking water threats is discussed only in relation to those significant drinking water threats that may exist once the new well is established. The report should identify all potential threats to drinking water (significant/moderate/low) associated with the project work itself. The ministry recommends that the proponent revise the report to include a general summary of activities associated with the construction and operation of the drinking water system that may pose a risk to sources of drinking water as they relate to the [tables of drinking water threats](#) as outlined in the *Clean Water Act, 2006* and ensure recommended mitigation measures are noted in the document.
- 11) In addition, there may be other kinds of drinking water systems present that are not explicitly addressed by the source protection plan. The proponent should also determine if any other types of drinking water systems could be affected during the construction or operation of the project that are not explicitly addressed in source protection plans, such as private systems –

individual or clusters, and designated facilities within the meaning of O. Reg. 170/03 under the *Safe Drinking Water Act* – i.e., camps, schools, health care facilities, etc.

12) Ontario Regulation 205 made under the *Safe Drinking Water Act, 2002* took effect on July 1, 2018. The key requirements include:

- Owners of municipal residential drinking water systems within source protection areas under the CWA must ensure work to assess the vulnerability of new or expanding drinking water systems is completed, and accepted by the local source protection authority, before they can apply for a drinking water works permit.
- Owners cannot provide water to the public from new or expanding drinking water systems until the local source protection plan has been updated to include these systems and it has been approved.
- This requirement does not apply if the new or expanded system is necessary to address emergency situations.

To support the implementation of this new regulation, complementary regulation amendments to the General regulation under the *Clean Water Act, 2006* were posted on April 5, 2018. These amendments require the source protection authority to issue a notice to a drinking water system owner when they have received, and are satisfied with, vulnerable area information for any new or expanding drinking water system where it differs from existing vulnerable areas. The notice must also identify what changes to the source protection plan are required.

To ensure that these regulations do not cause unnecessary delays for municipalities, it's important for municipalities and drinking water system owners to engage the local source protection authority project manager in the early stages of planning for new or expanding drinking water systems. The project manager will be able to assist with identifying whether the proposed project will require new technical work and amendments to the vulnerable areas or policies in the source protection plan, and also with identifying whether an activity associated with the construction or operation of the project may be considered to be a drinking water threat as per the legislation.

Taking these regulatory changes into consideration during the Class Environmental Assessment will allow for adequate time to plan and incorporate of these systems into source protection plans. Furthermore, undertaking vulnerable area work during the Class EA process allows for adequate consideration and consultation on the potential impacts of source protection policies on businesses and landowners.

A list of the prescribed drinking water threats can be found in [section 1.1 of Ontario Regulation 287/07](#) made under the *Clean Water Act, 2006*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional “local” threat activities, as approved by the MECP.

The [Source Protection Information Atlas \(SPIA\)](#) is publicly available and can be used to locate delineated vulnerable areas in Ontario, vulnerability scores, and directly links to associated threats and the relevant Source Protection Plan.

## Species at Risk

13) Section 4.5 of the Report states that the site has a small footprint within a previously disturbed area and that no species at risk are present at the site. However, it is not clear whether any natural heritage site assessment was completed to determine this.

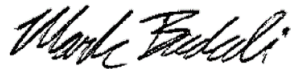
Please note that it is the responsibility of the proponent to ensure that Species at Risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the proposed activities to be carried out on the site. If the proposed activities cannot avoid impacting protected species and their habitats, then the proponent will need to apply for an authorization under the *Endangered Species Act* (ESA). If the proponent believes that their proposed activities are going to have an impact or are uncertain about the impacts, they should contact [SAROntario@ontario.ca](mailto:SAROntario@ontario.ca) to undergo a formal review under the ESA.

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Thank you for circulating this draft Report for the ministry's consideration. Please document the provision of the draft Report to the ministry as well as this Project Review Unit Comments letter in the final report, and please provide an accompanying response letter to support our review of the final report. A copy of the final Notice should be sent to the ministry's Southwest Region EA notification email account ([eanotification.swregion@ontario.ca](mailto:eanotification.swregion@ontario.ca)).

Should you or any members of your project team have any questions regarding the material above, please contact me at [mark.badali1@ontario.ca](mailto:mark.badali1@ontario.ca).

Sincerely,



Mark Badali  
Senior Project Evaluator  
Environmental Assessment Program Support, Environmental Assessment Branch  
Ontario Ministry of the Environment, Conservation and Parks

cc John Ritchie, Manager, Owen Sound District Office, MECP  
Monika Macki, Regional Environmental Planner, Project Review Unit, MECP

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saugeenojibwaynation.ca



January 30, 2024]

**SENT VIA EMAIL**

Township of Ashfield-Colborne-Wawanosh  
% Brent Pollock cbo@acwtownship

**VIA**

Lisa J. Courtney, MSc., MCIP, RPP  
B. M. Ross and Associates Limited  
Engineers and Planners

Email: lcourtney@bross.net

**Re. Saugeen Ojibway Nation conditions for ACW (Ashfield-Colborne-Wawanosh) Century Heights Water Expansion, a Expansion of Municipal Water Supply by Township of Ashfield-Colborne-Wawanosh**

The Saugeen Ojibway Nation (“SON”) Environment Office and Township of Ashfield-Colborne-Wawanosh entered into a Letter of Agreement (“LOA”) on August 19, 2022, with respect to our mutual goal to set out a consultation and accommodation framework regarding the proposed **Century Heights Water Expansion** development in SON’s Territory. As the Township of Ashfield-Colborne-Wawanosh is already aware, SON’s Territory has been significantly altered through ongoing development pressure. Over the past few decades, the SON has seen a decline in biodiversity and an erosion of healthy ecosystems, resulting in the undermining of SON’s rights, culture and way of life. The individual and cumulative impacts from projects on the SON’s Territory are ongoing concerns for us, as we strive to maintain our relationships with the land and waters, which we have used and protected for time immemorial.

The LOA supported SON’s participation in and input into the technical assessments undertaken as part of the **Century Heights Water Expansion** application process. More specifically, the LOA allowed SON and the Township of Ashfield-Colborne-Wawanosh to identify a plan for addressing any potential impacts of the **Century Heights Water Expansion** on SON’s lands and constitutionally protected Aboriginal and Treaty rights, proven and asserted, including SON’s land claims. This enabled a process that ensured appropriate and meaningful consultation and accommodation of SON’s rights and interests throughout the life of the Proponent’s proposed operation.



## **Township of Ashfield-Colborne-Wawanosh Century Heights Water Expansion -**

### **Description**

The Township of Ashfield-Colborne-Wawanosh initiated a Municipal Class Environmental Assessment (MCEA) study in March 2022 to investigate expanding the Century Heights Drinking Water System in the community of Salford. The current system (Century Heights Water System) services 84 properties from a groundwater supply. An expansion of the existing drinking water system is required to accommodate future development within the urban settlement area which includes the proposed Salford Heights subdivision. The MCEA was carried out to investigate options and potential impacts with respect to increasing the existing drinking water supply and expanding the distribution system.

Additional future demand will include 156 additional properties. The increased demand would require 20.3 L/s peak flow and with a maximum average of 12.5 L/s.

As per the LOA, SON Environment Office has conducted a peer review of the following documents to measure the impact of the development on SON's Indigenous rights and interests:

### **List the reports that were peer reviewed**

Township of Ashfield-Colborne-Wawanosh, Municipal Class Environmental Assessment for Expansion of Century Heights Drinking Water System – Environmental Screening Report prepared by B.M. Ross and Associates Limited (November 29, 2023)

Evaluation of Well 3 Century Heights Drinking Water System, Township of Ashfield-Colborne-Wawanosh prepared by Ian D. Wilson Associates Ltd. (November 21, 2022)

Preliminary Wellhead Protection Area Delineation and Vulnerability Scoring, Century Heights Well 3, Community of Salford, Ontario prepared Matrix Solutions Inc., A Montrose Environmental Company (November 2023)

### **Additional Information Review**

MECP Water Well Database Map: Well records | ontario.ca

Ontario Geological Survey (OGS) Surficial Geology OGSEarth (gov.on.ca)

### ***Hydrogeological Technical Review Summary***

The hydrogeological characterization presented in the reviewed reports is sufficiently detailed to provide the technical foundation for assessing the potential capture zone of the proposed well. In addition, the characterization provides enough detail to determine the potential groundwater/surface water linkages to the various ecological receptors.

The results from the pumping test indicate that the predicted groundwater level decline at the Maitland River would not be sufficient to decrease the overall groundwater level below the surface water elevation. This would indicate that groundwater discharge to the surface water or groundwater levels within the adjacent riparian zone would not be impacted. This interpretation is subsequently confirmed by the computer modeling (Figure 2) which shows there is no capture of groundwater/surface water associated with the Maitland River.

Based on the thickness of low permeable clay overburden there is hydraulic isolation between the bedrock aquifer and the ecological units in the vicinity of the wells and further east. As such, there are no expected impacts on any groundwater related function to these units from the pumping of the Well 3.

### ***Hydrogeological Technical Review Recommendations***

**Based on the assessment of the available hydrogeologic information, the results of the pumping test and the computer modeling we would conclude there will be no impacts from the pumping of the proposed Well 3 on the Maitland River and surficial ecological units.**

**Upon completion of the technical review, SON Environment Office has determined that the proposed Project may be approved. SON does not have any recommendations at this time.**

Miigwetch,

A handwritten signature in blue ink, appearing to be 'C. D.', is positioned below the text 'Miigwetch,'.

Manager, Resources and Infrastructure,  
Environment Office of the Saugeen Ojibway Nation

Cc' Karen Heisler, Resource and Infrastructure Associate, SON Environment Office

Enclosure: Century Heights (Saltford) Water Supply, Township of Ashfield-Colborne-Wawanosh  
Huron County, Ontario, Hydrogeological Technical Review Prepared for: Saugeen Ojibway  
Nation Environment Office Prepared by: Bill Blackport. Blackport & Associates, Advisor,  
Hydrogeology, SON Environment Office

**Century Heights (Saltford) Water Supply  
Township of Ashfield-Colborne-Wawanosh  
Huron County, Ontario  
Hydrogeological Technical Review**

*Prepared for:*

**Saugeen Ojibway Nation Environment Office**

*Prepared by:*

**Bill Blackport  
Blackport & Associates  
Advisor, Hydrogeology, SON Environment Office**

**Date: January 29, 2024**

**Re: Water Supply Municipal Class Environmental Assessment (MCEA)**

This memo assesses the hydrogeology/hydrology factors related to the proposed development.

**1. Technical Review Background**

Reviewed Documents Provided to the SON Environment Office

This memo is based on my review of the following documents:

- Township of Ashfield-Colborne-Wawanosh, Municipal Class Environmental Assessment for Expansion of Century Heights Drinking Water System – Environmental Screening Report prepared by B.M. Ross and Associates Limited (November 29, 2023)
- Evaluation of Well 3 Century Heights Drinking Water System, Township of Ashfield-Colborne-Wawanosh prepared by Ian D. Wilson Associates Ltd. (November 21, 2022)
- Preliminary Wellhead Protection Area Delineation and Vulnerability Scoring, Century Heights Well 3, Community of Saltford, Ontario prepared Matrix Solutions Inc., A Montrose Environmental Company (November 2023)

Additional Information Review

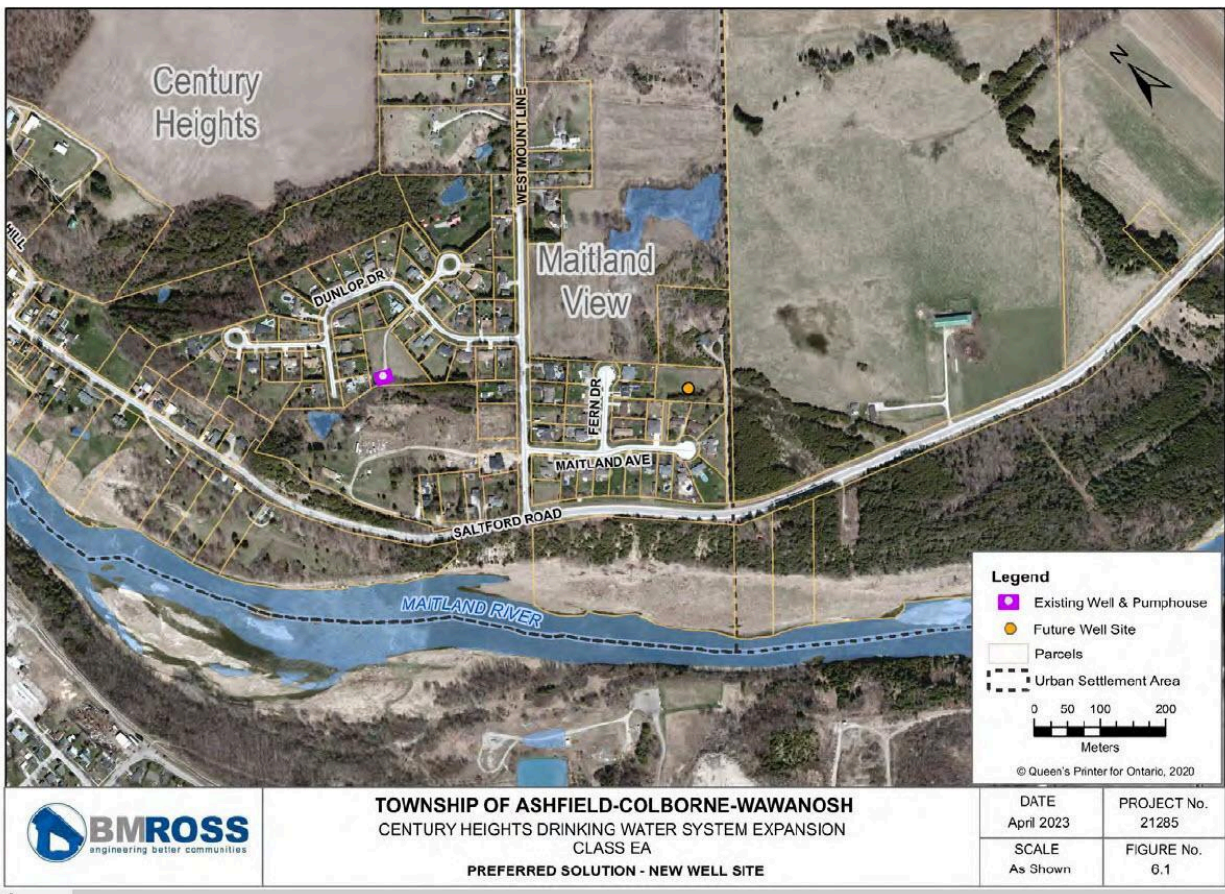
In addition to the review of the documents listed above I have reviewed the following information sources:

- MECP Water Well Database [Map: Well records | ontario.ca](https://www.ontario.ca/en/gov/service/water-well-reports)

- Ontario Geological Survey (OGS) Surficial Geology [OGSEarth \(gov.on.ca\)](http://OGSEarth.gov.on.ca)

## 2. Key Findings

The following are the key findings presented in the above noted reports. The specific purpose of this review was to assess the potential groundwater/surface water interaction impacts on the Maitland River and adjacent riparian zone resulting from groundwater taking of the proposed water supply.



**Figure 1 Location of Proposed Water Supply Well**

### MECA Report Findings/Documentation

The Township of Ashfield-Colborne-Wawanosh initiated a Municipal Class Environmental Assessment (MCEA) study in March 2022 to investigate expanding the Century Heights Drinking Water System in the community of Salford. The current system (Century Heights Water System) services 84 properties from a groundwater supply. An expansion of the existing drinking water system is required to accommodate future development within the urban settlement area which includes the proposed Salford Heights subdivision. The MCEA was carried out to investigate options and potential impacts with respect to increasing the existing drinking water supply and expanding the distribution system.

Additional future demand will include 156 additional properties. The increased demand would require 20.3 L/s peak flow and with a maximum average of 12.5 L/s. Various options for future water supply included:

- Do nothing and restrict development,
- Construct a new well,
- Expand existing well system,
- Connect to Goderich water and
- Replace groundwater well with a surface water (Lake Huron) supply.

Constructing a new well was chosen as the preferred option and 3 potential well locations were assessed including 2 well sites at Saltford Heights. The final decision selected a site north of Maitland Avenue (Figure 1). The site was chosen based on the higher well yield in the bedrock aquifer to support the proposed future development.

### Pumping Test Report Findings/Documentation

The primary purpose of the proponent's hydrogeological field investigation was to carry out a 72-hour pumping test (October 3-6, 2022) on a newly constructed well (Well 3) to analyze the potential impact of the proposed taking to groundwater resources and impacts to the potential groundwater linkages to the natural environment.

The study area (Figure 1) is divided topographically by the steep, ±20m high bluff forming the eastern and northeastern slope of the Maitland River Valley, the bluff extending along the river from the shore of Lake Huron to the west. The crest of the bluff is located about 200m southwest of Well 3, and the Maitland River is located about 350m southwest of Well 3.

Based on MECP water well records, the overburden in the vicinity of Well 3 ranges in depth between 30.2m and 41.7m, averaging 35.3m. The mapped upper granular deposits at Well 3 are reported to be 1.2m deep, with the balance of the overburden reported to consist fine-grained deposits primarily clay. Portions of the Maitland River floor sit directly on exposed limestone/dolostone bedrock.

Groundwater in the bedrock aquifer is interpreted to flow generally westwards towards Lake Huron.

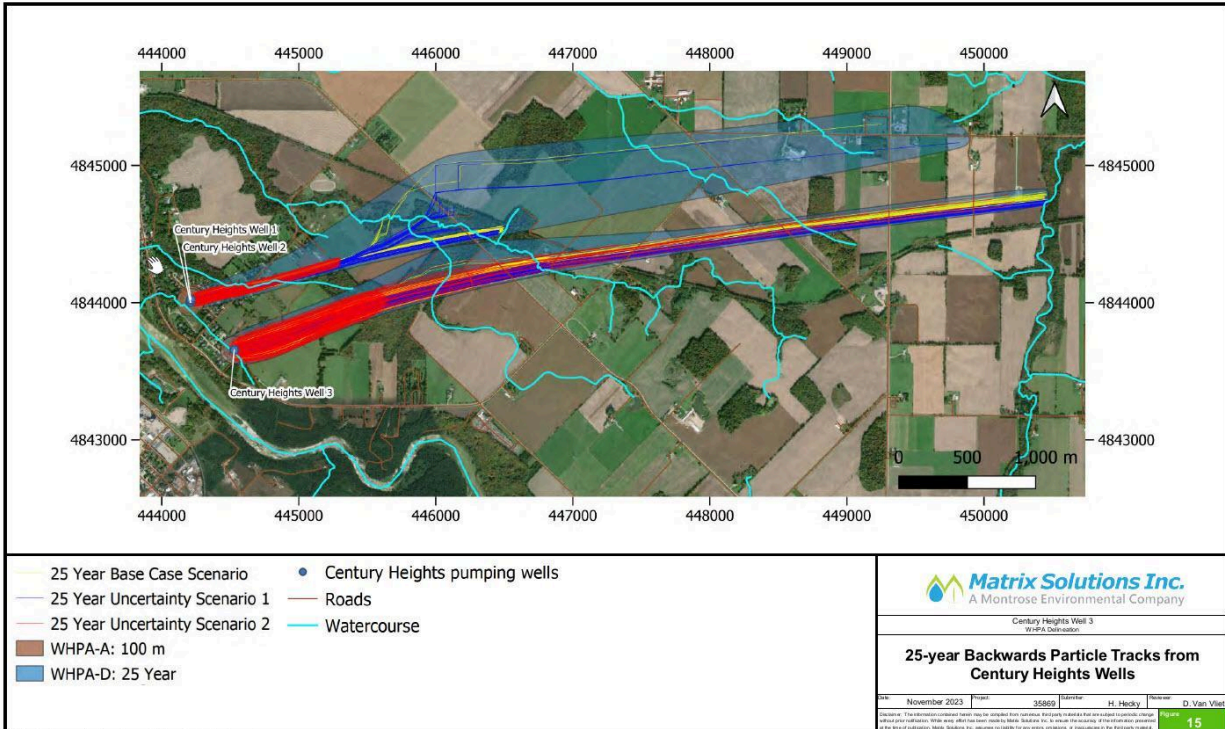
The test well (Well 3) was constructed through 30 m of overburden to a depth of 76.2 m into the limestone bedrock. The steel well casing extends from 0.6 m above grade to 35.7 m below grade. A bedrock liner was required in the test well due to unstable bedrock fracturing below 54.3 m.

During the 72-hour pumping test the low pumping level was determined to be below the approximate surface level of the Maitland River. The observed and calculated water level interference indicates that water levels within 270m of Well 3 will lower about 0.8m as a result of extended pumping withdrawals. As the static level in the aquifer at Well 3 is about 2.5m higher than the approximate level of the river surface, interference of up to 0.8m at the Maitland River will maintain the piezometric surface in the aquifer above the approximate surface water river level between the River and Well 3. As such, potential to draw water from the river to Well 3 is minimized.

### Wellhead Protection Area Delineation



A conceptual hydrogeological model was developed to assess the groundwater flow system in the vicinity of the proposed and existing municipal wells and the related capture zones (ie radius of influence) associated with the pumping of the proposed well. The capture zone for the various wells including Well 3 is presented in Figure 2. It is important to observe that the computer modelling does not indicate connections of the any of wells to the Maitland River.



**Figure 2 Municipal Well Capture Zones**

### 3. Assessment

The hydrogeological characterization presented in the reviewed reports is sufficiently detailed to provide the technical foundation for assessing the potential capture zone of the proposed well. In addition, the characterization provides enough detail to determine the potential groundwater/surface water linkages to the various ecological receptors.

The results from the pumping test indicate that the predicted groundwater level decline at the Maitland River would not be sufficient to decrease the overall groundwater level below the surface water elevation. This would indicate that groundwater discharge to the surface water or groundwater levels within the adjacent riparian zone would not be impacted. This interpretation is subsequently confirmed by the computer modeling (Figure 2) which shows there is no capture of groundwater/surface water associated with the Maitland River.

Based on the thickness of low permeable clay overburden there is hydraulic isolation between the bedrock aquifer and the ecological units in the vicinity of the wells and further east. As such, there are no expected impacts on any groundwater related function to these units from the pumping of the Well 3.

### 4. Outstanding Concerns



There are no outstanding concerns.

## **5. Information / Knowledge Gaps**

There are no significant information or knowledge gaps.

## **6. Conclusions**

Based on my assessment of the available hydrogeologic information, the results of the pumping test and the computer modeling I would conclude there will be no impacts from the pumping of the proposed Well 3 on the Maitland River and surficial ecological units.

## **7. Recommendations**

### Key Recommendations

No water related recommendations are necessary.

### Secondary Recommendations

No water related recommendations are necessary.

Regards



Bill Blackport  
Advisor, Hydrogeology, Saugeen Ojibway Nation Environment Office