



GEMTEC

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**Step 1 Groundwater Under the Direct
Influence of Surface Water (GUDI) Screening
Aroostook Well #1 and Well #2
Aroostook, New Brunswick**



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GEMTEC Project: 103013.006

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March 11, 2026

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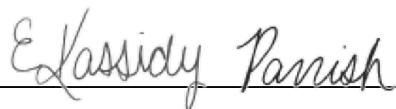
Village of Southern Victoria
1131 West Riverside Drive
Perth-Andover, New Brunswick
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Attention: Dan Dionne

**Re: Step 1 Groundwater Under the Direct Influence of Surface Water (GUDI) Screening
Aroostook Well #1 and Well #2, Aroostook, New Brunswick**

GEMTEC Consulting Engineers and Scientists Limited is pleased to submit this Step 1 Groundwater Under the Direct Influence of Surface Water (GUDI) screening assessment of Aroostook Well #1 and Well #2. If you have any questions or require further details, please do not hesitate to contact the undersigned.

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Environmental Engineer



Kassidy Parrish, P.Eng.
Intermediate Environmental Engineer

CC/kp

Enclosures

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1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by the Village of Southern Victoria (the Village) to complete Step 1 Groundwater Under the Direct Influence of Surface Water (GUDI) Screening assessments for two drinking water supply wells in Aroostook, New Brunswick. This report presents findings for Well #1 and Well #2, which are located at 179 Main Street and 20 Tower Road, respectively. They are situated on the properties identified by Service New Brunswick (SNB) Parcel Identifiers (PIDs) 65118580 and 65052458, respectively, (herein collectively referred to as the “Site”).

A GUDI designation indicates that conditions are such that microbial pathogens can travel from the surface or nearby surface water to the groundwater source. The New Brunswick Department of Environment and Local Government (NBDELG)’s GUDI Screening Protocol (provided in **Appendix A** of this report and referred to herein as the “Protocol”) provides phased guidance on determining the GUDI status of a well (i.e., the potential for a drinking water supply well to be influenced by surface water). The purpose of the Protocol is to help identify groundwater supply sources that are vulnerable to microbial contamination, either continuously or intermittently.

GEMTEC’s scope of services for this Step 1 GUDI Screening included:

- Completing a site visit to evaluate the physical condition of the wells and observe the immediate environs;
- Reviewing available information related to each well and (if any) nearby well construction, historical water chemistry, hydrogeological conditions; and,
- Preparing a GUDI Screening Report (this report), in accordance with the Protocol.

2.0 BACKGROUND

The Protocol specifies that groundwater is considered to be under the direct influence of surface water if that water exhibits:

- A direct hydraulic connection to the surface (i.e., infiltrating precipitation) or surface water by way of local geology and well construction; and/or
- Significant and relatively rapid shifts in water characteristics such as temperature, turbidity, conductivity, pH, and other parameters which closely correlate with climatological events or nearby surface waters; and/or,
- Significant occurrence of insects or other macro-organisms, algae, organic debris or microorganisms including large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*.

The four screening criteria used to determine if a well is non-GUDI, potentially GUDI, or GUDI are as follows:

1. **Sensitive Settings** – the source does not fall into any of the following categories: a spring, an infiltration gallery, a horizontal collection well, a shallow screened well (well depth less than 15 m), a dug well, a well in a karst aquifer, a well in an unconfined aquifer, a well located in a floodplain or flood prone area.
2. **Distance to Surface Water** – The well is located more than 60 m from the nearest intermittent or permanent surface water body. NBDELG defines a water body as water open to the atmosphere and subject to runoff, such as ponds, lakes, rivers, streams, brooks, wetlands, lagoons, reservoirs, estuaries, and potentially ditches.
3. **Well Construction** – The well meets the well construction criteria required by the current version of the *Water Well Regulation (90-79) – Clean Water Act* (Government of New Brunswick, 2025). For example, the casing length must extend a minimum of 6 m below ground surface, the well must have a drive shoe, and the well head and annular seal must prevent surface water from entering the well and migrating within the annular space. If well logs are not available, a downhole camera may be used to confirm well construction details. The construction of other nearby wells (e.g., observation wells) must also be evaluated to determine whether they pose a risk to the water quality in the production well.
4. **Water Quality** – the available raw groundwater quality data has no detections of Total Coliforms or *E. coli* bacteria nor show an obvious surface water influence in the other available indicator data, such as pH, turbidity, conductivity, and temperature. A minimum of 5 years of monthly microbiology data is required for the water quality assessment.

Generally, if all four screening criteria are met, the source is determined to be non-GUDI. Conversely, if a well fails all four screening criteria, it is considered to be GUDI. Use of professional judgement is important when the well meets some but not all criteria; however, classification of a well as non-GUDI is not permitted unless the well clearly meets *Screening Criteria No. 4: Water Quality*. Generally, if the well meets some but not all criteria, the well will be considered potentially GUDI and further assessment will be recommended.

3.0 WELL SETTING

The configuration of the Site is shown in **Figures B1 and B2 in Appendix B**. Select Site photos from GEMTEC's site visit on December 12, 2025 are included in **Appendix C**.

Well #1 and Well #2 are located inside locked well houses at 179 Main Street, and 20 Tower Road, respectively. There is a 1000-gallon (gal) pressure tank in the Well #1 well house. The 100,000-gal water tower reservoir is located 65 metres (m) northwest of Well #2. The water tower could not be accessed at the time of the site visit as the access road was snow-covered.

Well #1 is adjoined to the north, west and south by residential property. To the east, Well #1 is adjoined by Main Street; additional residential properties are present along the opposite side of Main Street. Well #2 is surrounded by wooded undeveloped land; however, the Trans-Canada

highway runs in a north-south direction approximately 80 m to the west (upgradient) of Well #2's location.

The capture areas for Wells #1 and Well #2 were both designated as Wellfield Protected Areas by NBDELG in 2004, under the name "Village of Aroostook"; however, the Protected Area is now under the name "Regional Community of Southern Victoria" (see **Appendix D** for mapping). Within a Designated Wellfield Protected Area, there are prohibitions or limitations on chemical storage and land use activities that may cause contamination of the associated public water supply. More information on NBDELG's Wellfield Protection Program is located online at https://www2.gnb.ca/content/gnb/en/services/services_renderer.201061.Wellfield_Protection.html.

3.1 Water and Sewer Services

The Aroostook system provides water to approximately 125 residences and consists of Well #1 (installed in 1965) and Well #2 (installed around 1975). Aroostook had historically been supplied by a spring; NBDELG initially installed the system after construction of the Trans-Canada Highway affected that spring.

The residences in the area are supplied with private septic systems; the area is not equipped with municipal sewer services.

3.2 Topography and Drainage

Regionally, the area gently slopes east toward the Saint John River, which is located approximately 300 m from Well #1.

Well #1 is situated on a relatively flat area at an elevation of 93 metres above sea level (masl); this relatively flat area begins dropping off to a flood-prone terrace approximately 70 m to the east of Well #1. The nearest mapped water feature is a Saint John River tributary located approximately 6.5 m south of the well house. However, the Site Operator indicated that GeoNB mapping shows this tributary in the wrong location; it actually flows about 30 m north of the well house along the northern boundary of PID 65203606, which adjoins the well house property to the north.

Well #2 is situated on top of a hill that has a steep slope toward the Saint John River, located approximately 550 m east. Well #2 sits at an elevation of approximately 118 masl. The nearest mapped water feature is a tributary of the Saint John River, located approximately 170 m north of the well house.

There are no catch basins or storm drainage present on the Site. Surface water is anticipated to infiltrate or run off, following the local topography. Due to snow cover at the time of the Site visit, nearby watercourses were not observed. Based on provincial flood mapping (**Appendix D**), flooding is not expected to be a concern at either well house.

3.3 Geology

Surficial geology mapping indicates that the Site areas are covered with a Late Wisconsinan aged blanket (generally 0.5 to 3 m thick) of morainal sediments, consisting of loamy lodgment till, minor ablation till, silt, sand, gravel, and rubble (Rampton, V.N., 1984).

Bedrock geology mapping indicates that overburden in both Site areas is underlain by the Late Ordovician to Early Silurian aged sedimentary rocks of the Matapedia Group (White Head Formation) (NBDNR, 2008; Smith and Fyffe, 2006). The White Head Formation consists of dark grey to bluish grey, massive to abundantly laminated, very fine-grained argillaceous limestone interbedded with calcareous shale (Smith and Fyffe, 2006).

3.4 Hydrogeology

GEMTEC was provided with a copy of the Wellfield Protection Plan for Well #1 and Well #2 (Neill and Gunter, 2003). As part of the wellfield protection plan development, six-hour pumping tests were conducted on both wells. Pumping rates were estimated based on reservoir levels. For groundwater flow modelling purposes, a storativity value of 0.002 and a specific yield value of 0.14 were assigned based on the results of these pumping tests and “previous work in surrounding areas with similar bedrock geology (Village of St-André)” (Neill and Gunter, 2003). A storativity value of 0.002 is within the expected range (0.00005 to 0.005) for a confined aquifer; however, a specific yield of 0.14 is within the expected range (0.01 to 0.30) for an unconfined aquifer (Freeze and Cherry, 1979). The report does not clearly state whether the fractured bedrock aquifer was considered to be confined or unconfined.

The following evidence suggests a possible unconfined aquifer:

- Surficial geology mapping indicates that overburden primarily consists of coarse-grained sediments, which are not expected to function as a confining layer for the underlying bedrock aquifer.
- Neill & Gunter (2003) indicated that groundwater sourced from the Aroostook wells may have been “affected by historical and ongoing use of road salt on the Trans-Canada Highway”, based on a comparison of chloride concentrations to background chloride concentrations observed in groundwater sourced from similar bedrock in St-André.
- Neill & Gunter (2003) stated “The well recharge is obviously from bedrock but could also originate from sand and gravel deposits above the bedrock.”
- The Village provided a page from a draft 2003 Preliminary Performance Survey that indicated an “unconfined, fractured sandstone bedrock” aquifer for both wells.

Based on the limited available information, it was conservatively assumed that the aquifer is unconfined, indicating a sensitive setting.

4.0 WELL CONSTRUCTION

Original well logs were not available for either Well #1 or Well #2. NBDELG provided a well log for Well #2 (**Appendix E**) that was prepared by Neill and Gunter in 2005 following remedial work and a down-hole video survey. Detailed records on historical well repairs were also available from the Village, and supplemental information relating to the work completed on Well #2 in 2005 was available from the New Brunswick Online Well Log System (OWLS). Available well construction details are summarized in **Table 1**.

Table 1 – Summary of Available Well Construction Information

Well	Year Drilled	Well Depth (m)	Casing Details	Screened Interval (mbgs)	Water Bearing Zones	Driller's Estimated Safe Yield (L/min)	Drive shoe and Grout information
Well #1	1965	Originally 125.6 m deep Reported in 2003 to be 83.8 m deep	Originally 20 cm dia. to 7.0 mbgs "Changed" to 15 cm dia. to 7.0 mbgs	-	-	-	-
Well #2	1975	106.7	20.3 cm dia. steel to 10.97 mbgs (Casing depth was extended from 4.3 m in 2005)	-	45.7 mbgs	682.5	Grouted with bentonite in 2005 from 4.27 m to 10.97 m. No drive shoe information.
m	metres						
mbgs	metres below ground surface						
L/min	litres per minutes						

The Wells were drilled and installed before the *Water Well Regulation – Clean Water Act* (NB Reg. 90-79) came into effect in 1990. It is unknown if the wells contain drive shoes, how casing lengths are connected (welded, threaded), or how Well #1 is grouted. Photos of all on-Site wells are included in **Appendix C**.

5.0 WATER SYSTEM OPERATION

Well #2 is Aroostook's main supply well; Well #1 is a back up well. The wells do not pump concurrently. Typically, Well #2 pumps once per day at approximately 100 gpm, for six to seven continuous hours, as required to replenish the 100,000-gal reservoir.

Water from Well #2 (main well) is pumped through a filter (installed 2024) and then disinfected by injection of sodium hypochlorite before travelling to the reservoir. Chlorine residual and turbidity are both monitored and alarmed in filtered, disinfected water only. If the chlorinator loses power, the pump turns off, and the operator receives a notification. If the turbidity reaches 0.80 NTU the operator receives a notification. No Supervisory Control and Data Acquisition (SCADA) system was in place at the time of the site visit. The Well #2 well house has a backup generator, but not the Well #1 well house.

Well #1 is triggered to run by low pressure in its associated 1000-gal pressure tank. Well #1 water is disinfected by injection of sodium hypochlorite before travelling to the reservoir. This backup well has not been used for supply purposes since the early 2000s; it is generally only activated for monthly sampling. No SCADA systems were present at the time of the Site visit.

6.0 WATER QUALITY

Raw water quality data for Well #1 and Well #2 were requested from NBDELG for January 2020 to November 2025. Relevant laboratory analytical results are tabulated in **Appendix F**.

6.1 Microbial Analyses

Regulated (i.e., municipally- and provincially- owned and operated) potable water supplies are required to test for *E. coli*, Total Coliforms, and Heterotrophic Plate Count (HPC) (NB Public Health, 2026). The Guidelines for Canadian Drinking Water Quality state that *E. coli* is an indicator of recent faecal contamination (Health Canada, 2025). Total Coliforms can comprise bacteria that occur naturally; however, their presence in non-disinfected groundwater may indicate that the system is vulnerable to contamination, or they may be a sign of bacterial regrowth (Health Canada, 2025). Health Canada (2013) states “In groundwaters, HPC levels are generally low and stable over time. In surface waters and groundwaters under the direct influence of surface water, HPC bacteria concentrations can be highly variable” (Health Canada, 2013).

Each well is sampled monthly for Total Coliforms and *E. coli*. Standard/Heterotrophic Plate Count analyses are completed twice per year. Summaries of historical microbial data are given for Well #1 and Well #2 in **Table 2** and **Table 3**, respectively.

Table 2 – Microbial Detections in Well #1

Pathogen	Earliest Assessed Sample Date	Last Assessed Sample Date	Total Number of Samples	Number of Samples with Detections	Proportion of Samples with Detections	Minimum Count)	Maximum Count
<i>E. coli</i> (MPN/100 mL)	January 2020	November 2025	71	0	0%	0	0
Total Coliforms (MPN/100 mL)	January 2020	November 2025	71	0	0%	0	0
Standard / Heterotrophic Plate Count (CFU/mL or MPN/mL)	February 2020	September 2025	14	6	43%	0	97
MPN/100 mL	Most Probable Number per 100 millilitres						
MPN/mL	Most Probable Number per millilitre						
CFU/mL	Colony Forming Units per millilitre						

Table 3 – Microbial Detections in Well #2

Pathogen	Earliest Assessed Sample Date	Last Assessed Sample Date	Total Number of Samples	Number of Samples with Detections	Proportion of Samples with Detections	Minimum Count	Maximum Count
<i>E. coli</i> (MPN/100 mL)	January 2020	December 2025	69	6	8.7%	0	2
Total Coliforms (MPN/100 mL)	January 2020	December 2025	69	48	70%	0	>200.5
Standard / Heterotrophic Plate Count (CFU/mL or MPN/mL)	March 2021	September 2025	9	5	56%	0	26
MPN/100 mL	Most Probable Number per 100 millilitres						
MPN/mL	Most Probable Number per millilitre						
CFU/mL	Colony Forming Units per millilitre						

Neither *E. coli* nor Total Coliforms have been detected in raw water in Well #1 within the past five years. Standard / Heterotrophic Plate Counts were generally low (0 to 33 MPN/mL, with only one higher result (97 CFU/mL) in March 2020). These data are not suggestive of a surface water influence; however, Well #1 is not used regularly and results may or may not be representative of water quality under operational conditions.

Total Coliforms were detected in most samples collected from Well #2, with concentrations exceeding 200 MPN/100 mL on several occasions. *E. coli* was also present in some samples at various times of the year. Furthermore, water system operators have noticed that Total Coliforms detections often occur after rainstorms. Boil water advisories are often required. These data suggest a possible surface water influence.

6.2 Chemistry

The analytical results for surface water indicator parameters, including conductivity, hardness, pH, Total Dissolved Solids (TDS), and turbidity were assessed as part of this report. Due to its longer residence time in contact with subsurface materials, groundwater isolated from surface water is expected to have higher TDS, conductivity, hardness, and pH relative to surface water. Turbidity is expected to be low (i.e., <1 NTU) in groundwater.

General chemistry parameters, including these indicator parameters, were measured every two years in Well #1 and Well #2. Relevant results are summarized in **Table 4** and **Table 5**, respectively.

Table 4 – Key Chemistry Data for Well #1

Parameter	Earliest Sample Date	Last (Assessed) Sample Date	Total Number of Samples	Units	Minimum	Median	Maximum
Conductivity	April 2021	July 2024	3	µS/cm	426	494	546
Hardness (as CaCO ₃)	April 2021	July 2024	3	mg/L	160	184	209
pH	April 2021	July 2024	3	units	7.9	7.9	8.2
TDS	April 2021	July 2024	3	mg/L	243	270	281
Turbidity	April 2021	July 2024	3	NTU	1.4	1.7	2
µS/cm microsiemens per centimetre NTU Nephelometric Turbidity Unit							

Table 5 – Key Chemistry Data for Well #2

Parameter	Earliest Sample Date	Last (Assessed) Sample Date	Total Number of Samples	Units	Minimum	Median	Maximum
Conductivity	April 2021	July 2024	3	µS/cm	557	642	657
Hardness (as CaCO ₃)	April 2021	July 2024	3	mg/L	208	241	249
pH	April 2021	July 2024	3	units	7.5	8	8.2
TDS	April 2021	July 2024	3	mg/L	289	355	385
Turbidity	April 2021	July 2024	3	NTU	0.2	0.5	0.7
µS/cm microsiemens per centimetre NTU Nephelometric Turbidity Unit							

Well #1 conductivities were not within the expected range for surface water (i.e., 50 to 150 µS/cm) (Environment Canada, 1994). The groundwater was classified as hard to very hard and was moderately alkaline. Turbidity marginally exceeded the Health Canada guideline of 1 NTU in every one of the three samples collected from Well #1, which may be related to the infrequent use of Well #1. Overall, groundwater chemistry does not clearly indicate a surface water influence; however, Well #1 is not used regularly and results may or may not be representative of water quality under operational conditions.

In Well #2, the raw water sampling port was observed during the site visit to be located downstream of the filtration system installed in 2024 and sample results may not be indicative of raw water quality after 2024. It was noted that both before and after the filtration system was installed, groundwater was classified as very hard, conductivity was well above the expected range for surface water, groundwater was slightly to moderately alkaline, and turbidity was low. None of these are indicative of a surface water influence. However, the number of samples was small, and the Site representative reported that, historically, raw water turbidity tended to increase during the spring freshet.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information compiled as part of this GUDI assessment:

- Limited information is available relating to Well #1 and Well #2 aquifer characteristics. The available evidence suggests that the fractured bedrock aquifer(s) underlying the Site is/are unconfined, indicating a sensitive setting.
- Well #1 is approximately 30 m from a watercourse, which was not visible at the time of the Site visit due to snow cover. Well #2 is not within 60 m of any known water feature.
- Original well logs were not available for either well and both wells pre-date the New Brunswick *Water Well Regulation – Clean Water Act (90-79)*. It is understood that the Well #2 casing was extended and grouted in 2005; however, it is unknown whether the casing was equipped with a drive shoe. Due to the lack of information, both wells are considered to fail the well construction criterion.
- Water quality in Well #1 had no recent detections of Total Coliforms or *E. coli*. Apart from turbidity that slightly exceeded 1 NTU, groundwater chemistry did not clearly indicate a surface water influence. However, Well #1 is not used regularly and results may or may not be representative of water quality under operational conditions.
- Total Coliforms were detected in most samples collected from Well #2, with concentrations exceeding 200 MPN on several occasions. *E. coli* was also present in some samples. Furthermore, water system operators have noticed a correlation between rainstorms and Total Coliforms detections. Boil water advisories are often required. These data suggest a surface water influence.

Table 6 summarizes the GUDI Screening for Well #1 and Well #2.

Table 6 – GUDI Screening Summary

GUDI Screening Criteria	Well #1 (Pass/ Fail)	Well #2 (Pass/ Fail)
The well is located in a non-sensitive setting.	Fail	Fail
The well is greater than 60 m from any intermittent or permanent surface water body.	Fail	Pass
The well meets the minimum construction criteria required by the current version of the <i>Water Well Regulation (90-79) – Clean Water Act</i> .	Fail	Fail
Raw well water is free from bacteria (<i>E. coli</i> and Total Coliforms), and water chemistry suggests deep groundwater with no influence from surface water.	Fail	Fail

Based on the above:

- GEMTEC classifies Well #2 as **GUDI**.
- GEMTEC classifies Well #1 as **potentially GUDI**. If undertaking additional assessment (i.e., a Step 2 Hydrogeological Assessment) of Well #1 is undesirable, the Village has the option to (conservatively) assume that Well #1 is also GUDI.

8.0 REFERENCES

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APPENDIX A

NBDELG GUDI Screening Protocol

GUDI Protocol

**Protocol for Determining Groundwater Under the Direct
Influence of Surface Water**

January 2026

Department of Environment and Local Government

Version 3.0

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Introduction

Groundwater Under the Direct Influence of Surface Water (GUDI) refers to groundwater sources where conditions are such that microbial pathogens can travel from the surface, or nearby surface water, to the groundwater source. The purpose of the GUDI protocol is to help identify groundwater supply sources that are vulnerable to microbiological contamination, either continuously or intermittently.

Groundwater is considered under the direct influence of surface water if that water exhibits:

- A direct hydraulic connection to the surface (i.e. infiltrating precipitation) or surface water by way of local geology and well construction; and/or
- Significant and relatively rapid shifts in water characteristics such as temperature, turbidity, conductivity, pH, and other parameters which closely correlate with meteorological events or nearby surface waters; and/or
- Significant occurrence of insects or other macro-organisms, algae, organic debris, or micro-organisms including large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*.

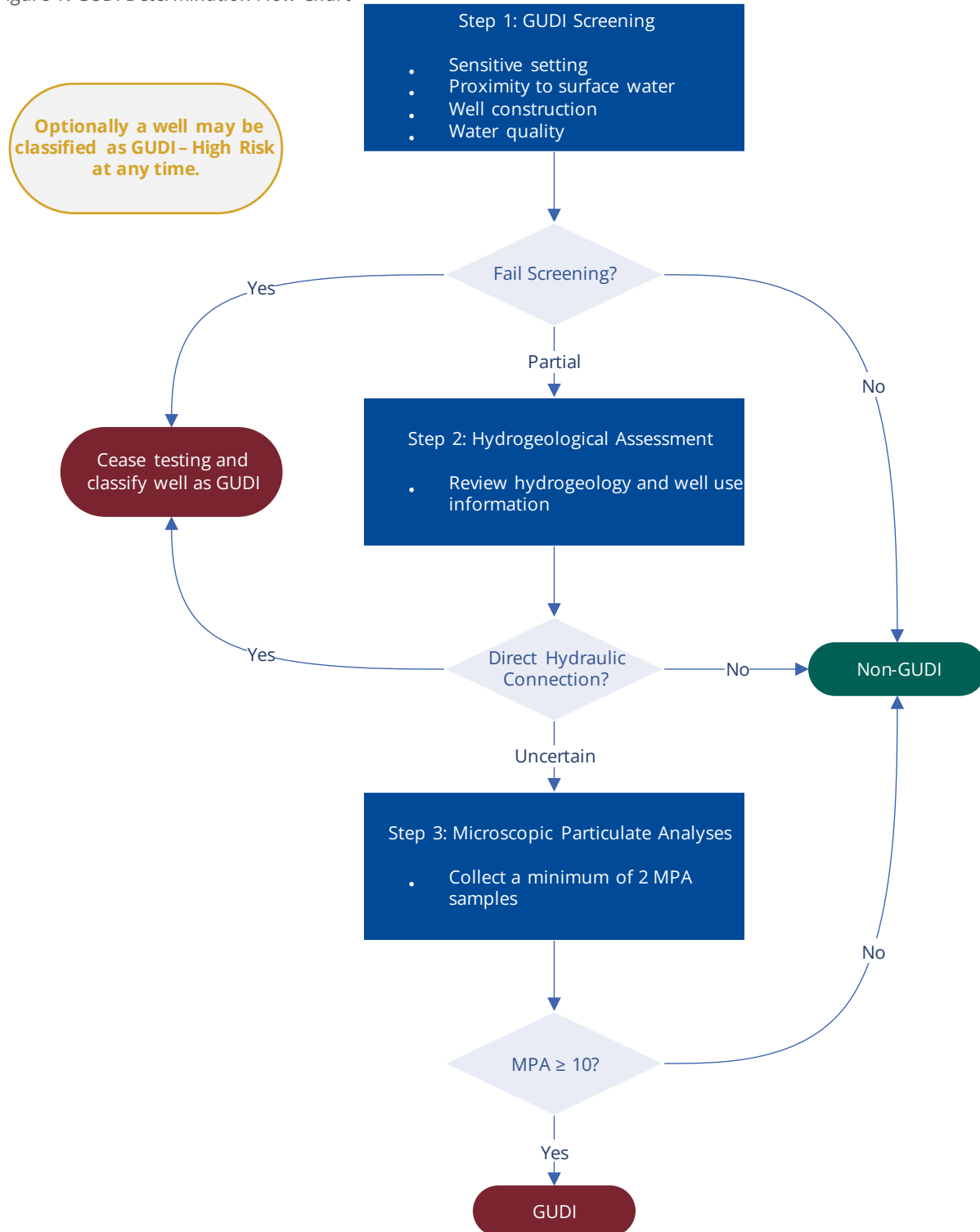
The GUDI protocol applies to all drinking water supplies regulated under the *Water Quality Regulation (82-126) – Clean Environment Act* and consists of the following three (3) general steps:

1. **Screening** – identifies obvious non-GUDI and GUDI groundwater sources based on a combination of environmental factors, well conditions, and water quality data. Exceptions to the requirements for further testing for potentially GUDI sources are detailed in the [Step 1 – Screening](#) section below.
 - If the source meets all the screening criteria it will be determined to be non-GUDI and there will be no requirement to complete Steps 2 and 3 of the protocol.
 - Sources meeting some but not all the criteria will generally be considered potentially GUDI and will require additional assessment.
 - Sources that fail all the screening criteria can be determined to be GUDI and will not require any further assessment steps.

2. **Hydrogeological Assessment** – evaluates whether there is an existing or potential hydraulic connection allowing rapid recharge from the surface (i.e. precipitation) or nearby surface water to the groundwater source. More details are available in the [Step 2 – Hydrogeologic Assessment](#) section below.
3. **Microscopic Particulate Analyses (MPA)** – determines if there are particulates present in the groundwater source that are indicative of surface water influence. The MPA results are presented in the form of a risk score that is used to classify the well as low, medium or high-risk. More details are available in the [Step 3 – Microscopic Particulate Analyses](#) section below.

Groundwater sources will be classified as non-GUDI or GUDI, based on the information and data collected and evaluated during the various steps of this protocol. A flow chart showing the general steps of the protocol is presented in Figure 1 on the following page and a more detailed explanation of each step is provided in the [Assessment Process](#) section.

Figure 1: GUDI Determination Flow Chart



Assessment Process

All GUDI assessments must be conducted by a Professional Engineer or Geoscientist registered with the Association of Professional Engineers and Geoscientists of New Brunswick (i.e. Site Professional). Professional judgement is to be used to evaluate all the information and data that is collected as part of this protocol in the determination of whether a well is classified as non-GUDI or GUDI.

Once a well is classified to be non-GUDI or GUDI at any point during the assessment, the completion of additional protocol steps is not required. A GUDI assessment is to be completed for each well in a wellfield and each well (as opposed to a water system) is to be classified as either non-GUDI or GUDI.

At any point in the evaluation process, a well may be classified as GUDI without completing all three steps of the full assessment. In such cases, the final classification of the well must be GUDI (high risk).

STEP 1 - SCREENING

The objective of the groundwater source screening is to identify obvious non-GUDI or GUDI sources that do not require further investigation. This step includes an on-site inspection to evaluate the physical condition of the source and the source setting (i.e. location, land use, etc.), along with a review of available information such as well construction details, well logs, water chemistry and related reports. Based on the evaluation, the source is to be classified as non-GUDI, potentially GUDI, or GUDI.

Generally, if all four (4) screening criteria (listed below) are met, the source is determined to be non-GUDI. If the source meets some but not all criteria, it is generally (but not always) determined to be potentially GUDI. If the source fails all the screening criteria, the source will be considered GUDI High-risk.

1. **Sensitive Settings** – the source does not fall into any of the following categories: a spring, an infiltration gallery, a horizontal collection well, a shallow screened well (well depth less than 15 m), a dug well, a well in a karst aquifer, a well in an unconfined aquifer, a well located in a floodplain or flood prone area.

2. **Distance to Surface Water** – the well is located more than 60 m from the nearest intermittent or permanent surface water body. Water bodies are defined as water open to the atmosphere and subject to runoff, such as ponds, lakes, rivers, streams, brooks, wetlands, lagoons, reservoirs, estuaries, and potentially ditches.
3. **Well Construction** – the well meets the well construction criteria required by the current version of the *Water Well Regulation (90-79) – Clean Water Act*. For example, the casing length must extend to a minimum of 6 m, the well must have an appropriately sized drive shoe, the wellhead and annular seal must prevent surface water from entering the well and migrating within the annular space (through grouting or naturally due to geological conditions). If well construction details are not complete or not available (e.g. no well log), then a well video may be completed to confirm well construction details and the well condition.

If there are other wells located near the production well (i.e. old test wells or observation wells), their presence and well construction must be evaluated to see if they potentially pose a risk to the water quality of the production well.

4. **Water Quality** – the available raw groundwater quality data cannot have detections of Total Coliforms or *E. coli* bacteria nor show an obvious surface water influence in the other available indicator data, such as pH, turbidity, conductivity, and temperature. A minimum of 5 years of monthly microbiology data is required for the water quality assessment.

While the location and setting of the well must be considered, along with the well construction, these criteria are not the defining factors in determining the classification of the well. The water quality data is the primary factor. Therefore, if a source does not meet screening criteria 1, 2, or 3, but meets criteria 4, the well could be determined to be non-GUDI if, in the opinion of the Site Professional, the water quality data indicates there is unlikely to be a connection to surface water. The well must have no detections of Total Coliform or *E. coli* bacteria in monthly raw water samples within the last 5 years. The data must also indicate that the turbidity of the raw water is below 1 NTU. If there is available pH, temperature and conductivity data, this shall also be evaluated. If there is significant uncertainty, the well shall be considered potentially GUDI and move on to [Step 2](#) of the protocol.

The well construction information may indicate that the source could be subject to direct surface water influence due to poor well construction. If remedial measures are identified to

correct any well construction issues (e.g. extending the casing, grouting the casing, or wellhead area drainage issues), these must be completed prior to proceeding to Step 2 of the protocol. Physical modifications to any well must be in accordance with the current *Water Well Regulation (90-79) – Clean Water Act*. In addition, screening may identify nearby wells (e.g. old test wells or observation wells) that potentially pose a risk to the production well and require further evaluation, well construction modifications or well decommissioning. Well construction modification or decommissioning is to be completed before proceeding to Step 2. If further evaluation of the well is required, it can be completed along with the Step 2 evaluation of the production well.

Wells deemed to be potentially GUDI will be considered to be under the direct influence of surface water (i.e. GUDI) until the protocol is completed (Step 2 and possibly Step 3 completed) and a final determination is made to the satisfaction of the Department of Environment and Local Government (DELG).

STEP 2 – HYDROGEOLOGICAL ASSESSMENT

The objective of this step is to determine if there is an existing or potential hydraulic connection that could allow rapid recharge (i.e. hours to weeks) of the well by precipitation or nearby surface water. The extent of the work that needs to be completed in this step will depend on the results of the well screening (Step 1 of the protocol). The hydrogeologic assessment is to be designed to further evaluate the issues/questions that were identified in Step 1 (e.g. periodic detections of bacteria, turbidity issues, elevated inorganic parameters, or potential biofouling) and to fulfill the objective of Step 2 (i.e. are these issues related to GUDI).

Step 2 involves conducting a hydrogeological assessment. This step may also include:

- Additional specific water quality testing, such as Biological Activity Reaction Testing (BART), isotope analysis, *Cryptosporidium* and *Giardia* analysis, inorganic parameters; and/or
- Collecting additional information/data from a nearby water well (e.g. test well or monitoring well) if the Site Professional determines this well may be a pathway for surface water infiltration and could potentially impact the water quality of the production well.

Water quality samples must be analyzed by an accredited laboratory.

The hydrogeological assessment has two (2) main components, which are the review of the available hydrogeological and well use information and the collection of up to one (1) year of specific water quality and other monitoring data related to GUDI.

The hydrogeological assessment must evaluate whether there is an existing or potential hydraulic connection by estimating the travel time between nearby surface water and the well. A connection is revealed if the travel time from nearby surface water is less than 90 days. If there is insufficient hydrogeologic information to determine if a hydraulic connection is present, additional data may need to be collected. The assessment must also evaluate if the well extracts water from deep water bearing zones and that there are no structural or construction issues with the well that are allowing surface water infiltration through the wellhead itself. In addition, up to a year's worth of specific water quality data can be used to further evaluate if the groundwater quality is being negatively influenced by rapid recharge from nearby surface water or infiltrating precipitation.

To complete the hydrogeological assessment the information listed below is to be collected and evaluated to determine the travel time between a nearby surface water source and the well.

- a) **Well Characteristics:** well depth and construction information, such as casing depth and type, annular seal, well cap, screened interval(s), connection to the water supply system, etc.
- b) **Topography/Geology/Lithology:** information on local topographic features, bedrock and surficial geology, including but not limited to, stratigraphy, depth of surficial deposits, formation thickness, composition, texture, and known relevant weathering/alteration/structural features (i.e. faults, joints, or bedding).
- c) **Hydrogeological Setting:** information of the hydrogeologic setting including details on the aquifer and any confining layers (including depth, thickness, lateral continuity, etc.) and the potential for a connection between surface water and the aquifer. This includes:
 - the aquifer parameters, including hydraulic conductivity, transmissivity, porosity, and storativity/specific storage.

- a determination of the vertical/horizontal hydraulic gradient under pumping conditions and between the well and any nearby surface water. Also, an evaluation of the variation of static groundwater level and nearby surface water level with time, precipitation, and potential flooding situations.
 - evaluation of historical/seasonal/pumping groundwater level trends and any pumping test results and interpretations.
- d) **Land Use and Surface Water:** Evaluation of the land use around the well and all nearby surface water features (including ditches) and the potential risk that these factors pose to the well. This is to include, but not be limited to, local topography and land use (e.g. farming, forestry, gravel pits/quarries, or development), type and size of local surface water features, seasonal variations of surface water features and associated water levels or flow rates, and the potential for flooding.

Water Quality and Other Monitoring Data: The purpose of collecting water quality data is to determine whether the well water quality reflects impacts from infiltrating surface water or are due to geochemical reactions within the aquifer. Raw water quality data is to be collected at the well and at nearby surface water for a period of up to one (1) year. The information from item d) above is to be used to determine which surface water(s), including possibly ditches, need to be included. If there is no nearby surface water, then precipitation water quality may need to be determined. In addition to water quality data, other information, such as the well pumping rate and schedule, must be examined. If a hydraulic connection is observed early, the full monitoring program may not need to be completed.

Table 1 outlines the general parameters that should be monitored, along with the frequency. Note that the Site Professional may modify the parameters and sampling frequency, with justification, to fit any site-specific well conditions or issues.

Table 1: Water Quality and Well Use Monitoring Program

Category	Source	Parameter	Frequency
<i>Water quality</i>	Groundwater source (well) and surface water source (if appropriate)	Dissolved Organic Carbon (DOC), Total Organic Carbon (TOC), Total coliforms, and <i>E. coli</i>	a) Monthly (i.e. minimum of 12 samples/year), where groundwater and surface water samples are to be collected on the same day; or b) Weekly from the well if there is no nearby surface water; or c) Monthly plus after rainfall/recharge events
	Groundwater source (well)	Conductivity, pH, temperature, turbidity	Daily (at least 5 days/week)
<i>Field measurements</i>	Surface water source (or possibly precipitation)	Conductivity, pH, temperature, turbidity	Weekly
	Environment and Climate Change Canada weather stations or other sources	Precipitation amount (rain or snow)	Daily (at least 5 days/week)
<i>Precipitation information</i>			
<i>Well use data</i>	Groundwater source (well)	Pumping schedule and water production data, water levels in well	Daily (at least 5 days/week)

The water quality data, along with water levels, precipitation data, and well pumping data is to be evaluated using various methods (e.g. graphing or statistical comparison). The data is to be used to determine whether the groundwater source quality is more closely representative of background water quality or if it is being influenced by nearby surface water and indicative of a hydraulic connection and lack of adequate subsurface filtration.

The information collected and evaluated as part of this step is to be used to determine if the well is:

1. Non-GUDI - If the hydrogeological assessment establishes that there is no direct hydraulic connection between the water source and surface water and no influence of surface water on the groundwater source quality.
2. GUDI - If a hydraulic connection is established and the groundwater source quality is being influenced by surface water characteristics.
3. Potentially GUDI – If the travel time cannot be adequately estimated, and/or there is significant uncertainty regarding a hydraulic connection between the groundwater source and surface water, and/or the water quality data is indeterminate, then further investigation (Step 3) will be required.

STEP 3 – MICROSCOPIC PARTICULATE ANALYSES

If a potential hydraulic connection is suspected, a series of water samples can be collected to determine if there are significant quantities of surface water organisms and plant debris in the groundwater source. The samples are analyzed using Microscopic Particulate Analysis (MPA). The MPA results are presented in the form of a risk score that is used to classify the well as a low, medium, or high-risk. The MPA samples must be analyzed by an accredited laboratory.

A minimum of two (2) seasonal MPA samples are to be collected during periods when the groundwater source is most vulnerable to surface water influence (i.e. spring/fall recharge, periods of high precipitation and/or run-off, periods of high-water demands). The results from Step 2 of this protocol are to be used to help select the most appropriate MPA sampling times (i.e. sampling based on groundwater travel time) and the information on how the MPA sampling times were determined is to be included with any results.

The MPA scores are to be evaluated based on the risk factors specified by the USEPA (1992) as follows:

- Low-risk = MPA score < 10
- Medium-risk = MPA score 10 to 19
- High-risk = MPA score >20

If both MPA samples are identified as low-risk, no further testing will be required and the groundwater source may be classified as non-GUDI. If any of the MPA samples fall into the medium or high-risk categories, the well is determined to be GUDI unless remedial action and/or appropriate further sampling demonstrates otherwise.

GUDI DETERMINATION

In general, a groundwater source that indicates a direct hydraulic connection with surface water and water quality that is influenced by surface water will be considered GUDI.

Water supply sources that demonstrate little-to-no evidence of a direct hydraulic connection with surface water and are shown to be free of microbial pathogens may be considered non-GUDI. Professional judgment, based on all the information collected throughout this protocol, will be the deciding factor for whether a well is classified to be GUDI or non-GUDI. Where significant uncertainty exists on the status of a water source, public health and safety must be held paramount, and the source should be considered GUDI.

Groundwater sources that are determined to be GUDI will be considered as surface water with respect to any DELG treatment and disinfection requirements.

Sources are determined to be non-GUDI or GUDI based on available evidence at the time of the assessment. This process is not considered a one-time determination and is subject to the results of continued long-term monitoring of the groundwater supply source and the conditions of the aquifer, the well capture zone, and the watershed over time. Reclassification of a well may be required, or requested, if there are changes to the well construction, or well setting that could cause significant changes to the groundwater and surface water interactions and affect water quality.

In cases where an active water supply classification has changed from non-GUDI to GUDI, the water system owner must prepare and submit a compliance plan for approval to DELG detailing how they intend to address the requirements for treatment and disinfection.

References

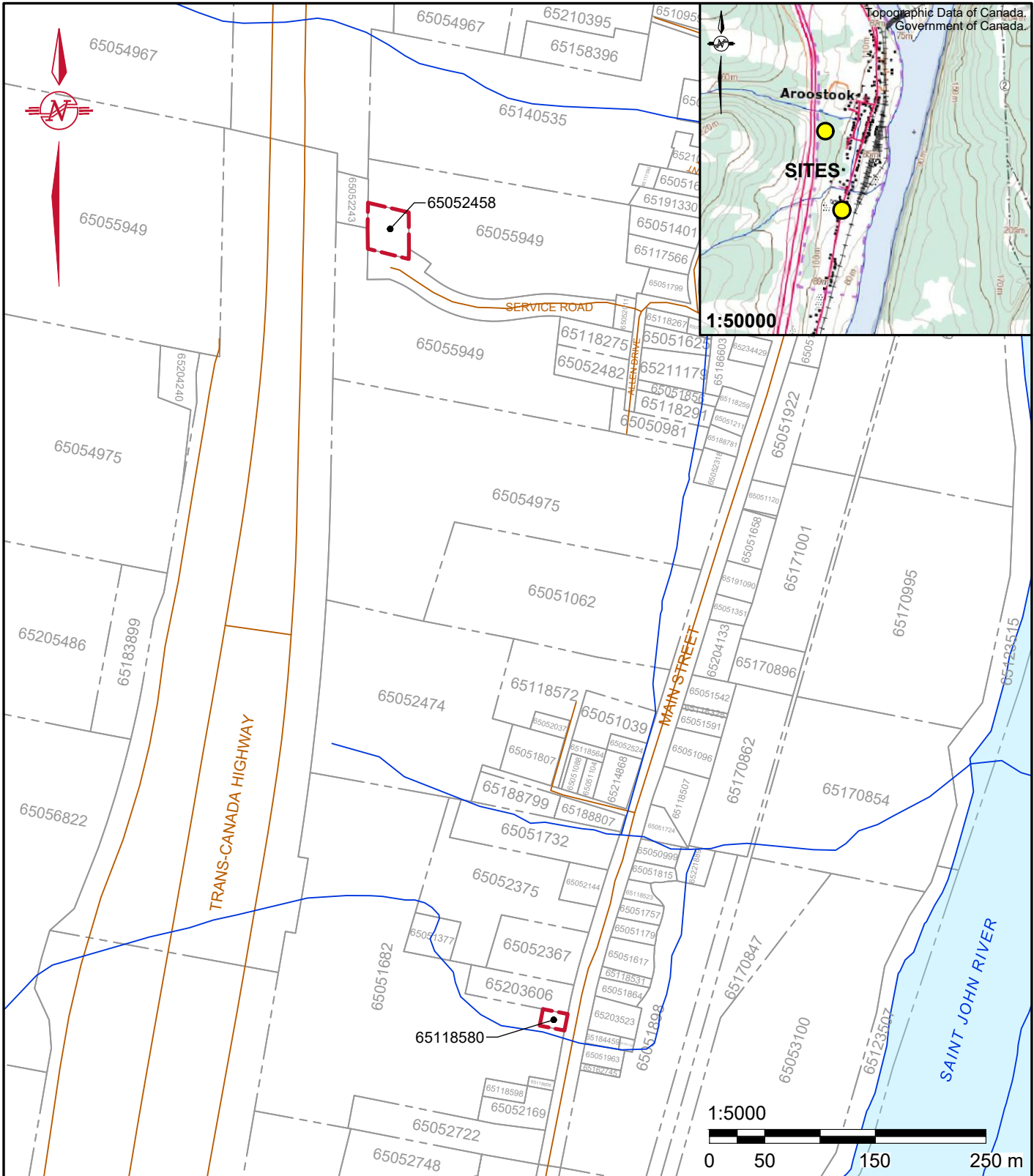
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APPENDIX B

Figures

Topographic Data of Canada.
Government of Canada.



Legend

	PROPERTY LINE		WATER BODY
	ROAD		SITE BOUNDARY
	WATERCOURSE		

Notes

1. Coordinate system: NAD83 (CSRS) / NB Stereographic.
2. This drawing contains information licensed under the Open Government Licence - New Brunswick.

Project			
STEP 1 GUDI SCREENING AROOSTOOK WELL #1 AND WELL #2 AROOSTOOK, NB			
Project No.	Drawing No.	Rev. No.	Date
103013.006	FIGURE B1	0	FEBRUARY 2026

Drawing	
SITE LOCATION PLAN	
Client	
VILLAGE OF SOUTHERN VICTORIA	
Drawn by	Checked by
AR	KP



N:\Projects\103000\103013.006\06_Civil Drafting\Design\103013.006_Aroostook Step 1 GUDI_2026-01-06_RevA.dwg

N:\Projects\103000\103013.006_Civil Drafting\Design\103013.006_DWG_Aroostook Step 1 GUDI_2026-01-06_RevA.dwg



Legend

- PROPERTY LINE
- WATERCOURSE
- WATER BODY
- SITE BOUNDARY
- WELL
- RESERVOIR

General Notes

- This drawing is a schematic representation. Sizes, locations and dimensions are approximate.
- Coordinate system: NAD83(CSRS) / NB Stereographic.
- Aerial photograph from 2018. Source: GeoNB Imagery.
- This drawing contains information licensed under the Open Government Licence - New Brunswick.

Date	Drawn by	Checked by
FEBRUARY 2026	AR	KP

Client
VILLAGE OF SOUTHERN VICTORIA

Project
STEP 1 GUDI SCREENING
AROOSTOOK WELL #1 AND WELL #2
AROOSTOOK, NB

Drawing
SITE CONFIGURATION

Scale
1:4000

Project No.	Drawing No.	Rev. No.
103013.006	FIGURE B2	0





APPENDIX C

Site Photos



PHOTO 1 – View of Well #1 well house from east.



PHOTO 2 – View of Well #1.



PHOTO 3 – View of Well #1.



PHOTO 4 – View of pressure tank in Well #1 well house.



PHOTO 5 – View of Well #2 well house from east.



PHOTO 6 – View of Well #2 well house from north.



PHOTO 7 – View of Well #2.



PHOTO 8 – View of filters for Well #2.



APPENDIX D

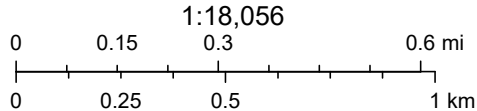
GeoNB Mapping

Aroostook Protected Wellfields



12/18/2025, 8:30:42 AM

- parcels
- Property Assessment
- Protected Wellfields
- Preliminary - Wellfield area not defined
- Zone A - Preliminary
- Zone B - Preliminary
- Zone C - Preliminary
- Zone A - Designated
- Zone B - Designated
- Zone C - Designated
- 2
- Buffer 30m
- Large Scale / Grande échelle

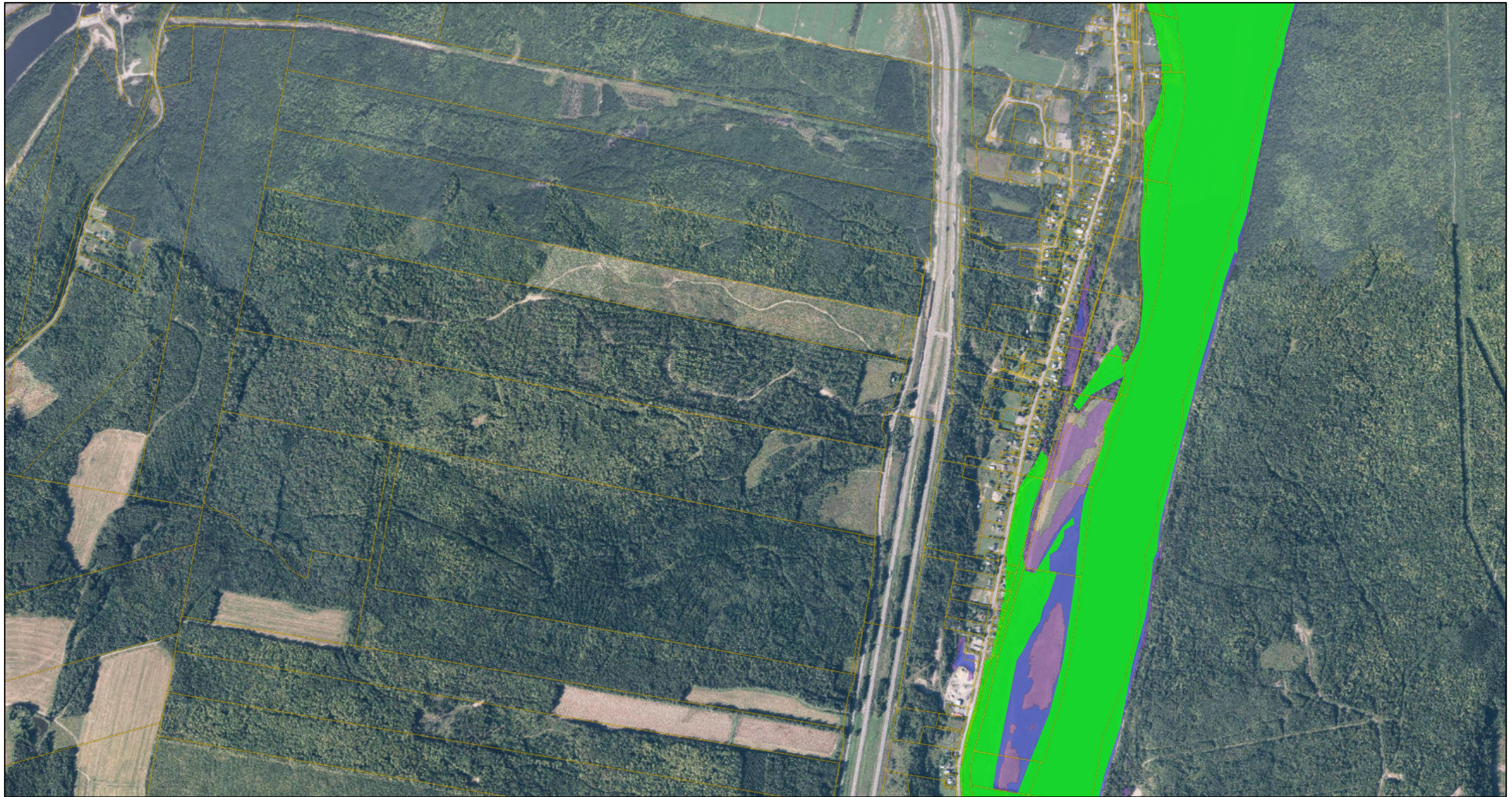


Department of Environment & Local Government / Ministère de l'Environnement et Gouvernements locaux, Service New Brunswick, Service

GeoNB

This map is a graphical representation which approximates the size, configuration and location of features. This map is not intended to be used for legal descriptions or to calculate exact dimensions or area.

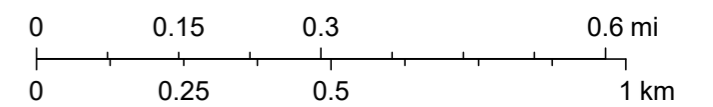
GeoNB - New Brunswick Historical Flood and Flood Hazard Maps



2026-02-26, 11:40:05 p.m.

1:12,832

- parcels
- 1976 Ice Jam Flood Extents – Perth-Andover
- 1987 Ice Jam Flood Extents – Perth-Andover
- 1973 Flood Limits
- 1973 Flood Extents – Fredericton to Gagetown
- 2008 Flood Limits
- 2008 Flood Extents – Upper Saint John River
- 2008 Flood Extents – Lower Saint John River
- 2018 Flood Limits
- 2018 Flood Extents – Lower Saint John River
- Present Day Flood, 1 in 20 year (5% Annual Exceedance Probability)
- Present Day Flood, 1 in 100 year (1% Annual Exceedance Probability)
- 2100 Flood with Climate Change, 1 in 20 year (5% Annual Exceedance Probability)
- 2100 Flood with Climate Change, 1 in 100 year (1% Annual Exceedance Probability)
- Imagery_Basemap_Year



Service New Brunswick / Service Nouveau-Brunswick



APPENDIX E

Well Logs

Well Driller's Report

Date printed 12/18/2025

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Municipal	Extended Casing	Rotary	11/25/2005

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
12696	Steel	20.32cm	0m	10.97m	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Air	91.44m	682.5 lpm	2hrs	0m	682.5 lpm	No	0 lpm
<i>(BTC - Below top of casing)</i>							

Well Grouting				Drilling Fluids Used	Disinfectant	Pump Installed
Well Log	Grout Type	From	End	None	Bleach (Javex)	Submersible Intake Setting (BTC)
12696	Bentonite	0m	10.97m		Qty 0L	54.86m

Driller's Log					Overall Well Depth 10.97m Bedrock Level 4.27m
Well Log	From	End	Colour	Rock Type	
12696	4.27m	10.97m	Grey	Granite	

Water Bearing Fracture Zone
There is no water bearing fracture zone information.

Setbacks
There is no Setback information.



Village of Aroostook
 383 Main Street
 Aroostook, New Brunswick E7H 2Z4
 506-273-6443

Log of: Production Well #2

Location: Aroostook, New Brunswick

Last Revised: December 6, 2005

Depth (m)	Symbol	Description	Elevation (m)	Depth (ft)	Completion Details (Construction Details Referenced from Pump Base Geodetic)
0		Ground Geodetic Elevation	0.0	-1	<p>Stick-up</p> <p>Grout</p> <p>Casing 8 inches (203.2 mm)</p> <p>Casing depth to 36 feet (11 metres)</p> <p>Pumping Intake</p> <p>Apparent Water Bearing Zone (150 feet/45.7 metres)</p> <p>Maximum depth video camera could be lower - 335 feet (102 metres)</p> <p>Bottom of Well</p>
		Topsoil	-1.8	24	
		Grey medium sandstone		49	
				74	
25				99	
				124	
				149	
50		Yellow medium sandstone	-48.8	174	
				199	
		Grey medium sandstone	-61.0	224	
				249	
				274	
				299	
				324	
				349	
100				374	
			-118.9		



APPENDIX F

Analytical Results

Sample Location	Station Type	Sample Date	E.coli-MPN Flag	E.coli-MPN	E.coli-MPN Unit	SPC/HPC Flag	SPC/HPC	SPC/HPC Unit	TC-MPN Flag	TC-MPN	TC-MPN Unit
Well #1	DWS - Source - GW	1/14/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	2/18/2020		0	MPN/100ml		0	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	3/17/2020		0	MPN/100ml		97	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	4/14/2020		0	MPN/100ml		3	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	5/12/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	6/9/2020		0	MPN/100ml		0	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	7/14/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	8/4/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	9/1/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	9/29/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	10/27/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	11/24/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	12/21/2020		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	1/19/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	2/16/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	3/2/2021		0	MPN/100ml		6	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	4/20/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	4/20/2021		-			-			-	
Well #1	DWS - Source - GW	4/20/2021		-			-			-	
Well #1	DWS - Source - GW	5/4/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	6/1/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	7/6/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	8/10/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	10/12/2021		0	MPN/100ml		0	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	10/19/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	11/2/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	12/7/2021		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	1/4/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	2/1/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	3/8/2022		0	MPN/100ml		0	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	4/6/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	4/6/2022		-			-			-	
Well #1	DWS - Source - GW	5/3/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	5/31/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	6/28/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	7/26/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	9/6/2022		0	MPN/100ml		0	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	10/4/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	11/1/2022		0	MPN/100ml		-			0	MPN/100ml

Sample Location	Station Type	Sample Date	E.coli-MPN Flag	E.coli-MPN	E.coli-MPN Unit	SPC/HPC Flag	SPC/HPC	SPC/HPC Unit	TC-MPN Flag	TC-MPN	TC-MPN Unit
Well #1	DWS - Source - GW	12/6/2022		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	12/28/2022		-			-			-	
Well #1	DWS - Source - GW	1/4/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	1/31/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	3/8/2023		0	MPN/100ml		0	CFU/ml		0	MPN/100ml
Well #1	DWS - Source - GW	4/4/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	5/2/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	5/30/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	7/4/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	8/1/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	9/13/2023		0	MPN/100ml		2	MPN/ml		0	MPN/100ml
Well #1	DWS - Source - GW	10/3/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	12/5/2023		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	1/9/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	2/13/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	3/12/2024		0	MPN/100ml		33	MPN/ml		0	MPN/100ml
Well #1	DWS - Source - GW	3/26/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	4/30/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	6/19/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	7/10/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	7/30/2024		-			-			-	
Well #1	DWS - Source - GW	7/31/2024		-			-			-	
Well #1	DWS - Source - GW	8/8/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	9/10/2024		0	MPN/100ml		<	2	MPN/ml	0	MPN/100ml
Well #1	DWS - Source - GW	10/23/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	11/26/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	12/16/2024		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	1/21/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	2/19/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	3/18/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	4/15/2025		0	MPN/100ml		<	2	MPN/ml	0	MPN/100ml
Well #1	DWS - Source - GW	5/7/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	6/10/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	7/7/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	8/5/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	9/9/2025		0	MPN/100ml		2	MPN/ml		0	MPN/100ml
Well #1	DWS - Source - GW	10/21/2025		0	MPN/100ml		-			0	MPN/100ml
Well #1	DWS - Source - GW	11/25/2025		0	MPN/100ml		-			0	MPN/100ml

Sample Location	Station Type	Sample Date	COND Flag	COND	COND Unit	HARD Flag	HARD	HARD Unit	pH Flag	pH	pH Unit	p = TDS Flag	p = TDS	p = TDS Unit	TURB Flag	TURB	TURB Unit
Well #1	DWS - Source - GW	4/20/2021		546	μSIE/cm		184	mg/L as CaCO3		8.2	pH		281	mg/L		1.4	NTU
Well #1	DWS - Source - GW	12/28/2022		426	μSIE/cm		160	mg/L as CaCO3		7.9	pH		243	mg/L		2	NTU
Well #1	DWS - Source - GW	7/31/2024		494	μSIE/cm		209	mg/L as CaCO3		7.9	pH		270	mg/L		1.7	NTU

Sample Location	Station Type	Sample Date	E.coli-MPN Flag	E.coli-MPN	E.coli-MPN Unit	SPC/HPC Flag	SPC/HPC	SPC/HPC Unit	TC-MPN Flag	TC-MPN	TC-MPN Unit
Well #2	DWS - Source - GW	1/7/2020		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	2/4/2020		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	4/7/2020		0	MPN/100ml		-			6.4	MPN/100ml
Well #2	DWS - Source - GW	5/5/2020		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	6/2/2020		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	7/7/2020		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	8/18/2020		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	9/8/2020		0	MPN/100ml		-			6.4	MPN/100ml
Well #2	DWS - Source - GW	10/13/2020		0	MPN/100ml		-			9.9	MPN/100ml
Well #2	DWS - Source - GW	11/11/2020		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	12/8/2020		1	MPN/100ml		-			22.2	MPN/100ml
Well #2	DWS - Source - GW	1/5/2021		0	MPN/100ml		-			16.4	MPN/100ml
Well #2	DWS - Source - GW	2/2/2021		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	3/2/2021		-			0	CFU/ml		-	
Well #2	DWS - Source - GW	3/9/2021		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	3/30/2021		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	4/20/2021		-			-			-	
Well #2	DWS - Source - GW	5/11/2021		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	7/13/2021		0	MPN/100ml		-			13.7	MPN/100ml
Well #2	DWS - Source - GW	8/10/2021		0	MPN/100ml		-			11.1	MPN/100ml
Well #2	DWS - Source - GW	9/7/2021		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	9/15/2021		0	MPN/100ml		-			16.4	MPN/100ml
Well #2	DWS - Source - GW	10/5/2021		0	MPN/100ml		-			36.4	MPN/100ml
Well #2	DWS - Source - GW	10/12/2021		-			5	CFU/ml		-	
Well #2	DWS - Source - GW	11/9/2021		0	MPN/100ml		-			7.5	MPN/100ml
Well #2	DWS - Source - GW	2/15/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	3/8/2022		-			0	CFU/ml		-	
Well #2	DWS - Source - GW	3/15/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	4/12/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	5/10/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	7/12/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	8/30/2022		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	9/20/2022		1	MPN/100ml		1	CFU/ml		3.1	MPN/100ml
Well #2	DWS - Source - GW	10/11/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	11/8/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	12/13/2022		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	12/28/2022		-			-			-	
Well #2	DWS - Source - GW	1/10/2023		0	MPN/100ml		-			8.7	MPN/100ml
Well #2	DWS - Source - GW	2/14/2023		0	MPN/100ml		-			0	MPN/100ml

Sample Location	Station Type	Sample Date	E.coli-MPN Flag	E.coli-MPN	E.coli-MPN Unit	SPC/HPC Flag	SPC/HPC	SPC/HPC Unit	TC-MPN Flag	TC-MPN	TC-MPN Unit
Well #2	DWS - Source - GW	3/14/2023		0	MPN/100ml		3	CFU/ml		7.5	MPN/100ml
Well #2	DWS - Source - GW	4/11/2023		0	MPN/100ml		-			16.4	MPN/100ml
Well #2	DWS - Source - GW	4/11/2023		-			-			-	
Well #2	DWS - Source - GW	5/9/2023		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	6/6/2023		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	8/8/2023		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	10/10/2023		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	11/15/2023		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	12/19/2023		0	MPN/100ml		-			6.4	MPN/100ml
Well #2	DWS - Source - GW	1/23/2024		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	2/27/2024		0	MPN/100ml		-			3.1	MPN/100ml
Well #2	DWS - Source - GW	3/19/2024		0	MPN/100ml	<	2	MPN/ml		1	MPN/100ml
Well #2	DWS - Source - GW	4/9/2024		0	MPN/100ml		-			6.4	MPN/100ml
Well #2	DWS - Source - GW	5/14/2024		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	7/2/2024		1	MPN/100ml		-		>	200.5	MPN/100ml
Well #2	DWS - Source - GW	7/23/2024		0	MPN/100ml		-			13.7	MPN/100ml
Well #2	DWS - Source - GW	7/30/2024		-			-			-	
Well #2	DWS - Source - GW	7/31/2024		-			-			-	
Well #2	DWS - Source - GW	8/20/2024		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	9/17/2024		0	MPN/100ml	<	2	MPN/ml		0	MPN/100ml
Well #2	DWS - Source - GW	10/8/2024		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	11/12/2024		0	MPN/100ml		-			1	MPN/100ml
Well #2	DWS - Source - GW	12/3/2024		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	1/7/2025		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	2/4/2025		0	MPN/100ml		-			6.4	MPN/100ml
Well #2	DWS - Source - GW	3/4/2025		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	3/18/2025		0	MPN/100ml		-		>	200.5	MPN/100ml
Well #2	DWS - Source - GW	3/25/2025		0	MPN/100ml		-			16.4	MPN/100ml
Well #2	DWS - Source - GW	3/26/2025		0	MPN/100ml		-			0	MPN/100ml
Well #2	DWS - Source - GW	4/1/2025		0	MPN/100ml		2	MPN/ml		2	MPN/100ml
Well #2	DWS - Source - GW	5/20/2025		1	MPN/100ml		-		>	200.5	MPN/100ml
Well #2	DWS - Source - GW	6/25/2025		1	MPN/100ml		-			13.7	MPN/100ml
Well #2	DWS - Source - GW	7/22/2025		0	MPN/100ml		-			28.8	MPN/100ml
Well #2	DWS - Source - GW	8/19/2025		0	MPN/100ml		-			3.1	MPN/100ml
Well #2	DWS - Source - GW	9/17/2025		0	MPN/100ml		26	MPN/ml		0	MPN/100ml
Well #2	DWS - Source - GW	10/7/2025		0	MPN/100ml		-			2	MPN/100ml
Well #2	DWS - Source - GW	11/18/2025		2	MPN/100ml		-			7.5	MPN/100ml
Well #2	DWS - Source - GW	12/3/2025		0	MPN/100ml		-			3.1	MPN/100ml

Sample Location	Station Type	Sample Date	COND Flag	COND	COND Unit	HARD Flag	HARD	HARD Unit	pH Flag	pH	pH Unit	p = TDS Flag	p = TDS	p = TDS Unit	TURB Flag	TURB	TURB Unit
Well #2	DWS - Source - GW	4/20/2021		642	µSIE/cm		241	mg/L as CaCO3		8.2	pH		355	mg/L		0.7	NTU
Well #2	DWS - Source - GW	12/28/2022		657	µSIE/cm		249	mg/L as CaCO3		7.5	pH		385	mg/L		0.5	NTU
Well #2	DWS - Source - GW	7/31/2024		557	µSIE/cm		208	mg/L as CaCO3		8	pH		289	mg/L		0.2	NTU

experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnement
structural	structures
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

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