2024 Annual Drinking Water System Summary Report

St. George Drinking Water System

1. General Information

The County of Brant (the County) prepares a report summarizing system operation and water quality for every municipal drinking water system annually. The reports detail the latest water quality testing results, water quantity statistics and any adverse conditions that may have occurred for the previous year, January 1 through December 31. They are available on March 31 on the County website at www.brant.ca/en/water-services/water-services.aspx or by contacting the County of Brant Operations Department.

All efforts have been made to ensure the information presented in this report is accurate. If you have any questions or comments concerning the report, please contact the County at the address and phone number listed below or by email at operations@brant.ca.

Drinking Water System:	**St. George Drinking Water System**
Drinking Water System Number:	**220002734**
Reporting Period:	**January 1, 2024 – December 31, 2024**

Drinking Water System Owner & Contact Information:
Corporation of the County of Brant
P.O. Box 160, 26 Park Avenue
Burford, ON N0E 1A0
Telephone: 519.442.7268
Toll Free: 855.442.7268
Email: operations@brant.ca

1.1 System Description

Located at 20 Church Ave, the St. George Drinking Water System is a Large Municipal Water System as defined by Ontario Regulation (O.Reg.) 170/03. This drinking water system is made up of two (2) pressure zones, nearly 30 kilometers of watermain, 1311 residential service connections, 108 commercial service connections and serves a population of approximately 3,684 people.

The St. George Drinking Water System consists of three (3) drilled wells completed in the overburden. Two (2) wells are equipped with vertical turbine pumps capable of pumping 45.5 L/s each. The third well is equipped with a submersible pump capable of pumping 24.3 L/s. Chlorine disinfection is provided to the treatment system through a sodium hypochlorite dosing system and two (2) 52.2 m^3 chlorine contact chambers. System storage is provided in the distribution system via a 437 m^3 standpipe and a 2,876 m^3 elevated tank located at 54 main street.

1.2 Major Expenses

In 2024 the St. George Drinking Water System had operating and maintenance expenditures of approximately $280,000, which included $24,000 for the maintenance and inspection of the elevated tank and standpipe. The St. Geroge Drinking Water System also incurred capital costs for SCADA maintenance and licensing upgrades. These upgrades totalled $115,000 and were cost shared amongst all five (5) Municipal Drinking Water Systems.

2. Aquifer Monitoring

This section documents the key aspects of the St Geroge DWS groundwater system including details about the source aquifer monitoring, groundwater quantity and groundwater quality. Groundwater monitoring is completed in accordance with Ministry of the Environment, Conservation and Parks (MECP) approvals and to meet all applicable provincial regulations. In addition to the regulatory monitoring the County implements a due diligence monitoring program in support of the groundwater management strategy and source water protection initiatives.

2.1 Wellfield and Monitoring Program

The St. George DWS consists of one (1) groundwater wellfield, which contains three (3) production wells that terminate in the overburden aquifer (Well 1, 2, 3). The due diligence water monitoring program consists of a total of nine (9) monitoring wells located at three (3) locations. This program monitors both the water quantity and quality of the groundwater resource as delineated by the wellhead protection areas outlines in the Source Protection Plan.

The due diligence monitoring program consists of monthly water level measurements and the collection of semi-annual groundwater samples for analysis of nitrates, nitrite, chloride and sulphate. The purpose of the due diligence monitoring is to detect potential water quality and quantity threats to the groundwater resource as it is occurring in an effort to mitigate the risk before it becomes an irreversible threat.

2.2 Groundwater Quantity

Based on the water level, precipitation and pumping data, pumping from the production wells at the St. George DWS has not resulted in long-term changes to groundwater levels or hydraulic gradients measured at the monitoring wells. Groundwater levels fluctuated seasonally in 2024 and remained within the historical ranges. No complaints have been received by the County regarding the operation of the wells interfering with neighbouring wells or surface water features. Overall, the St. George DWS has not had a negative impact on the groundwater resource.

2.3 Groundwater Quality

The 2024 groundwater quality data for the monitoring wells was consistent with historical results and were below the Ontario Drinking Water Quality Standards (ODWQS). Chloride concentrations were below the ODWQS of 250 mg/L and remain stable over the long term. Nitrate (as N) concentrations were below the ODWQS of 10.0 mg/L at the monitoring wells and ranged between <0.10 mg/L and 7.22 mg/L. Although nitrate concentrations at the production and monitoring wells have remained below the ODWQS since 2010 a nitrate Issue Contributing Area has been delineated for the wellfield due to nearby agricultural practices and subsurface sewage disposal systems. Sulphate concentrations remain stable and below the ODWQS of 500 mg/L.

3. Microbiological Testing

3.1 E. coli, Total Coliform, Background (BKG)

Bacteriological tests for E. coli and total coliforms are required weekly from the raw and treated water at the facility and from the distribution system. Extra samples are taken after major repairs or maintenance work. Any E. coli or total coliform results above zero in treated water samples must be reported to the Ministry of Environment, Conservation and Parks (MECP) and Medical Officer of Health (MOH). Resamples and any other required actions are taken as quickly as possible.

Bacteriological tests for BKG bacteria are not regulatory but are done as a due diligence action. Background tests are an indicator of the general bacteria population in a water sample. Background bacteria should be less than 200 colonies per 1 mL. Results over 200 colonies per 1 mL may indicate a change in water quality but it is not considered an indicator of unsafe water.

The results from the 2024 sampling program are shown in the table below. There were no adverse test results from the 261 treated water samples in this reporting period.

Sample Location	# of Samples	Range of E. coli Results (cfu/100ml)	Range of Total Coliform Results (cfu/100ml)	Range of BKG Results (cfu/100ml)
Raw Well #1	53	0-0	0-0	0-0
Raw Well #2	53	0-0	0-7	0-0
Raw Well #3	45	0-0	0-0	0-1
Treated	53	0-0	0-0	0-0
Distribution	208	0-0	0-0	0-54

3.2 Heterotrophic Plate Count (HPC)

HPC analyses are required from the treated and distribution water. The tests are required weekly for treated water and for 25% of the required distribution system bacteriological samples. HPC tests are conducted on ALL raw, treated and distribution samples for due diligence. HPC should be less than 500 colonies per 1 mL. Results over 500 colonies per 1 mL may indicate a change in water quality but it is not considered an indicator of unsafe water.

Sample Location	# of Samples	Range of HPC Results (cfu/1ml)
Raw Well #1	53	0-NDOGHPC*
Raw Well #2	53	0-10
Raw Well #3	45	0-NDOGHPC*
Treated	53	0-10
Distribution	208	0-720

** Non-determinate Overgrowth Heterotrophic Plate Count (NDOGHPC*) refers to an HPC result that has overgrown on the test plate and bacteria colonies cannot be read. This can occur from outside sample contamination. The next HPC sample taken from that sample point had zero HPC confirming that the overgrowth result was not indicative of the water quality.*

4. Chemical Testing

The *Safe Drinking Water Act* requires periodic testing of the water for approximately 60 different chemical parameters. The latest results for all parameters are provided in Appendix A. The sampling frequency varies for different types and sizes of water systems and chemical parameters. If the concentration of a parameter is above half of the Maximum Allowable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three (3) months is required by the Regulation. Where concerns regarding a parameter exist, the MECP can also require additional sampling be undertaken.

Information on the health effects and allowable limits of components in drinking water may be found on the MECP web page through the link provided in Appendix A. Additional information on common chemical parameters specific to the St. George Drinking Water System is provided below.

4.1 Sodium

Sodium levels in drinking water are tested once every five (5) years. The aesthetic objective is 200 mg/L meaning at levels less than this the sodium will not impair the taste of the water. When sodium levels are above 20 mg/L the MECP and MOH are notified.

The last sodium sample taken in the St. George Drinking Water System was in 2023 and had a result of 10 mg/L.

4.2 Hardness

Hardness is an aesthetic parameter that may affect the appearance of the water but is not related to health. Groundwater commonly has high levels of hardness and other minerals from being in contact with geological substrate. Many households have water softeners to help reduce white calcium deposits and improve the efficiency of soaps. This information is included here to help set the water softener at the level recommended by the manufacturer. Samples for hardness are collected at a minimum every 3 years from raw water.

The hardness of the wells was tested in 2024 and ranged from 360 - 410 mg/L (21.1 – 24.0 grains/gallon).

4.3 Additional Testing Required by MECP

No additional testing is required by the latest Municipal Drinking Water License for this system.

5. Operational Monitoring

5.1 Chlorine Residual

Free chlorine levels of the treated water are monitored continuously at the discharge point of the Water Treatment Facility. In the distribution system, free chlorine is measured daily at various locations. As a critical control limit, free chlorine residual within the distribution system should be above 0.3 mg/L. A free chlorine level lower than 0.05 mg/L must be reported and corrective action taken. There were no reportable incidents in 2024. A summary of the chlorine residual readings is provided in the table below.

Sample Location	Number of Samples or Monitoring Frequency	Range of Results (mg/L)
Treated – Discharge Point	Continuous	0.60-1.18
Distribution	540	0.45-1.03

5.2 Turbidity

Turbidity of treated water is continuously monitored at the treatment facilities as a change in turbidity can indicate an operational problem. As a minimum, turbidity for each well is required to be tested monthly. Turbidity is measured in nephelometric turbidity units (NTU). Under O.Reg. 170/03 turbidity in groundwater from a secure well or a well with effective in-situ filtration is not reportable however turbidity should be < 1 NTU at the treatment plant and < 5 NTU in the distribution system. A summary of the monitoring results for 2024 is provided in the table below.

Sample Location	Number of Samples	Range of Results (NTU)
Well #1 – Raw Manual	17	0.06-0.17
Well #2 – Raw Manual	17	0.06-0.17
Well #3 – Raw Manual	14	0.07-0.17

6. Water Quantity

Continuous monitoring of flow rates from supply wells into the treatment system and from the Water Treatment Facility into the distribution system is required by O.Reg. 170/03.

The Municipal Drinking Water License and Permit to Take Water (PTTW) issued by the MECP regulate the amount of water that can be taken and treated over a given time period. A summary of the 2024 flows is provided in the tables below and presented graphically in Appendix B.

Permit to Take Water (m^3/day)	2024 Max Daily Taking (m^3/day)	2024 Average Daily Taking (m^3/day)	2024 Total Yearly Taking (m^3/year)
9,961	3,953*	821	300,650

* The max daily taking occurred as a result of an emergency watermain break. The max daily taking outside of that incident was 1,309 m^3 which represents 13% of the allowable daily taking.

Pumping from the St. George DWS was conducted in compliance with the maximum daily taking volumes permitted by the Permit to Take Water (PTTW) of 9,961 m^3/day. A total of 300,650 m^3 of water was pumped from the St. George DWS in 2024, which represents 8% of the allowable annual water taking, and the maximum daily taking was 3,953 m^3, which represents nearly 40% of the allowable daily taking. The St. George Drinking Water System has available water takings to support future growth in this community.

Municipal Drinking Water Licence (m^3/day)	2024 Max Daily Flow (m^3/day)	2024 Average Daily Flow (m^3/day)	2024 Total Yearly Flow (m^3/year)
7,855	3,952*	821	300,650

* The max daily flow occurred as a result of an emergency watermain break. The max daily flow outside of that incident was 1,309 m^3 which represents 17% of the MDWL Rated Capacity.

The Municipal Drinking Water License (MDWL) Rated Capacity for the St. George Drinking Water System is 7,855 m^3/day. A total of 300,650 m^3 of water was supplied by the St. George Drinking Water System in 2024, which represents 10% of the MDWL Rated Capacity. The maximum daily flow in 2024 was 3,952 m^3/day, which represents 50% of the MDWL Rated Capacity. The St. George Drinking Water System has available supply capacity to support future growth in this community but is lacking in redundancy. The St. George Water Servicing Environmental Study Report and Schedule C Class Environmental Assessment Study completed in 2023 has identified a preferred location for a new municipal well, water treatment plant and storage reservoir. The County of Brant began the land acquisition process in 2024 and is ongoing. Design is planned to begin in 2026.

7. Non-Compliance Findings and Adverse Results

This section documents any known incidents of non-compliance or adverse results and the associated correction actions taken to resolve the issue. Non-compliance issues are typically identified by either the Operating Authority or the MECP Drinking Water Inspectors. The issues and associated required actions are documented by the Inspectors in the system's Annual Inspection Report. All non-compliance issues are investigated, corrective actions taken and documented using the County's Drinking Water Quality Management System (DWQMS) procedures.

7.1 Non-Compliance Findings

An MECP drinking water system inspection was conducted on June 11, 2024. There were no Non-Compliance findings from the inspection and the County received a Final Inspection Rating from the MECP of 100%.

7.2 Adverse Results

Any adverse results from bacteriological, chemical samples or observations of operational conditions that indicate adverse water quality are reported as required and corrective actions are taken. There were no adverse or reportable occurrences in 2024.

Appendix A: Summary of Chemical Results

Understanding Chemical Test Results

The following tables summarize the laboratory results of the chemical testing the County is required to complete. Parameters are required to be tested at frequencies as noted below. Explanations on the health impacts of these parameters can be found in the MECP document PSIB 4449e01 titled "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines" available at https://cvc.ca/wp-content/uploads/2011/03/std01_079707.pdf.

Results are shown as concentrations with units of either milligrams per litre (mg/L) or micrograms per litre (µg/L). 1 mg/L is equal to 1000 µg/L. The Maximum Acceptable Concentration (MAC) is the highest amount of a parameter that is acceptable in Municipal drinking water and can be found in the MECP Drinking Water Standards. The aesthetic objective (A/O) is established for parameters that may impair the taste, odour or colour of water or which may interfere with good quality control practices. For parameters that the Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines have not established either a MAC or an A/O, a "-" will indicate this. A result of "ND" stands for "Not Detected" and means that the concentration of the chemical is lower than level that the laboratory equipment is capable of measuring.

Table 1 – Nitrite and Nitrate

Nitrate and nitrite samples are required every three (3) months from the treatment system in normal operation.

Parameter	Sample Date (mm/dd/yy)	Result (mg/L)	MAC (mg/L)	Exceedance
Nitrite (as N)	02/02/24	ND	1.0	No
	05/01/24	ND	1.0	No
	08/09/24	ND	1.0	No
	11/05/24	ND	1.0	No
Nitrate (as N)	02/02/24	3.15	10.0	No
	05/01/24	3.38	10.0	No
	08/09/24	3.69	10.0	No
	11/05/24	3.96	10.0	No

Table 2 – Trihalomethane and Haloacetic Acids

Trihalomethane (THM) and total Haloacetic Acids (HAA) are by-products of the disinfection process. The samples are required every three (3) months from the distribution system.

Parameter	Sample Location	Sample Date (mm/dd/yy)	Result (mg/L)	MAC (mg/L)	Exceedance
THM	312 German School Rd	02/02/24	4.48	100	No
	245 Prospect St.	05/01/24	3.13	100	No
	Willits Sample STN	08/09/24	3.95	100	No
	HYD 1-055 St. George Rd	11/06/24	4.46	100	No
HAA	312 German School Rd	02/02/24	ND	80	No
	245 Prospect St.	05/01/24	ND	80	No
	Willits Sample STN	08/09/24	ND	80	No
	HYD 1-055 St. George Rd	11/06/24	ND	80	No

Table 3 – Sodium and Fluoride

Testing of fluoride and sodium is required every five (5) years from the treatment system.

Parameter	Sample Date (mm/dd/yy)	Result (mg/L)	MAC (mg/L)	A/O (mg/L)	Exceedance
Fluoride	01/05/23	0.19	1.5	-	No**
Sodium	01/05/23	10	20	200	No*

**Sodium levels between 20 – 200 mg/L must be reported every 5 years.*

***Natural levels of fluoride between 1.5 – 2.4 mg/L must be reported every five (5) years.*

Table 4 – Alkalinity, pH and Lead

The following Table summarizes the most recent results for the Lead Testing Program, having been conducted in 2024. Lead samples are taken every three (3) years from the distribution system. Levels of alkalinity and pH are monitored twice per year in the distribution system to ensure water quality is consistent and does not facilitate leaching of lead into the water.

Parameter	Number of Samples	Result Range (Min – Max)	MAC	A/O	Operational Target	Exceedance
Distribution Alkalinity (mg/L)	6	270-270	-	-	30-500	-
Distribution pH	6	7.87-8.13	-	6.5-8.5	-	-
Distribution Lead (ug/L)	6	ND-ND	10	-	-	No

Table 5 – Schedule 23 Inorganic Parameters

The following Table summarizes the most recent test results for Schedule 23. Testing is required every three (3) years for the secure, non-GUDI wells in the St. George Drinking Water System.

Parameter	Sample Date (mm/dd/yy)	Result	Unit of Measure	MAC	A/O	Exceedance
Antimony	01/05/23	ND	mg/L	0.006	-	No
Arsenic	01/05/23	ND	mg/L	0.01	-	No
Barium	01/05/23	0.078	mg/L	1.0	-	No
Boron	01/05/23	0.013	mg/L	5.0	-	No
Cadmium	01/05/23	ND	mg/L	0.005	-	No
Chromium	01/05/23	ND	mg/L	0.05	-	No
Mercury	01/05/23	ND	mg/L	0.001	-	No
Selenium	01/05/23	ND	mg/L	0.05	-	No
Uranium	01/05/23	0.0011	mg/L	0.02	-	No

Table 5 – Schedule 24 Organic Parameters

The following Table summarizes the Organic parameters in Schedule 24 sampled during this reporting period or the most recent sample results. Testing is required every three (3) years for the secure, non-GUDI wells in the St. George Drinking Water System.

Parameter	Sample Date (mm/dd/yy)	Result Value	Unit of Measure	MAC	A/O	Exceedance
1,1-Dichloroethylene	01/05/23	ND	ug/L	14	-	No
1,2-Dichlorobenzene	01/05/23	ND	ug/L	200	-	No
1,2-Dichloroethane	01/05/23	ND	ug/L	5	-	No
1,4-Dichlorobenzene	01/05/23	ND	ug/L	5	-	No
2,3,4,6-Tetrachlorophenol	01/05/23	ND	ug/L	100	-	No
2,4,6-Trichlorophenol	01/05/23	ND	ug/L	5	-	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	01/05/23	ND	ug/L	100	-	No
2-4 Dichlorophenol	01/05/23	ND	ug/L	900	-	No
Alachlor	01/05/23	ND	ug/L	5	-	No
Aroclor 1016	01/05/23	ND	ug/L	-	-	-
Aroclor 1221	01/05/23	ND	ug/L	-	-	-
Aroclor 1232	01/05/23	ND	ug/L	-	-	-
Aroclor 1242	01/05/23	ND	ug/L	-	-	-
Aroclor 1248	01/05/23	ND	ug/L	-	-	-
Aroclor 1254	01/05/23	ND	ug/L	-	-	-
Aroclor 1260	01/05/23	ND	ug/L	-	-	-
Atrazine	01/05/23	ND	ug/L	-	-	-
Atrazine + N-dealkylated metabolites (Atrazine+Desethyl-atrazine)	01/05/23	ND	ug/L	5	-	No
Benzene	01/05/23	ND	ug/L	1	-	No
Benzo(a)pyrene	01/05/23	ND	ug/L	0.01	-	No
Bromoxynil	01/05/23	ND	ug/L	5	-	No
Carbaryl	01/05/23	ND	ug/L	90	-	No

Parameter	Sample Date (mm/dd/yy)	Result Value	Unit of Measure	MAC	A/O	Exceedance
Carbofuran	01/05/23	ND	ug/L	90	-	No
Carbon Tetrachloride	01/05/23	ND	ug/L	2	-	No
Chlorobenzene	01/05/23	ND	ug/L	80	-	No
Chlorpyrifos	01/05/23	ND	ug/L	90	-	No
Desethyl-atrazine	01/05/23	ND	ug/L	-	-	No
Diazinon	01/05/23	ND	ug/L	20	-	No
Dicamba	01/05/23	ND	ug/L	120	-	No
Diclofop-methyl	01/05/23	ND	ug/L	9	-	No
Dimethoate	01/05/23	ND	ug/L	20	-	No
Diquat	01/05/23	ND	ug/L	70	-	No
Diuron	01/05/23	ND	ug/L	150	-	No
Ethylbenzene	01/05/23	ND	ug/L	140	2.4	No
Glyphosate	01/05/23	ND	ug/L	280	-	No
Guthion	01/05/23	ND	ug/L	20	-	No
Malathion	01/05/23	ND	ug/L	190	-	No
MCPA	01/05/23	ND	ug/L	100	-	No
Methylene Chloride	01/05/23	ND	ug/L	50	-	No
Metolachlor	01/05/23	ND	ug/L	50	-	No
Metribuzin	01/05/23	ND	ug/L	80	-	No
Paraquat	01/05/23	ND	ug/L	10	-	No
Pentachlorophenol	01/05/23	ND	ug/L	60	-	No
Phorate	01/05/23	ND	ug/L	2	-	No
Picloram	01/05/23	ND	ug/L	190	-	No
Total PCB	01/05/23	ND	ug/L	3	-	No
Prometryne	01/05/23	ND	ug/L	1	-	No
Simazine	01/05/23	ND	ug/L	10	-	No
Terbufos	01/05/23	ND	ug/L	1	-	No
Tetrachloroethylene	01/05/23	ND	ug/L	10	-	No

Parameter	Sample Date (mm/dd/yy)	Result Value	Unit of Measure	MAC	A/O	Exceedance
Toluene	01/05/23	ND	ug/L	60	24	No
Triallate	01/05/23	ND	ug/L	230	-	No
Trichloroethylene	01/05/23	ND	ug/L	5	-	No
Trifluralin	01/05/23	ND	ug/L	45	-	No
Vinyl Chloride	01/05/23	ND	ug/L	1	-	No
o-Xylene	01/05/23	ND	ug/L	-	-	-
p+m-Xylene	01/05/23	ND	ug/L	-	-	-

Appendix B: Water Quantity Summary

Figure 1 - 2024 Total Production by Well (m³)

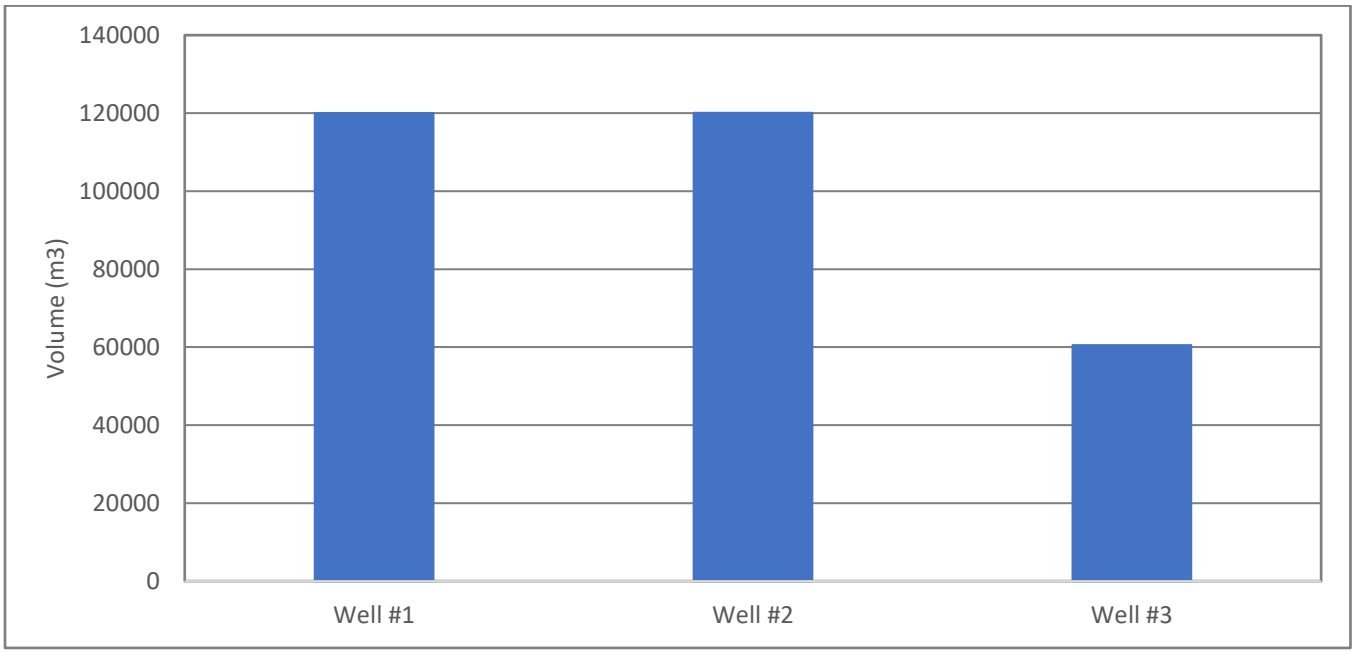

Figure 2 – 2024 Total Daily Water Taking (m³)

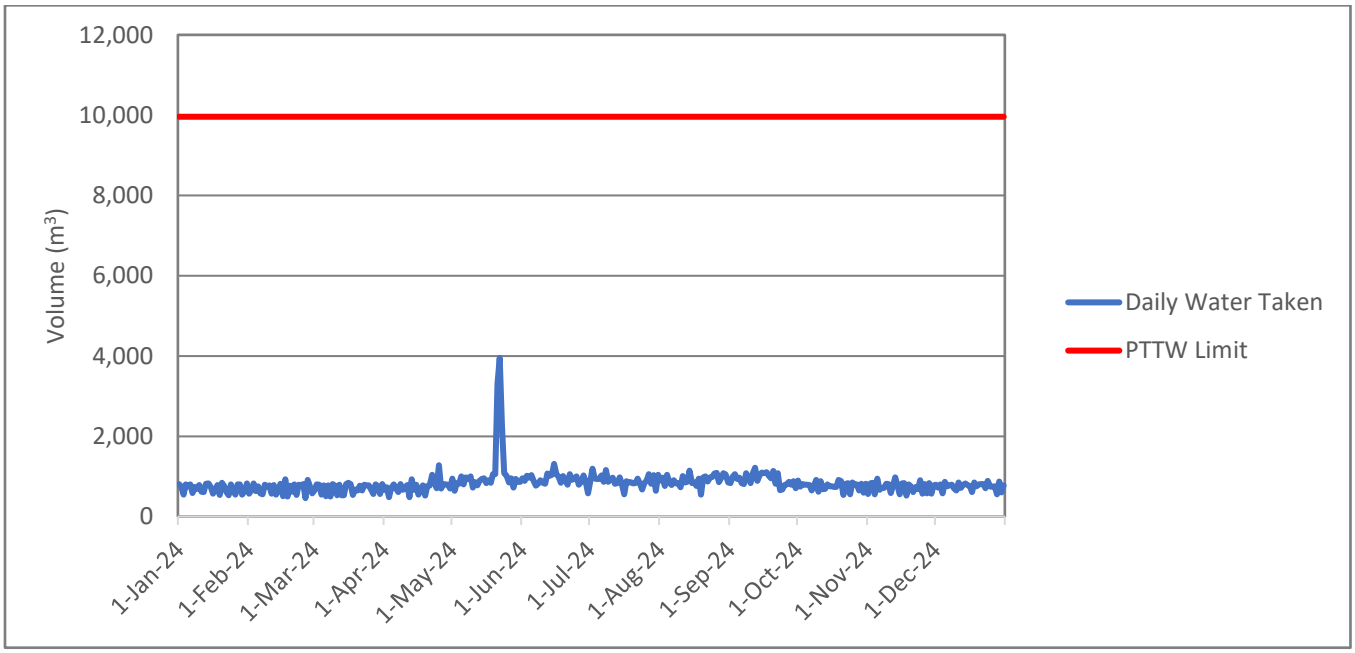

Figure 3 - 2024 Average vs Maximum Daily Flow Rates

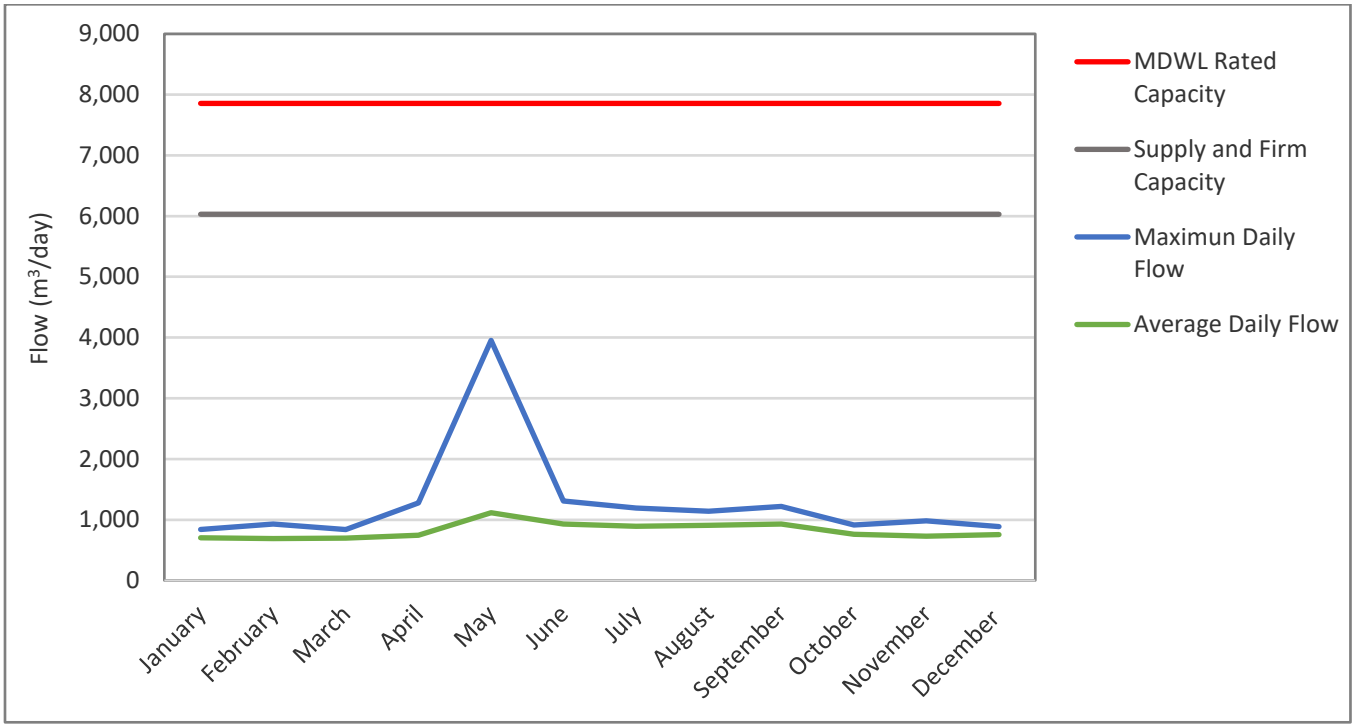

Figure 4 – 2024 Daily Flow Rates