R.V. Anderson Associates Limited
2001 Sheppard Avenue East Suite 300
Toronto Ontario M2J 4Z8 Canada
Tel 416 497 8600 Fax 855 833 4022
www.rvanderson.com

MEMORANDUM

TO:	Rob Greenwood	**RVA:**	184167.04
FROM:	Kimberly Sayers, P.Eng., P.M.P.		
DATE:	February 22, 2021		
SUBJECT:	October 2020 – Review of Groundwater Quality		

The Tottenham Water Supply system in the Town of New Tecumseth is currently supplied by groundwater wells. The groundwater water supply challenges relating to maintaining stable chlorine residuals and elevated levels of THM formation. The Town installed an aeration system in the Mill Street Reservoir in October 2019 to reduce THM levels. As part of the implementation of the aeration system, the Town is completing a review of the groundwater quality to determine if the raw water quality has changed over time, and if any correlations between the groundwater quality and THM formation could be found.

As requested by the Town, the following memorandum is provided to review historical groundwater quality variations for the Tottenham Water Supply system with respect to potential impacts on Trihalomethane formation.

1.0 TOTTENHAM WATER SUPPLY

The Tottenham ground water supply consists of four wells, located at two well sites:

- Walkem Drive Wells - Well 4 (18.9 L/s) and 5 (18.9 L/s). The well operation is limited to one well at a time.
- Coventry Park Wells - Wells 6A (20 L/s) and 7 (30.3 L/s). Both wells can be operated concurrently.
- The wells operate to maintain the water level in the Mill St Reservoir. Operational data provided by the Town for the period of March 12 to May 11, 2020 shows that three wells (either Wells 4, 6A and 7 or Wells 5, 6A and 7) turn on and off at the same time to maintain the reservoir level.

The discharge from all wells are pumped to the Mill Street Reservoir for treatment as follows:

- Chlorination for disinfection;

- Sequestration with sodium silicate for aesthetics (iron and manganese sequestration); and
- Aeration for Trihalomethane (THM) reduction.

The groundwater supply has a complex matrix which includes naturally occurring ammonia, bromide, methane and organics and has resulted in quality challenges relating to maintaining stable chlorine residuals and elevated levels of THM formation.

2.0 TRIHALOMETHANE FORMATION POTENTIAL

Trihalomethanes (THMs) are formed by the reaction between naturally occurring organic compounds in the groundwater supply and chlorine. There are a number of additional factors that influence THM formation.

2.1 Precursors

THM precursors are broadly defined as naturally occurring compounds that react with chlorine (a halogen) to form Trihalomethanes. These compounds are typically organic in nature, with humic fractions (often derived from peat type materials) being identified as key precursors materials. Another pre-cursors contributor is the presence of bromide in the source water, which results in brominated THMs and potentially higher overall THM formation. Generally, the rate and degree of THM formation may increase as a function of the humic acid concentration and bromide ion concentration.

With regards to groundwater quality the following parameters would help to identify precursor variability. These parameters may not directly correspond to THM precursor levels; however, there may be some correlation, and at minimum they can be indicative of variations in groundwater composition:

- Dissolved/Total Organic Carbon (DOC/TOC) (Lower is preferred). The DOC/TOC can give an indication of how much organic carbon is in the water matrix. However, it is not directly proportional to THM formation, as this measurement does not provide a breakdown of the organic fraction/composition, of which only a small fraction will react to form THMs. Increases in DOC levels would likely result in increased THM formation assuming a proportional increase in organic precursors.
- Surrogate parameters can help to indicate changes in the composition of organics in the water matrix. These measurements are not able to be directly translated into THM formation potential, however, continuous monitoring of these parameters can help to determine if there are changes in the groundwater quality that could impact THM formation.
    - Ultraviolet Transmittance (UVT) (Higher is preferred). This measurement gives the percentage of light that passes through a water sample at the wavelength of 254 nm

(UV254). Reductions in UVT relate to the presence of organics, colloidal solids, and suspended particles that absorb and scatter this UV light wavelength. In particular, UV254 provides an indication of particular organic fractions, such as humics as they readily absorb UV254. In turn, these compounds are known to be precursors of DBP formation. Therefore, if the groundwater quality is degrading, a transmittance decline of a few % points could indicate increase in THM precursors.

- Methane levels (Lower is preferred). Although methane is not a THM precursor, higher methane levels in groundwater can indicate higher organics which could contribute to THM formation.

- Nitrogenous compounds (Lower is preferred). Nitrogenous compounds are not THM precursors; however, changes in Total Kjedahl Nitrogen or Organic Nitrogen levels may correlate with changes in the organic precursor composition. This would be reflected in TKN levels being higher than Ammonia, indicating organic complexation. Higher levels of ammonia has also been linked with increased reactivity of organics to form THMs.

- Colour (Lower is preferred). Groundwater with higher color can indicate higher organics but it can also be caused by other compounds such as Iron or Manganese. Generally, colour can be indicative of changes to water composition.

- Turbidity (Lower is preferred). Groundwater with higher turbidity may indicate increased presence of particles in the groundwater. Generally, indicative of changes to water composition.

- Bromide levels (Lower is preferred) would contribute to the formation of more brominated THMs compared with chlorinated THMs. Bromide also enhances the reactivity of organics leading to increased formation of THMs. Bromide levels should trend similar to chloride, as both should have the same origins within the aquifer. Changes of only chloride may indicate surface water infiltration. Generally, surface water should be lower in chlorides with the exception of sources such as road salting runoff.

2.2 Chlorine Demand

Higher chlorine doses also contribute to THM formation when THM precursors are present. Due to the presence of ammonia in the groundwater, the disinfection process requires breakpoint chlorination to be achieved, which is influenced by the chlorine demand factors of the individual water parameters. The following is a summary of the key parameters in the ground water supply and their associated chlorine demand factor per mg/L.

- Ammonia-N: 9 to 11 mg/L of chlorine per 1 mg/L of Ammonia

- Iron: 0.64 mg/L of chlorine per mg/L of iron
- Total Organic Carbon (TOC): 0.1 mg/L of chlorine per mg/L of TOC
- Manganese: 1.3 mg/L of chlorine per mg/L of manganese

Changes to any of these parameters could alter the required chlorine dose to reach breakpoint, with ammonia being the most significant. For example, a 0.5 mg/L increase in ammonia levels could in turn require a 5.5. mg/L increase in the applied chlorine dose; whereas, a 0.5 mg/L increase in TOC would only result in a 0.05 mg/L increase in the applied chlorine dose.

In addition, changes to the composition of the nitrogenous compounds can also impact chlorine breakpoint kinetics (i.e. more reaction time may be required). This would be reflected in TKN levels being higher than Ammonia, indicating organic complexation.

2.3 Reaction Conditions

The following reaction conditions can also impact the rate of THM formation. However, it is noted that in groundwater supplies, these parameters would typically remain relatively unchanged:

- pH - higher pH will increase THM formation. Typically, groundwater has relatively stable pH within deep aquifers; however, some variation is typical.
- Temperature – higher temperatures will increase THM formation. Typically, groundwater temperature is relatively stable at depths greater than 5 – 6 m.
- Time – THMs continue to form for a number of days after chlorination. Water will age as it travels through the distribution system.

3.0 GROUNDWATER QUALITY

3.1 2020 Well Quality Results

A monthly sampling program was initiated between July and October 2020 to assess the variability of the four well sources and the complete data set can be found in Appendix 1, with a total of four sampling sets taking per well.

In reviewing the general chemistry including parameters such as pH, Alkalinity and Hardness, the levels were found to be similar and stable across all wells. The pH readings did appear to increase slightly by 0.2 units, which would be more conducive to THM formation.

Figure 3.1 provides an illustrative comparison of all four wells relative to their combined 2020 average represented as a box and whisker plot. A form of data normalization was used to allow multiple parameters with differing units and magnitudes to be readily compared. This approach allows differences and variabilities to be visually very apparent. The normalization procedure entails the creation of a parameter ratio between an individual well sample compared relative to the average of all samples for the four wells. The following is a guide for reviewing the figure:

- A value of 100% represents the parameter average of all four wells, to which they have been normalized to.
- For the corresponding well and parameter:
  - Values above 100% indicates a relatively higher parameter level
  - Values below 100% indicates a relatively lower parameter level
  - Larger boxes indicate more variability for the parameter levels
  - Smaller boxes indicate less variability for the parameter levels

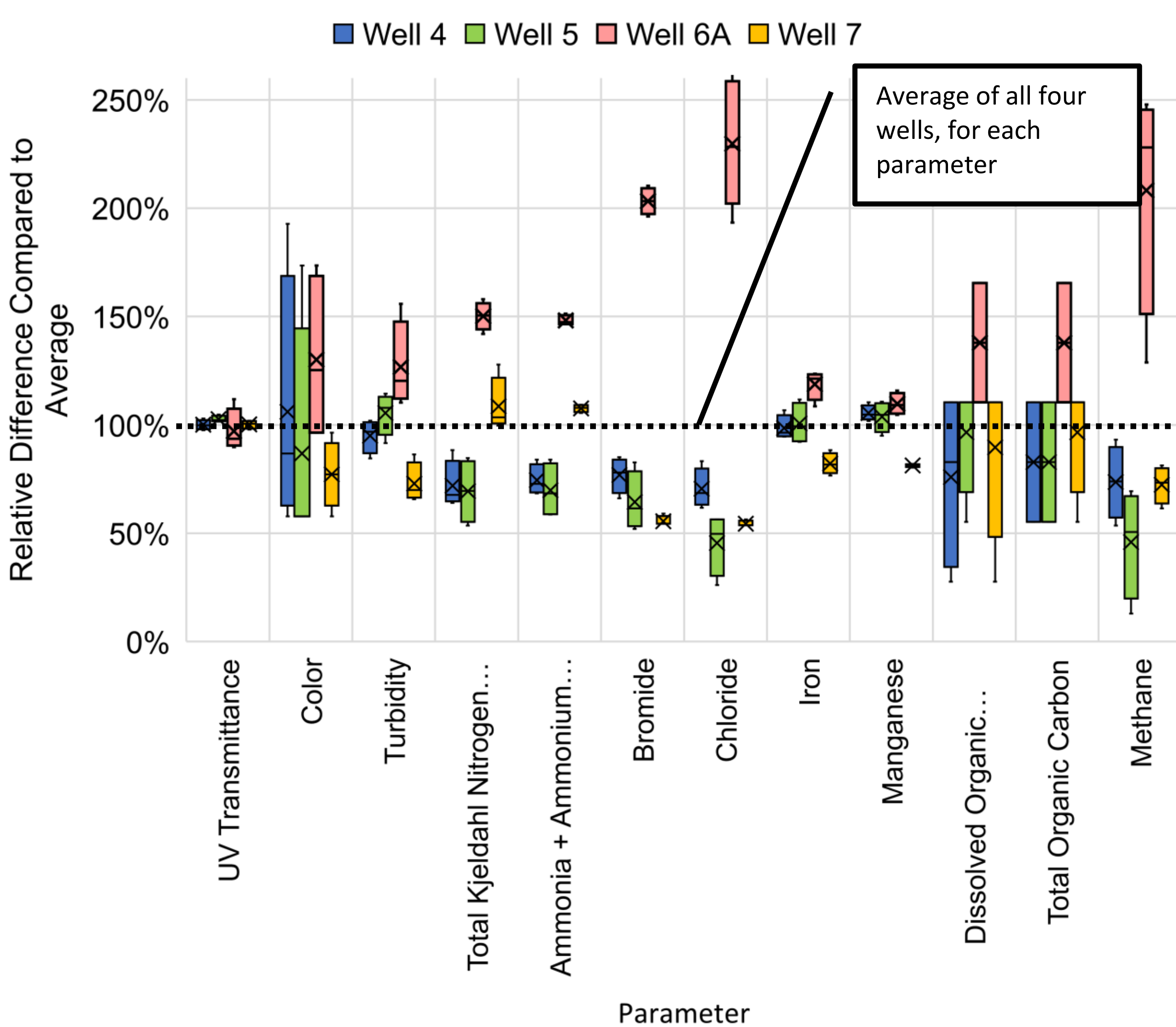

Figure 3.1 – Normalized Well Data

From the above figure, the following observations can be made:

Using this method, it is apparent that each well has a unique water matrix and variability, otherwise the boxes would all rest upon the 100% mark.

Well 6A has higher average concentrations for the majority of parameters compared to the other wells. The only exception being UV Transmittance, where a higher value is actually preferred.

Wells 4 & 5 are generally lower than or equal to the system average. The same could be said of Well 7 apart from nitrogenous compounds, which are higher than the system average.

This data (as observed by the large box sizes) indicates that the colour, turbidity, TOC, DOC and Methane were highly variable throughout the monitoring period. Inversely this figure also indicates the invariability of certain parameters (as observed by the small box sizes), for example the levels of Ammonia, Bromide and Manganese remained relatively constant at Well 6A and 7.

A trend across the parameters could not be discerned with this limited dataset, other than the parameter variability that has already been identified. TOC/DOC levels generally increased between July – October. Additionally, changes in TOC/DOC correlated with changes in UVT.

<u>2020 results</u> – Precursors Levels:

The following identifies wells with the highest relative concentrations of potential precursors. Generally, the rate and degree of THM formation may increase as a function of increased precursor levels.

- Well 6A had the highest average concentrations of most identified indicator parameters, with colour (130% greater), turbidity (126% greater), bromide (200% greater), TOC/DOC (140% greater) and methane (200% greater). TKN values were slightly higher than the corresponding ammonia levels, indicating some organic complexation with nitrogenous compounds. In addition, the UVT levels measured were much more variable (greater than 20% change) compared to the other wells.
- Wells 4, 5 and 7 are generally lower than or equal to the system average.
- Colour, DOC/TOC and Methane were all highly variable across all four wells

There is a noticeable change both in individual wells throughout the sampling period and well concentration compared to system averages. This variability in precursors could be reflected in overall THM formation rates and could explain why the THM levels in Tottenham vary widely throughout the year.

As indicated in Section 2.1, monitoring of UVT/UV254 levels could potentially be used as a means to assess changes in precursor levels related to certain organic fractions. If there are decreases in UVT, supply from those wells could then be reduced during periods of lower demand.

2020 results – Chlorine Demand:

The following identifies wells with the highest relative concentrations of parameters which would increase chlorine demand/dose. Higher chlorine doses can contribute to increased THM formation when THM precursors are present. This is compared to the parameter average for all four wells.

- Well 6A has the highest concentration of compounds which would contribute to chlorine demand. This includes ammonia (150% greater) organics (140%) greater and Iron (10% greater). As noted in Section 2.2, ammonia is a significant contributor to chlorine demand. Well 6A contains on average an additional 0.5 mg/L of ammonia and could at times require an additional 5.5 mg/L chlorine dose compared to the system average.
- Well 7 also has higher than average concentrations of ammonia (10% greater) and organics (5% greater) that could also contribute to increased demand. Iron concentrations were 20% lower.
- Wells 4 & 5 were generally lower than or equal to the system average. In particular the ammonia (70% lower) and organics (70 – 90% lower). Iron concentrations were similar to the system average.

All wells contained elevated concentrations of compounds which would require an increased overall chlorine dose to achieve breakpoint, in particular ammonia. This higher overall dose could contribute to higher THM levels. In addition, from a dosing controls prospective it is more challenging to accommodate this variable demand across the wells. Typically, some degree of chlorine overdosing is required to ensure a residual target is achieved.

Although not captured within the data, the Town has noted that sporadic spikes in chlorine demand can occur and this could likely be caused by pockets of elevated ammonia. Sequential isolation of the wells during these periods could help to identify which well is causing the increased demand.

2020 results – Reaction Condition Variability:

Generally, the results were similar between wells with the only exception being a 0.2 pH unit increase. An increase in pH is more conducive to THM formation; however, this increase was consistent across all four wells.

3.2 Comparison of Current to Historical Groundwater Quality

The groundwater raw water samples that were taken in 2020 were compared to available historical information to identify if there have been any changes in groundwater quality over time. There is limited historical data available for the Tottenham Wells systems, and historical samples captured only a limited number of parameters. From the available data the following high-level observations were noted in comparison to the **average of the results from samples taken in 2020**. An item to note is the historical data often only has a **single measurement**, which may not truly represent the historical quality. The complete data set can be found in Appendix 1.

<u>Well 4</u>

- This well has a limited historical dataset and from the available data it appears to be within a similar range. One exception is a decrease in chlorides compared to the 1977 samples (25 mg/L vs. 50 mg/L). This could indicate a change in aquifer quality.

<u>Well 5</u>

- This well has a limited historical dataset. Current and historical levels are within a similar range. On exception is an increase in iron compared to 1977 samples (0.80 mg/L vs. 0.56 mg/L). This would cause a slight increase in chlorine demand.

<u>Well 6A</u>

The following observations were made between the 2020 average compared to a 2009 sample.

- An increase in Ammonia (1.5 mg/L vs. 0.53 – 0.73 mg/L), which would result in a significant increase in chlorine demand. A 1 mg/L increase in ammonia would result in an approximate 11 mg/L increase in chlorine demand. In turn there was an increase in TKN levels (1.6 mg/L vs. 0.43 mg/L), with a slightly higher organic fraction. This could also indicate a change in the aquifer composition.

- An increase in bromide (0.86 mg/L vs. 0.48 mg/L), which would contribute to brominated THMs and overall increased formation of THMs.

- An increase in chloride (86 mg/L vs. 45 mg/L), with a similar trend as bromide. Similar ratios indicate a change in aquifer quality.

- An increase in Iron (0.920 mg/L vs. 0.613 mg/L), which would result in increased chlorine demand.

- Increase in Manganese (0.039 mg/L vs. 0.028 mg/L), which would result in increased chlorine demand.

- Increase in Total Organic Carbon (2.5 mg/L vs. 1.9 mg/L). This would contribute to an increase in chlorine demand but more significantly could indicate an increase in THM precursors.

- An increase in methane production compared to 2009, 2012, 2013 and 2015 samples. This generally indicates a change in groundwater quality.

Well 7

The following observations were made between the 2020 average compared to a 1997 sample:

- An increase in Ammonia (1.1 vs. 0.37-0.92 mg/L), which would result in a significant increase in chlorine demand. The resulting increase in chlorine demand would be approximately 8 mg/L. In addition, there was an increase in TKN levels (1.2 mg/L vs. 0.6 mg/L), with a slightly higher organic fraction. This could also indicate a change in the aquifer composition.

- A decrease in Chlorides (24 mg/L vs. 56 mg/L). This could indicate a change in aquifer quality.

- Increase in Total Organic Carbon (1.7 mg/L vs. 1.4 mg/L). This would result in a minor increase in chlorine demand but more significantly an increase in THM precursors.

The following observations were made between the 2020 average compared to a 2010 sample:

- A decrease in bromide (0.03 mg/L vs. 0.06 mg/L), which could reduce brominated THMs. This trend is consistent with the decreased observed in chlorides in the 1997 sample.

With respect to the available historical data, Wells 6A and 7 both exhibited the most observable changes with respect to increases in nitrogenous compounds (Ammonia and TKN) and TOC. These changes could contribute to higher concentrations of THM precursors and increased chlorine demand. Well 6A also experienced an increase in bromide levels, which would contribute to more brominated THMs.

4.0 SUMMARY

The monitoring data indicates that the Tottenham groundwater system has a complex water matrix, with variations in parameter levels that could influence the potential THM formation rates.

- Wells 6A and 7 have experienced shifts in their composition compared to historical samples. This includes increases in bromide, organics, and nitrogenous compounds that could have the potential to increase THM formation rates. There is limited historical information for Wells 4 & 5 to determine if they have also experienced changes in raw water composition.

- There is a variation in parameters levels within and between the different wells over the monitoring period. For example, parameter levels change between samples for the same well over the monitoring period. In addition, each well has its individual water characteristics when compared to the other wells. This variation could then translate to variable rates of THM formation depending on the supply breakdown between wells.

It is difficult to decern trends within the limited 2020 dataset, though a few observations can be made for the parameters of note:

- Well 4 & 5
    - Parameters for Well 4 & 5 are similar and follow the same general trends.
    - Parameters levels for Well 4 & 5 are typically lower than Wells 6A or 7 or the system average. Lower levels would typically be associated conditions less conducive to THM formation compared to the other wells.
- Well 7 - Majority of parameters levels were similar to Well 4 & 5. Key parameters such as nitrogenous compounds were higher than Well 4&5. Increases in these parameters would be associated an increase in conditions more conducive to THM formation compared to Well 4 & 5.
- Well 6A - Overall, higher parameter levels when compared with Wells 4, 5 and 7 and the system average. In particular, noticeably higher organics, nitrogenous compounds and bromide. Increases in these parameters would be associated with an increase in conditions more conducive to THM formation compared to the other wells.

5.0 RECOMMENDATIONS

It is recommended that the Town:

- Continue with the construction of the Transmission Main as the primary solution to replace the existing groundwater supply. The groundwater wells should remain to provide security of supply.
- Continue to perform regular quarterly testing of the raw well water quality to compare to historical water quality data to determine if there have been any significant changes.
- The Town has identified that previous investigations have been completed to stagger the starting of the wells to prioritize the usage of wells with lower water quality parameters associated with potential THM formation (i.e., Wells 4 and 5 first, followed by Well 7 and then 6A). However, the Town had experienced operational challenges related to control of the chlorine disinfection process. In addition, typical water demand often requires concurrent usage of Well 4 or 5 and Well 6A and 7. Therefore, this option is not feasible. Once the pipeline is on line, when the groundwater wells are required for security of supply and to

supplement flows, it is expected that the groundwater flows will be lower than current flows. At that time, the Town can explore staggering of well starts.

APPENDIX I – MONITORING DATA

Raw Well DATA

		4	4	5	6A	7
		4				
Date	Well	Well 4				
2020-07-21	UV Transmittance	1.029150452	87.6	86.7	80.3	86.8
2020-07-21	Color	0.578313253	3	3	5	3
2020-07-21	Turbidity	0.944966443	3.96	4.47	6.53	3.62
2020-07-21	Total Kjeldahl Nitrogen (N)	0.686251469	0.73	0.84	1.6	1.1
2020-07-21	Ammonia + Ammonium (N)	0.702867602	0.72	0.86	1.52	1.12
2020-07-21	Bromide	0.756277696	0.32	0.24	0.83	0.23
2020-07-21	Chloride	0.69833809	26	21	85	20
2020-07-21	Iron	1.06692469	827	866	958	685
2020-07-21	Manganese	1.103448276	38.8	38.9	37.6	28.6
2020-07-21	Dissolved Organic Carbon	0.5	1	2	2	2
2020-07-21	Total Organic Carbon	0.551724138	1	2	2	2
2020-07-21	Methane	0.535315985	5.4	7	24	7.7
2020-08-04	UV Transmittance	1.002129378	85.3	86.4	95.2	83.2
2020-08-04	Color	1.927710843	10	9	9	4
2020-08-04	Turbidity	0.990305742	4.15	3.84	5.16	2.75
2020-08-04	Total Kjeldahl Nitrogen (N)	0.639247944	0.68	0.9	1.6	1.1
2020-08-04	Ammonia + Ammonium (N)	0.683343502	0.7	0.79	1.5	1.1
2020-08-04	Bromide	0.803545052	0.34	0.35	0.85	0.23
2020-08-04	Chloride	0.671478932	25	21	85	20
2020-08-04	Iron	0.945653927	733	816	932	626
2020-08-04	Manganese	1.049413438	36.9	37.9	40.7	28.8
2020-08-04	Dissolved Organic Carbon		<mdl	1	2	<mdl
2020-08-04	Total Organic Carbon	0.551724138	1	1	2	1
2020-08-04	Methane	0.793060719	8	6.1	13	6.2
2020-09-25	UV Transmittance	0.993905573	84.6	89.1	78.9	86.2
2020-09-25	Color	0.963855422	5	3	8	5
2020-09-25	Turbidity	0.844742729	3.54	4.79	4.62	2.87
2020-09-25	Total Kjeldahl Nitrogen (N)	0.667450059	0.71	0.57	1.51	1.06
2020-09-25	Ammonia + Ammonium (N)	0.751677852	0.77	0.61	1.5	1.08
2020-09-25	Bromide	0.850812408	0.36	0.22	0.89	0.25
2020-09-25	Chloride	0.832633876	31	16	100	21
2020-09-25	Iron	0.976616675	757	725	949	641
2020-09-25	Manganese	1.046569499	36.8	33.4	39.1	28.6
2020-09-25	Dissolved Organic Carbon	1	2	2	3	2
2020-09-25	Total Organic Carbon	1.103448276	2	1	3	2
2020-09-25	Methane	0.931846344	9.4	4.1	25	8.2
2020-10-06	UV Transmittance	0.975108305	83	87.3	76.4	84.9
2020-10-06	Color	0.771084337	4	3	5	4
2020-10-06	Turbidity	1.018941089	4.27	4.57	4.92	2.99
2020-10-06	Total Kjeldahl Nitrogen (N)	0.883666275	0.94	0.64	1.68	1.36
2020-10-06	Ammonia + Ammonium (N)	0.839536303	0.86	0.6	1.55	1.11
2020-10-06	Bromide	0.661742984	0.28	0.28	0.87	0.23
2020-10-06	Chloride	0.617760618	23	9.7	72	20
2020-10-06	Iron	0.950814385	737	714	842	594
2020-10-06	Manganese	1.01813011	35.8	35.7	36.8	28.2
2020-10-06	Dissolved Organic Carbon	1	2	2	3	2
2020-10-06	Total Organic Carbon	1.103448276	2	2	3	2
2020-10-06	Methane	0.68401487	6.9	1.3	22	7.1

Well Data with MDL Correction (if below MDL = 0.5 x MDL)

		4	5	6A	7	
Date	Parameter	Well 4	Well 5	Well 6A	Well 7	Average
2020-07-21	UV Transm	87.6	86.7	80.3	86.8	85.12
2020-07-21	Color	3	3	5	3	5.19
2020-07-21	Turbidity	3.96	4.47	6.53	3.62	4.19
2020-07-21	Total Kjeld	0.73	0.84	1.6	1.1	1.06
2020-07-21	Ammonia ·	0.72	0.86	1.52	1.12	1.02
2020-07-21	Bromide	0.32	0.24	0.83	0.23	0.42
2020-07-21	Chloride	26	21	85	20	37.23
2020-07-21	Iron	827	866	958	685	775.13
2020-07-21	Manganese	38.8	38.9	37.6	28.6	35.16
2020-07-21	Dissolved (	1	2	2	2	1.81
2020-07-21	Total Orga	1	2	2	2	1.81
2020-07-21	Methane	5.4	7	24	7.7	10.09
2020-08-04	UV Transm	85.3	86.4	95.2	83.2	85.11875
2020-08-04	Color	10	9	9	4	5.1875
2020-08-04	Turbidity	4.15	3.84	5.16	2.75	4.190625
2020-08-04	Total Kjeld	0.68	0.9	1.6	1.1	1.06375
2020-08-04	Ammonia ·	0.7	0.79	1.5	1.1	1.024375
2020-08-04	Bromide	0.34	0.35	0.85	0.23	0.423125
2020-08-04	Chloride	25	21	85	20	37.23125
2020-08-04	Iron	733	816	932	626	775.125
2020-08-04	Manganese	36.9	37.9	40.7	28.8	35.1625
2020-08-04	Dissolved (	0.5	1	2	0.5	1.8125
2020-08-04	Total Orga	1	1	2	1	1.8125
2020-08-04	Methane	8	6.1	13	6.2	10.0875
2020-09-25	UV Transm	84.6	89.1	78.9	86.2	85.11875
2020-09-25	Color	5	3	8	5	5.1875
2020-09-25	Turbidity	3.54	4.79	4.62	2.87	4.190625
2020-09-25	Total Kjeld	0.71	0.57	1.51	1.06	1.06375
2020-09-25	Ammonia ·	0.77	0.61	1.5	1.08	1.024375
2020-09-25	Bromide	0.36	0.22	0.89	0.25	0.423125
2020-09-25	Chloride	31	16	100	21	37.23125
2020-09-25	Iron	757	725	949	641	775.125
2020-09-25	Manganese	36.8	33.4	39.1	28.6	35.1625
2020-09-25	Dissolved (	2	2	3	2	1.8125
2020-09-25	Total Orga	2	1	3	2	1.8125
2020-09-25	Methane	9.4	4.1	25	8.2	10.0875
2020-10-06	UV Transm	83	87.3	76.4	84.9	85.11875
2020-10-06	Color	4	3	5	4	5.1875
2020-10-06	Turbidity	4.27	4.57	4.92	2.99	4.190625
2020-10-06	Total Kjeld	0.94	0.64	1.68	1.36	1.06375
2020-10-06	Ammonia ·	0.86	0.6	1.55	1.11	1.024375
2020-10-06	Bromide	0.28	0.28	0.87	0.23	0.423125
2020-10-06	Chloride	23	9.7	72	20	37.23125
2020-10-06	Iron	737	714	842	594	775.125
2020-10-06	Manganese	35.8	35.7	36.8	28.2	35.1625
2020-10-06	Dissolved (	2	2	3	2	1.8125
2020-10-06	Total Orga	2	2	3	2	1.8125
2020-10-06	Methane	6.9	1.3	22	7.1	10.0875

Normalized Data (Well value/average value)

Date	Parameter	Date	Well 4	Well 5	Well 6A	Well 7
	UV Transm	2020-07-21	1.03	1.02	0.94	1.02
	Color	2020-07-21	0.58	0.58	0.96	0.58
	Turbidity	2020-07-21	0.94	1.07	1.56	0.86
	Total Kjeld	2020-07-21	0.69	0.79	1.50	1.03
	Ammonia ·	2020-07-21	0.70	0.84	1.48	1.09
	Bromide	2020-07-21	0.76	0.57	1.96	0.54
	Chloride	2020-07-21	0.70	0.56	2.28	0.54
	Iron	2020-07-21	1.07	1.12	1.24	0.88
	Manganese	2020-07-21	1.10	1.11	1.07	0.81
	Dissolved (	2020-07-21	0.55	1.10	1.10	1.10
	Total Orga	2020-07-21	0.55	1.10	1.10	1.10
2020-07-21	Methane	2020-07-21	0.54	0.69	2.38	0.76
	UV Transm	2020-08-04	1.00	1.02	1.12	0.98
	Color	2020-08-04	1.93	1.73	1.73	0.77
	Turbidity	2020-08-04	0.99	0.92	1.23	0.66
	Total Kjeld	2020-08-04	0.64	0.85	1.50	1.03
	Ammonia ·	2020-08-04	0.68	0.77	1.46	1.07
	Bromide	2020-08-04	0.80	0.83	2.01	0.54
	Chloride	2020-08-04	0.67	0.56	2.28	0.54
	Iron	2020-08-04	0.95	1.05	1.20	0.81
	Manganese	2020-08-04	1.05	1.08	1.16	0.82
	Dissolved (	2020-08-04	0.28	0.55	1.10	0.28
	Total Orga	2020-08-04	0.55	0.55	1.10	0.55
2020-08-04	Methane	2020-08-04	0.79	0.60	1.29	0.61
	UV Transm	2020-09-25	0.99	1.05	0.93	1.01
	Color	2020-09-25	0.96	0.58	1.54	0.96
	Turbidity	2020-09-25	0.84	1.14	1.10	0.68
	Total Kjeld	2020-09-25	0.67	0.54	1.42	1.00
	Ammonia ·	2020-09-25	0.75	0.60	1.46	1.05
	Bromide	2020-09-25	0.85	0.52	2.10	0.59
	Chloride	2020-09-25	0.83	0.43	2.69	0.56
	Iron	2020-09-25	0.98	0.94	1.22	0.83
	Manganese	2020-09-25	1.05	0.95	1.11	0.81
	Dissolved (	2020-09-25	1.10	1.10	1.66	1.10
	Total Orga	2020-09-25	1.10	0.55	1.66	1.10
2020-09-25	Methane	2020-09-25	0.93	0.41	2.48	0.81
	UV Transm	2020-10-06	0.98	1.03	0.90	1.00
	Color	2020-10-06	0.77	0.58	0.96	0.77
	Turbidity	2020-10-06	1.02	1.09	1.17	0.71
	Total Kjeld	2020-10-06	0.88	0.60	1.58	1.28
	Ammonia ·	2020-10-06	0.84	0.59	1.51	1.08
	Bromide	2020-10-06	0.66	0.66	2.06	0.54
	Chloride	2020-10-06	0.62	0.26	1.93	0.54
	Iron	2020-10-06	0.95	0.92	1.09	0.77
	Manganese	2020-10-06	1.02	1.02	1.05	0.80
	Dissolved (	2020-10-06	1.10	1.10	1.66	1.10
	Total Orga	2020-10-06	1.10	1.10	1.66	1.10
2020-10-06	Methane	2020-10-06	0.68	0.13	2.18	0.70

Normalized Data - Sample Average

Date	Parameter	Date	Value
	UV Transmittance	2020-07-21	1.002717
	Color	2020-07-21	0.674699
	Turbidity	2020-07-21	1.108427
	al Kjeldahl Nitroger	2020-07-21	1.003525
	nonia + Ammoniur	2020-07-21	1.029896
	Bromide	2020-07-21	0.957164
	Chloride	2020-07-21	1.020648
	Iron	2020-07-21	1.075955
	Manganese	2020-07-21	1.023107
	solved Organic Carl	2020-07-21	0.965517
	'otal Organic Carbo	2020-07-21	0.965517
2020-07-21	Methane	2020-07-21	1.092937
	UV Transmittance	2020-08-04	1.028269
	Color	2020-08-04	1.542169
	Turbidity	2020-08-04	0.948546
	al Kjeldahl Nitroger	2020-08-04	1.005875
	nonia + Ammoniur	2020-08-04	0.99817
	Bromide	2020-08-04	1.04579
	Chloride	2020-08-04	1.013933
	Iron	2020-08-04	1.002096
	Manganese	2020-08-04	1.025951
	solved Organic Carl	2020-08-04	0.551724
	'otal Organic Carbo	2020-08-04	0.689655
2020-08-04	Methane	2020-08-04	0.825279
	UV Transmittance	2020-09-25	0.99508
	Color	2020-09-25	1.012048
	Turbidity	2020-09-25	0.943773
	al Kjeldahl Nitroger	2020-09-25	0.904818
	nonia + Ammoniur	2020-09-25	0.966443
	Bromide	2020-09-25	1.016248
	Chloride	2020-09-25	1.128085
	Iron	2020-09-25	0.990808
	Manganese	2020-09-25	0.980448
	solved Organic Carl	2020-09-25	1.241379
	'otal Organic Carbo	2020-09-25	1.103448
2020-09-25	Methane	2020-09-25	1.157373
	UV Transmittance	2020-10-06	0.973933
	Color	2020-10-06	0.771084
	Turbidity	2020-10-06	0.999254
	al Kjeldahl Nitroger	2020-10-06	1.085781
	nonia + Ammoniur	2020-10-06	1.005491
	Bromide	2020-10-06	0.980798
	Chloride	2020-10-06	0.837334
	Iron	2020-10-06	0.93114
	Manganese	2020-10-06	0.970494
	solved Organic Carl	2020-10-06	1.241379
	'otal Organic Carbo	2020-10-06	1.241379
2020-10-06	Methane	2020-10-06	0.924411

Normalized Data, with corrector for errors

	Well 4	Well 5	Well 6A	Well 7
UV Transm	1.02915	1.018577	0.943388	1.019752
Color	0.578313	0.578313	0.963855	0.578313
Turbidity	0.944966	1.066667	1.55824	0.863833
Total Kjeld	0.686251	0.789659	1.504113	1.034078
Ammonia ·	0.702868	0.839536	1.483832	1.09335
Bromide	0.756278	0.567208	1.961595	0.543575
Chloride	0.698338	0.564042	2.283028	0.537183
Iron	1.066925	1.117239	1.23593	0.883728
Manganes	1.103448	1.106292	1.069321	0.813367
Dissolved (	0.551724	1.103448	1.103448	1.103448
Total Orga	0.551724	1.103448	1.103448	1.103448
Methane	0.535316	0.693928	2.379182	0.763321
UV Transm	1.002129	1.015053	1.118437	0.977458
Color	1.927711	1.73494	1.73494	0.771084
Turbidity	0.990306	0.916331	1.23132	0.656227
Total Kjeld	0.639248	0.846063	1.504113	1.034078
Ammonia ·	0.683344	0.771202	1.464308	1.073826
Bromide	0.803545	0.827179	2.008863	0.543575
Chloride	0.671479	0.564042	2.283028	0.537183
Iron	0.945654	1.052733	1.202387	0.807612
Manganes	1.049413	1.077853	1.157483	0.819054
Dissolved (	0.275862	0.551724	1.103448	0.275862
Total Orga	0.551724	0.551724	1.103448	0.551724
Methane	0.793061	0.604709	1.288724	0.614622
UV Transm	0.993906	1.046773	0.92694	1.012703
Color	0.963855	0.578313	1.542169	0.963855
Turbidity	0.844743	1.143028	1.102461	0.684862
Total Kjeld	0.66745	0.53584	1.419506	0.996475
Ammonia ·	0.751678	0.595485	1.464308	1.054301
Bromide	0.850812	0.519941	2.103397	0.590842
Chloride	0.832634	0.429747	2.685916	0.564042
Iron	0.976617	0.935333	1.224319	0.826963
Manganes	1.046569	0.949876	1.11198	0.813367
Dissolved (	1.103448	1.103448	1.655172	1.103448
Total Orga	1.103448	0.551724	1.655172	1.103448
Methane	0.931846	0.406444	2.478315	0.812887
UV Transm	0.975108	1.025626	0.89757	0.99743
Color	0.771084	0.578313	0.963855	0.771084
Turbidity	1.018941	1.090529	1.174049	0.713497
Total Kjeld	0.883666	0.601645	1.579318	1.278496
Ammonia ·	0.839536	0.585723	1.513118	1.083588
Bromide	0.661743	0.661743	2.05613	0.543575
Chloride	0.617761	0.260534	1.933859	0.537183
Iron	0.950814	0.921142	1.086276	0.766328
Manganes	1.01813	1.015286	1.046569	0.801991
Dissolved (	1.103448	1.103448	1.655172	1.103448
Total Orga	1.103448	1.103448	1.655172	1.103448
Methane	0.684015	0.128872	2.180917	0.703841

Tottenham Groundwater Testing

	Date	MDL	1970	2013-08-29	2015-07-06	2020-07-21	2020-08-04	2020-09-25	2020-10-06
Well			4	4	4	4	4	4	4
Temperature upon receipt						18	7	9	11
Total Suspended solids		2				4	<mdl	2	<mdl
pH		0.05	8.2			8.13	8.18	8.33	8.3
Alkalinity		2				206	205	218	218
Carbonate		2				<mdl	<mdl		<mdl
Bicarbonate		2				206	205	215	217
OH		2				<mdl	<mdl		<mdl
Conductivity		2				467	457	474	453
UV Transmittance						87.6	85.3	84.6	83
Color		3	3			3	10	5	4
Turbidity		0.1				3.96	4.15	3.54	4.27
Organic Nitrogen		0.05				<mdl	<mdl	<MDL	0.08
Total Kjeldahl Nitrogen (N)		0.05				0.73	0.68	0.71	0.94
Ammonia + Ammonium (N)		0.04				0.72	0.7	0.77	0.86
4AAP-Phenolics		2				<mdl	2		<mdl
Sulphide		6				8	<mdl		<mdl
Bromide		0.05				0.32	0.34	0.36	0.28
Chloride		0.04	50			26	25	31	23
Fluoride		0.06				0.21	0.2	0.23	0.25
Sulphate		0.04				<mdl	<mdl	<MDL	0.79
Nitrite (as N)		0.003				<mdl	<mdl	<MDL	<mdl
Nitrate (as N)		0.006				<mdl	<mdl	<MDL	<mdl
Nitrate + Nitritie (as N)		0.006				<mdl	<mdl	<MDL	<mdl
Hardness		0.05	195			196	190	196	180
Aluminum		1				3	<mdl	<MDL	3
Arsenic		0.2				0.8	0.8	1.2	1.1
Barium		0.02				55.9	54.1	61.7	58.8
Boron		2				53	61	61	63
Calcium		0.001				46.3	43.3	47.9	44.2
Cadmium		0.003				0.005	0.003	0.004	0.003
Chromium		0.08				0.19	0.13	0.1	0.16
Copper		0.2				3.7	2.7	2.8	2.6
Iron		7	850			827	733	757	737
Mercury		0.01				<mdl	<mdl	<MDL	<mdl
Sodium		0.01				29.5	26.7	31.2	26.4
Manganese		0.01				38.8	36.9	36.8	35.8
Lead		0.01				0.09	0.04	<MDL	<mdl
Antimony		0.09				<mdl	<mdl	<MDL	<mdl
Selenium		0.04				<mdl	<mdl	<MDL	<mdl
Uranium		0.002				0.008	0.02	0.008	0.004
Zinc		2				12	13	14	8
Potassium		0.009				1.97	1.8	1.87	1.76
Beryllium		0.007				<mdl	<mdl	<MDL	<mdl
Bismuth		0.007				<mdl	<mdl	<MDL	<mdl
Cobalt		0.004				0.014	0.015	0.015	0.013
Molybdenum		0.04				0.85	0.86	1.26	1.47
Nickel		0.1				<mdl	<mdl	<MDL	<mdl
Phosphorus		0.003				0.049	0.037	0.046	0.008
Silicon		20				8480	8640	9900	8050
Silver		0.05				<mdl	<mdl	<MDL	<mdl
Strontium		0.02				506	522	551	494
Thallium		0.005				<mdl	<mdl	<MDL	<mdl
Tin		0.06				0.13	0.07	0.07	0.08
Titanium		0.05				0.14	0.09	0.14	0.12
Vanadium		0.01				0.03	0.02	0.03	0.04
Dissolved Organic Carbon		1				1	<mdl	2	2
Total Organic Carbon		1				1	1	2	2
Methane		0.02		7.9	4.7	5.4	8	9.4	6.9
Total coliform		0				0	0	0	0
E. Coli		0				0	0	0	0
Heterotrophic Plate Count (HPC)		0				17	2	0	0
Notes			Golder Associates Ltd and Waterloo Hydrogeologic Inc. Report entitled “South Simcoe Municipal Groundwater Study (2002). This report summarizes data collected in the original			Town sampling program			

Tottenham Groundwater Testing

Date	MDL	1977	2010-06-15	2013-08-29	2015-07-06	2020-07-21	2020-08-04	2020-09-25	2020-10-06
Well		5	5	5	5	5	5	5	5
Temperature upon receipt						18	7	9	11
Total Suspended solids	2					<mdl	<mdl	2	<mdl
pH	0.05	7.9				8.17	8.18	8.37	8.33
Alkalinity	2					206	208	214	214
Carbonate	2					<mdl	<mdl		
Bicarbonate	2					206	208	209	
OH	2					<mdl	<mdl		
Conductivity	2					459	452	431	412
UV Transmittance						86.7	86.4	89.1	87.3
Color	3					3	9	3	3
Turbidity	0.1					4.47	3.84	4.79	4.57
Organic Nitrogen	0.05					<mdl	0.11	<MDL	<MDL
Total Kjeldahl Nitrogen (N)	0.05					0.84	0.9	0.57	0.64
Ammonia + Ammonium (N)	0.04		0.71			0.86	0.79	0.61	0.6
4AAP-Phenolics	2					<mdl	<mdl		<mdl
Sulphide	6					8	7		<mdl
Bromide	0.05		0.25			0.24	0.35	0.22	0.28
Chloride	0.04	23				21	21	16	9.7
Fluoride	0.06					0.2	0.18	0.19	0.2
Sulphate	0.04	2				1.2	1.2	2.7	3.7
Nitrite (as N)	0.003					<mdl	<mdl	<MDL	<mdl
Nitrate (as N)	0.006	<mdl				<mdl	<mdl	<MDL	<mdl
Nitrate + Nitritie (as N)	0.006					<mdl	<mdl	<MDL	<mdl
Hardness	0.05	198				192	193	187	187
Aluminum	1					1	<mdl	2	2
Arsenic	0.2					0.8	0.8	0.3	0.3
Barium	0.02					77.4	83	80	77
Boron	2					51	61	51	54
Calcium	0.001	48				46.9	45.9	46.8	46.7
Cadmium	0.003					0.006	0.007	<MDL	<mdl
Chromium	0.08					0.18	0.6	0.15	0.23
Copper	0.2					5.4	6.8	2	2
Iron	7	560				866	816	725	714
Mercury	0.01					<mdl	<mdl	<MDL	<mdl
Sodium	0.01					28.6	27.4	23.8	21.2
Manganese	0.01	29				38.9	37.9	33.4	35.7
Lead	0.01					0.01	0.06	<MDL	<mdl
Antimony	0.09					<mdl	<mdl	<MDL	<mdl
Selenium	0.04					<mdl	<mdl	<MDL	<mdl
Uranium	0.002					0.008	0.01	0.012	0.007
Zinc	2					19	28	8	7
Potassium	0.009					1.7	1.65	1.59	1.68
Beryllium	0.007					<mdl	<mdl	<MDL	<mdl
Bismuth	0.007					<mdl	<mdl	<MDL	<mdl
Cobalt	0.004					0.017	0.017	0.015	0.012
Molybdenum	0.04					0.88	0.96	0.89	1.03
Nickel	0.1					0.1	0.2	<MDL	<mdl
Phosphorus	0.003					0.056	0.059	0.039	<mdl
Silicon	20					8940	9090	10500	8640
Silver	0.05					<mdl	<mdl	<MDL	<mdl
Strontium	0.02					438	485	464	464
Thallium	0.005					<mdl	<mdl	<MDL	<mdl
Tin	0.06					0.1	0.08	<MDL	0.1
Titanium	0.05					0.06	0.13	0.12	0.1
Vanadium	0.01					0.06	0.07	0.03	0.04
Dissolved Organic Carbon	1					2	1	2	2
Total Organic Carbon	1					2	1	1	2
Methane	0.02		4.6	1.6	5.1	7	6.1	4.1	1.3
Total coliform	0					0	0	0	0
E. Coli	0					0	0	0	0
Heterotrophic Plate Count (HPC)	0					11	4	0	0
Notes		Golder Associates Ltd and Waterloo Hydrogeologic Inc. Report entitled "South Simcoe Municipal Groundwater Study (2002). This report summarizes data collected in the original reports on the construction of	GENIVAR testing			Town sampling program			

Tottenham Groundwater Testing

Date	MDL	2009-05-07	2012-09-17	2013-08-29	2015-07-06	2020-07-21	2020-08-04	2020-09-25	2020-10-06
Well		6A	6A	6A	6A	6A	6A	6A	6A
Temperature upon receipt						18	7	9	11
Total Suspended solids	2					2	2	3	2
pH	0.05	8.22	8.16			8.12	8.17	8.37	8.26
Alkalinity	2	205				212	216	225	225
Carbonate	2					<mdl	<mdl		
Bicarbonate	2	205				212	216	220	
OH	2					<mdl	<mdl		
Conductivity	2		587			641	627	632	630
UV Transmittance						80.3	95.2	78.9	76.4
Color	3	20				5	9	8	5
Turbidity	0.1	3.2				6.53	5.16	4.62	4.92
Organic Nitrogen	0.05					0.08	0.14	<MDL	0.13
Total Kjeldahl Nitrogen (N)	0.05	0.43				1.6	1.6	1.51	1.68
Ammonia + Ammonium (N)	0.04	0.53-0.73				1.52	1.5	1.5	1.55
4AAP-Phenolics	2					<mdl	<mdl		<mdl
Sulphide	6		<mdl			10	11		<mdl
Bromide	0.05	0.48				0.83	0.85	0.89	0.87
Chloride	0.04	44.7				85	85	100	72
Fluoride	0.06	0.22				0.22	0.22	0.23	0.25
Sulphate	0.04	<mdl				0.12	0.11	0.11	0.07
Nitrite (as N)	0.003	<mdl				<mdl	<mdl	<MDL	<mdl
Nitrate (as N)	0.006	<mdl				<mdl	<mdl	<MDL	<mdl
Nitrate + Nitritie (as N)	0.006					<mdl	<mdl	<MDL	<mdl
Hardness	0.05	180				201	216	222	195
Aluminum	1	87				2	<mdl	<MDL	2
Arsenic	0.2	<mdl				0.8	0.9	0.9	0.8
Barium	0.02	112				165	180	172	149
Boron	2	59				83	98	92	89
Calcium	0.001	38				44.4	46.5	51.3	44.4
Cadmium	0.003	<mdl				<mdl	<mdl	<MDL	<mdl
Chromium	0.08	3				0.23	0.16	0.2	0.18
Copper	0.2	<mdl				<mdl	<mdl	<MDL	<mdl
Iron	7	613				958	932	949	842
Mercury	0.01					<mdl	<mdl	0.04	<mdl
Sodium	0.01					53.6	53.1	54.7	49.6
Manganese	0.01	28				37.6	40.7	39.1	36.8
Lead	0.01	<mdl				<mdl	<mdl	<MDL	<mdl
Antimony	0.09					<mdl	<mdl	<MDL	<mdl
Selenium	0.04					<mdl	<mdl	<MDL	<mdl
Uranium	0.002	<mdl				0.002	0.01	0	<mdl
Zinc	2	24				<mdl	3	<MDL	<mdl
Potassium	0.009	1.98				2.48	2.54	2.81	2.43
Beryllium	0.007					<mdl	<mdl	<MDL	<mdl
Bismuth	0.007					<mdl	<mdl	<MDL	<mdl
Cobalt	0.004					0.03	0.04	0.03	0.029
Molybdenum	0.04	<mdl				1.65	1.75	1.72	1.66
Nickel	0.1	<mdl				<mdl	<mdl	<MDL	<mdl
Phosphorus	0.003					0.05	0.05	0.05	0.003
Silicon	20					8470	8540	9840	7670
Silver	0.05	<mdl				<mdl	<mdl	<MDL	<mdl
Strontium	0.02	589				740	813	807	722
Thallium	0.005	<mdl				<mdl	<mdl	<MDL	<mdl
Tin	0.06					0.13	0.1	<MDL	0.09
Titanium	0.05					0.13	0.12	0.16	0.11
Vanadium	0.01	<mdl				0.06	0.08	0.07	0.07
Dissolved Organic Carbon	1					2	2	3	3
Total Organic Carbon	1	1.9				2	2	3	3
Methane	0.02	14	16	16	12	24	13	25	22
Total coliform	0		0			0	0	0	0
E. Coli	0		0			0	0	0	0
Heterotrophic Plate Count (HPC)	0		7			1140	135	620	69
Notes		GENIVAR Report entitled “Well Upgrades for Tottenham Well 6 - Exploration, Construction and Testing of Upgraded Tottenham Well 6” (2009)					Town sampling program		

Tottenham Groundwater Testing

Date	MDL	1997	2010-06-15	2013-08-29	2015-07-06	2020-07-21	2020-08-04	2020-09-25	2020-10-06
Well		7	7	7	7	7	7	7	7
Temperature upon receipt						18	7	9	11
Total Suspended solids	2					3	<mdl	4	<mdl
pH	0.05	8				8.1	8.19	8.3	8.34
Alkalinity	2					203	204	212	207
Carbonate	2					<mdl	<mdl		
Bicarbonate	2					203	204	211	
OH	2					<mdl	<mdl		
Conductivity	2					441	431	431	432
UV Transmittance						87	83.2	86.2	84.9
Color	3	8				3	4	5	4
Turbidity	0.1	1.3				3.6	2.75	2.87	2.99
Organic Nitrogen	0.05					<mdl	<mdl	<MDL	0.25
Total Kjeldahl Nitrogen (N)	0.05	0.6				1.1	1.1	1.06	1.36
Ammonia + Ammonium (N)	0.04	0.37-0.92	1.28			1.1	1.1	1.08	1.11
4AAP-Phenolics	2					<mdl	<mdl		<mdl
Sulphide	6					<mdl	<mdl		<mdl
Bromide	0.05		0.62			0.2	0.23	0.25	0.23
Chloride	0.04	56				20	20	21	20
Fluoride	0.06					0.2	0.21	0.22	0.24
Sulphate	0.04	<mdl				0.1	0.07	0.08	<mdl
Nitrite (as N)	0.003	<mdl				<mdl	<mdl	<MDL	<mdl
Nitrate (as N)	0.006	<mdl				<mdl	<mdl	<MDL	<mdl
Nitrate + Nitritie (as N)	0.006					<mdl	<mdl	<MDL	<mdl
Hardness	0.05	188				176	183	187	171
Aluminum	1					2	<mdl	<MDL	2
Arsenic	0.2					0.6	0.6	0.06	0.6
Barium	0.02					138	151	144	130
Boron	2					54	64	62	61
Calcium	0.001	39.4				39	39.9	44	39.6
Cadmium	0.003	<mdl				<mdl	<mdl	<MDL	<mdl
Chromium	0.08	<mdl				0.3	0.1	0.19	0.1
Copper	0.2	<mdl					<mdl	0.3	<mdl
Iron	7	520				685	626	641	594
Mercury	0.01					<mdl	<mdl	0.01	<mdl
Sodium	0.01					27	25.9	26.5	24.4
Manganese	0.01	24				29	28.8	28.6	28.2
Lead	0.01	<mdl				<mdl	<mdl	<MDL	<mdl
Antimony	0.09					<mdl	<mdl	<MDL	<mdl
Selenium	0.04					<mdl	<mdl	<MDL	<mdl
Uranium	0.002					0	<mdl	0	<mdl
Zinc	2					10	<mdl	<MDL	<mdl
Potassium	0.009					2.2	2.17	2.34	2.16
Beryllium	0.007					<mdl	<mdl	<MDL	<mdl
Bismuth	0.007					<mdl	<mdl	<MDL	<mdl
Cobalt	0.004					0	0.02	0.01	0.01
Molybdenum	0.04					0.7	0.77	0.78	0.76
Nickel	0.1					<mdl	<mdl	<MDL	<mdl
Phosphorus	0.003					0	0.03	0.03	<mdl
Silicon	20					####	8840	####	8050
Silver	0.05					<mdl	<mdl	<MDL	<mdl
Strontium	0.02					576	640	644	617
Thallium	0.005					<mdl	<mdl	<MDL	<mdl
Tin	0.06					2.9	0.1	<MDL	0.08
Titanium	0.05					0.1	0.1	0.12	0.08
Vanadium	0.01					0	0.05	0.04	0.03
Dissolved Organic Carbon	1					2	<mdl	2	2
Total Organic Carbon	1	1.4				2	1	2	2
Methane	0.02	10.73	16	13	2.9	7.7	6.2	8.2	7.1
Total coliform	0					0	0	0	0
E. Coli	0					0	0	0	0
Heterotrophic Plate Count (HPC)	0					0	0	0	0
Notes		Dixon Hydrogeology Report entitled “Coventry Park, Well Construction and Testing Hydrogeological Investigation” (1997)	GENIVAR testing			Town sampling program			