Appendix J

Hydrogeological Report in Support of Arthur Water Supply Environmental Assessment (RJ Burnside, Rev. 1, November 2022)

BURNSIDE

Long Term Pumping Test of TW1-21 Hydrogeological Report in Support of Arthur Water Supply Environmental Assessment

Arthur, Ontario
Township of Wellington North

Long Term Pumping Test of TW1-21 Hydrogeological Report in Support of Arthur Water Supply Environmental Assessment

Arthur, Ontario
Township of Wellington North

R.J. Associates Burnside & Limited
292 Speedvale Avenue West Unit 20
Guelph ON N1H 1C4 CANADA

October 2022 (Rev. November 2022)
300052287.0000

Distribution List

No. of Hard Copies	PDF	Email	Organization Name
0	1	1	Matt Aston, Township of Wellington North
0	1	1	Corey Schmidt, Township of Wellington North
0	1	1	Kyle Davis, Wellington County Source Protection

Record of Revisions

Revision	Date	Description
0	September 2, 2022	Draft Report Submission to project team
1	October 21, 2022	Second Draft Report Submission to project team
2	November 9, 2022	Final Report Submission to team
3		Submission to the MECP for a PTTW application

*** Current Arthur PTTW 8202-9DNKD3 Expires May 31, 2024**

R.J. Burnside & Associates Limited

Report Prepared By:

Josh Donkersgoed, P.Eng.
Project Engineer
JD:sn

Report Reviewed By:

Jim Baxter, P.Eng
Groundwater Resource Engineer

Table of Contents

Tables

Figures

Appendices

Disclaimer

Other than by the addressee, copying or distribution of this document, in whole or in part, is not permitted without the express written consent of R.J. Burnside & Associates Limited.

In the preparation of the various instruments of service contained herein, R.J. Burnside & Associates Limited was required to use and rely upon various sources of information (including but not limited to: reports, data, drawings, observations) produced by parties other than R.J. Burnside & Associates Limited. For its part R.J. Burnside & Associates Limited has proceeded based on the belief that the third party/parties in question produced this documentation using accepted industry standards and best practices and that all information was therefore accurate, correct and free of errors at the time of consultation. As such, the comments, recommendations and materials presented in this instrument of service reflect our best judgment in light of the information available at the time of preparation. R.J. Burnside & Associates Limited, its employees, affiliates and subcontractors accept no liability for inaccuracies or errors in the instruments of service provided to the client, arising from deficiencies in the aforementioned third party materials and documents.

R.J. Burnside & Associates Limited makes no warranties, either express or implied, of merchantability and fitness of the documents and other instruments of service for any purpose other than that specified by the contract.

1.0 Introduction

R. J. Burnside & Associates Limited (Burnside) has been retained by the Township of Wellington North (Township) to complete the hydrogeological components of a water supply Environmental Assessment (EA) for the community of Arthur. The Township supplies drinking water to its residents within the community of Arthur boundaries through the Arthur Water Supply System which consists of three groundwater supply wells called 7B, 8A, and 8B. A new municipal supply well is required to support the growth of the Township and to improve water quality.

A review of existing information was presented to Township council in June 2021 that identified potential test drilling locations north of Arthur and south of Arthur at the Arthur Well 8AB site. Test well drilling north of Arthur was completed in November 2021. The project team reported the construction of a successful test well to council at their January 2022 meeting and recommended long term testing of the test well to determine the capacity and quality of the water from the site.

The test well named TW1-21 was constructed on Township owned land on the southeast corner of the unopened road allowances for Wells and MaCauley Streets, 840 m north of Domville Street. The location of TW1-21 is shown on Figures 1 and 2. The surrounding properties are currently cultivated but lands to the east are within the Arthur boundary and zoned industrial. Land to the west of Wells Street are outside the Arthur boundary and are zoned agricultural.

This report describes the construction and testing of TW1-21 which accesses an overburden aquifer that is interpreted as a potential new municipal water source for the community of Arthur. The TW1-21 overburden aquifer can produce over 27 L/s of water that contains lower concentrations of hardness, iron and manganese than the existing Arthur municipal wells but contains arsenic at a level that is above the half maximum allowable concentration (MAC) that would require treatment.

2.0 Background

2.1 Description of Existing Taking

In 1984 Burnside, with the assistance of Mr. David Crowley, established a new higher capacity overburden well called Arthur Well 7 in the southwest corner of the community. Arthur Well 7 was a 150 mm diameter well, had a capacity of 12.5 L/s (165 Igpm) and became the primary water supply for the Arthur municipal water system. Arthur Well 7 developed a hole in the casing, in 1997, due to corrosion and required repair. Once repaired, it was determined that Arthur Well 7 should be replaced with a new larger diameter well, Arthur Well 7B. Well 7B is a 250 mm diameter well and is located in the south west corner of Arthur on Wells Street (Figure 2) and was brought on-line on June 16, 2004.

A groundwater management study (GMS) was completed by Burnside for the Township of Wellington North in 2001. The GMS included the construction of several test wells one of which was located at the intersection of Highway 6 and County Road 109 on Eliza St. in an unopened road allowance. This Test Well indicated the presence of a deep overburden aquifer with a capacity in excess of 15.2 L/sec (200 Igpm).

Exploration at the southeast corner of Arthur continued in 2002 as part of a water supply EA. Due to less than ideal aquifer conditions and potential sources of contamination close to Arthur, Wells 8A/8B were eventually commissioned on the Jones Baseline approximately 2 km south of Arthur in November 2005 (Figure 2).

The wells for the Arthur System operate under PTTW 8202-9DNKD3 (Appendix A). The PTTW was renewed and issued on December 12, 2013 and expires on May 31, 2024. The well construction and permitted taking from each well is summarized below in Table 1.

Table 1: Arthur Water Supply Wells

Well	Depth (m)	Screened Interval (m)	Permitted Flow	
			Maximum Rate (L/min)	Maximum Taking (L/day)
Well 7B	45.9	42.5 to 45.6	1,364	1,965,000
Well 8A	61.9	55.8 to 61.9	1,570	2,261,000
Well 8B	62.2	56.1 to 62.2	1,570	2,261,000

2.2 2021-2022 Water Supply Environmental Assessment and Exploration

Exploration for a new water source outlined in the introduction was initiated to increase water quantity as per the 2021 water supply reserve calculations as well as redundancy through a desktop review of potential areas to develop new water sources.

2.2 2021-2022 Water Supply Environmental Assessment and Exploration

Exploration for a new water source outlined in the introduction was initiated to increase water quantity as per the 2021 water supply reserve calculations as well as redundancy through a desktop review of potential areas to develop new water sources.

2.3 Quaternary and Bedrock Geology

The hydrogeology of the Arthur area consists of about 50 to 75 m of glacial derived overburden materials underlain by Paleozoic aged carbonate and shale bedrock. The glacial overburden consists primarily of thick layers of glacial till with thinner layers of sand and gravel sediments. The layers were laid down from glaciers that advanced and retreated (melted) multiple times from the north about 10,000 years ago. The thickest sand and gravel layers are typically found just above the bedrock in what are sometimes referred to as contact aquifers.

The deep sand and gravel contact aquifer is interpreted to be the source of water for Wells 7B, 8A, and 8B. The interpreted cross-sections (Figures 7 and 8) indicate few wells encounter these deposits in north Arthur, but it is the source of water for TW1-21.

2.4 Local Hydrogeology

Properties surrounding Arthur obtain their water from private groundwater supply wells. A review of MECP water well records and existing dwellings within 2,500 m of the TW1-21 Site (Appendix B) indicates 183 well records (excluding abandonment records) but no wells within 500 m. The well records locations are shown on Figure 2.

Of the 183 well records, 95 are recorded as supply wells. It is noted that many of these are located within the community of Arthur and have since been abandoned. Arthur Wells 1,2,3,4,5 and 6 were abandoned over 15 years ago. Of the 95 wells there are only 15 wells completed in the same sand and gravel overburden as TW1-21.

2.5 Well Survey

A door to door well survey was completed prior to long term testing. A review of the current MECP records database was used to identify existing wells within 2,500 m of the site. Burnside staff conducted a well survey of these locations and received permission to monitor 14 private wells, including four shallow monitoring wells. The monitoring wells were chosen based on accessibility, depth and location to be representative of all of the wells in the area.

A letter was provided to all homeowners within 1,000 m of the well testing to provide notice of the test and emergency contact information. A copy of the letter is included in Appendix C.

2.6 Local Surface Water Features

The surface water features are shown on the surficial geology map. (Figure 3) The Conestogo River flows from east to west along the south side of Arthur. TW1-21 is located approximately 1500 m north of the Conestogo River. Farely Creek is a tributary of the Conestogo River that flows from east to west north of Arthur and curves to the southwest on the west side of Arthur. The confluence of Farley Creek and the Conestogo River is just upstream of Arthur Well 7.

Farley Creek flows from northeast to southwest approximately 150 m west of TW1-21. An intermittent drainage swale, that is visible on Figure 3, begins in the farm field just east of Wells Street, crosses west under Wells Street approximately 530 m to the north of TW1-21 and then joins Farley Creek. Farley Creek flows to the southeast and crosses south under Wellington County Rd 109 west of Arthur (Figure 2).

A piezometer and a staff gauge were installed in Farley creek to monitor changes in the creek flows and shallow groundwater levels beneath the Creek. The installation of the piezometer and subsequent water level measurements indicate that the soils are relatively fine grained which is consistent with the surficial geology map that indicates silty to clayey till for the area. The location of the piezometer (PZ1) and the staff gauge (SG1) are shown on Figure 2.

3.0 Methodology

3.1 Well Monitoring Program

As part of the long-term pumping test monitoring program, Burnside installed automatic water level recorders (AWLR's) in seven of the fourteen selected private wells. The wells were also monitored manually before, during and after the pumping test, except for the domestic well at 7975 Side Road 10 East which was added to the monitoring network at the start of the pumping test. The wells at 7975 side Road 10 East, 15 Wells Street and 8565 County Road 14 were monitored with a sonic level meter due to accessibility issues. ALWRs were also installed in PZ1 and SG1 during the pumping test. The monitored wells are summarized in Table 2 below.

The wells that are included in the Township's PTTW monitoring program were also included, as well as TW1-21 and MW1-21. MW1-21 is a 50 mm diameter monitoring well-constructed 7 m south of TW1-21 and screened into the same formation as TW1-21. Water levels at the three Arthur supply wells (7B, 8A, and 8B) are monitored with a SCADA system the water level and pumping data prior to, during and after the

pumping test was provided to Burnside following the pumping test. The monitoring locations are summarized in Table 2 and the well locations are shown on Figure 2.

Table 2: Well Monitoring Locations

Monitoring Location	Monitoring Method	Well Use	Well Depth (m)	Primary Water Source	Distance to TW1-21 (m)
TW1-21	Manual / AWLR	Test Well	47.5	Deep Overburden	0
MW1-21	Manual / AWLR	Monitoring	42.7	Deep Overburden	7
PZ1	Manual / AWLR	Monitoring	0.9	Shallow Overburden	180
MW1	Manual	Monitoring	4.6	Shallow Overburden	350
MW3	Manual	Monitoring	4.5	Shallow Overburden	510
510 Eliza	Manual / AWLR	Commercial	72.1	Bedrock	645
MW2	Manual	Monitoring	7.1	Shallow Overburden	660
8580 CR14	Manual / AWLR	Domestic / Farm	61.0	Bedrock	775
8565 CR14	Sonic	Domestic / Farm	130	Bedrock	790
8566 CR14	Manual / AWLR	Domestic	114	Bedrock	795
8590 CR14	Manual / AWLR	Domestic	45.7	Deep Overburden	1095
15 Wells St	Sonic	Commercial	108	Bedrock	1190
8048 Line 2	Manual	Domestic	113	Bedrock	1600
8061 Line 2	Manual / AWLR	Domestic	52.4	Bedrock	1615
MW4	Manual / AWLR	Monitoring	10.6	Shallow Overburden	1890
8610 HW6	Manual / AWLR	Domestic	56.1	Deep Overburden	2315
7795 SR10E	Manual / AWLR	Domestic	70.1	Bedrock	2405
7975 SR10E	Manual	Domestic	37.2	Deep Overburden	2300
WN-MW1/00	Manual / AWLR	PTTW Monitoring	51.5	Deep Overburden	2030

Monitoring Location	Monitoring Method	Well Use	Well Depth (m)	Primary Water Source	Distance to TW1-21 (m)
7794 HW 109	Manual / AWLR	Domestic / PTTW Monitoring	51.4	Deep Overburden	2295
Arthur 7A	SCADA	Municipal	44.6	Deep Overburden	2050
Arthur 8A	SCADA	Municipal	61.9	Deep Overburden	3220
Arthur 8B	SCADA	Municipal	62.2	Deep Overburden	3190
TW4/02	AWLR	PTTW Monitoring	63.3	Deep Overburden	3250

Hydrographs showing the water level monitoring data for each location are provided in Appendix D.

Water quality was monitored throughout the test and included:

- Continuous ultraviolet light transmission (UVT) and Turbidity monitoring at the pumping well TW1-21.
- Regular sampling from TW1-21 for analysis of general chemistry.
- Regular sampling from TW1-21 for analysis of e. coli and total coliforms.
- Pre-test and end of test sampling from shallow and deep overburden monitoring wells for analysis of general chemistry.
- Sampling from Farley Creek for analysis of general chemistry.
- Two samples from TW1-21 for analysis to indicate the presence of *Cryptosporidium* spp. and *Giardia* spp., and the presence of pigment-bearing algae and diatoms (PBADs).
- Sample collected from TW1-21 at the end of the test for analysis of ODWS.

The water quality results are discussed in Section 5.0.

3.2 Construction of TW1-21 and MW1-21

Microbiological and Protozoa Evaluation Results TW1-21 construction included a 150 mm nominal diameter steel casing installed to 42.4 mbgs. The annular space outside the well casing was sealed with neat cement grout with a wet density of 1,750 kg/m^3. A 4.9 m long, no. 50 slot opening screen with a 140 mm diameter was installed from 42.7 to 47.5 mbgs. The screen was connected to the well casing with a 1.2 m screen extension and neoprene rubber K-packer which was installed from 41.5 to 42.7 mbgs.

A monitor well called MW1-21 was constructed 7.4 south of TW1-21. MW1-21 is a 50 mm nominal diameter PVC monitoring well that accesses the deep overburden aquifer through a No. 10 slot screen installed from 39.6 to 42.7 mbg. MW1-21 is screened into the same formation as TW1-21, although at a slightly higher interval. The monitoring data indicates that the water levels in the wells are the same under static conditions.

3.3 Variable Rate Testing

A variable rate pumping test was completed on TW1-21 on November 29, 2021. During the test, TW1-21 was pumped at successively increasing rates of 6, 13, and 19 and 25 L/s for 20 minutes each with 20 minutes recovery between steps. The results of the variable rate testing are summarized in Table 3. Graphs of the variable rate test are included in Appendix E.

Table 3: Variable Rate Testing

Step	Pumping Rate (L/s (L/min))	Pumping Water Level at 30 minutes (m bgl)	Drawdown at 20 minutes (m)	Specific Capacity (L/s/m)
1	6.3 (379)	10.54	0.70	9.01
2	12.6 (757)	11.56	1.72	7.34
3	18.9 (1136)	12.97	3.13	6.05
4	25.3 (1514)	14.67	4.83	5.22

Specific capacity is a way to measure efficiency of a well and available capacity. It is a pumping rate divided by the drawdown required to achieve the pumping rate. The variable rate test indicated that TW1-21 could produce a high capacity of water with a relatively high specific capacity of over 5 L/s/m. The specific capacity declined as pumping test increased due to the lack of full recovery between steps. The variable rate test indicated that a 6-day long-term pumping test could be completed at greater than 20 L/s (1200 L/min).

3.4 Long Term Pumping Test

A pumping test design report was completed by Burnside to meet the requirements for registering in the Environmental Activity Sector Registry (EASR). The pumping test EASR was registered on May 16, 2022 (Reg. No. R-011-9152754560) and permitted taking at maximum rate of 42 L/s (2,500 L/min) for seven days. Letters were delivered to properties within 1,000 m of TW1-21 (and outside of Arthur) prior to the test to provide notification and contact information.

The long-term pumping test consisted of pumping from TW1-21 at 23 L/s for 144 hours (6 days) and pretest and post-test monitoring. During the test, discharged water was pumped through a 150 mm diameter lay-flat hose to Farley Creek 150 m north of

TW1-21, downstream of PZ1 and SG1. The water was discharged first to a tarp to remove the potential for erosion before draining into Farley Creek.

TW1-21 was pumped at 23 L/s (1,382 L/min, 304 IGPM) for 144 hours (6 days) from June 18, 2022 at 09:10 to June 24, 2022 at 09:15.

3.5 Weather Conditions

Temperature and precipitation data during the monitoring period was obtained from the Environment and Climate Change Canada's nearby Fergus Shand Dam weather station. The data indicate that on June 11, 7 days before the test, 8.6 mm of rain was recorded. For the next 12 days the station only reported precipitation on June 20, when 0.2 m of precipitation was recorded. 7 days after the end of the test a total of 4 mm of precipitation was recorded with the precipitation occurring five and seven days after the test ended. The daily precipitation recorded at the Shand Dam is included on the hydrographs in Appendix C.

Precipitation data for 2022 was compared to historical data from the 1981 to 2010 Climate Normals. The precipitation data from April to June 2022 was below average as it was only 70 % of the historical normals. The period following the test was also drier than normal as 50 % of the historical normal precipitation was recorded in July.

4.0 Response to Long Term Pumping Test

A summary of the water level response to the long-term pumping test is provided in Table 4 and on Figure 9. Hydrographs showing the monitoring data for all the monitored wells have been included in Appendix C. The hydrographs show the water level data before, during and after the pumping test in relation to the ground surface, well depth and approximate pump depth. A second hydrograph for each well is also included to show more detailed water level trends during the pumping test period. These were used to interpret the drawdown caused by the pumping test and seasonal water level declines.

Table 4: Summary of Pumping Test Drawdown

Well	Aquifer	Distance (m)	Interpreted Drawdown (m)
TW1-21	Deep Overburden	0	14.56
MW1-21	Deep Overburden	7	13.02
8565 CR14	Bedrock	780	3.3
8580 CR14	Bedrock	745	3.0
8566 CR14	Bedrock	795	2.5
510 Eliza	Bedrock	645	2.2
15 Wells St Arthur	Bedrock	1185	0.8

Well	Aquifer	Distance (m)	Interpreted Drawdown (m)
7975 SR10E	Deep Overburden	2300	0.7
8590 CR14	Deep Overburden	1080	0.7
7795 SR10E	Bedrock	2400	0.4
PZ1	Shallow Overburden	176	0
8048 Line 2	Bedrock	1580	0
8610 HW6	Bedrock	2275	0
MW3	Shallow Overburden	491	0
MW1	Shallow Overburden	341	0
MW4	Shallow Overburden	1890	0
8061 Line 2	Bedrock	1600	0
MW4	Shallow Overburden	660	0
WN-MW1/00	Deep Overburden	2030	0
Voisin Well	Deep Overburden	2295	0
TW4/02	Deep Overburden	3250	0
Arthur 7A	Deep Overburden	2050	0
Arthur 8B	Deep Overburden	3190	0
Arthur 8A	Deep Overburden	3220	0

4.1 Response at TW1-21 and MW1-21

The static water level in TW1-21 prior to pumping was 8.63 mbgs. At the end of the pumping test the water level at TW1-21 was 23.19 mbgs (total drawdown of 14.56 m). The hydrograph of TW1-21 shows a gradual flattening as the last 8 hours of pumping produced only 0.15 m in drawdown (Appendix D). After pumping stopped, TW1-21 reached 30% recovery after two hours, and 80% recovery after 36 hours. The post pumping test water level is approximately 0.7 m lower than the static level prior to the pumping test. The lower level is interpreted to be a seasonal decline due to the dry conditions and increased taking from the aquifer on a regional level. The seasonal decline observed in the monitoring wells is discussed further in Section 4.3.

MW1-21 is a 50 mm diameter monitoring well located 7.4 m south of TW1-21. MW1-21 is interpreted to be screened in the same overburden aquifer as TW1-21. The static water levels in MW1-21 and TW1-21 differ by less than 0.03 m during static conditions.

The water levels at MW1-21 matched the water level trends at TW1-21, with 1.54 m less drawdown at MW1-21 than TW1-21 for the duration of the test. The final drawdown at TW1-21 was 13.02 m. Recovery trends were the same at MW1-21 as TW1-21.

4.2 Response at Monitoring Wells

Figure 9 shows the interpreted drawdown at each monitoring location. Four of the monitoring wells, located on Eliza Street / Wellington County Road 14 (8580 CR14, 8565 CR14, 8566 CR14 and 510 Eliza) responded to the pumping with more than 2 m of drawdown. These four wells are the only supply wells located within 1 km of TW1-21 and are located at distances between 645 and 795 m from TW1-21. The four wells followed similar trends prior to and during the pumping test, however the water levels are obscured at 8580 CR14 due constant high use of the well.

The wells are all completed in bedrock. The hydrographs show the wells began responding during the first day of the test and are interpreted to continue drawing down until approximately 24 hours after pumping was stopped. The interpreted total drawdown from the pumping test ranged from 2.2 to 3.3 m. The post pumping test water levels show the recovery is slower than the rate of drawdown during the pumping test, with approximately 50% recovery recorded 4 weeks after the pumping stopped, and the interpreted static levels after the pumping test are approximately 0.9 m lower than the static levels prior to the pumping test.

8590 Wellington Country Road 14 (8590 CR14) is a domestic well located 1 km north of TW1-21 that is completed in the deep overburden. The well is interpreted to follow a similar trend to that of the four close bedrock wells, however the water level trend is obscured by 1 to 2 m water level fluctuations. The fluctuations are interpreted to be caused by periods of increased water taking at nearby farms. The general trend indicates the well began drawing down approximately 3 days after the start of the pumping test, and total drawdown is interpreted to be approximately 0.8 m. The well then recovered to about 0.6m below the pre-test levels after 4 weeks.

7795 Side Road 10 East (7795 SR10E) is a domestic / farm well located approximately 2.3 km north of TW1-21 that is completed in the deep overburden. Permission to monitor the well was not received until the start of the pumping test. 7975 Side Road 10 East (7975 SR10E) is a domestic well located approximately 2.4 km northwest of TW1-21 that is completed in bedrock. Both wells are interpreted to be gradually declining prior to the pumping test and started drawing down in response to the pumping test after approximately 4 days of pumping. The drawdown is interpreted to continue for 2 to 4 days after the end of pumping at both wells. The AWLR data at 7975 SR10E indicated the wells slowly recovered for approximately 4 weeks after the pumping test and then continued declining on a trend similar to the trend observed before the pumping test. The interpreted total drawdown at 7795 SR10E is 0.4 m and at 7975 SR10E is 0.7 m.

15 Wells Street (15 Wells St) is a bedrock well located approximately 1.2 m southwest of TW1-21 and is also located approximately halfway between TW1-21 and Arthur Well 7B. Similar to 7795 SR10E and 7975 SR10E, 15 Wells St is interpreted to have been

gradually declining down prior to the start of the pumping test and began responding to the pumping test after approximately 2 days of pumping. The well is interpreted to continue drawing down after pumping stopped for 24 hours, and the interpreted total drawdown is 0.8 m. As the well was only monitored manually, the interpretation of the recovery data is limited. However, recovery is interpreted to have been slow, like the recovery of the wells previously discussed.

8048 Line 2 and 8061 Line 2 are domestic bedrock wells located approximately 1.6 km northeast of TW1-21. Both wells are interpreted to have been seasonally declining during the monitoring period with no observable response to the pumping test. The water levels declined by approximately 0.6 and 1.0 m during the monitoring period.

The monitoring wells (MW1 through MW4) are between 4 and 11 m in depth and are all completed in the fine-grained (silt and / or clay) shallow overburden. MW1, MW2 and MW3 are located to the east, north and south of TW1-21 within 700 m. MW4 is located on the East side of Arthur approximately 2 km south of TW1-21. MW1, MW3 and MW4 water levels declined seasonally during the monitoring period between 0.3 to 0.6 m with no observable response to the pumping test. MW2 (a monitoring well located adjacent to a manure pit, Figure 9) was sampled prior to and at the end of the pumping test and was recovering from the sampling throughout the monitoring period.

Arthur 7B is a municipal production well located 2.0 km south of TW1-21. Arthur 7B draws water from a deep overburden like TW1-21. The SCADA system records water levels that were provided by Wellington North staff following the pumping test. The hydrographs are provided in Appendix D and show the water level declined by 1.2 m during the pumping test, beginning on the second day of the test. At the same time the daily production from Arthur 7B increased from 200 to 300 m^3 to 650 m^3. The Arthur 7B hydrographs show no interpreted response to the pumping test.

Arthur 8A and 8B are municipal production wells located south of Arthur, approximately 3.2 km south of TW1-21. Both wells are completed in the deep overburden like Arthur Well 7B and TW1-21. The hydrographs show the static water level in both wells was declining throughout the monitoring period. Based on review of water level trends in previous years, the declining trend is interpreted to be due to increased water consumption and seasonal variations.

4.3 Surface Water Monitoring

SG1 and PZ1 were used to monitor Farley Creek during the pumping test. PZ1 was installed adjacent to the creek, upstream of the pumping test discharge, and is 0.9 m deep. SG1 was installed in the creek adjacent to PZ1. The monitoring data for SG1 and PZ1 were plotted on the same hydrograph for comparison of the creek and shallow groundwater levels. The hydrographs show the level of Farley Creek generally declined throughout the monitoring period due to seasonally dry conditions, groundwater levels in

PZ1 were consistently above the surface water levels prior to during and after the pumping test. No response to pumping is interpreted.

4.4 Aquifer Analysis

The deep overburden aquifer at TW1-21 directly overlies the bedrock aquifer. TW1-21 and MW1-21 are both constructed in a very thick and permeable (highly transmissive) portion of the overburden aquifer that thins and becomes finer moving away from TW1-21 and MW1-21. The water level response observed during the test is typical for a leaky confined aquifer with a limiting boundary. Cross-sections on Figures 5, 6, and 7 show the interpreted geology in the area (based on available well records) and show that sand and gravel deposits or contact aquifer have been interpreted to be present over much of the area, however the thickness of the sand and gravel aquifer reduces and is not present (or not reported) in many water well logs. Many bedrock well records do not report a deposit of sand and gravel overlying the bedrock as many drillers target the bedrock aquifer as their water source.

The deep overburden aquifer that TW1-21 draws from meets some of the requirements for Cooper & Jacob analysis. The drawdown has been plotted on a semi-logarithmic plot included in Appendix E. The early time (1 to 10 minutes) rate of drawdown corresponds to a Transmissivity of approximately 467 m^2/day. This is a relatively high value and is representative of the confined coarse deposits of sand and gravel encountered during well construction and likely in the nearby area.

After 10 minutes the rate of drawdown began declining until reaching a steady rate of 5.6 m/log cycle at 100 minutes, corresponding to a transmissivity of 66 m^2/day. At approximately 800 minutes, the rate of decline began decreasing, reaching a steady rate of 4.2 m per log cycle between 2000 minutes and the end of the pumping test. The final rate of drawdown corresponds to a transmissivity of 84 m^2/day. Similar transmissivities can be calculated at MW1-21, and the corresponding storativity at the end of pumping test is 0.02. This data supports the interpretation described above.

The drawdown during the pumping test at 510 Eliza and 8566 CR14 has been plotted on a semi-logarithmic plot included in Appendix E. 8565 CR14 and 8580 CR14 followed very similar trends however the drawdown at these locations is obscured by heavy use of the well at 8580 CR14 and only manual readings at 8565 CR14. The rate of drawdown at the end of the test corresponds to a transmissivity of 86 m^2/day and a storativity of 0.001. The transmissivity is like the value calculated at TW1-21, while the lower storativity indicates these wells are part of an aquifer with different characteristics than the deep overburden aquifer of TW1-21. These wells are all constructed as bedrock wells.

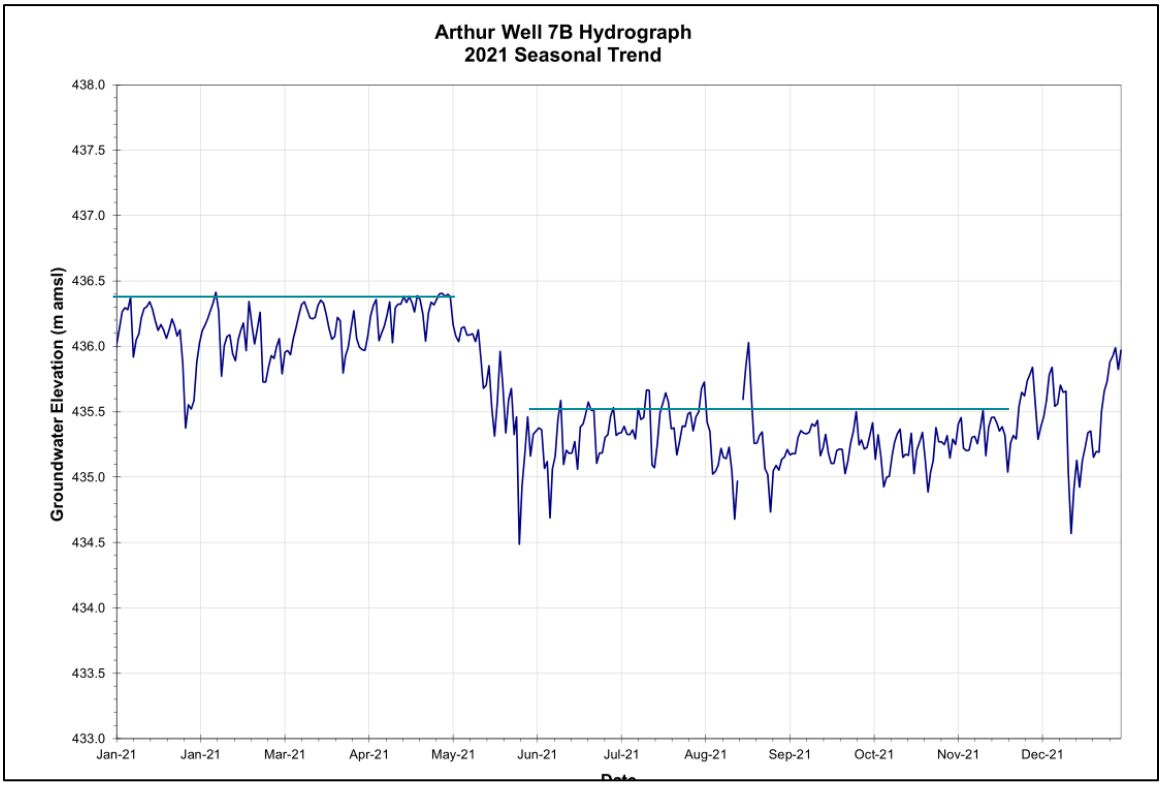
A distance drawdown plot is an alternative method of applying the Jacob Cooper straight line analysis that provides an ‘average’ aquifer transmissivity. A distance drawdown plot

was prepared using the total interpreted drawdowns presented in Table 4 and is included in in Appendix E (Figure E-3). The plotted drawdowns show a general trend with a slope of approximately 5.6 m per log cycle which corresponds to a transmissivity of 129 m^2/day and a storativity of 0.0004. This transmissivity is interpreted to represent an averaging of a more regional bedrock aquifer and the discontinuous contact aquifer. Slightly more drawdown was interpreted at upgradient wells when compared to their distance from the Test Well, except for 8590 CR14. 8590 CR14 is the closest deep overburden well to TW1-21 and may be more directly connected.

The hydrographs show that water levels in the monitored wells were declining from a typical springtime high during the monitoring period by 0.2 to 1 m. Most of the wells were observed to be gradually declining prior to and after the pumping test, while some wells, such as 8566 CR14 and Arthur 7B, only showed significant decline during the 6 day pumping test. The supply wells that responded to the test did not recovery fully and recovery was delayed.

The reduced recovery is interpreted to be due to end-of-spring decline in the regional aquifer due to a combination of reduced precipitation and increased taking by high-capacity water users. Historical water level monitoring data beginning in 2005 for Arthur is available and the historical data shows the typical summer drawdown in the deep overburden supply wells is approximately 1 m. In 2021 approximately 1 m of decline occurred at Well 7B during the month of May. The 2021 decline is like the decline observed during the 2022 pumping test, as the hydrograph shows fairly stable levels in the months before and after the decline (Inset 1).

Inset 1: Arthur Well 7B - 2021 Hydrograph



Review of the pumping test recovery shows that in MW1-21 and TW1-21, where drawdown was several times larger than the seasonal decline, recovery primarily occurred within the same period as the length of the pumping test. For wells that responded to the pumping test with drawdown close to or equal to the expected seasonal decline, recovery was observed to be delayed or to have not occurred at all. The slow recovery and occasional lack of any recovery is interpreted to be due to the expected seasonal decline coinciding with the pumping test and recovery periods.

4.5 Estimated Impact of Pumping at TW1-21

The Water and Sanitary Systems Technical Study – Arthur (Triton, 2020) reports the projected water use in Arthur for the year 2045 is 2368 m^3/day (Maximum Day Demand (MDD)) which is a continuous flow of 27 L/s. The 2045 average day demand is assumed to half the maximum day demand, or 13.5 L/s. Figure E-6 and E-7 are a semi logarithmic plots illustrating the projected drawdown after 10 years of continuous pumping TW1-21 at the average demand, and 6 months of pumping at maximum demand. Results from the plots are summarized in Table 7.

The projected drawdown of the pumping well TW1-21 for 10 years of continuously pumping at 13.5 L/s is 15.5 m, and for 6 months at 27 L/s is 20.0 m. The closest monitored private supply wells are estimated to be impacted by approximately 4 m to

8 m for these scenarios. The remaining available drawdown was calculated at each well by subtracting the typical drawdown from use of the well and the projected drawdown from the static water level.

The remaining available drawdown ranges from 11 to 24 m, except at 8580 CR14 where no remaining drawdown is predicted. 8580 CR14 is the only well where interference was reported by the owner during the pumping test. This well is reported to produce sand under heavy pumping. The pump is installed higher than typical above the bottom of the well and is equipped with a flow restrictor. Long term pumping of a permanent production well at the TW1-21 site would require well upgrades or replacement of 8580 CR14.

Table 5: Estimated Long-Term Drawdown from Pumping TW1-21

Location	Drawdown due to 6 day 23 L/s Pumping Test (m)	Estimated Drawdown after 6 months at 27 L/s	Estimated Drawdown after 10 years at 13.5 L/s	Available Drawdown (m)
TW1-21	14.56	20.0	15.5	14.1
MW1-21	13.02	18.5	14.0	-
8565 CR14	3.3	8	6	18.6
8580 CR14	**3.0**	**8**	**6**	**-1.4**
8566 CR14	2.5	8	6	24.0
510 Eliza	2.2	8	6	20.9
15 Wells St Arthur	0.8	7	5	20.7
7975 SR10E	0.7	7	5	11.8
8590 CR14	0.7	7	5	11.7
7795 SR10E	0.4	6	4	11.0
PZ1	0	0	0	-
8048 Line 2	0	0	0	-
8610 HW6	0	0	0	-
MW3	0	0	0	-
MW1	0	0	0	-
MW4	0	0	0	-
8061 Line 2	0	0	0	-
MW4	0	0	0	-
WN-MW1/00	0	0	0	-
Voisin Well	0	0	0	-
TW4/02	0	0	0	-
Arthur 7A	0	0	0	-
Arthur 8B	0	0	0	-
Arthur 8A	0	0	0	-

5.0 Water Quality Pumping Test Results

The results of the water quality sampling program are included in Appendix F including the chlorine demand testing and UVT and Turbidity monitoring. Table 8 provides a summary of key water quality parameters in samples obtained from TW1-21 during the long-term test compared to the ODWS and the existing Arthur municipal Wells.

Table 6: TW1-21 Water Quality during Long Term Pumping Test (mg/L)

Date	18-Jun	20-Jun	23-Jun	24-Jun	**ODWS**	**Well 7B**	**Well 8AB**
Elapsed Time (hr)	1	48	122	142	**-**	Typical Quality	
Hardness as CaCO3	**137**	**149**	**154**	**151**	**80-100 (OG)**	**309**	**187**
Chloride	1.2	1.3	1.3	1.4	250 (AO)	25.9	0.9
Sodium	**26.9**	**24.2**	**22.4**	**23.3**	**20 (*)**	**36.6**	**22.4**
Iron	0.079	0.136	0.149	0.153	**0.3 (AO)**	**0.7**	**0.04**
Manganese	0.0182	0.0152	0.0155	0.0149	0.05 (AO)	0.02	**0.174**
Arsenic	0.0061	0.0074	0.0063	0.0070	0.010 (MAC)	0.003	<0.0002
Fluoride	0.49	0.50	0.55	0.51	1.5 (MAC)	1.3	0.35
Nitrate as N	< 0.06	< 0.06	< 0.06	< 0.06	10 (MAC)	<0.05	<0.2
Sulphate	7.3	7.1	6	5.9	500 (AO)	294	4.5
Total Dissolved Solids	195	198	197	196	500 (AO)	520	206

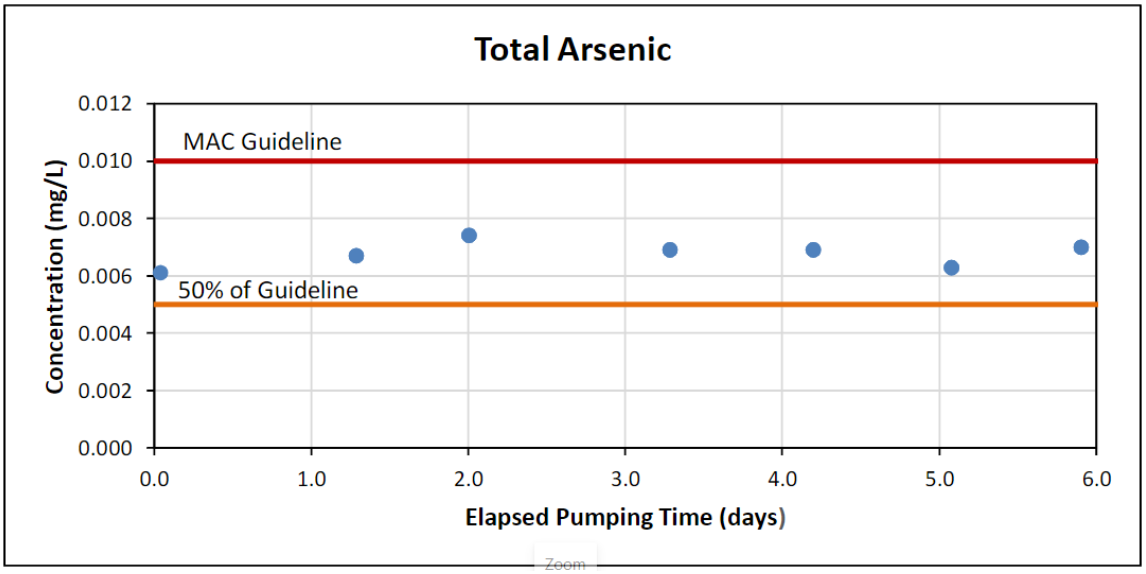
ODWS – Ontario Drinking Water Standards
AO – Aesthetic Objective
OG – Operation Guideline
MAC – Maximum Acceptable Concentration
* - local Medical Officer of Health should be notified when concentration exceeds 20 mg/L

General chemistry of the pumped water from TW1-21 was sampled daily during the test, which included analysis of major ions and metals. The laboratory results indicate essentially stable water quality with slight changes. Some parameters increased in concentration to day 3 and then stabilized while others decreased slightly.

Arsenic, sodium, fluoride is noted to be within range of health related guideline limits.

- The concentration of arsenic was above 50% of the OWDS MAC guideline of 10 µg /L. The concentrations ranged from 6.1 to 7.4 µg /L as shown in the following graph.

Inset 2: Total Arsenic Concentration



- Concentrations of fluoride ranged from 0.49 to 0.55 mg/L with a slight increasing trend, reaching 37% of the OWDS MAC guideline of 1.5 mg/L. The concentrations are noted to be less than those at Arthur Well 7B.
- Similar to Wells 7B and 8AB, sodium was above the health guideline limit of 20 mg/L throughout the pumping test.

The water quality produced from TW1-21 is excellent except for arsenic. It is important to note that arsenic can change over a distance of less than 5 m so that a final production well constructed at this site may produce water with different arsenic content but it is likely that a well in this area will produce water with an arsenic concentration of more than 5 µg/L.

MW1-21 was sampled for arsenic in October 2022 to assess the local variability of arsenic at the test site. The results of the sampling are included in Appendix F and ranged from 4.3 to 4.5 µq/L and showed an increasing trend with time pumped. These results are like TW1-21 that indicated arsenic of about 4.5 µg/L during initial testing.

5.1 Water Quality – Monitoring Wells and Surface Water

Water quality results for samples from MW3 and 8590 CR14 are included in Appendix F. The wells were sampled before and at the end of the pumping test to monitor for changes in water quality and to compare to the water quality at TW1-21. The results for indicator parameters nitrate, sodium, chloride, and sulphate are summarized in Table 7.

Table 7: Monitor Well/Domestic Well Water Quality Summary

Analysis (mg/L)	Filtered MW3 (Shallow Monitoring Well)		8590 CR14 (Deep Overburden Domestic Well)	
	Pre-Test	End of Test	Pre-Test	End of Test
Nitrate	< 0.03	< 0.03	0.161	< 0.06
Sodium	60.1	59.9	50.2	42.5
Chloride	110	100	6.5	4.7
Sulphate	34	54	3.8	3.4
Iron	0.012	0.099	0.994	0.671
Manganese	0.0080	0.0158	0.042	0.0413

The results from MW3 indicate the pumping test likely had no impact on the water quality of the shallow groundwater table. The relatively low nitrate and sulphate suggest the well is not impacted by agricultural land use.

The samples from 8590 CR14 indicate a slight decrease in nitrate, sodium and iron over the course of the pumping test. The concentration of iron was 0.9 to 0.6 mg/L, above the ODWQS of 0.3 mg/L before and at the end of the test. The sodium concentration was above the reporting level of 20 mg/L before and at the end of the test. The relatively low nitrate and chloride suggest the well is not impacted by surrounding land use.

Samples were collected from Farley Creek at SG1 prior to and at the end of the pumping test, and the results are included in Appendix F. The results are typical of surface water and the nitrate concentrations of between 4 to 9 mg/L indicate the water quality is impacted by surrounding land use. No significant differences are noted in the water quality between the sampling events.

A piper plot has been prepared to compare the chemical composition of TW1-21 to 8590 CR14, MW3 and Farley Creek and the plot is included in Appendix F. The plot indicates the waters all differ in chemical composition and the samples from 8590 CR14 is interpreted to be the closest to that of the TW1-21 samples.

5.2 Microbiological and Protozoa Water Quality

Samples were collected from TW1-21 to evaluate the microbiological quality of the source water including: 1) presence of Escherichia coli (*E. coli*); 2) presence of *Cryptosporidium* spp. and *Giardia* spp., which respectively indicate fecal contamination by protozoa of public health significance and the need to provide treatment for protozoa;

and 3) the presence of pigment-bearing algae and diatoms (PBADs) which indicate hydraulic connectivity (i.e., a pathway) to the near surface. The samples were sent to AGAT labs for bacteriological analysis. Two samples of 400 L of filtered water were sent to the York Durham laboratory for PBAD, giardia and cryptosporidium analysis. Results are found in Appendix F.

Table 8: Microbiological and Protozoa Evaluation Results

Date	Elapsed Time (hours)	Escherichia coli	Total Coliform	PBAD	Cryptosporidium (Oo) cysts	Giardia Cysts
June 19	1850	Not detected	Not detected	-	-	-
June 20	2885	Not detected	Not detected	-	-	-
June 21	4730	Not detected	Not detected	Absent	0	0
June 22	6045	Not detected	2 cfu/100 mL	-	-	-
June 23	7310	Not detected	Not detected	Absent	0	0

There were no Escherichia coli bacteria, PBADs, Cryptosporidium cysts or Giardia Cysts detected in any of the water samples analysed from TW1-21. Total coliform was only detected in the June 22 sample at 2 cfu/100 mL.

The water quality data (Appendix F) indicates that TW1-21 does not contain microscopic particles found in surface water. The results combined with the interpretation that the deep overburden aquifer is separated from surface water indicate that the aquifer accessed by TW1-21 is a secure source of groundwater.

5.3 Physical Water Quality – Turbidity and UVT

Continuous turbidity monitoring was completed by WIL during the pumping test using a HF Scientific MTOL+ Online Turbidimeter. UVT was measured using a HF Scientific AccuView LED Online UV Analyze. Results are plotted in Appendix F with the manual turbidity readings.

Manual turbidity readings were taken regularly at the site with a portable turbidity meter. The turbidity was an average of approximately 0.4 NTU and primarily fluctuated between 0.2 and 0.5 NTU. Temporary increases up to 0.8 NTU observed at after 1, 2 and 5 days of pumping. The OWDS MAC guideline is 1 NTU.

The online UVT monitoring indicates the UVT fluctuated between 92 and 95 % with no significant changes observed, other than during maintenance. Field manual and laboratory UVT readings taken at the end of the pumping test were 95.5 % and 95 %, respectively. The online UVT meter is suspected to have lost calibration due to build up of sediment or condensation and the maintenance completed midway through the pumping test may have exacerbated this issue.

5.4 Chlorine Demand Testing

The results of the chlorine demand testing are included in Appendix F. The data documents the required chlorine dose to obtain a suitable residual for proper chlorination of this water.

6.0 Source Water Protection

All new municipal supply wells must complete the necessary technical studies to be in compliance with the Clean Water Act (2006). Vulnerability assessments and threat assessments were completed for the existing Arthur supply wells in 2010 (Burnside, 2010?). This work completed by Burnside was included in the Grand River Source Protection Area - Approved Assessment Report (January 2015 – Updated June 2020).

A separate study is underway to provide updates to the existing information for the Arthur Water Supply System to be incorporated into the Grand River SPA Assessment Report. The technical work is required for a Section 34 update and has been completed as per the guidelines provided in the Technical Rules: Assessment Report (Clean Water Act, 2006). The original model used to develop the WHPAs for Arthur Wells 7B and 8AB will be obtained from the GRCA and will be used to delineate the WHPA for the TW1-21 site. We note that discussion with the Wellington County Source Protection staff indicate that the existing model may be due for an update. This will be discussed prior to completion of a model for the TW1-21 site.

The report will include the following components:

- Mapping of Wellhead Protection Areas (WHPAs).
- Identification of transport pathways.
- Increase in vulnerability based on transport pathways.
- Mapping of vulnerability scores.
- A list of potential significant drinking water threats within each vulnerable area.
- A list of conditions that are drinking water threats.
- Analysis of the uncertainty.
- Maps and supporting documentation for the above information.

7.0 Conclusions

Based on the information above, Burnside offers the following conclusions:

- TW1-21 at the corner of Wells and MacCauley Streets was constructed as a 150 mm diameter test well with a screen set in overburden gravel from 45.7 to 47.2 mbgl.
- TW1-21 was tested at a rate of 23 L/s for 6 days with drawdown of 14.56 m.
- The deep overburden aquifer at the TW1-21 site is interpreted to be a leaky confined aquifer that is extremely permeable in the local area and thins and becomes less permeable away from the site.
- Nearby water supply wells were monitored before, during and after the test with drawdown up to 3.3 m observed.
- The closest well, 8580 CR14, experienced erratic water levels due to a combination of the test and high use for crop spraying.
- The resident at 8590 CR14 complained of lost pressure and it was determined that the well had been run for an extended period but that the test had caused drawdown at this location.
- Water quality results indicate that the deep overburden aquifer is a secure source of groundwater or Category 1 (MECP, 2019) and not a GUDI water source.
- Water quality of TW1-21 is considered excellent with levels of hardness, iron and manganese that are significantly less than Arthur Wells 7B, 8A, and 8B.
- The only parameter of concern at the TW1-21 site is Arsenic which is expected to be present in water produced from a production well at the TW1-21 site at a concentration of 6 to 8 µg/L. This level is less than the ODWS standard of 10 µg/L but exceeds the half MAC which results in quarterly sampling and special sampling attention by operations staff.
- The concentration of arsenic at the TW1-21 warrants design at the permanent pumping station that will remove or minimize arsenic in the water so that there is no chance for water to exceed the ODWS of 10 µg/L

8.0 Recommendations

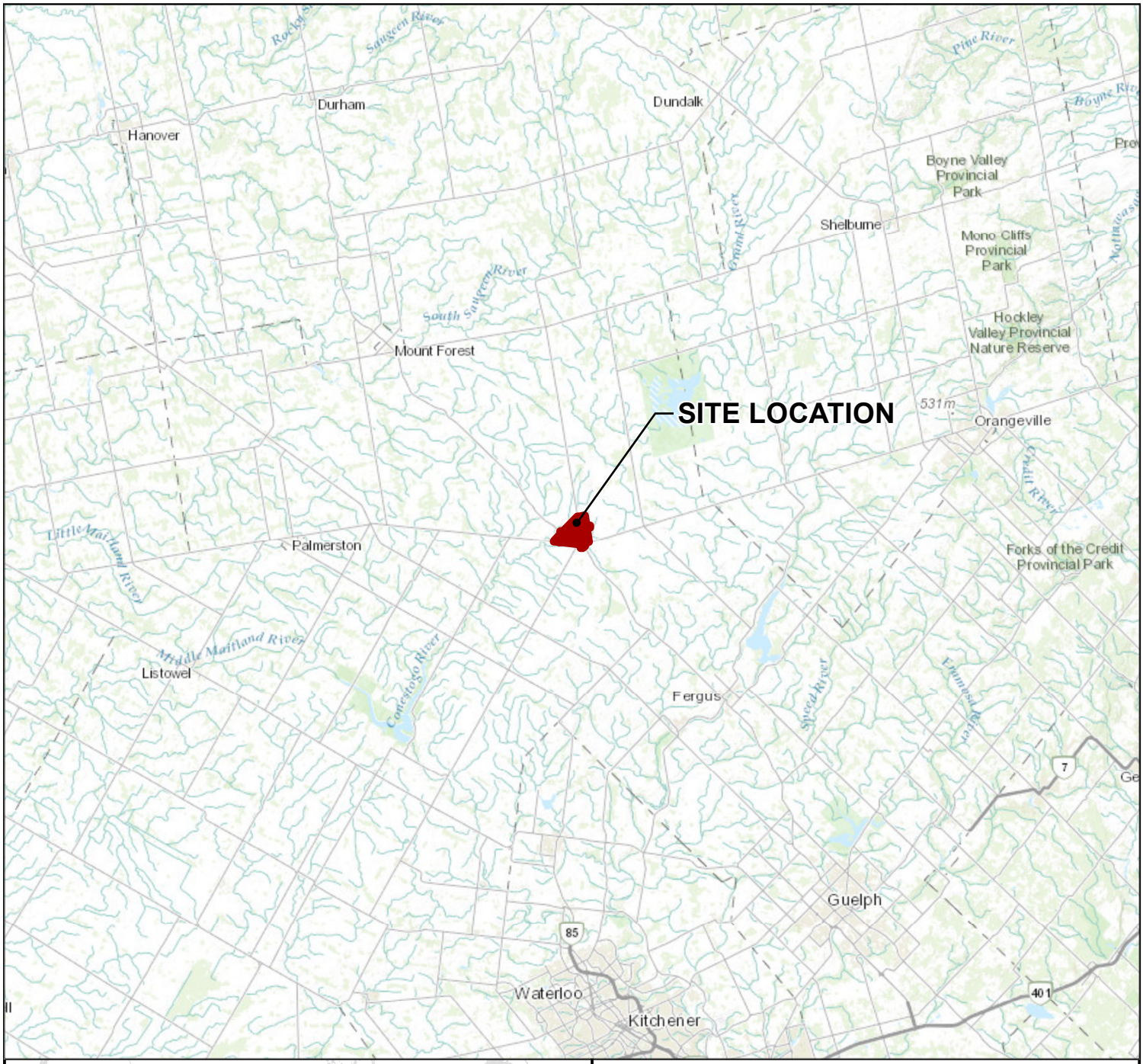
Based on the information above, Burnside offers the following recommendations:

- The results of the pumping test of TW1-21should be included in the Arthur Water Supply Environmental Assessment as a potential municipal water source.
- If development of the TW1-21 site is determined to be a preferred solution to increase capacity and improve water quality in Arthur then:
  - Two (2) new 250 mm diameter production overburden wells should be constructed at the TW1-21 site.
  - The new production wells should be tested using short term step and 6-hour tests to ensure that they can produce at least 30 L/s.
  - The water quality and specifically the arsenic content of the production wells should be tested at the design flow rate to identify any concentrations that exceed the ½ MAC criteria of 5 µg/L.
  - Appropriate treatment for secure groundwater (Category 1) and arsenic should be included in the pumphouse design for this site.
  - The existing PTTW 8202-9DNKD3 should be amended to add the two new wells at a continuous rate of 27 L/S using this report and a well construction report for the new production wells as supporting documentation.
  - AWLRs should be installed in MW1-21 and 8590 CR14 to monitor water levels and confirm the aquifer response beginning one year before municipal pumping begins at this site.
  - A new well should be drilled for the closest farm at 8580 CR14 to ensure that their existing water supply is not interrupted once the new wells begin pumping.
  - Additional survey of all wells within 1,500 m of the TW1-21 should be completed to identify additional well interference issues and to document baseline conditions as part of the PTTW application for this site.
- If additional exploration is desired by the project team to confirm all probable sources have been assessed, we recommend drilling of 150 mm diameter test wells the Gasport bedrock aquifer:
  - North of Arthur near the TW1-21 site to identify potential solution features in the bedrock between 50 and 180 m.
  - At the existing Arthur Well 8AB municipal well site where the bedrock aquifer is present from 60 to 180 m below grade.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Figures



BURNSIDE

Client

TOWNSHIP OF WELLINGTON NORTH
VILLAGE OF ARTHUR

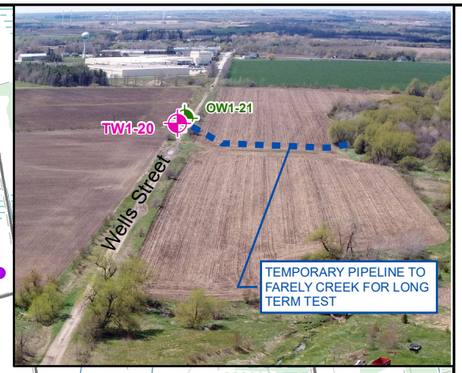
Map Title

PUMPING TEST REPORT

SITE LOCATION PLAN

Drawn	Checked	Date	Figure No.
CD	JD	August 2022	1
Scale		Project No.	
1:500,000		300052287.0000	

File Path: \\ELMO\Shared Work Areas\052287 Arthur Well Exploration\06_GIS\03 Pumping Test\052287 Pumping Test Site Location Plan.mxd Print Date: 2022/08/11 Time: 09:34 AM



Gordonville

Arthur North [CPT4]

Petherton

Township of Mapleton

Township of Wellington North

Arthur

A
A'
B
B'
C
C'

TW1-21

WELL 7B

WELL 8B

WELL 8A

6713971
7170386
6709274
7113269
7236115
6708210
6716014
6710306
6700013
6710307
6709169
6708191
6713391
6708542
6713426
7213881
6708424
6700014
6710468
6707276
7353747
6705494
6700004
6703466
6703637
6700001
6712921
6703798
6713085
6708240
6716013
6712466
6702883

Mitchell's Cr.
Four Mile Cr.
Farleys Cr.
Brandy Cr.

Legend

- New Test Well Location TW1-21
- Municipal Well
- MECP Bedrock Well Location
- MECP Overburden Well Location
- MECP Well - Unknown Status/Formation
- MECP Abandoned Well Location
- Cross Section Orientation
- Expressway / Highway
- Arterial / Collector Road
- Local Road
- Contour (25m Interval)
- Municipal Boundary
- Geographic Township Boundary
- Lot Boundary
- ANSI (MNR)
- Wetland
- Waterbody: Permanent
- Stream: Permanent
- Stream: Intermittent
- Airports and Related Lands
- Wooded Area
- Plantation
- Built-Up Area: Impervious
- Built-Up Area: Pervious

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.

Datum: North American 1983

Coord. System: NAD 1983 CSRS UTM Zone

N

0 500 1,000 1,500 2,000 2,500 3,000

Metres

BURNSIDE

Client

TOWNSHIP OF WELLINGTON NORTH VILLAGE OF ARTHUR

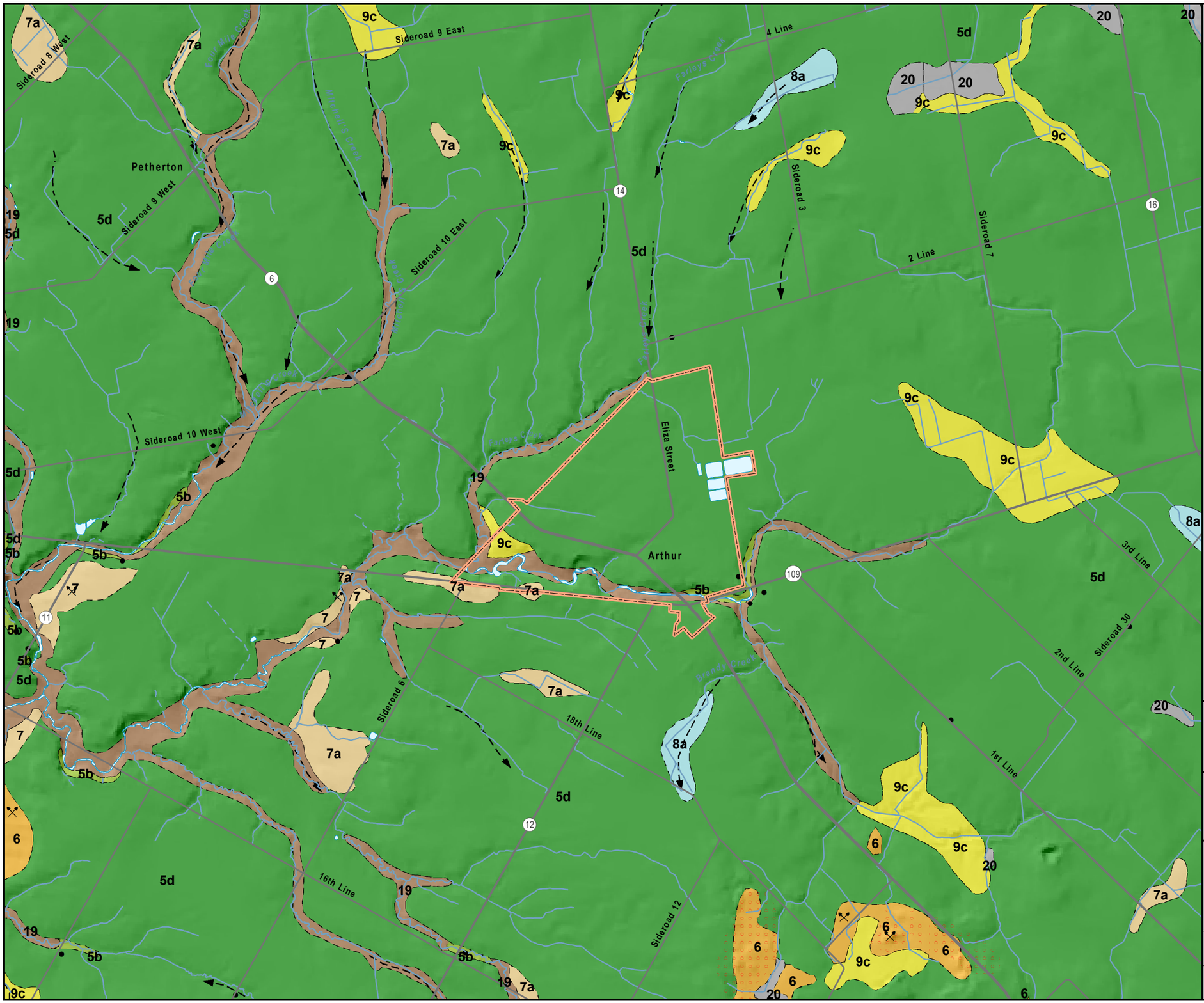
Figure Title

PUMPING TEST DESIGN REPORT

REGIONAL TOPOGRAPHY AND MECP WELL LOCATIONS

Drawn	Checked	Date	Figure No.
CD	JB	December 2021	2
Scale		Project No.	
1:18,000		300052287.0000	

File Path: \\ELMO\Shared Work Areas\052287 Arthur Well Exploration\06_GIS\02 Well Drilling\052287 Test Well Drilling Regional Plan.mxd Print Date: 2021/12/03 Time: 09:40 AM



LEGEND

- Approximate Village Boundary
- Stream: Permanent
- Stream: Intermittent
- Expressway / Highway
- Arterial / Collector Road
- Local Road
- Waterbody

Surficial Geology

- 5b: Till: Stone-poor, carbonate-derived silty to sandy till
- 5d: Till: Glaciolacustrine-derived silty to clayey till
- 6: Ice-contact stratified deposits
- 7: Glaciofluvial deposits
- 7a: Glaciofluvial deposits: Sandy deposits
- 8a: Fine-textured glaciolacustrine deposits: Massive-well laminated
- 9c: Coarse-textured glaciolacustrine deposits: Foreshore-basinal deposits
- 19: Modern alluvial deposits
- 20: Organic deposits
- Unit Contact Boundary
- Sand and Gravel Pit
- Meltwater Channel: Inferred Direction of Flow
- Meltwater Channel: Unknown Direction of Flow
- Sample Location
- Hummocky Topography

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2010. Surficial geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 128 – Revised.

N

Datum: North American 1983 CSRS

Coord. System: NAD 1983 CSRS UTM Zone 17N

0 500 1,000 1,500 2,000 2,500 3,000

Metres

BURNSIDE

Client

TOWNSHIP OF WELLINGTON NORTH
VILLAGE OF ARTHUR

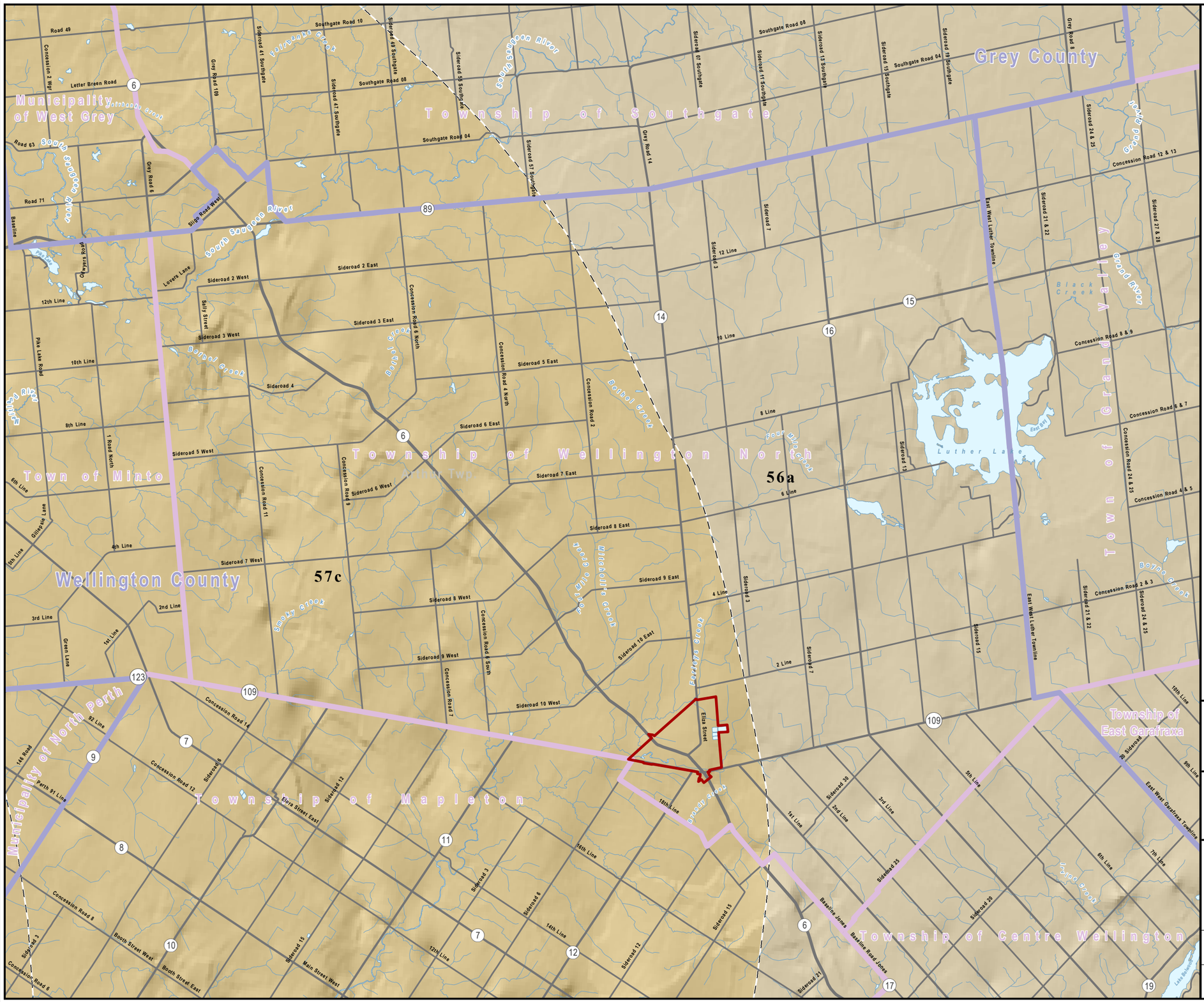
Figure Title

PUMPING TEST DESIGN REPORT

SURFICIAL GEOLOGY

Drawn	Checked	Date	Figure No.
CD	CD	December 2021	3
Scale		Project No.	
1:40,000		300052287.0000	

File Path: \\ELMO\Shared Work Areas\052287 Arthur Well Exploration\06_GIS\02 Well Drilling\052287 Test Well Drilling Surficial Geology.mxd Print Date: 2021/12/02 Time: 10:32 PM



LEGEND

- Approximate Village Boundary
- County, Regional Municipality, District Boundary
- Municipal Boundary
- Watercourse
- Waterbody
- Expressway / Highway
- Arterial / Collector Road
- Local Road

LOWER SILURIAN - 56 Sandstone, shale, dolostone, siltstone

- 56a Guelph Fm.

UPPER SILURIAN - 57 Limestone, dolostone, shale, sandstone, gypsum, salt

- 57a Bass Islands Fm.
- 57c Salina Fm.

Sources:

1. Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release–Data 126 - Revision 1.
2. Ministry of Natural Resources, © Queen's Printer for Ontario
3. Natural Resources Canada © Her Majesty the Queen in Right of Canada

Datum: North American 1983 CSRS

Coord. System: NAD 1983 CSRS UTM Zone 18N

N

0 1 2 3 4 5 6 7 8 9 10

Kilometers

BURNSIDE

Client

TOWNSHIP OF WELLINGTON NORTH
VILLAGE OF ARTHUR

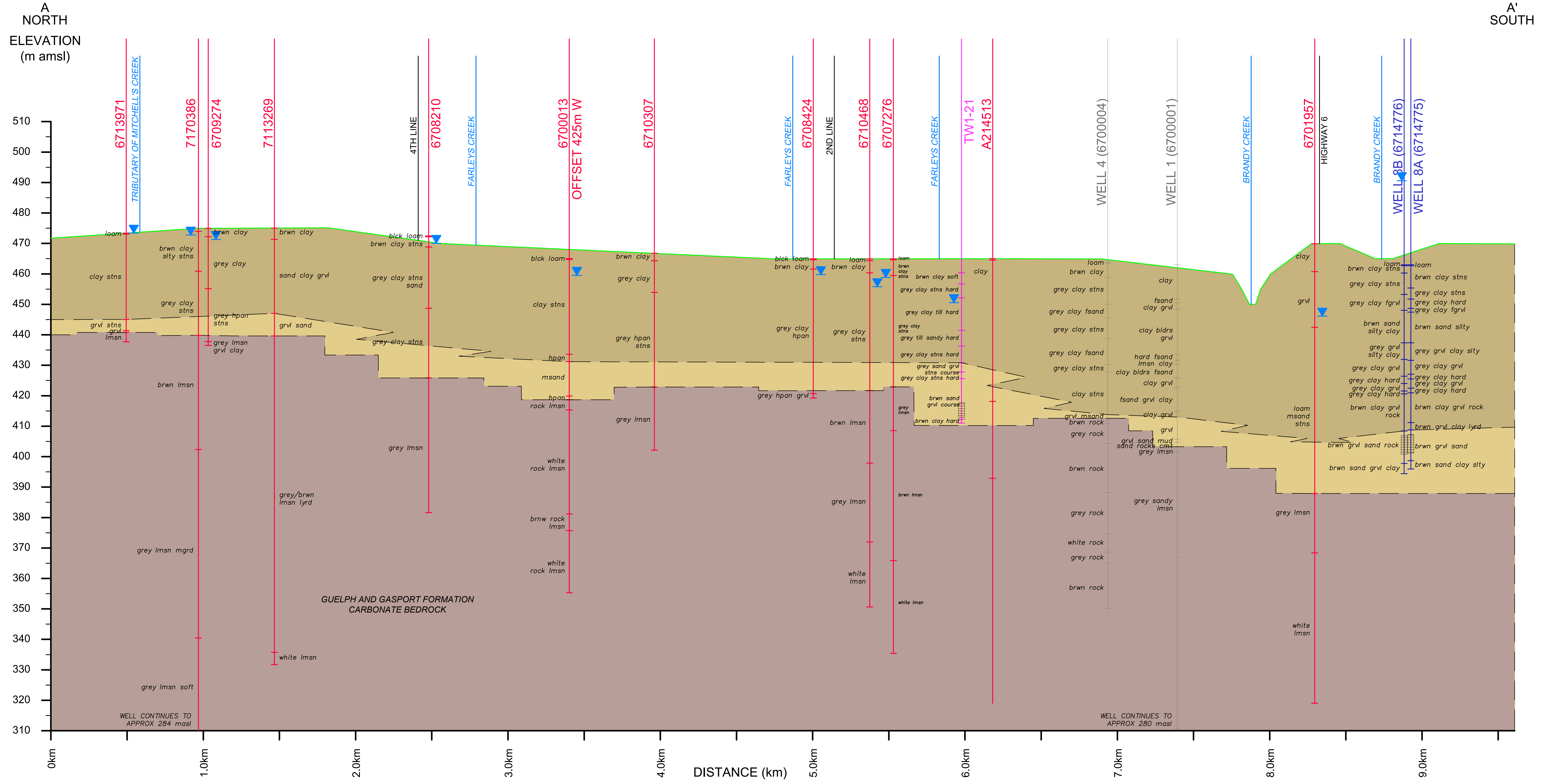
Figure Title

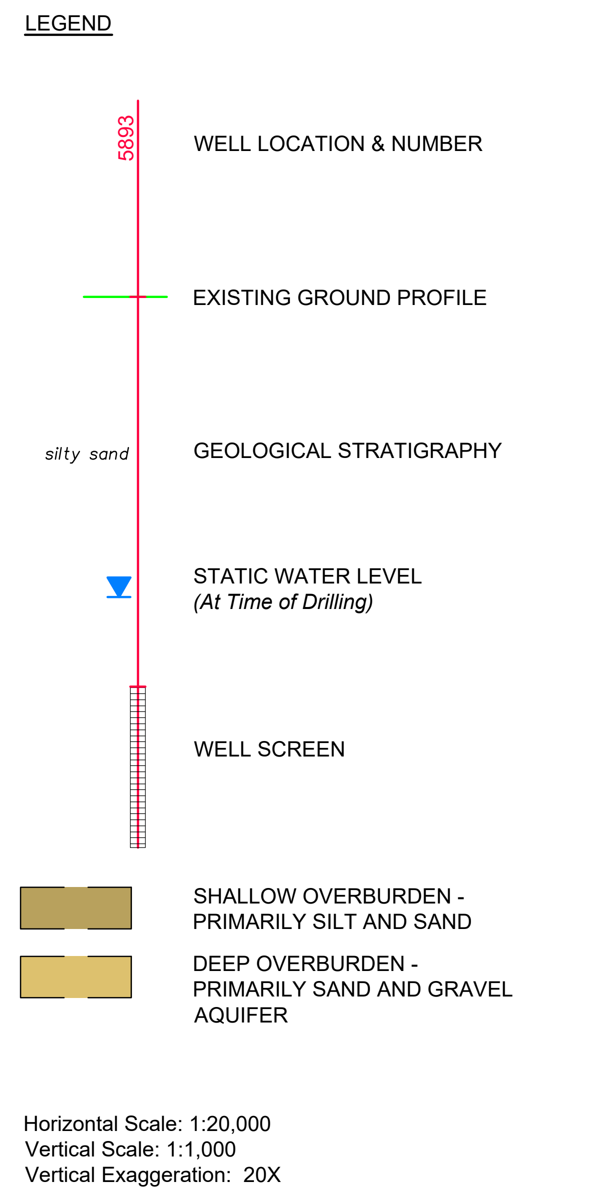
PUMPING TEST DESIGN REPORT

BEDROCK GEOLOGY

Drawn	Checked	Date	Figure No.
CD	JB	December 2021	4
Scale		Project No.	
1:125,000		300052287.0000	

File Path: \\ELMO\Shared Work Areas\052287 Arthur Well Exploration\06_GIS\02 Well Drilling\052287 Test Well Drilling Bedrock Geology.mxd Print Date: 2021/12/02 Time: 10:38 PM





BURNSIDE

Client

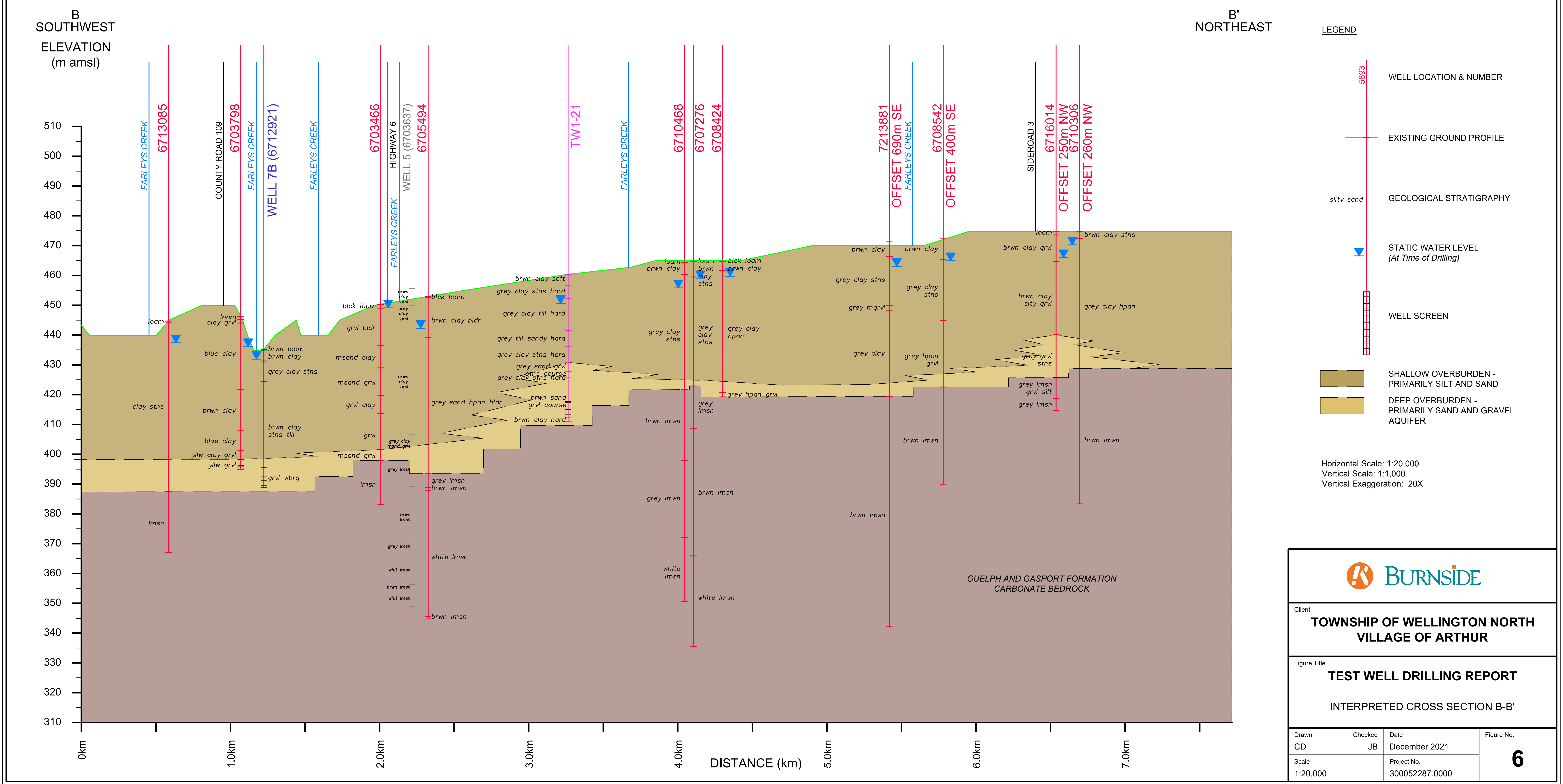
TOWNSHIP OF WELLINGTON NORTH
VILLAGE OF ARTHUR

Figure Title

TEST WELL DRILLING REPORT

INTERPRETED CROSS SECTION A-A'

Drawn	Checked	Date	Figure No.
CD	JB	December 2021	5
Scale		Project No.	
1:20,000		300052287.0000	


B
SOUTHWEST
B'
NORTHEAST
ELEVATION
(m amsl)
DISTANCE (km)
FARLEYS CREEK
6713085
COUNTY ROAD 109
6703798
WELL 7B (6712921)
6703466
HIGHWAY 6
WELL 5 (6703637)
6705494
TW1-21
6710468
6707276
6708424
7213881
OFFSET 690m SE
6708542
OFFSET 400m SE
SIDEROAD 3
6716014
OFFSET 250m NW
6710306
OFFSET 260m NW
GUELPH AND GASPORT FORMATION
CARBONATE BEDROCK
LEGEND
WELL LOCATION & NUMBER
EXISTING GROUND PROFILE
GEOLOGICAL STRATIGRAPHY
STATIC WATER LEVEL
(At Time of Drilling)
WELL SCREEN
SHALLOW OVERBURDEN - PRIMARILY SILT AND SAND
DEEP OVERBURDEN - PRIMARILY SAND AND GRAVEL AQUIFER
Horizontal Scale: 1:20,000
Vertical Scale: 1:1,000
Vertical Exaggeration: 20X

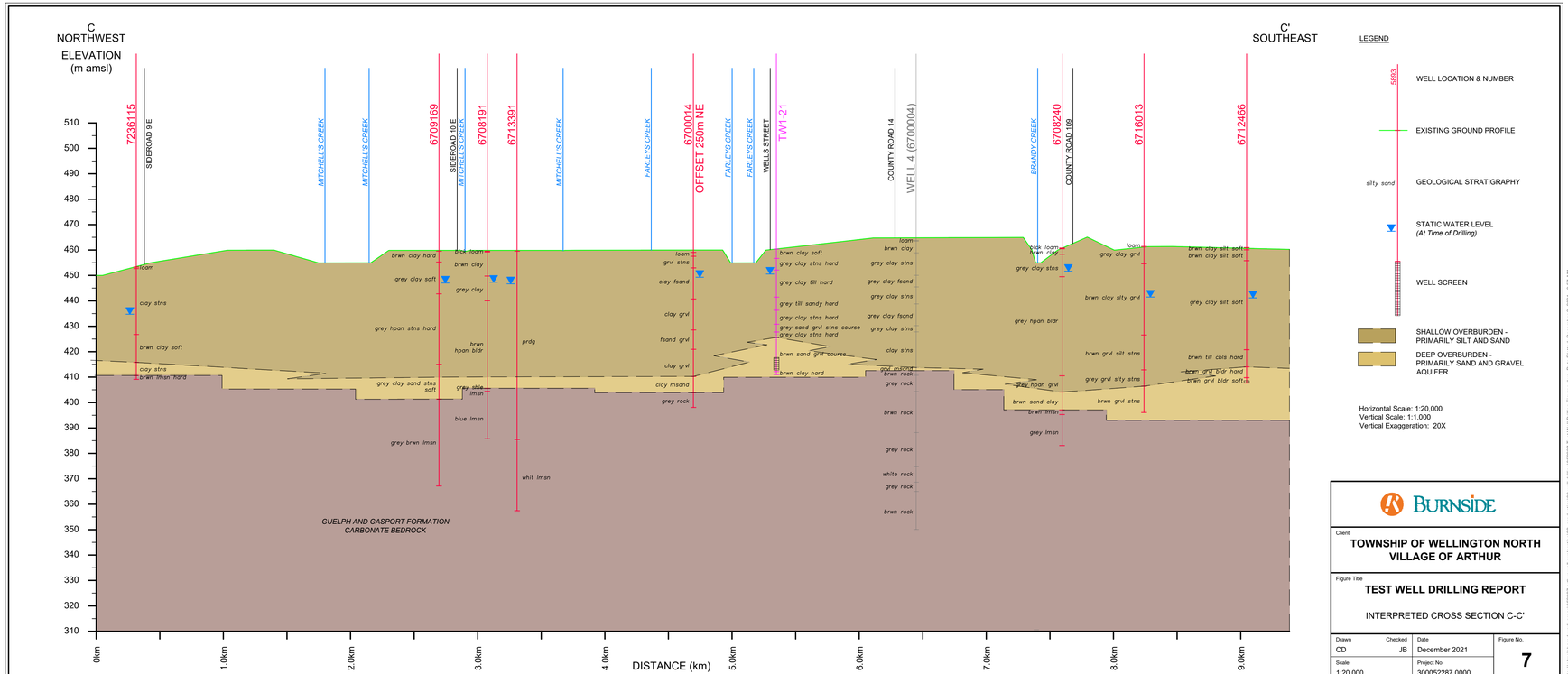
BURNSIDE

Client
TOWNSHIP OF WELLINGTON NORTH
VILLAGE OF ARTHUR

Figure Title
TEST WELL DRILLING REPORT

INTERPRETED CROSS SECTION B-B'

Drawn	Checked	Date	Figure No.
CD	JB	December 2021	6
Scale		Project No.	
1:20,000		300052287.0000	



Horizontal Scale: 1:20,000
Vertical Scale: 1:1,000
Vertical Exaggeration: 20X

BURNSIDE

Client
TOWNSHIP OF WELLINGTON NORTH
VILLAGE OF ARTHUR

Figure Title
TEST WELL DRILLING REPORT

INTERPRETED CROSS SECTION C-C'

Drawn	Checked	Date	Figure No.
CD	JB	December 2021	7
Scale		Project No.	
1:20,000		300052287.0000	

File: \\emo\shared work areas\052287 arthur well exploration\02_production\02 well drilling\052287 Test Well Drilling Figures.dwg Date Plotted: December 2, 2021 - 8:57 AM

LEGEND

Village Boundary (Wellington County)

Pumping Test Monitoring Locations

- Bedrock Monitoring Location
- Deep Overburden Monitoring Location
- Production Well; Production Well Deep OB
- Surface Water Monitoring Location
- Shallow Overburden Monitoring Location
- Test Well Location TW1-21
- [1.40] Interpreted Pumping Test Drawdown (m) (1,380 L/min)

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Background 2016 Air Photo Source: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Datum: North American 1983 CSRS

Coord. System: NAD 1983 CSRS UTM Zone 17N

N

0 250 500 750 1,000 1,250 1,500 1,750

Metres

BURNSIDE

Client

TOWNSHIP OF WELLINGTON NORTH
VILLAGE OF ARTHUR

Figure Title

PUMPING TEST REPORT

PUMPING TEST DRAWDOWN

Drawn	Checked	Date	Figure No.
CD	JB	August 2022	9
Scale		Project No.	
1:24,000		300052287.0000	

File Path: \\ELMO\Shared Work Areas\052287 Arthur Well Exploration\06_GIS\03 Pumping Test\052287 Pumping Test Monitoring Results.mxd Print Date: 2022/08/12 Time: 05:31 PM

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

PTTW No. 8202-9DNKD3
EASR R-011-9152754560

Ontario

Ministry of the Environment
Ministère de l'Environnement

PERMIT TO TAKE WATER
Ground Water
NUMBER 8202-9DNKD3

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

The Corporation of the Township of Wellington North
7490 Sideroad 7 West
Wellington North, Ontario N0G 2E0

For the water taking from: Arthur Well #7B, Arthur Well #8A, Arthur Well #8B

Located at: Lot Part 35, Concession 4WOSR, Geographic Township of Arthur
Wellington North, County of Wellington

Lot Part of 20 and 21, Concession A, Geographic Township of Arthur
Wellington North, County of Wellington

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment.

(d) "District Office" means the Guelph District Office.

(e) "Permit" means this Permit to Take Water No. 8202-9DNKD3 including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means The Corporation of the Township of Wellington North.

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated September 25, 2013 and signed by Barry Trood, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and

the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **May 31, 2024**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name	Source:	Taking	Taking	Max.	Max. Num.	Max. Taken	Max. Num. of	Zone/

	/ Description:	Type:	Specific Purpose:	Major Category:	Taken per Minute (litres):	of Hrs Taken per Day:	per Day (litres):	Days Taken per Year:	Easting/ Northing:
1	Arthur Well #7B	Well Drilled	Municipal	Water Supply	1,364	24	1,965,000	365	17 535319 4853057
2	Arthur Well #8A	Well Drilled	Municipal	Water Supply	1,570	24	2,261,000	365	17 538499 4852043
3	Arthur Well #8B	Well Drilled	Municipal	Water Supply	1,570	24	2,261,000	365	17 538494 4852048
						Total Taking:	6,487,000		

3.3 The Permit Holder may, at any one time pump either Well 8A or Well 8B but not both wells concurrently.

4. Monitoring

4.1 Under section 9 of O. Reg. 387/04, and as authorized by subsection 34(6) of the *Ontario Water Resources Act* , the Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter or calculated in accordance with the method described in the application for this Permit, or as otherwise accepted by the Director. A separate record shall be maintained for each source. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the records required by this condition to the ministry's Water Taking Reporting System.

4.2 The Permit Holder shall monitor the water levels with continuous dataloggers in the following wells:

a) Arthur Wells 7B, 8A and 8B
b) Water Well # 6711237, (O'Donnell), Easting 534450, Northing 4851212, NAD83- Zone 17
c) Water Well # 6700104, (Voisin), Easting 535075, Northing 4853205, NAD83-Zone 17
d) Test Well TW4/02
e) Well WN-MW1/00.

4.3 The Permit Holder shall submit an annual monitoring report to the Director by May 31 of each year for the 12 month period ending December 31 of the previous year. The report shall include:
(a) all monitoring data
(b) rates and amounts of water taken from each well
(c) summary of any interference complaints

(d) interpretation of monitoring data
(e) recommended changes to the monitoring program
(f) comments on whether the wellhead protection areas are reasonable.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 314-4506
Email: ERTTribunalsecretary@ontario.ca

AND

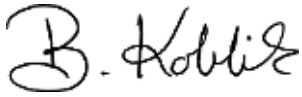
The Director, Section 34
Ministry of the Environment
12th Floor
119 King St W
Hamilton ON L8P 4Y7
Fax: (905)521-7820

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This Permit cancels and replaces Permit Number 5237-6PGLHF, issued on 2006/06/08.

Dated at Hamilton this 12th day of December, 2013.



Belinda Koblik
Director, Section 34
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule “A” forms part of Permit To Take Water 8202-9DNKD3, dated December 12, 2013.

Ontario

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

Confirmation of Registration

Registration Number: R-011-9152754560
Version Number: 1.0
Date Registration Filed: May 16, 2022 11:47:07
Date Registration Updated: May 16, 2022 11:47:07

TOWNSHIP OF WELLINGTON NORTH

7490 Sideroad 7
Kenilworth
ON
N0G 2E0

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

Lot No. 29, Concession No. 1, ARTHUR

Ministry District Office: Guelph District Office

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

Dated on May 16, 2022 11:47:07

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

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

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

Schedule 'A'

Activity Information

Registration Information

Will you be taking water for the purpose of conducting a pumping test from a well?	Yes
Will you be taking more than 50,000 litres of water per day on any day?	Yes
Is the site where the activity will occur a mine or is being used for mining exploration activities?	No
Will you be taking water for seven or less days within a single 30-day period?	Yes
Will the pumping test take water at a volume of 5,000,000 litres per day or less?	Yes
Does the taking involve a transfer from a water basin described in subsection 34.3 (1) of the *Ontario Water Resources* Act or a transfer as defined in subsection 34.5 (1) of that Act?	No

Please describe what the site is currently used for.
Field Crops

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

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

First Name	Last Name	Company Name	Licence Number(s)	Date Signed
Jim	Baxter	R.J. Burnside & Associates Limited	100184156	2022-01-28
Josh	Donkersgoed	R.J. Burnside & Associates Limited	90244971	2022-01-28

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

Please provide additional information if available.
Discharge location will be to land and and will drain to a creek.

Has the Qualified Person (QP) included one or more of the following as part of the pumping test design report? (select all that apply)
Monitoring of groundwater (flow, etc.)
Monitoring of surface water
Monitoring of discharge (flow, chemical parameters, etc.)
Treatment measures for discharge

Source Information

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

Arthur TW1-21

Address
Lot 29 Conc 1, ARTHUR, ONTARIO

Special Policy Area

TW1-21

Source

Source Type	Well
Water Taking Source(s)	Groundwater
Well Record	310481
What is the maximum estimated drawdown of the water table (in metres), if available?	8

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

Method of Collection	Accuracy Estimate	UTM Zone	UTM East (M)
Map	1-10 M(Map)	17	536802.02

UTM North (M)
4854722.74

Watershed Name	Watershed Use - Annual	Watershed Use - Summer
Upper Grand River	N/A	N/A

Source Protection Area

Source Protection Area (SPA)	Wellhead Protection Area Q1	Wellhead Protection Area Q1 Stress
Grand River	No	N/A

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

Well Related Information

Estimated start date of water taking * 2022-06-01

Estimated end date of water taking * 2022-09-01

Water Taking Volumes (Units in Litres):

Descriptor (i.e. Nickname)	Purpose Category	Specific Purpose	Activity	Maximum rate per minute	Maximum number of hours of taking a day	Maximum volume per day	Typical volume per day	Maximum number of days of taking in a year	Earliest month of taking	Latest month of taking
TW1-21	91 - Public administration	Pumping Test	Pumping Test	2500	24	3456000	2160000	7	June	September

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

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

Water Taking Summary

Descriptor (i.e. Nickname)	Purpose Category	Specific Purpose	Activity	Maximum rate per minute	Maximum number of hours of taking a day	Maximum volume per day	Typical volume per day	Maximum number of days of taking in a year	Earliest month of taking	Latest month of taking
Site Name:Arthur TW1-21 **Lot 29 Conc 1, ARTHUR, ONTARIO**							**Special Policy Area:**			
Source Name:TW1-21					**UTM: 17 / 536802.02 / 4854722.74**					
TW1-21	91 - Public administration	Pumping Test	Pumping Test	2500	24	3456000	2160000	7	June	September
Calculated Total Maximum Daily Volume (L/day)						**3456000**	**Total Number of Well Intakes**			**1**

Related Approvals

Water Taking Permissions Information:

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

The fee for this registration is $1916

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

MECP Well Records

Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below): Tag#:A310481

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Township of Wellington North		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
7490 Sideroad 7 W	Kenilworth	ON	N0G2E0	5198483620

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Wells Street	Wellington North		

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Arthur	Ontario	N0G1A0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	536790	4854710		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Br	clay		Soft	0	12
grey	clay	stones	Hard	12	27
grey	clay	Till	Hard	27	62
grey	Till	Sandy	Hard	62	79
grey	clay	stones	hard	79	97
grey	Sand	gravel stones	Courge	97	107
grey	Clay	stones	Hard	107	114
Br	Sand	gravel - gritty	Courge	114	158
Br	clay		Hard	158	162

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
139	0	Cement	36 bgs

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☑ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 5/8	steel	188	+2	139
5"	Steel + k packer	188	136	140

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
5 5/8	S. steel	50	156	140

Status of Well

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
	☐	☐ Fresh ☑ Untested	156
	☐	☐ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	139	8 3/4
139	156	6 5/8

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 129

Pumping rate (l/min / GPM): 100, 200, 300 (only water levels on record for 300)

Duration of pumping: 0 hrs + 60 min

Final water level end of pumping (m/ft)

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min/GPM)

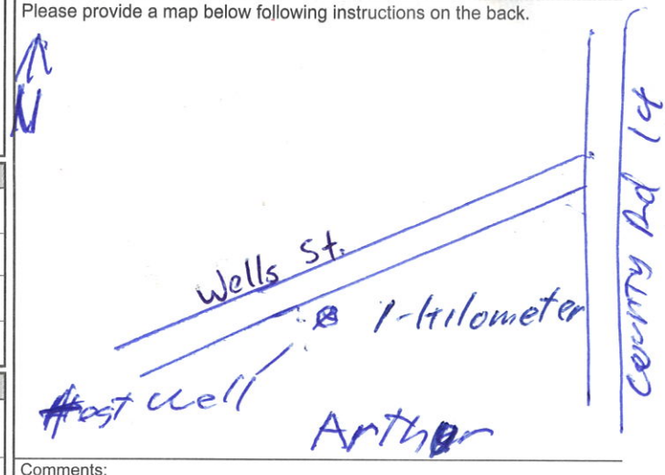
Well production (l/min/GPM)

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	32.2		426
1	39.5	1	37.5
2	39.8	2	37.1
3	40.1	3	37.0
4	40.3	4	36.9
5	40.6	5	36.8
10	41.3	10	36.4
15	42.0	15	36.1
20	42.6	20	36.0
25		25	
30		30	
40		40	
50		50	
60		60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Well Initiatives	7221

Business Address (Street Number/Name)	Municipality
15 Townline Orangeville	

Province	Postal Code	Business E-mail Address
ON	L9W3R4	info@wellinitiatives.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5198468289	Fenton Doug

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
7203	Doug Fenton	2021/11/23

Well owner's information package delivered: ☐ Yes ☐ No

Date Package Delivered: Y Y Y Y M M D D

Date Work Completed: 2021/11/22

Ministry Use Only

Audit No. Z372729

Received

Ministry's Copy

Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below): A329801

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Township of Wellington North		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
7490 Sideroad 7W	Kenilworth	ON	N0G2E0	5198483620

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Wells Street	Wellington North		

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Arthur	Ontario	N0G1A0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	536789	4854706		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Br	clay		Hard	0	12
grey	clay	stones	Hard	12	27
grey	Till clay	stones	Hard	27	62
grey	Till sandy	stones	Hard	62	79
grey	Till	clay stones	Hard	79	116
Br	gravel	sand stones	Course	116	140

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
140	122	Sand	18 bgs
122	3	Holeplug	27 bgs

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2	Plastic	Sch 40	+2	130

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.5	Plastic	10	130	140

Status of Well

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water: Fresh / Untested / Other, specify
140		

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	140	6 5/8

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min/GPM)

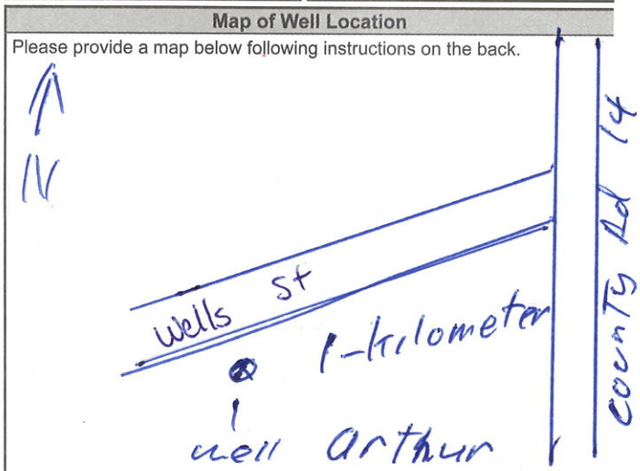
Well production (l/min/GPM)

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	29.3			
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Well Initiatives	7221

Business Address (Street Number/Name)	Municipality
14 Townline Orangeville	

Province	Postal Code	Business E-mail Address
Ont	L9W3R4	info@wellinitiatives.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5198468289	Fenton Doug

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
7003	Doug Fenton	2021/11/26

Well owner's information package delivered: ☐ Yes ☐ No

Date Package Delivered: Y Y Y Y M M D D

Date Work Completed: 2021/11/29

Ministry Use Only

Audit No. Z372731

Received

Ministry's Copy

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

40P/15e

Ontario

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

11 — 16705494 — MUNICIP 67001 — COR SR E

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Wellington	Arthur	E.O.S.R.	035

[redacted] R. 2, Arthur

DATE COMPLETED 48-53: DAY 17 MO. 04 YR. 75

NG 553846 — RC 3 — ELEVATION 1480 — RC 5 — BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
black	topsoil			0	1
brown	clay	boulders		1	45
grey	sand	hardpan & boulders		45	195
grey	limestone			195	210
brown	limestone			210	214
white grey	limestone			214	352
brown	limestone			352	355

31 — 0001802 — 0045605 13 — 0195228 14 13 — 0210215 — 0214615 — 0352115 — 1

32 — 0355615

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0270	1 ☒ FRESH 3 ☐ SULPHUR / 2 ☐ SALTY 4 ☐ MINERAL
0355	1 ☐ FRESH 3 ☐ SULPHUR / 2 ☒ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR / 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR / 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR / 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
04	1 ☒ STEEL / 2 ☐ GALVANIZED / 3 ☐ CONCRETE / 4 ☐ OPEN HOLE	188	0	0200
	1 ☐ STEEL / 2 ☐ GALVANIZED / 3 ☐ CONCRETE / 4 ☐ OPEN HOLE			
	1 ☐ STEEL / 2 ☐ GALVANIZED / 3 ☐ CONCRETE / 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0006 GPM — DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
035 FEET	115 FEET		FEET	FEET	FEET	115 FEET

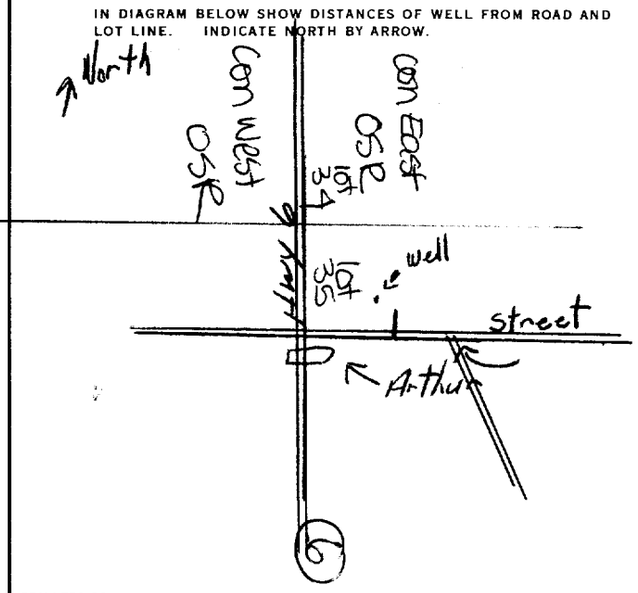
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	140 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	140 FEET	0006 GPM

GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 3653

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL 54: 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE 55-56: 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED; ☐ OTHER — 01

METHOD OF DRILLING 57: 1 ☐ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); ☐ ROTARY (REVERSE); 4 ☒ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING — 4

CONTRACTOR

NAME OF WELL CONTRACTOR: Hugh Morrison Well Drilling Ltd. — LICENCE NUMBER: 3740

ADDRESS: R. R. 5 Mount Forest, Ont.

NAME OF DRILLER OR BORER: Hugh Morrison — LICENCE NUMBER: 3740

SIGNATURE OF CONTRACTOR: Hugh Morrison — SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 58: 1 — CONTRACTOR 59-62: 3740 — DATE RECEIVED 63-68: 020575

DATE OF INSPECTION: ____ INSPECTOR: ____

REMARKS: PKO. WI

CSS.S8

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☑ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* A246141

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
211 ELIZA ST.	—	—	—

County/District/Municipality	City/Town/Village	Province	Postal Code
—	Arthur	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	537634	4853063	—	—

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
MWID					
Brown	Topsoil.			0	.3
Brown	Sandy silt			.3	2.4
Black	organics			2.4	3.6
grey	clayey silt			3.6	6.0
grey	Silty sand	some gravel		6.0	7.6
grey	Sand.			7.6	9.1
grey	Silty sand	some gravel		9.1	10.6

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	.3	Concrete	.01
.3	.9	Bentonite chips	.02
.9	7.9	Bentonite grout slurry	.242
7.9	8.8	Bentonite chips	.03

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☑ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☑ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
5.1	P.V.C	.65	0	9.1

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
6.4	P.V.C	.10	9.1	10.6

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☑ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Water Details

Water found at Depth	Kind of Water	
N/A (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	
Water found at Depth (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	
Water found at Depth (m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	10.6	21cm

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

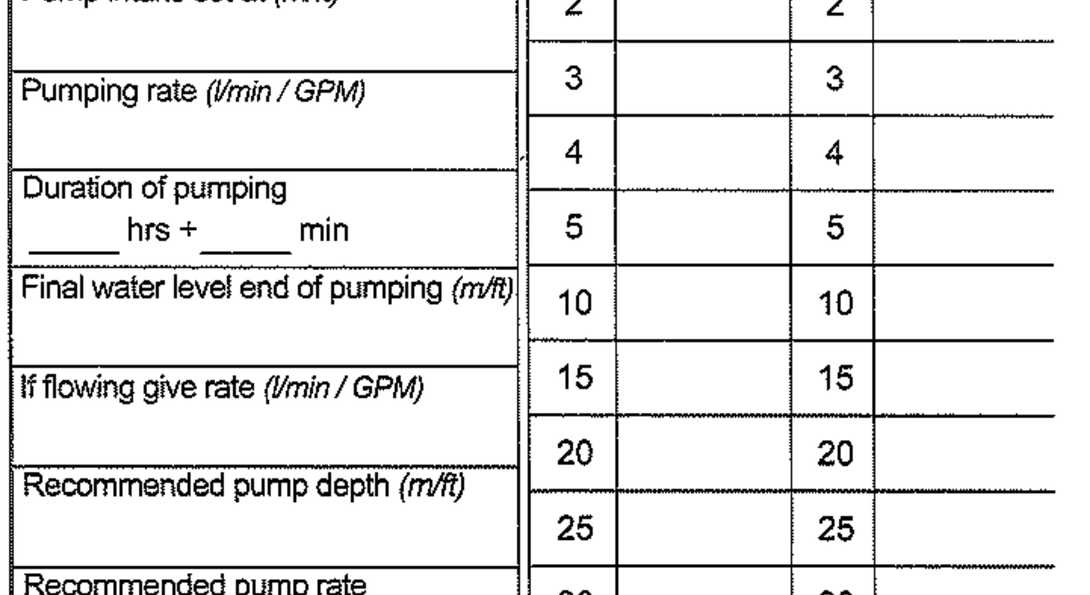
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
GEO-ENVIRONMENTAL DRILLING	6607

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
1 MANSEWOOD COURT	Halton Hills	ON	L7J0A1	estimates@geo-environmentaldrilling.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
9058763388	PIAQUETTE JEFF	2386	J Piaquette	2019/04/04

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2019/04/04

Ministry Use Only

Audit No. Z282665

APR 04 2019

Received

0506E (2014/11) Ministry's Copy

19-17

Ontario Ministry of the Environment and Climate Change

Measurements recorded in: ☑ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*

Tag#: A 214513

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
510 ELIZA ST	ARTHUR	28	1

County/District/Municipality	City/Town/Village	Province	Postal Code
WELLINGTON		Ontario	N0G1A0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	537401	4845420		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
BROWN	TOPSOIL			0	.5
	CLAY	GRAVEL		.5	46.9
GREY	LIMESTONE	BROWN LAYERS		46.9	72.1
			DEPTH 236 1/2'		

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	7.0	BENTONITE	.2

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.9	STEEL	.48	+.8	48.0
15.6	OPEN HOLE		48.0	72.1

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Status of Well

☑ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Water Details

Water found at Depth	Kind of Water	
60-72 (m/ft) ☐ Gas	☐ Fresh ☑ Untested ☐ Other, *specify*	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	7.0	25.1
7.0	48.0	22.3
48.0	72.1	15.6

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at (m/ft): 46m 150'

Pumping rate (l/min / GPM): 45 LPM 12GPM

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 33.68m 110.5'

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 46m 150'

Recommended pump rate (l/min / GPM): 38LPM 10GPM

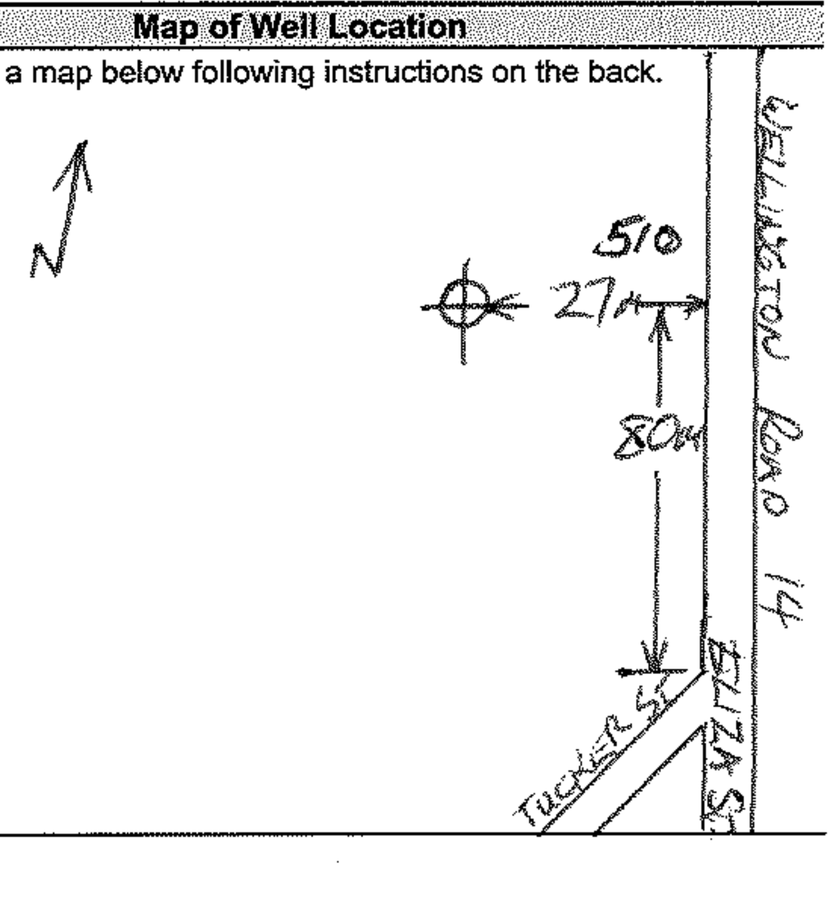
Well production (l/min / GPM):

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	11.34		33.68
1	13.32	1	31.91
2	14.94	2	30.36
3	16.35	3	28.91
4	17.60	4	27.67
5	18.75	5	26.35
10	23.10	10	21.50
15	26.06	15	18.32
20	28.12	20	16.29
25	29.67	25	14.91
30	30.82	30	14.04
40	32.25	40	13.09
50	33.07	50	12.65
60	33.68	60	12.37

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
MEADOW BANK DRILLING SERVICES	6865

Business Address (Street Number/Name)	Municipality
RR5	MT FOREST

Province	Postal Code	Business E-mail Address
ON	N0G2L0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5193233548	HUGH BRONDFOOT

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
1897		2019 M 12 5

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2019 M 12 20	2019 M 12 16

Ministry Use Only

Audit No. Z298683

FEB 18 2020

Received

0506E (2014/11) Ministry's Copy

Meadowbank Drilling Services

RR 5, Mt Forest, Ont. N0G 2L0

519-323-3548 MOE Lic. 6865

Well Test Data

MOE Audit No. Z298683	Well Tag No. A214513	PL 28, C 1, Arthur Twp, Wellington Cty
Date 16-Dec-19	Client Clark Bros Contracting	510 Eliza St, Arthur, ON

Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth	Datum
19-17	37.2'	10 IGPM	150'	+2' 9" 157' 6"	Open Hole	To Grade 236.5'	Top of Casing

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks
							Rock starts @ 154'
0		37.2				110.5	
1		43.7				104.7	
2		49.0				99.6	
3		53.65				94.85	
4		57.75				90.45	
5		61.5				86.45	
6		64.9				82.7	
7		67.95				79.3	
8		70.8				76.1	
9		73.4				73.25	
10		75.8				70.55	
12		80.15				65.8	
14		83.8				61.85	
15		85.5		48.3		60.1	
16		87.0				58.45	
18		89.8				55.65	
20		92.25				53.45	
25		97.35				48.9	
30		101.1		15.6		46.05	87.9%
35		103.8				44.2	90.5%
40		105.8				42.95	
45		107.4		6.3		42.1	
50		108.5				41.5	
55		109.45				41.0	
60		110.5		3.1		40.6	
Drawdown @ 60 Minutes				73.3			
Recovery @ 60 Minutes						69.9	95.4%

Comments

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 | 6708191 | MUNICIP | CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC	LOT	DATE COMPLETED
[redacted]	ARTHUR	CON 2.	22.	DAY 17 MO APR YR 85
	RR#2 ARTHUR.			

HING | RC | ELEVATION | RC | BASIN CODE | II | III | IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BLACK	TOP SOIL.			0	1
BROWN	CLAY.			1	32.
GREY	CLAY			32	64
BROWN	HARD PAN	BOULDERS.		64	177.
GREY	SHALE.	LIMESTONE		177	181
BLUE	LIMESTONE	GREY	WHITE STREAKS.	181.	242.

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
182	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
202 TO 240	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	182.
5			182	242
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☑ PUMP 2 ☐ BAILER	11 GPM	2 HOURS ___ MINS

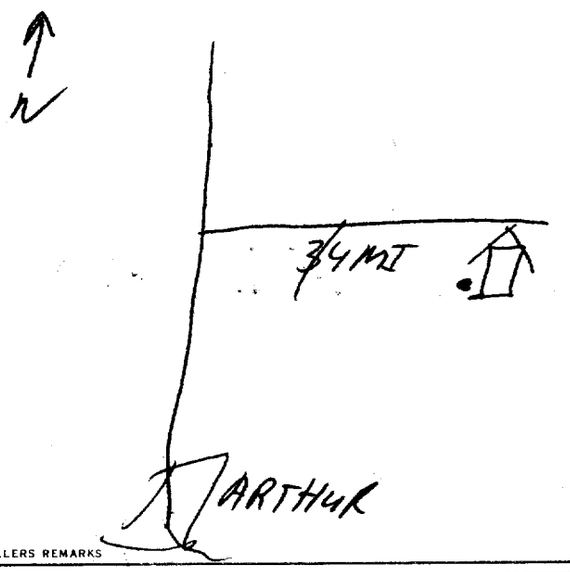
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
40 FEET	160 FEET	1 ☐ PUMPING 2 ☐ RECOVERY	160 FEET	160 FEET	160 FEET	160 FEET

IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	160 FEET	1 ☑ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☑ DEEP	160 FEET	10 GPM

1418 LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE

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

METHOD OF DRILLING

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

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
RAY SPENCER WELL DR INC	4856
ADDRESS RR#5 MT FOREST	
NAME OF DRILLER OR BOREF	LICENCE NUMBER
RAY SPENCER	4856
SIGNATURE OF CONTRACTOR Ray Spencer	SUBMISSION DATE DAY ___ MO ___ YR ___

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
		10 05 85
DATE OF INSPECTION	INSPECTOR	
REMARKS		

MINISTRY OF THE ENVIRONMENT COPY

CSS.ES

FORM NO. 0506-4-77 FORM 7

Ontario **Ministry of the Environment**

The Ontario Water Resources Act
WATER WELL RECORD

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

$ [11] 6713391 Municipality 67001 Con. CON 02

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
Wellington	Arthur Twp.	Con. 2	27

[redacted]

Address: R.R. 2, Arthur, Ontario N0G 1A0

Date completed: 4 day May month 00 year

21 O T M Northing RC Elevation RC Basin Code ii iii iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
	WELL PREVIOUSLY DRILLED TO (6 inch) TO 243 FEET				
	DEEPENED TO 335 FEET				
	Previously drilled			0	243
White	Limestone with Brown Streaks			243	335

31

32

41 WATER RECORD

Water found at - feet	Kind of water
300 / 335	1 [X] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
5	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [X] Open hole 5 [ ] Plastic		243	335
	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic			
	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic			

SCREEN

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

Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

[ ] Annular space [ ] Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)

71 PUMPING TEST

Pumping test method: 1 [X] Pump 2 [ ] Bailer — air

Pumping rate: 12 GPM

Duration of pumping: 3 Hours ..... Mins

Static level	Water level end of pumping	Water levels during: 1 [ ] Pumping 2 [X] Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
42 feet	90 feet	80 feet	50 feet	42 feet	42 feet

If flowing give rate: GPM

Pump intake set at: 160 feet

Water at end of test: [X] Clear [ ] Cloudy

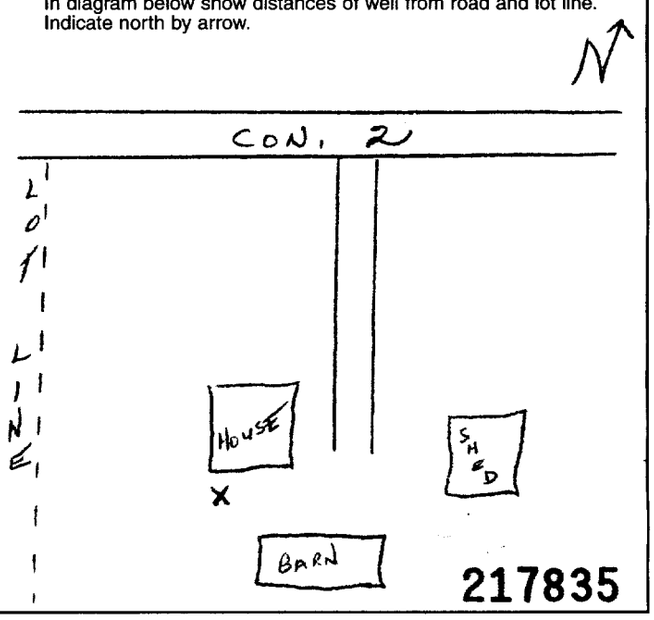
Recommended pump type: [ ] Shallow [X] Deep

Recommended pump setting: 160 feet

Recommended pump rate: 10 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



217835

FINAL STATUS OF WELL

1 [X] Water supply 2 [ ] Observation well 3 [ ] Test hole 4 [ ] Recharge well 5 [ ] Abandoned, insufficient supply 6 [ ] Abandoned, poor quality 7 [ ] Abandoned (Other) 8 [ ] Dewatering 9 [ ] Unfinished 10 [ ] Replacement well

WATER USE

1 [X] Domestic 2 [X] Stock 3 [ ] Irrigation 4 [ ] Industrial 5 [ ] Commercial 6 [ ] Municipal 7 [ ] Public supply 8 [ ] Cooling & air conditioning 9 [ ] Not use 10 [ ] Other .....

METHOD OF CONSTRUCTION

1 [ ] Cable tool 2 [X] Rotary (conventional) 3 [ ] Rotary (reverse) 4 [ ] Rotary (air) 5 [ ] Air percussion 6 [ ] Boring 7 [ ] Diamond 8 [ ] Jetting 9 [ ] Driving 10 [ ] Digging 11 [ ] Other .....

Name of Well Contractor	Well Contractor's Licence No.
Davidson Well Drilling Limited	1737
Address	
Box 486, Wingham, Ontario N0G 2W0	
Name of Well Technician	**Well Technician's Licence No.**
K. Losch	T0927
Signature of Technician/Contractor	**Submission date**
D.F. Davidson per: D.F. Davidson	day 09 mo May yr 00

MINISTRY USE ONLY

Data source | Contractor: 1737 | Date received: AUG 03 2000

Date of inspection | Inspector

Remarks: CSS.ES0

2 - MINISTRY OF THE ENVIRONMENT COPY

Ontario Ministry of the Environment 02-05

The Ontario Water Resources Act
WATER WELL RECORD

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

11 — 6714062 — Municipality 67001 — Con. OSR E

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
WELLINGTON	ARTHUR TWP	CON E	32

Address: Box 969 ARTHUR ON N0B 1A0

Date completed: 30 day 01 month 02 year

21 — UTM — Northing — RC — Elevation — RC — Basin Code — ii — iii — iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BROWN	CLAY	STONES		0	13
GREY	CLAY	STONES		13	120
GREY	CLAY	ROCKS		120	125
GREY	CLAY		HARD	125	174
GREY	CLAY	GRAVEL		174	194
GREY	LIMESTONE			194	230

31

32

41 WATER RECORD

Water found at - feet	Kind of water
230	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 1/4	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+2	199
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		199	230
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

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

Material and type — Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
8	199	BENTONITE

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer

Pumping rate: 8 GPM

Duration of pumping: 1 Hours 0 Mins

Static level	Water level end of pumping	Water levels during: 1 ☒ Pumping 2 ☐ Recovery			
22' 11" feet	76' 3" feet	15 minutes 59' 7" feet	30 minutes 69' 11" feet	45 minutes 74' 5" feet	60 minutes 76' 3" feet

If flowing give rate: GPM

Pump intake set at: 100 feet

Water at end of test: ☒ Clear ☐ Cloudy

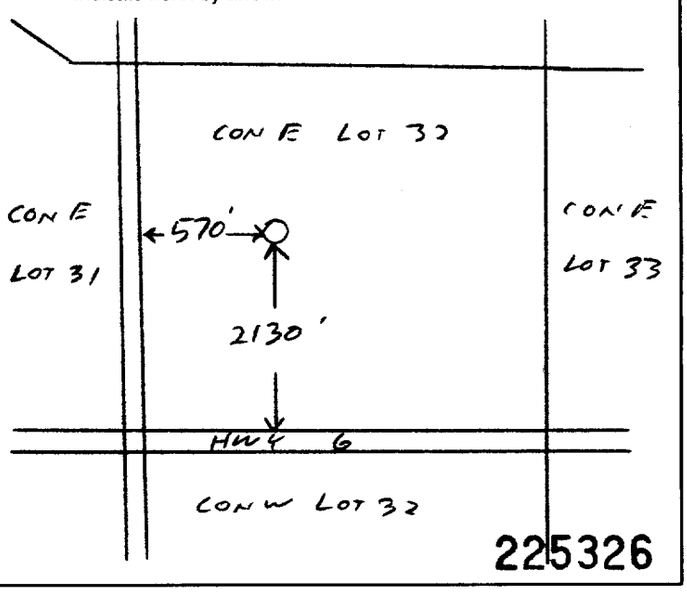
Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump setting: 100 feet

Recommended pump rate: 8 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



225326

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☒ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
MEADOWBANK DRILLING SERVICES	6865
Address: RR 1 ELORA ONT N0B 1S0	
Name of Well Technician: JIM BROADFOOT	Well Technician's Licence No.: T0370
Signature of Technician/Contractor: Jim Broadfoot	Submission date: 3 day 02 mo yr

MINISTRY USE ONLY

Data source	Contractor	Date received
	6865	MAY 06 2002
Date of inspection	Inspector	
Remarks		

CSS.ES2

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario **Ministry of the Environment**

The Ontario Water Resources Act
WATER WELL RECORD

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

11 (1 2) **6714124**

Municipality (10–14) **67006** Con. (15–22 23 24) **CON 02**

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
WELLINGTON	**WEST LUTHER**	**2**	**2**

[redacted]

Address: **R.R #2, ARTHUR, ONTARIO**

Date completed (48-53): **3 / 6 / 2002** (day / month / year)

21 (1 2) UTM (10–12 / 12–17) Northing (18–24) RC (25) Elevation (26–29) RC (30) Basin Code (31–47) ii iii iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BROWN	TOPSOIL			0	2
BROWN	CLAY			2	18
GREY	CLAY	OCC STONES		18	121
GREY	HARDPAN			121	157
BROWN	LIMESTONE			157	164
GREY	LIMESTONE			164	172

31 (10–80)

32 (10–80)

41 WATER RECORD

Water found at - feet	Kind of water
164-172 (10-13)	1 ☒ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (14)
(15-18)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (19)
(20-23)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (24)
(25-28)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (29)
(30-33)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (34) (60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6" (10-11)	1 ☒ Steel (12) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	161 (13-16)
6" (17-18)	1 ☐ Steel (19) 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		161	172 (20-23)
(24-25)	1 ☐ Steel (26) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			(27-30)

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter (34-38) inches	Length (39-40) feet

Material and type	Depth at top of screen (41-44) feet	(30)

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0 (10-13)	172 (14-17)	BEN.CLAY.SLUR
(18-21)	(22-25)	
(26-29)	(30-33) (80)	

71 PUMPING TEST

Pumping test method (10): 1 ☒ Pump 2 ☐ Bailer

Pumping rate (11-14): 30 GPM

Duration of pumping (15-16 / 17-18): 1 Hours 45 Mins

Static level	Water level end of pumping	Water levels during (25): 1 ☐ Pumping 2 ☐ Recovery			
(19-21) 29 feet	(22-24) 58 feet	15 minutes (26-28) 29 feet	30 minutes (29-31) feet	45 minutes (32-34) feet	60 minutes (35-37) feet

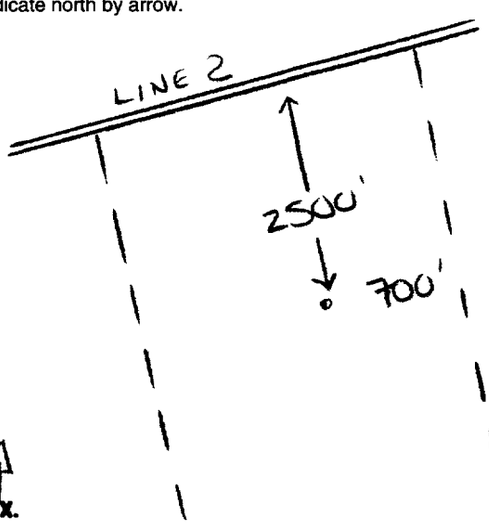
If flowing give rate (38-41)	Pump intake set at	Water at end of test (42)
GPM	feet	☐ Clear ☐ Cloudy

Recommended pump type	Recommended pump setting (43-45)	Recommended pump rate (46-49)
☐ Shallow ☐ Deep	65 feet	30 GPM

(50-53)

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



236183

FINAL STATUS OF WELL (54)

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE (55-56)

1 ☒ Domestic 2 ☒ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION (57)

1 ☐ Cable tool 2 ☒ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
DURL HOPPER LIMITED	2644
Address: R.R. #7, ST. MARYS, ONTARIO N4X 1C9	
Name of Technician: DOUGLAS HOPPER	Well Technician's Licence No. T-2516
Signature of Technician/Contractor	Submission date: 5 / 6 / 2002 (day mo yr)

MINISTRY USE ONLY

Data source (58)	Contractor (59-62) 2644	Date received (63-68) JUL 25 2002	(80)
Date of inspection	Inspector		
Remarks			

CSS.ES2

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 — 6707276 — MUNICIP. — CON.

COUNTY OR DISTRICT: Wellington
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: West Luther
CON., BLOCK, TRACT, SURVEY, ETC: Con. 2
LOT: 1
R. 2 Arthur, Ont.
DATE COMPLETED: DAY 29 MO 5 YR 80

RC. — ELEVATION — RC. — BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
black	topsoil			0	1
brown	clay	stones		1	18
grey	clay	stones		18	138
grey	limestone			138	185
brown	limestone			185	325
white	limestone			325	425

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
405	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
425	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
4	1 ☒ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	188	0	140
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☒ OPEN HOLE		140	425
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE — DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

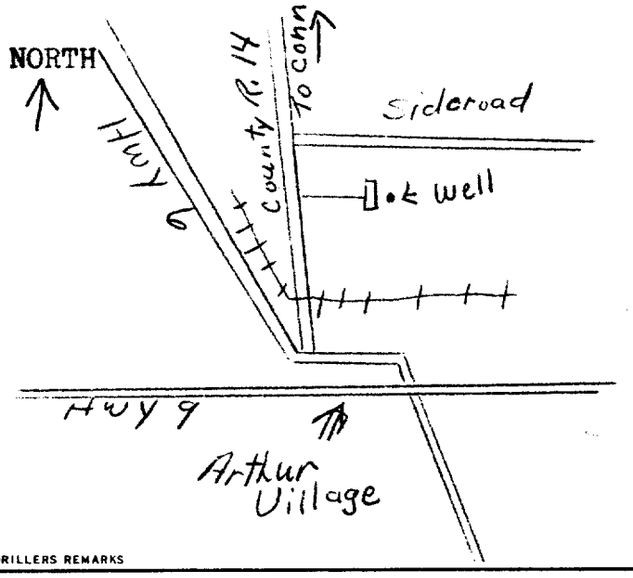
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 5 GPM
DURATION OF PUMPING: 1 HOURS ____ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
20 FEET	80 FEET		FEET	FEET	FEET	80 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 130 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 130 FEET
RECOMMENDED PUMPING RATE: 5 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE

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

METHOD OF DRILLING

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Hugh Morrison Well Drilling Ltd. — LICENCE NUMBER: 3740
ADDRESS: R.R. 5 Mount Forest, Ont.
NAME OF DRILLER OR BORER: Hugh Morrison — LICENCE NUMBER: 3740
SIGNATURE OF CONTRACTOR: Hugh Morrison — SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR — DATE RECEIVED: 020780
DATE OF INSPECTION — INSPECTOR
REMARKS:

CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 6710468 MUNICIP 6700.1 CON. CON 0.1

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON BLOCK TRACT SURVEY ETC	LOT
Wellington	Arthur	Con. 1	28

[redacted] R. 1 Arthur, Ontario N0G 1A0

DATE COMPLETED: DAY 10 MO 09 YR 90

NG | EC | ELEVATION | EC | BASIN CODE | II | III | IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	topsoil			0	2
brown	clay			2	15
grey	clay	stones		15	142
brown	limestone			142	220
grey	limestone			220	305
white	limestone			305	375

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
302-375	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	144
5	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		144	375
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER — air

PUMPING RATE: 10 GPM

DURATION OF PUMPING: 1 HOURS ____ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING
30 FEET	95 FEET

WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
FEET	FEET	FEET	95 FEET

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: 150 FEET

WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

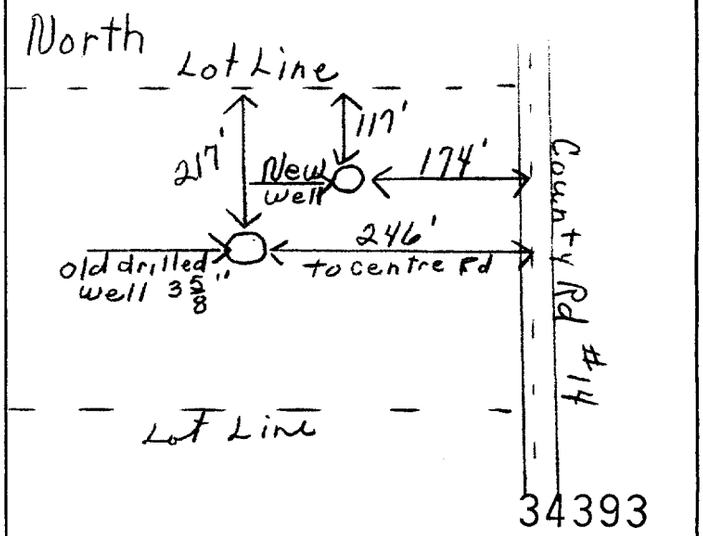
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 150 FEET

RECOMMENDED PUMPING RATE: 10 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING

WATER USE

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

METHOD OF CONSTRUCTION

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Hugh Morrison Well Drilling Ltd.
WELL CONTRACTOR'S LICENCE NUMBER: 3740
ADDRESS: R.R. 5 Mount Forest, Ontario
NAME OF WELL TECHNICIAN: Howard Morrison
WELL TECHNICIAN'S LICENCE NUMBER: T-0353
SIGNATURE OF TECHNICIAN/CONTRACTOR: Hugh Morrison
SUBMISSION DATE: DAY ____ MO. ____ YR. ____

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE 58 | CONTRACTOR 59-62: 3740 | DATE RECEIVED 63-68: NOV 01 1990

DATE OF INSPECTION | INSPECTOR

REMARKS

CSS.ES

FORM NO. 0506 (11/86) FORM 9

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below)

Tag#: A157686

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
#8566 Cty. Rd. 14	North Wellington	25	2

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Arthur	Ontario	N0B1A0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	534587	4853949		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Clay		Loose	0	34
Grey	Boulder			34	36
Brown	Clay			36	94
Brown	Sand	Gravel		94	122
			Total =		122 FT.
		6 1/4" Casing Drive Shoe			

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	20	Quick Grout	90 Gal.

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion ☐ Other, *specify* Rotary Air

Well Use

☐ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify*

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 5/8	Steel	.188	+ 2	122 Gravel

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

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

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, *specify*

If pumping discontinued, give reason:

Pump intake set at (m/ft): 100 -

Pumping rate (l/min / GPM): 10 -

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 39.8

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 100 -

Recommended pump rate (l/min / GPM): 10 To 20

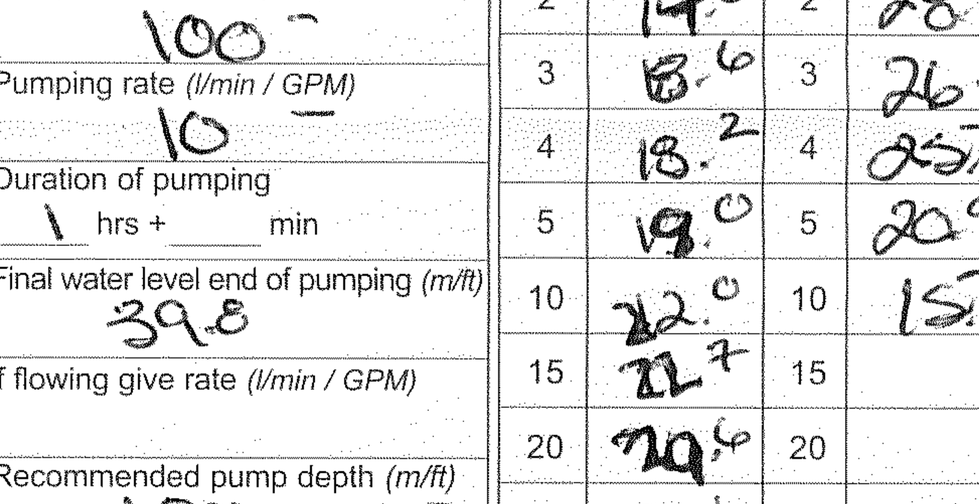
Well production (l/min / GPM): 10 +

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	15.0		39.8
1	16.5	1	30.0
2	17.0	2	28.3
3	18.6	3	26.1
4	18.2	4	25.4
5	19.0	5	20.9
10	22.0	10	15.0
15	22.7	15	
20	29.6	20	
25	29.6	25	
30	39.8	30	
40	39.8	40	
50	39.8	50	
60	39.8	60	

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth	Kind of Water	Gas	Other, specify
122 (m/ft)	☐ Fresh ☑ Untested	☐	
(m/ft)	☐ Fresh ☐ Untested	☐	
(m/ft)	☐ Fresh ☐ Untested	☐	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	20	10"
20	122	6 1/8"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Hannon Well Drilling LTD	2663

Business Address (Street Number/Name)	Municipality
#5896 Wellington Rd. #7 RR#5	Guelph

Province	Postal Code	Business E-mail Address
ON	N1H6J2	info@hannonwelldrilling.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
519 763 8239	Hannon, Henry

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0590	[signature]	2014/07/25

Comments:

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2014/06/12	2014/06/25

Ministry Use Only

Audit No. Z 181046

Received SEP 26 2014

Ministry's Copy

UTM | | |Z | | | | | | | | |E

Co. 5 R | | | | | | | |N

Elev. 5 R | 1 | 5 | 0 | 6 |

Basin | 2 | 3 |

No 014

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Wellington
Township, Village, Town or City: ~~West Luther~~ Arthur
Con. 1 Lot S½ 27
Date completed: 13 (day) July (month) 1963 (year)
[redacted]ress: RR#? Arthur

Casing and Screen Record	
Inside diameter of casing	4"
Total length of casing	180'
Type of screen	Nil
Length of screen	
Depth to top of screen	
Diameter of finished hole	4"

Pumping Test	
Static level	32
Test-pumping rate	10 G.P.M.
Pumping level	50
Duration of test pumping	4 hrs
Water clear or cloudy at end of test	Clear
Recommended pumping rate	10 G.P.M.
with pump setting of	80' feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Topsoil	0	5	185	FRESH
Gravel and Stones	5	20		
Clay and fine Sand	20	60		
	~~60~~	~~100~~		
Clay and Gravel	60	100		
Fine Sand and Gravel	100	125		
Clay and Gravel	125	160		
Clay and Sand	160	181		
Gray Rock	181	200		

For what purpose(s) is the water to be used? Domestic and Stock

Is well on upland, in valley, or on hillside?

Drilling or Boring Firm: Durham Drilling Enterprises Ltd.

Address: Box 299. Durham Ont.

Licence Number: 1000

Name of Driller or Borer: Fred Hotchkiss

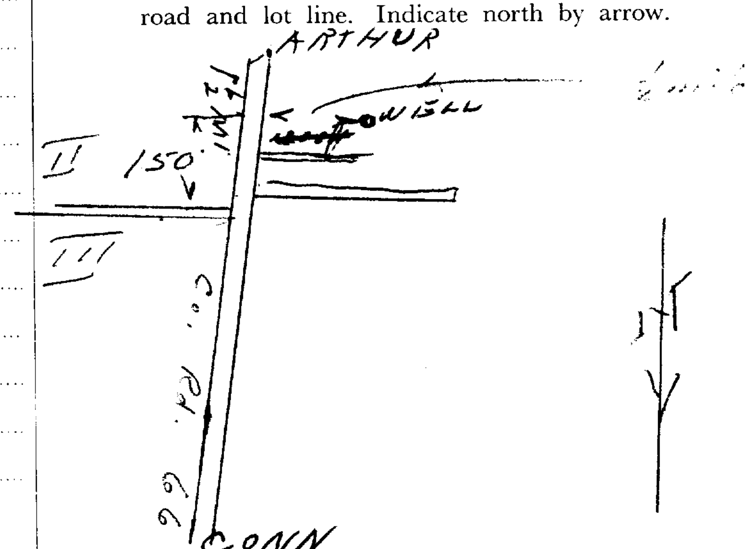
Address: Mt. Forest RR#5.

Date: July 20. 1963.

Percy Johnston
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 7 15M-60-4138

OWRC COPY

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

6708424

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	[redacted]ur	Con. 1	27

[redacted]R. 2, Arthur, Ontario.

DATE COMPLETED DAY 14 MO 04 YR 86

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
black	topsoil			0	1
brown	clay			1	11
grey	clay	hardpan		11	145
grey	hardpan	gravel		145	150

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
150	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5	1 ☒ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	188	0	150
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	6 GPM	4 HOURS ___ MINS

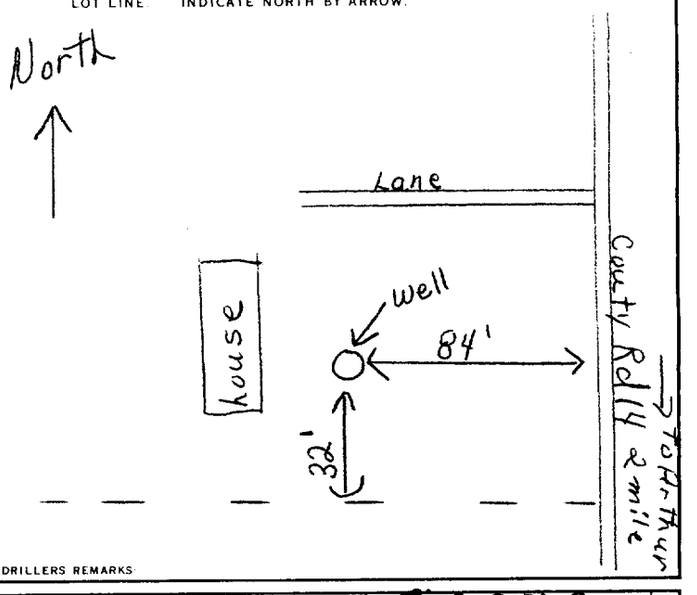
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☐ PUMPING 2 ☐ RECOVERY)	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
17 FEET	25 FEET		FEET	FEET	FEET	25 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	90 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	90 FEET	6 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL	1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED
WATER USE	1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; ☐ OTHER; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED
METHOD OF DRILLING	1 ☐ CABLE TOOL; 2 ☒ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Hugh Morrison Water Well Drilling Ltd. | LICENCE NUMBER

ADDRESS: R,R. 5 Mount Forest, Ontario.

NAME OF DRILLER OR BORER: Hugh Morrison | LICENCE NUMBER: 3740

SIGNATURE OF CONTRACTOR: Hugh Morrison | SUBMISSION DATE DAY ___ MO ___ YR ___

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR | DATE RECEIVED: 140586

DATE OF INSPECTION | INSPECTOR

REMARKS

CSS.ES

FORM NO. 0506—4—77 FORM 7

MINISTRY OF THE ENVIRONMENT COPY

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 6709327 MUNICIP 67001 CON.

COUNTY OR DISTRICT: WELLINGTON
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: ARTHUR
[redacted] 2 ARTHUR
CON. BLOCK, TRACT, SURVEY, ETC: WOSR
LOT: 33
DATE COMPLETED: DAY 19 MO 8 YR 88
NOGIAO.
RC ELEVATION RC BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	FILL			0	3
BROWN	CLAY			3	42
GREY	HARDPAN & STONES			42	171
BROWN	GRAVEL			171	184

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
172	1 ☑ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
TO	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
184	1 ☑ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY — 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	184
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
30	6 INCHES	3 FEET

MATERIAL AND TYPE: STEEL
DEPTH TO TOP OF SCREEN: 181 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

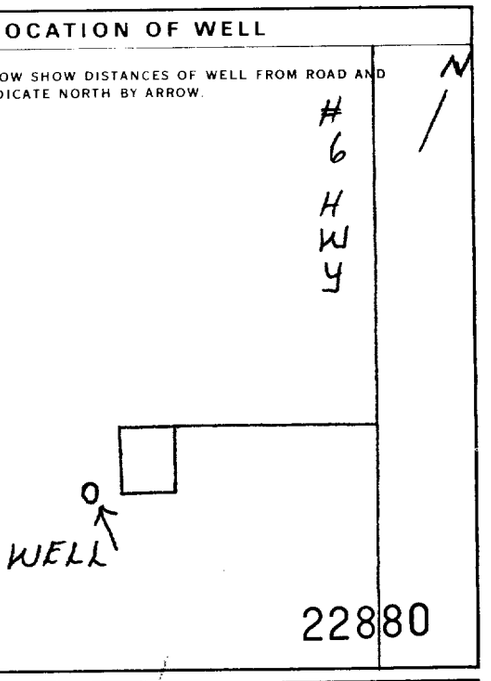
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER — AIR
PUMPING RATE: 10 GPM
DURATION OF PUMPING: 2 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☐ PUMPING 2 ☑ RECOVERY) 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
28 FEET	90 FEET	32 FEET	28 FEET	28 FEET	28 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: AIR 170 FEET
WATER AT END OF TEST: 1 ☑ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 110 FEET
RECOMMENDED PUMPING RATE: 8-10 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



22880

DRILLERS REMARKS

FINAL STATUS OF WELL
1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING

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

METHOD OF CONSTRUCTION
1 ☐ CABLE TOOL 2 ☑ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: DURHAM DRILLING ENT
WELL CONTRACTOR'S LICENCE NUMBER: 1804
ADDRESS: RR2 DURHAM NOGIRO
NAME OF WELL TECHNICIAN: KURANYI & JACKSON
WELL TECHNICIAN'S LICENCE NUMBER: 7-0206
SIGNATURE OF TECHNICIAN/CONTRACTOR: P.E. Johnston
SUBMISSION DATE: DAY 29 MO 8 YR 88

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR 1804
DATE RECEIVED SEP 12 1988
DATE OF INSPECTION
INSPECTOR
REMARKS

CSS.ES

FORM NO. 0506 (11/86) FOR

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11 — 6712921 — Municipality 67701 — Con.

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot
Wellington	Arthur					

Address: Box 189 146 George St Arthur

Date completed: 24 day 07 month 98 year

21 — Zone — Easting — Northing — RC — Elevation — RC — Basin Code — ii — iii — iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Brown	Top Soil			0	1
Brown	Clay	cobbles	stream bed	1	13
Grey	Clay	stones		13	36
Brown	Clay	stones & cobbles	till	36	130
	Gravel		water bearing	130	152

31

32

41 WATER RECORD

Water found at – feet	Kind of water
130	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas — NOT TESTED
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
010	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	+.365	+2	138
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter	Length
TAPE = #50	10 Telescope inches	10 feet

Material and type	Depth at top of screen
STAINLESS STEEL	139 1/2 feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	40	CEMENT GROUT & BENTONITE

71 PUMPING TEST

Pumping test method: 1 ☑ Pump 2 ☐ Bailer

Pumping rate: 300 I GPM

Duration of pumping: 24 Hours 10 Mins

Static level	Water level end of pumping	Water levels during: 1 ☑ Pumping 2 ☐ Recovery — 15 minutes	30 minutes	45 minutes	60 minutes
+1.72 M	9.29 M	3.31 M	4.17 M	4.77 M	5.16 M

If flowing give rate	Pump intake set at	Water at end of test
GPM	feet	☑ Clear ☐ Cloudy

Recommended pump type	Recommended pump setting	Recommended pump rate
☐ Shallow ☐ Deep	feet	300 GPM

FINAL STATUS OF WELL

1 ☑ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

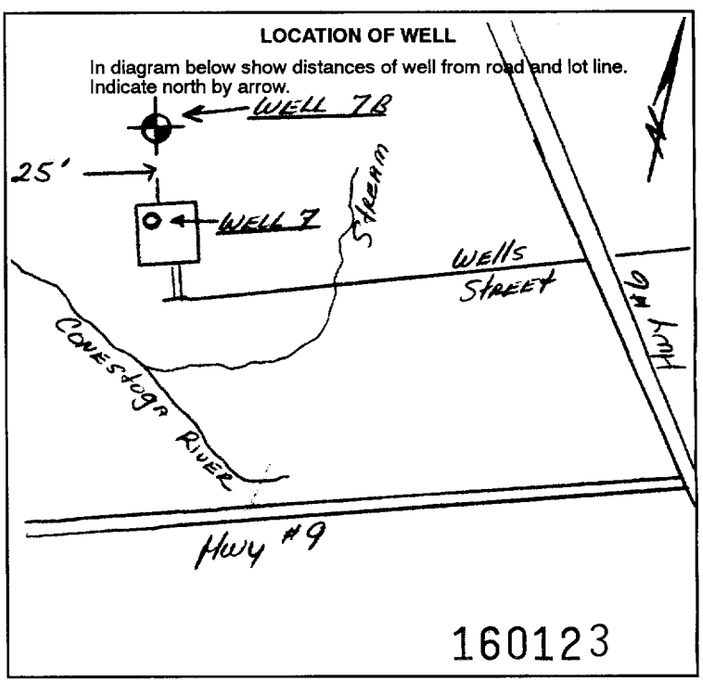
1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☑ Commercial 6 ☑ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☑ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☑ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



160123

Name of Well Contractor: Lynney Well Drilling — Well Contractor's Licence No.: 3406

Address: RR#1 Grand Valley

Name of Well Technician: T. Gerrits — Well Technician's Licence No.: T-0080

Signature of Technician/Contractor: [signature] — Submission date: 24 day 07 mo 98 yr

MINISTRY USE ONLY

Data source — Contractor: 3406 — Date received: APR 0 1 1999

Date of inspection — Inspector

Remarks: CSS.ES9

0506 (07/94) Front Form 9

2 - MINISTRY OF ENVIRONMENT & ENERGY COPY

Ontario 37 8A — Ministry of the Environment

03-67

The Ontario Water Resources Act
WATER WELL RECORD

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

6714775

Municipality 67010 Con A Pg 1

Sheet 1 of 2

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
WELLINGTON	FORMER TWP OF PEEL TOWN OF ARTHUR	CON A	PART 20

Owner's surname	First Name	Address	Date completed
TWP OF WELLINGTON NORTH		PO BOX 125 KENILWORTH ONT N0G2E0	08 (day) 09 (month) 03 (year)

21 Zone | Easting | Northing | RC | Elevation | RC | Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
	TOP SOIL			0	1
BROWN	CLAY	STONES		1	25
GREY	CLAY	STONES		25	37
GREY	CLAY		HARD	37	47
GREY	CLAY	GRAVEL	FINE	47	51
BROWN	SAND	GREY SILTY CLAY		51	84
GREY	GRAVEL	SILTY CLAY		84	103
GREY	CLAY	GRAVEL		103	118
GREY	CLAY		HARD	118	123
GREY	CLAY	GRAVEL		123	133
	CONTINUED	ON WELL RECORD	# 253366		

31

32

41 WATER RECORD

Water found at - feet	Kind of water
183 to 203	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
10	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.365	+2	183
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter	Length
60	8½ inches	20 feet

Material and type	Depth at top of screen
STAINLESS STEEL V-WIRE	183 feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	183	CEMENT GROUT

71 PUMPING TEST

Pumping test method: 1 ☐ Pump 2 ☐ Bailer

Pumping rate: ..... GPM

Duration of pumping: ..... Hours ..... Mins

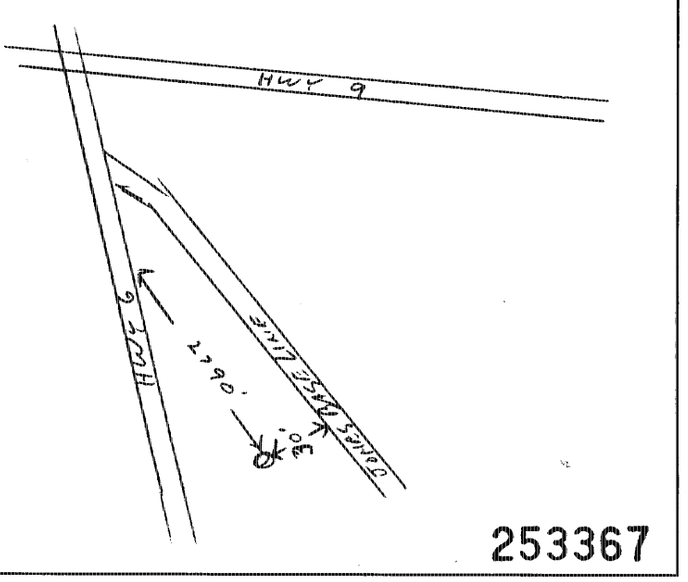
Static level	Water level end of pumping	Water levels during: 1 ☐ Pumping 2 ☐ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
WELL TEST feet	feet	BE feet	OTHERS feet	feet	feet

If flowing give rate	Pump intake set at	Water at end of test
GPM	feet	☐ Clear ☐ Cloudy

Recommended pump type	Recommended pump setting	Recommended pump rate
☐ Shallow ☐ Deep	feet	GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☒ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other .....

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☒ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other .....

Name of Well Contractor	Well Contractor's Licence No.
MEADOWBANK DRILLING SERVICES	G865

Address
RR 1 ELORA ONT N0B1S0

Name of Well Technician	Well Technician's Licence No.
Jim BROADFOOT	TC370

Signature of Technician/Contractor	Submission date
Jim Broadfoot	day mo yr

MINISTRY USE ONLY

Data source	Contractor	Date received
	6865	JAN 19 2004

Date of inspection | Inspector

Remarks

CSS ES4

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario Ministry of the Environment

(37) 8A

03-67

The Ontario Water Resources Act
WATER WELL RECORD

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

6714775

PG 2

Municipality 67010 Con CCN A

Sheet 2 of 2

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot

Owner's surname / First Name	Address	Date completed (day month year)
TWP OF WELLINGTON NORTH		

Zone | Easting | Northing | RC | Elevation | RC | Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	To
	CONTINUED FROM WELL RECORD		#253367		
GREY	CLAY		HARD	133	138
BROWN	CLAY	GRAVEL & ROCKS		138	170
BROWN	GRAVEL	CLAY	LAYERED	170	178
BROWN	GRAVEL	SAND		178	211
BROWN	SAND	SILTY CLAY		211	220

WATER RECORD

Water found at - feet	Kind of water
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas

CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	To
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter (inches)	Length (feet)
Material and type	Depth at top of screen (feet)	

PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)

PUMPING TEST

Pumping test method ☐ Pump ☐ Bailer | Pumping rate GPM | Duration of pumping Hours Mins

Static level | Water level end of pumping | Water levels during ☐ Pumping ☐ Recovery: 15 minutes, 30 minutes, 45 minutes, 60 minutes (feet)

If flowing give rate GPM | Pump intake set at feet | Water at end of test ☐ Clear ☐ Cloudy

Recommended pump type ☐ Shallow ☐ Deep | Recommended pump setting feet | Recommended pump rate GPM

FINAL STATUS OF WELL

☐ Water supply ☐ Observation well ☐ Test hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Abandoned (Other) ☐ Dewatering ☐ Unfinished ☐ Replacement well

WATER USE

☐ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public supply ☐ Cooling & air conditioning ☐ Not use ☐ Other

METHOD OF CONSTRUCTION

☐ Cable tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air) ☐ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.

253366

Name of Well Contractor	Well Contractor's Licence No.
Address	
Name of Well Technician	Well Technician's Licence No.
Signature of Technician/Contractor	Submission date day mo yr

MINISTRY USE ONLY

Data source	Contractor 6865	Date received JAN 19 2004
Date of inspection	Inspector	
Remarks	CSS. ES4	

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario
Ministry of the Environment

03-68

The Ontario Water Resources Act
WATER WELL RECORD

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

6714776

Municipality 67010 Con CON 1 A

SHEET 1 of 2

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
WELLINGTON	FMP TWP OF PEEL TOWN OF ARTHUR	CON A	PART 20

Owner's surname	First Name	Address	Date completed
TWP OF WELLINGTON NORTH		PO BOX 125 KENILWORTH ONT N0G 2E0	23 day 03 month 03 year

21 Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
	TOP SOIL			0	1
BROWN	CLAY	STONES		1	9
GREY	CLAY	STONES		9	32
GREY	CLAY	GRAVEL	FINE	32	49
BROWN	SAND	SILTY CLAY		49	84
GREY	GRAVEL	SILTY CLAY	FINE	84	102
GREY	CLAY	GRAVEL		102	120
GREY	CLAY		HARD	120	128
GREY	CLAY	GRAVEL		128	136
GREY	CLAY		HARD	136	139
	CONTINUED ON WELL RECORD #	253364			

31

32

41 WATER RECORD

Water found at - feet	Kind of water
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
10	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.365	+2	183
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter	Length
60	6 1/2 inches	20 feet

Material and type: STAINLESS STEEL V WIRE

Depth at top of screen: 184 feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	183	CEMENT GROUT

71 PUMPING TEST

Pumping test method: 1 ☐ Pump 2 ☐ Bailer

Pumping rate: GPM

Duration of pumping: Hours Mins

Water levels during: 1 ☐ Pumping 2 ☐ Recovery

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
WELL TEST BY OTHERS					
feet	feet	feet	feet	feet	feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☐ Cloudy

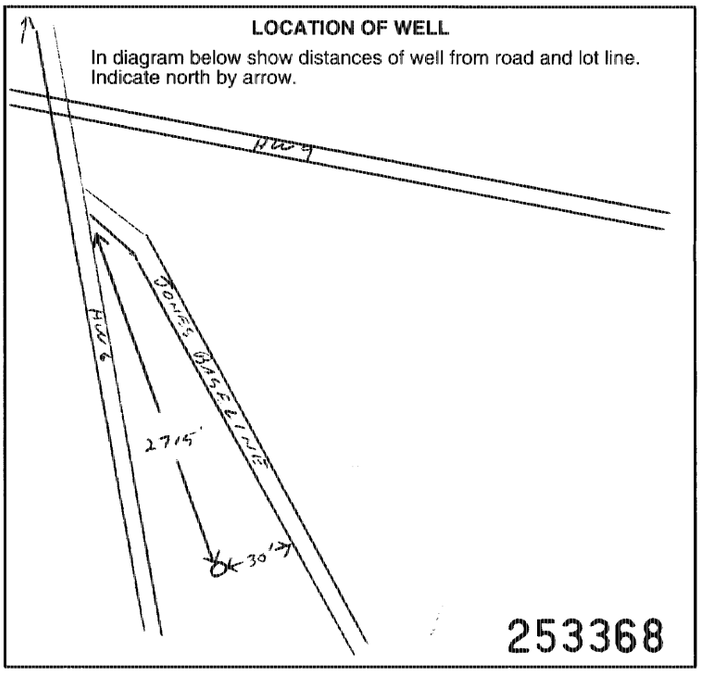
Recommended pump type: ☐ Shallow ☐ Deep

Recommended pump setting: feet

Recommended pump rate: GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



253368

FINAL STATUS OF WELL

1 ☒ Water supply
2 ☐ Observation well
3 ☐ Test hole
4 ☐ Recharge well
5 ☐ Abandoned, insufficient supply
6 ☐ Abandoned, poor quality
7 ☐ Abandoned (Other)
8 ☐ Dewatering
9 ☐ Unfinished
10 ☐ Replacement well

WATER USE

1 ☐ Domestic
2 ☐ Stock
3 ☐ Irrigation
4 ☐ Industrial
5 ☐ Commercial
6 ☒ Municipal
7 ☐ Public supply
8 ☐ Cooling & air conditioning
9 ☐ Not use
10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool
2 ☒ Rotary (conventional)
3 ☐ Rotary (reverse)
4 ☐ Rotary (air)
5 ☐ Air percussion
6 ☐ Boring
7 ☐ Diamond
8 ☐ Jetting
9 ☐ Driving
10 ☐ Digging
11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
MCADOUGALL DRILLING SERVICES	6865

Address: RR 1 ELORA ONT N0B 1S0

Name of Well Technician	Well Technician's Licence No.
JIM BROADFOOT	

Signature of Technician/Contractor: Jim Broadfoot

Submission date: day mo yr

MINISTRY USE ONLY

Data source

Contractor: 6865

Date received: JAN 19 2004

Date of inspection

Inspector

Remarks

CSS. ES4

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario Ministry of the Environment

(38) 8B

03-68

The Ontario Water Resources Act
WATER WELL RECORD

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

11 | 6714776

Municipality: 67010 Con. CON A

Pg 2

Sheet 2 of 2

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot

Owner's surname	First Name	Address	Date completed (day month year)
TWP OF WELLINGTON	NORTH		

21 Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
	CONTINUED	FROM WELL RECORD # 253368			
BROWN	CLAY	GRAVEL + ROCKS		139	179
BROWN	GRAVEL	SAND + ROCKS		179	214
BROWN	SAND	GRAVEL + CLAY		214	225

31

32

41 WATER RECORD

Water found at - feet	Kind of water
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)

71 PUMPING TEST

Pumping test method: ☐ Pump ☐ Bailer | Pumping rate GPM | Duration of pumping Hours Mins

Static level | Water level end of pumping | Water levels during ☐ Pumping ☐ Recovery: 15 minutes, 30 minutes, 45 minutes, 60 minutes (feet)

If flowing give rate GPM | Pump intake set at feet | Water at end of test ☐ Clear ☐ Cloudy

Recommended pump type ☐ Shallow ☐ Deep | Recommended pump setting feet | Recommended pump rate GPM

FINAL STATUS OF WELL

☐ Water supply ☐ Observation well ☐ Test hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Abandoned (Other) ☐ Dewatering ☐ Unfinished ☐ Replacement well

WATER USE

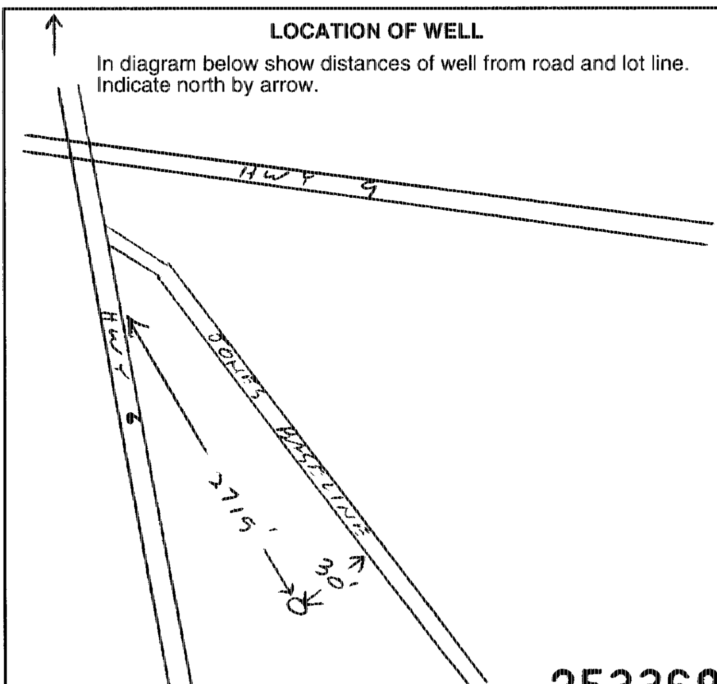
☐ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public supply ☐ Cooling & air conditioning ☐ Not use ☐ Other

METHOD OF CONSTRUCTION

☐ Cable tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air) ☐ Air percussion ☐ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



253369

Name of Well Contractor	Well Contractor's Licence No.
Address	
Name of Well Technician	Well Technician's Licence No.
Signature of Technician/Contractor	Submission date day mo yr

MINISTRY USE ONLY

Data source	Contractor 6865	Date received JAN 19 2004
Date of inspection	Inspector	
Remarks	CSS. ES4	

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario — Ministry of the Environment and Climate Change

Well Tag No. *(Place Sticker and/or Print Below)*: A227265

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☑ Metric ☐ Imperial

Page 1 of 1

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	940749 Ontario Ltd.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
206 George St.	Arthur	ON	N0G 1A0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Domville St (Arthur)			

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Arthur.	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	536637	4854272		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Black	Topsoil		Loose	0	0.3
Brown	Silt	Sand		0.3	1.5
Grey	Silt	Clay		1.5	4.5

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed (m³/ft³)
0	2.4	#3/8 Holeplug	1
2.4	4.5	#2 Sand	1

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☑ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☑ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
2.54	Plastic		0	3

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
3.3	Plastic	10	3	4.5

Status of Well

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

Water Details

Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	4.5	10

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

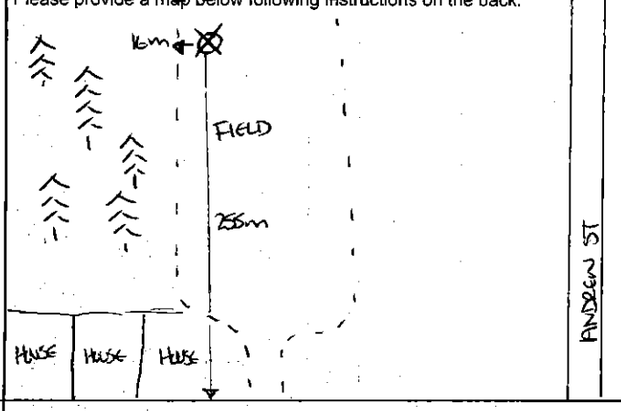
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
CMT Drilling Inc.	7166

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
1011 Industrial Cres	Waterloo	ON	N0B 2M0	cmtinc.net

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
519 699 5775	Black, Chris	3711	CB	2017/10/02

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No	YYYY MM DD	2017/09/25

Ministry Use Only

Audit No. Z273337

Received OCT 06 2017

0506E (2014/11)

Ministry's Copy

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

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

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A 295003

Type *

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

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

Last Name	First Name
[redacted]	
Organization	Email Address
MILO GROUP OF COMPANIES LTD.	[redacted]

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
		[redacted]	

Country	Province	Postal Code	Telephone Number
CAN	ON	[redacted]	

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	FIELD	WEST OF TUCKER ST	

Lot	Concession	County/District/Municipality

City/Town	Province	Postal Code
ARTHUR	Ontario	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	537006	4854452	Test UTM in Map	

Other

3. Overburden and Bedrock Material *

Well Depth * 15 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Silt	Till	Dense	0	15

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	4	3/8 HOLEPLUG	0.08
4	15	#2 SAND	0.2

5. Method of Construction *

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

6. Well Use *

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

7. Status of Well *

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

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

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
1.5	Plastic	0.06	-3	5

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
1.56	Plastic	10	5	15

10. Water Details

Water found at Depth (ft)	☐ Gas	Kind of water ☐ Fresh ☐ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	15	3.5

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain _____

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

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

Recovery

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

After test of well yield, water was

☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? * ☐ Yes ☑ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

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

14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☐ Yes ☐ No		2020/09/17

Comments

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
CMT DRILLING INC	7366

Business Address

Unit Number	Street Number	Street Name *
1	1011	INDUSTRIAL CRES

City/Town/Village *	Province	Postal Code *
ST CLEMENTS	ON	N0B 2M0

Business Telephone Number	Business Email Address
519-699-5775	info@cmtinc.net

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
BLACK	CHRIS	3711

16. Declaration *

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

Last Name	First Name	Email Address
BLACK	CHRIS	cblack@cmtinc.net

Signature		Date Submitted (yyyy/mm/dd)
Chris Black	Digitally signed by Chris Black Date: 2020.10.05 16:12:54 -04'00'	2020/10/05

17. Ministry Use Only

Audit Number

Z4V3 DQ6U

Water Well Records

Wednesday, December 01, 2021

1:53:43 PM

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR TOWNSHIP	17 536179 4853736 W	2012/02 7221				MO		7179345 (Z143817) A	
ARTHUR TOWNSHIP	17 536097 4853701 W	2009/07 7241	5.19			MT	0007 10	7128094 (Z102260) A089005	BRWN SAND FILL LOOS 0002 BRWN SAND SILT LOOS 0008 BRWN SILT ROCK DNSE 0015 GREY SILT CLAY DNSE 0017
ARTHUR TOWNSHIP	17 536121 4853700 W	2009/07 7241	5.19			MT	0005 10	7128095 (Z102259) A089015	BRWN SAND FILL LOOS 0002 BRWN SAND SILT LOOS 0008 BRWN SILT ROCK DNSE 0015
ARTHUR TOWNSHIP	17 535330 4853277 W	2006/07 7221	5.90 4.32				0149 10	6715856 (Z42939) A	
ARTHUR TOWNSHIP	17 537639 4853114 W	2006/03 6988	2.00				0003 10	7042081 (Z41261) A037358	BRWN SAND SILT LOAM 0004 BRWN SILT SAND CLAY 0006 BRWN SAND SILT 0008 BRWN SILT 0010 GREY SILT CLAY SAND 0013 GREY CLAY 0013
ARTHUR TOWNSHIP	17 537631 4852888 W	2010/05 7383	0.79 0.79			MO		7145549 (M06954) A069003	BLCK 0007 BRWN SAND GRVL FILL 0016 BRWN SILT CLAY SOFT 0041 BRWN SAND SILT LOOS 0066
ARTHUR TOWNSHIP	17 535803 4853637 W	2020/04 7609						7363874 (Z336573) A283574 P	
ARTHUR TOWNSHIP	17 536338 4853746 W	2012/04 7238						7231470 (C15153) A123976 P	
ARTHUR TOWNSHIP	17 537445 4854267 W	2013/06 7366						7204097 (C17112) A148247 P	
ARTHUR TOWNSHIP	17 536096 4853693 W	2009/07 7241	5.19			MT	0008 10	7128093 (Z102261) A089003	BRWN SAND FILL DNSE 0002 BRWN SAND SILT DNSE 0008 BRWN SILT ROCK DNSE 0015 GREY SILT CLAY DNSE 0018
ARTHUR TOWNSHIP	17 537307 4853285 W	2014/06 7221				MN NU		7223173 (Z188882) A	
ARTHUR TOWNSHIP	17 536108 4853687 W	2009/07 7241	5.19			MT	0007 10	7128096 (Z102258) A089014	BRWN SAND FILL LOOS 0002 BRWN SAND SILT LOOS 0008 BRWN SILT ROCK DNSE 0017 GREY SILT CLAY
ARTHUR TOWNSHIP	17 536179 4853736 W	2012/02 7221				MO		7179346 (Z143816) A	
ARTHUR TOWNSHIP	17 537649 4852945 W	2017/01 7190	1.5	UT 0008		MO	0005 5	7281679 (Z246442) A156712	BRWN SAND SILT LOOS 0010 BRWN SILT SAND LOOS 0015

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR TOWNSHIP	17 536338 4853746 W	7238						7180999 (M08231) A123976 P	
ARTHUR TOWNSHIP	17 537254 4853279 W	2012/07 7241	1.58			MT	0005 10	7185004 (Z151068) A109742	BLCK ---- SOFT 0000 BRWN SAND GRVL SOFT 0005 BRWN SILT SAND SOFT 0015
ARTHUR TOWNSHIP	17 537254 4853279 W	2012/07 7241	1.58			MT	0006 10	7185005 (Z151070) A109744	BLCK ---- SOFT 0000 BRWN SAND GRVL LOOS 0007 BRWN SILT SAND SOFT 0016
ARTHUR TOWNSHIP	17 537254 4853279 W	2012/07 7241	1.58			MT	0005 10	7185006 (Z151072) A109745	BLCK ---- SOFT 0000 BRWN SAND GRVL SOFT 0007 BRWN SILT SAND SOFT 0015
ARTHUR TOWNSHIP	17 536663 4853460 W	2013/06 7488	2			MO	0005 10	7204089 (Z138620) A122257	BRWN GRVL LOOS 0001 BRWN SILT TILL 0015
ARTHUR TOWNSHIP	17 537254 4853279 W	2012/07 7241	1.58			MT	0005 10	7185007 (Z151069) A109743	BLCK ---- SOFT 0000 BRWN SAND GRVL SOFT 0007 BRWN SILT SAND SOFT 0015
ARTHUR TOWNSHIP	17 537641 4852940 W	2014/05 7190	2			MO	0010 10	7220861 (Z180443) A146221	BRWN SILT SAND SOFT 0015 GREY SILT SAND SOFT 0020
ARTHUR TOWNSHIP	17 536345 4853263 W	2008/12 6607				NU		7118614 (M03071) A074897 A	
ARTHUR TOWNSHIP	17 535962 4853797 W	2009/07 7241	2.04			MT	0006 12	7127800 (Z102284) A088967	BLCK HARD 0000 BRWN SAND GRVL LOOS 0015 GREY SILT FSND HARD 0018
ARTHUR TOWNSHIP	17 535994 4853759 W	2009/07 7241	2.04			MT	0007 12	7127799 (Z099404) A087353	BLCK HARD 0000 BRWN SAND GRVL LOOS 0015 BRWN SILT FSND HARD 0019
ARTHUR TOWNSHIP	17 535815 4853635 W	2020/04 7609						7363873 (Z336572) A285573 P	
ARTHUR TOWNSHIP	17 535866 4853624 W	2020/04 7609						7363872 (Z336571) A283571 P	
ARTHUR TOWNSHIP	17 535866 4853624 W	2020/06 7609						7363868 (Z336593) A283571 P	
ARTHUR TOWNSHIP	17 537183 4853019 W	2006/12 6607	0.75	0016			0017 8	7040778 (Z59650) A051099	BRWN SILT LOAM FILL 0015 BLCK PEAT 0017 BRWN SAND GRVL 0019 GREY SILT SAND CLAY 0025

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR TOWNSHIP	17 535815 4853635 W	2020/06 7609						7363869 (Z336592) A283573 P	
ARTHUR TOWNSHIP	17 535822 4853670 W	2020/04 7609						7363871 (Z336570) A283572 P	
ARTHUR TOWNSHIP	17 536006 4853792 W	2009/07 7241	2.04			MT	0008 12	7127801 (Z102280) A088966	BLCK HARD 0000 BRWN SAND GRVL LOOS 0016 BRWN SILT FSND HARD 0021
ARTHUR TOWNSHIP	17 535822 4853670 W	2020/06 7609						7363867 (Z336590) A283572 P	
ARTHUR TOWNSHIP 01 028	17 537164 4855246 W	2005/06 7282	2.06	FR 0020		NU	0013 10	6715447 (Z27704) A027809	BRWN CLAY STNS 0012 GREY SILT STNS CLAY 0020 GREY SILT SAND 0023 GREY CLAY 0030
ARTHUR TOWNSHIP 02 027	17 535276 4856419 W	2005/11 2644						6715649 (Z41890) A	PRDG 0282
ARTHUR TOWNSHIP CON 01 025	17 537003 4856857 W	1987/08 3740	5 5	FR 0245 FR 0260	24/75/4/1:0	DO		6708889 (06091)	BRWN CLAY 0012 GREY HPAN STNS 0140 GREY LMSN 0260
ARTHUR TOWNSHIP CON 01 025	17 536631 4857014 W	2014/06 2663	6.61	UT 0122	15/40/10/1:	DO		7228245 (Z181046) A157686	BRWN CLAY LOOS 0034 GREY BLDR 0036 BRWN CLAY 0094 BRWN SAND GRVL 0122
ARTHUR TOWNSHIP CON 01 027	17 536536 4855340 W	1963/07 1804	4 4	FR 0185	32/50/10/4:0	ST DO		6700014 ()	LOAM 0005 GRVL STNS 0020 CLAY FSND 0060 CLAY GRVL 0100 FSND GRVL 0125 CLAY GRVL 0160 CLAY MSND 0181 GREY ROCK 0200
ARTHUR TOWNSHIP CON 01 027	17 537203 4855713 W	1986/04 3740	5	FR 0150	17/25/6/4:	DO		6708424 ()	BLCK LOAM 0001 BRWN CLAY 0011 GREY CLAY HPAN 0145 GREY HPAN GRVL 0150
ARTHUR TOWNSHIP CON 01 028	17 537218 4855338 W	2015/12 7556						7255395 (Z226366) A	
ARTHUR TOWNSHIP CON 01 028	17 537233 4855356 W	1990/09 3740	5 5	FR 0302	30/95/10/1:0	DO ST		6710468 (34393)	LOAM 0002 BRWN CLAY 0015 GREY CLAY STNS 0142 BRWN LMSN 0220 GREY LMSN 0305 WHIT LMSN 0375
ARTHUR TOWNSHIP CON 01 029	17 536618 4853591 W	2020/01 7190	2	UT 0022	22///:	MT	0020 10	7362917 (7D4JPUGO) A287472	BRWN LOAM 0001 GREY SILT TILL DNSE 0018 GREY SILT SAND 0030
ARTHUR TOWNSHIP CON 01 029	17 537499 4853203 W	2020/07 7366			///:			7363656 (4L2BI7RE) A294993 A	
ARTHUR TOWNSHIP CON 01 029	17 536447 4853997 W	2020/01 7190	2	UT 0011	11///:	MT	0010 10	7362920 (OT7JHFQK) A287480	BRWN LOAM 0001 GREY SILT SAND LYRD 0020
ARTHUR TOWNSHIP CON 01 029	17 536422 4853852 W	2020/01 7190	2	UT 0015	15///:	MT	0010 10	7362918 (9FH2R3L8) A287473	BRWN LOAM 0001 GREY SILT SAND LYRD 0020

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR TOWNSHIP CON 01 029	17 536266 4853033 W	2013/07 7221	6.30		60/85/13/1:0	DO		7207131 (Z159292) A121597	BRWN CLAY 0005 BRWN SILT SAND 0012 GREY CLAY STNS 0057 GREY SILT SAND CLAY 0075 GREY CLAY STNS SAND 0098 BRWN GRVL SAND 0115
ARTHUR TOWNSHIP CON 01 029	17 537491 4853192 W	2020/04 7366	1.5		///:		0010 10	7360352 (WXHC9MH3) A294992	BRWN FILL GRVL 0006 BRWN TILL 0013 GREY SILT SAND 0020
ARTHUR TOWNSHIP CON 01 029	17 537489 4853201 W	2020/04 7366	1.5		///:		0005 10	7360351 (OYVTQ3W4) A294989	BRWN FILL SAND LOOS 0007 BRWN TILL 0011 GREY SILT SAND 0015
ARTHUR TOWNSHIP CON 01 029	17 537483 4853206 W	2020/04 7366	1.5		///:		0005 10	7360350 (CTMH27X6) A294991	BRWN FILL SAND 0007 BRWN TILL 0011 GREY SAND SILT 0015
ARTHUR TOWNSHIP CON 01 029	17 537499 4853203 W	2020/04 7366	1.5		///:		0010 10	7360349 (BMY2XQEA) A294993	BRWN FILL SAND 0006 BRWN TILL 0013 GREY SILT SAND 0020
ARTHUR TOWNSHIP CON 01 029	17 537401 4854520 W	2019/12 6865						7353747 (Z298683) A214512 P	
ARTHUR TOWNSHIP CON 01 029	17 536365 4853685 W	2020/01 7190	2	UT 0012	12///:	MT	0010 10	7362919 (D2WDWUZV) A287479	BRWN LOAM 0001 GREY SILT SAND LYRD 0020
ARTHUR TOWNSHIP CON 02 026	17 534972 4856658 W	2014/05 7146						7224269 (Z178969) A	
ARTHUR TOWNSHIP CON 02 026	17 535173 4857034 W	2015/09 7090		UT UT	24/36/15/1:30	ST		7254812 (Z217637) A147771	BRWN LOAM 0001 BRWN CLAY STNS 0017 GREY HPAN 0105 GREY HPAN STNY 0106 BRWN LMSN 0175 WHIT LMSN 0198 BRWN LMSN 0355 BRWN LMSN LYRD 0395
ARTHUR TOWNSHIP CON 02 026	17 534967 4856601 W	1988/02 1737	6 6	FR 0240 FR 0293	41/150/8/1:30	DO		6709169 (24605)	BRWN CLAY HARD 0014 GREY CLAY SOFT 0055 GREY HPAN STNS HARD 0146 GREY CLAY SAND STNS 0191 GREY LMSN HARD 0303
ARTHUR TOWNSHIP CON 02 027	17 535419 4856165 L	2000/05 1737	5	FR 0335	42/90/12/3:	DO		6713391 (217835)	PRDR 0243 WHIT LMSN 0335
ARTHUR TOWNSHIP CON 02 027	17 535265 4856355 W	1985/04 4856	5 5	FR 0182 FR 0202	40/160/11/2:0	DO ST		6708191 ()	BLCK LOAM 0001 BRWN CLAY 0032 GREY CLAY 0064 BRWN HPAN BLDR 0177 GREY SHLE LMSN 0181 BLUE LMSN 0242
ARTHUR TOWNSHIP CON 03 029	17 534542 4853221 W	1990/09 1804	5	FR 0136 FR 0141	/28/30/2:0	DO		6710416 (81886)	LOAM 0002 BRWN HPAN STNS 0035 GREY CLAY 0100 GREY HPAN STNS 0112 BRWN ROCK 0141
ARTHUR TOWNSHIP OSR E 032	17 534601 4855758 W	2002/01 6865	6 6	UK 0230	22/76/8/1:0	DO		6714062 (225326)	BRWN CLAY STNS 0013 GREY CLAY STNS 0120 GREY CLAY ROCK 0125 GREY CLAY HARD 0174 GREY CLAY GRVL 0194 GREY LMSN 0230
ARTHUR TOWNSHIP OSR E 032	17 534763 4856077 W	2016/10 7154	6.25 6	FR 0286 FR 0316	36/164/8/1:	DO		7273742 (Z234488) A193018	BRWN CLAY STNS 0098 GREY CLAY 0165 GREY CLAY STNS 0193 GREY LMSN 0322

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR TOWNSHIP OSR E 034	17 535704 4854930 L	2003/07 6865	6 6	UK 0260	20/154/8/1:0	DO		6714548 (253339)	BRWN CLAY STNS 0009 GREY CLAY HARD 0044 GREY CLAY STNS 0075 GREY CLAY GRVL STNS 0115 BRWN CLAY HARD 0123 GREY CLAY GRVL 0181 GREY GRVL CLAY 0193 GREY LMSN 0218 LMSN 0238 GREY LMSN 0260
ARTHUR TOWNSHIP OSR E 035	17 535661 4854201 W	1951/12 1723	4 4	UK 0230 FR 0263	-3//25/:	ST DO		6700089 ()	CLAY 0063 FILL 0191 GREY LMSN 0263
ARTHUR TOWNSHIP OSR E 035	17 536072 4854069 W	1975/04 3740	4	FR 0270 FR 0355	35/115/6/1:0	DO		6705494 ()	BLCK LOAM 0001 BRWN CLAY BLDR 0045 GREY SAND HPAN BLDR 0195 GREY LMSN 0210 BRWN LMSN 0214 WHIT LMSN 0352 BRWN LMSN 0355
ARTHUR TOWNSHIP OSR W 025	17 534537 4853949 W	2014/06 2663				DO		7228278 (Z181047) A	
ARTHUR TOWNSHIP OSR W 033	17 534552 4854841 W	1988/08 1804	5	FR 0172	28/90/10/2:0	DO	0181 3	6709327 (22880)	BRWN FILL 0003 BRWN CLAY 0042 GREY HPAN STNS 0171 BRWN GRVL 0184
ARTHUR TOWNSHIP OSR W 033	17 534817 4854642 W	2019/04 7557	6.11		35/50/10/1:0	DO		7333175 (Z308013) A256296	BRWN SAND STNS 0010 BRWN CLAY STNS SOFT 0075 BRWN CLAY BLDR 0091 BRWN CLAY SOFT 0120 BRWN CLAY GRVL STNS 0183 BRWN LMSN 0192 GREY LMSN HARD 0220 BRWN LMSN HARD 0240 GREY LMSN HARD 0260
ARTHUR TOWNSHIP OSR W 033	17 534817 4854644 W	2019/04 7557			35///:			7333174 (Z308012) A	
ARTHUR TOWNSHIP OSR W 034	17 535414 4854273 W	1969/01 2313	5 5	FR 0281 FR 0412	24/35/15/2:0	ST DO		6703297 ()	LOAM 0002 CLAY 0130 HPAN 0190 GRVL 0200 MSND 0205 GREY LMSN 0235 BRWN LMSN 0281 GREY LMSN 0421
ARTHUR TOWNSHIP OSR W 034	17 535254 4854409 W	1993/08 3317	6 6	FR 0250 FR 0264	28/60/10/1:30	DO		6711333 (128299)	BRWN CLAY STNS 0010 GREY CLAY STKY 0088 GREY CLAY STNS 0203 GREY LMSN 0270
ARTHUR TOWNSHIP OSR W 035	17 535324 4853271 W	1998/01 3428	1			MN	0142 10	6712493 (093326)	PRDR 0142
ARTHUR TOWNSHIP OSR W 035	17 535324 4853271 W	1998/03 6865	6 6					6712508 (188508)	BRWN CLAY GRVL 0001 BRWN GRVL SAND WBRG 0014 GREY GRVL CLAY 0019 GREY CLAY STNS 0040 BRWN CLAY STNS 0071 GREY CLAY STNS 0075 BRWN CLAY STNS 0131 BRWN HPAN 0134 BRWN GRVL CLAY 0141 BRWN GRVL SAND 0152 GREY LMSN 0155 BRWN LMSN 0157 GREY LMSN 0163
ARTHUR TOWNSHIP OSR W 035	17 535864 4853823 W	1969/09 1804	4	FR 0200 FR 0220	4/52/10/2:0	ST DO		6703466 ()	BLCK LOAM 0005 GRVL BLDR 0045 MSND CLAY 0070 MSND GRVL 0100 GRVL CLAY 0120 GRVL 0160 MSND GRVL 0172 LMSN 0220
ARTHUR TOWNSHIP OSR W 035	17 535683 4854003 W	1990/07 1804	5	FR 0210	29/110/5/2:20	DO		6710365 (81821)	LOAM 0003 BRWN CLAY STNS 0189 BRWN ROCK 0231
ARTHUR TOWNSHIP OSR W 035	17 535549 4854083 W	1951/09 1723	4 4	FR 0228 FR 0246	2/2/20/:	ST DO		6700102 ()	PRDG 0016 FILL 0193 GREY ROCK LMSN 0246
ARTHUR TOWNSHIP OSR W 035	17 536176 4853030 W	2000/10 6865	6	UK 0142	44/48/10/1:	DO		6713542 (211352)	LOAM 0001 BRWN GRVL CLAY STNS 0009 BRWN GRVL SAND 0021 GREY CLAY GRVL 0038 GREY CLAY 0050 GREY CLAY STNS STNS 0131 BRWN GRVL SAND CMTD 0141 BRWN GRVL SAND 0142
ARTHUR TOWNSHIP OSR W 035	17 535334 4853273 W	1998/01 3428	4		6/22/180/0:30	MN	0149 10	6712492 (093325)	PRDR 0149

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR TOWNSHIP OSR W 035	17 534784 4853310 W	2017/07 6865	6.26 6.13	UT 0131 UT 0141	1/107/7/2:0	DO		7292800 (Z244502) A171815	BRWN GRVL CLAY FILL 0004 BRWN CLAY STNS GRVL 0015 GREY CLAY 0102 GREY GRVL CLAY 0103 GREY CLAY GRVL 0115 GREY LMSN 0118 GREY LMSN 0141
ARTHUR TOWNSHIP OSR W 035	17 535330 4853279 W	1998/07 3406	21	UK 0130	11/9/300/24:10	MN	0140 10	6712921 (160123)	BRWN LOAM 0001 BRWN CLAY 0013 GREY CLAY STNS 0036 BRWN CLAY STNS TILL 0130 GRVL WBRG 0152
ARTHUR TOWNSHIP OSR W 035	17 535314 4853143 W	1975/09 4856	4	FR 0178	35/50/42/2:0	DO		6705722 ()	LOAM GRVL 0002 BRWN GRVL 0042 GREY HPAN GRVL BLDR 0098 GREY SAND BLDR CLAY 0171 BLUE GRVL SHLE LYRD 0180
ARTHUR TOWNSHIP OSR W 035	17 535219 4853688 L	2003/08 6865	6	FR 0127	24/28/15/1:0	DO		6714684 (253375)	LOAM 0002 CLAY STNS 0055 CLAY BLDR 0063 HPAN STNS BLDR 0097 GRVL SAND 0127
ARTHUR TOWNSHIP OSR W 035	17 535077 4853309 W	1962/07 1804	5	FR 0140	///:	PS		6700104 ()	LOAM 0002 CLAY 0105 CLAY BLDR 0125 MSND 0132 GRVL 0140
ARTHUR TOWNSHIP OSR W 035	17 535214 4853153 W	1970/07 3104	5	FR 0165	33/35/12/2:30	DO	0164 4	6703798 ()	LOAM 0003 CLAY GRVL 0007 BLUE CLAY 0080 BRWN CLAY 0125 BLUE CLAY 0147 YLLW CLAY GRVL 0157 YLLW GRVL 0168
ARTHUR TOWNSHIP OSR W 035	17 535065 4853153 W	1988/08 1804	5	FR 0090 FR 0112	62/90/9/2:0	DO	0108 4	6709328 (22881)	BRWN CLAY STNS 0089 BRWN GRVL 0112
ARTHUR TOWNSHIP OSR W 035	17 535205 4853172 W	1961/06 2519	30	FR 0009	14/19/4/1:0	DO		6700103 ()	LOAM 0001 BRWN CLAY 0009 GRVL 0019
ARTHUR TOWNSHIP OSR W 035	17 535740 4853917 W	2009/06 6231	6.30					7129169 (Z85092) A002990	
ARTHUR VILLAGE	17 536244 4853683 W	1969/12 2801	2	FR 0080	22/54/5/:		0088 11	6703603 () A	BRWN CLAY 0007 BRWN CLAY GRVL MSND 0019 GREY CLAY GRVL 0037 MSND GRVL 0038 BRWN CLAY GRVL 0080 BRWN MSND GRVL CLAY 0100 BRWN CLAY MSND GRVL 0161 GREY CLAY MSND GRVL 0180 RED CLAY MSND GRVL 0186 BRWN LMSN 0189
ARTHUR VILLAGE	17 536214 4853063 W	1969/12 1657	5	FR 0147	25/145/4/4:0	DO	0148 3	6703566 ()	BRWN CLAY 0045 BLUE CLAY 0095 CLAY MSND 0098 CLAY BLDR 0147 GRVL MSND 0151
ARTHUR VILLAGE	17 537302 4853291 W	1997/07 3428	6		65/148/60/23:0	MN		6712301 (093334)	PRDR 0173
ARTHUR VILLAGE	17 537394 4853217 W	2008/04 7366	1.5			MO		7105361 (M01110) A058441	BRWN LOAM LOOS 0002 BRWN SAND SILT LOOS 0008 BRWN CLAY SILT DNSE 0015
ARTHUR VILLAGE	17 536705 4852989 W	2007/07 6865	6.30 5.11	FR 0171	29/31/12/1:	DO	0168 3	7108048 (Z74779) A034737	BRWN CLAY SAND 0006 GREY CLAY SAND 0084 GRVL SAND 0130 CLAY GRVL 0136 GRVL SAND CLAY 0174
ARTHUR VILLAGE	17 536264 4853683 W	1970/03 2801	10	FR 0240	33/175/61/7:0	MN		6703637 ()	BRWN CLAY GRVL 0019 GREY CLAY GRVL 0038 BRWN CLAY GRVL 0161 GREY CLAY MSND GRVL 0180 BRWN CLAY GRVL 0186 GREY LMSN 0218 BRWN LMSN 0276 GREY LMSN 0297 WHIT LMSN 0326 BRWN LMSN 0332 WHIT LMSN 0350
ARTHUR VILLAGE	17 536066 4853668 W	2006/08 7215						6715952 (Z50067) A019883 A	

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR VILLAGE	17 537695 4852834 W	2006/06 7241	1.5				0006 10	6715824 (Z50137) A039339	BRWN SAND SILT FILL 0010 BRWN CLAY SILT GRVL 0016
ARTHUR VILLAGE	17 536166 4853742 W	2005/10 7221	10		41///:			6715546 (Z26593) A	
ARTHUR VILLAGE	17 537716 4852903 W	2006/01 6061						6715657 (Z39480) A	
ARTHUR VILLAGE	17 537731 4852904 W	1998/12 3406	6	UK 0056 UK 0143	27/43/20/24:0	CO		6712922 (201732)	BRWN FILL 0011 BRWN CLAY STNS TILL 0056 BRWN SAND CLAY SILT 0061 BRWN CLAY STNS 0121 BRWN CLAY STNS 0143 BRWN GRVL SAND 0153
ARTHUR VILLAGE	17 536066 4853668 W	2004/12 7282	2.24	0010		NU	0005 10	6715219 (Z20079) A019883	BLCK SAND GRVL SOFT 0001 BRWN SAND STNS SOFT 0004 BRWN GRVL STNS WBRG 0008 GREY CLAY STNS DRY 0017
ARTHUR VILLAGE	17 537517 4853844 W	2005/03 7221	9.84			MN PS		6715277 (Z26588) A	
ARTHUR VILLAGE	17 537037 4853063 W	2005/03 7221	9.84			MN PS		6715278 (Z26589) A	
ARTHUR VILLAGE	17 537663 4852858 W	2011/05 7190	2 2	UT 0015		MT	0005 10	7163864 (Z120266) A105833	BRWN LOAM LOOS 0001 BRWN SAND GRVL LOOS 0003 BRWN SILT GRVL 0010 GREY SAND GRVL DNSE 0015
ARTHUR VILLAGE	17 536474 4854123 W	2005/11 6865						6715619 (Z38390) A	
ARTHUR VILLAGE	17 537394 4853217 W	2008/07 7366	3.79			OT	0010 5	7109131 (Z82317) A058441 A	
ARTHUR VILLAGE	17 537490 4853366 W	2005/10 7221	7.86		67///:			6715545 (Z26595) A	
ARTHUR VILLAGE	17 537693 4853116 W	2006/08 6634						6715886 (Z71053) A043259 A	
ARTHUR VILLAGE	17 537947 4853283 W	2019/01 6607	2.00		///:	MT	0015 5	7331058 (Z282666) A246140	BRWN CLAY SLTY 0016 GREY CLAY SAND LYRD 0020
ARTHUR VILLAGE	17 537659 4853872 W	2017/07 7230						7306845 (C40148) A226699 P	
ARTHUR VILLAGE	17 537514 4853828 W	1966/11 2406	10 10	FR 0200 UK 0372	35/235/85/7:30	MN		6700004 ()	LOAM 0001 BRWN CLAY 0016 GREY CLAY STNS 0045 GREY CLAY FSND 0060 GREY CLAY STNS 0082 GREY CLAY FSND 0110 GREY CLAY STNS 0118 CLAY STNS 0164 GRVL MSND 0168 BRWN ROCK 0174 GREY ROCK 0195 BRWN ROCK 0248 GREY ROCK 0292 WHIT ROCK 0312 GREY ROCK 0324 BRWN ROCK 0372

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR VILLAGE	17 537394 4853463 W	1963/09 1804	4 4	FR 0162	60/75/18/10:0	DO		6700003 ()	LOAM 0004 GRVL BLDR 0020 GREY CLAY 0040 GREY CLAY STNS 0100 GREY CLAY MSND 0115 GREY QSND 0150 YLLW MSND 0161 BRWN ROCK 0179
ARTHUR VILLAGE	17 536302 4853349 W	2008/08 6607	2.00	UK 0010		MO		7113898 (M03064) A074897	BRWN SILT LOAM 0001 BRWN SILT CLAY SAND 0008 GREY SILT CLAY SAND 0020
ARTHUR VILLAGE	17 538831 4853098 W	2016/11 7241	2			MT	0004 10	7276934 (Z245645) A211453	BRWN GRVL SAND 0001 BRWN SILT CLAY 0012 BRWN SAND SILT 0013 GREY CLAY SILT 0014
ARTHUR VILLAGE	17 537785 4852848 W	2016/06 7215						7276127 (C33098) A206774 P	
ARTHUR VILLAGE	17 537484 4853003 W	1950/06 2414	10 10	FR 0285	30/130/70/8:0	MN		6700002 ()	FILL 0005 BRWN CLAY 0035 BRWN FSND 0050 BLUE CLAY 0060 BLUE CLAY MSND 0155 GRVL SILT 0159 BRWN LMSN 0183 WHIT LMSN 0187 BLUE ROCK 0194 GREY ROCK 0203 BRWN ROCK 0240 BLUE ROCK 0259 WHIT ROCK 0267 BLUE ROCK 0269 GREY ROCK 0273 BRWN ROCK 0288 BLUE ROCK 0305
ARTHUR VILLAGE	17 535377 4853167 W	2018/11 7221	6.11	UT 0207	44/44/15/1:	DO	0203 4	7323473 (Z293203) A236834	BRWN SAND GRVL STNS 0013 GREY CLAY STNS HARD 0020 BRWN GRVL STNS CGVL 0024 GREY CLAY HARD 0042 GREY TILL STNS HARD 0157 GREY CLAY STNS HARD 0199 GREY GRVL STNS CGVL 0209
ARTHUR VILLAGE	17 535814 4853123 W	1975/05 1737	4	FR 0123	40/45/12/2:30	DO		6705509 ()	BRWN CLAY SNDY SOFT 0013 BRWN CLAY STNS HARD 0025 CGVL 0033 BLUE CLAY HARD 0093 GREY HPAN STNS HARD 0121 FGVL 0123
ARTHUR VILLAGE	17 537785 4852864 W	2013/10 7241	1.5			MT	0005 10	7210892 (Z179159) A152547	BRWN FILL LOOS 0002 BRWN SAND SILT LOOS 0013 BRWN SAND SILT HARD 0015
ARTHUR VILLAGE	17 537633 4853064 W	2019/01 6607	2.00		///:	MT	0015 5	7331056 (Z282664) A246093	BRWN LOAM 0001 BRWN SILT GRVL SNDY 0008 BLCK ---- 0012 GREY SILT CLYY 0020
ARTHUR VILLAGE	17 537634 4853063 W	2019/01 6607	2.00		///:	MT	0030 5	7331057 (Z282665) A246141	BRWN LOAM 0001 BRWN SILT SNDY 0008 BLCK ---- 0012 GREY SILT CLYY 0020 GREY SAND SLTY GRVL 0025 GREY SAND 0032 GREY SAND GRVL SLTY 0035
ARTHUR VILLAGE	17 537597 4852908 W	2011/05 7383						7163571 (M07840) A099198 P	
ARTHUR VILLAGE	17 536772 4852531 W	2020/06 6946						7361065 (Z332267) A285936 P	
ARTHUR VILLAGE	17 537769 4852678 W	2009/05 7238	1.97			MO	0008 10	7123321 (Z098684) A083323	BRWN CLAY SILT 0018
ARTHUR VILLAGE	17 537754 4852658 W	2009/05 7238	1.97			MO	0011 5	7123322 (Z098685) A083342	BRWN CLAY SILT 0016

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR VILLAGE	17 537767 4852649 W	2009/05 7238	1.97			MO	0007 5	7123323 (Z098686) A083354	BRWN CLAY SILT 0012
ARTHUR VILLAGE	17 537783 4852629 W	2009/05 7238	1.97			MO	0009 5	7123324 (Z098687) A083355	BRWN CLAY SILT 0014
ARTHUR VILLAGE	17 537014 4853023 W	1977/10 2336	10 10	FR 0310 FR 0393	14/100/60/23:0	MN		6706565 ()	BRWN CLAY STNS 0015 BRWN CLAY STNS GRVL 0065 BRWN CLAY GRVL 0075 HPAN GRVL 0085 BRWN CLAY GRVL 0115 BRWN CLAY 0135 BRWN STNS GRVL 0172 BRWN STNS 0185 GREY STNS 0195 BRWN STNS 0285 GREY STNS 0335 BRWN STNS 0390 GREY STNS 0400
ARTHUR VILLAGE	17 536934 4854043 W	1973/05 3737	4	FR 0197	50/100/5/1:0	DO		6704639 ()	BLCK LOAM 0001 BRWN CLAY STNS 0037 GREY HPAN BLDR 0156 BRWN HPAN GRVL 0160 BLUE LMSN 0168 GREY LMSN 0200
ARTHUR VILLAGE	17 535803 4853646 W	2020/06 7609						7363870 (Z336591) A283574 P	
ARTHUR VILLAGE	17 538826 4853093 W	2016/11 7241	2			MT	0004 10	7276935 (Z245646) A211454	BRWN GRVL SAND 0001 BRWN SILT CLAY 0011 BRWN SAND SILT 0012 GREY CLAY SILT 0014
ARTHUR VILLAGE	17 537956 4852944 W	2019/01 6607	2.00		///:	MT	0020 5	7331060 (Z282668) A246146	BRWN SAND GRVL WBRG 0005 BRWN SAND GRVL CLYY 0015 BRWN SAND GRVL SLTY 0025
ARTHUR VILLAGE	17 537670 4853074 W	2010/05 7221				MO		7149905 (Z104704) A	
ARTHUR VILLAGE	17 536302 4853431 W	2010/10 7190	4 2	UT 0007		MO	0007 10	7155317 (Z103994) A076118	BLCK LOAM 0001 BRWN CLAY SILT 0010 GREY CLAY SILT 0017
ARTHUR VILLAGE	17 537985 4852936 W	2010/05 7221						7158779 (Z125322) A	
ARTHUR VILLAGE	17 538256 4853242 W	2019/01 6607	2.00		///:	MT	0017 5	7331059 (Z282667) A246142	BRWN LOAM 0003 BRWN SAND CLAY SLTY 0006 BRWN SILT TILL CLYY 0015 GREY SAND TILL GRVL 0022
ARTHUR VILLAGE	17 537210 4853276 W	2010/05 7221	1.25 0.98 1.25			MO		7149904 (Z104703) A	
ARTHUR VILLAGE ---	17 536657 4854084 W	2017/09 7366	1			MO	0010 5	7296819 (Z273336) A227263	BLCK LOAM LOOS 0001 BRWN SILT SAND 0008 GREY SILT CLAY 0015
ARTHUR VILLAGE ---	17 536637 4854272 W	2017/09 7366	1			MO	0010 5	7296818 (Z273337) A227265	BLCK LOAM LOOS 0001 BRWN SILT SAND 0005 GREY SILT CLAY 0015
ARTHUR VILLAGE ---	17 536696 4854238 W	2017/09 7366	1			MO	0007 10	7296817 (Z273335) A227264	BLCK LOAM LOOS 0001 BRWN SILT SAND 0007 GREY SILT CLAY DNSE 0017

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
ARTHUR VILLAGE con 01 029	17 536954 4853362 W	2005/12 7221	9.84					6715600 (Z42942) A	
ARTHUR VILLAGE con 01 029	17 537307 4853285 W	2005/12 7221	5.90					6715601 (Z42941) A	
PEEL TOWNSHIP	17 537334 4852835 W	2013/10 7241	1.5			MT	0005 10	7210896 (Z179157) A152549	BRWN FILL LOOS 0002 BRWN SILT SAND LOOS 0013 BRWN TILL DNSE 0015
PEEL TOWNSHIP CON 18 006	17 534488 4852481 W	1962/06 1804	4	FR 0168	///:	ST DO		6702123 ()	LOAM 0005 YLLW MSND 0020 BLUE CLAY 0100 HPAN BLDR 0135 MSND GRVL 0160 GRVL 0168
PEEL TOWNSHIP CON 18 006	17 534647 4852503 W	1992/08 3518	6	FR 0214	23/50/20/1:0	DO		6711121 (105017)	BRWN CLAY STNS HARD 0080 GREY STNS BLDR CLAY 0105 GREY SILT CLAY STNS 0195 BRWN SILT SAND STNS 0210 BRWN GRVL LOOS 0214
PEEL TOWNSHIP CON 19 005	17 534528 4853127 W	1957/06 1705	4 4	FR 0215 FR 0234	18/140/4/8:0	ST DO		6702128 ()	MSND 0038 BLUE CLAY 0064 MSND 0072 BLUE CLAY 0108 MSND 0118 HPAN STNS 0172 MSND GRVL SILT 0182 BLUE CLAY SHLE 0210 BRWN LMSN 0221 WHIT LMSN 0234
PEEL TOWNSHIP CON 19 006	17 535058 4853059 W	2017/12 7221	6.30 6.13	UT	30/147/5/1:	DO		7302852 (Z272633) A222615	BRWN SILT CLAY 0032 GREY CLAY HARD 0053 GREY CLAY STNS 0103 GREY SILT CLAY 0116 GREY CLAY STNS 0163 BRWN CLAY HARD 0174 BRWN CLAY GRVL 0177 BRWN LMSN 0260
PEEL TOWNSHIP CON 19 006	17 534903 4852785 L	1999/08 6634	6	FR 0255	24/160/15/2:0	DO		6713085 (205310)	LOAM 0002 CLAY STNS 0188 LMSN 0255
PEEL TOWNSHIP CON 19 007	17 535167 4852516 W	2016/12 7221	6.30 6.13	UT 0220	41/62/10/1:0	DO		7278146 (Z249166) A202566	BRWN CLAY 0011 GREY CLAY STNS 0111 BRWN CLAY STNS 0146 GREY CLAY STNS STNS 0183 BRWN SAND SILT 0188 GREY CLAY GRVL 0213 BRWN LMSN 0216 GREY LMSN 0220
PEEL TOWNSHIP CON 19 007	17 535480 4852289 W	2016/12 6634	6	FR 0130	20/42/7/50:	DO ST		7278955 (Z243693) A213688	LOAM 0004 CLAY STNS 0087 GREY CLAY HARD 0120 GRVL FGRD 0122 GRVL CGRD 0130
PEEL TOWNSHIP CON 19 007	17 535160 4852524 W	2017/06 7221	35.8			DO		7288591 (Z256313) A	
PEEL TOWNSHIP CON 19 007	17 535214 4852523 W	1971/11 1906	5	FR 0180	20/140/3/1:0	ST DO		6704100 ()	PRDG 0015 BRWN CLAY BLDR 0025 BRWN STNS CLAY 0030 BRWN GRVL CLAY 0095 BRWN CLAY STNS 0110 BRWN GRVL CLAY 0150 BLUE CLAY 0170 RED SAND GRVL 0180
PEEL TOWNSHIP CON 19 008	17 536425 4852849 W	1988/08 1804	5	FR 0088	17/37/20/2:20	DO ST	0095 3	6709325 (22870)	BRWN FILL 0003 BRWN CLAY 0042 GREY HPAN STNS 0081 BRWN GRVL 0098
PEEL TOWNSHIP CON 19 008	17 536348 4852936 W	1990/05 1804	5	FR 0074	28/58/25/2:10	DO	0080 4	6710279 (75321)	LOAM 0003 BRWN CLAY 0035 BRWN HPAN STNS 0074 BRWN GRVL 0084
PEEL TOWNSHIP CON 19 008	17 536287 4852879 W	1958/04 3111	4 4	FR 0403	30/60/12/8:0	ST DO		6702129 ()	BLUE CLAY 0051 GRVL CLAY 0168 BRWN SHLE 0220 LMSN 0403
PEEL TOWNSHIP CON 19 008	17 536164 4852973 W	1970/10 1657	6	UK 0135	120/137/2/2:0	ST DO		6703813 ()	BRWN CLAY 0020 BLUE CLAY 0073 BLUE CLAY BLDR 0135 GRVL 0142
PEEL TOWNSHIP CON 19 009	17 537265 4852774 W	1991/02 3406	6	UK 0091 UK 0182 UK 0206	38/90/10/72:0	DO		6710893 (61709)	BRWN GRVL CLAY SAND 0060 GREY GRVL CLAY BLDR 0095 GREY CLAY GRVL SAND 0182 GRVL SAND CGRD 0206

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PEEL TOWNSHIP CON 19 009	17 537214 4852683 W	1971/05 3316	4 4	FR 0278	46/65/5/1:0	DO		6703976 ()	CLAY STNS 0234 GREY LMSN 0280
PEEL TOWNSHIP CON 19 009	17 536894 4852764 W	1989/05 1804	5	FR 0093	25/50/25/2:20	DO	0094 3	6709739 (14069)	BRWN FILL 0003 BRWN CLAY 0028 GREY HPAN STNS 0093 BRWN GRVL 0097
PEEL TOWNSHIP CON A 021	17 538091 4852378 W	2002/08 6865	6			NU		6714319 (242362)	BRWN CLAY SAND 0030 BRWN GRVL SAND CLAY 0072 BRWN GRVL SAND CLAY 0075 BRWN GRVL SAND SILT 0120 BRWN CLAY GRVL SAND 0152 GREY TILL 0187 BRWN SAND TILL LYRD 0200 GRVL SAND CLAY 0211 GRVL STNS CLAY 0229 GRVL SAND STNS 0268 BRWN LMSN 0271
PEEL TOWNSHIP CON A 022	17 538057 4852423 W	2009/07 7221						7129534 (Z102432) A	
PEEL TOWNSHIP CON A 023	17 537734 4852623 W	1969/06 1804	4	FR 0248	48/55/15/3:0			6703367 ()	LOAM 0003 YLLW CLAY MSND 0050 HPAN BLDR 0085 CLAY MSND 0160 CLAY STNS 0210 BLDR 0215 GREY MSND 0225 BRWN LMSN 0240 ROCK 0257
PEEL TOWNSHIP CON A 023	17 537253 4852643 W	2005/03 6865	6.26	0208	52/61/8/1:0	DO		6715303 (Z05815) A005723	BRWN CLAY 0013 GREY CLAY STNS ROCK 0077 GREY GRVL CLAY 0086 GREY CLAY SAND 0117 BRWN CLAY GRVL STNS 0200 BRWN GRVL SAND STNS 0208
PEEL TOWNSHIP CON B 022	17 537883 4852412 W	2012/07 7015			78///:			7187029 (Z141378) A130727	
PEEL TOWNSHIP CON B 022	17 537920 4852514 W	1952/08 1723	4 4	FR 0491	78/200/5/:	ST DO		6701957 ()	CLAY 0030 GRVL 0090 LOAM MSND STNS 0269 GREY LMSN 0333 WHIT LMSN 0495
PEEL TOWNSHIP CON B 023	17 537647 4852806 W	2012/08 7221				DO		7187196 (Z143759) A	
PEEL TOWNSHIP CON B 023	17 537141 4852475 W	1975/01 1804	4 4	FR 0270	50/105/8/3:30	DO		6705420 ()	BLCK LOAM 0001 RED CLAY 0140 BLUE CLAY BLDR GRVL 0190 BRWN SAND GRVL CLAY 0236 BRWN ROCK 0270 GREY ROCK 0284
PEEL TOWNSHIP CON B 023	17 537814 4852673 W	1978/08 2332	4 4	FR 0320	59/60/6/4:0	DO		6706945 ()	BRWN OBDN SAND STNS 0018 GREY CLAY 0105 GREY CLAY STNS GRVL 0150 GREY CLAY STNS 0225 BLUE UNKN 0231 HPAN 0249 WHIT STNS LYRD 0315 GREY STNS LMSN 0360
PEEL TOWNSHIP CON B 023	17 537693 4852774 W	1997/10 2576	6	FR 0190	45//30/1:30	DO	0192 4	6712367 (177667)	LOAM 0001 BRWN CLAY 0008 BRWN SILT GRVL 0141 BRWN CLAY GRVL 0176 BRWN SAND GRVL CGRD 0196
PEEL TOWNSHIP CON B 023	17 537463 4852816 W	1950/08 4314	4	FR 0101	34/55/6/5:0	DO		6701958 ()	CLAY STNS 0014 MSND 0020 CLAY HPAN STNS 0050 MSND CLAY HPAN 0090 STNS 0094 HPAN 0098 GRVL 0101
PEEL TOWNSHIP CON B 023	17 537704 4852817 W	1956/04 1723	4 4	FR 0200 FR 0274	28/80/2/:	DO		6701959 ()	CLAY STNS 0220 SHLE 0225 GREY LMSN 0283
PEEL TOWNSHIP CON B 023	17 537589 4852504 W	1956/05 1723	4 4	FR 0242	54/80/6/:	DO		6701960 ()	CLAY STNS 0094 MSND 0150 CLAY STNS 0238 SHLE 0242
PEEL TOWNSHIP CON B 023	17 537824 4852647 W	1989/05 1804	5	FR 0206	52/102/16/2:10	DO		6709740 (14070)	BLCK LOAM 0002 BRWN SAND CLAY 0205 BRWN SAND 0216

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
WEST GARAFRAXA TOWNS	17 537749 4852823 W	2013/10 7241	1.5			MT	0005 10	7210895 (Z179158) A150688	BRWN FILL LOOS 0002 BRWN SAND SILT DNSE 0009 BRWN TILL DNSE 0015
WEST GARAFRAXA TOWNS	17 537767 4852842 W	2011/03 7241	1.58			MT	0007 10	7161022 (Z124018) A096285	BLCK SOFT 0000 BRWN SAND SOFT 0013 BRWN SILT FSND SOFT 0017
WEST GARAFRAXA TOWNS	17 538813 4853031 W	2017/01 7241	2			TH MO	0005 10	7281837 (Z211900) A181627	BRWN GRVL FSND SOFT 0008 GREY CLAY SILT SOFT 0015
WEST GARAFRAXA TOWNS	17 537744 4852832 W	2013/10 7241	1.5			MT	0005 10	7210893 (Z179155) A152550	BRWN FILL LOOS 0003 BRWN SAND SILT LOOS 0012 BRWN TILL DNSE 0015
WEST GARAFRAXA TOWNS	17 537760 4852854 W	2013/10 7241	1.5			MT	0005 10	7210891 (Z179156) A152548	BRWN FILL LOOS 0004 GREY SAND SILT GRVL 0012 GREY SAND GRVL SILT 0015
WEST GARAFRAXA TOWNS	17 537769 4852841 W	2011/03 7241	1.58			MT	0010 10	7161023 (Z124019) A096284	BLCK SOFT 0000 BRWN SAND SOFT 0016 BRWN SILT FSND SOFT 0020
WEST GARAFRAXA TOWNS	17 537758 4852832 W	2011/03 7241	1.58			MT	0006 10	7161021 (Z124017) A096345	BLCK SOFT 0000 BRWN SAND SOFT 0013 BRWN FSND SOFT 0016
WEST GARAFRAXA TOWNS	17 537950 4852863 W	2011/10 7366						7171480 (M10955) A121250 P	
WEST GARAFRAXA TOWNS CON 01 025	17 538996 4852792 W	2006/10 2576	2.35	0656 0709	67//2/1:0	DO		6716013 (Z55903) A048772	LOAM 0007 GREY CLAY GRVL 0079 BRWN CLAY SLTY GRVL 0381 BRWN GRVL SILT STNS 0528 GREY GRVL SLTY STNS 0597 BRWN GRVL STNS 0709
WEST GARAFRAXA TOWNS CON 01 033	17 538240 4852496 W	2007/01 2644	4		28///:	NU		7044991 (Z41980) A	0340
WEST GARAFRAXA TOWNS CON 01 033	17 538120 4852497 W	2007/02 2644	6.25	FR 0074	45/60/4/2:0	DO		7044990 (Z41979) A037667	BRWN SAND CLAY 0036 BRWN SAND GRVL 0054 BRWN GRVL SLTY 0078 GREY GRVL SAND CLAY 0080
WEST GARAFRAXA TOWNS CON 01 036	17 538834 4853143 W	1975/10 4856	4 4	FR 0203	49/75/30/1:30	CO		6705781 ()	BRWN CLAY BLDR 0014 GREY HPAN BLDR GRVL 0170 BRWN GRVL SAND CLAY 0187 BRWN FGVL 0205
WEST GARAFRAXA TOWNS CON 01 036	17 538593 4852931 W	2016/04 6475						7263957 (Z210104) A183626	
WEST GARAFRAXA TOWNS CON 01 036	17 538311 4852326 W	2018/05 7643	6.25 6.25 6.25	FR 0144 FR 0153	55/66/30/1:0	DO IN	0144 4	7315750 (Z286071) A247859	BRWN CLAY STNS 0018 BRWN SAND SILT 0064 BRWN SAND FSND 0067 BRWN SILT SAND 0097 GREY CLAY STNS 0144 GREY SAND GRVL 0148 GREY CLAY 0153 GREY SAND GRVL 0156 GREY CLAY STNS 0220
WEST GARAFRAXA TOWNS CON 01 036	17 538297 4852319 W	2009/06 2644	6	FR 0055	34/60/30/2:20		0061 8	7129688 (Z099012) A086320	BRWN LOAM 0001 BRWN CLAY STNS 0019 BRWN SAND SLTY 0055 BRWN SAND GRVL SLTY 0070

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
WEST GARAFRAXA TOWNS CON 01 036	17 538322 4852339 W	2018/05 7643	6.25 6.25	FR 0131	49/118/20/1:0	DO IN		7315749 (Z286070) A247858	BRWN SAND CLAY STNS 0020 BRWN SAND SILT 0062 BRWN SAND SILT 0077 BRWN SAND 0089 GREY CLAY SAND 0102 GREY CLAY STNS 0128 GREY SAND GRVL 0137 GREY GRVL SAND 0140 GREY CLAY STNS 0151
WEST GARAFRAXA TOWNS CON 01 036	17 538883 4852992 W	2006/09 2576	6	0210	69//15/1:	DO		6715955 (Z48861) A024950	LOAM 0001 GREY CLAY GRVL 0013 BRWN GRVL CLAY 0121 BRWN SAND GRVL CLAY 0139 BRWN CLAY GRVL 0203 BRWN GRVL CSND 0216
WEST GARAFRAXA TOWNS CON 01 036	17 538263 4852403 W	1959/04 1705	4 4	FR 0308	70/180/4/18:0	ST DO		6702880 ()	BLUE CLAY 0060 MSND STNS 0148 HPAN MSND 0245 MSND 0247 BRWN LMSN 0308
WEST GARAFRAXA TOWNS CON 01 036	17 538322 4852322 W	1963/11 5416	4	FR 0112	40/40/8/3:0	ST DO		6702881 ()	BRWN CLAY 0045 MSND GRVL 0112
WEST GARAFRAXA TOWNS CON 01 036	17 538014 4852623 W	1977/12 1804	5	FR 0090	58/105/15/3:30	DO		6706605 ()	BRWN FILL 0008 BRWN CLAY 0090 BRWN SAND HPAN STNS 0160 BRWN SAND 0195 BRWN GRVL 0208
WEST GARAFRAXA TOWNS CON 01 037	17 537770 4852812 W	2012/06 7466						7183961 (Z119352) A	
WEST GARAFRAXA TOWNS CON 01 037	17 537934 4852723 W	1968/07 1705	4	FR 0217	68/79/7/5:0	DO		6703273 ()	CLAY 0018 MSND GRVL CLAY 0100 MSND 0138 CLAY 0143 MSND HPAN 0172 HPAN 0178 HPAN MSND GRVL 0207 CSND 0217
WEST GARAFRAXA TOWNS CON 01 037	17 538164 4852953 W	1969/12 2406	6	FR 0210	22/28/10/3:0	DO		6703483 ()	BRWN CLAY BLDR 0035 BRWN CLAY STNS 0070 BRWN CLAY GRVL 0120 BRWN MSND SILT CLAY 0186 YLLW CLAY 0196 LMSN MSND 0215
WEST GARAFRAXA TOWNS CON 01 037	17 537845 4852850 W	1952/10 2411	4 4	FR 0216	40/44/10/5:0	CO		6702882 ()	CLAY BLDR 0060 CLAY 0115 GRVL 0200 LMSN 0216
WEST GARAFRAXA TOWNS CON 01 037	17 537873 4852775 W	1956/10 1723	4 4	FR 0244	70/75/15/:	DO		6702883 ()	PRDG 0012 CLAY 0228 LMSN 0244
WEST GARAFRAXA TOWNS CON 01 037	17 537977 4852612 W	1986/11 1804	5	FR 0208	58/80/18/2:20	DO		6708594 (05999)	BRWN FILL 0005 GREY CLAY 0066 BRWN HPAN STNS 0202 BRWN GRVL SAND 0218
WEST GARAFRAXA TOWNS CON 01 037	17 537849 4852855 W	1997/04 2576	6 6	FR 0156 FR 0198 FR 0217	23//150/2:0	DO		6712213 (177322)	FILL 0002 GREY CLAY STKY 0010 GREY CLAY SLTY GRVL 0049 BRWN GRVL SILT 0094 BRWN SAND GRVL WBRG 0103 GREY CLAY GRVL 0120 BRWN CLAY STNS WBRG 0156 BRWN SAND GRVL WBRG 0175 YLLW SHLE LMSN FCRD 0220
WEST GARAFRAXA TOWNS CON 01 037	17 538514 4853073 W	1977/07 4856	4 4	FR 0186	33/80/12/1:30	DO		6706459 ()	BLCK LOAM 0001 BRWN CLAY GRVL 0010 GREY CLAY STNS 0029 BRWN HPAN GRVL 0070 GREY SILT STNS 0095 WHIT GRVL SAND 0122 BRWN HPAN GRVL 0170 RED CLAY 0174 BRWN GRVL 0186
WEST GARAFRAXA TOWNS CON 01 037	17 538211 4852929 W	1987/07 3740	5 5	FR 0210	15/20/30/1:	DO		6708870 (06077)	BRWN CLAY 0040 GREY HPAN BLDR 0188 BRWN SHLE SOFT 0198 GREY LMSN 0210
WEST GARAFRAXA TOWNS CON 01 037	17 537849 4852855 W	1997/04 2576	5			NU		6712214 (177323) A	PRDG 0112
WEST GARAFRAXA TOWNS CON 02 036	17 539237 4852883 W	1998/12 6865	6	FR 0194	80/81/10/1:0	DO		6712920 (199093)	LOAM 0001 BRWN CLAY STNS 0012 GREY CLAY STNS 0056 GREY HPAN 0061 GREY CLAY GRVL 0099 GREY GRVL SLTY CLAY 0137 GREY CLAY GRVL 0190 BRWN GRVL SAND 0194

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
WEST LUTHER TOWNSHIP	17 537748 4852912 W	2014/06 7383						7228721 (C18533) A151231 P	
WEST LUTHER TOWNSHIP 01 003	17 538995 4853460 W	2007/11 7146			///:			7052875 (Z61555) _NO_TAG A	
WEST LUTHER TOWNSHIP 01 003	17 539034 4853496 W	2007/11 7146			///:			7052876 (Z61549) _NO_TAG A	
WEST LUTHER TOWNSHIP 02 003	17 538743 4855483 W	2006/10 2644	2.5	FR 0028	28///:	NU		7041846 (Z41952) A	0062
WEST LUTHER TOWNSHIP CON 01 001	17 537760 4853170 W	2016/04 7557						7263086 (Z218731) A	
WEST LUTHER TOWNSHIP CON 01 002	17 538443 4853154 W	1985/05 3740	5	FR 0245 FR 0255	30/90/6/1:45	DO ST		6708240 ()	BLCK LOAM 0001 BRWN CLAY 0008 GREY CLAY STNS 0037 GREY HPAN BLDR 0165 GREY HPAN GRVL 0186 BRWN SAND CLAY 0209 BRWN LMSN 0215 GREY LMSN 0255
WEST LUTHER TOWNSHIP CON 01 002	17 538274 4853093 W	1972/09 3737	4	FR 0220 FR 0223	51/55/10/2:0	DO		6704343 ()	BRWN HPAN GRVL BLDR 0150 BRWN CLAY GRVL BLDR 0208 BRWN GRVL 0220 BLCK GRVL 0223
WEST LUTHER TOWNSHIP CON 01 002	17 538675 4853673 W	2007/08 6865	6.30	FR 0243 FR 0269	52/96/7/1:0	DO		7050300 (Z74787) A034736	BRWN CLAY GRVL 0012 GREY CLAY GRVL STNS 0093 BRWN CLAY SAND 0131 GREY CLAY GRVL 0162 GREY GRVL CLAY 0228 GREY LMSN 0258 WHIT LMSN 0270
WEST LUTHER TOWNSHIP CON 01 002	17 538863 4853233 W	1988/10 4854	30	UK 0017		DO		6709487 (39106)	BRWN CLAY 0008 BRWN SAND CLAY SNDY 0010 BRWN CLAY 0017 BRWN SAND CLAY SNDY 0020 BLUE CLAY 0033 GREY CLAY BLDR 0044
WEST LUTHER TOWNSHIP CON 01 002	17 538514 4853173 W	1974/06 2519	5	FR 0180	38/60/10/2:0	DO		6705119 ()	BRWN CLAY 0010 GREY CLAY STNS 0165 GREY HPAN 0180 GRVL 0180
WEST LUTHER TOWNSHIP CON 01 003	17 538964 4853513 W	1965/03 3316	4 4	FR 0315	40/60/10/2:0	ST DO		6703000 ()	GREY CLAY STNS 0040 MSND 0060 GREY CLAY MSND 0180 GRVL STNS 0215 MSND 0235 GREY CLAY STNS 0242 BLUE ROCK 0265 WHIT LMSN 0324
WEST LUTHER TOWNSHIP CON 02 001	17 537384 4855214 W	1980/05 3740	4	FR 0405 FR 0425	20/80/5/1:0	DO		6707276 ()	BLCK LOAM 0001 BRWN CLAY STNS 0018 GREY CLAY STNS 0138 GREY LMSN 0185 BRWN LMSN 0325 WHIT LMSN 0425
WEST LUTHER TOWNSHIP CON 02 001	17 537814 4855650 W	1991/10 1804	6	FR 0300 FR 0320 FR 0390 FR 0420	35/120/16/4:30	DO		6710789 (109190)	BRWN CLAY STNS 0145 BRWN SAND CLAY 0150 GREY ROCK 0210 BRWN ROCK 0325 GREY ROCK 0432
WEST LUTHER TOWNSHIP CON 02 002	17 538321 4855202 W	2002/10 2644				NU		6714301 (250112) A	
WEST LUTHER TOWNSHIP CON 02 002	17 537914 4855673 W	1978/07 3740	4	FR 0340 FR 0375 FR 0390	26/95/5/1:0	DO		6706732 ()	BLCK LOAM 0001 BRWN CLAY STNS 0018 GREY CLAY STNS SAND 0141 GREY LMSN 0190 BRWN LMSN 0310 WHIT LMSN 0390
WEST LUTHER TOWNSHIP CON 02 002	17 538306 4855092 W	2002/05 2644	6 6	FR 0164 FR 0172	29/58/30/1:45	DO ST		6714124 (236183)	BRWN LOAM 0002 BRWN CLAY 0018 GREY CLAY STNS 0121 GREY HPAN 0157 BRWN LMSN 0164 GREY LMSN 0172

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
WEST LUTHER TOWNSHIP CON 02 003	17 538640 4855867 W	2013/11 2644	6 6	FR 0195 FR 0295 FR 0415	27/300/30/1:	ST		7213881 (Z171199) A156802	BRWN LOAM 0002 BRWN CLAY 0016 GREY CLAY STNS 0070 GREY MGVL 0076 GREY CLAY 0170 BRWN LMSN 0423
WEST LUTHER TOWNSHIP CON 02 003	17 538694 4855900 W	2000/06 2644	6 6	FR 0249	25//30/1:45	DO		6713426 (209888)	BRWN LOAM 0002 BRWN CLAY STNS 0018 GREY CLAY STNS 0047 GREY HPAN 0173 BRWN LMSN 0249
WEST LUTHER TOWNSHIP CON 02 004	17 539070 4855983 W	2018/12 6865						7326247 (Z298659) A	
WEST LUTHER TOWNSHIP CON 03 001	17 537131 4856779 W	1990/05 3740	5 5	FR 0185	17/70/6/1:	DO		6710307 (34365)	BRWN CLAY 0008 GREY CLAY 0042 GREY HPAN STNS 0144 GREY LMSN 0212
WEST LUTHER TOWNSHIP CON 03 003	17 538690 4856351 W	1986/08 3740	5 5	FR 0230 FR 0270	24/95/8/1:0	DO ST		6708542 (NA)	BRWN CLAY 0023 GREY CLAY STNS 0090 GREY HPAN GRVL 0163 BRWN LMSN 0270
WEST LUTHER TOWNSHIP CON 04 001	17 537074 4856972 W	1988/05 1804	5 5	FR 0160 FR 0180	20/100/10/1:20	DO		6709243 (22690)	BLCK LOAM 0002 GREY CLAY 0090 GREY CLAY GRVL 0140 GREY ROCK 0180

Notes:
UTM: UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
DATE CNTR: Date Work Completedand Well Contractor Licence Number
CASING DIA: .Casing diameter in inches
WATER: Unit of Depth in Fee. See Table 4 for Meaning of Code

PUMP TEST: Static Water Level in Feet / Water Level After Pumping in Feet / Pump Test Rate in GPM / Pump Test Duration in Hour : Minutes
WELL USE: See Table 3 for Meaning of Code
SCREEN: Screen Depth and Length in feet
WELL: WEL (AUDIT #) Well Tag . A: Abandonment; P: Partial Data Entry Only
FORMATION: See Table 1 and 2 for Meaning of Code

1. Core Material and Descriptive terms

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
BLDR	BOULDERS	FCRD	FRACTURED	IRFM	IRON FORMATION	PORS	POROUS	SOFT	SOFT
BSLT	BASALT	FGRD	FINE-GRAINED	LIMY	LIMY	PRDG	PREVIOUSLY DUG	SPST	SOAPSTONE
CGRD	COARSE-GRAINED	FGVL	FINE GRAVEL	LMSN	LIMESTONE	PRDR	PREV. DRILLED	STKY	STICKY
CGVL	COARSE GRAVEL	FILL	FILL	LOAM	TOPSOIL	QRTZ	QUARTZITE	STNS	STONES
CHRT	CHERT	FLDS	FELDSPAR	LOOS	LOOSE	QSND	QUICKSAND	STNY	STONEY
CLAY	CLAY	FLNT	FLINT	LTCL	LIGHT-COLOURED	QTZ	QUARTZ	THIK	THICK
CLN	CLEAN	FOSS	FOSILIFEROUS	LYRD	LAYERED	ROCK	ROCK	THIN	THIN
CLYY	CLAYEY	FSND	FINE SAND	MARL	MARL	SAND	SAND	TILL	TILL
CMTD	CEMENTED	GNIS	GNEISS	MGRD	MEDIUM-GRAINED	SHLE	SHALE	UNKN	UNKNOWN TYPE
CONG	CONGLOMERATE	GRNT	GRANITE	MGVL	MEDIUM GRAVEL	SHLY	SHALY	VERY	VERY
CRYS	CRYSTALLINE	GRSN	GREENSTONE	MRBL	MARBLE	SHRP	SHARP	WBRG	WATER-BEARING
CSND	COARSE SAND	GRVL	GRAVEL	MSND	MEDIUM SAND	SHST	SCHIST	WDFR	WOOD FRAGMENTS
DKCL	DARK-COLOURED	GRWK	GREYWACKE	MUCK	MUCK	SILT	SILT	WTHD	WEATHERED
DLMT	DOLOMITE	GVLY	GRAVELLY	OBDN	OVERBURDEN	SLTE	SLATE		
DNSE	DENSE	GYPS	GYPSUM	PCKD	PACKED	SLTY	SILTY		
DRTY	DIRTY	HARD	HARD	PEAT	PEAT	SNDS	SANDSTONE		
DRY	DRY	HPAN	HARDPAN	PGVL	PEA GRAVEL	SNDY	SANDYOAPSTONE		

2. Core Color

Code	Description
WHIT	WHITE
GREY	GREY
BLUE	BLUE
GREN	GREEN
YLLW	YELLOW
BRWN	BROWN
RED	RED
BLCK	BLACK
BLGY	BLUE-GREY

3. Well Use

Code	Description	Code	Description
DO	Domestic	OT	Other
ST	Livestock	TH	Test Hole
IR	Irrigation	DE	Dewatering
IN	Industrial	MO	Monitoring
CO	Commercial	MT	Monitoring TestHole
MN	Municipal		
PS	Public		
AC	Cooling And A/C		
NU	Not Used		

4. Water Detail

Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

Notice to Residents

Well Survey Summary

Well Location	Survey Result	MECP ID No.	Well Constructed	Well Depth (m)	Casing Diameter (inches)	Notes
8565 County Road 14	Monitoring Approved	6707276	1980	129.5	4	Sampled for Desktop Study
8566 County Road 14 - House Well	Monitoring Approved	6710468	1990	114.3	5	
8566 County Road 14 - Monitoring Well	Monitoring Approved	7228245	2014	37.2	6	Near manuare pit, for ECA
8580 County Road 14	Monitoring Approved	6700014	1963	64.6	4	Used to be in a pit, made sand when pump was upgraded
8590 County Road 14	Monitoring Approved	6708424	1986	45.7	5	Makes sand during dry conditions
8600 County Road 14	Not Accessible					Under deck
8616 County Road 14	No contact					Drilled well near sandbox
510 Eliza Street	Monitoring Approved	7353747	2019	72.1	6	
665 Eliza Street	Not Accessible					Under deck in pit
Eliza Street (Field behind 510 Eliza)	Monitoring Approved	7296818	2017	4.5	2	Monitoring Well north of Domville St.
8510 Highway 6	Monitoring Approved	6714062	2009	70.1	6	Previously Monitored for Arthur Well 7
8610 Highway 6	Monitoring Approved	6709327	1988	56.1	5	Overburden
8035 Line 2	Not Accessible	6710789		131.7	6	Inside warehouse
8048 Line 2	Monitoring Approved		1993	112.8	6	
8061 Line 2	Monitoring Approved	6714124	2002	52.4	6	
7795 Sideroad 10 East	Monitoring Approved	6714062	2002	70.1	6	
7825 Sideroad 10 East	Not Approved	7273742	2016	98.1	6	
7875 Sideroad 10 East	Not Approved	6713391	2000	102.1	5	Deepened from WWR 6708191
7979 Sideroad 10 East	Monitoring Approved	7228245	2016	37.2	6	Overburden
15 Wells Street	Monitoring Approved	6705494	1975	108.2	4	
Arthur 7B (Wells Street)	SCADA	6712921	1998	45.5	10	Arthur Supply Well
Arthur 8A (Jones Baseline)	SCADA	6714775	2004	45.9	12	Arthur Supply Well
Arthur 8B (Jones Baseline)	SCADA	6714776	2004	61.9	12	Arthur Supply Well
400 Domville Street - Monitoring Well	Monitoring Approved	7369549	2020	62.2	1	North side of field
211 Eliza Street - Monitoring Well	Monitoring Approved	7331057	2019	10.63	2	Monitoring Well
TW1/00 (Jones Baseline)	Monitored					Arthur PTTW Monitoring Well
7794 Wellington Road 109	Monitored					Arthur PTTW Monitoring Well
WN-MW1/00 (WR 109 and HW 6)	Monitored			51.5	6	Arthur PTTW Monitoring Well

R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.rjburnside.com

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

June 17, 2022

Via: Hand Delivery

Dear Resident:

Re: Notification of Pumping Test - Potential New Supply Well
Project No.: 300052887.0000

The Town of Wellington North has registered on the Environmental Activity and Sector Registry of Ontario (Registration No. R-011-9152754560) for the testing of a well in north Arthur. The well is located on Wells Street south of Wellington County Road 14 in north Arthur. The well is completed in the overburden above the bedrock. Most domestic wells in the area obtain water from the bedrock.

The testing activities are anticipated to start June 18, 2022 and last approximately 5 days. R.J. Burnside & Associates Limited are the engineers for the project and will be monitoring water levels during the pumping test.

If you experience any interference with your well, please contact the project representative below:

Jim Baxter, P. Eng.
Groundwater Resource Engineer
R.J. Burnside & Associates Limited
Tel: 519-831-1747
Email: jim.baxter@rjburnside.com

Yours truly,

R.J. Burnside & Associates Limited

Josh Donkersgoed, P.Eng
Project Engineer
226-962-2707

R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.rjburnside.com

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

May 20, 2022

Via: Hand Delivery

Dear Resident:

Re: Notification of Pumping Test - Potential New Arthur Municipal Well
Project No.: 300052287.0000

The Town of Wellington North has obtained approval from the Ontario Ministry of Environment, Conservation and Parks (EASR No. R-011-9152754560) for a pumping test of a well located on Wells Street south of Wellington County Road 14. The test process is designed to protect existing wells in the area and identifying the location and use of neighbouring private groundwater supply wells is part of the process.

R.J. Burnside & Associates Limited (Burnside) are the engineers for the project and will be monitoring water levels during the pumping test. With your permission, Burnside would like to collect information about your well which will assist in confirming the number and types of wells in the area.

If you would like to participate in the monitoring program or have any questions, please feel free to contact either of the contacts provided below.

Josh Donkersgoed, P.Eng.
Project Engineer
Tel: 226-962-2707
Email: josh.donkersgoed@rjburnside.com

Jim Baxter, P. Eng.
Groundwater Resource Engineer
Tel: 519-831-1747
Email: jim.baxter@rjburnside.com

Participation in the survey is voluntary and any information you provide will be kept confidential.

Yours truly,

R.J. Burnside & Associates Limited

Josh Donkersgoed, P.Eng
Project Engineer
JD:js

BURNSIDE

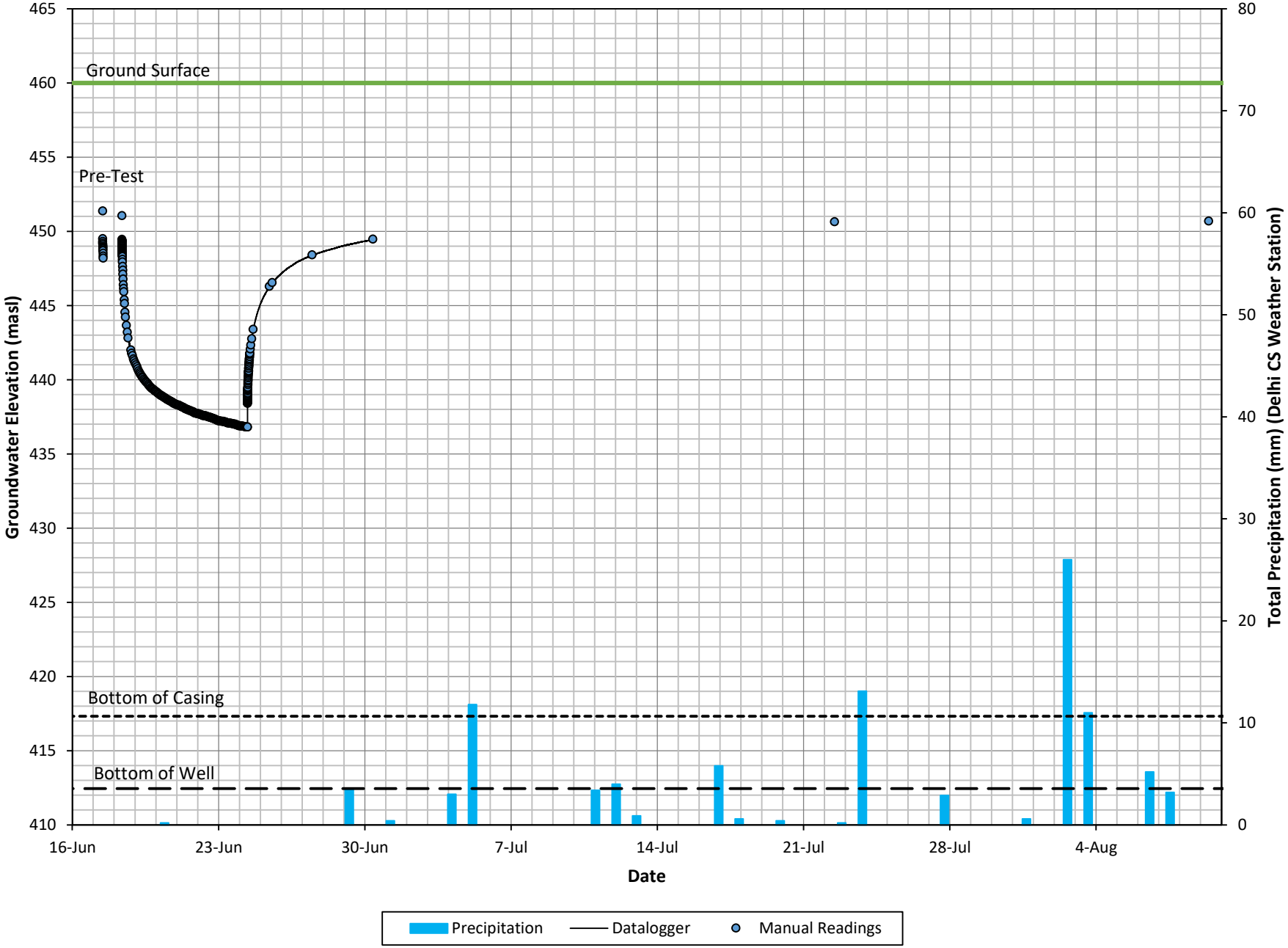
[THE DIFFERENCE IS OUR PEOPLE]

Appendix D

Hydrographs, Semi Log Plots and Distance Drawdown

Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test

TW1-21 (DO) Hydrograph - Pumping Well

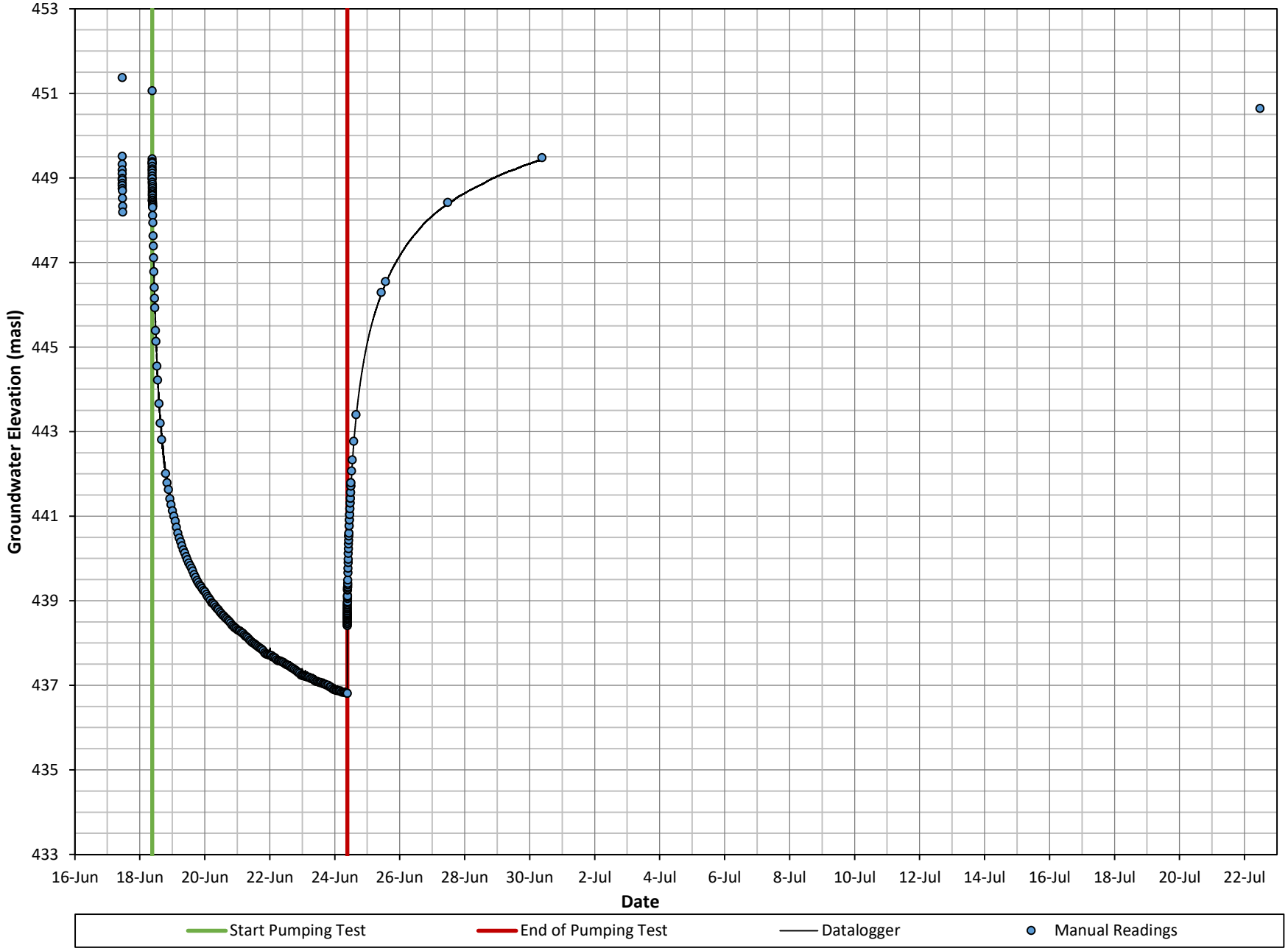


R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test

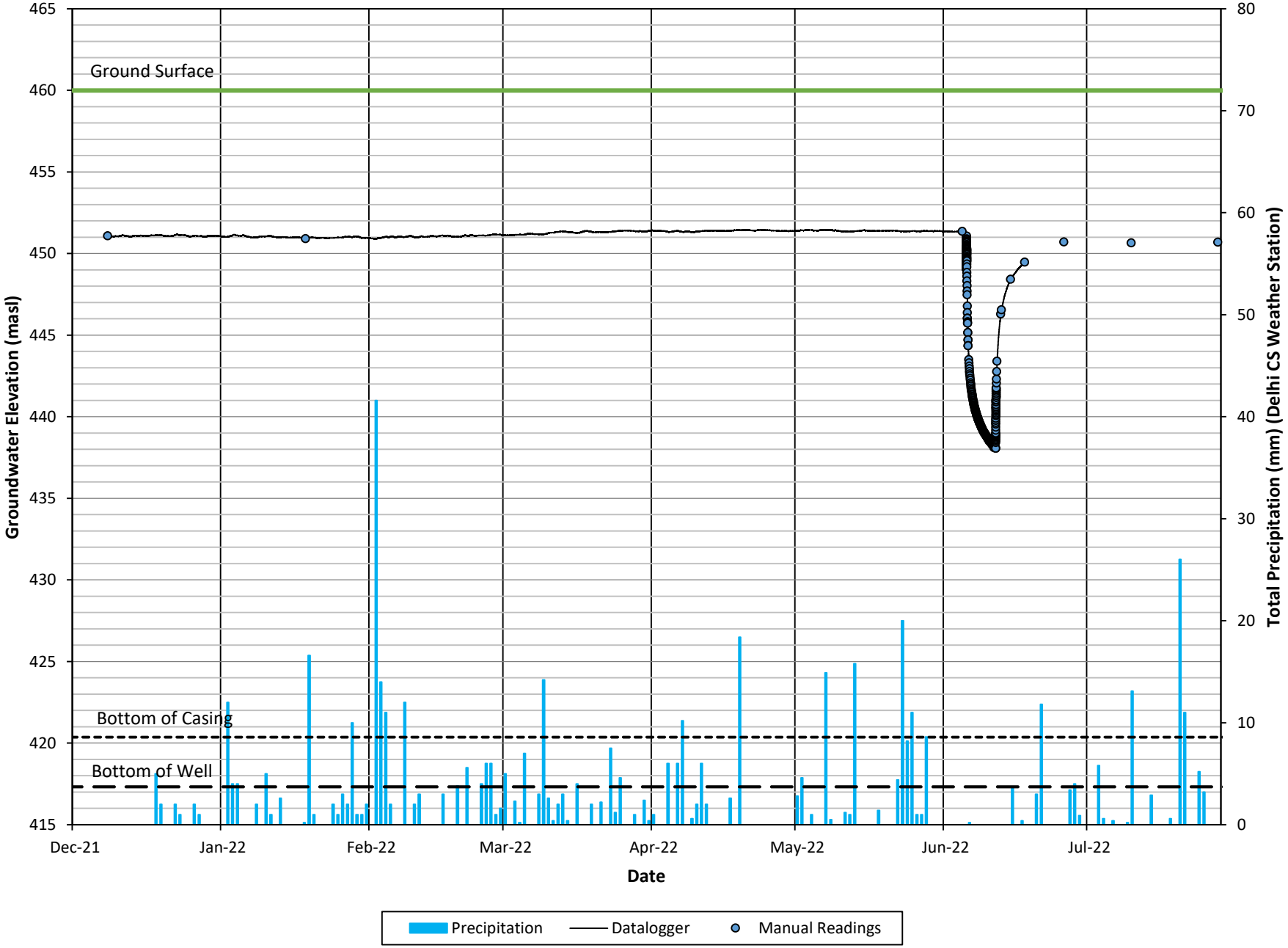
TW1-21 (DO) Detailed Hydrograph - Pumping Well



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

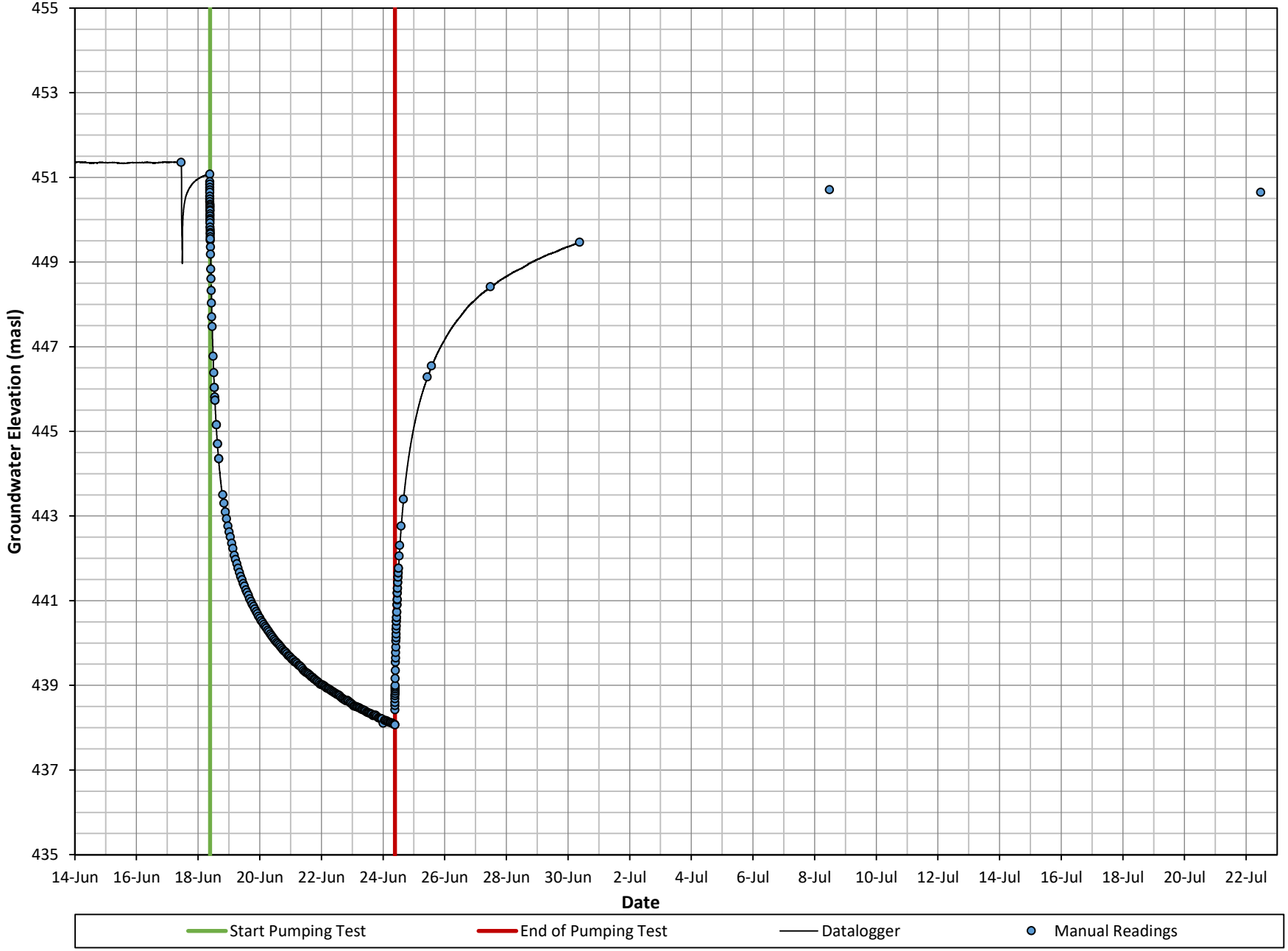
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW1-21 (DO) Hydrograph - Monitoring Well (r = 7 m)



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

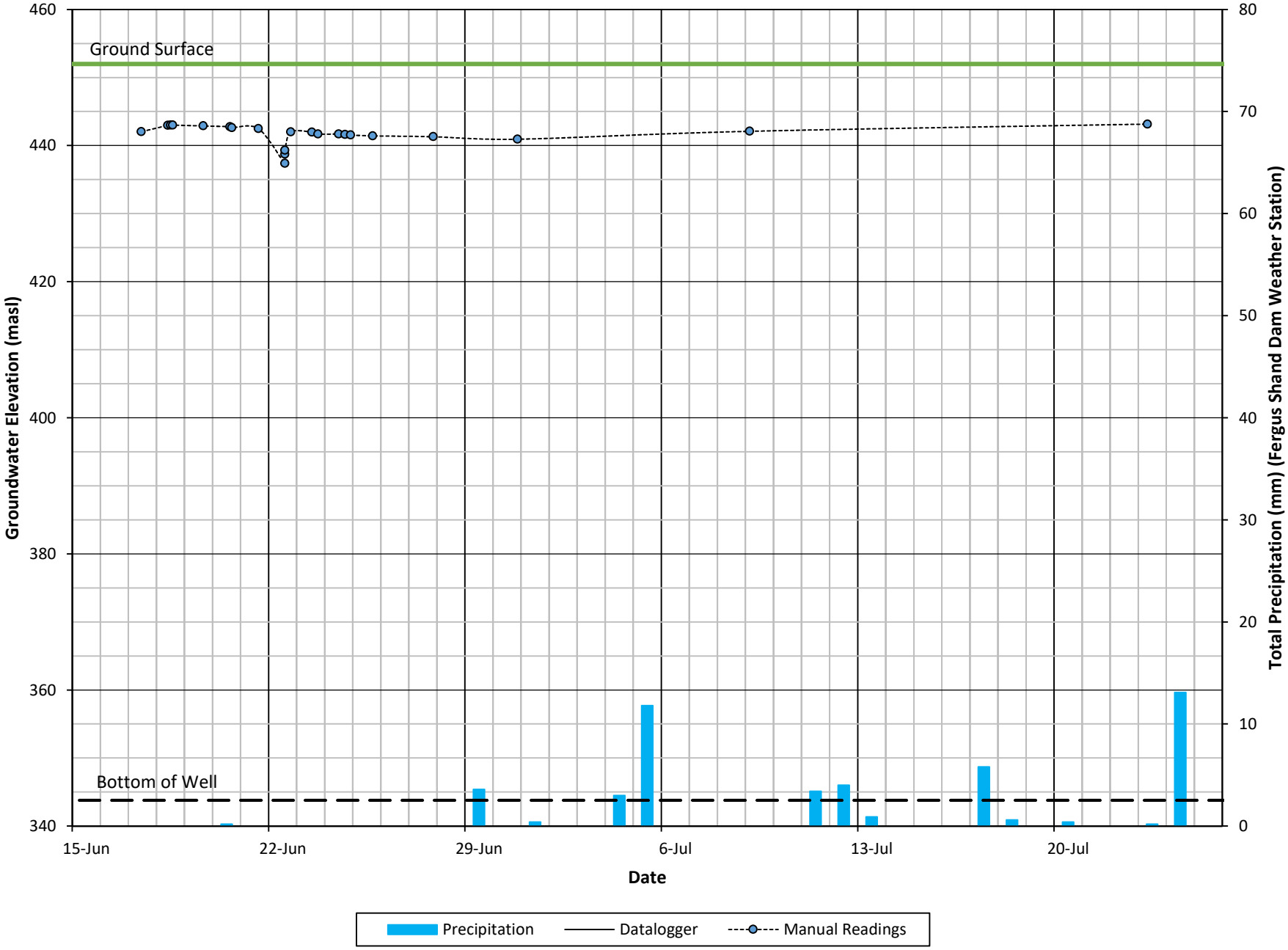
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW1-21 (DO) Detailed Hydrograph - Monitoring Well (r = 7 m)



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

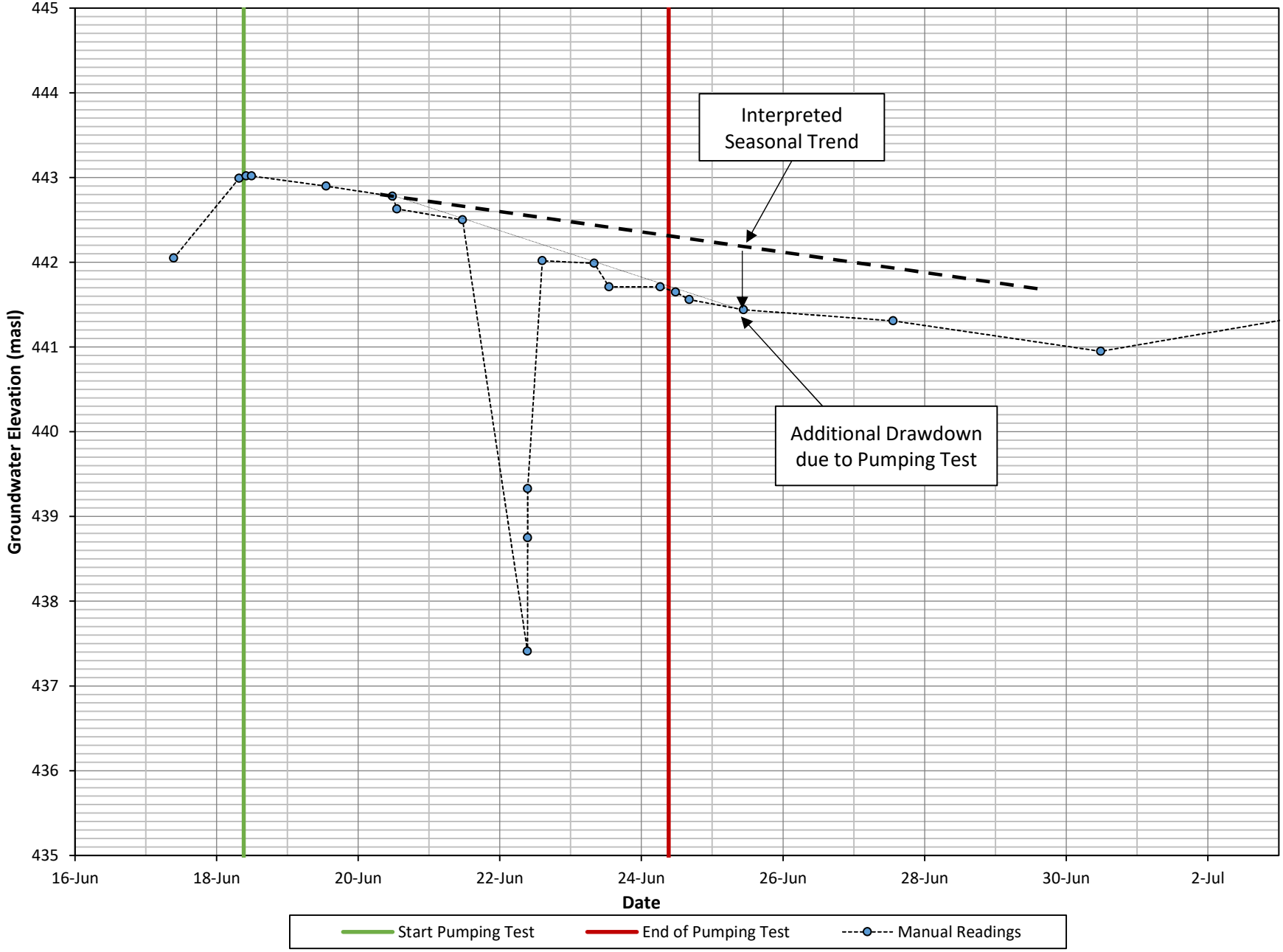
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
15 Wells Street (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

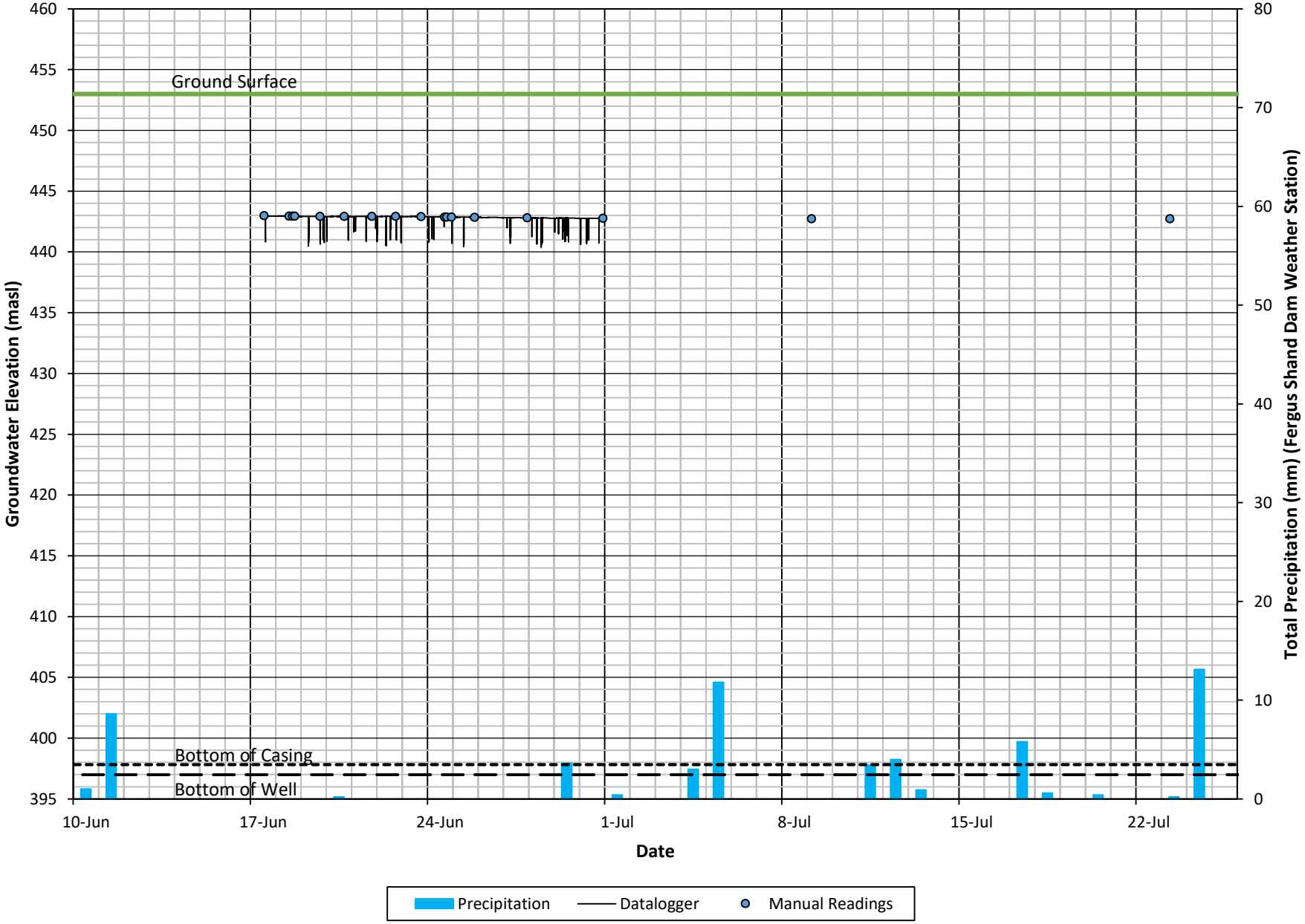
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
15 Wells Street (B) Detailed Hydrograph



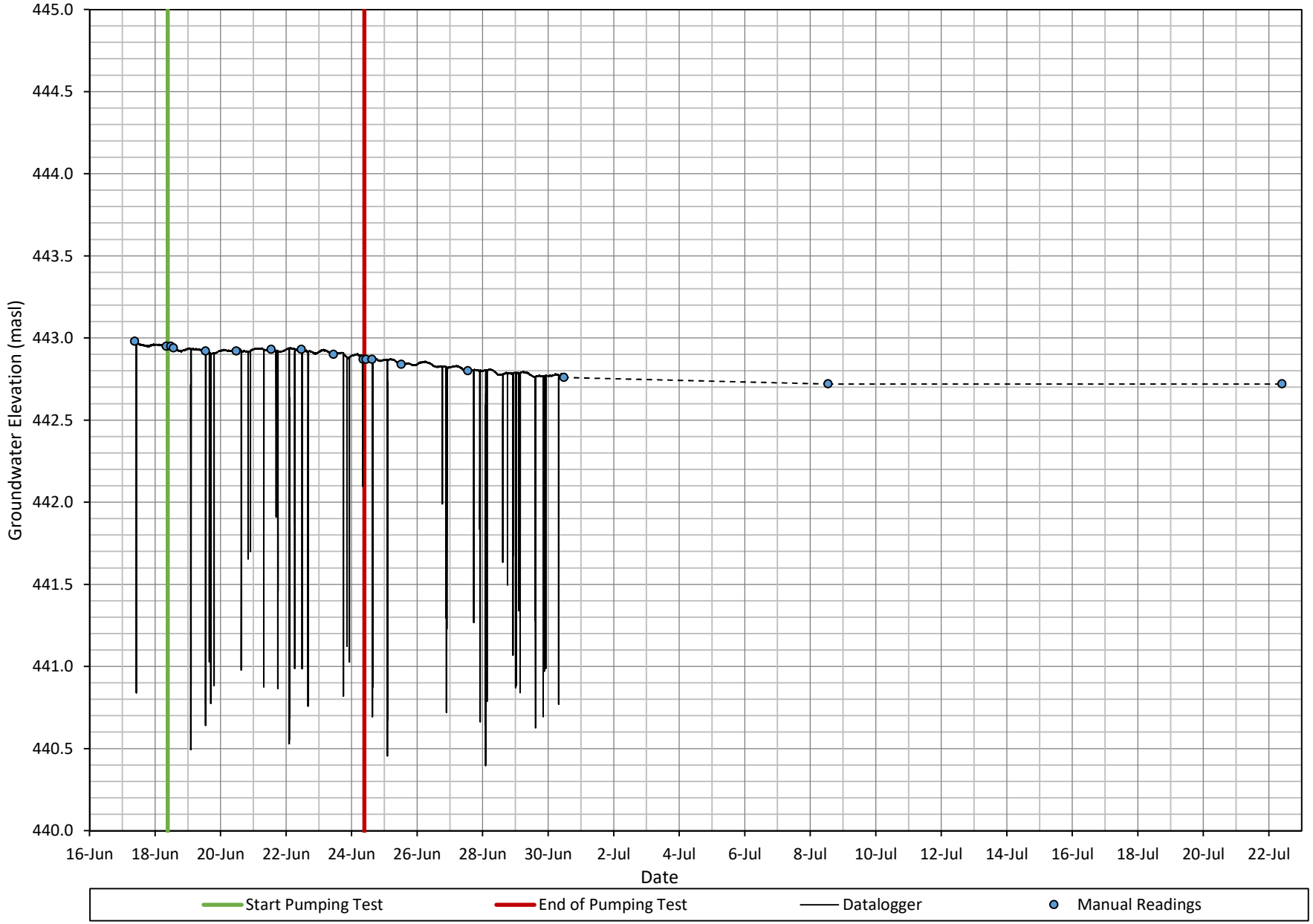
R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

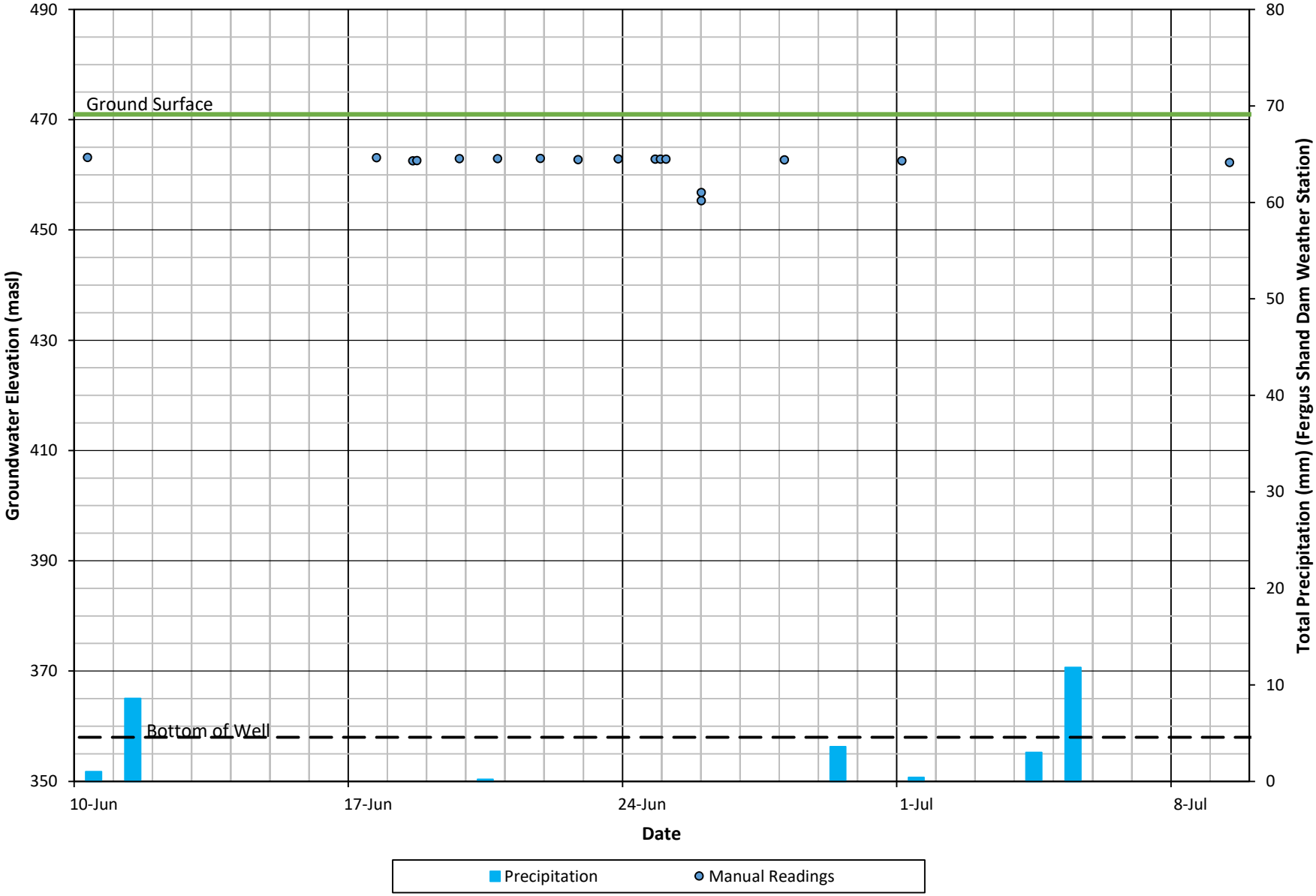
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8610 Highway 6 (DO) Hydrograph



Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8610 Highway 6 (DO) Detailed Hydrograph



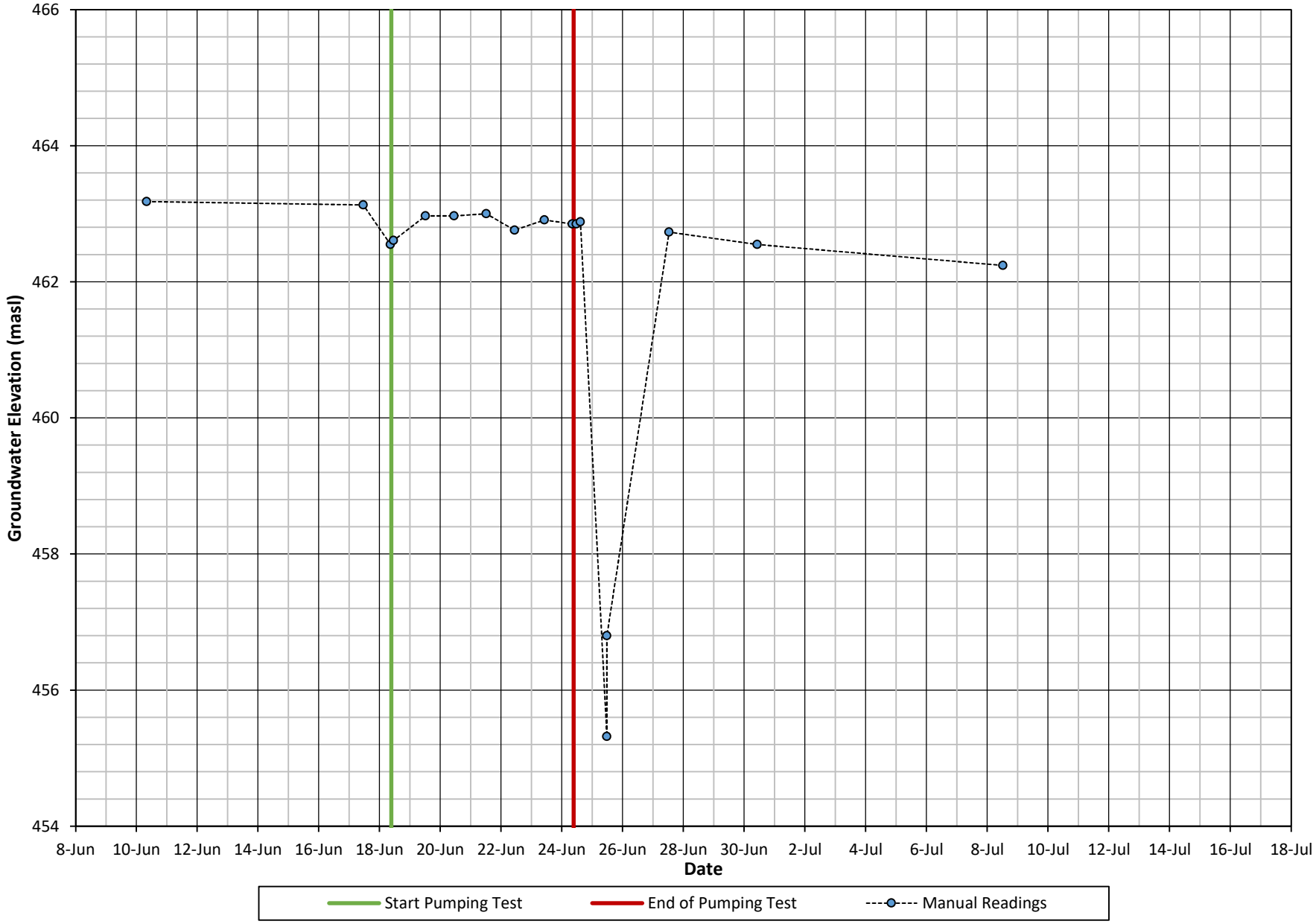
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8048 Line 2 (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

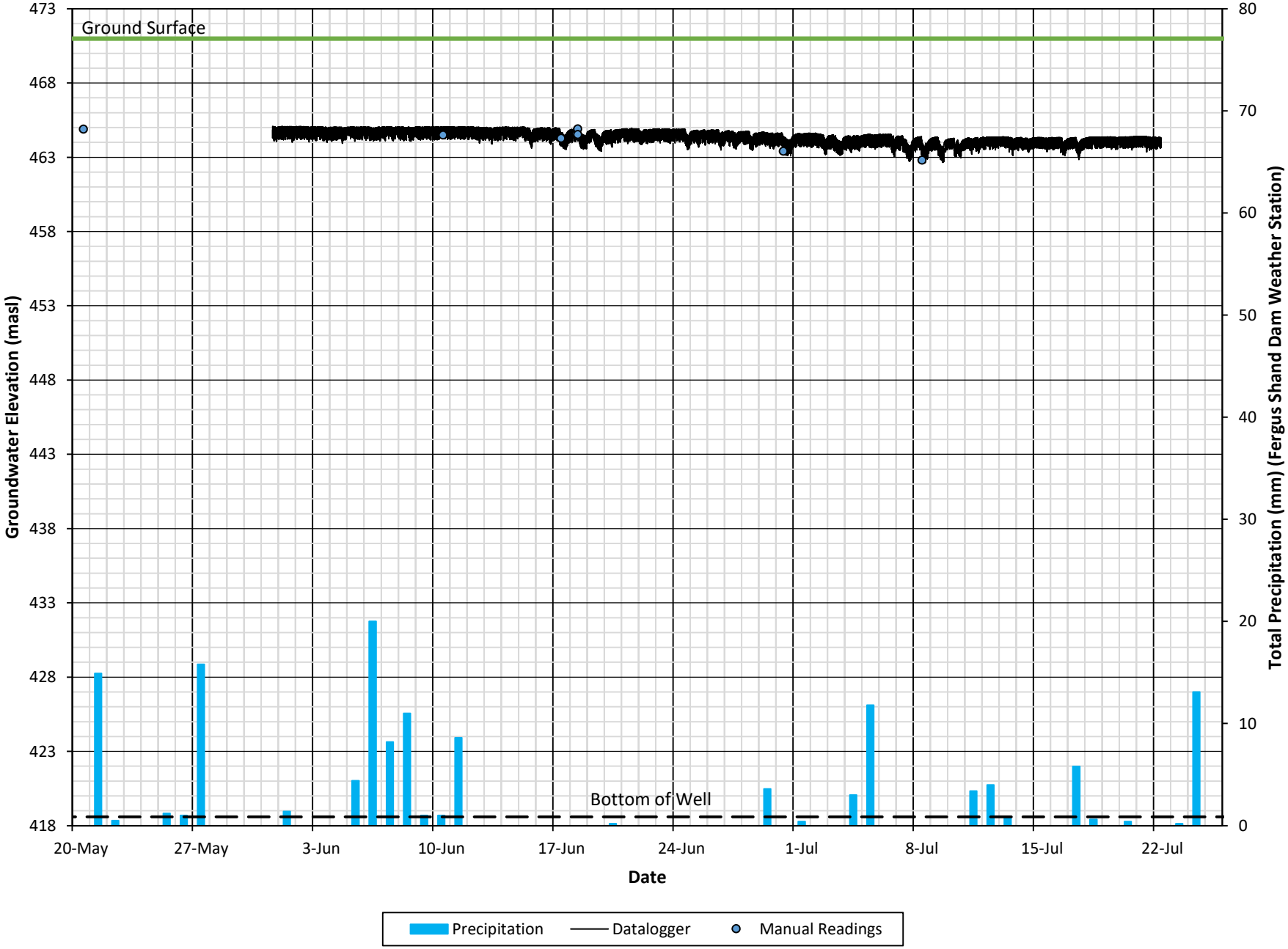
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8048 Line 2 (B) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

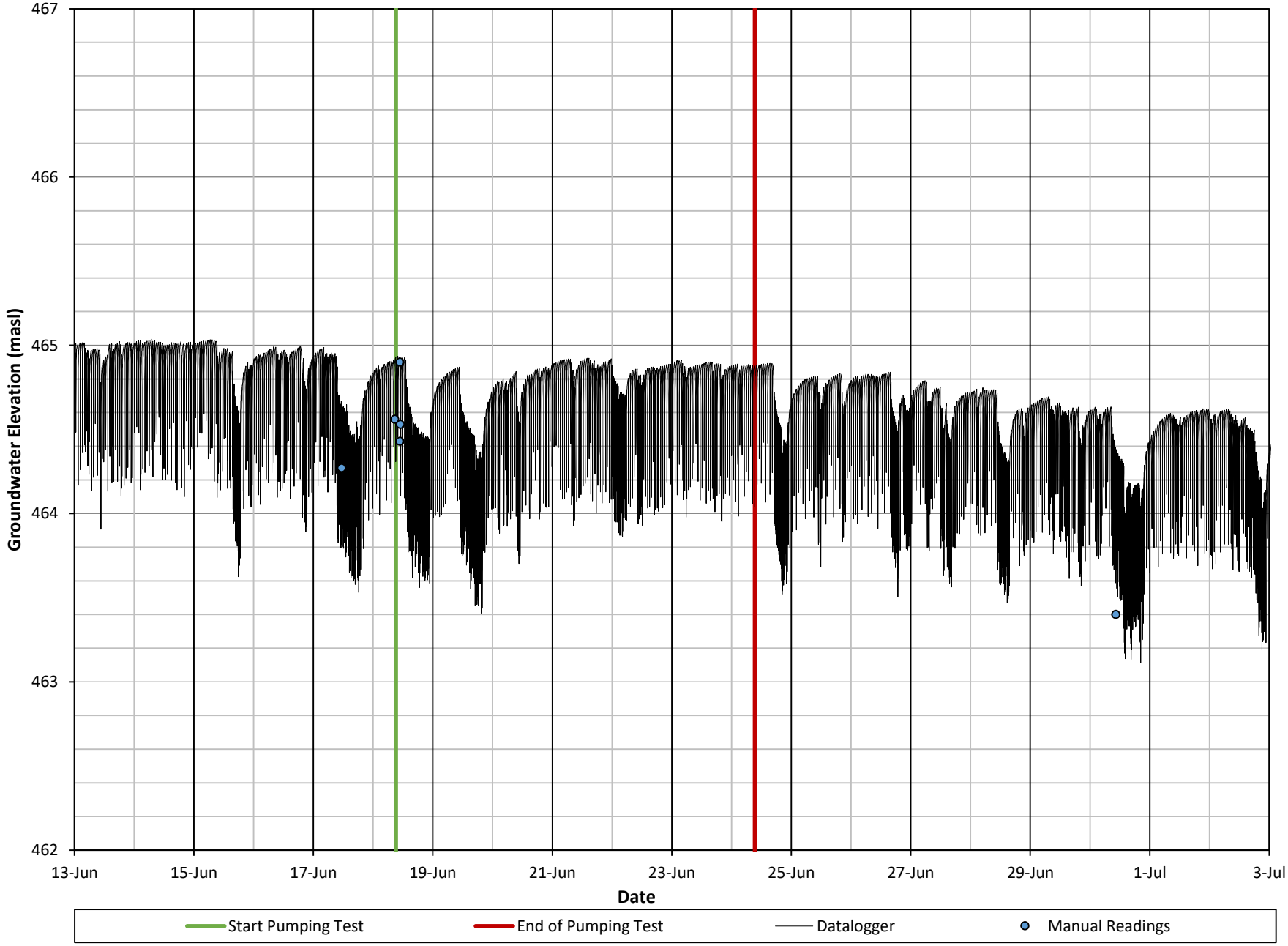
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8061 Line 2 (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

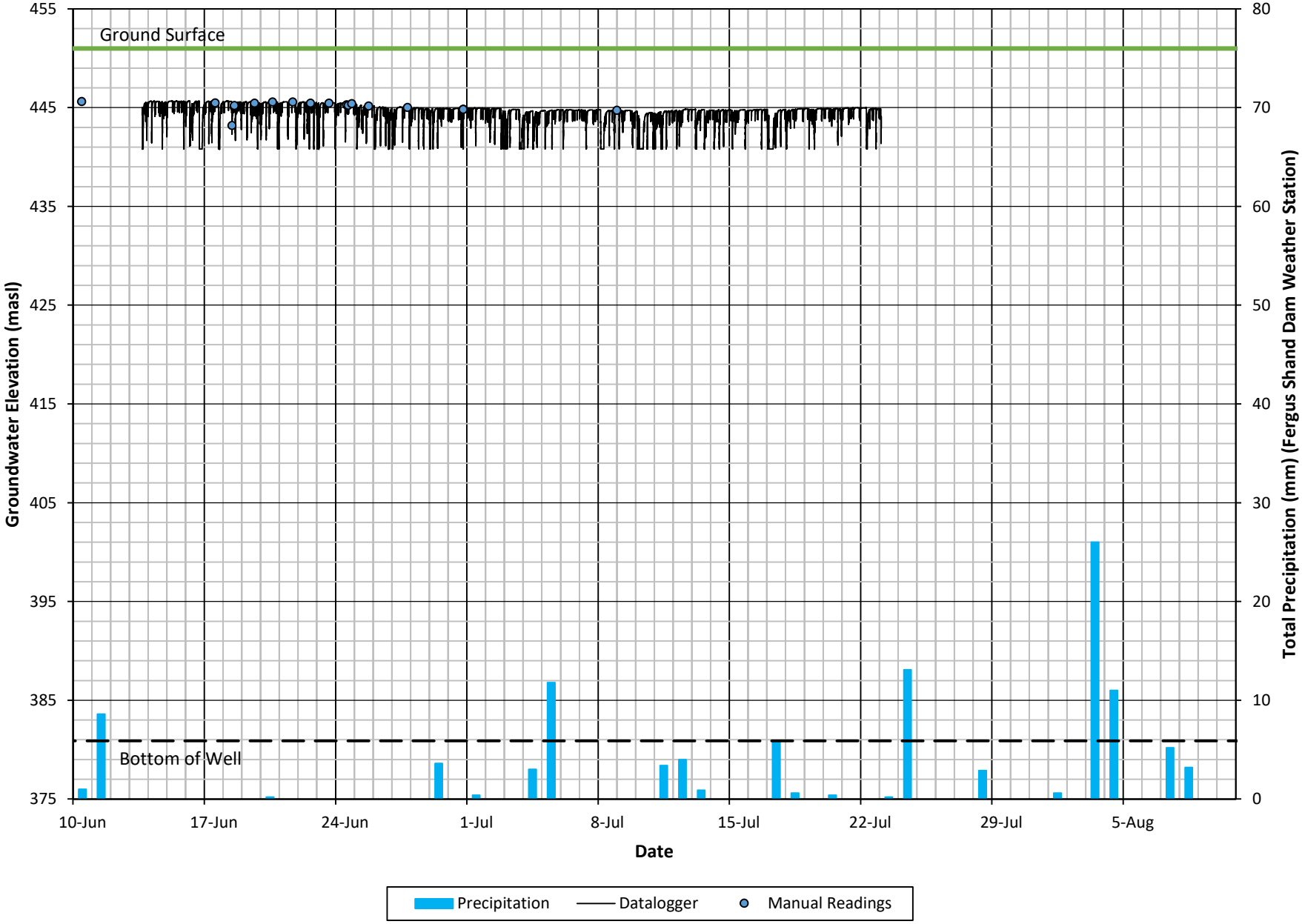
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8061 Line 2 (B) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

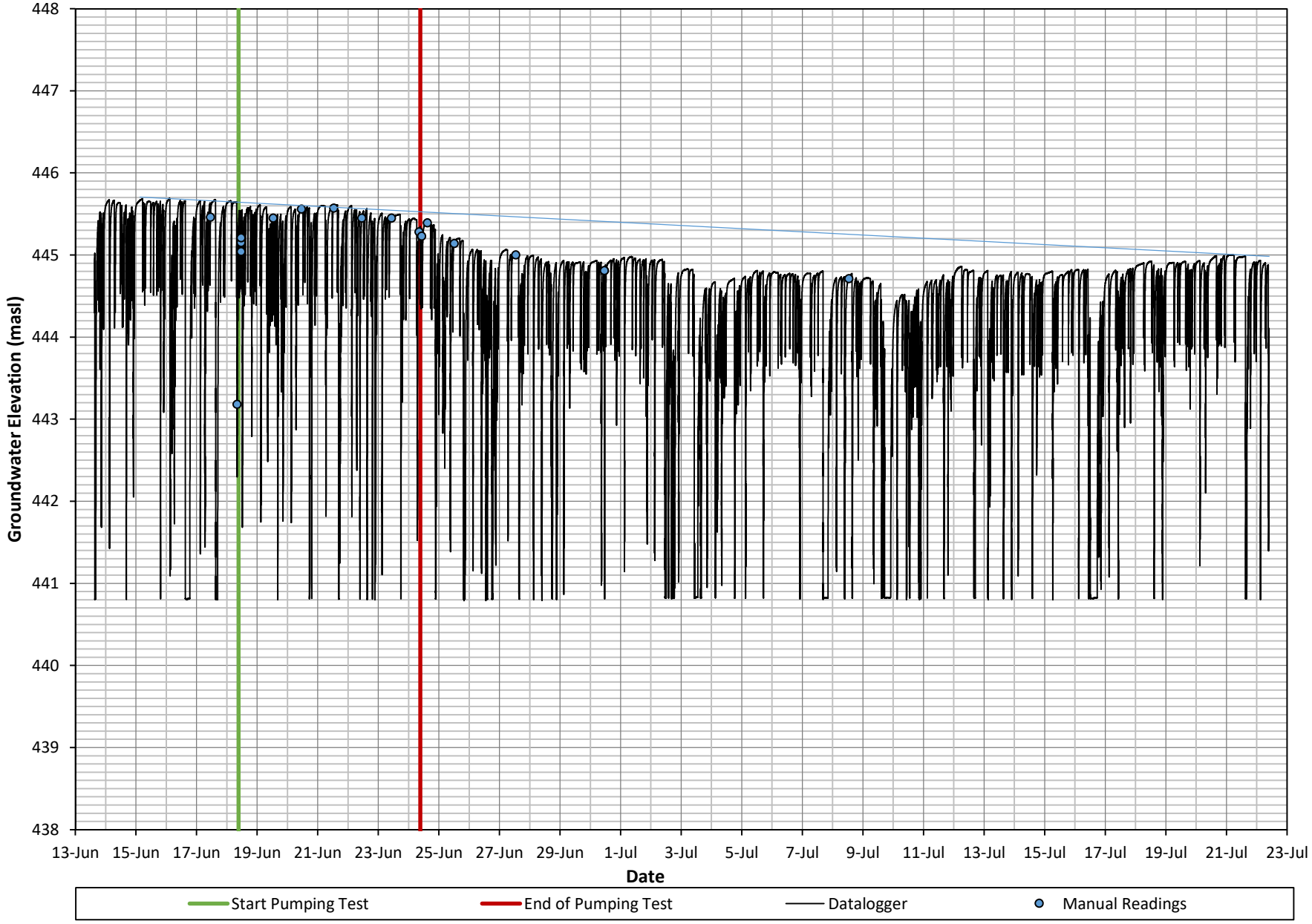
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
7795 Sideroad 10 East (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

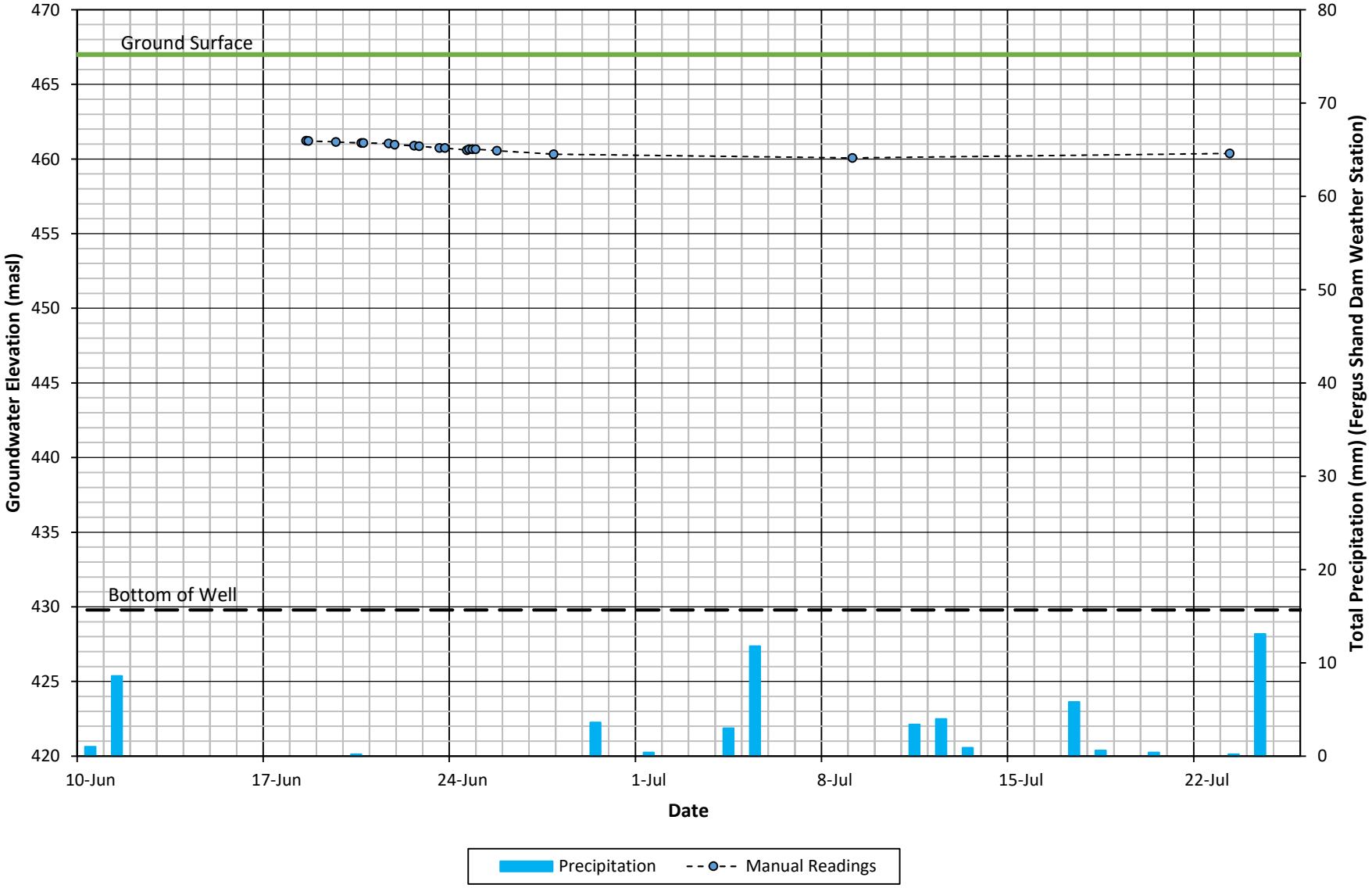
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
7795 Sideroad 10 E (B) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

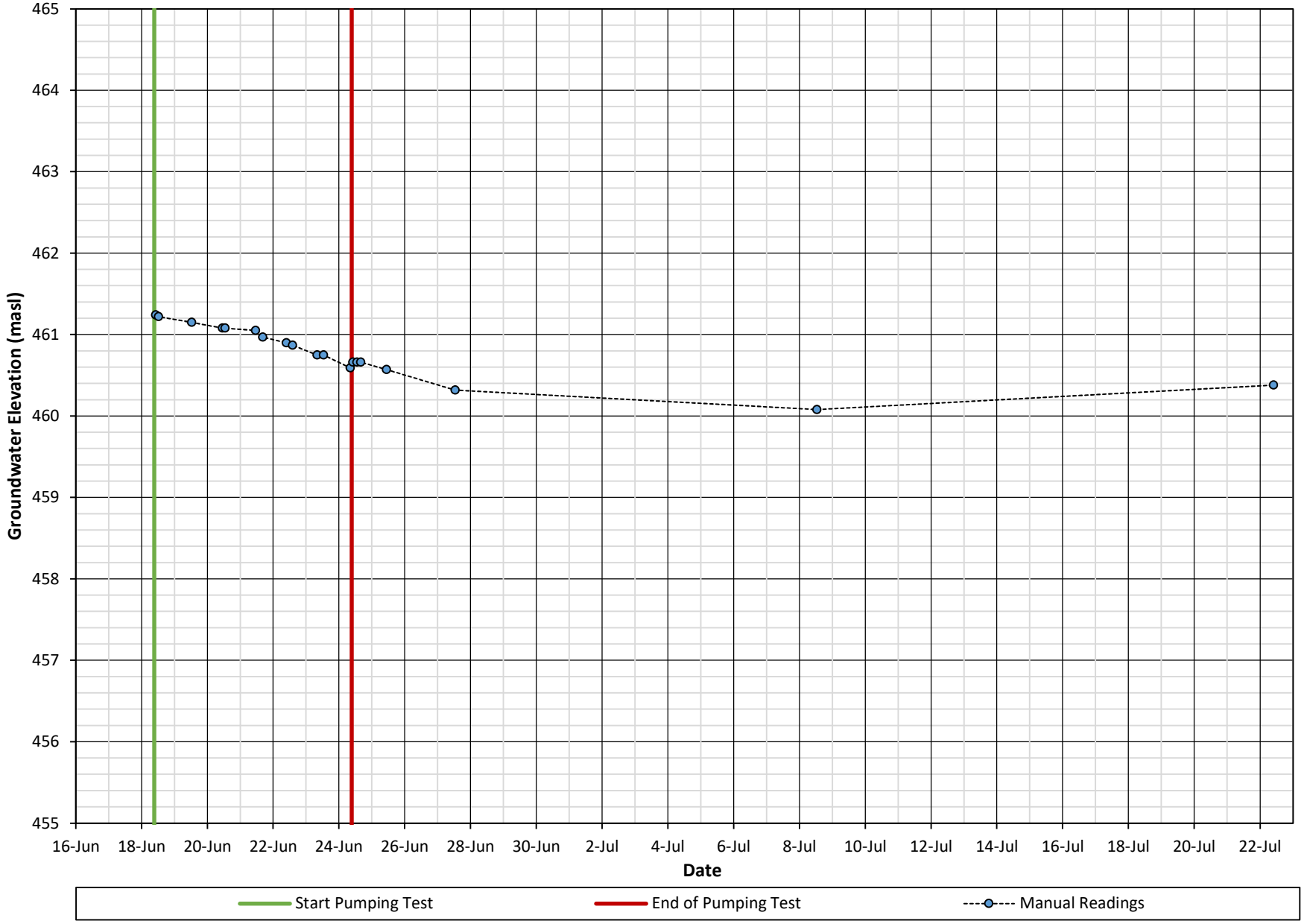
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
7975 Sideroad 10 East (DO) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

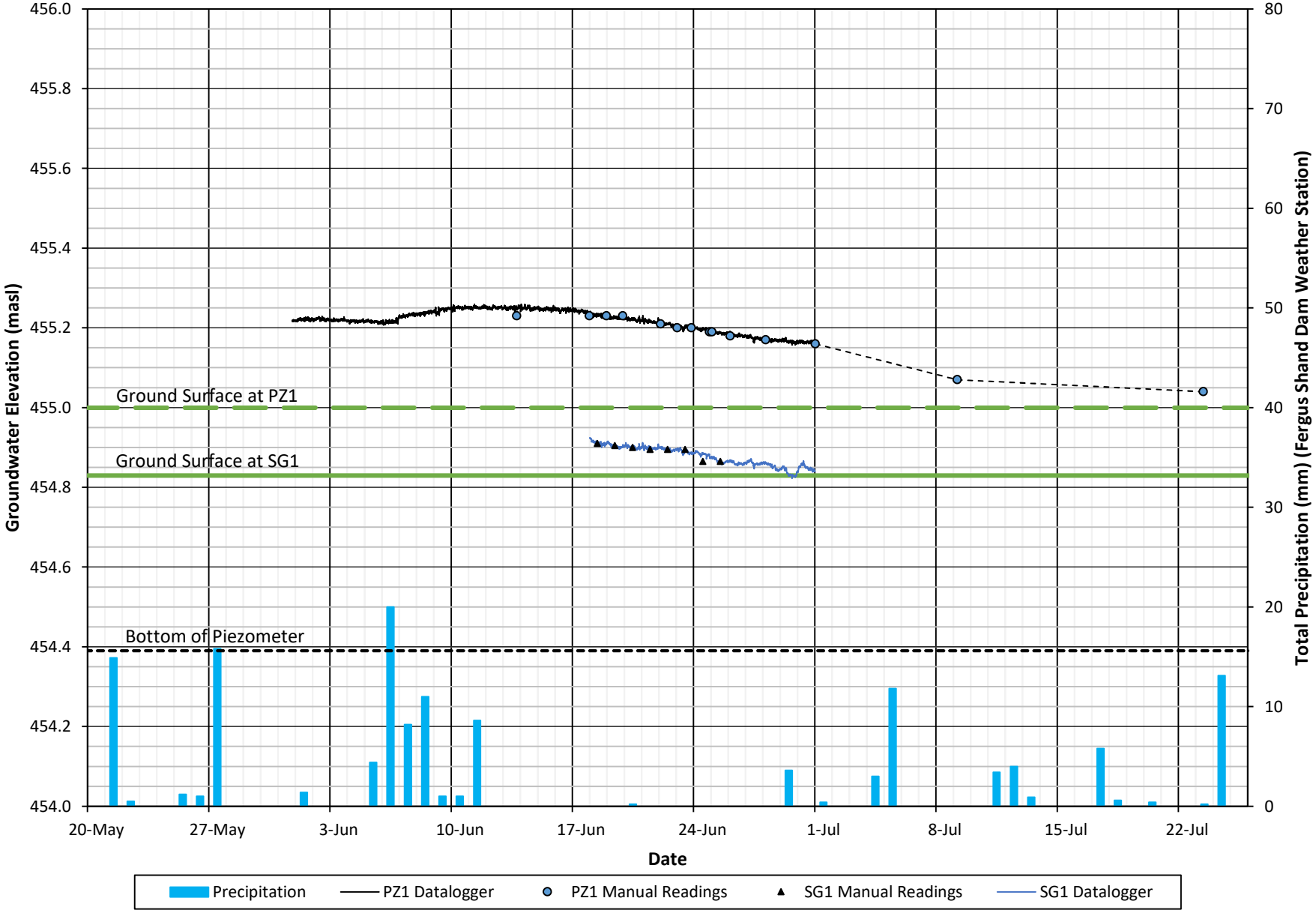
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
7975 Sideroad 10 E (DO) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

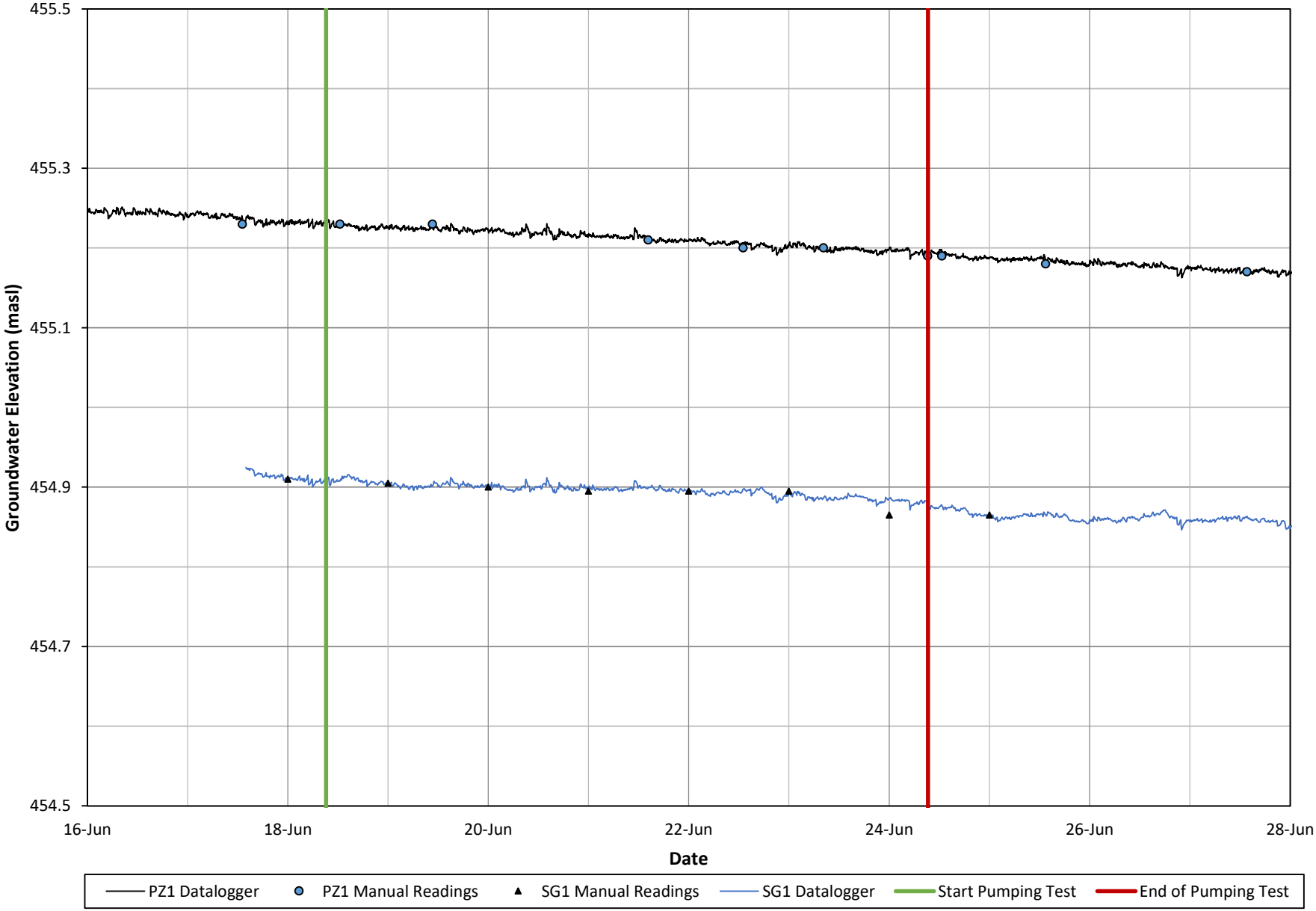
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
PZ1 and SG1 Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

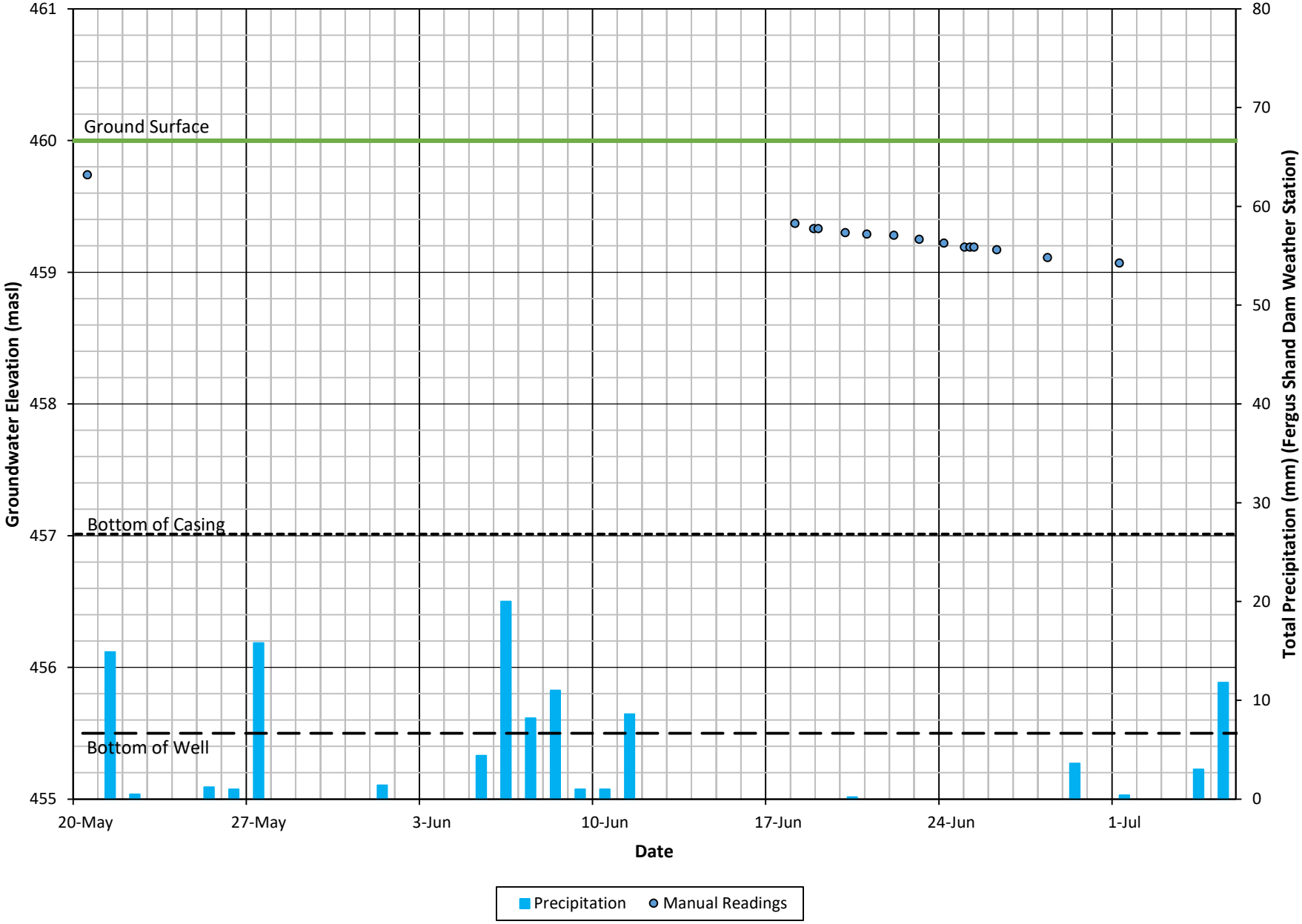
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
PZ1 and SG1 Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

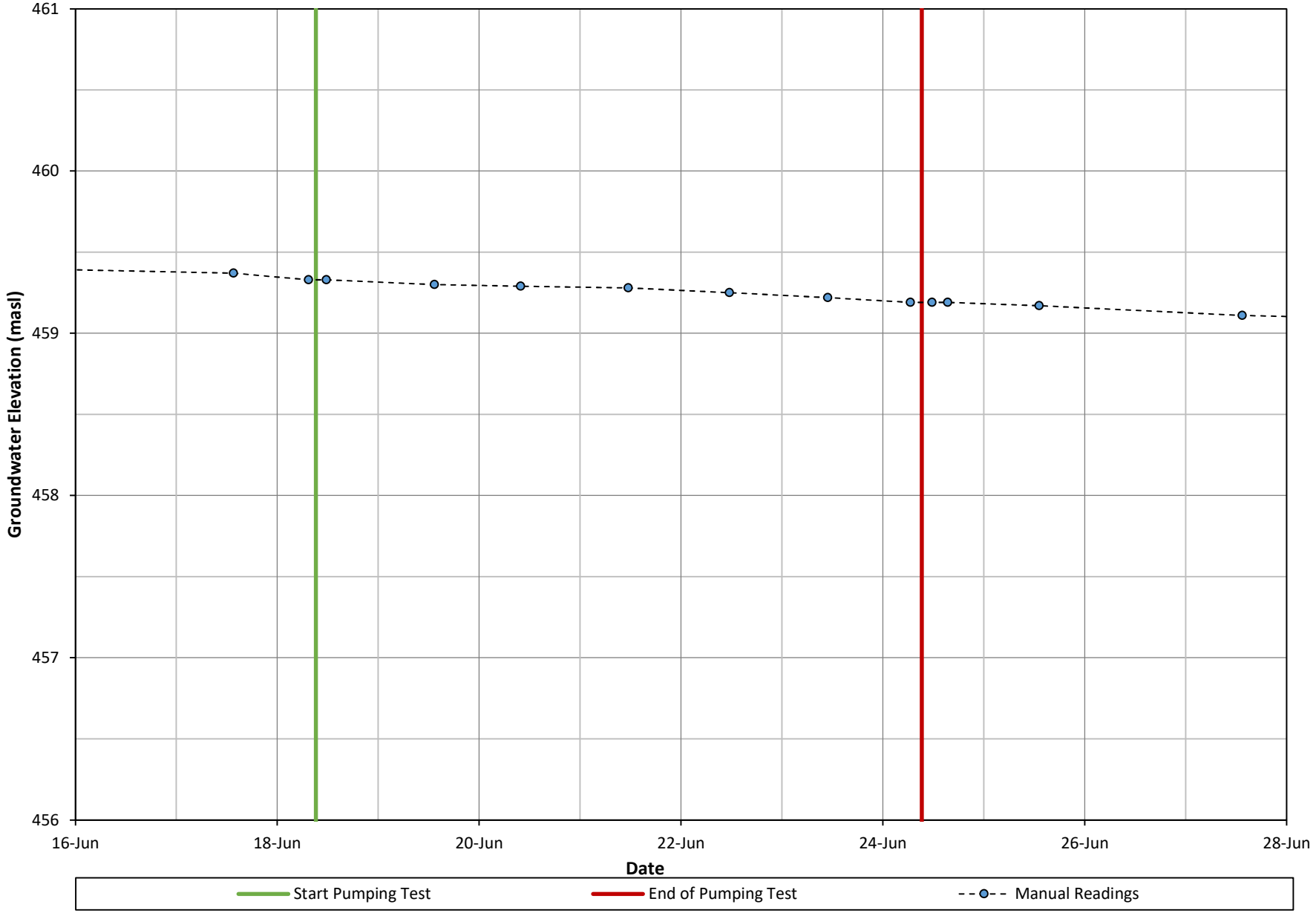
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW1 (SO) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

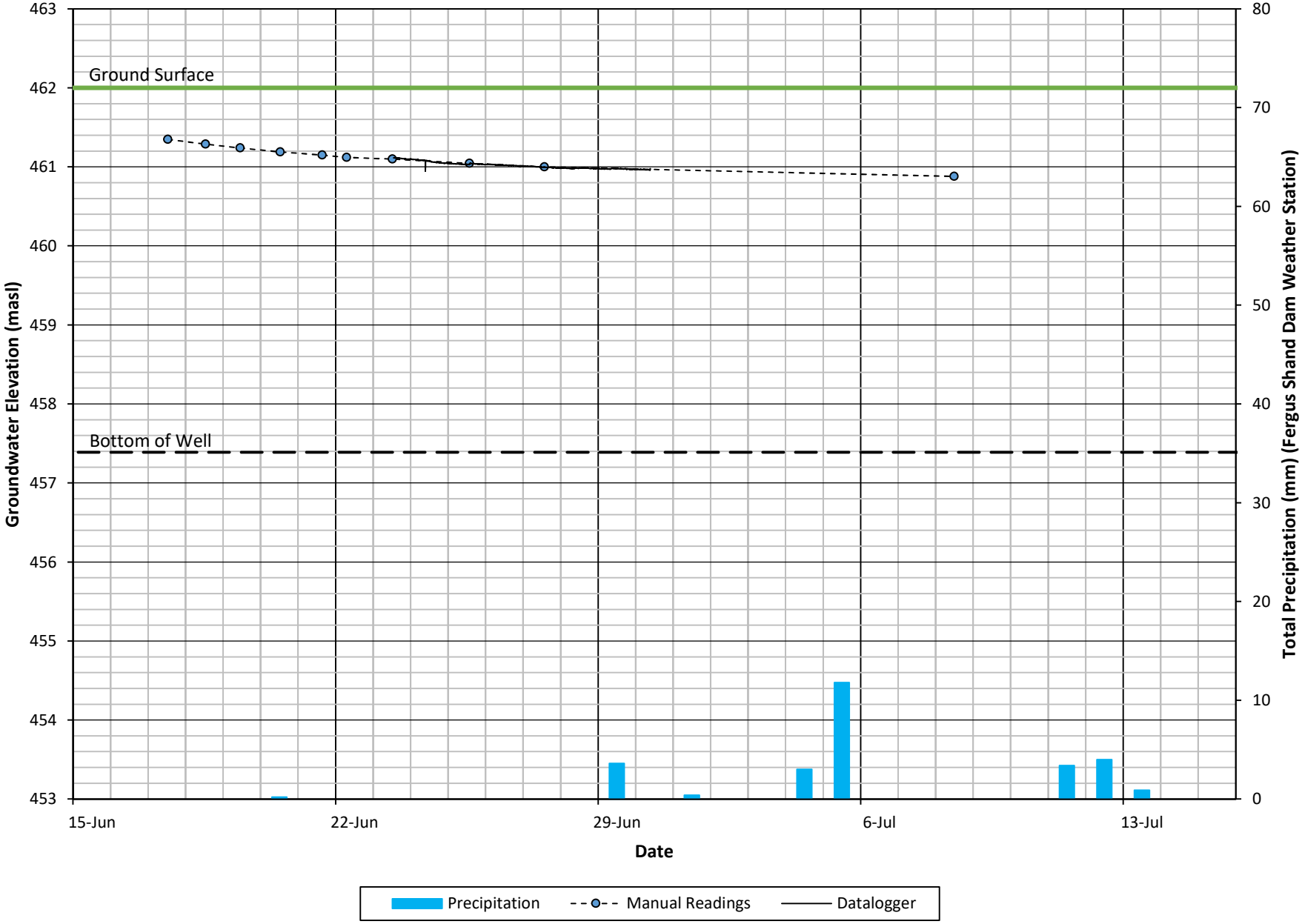
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW1 (SO) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

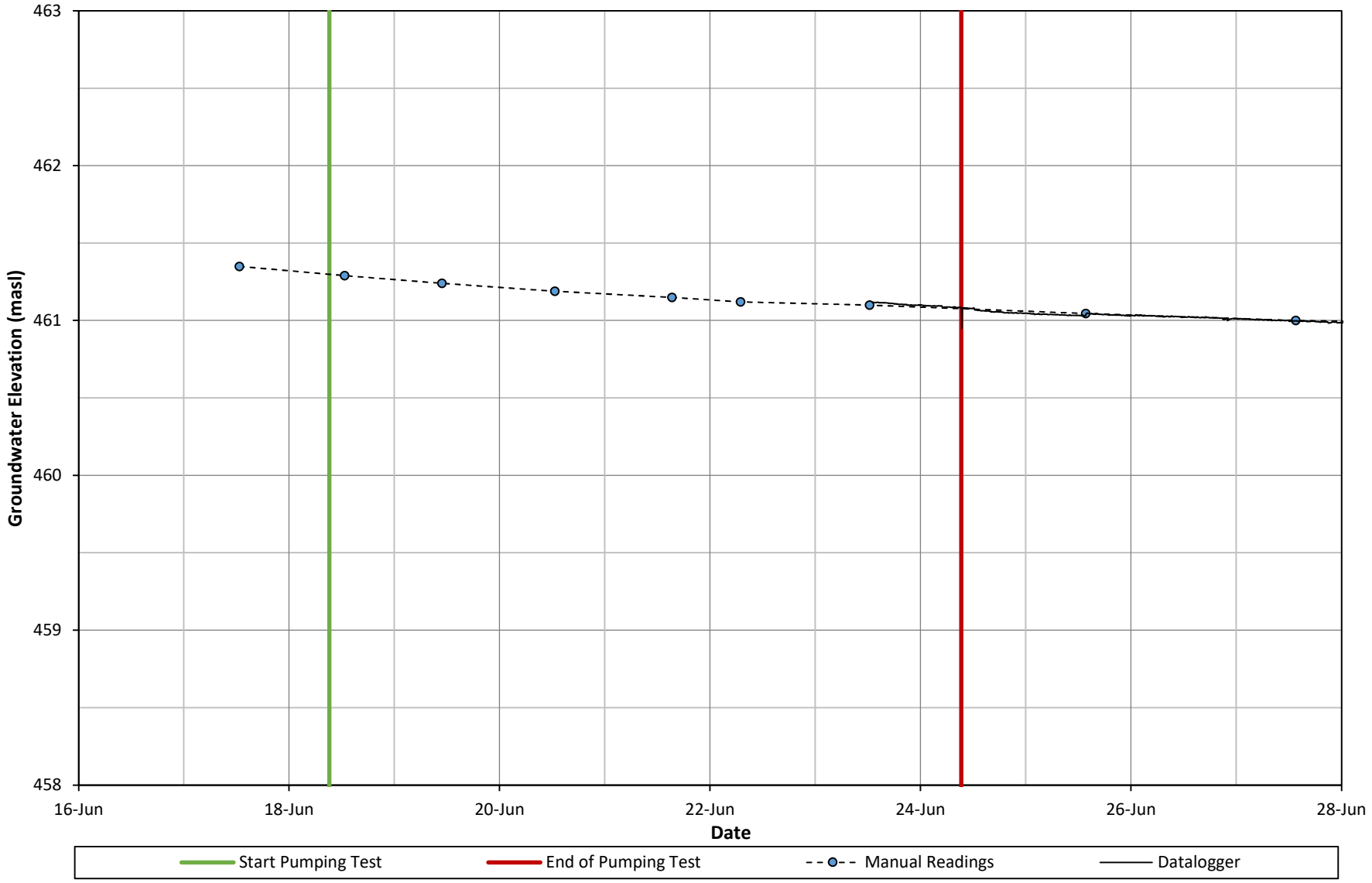
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW2 (SO) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

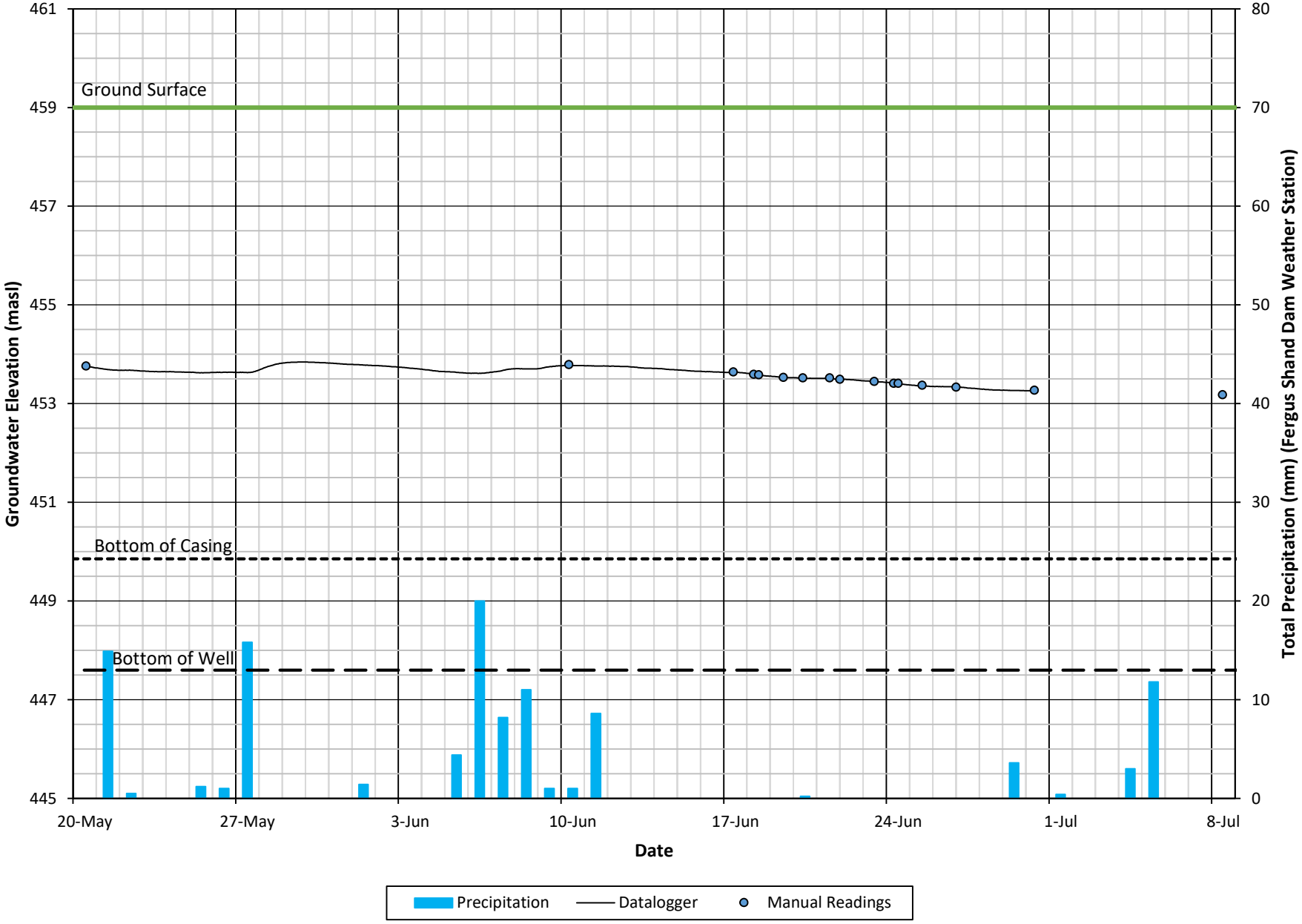
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW2 (SO) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

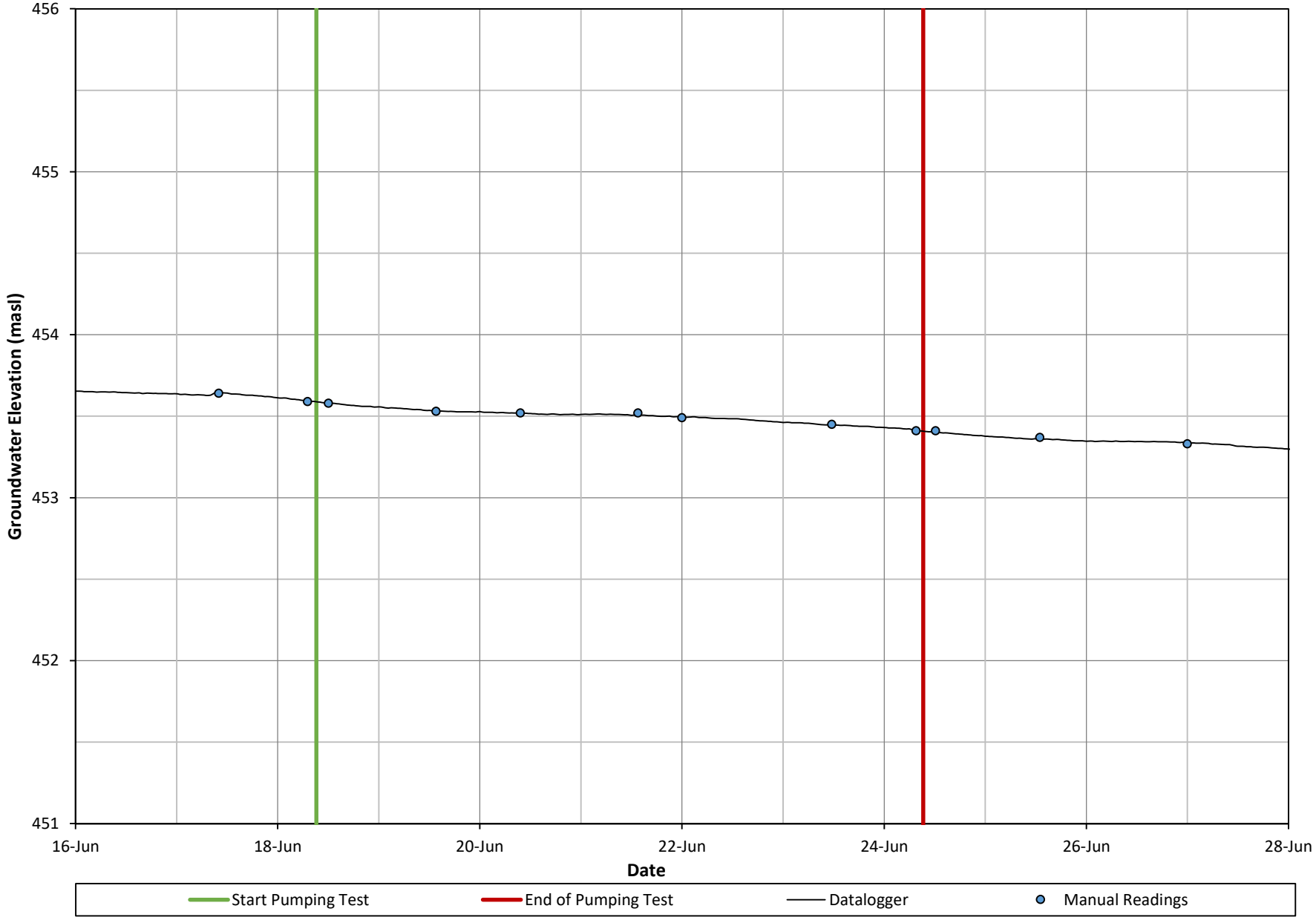
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW4 (SO) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

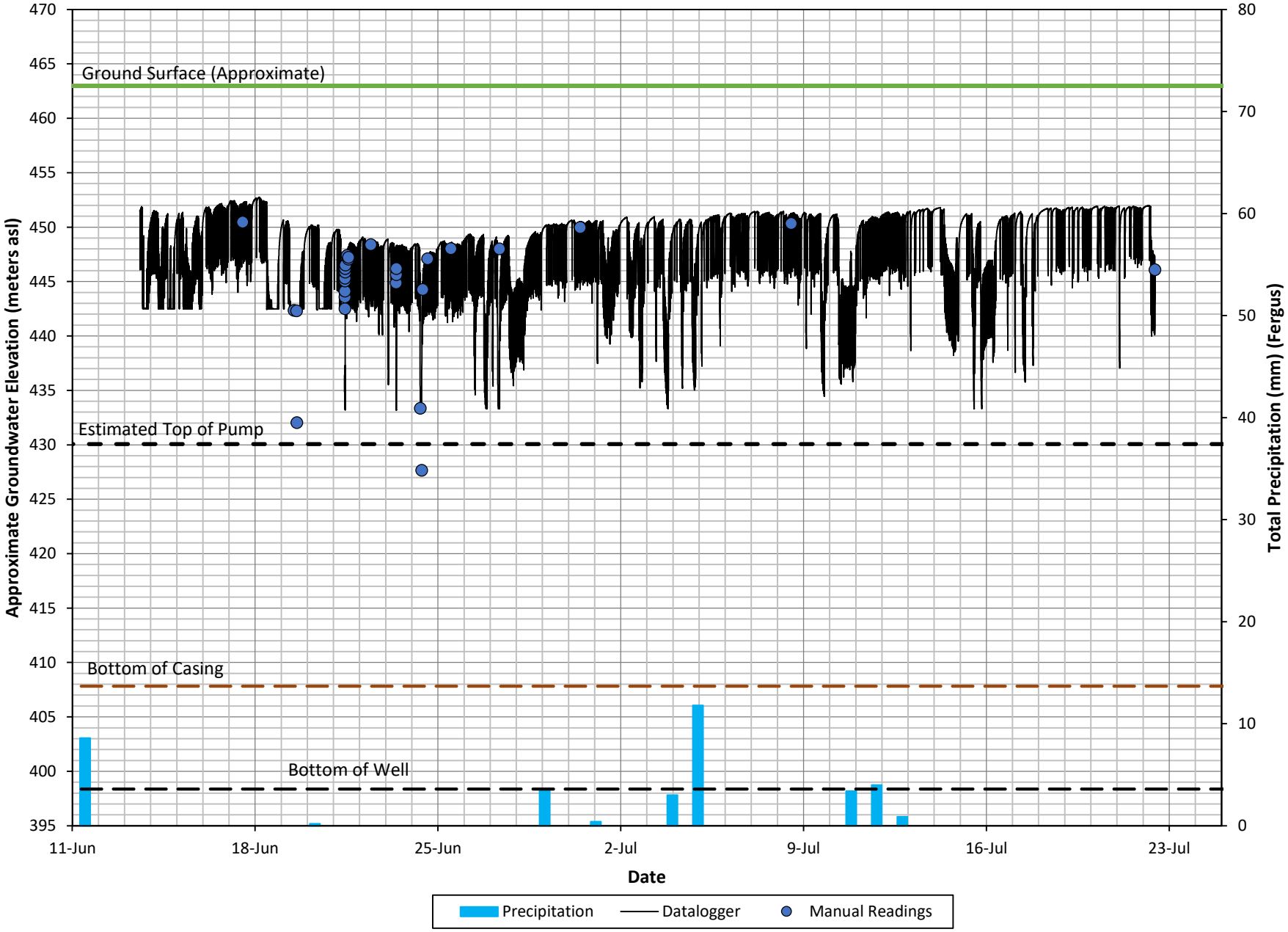
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
MW4 (SO) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

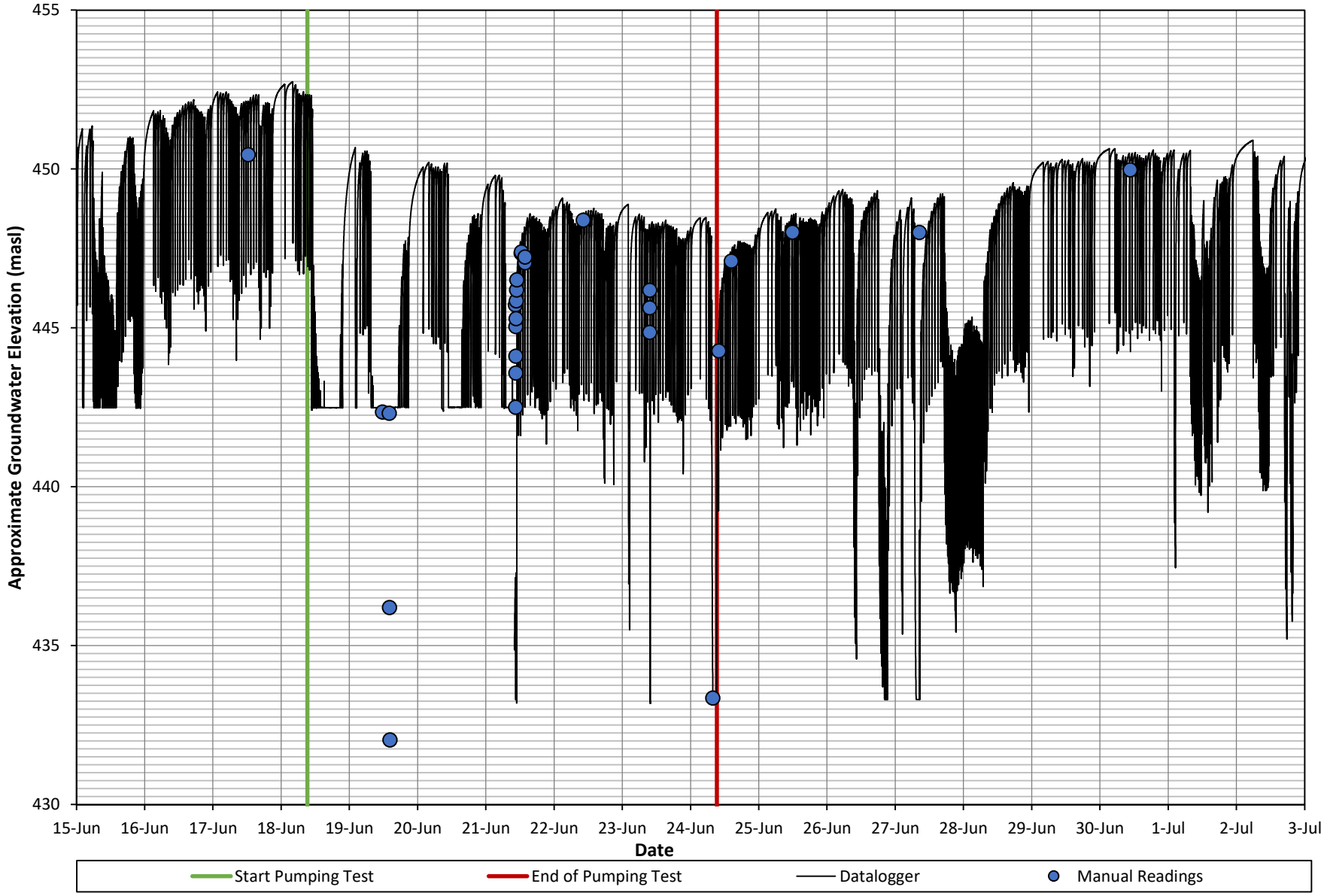
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8580 Wellington Road 14 (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

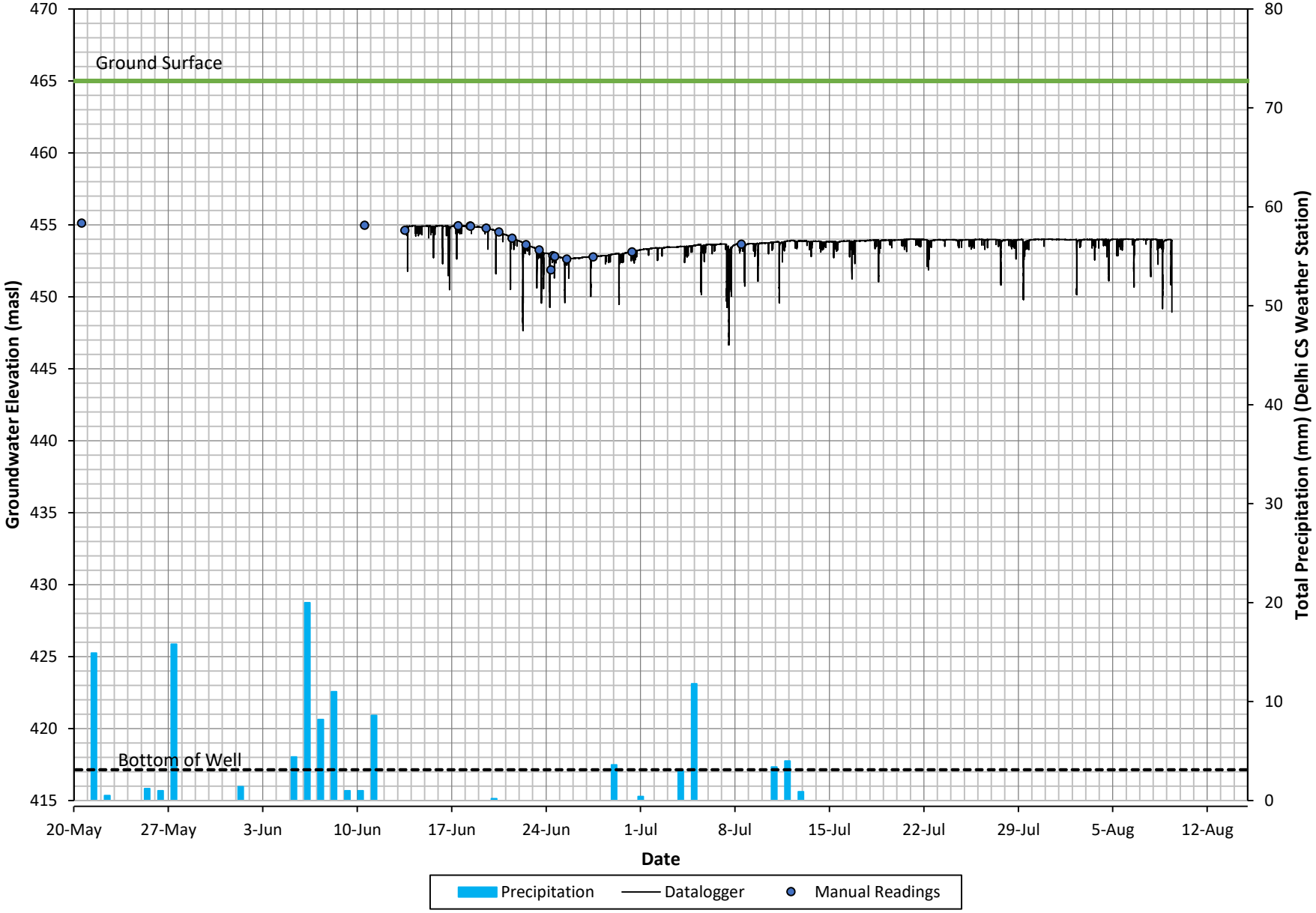
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8580 Wellington Rd 14 (B) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

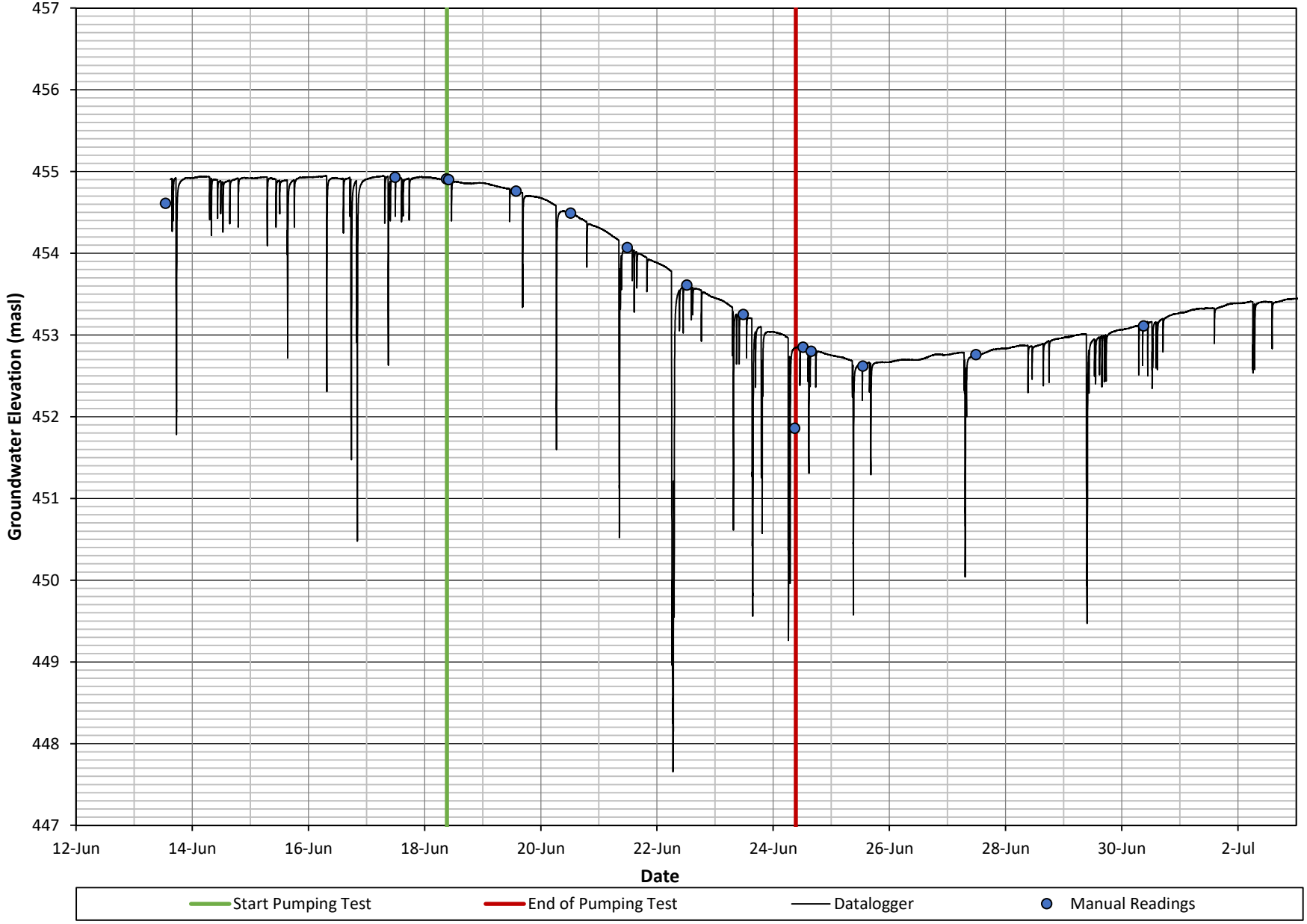
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
510 Eliza Street (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

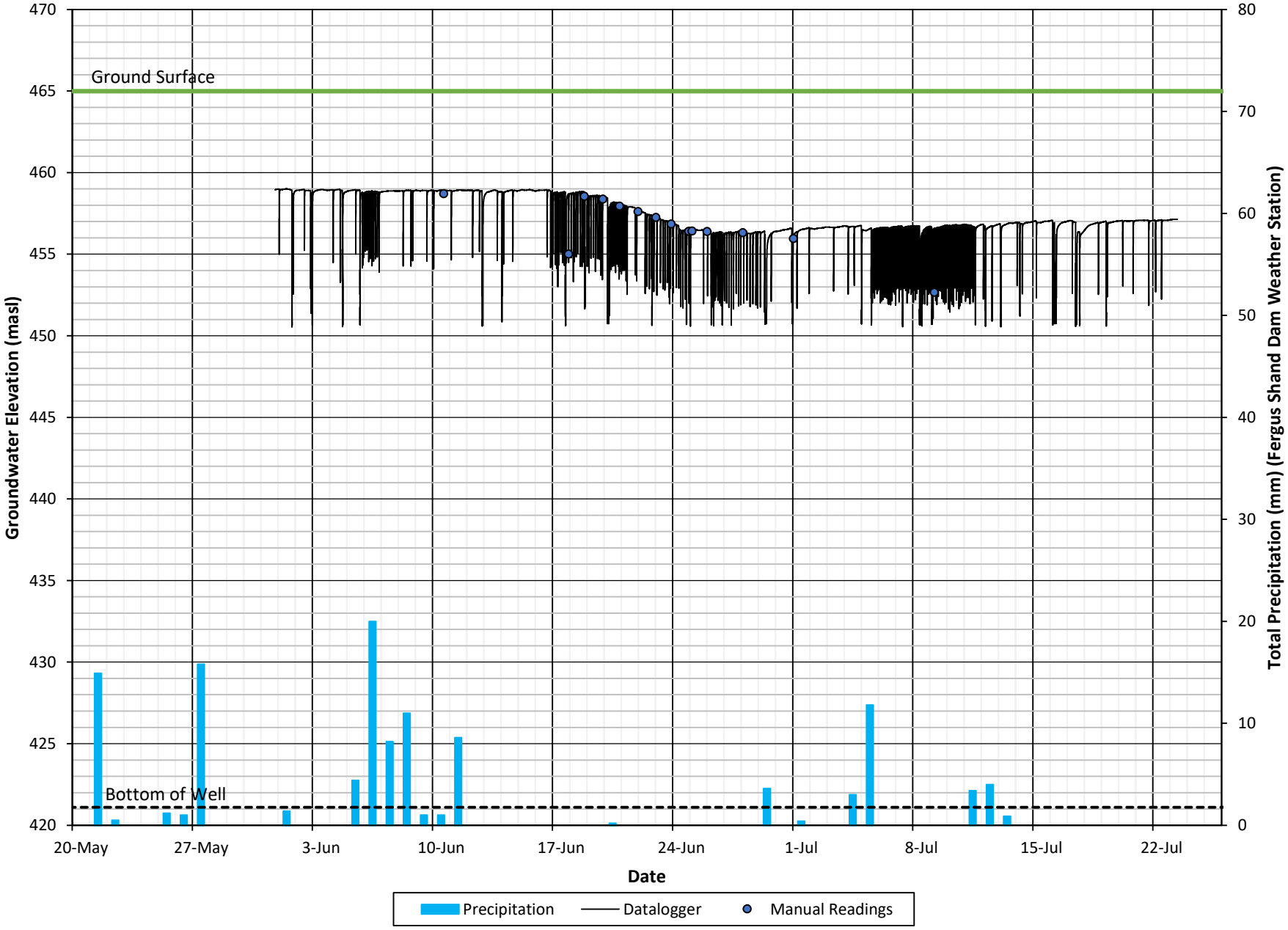
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
510 Eliza Street (B) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

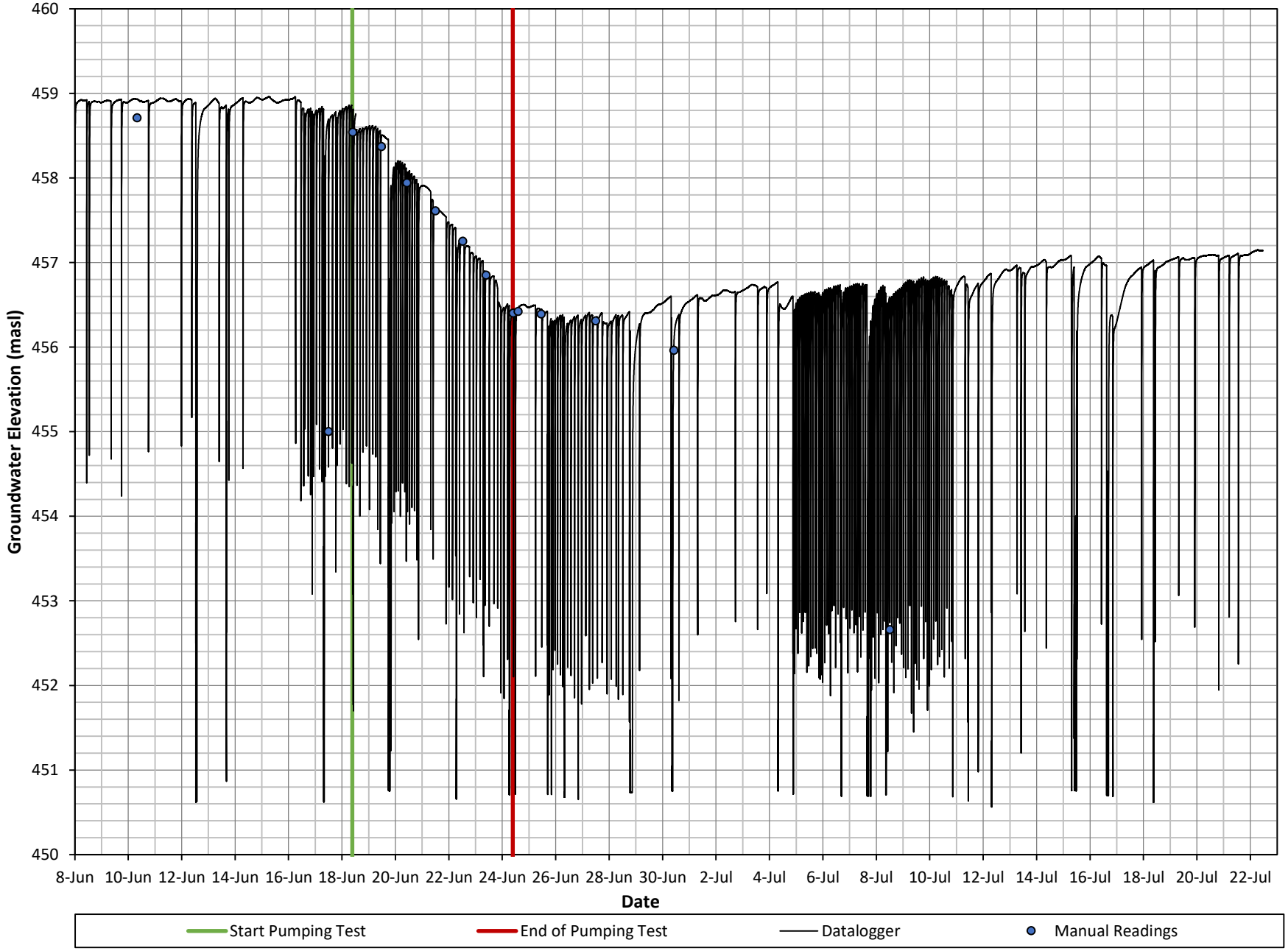
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8566 Wellington Road 14 (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

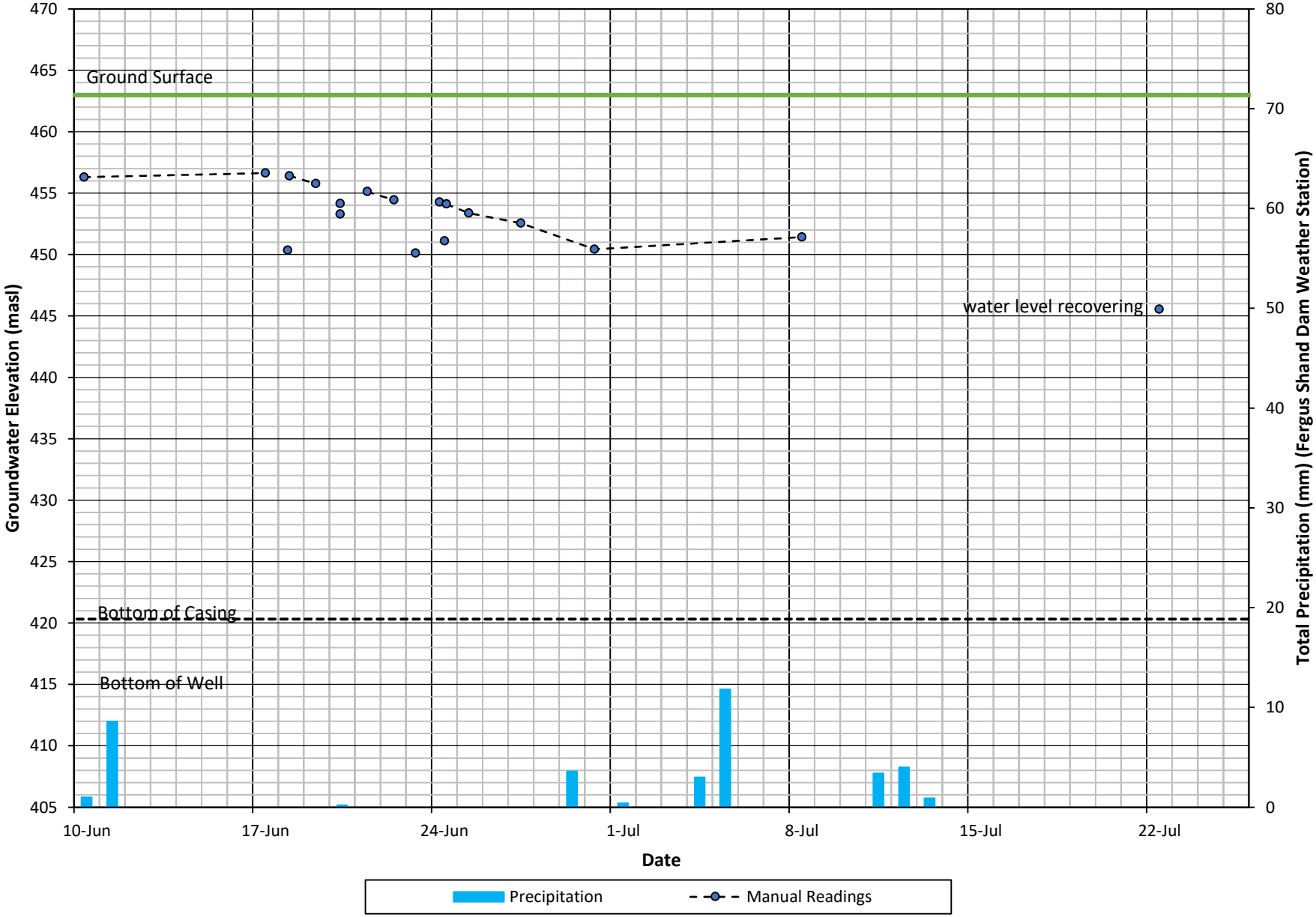
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8566 Wellington Rd 14 (B) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

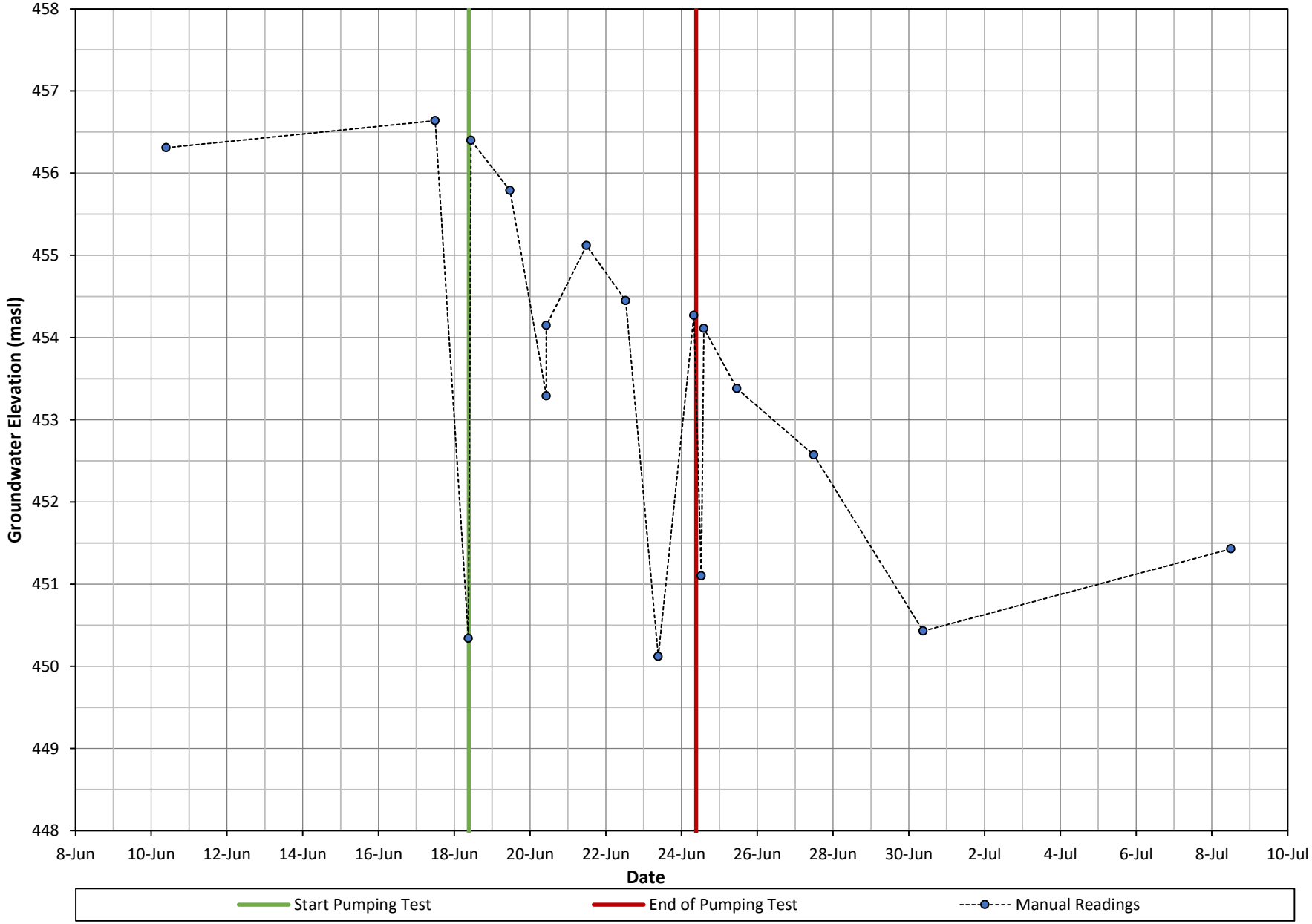
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8565 Wellington Road 14 (B) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/2/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

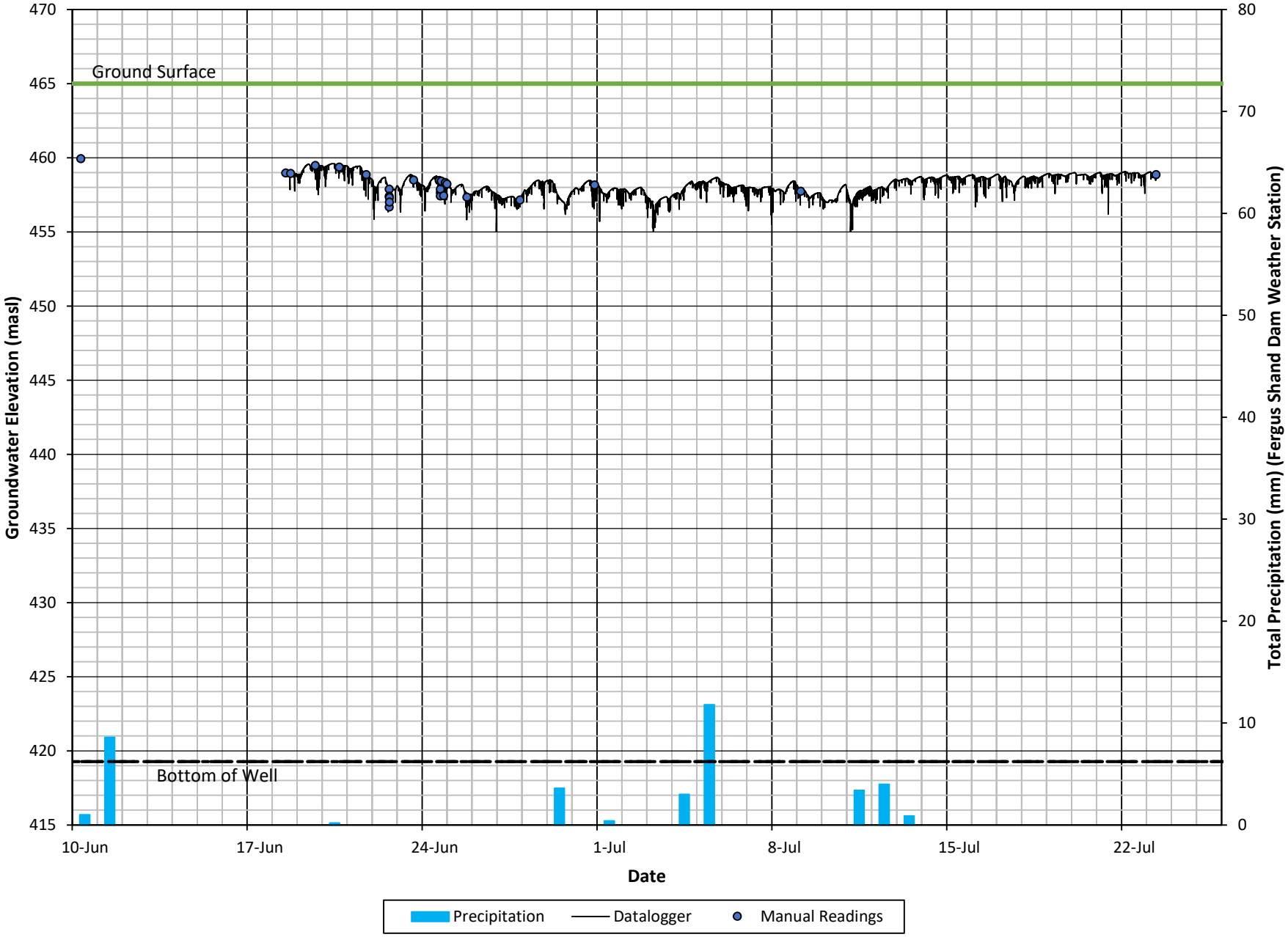
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8565 Wellington Rd 14 (B) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

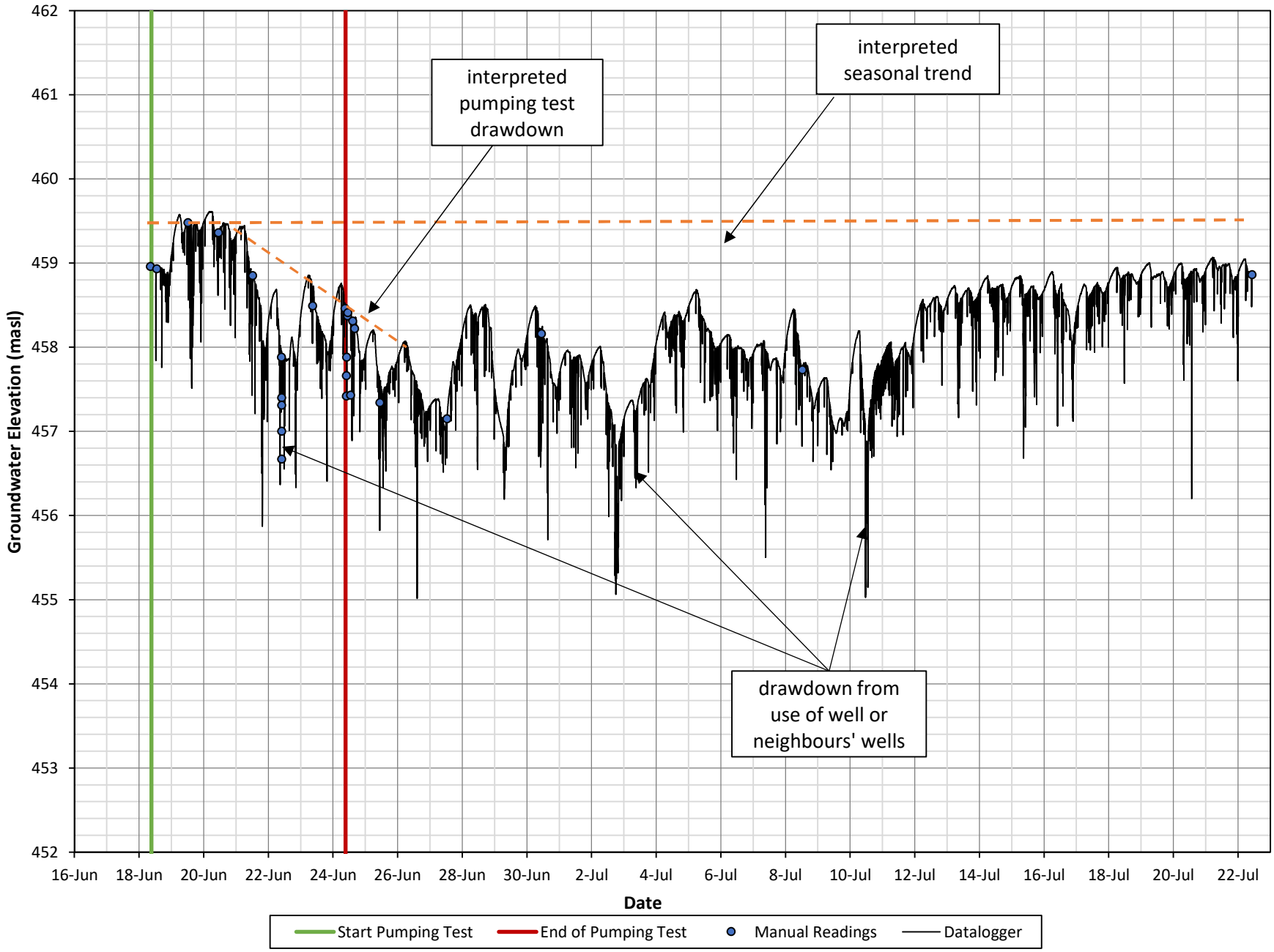
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8590 Wellington Road 14 (DO) Hydrograph



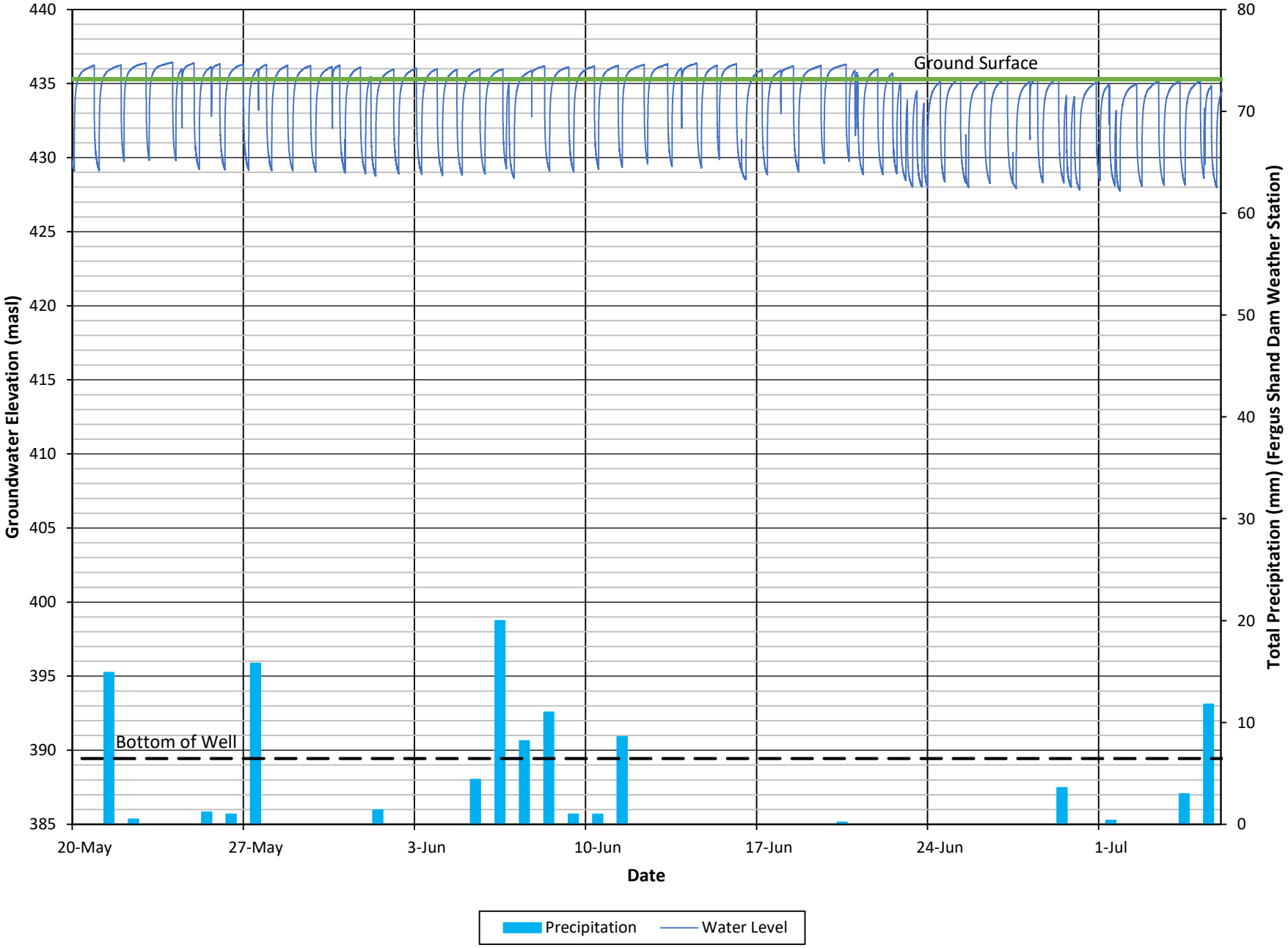
R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 2

Arthur Test Well
Long Term Pumping Test
300052287

Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
8590 Wellington Rd 14 (DO) Detailed Hydrograph



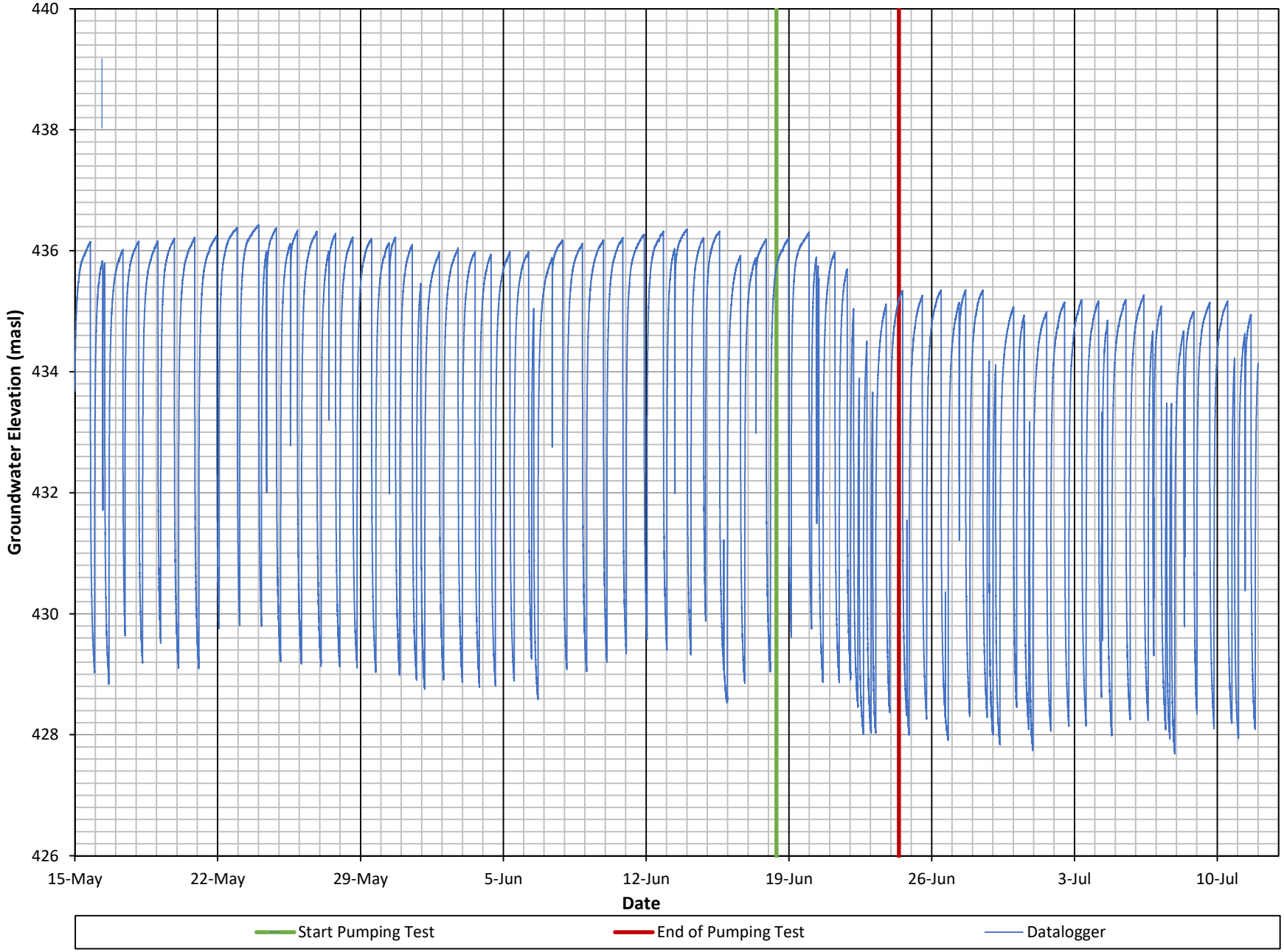
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
Arthur Well 7B (DO) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Arthur Well 7B

Arthur Test Well
Long Term Pumping Test
300052287

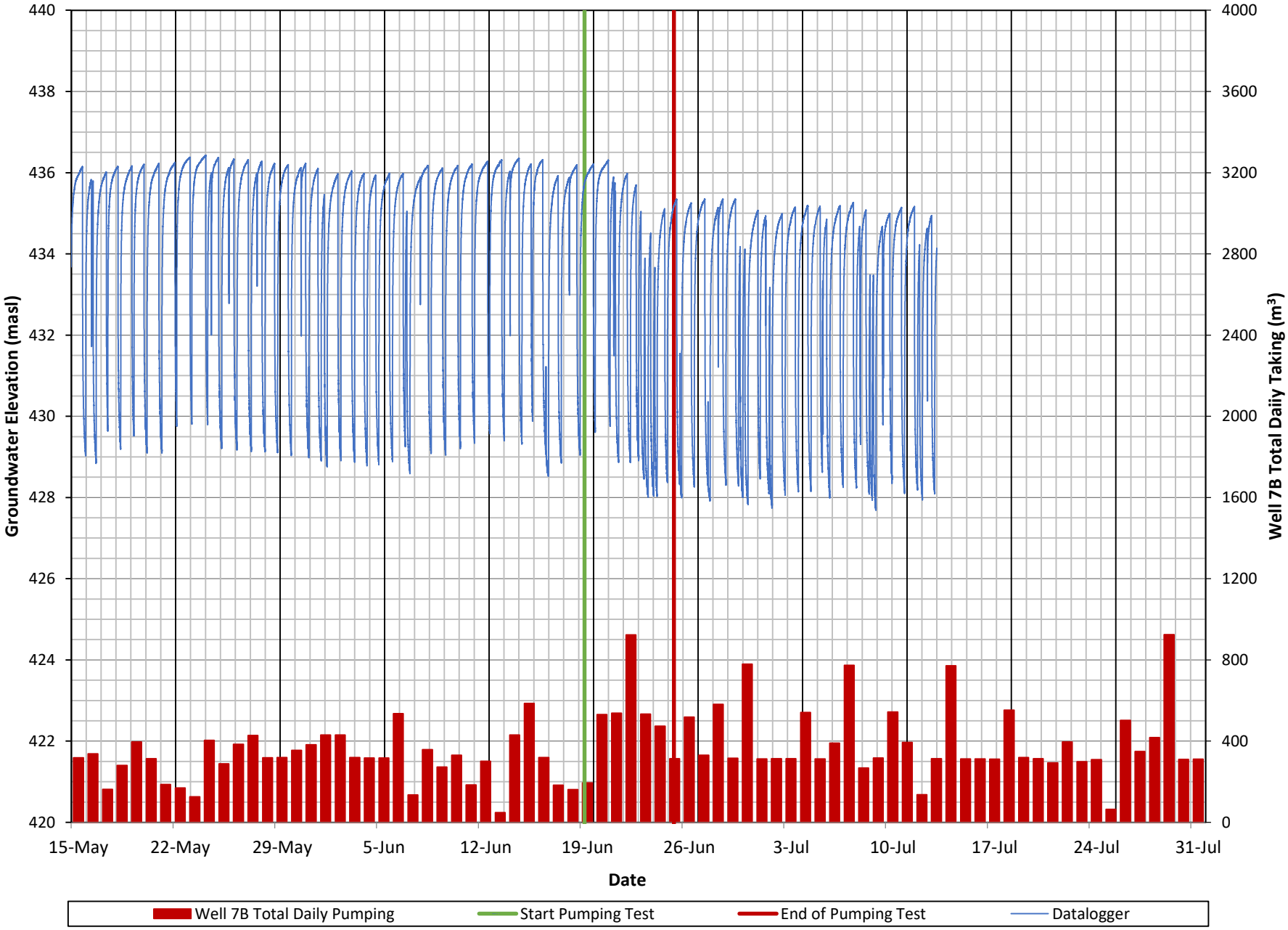
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
Arthur Well 7B (DO) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Arthur Well 7B

Arthur Test Well
Long Term Pumping Test
300052287

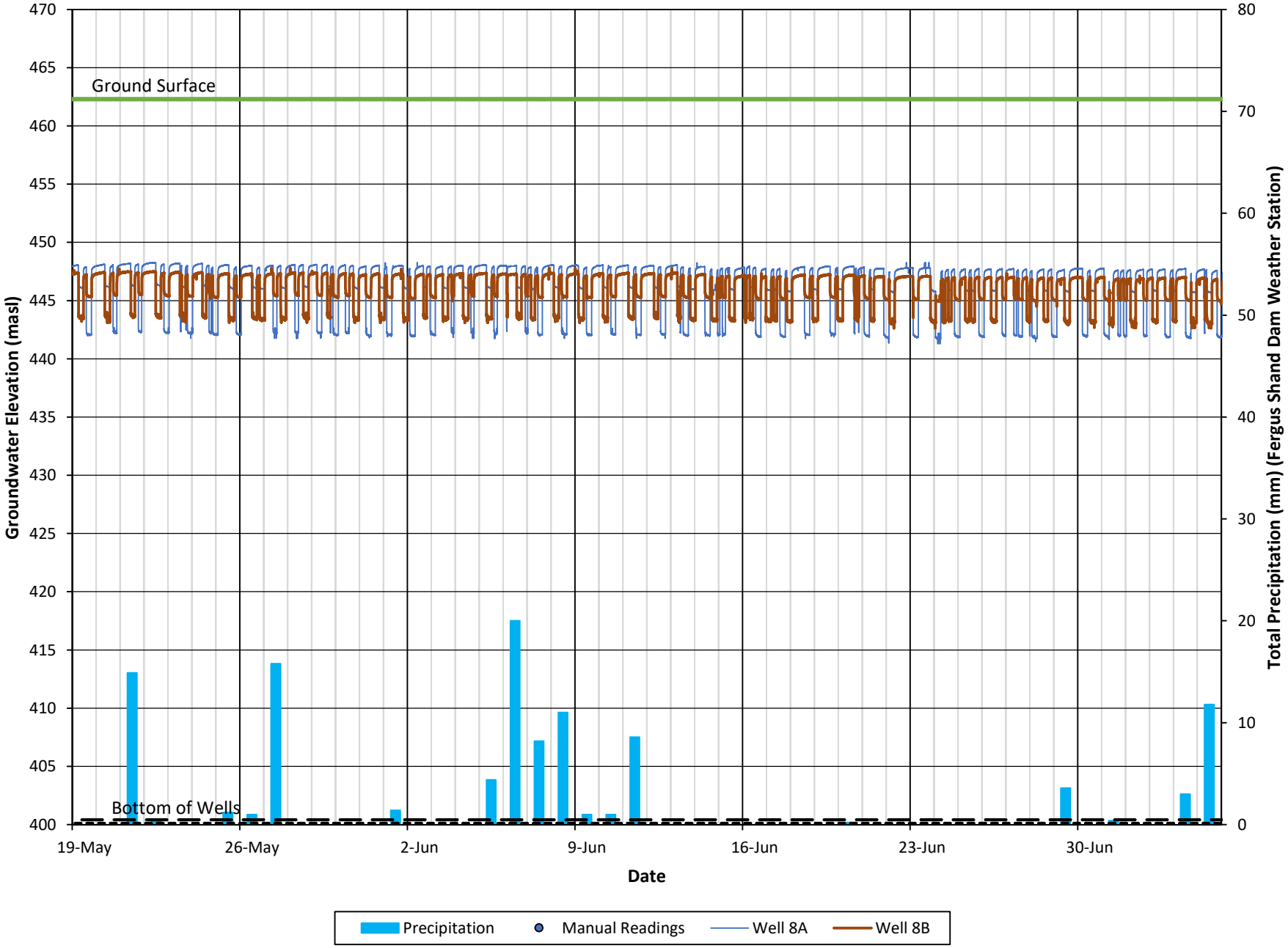
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
Arthur Well 7B (DO) Total Daily Pumping



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Arthur Well 7B

Arthur Test Well
Long Term Pumping Test
300052287

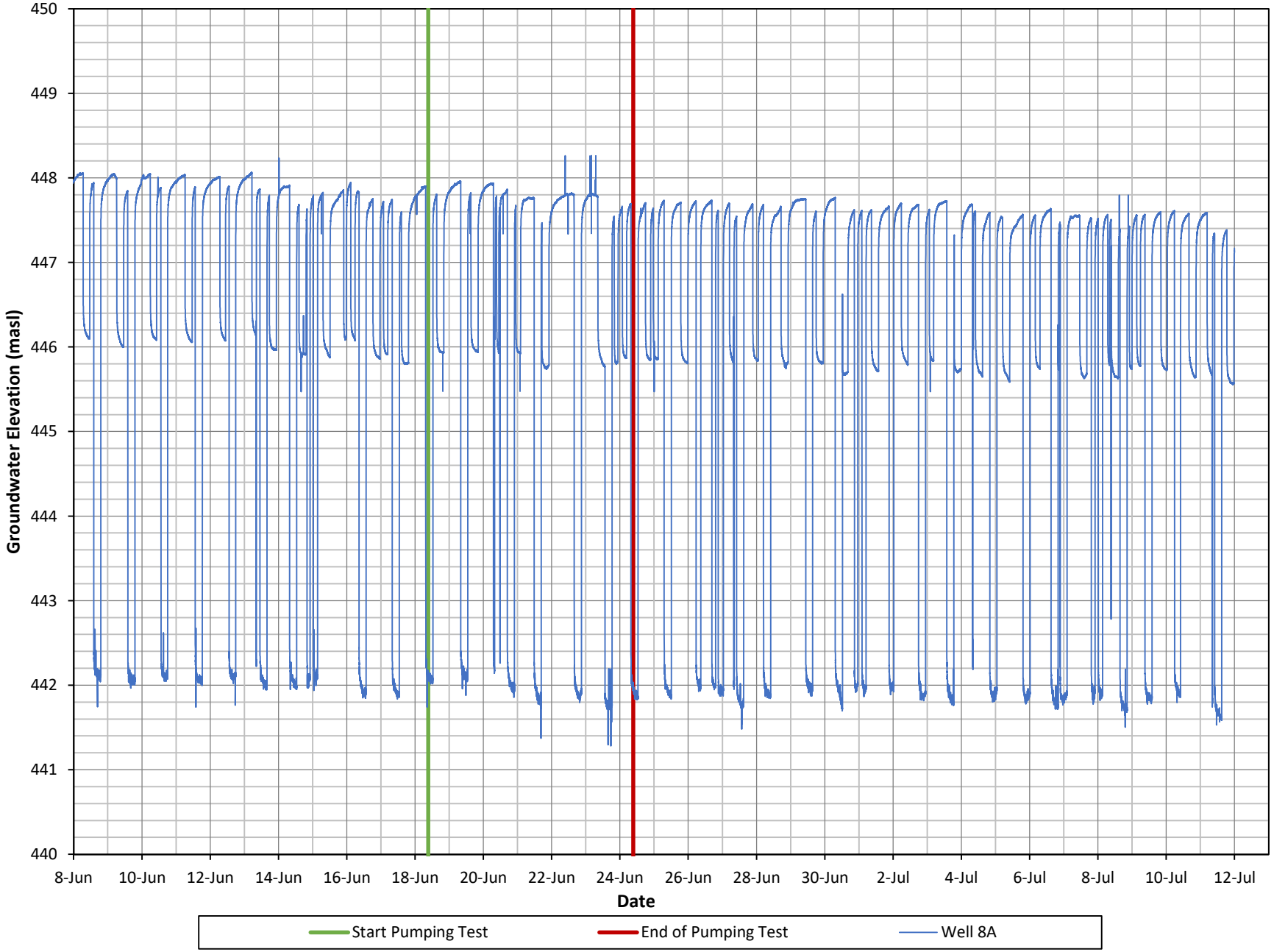
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
Arthur Well 8A (DO) & 8B (DO) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Arthur Well 8AB

Arthur Test Well
Long Term Pumping Test
300052287

Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
Arthur Well 8A (DO) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Arthur Well 8AB

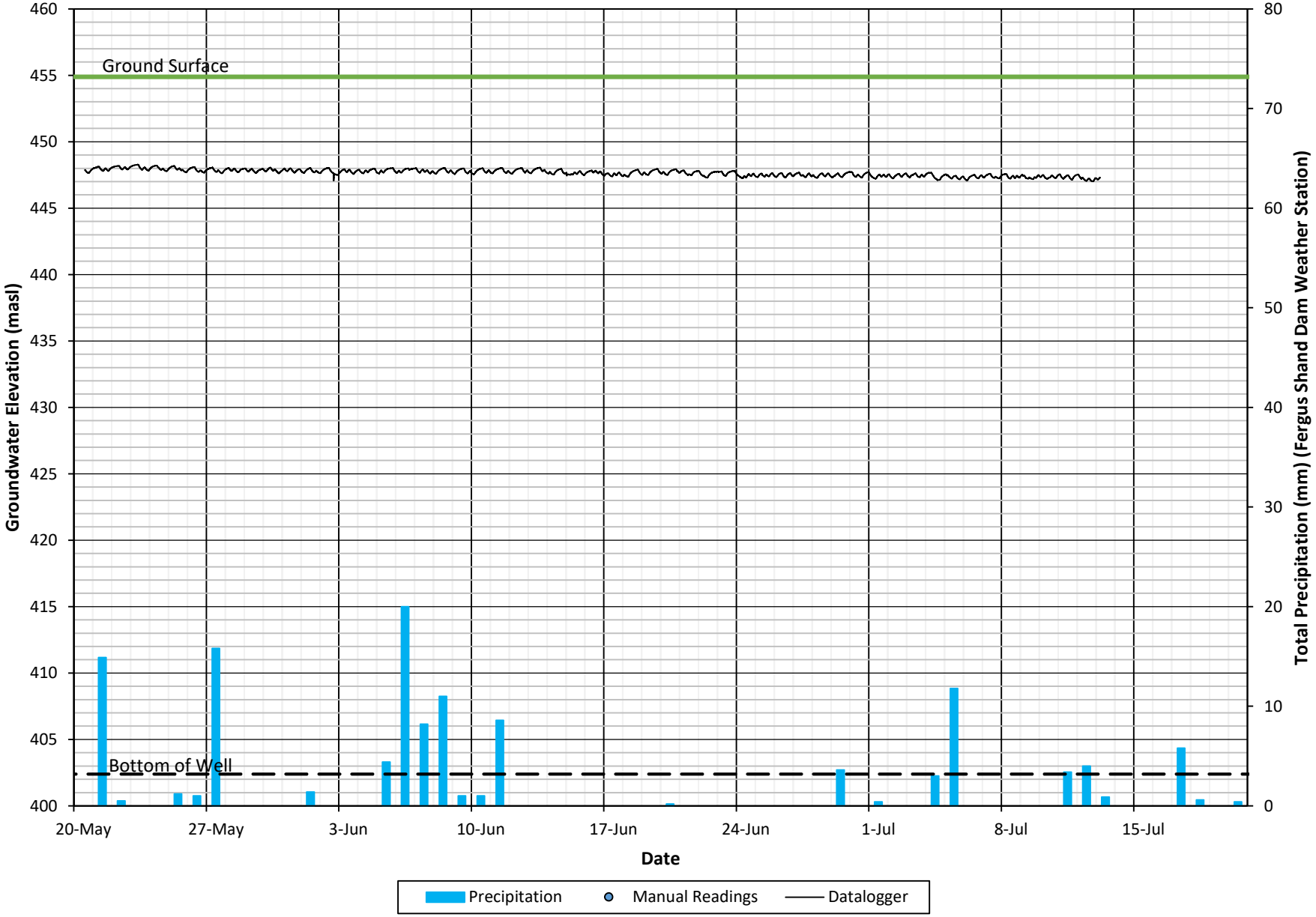
Arthur Test Well
Long Term Pumping Test
300052287

Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
Arthur Well 8B (DO) Detailed Hydrograph

R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Arthur Well 8AB

Arthur Test Well
Long Term Pumping Test
300052287

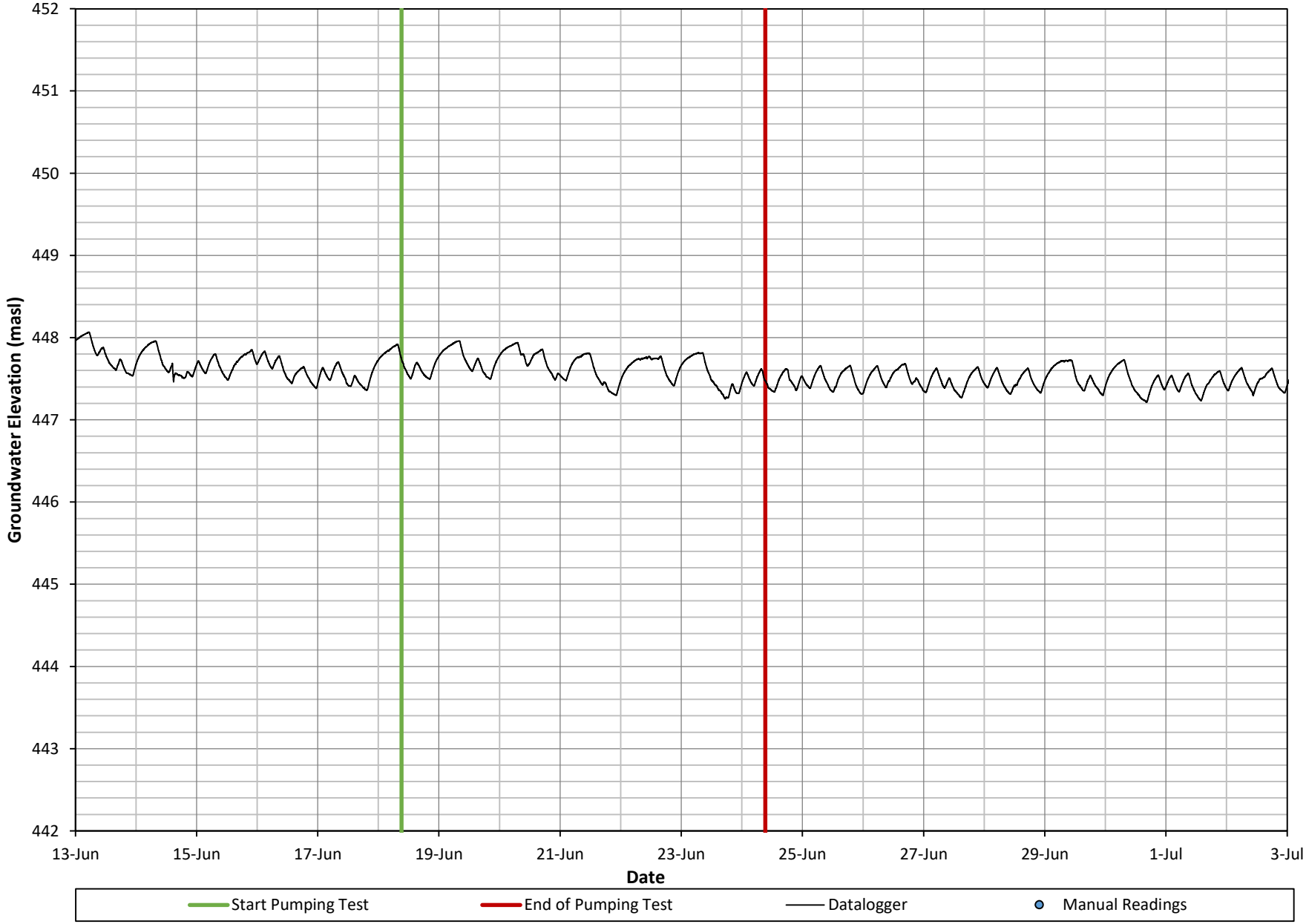
Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
WN-MW1-00 (DO) Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

Arthur Water Supply EA - Test Well TW1-21 Long Term Pumping Test
WN-MW1-00 (DO) Detailed Hydrograph



R.J. Burnside & Associates Limited
Date: 9/8/2022
File: 052287_Hydrographs 1

Arthur Test Well
Long Term Pumping Test
300052287

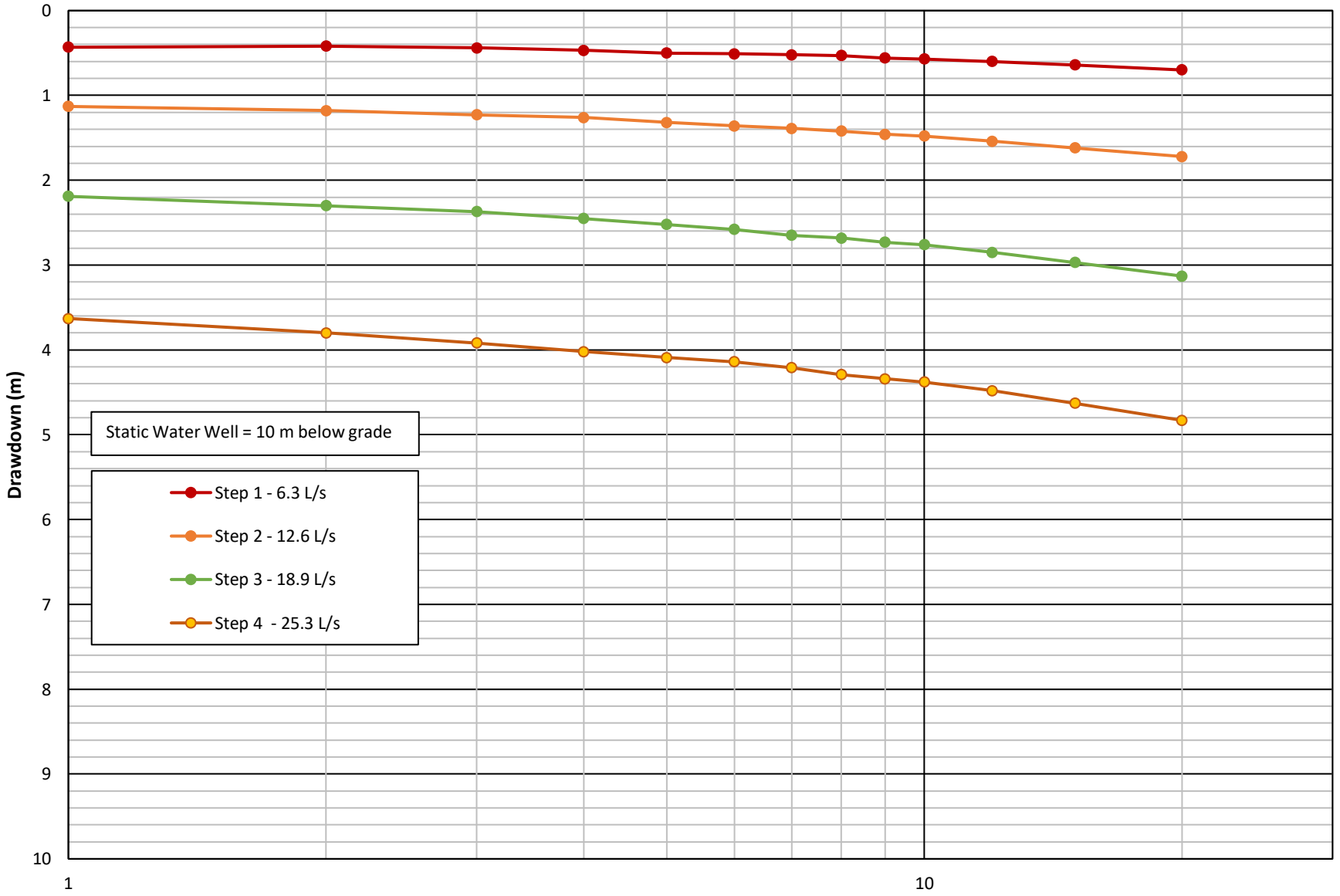
BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix E

Analytical Plots

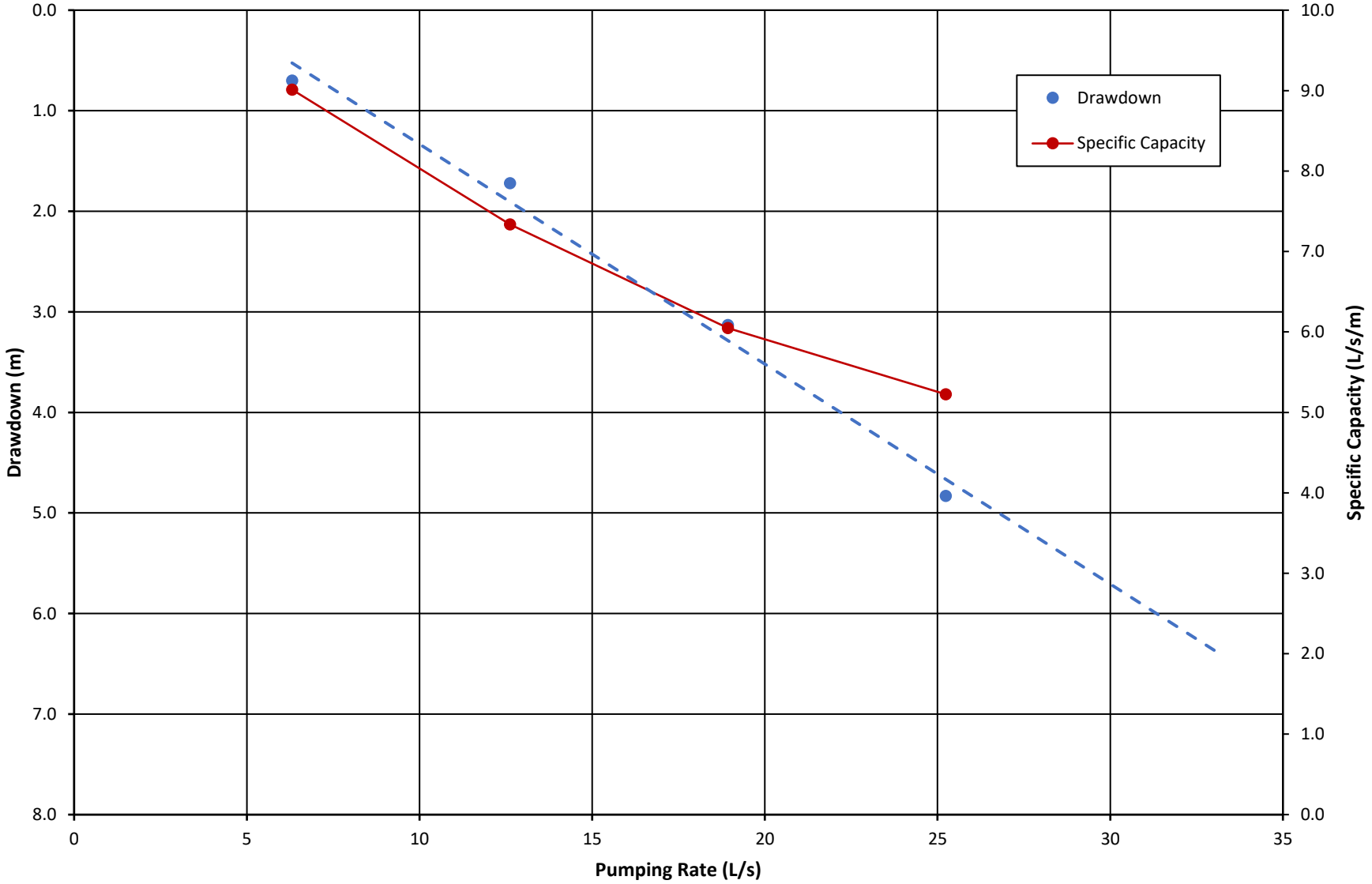
Wellington North, Arthur Test Well TW1-21
As Constructed Variable Rate Pumping Test, November 29, 2021



R.J. Burnside & Associates Limited
Date: 10/7/2022
File: Arthur Test Well - Nov 29, 2021 Steps.xlsx

Figure E-1
Variable Rate Testing
300052287

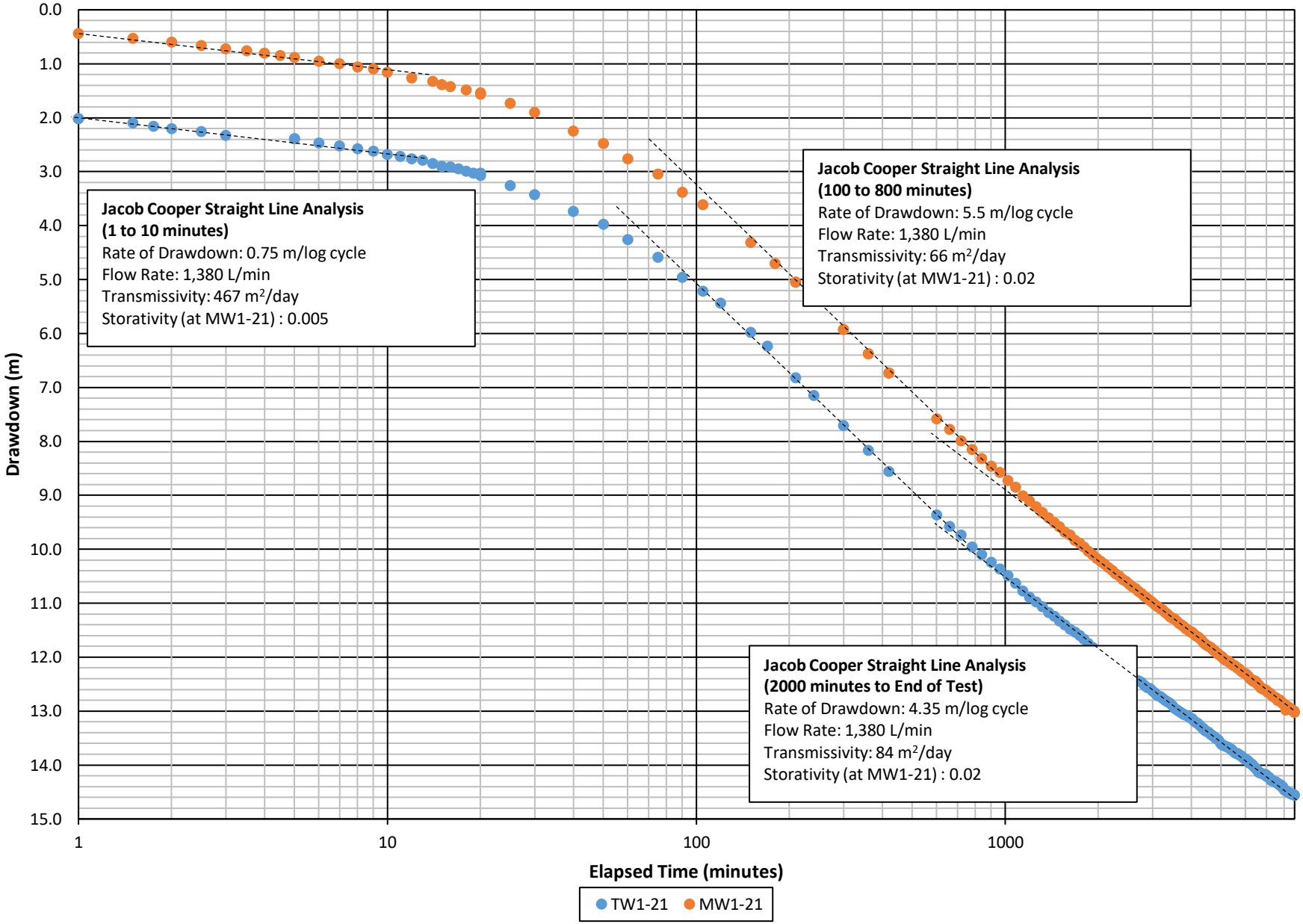
Arthur Test Well TW1-21 - Variable Rate Testing
Drawdown and Specific Capacity versus Pumping Rate November 29, 2021



R.J. Burnside & Associates
Date: 10/7/2022
File: Step Test Nov 29, 2021.xlsx

Figure E-2
Variable Rate Testing
300052287

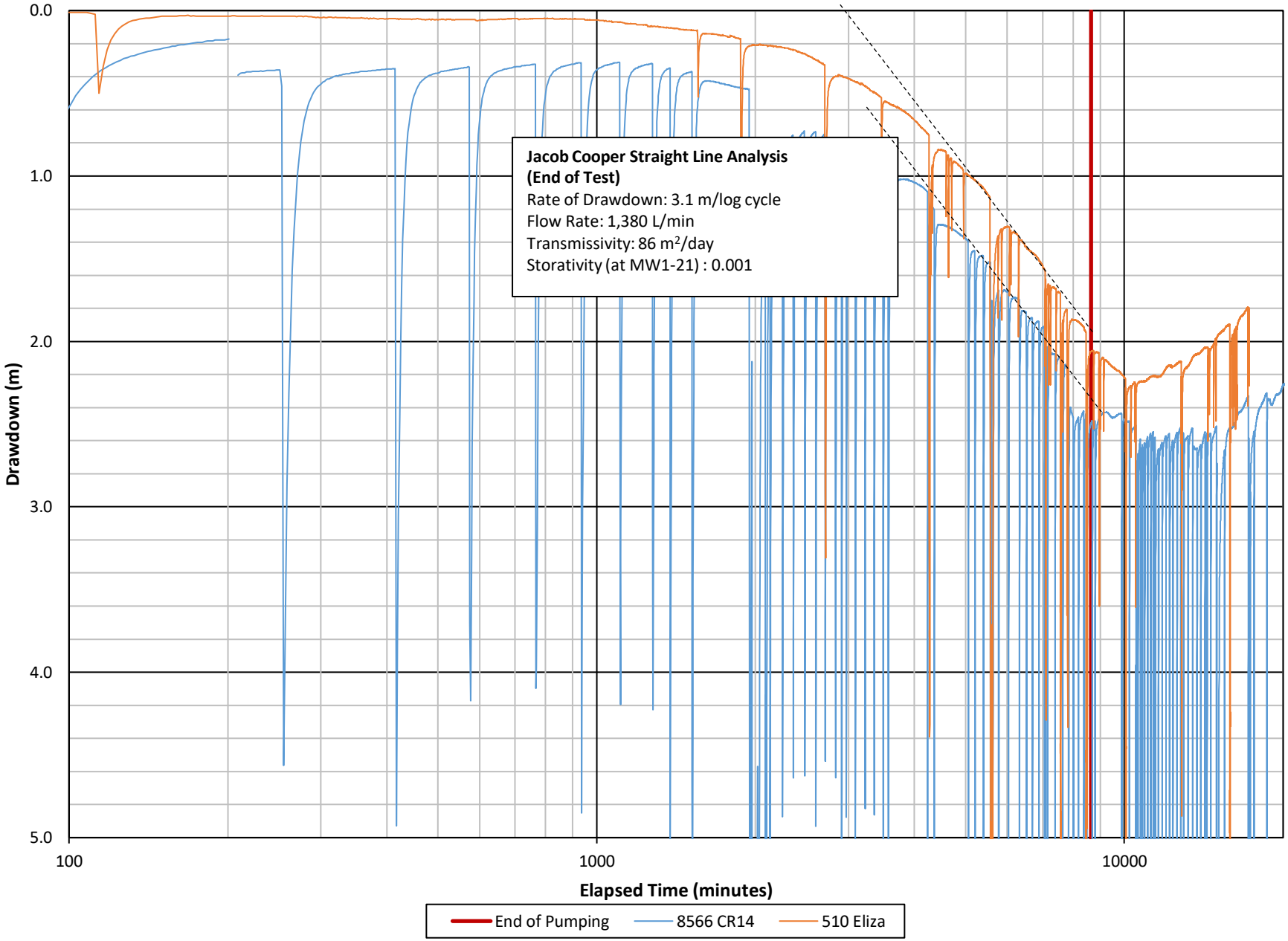
Arthur Long Term Pumping Test
Semilog Drawdown at TW1-21 and MW1-21



R.J. Burnside & Associates Limited
Date: 8/12/2022
File: 052287_Hydrographs 1.xlsx

Figure E-3
Long Term Pumping Test
300054100

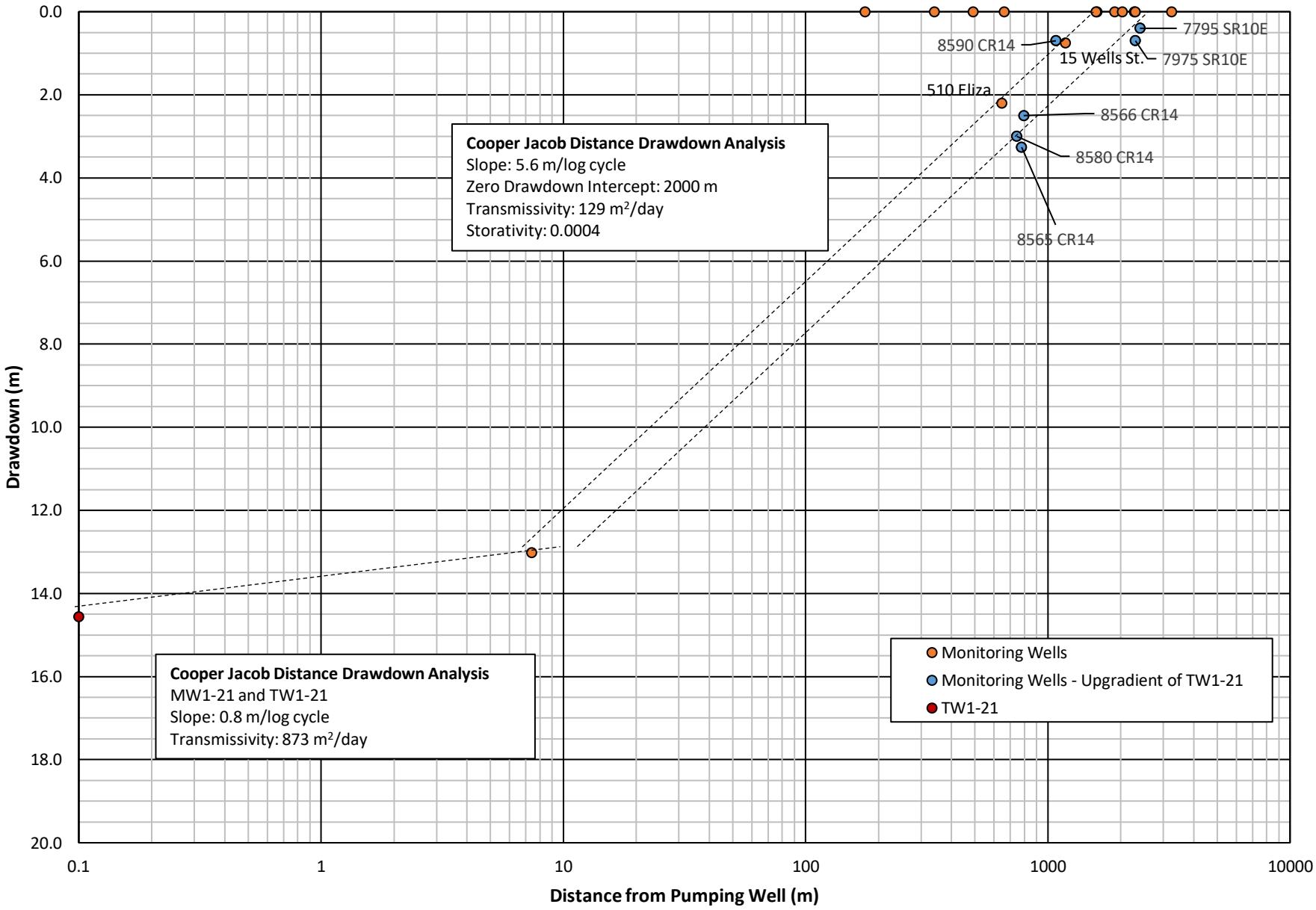
Arthur Long Term Pumping Test
Semilog Drawdown at 8566 Wellington County Rd. 14 and 510 Eliza Street



R.J. Burnside & Associates Limited
Date: 8/12/2022
File: 052287_Arthur LTT Summary.xlsx

Figure E-4
Long Term Pumping Test
300052287

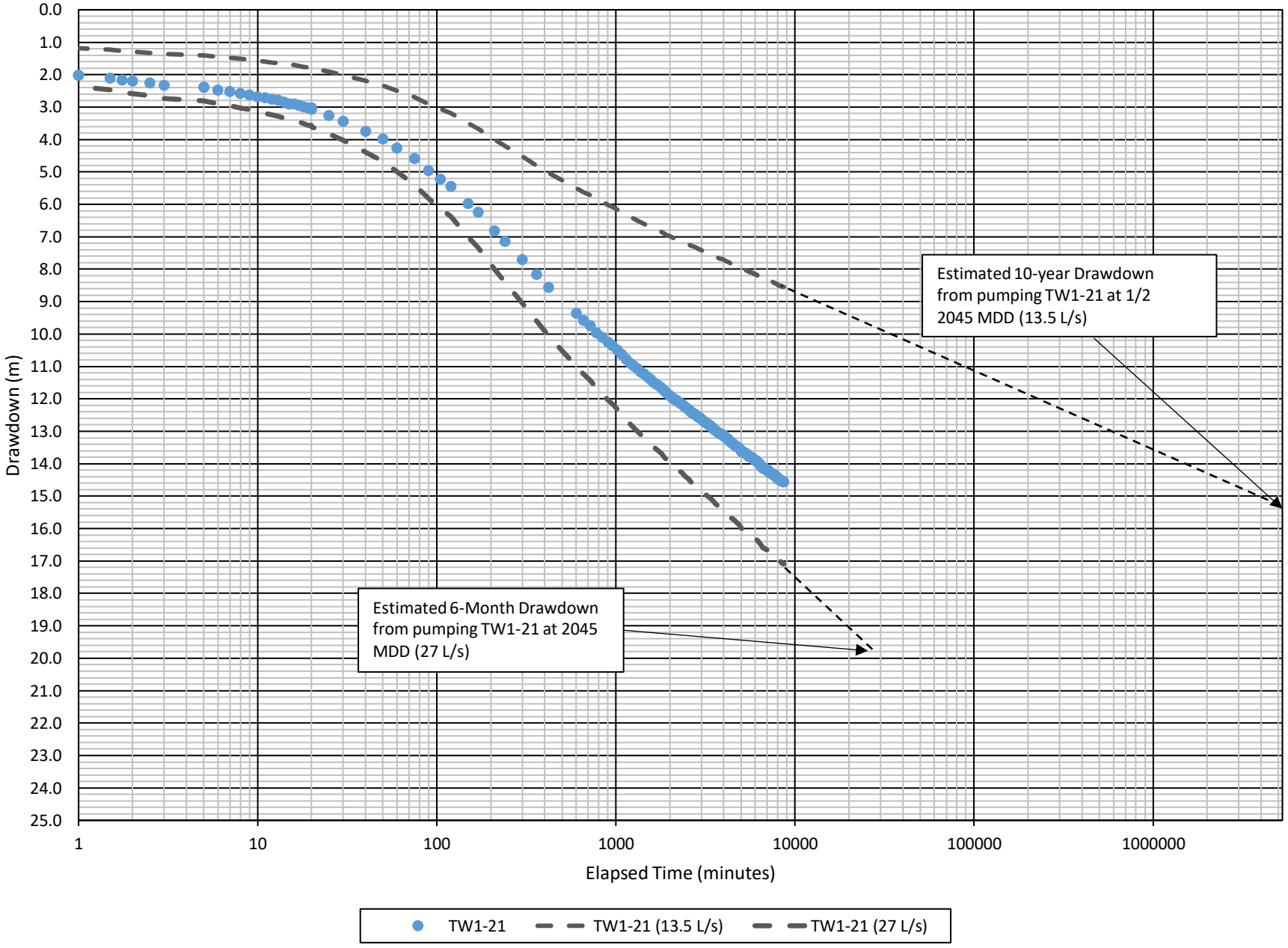
Pacey Long Term Pumping Test
Distance versus Drawdown



R.J. Burnside & Associates Limited

Figure E-5
Long Term Pumping Test
300054100

Arthur Test Well
Estimated Long-Term Drawdown at TW1-21

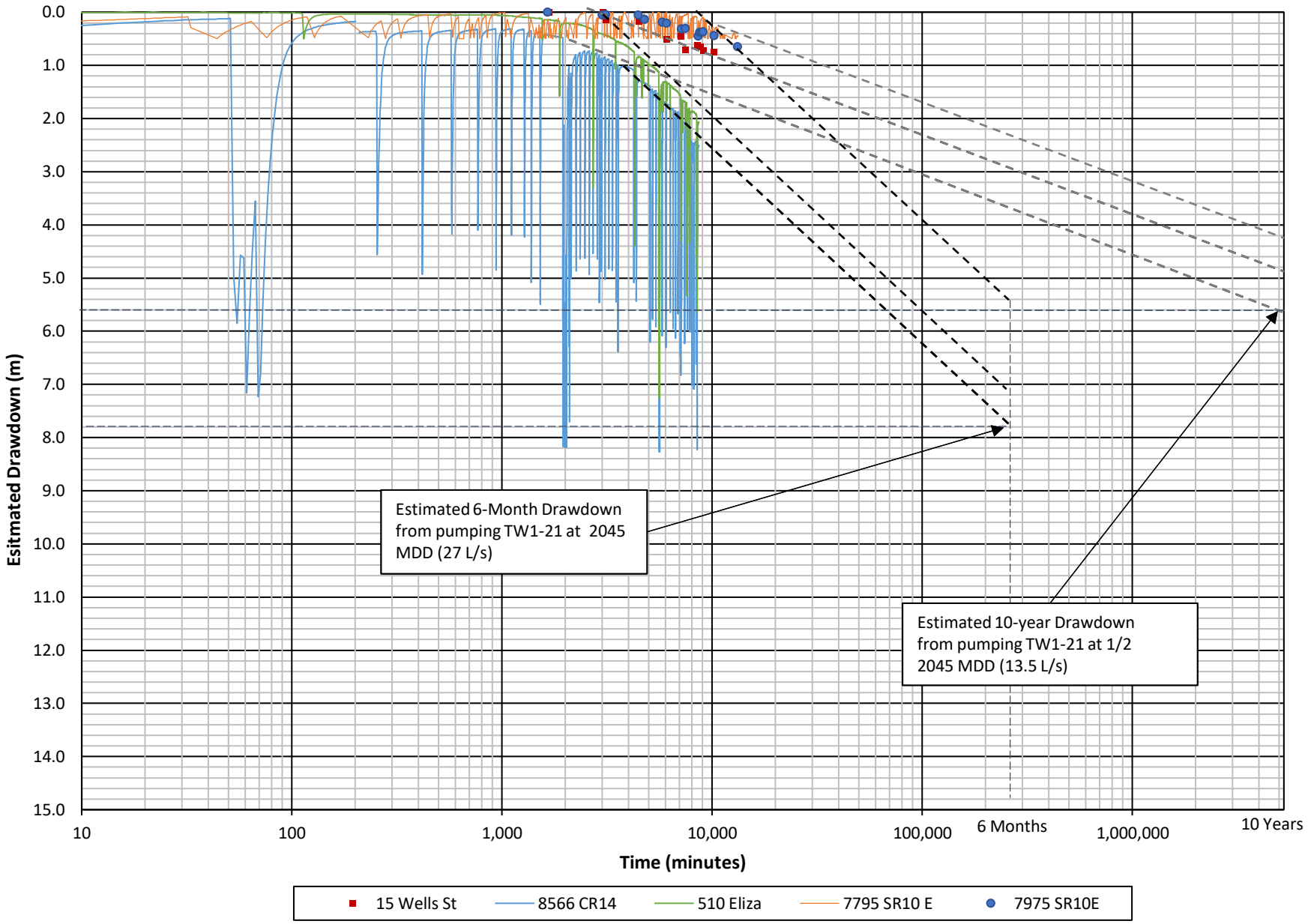


R.J. Burnside & Associates Limited
Date: 8/26/2022
File:: 052287_Hydrographs 1.xlsx

Figure E-6
Arthur Test Well
300054100

Arthur Test Well

Estimated Drawdown at 8566 Wellington County Rd. 14 and 510 Eliza Street



R.J. Burnside & Associates Limited
Date: 8/26/2022
File: 052287_Arthur LTT Summary.xlsx

Figure E-7
Long Term Pumping Test
300052287

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix F

Water Quality Results

Arthur Test Well
Long Term Pumping Test
TW1-21 Water Quality

Sample Date / Time				18-Jun-22 10:10	19-Jun-22 16:00	20-Jun-22 09:15	21-Jun-22 16:00	22-Jun-22 13:55	23-Jun-22 11:00	24-Jun-22 6:55
Elapsed Days				**0**	**1**	**2**	**3**	**4**	**5**	**6**
Analysis	**Units**	MAC	AO/OG							
E. Coli	cfu/100mL	0		---	0	0	0	0	0	---
Total Coliform	cfu/100mL	0		---	0	0	0	**2**	0	---
Alkalinity	mg/L as CaCO3		30-500	190	192	193	193	191	193	192
Bicarbonate	mg/L as CaCO3			190	192	193	193	191	193	187
Carbonate	mg/L as CaCO3			< 2	< 2	< 2	< 2	< 2	< 2	5
OH	mg/L as CaCO3			< 2	< 2	< 2	< 2	< 2	< 2	< 2
Colour	TCU		5	5	**7**	< 3	4	4	3	3
Conductivity	uS/cm			367	366	356	360	358	363	376
pH	No unit		6.5-8.5	8.16	8.11	8.23	8.26	8.17	8.19	8.38
Turbidity	NTU	1	5	---	0.74	0.86	0.63	0.75	0.76	0.42
Ammonia+Ammonium (N)	as N mg/L			0.2	0.2	0.5	0.2	0.2	0.2	0.2
Phosphorus (total reactive)	mg/L			< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Total Organic Carbon	mg/L			< 1	< 1	1	< 1	< 1	< 1	2
Chloride	mg/L		250	1.2	1.2	1.3	1.2	1.1	1.3	1.4
Fluoride	mg/L	1.5		0.49	0.48	0.5	0.54	0.55	0.55	0.51
Bromide	mg/L			< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nitrite (as N)	as N mg/L	1		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.19
Nitrate (as N)	as N mg/L	10		< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Sulphate	mg/L		500	7.3	6.5	7.1	6.3	6.3	6	5.9
Mercury (total)	mg/L	0.001		< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Hardness	mg/L as CaCO3		80-100	**137**	**142**	**149**	**153**	**149**	**154**	**151**
Aluminum (total)	mg/L		0.1	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001
Arsenic (total)	mg/L	0.01		0.0061	0.0067	0.0074	0.0069	0.0069	0.0063	0.007
Boron (total)	mg/L	5		0.076	0.072	0.069	0.066	0.064	0.077	0.082
Barium (total)	mg/L	2		0.0363	0.0348	0.0344	0.0364	0.035	0.0355	0.0332
Beryllium (total)	mg/L			< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
Cobalt (total)	mg/L			0.000061	0.000046	0.000063	0.000052	0.000047	0.000052	0.000048
Calcium (total)	mg/L			28.6	29.9	30.7	32.2	30.8	32.9	30.8
Cadmium (total)	mg/L	0.005		< 0.000003	< 0.000003	< 0.000003	0.000003	< 0.000003	0.000007	0.000007
Copper (total)	mg/L		1	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002	< 0.0002
Chromium (total)	mg/L	0.05		0.00014	0.00008	0.00012	0.00012	0.00015	0.00013	0.00009
Iron (total)	mg/L		0.3	0.079	0.122	0.136	0.174	0.143	0.149	0.153
Potassium (total)	mg/L			0.819	0.772	0.809	0.881	0.849	0.856	0.799
Magnesium (total)	mg/L			16.1	16.4	17.5	17.5	17.4	17.5	18.1
Manganese (total)	mg/L		0.05	0.0182	0.0161	0.0152	0.0151	0.0152	0.0155	0.0149
Molybdenum (total)	mg/L			0.00708	0.00591	0.00538	0.00519	0.00511	0.00533	0.00485
Nickel (total)	mg/L			0.0001	0.0001	0.0001	0.0002	0.0002	< 0.0001	0.0023
Sodium (total)	mg/L	20*	200	**26.9**	**23.3**	**24.2**	**23.4**	**22.6**	**22.4**	**23.3**
Phosphorus (total)	mg/L			< 0.003	< 0.003	0.01	< 0.003	< 0.003	0.021	< 0.003
Lead (total)	mg/L	0.01		< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Silicon (total)	mg/L			5.61	5.76	5.27	6.26	5.8	6.3	6.57
Silver (total)	mg/L			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Strontium (total)	mg/L			0.421	0.414	0.405	0.432	0.422	0.394	0.36
Thallium (total)	mg/L			< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
Tin (total)	mg/L			< 0.00006	0.00010	< 0.00006	< 0.00006	< 0.00006	0.00021	< 0.00006
Titanium (total)	mg/L			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.00014	< 0.00005
Antimony (total)	mg/L	0.006		< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Selenium (total)	mg/L	0.05		< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004
Uranium (total)	mg/L	0.02		0.000309	0.000263	0.000268	0.000262	0.000247	0.000236	0.000242
Vanadium (total)	mg/L			0.00010	0.00007	0.00007	0.00008	0.00007	0.00006	0.00006
Zinc (total)	mg/L		5	0.002	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002

ODWQS - Ontario Drinking Water Quality Standards
MAC - Maximum acceptable concentration
AO/OG - Aesthetic objectives/Operational Guidelines
Bold indicates an exceedence of the ODWQS

Arthur Test Well
Long Term Pumping Test
TW1-21 Water Quality

Sample Date / Time				18-Jun-22 10:10	19-Jun-22 16:00	20-Jun-22 09:15	21-Jun-22 16:00	22-Jun-22 13:55	23-Jun-22 11:00	24-Jun-22 6:55
Elapsed Days				**0**	**1**	**2**	**3**	**4**	**5**	**6**
Analysis	**Units**	MAC	AO/OG							
Aluminum (dissolved)	mg/L	---	0.1	---	---				< 0.001	
Arsenic (dissolved)	mg/L	0.01	---	---	---				0.0073	
Boron (dissolved)	mg/L	5	---	---	---				0.077	
Barium (dissolved)	mg/L	2.00	---	---	---				0.0373	
Beryllium (dissolved)	mg/L	---	---	---	---				< 0.000007	
Cobalt (dissolved)	mg/L	---	---	---	---				0.000055	
Calcium (dissolved)	mg/L	---	---	---	---				33.6	
Cadmium (dissolved)	mg/L	0.005	---	---	---				< 0.000003	
Copper (dissolved)	mg/L	---	1	---	---				< 0.0002	
Chromium (dissolved)	mg/L	0.05	---	---	---				0.00015	
Iron (dissolved)	mg/L	---	0.3	---	---				0.147	
Potassium (dissolved)	mg/L	---	---	---	---				0.875	
Magnesium (dissolved)	mg/L	---	---	---	---				18.3	
Manganese (dissolved)	mg/L	---	0.05	---	---				0.0157	
Molybdenum (dissolved)	mg/L	---	---	---	---				0.00485	
Nickel (dissolved)	mg/L	---	---	---	---				< 0.0001	
Sodium (dissolved)	mg/L	20*	200	---	---				**23.6**	
Phosphorus (dissolved)	mg/L	---	---	---	---				0.003	
Lead (dissolved)	mg/L	0.01	---	---	---				< 0.00009	
Silicon (dissolved)	mg/L	---	---	---	---				6.38	
Silver (dissolved)	mg/L	---	---	---	---				< 0.00005	
Strontium (dissolved)	mg/L	---	---	---	---				0.397	
Thallium (dissolved)	mg/L	---	---	---	---				< 0.000005	
Tin (dissolved)	mg/L	---	---	---	---				< 0.00006	
Titanium (dissolved)	mg/L	---	---	---	---				< 0.00005	
Antimony (dissolved)	mg/L	0.006	---	---	---				< 0.0009	
Selenium (dissolved)	mg/L	0.05	---	---	---				< 0.00004	
Uranium (dissolved)	mg/L	0.02	---	---	---				0.000244	
Vanadium (dissolved)	mg/L	---	---	---	---				0.00006	
Zinc (dissolved)	mg/L	---	5	---	---				< 0.002	
Cation sum	meq/L	---	---	3.97	3.90	4.1	4.12	4	4.11	4.09
Anion Sum	meq/L	---	---	4.01	4.03	4.06	4.05	4	4.04	4.03
Anion-Cation Balance	% difference	---	---	-0.51	-1.62	0.4	0.91	-0.04	0.78	0.79
Ion Ratio		---	---	0.99	0.97	1.01	1.02	1	1.02	1.02
Total Dissolved Solids (calculated)	mg/L	---	---	195	194	198	198	194	197	196
Conductivity (calculated)	uS/cm	---	---	399	396	408	408	400	408	406
Langeliers Index 4° C	@ 4° C	---	---	-0.04	-0.07	0.07	0.12	0	0.06	0.22
Saturation pH 4°C	pHs @ 4°C	---	---	8.20	8.18	8.16	8.14	8.17	8.13	8.16

ODWQS - Ontario Drinking Water Quality Standards
MAC - Maximum acceptable concentration
AO/OG - Aesthetic objectives/Operational Guidelines
Bold indicates an exceedence of the ODWQS

Ontario Drinking Water Quality Standards Summary
TW1-21

Analysis	Units	MAC	Half MAC	AO/OG	TW1-21 23-Jun-22 11:00
SCHEDULE 1 - Microbiological Standards					
E. Coli	cfu/100mL	0			0
Total Coliform	cfu/100mL	0			0
SCHEDULE 2 - Chemical Standards					
Alachlor	µg/L	5	2.5		0.02 <MDL
Antimony	µg/L	6	3		< 0.6
Arsenic	µg/L	10	**5**		6.8
Atrazine + N-dealkylated metabolites	µg/L	5	2.5		0.01 <MDL
Azinphos-methyl	µg/L	20	10		0.05 <MDL
Barium	µg/L	1000	500		32.3
Benzene	ug/L	1	0.5		0.32 <MDL
Benzo(a)pyrene	µg/L	0.01	0.005		0.004 <MDL
Boron	µg/L	5000	2500		69
Bromate	mg/L	0.01	0.005		<0.005
Bromoxynil	µg/L				0.33 <MDL
Cadmium	µg/L	5	2.5		0.004
Carbaryl	µg/L	90	45		0.05 <MDL
Carbofuran	µg/L	90	45		0.01 <MDL
Carbon Tetrachloride	µg/L				0.17 <MDL
Chloramines (calculated)	mg/L	***	***	***	***
Chlorate	mg/L				0.01 <MDL
Chlorite	mg/L				0.01 <MDL
Chlorpyrifos	µg/L	90	45		0.02 <MDL
Chromium	µg/L	50	25		< 0.08
Cyanide (total)	ug/L	200	100		< 2
Diazinon	µg/L	20	10		0.02 <MDL
Dicamba	µg/L	120	60		0.20 <MDL
1,2-Dichlorobenzene	µg/L	200	100		0.41 <MDL
1,4-Dichlorobenzene	µg/L	5	2.5	1	0.36 <MDL
1,2-Dichloroethane	µg/L	5	2.5		0.35 <MDL
1,1-Dichloroethylene (vinylidene chloride)	µg/L	14	7		0.33 <MDL
Dichloromethane	µg/L	50	25		0.35 <MDL
2,4-Dichlorophenol	µg/L	900	450	0.3	0.15 <MDL
Diclofop-methyl	µg/L	9	4.5		0.40 <MDL
Dimethoate	µg/L	20	10		0.06 <MDL
Dioxin and Furan	mg/L	1.5E-08			<DL
Diquat	ug/L	70	35		1 <MDL
Diuron	µg/L				0.03 <MDL
Ethylbenzene	ug/L	140	70	1.6	0.33 <MDL
Fluoride	mg/L	1.5	**0.75**		0.54
Glyphosate	ug/L	280	140		1 <MDL
Haloacetic acids	mg/L	0.08	0.04		-
Lead	µg/L	10	5		< 0.01
Malathion	µg/L	190	95		0.02 <MDL
Mercury	µg/L	1	0.5		< 0.01
2,4-dichlorophenoxyacetic acid (2,4-D)	µg/L				0.19 <MDL
Metolachlor	µg/L	50	25		0.01 <MDL
Metribuzin	µg/L	80	40		0.02 <MDL
Microcystin (Quantitative)	ug/L	1.5			0.1 <MDL
Monochlorobenzene	µg/L	80	40	30	0.3 <MDL
Nitrate (as N)	as N mg/L	10	5		0.006 <MDL
Nitrite (as N)	as N mg/L	1	0.5		0.003 <MDL
Nitrilotriacetic Acid (NTA)	mg/L	0.4	0.2		0.03 <MDL
N-Nitrosodimethylamine (NDMA)	ug/L	0.000009			<DL
Paraquat	ug/L	10	5		1 <MDL
Pentachlorophenol	µg/L	60	30	30	0.15 <MDL
Phorate	µg/L	2	1		0.01 <MDL
Picloram	µg/L	190	95		1 <MDL
Polychlorinated Biphenyls (PCBs) - Total	µg/L	3	1.5		0.04 <MDL
Prometryne	µg/L	1	0.5		0.03 <MDL
Selenium	µg/L	50	25		< 0.04
Simazine	µg/L	10	5		0.01 <MDL
Terbufos	µg/L	1	0.5		0.01 <MDL
Tetrachloroethylene (perchloroethylene)	µg/L				0.35 <MDL
2,3,4,6-Tetrachlorophenol	µg/L	100	50	1	0.20 <MDL
Toluene	ug/L	60	30	24	0.36 <MDL
Triallate	µg/L	230	115		0.01 <MDL
Trichloroethylene	µg/L	5	2.5		0.44 <MDL
2,4,6-Trichlorophenol	µg/L	5	2.5	2	0.25 <MDL
Trifluralin	µg/L				0.02 <MDL
Trihalomethanes (total)	µg/L	100 (RAA)	50		0.37 <MDL
Uranium	µg/L	20	10		0.245
Vinyl Chloride	µg/L	1	0.5		0.17 <MDL
Xylene (total)	ug/L	90	45	20	0.43 <MDL

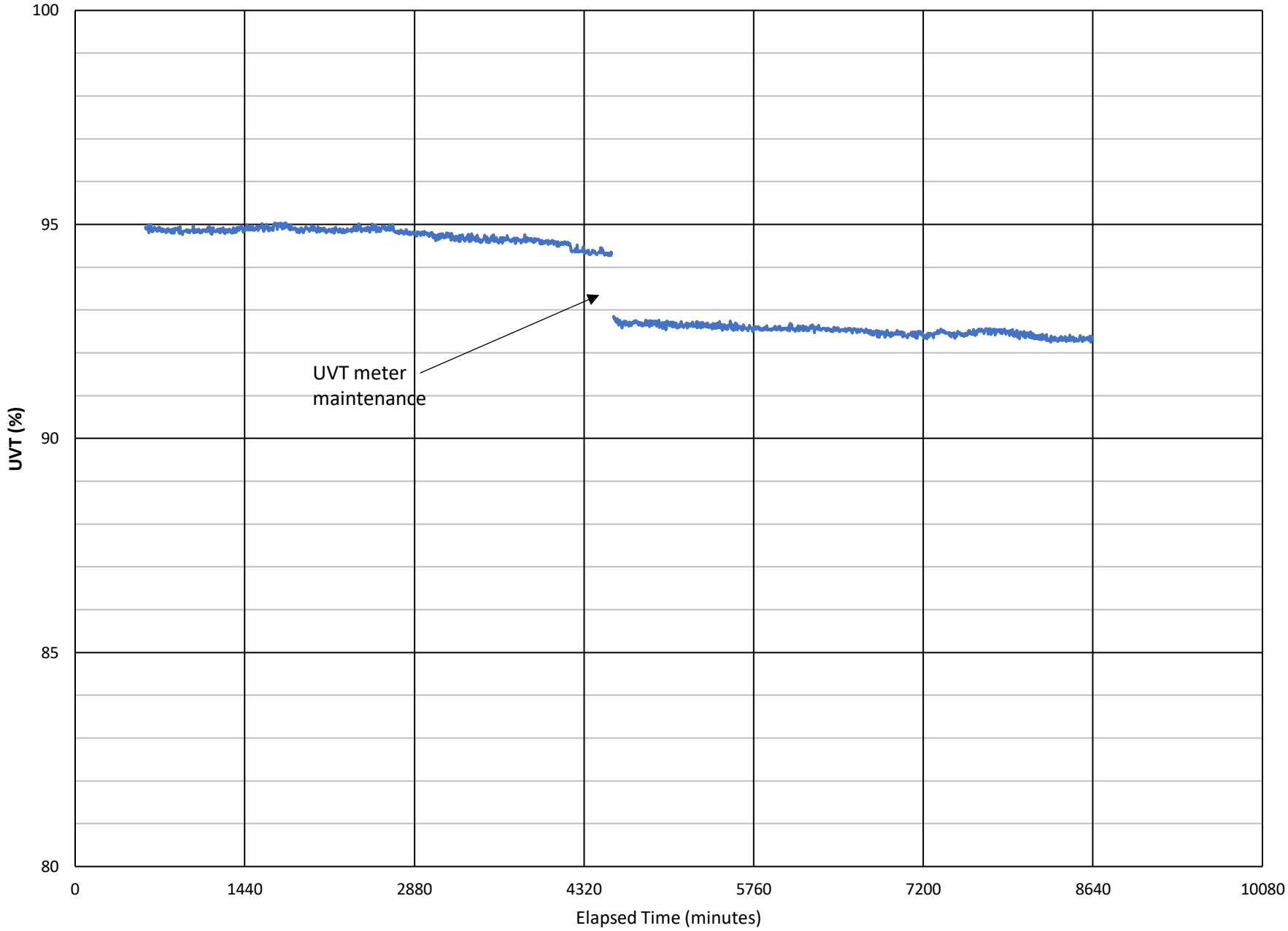
MDL - Method detection limit
DL - detection limit
AO/OG -Aesthetic Objective / Operation Guidelines
MAC - Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Summary
TW1-21

Analysis	Units	MAC	Half MAC	AO/OG	TW1-21 23-Jun-22 11:00
SCHEDULE 3 - Radionuclide (Pre-Scan Only)					
Gross Alpha (1)	Bq/L				< 0.11
Gross Beta (2)	Bq/L				< 0.1
Tritium	Bq/L				< 100
Chemical/Physical Objectives and Guidelines					
1,2-Dichlorobenzene	µg/L	200	100		0.41 <MDL
1,4-Dichlorobenzene	µg/L	5	2.5	1	0.36 <MDL
2,4-Dichlorophenol	µg/L	900	450	0.3	0.15 <MDL
2,3,4,6-Tetrachlorophenol	µg/L	100	50	1	0.20 <MDL
2,4,6-Trichlorophenol	µg/L	5	2.5	2	0.25 <MDL
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	µg/L				0.22 <MDL
Alkalinity (as CaCO3)	mg/L			30-500	197
Aluminum	µg/L			100	< 1
Chloride	mg/L			250	1.2
Colour	TCU			5	< 3
Copper	µg/L			1000	< 0.2
Dissolved Organic Carbon	mg/L			5	1
Ethylbenzene	ug/L	140	70	1.6	0.33 <MDL
Hardness (as CaCO3)	mg/L			80-100	148
Iron	ug/L			300	146
Manganese	µg/L			50	14.6
Methane	L/m3			3	0.06
Monochlorobenzene	µg/L	80	40	30	0.3 <MDL
Organic Nitrogen	mg/L			0.15	0.08
pH	No unit			6.5-8.5	8.05
Pentachlorophenol	µg/L	60	30	30	0.15 <MDL
Sodium	mg/L	20		200	**22.4**
Sulphate	mg/L			500	6
Sulphide	µg/L			50	< 6
Toluene	ug/L	60	30	24	0.36 <MDL
Total Dissolved Solids	mg/L			500	203
Turbidity	NTU	1	**0.5**	5	0.89
Xylene (total)	ug/L	90	45	20	0.43 <MDL
Zinc	µg/L			5000	< 2

MDL - Method detection limit
DL - detection limit
AO/OG -Aesthetic Objective / Operation Guidelines
MAC - Maximum Acceptable Concentration

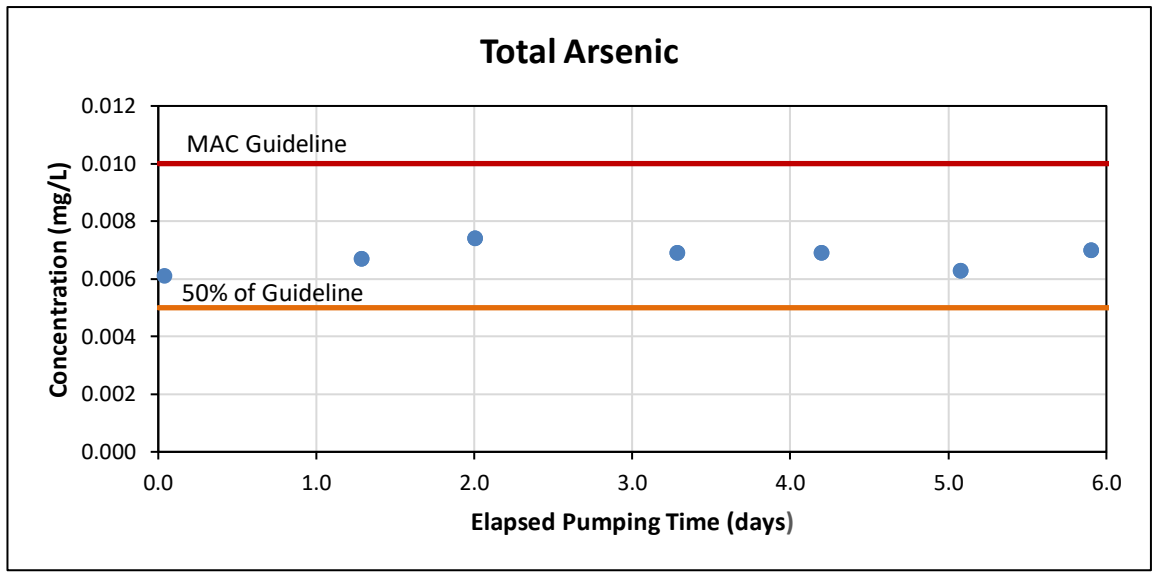
Arthur Test Well
Long Term Pumping Test

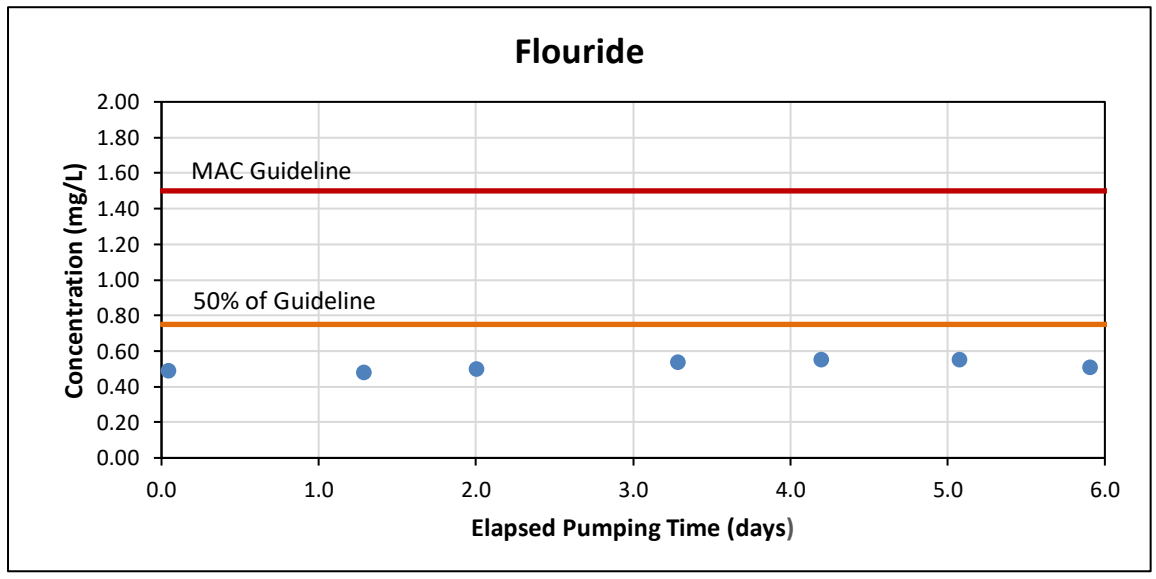


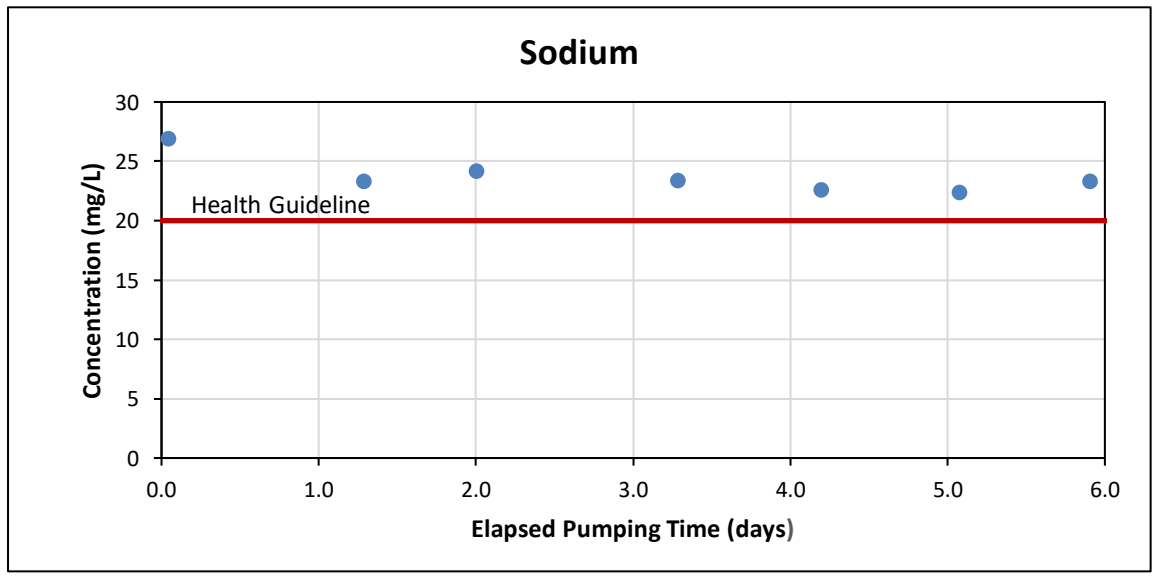
R.J. Burnside & Associates Limited
Date: 8/26/2022
File: Water Quality Board 6 day test.xls

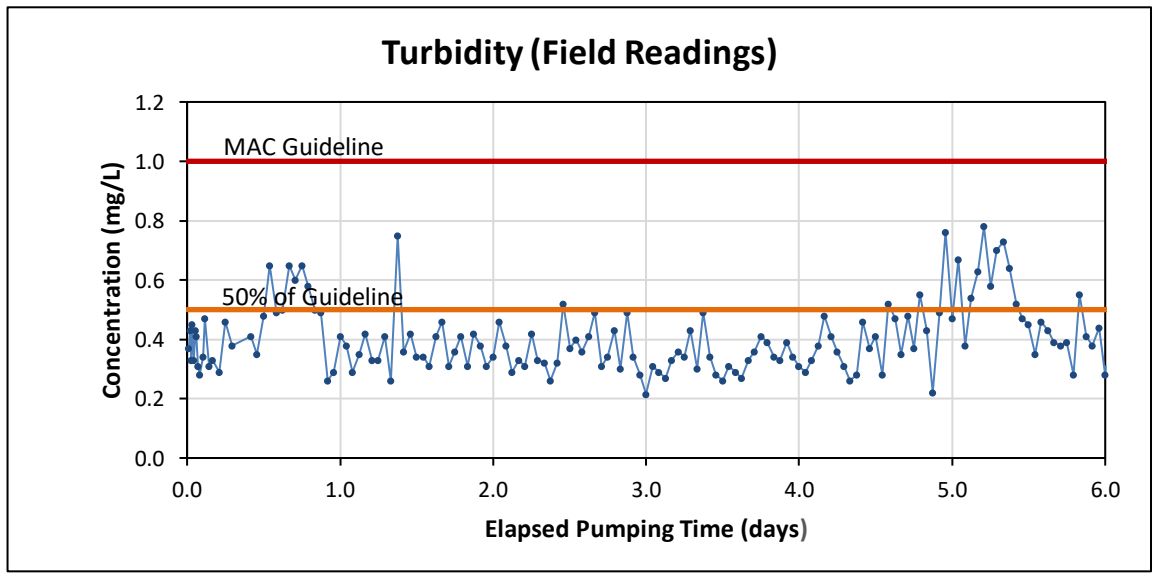
Appendix F
Online UVT Monitoring
300052287

Arthur Test Well
Long Term Pumping Test
Water Quality Trends









Arthur Test Well
Long Term Pumping Test
Deep Overburden Monitoring Well Water Quality

Sample ID				8590 CR14	
Sample Date / Time				17-Jun-22 10:00	23-Jun-22 08:55
Analysis	**Units**	MAC	AO/OG		
Alkalinity	mg/L as CaCO3		30-500	190	191
Bicarbonate	mg/L as CaCO3			189	191
Carbonate	mg/L as CaCO3			2	< 2
OH	mg/L as CaCO3			< 2	< 2
Colour	TCU		5	5	4
Conductivity	uS/cm			373	365
pH	No unit		6.5-8.5	8.28	8.26
Turbidity	NTU	1	5	6.53	7.76
Ammonia+Ammonium (N)	as N mg/L			0.45	0.2
Phosphorus (total reactive)	mg/L			< 0.03	< 0.03
Total Organic Carbon	mg/L			4	1
Chloride	mg/L		250	6.5	4.7
Fluoride	mg/L	1.5		0.56	0.6
Bromide	mg/L			<0.05	< 0.3
Nitrite (as N)	as N mg/L	1		<0.03	< 0.03
Nitrate (as N)	as N mg/L	10		0.161	< 0.06
Sulphate	mg/L		500	3.8	3.4
Mercury (total)	mg/L	0.001		0.00004	0.00001
Hardness	mg/L as CaCO3		80-100	112	109
Aluminum (total)	mg/L		0.1	**0.207**	**< 0.001**
Arsenic (total)	mg/L	0.01		0.0042	0.0038
Boron (total)	mg/L	5		0.137	0.135
Barium (total)	mg/L	2		0.0331	0.0308
Beryllium (total)	mg/L			0.000018	< 0.000007
Cobalt (total)	mg/L			0.000134	0.000031
Calcium (total)	mg/L			23.7	24.1
Cadmium (total)	mg/L	0.005		0.000172	0.000005
Copper (total)	mg/L		1	0.137	0.0002
Chromium (total)	mg/L	0.05		0.0003	0.00011
Iron (total)	mg/L		0.3	**0.994**	**0.671**
Potassium (total)	mg/L			1.07	0.7
Magnesium (total)	mg/L			12.8	11.9
Manganese (total)	mg/L		0.05	0.042	0.0413
Molybdenum (total)	mg/L			0.00647	0.00825
Nickel (total)	mg/L			0.0032	< 0.0001
Sodium (total)	mg/L	20*	200	**50.2**	**42.5**
Phosphorus (total)	mg/L			0.032	0.011
Lead (total)	mg/L	0.01		0.0376	< 0.00009
Silicon (total)	mg/L			5.123	6.14
Silver (total)	mg/L			<0.00005	< 0.00005
Strontium (total)	mg/L			0.304	0.311
Thallium (total)	mg/L			< 0.000005	< 0.000005
Tin (total)	mg/L			0.00045	0.00117
Titanium (total)	mg/L			0.00371	0.00006
Antimony (total)	mg/L	0.006		< 0.0006	< 0.0009
Selenium (total)	mg/L	0.05		0.00005	< 0.00004
Uranium (total)	mg/L	0.02		0.000454	0.000263
Vanadium (total)	mg/L			0.00009	0.00004
Zinc (total)	mg/L		5	0.313	0.005
Cation sum	meq/L	---	---	4.54	4.11
Anion Sum	meq/L	---	---	4.09	4.05
Anion-Cation Balance	% difference	---	---	5.28	0.71
Ion Ratio		---	---	1.11	1.01
Total Dissolved Solids (calculated)	mg/L	---	---	213	203
Conductivity (calculated)	uS/cm	---	---	432	408
Langeliers Index 4° C	@ 4° C	---	---	---	-0.01
Saturation pH 4°C	pHs @ 4°C	---	---	---	8.27

ODWQS - Ontario Drinking Water Quality Standards
MAC - Maximum acceptable concentration
AO/OG - Aesthetic objectives/Operational Guidelines
Bold indicates an exceedence of the ODWQS

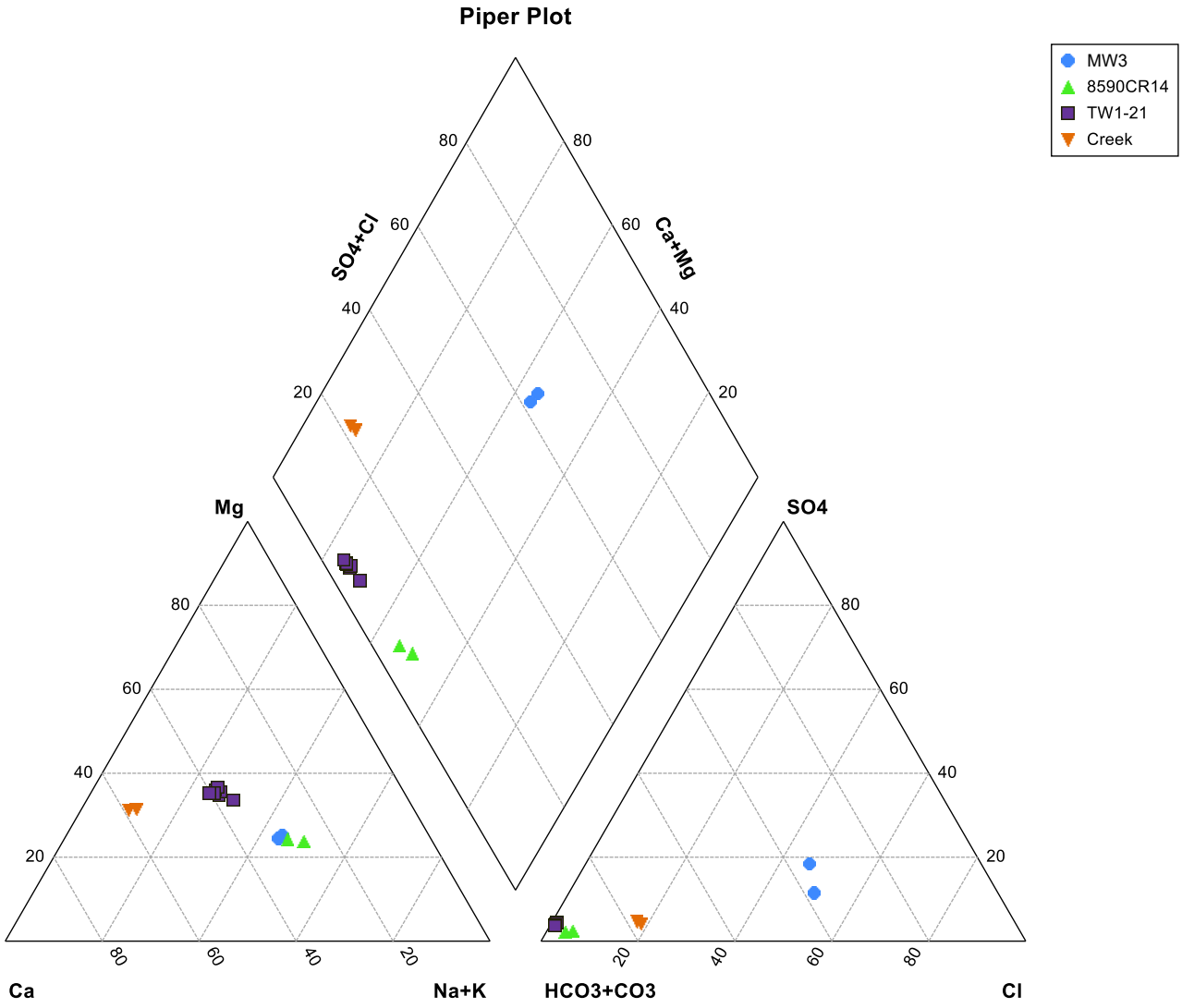
Arthur Test Well
Long Term Pumping Test
Shallow Monitoring Well Water Quality

Sample ID				MW3	
Sample Date / Time				18-Jun-22 08:30	24-Jun-22 7:15
Analysis	**Units**	MAC	AO/OG		
Alkalinity	mg/L as CaCO3		30-500	138	128
Bicarbonate	mg/L as CaCO3			138	128
Carbonate	mg/L as CaCO3			< 2	< 2
OH	mg/L as CaCO3			< 2	< 2
Colour	TCU		5	13	8
Conductivity	uS/cm			672	671
pH	No unit		6.5-8.5	8.10	8.05
Turbidity	NTU	1	5	---	0.28
Ammonia+Ammonium (N)	as N mg/L			0.3	0.3
Phosphorus (total reactive)	mg/L			< 0.03	< 0.03
Total Organic Carbon	mg/L			4	3
Chloride	mg/L		250	110	100
Fluoride	mg/L	1.5		0.31	0.27
Bromide	mg/L			< 0.3	< 0.3
Nitrite (as N)	as N mg/L	1		< 0.03	< 0.03
Nitrate (as N)	as N mg/L	10		< 0.06	< 0.06
Sulphate	mg/L		500	34	54
Mercury (total)	mg/L	0.001		< 0.00001	< 0.00001
Hardness	mg/L as CaCO3		80-100	168	165
Aluminum (dissolved)	mg/L		0.1	0.005	0.018
Arsenic (dissolved)	mg/L	0.01		0.0017	0.0021
Boron (dissolved)	mg/L	5		0.144	0.175
Barium (dissolved)	mg/L	2.00		0.0494	0.0452
Beryllium (dissolved)	mg/L			< 0.000007	0.000007
Cobalt (dissolved)	mg/L			0.000156	0.000292
Calcium (dissolved)	mg/L			37.9	36.0
Cadmium (dissolved)	mg/L	0.005		0.00007	0.000034
Copper (dissolved)	mg/L		1	0.0002	0.0011
Chromium (dissolved)	mg/L	0.05		0.00012	0.00058
Iron (dissolved)	mg/L		0.3	0.012	0.099
Potassium (dissolved)	mg/L			1.670	1.820
Magnesium (dissolved)	mg/L			17.9	18.1
Manganese (dissolved)	mg/L		0.05	0.0080	0.0158
Molybdenum (dissolved)	mg/L			0.16500	0.05870
Nickel (dissolved)	mg/L			0.0013	0.005
Sodium (dissolved)	mg/L	20*	200	60.1	59.9
Phosphorus (dissolved)	mg/L			< 0.003	0.007
Lead (dissolved)	mg/L	0.01		< 0.00009	< 0.00009
Silicon (dissolved)	mg/L			2.47	3.44
Silver (dissolved)	mg/L			< 0.00005	< 0.00005
Strontium (dissolved)	mg/L			1.630	1.530
Thallium (dissolved)	mg/L			< 0.000005	< 0.000005
Tin (dissolved)	mg/L			0.00012	0.00015
Titanium (dissolved)	mg/L			0.0001	0.00042
Antimony (dissolved)	mg/L	0.006		0.0042	0.0015
Selenium (dissolved)	mg/L	0.05		0.00083	0.00171
Uranium (dissolved)	mg/L	0.02		0.024500	0.010700
Vanadium (dissolved)	mg/L			0.00107	0.00075
Zinc (dissolved)	mg/L		5	< 0.002	0.002
Cation sum	meq/L			6.08	6.00
Anion Sum	meq/L			6.66	6.57
Anion-Cation Balance	% difference			-4.55	-4.52
Ion Ratio				0.91	0.91
Total Dissolved Solids (calculated)	mg/L			348	349
Conductivity (calculated)	uS/cm			637	628
Langeliers Index 4° C	@ 4° C			-0.14	-0.25
Saturation pH 4°C	pHs @ 4°C			8.24	8.30

ODWQS - Ontario Drinking Water Quality Standards
MAC - Maximum acceptable concentration
AO/OG - Aesthetic objectives/Operational Guidelines
Bold indicates an exceedence of the ODWQS
*Sodium over 20 mg/L is required to be reported to Public Health

Arthur Test Well
Long Term Pumping Test
Surface Water Quality

Sample ID		**Creek at SG1**	
Sample Date / Time		18-Jun-22 08:00	23-Jun-22 11:30
Analysis	**Units**		
Alkalinity	mg/L as CaCO3	319	331
Bicarbonate	mg/L as CaCO3	319	324
Carbonate	mg/L as CaCO3	< 2	7
OH	mg/L as CaCO3	< 2	< 2
Colour	TCU	24	20
Conductivity	uS/cm	798	765
pH	No unit	8.12	8.34
Ammonia+Ammonium (N)	as N mg/L	< 0.1	< 0.1
Phosphorus (total reactive)	mg/L	0.08	0.22
Total Organic Carbon	mg/L	4	4
Chloride	mg/L	42	47
Fluoride	mg/L	0.07	0.1
Bromide	mg/L	< 0.3	< 0.3
Nitrite (as N)	as N mg/L	0.24	0.2
Nitrate (as N)	as N mg/L	9.89	4.56
Sulphate	mg/L	15	14
Mercury (total)	mg/L	0.00004	< 0.00001
Hardness	mg/L as CaCO3	382	395
Aluminum (total)	mg/L	0.002	0.063
Arsenic (total)	mg/L	0.0008	0.0009
Boron (total)	mg/L	0.015	0.028
Barium (total)	mg/L	0.0302	0.0329
Beryllium (total)	mg/L	< 0.000007	0.000008
Cobalt (total)	mg/L	0.000123	0.000168
Calcium (total)	mg/L	100	102
Cadmium (total)	mg/L	0.000004	0.000012
Copper (total)	mg/L	0.0028	0.002
Chromium (total)	mg/L	0.00014	0.00017
Iron (total)	mg/L	0.010	0.102
Potassium (total)	mg/L	1.57	2.58
Magnesium (total)	mg/L	32.0	33.9
Manganese (total)	mg/L	0.00318	0.00506
Molybdenum (total)	mg/L	0.00042	0.00045
Nickel (total)	mg/L	0.0006	< 0.0001
Sodium (total)	mg/L	18.2	21.7
Phosphorus (total)	mg/L	0.106	0.322
Lead (total)	mg/L	0.00010	0.00015
Silicon (total)	mg/L	1.53	3.1
Silver (total)	mg/L	< 0.00005	< 0.00005
Strontium (total)	mg/L	0.229	0.223
Thallium (total)	mg/L	< 0.000005	0.000005
Tin (total)	mg/L	< 0.00006	0.0001
Titanium (total)	mg/L	0.00017	0.0019
Antimony (total)	mg/L	< 0.0009	< 0.0009
Selenium (total)	mg/L	0.00021	0.0002
Uranium (total)	mg/L	0.000836	0.000881
Vanadium (total)	mg/L	0.00064	0.00103
Zinc (total)	mg/L	0.005	< 0.002
Cation sum	meq/L	8.47	8.91
Anion Sum	meq/L	8.04	8.31
Anion-Cation Balance	% difference	2.64	3.48
Ion Ratio		1.05	1.07
Total Dissolved Solids (calculated)	mg/L	411	424
Conductivity (calculated)	uS/cm	826	861
Langeliers Index 4° C	@ 4° C	0.66	0.9
Saturation pH 4°C	pHs @ 4°C	7.46	7.44



BURNSIDE	**Arthur Pumping Test** Arthur Well Exploration Town of Wellington North	**Project No: 300052287** **Date: Augusr 2022**

BURNSIDE

Chlorine Demand Test

Project:	Arthur Well Exploration
Ref. Number:	300052287.0000
Client:	Town of Wellington North

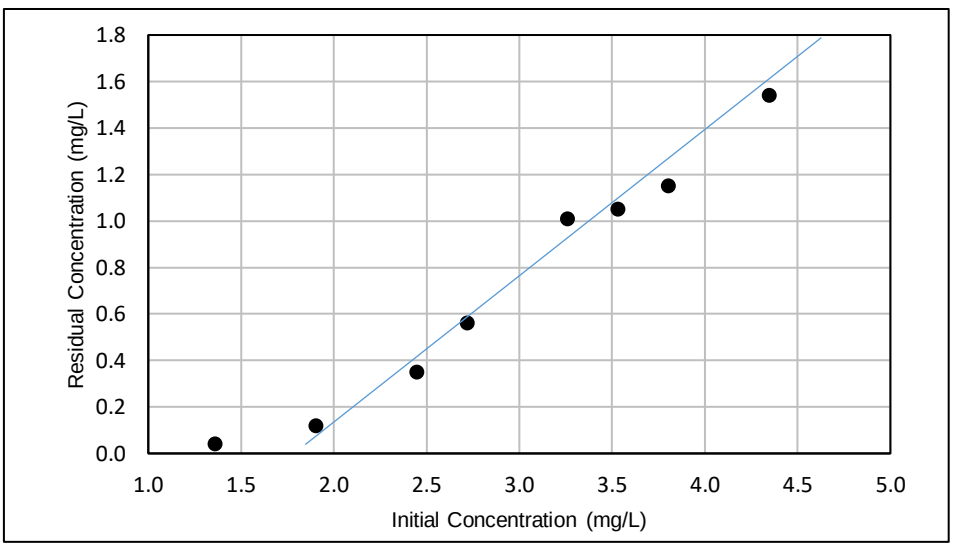
Well:	**TW1-21**	Tested by:	J.D.	Date:	23-Jun-22
Description:	End of LTT Test	Sampled From:	Sampling Tap	Sample Time:	10:00

Test Method: Colorimeter/DPD Method
Equipment: Hach DR/890 Portable Colorimeter
Reagent: Hach DPD Free Chlorine Reagent PP
Chlorine: Dosing Solution Ampules (1443 mg/L)

Sample Tested at:	
pH	7.8
Temperature (°C)	9.4
Turbidity (NTU)	0.05

Bottle Number		1	2	3	4	5	6	7	8
Bottle Volume	mL	531	531	531	531	531	531	531	531
Contact Time	minutes	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Chlorine Concentration	mg/L	1443	1443	1443	1443	1443	1443	1443	1443
Added Dose	mL	0.5	0.7	0.9	1.2	1.4	1.6	1.3	1.0
Initial Concentration	mg/L	1.36	1.90	2.45	3.26	3.80	4.35	3.53	2.72
Residual Concentration	mg/L	0.04	0.12	0.35	1.01	1.15	1.54	1.05	0.56
Chlorine Demand	mg/L	1.32	1.78	2.10	2.25	2.65	2.81	2.48	2.16

Result: Sample required a dose of 1.2 mg/L chlorine to get a free chlorine residual of 1.01 mg/L after 10 minutes at 9.4°C and pH 7.8.



R.J. Burnside & Associates Limited