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Strada Shelburne

ANNUAL COMPLIANCE REPORT 2023

Strada Aggregates Inc.

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Issue	Date	Description
1	March 28, 2024	Final Report

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1 Introduction

Tatham Engineering Limited (Tatham) has been retained by Strada Aggregates Inc. (Strada) to complete the 2023 compliance monitoring and reporting for the Strada Shelburne pits comprising the Bonnefield/Prince Pits, Melancthon Pit #1, and Melancthon Pit #2, all located on Part Lot 11-13, Concession 3, in the Township of Melancthon.

1.1 SITE DESCRIPTION

The Strada Shelburne aggregate pits, hereafter referred to as the "site", are located northwest of Shelburne, north of Dufferin 17 between Line 4 and Line 3. The site is 152 ha in size and is surrounded by rural residential properties and agricultural lands with a separate aggregate operation located immediately west of the site. The site is licensed for aggregate extraction under the Ministry of the Natural Resources and Forestry (MNRF) Aggregate Resources Act (ARA) for extraction of aggregate above the water table. Class "A" Pit Above Water Licenses are licensed to extract sand and gravel within 1.5 m of the water table. The location of the Strada Shelburne aggregate pits are shown on Figure 1.

2 Regulatory Requirements

The Strada Shelburne pits are comprised of the Bonnefield/Prince properties, Melancthon Pit #1, and Melancthon Pit #2. Each property has been integrated into one all-encompassing operation, which includes a closed loop washing facility regulated under the Melancthon Pit #2 Ontario Water Resources Act, Section 34, Permit to Take Water (PTTW) No.: 3210-AKRL9C, included in Appendix A.

Melancthon Pit #1 is located on the West Half of Lot 13, Concession 3, and has been licensed under MNRF ARA License No. 12253 since 2004. Melancthon Pit #2 is located on the West Half of Part Lot 11 and 12, Concession 3, and has been licensed under MNRF ARA License No. 625155 since 2012.

The proposed Bonnefield and Prince properties, which are located on Part of West Half of Lots 12 and 13, Concession 3, have not yet been licensed, but the expectation is these extensions will be fully integrated with the existing aggregate operations.

To monitor the groundwater and surface water conditions throughout extraction, an integrated monitoring plan was developed by Whitewater Hydrogeology (2018) to effectively identify and characterize any cumulative influences on the groundwater and surface water regimes as a result of any extraction and/or washing operations on-site. A copy of the integrated monitoring plan is included in Appendix B.

This report has been prepared to comply with both the PTTW and integrated monitoring plan requirements.

2.1 WATER TAKING

Strada is required to monitor daily water takings in accordance with PTTW 3210-AKRL9C. This data is required to be reported every year to the Ministry's Water Taking Reporting System on or before March 31 of the following year. PTTW 3210-AKRL9C allows for the taking of 4,000 L/min for a maximum of 10 hours per day while ensuring water takings do not exceed 2,400,000 L/day for a maximum of 230 days between April 1 and November 16 of each year.

The permitted water taking is for the purposes of washing gravel in a closed loop system and does not include dust suppression.

2.2 GROUNDWATER AND SURFACE WATER MONITORING REQUIREMENTS

The required groundwater and surface water monitoring program is summarized in Table 1, and the monitoring locations are shown on Figure 2.

Table 1: Monitoring Details

MONITORING LOCATION[1]	PARAMETER	FREQUENCY
INTEGRATED MONITORING PLAN REQUIREMENTS		
~~OW2A, OW2B,~~ OW3B, OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7C[2], OW8A, OW9A, OW10A[3], ~~OW11A, OW11B,~~ OW12A, OW13A, OW13C[2], OW14C[2], ~~OW15B,~~ OW16C[2], ~~OW17A, OW17B,~~ OW18A, OW18C[2], OW19A[3], OW19C[2], OW20C[2], OW21C[2], OW22C[2], OW23C[2]	Water Level	Continuous data logger
~~OW2A, OW2B,~~ OW3B, OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7B, OW8A, OW9A, OW10A[3], ~~OW11A, OW11B,~~ OW12A, OW13A, OW13C[2], OW14C, OW16C[2], OW18A, OW18C[2], OW19C[2], OW20C[2], OW21C[2], OW22C[2], OW23C[2]	Sulphate, Nitrates/Nitrites, ODWS Metals, Chloride, Alkalinity, Bicarbonate, pH, Conductivity	Semi-Annual (spring and fall)
OW5A, OW6A, OW7A, OW8A, OW9A, OW10A[3], ~~OW11A~~ OW12A, OW14C[2], OW16C[2], OW18A, OW20C[2], OW21C	Oil and Grease, PHC (F1-F4), BTEX	Annual
Wetland (SW1) and Vernal Pool (SW2)	Water Level	Continuous data logger
PTTW REQUIREMENTS		
Wash Pond[4], ~~OW2A, OW2B, OW2C,~~ OW3A[3], OW3B, OW4A, OW4B, OW4C[5], OW5A, OW5B, OW5C, OW6A, OW7A, OW7C, OW8A, ~~OW8B~~, OW9A, OW10A[3], OW10B, ~~OW11A, OW11C~~, OW12A, OW13A, North Pond, South Pond	Water Level	Continuous data logger

MONITORING LOCATION[1]	PARAMETER	FREQUENCY
ADDITIONAL DUE DILIGENCE MONITORING		
North Pond, South Pond	Sulphate, Nitrates/Nitrites, ODWS Metals, Chloride, Alkalinity, Bicarbonate, pH, Conductivity, Phosphorus, Hardness	Semi-Annual (spring and fall)
North Pond, South Pond	Surface Water Level	Continuous data logger
DW1, DW2, DW3, DW4, DW5	Water Levels	Continuous data logger
DW1, DW2, DW3, DW4, DW5	Sulphate, Nitrates/Nitrites, ODWS Metals, Chloride, Alkalinity, Bicarbonate, pH, Conductivity, Phosphorus, Hardness	Semi-Annual (spring and fall)

Note:
1. OW2A, OW2B, OW2C, OW8B, OW11A, OW11B, OW15B, OW17A and OW17B have been destroyed.
2. OW7B, OW14B, OW16B, OW18B, OW19B, OW20B, OW21C, OW22C, and OW23C are now referred to as OW7C, OW14C, OW16C, OW18C, OW19C, OW20C, OW21C, OW22C, and OW23C, respectively.
3. Monitoring of OW3A, OW10A, OW19A, and OW20A has been discontinued as the monitors were consistently dry through the summer months.
4. The wash pond was removed and reconstruction has been on-going throughout 2023. As the location has not been permanently constructed monitoring has been discontinued for the time being.
5. Monitoring of OW4C was discontinued in 2016.
6. Monitoring of OW21A was discontinued because the monitor was plugged.
7. Monitoring of OW22A and OW23A has been discontinued as the deep and shallow groundwater levels were very similar. It is suspected that the well seal between the deep and shallow is not sufficient.

All three of the pits have an extensive history of groundwater monitoring, which have been a part of the development of the site's integrated monitoring plan. The PTTW requires water levels to be monitored at 23 groundwater monitoring wells and three surface water locations, and the integrated monitoring plan requires water levels to be monitored at 31 groundwater monitoring wells and two surface water locations. The integrated monitoring plan also requires groundwater quality to be monitored semi-annually at 27 locations and annually at 13 locations. In addition to both the PTTW and integrated monitoring plan, water levels and semi-annual water quality is monitored in five off-site domestic water wells and an additional two surface water locations.

Monitors labelled with an "A" as the suffix are screened at the base of the sand and gravel unit (water table aquifer). Monitors labelled with a "B" as the suffix are screened at the base of the Tavistock Till (just above the bedrock contact). Monitors labelled with a "C" as the suffix are

constructed within the bedrock aquifer. Borehole records are included in Appendix C for reference.

The groundwater monitoring program focuses on the on-going monitoring of background conditions (upgradient locations) in both the overburden and bedrock aquifers as well as the monitoring of potential influences from the aggregate operation on down-gradient locations.

It is noted three monitoring wells were retrofitted with nested monitoring wells (OW24A and C, OW25A and C and OW26A and C), and additional monitoring wells were constructed at OW27C, OW28A, OW28C, OW29A, OW29C and OW30C during the 2023 monitoring period. The additional monitoring locations were constructed as part of an on-going hydrogeological assessment in support of a below water table aggregate license. As the new monitoring locations were installed in the fall of 2023 the monitoring results measured to date have not been included in the 2023 annual compliance report. However, they will be included in the annual compliance reports moving forward.

3 2023 Compliance Monitoring Results

3.1 WATER TAKING

In 2023, water was taken on 115 days between April 26 and November 20. The maximum reported daily taking was 2,028,980.72 L. The reported water takings for 2023 remain within the permitted volumes in accordance with PTTW 3210-AKRL9C. The 2023 daily water takings are summarized in Table 2.

3.2 GROUNDWATER MONITORING

Groundwater levels from the on-site and off-site monitoring wells were collected over the 2023 monitoring period, and the highest and lowest groundwater levels observed are summarized in Table 3. The monitoring wells are equipped with continuously recording dataloggers to allow for a detailed analysis of the groundwater conditions at the site. This is to allow for the assessment of the seasonal trends as well as the response to local precipitation events. The data logger values have been calibrated against manual measurements and the 2023 hydrographs are provided in Appendix D.

3.2.1 Overburden Groundwater Elevations (Series A)

The groundwater elevations in the vicinity of the Strada properties are strongly influenced by the bedrock topography and the buried bedrock valley system reported in the southeast portion of the study area. This feature has created a primarily downward gradient from the shallow overburden aquifer to the bedrock aquifer. As a result, the overburden is dry in the north and northwestern portion of Melancthon Pit #1 as well as beneath the Prince property. Permanent unsaturated conditions in the overburden are reported at OW3A, OW10A, OW14A, OW19A, and OW20A, where the first water-bearing zone is found beneath the bedrock contact (bedrock aquifer).

Generally, the groundwater level trends within the overburden aquifer (Series A) are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months. A summary hydrograph with all Series A water levels is provided in Figure 3. The groundwater elevations on-site within the overburden aquifer ranged across the site from 499.89 to 487.42 metres above sea level (m asl), with the highest groundwater levels noted between April and May, due to the spring melt. In general, the groundwater levels observed on-site in 2023 are consistent with groundwater levels and trends historically observed on-site.

Groundwater contour maps have been prepared for the shallow aquifers, based on the April and December (spring and fall) site visits. The general groundwater flow direction appears to be towards the east central portion of the site and the southeastern corner of the site, respectively, as shown on Figures 4 and 5.

3.2.2 Bedrock/Till Contact Groundwater Elevations (Series B and C)

Like the overburden water levels, the water levels in the Till contact unit and weathered bedrock aquifer (bedrock contact) show muted seasonal trends where water level highs are reached during the spring, followed by a slight decrease during the summer, fall, and winter months. Water levels in the bedrock aquifer are less influenced by seasonal trends and remain relatively stable over the monitoring period.

The groundwater elevations on-site at the Till contact (Series B) ranged across the site from 498.44 to 487.20 m asl, and the groundwater elevations on-site within the bedrock aquifer (Series C) ranged across the site from 498.20 to 496.61 m asl, with the highest groundwater levels noted between April and May due to the spring melt. A summary hydrograph with all Series B and C water levels are provided on Figures 6 and 7 respectively.

Groundwater contour maps have been prepared for the bedrock aquifer based on the April and December (spring and fall) site visits. The general groundwater flow direction appears to be towards the east as shown on Figures 8 and 9.

Table 2: 2023 Water Takings

DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)
26-Apr-23	--	12-May-23	821,434.36	1-June-23	1,377,889.89	20-June-23	1,249,185.89
27-Apr-23	1,843,495.54	15-May-23	1,218,902.59	2-June-23	1,563,375.07	21-June-23	1,249,185.89
28-Apr-23	1,839,710.13	16-May-23	1,430,885.65	5-June-23	969,065.42	22-June-23	1,729,933.19
1-May-23	1,714,791.54	17-May-23	1,226,473.42	6-June-23	1,025,846.59	22-June-23	1,673,152.01
2-May-23	950,138.36	18-May-23	1,075,056.95	7-June-23	1,514,164.71	27-June-23	1,052,344.48
3-May-23	--	19-May-23	158,987.29	8-June-23	1,563,375.07	28-June-23	1,181,048.48
4-May-23	1,396,816.95	23-May-23	1,135,623.54	9-June-23	802,507.30	28-June-23	1,056,129.89
5-May-23	1,574,731.30	24-May-23	1,813,212.24	12-June-23	401,253.65	29-June-23	1,676,937.42
6-May-23	1,510,379.30	25-May-23	1,022,061.18	13-June-23	--	30-June-23	1,631,512.48
8-May-23	1,510,379.30	26-May-23	--	14-June-23	620,807.53	4-July-23	1,003,134.12
9-May-23	1,873,778.83	29-May-23	586,738.83	15-June-23	1,782,928.95	5-July-23	651,090.83
10-May-23	1,866,208.01	30-May-23	1,760,216.48	16-June-23	1,854,851.77	6-July-23	726,799.06
11-May-23	1,162,121.42	31-May-23	1,756,431.07	19-June-23	1,067,486.12	7-July-23	1,661,795.77

DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)
10-July-23	972,850.83	27-July-23	1,593,658.36	17-Aug-23	1,866,208.01	7-Sep-23	1,885,135.07
11-July-23	--	28-July-23	1,642,868.71	18-Aug-23	1,438,456.48	8-Sep-23	1,673,152.01
12-July-23	1,854,851.77	31-July-23	1,131,838.12	21-Aug-23	1,090,198.59	11-Sep-23	--
13-July-23	1,907,847.54	1-Aug-23	647,305.42	22-Aug-23	1,881,349.66	15-Sep-23	1,131,838.12
14-July-23	1,824,568.48	2-Aug-23	1,983,555.77	23-Aug-23	1,022,061.18	18-Sep-23	1,146,979.77
17-July-23	1,181,048.48	3-Aug-23	980,421.65	24-Aug-23	1,919,203.77	18-Sep-23	495,888.94
18-July-23	1,983,555.77	4-Aug-23	1,680,722.83	25-Aug-23	934,996.71	19-Sep-23	1,711,006.13
19-July-23	1,900,276.72	8-Aug-23	934,996.71	28-Aug-23	1,143,194.36	20-Sep-23	1,673,152.01
20-July-23	1,885,135.07	9-Aug-23	1,911,632.95	29-Aug-23	1,487,666.83	21-Sep-23	1,570,945.89
21-July-23	1,491,452.24	10-Aug-23	2,017,624.48	30-Aug-23	1,328,679.54	22-Sep-23	1,658,010.36
24-July-23	--	11-Aug-23	1,854,851.77	31-Aug-23	1,911,632.95	25-Sep-23	1,294,610.83
24-July-23	681,374.12	14-Aug-23	1,317,323.30	1-Sep-23	1,438,456.48	26-Sep-23	1,688,293.66
25-July-23	1,922,989.19	15-Aug-23	2,028,980.72	5-Sep-23	882,000.95	27-Sep-23	1,767,787.30

DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)
26-July-23	1,953,272.48	16-Aug-23	--	6-Sep-23	1,858,637.19	28-Sep-23	1,230,258.83
29-Sep-23	1,328,679.54	16-Oct-23	1,146,979.77	30-Oct-23	--	13-Nov-23	870,644.71
2-Oct-23	1,097,769.42	17-Oct-23	1,695,864.48	31-Oct-23	1,033,417.42	14-Nov-23	1,782,928.95
3-Oct-23	1,563,375.07	18-Oct-23	1,654,224.95	1-Nov-23	1,695,864.48	15-Nov-23	1,692,079.07
4-Oct-23	1,646,654.13	19-Oct-23	1,563,375.07	3-Nov-23	1,582,302.13	16-Nov-23	1,722,362.36
5-Oct-23	1,692,079.07	20-Oct-23	--	3-Nov-23	1,457,383.54	17-Nov-23	1,536,877.18
6-Oct-23	1,680,722.83	23-Oct-23	1,101,554.83	6-Nov-23	1,131,838.12	20-Nov-23	1,037,202.83
10-Oct-23	1,063,700.71	24-Oct-23	1,536,877.18	7-Nov-23	1,105,340.24		
11-Oct-23	1,616,370.83	25-Oct-23	934,996.71	8-Nov-23	1,184,833.89		
12-Oct-23	1,782,928.95	26-Oct-23	1,733,718.60	9-Nov-23	1,260,542.12		
13-Oct-23	1,305,967.07	27-Oct-23	1,869,993.42	10-Nov-23	476,961.88		

Table 3: Manual Groundwater Elevations

WELL IDENTIFICATION	LOCATION (UTM NAD83)	GROUND ELEVATION (m asl)	WELL DEPTH (m bgs)	GROUNDWATER LEVEL ELEVATION (m asl)	
				HIGH	LOW
OW3B	17T 561273E, 4886844N	504.47	12.80	493.68	491.09
OW4A	17T 561355E, 4886425N	505.52	7.92	498.09	497.68
OW4-B	17T 561355E, 4886425N	505.52	13.72	498.44	497.51
OW5-A	17T 561738E, 4886523N	493.51	5.70	490.98	488.69
OW5-B	17T 561738E, 4886523N	493.51	10.05	492.64	488.34
OW5-C	17T 561738E, 4886520N	493.61	13.10	492.62	488.84
OW6-A	17T 561663E, 4886939N	494.13	7.80	493.30	490.14
OW7-A	17T 561771E, 4886674N	497.18	10.05	491.68	492.22
OW7-C	17T 561773E, 4886668N	496.98	30.60	489.77	488.25
OW8-A	17T 561282E, 4887057N	504.93	12.00	497.30	497.16
OW9-A	17T 561798E, 4887451N	496.51	6.40	493.43	491.02
OW10-B	17T 561632E, 4887297N	495.45	19.20	490.35	487.20
OW12-A	17T 561882E, 4887192N	495.70	7.62	493.36	492.09
OW13-A	17T 561140E, 4887598N	506.78	14.34	499.89	492.12 (dry)
OW13-C	17T 561140E, 4887598N	506.78	18.94	496.77	491.66 (dry)

WELL IDENTIFICATION	LOCATION (UTM NAD83)	GROUND ELEVATION (m asl)	WELL DEPTH (m bgs)	GROUNDWATER LEVEL ELEVATION (m asl)	
				HIGH	LOW
OW14-C	17T 561763E, 4887841N	496.82	20.00	483.44	479.82
OW16-C	17T 561726E, 4887993N	497.11	27.30	482.14	477.47
OW18-A	17T 561653E, 4887685N	501.21	19.80	488.49	487.42
OW18-C	17T 561653E, 4887685N	501.21	23.70	486.77	484.49
OW19-C	17T 561036E, 4888192N	510.32	35.50	484.28	481.74
OW20-C	17T 561544E, 4888333N	509.30	26.40	485.83	485.29
OW21-C	17T 561593E, 4888680N	511.41	25.30	487.70	487.17
OW22-C	17T 561384E, 4888890N	513.66	27.50	498.20	497.19
OW23-C	17T 560938E, 4888787N	510.31	29.50	497.79	496.61
DW1	17T 562951E, 4886286N	479.67	-	497.18	496.61
DW2	17T 562704E, 4888248N	482.36	-	473.14	472.14
DW3	17T 562373E, 4887677N	493.92	-	477.95	468.32
DW4	17T 562197E, 4890008N	486.02	-	483.33	479.78
DW5	17T 559538E, 4889095N	517.26	-	512.27	508.05

3.2.3 Groundwater Quality

To monitor groundwater conditions, representative groundwater samples were collected for the spring event on March 22 and March 28, 2023, and the fall event on October 20 and October 25, 2023. A summary of the sampled locations and parameters tested are summarized in Table 4.

Table 4: Groundwater Sampling Locations and Parameters

SAMPLING EVENT	SAMPLING TYPE	LOCATIONS SAMPLED	PARAMETERS TESTED
		On-Site Monitoring Wells	
March 22 and 28, 2023	Semi-Annual	OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7B, OW8A, OW9A, OW10A[1], OW12A, OW13A, OW13C, OW14C, OW16C, OW18A, OW18C, OW19C, OW20C, OW21C, OW22C, OW23C	Sulphate, Nitrates/Nitrites, ODWS Metals, Chloride, Alkalinity, Bicarbonate, pH, Conductivity
	Annual	OW5A, OW6A, OW7A, OW8A, OW9A, OW10A[1], OW12A, OW14C, OW16C, OW18C, OW20C, OW21C	Oil and Grease, PHC (F1-F4), BTEX
October 18, 2023	Semi-Annual	OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7C, OW8A, OW9A, OW10A, OW12A, OW13C, OW14C, OW18A, OW18C, OW20C, OW21C, OW22C, OW23C	Sulphate, Nitrates/Nitrites, ODWS Metals, Chloride, Alkalinity, Bicarbonate, pH, Conductivity,
		Domestic Water Wells	
October 4, 2022 and February 27, 2023	Semi-Annual	DW1, DW2, DW3, DW4, DW5	Sulphate, Nitrates/Nitrites, ODWS Metals, Chloride, Alkalinity, Bicarbonate, pH, Conductivity, Phosphorous, Hardness
October 17, 2023	Domestic	DW1, DW2, DW3, DW4, DW5	Sulphate, Nitrates/Nitrites, ODWS Metals, Chloride, Alkalinity, Bicarbonate, pH, Conductivity, Phosphorous, Hardness

Note:
1) OW10A did not have sufficient water to sample during the spring groundwater sampling round.

Each sample was collected using dedicated waterra tubing and was placed directly into pre-cleaned laboratory supplied vials and bottles with analytical test group specific preservatives. Dedicated nitrile gloves were used during sampling and non-dedicated equipment was sanitized between monitoring wells.

Samples were analyzed by Caduceon Environmental Laboratories (Caduceon), a CALA accredited lab, in Barrie. Groundwater chemistry results are included in the laboratory Certificates of Analysis included in Appendix E for reference.

The results were compared to the applicable Ontario Drinking Water Standards (ODWS) for due diligence purposes. Groundwater on-site generally met the applicable ODWS with the exception of:

- Hardness in the majority of the on-site monitors, which is typical for till and bedrock aquifers in southern Ontario;
- Nitrate in OW4A, 4B, 8A and 9A, which are assumed to be a result of the neighbouring agricultural activities;
- Aluminum in OW5A, 21C, and 23C, which is an ODWS Operational Guideline rather than an environmental or health related limit;
- Sodium in OW4B, 5A and 5B, which is assumed to be a result of the de-icing substances applied to County Road 17 located immediately to the south of these monitors;
- Manganese in OW7C, which is an ODWS Aesthetic Objective rather than an environmental or health related limit; and
- Iron in OW21C, which is typical for a bedrock aquifer in southern Ontario.

The results from 2023 are comparable to the historical ranges in concentrations reported at the monitoring wells. Further, no PHCs were noted in any of the tested wells.

The domestic water wells were also sampled and the individual homeowner letters for both the spring and fall sampling events are provided in Appendix F. 2023 was the first year which included water quality sampling of off-site private water wells. The groundwater was generally in compliance with the applicable Ontario Drinking Water Standards (ODWS) with the exception of hardness, manganese and iron which are still considered typical for bedrock water wells in southern Ontario. Further elevated concentrations of lead were noted in DW1 and DW3, however, after re-sampling from an indoor tap the lead concentrations were below the ODWS. As such, the elevated lead concentrations are considered to be erroneous. On both occasions the homeowner was notified regarding the elevated lead concentrations.

3.3 SURFACE WATER

Historically surface water monitoring has been completed during unfrozen conditions across the site at the North Pond, South Pond, Wash Pond, Vernal Pool (SW2), and Wetland (SW1). Historically, water levels within the Wash Pond have not been able to be collected due to issues with access, and data loggers were continually damaged as a result of the on-going aggregate activities. In 2024, a new approach to monitoring water levels in the Wash Pond will be initiated.

Surface water levels at the four on-site monitoring locations were collected over the 2023 monitoring period, and the highest and lowest surface levels observed are summarized in Table 5. The surface water locations are equipped with continuously recording dataloggers to allow for a detailed analysis of the water conditions at the site. This is to allow for the assessment of the seasonal trends as well as the response to local precipitation events. The data logger values have been calibrated against manual measurements and the 2023 hydrographs are provided in Appendix D.

Table 5: Manual Surface Water Elevations

LOCATION	COORDINATES	WATER LEVEL DEPTH (m)	
		High	Low
North Pond	17T 561630E, 4887268N	494.02	491.31 (Dry)
South Pond	17T 561778E, 4887155N	491.76	491.28 (Dry)
SW1 (Wetland)	17T 561767E, 4887622N	100.31[1]	99.68[1]
SW2 (Vernal Pool)	17T 561734E, 4887538N	100.29[1]	99.67[1]

Note:
1. For SW1 and SW2 a relative elevation of 100 m asl was assumed to assess seasonal changes in the surface water levels.

3.3.1 North and South Ponds

The North Pond and South Pond were measured using a datalogger tied to a string and a tree. The logger was thrown into the middle of the pond, and not removed throughout the year to try and keep results consistent.

Generally, the surface water level trends within the North and South Ponds are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months. The surface water elevations in the North and South Ponds ranged from 494.02 to 491.28 m asl, with the highest surface water levels noted between April and May, due to the spring melt. The North Pond dried out in the late fall, and the South Pond dried out between May and October. Dataloggers were removed in the late fall to limit damage to the devices. Hydrographs for the North and South Ponds are provided in Appendix D. Based on historical groundwater level monitoring it is assumed both the North and South Ponds are perched above the overburden aquifer.

In general, the surface water levels observed on-site in 2023 are consistent with surface water levels and trends historically observed on-site.

3.3.2 SW1 and SW2

SW1 and SW2 are located within the forested area approximately 100 m from the proposed extraction boundary of the Bonnefield Pit. Both features are perched above the water table and therefore isolated from the groundwater regime.

SW1 and SW2 were constructed by driving a steel, screened well point approximately 1 m into the ground. A steel pipe was attached to the top of this drive point so it could be easily located. SW1 was replaced and relocated in 2023 due to vandalism. These monitors are subject to freeze/thaw cycles and ice movement since they stay in all year round. As such, the data from year to year may vary slightly.

Generally, the surface water level trends at SW1 and SW2 are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months. The surface water elevations at SW1 and SW2 ranged from an elevation of 100.31 to 99.68 m, with the highest surface water levels noted between April and May, due to the spring melt. SW1 and SW2 both dried out in 2023 in late fall. Dataloggers were removed in the late fall to limit damage to the devices. Hydrographs for the North and South Ponds are provided in Appendix D.

In general, the surface water levels observed on-site in 2023 are consistent with surface water levels and trends historically observed on-site.

3.3.3 Surface Water Chemistry

To monitor surface conditions, representative surface water samples were collected from the North and South Pond on May 24 and October 19, 2023, and submitted for chemical analysis of sulphate, nitrates/nitrites, ODWS metals, chloride, alkalinity, bicarbonate, pH, conductivity, phosphorous, and hardness.

The samples were collected and placed directly into pre-cleaned laboratory supplied vials and bottles with analytical test group specific preservatives. Dedicated nitrile gloves were used during sampling.

Samples were analyzed by Caduceon, a CALA accredited lab, in Barrie. Surface water chemistry results are included in the laboratory Certificates of Analysis provided in Appendix E.

The results were compared to the applicable Provincial Water Quality Objectives (PWQO) for due diligence purposes. Surface water on-site generally met the applicable PWQO with the exception of iron during the fall sampling round at the North Pond. Further, elevated concentrations of phosphorous were noted during the fall sampling round when compared to interim PWQO. The 2023 water quality results are similar to previous years.

4 Conclusions

The compliance monitoring in support of the Bonnefield/Prince properties, Melancthon Pit #1 and Melancthon Pit #2 in 2023 was completed in accordance with the integrated monitoring plan developed for the aggregate operation and PTTW No. 3210-AKRL9C. The monitoring included surface and groundwater level monitoring and quality sampling at 24 groundwater monitoring wells, 5 surface water locations and 5 domestic wells in 2023.

In addition, the daily water takings were monitored and recorded for submission to the MECP via the Ministry's Water Taking Reporting System. The results of the 2023 monitoring program are summarized as follows:

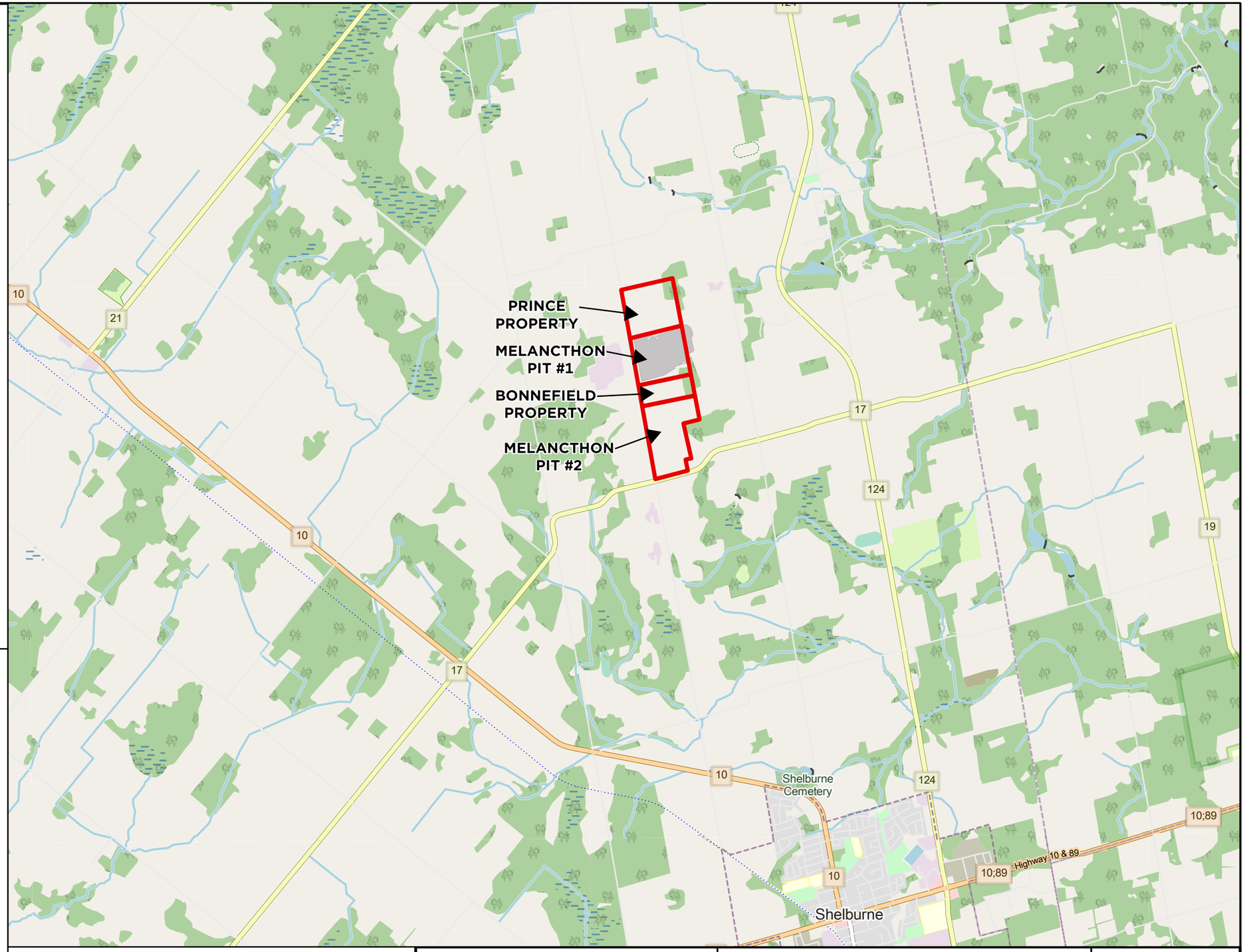
- The maximum recorded water taking was 2,028,981 L in 2023 and the water takings remained in compliance with the conditions of PTTW No. 3210-AKRL9C;
- The overburden groundwater elevations are seasonal, peaking in the spring and decreasing over the summer months, and the 2023 monitoring results are consistent with historic trends;
- The bedrock/till groundwater elevations show muted seasonal trends, with highs in the spring followed by slight declines through the summer, and the 2023 monitoring results are consistent with historic trends;
- The groundwater quality on-site generally met the applicable OPWS with a few noted exceptions, however, the 2023 results are comparable to the historic trends and no PHCs were noted in any of the tested wells;
- The water levels in the north and south ponds varied seasonally over the year, with highs in the spring and drying out over the summer or fall, and the 2023 monitoring results are consistent with the historic trends;
- The water levels at SW1 and SW2 varied seasonally in 2023, with highs in the spring and drying out in the fall, and the 2023 monitoring results are consistent with the historic trends;
- The surface water quality on-site generally met the application PWQO, with the exception of iron in the north pond and phosphorus during the fall sampling round; but the results are consistent with trends; and
- The wash pond water levels were unable to be obtained in 2023 due to access issues and a damaged data logger and a new monitoring approach will be employed in 2024 to resolve this issue.

N

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2.CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

SITE



0 0.75 1.5 3 KILOMETERS

TATHAM ENGINEERING

STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
SITE LOCATION PLAN

DWG. No. **FIG-1**

SCALE: 1:50,000 | DRAWN: AO | DATE: MAR. 2024 | JOB NO. 123016

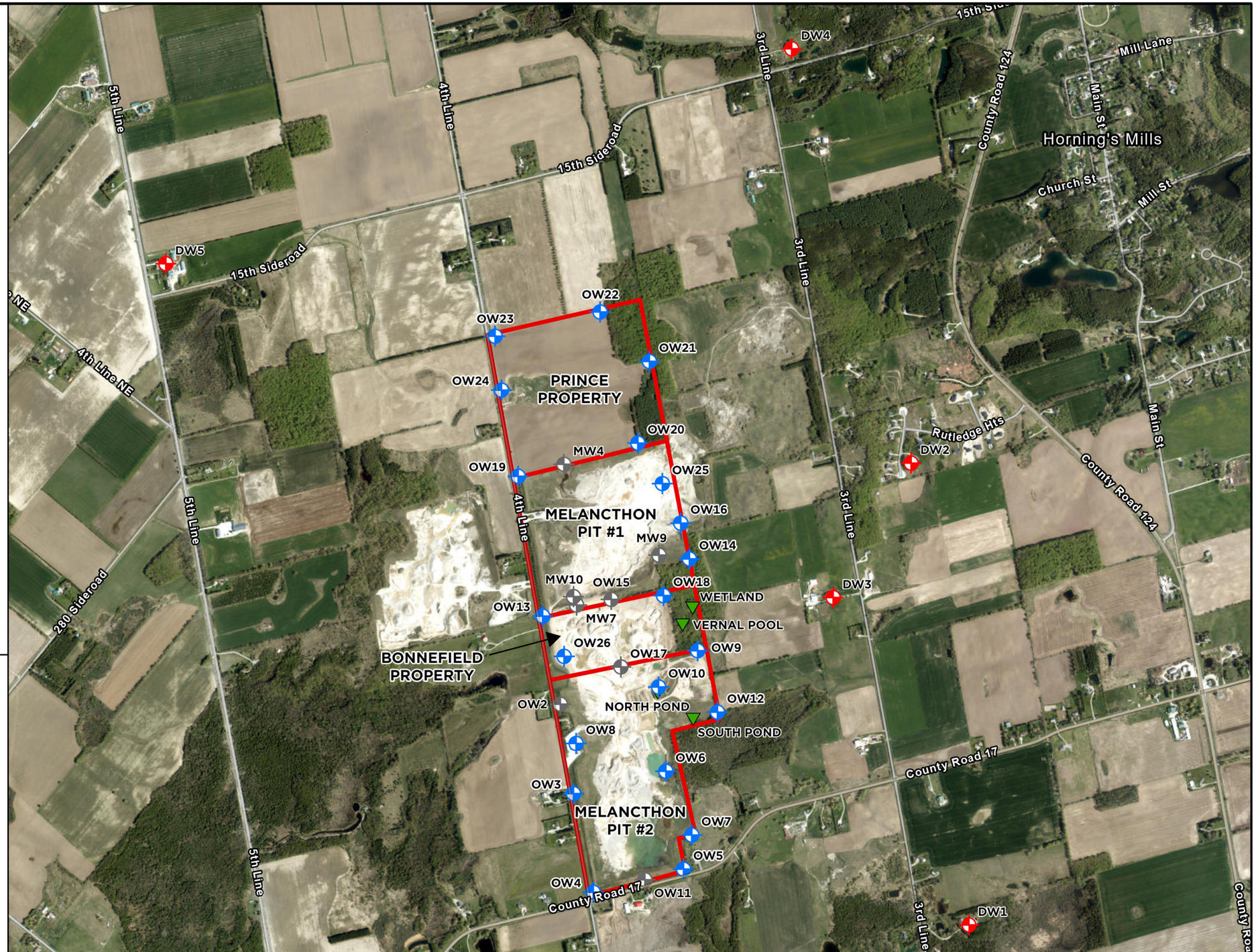
I:\2023 Projects\123016 - Strada - Shelburne\GIS\GIS Models\123016 - Strada - Shelburne\123016 - Strada - Shelburne.aprx

N

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2.CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

- SITE
- DOMESTIC WELLS
- DESTROYED WELLS
- SURFACE WATER LOCATIONS



0 350 700 1,400 METERS

TATHAM ENGINEERING

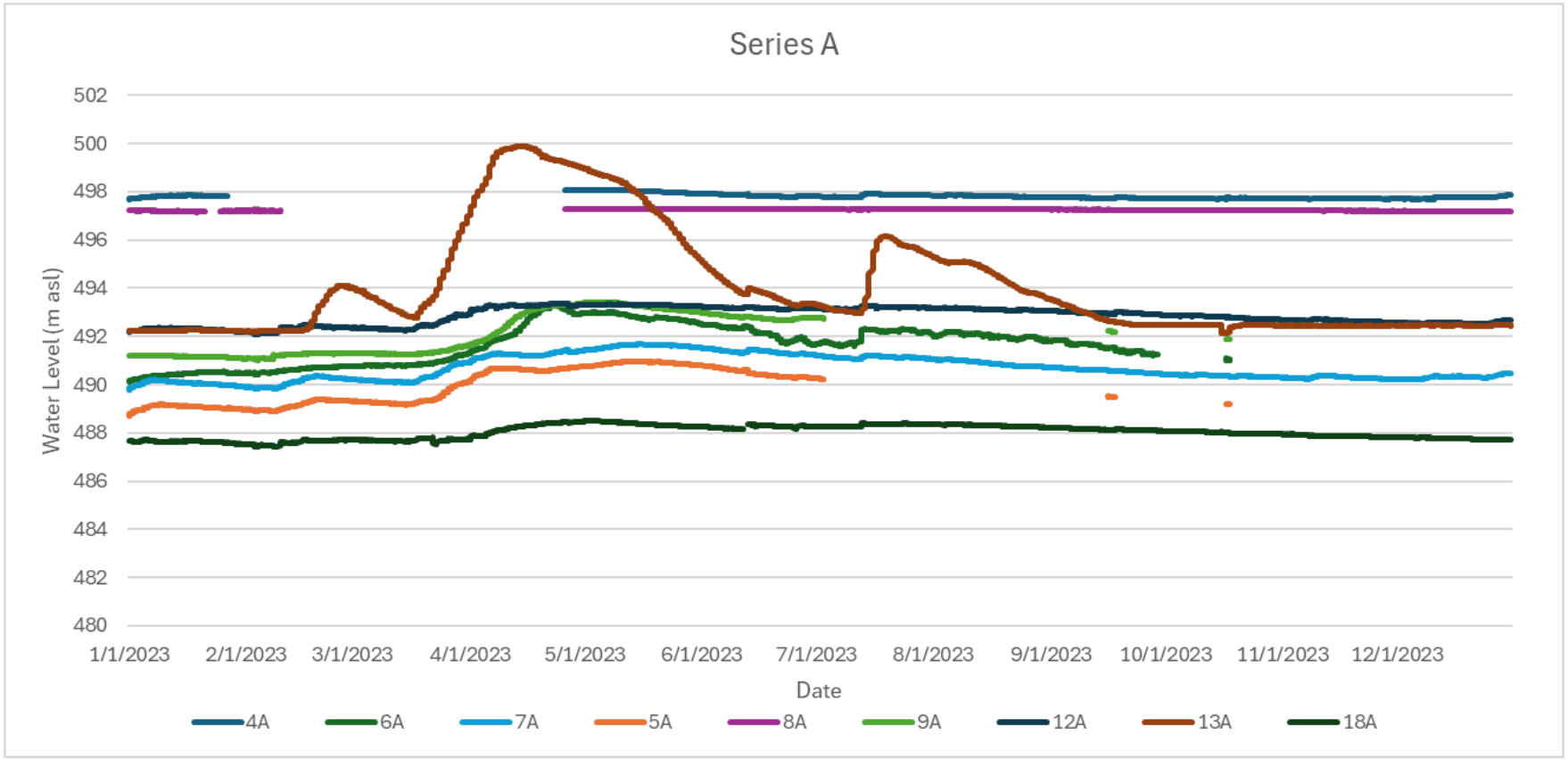
STRADA PIT, SHELBURNE
2023 ANNUAL COMPLIANCE REPORT
GROUNDWATER AND SURFACE WATER MONITORING LOCATIONS

DWG. No. **FIG-2**

SCALE: 1:17,000 | DRAWN: AO | DATE: MAR. 2024 | JOB NO. 123016

I:\2023 Projects\123016 - Strada - Shelburne\GIS\GIS Models\123016 - Strada - Shelburne\123016 - Strada - Shelburne.aprx

Figure 3: Series A 2023 Groundwater Levels

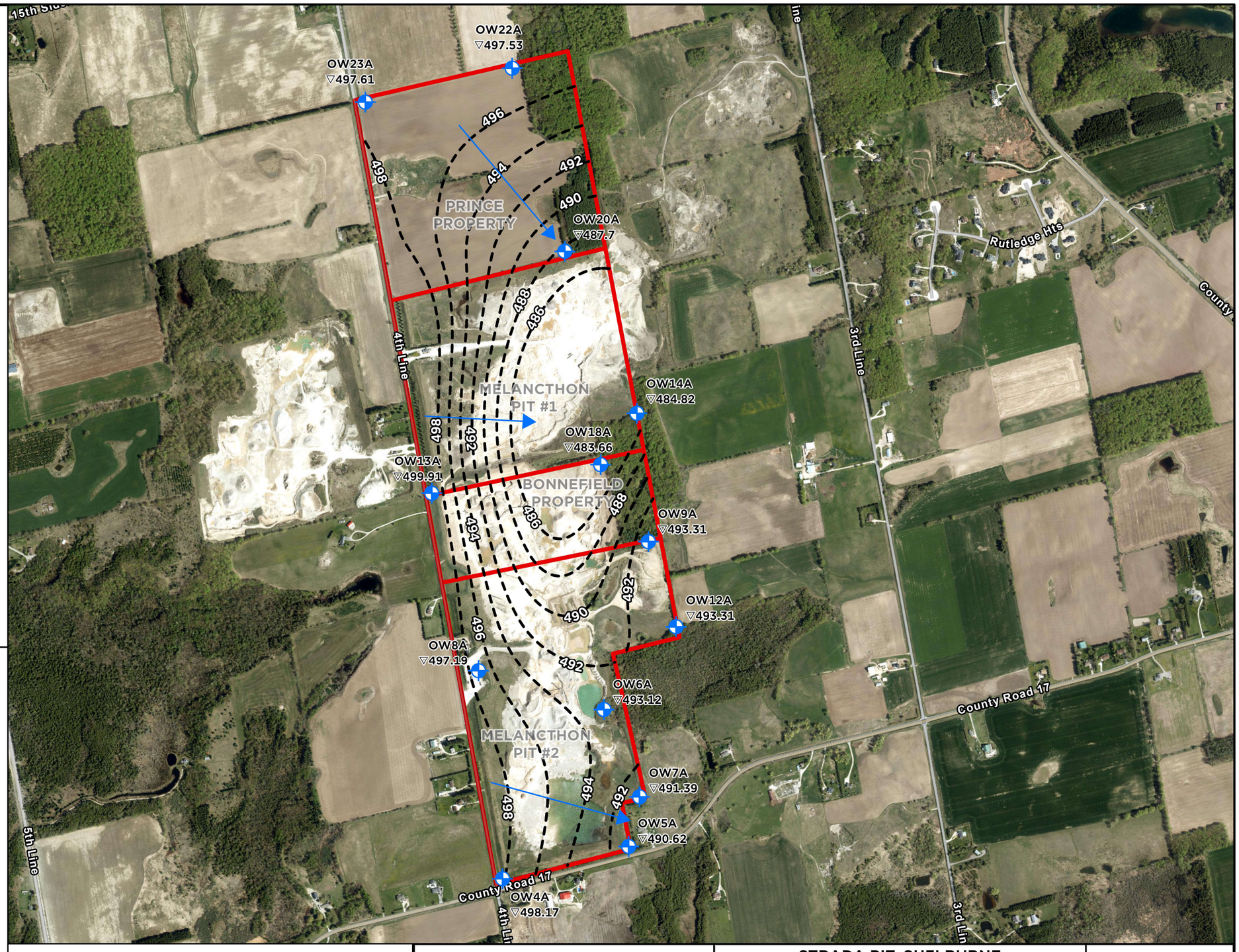


N

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2.CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

- SITE
- APRIL MONITORING WELLS - SHALLOW
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION (TAKEN APRIL 26,27, 2023)



0 250 500 1,000 METERS

TATHAM ENGINEERING

STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
GROUNDWATER CONTOUR APRIL 2023
SHALLOW WELLS

DWG. No. **FIG-4**

SCALE: 1:12,000	DRAWN: AO	DATE: MAR. 2024	JOB NO. 123016

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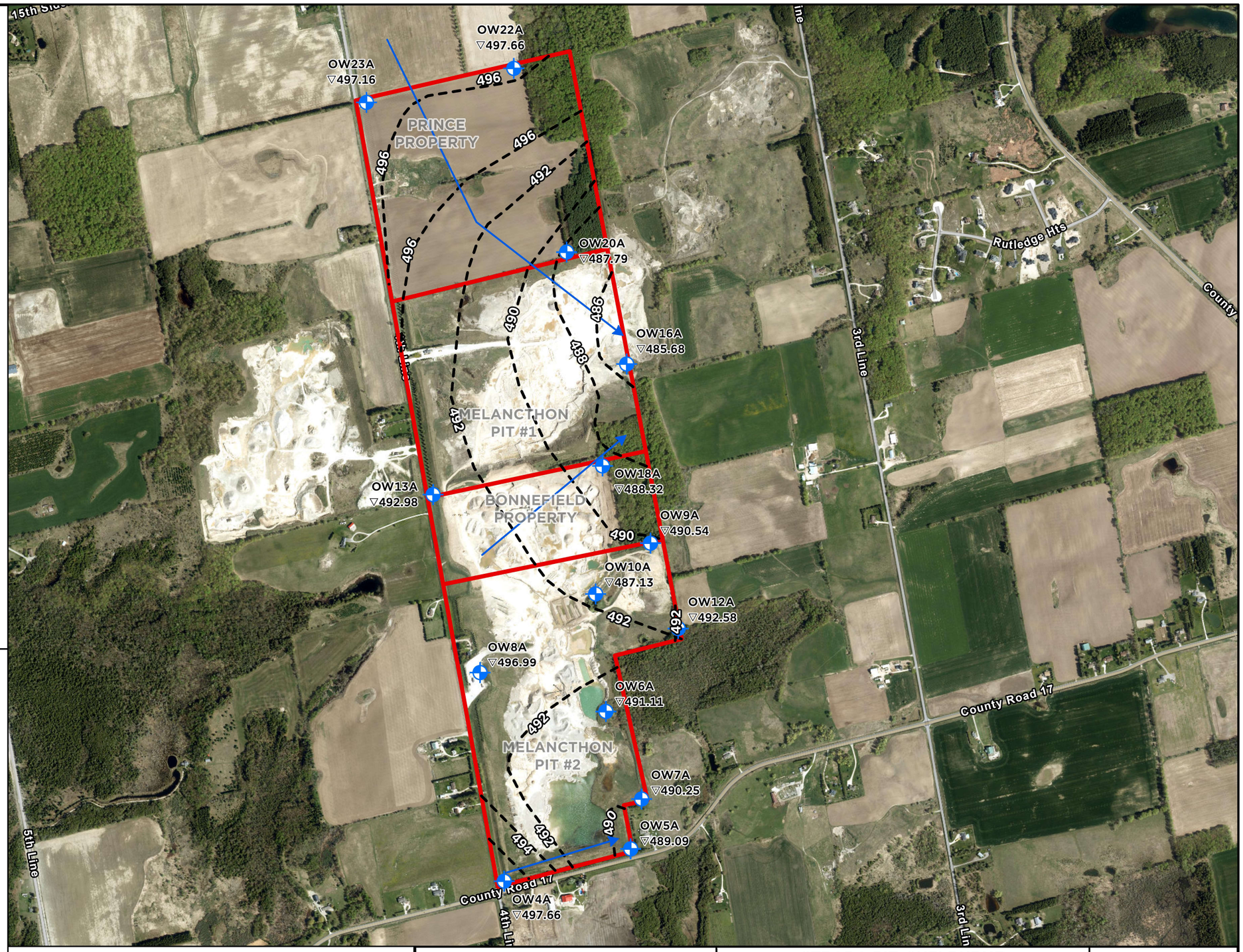
N

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2.CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

- SITE
- DECEMBER MONITORING WELLS - SHALLOW
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION (TAKEN DECEMBER 11, 2023)



0 250 500 1,000 METERS

TATHAM ENGINEERING

STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
GROUNDWATER CONTOUR DECEMBER 2023
SHALLOW WELLS

DWG. No. **FIG-5**

SCALE: 1:12,000 | DRAWN: AO | DATE: MAR. 2024 | JOB NO. 123016

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Figure 6: Series B 2023 Groundwater Levels

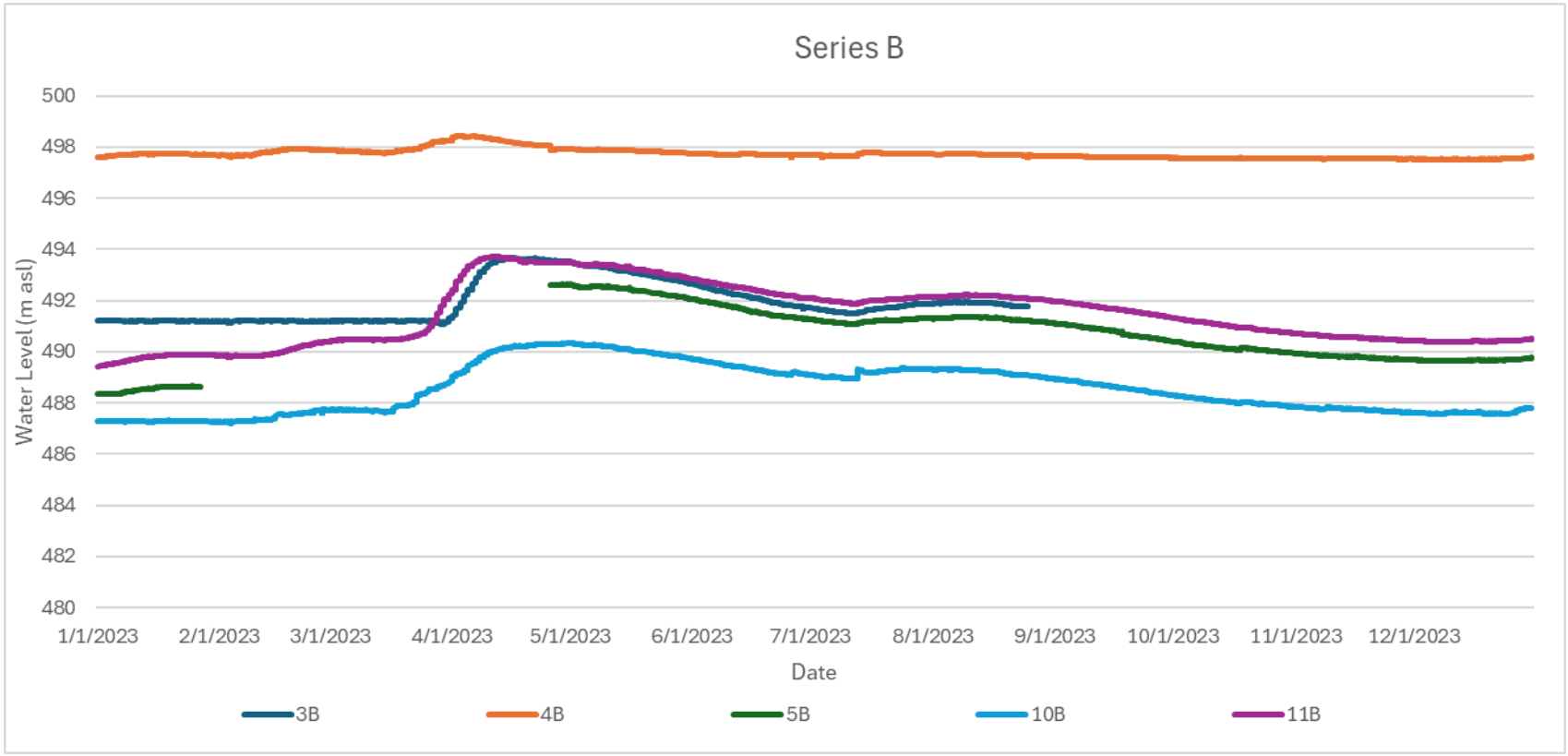
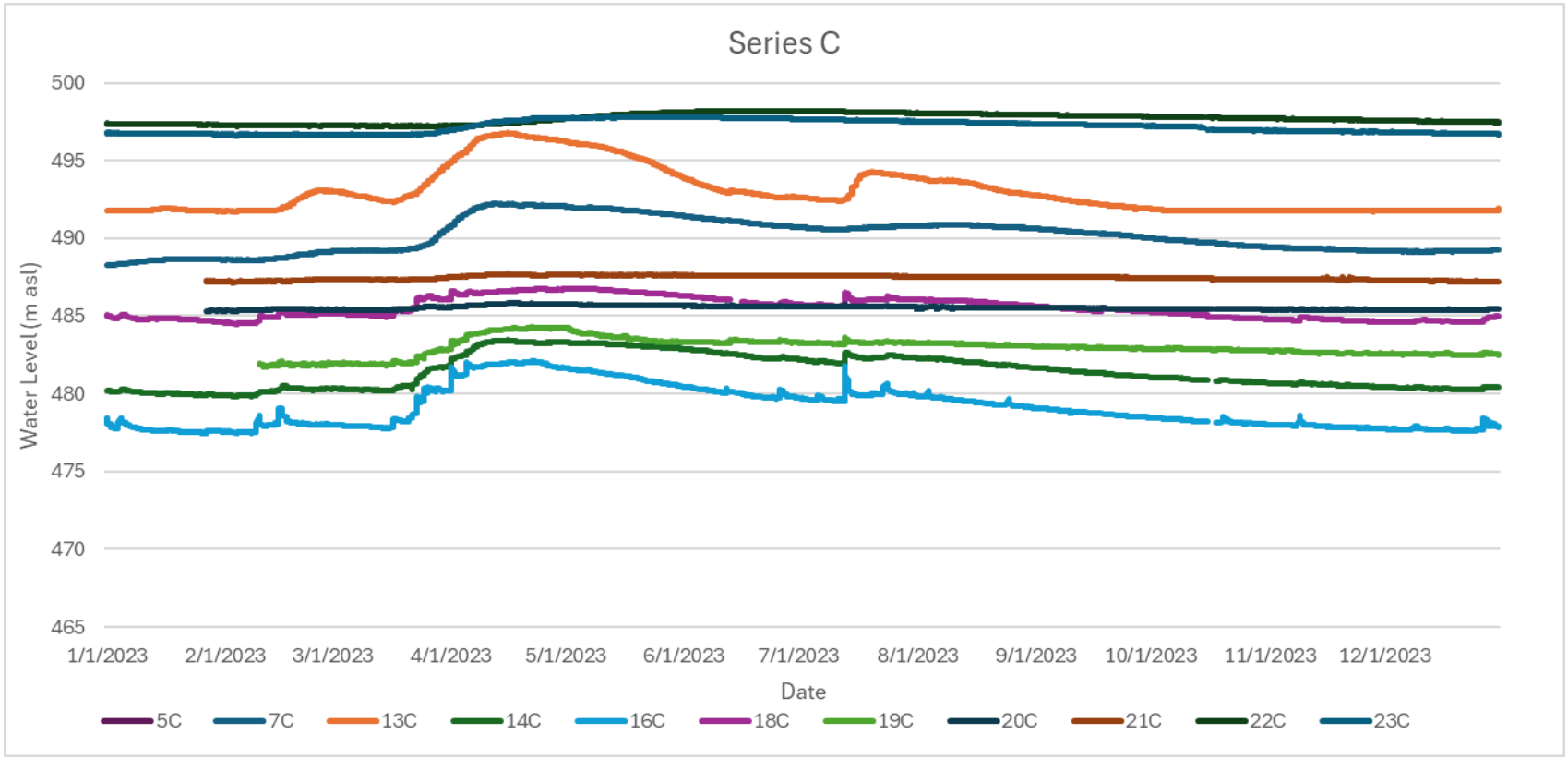


Figure 7: Series C 2023 Groundwater Levels

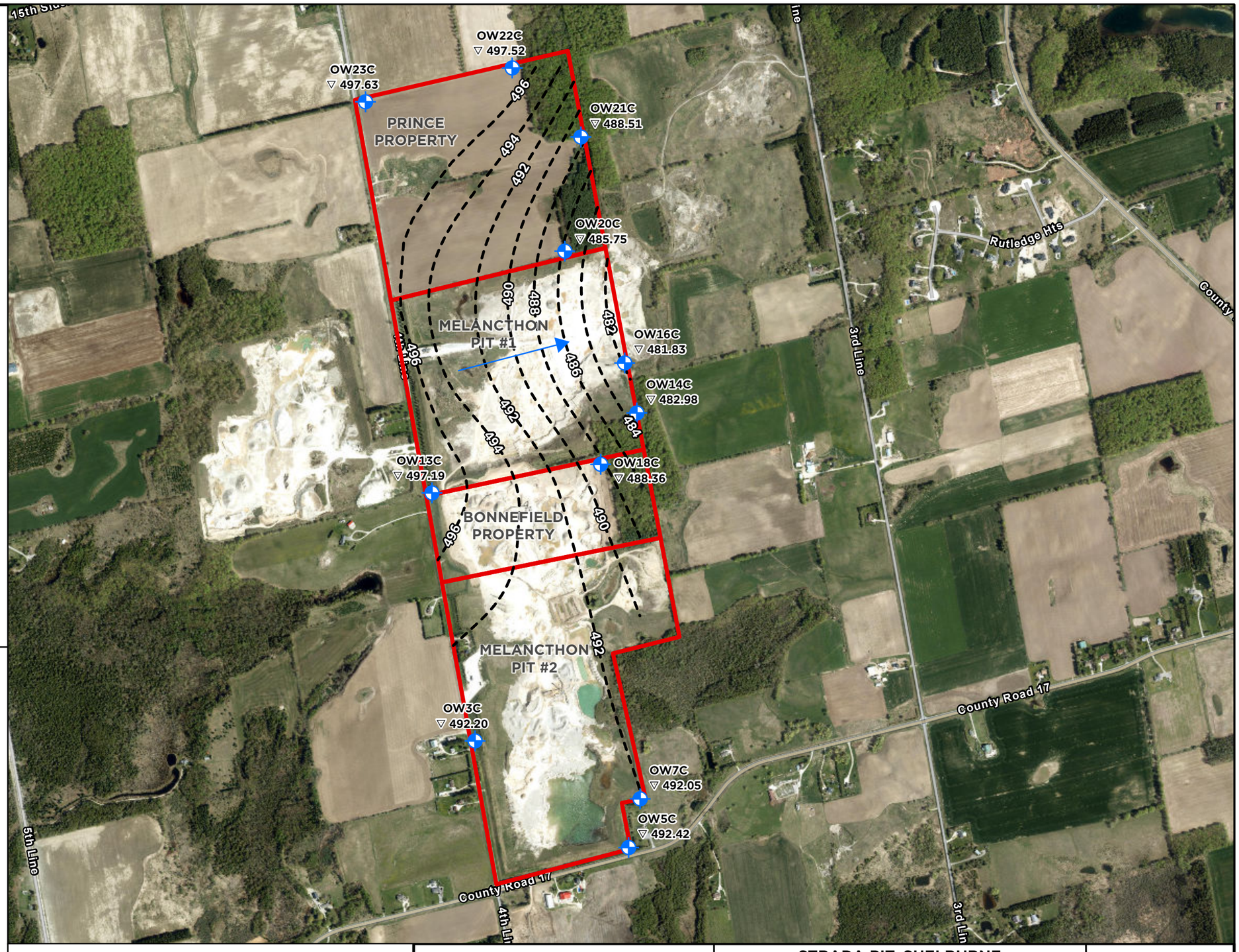


N

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2.CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

- SITE
- APRIL MONITORING WELLS - DEEP
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION (TAKEN APRIL 26,27, 2023)



0 250 500 1,000 METERS

TATHAM ENGINEERING

STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
GROUNDWATER CONTOUR APRIL 2023
SHALLOW WELLS

DWG. No. **FIG-8**

SCALE: 1:12,000 | DRAWN: AO | DATE: MAR. 2024 | JOB NO. 123016

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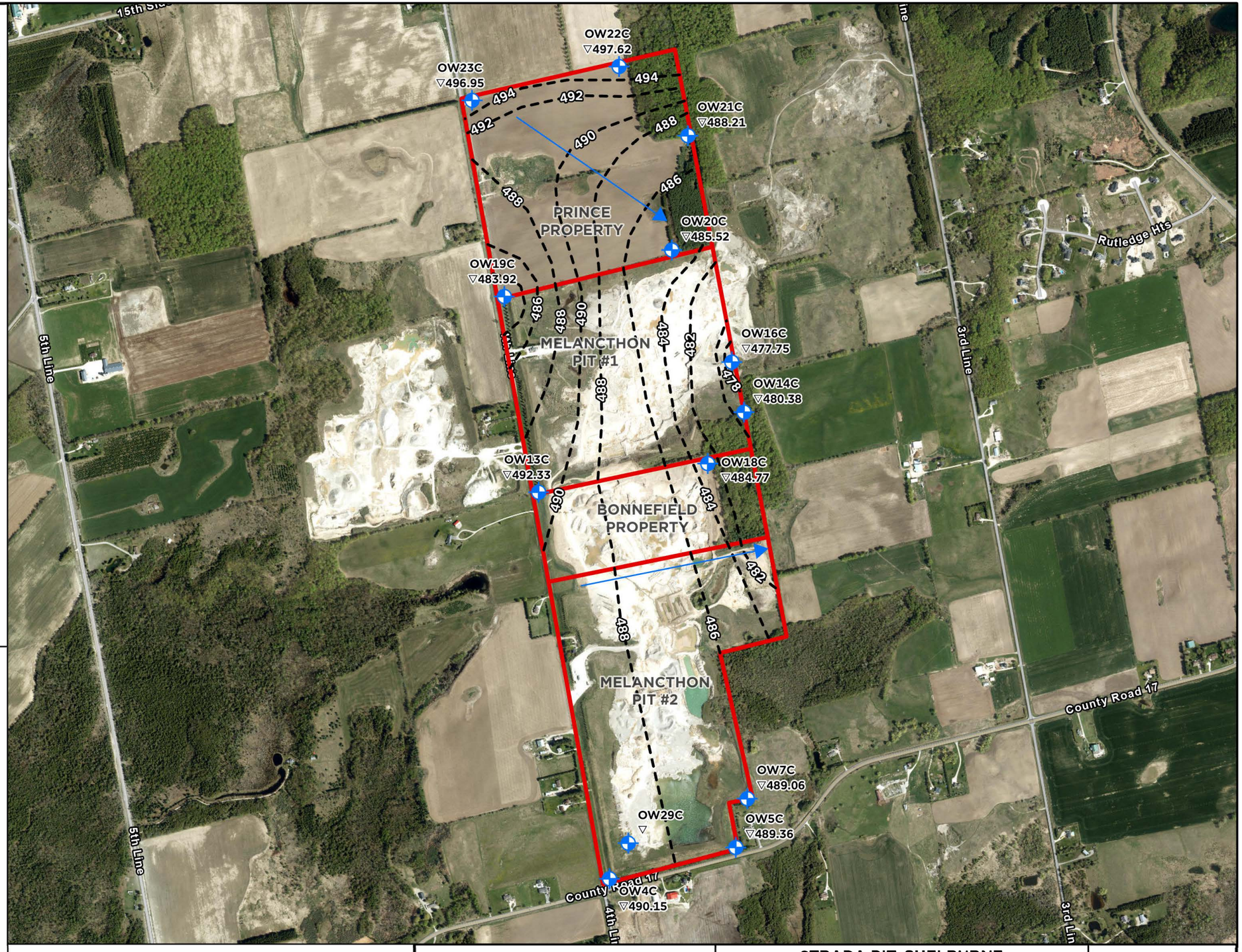
N

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2.CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

- SITE
- DECEMBER MONITORING WELLS - DEEP
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION (TAKEN DECEMBER 11, 2023)



0 250 500 1,000 METERS

TATHAM ENGINEERING

STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
GROUNDWATER CONTOUR DECEMBER 2023
DEEP WELLS

DWG. No. **FIG-9**

SCALE: 1:12,000 | DRAWN: AO | DATE: MAR. 2024 | JOB NO. 123016

Appendix A: PTTW

PERMIT TO TAKE WATER
Ground Water
NUMBER 3210-AKRL9C

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Strada Aggregates Inc.
30 Floral Parkway
Vaughan, Ontario
L4K 4R1

For the water taking from: Shelburne South Pit - Wash Pond

Located at: Lot 11 and 12, Concession 3, Geographic Township of Melancthon
Melancthon, County of Dufferin

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 34.1, 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 and Climate Change.

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

(e) "Permit" means this Permit to Take Water No. 3210-AKRL9C including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

(f) "Permit Holder" means Strada Aggregates Inc..

(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 18, 2016 and signed by Grant C. Horan, 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 **March 31, 2027**. 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 / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Wash Pond	Pond Dugout	Aggregate Washing	Industrial	4,000	10	2,400,000	230	17 561589 4887164
						Total Taking:	2,400,000		

3.3 Water taking under the authorization of this Permit shall only occur to a maximum of 230 days between April 1 and November 16 of each year from date of issue to March 31, 2027.

3.4 This Permit is issued for the sole purpose of washing gravel in a closed loop system where the majority of the water is recirculated and does not include dust suppression.

3.5 Prior to taking of water under this Permit, the Permit Holder shall ensure that any and all applicable permits or authorizations are obtained from Federal and Provincial Agencies having legislative mandates in water resources management.

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. 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 water levels at the following monitoring points as described below:

Well No. /Pond Name	Water Level Elevations	
	Continuous Datalogger (4-hour intervals)	Monthly Manuals

Wash Pond (during unfrozen conditions)	X	X
OW2-A	X	X
OW2-B	X	X
OW2-C	X	X
OW3-A	X	X
OW3-B	X	X
OW4-A	X	X
OW4-B	X	X
OW4-C	X	X
OW5-A	X	X
OW5-B	X	X
OW5-C	X	X
OW6-A	X	X
OW7-A	X	X
OW7-C	X	X
OW8-A	X	X
OW8-B	X	X
OW9-A	X	X
OW10-A	X	X
OW10-B	X	X
OW11-A	X	X
OW11-C	X	X
OW12-A	X	X
OW13-A	X	X
North Pond	X	X
South Pond	X	X

4.3 The Permit Holder shall submit to the Director by March 31, 2019, a report with the monitoring data collected under Sections 4.1 and 4.2 of this Permit during the first two years of the aggregate washing operation, along with its interpretation; the report should include an assessment of the impact of the water taking, if any, on the surface water features (wetland) adjacent to the Wash Pond. The report should also include recommendations on modifications to the water taking and/or to the monitoring program as described in this Permit.

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, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a 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:

a. The name of the appellant;
b. The address of the appellant;
c. The Permit to Take Water number;
d. The date of the Permit to Take Water;
e. The name of the Director;
f. 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) 326-5370
Email:
ERTTribunalsecretary@ontario.ca

AND

The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5

AND

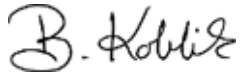
The Director, Section 34.1,
Ministry of the Environment and Climate Change
12th Floor
119 King St W
Hamilton ON L8P 4Y7
Fax: (905) 521-7820

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

by Telephone at	by Fax at	by e-mail at
(416) 212-6349	(416) 326-5370	www.ert.gov.on.ca
Toll Free 1(866) 448-2248	Toll Free 1(844) 213-3474	

*This instrument is subject to Section 38 of the **Environmental Bill of Rights** that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

Dated at Hamilton this 8th day of May, 2017.



Belinda Koblik
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule “A” forms part of Permit To Take Water 3210-AKRL9C, dated May 8, 2017.

1. Hydrogeological Assessment in Support an OWRA Sec 34 PTTW, Shelburne South Pit, dated December, 2016, prepared by Whitewater Hydrogeology Ltd. for Strada Aggregates.

2. 2016 Compliance Groundwater Monitoring Report, Shelburne South Pit, dated January 2017, prepared by Whitewater Hydrogeology Ltd. for Strada Aggregates.

Appendix B:
Integrated Monitoring Plan

Strada Aggregates Melancthon Pits – Integrated Monitoring Plan
February 2018

Background

The Strada Melancthon Pits consist of:

- Pit #1 (Licence # 129167) located at West Half of Lot 13, Concession 3 O.S., licenced in 2004;
- Pit #2 (Licence # 625155) located at West Half of Part Lot 11 and 12, Concession 3 O.S., licenced in 2012; and
- The proposed Bonnefield and Prince extension lands located at Part of West Half of Lots 12 and 14, Concession 3 O.S.

The proposed Prince and Bonnefield extensions will be fully integrated with existing aggregate operations at Melancthon Pits #1 and #2. The existing operations require monitoring and annual reporting with respect to the water table, water quality and the natural environment. Hydrogeological and natural environment investigations for the proposed extension have recommended expansion of the monitoring programs to include the additional lands. The Ministry of Natural Resources and Forestry (MNRF) has requested an Integrated Monitoring Plan to consolidate the existing and proposed monitoring requirements.

Natural Environment

Amphibian Monitoring

Annual monitoring of the wetlands for the presence of breeding amphibians was originally recommended in the Level 2 Natural Environment Assessment (NEA) report for Melancthon Pit #2, as well as surface and groundwater monitoring to assess water level fluctuations (NRSI 2010). The implementation of an amphibian monitoring program was further requested by the Nottawasaga Valley Conservation Authority (NVCA) and Michalski Nielson in their review of the Level 2 NEA report.

NRSI has undertaken annual amphibian monitoring at the wetlands located adjacent to Melancthon Pit #2 since 2013. Initial amphibian call surveys were undertaken in 2009.

Of the two proposed pit areas, only the Bonnefield Pit property contains wetland habitat (outside the extraction area). Surveys completed in 2016 recorded the presence of breeding amphibians. To ensure that the proposed pit does not negatively impact the wetland and its amphibian breeding habitat function it was recommended that the existing amphibian monitoring program for Melancthon Pit #2 be expanded to include the Bonnefield Pit to maximize efficiencies, and achieve consistency in methodology and data comparability.

Annual amphibian call surveys that were initiated at Melancthon Pit #2 will continue for the duration of the lifespan of the pit, as was originally proposed. Beginning in 2018, NRSI will initiate annual monitoring of the Bonnefield property wetland which will also be undertaken for the lifespan of that pit. Annual monitoring of the Bonnefield Pit wetland will build on NRSI's 2016 amphibian call surveys on the property

to inform the NEA report. See **Map 1** for the location of the existing monitoring stations at Melancthon Pit #2 in addition to the single monitoring station at the Bonnefield Pit wetland. Since no amphibian calling activity was documented within the Bonnefield property vernal pool during 2016 surveys, despite the presence of standing water, additional long-term monitoring of the vernal pool is not included in this plan. However, if amphibian calling activity is heard within the vernal pool during future monitoring years, an additional monitoring station will be established at this location and will be monitored annually.

Proposed monitoring at the Bonnefield Pit wetland will document additional baseline data on breeding amphibian species presence and relative abundance prior to aggregate extraction, followed by multiple years of operational-stage monitoring. As has been completed for Melancthon Pit #2, long-term data will be collected to identify trends or other indicators that will be used to assess any negative occurrences to amphibian breeding activity that may be the result of pit activities. The amphibian survey data collected at the Bonnefield and Melancthon Pit #2 sites will also be compared to look for spatial trends, or any similarities or differences in survey results over time that may indicate presence of localized or widespread pit operation effects.

In accordance with survey methodology completed to date, the monitoring program will utilize the Marsh Monitoring Program methodology (BSC 2009), which records amphibian call activity during 3-minute call counts. Counts will be conducted once per month during each of April, May and June in conjunction with appropriate night time air temperatures and wind speeds. If the provincial Species of Conservation Concern Western Chorus Frog (Pseudacris triseriata) is detected during any monitoring event, additional monitoring events may be added to fully document the abundance and distribution of this species within the surveyed wetlands.

A brief summary report, combining the results collected from the Melancthon Pit #2 site with the Bonnefield Pit site, will be prepared each year which outlines the findings of the annual monitoring. This will include an assessment of the surface water and groundwater monitoring data to be collected by Whitewater Hydrogeology within both properties (Whitewater Hydrogeology 2017) as it relates to amphibian breeding conditions. Each annual report will be provided to Strada for their review, and then to the NVCA and the Township of Melancthon.

Woodland Buffer

The deciduous woodland communities within the Bonnefield and Prince extension lands will be retained outside the proposed limit of extraction. 10 metre woodland buffers have been recommended to protect these features and mitigate impacts from adjacent extraction activities. The woodland buffers will be allowed to re-naturalize and will be supplemented with targeted native species plantings.

The woodland buffers will be inspected during pit operations to ensure disturbances are not occurring. The health and survival of buffer planting will also be inspected.

Hydrogeology

Compliance groundwater and surface water monitoring has been occurring at both Melancthon Pit #1 and #2 since 2001 and 2007, respectively. In addition, baseline groundwater monitoring commenced in

2017 at the Bonnefield and Prince properties. In total, there are currently 28 groundwater well nests that monitor 52 discrete aquifer intervals in the overburden and bedrock aquifers. The Melancthon Pit #1 and #2 groundwater monitoring programs were developed to characterize the local groundwater conditions at each individual property and were based on two operating pits (two scale houses, two fuel storage areas, and multiple crushing and processing operations). The proposed licensing of the Bonnefield and Prince properties provides an opportunity to not only streamline operations by eliminating the need to operate as individual pits but to develop a revised groundwater monitoring program. The revision would remove redundancies in the monitoring network and reporting allowing for an opportunity to complete an accumulative impact assessment from the Strada properties.

The revised groundwater monitoring program is shown on **Map 2**. The revised program consists of 22 groundwater well nests that monitor 36 discrete aquifer intervals in the overburden and bedrock aquifers.

The proposed program focuses on the on going monitoring of background conditions (up gradient locations) in both the overburden and bedrock aquifers and the monitoring of potential influences from the aggregate operation on down gradient locations. The proposed groundwater monitoring program is provided in **Table 1**. Selected up gradient and down gradient wells will be sampled for water quality. The water quality parameters for the semi annual (spring and fall) and annual (spring) sampling programs are provided in **Table 2**.

Surface water elevation monitoring has been on-going at the North and South Ponds (Map 2), since 2007. Two additional surface water monitoring stations to monitor the hydro-period in the wetland and vernal pool (Map 2) will commence in 2018. This monitoring will consist of the collection of continuous water level data during non-frozen conditions. Data will be assessed in conjunction with the groundwater monitoring data as part of the annual reporting requirement.

Table 1 – Proposed Groundwater Monitoring Network

Well ID	Water Levels	Water Quality	
	Monthly Manual Water	Semi-Annual	Annual
OW2-A	X	X	
OW2-B	X	X	
OW3-B	X	X	
OW4-A	X	X	
OW4-B	X	X	
OW5-A	X	X	X
OW5-B	X	X	
OW6-A	X	X	X
OW7-A	X	X	X
OW7-B	X	X	
OW8-A	X	X	X
OW9-A	X	X	X
OW10-A	X	X	X
OW11-A	X	X	X
OW11-B	X	X	
OW12-A	X	X	X

Well ID	Water Levels	Water Quality	
	Monthly Manual Water	Semi-Annual	Annual
OW13-A	X	X	
OW13-B	X	X	
OW14-B	X	X	X
OW15-B	X		
OW16-B	X	X	X
OW17-A	X		
OW17-B	X		
OW18-A	X	X	X
OW18-B	X	X	
OW19-A	X		
OW19-B	X	X	
OW20-B	X	X	X
OW21-B	X	X	x
OW22-B	X	X	
OW23-B	X	X	

Note: the collection of continuous water levels at selected groundwater monitoring locations is recommended.

Table 2 – Proposed Water Quality Parameters

Semi-Annual Groundwater Quality Parameters	Annual Groundwater Quality Parameters
General Water Quality Parameters: pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorous, and Metals (dissolved).	Total Petroleum Hydrocarbons (F1-F4) BTEX, Total Oil and Grease

It is recommended that a single annual groundwater monitoring report for the Melancthon Pits #1 and 2, as well as the proposed Bonnefield and Prince Pits be prepared and submitted to the MNRF, Township of Melancthon and NVCA prior to March 31st of each year and include the monitoring data for the 12 month period ending December 31st of the previous year. The report shall include, but not be limited to, the following:

1. Monitoring data collected as per Table 1 and Table 2;
2. Data in tabulated and graphical formats;
3. Interpretation of the collected data including discussions of any observed trends in groundwater levels and groundwater quality (analytical) results;
4. Recommendations on and justification for the need for make changes to monitoring locations, monitoring frequency, type of monitoring, pumping patterns and/or the need for mitigation, and
5. Summary and documentation of any water well complaint(s) and their resolution(s).

Map 1

Melancthon #2 and Bonnefield Pits

Anuran Monitoring Stations

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Date: November 7, 2017
Project: NRSI-1748
Scale: 1:3,000
NAD83 - UTM Zone 17

Proposed Bonnefield Pit

Melanchton Pit #2

ANR-009
ANR-003
ANR-002
ANR-001
ANR-004
ANR-005
ANR-006
ANR-007a
ANR-007b
ANR-008a

Legend

- Subject Property
- Anuran Monitoring Station (ANR)
- Direction of Survey
- Surveyed Wetland Boundary
- Wetland (Boundaries Approximate)

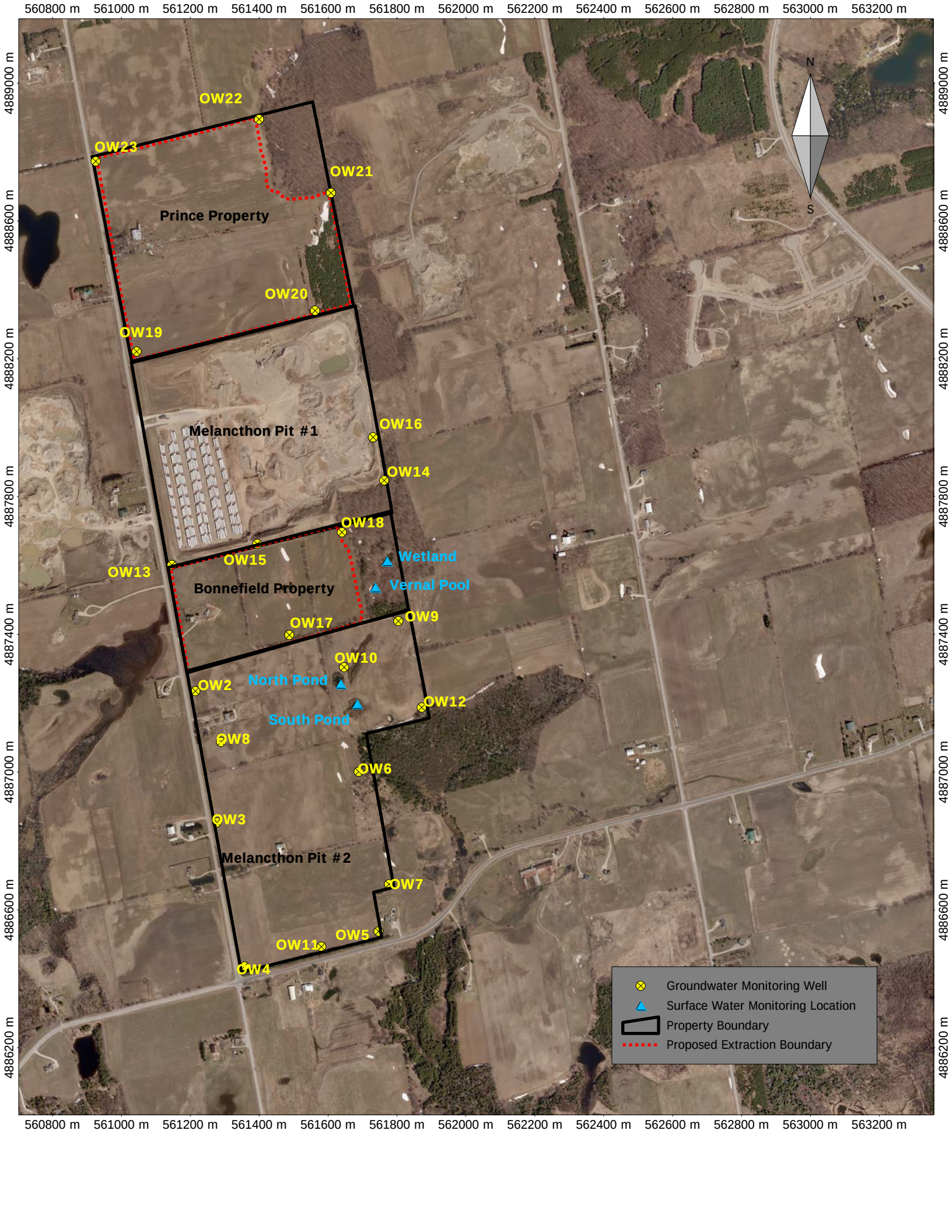
N

0 100 200 Metres

561400 561500 561600 561700 561800 561900 562000

4887700 4887600 4887500 4887400 4887300 4887200 4887100 4887000 4886900 4886800 4886700 4886600

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map1_AnuranMonitoring_3K_2017_11_07_LEH.mxd


560800 m
561000 m
561200 m
561400 m
561600 m
561800 m
562000 m
562200 m
562400 m
562600 m
562800 m
563000 m
563200 m
4889000 m
4888600 m
4888200 m
4887800 m
4887400 m
4887000 m
4886600 m
4886200 m
N
S
OW22
OW23
OW21
Prince Property
OW20
OW19
Melancthon Pit #1
OW16
OW14
OW18
OW15
OW13
Wetland
Vernal Pool
Bonnefield Property
OW17
OW9
OW10
OW2
North Pond
OW12
South Pond
OW8
OW6
OW3
Melancthon Pit #2
OW7
OW5
OW11
OW4
Groundwater Monitoring Well
Surface Water Monitoring Location
Property Boundary
Proposed Extraction Boundary

Appendix C:
Borehole Logs

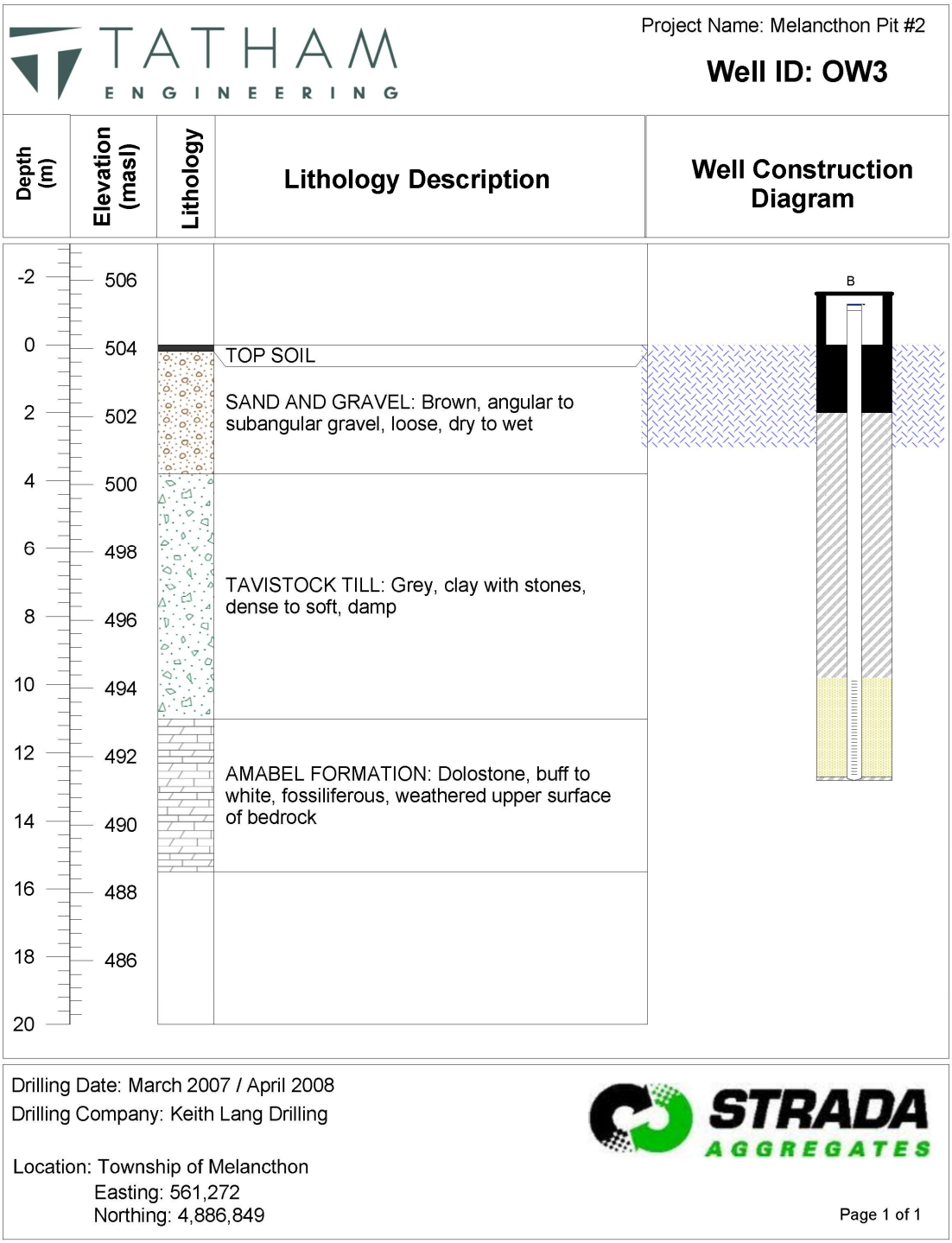


Figure A.17: New Borehole log for Well OW3.

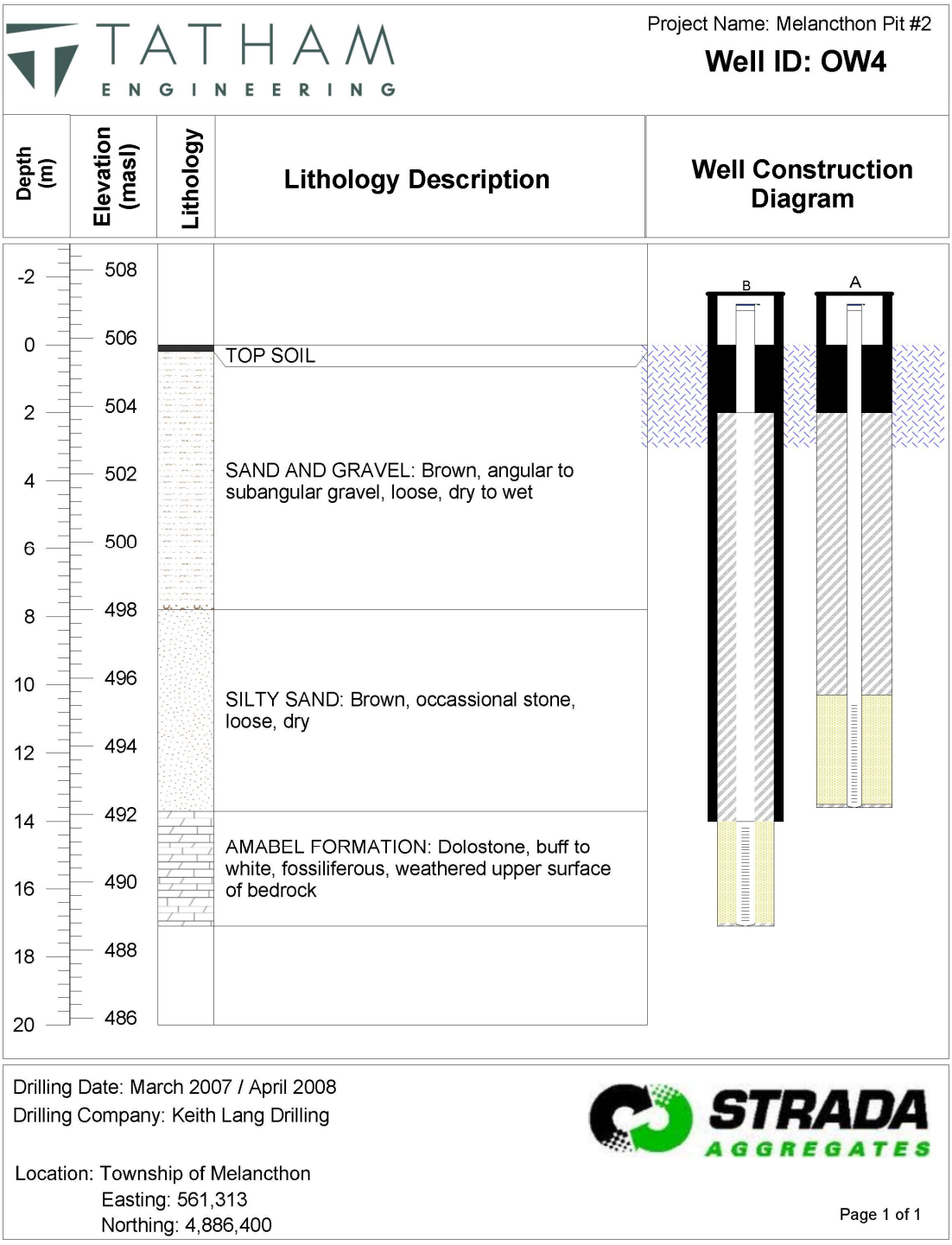


Figure A.19: New Borehole log for Well OW4.

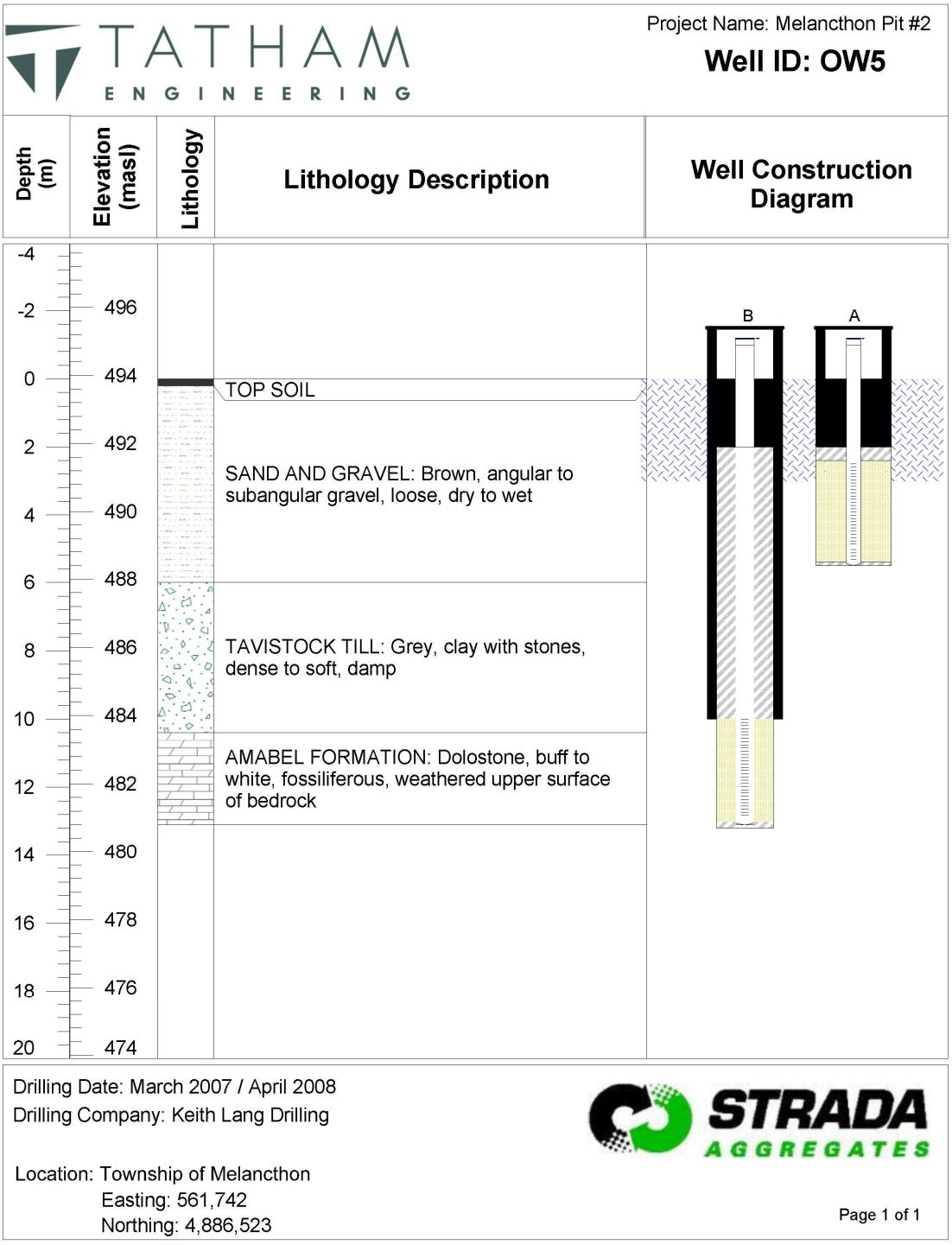


Figure A.21: Updated Borehole log for Well OW5.

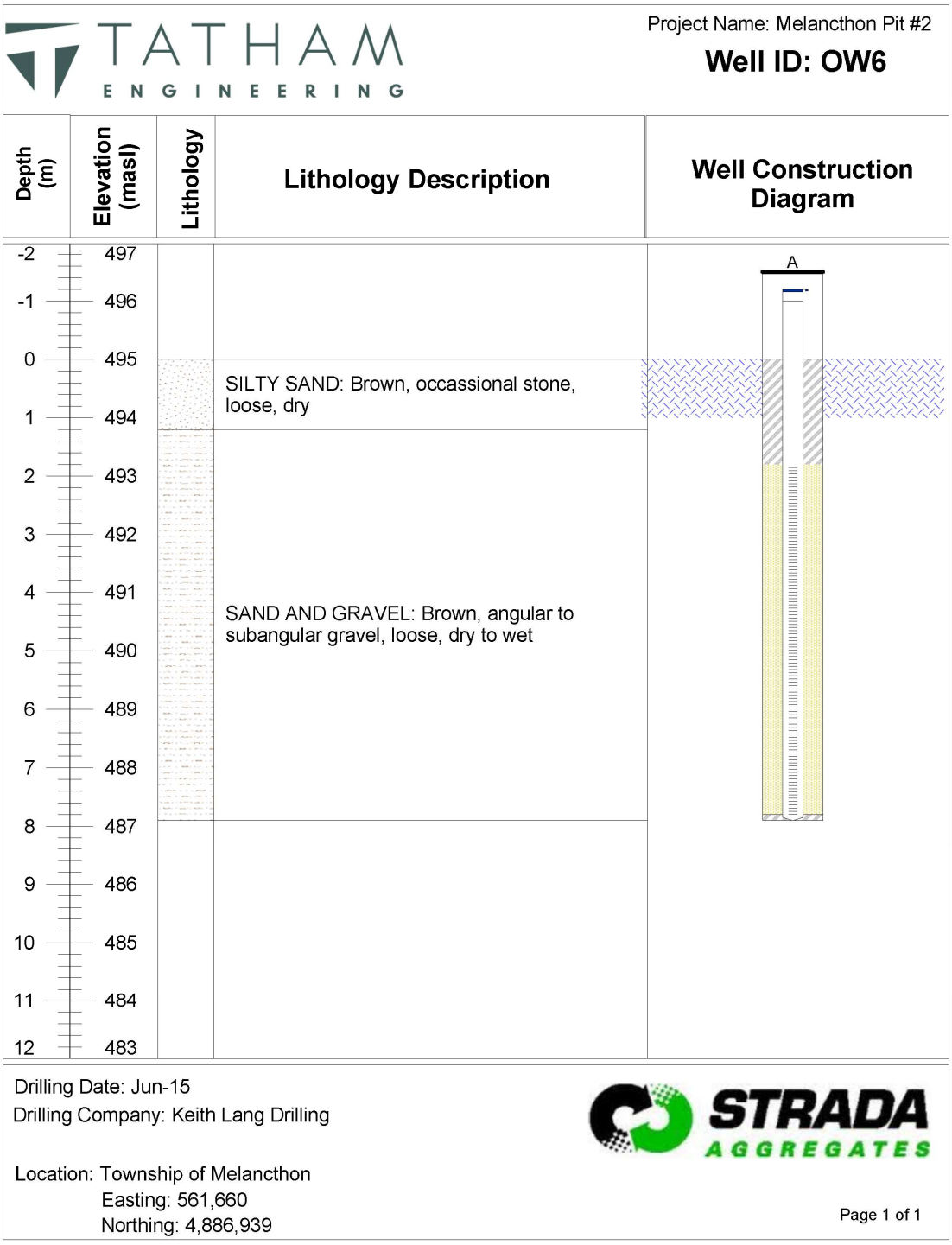


Figure A.22: Borehole log for Well OW6-A.

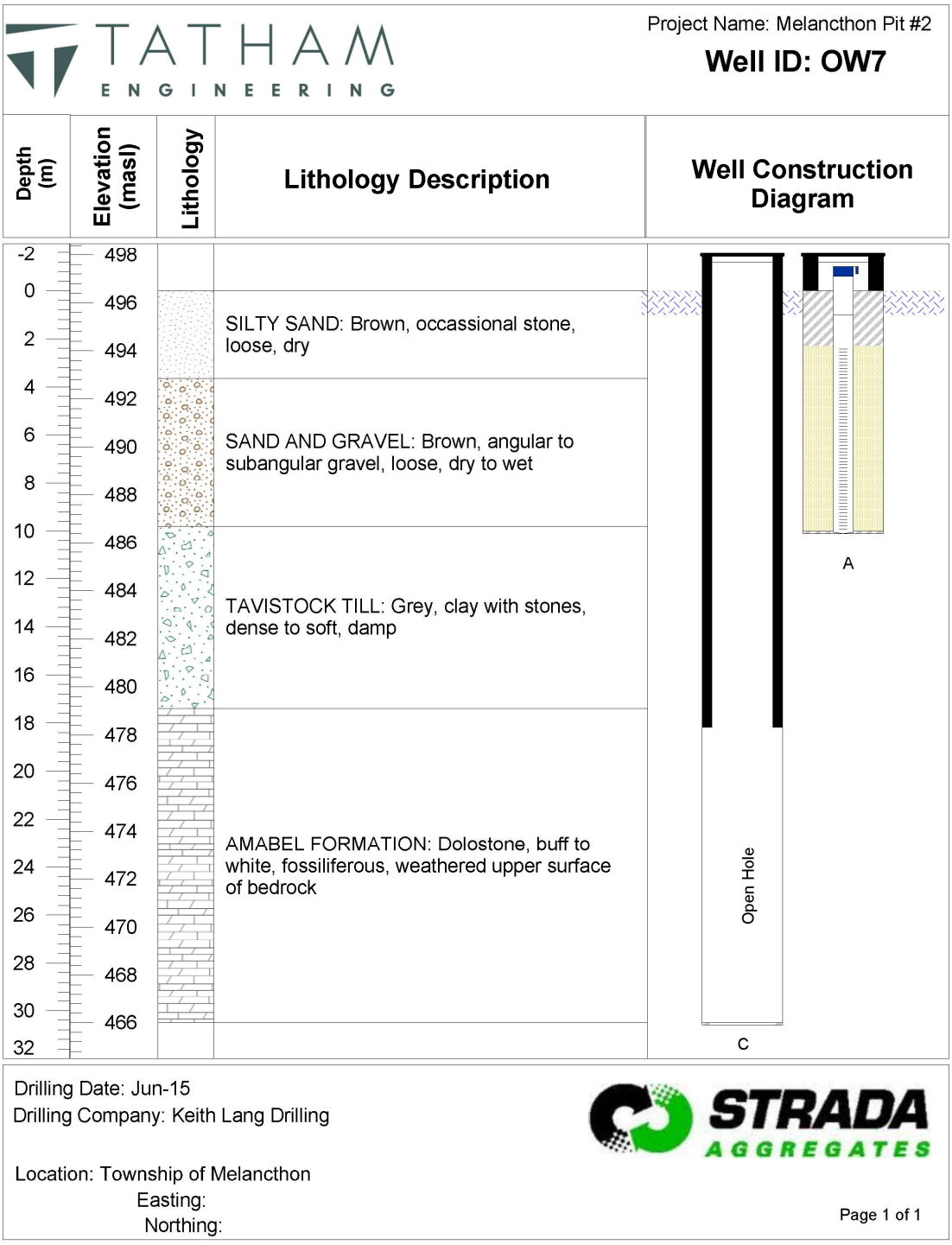


Figure A.23: Borehole log for Well OW7 A and C.

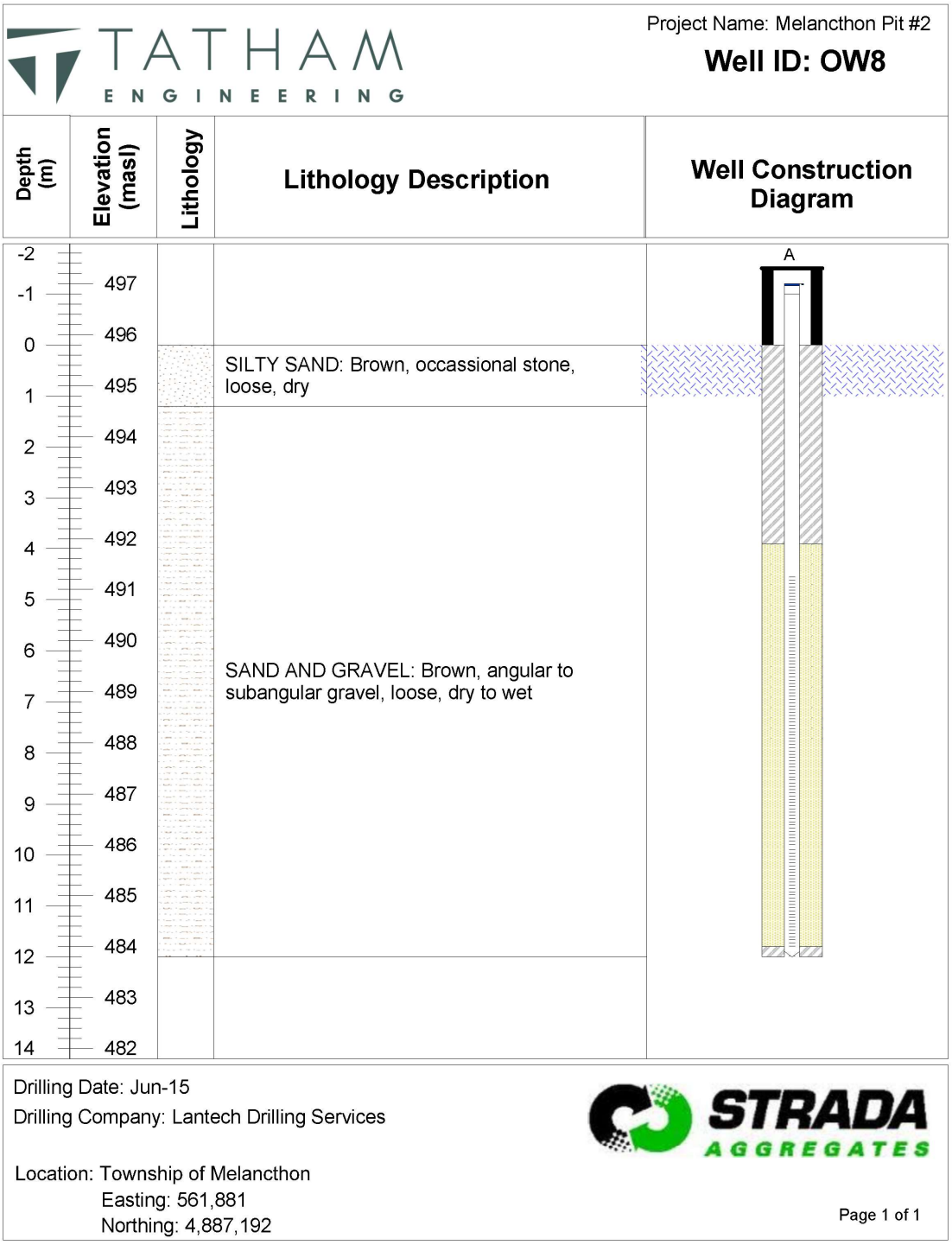


Figure A.24: Borehole log for Well OW8.

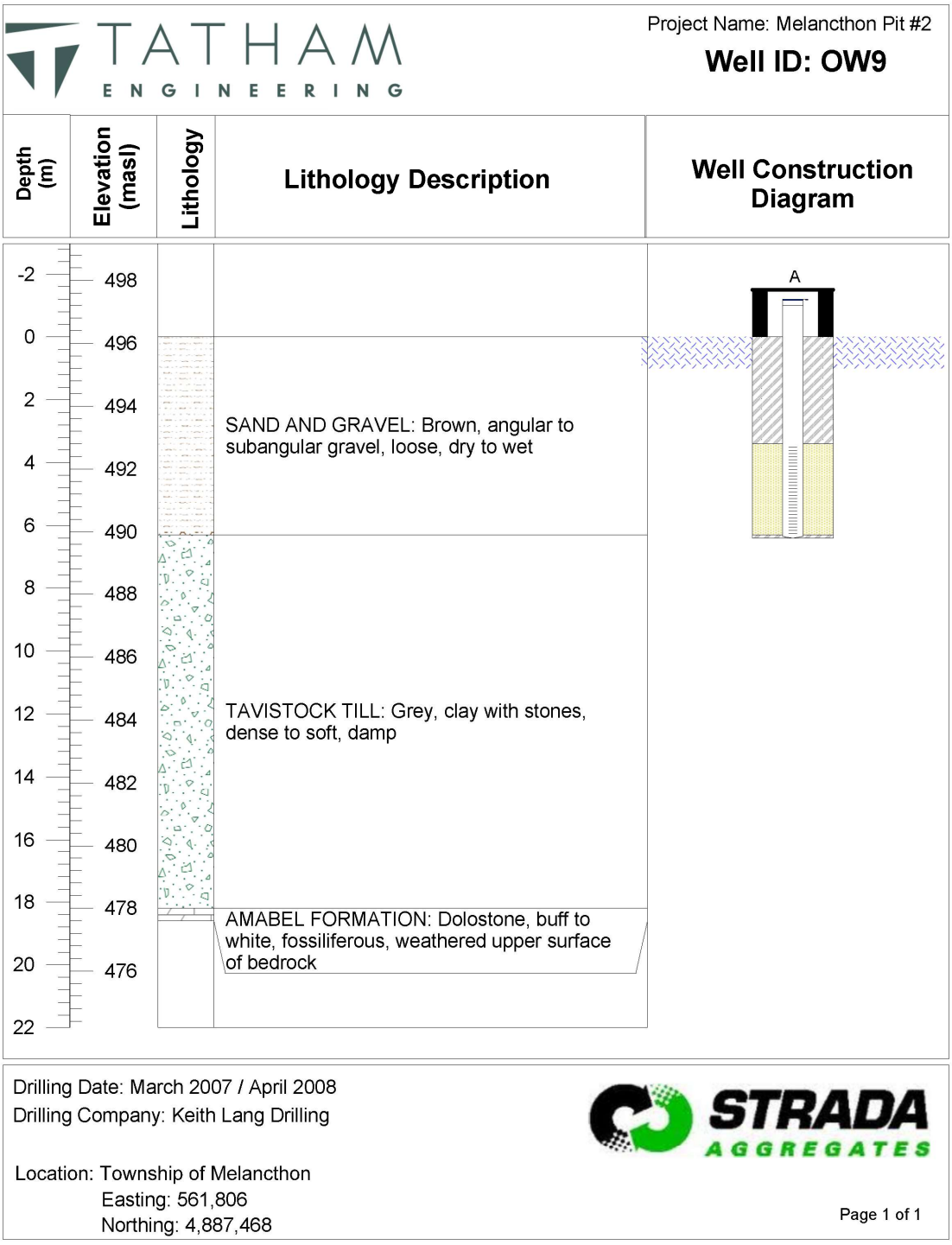


Figure A.26: New Borehole log for Well OW9-A.

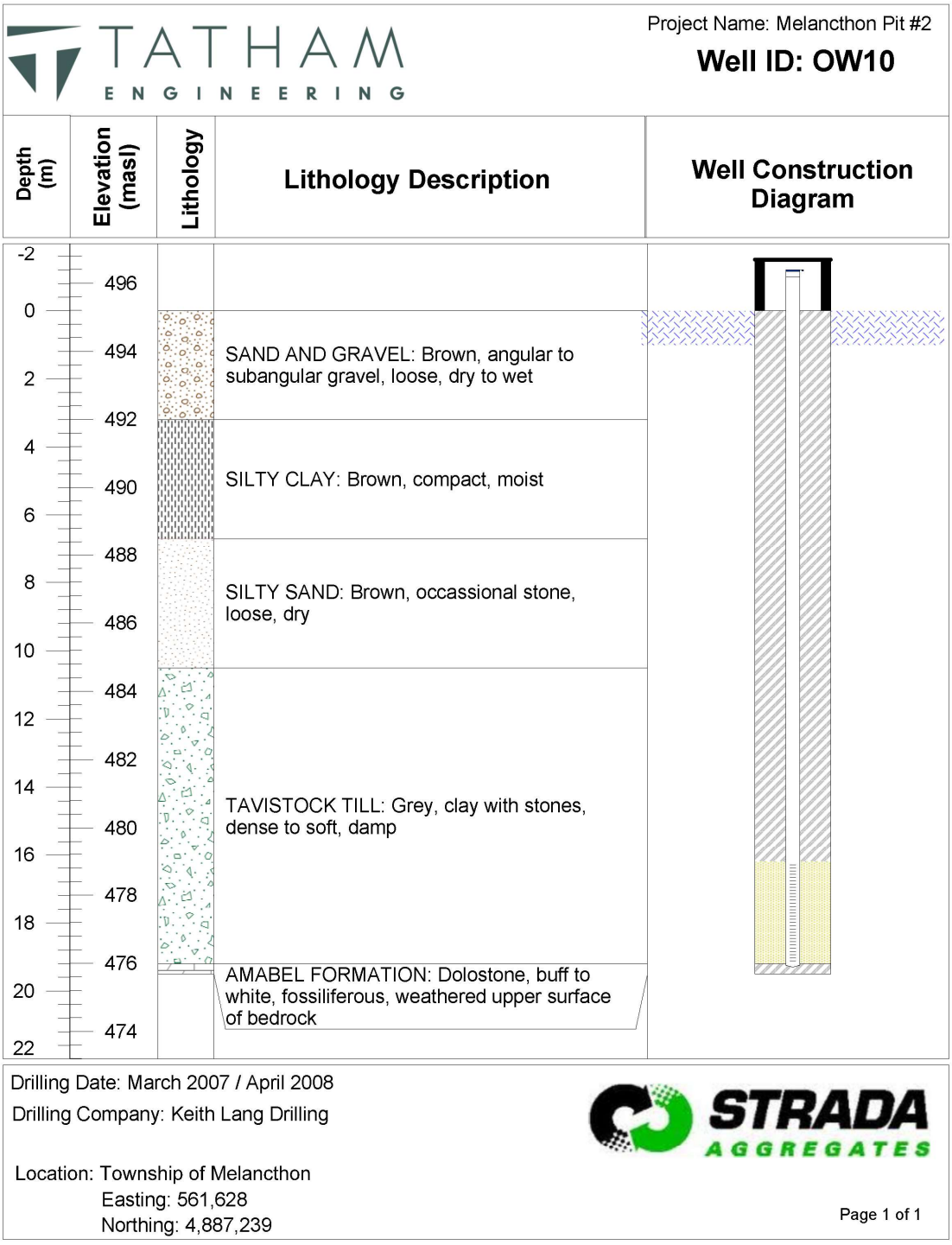


Figure A.28: New Borehole log for Well OW10.

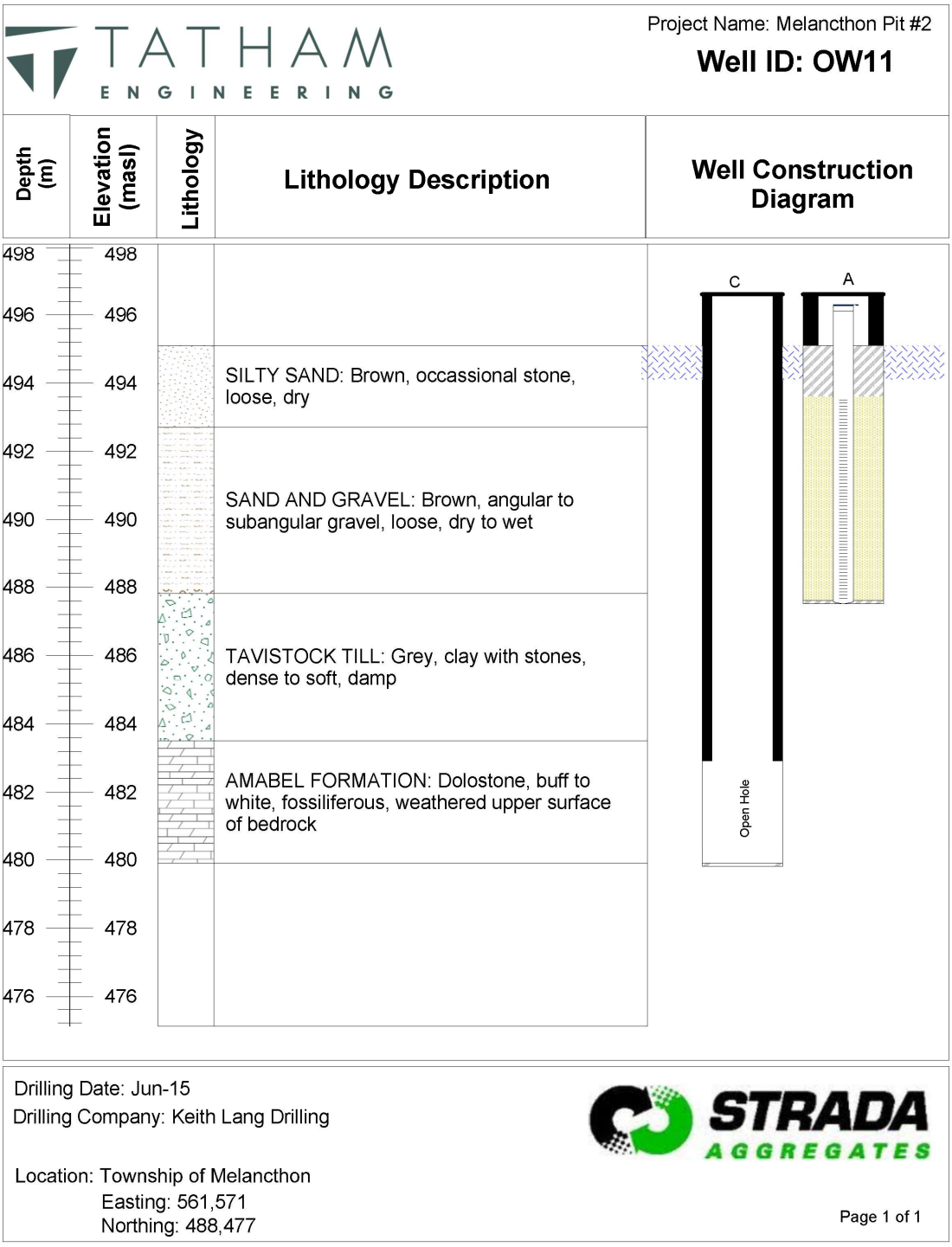
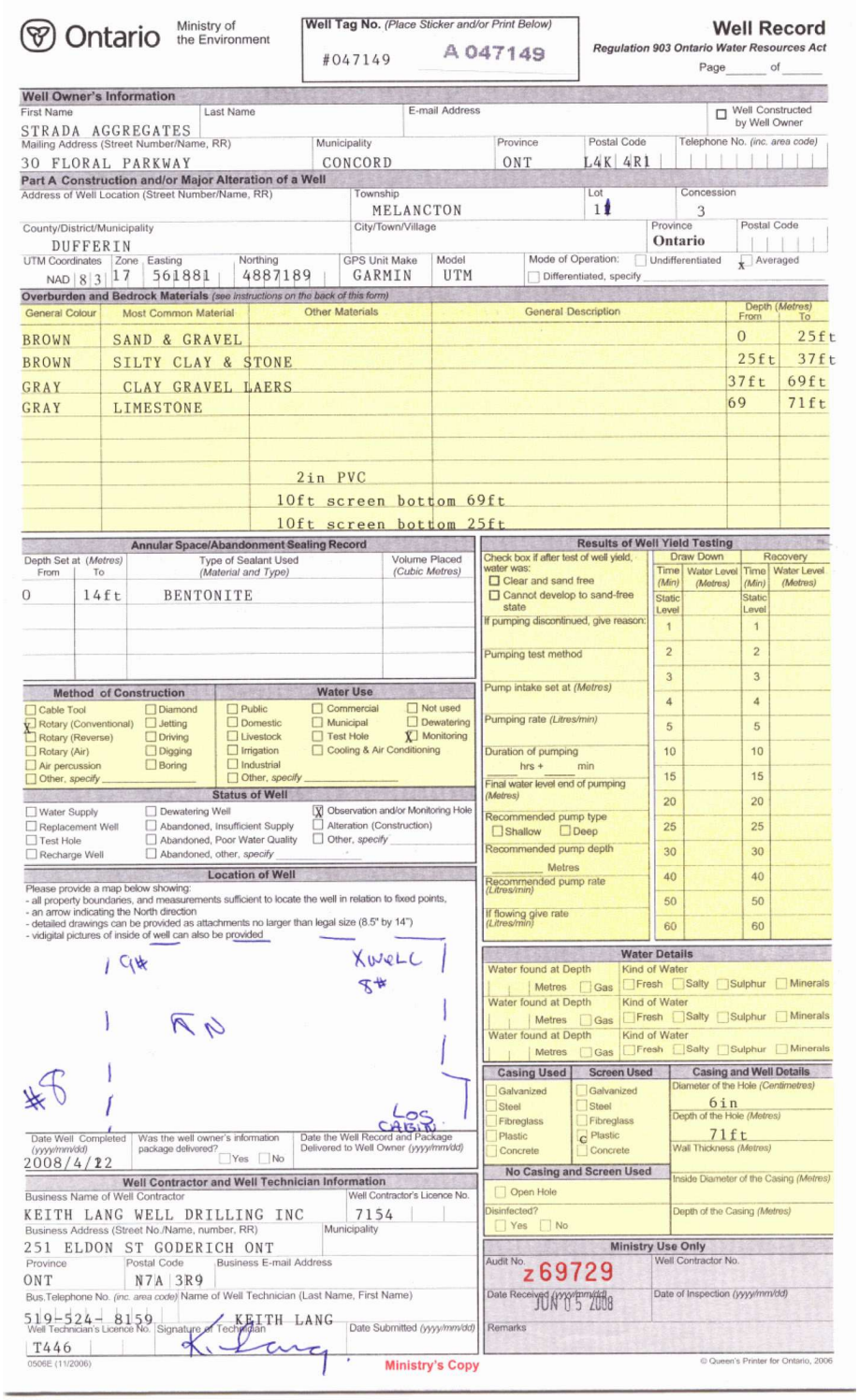


Figure A.29: Borehole log for Well OW11 A and C.



Ontario Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)* #047149 A 047149

Well Record
Regulation 903 Ontario Water Resources Act
Page ____ of ____

Well Owner's Information

First Name	Last Name	E-mail Address	Well Constructed by Well Owner
STRADA AGGREGATES			☐

Mailing Address (Street Number/Name, RR)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
30 FLORAL PARKWAY	CONCORD	ONT	L4K 4R1	

Part A Construction and/or Major Alteration of a Well

Address of Well Location (Street Number/Name, RR)	Township	Lot	Concession
	MELANCTON	11	3

County/District/Municipality	City/Town/Village	Province	Postal Code
DUFFERIN		Ontario	

UTM Coordinates	Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation
NAD 8 3	17	561881	4887189	GARMIN	UTM	☐ Undifferentiated ☐ Differentiated, specify ☒ Averaged

Overburden and Bedrock Materials *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	To
BROWN	SAND & GRAVEL			0	25ft
BROWN	SILTY CLAY & STONE			25ft	37ft
GRAY	CLAY GRAVEL LAERS			37ft	69ft
GRAY	LIMESTONE			69	71ft
		2in PVC			
		10ft screen bottom 69ft			
		10ft screen bottom 25ft			

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	14ft	BENTONITE	

Method of Construction
☐ Cable Tool ☐ Diamond ☒ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Rotary (Air) ☐ Digging ☐ Air percussion ☐ Boring ☐ Other, specify

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

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

Location of Well
Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- vidigital pictures of inside of well can also be provided

Date Well Completed (yyyy/mm/dd)	Was the well owner's information package delivered?	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd)
2008/4/22	☐ Yes ☐ No	

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
KEITH LANG WELL DRILLING INC	7154

Business Address (Street No./Name, number, RR)	Municipality
251 ELDON ST GODERICH ONT	

Province	Postal Code	Business E-mail Address
ONT	N7A 3R9	

Bus.Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician	Date Submitted (yyyy/mm/dd)
519-524- 8159	KEITH LANG	T446	K. Lang	

0506E (11/2006) **Ministry's Copy**

Results of Well Yield Testing
Check box if after test of well yield, water was:
☐ Clear and sand free
☐ Cannot develop to sand-free state
If pumping discontinued, give reason:
Pumping test method
Pump intake set at (Metres)
Pumping rate (Litres/min)
Duration of pumping hrs + ____ min
Final water level end of pumping (Metres)
Recommended pump type ☐ Shallow ☐ Deep
Recommended pump depth ____ Metres
Recommended pump rate (Litres/min)
If flowing give rate (Litres/min)

	Draw Down Time (Min)	Draw Down Water Level (Metres)	Recovery Time (Min)	Recovery Water Level (Metres)
Static Level			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	

Water Details

Water found at Depth	Kind of Water
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing Used	Screen Used
☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete	☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete

No Casing and Screen Used
☐ Open Hole
Disinfected? ☐ Yes ☐ No

Casing and Well Details
Diameter of the Hole (Centimetres) 6in
Depth of the Hole (Metres) 71ft
Wall Thickness (Metres)
Inside Diameter of the Casing (Metres)
Depth of the Casing (Metres)

Ministry Use Only
Audit No. z69729
Well Contractor No.
Date Received (yyyy/mm/dd) JUN 05 2008
Date of Inspection (yyyy/mm/dd)
Remarks

Figure A.30: Borehole log for Well OW12.

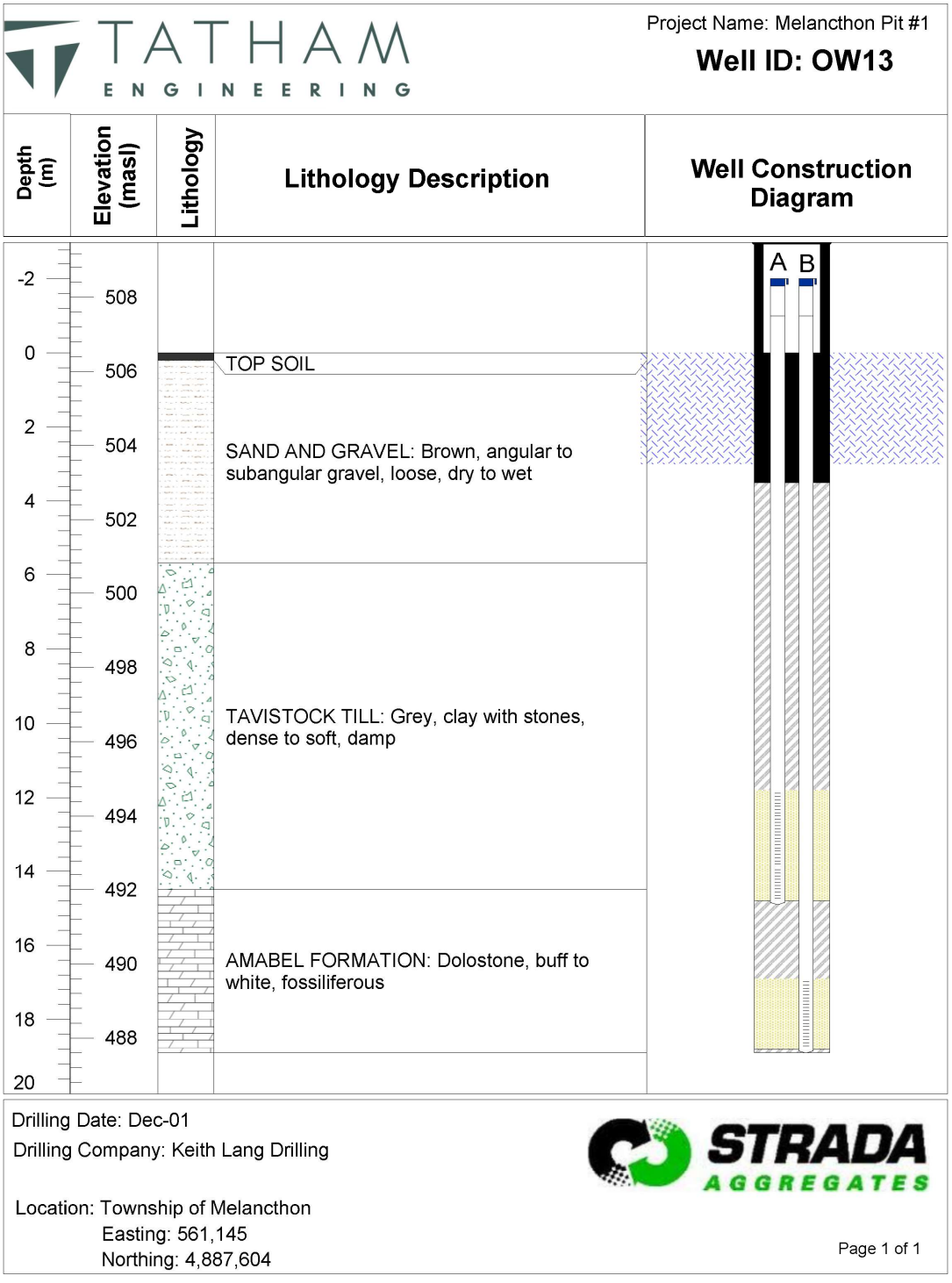


Figure A.31: Borehole log for Well OW13 A and B.

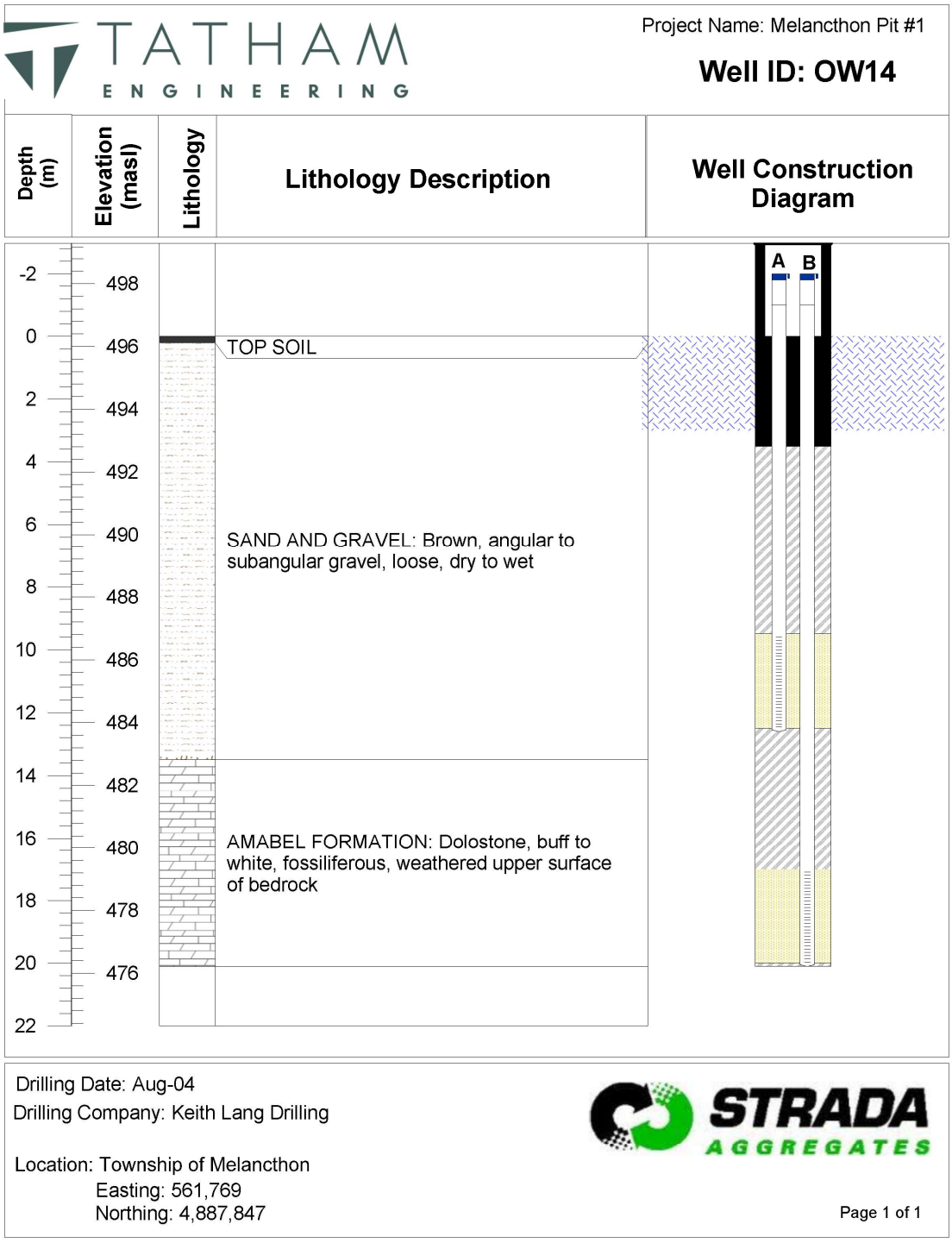


Figure A.32: Updated Borehole log for Well OW14 A and C.

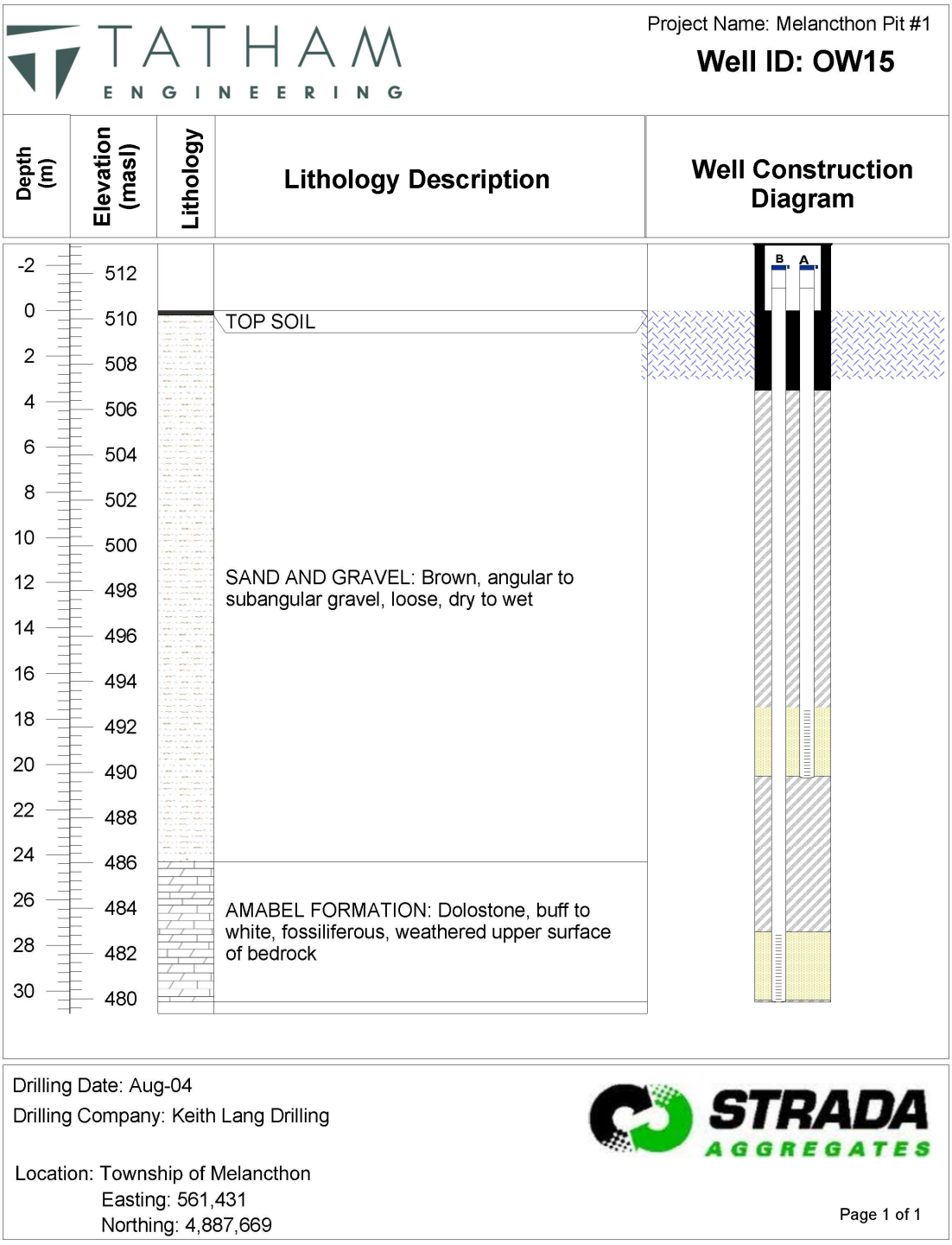
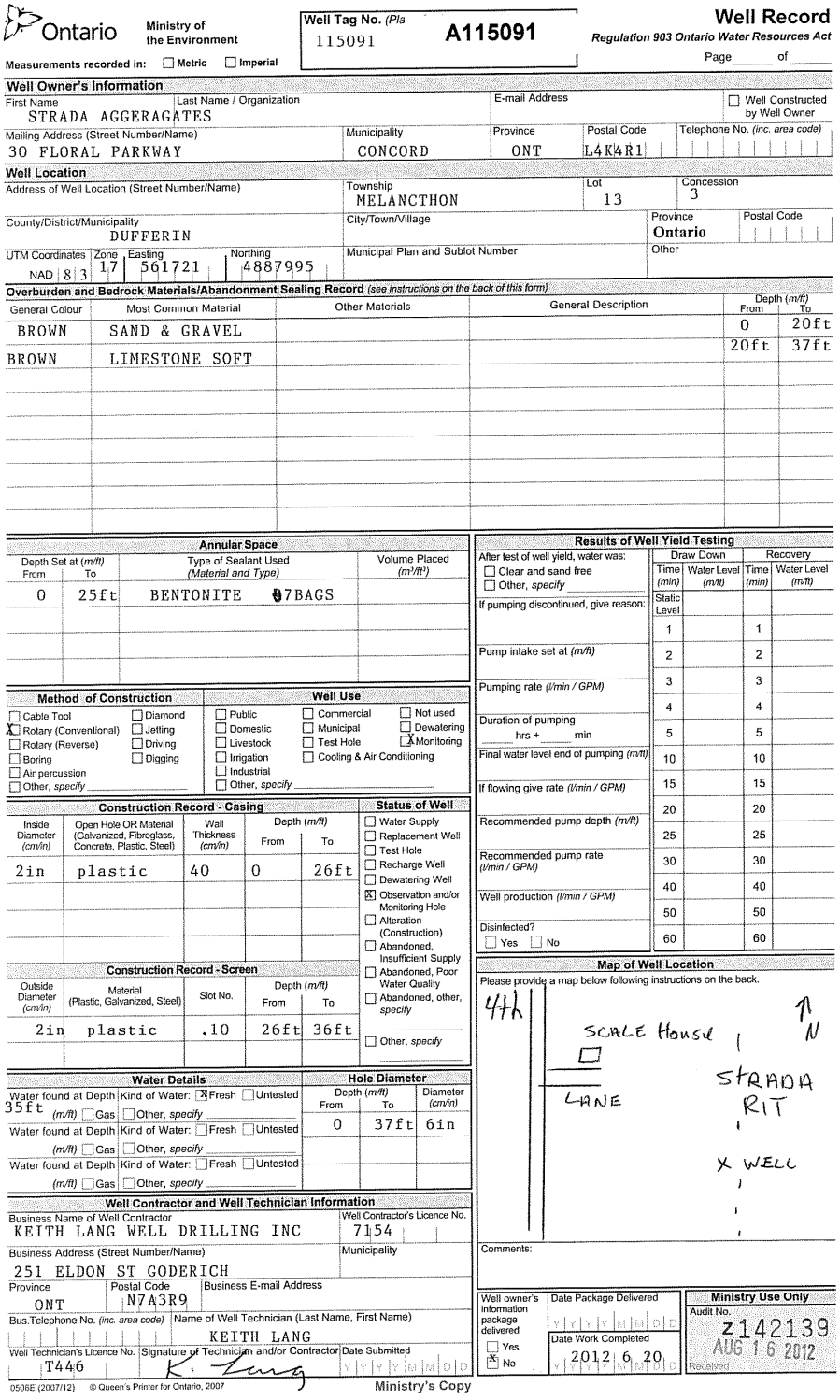


Figure A.33: Borehole log for Well OW15.



Ontario Ministry of the Environment

Well Tag No. (Pla 115091 **A115091**

Well Record
Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☐ Imperial

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	STRADA AGGERAGATES		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
30 FLORAL PARKWAY	CONCORD	ONT	L4K4R1	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
	MELANCTHON	13	3

County/District/Municipality	City/Town/Village	Province	Postal Code
DUFFERIN		Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	17	561721	4887995		

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	SAND & GRAVEL			0	20ft
BROWN	LIMESTONE SOFT			20ft	37ft

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	25ft	BENTONITE 7BAGS	

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
2in	plastic	40	0	26ft

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2in	plastic	.10	26ft	36ft

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	Hole Diameter Depth From	Depth To	Diameter (cm/in)
35ft (m/ft) ☐ Gas ☐ Other, specify	☒ Fresh ☐ Untested	0	37ft	6in
(m/ft) ☐ Gas ☐ Other, specify	☐ Fresh ☐ Untested			
(m/ft) ☐ Gas ☐ Other, specify	☐ Fresh ☐ Untested			

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
KEITH LANG WELL DRILLING INC	7154

Business Address (Street Number/Name)	Municipality
251 ELDON ST GODERICH	

Province	Postal Code	Business E-mail Address
ONT	N7A3R9	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
	KEITH LANG

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T446	K. Lang	

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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 owner's information package delivered ☐ Yes ☒ No

Date Package Delivered

Date Work Completed 2012 6 20

Ministry Use Only

Audit No. Z142139

AUG 16 2012 Received

Figure A.34: Borehole log for Well OW16C.

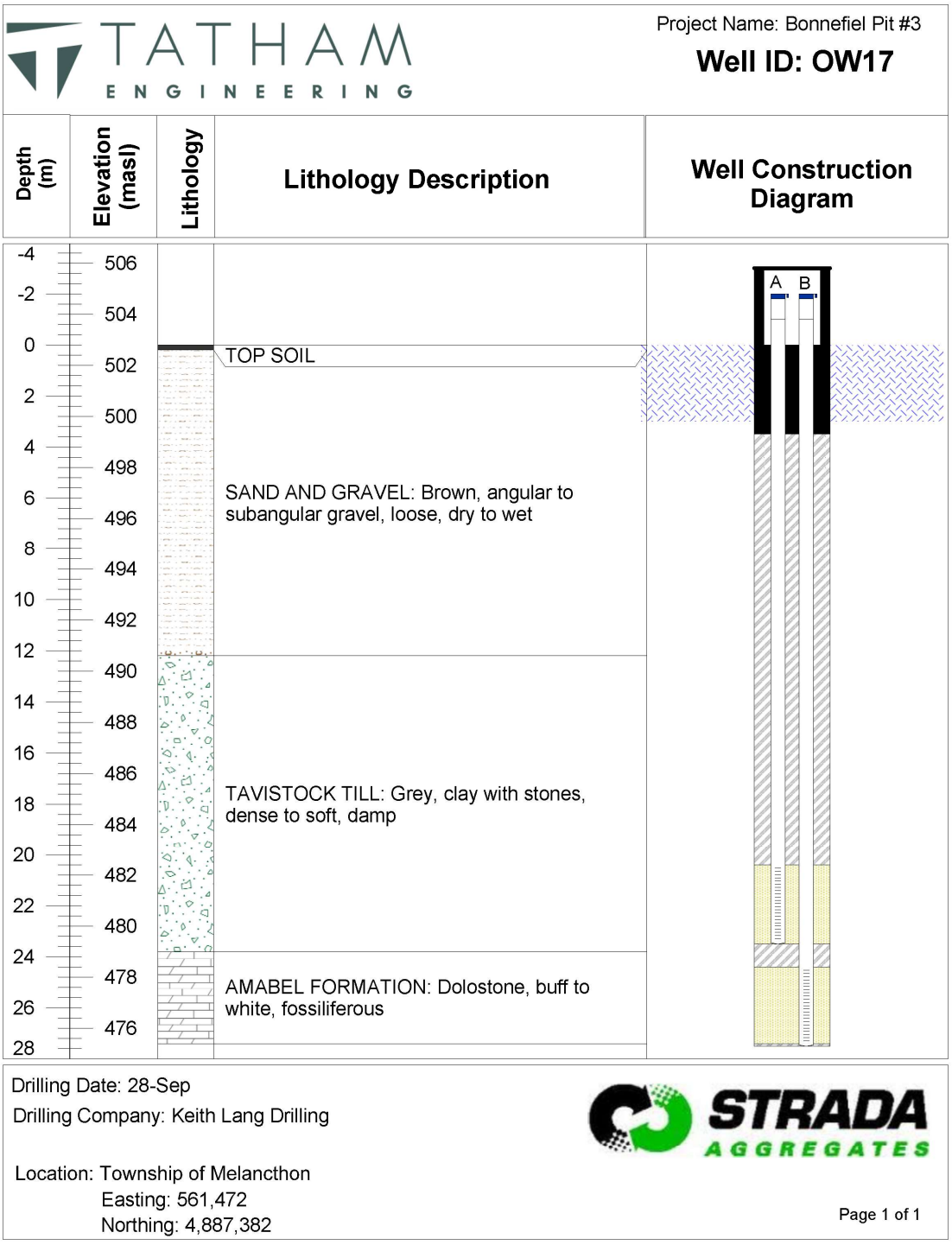


Figure A.35: Borehole log for Well OW17.

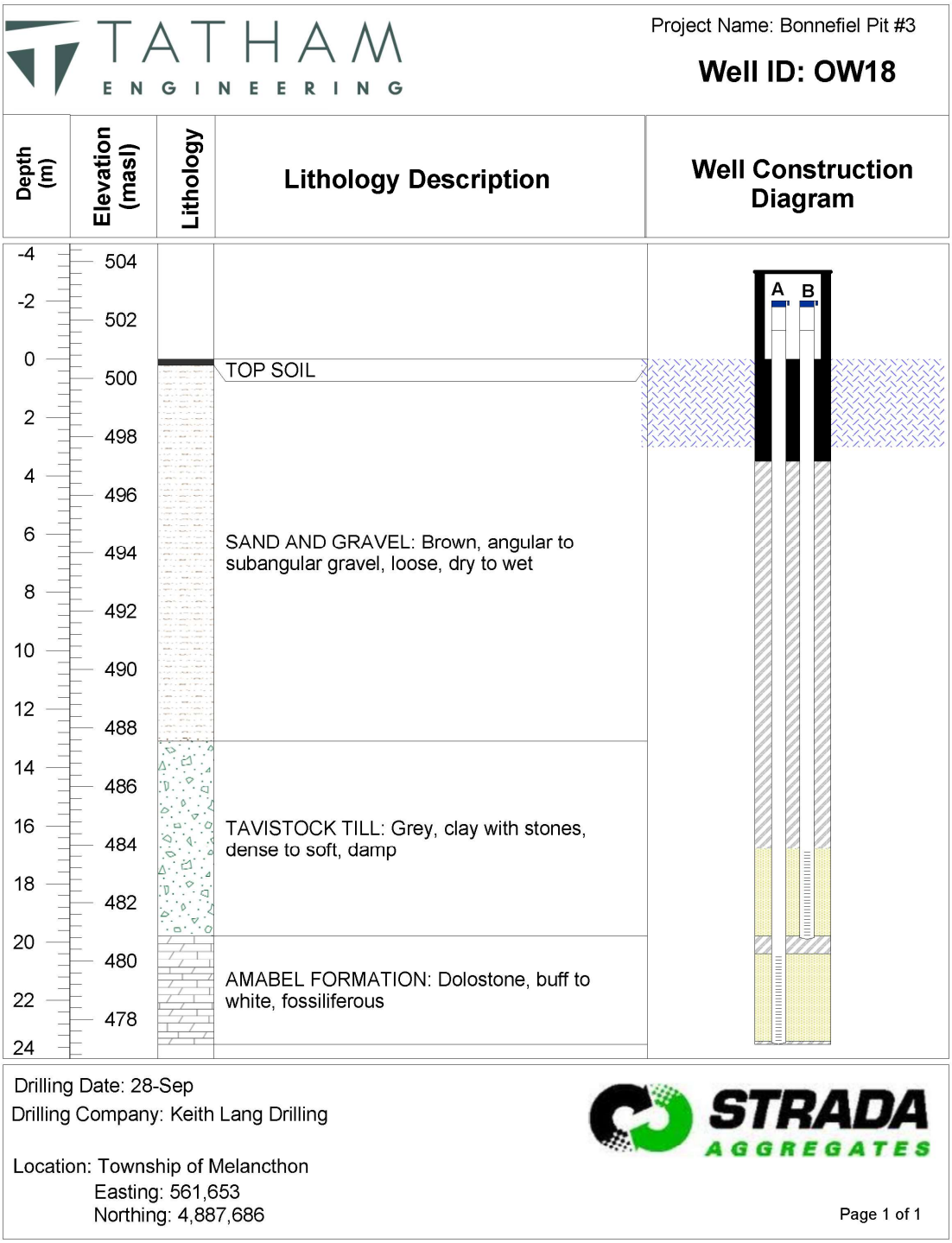


Figure A.36: Borehole log for Well OW18.

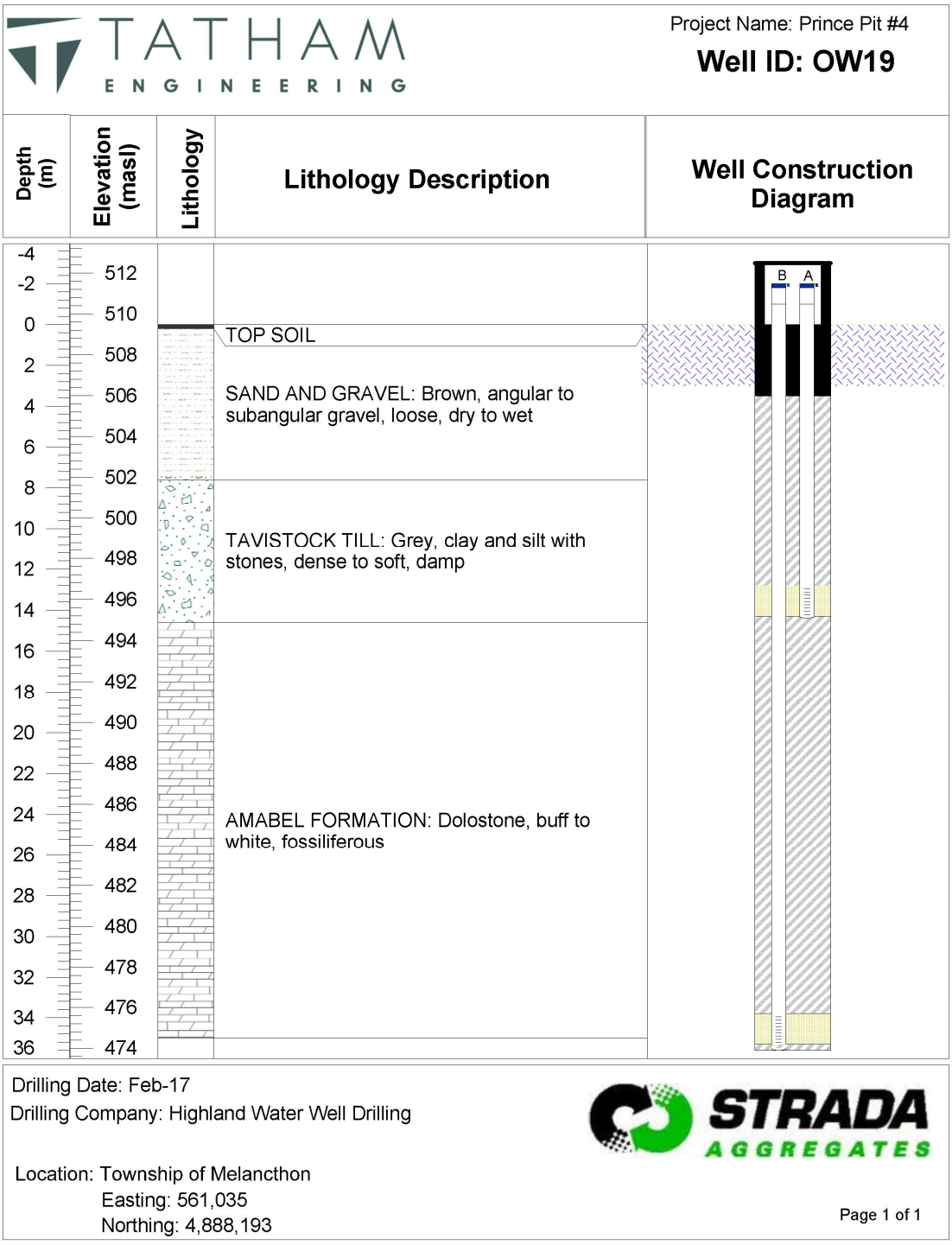


Figure A.37: Borehole log for Well OW19.

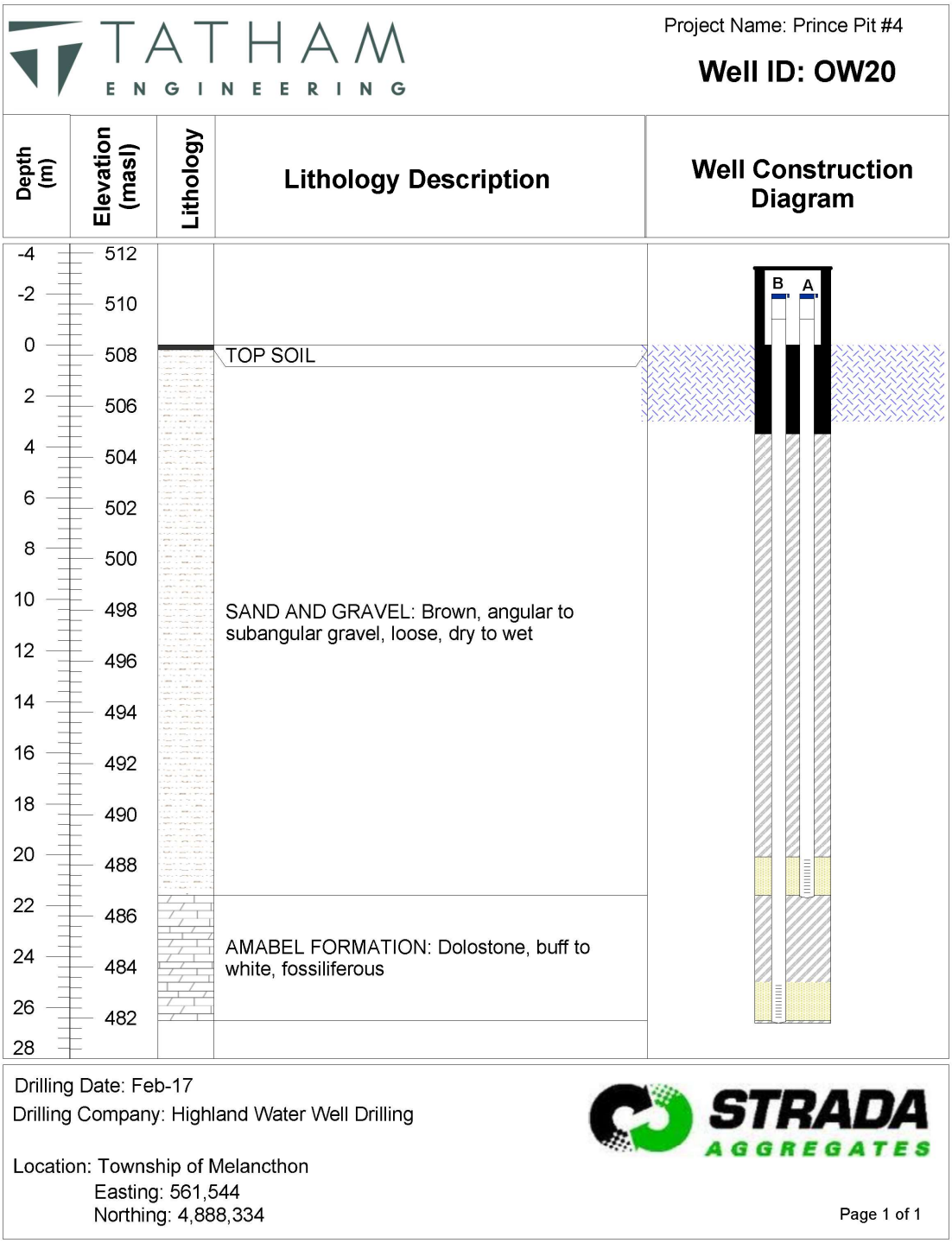


Figure A.38: Borehole log for Well OW20.

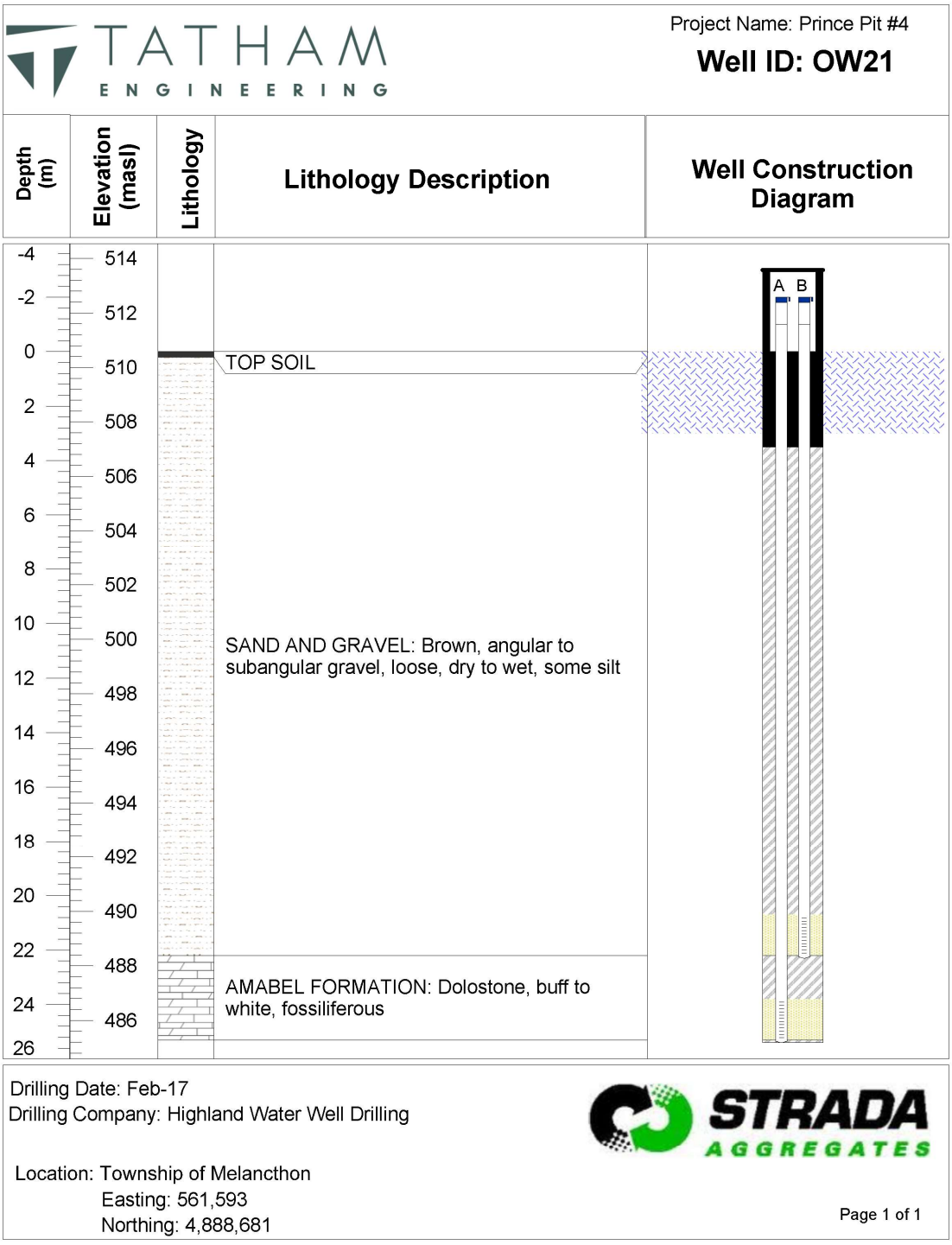


Figure A.39: Borehole log for Well OW21.

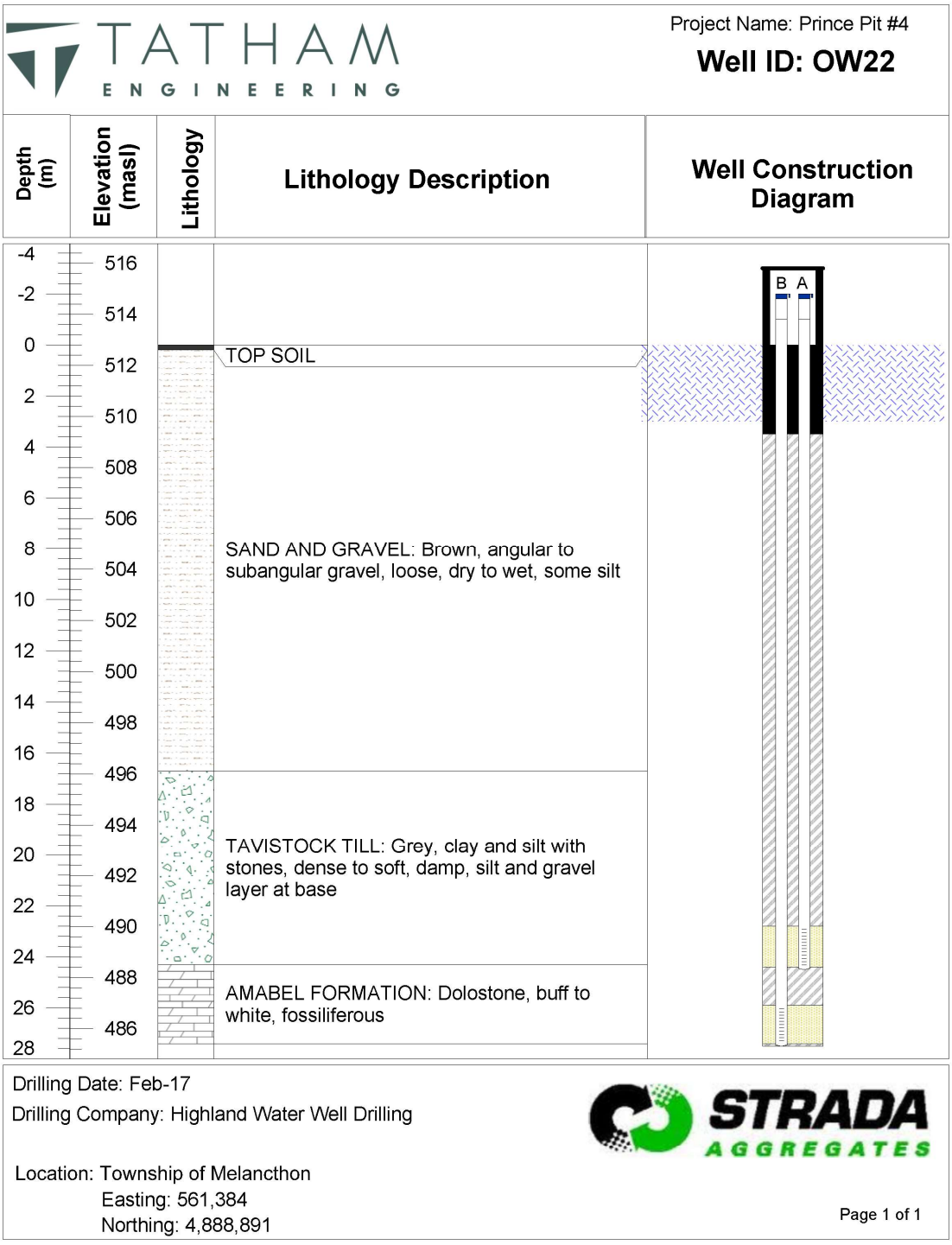


Figure A.40: Borehole log for Well OW22.

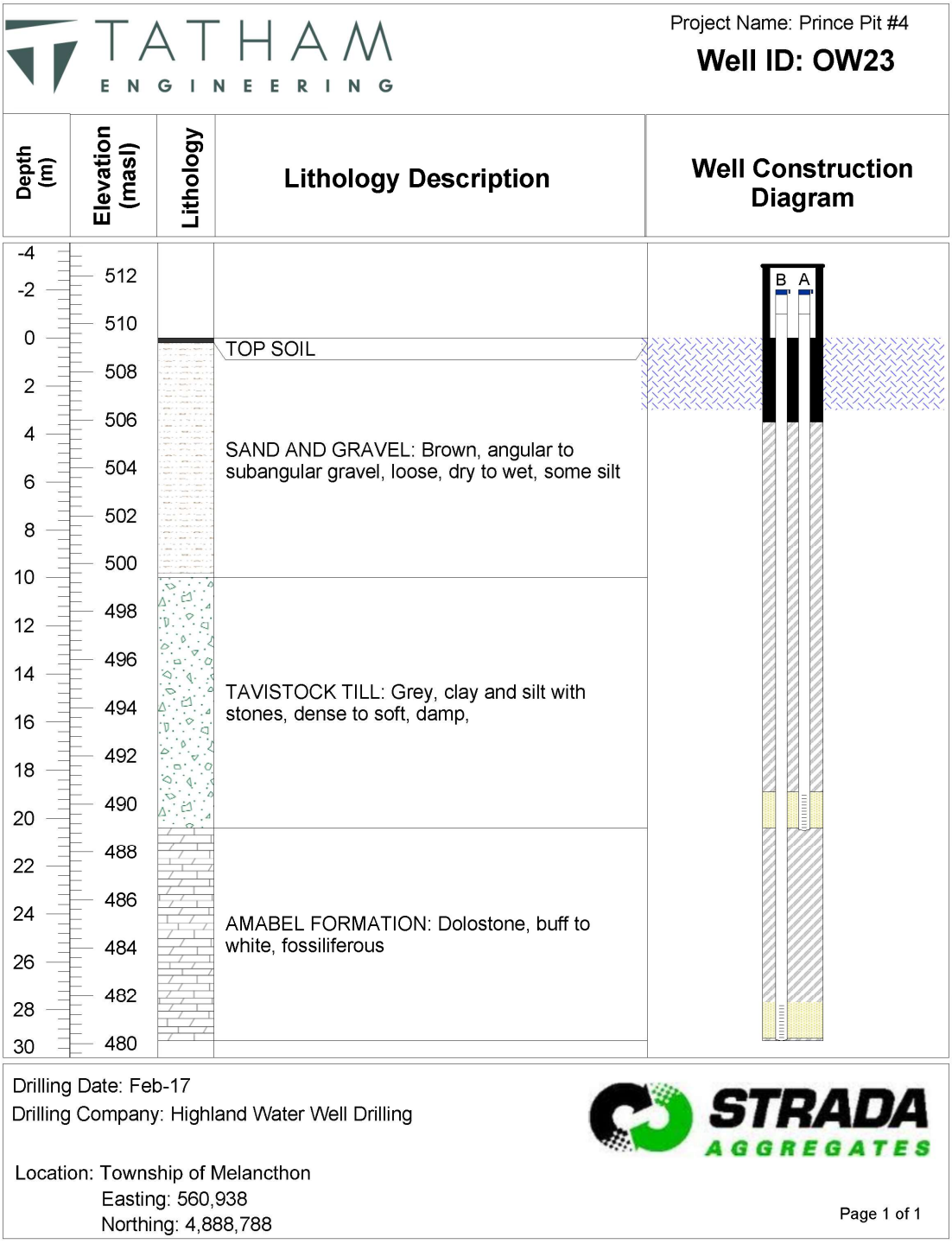
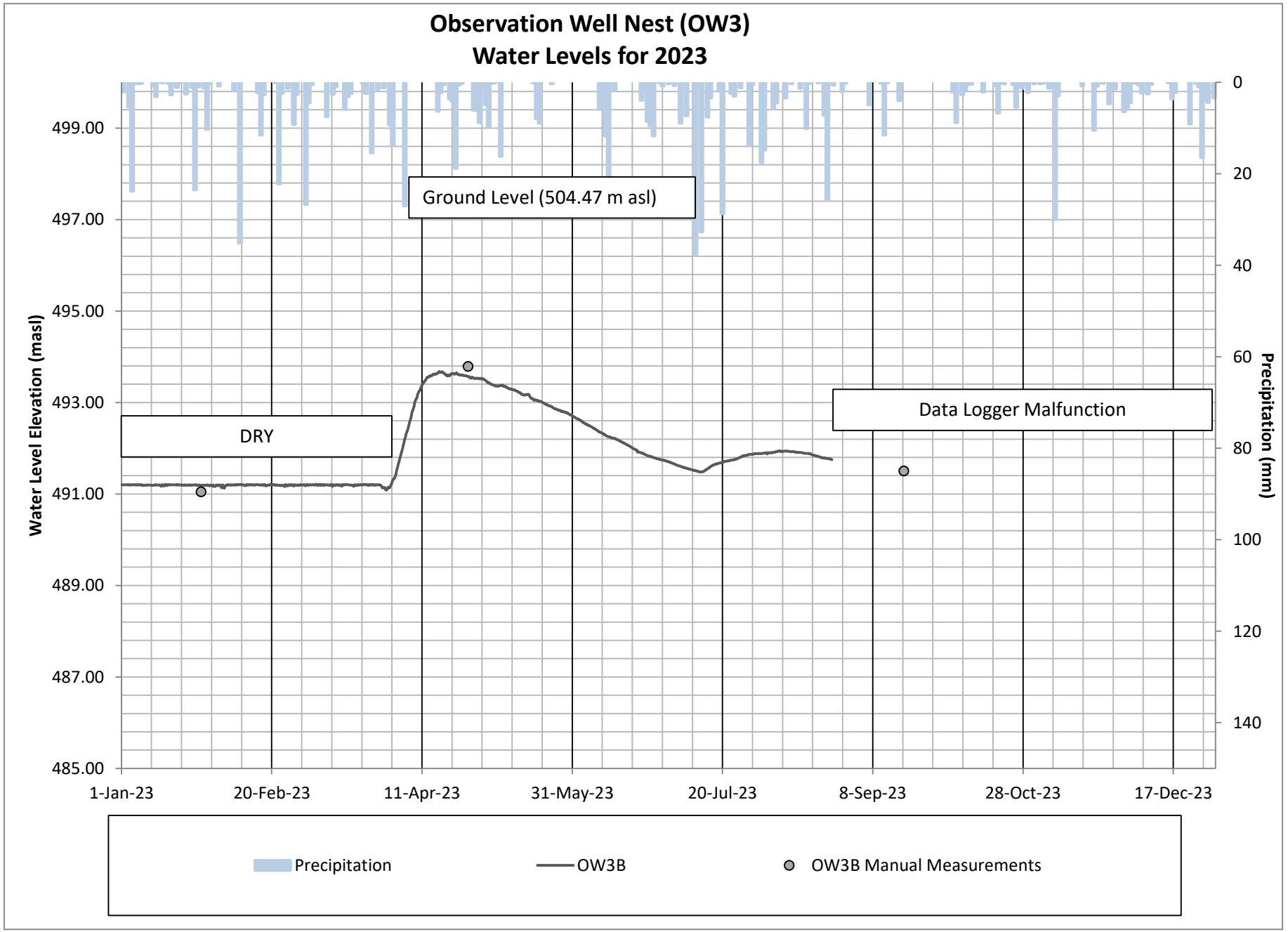
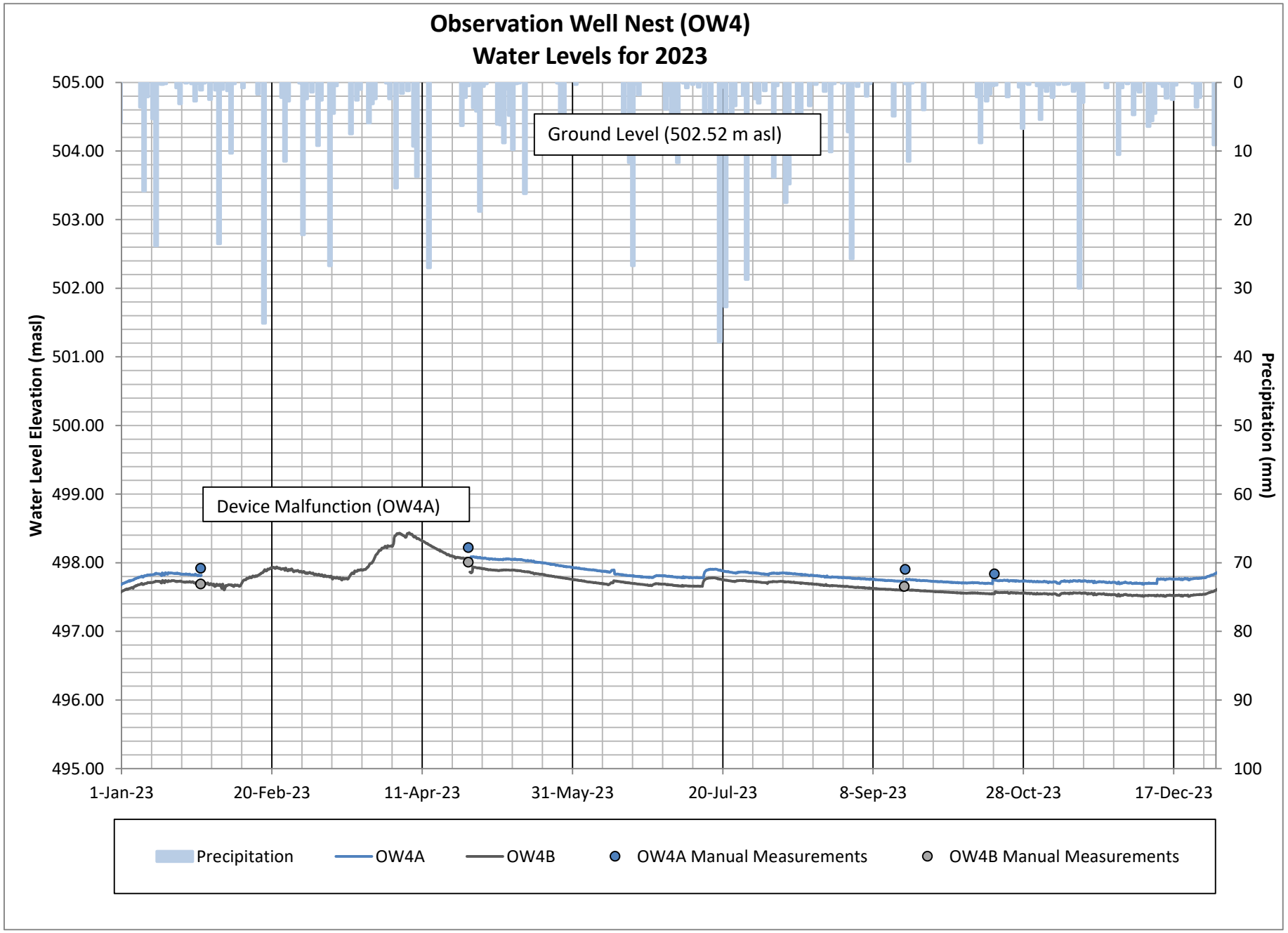
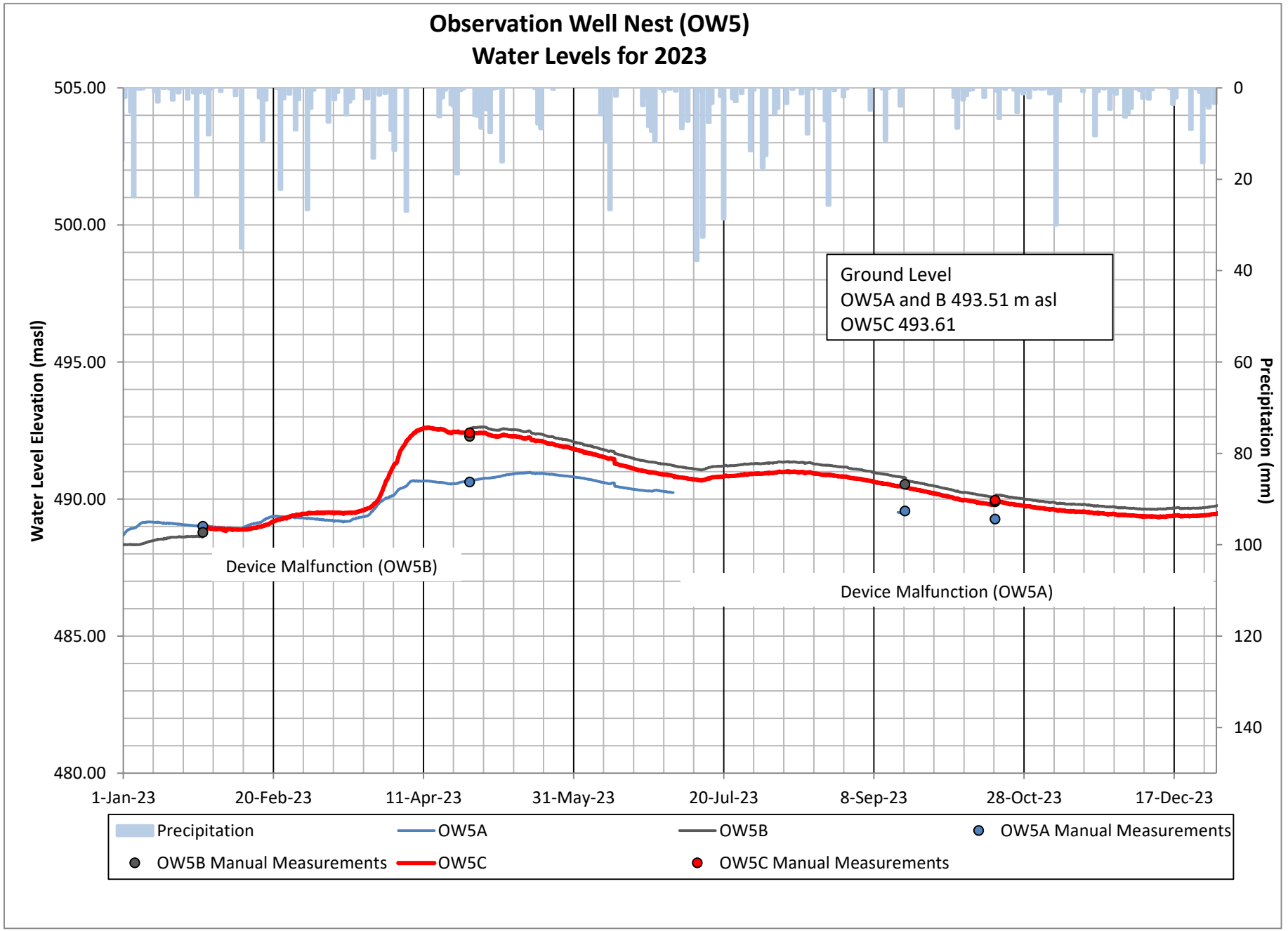


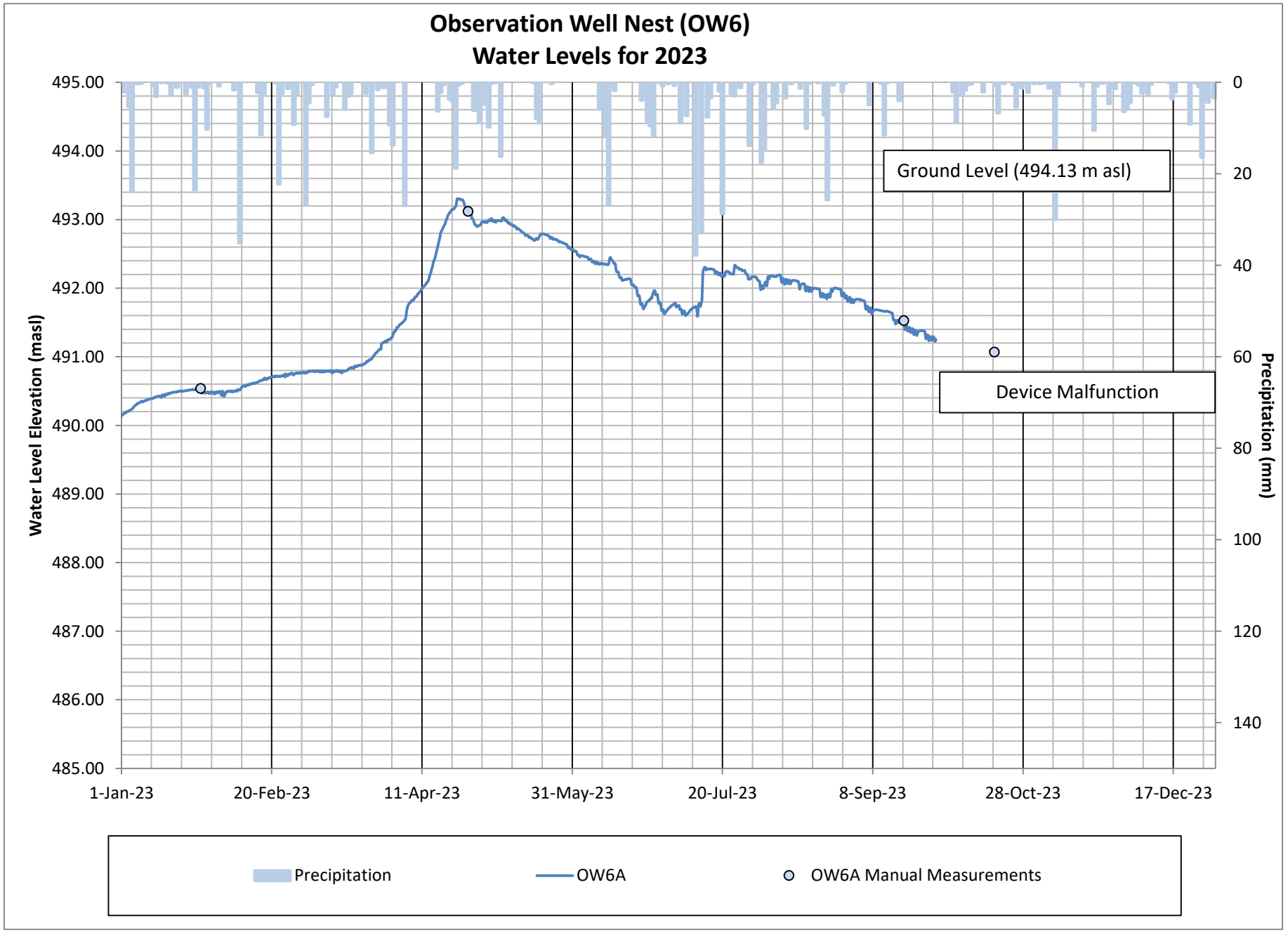
Figure A.41: Borehole log for Well OW23.

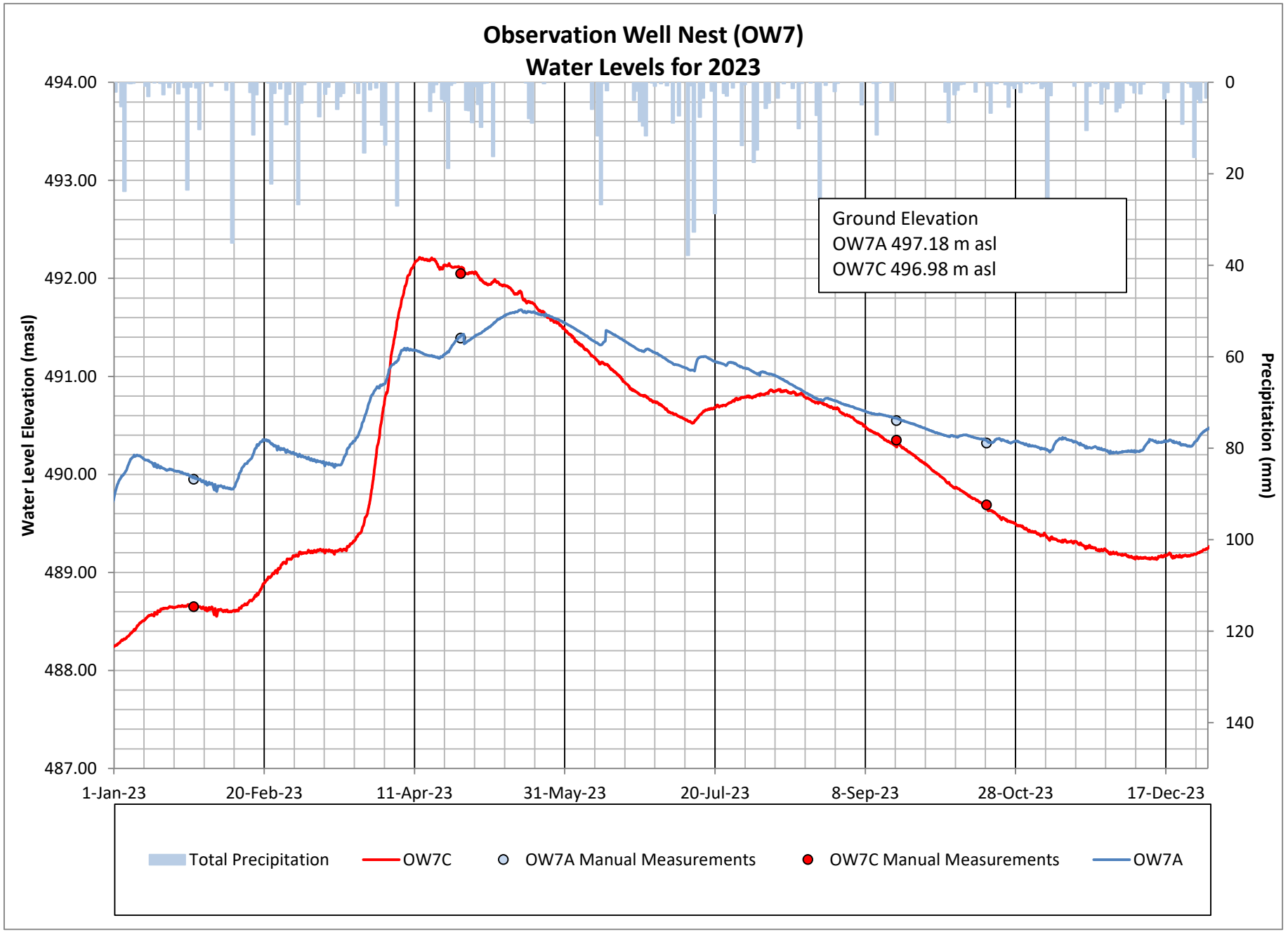
Appendix D: Hydrographs

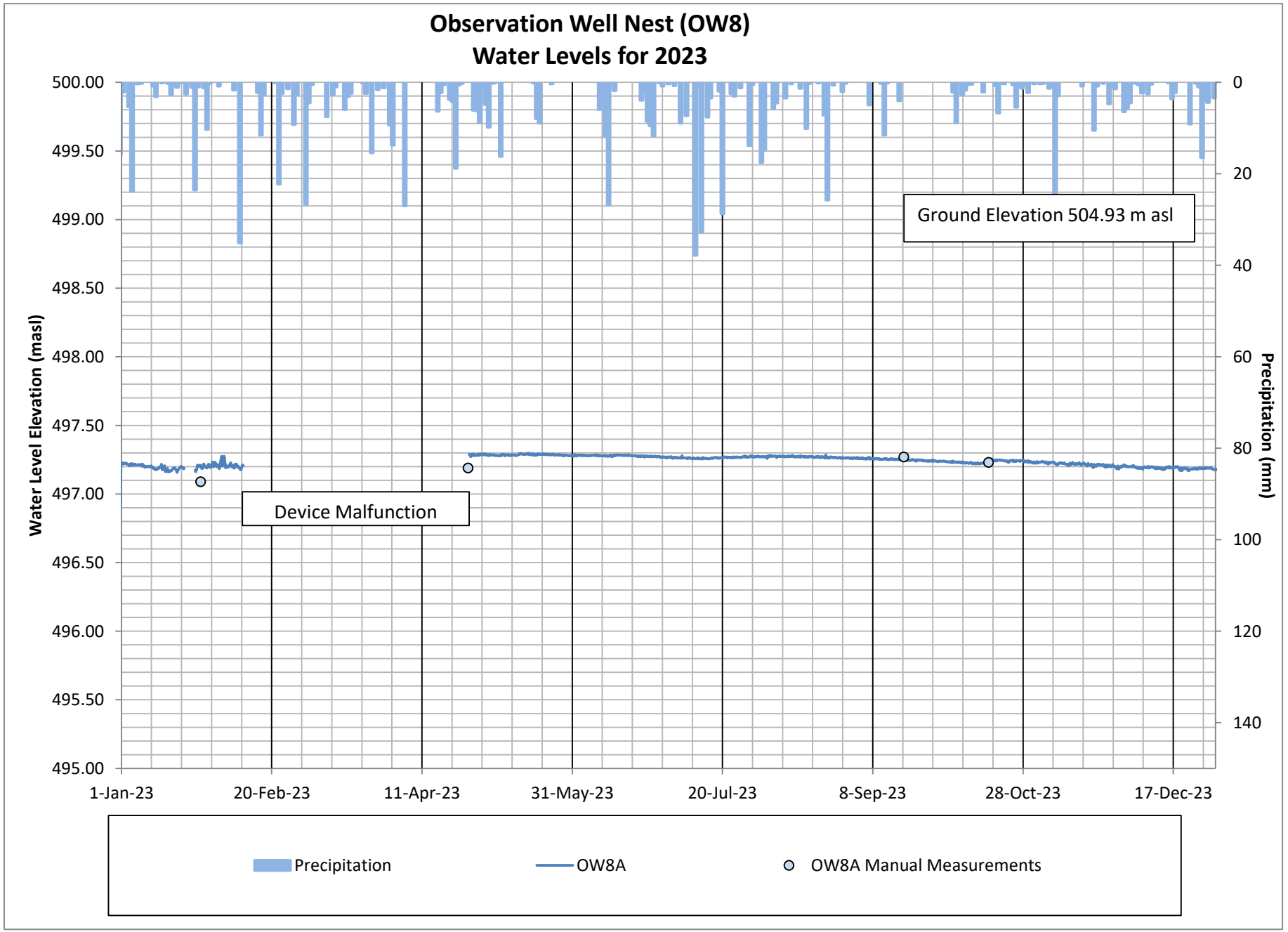

Observation Well Nest (OW3)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
499.00
497.00
495.00
493.00
491.00
489.00
487.00
485.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Level (504.47 m asl)
DRY
Data Logger Malfunction
Precipitation
OW3B
OW3B Manual Measurements

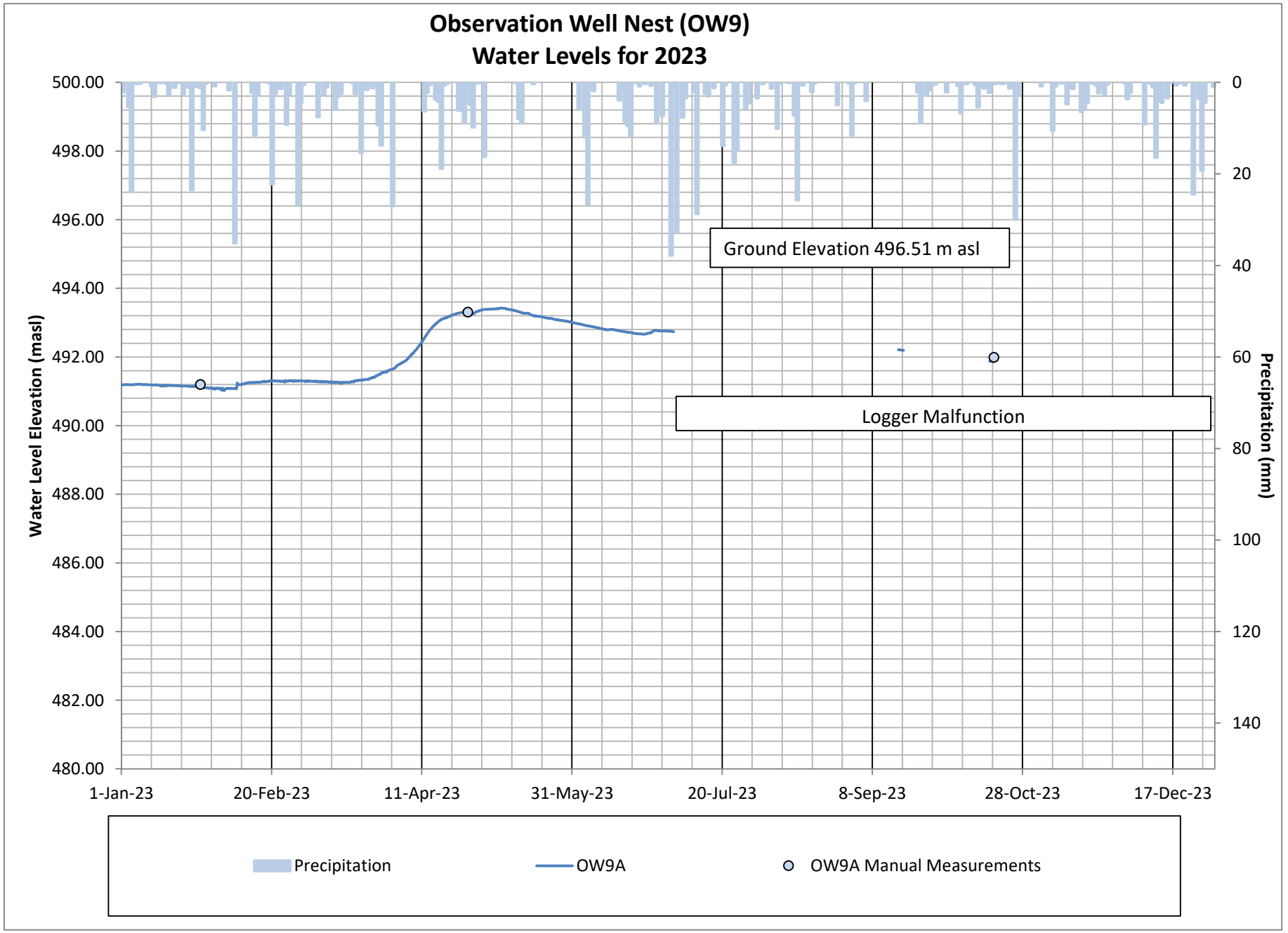

Observation Well Nest (OW4)
Water Levels for 2023
Ground Level (502.52 m asl)
Device Malfunction (OW4A)
Water Level Elevation (masl)
Precipitation (mm)
505.00
504.00
503.00
502.00
501.00
500.00
499.00
498.00
497.00
496.00
495.00
0
10
20
30
40
50
60
70
80
90
100
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Precipitation
OW4A
OW4B
OW4A Manual Measurements
OW4B Manual Measurements

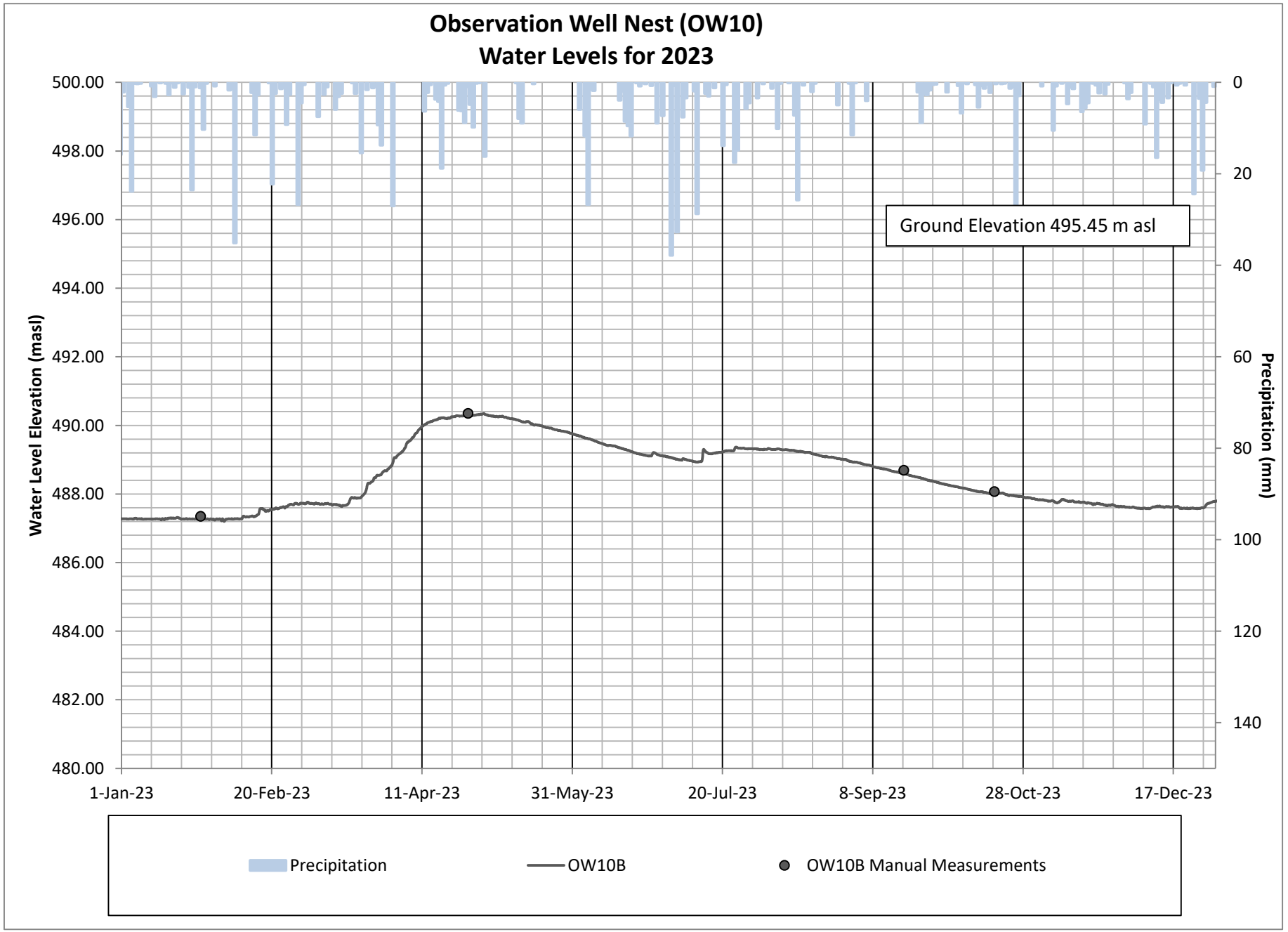

Observation Well Nest (OW5)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
505.00
500.00
495.00
490.00
485.00
480.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Level
OW5A and B 493.51 m asl
OW5C 493.61
Device Malfunction (OW5B)
Device Malfunction (OW5A)
Precipitation
OW5A
OW5B
OW5A Manual Measurements
OW5B Manual Measurements
OW5C
OW5C Manual Measurements

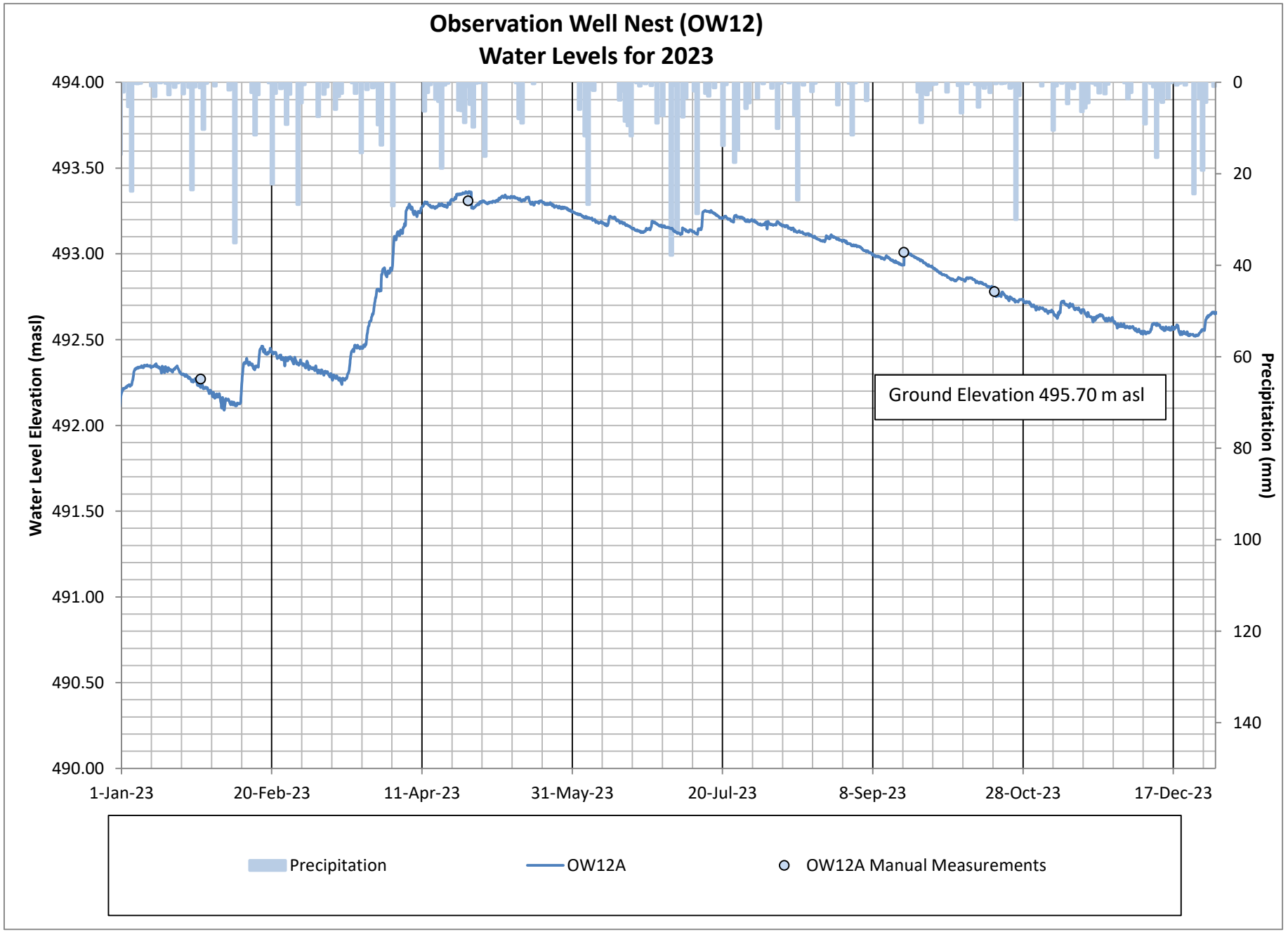

Observation Well Nest (OW6)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
495.00
494.00
493.00
492.00
491.00
490.00
489.00
488.00
487.00
486.00
485.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Level (494.13 m asl)
Device Malfunction
Precipitation
OW6A
OW6A Manual Measurements

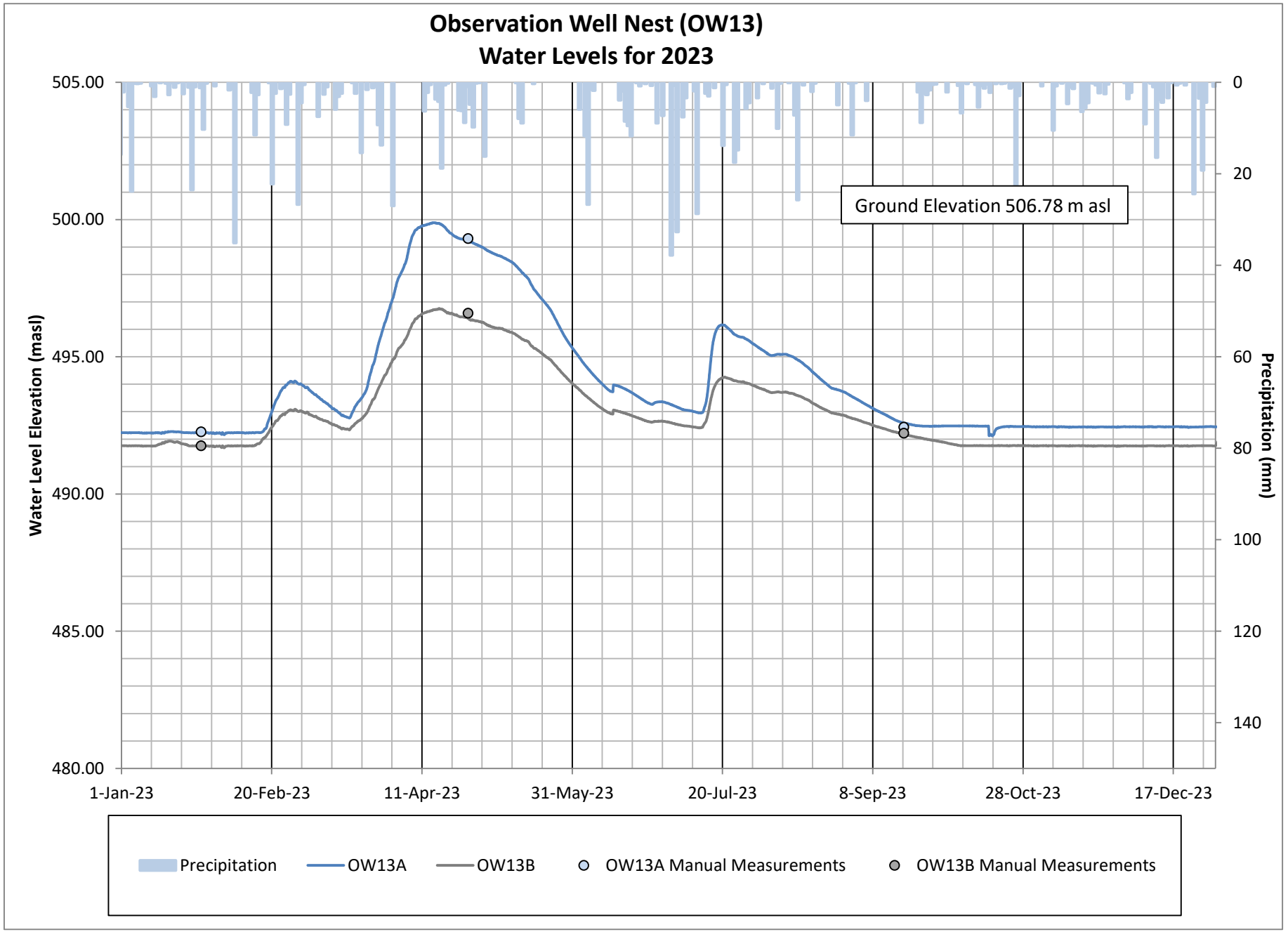

Observation Well Nest (OW7)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
494.00
493.00
492.00
491.00
490.00
489.00
488.00
487.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation
OW7A 497.18 m asl
OW7C 496.98 m asl
Total Precipitation
OW7C
OW7A Manual Measurements
OW7C Manual Measurements
OW7A

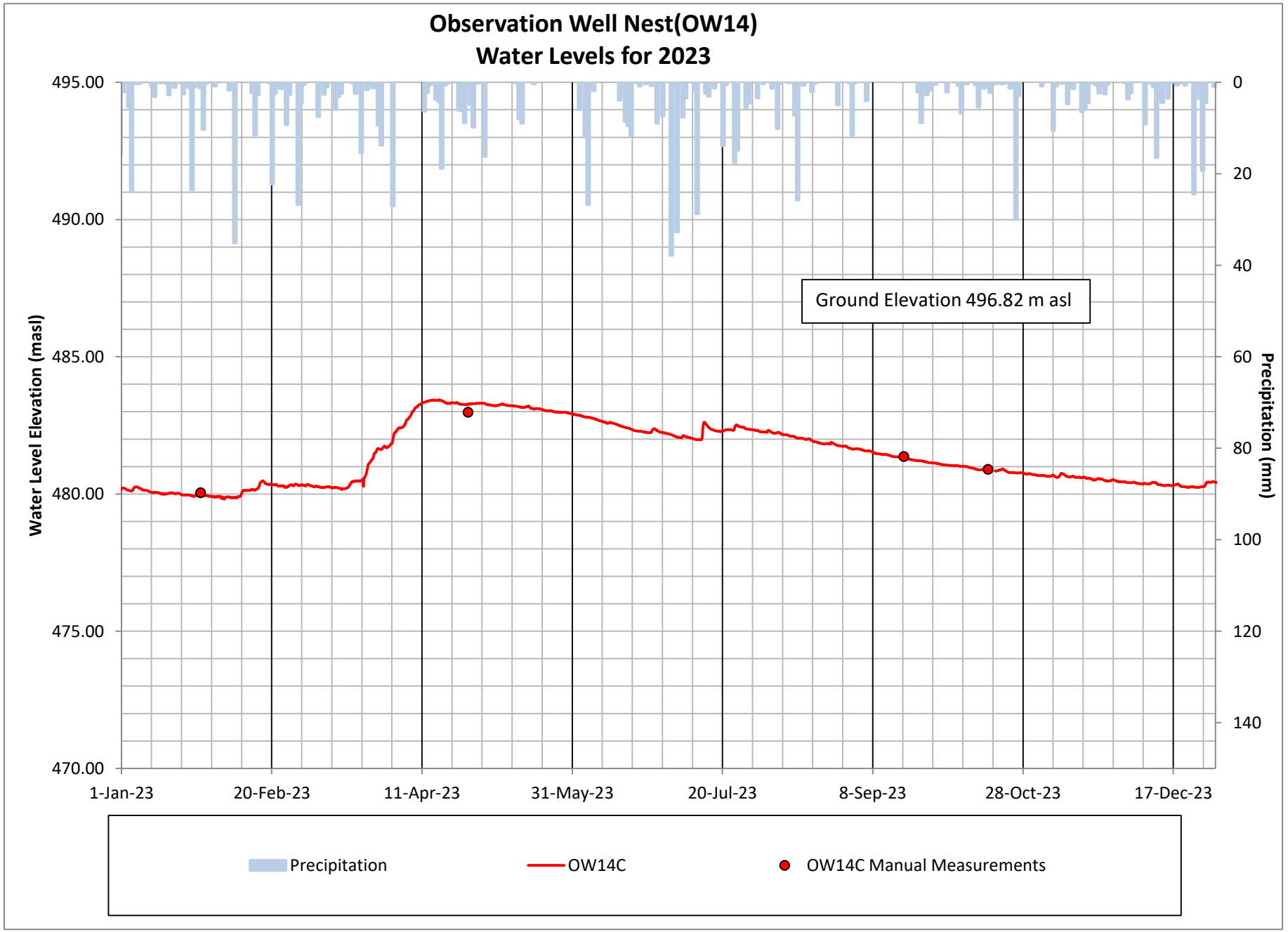

Observation Well Nest (OW8)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
500.00
499.50
499.00
498.50
498.00
497.50
497.00
496.50
496.00
495.50
495.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 504.93 m asl
Device Malfunction
Precipitation
OW8A
OW8A Manual Measurements

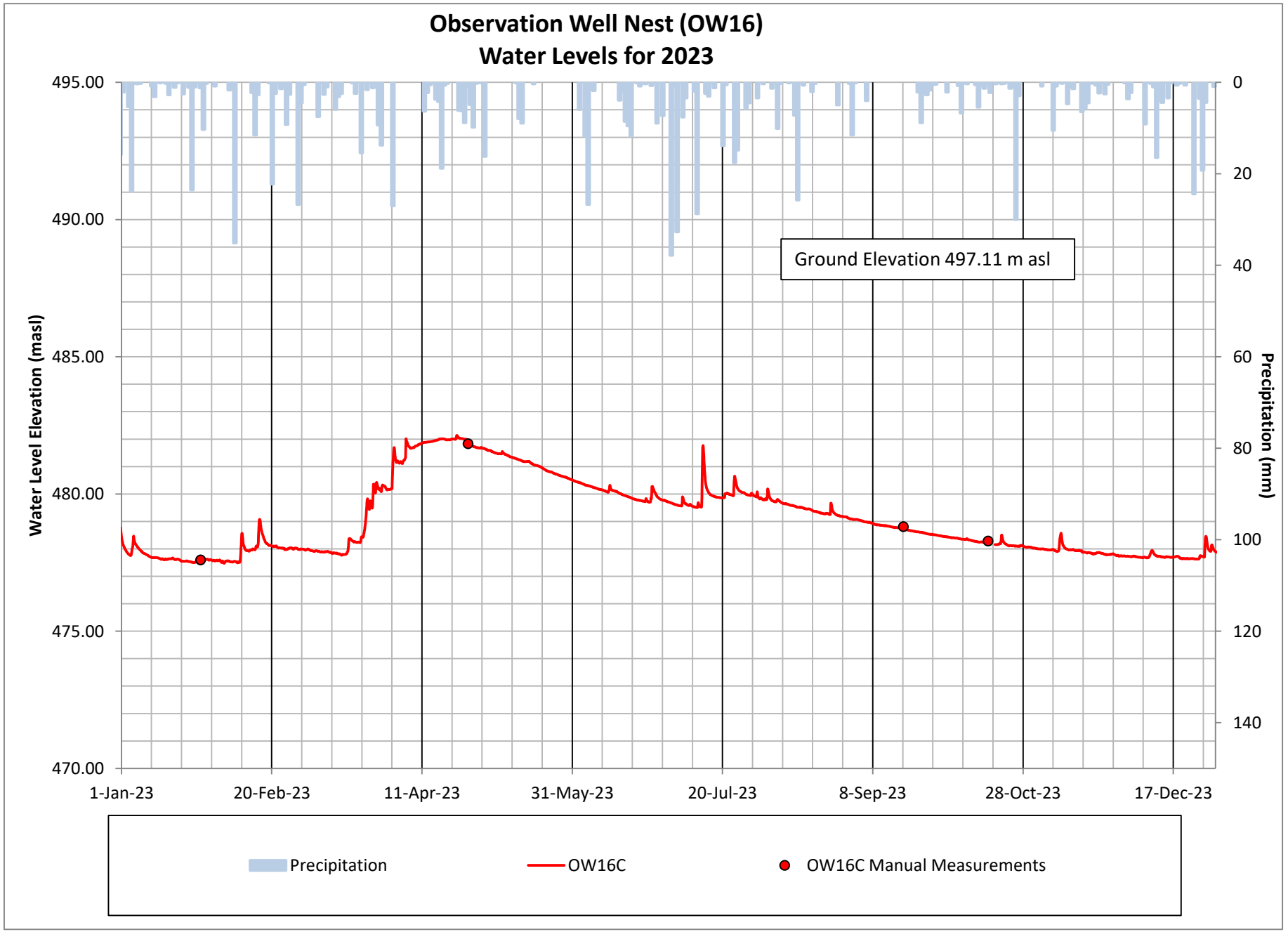

Observation Well Nest (OW9)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
500.00
498.00
496.00
494.00
492.00
490.00
488.00
486.00
484.00
482.00
480.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 496.51 m asl
Logger Malfunction
Precipitation
OW9A
OW9A Manual Measurements

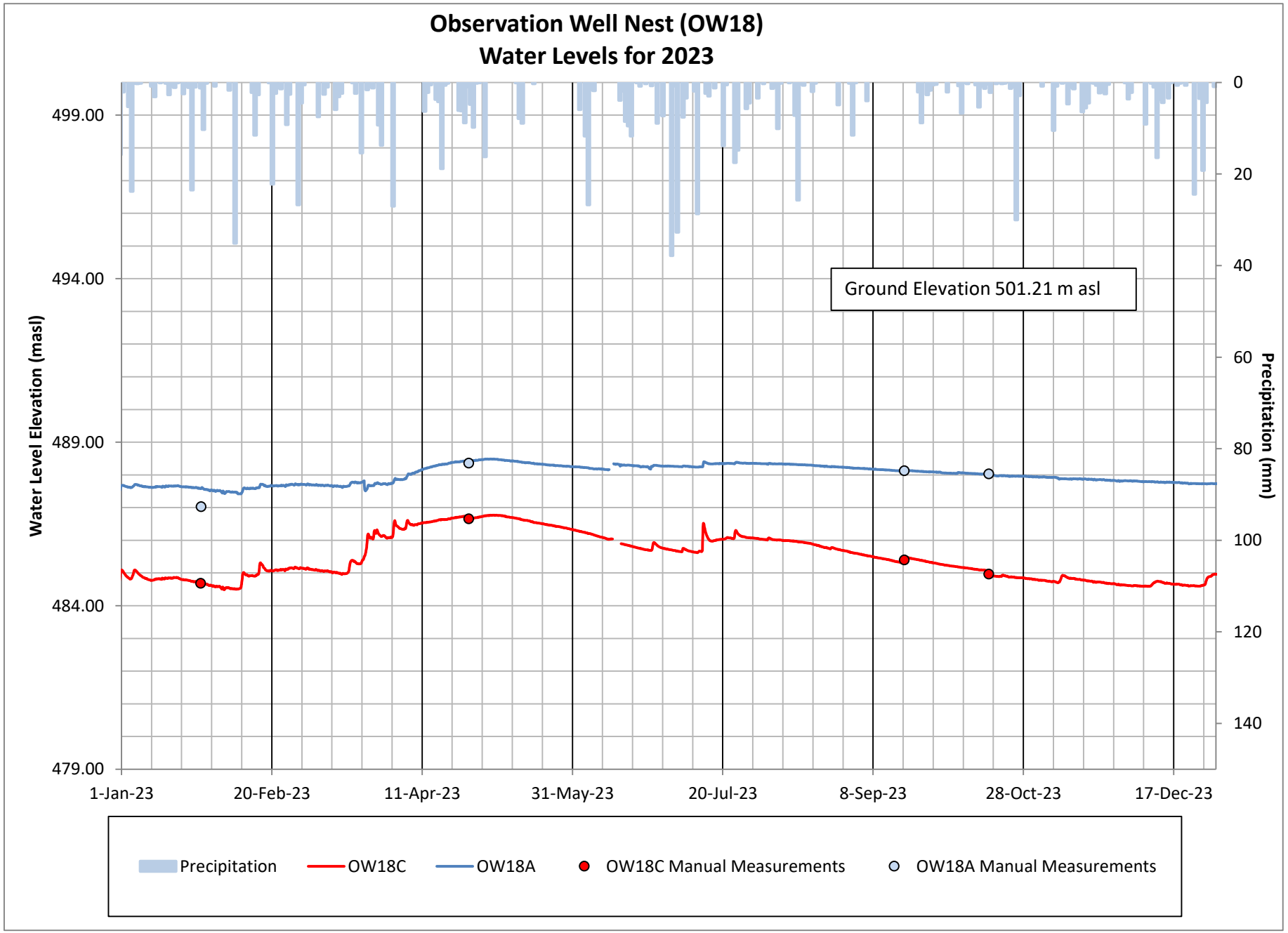

Observation Well Nest (OW10)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
500.00
498.00
496.00
494.00
492.00
490.00
488.00
486.00
484.00
482.00
480.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 495.45 m asl
Precipitation
OW10B
OW10B Manual Measurements

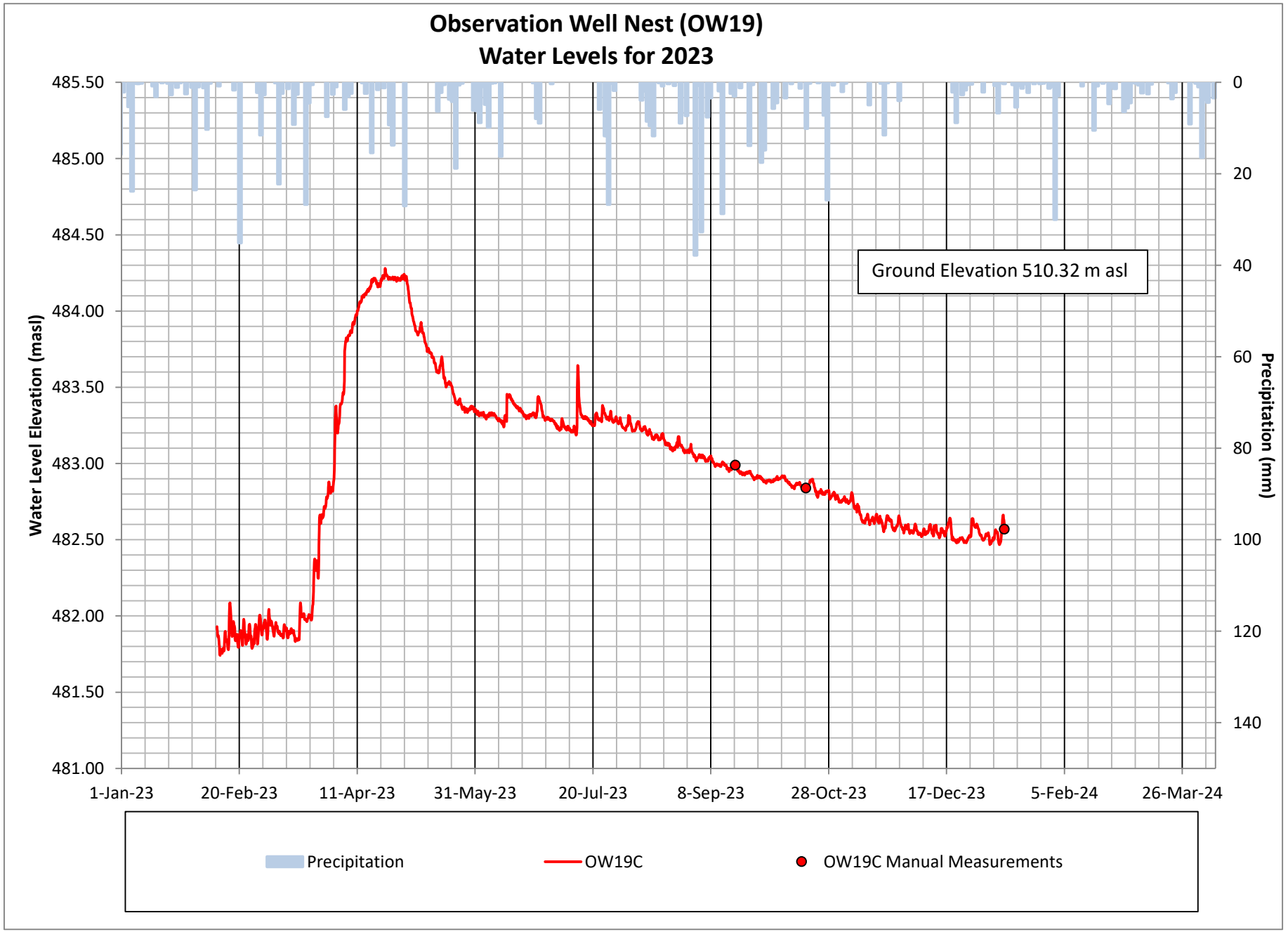

Observation Well Nest (OW12)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
494.00
493.50
493.00
492.50
492.00
491.50
491.00
490.50
490.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 495.70 m asl
Precipitation
OW12A
OW12A Manual Measurements

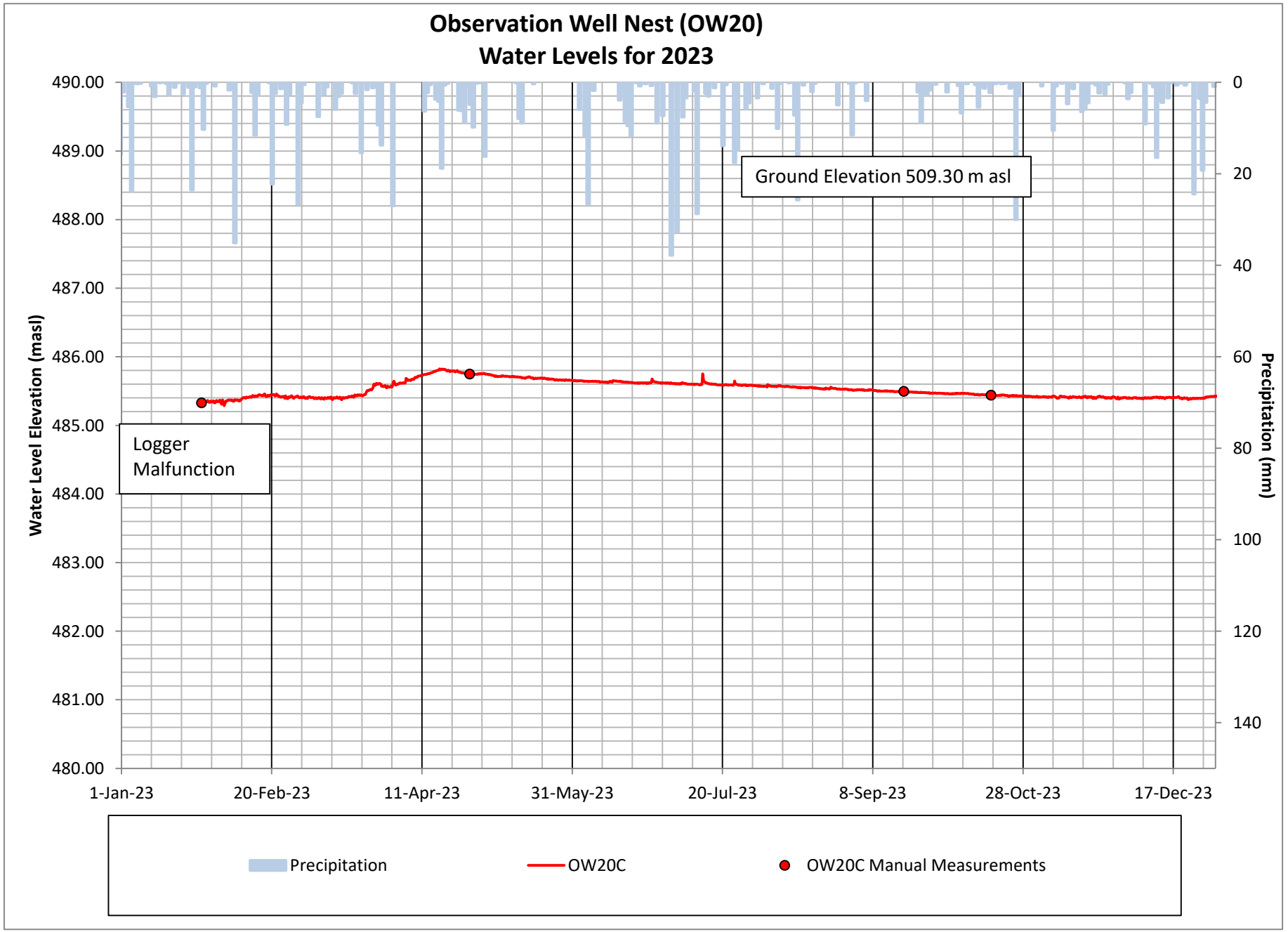

Observation Well Nest (OW13)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
505.00
500.00
495.00
490.00
485.00
480.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 506.78 m asl
Precipitation
OW13A
OW13B
OW13A Manual Measurements
OW13B Manual Measurements

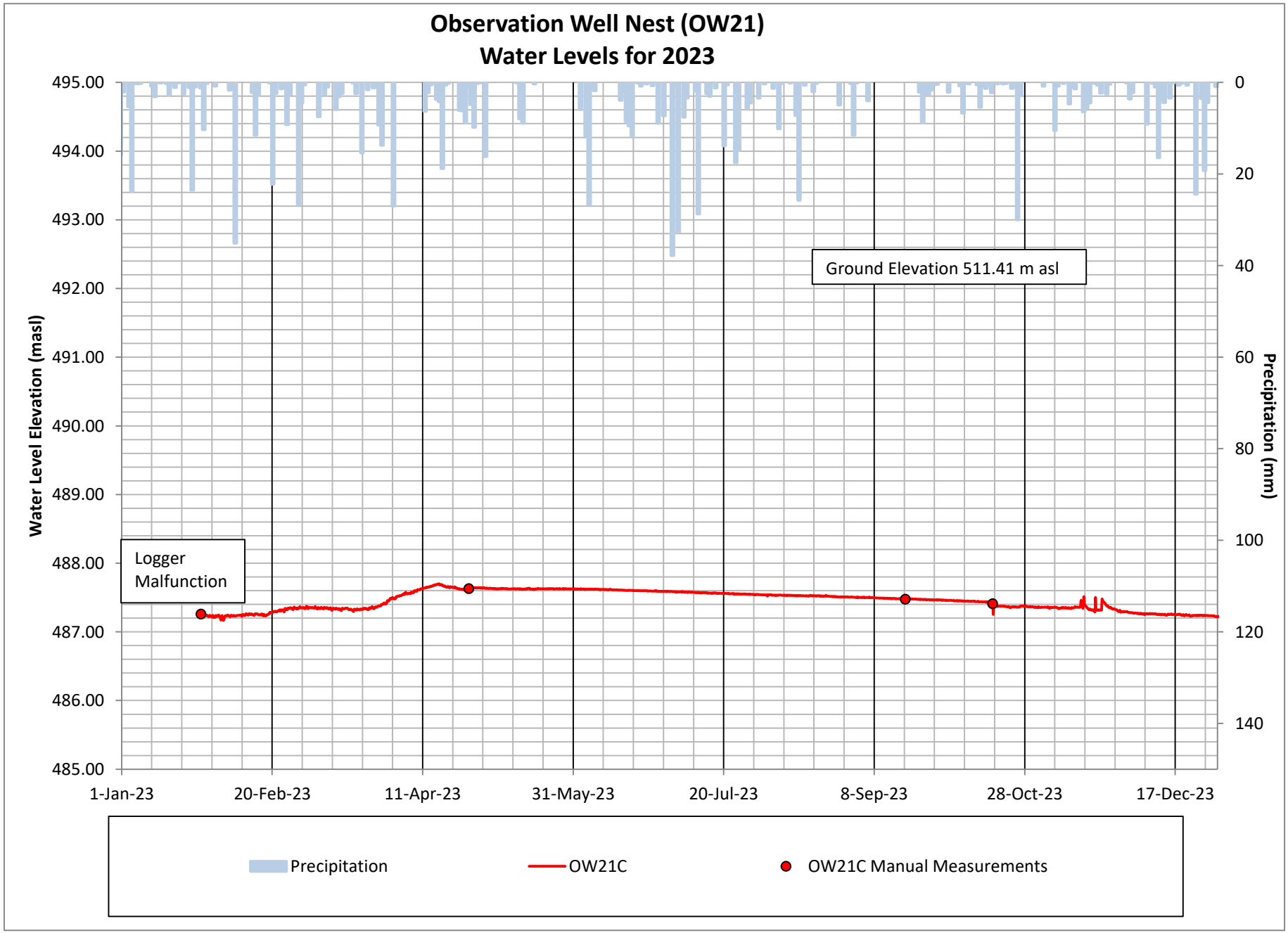

Observation Well Nest(OW14)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
495.00
490.00
485.00
480.00
475.00
470.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 496.82 m asl
Precipitation
OW14C
OW14C Manual Measurements

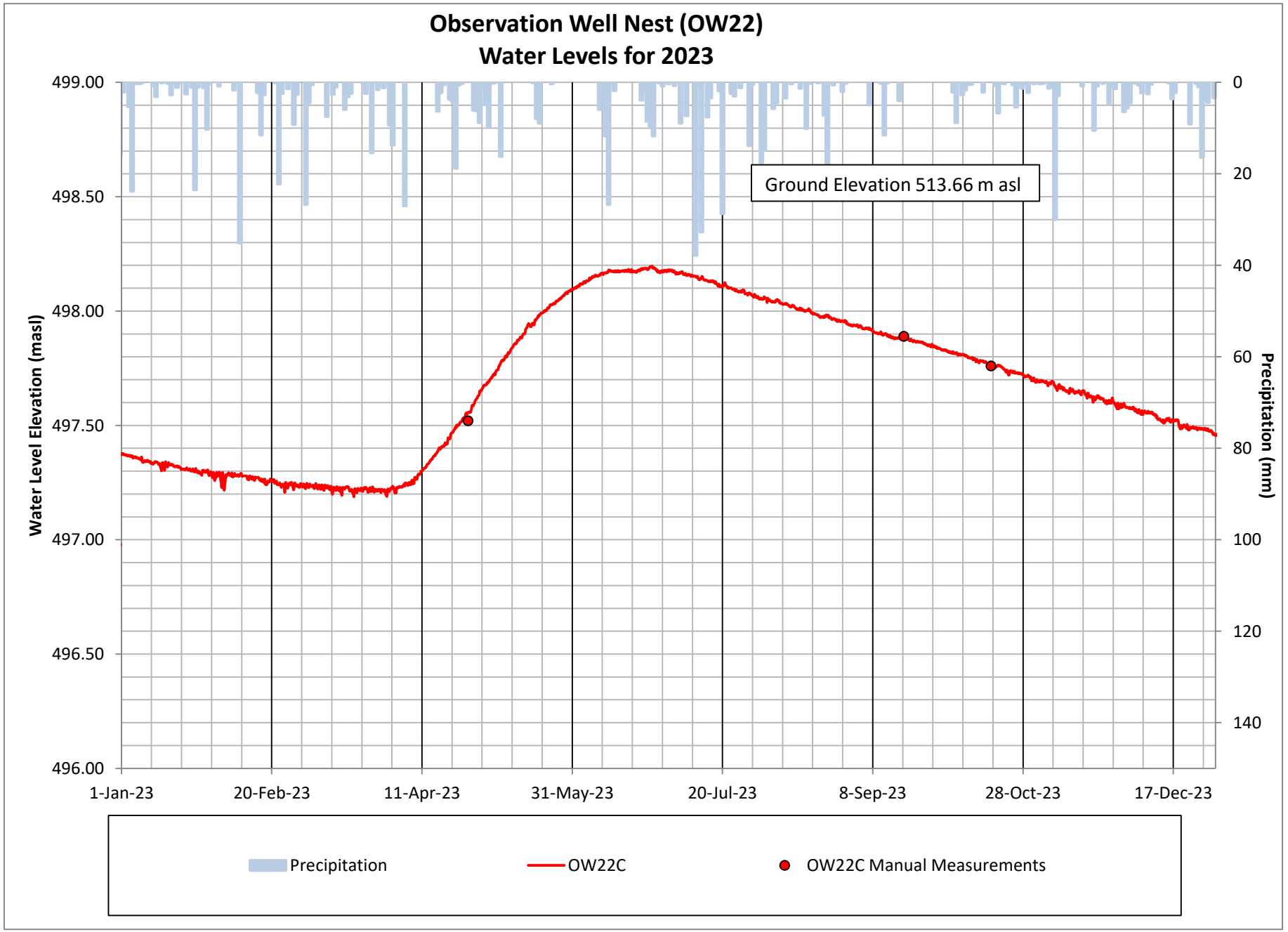

Observation Well Nest (OW16)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
495.00
490.00
485.00
480.00
475.00
470.00
0
20
40
60
80
100
120
140
Ground Elevation 497.11 m asl
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Precipitation
OW16C
OW16C Manual Measurements

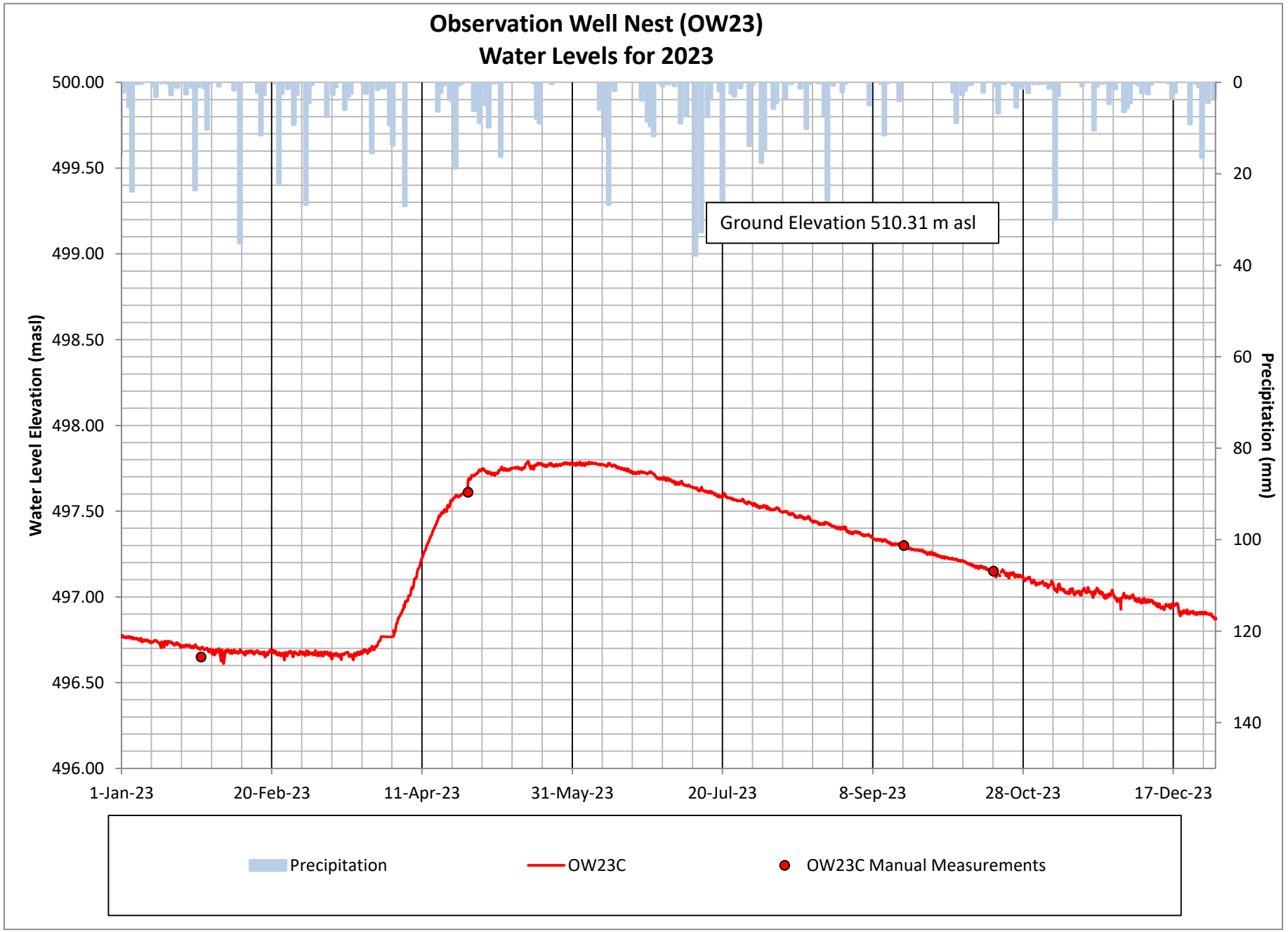

Observation Well Nest (OW18)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
499.00
494.00
489.00
484.00
479.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 501.21 m asl
Precipitation
OW18C
OW18A
OW18C Manual Measurements
OW18A Manual Measurements

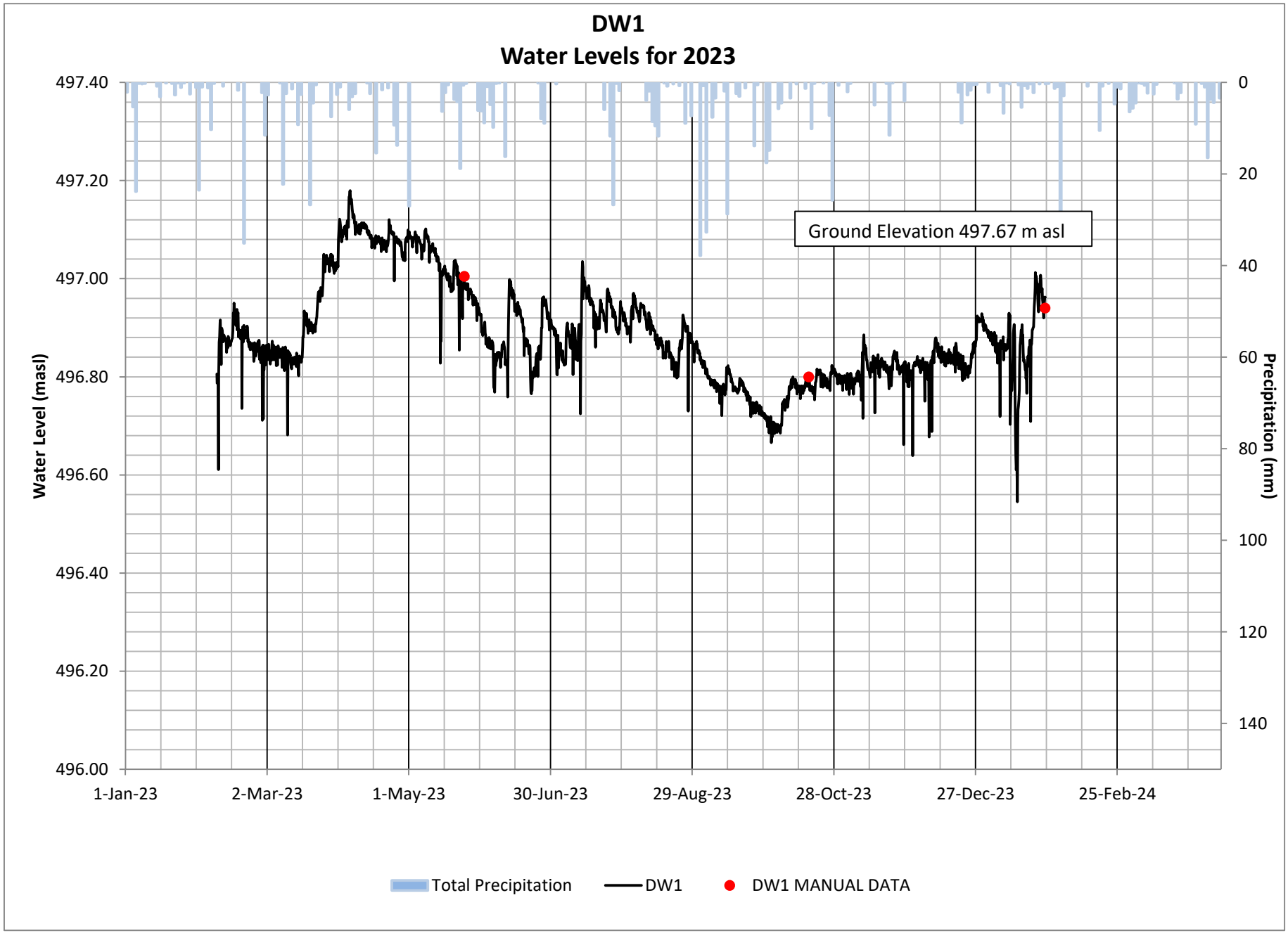

Observation Well Nest (OW19)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
485.50
485.00
484.50
484.00
483.50
483.00
482.50
482.00
481.50
481.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
5-Feb-24
26-Mar-24
Ground Elevation 510.32 m asl
Precipitation
OW19C
OW19C Manual Measurements

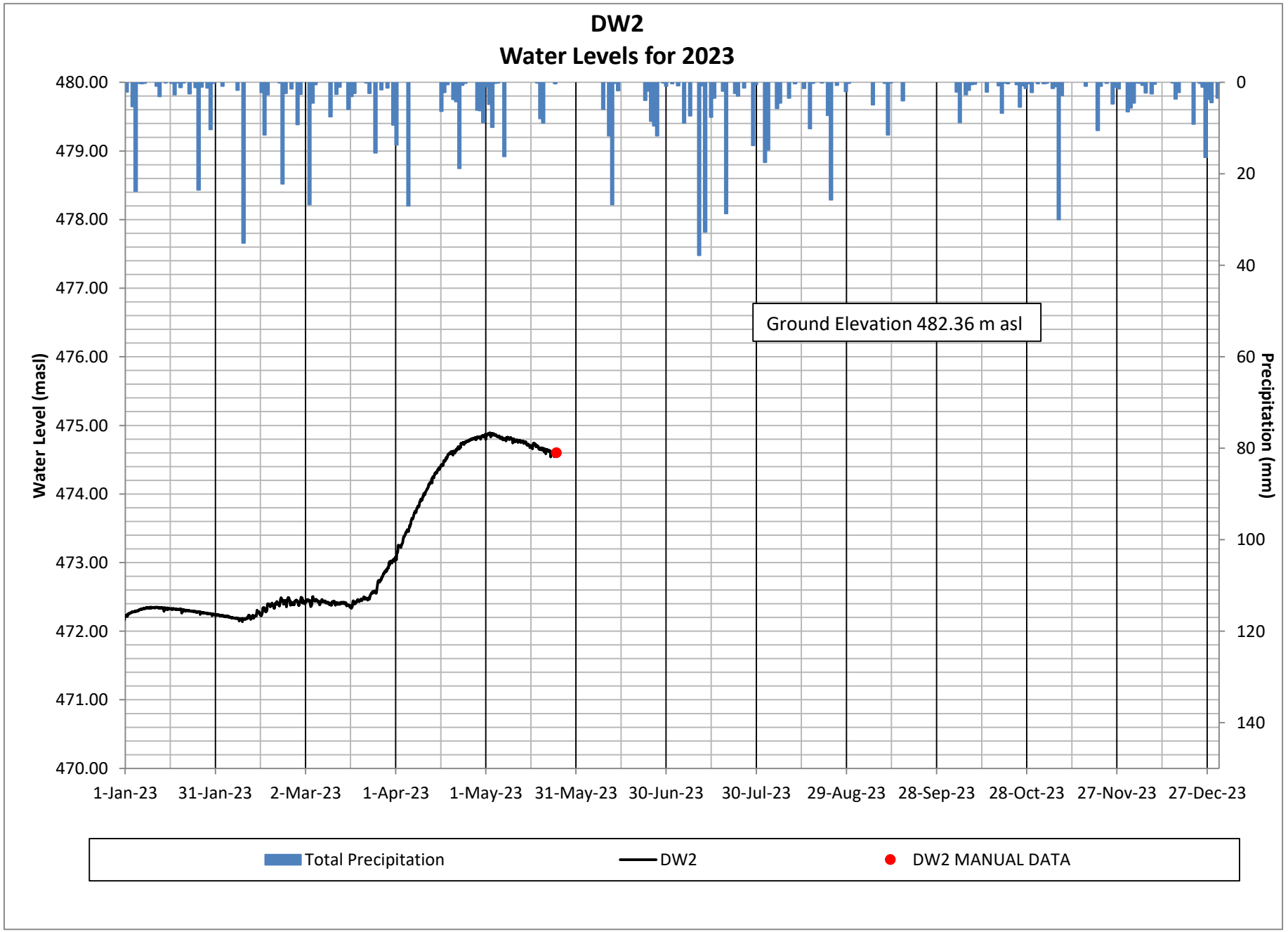

Observation Well Nest (OW20)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
490.00
489.00
488.00
487.00
486.00
485.00
484.00
483.00
482.00
481.00
480.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 509.30 m asl
Logger Malfunction
Precipitation
OW20C
OW20C Manual Measurements

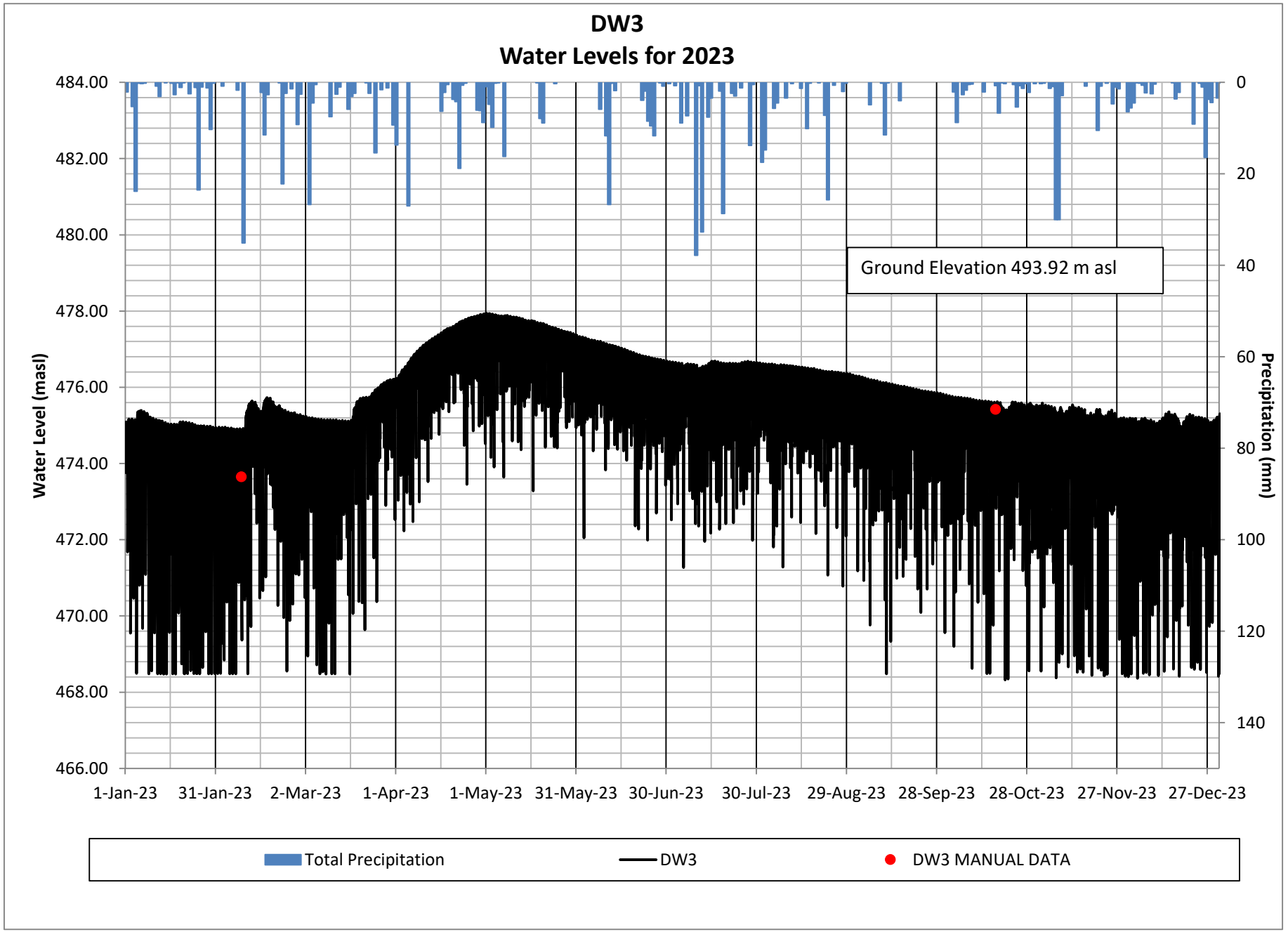

Observation Well Nest (OW21)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
495.00
494.00
493.00
492.00
491.00
490.00
489.00
488.00
487.00
486.00
485.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 511.41 m asl
Logger Malfunction
Precipitation
OW21C
OW21C Manual Measurements

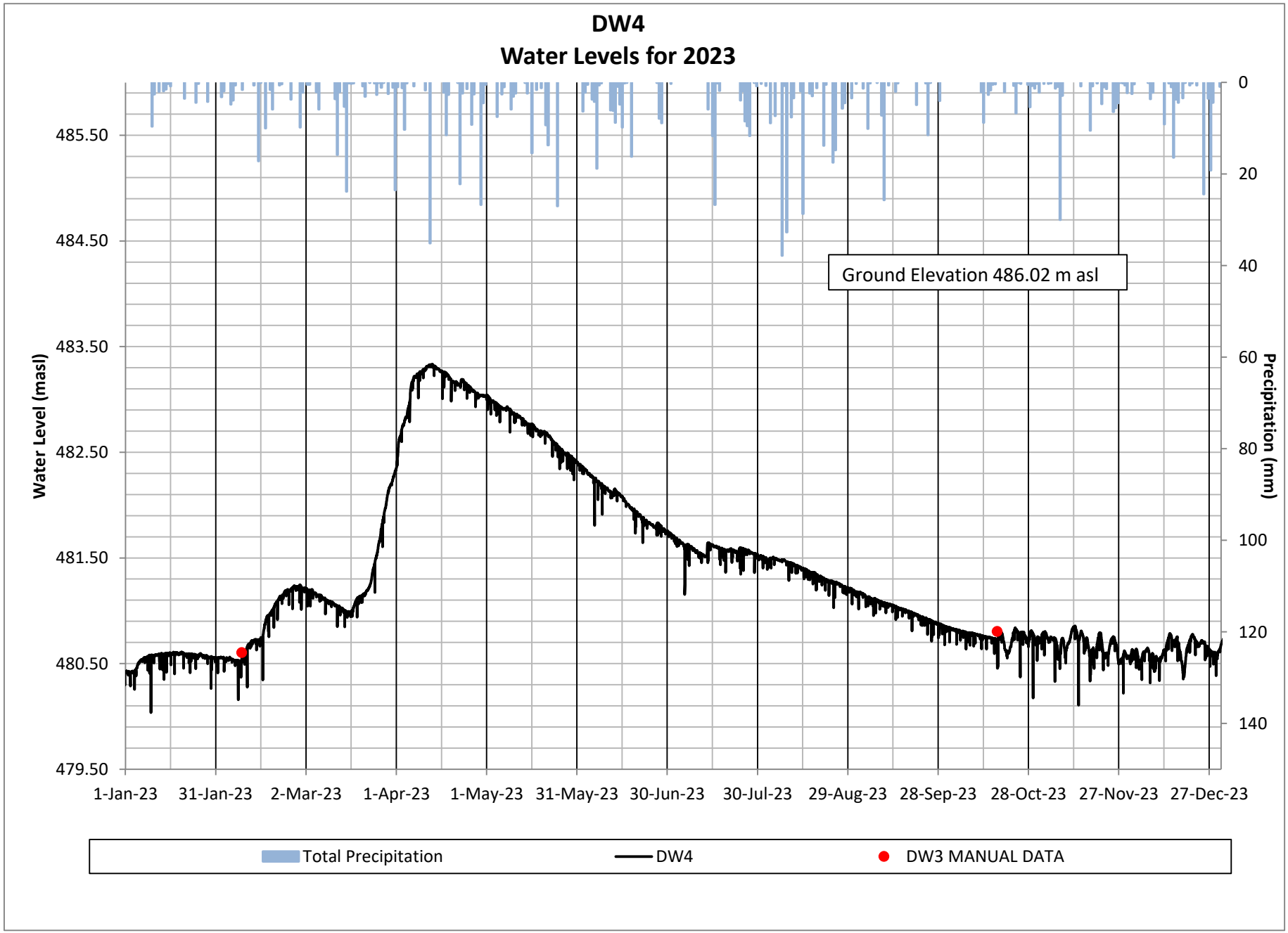

Observation Well Nest (OW22)
Water Levels for 2023
Ground Elevation 513.66 m asl
Water Level Elevation (masl)
Precipitation (mm)
499.00
498.50
498.00
497.50
497.00
496.50
496.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Precipitation
OW22C
OW22C Manual Measurements

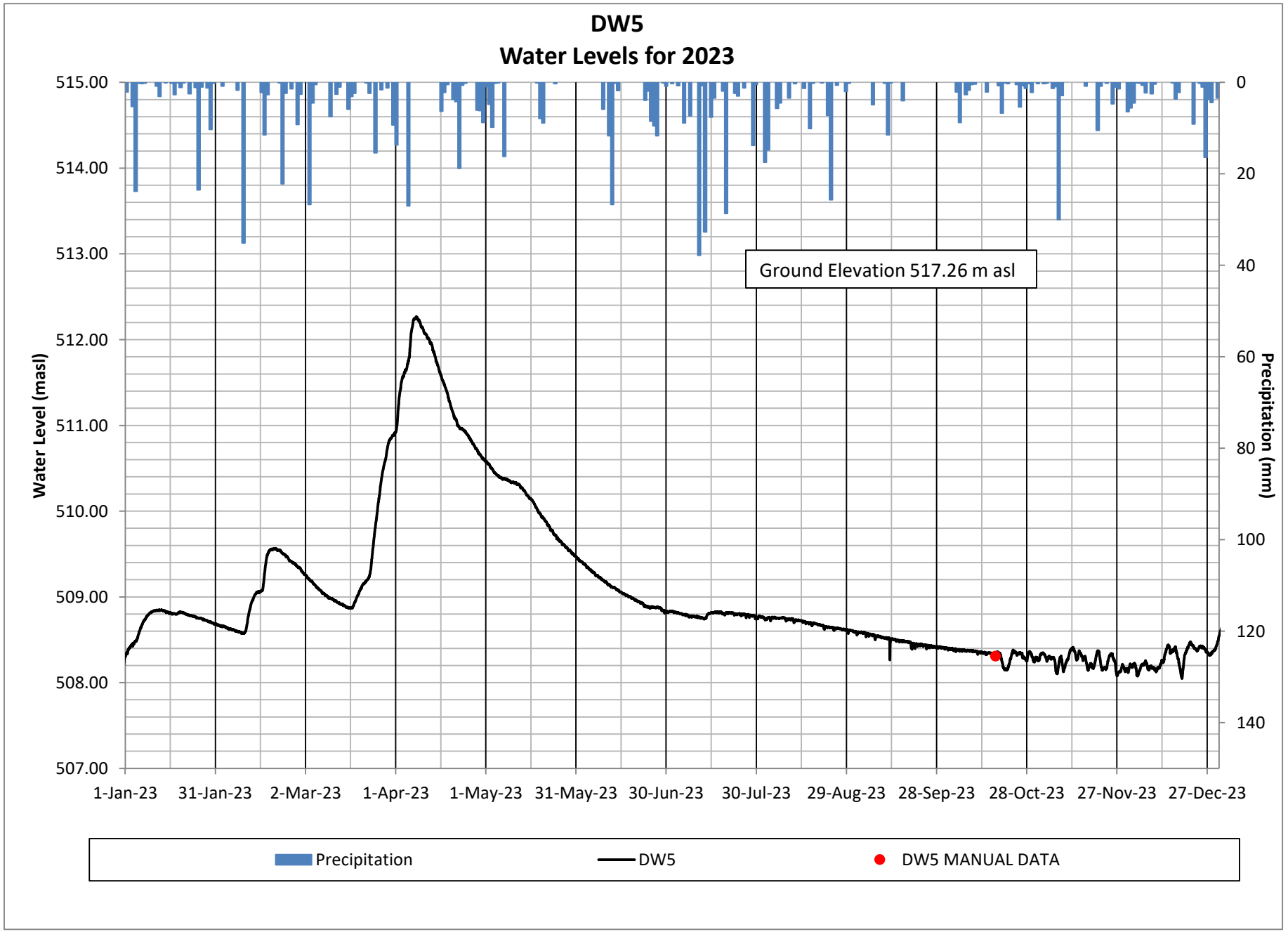

Observation Well Nest (OW23)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
500.00
499.50
499.00
498.50
498.00
497.50
497.00
496.50
496.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation 510.31 m asl
Precipitation
OW23C
OW23C Manual Measurements

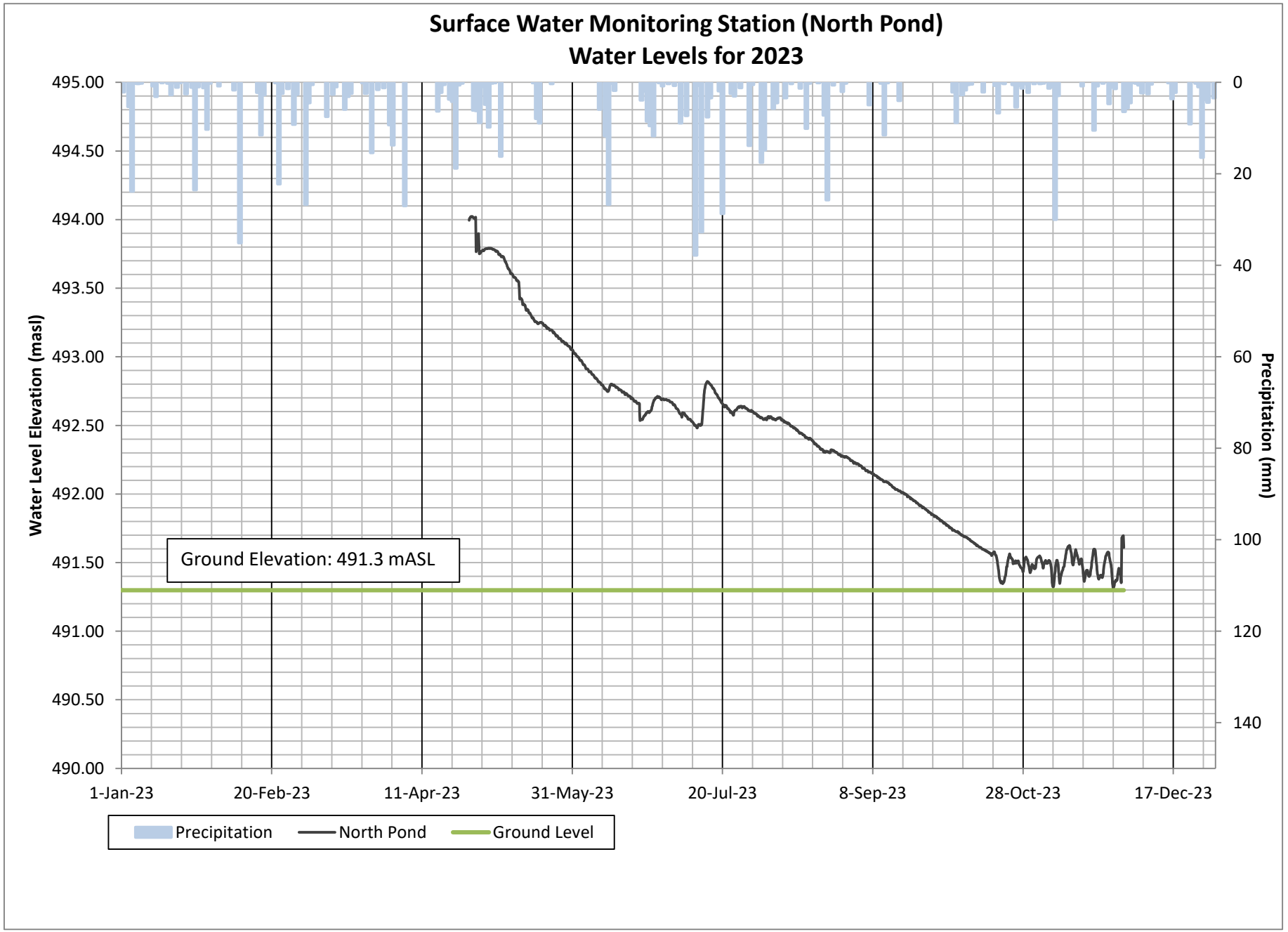

DW1
Water Levels for 2023
Ground Elevation 497.67 m asl
Water Level (masl)
Precipitation (mm)
497.40
497.20
497.00
496.80
496.60
496.40
496.20
496.00
0
20
40
60
80
100
120
140
1-Jan-23
2-Mar-23
1-May-23
30-Jun-23
29-Aug-23
28-Oct-23
27-Dec-23
25-Feb-24
Total Precipitation
DW1
DW1 MANUAL DATA

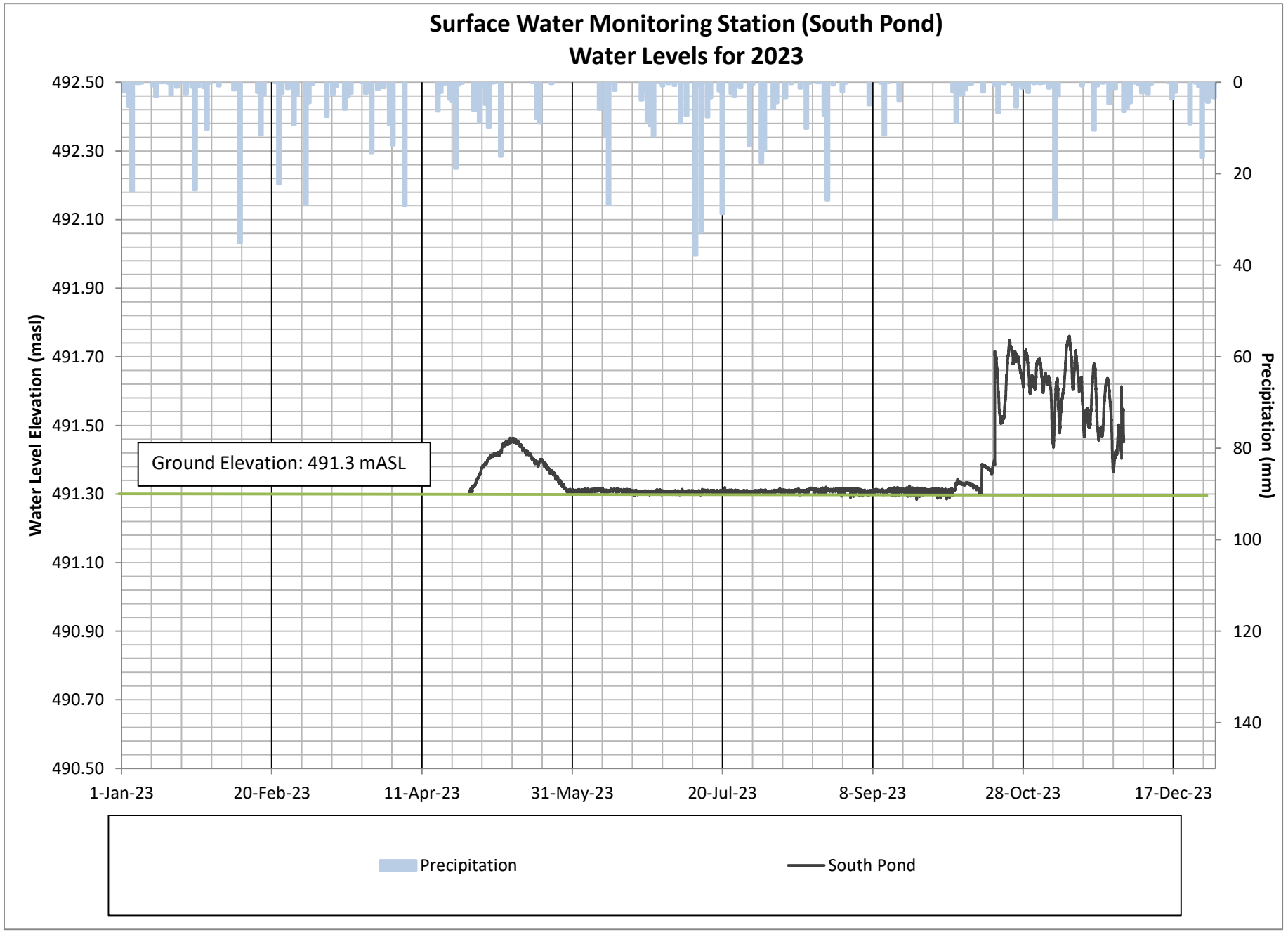

DW2
Water Levels for 2023
480.00
479.00
478.00
477.00
476.00
475.00
474.00
473.00
472.00
471.00
470.00
Water Level (masl)
0
20
40
60
80
100
120
140
Precipitation (mm)
Ground Elevation 482.36 m asl
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Total Precipitation
DW2
DW2 MANUAL DATA

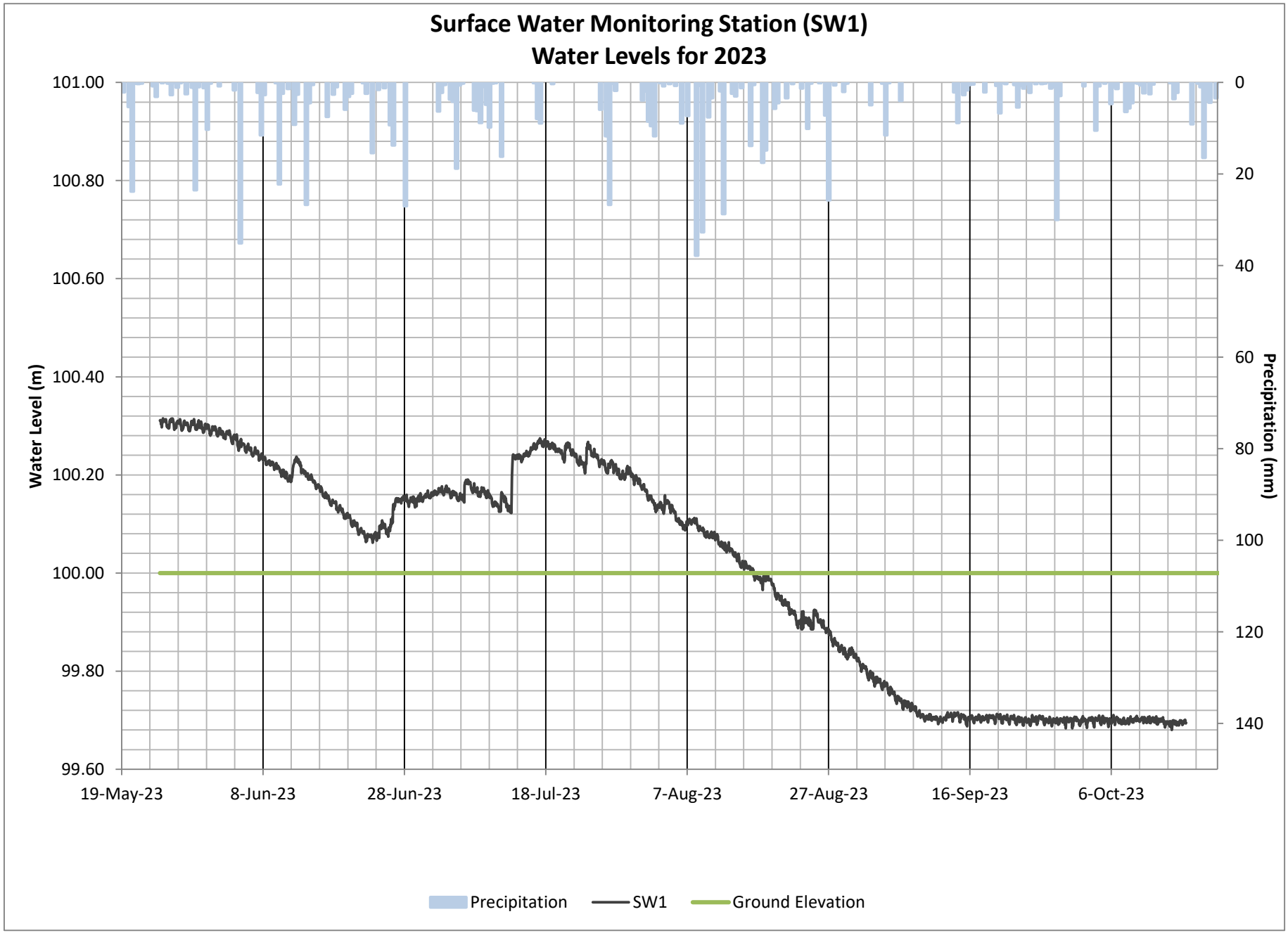

DW3
Water Levels for 2023
Water Level (masl)
Precipitation (mm)
484.00
482.00
480.00
478.00
476.00
474.00
472.00
470.00
468.00
466.00
0
20
40
60
80
100
120
140
Ground Elevation 493.92 m asl
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Total Precipitation
DW3
DW3 MANUAL DATA

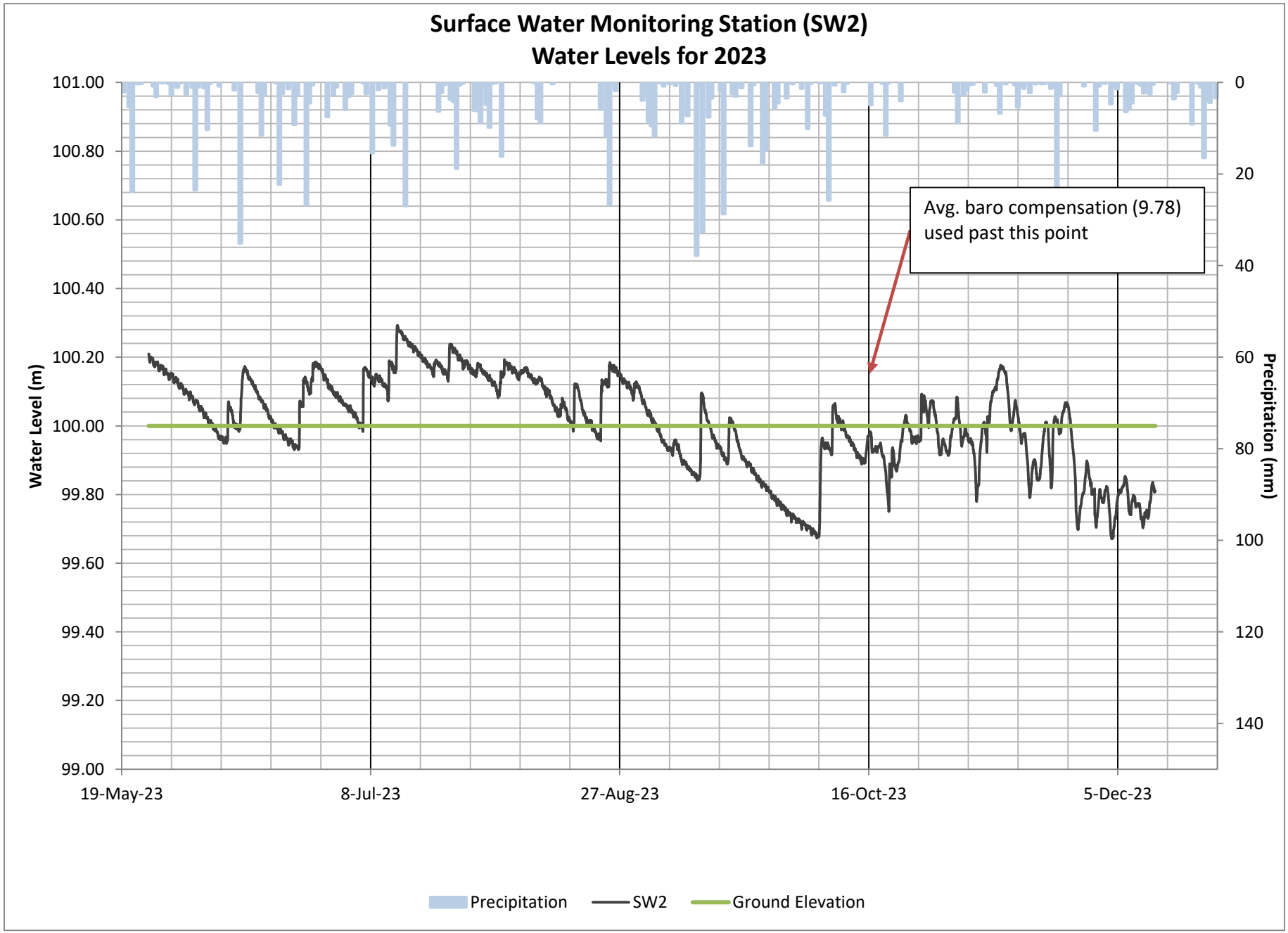

DW4
Water Levels for 2023
Ground Elevation 486.02 m asl
Water Level (masl)
Precipitation (mm)
485.50
484.50
483.50
482.50
481.50
480.50
479.50
0
20
40
60
80
100
120
140
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Total Precipitation
DW4
DW3 MANUAL DATA


DW5
Water Levels for 2023
Ground Elevation 517.26 m asl
Water Level (masl)
Precipitation (mm)
515.00
514.00
513.00
512.00
511.00
510.00
509.00
508.00
507.00
0
20
40
60
80
100
120
140
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Precipitation
DW5
DW5 MANUAL DATA


Surface Water Monitoring Station (North Pond)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
495.00
494.50
494.00
493.50
493.00
492.50
492.00
491.50
491.00
490.50
490.00
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation: 491.3 mASL
Precipitation
North Pond
Ground Level


Surface Water Monitoring Station (South Pond)
Water Levels for 2023
Water Level Elevation (masl)
Precipitation (mm)
492.50
492.30
492.10
491.90
491.70
491.50
491.30
491.10
490.90
490.70
490.50
0
20
40
60
80
100
120
140
1-Jan-23
20-Feb-23
11-Apr-23
31-May-23
20-Jul-23
8-Sep-23
28-Oct-23
17-Dec-23
Ground Elevation: 491.3 mASL
Precipitation
South Pond


Surface Water Monitoring Station (SW1)
Water Levels for 2023
Water Level (m)
101.00
100.80
100.60
100.40
100.20
100.00
99.80
99.60
Precipitation (mm)
0
20
40
60
80
100
120
140
19-May-23
8-Jun-23
28-Jun-23
18-Jul-23
7-Aug-23
27-Aug-23
16-Sep-23
6-Oct-23
Precipitation
SW1
Ground Elevation


Surface Water Monitoring Station (SW2)
Water Levels for 2023
Water Level (m)
101.00
100.80
100.60
100.40
100.20
100.00
99.80
99.60
99.40
99.20
99.00
Precipitation (mm)
0
20
40
60
80
100
120
140
19-May-23
8-Jul-23
27-Aug-23
16-Oct-23
5-Dec-23
Avg. baro compensation (9.78) used past this point
Precipitation
SW2
Ground Elevation

Appendix E:
Water Quality Results

CADUCEON ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G106186 **REPORT No: 23-005120 - Rev. 2**

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

Attention: Alicia Kimberley

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

DATE RECEIVED: 2023-Mar-22
DATE REPORTED: 2024-Mar-12
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: Strada - Shelburne
P.O. NUMBER: 123016

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	4	OTTAWA	VKASYAN	2023-Mar-24	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	4	OTTAWA	SBOUDREAU	2023-Mar-24	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
ICP/MS (Liquid)	4	OTTAWA	TPRICE	2023-Mar-28	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	4	OTTAWA	NHOGAN	2023-Mar-28	D-ICP-01	SM 3120B
Oil & Grease (Liquid)	3	KINGSTON	MTYMCHUK	2023-Mar-27	O&G-001	SM 5520
PHC F1 (Liquid)	3	RICHMOND_HILL	JEVANS	2023-Mar-25	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	3	KINGSTON	KPARKER	2023-Mar-24	PHC-W-001	MECP E3421
VOC-Volatiles Full (Water)	3	RICHMOND_HILL	JEVANS	2023-Mar-25	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 18 - C	OW 18 - A	OW 14 - C	OW 16 - C
					Sample I.D.	23-005120-1	23-005120-2	23-005120-3	23-005120-4
					Date Collected	2023-Mar-22	2023-Mar-22	2023-Mar-22	2023-Mar-22
						-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		207	205	416	121
Bicarbonate (as CaCO3)	mg/L as CaCO3	5				207	205	416	121
pH @25°C	pH units	-	8.5	OG		7.76	7.79	7.65	7.44
Conductivity @25°C	uS/cm	1				444	443	820	273
Chloride	mg/L	0.5	250	AO		6.1	6.1	2.9	4.7
Nitrate (N)	mg/L	0.05	10.0	MAC		1.48	1.44	3.71	0.87
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		7	8	7	7
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		223	237	418	130
Aluminum	mg/L	0.01	0.1	OG		0.03	0.03	0.08	0.02
Barium	mg/L	0.001	1	MAC		0.039	0.045	0.099	0.026
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.007	0.007	0.006	<0.005
Calcium	mg/L	0.02				65.7	70.5	111	39.9
Iron	mg/L	0.005	0.3	AO		<0.005	0.016	0.043	0.012
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				14.3	14.8	34.3	7.43
Manganese	mg/L	0.001	0.05	AO		0.001	0.002	0.006	0.003
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				0.7	0.7	0.8	1.1
Silicon	mg/L	0.01				1.68	1.67	2.69	0.84

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 18 - C	OW 18 - A	OW 14 - C	OW 16 - C
					Sample I.D.	23-005120-1	23-005120-2	23-005120-3	23-005120-4
					Date Collected	2023-Mar-22	2023-Mar-22	2023-Mar-22	2023-Mar-22
						-	-	-	-
Silica	mg/L	0.02				3.60	3.57	5.76	1.80
Sodium	mg/L	0.2	200, 20	AO, MAC		2.1	2.0	2.1	3.4
Strontium	mg/L	0.001				0.089	0.091	0.183	0.060
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	0.044	0.007
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		0.0007	0.0002	<0.0001	0.0003
Arsenic	mg/L	0.0001	0.01	MAC		0.0002	0.0001	0.0002	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		0.000022	<0.000015	0.000043	0.000019
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	0.0001	1	AO		0.0016	0.0013	0.0006	0.0010
Lead	mg/L	0.00002	0.010	MAC		0.00010	0.00005	0.00026	<0.00002
Molybdenum	mg/L	0.0001				0.0001	0.0001	<0.0001	0.0004
Nickel	mg/L	0.0002				0.0002	0.0004	0.0007	<0.0002
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005

Christine Burke
Laboratory Manager

Final Report

REPORT No: 23-005120 - Rev. 2

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 18 - C	OW 18 - A	OW 14 - C	OW 16 - C
					Sample I.D.	23-005120-1	23-005120-2	23-005120-3	23-005120-4
					Date Collected	2023-Mar-22	2023-Mar-22	2023-Mar-22	2023-Mar-22
						-	-	-	-
Uranium	mg/L	0.00005	0.02	MAC		0.00015	0.00015	0.00016	0.00016
Vanadium	mg/L	0.0001				0.0002	0.0001	<0.0001	<0.0001

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 18 - A	OW 14 - C	OW 16 - C
					Sample I.D.	23-005120-2	23-005120-3	23-005120-4
					Date Collected	2023-Mar-22	2023-Mar-22	2023-Mar-22
						-	-	-
Benzene	µg/L	0.5	1	MAC		<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO		<0.5	<0.5	<0.5
Toluene	µg/L	0.5	60	MAC		<0.5	<0.5	<0.5
Xylene, m,p-	µg/L	1				<1	<1	<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO		<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5				<0.5	<0.5	<0.5
PHC F1 (C6-C10)	µg/L	25				<25	<25	<25
PHC F2 (>C10-C16)	µg/L	50				<50	<50	<50
PHC F3 (>C16-C34)	µg/L	400				<400	<400	<400
PHC F4 (>C34-C50)	µg/L	400				<400	<400	<400
Oil & Grease (Total)	mg/L	1.0				1.8	3.0	2.8

Revised report to update sample ID's as per client request

DWG - Drinking Water Guidelines

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets

Christine Burke
Laboratory Manager

Summary of Exceedances		
Operational Guidelines		
OW 18 - C	**Found Value**	**Limit**
Hardness (as CaCO3)	223	100
OW 18 - A	**Found Value**	**Limit**
Hardness (as CaCO3)	237	100
OW 14 - C	**Found Value**	**Limit**
Hardness (as CaCO3)	418	100
OW 16 - C	**Found Value**	**Limit**
Hardness (as CaCO3)	130	100

Christine Burke
Laboratory Manager

CADUCEON ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G106189 **REPORT No: 23-005262 - Rev. 1**

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

Attention: Alicia Kimberley

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

DATE RECEIVED: 2023-Mar-24
DATE REPORTED: 2024-Mar-12
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: Strada - Shelburne
P.O. NUMBER: 123016

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	2	OTTAWA	PCURIEL	2023-Mar-29	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	2	OTTAWA	SBOUDREAU	2023-Mar-28	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
ICP/MS (Liquid)	2	OTTAWA	TPRICE	2023-Mar-30	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	2	OTTAWA	NHOGAN	2023-Mar-29	D-ICP-01	SM 3120B

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Christine Burke
Laboratory Manager

Final Report

REPORT No: 23-005262 - Rev. 1

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 13-A	OW 13-C
					Sample I.D.	23-005262-1	23-005262-2
					Date Collected	2023-Mar-22	2023-Mar-22
						-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		248	275
Bicarbonate (as CaCO3)	mg/L as CaCO3	5				248	275
pH @25°C	pH units	-	8.5	OG		7.63	7.56
Conductivity @25°C	uS/cm	1				571	596
Chloride	mg/L	0.5	250	AO		12.1	10.1
Nitrate (N)	mg/L	0.05	10.0	MAC		1.37	1.68
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05
Sulphate	mg/L	1	500	AO		19	7
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		279	305
Aluminum	mg/L	0.01	0.1	OG		0.05	0.07
Barium	mg/L	0.001	1	MAC		0.037	0.040
Bismuth	mg/L	0.02				<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.007	0.007
Calcium	mg/L	0.02				78.8	88.7
Iron	mg/L	0.005	0.3	AO		0.027	0.016
Lithium	mg/L	0.005				<0.005	<0.005
Magnesium	mg/L	0.02				20.0	20.2
Manganese	mg/L	0.001	0.05	AO		0.028	0.007
Phosphorus	mg/L	0.1				<0.1	<0.1
Potassium	mg/L	0.1				1.2	1.3
Silicon	mg/L	0.01				2.60	2.43

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D. OW 13-A Sample I.D. 23-005262-1 Date Collected 2023-Mar-22 -	Client I.D. OW 13-C Sample I.D. 23-005262-2 Date Collected 2023-Mar-22 -
Silica	mg/L	0.02			5.56	5.20
Sodium	mg/L	0.2	200, 20	AO, MAC	11.8	6.7
Strontium	mg/L	0.001			0.119	0.115
Tin	mg/L	0.05			<0.05	<0.05
Titanium	mg/L	0.005			<0.005	<0.005
Tungsten	mg/L	0.01			<0.01	<0.01
Zinc	mg/L	0.005	5	AO	<0.005	0.010
Zirconium	mg/L	0.003			<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC	0.0006	0.0002
Beryllium	mg/L	0.0001			<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC	0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC	<0.001	<0.001
Cobalt	mg/L	0.0001			0.0003	0.0002
Copper	mg/L	0.0001	1	AO	0.0016	0.0011
Lead	mg/L	0.00002	0.010	MAC	0.00005	0.00007
Molybdenum	mg/L	0.0001			0.0002	0.0001
Nickel	mg/L	0.0002			0.0004	0.0003
Selenium	mg/L	0.001	0.05	MAC	<0.001	<0.001
Silver	mg/L	0.0001			<0.0001	<0.0001
Thallium	mg/L	0.00005			<0.00005	<0.00005

Christine Burke
Laboratory Manager

				Client I.D.	OW 13-A	OW 13-C
				Sample I.D.	23-005262-1	23-005262-2
				Date Collected	2023-Mar-22	2023-Mar-22
Parameter	Units	R.L.	Limits	DWG	-	-
Uranium	mg/L	0.00005	0.02	MAC	0.00032	0.00025
Vanadium	mg/L	0.0001			0.0002	<0.0001

Revised report to update sample ID's as per client request

DWG - Drinking Water Guidelines
ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets

Summary of Exceedances		
Operational Guidelines		
OW 13-A	**Found Value**	**Limit**
Hardness (as CaCO3)	279	100
OW 13-C	**Found Value**	**Limit**
Hardness (as CaCO3)	305	100

Christine Burke
Laboratory Manager

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Canadian owned.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G106193-4 **REPORT No: 23-005581 - Rev. 1**

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

Attention: Alicia Kimberley

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

DATE RECEIVED: 2023-Mar-28
DATE REPORTED: 2024-Mar-12
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	16	OTTAWA	PCURIEL	2023-Mar-30	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	16	OTTAWA	SLOZO	2023-Mar-30	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
ICP/MS (Liquid)	16	OTTAWA	TPRICE	2023-Mar-30	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	16	OTTAWA	NHOGAN	2023-Mar-31	D-ICP-01	SM 3120B
Oil & Grease (Liquid)	9	KINGSTON	MTYMCHUK	2023-Mar-31	O&G-001	SM 5520
PHC F1 (Liquid)	9	RICHMOND_HILL	FLENA	2023-Mar-31	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	9	KINGSTON	KPARKER	2023-Mar-31	PHC-W-001	MECP E3421
VOC-Volatiles Full (Water)	9	RICHMOND_HILL	FLENA	2023-Apr-01	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 9A	OW 12A	OW 6A	OW 8A
					Sample I.D.	23-005581-1	23-005581-2	23-005581-3	23-005581-4
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		329	191	216	292
Bicarbonate (as CaCO3)	mg/L as CaCO3	5				329	191	216	292
pH @25°C	pH units	-	8.5	OG		7.88	8.02	8.04	7.91
Conductivity @25°C	uS/cm	1				833	365	510	776
Chloride	mg/L	0.5	250	AO		24.5	1.8	11.4	43.1
Nitrate (N)	mg/L	0.05	10.0	MAC		17.3	1.76	0.82	14.8
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		18	5	37	9
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		413	190	249	380
Aluminum	mg/L	0.01	0.1	OG		0.08	0.05	0.02	0.06
Barium	mg/L	0.001	1	MAC		0.073	0.007	0.061	0.109
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.008	0.008	0.016	0.005
Calcium	mg/L	0.02				131	67.0	70.3	103
Iron	mg/L	0.005	0.3	AO		<0.005	0.025	0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				20.7	5.57	17.8	29.7
Manganese	mg/L	0.001	0.05	AO		0.005	0.003	0.005	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.0	1.3	2.3	1.1
Silicon	mg/L	0.01				3.22	1.74	1.68	3.77

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 9A	OW 12A	OW 6A	OW 8A
					Sample I.D.	23-005581-1	23-005581-2	23-005581-3	23-005581-4
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Silica	mg/L	0.02				6.89	3.72	3.60	8.07
Sodium	mg/L	0.2	200, 20	AO, MAC		2.7	1.0	5.3	8.9
Strontium	mg/L	0.001				0.195	0.149	0.154	0.177
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		0.005	<0.005	<0.005	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		0.000018	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	0.002	0.002
Cobalt	mg/L	0.0001				0.0002	0.0002	0.0001	0.0002
Copper	mg/L	0.0001	1	AO		0.0008	0.0011	0.0006	0.0008
Lead	mg/L	0.00002	0.010	MAC		0.00004	0.00008	0.00006	<0.00002
Molybdenum	mg/L	0.0001				<0.0001	<0.0001	0.0002	<0.0001
Nickel	mg/L	0.0002				0.0003	0.0002	0.0011	0.0003
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005

Christine Burke
Laboratory Manager

Final Report

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Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 9A	OW 12A	OW 6A	OW 8A
					Sample I.D.	23-005581-1	23-005581-2	23-005581-3	23-005581-4
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
					DWG	-	-	-	-
Uranium	mg/L	0.00005	0.02	MAC		0.00016	<0.00005	0.00019	0.00020
Vanadium	mg/L	0.0001				0.0001	0.0002	<0.0001	0.0001

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 22C	OW 23C	OW 5A	OW 5B
					Sample I.D.	23-005581-5	23-005581-6	23-005581-7	23-005581-8
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		256	253	301	288
Bicarbonate (as CaCO3)	mg/L as CaCO3	5				256	253	301	288
pH @25°C	pH units	-	8.5	OG		7.97	7.99	7.99	7.93
Conductivity @25°C	uS/cm	1				643	600	677	737
Chloride	mg/L	0.5	250	AO		15.9	16.0	26.3	56.4
Nitrate (N)	mg/L	0.05	10.0	MAC		8.83	8.08	2.96	2.65
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		37	19	20	15
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		326	318	313	320
Aluminum	mg/L	0.01	0.1	OG		0.04	0.15	0.13	0.07
Barium	mg/L	0.001	1	MAC		0.078	0.029	0.045	0.061
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.008	0.009	0.010	0.010
Calcium	mg/L	0.02				83.1	83.5	95.1	94.9
Iron	mg/L	0.005	0.3	AO		<0.005	0.108	0.073	0.022
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				28.7	26.5	18.3	20.2
Manganese	mg/L	0.001	0.05	AO		<0.001	0.018	0.013	0.002
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				0.8	1.3	3.0	2.0
Silicon	mg/L	0.01				3.28	2.90	2.30	2.40

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 22C	OW 23C	OW 5A	OW 5B
					Sample I.D.	23-005581-5	23-005581-6	23-005581-7	23-005581-8
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Silica	mg/L	0.02				7.02	6.21	4.92	5.14
Sodium	mg/L	0.2	200, 20	AO, MAC		3.2	3.2	15.8	**26.3**
Strontium	mg/L	0.001				0.155	0.107	0.141	0.143
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	0.021	<0.005	0.029
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0001	0.0009	0.0001	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	0.000015	<0.000015	0.000040
Chromium	mg/L	0.001	0.05	MAC		<0.001	0.001	<0.001	0.001
Cobalt	mg/L	0.0001				0.0001	0.0003	0.0002	0.0002
Copper	mg/L	0.0001	1	AO		0.0003	0.0008	0.0012	0.0029
Lead	mg/L	0.00002	0.010	MAC		<0.00002	0.00074	0.00032	0.00009
Molybdenum	mg/L	0.0001				0.0001	0.0001	0.0001	0.0003
Nickel	mg/L	0.0002				<0.0002	0.0006	0.0002	0.0008
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005

Christine Burke
Laboratory Manager

Final Report

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Parameter	Units	R.L.	Limits	DWG	Client I.D.	Sample I.D.	Date Collected	
					OW 22C	23-005581-5	2023-Mar-28	-
					OW 23C	23-005581-6	2023-Mar-28	-
					OW 5A	23-005581-7	2023-Mar-28	-
					OW 5B	23-005581-8	2023-Mar-28	-
Uranium	mg/L	0.00005	0.02	MAC	0.00039	0.00032	0.00034	0.00041
Vanadium	mg/L	0.0001			0.0001	0.0006	0.0002	<0.0001

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 7A	OW 7C	OW 4A	OW 4B
					Sample I.D.	23-005581-9	23-005581-10	23-005581-11	23-005581-12
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		262	69	268	328
Bicarbonate (as CaCO3)	mg/L as CaCO3	5				262	68	268	328
pH @25°C	pH units	-	8.5	OG		7.95	8.33	8.07	7.92
Conductivity @25°C	uS/cm	1				590	133	717	783
Chloride	mg/L	0.5	250	AO		15.9	2.7	11.6	44.1
Nitrate (N)	mg/L	0.05	10.0	MAC		1.86	<0.05	22.7	6.36
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		29	<1	11	8
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		294	61.9	320	378
Aluminum	mg/L	0.01	0.1	OG		0.06	0.01	0.07	0.07
Barium	mg/L	0.001	1	MAC		0.069	0.001	0.050	0.067
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.013	0.010	0.010	0.008
Calcium	mg/L	0.02				89.3	4.71	96.4	115
Iron	mg/L	0.005	0.3	AO		<0.005	0.041	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				17.3	12.2	19.1	21.9
Manganese	mg/L	0.001	0.05	AO		<0.001	0.054	0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.8	0.9	2.0	0.7
Silicon	mg/L	0.01				2.30	0.04	2.65	2.60

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 7A	OW 7C	OW 4A	OW 4B
					Sample I.D.	23-005581-9	23-005581-10	23-005581-11	23-005581-12
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Silica	mg/L	0.02				4.92	0.07	5.67	5.56
Sodium	mg/L	0.2	200, 20	AO, MAC		6.1	2.0	12.2	18.3
Strontium	mg/L	0.001				0.148	0.006	0.170	0.172
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0001	<0.0001	0.0001	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0002	<0.0001	0.0002	0.0002
Copper	mg/L	0.0001	1	AO		0.0008	0.0003	0.0026	0.0011
Lead	mg/L	0.00002	0.010	MAC		<0.00002	<0.00002	0.00004	<0.00002
Molybdenum	mg/L	0.0001				0.0002	0.0042	0.0003	<0.0001
Nickel	mg/L	0.0002				0.0002	<0.0002	0.0004	0.0002
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005

Christine Burke
Laboratory Manager

				Client I.D.	OW 7A	OW 7C	OW 4A	OW 4B
				Sample I.D.	23-005581-9	23-005581-10	23-005581-11	23-005581-12
				Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
Parameter	Units	R.L.	Limits	DWG	-	-	-	-
Uranium	mg/L	0.00005	0.02	MAC	0.00074	0.00006	0.00047	0.00014
Vanadium	mg/L	0.0001			<0.0001	<0.0001	0.0001	<0.0001

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 19C	OW 21C	OW 10A	OW 20C
					Sample I.D.	23-005581-13	23-005581-14	23-005581-15	23-005581-16
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		352	258	200	234
Bicarbonate (as CaCO3)	mg/L as CaCO3	5				352	258	200	234
pH @25°C	pH units	-	8.5	OG		7.96	7.95	8.01	8.01
Conductivity @25°C	uS/cm	1				692	497	457	500
Chloride	mg/L	0.5	250	AO		14.9	2.0	14.7	3.8
Nitrate (N)	mg/L	0.05	10.0	MAC		<0.05	0.84	1.31	7.92
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		9	10	19	7
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		356	290	233	259
Aluminum	mg/L	0.01	0.1	OG		0.07	0.36	0.07	0.04
Barium	mg/L	0.001	1	MAC		0.177	0.061	0.071	0.074
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.017	0.007	0.012	0.006
Calcium	mg/L	0.02				100	75.8	65.2	69.3
Iron	mg/L	0.005	0.3	AO		0.025	0.322	0.061	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				25.8	24.4	17.0	20.9
Manganese	mg/L	0.001	0.05	AO		0.023	0.026	0.024	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				6.4	1.0	1.2	0.6
Silicon	mg/L	0.01				3.06	3.08	2.52	2.81

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 19C	OW 21C	OW 10A	OW 20C
					Sample I.D.	23-005581-13	23-005581-14	23-005581-15	23-005581-16
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Silica	mg/L	0.02				6.55	6.59	5.39	6.01
Sodium	mg/L	0.2	200, 20	AO, MAC		4.2	2.6	5.0	2.4
Strontium	mg/L	0.001				0.167	0.114	0.130	0.107
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	0.010	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	0.049	0.042	0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		0.0004	0.0008	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0001	0.0003	0.0005	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	0.000062	0.000037	<0.000015
Chromium	mg/L	0.001	0.05	MAC		0.002	0.002	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0002	0.0005	0.0004	0.0001
Copper	mg/L	0.0001	1	AO		0.0004	0.0033	0.0022	0.0005
Lead	mg/L	0.00002	0.010	MAC		<0.00002	0.00301	0.00092	<0.00002
Molybdenum	mg/L	0.0001				<0.0001	0.0001	0.0003	0.0001
Nickel	mg/L	0.0002				0.0008	0.0013	0.0008	0.0005
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 19C	OW 21C	OW 10A	OW 20C
					Sample I.D.	23-005581-13	23-005581-14	23-005581-15	23-005581-16
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Uranium	mg/L	0.00005	0.02	MAC		0.00032	0.00024	0.00052	0.00019
Vanadium	mg/L	0.0001				<0.0001	0.0007	0.0003	0.0001

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW 9A	OW 12A	OW 6A	OW 8A
					Sample I.D.	23-005581-1	23-005581-2	23-005581-3	23-005581-4
					Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
						-	-	-	-
Benzene	µg/L	0.5	1	MAC		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	60	MAC		<0.5	<0.5	<0.5	<0.5
Xylene, m,p-	µg/L	1				<1	<1	<1	<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO		<1.1	<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5				<0.5	<0.5	<0.5	<0.5
PHC F1 (C6-C10)	µg/L	25				<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L	50				<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L	400				<400	<400	<400	<400
PHC F4 (>C34-C50)	µg/L	400				<400	<400	<400	<400
Oil & Grease (Total)	mg/L	1.0				9.1	9.3	10.5	8.8

Christine Burke
Laboratory Manager

				Client I.D.	OW 5A	OW 7A	OW 21C	OW 10A
				Sample I.D.	23-005581-7	23-005581-9	23-005581-14	23-005581-15
				Date Collected	2023-Mar-28	2023-Mar-28	2023-Mar-28	2023-Mar-28
Parameter	Units	R.L.	Limits	DWG	-	-	-	-
Benzene	µg/L	0.5	1	MAC	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	60	MAC	<0.5	<0.5	<0.5	<0.5
Xylene, m,p-	µg/L	1			<1	<1	<1	<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO	<1.1	<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5
PHC F1 (C6-C10)	µg/L	25			<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L	50			<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L	400			<400	<400	<400	<400
PHC F4 (>C34-C50)	µg/L	400			<400	<400	<400	<400
Oil & Grease (Total)	mg/L	1.0			12.1	9.8	8.3	5.2

Christine Burke
Laboratory Manager

				Client I.D.	OW 20C
				Sample I.D.	23-005581-16
				Date Collected	2023-Mar-28
Parameter	Units	R.L.	Limits	DWG	-
Benzene	µg/L	0.5	1	MAC	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO	<0.5
Toluene	µg/L	0.5	60	MAC	<0.5
Xylene, m,p-	µg/L	1			<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO	<1.1
Xylene, o-	µg/L	0.5			<0.5
PHC F1 (C6-C10)	µg/L	25			<25
PHC F2 (>C10-C16)	µg/L	50			<50
PHC F3 (>C16-C34)	µg/L	400			<400
PHC F4 (>C34-C50)	µg/L	400			<400
Oil & Grease (Total)	mg/L	1.0			8.7

Revised report to update sample ID's as per client request

DWG - Drinking Water Guidelines
ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets

Christine Burke
Laboratory Manager

Summary of Exceedances		
Aesthetic Objectives		
OW 7C	**Found Value**	**Limit**
Manganese	0.054	0.05
OW 21C	**Found Value**	**Limit**
Iron	0.322	0.3
Maximum Acceptable Concentration		
OW 9A	**Found Value**	**Limit**
Nitrate (N)	17.3	10.0
OW 8A	**Found Value**	**Limit**
Nitrate (N)	14.8	10.0
OW 5B	**Found Value**	**Limit**
Sodium	26.3	20
OW 4A	**Found Value**	**Limit**
Nitrate (N)	22.7	10.0
Operational Guidelines		
OW 9A	**Found Value**	**Limit**
Hardness (as CaCO3)	413	100
OW 12A	**Found Value**	**Limit**
Hardness (as CaCO3)	190	100
OW 6A	**Found Value**	**Limit**
Hardness (as CaCO3)	249	100
OW 8A	**Found Value**	**Limit**
Hardness (as CaCO3)	380	100
OW 22C	**Found Value**	**Limit**
Hardness (as CaCO3)	326	100
OW 23C	**Found Value**	**Limit**
Hardness (as CaCO3)	318	100
Aluminum	0.15	0.1
OW 5A	**Found Value**	**Limit**
Hardness (as CaCO3)	313	100
Aluminum	0.13	0.1
OW 5B	**Found Value**	**Limit**
Hardness (as CaCO3)	320	100
OW 7A	**Found Value**	**Limit**
Hardness (as CaCO3)	294	100
OW 4A	**Found Value**	**Limit**
Hardness (as CaCO3)	320	100
OW 4B	**Found Value**	**Limit**

Christine Burke
Laboratory Manager

Hardness (as CaCO3)	378	100
OW 19C	**Found Value**	**Limit**
Hardness (as CaCO3)	356	100
OW 21C	**Found Value**	**Limit**
Hardness (as CaCO3)	290	100
Aluminum	0.36	0.1
OW 10A	**Found Value**	**Limit**
Hardness (as CaCO3)	233	100
OW 20C	**Found Value**	**Limit**
Hardness (as CaCO3)	259	100

Christine Burke
Laboratory Manager

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Canadian owned.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: -

REPORT No: 23-029474 - Rev. 0

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

DATE RECEIVED: 2023-Oct-20
DATE REPORTED: 2023-Oct-31
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	19	OTTAWA	PCURIEL	2023-Oct-25	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	19	OTTAWA	SBOUDREAU	2023-Oct-25	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
ICP/MS (Liquid)	19	OTTAWA	AOZKAYMAK	2023-Oct-26	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	19	OTTAWA	APRUDYVUS	2023-Oct-25	D-ICP-01	SM 3120B
TP & TKN (Liquid)	19	KINGSTON	KDIBBITS	2023-Oct-30	TPTKN-001	MECP E3516.2

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW4A	OW4B	OW5A	OW5B
					Sample I.D.	23-029474-1	23-029474-2	23-029474-3	23-029474-4
					Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-18
						-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		322	329	290	292
Bicarbonate (as CaCO3)	mg/L	5				322	329	290	292
pH @25°C	pH units	-	8.5	OG		7.88	7.58	7.52	7.50
Conductivity @25°C	uS/cm	1				760	8	765	770
Chloride	mg/L	0.5	250	AO		22.0	43.4	61.2	60.7
Nitrate (N)	mg/L	0.05	10.0	MAC		11.5	10.3	3.67	3.65
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	0.10	<0.05	<0.05
Sulphate	mg/L	1	500	AO		12	10	14	15
Phosphorus (Total)	mg/L	0.01				2.20	0.15	0.51	2.06
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		399	421	346	353
Aluminum	mg/L	0.01	0.1	OG		0.05	0.03	0.04	0.03
Barium	mg/L	0.001	1	MAC		0.051	0.069	0.045	0.044
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.007	0.010	0.011	0.010
Calcium	mg/L	0.02				122	127	99.4	102
Iron	mg/L	0.005	0.3	AO		<0.005	0.007	0.008	0.131
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				22.8	25.1	23.8	23.9
Manganese	mg/L	0.001	0.05	AO		0.008	0.002	0.002	0.029
Potassium	mg/L	0.1				2.1	0.9	2.8	2.4
Silicon	mg/L	0.01				4.32	3.87	3.76	3.74

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW4A	OW4B	OW5A	OW5B
					Sample I.D.	23-029474-1	23-029474-2	23-029474-3	23-029474-4
					Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-18
						-	-	-	-
Silica	mg/L	0.02				9.23	8.28	8.04	8.00
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		10.8	**20.8**	**33.6**	**32.6**
Strontium	mg/L	0.001				0.195	0.181	0.149	0.150
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	<0.005	0.026
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		0.0004	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0002 (11)	<0.0001	<0.0001	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	0.000027
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0002	0.0002	0.0002	0.0002
Copper	mg/L	0.0001	1	AO		0.0006	0.0010	0.0015	0.0017
Lead	mg/L	0.00002	0.010	MAC		<0.00002	0.00002	0.00002	0.00004
Molybdenum	mg/L	0.0001				0.0003	<0.0001	0.0002	0.0003
Nickel	mg/L	0.0002				0.0013	0.0011	0.0009	0.0004
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005

Michelle Dubien
Data Specialist

				Client I.D.	OW4A	OW4B	OW5A	OW5B
				Sample I.D.	23-029474-1	23-029474-2	23-029474-3	23-029474-4
				Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-18
Parameter	**Units**	**R.L.**	**Limits**	**DWG**	-	-	-	-
Uranium	mg/L	0.00005	0.02	MAC	0.00022	0.00014	0.00046	0.00050
Vanadium	mg/L	0.0001			0.0002	<0.0001	<0.0001	<0.0001

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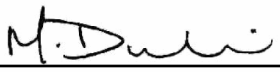
				Client I.D.	OW6A	OW7A	OW7C	OW8A
				Sample I.D.	23-029474-5	23-029474-6	23-029474-7	23-029474-8
				Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-16
Parameter	Units	R.L.	Limits	DWG	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG	180	287	86	312
Bicarbonate (as CaCO3)	mg/L	5			180	287	86	312
pH @25°C	pH units	-	8.5	OG	7.28	7.63	7.54	7.63
Conductivity @25°C	uS/cm	1			413	596	140	963
Chloride	mg/L	0.5	250	AO	15.9	12.8	3.1	60.5
Nitrate (N)	mg/L	0.05	10.0	MAC	0.86	1.32	<0.05	**26.5**
Nitrite (N)	mg/L	0.05	1.0	MAC	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO	20	20	<1	11
Phosphorus (Total)	mg/L	0.01			0.28	2.12	0.01	5.42
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG	**215**	**333**	73.9	**497**
Aluminum	mg/L	0.01	0.1	OG	0.02	0.05	0.01	0.04
Barium	mg/L	0.001	1	MAC	0.053	0.069	0.002	0.133
Bismuth	mg/L	0.02			<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC	0.020	0.013	0.015	0.008
Calcium	mg/L	0.02			60.5	102	4.74	129
Iron	mg/L	0.005	0.3	AO	0.012	0.072	0.022	0.011
Lithium	mg/L	0.005			<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02			15.5	19.0	15.1	42.5
Manganese	mg/L	0.001	0.05	AO	0.003	0.008	0.029	<0.001
Potassium	mg/L	0.1			2.6	1.7	0.9	1.4
Silicon	mg/L	0.01			2.62	3.52	0.07	6.09

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW6A	OW7A	OW7C	OW8A
					Sample I.D.	23-029474-5	23-029474-6	23-029474-7	23-029474-8
					Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-16
						-	-	-	-
Silica	mg/L	0.02				5.61	7.54	0.14	13.0
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		4.8	6.2	2.1	12.3
Strontium	mg/L	0.001				0.138	0.145	0.005	0.225
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				<0.0001	0.0002	<0.0001	0.0002
Copper	mg/L	0.0001	1	AO		0.0012	0.0015	0.0003	0.0010
Lead	mg/L	0.00002	0.010	MAC		0.00002	0.00014	0.00002	<0.00002
Molybdenum	mg/L	0.0001				0.0003	<0.0001	0.0045	<0.0001
Nickel	mg/L	0.0002				0.0006	0.0010	0.0002	<0.0002
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005



Michelle Dubien
Data Specialist

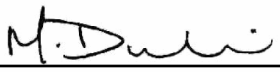
Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW6A	OW7A	OW7C	OW8A
					Sample I.D.	23-029474-5	23-029474-6	23-029474-7	23-029474-8
					Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-16
						-	-	-	-
Uranium	mg/L	0.00005	0.02	MAC		0.00017	0.00018	<0.00005	0.00023
Vanadium	mg/L	0.0001				<0.0001	0.0001	<0.0001	0.0001

Michelle Dubien
Data Specialist

				Client I.D.	OW9A	OW10A	OW12A	OW13C
				Sample I.D.	23-029474-9	23-029474-10	23-029474-11	23-029474-12
				Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-17
Parameter	Units	R.L.	Limits	DWG	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG	393	209	154	299
Bicarbonate (as CaCO3)	mg/L	5			393	209	154	299
pH @25°C	pH units	-	8.5	OG	7.75	7.41	7.24	7.74
Conductivity @25°C	uS/cm	1			821	442	290	600
Chloride	mg/L	0.5	250	AO	9.4	10.7	1.4	11.3
Nitrate (N)	mg/L	0.05	10.0	MAC	8.79	1.13	1.18	1.76
Nitrite (N)	mg/L	0.05	1.0	MAC	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO	9	16	3	7
Phosphorus (Total)	mg/L	0.01			0.82	2.39	7.59	0.03
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG	476	237	154	329
Aluminum	mg/L	0.01	0.1	OG	0.05	0.02	0.02	0.03
Barium	mg/L	0.001	1	MAC	0.083	0.054	0.004	0.039
Bismuth	mg/L	0.02			<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC	0.010	0.015	0.008	0.009
Calcium	mg/L	0.02			151	66.0	53.8	94.6
Iron	mg/L	0.005	0.3	AO	0.013	0.013	0.016	0.006
Lithium	mg/L	0.005			<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02			24.0	17.6	4.79	22.5
Manganese	mg/L	0.001	0.05	AO	0.012	0.028	<0.001	0.001
Potassium	mg/L	0.1			0.9	1.2	1.3	1.3
Silicon	mg/L	0.01			5.59	3.46	2.59	3.72

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW9A	OW10A	OW12A	OW13C
					Sample I.D.	23-029474-9	23-029474-10	23-029474-11	23-029474-12
					Date Collected	2023-Oct-18	2023-Oct-18	2023-Oct-18	2023-Oct-17
						-	-	-	-
Silica	mg/L	0.02				12.0	7.41	5.53	7.95
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		3.0	4.3	0.7	7.1
Strontium	mg/L	0.001				0.212	0.122	0.118	0.121
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	0.031	<0.005	0.019
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	0.0003	<0.0001	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0002	0.0003	0.0001	0.0001
Copper	mg/L	0.0001	1	AO		0.0012	0.0008	0.0021	0.0008
Lead	mg/L	0.00002	0.010	MAC		0.00003	0.00002	0.00003	0.00003
Molybdenum	mg/L	0.0001				<0.0001	0.0003	0.0002	0.0002
Nickel	mg/L	0.0002				<0.0002	0.0004	0.0006	0.0008
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005



Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	Sample I.D.	Date Collected	
					OW9A	23-029474-9	2023-Oct-18	-
Uranium	mg/L	0.00005	0.02	MAC	0.00014			
Vanadium	mg/L	0.0001			0.0001			

Parameter	Units	R.L.	Limits	DWG	Client I.D.	Sample I.D.	Date Collected	
					OW10A	23-029474-10	2023-Oct-18	-
Uranium	mg/L	0.00005	0.02	MAC	0.00042			
Vanadium	mg/L	0.0001			<0.0001			

Parameter	Units	R.L.	Limits	DWG	Client I.D.	Sample I.D.	Date Collected	
					OW12A	23-029474-11	2023-Oct-18	-
Uranium	mg/L	0.00005	0.02	MAC	<0.00005			
Vanadium	mg/L	0.0001			0.0002			

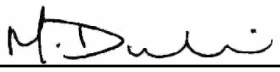
Parameter	Units	R.L.	Limits	DWG	Client I.D.	Sample I.D.	Date Collected	
					OW13C	23-029474-12	2023-Oct-17	-
Uranium	mg/L	0.00005	0.02	MAC	0.00017			
Vanadium	mg/L	0.0001			0.0001			

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW14C	OW18A	OW18C	OW20C
					Sample I.D.	23-029474-13	23-029474-14	23-029474-15	23-029474-16
					Date Collected	2023-Oct-17	2023-Oct-17	2023-Oct-17	2023-Oct-17
						-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		465	189	262	235
Bicarbonate (as CaCO3)	mg/L	5				465	189	262	235
pH @25°C	pH units	-	8.5	OG		7.67	7.41	7.56	7.75
Conductivity @25°C	uS/cm	1				871	381	518	514
Chloride	mg/L	0.5	250	AO		2.9	5.6	6.8	4.5
Nitrate (N)	mg/L	0.05	10.0	MAC		4.53	1.18	1.29	8.86
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		7	8	8	8
Phosphorus (Total)	mg/L	0.01				0.63	2.87	1.09	0.66
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		509	211	267	291
Aluminum	mg/L	0.01	0.1	OG		0.05	0.03	0.02	0.02
Barium	mg/L	0.001	1	MAC		0.111	0.038	0.033	0.074
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.011	0.008	0.008	0.007
Calcium	mg/L	0.02				143	63.1	77.5	75.2
Iron	mg/L	0.005	0.3	AO		0.036	0.028	0.006	0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				36.8	13.0	17.9	25.0
Manganese	mg/L	0.001	0.05	AO		<0.001	0.002	<0.001	<0.001
Potassium	mg/L	0.1				0.9	0.6	0.8	0.5
Silicon	mg/L	0.01				5.60	2.86	3.34	4.40

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D. OW14C	OW18A	OW18C	OW20C
					Sample I.D. 23-029474-13	23-029474-14	23-029474-15	23-029474-16
					Date Collected 2023-Oct-17	2023-Oct-17	2023-Oct-17	2023-Oct-17
					-	-	-	-
Silica	mg/L	0.02			12.0	6.13	7.14	9.42
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC	2.0	2.4	3.2	2.3
Strontium	mg/L	0.001			0.206	0.085	0.100	0.116
Tin	mg/L	0.05			<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005			<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01			<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO	0.132	<0.005	<0.005	0.006
Zirconium	mg/L	0.003			<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC	0.0001	<0.0001	0.0001	<0.0001
Beryllium	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC	0.000064	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001			0.0002	0.0001	0.0001	0.0001
Copper	mg/L	0.0001	1	AO	0.0010	0.0014	0.0017	0.0017
Lead	mg/L	0.00002	0.010	MAC	0.00004	0.00004	0.00003	0.00003
Molybdenum	mg/L	0.0001			<0.0001	0.0001	0.0002	0.0002
Nickel	mg/L	0.0002			0.0006	0.0007	0.0008	0.0007
Selenium	mg/L	0.001	0.05	MAC	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005			<0.00005	<0.00005	<0.00005	<0.00005



Michelle Dubien
Data Specialist

				Client I.D.	OW14C	OW18A	OW18C	OW20C
				Sample I.D.	23-029474-13	23-029474-14	23-029474-15	23-029474-16
				Date Collected	2023-Oct-17	2023-Oct-17	2023-Oct-17	2023-Oct-17
Parameter	Units	R.L.	Limits	DWG	-	-	-	-
Uranium	mg/L	0.00005	0.02	MAC	0.00020	0.00012	0.00012	0.00026
Vanadium	mg/L	0.0001			<0.0001	<0.0001	<0.0001	0.0001

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW21C	OW22C	OW23C
					Sample I.D.	23-029474-17	23-029474-18	23-029474-19
					Date Collected	2023-Oct-17	2023-Oct-17	2023-Oct-18
						-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		264	270	262
Bicarbonate (as CaCO3)	mg/L	5				264	270	262
pH @25°C	pH units	-	8.5	OG		7.73	7.60	7.64
Conductivity @25°C	uS/cm	1				486	660	613
Chloride	mg/L	0.5	250	AO		1.5	15.4	15.4
Nitrate (N)	mg/L	0.05	10.0	MAC		0.51	9.22	8.25
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		10	36	19
Phosphorus (Total)	mg/L	0.01				1.76	0.08	1.46
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		287	369	341
Aluminum	mg/L	0.01	0.1	OG		0.03	0.03	0.04
Barium	mg/L	0.001	1	MAC		0.060	0.082	0.027
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.012	0.012	0.007
Calcium	mg/L	0.02				74.5	91.7	86.6
Iron	mg/L	0.005	0.3	AO		0.016	0.010	0.010
Lithium	mg/L	0.005				<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				24.4	34.0	30.4
Manganese	mg/L	0.001	0.05	AO		<0.001	<0.001	0.001
Potassium	mg/L	0.1				0.5	0.9	1.3
Silicon	mg/L	0.01				4.42	5.21	4.26

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW21C	OW22C	OW23C
					Sample I.D.	23-029474-17	23-029474-18	23-029474-19
					Date Collected	2023-Oct-17	2023-Oct-17	2023-Oct-18
						-	-	-
Silica	mg/L	0.02				9.45	11.2	9.12
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		1.9	3.5	3.3
Strontium	mg/L	0.001				0.117	0.165	0.109
Tin	mg/L	0.05				<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		0.007	0.005	0.010
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	0.0001	0.0005
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0001	0.0001	0.0001
Copper	mg/L	0.0001	1	AO		0.0010	0.0011	0.0004
Lead	mg/L	0.00002	0.010	MAC		0.00002	0.00002	0.00004
Molybdenum	mg/L	0.0001				0.0001	0.0002	0.0001
Nickel	mg/L	0.0002				0.0007	0.0009	0.0009
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005

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Parameter	Units	R.L.	Limits	DWG	Client I.D.	OW21C	OW22C	OW23C
					Sample I.D.	23-029474-17	23-029474-18	23-029474-19
					Date Collected	2023-Oct-17	2023-Oct-17	2023-Oct-18
					DWG	-	-	-
Uranium	mg/L	0.00005	0.02	MAC		0.00020	0.00042	0.00031
Vanadium	mg/L	0.0001				<0.0001	0.0001	0.0001

Comments:

11. Filtered from GWC.

DWG - Drinking Water Guidelines
ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets

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Summary of Exceedances		
Maximum Acceptable Concentration		
OW4A	**Found Value**	**Limit**
Nitrate (N)	11.5	10.0
OW4B	**Found Value**	**Limit**
Nitrate (N)	10.3	10.0
Sodium	20.8	20
OW5A	**Found Value**	**Limit**
Sodium	33.6	20
OW5B	**Found Value**	**Limit**
Sodium	32.6	20
OW8A	**Found Value**	**Limit**
Nitrate (N)	26.5	10.0
Operational Guidelines		
OW4A	**Found Value**	**Limit**
Hardness (as CaCO3)	399	100
OW4B	**Found Value**	**Limit**
Hardness (as CaCO3)	421	100
OW5A	**Found Value**	**Limit**
Hardness (as CaCO3)	346	100
OW5B	**Found Value**	**Limit**
Hardness (as CaCO3)	353	100
OW6A	**Found Value**	**Limit**
Hardness (as CaCO3)	215	100
OW7A	**Found Value**	**Limit**
Hardness (as CaCO3)	333	100
OW8A	**Found Value**	**Limit**
Hardness (as CaCO3)	497	100
OW9A	**Found Value**	**Limit**
Hardness (as CaCO3)	476	100
OW10A	**Found Value**	**Limit**
Hardness (as CaCO3)	237	100
OW12A	**Found Value**	**Limit**
Hardness (as CaCO3)	154	100
OW13C	**Found Value**	**Limit**
Hardness (as CaCO3)	329	100
OW14C	**Found Value**	**Limit**
Hardness (as CaCO3)	509	100
OW18A	**Found Value**	**Limit**

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Hardness (as CaCO3)	211	100
OW18C	**Found Value**	**Limit**
Hardness (as CaCO3)	267	100
OW20C	**Found Value**	**Limit**
Hardness (as CaCO3)	291	100
OW21C	**Found Value**	**Limit**
Hardness (as CaCO3)	287	100
OW22C	**Found Value**	**Limit**
Hardness (as CaCO3)	369	100
OW23C	**Found Value**	**Limit**
Hardness (as CaCO3)	341	100
Warning Level - Sodium Restricted Diets		
OW4B	**Found Value**	**Limit**
Sodium	20.8	20
OW5A	**Found Value**	**Limit**
Sodium	33.6	20
OW5B	**Found Value**	**Limit**
Sodium	32.6	20

Michelle Dubien
Data Specialist

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: -

REPORT No: 23-011900 - Rev. 0

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

Attention: Jordon Miller

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

DATE RECEIVED: 2023-May-26
DATE REPORTED: 2023-Jun-12
SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	2	OTTAWA	PCURIEL	2023-May-30	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	2	OTTAWA	SBOUDREAU	2023-May-30	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
ICP/MS Total (Liquid)	2	OTTAWA	TPRICE	2023-May-31	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	2	OTTAWA	NHOGAN	2023-May-31	D-ICP-01	SM 3120B

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits		Client I.D.: South Pond Sample I.D.: 23-011900-9 Date Collected: 2023-May-24 -	Client I.D.: North Pond Sample I.D.: 23-011900-10 Date Collected: 2023-May-24 -
Alkalinity(CaCO3) to pH4.5	mg/L	5			218	250
Bicarbonate (as CaCO3)	mg/L	5			218	250
pH @25°C	pH units	-	8.5	PWQO	8.11	8.12
Conductivity @25°C	uS/cm	1			395	482
Chloride	mg/L	0.5			1.5	7.0
Nitrate (N)	mg/L	0.05			0.15	0.14
Nitrite (N)	mg/L	0.05			<0.05	<0.05
Sulphate	mg/L	1			2	10
Hardness (as CaCO3)	mg/L	-			232	256
Aluminum (Total)	mg/L	0.01			0.05	0.07
Barium (Total)	mg/L	0.001			0.019	0.037
Bismuth (Total)	mg/L	0.02			<0.02	<0.02
Boron (Total)	µg/L	5	200	INTERIM	11	9
Calcium (Total)	mg/L	0.02			81.1	83.0
Iron (Total)	µg/L	5	300	PWQO	95	94
Lithium (Total)	mg/L	0.005			<0.005	<0.005
Magnesium (Total)	mg/L	0.02			7.21	11.8
Manganese (Total)	mg/L	0.001			0.038	0.029
Phosphorus (Total)	mg/L	0.1			<0.1	<0.1
Potassium (Total)	mg/L	0.1			2.5	2.2
Silicon (Total)	mg/L	0.01			1.09	1.64

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits		Client I.D. South Pond Sample I.D. 23-011900-9 Date Collected 2023-May-24 -	Client I.D. North Pond Sample I.D. 23-011900-10 Date Collected 2023-May-24 -
Silica (Total)	mg/L	0.02			2.33	3.51
Sodium (Total)	mg/L	0.2			1.6	2.5
Strontium (Total)	mg/L	0.001			0.119	0.111
Tin (Total)	mg/L	0.05			<0.05	<0.05
Titanium (Total)	mg/L	0.005			<0.005	<0.005
Tungsten (Total)	µg/L	10	30	INTERIM	<10	<10
Zinc (Total)	µg/L	5	20, 30	INTERIM, PWQO	<5	<5
Zirconium (Total)	µg/L	3	4	INTERIM	<3	<3
Antimony (Total)	µg/L	0.1	20	INTERIM	0.1	<0.1
Arsenic (Total)	µg/L	0.1	5, 5	INTERIM, PWQO	0.6	0.6
Beryllium (Total)	µg/L	0.1	11	PWQO	<0.1	<0.1
Cadmium (Total)	µg/L	0.015	0.1, 0.2	INTERIM, PWQO	0.019	0.022
Chromium (Total)	mg/L	0.001			<0.001	<0.001
Cobalt (Total)	µg/L	0.1	0.9	INTERIM	0.2	0.2
Copper (Total)	µg/L	0.1	5	INTERIM	0.7	0.8
Lead (Total)	µg/L	0.02	1, 5	INTERIM, PWQO	0.06	0.02
Molybdenum (Total)	µg/L	0.1	40	INTERIM	0.2	0.2
Nickel (Total)	µg/L	0.2	25	PWQO	0.5	0.4
Selenium (Total)	µg/L	1	100	PWQO	<1	<1
Silver (Total)	µg/L	0.1	0.1	PWQO	<0.1	<0.1
Thallium (Total)	µg/L	0.05	0.3, 0.3	INTERIM, PWQO	<0.05	<0.05

Christine Burke
Laboratory Manager

				Client I.D.	South Pond	North Pond
				Sample I.D.	23-011900-9	23-011900-10
				Date Collected	2023-May-24	2023-May-24
Parameter	**Units**	**R.L.**	**Limits**		-	-
Uranium (Total)	µg/L	0.05	5	INTERIM	0.39	0.63
Vanadium (Total)	µg/L	0.100	6	INTERIM	<0.100	<0.100

: PWQO Limits
INTERIM: Interim PWQO
PWQO: PWQO

Christine Burke
Laboratory Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: -

REPORT No: 23-029907 - Rev. 1

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

DATE RECEIVED: 2023-Oct-25
DATE REPORTED: 2024-Mar-13
SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	2	OTTAWA	VKASYAN	2023-Oct-27	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	2	OTTAWA	SBOUDREAU	2023-Oct-27	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
ICP/MS Total (Liquid)	2	OTTAWA	TPRICE	2023-Oct-27	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	2	OTTAWA	NHOGAN	2023-Oct-27	D-ICP-01	SM 3120B
TP & TKN (Liquid)	2	KINGSTON	KDIBBITS	2023-Oct-30	TPTKN-001	MECP E3516.2

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Christine Burke
Laboratory Manager

Final Report

REPORT No: 23-029907 - Rev. 1

Parameter	Units	R.L.	Limits		Client I.D.: North Pond	Client I.D.: South Pond
					Sample I.D.: 23-029907-1	Sample I.D.: 23-029907-2
					Date Collected: 2023-Oct-19	Date Collected: 2023-Oct-19
					-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5			204	171
Bicarbonate (as CaCO3)	mg/L	5			204	171
Conductivity @25°C	uS/cm	1			383	317
pH @25°C	pH units	-	8.5	PWQO	7.87	7.97
Chloride	mg/L	0.5			7.0	1.5
Nitrate (N)	mg/L	0.05			0.12	0.07
Nitrite (N)	mg/L	0.05			<0.05	<0.05
Sulphate	mg/L	1			3	<1
Phosphorus (Total)	µg/L	10	10	INTERIM	40	100
Hardness (as CaCO3)	mg/L as CaCO3	-			169	146
Aluminum (Total)	µg/L	10			50	40
Barium (Total)	µg/L	1			28	7
Bismuth (Total)	µg/L	20			<20	<20
Boron (Total)	µg/L	5	200	INTERIM	9	6
Calcium (Total)	µg/L	20			49300	48500
Iron (Total)	µg/L	5	300	PWQO	564	124
Lithium (Total)	µg/L	5			<5	<5
Magnesium (Total)	µg/L	20			11100	6100
Manganese (Total)	µg/L	1			20	39
Phosphorus (Total)	µg/L	100			<100	<100
Potassium (Total)	µg/L	100			4100	5100

Christine Burke
Laboratory Manager

Parameter	Units	R.L.	Limits		Client I.D.: North Pond Sample I.D.: 23-029907-1 Date Collected: 2023-Oct-19 -	Client I.D.: South Pond Sample I.D.: 23-029907-2 Date Collected: 2023-Oct-19 -
Silicon (Total)	µg/L	10			2610	250
Silica (Total)	µg/L	20			5590	530
Sodium (Total)	µg/L	200			2200	1100
Strontium (Total)	µg/L	1			93	67
Tin (Total)	µg/L	50			<50	<50
Tungsten (Total)	µg/L	10	30	INTERIM	<10	<10
Zinc (Total)	µg/L	5	20, 30	INTERIM, PWQO	14	16
Zirconium (Total)	µg/L	3	4	INTERIM	<3	<3
Antimony (Total)	µg/L	0.1	20	INTERIM	0.3	0.4
Arsenic (Total)	µg/L	0.1	5, 5	INTERIM, PWQO	0.8	0.4
Beryllium (Total)	µg/L	0.1	11	PWQO	<0.1	<0.1
Cadmium (Total)	µg/L	0.015	0.1, 0.2	INTERIM, PWQO	<0.015	0.024
Chromium (Total)	µg/L	1			<1	<1
Cobalt (Total)	µg/L	0.1	0.9	INTERIM	0.2	0.2
Copper (Total)	µg/L	0.1	5	INTERIM	0.3	0.6
Lead (Total)	µg/L	0.02	1, 5	INTERIM, PWQO	0.06	0.04
Molybdenum (Total)	µg/L	0.1	40	INTERIM	0.2	0.2
Nickel (Total)	µg/L	0.2	25	PWQO	0.9	0.7
Selenium (Total)	µg/L	1	100	PWQO	<1	<1
Silver (Total)	µg/L	0.1	0.1	PWQO	<0.1	<0.1
Thallium (Total)	µg/L	0.05	0.3, 0.3	INTERIM, PWQO	<0.05	<0.05

Christine Burke
Laboratory Manager

				Client I.D.	North Pond	South Pond
				Sample I.D.	23-029907-1	23-029907-2
				Date Collected	2023-Oct-19	2023-Oct-19
Parameter	Units	R.L.	Limits		-	-
Uranium (Total)	µg/L	0.05	5	INTERIM	0.29	0.20
Vanadium (Total)	µg/L	0.1	6	INTERIM	<0.1	0.1

Revised report to include guidelines as per client request

: PWQO Limits
INTERIM: Interim PWQO
PWQO: PWQO

Summary of Exceedances		
Interim PWQO		
North Pond	**Found Value**	**Limit**
Phosphorus (Total)	40	10
South Pond	**Found Value**	**Limit**
Phosphorus (Total)	100	10
PWQO		
North Pond	**Found Value**	**Limit**
Iron (Total)	564	300

Christine Burke
Laboratory Manager

Appendix F: Domestic Water Monitoring Program Results

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

February 9, 2024

Dan and Jennifer Robertson
1 Ashlea Lane,
Melancthon Township, Ontario, L9V 3M9
Robertsond24@gmail.com jenharkness@hotmail.com

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mr. and Mrs. Robertson:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to initiate a domestic water well monitoring program as part of the due diligence investigation process associated with the on-going domestic water well monitoring program for the Shelburne Quarry.

In January 2023, Tatham took over the monitoring of the level datalogger in your drilled well, as a part of the monitoring program at the Strada Quarry. A water level datalogger is an instrument used to automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

Manual groundwater levels were measured at depths of 7.8 m below existing grade on May 24, 2023. A hydrograph illustrating the continuous groundwater levels in your well over the course of a year of monitoring is provided for reference. It should be noted this graph only has data from until May of 2023. When the well was visited on October 17, 2023, the logger was missing.

On October 17, 2023, a water sample was taken from your outside faucet, as this typically bypasses any filtration that you may have. Results from this sample have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 279 mg/L compared to a ODWQS Operational Guideline of 80 to 100 mg/L.

The operational guideline for hardness is set between 80 to 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water too

soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate ($CaCO_3$) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

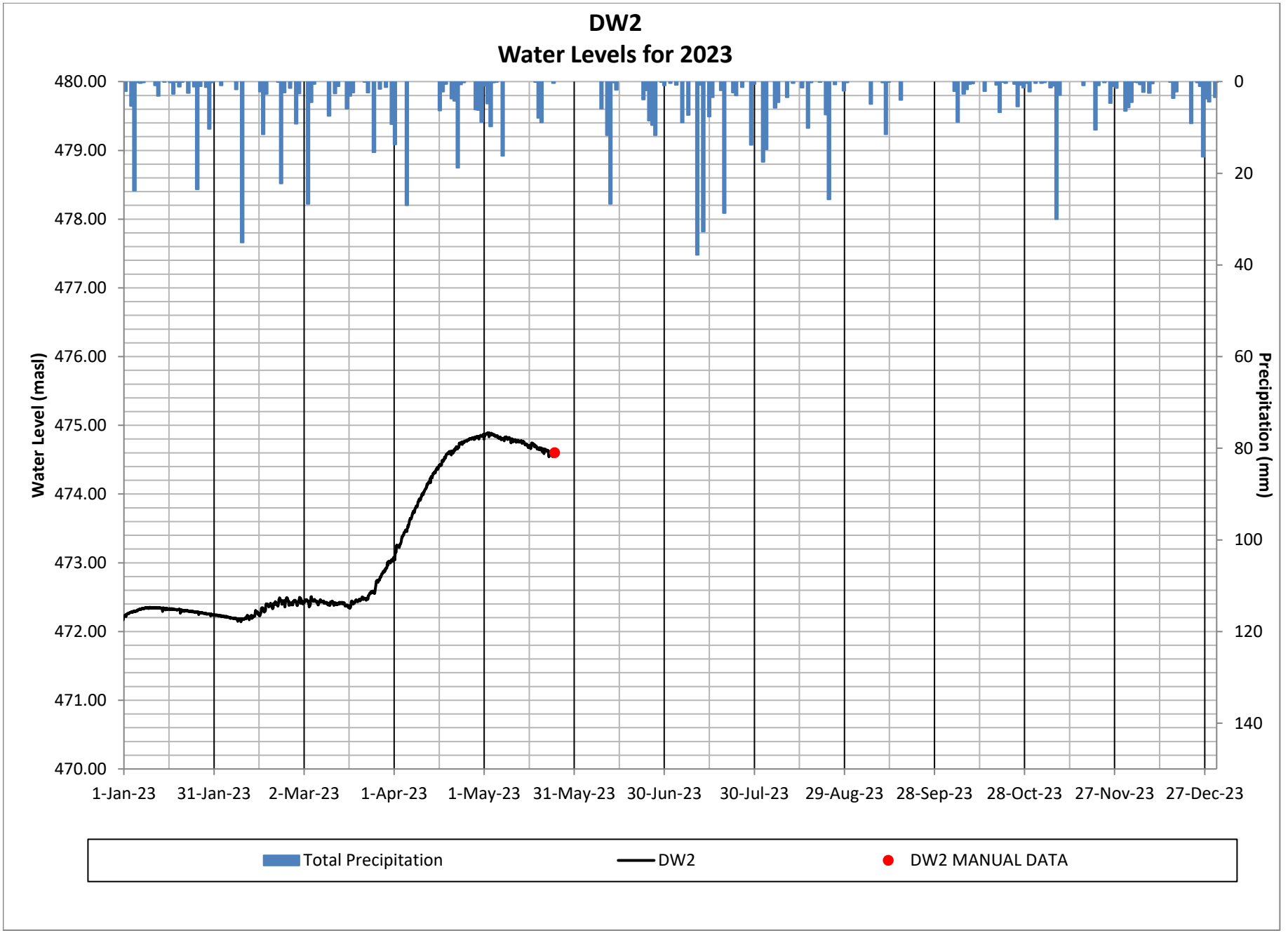
Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Lead - Hydrogeology
JRM/AK:ha

I:\2023 Projects\123016 - Strada - Shelburne\04 - ARA Submission\Documents\Reports\Domestic Well Reports\2023 Letter\DW2\L - 1 Ashlea Lane - DW Monitoring Program Letter.docx


DW2
Water Levels for 2023
Water Level (masl)
Precipitation (mm)
480.00
479.00
478.00
477.00
476.00
475.00
474.00
473.00
472.00
471.00
470.00
0
20
40
60
80
100
120
140
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Total Precipitation
DW2
DW2 MANUAL DATA

CADUCEON
ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

REPORT NO: 23-029437 Rev2
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW2
	Sample ID:		23-029437-2
	Date Collected:		17-Oct-23
Parameter	**Units**	**R.L.**	
Alkalinity(CaCO3) to pH4.5	mg/L	5	283
Bicarbonate (as CaCO3)	mg/L	5	283
pH @25°C	pH units		8.07
Conductivity @25°C	uS/cm	1	583
Chloride	mg/L	0.5	10.4
Nitrate (N)	mg/L	0.05	3.35
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	12
Phosphorus (Total)	mg/L	0.01	<0.01
Total Kjeldahl Nitrogen	mg/L	0.1	<0.1
Hardness (as CaCO3)	mg/L as CaCO3	0.02	279
Aluminum	mg/L	0.01	0.05
Barium	mg/L	0.001	0.032
Bismuth	mg/L	0.02	<0.02
Boron	mg/L	0.005	0.01
Calcium	mg/L	0.02	79.3
Iron	mg/L	0.005	<0.005
Lithium	mg/L	0.005	<0.005
Magnesium	mg/L	0.02	19.7
Manganese	mg/L	0.001	<0.001
Nickel	mg/L	0.01	<0.01
Potassium	mg/L	0.1	1
Silicon	mg/L	0.01	3.64
Silica	mg/L	2	8
Sodium	mg/L	0.2	4
Strontium	mg/L	0.001	0.111
Tin	mg/L	0.05	<0.05
Titanium	mg/L	0.005	<0.005
Tungsten	mg/L	0.01	<0.01
Zinc	mg/L	0.005	0.077
Zirconium	mg/L	0.003	<0.003
Antimony	mg/L	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0001
Beryllium	mg/L	0.0001	<0.0001
Cadmium	mg/L	0.000015	0.000033
Chromium	mg/L	0.001	<0.0010
Cobalt	mg/L	0.0001	0.0002
Copper	mg/L	0.0001	0.0209
Lead	mg/L	0.00002	0.00096

CADUCEON
ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

REPORT NO: 23-029437 Rev2
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW2
	Sample ID:		23-029437-2
	Date Collected:		17-Oct-23
Molybdenum	mg/L	0.0001	0.0001
Selenium	mg/L	0.001	<0.001
Silver	mg/L	0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005
Uranium	mg/L	0.00005	0.00022
Vanadium	mg/L	0.0001	<0.0001

R.L. = Reporting Limit

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

February 8, 2023

Troy and Laura Allen
476537 3rd Line
Melancthon Township, Ontario, L9V 1T4
troy@troysgarage.com

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mr. and Mrs. Allen:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to initiate a domestic water well monitoring program as part of the due diligence investigation process associated with the on-going domestic water well monitoring program for the Shelburne Quarry.

On February 8, 2023, Tatham installed an automatic water level datalogger in your drilled well after you expressed interest in the monitoring program. A water level datalogger is an instrument used to automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

Manual groundwater levels were measured at depths of 1.2 and 1.4 m below existing grade on May 24 and October 17, 2023, respectively. A hydrograph illustrating the continuous groundwater levels in your well over the course of a year of monitoring is provided for reference. The downward spikes illustrate typical household water usage.

On October 17, 2023, a water sample was taken from your outside faucet, as this typically bypasses any filtration you may have. Results from this sample have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 279 mg/L compared to a ODWQS Operational Guideline of 80 to 100 mg/L.

The operational guideline for hardness is set between 80 to 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water too

soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate ($CaCO_3$) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Lead - Hydrogeology
JRM/AK:ha

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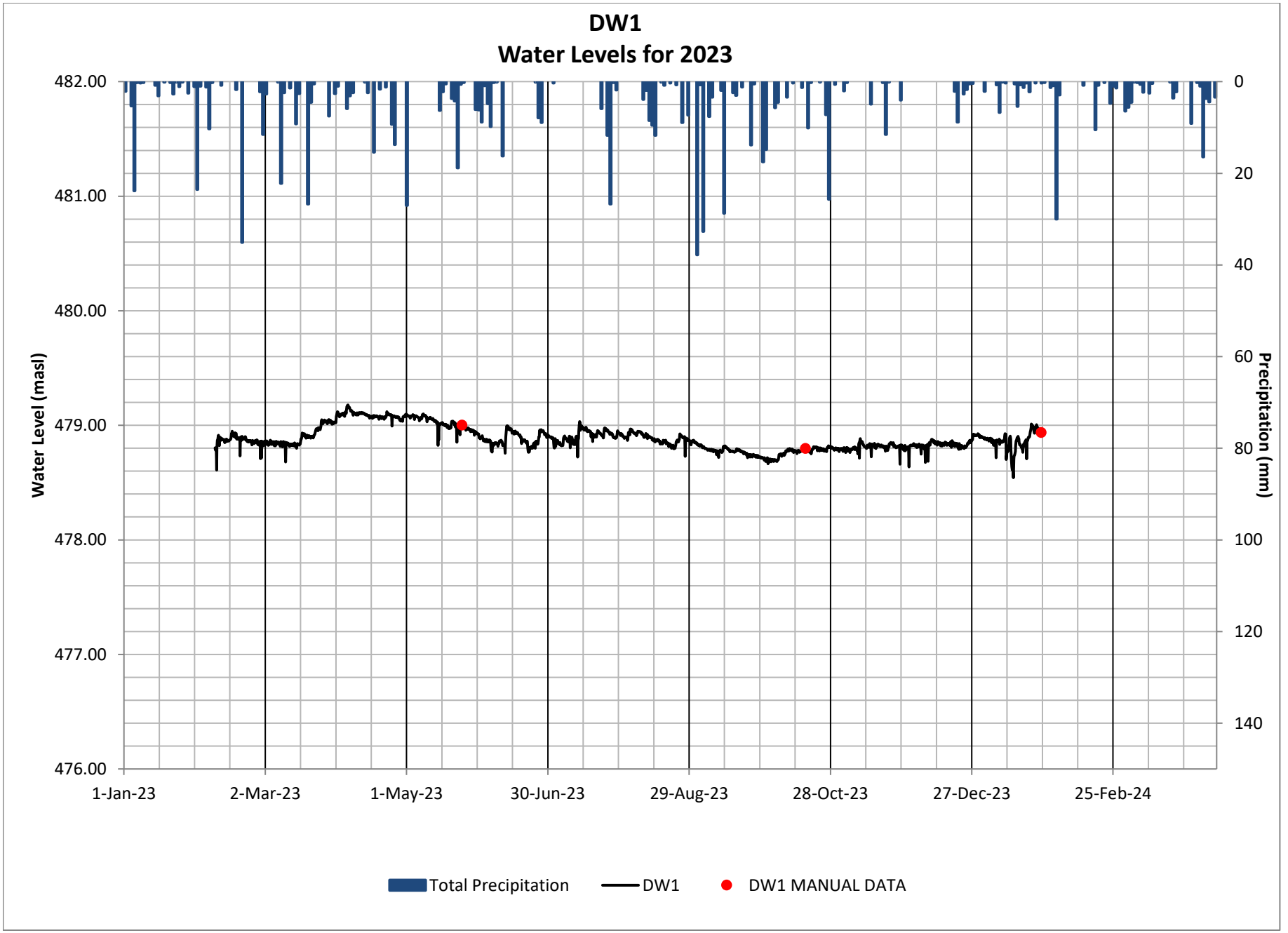

DW1
Water Levels for 2023
Water Level (masl)
Precipitation (mm)
482.00
481.00
480.00
479.00
478.00
477.00
476.00
0
20
40
60
80
100
120
140
1-Jan-23
2-Mar-23
1-May-23
30-Jun-23
29-Aug-23
28-Oct-23
27-Dec-23
25-Feb-24
Total Precipitation
DW1
DW1 MANUAL DATA

CADUCEON ENVIRONMENTAL LABORATORIES

REPORT NO: 23-029437 Rev1
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW1
	Sample ID:		23-029437-1
	Date Collected:		17-Oct-23
Parameter	**Units**	**R.L.**	
Alkalinity(CaCO3) to pH4.5	mg/L	5	278
Bicarbonate (as CaCO3)	mg/L	5	278
pH @25°C	pH units		8.16
Conductivity @25°C	uS/cm	1	636
Chloride	mg/L	0.5	29.8
Nitrate (N)	mg/L	0.05	2.34
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	17
Phosphorus (Total)	mg/L	0.01	<0.01
Total Kjeldahl Nitrogen	mg/L	0.1	<0.1
Hardness (as CaCO3)	mg/L as CaCO3	0.02	279
Aluminum	mg/L	0.01	0.05
Barium	mg/L	0.001	0.04
Bismuth	mg/L	0.02	<0.02
Boron	mg/L	0.005	0.009
Calcium	mg/L	0.02	79.8
Iron	mg/L	0.005	0.005
Lithium	mg/L	0.005	<0.005
Magnesium	mg/L	0.02	19.4
Manganese	mg/L	0.001	0.001
Nickel	mg/L	0.01	<0.01
Potassium	mg/L	0.1	1.6
Silicon	mg/L	0.01	3.65
Silica	mg/L	2	8
Sodium	mg/L	0.2	14
Strontium	mg/L	0.001	0.13
Tin	mg/L	0.05	<0.05
Titanium	mg/L	0.005	<0.005
Tungsten	mg/L	0.01	<0.01
Zinc	mg/L	0.005	0.108
Zirconium	mg/L	0.003	<0.003
Antimony	mg/L	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0002
Beryllium	mg/L	0.0001	<0.0001
Cadmium	mg/L	0.000015	0.000074
Chromium	mg/L	0.001	<0.0010
Cobalt	mg/L	0.0001	0.0002
Copper	mg/L	0.0001	0.0381
Lead	mg/L	0.00002	0.00095

CADUCEON ENVIRONMENTAL LABORATORIES

REPORT NO: 23-029437 Rev1
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW1
	Sample ID:		23-029437-1
	Date Collected:		17-Oct-23
Molybdenum	mg/L	0.0001	0.0005
Selenium	mg/L	0.001	<0.001
Silver	mg/L	0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005
Uranium	mg/L	0.00005	0.00059
Vanadium	mg/L	0.0001	<0.0001

R.L. = Reporting Limit

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

February 9, 2024

Kevin McGriskin
477084 3rd Line
Melancthon Township, Ontario, L9V 1S6
kevinmcgriskin@hotmail.com

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to initiate a domestic water well monitoring program as part of the due diligence investigation process associated with the on-going domestic water well monitoring program for the Shelburne Quarry.

In January 2023, Tatham took over the monitoring of the level datalogger in your drilled well, as a part of the monitoring program at the Strada Quarry. A water level datalogger is an instrument used to automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

Manual groundwater levels were measured at depths of 20.3 and 18.5 m below existing grade on May 24 and October 17, 2023, respectively. A hydrograph illustrating the continuous groundwater levels in your well over the course of a year of monitoring is provided for reference. The downward spikes illustrate typical household water usage.

On October 17, 2023, a water sample was taken from your outside faucet, as this typically bypasses any filtration that you may have. Results from this sample have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of lead, and hardness with a measured concentration of 0.0269mg/L and 279 mg/L respectively. The ODWQS maximum acceptable concentration for lead has been listed at 0.01 mg/L and the ODWQS Operational Guideline for hardness has been set at 80 to 100 mg/L.

As lead is considered a health based ODWQS you were notified by Tatham of the lead exceedance on November 27, 2023, and Tatham scheduled a re-sample to confirm the elevated Lead concentrations. Tatham returned on November 30, 2023 and retrieved an untreated water sample from your tap. The second sample was submitted for chemical testing of lead only, and the results indicated the Lead concentrations were well below the applicable ODWQS. Based on the results of the second sample it can

be concluded with a high degree of confidence that there is no threat at the point of consumption, but we would recommend not drinking water from the outside tap.

The operational guideline for hardness is set between 80 to 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water too soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate ($CaCO_3$) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

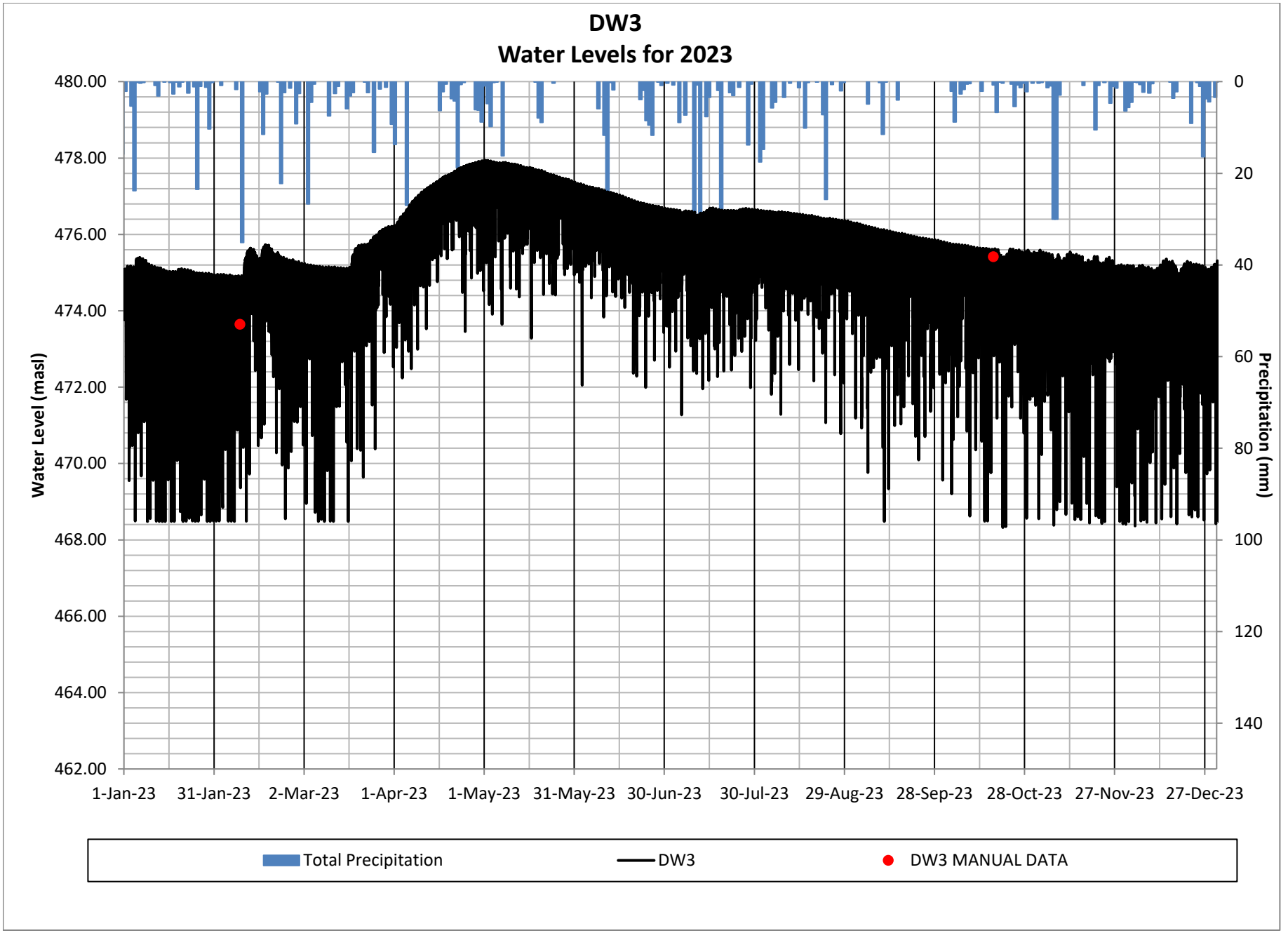
Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Leader - Hydrogeology
JRM/AK:ha

I:\2023 Projects\123016 - Strada - Shelburne\04 - ARA Submission\Documents\Reports\Domestic Well Reports\2023 Letter\DW3\L - 477084 3rd Line - DW Monitoring Program Letter.docx


DW3
Water Levels for 2023
Water Level (masl)
Precipitation (mm)
480.00
478.00
476.00
474.00
472.00
470.00
468.00
466.00
464.00
462.00
0
20
40
60
80
100
120
140
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Total Precipitation
DW3
DW3 MANUAL DATA

CADUCEON
ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

REPORT NO: 23-029437 Rev3
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW3
	Sample ID:		23-029437-3
	Date Collected:		17-Oct-23
Parameter	**Units**	**R.L.**	
Alkalinity(CaCO3) to pH4.5	mg/L	5	244
Bicarbonate (as CaCO3)	mg/L	5	244
pH @25°C	pH units		8.04
Conductivity @25°C	uS/cm	1	562
Chloride	mg/L	0.5	10.9
Nitrate (N)	mg/L	0.05	7.61
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	22
Phosphorus (Total)	mg/L	0.01	<0.01
Total Kjeldahl Nitrogen	mg/L	0.1	<0.1
Hardness (as CaCO3)	mg/L as CaCO3	0.02	268
Aluminum	mg/L	0.01	0.05
Barium	mg/L	0.001	0.055
Bismuth	mg/L	0.02	<0.02
Boron	mg/L	0.005	0.007
Calcium	mg/L	0.02	73
Iron	mg/L	0.005	0.023
Lithium	mg/L	0.005	<0.005
Magnesium	mg/L	0.02	20.8
Manganese	mg/L	0.001	0.001
Nickel	mg/L	0.01	<0.01
Potassium	mg/L	0.1	1.4
Silicon	mg/L	0.01	3.93
Silica	mg/L	2	8
Sodium	mg/L	0.2	3.3
Strontium	mg/L	0.001	0.157
Tin	mg/L	0.05	<0.05
Titanium	mg/L	0.005	<0.005
Tungsten	mg/L	0.01	<0.01
Zinc	mg/L	0.005	1.73
Zirconium	mg/L	0.003	<0.003
Antimony	mg/L	0.0001	0.0002
Arsenic	mg/L	0.0001	0.0003
Beryllium	mg/L	0.0001	<0.0001
Cadmium	mg/L	0.000015	0.000131
Chromium	mg/L	0.001	<0.0010
Cobalt	mg/L	0.0001	0.0001
Copper	mg/L	0.0001	0.0205
Lead	mg/L	0.00002	0.0269

CADUCEON ENVIRONMENTAL LABORATORIES

REPORT NO: 23-029437 Rev3
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW3
	Sample ID:		23-029437-3
	Date Collected:		17-Oct-23
Molybdenum	mg/L	0.0001	0.0007
Selenium	mg/L	0.001	<0.001
Silver	mg/L	0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005
Uranium	mg/L	0.00005	0.00067
Vanadium	mg/L	0.0001	<0.0001

R.L. = Reporting Limit

CADUCEON ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW112379 **REPORT No: 23-033605 - Rev. 0**

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

Attention: Alicia Kimberley

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

DATE RECEIVED: 2023-Nov-30
DATE REPORTED: 2023-Dec-04
SAMPLE MATRIX: Drinking Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
ICP/MS (Liquid)	1	OTTAWA	AOZKAYMAK	2023-Dec-04	D-ICPMS-01	EPA 200.8

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

				Client I.D.	477084 3rd Line
				Sample I.D.	23-033605-1
				Date Collected	2023-Nov-29
Parameter	**Units**	**R.L.**	**Limits**	**DWG**	-
Lead	mg/L	0.00002	0.010	MAC	0.00017

DWG - Drinking Water Guidelines
ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets

Michelle Dubien
Data Specialist

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

February 9, 2024

Rick Wallace
635007 Side Road 15
Melancthon Township, Ontario, L0N 1S6

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mr. Wallace:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to initiate a domestic water well monitoring program as part of the due diligence investigation process associated with the on-going domestic water well monitoring program for the Shelburne Quarry.

On October 4, 2023, Tatham installed an automatic water level datalogger in your drilled well after you expressed interest in the monitoring program. A water level datalogger is an instrument used to automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

Manual groundwater levels were measured at depths of 9.1 and 9.0 m below existing grade on October 4 and October 17, 2023, respectively. A hydrograph illustrating the continuous groundwater levels in your well over the course of a year of monitoring is provided for reference. The downward spikes illustrate typical household water usage.

On October 17, 2023, a water sample was taken from your outside faucet, as this typically bypasses any filtration that you may have. Results from this sample have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 323 mg/L compared to a ODWQS Operational Guideline of 80 to 100 mg/L.

The operational guideline for hardness is set between 80 to 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water too soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate ($CaCO_3$) is considered an acceptable balance between corrosion and incrustation.

Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

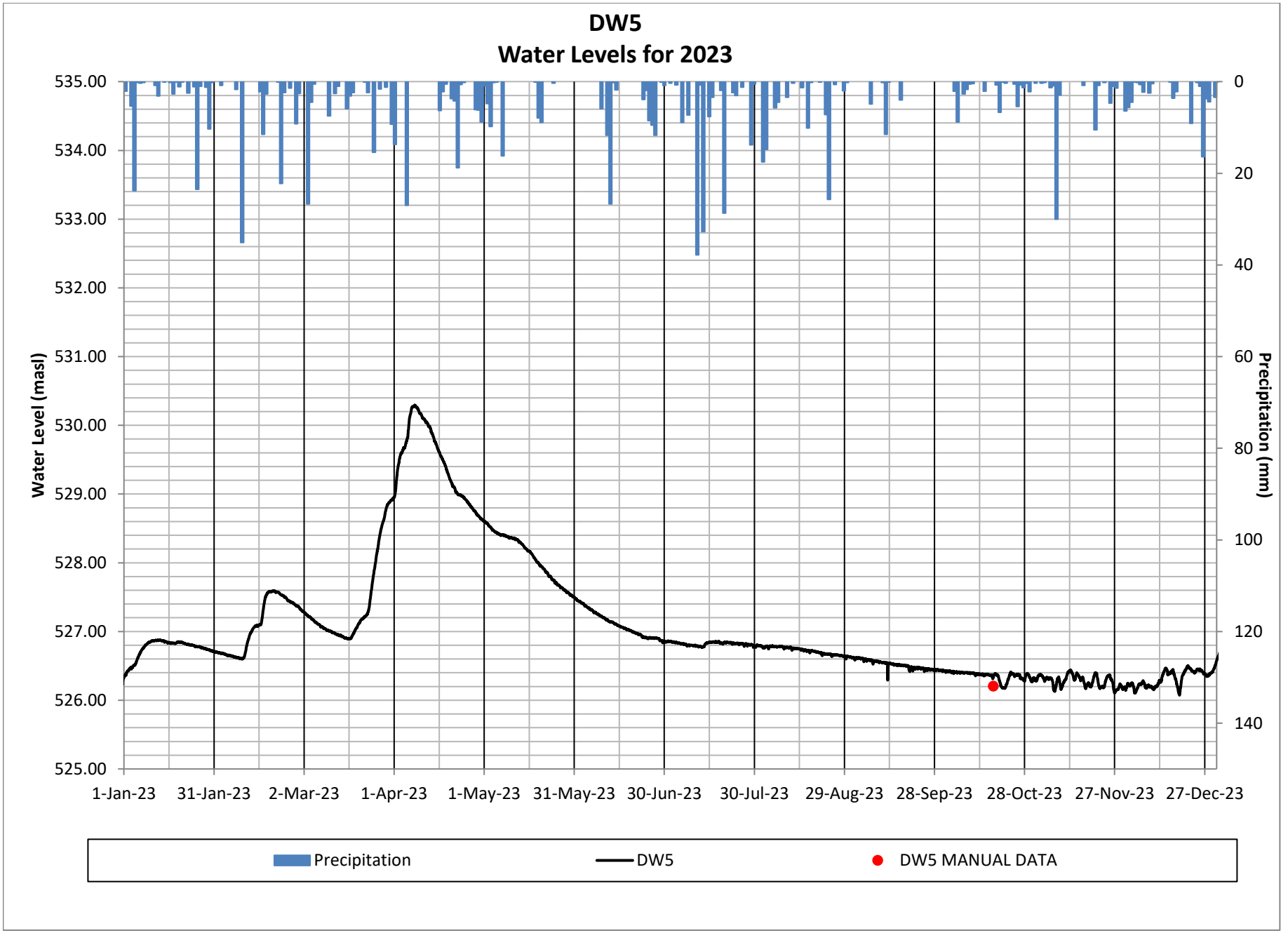
If you have any questions, feel free to call or email at any time.

Yours truly,

Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Leader - Hydrogeology
JRM/AK:ha

I:\2023 Projects\123016 - Strada - Shelburne\04 - ARA Submission\Documents\Reports\Domestic Well Reports\2023 Letter\DW5\L - 625007 Side Road 15 - DW Monitoring Program Letter.docx


DW5
Water Levels for 2023
Water Level (masl)
Precipitation (mm)
535.00
534.00
533.00
532.00
531.00
530.00
529.00
528.00
527.00
526.00
525.00
0
20
40
60
80
100
120
140
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Precipitation
DW5
DW5 MANUAL DATA

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ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

REPORT NO: 23-029437 Rev5
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW5
	Sample ID:		23-029437-5
	Date Collected:		17-Oct-23
Parameter	**Units**	**R.L.**	
Alkalinity(CaCO3) to pH4.5	mg/L	5	294
Bicarbonate (as CaCO3)	mg/L	5	294
pH @25°C	pH units		8.08
Conductivity @25°C	uS/cm	1	703
Chloride	mg/L	0.5	26.6
Nitrate (N)	mg/L	0.05	9.8
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	18
Phosphorus (Total)	mg/L	0.01	0.02
Total Kjeldahl Nitrogen	mg/L	0.1	<0.1
Hardness (as CaCO3)	mg/L as CaCO3	0.02	323
Aluminum	mg/L	0.01	0.07
Barium	mg/L	0.001	0.023
Bismuth	mg/L	0.02	<0.02
Boron	mg/L	0.005	0.016
Calcium	mg/L	0.02	83.9
Iron	mg/L	0.005	0.007
Lithium	mg/L	0.005	<0.005
Magnesium	mg/L	0.02	27.6
Manganese	mg/L	0.001	0.002
Nickel	mg/L	0.01	<0.01
Potassium	mg/L	0.1	4.2
Silicon	mg/L	0.01	2.79
Silica	mg/L	2	6
Sodium	mg/L	0.2	6.4
Strontium	mg/L	0.001	0.087
Tin	mg/L	0.05	<0.05
Titanium	mg/L	0.005	<0.005
Tungsten	mg/L	0.01	<0.01
Zinc	mg/L	0.005	0.187
Zirconium	mg/L	0.003	<0.003
Antimony	mg/L	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0002
Beryllium	mg/L	0.0001	<0.0001
Cadmium	mg/L	0.000015	0.000049
Chromium	mg/L	0.001	<0.0010
Cobalt	mg/L	0.0001	0.0002
Copper	mg/L	0.0001	0.0533
Lead	mg/L	0.00002	0.00091

CADUCEON ENVIRONMENTAL LABORATORIES

REPORT NO: 23-029437 Rev5
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW5
	Sample ID:		23-029437-5
	Date Collected:		17-Oct-23
Molybdenum	mg/L	0.0001	<0.0001
Selenium	mg/L	0.001	<0.001
Silver	mg/L	0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005
Uranium	mg/L	0.00005	0.00019
Vanadium	mg/L	0.0001	0.0002

R.L. = Reporting Limit

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

February 9, 2024

Debbie Fawcett
625293 15th Side Road
Melancthon Township, Ontario, L0N 1S6
Debbie.fawcett@sympatico.ca

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mrs. Fawcett:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to initiate a domestic water well monitoring program as part of the due diligence investigation process associated with the on-going domestic water well monitoring program for the Shelburne Quarry.

In January 2023, Tatham took over the monitoring of the level datalogger in your drilled well, as a part of the monitoring program at the Strada Quarry. A water level datalogger is an instrument used to automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

Manual groundwater levels were measured at depths of 5.4 and 5.2 m below existing grade on May 24 and October 17, 2023, respectively. A hydrograph illustrating the continuous groundwater levels in your well over the course of a year of monitoring is provided for reference. The downward spikes illustrate typical household water usage.

On October 17, 2023, a water sample was taken from your outside faucet, as this typically bypasses any filtration that you may have. Results from this sample have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 284 mg/L compared to a ODWQS Operational Guideline of 80 to 100 mg/L.

The operational guideline for hardness is set between 80 to 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water too

soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate ($CaCO_3$) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

Yours truly,

Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Leader - Hydrogeology
JRM/AK:ha

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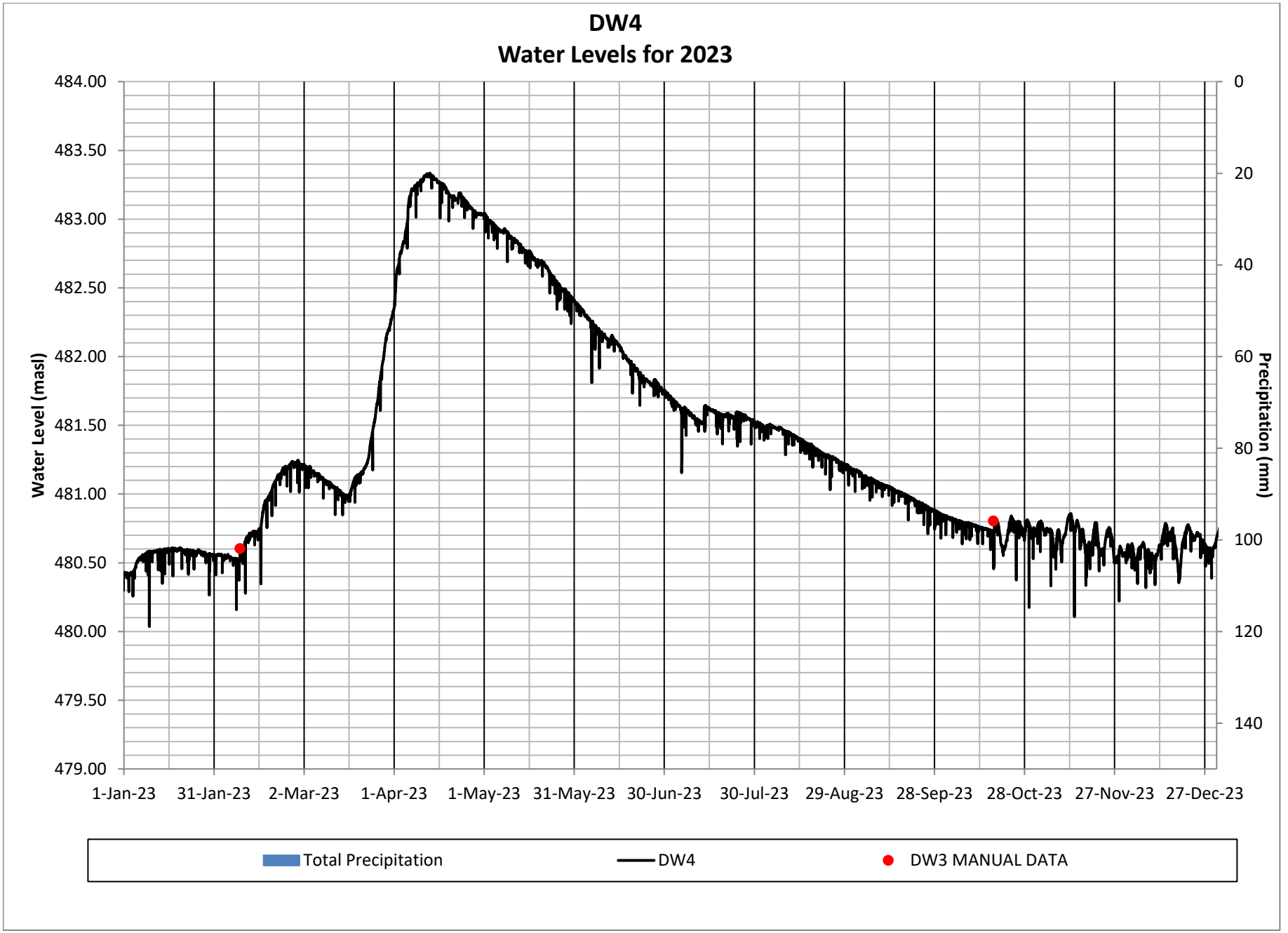
DW4
Water Levels for 2023
Water Level (masl)
Precipitation (mm)
484.00
483.50
483.00
482.50
482.00
481.50
481.00
480.50
480.00
479.50
479.00
0
20
40
60
80
100
120
140
1-Jan-23
31-Jan-23
2-Mar-23
1-Apr-23
1-May-23
31-May-23
30-Jun-23
30-Jul-23
29-Aug-23
28-Sep-23
28-Oct-23
27-Nov-23
27-Dec-23
Total Precipitation
DW4
DW3 MANUAL DATA

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Client committed. Quality assured.

REPORT NO: 23-029437 Rev4
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW4
	Sample ID:		23-029437-4
	Date Collected:		17-Oct-23
Parameter	**Units**	**R.L.**	
Alkalinity(CaCO3) to pH4.5	mg/L	5	265
Bicarbonate (as CaCO3)	mg/L	5	265
pH @25°C	pH units		8.05
Conductivity @25°C	uS/cm	1	609
Chloride	mg/L	0.5	12.2
Nitrate (N)	mg/L	0.05	8.17
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	22
Phosphorus (Total)	mg/L	0.01	<0.01
Total Kjeldahl Nitrogen	mg/L	0.1	<0.1
Hardness (as CaCO3)	mg/L as CaCO3	0.02	284
Aluminum	mg/L	0.01	0.05
Barium	mg/L	0.001	0.023
Bismuth	mg/L	0.02	<0.02
Boron	mg/L	0.005	0.015
Calcium	mg/L	0.02	76.8
Iron	mg/L	0.005	<0.005
Lithium	mg/L	0.005	<0.005
Magnesium	mg/L	0.02	22.5
Manganese	mg/L	0.001	<0.001
Nickel	mg/L	0.01	<0.01
Potassium	mg/L	0.1	2.2
Silicon	mg/L	0.01	3.12
Silica	mg/L	2	7
Sodium	mg/L	0.2	3.2
Strontium	mg/L	0.001	0.089
Tin	mg/L	0.05	<0.05
Titanium	mg/L	0.005	<0.005
Tungsten	mg/L	0.01	<0.01
Zinc	mg/L	0.005	0.141
Zirconium	mg/L	0.003	<0.003
Antimony	mg/L	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0001
Beryllium	mg/L	0.0001	<0.0001
Cadmium	mg/L	0.000015	0.000067
Chromium	mg/L	0.001	<0.0010
Cobalt	mg/L	0.0001	0.0002
Copper	mg/L	0.0001	0.137
Lead	mg/L	0.00002	0.0037

CADUCEON ENVIRONMENTAL LABORATORIES

REPORT NO: 23-029437 Rev4
COC #: DWTE231020

Report To:
Tatham Engineering
115 Sandford Fleming Drive
Collingwood, ON L9Y 5A6
Attention: Oliver Lestyan

CADUCEON Environmental Laboratories
112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8
Tel: 705-252-5743

DATE SUBMITTED:	20-Oct-23	CUSTOMER PROJECT:	123016
DATE REPORTED:	27-Oct-23	P.O. NUMBER:	
SAMPLE MATRIX:	Drinking Water	WATERWORKS NO:	

	Client ID:		DW4
	Sample ID:		23-029437-4
	Date Collected:		17-Oct-23
Molybdenum	mg/L	0.0001	0.0005
Selenium	mg/L	0.001	<0.001
Silver	mg/L	0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005
Uranium	mg/L	0.00005	0.0004
Vanadium	mg/L	0.0001	<0.0001

R.L. = Reporting Limit

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

March 30, 2023

Troy and Laura Allen
476537 3rd Line
Melancthon, Ontario L9V 1T4

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mr. and Mrs. Allen:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to continue the on-going domestic water well monitoring program for the Shelburne Quarry. Whitewater Hydrogeology Ltd (Whitewater), which as of January 2023 has fully integrated with Tatham, previously carried out the domestic water well monitoring program.

On February 8th, 2023, Tatham installed an automatic water level datalogger in your drilled well after you expressed interest in the monitoring program. A water level datalogger is an instrument that automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

A hydrograph illustrating the measured groundwater levels in your well over the course of a year of monitoring will be provided annually. Given the data logger was only installed in February 2023 a hydrograph was not generated as part of this summary letter but will be provided in next years summary letter.

On February 8th, 2023, a water sample was taken from your well and tested for various parameters. Results have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of Lead with a measured concentration of 41.3 µg/L compared to a health based ODWQS Maximum Allowable Concentration of 10 µg/L, and Iron with a measured concentration of 1900 µg/L compared to an ODWQS Aesthetic Objective of 300 µg/L.

As Lead is considered a health based ODWQS you were notified by Tatham immediately upon receipt of the laboratory results, and Tatham scheduled a re-sample to confirm the elevated Lead concentrations. Tatham returned on February 27, 2023 and retrieved an untreated water sample from your tap. The second sample was submitted for chemical testing of Lead only, and the results indicated the Lead

concentrations were well below the applicable ODWQS. Based on the results of the second sample it is suspected the original measured Lead concentrations were anomalous.

With respect to the elevated Iron concentrations, high iron levels are very common in Ontario. Iron is usually a result of mineral deposits present in groundwater. The standard found in ODWQS is an aesthetic objective and does not pose a threat to your health. High levels of iron can stain clothing, plumbing fixtures or give the water an unpleasant colour. Treatment options such as ferric sulfate can be effective in removing iron if it is of concern to you.

Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Lead - Hydrogeology

Daniel Twigger, B.Sc.Eng., P.Eng.
Manager – Water Resources Engineering

JRM/AK/DT:ha
I:\2023 Projects\123016 - Strada - Shelburne\04 - ARA Submission\Documents\Reports\Domestic Well Reports\Strada Letters\DW1\L - Allen (DW1) 2023.docx

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 03/21/2023 12:15

Client:	Jordan Miller	Work Order Number:	490466
Company:	Tatham Engineering Limited	PO #:	
Address:	115 Sandford Fleming Drive, Suite 200 Collingwood, ON, L9Y 5A6	Regulation:	ODWS
		Project #:	
Phone:		DWS #:	
Email:	jmiller@tathameng.com	Sampled By:	Jordan Miller
Date Order Received:	2/10/2023	Analysis Started:	2/10/2023
Arrival Temperature:	13.2 °C	Analysis Completed:	2/17/2023

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
476537 3rd Line (Alen)	1850151	Ground Water	None	SAMPLE CONTAINED RESULT EXCEEDENCES.	2/8/2023	1:05 PM

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Alkalinity (A1.0)	Mississauga	Determination of Alkalinity by Titration	Modified from APHA-2320B
Anions Water (mg/L by IC) (A5)	Mississauga	Determination of Anions in Water by Ion Chromatography	Modified from SW846-9056A
Carbonate (A94)	Mississauga	Determination of Carbonate and Bi-Carbonate	Modified from APHA-2320
Conductivity of Water (A12)	Mississauga	Determination of Conductivity in Water at 25°C	Modified from SM 2510 B
ICPMS Reg. Water (A13)	Mississauga	Determination of Metals in Water by ICP/MS	Modified from SW846-6020
pH of Water (A2.0)	Mississauga	Determination of Water pH by Ion Selective Electrode	Modified from APHA-4500H+ B
TDS (A27)	Mississauga	Determination of Total Dissolved Solids in water by gravimetry	Modified from SM-2540
TKN Water Dig. (A58)	Kirkland Lake	Determination of Total Kjeldahl Nitrogen in Waters with Block Digestion.	Modified from SM-4500 NORG-D
TP Water (A23.2)	Kirkland Lake	Determination of Total Phosphorus in Water.	Modified from EPA 365.3 and ESS 310.2,

6820 Kitimat Road Unit 4, Mississauga, ON, L5N 5M3
Phone: (905) 821-1112 Fax: (905) 821-2095 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 03/21/2023 12:15

Tatham Engineering Limited

Work Order Number: 490466

REPORT COMMENTS

Report revised to include retest data for ICMPS (Pb) as per CI 20426 02/21/23 YH
Report revised to add comparative regulation (ODWS) as per CI 20534 03/21/23 YH

This report has been approved by:

Marc Creighton
Laboratory Director

6820 Kitimat Road Unit 4, Mississauga, ON, L5N 5M3
Phone: (905) 821-1112 Fax: (905) 821-2095 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 03/21/2023 12:15

Tatham Engineering Limited

Work Order Number: 490466

WORK ORDER RESULTS

Sample Description	476537 3rd Line (Alen)			
Sample Date/Time	2/8/2023 1:05 PM			
Lab ID	1850151			
Anions	Result	MDL	Units	Criteria: ODWS
Chloride	31.1	0.2	mg/L	250
Nitrate (as N)	2.59	0.05	mg/L	10
Nitrite (as N)	<0.05	0.05	mg/L	1
Sulphate	17.8	0.3	mg/L	500
General Chemistry	Result	MDL	Units	Criteria: ODWS
Bicarbonate (Calc.)	251	1	mg/L as CaCO3	~
Conductivity	605	1	µS/cm	~
M-Alkalinity (pH 4.5)	253	2	mg/L as CaCO3	~
pH	7.88	N/A	pH	~
Total Kjeldahl Nitrogen	1.7	0.4	mg/L	~
Total Phosphorus (as P)	0.006	0.002	mg/L	~
Metals	Result	MDL	Units	Criteria: ODWS
Aluminum	<1	1	ug/L	100
Antimony	<0.5	0.5	ug/L	6
Arsenic	<1	1	ug/L	10
Barium	49	1	ug/L	1000
Beryllium	<0.5	0.5	ug/L	~
Bismuth	<1	1	ug/L	~
Boron	7	2	ug/L	5000
Cadmium	0.3	0.1	ug/L	5
Calcium	82600	500	ug/L	~
Cerium	<1	1	ug/L	~
Cesium	<1	1	ug/L	~
Chromium	6	1	ug/L	50

6820 Kitimat Road Unit 4, Mississauga, ON, L5N 5M3
Phone: (905) 821-1112 Fax: (905) 821-2095 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 03/21/2023 12:15

Tatham Engineering Limited

Work Order Number: 490466

Cobalt	0.2	0.1	ug/L	~
Copper	3	1	ug/L	1000
Europium	<1	1	ug/L	~
Gallium	1	1	ug/L	~
Iron	1900	200	ug/L	300
Lanthanum	<1	1	ug/L	~
Lead	26.9	0.1	ug/L	10
Lead [rr]	41.3	0.1	ug/L	10
Lithium	<5	5	ug/L	~
Magnesium	20300	5	ug/L	~
Manganese	34	1	ug/L	50
Mercury	<0.1	0.1	ug/L	1
Molybdenum	<1	1	ug/L	~
Nickel	4	1	ug/L	~
Niobium	<1	1	ug/L	~
Phosphorus	<50	50	ug/L	~
Potassium	2120	100	ug/L	~
Rhodium	<1	1	ug/L	~
Rubidium	2	1	ug/L	~
Scandium	<1	1	ug/L	~
Selenium	<0.5	0.5	ug/L	50
Silicon	4400	600	ug/L	~
Silver	<0.1	0.1	ug/L	~
Sodium	14300	100	ug/L	20000
Strontium	127	1	ug/L	~
Sulfur	5300	800	ug/L	~
Tellurium	<1	1	ug/L	~
Thallium	<0.1	0.1	ug/L	~
Thorium	<1	1	ug/L	~

6820 Kitimat Road Unit 4, Mississauga, ON, L5N 5M3
Phone: (905) 821-1112 Fax: (905) 821-2095 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 03/21/2023 12:15

Tatham Engineering Limited

Work Order Number: 490466

Metals	Result	MDL	Units	Criteria: ODWS
Tin	<1	1	ug/L	~
Titanium	2	1	ug/L	~
Tungsten	<1	1	ug/L	~
Uranium	<1	1	ug/L	20
Vanadium	2	1	ug/L	~
Yttrium	<1	1	ug/L	~
Zinc	175	1	ug/L	5000
Zirconium	<1	1	ug/L	~
Solids	**Result**	**MDL**	**Units**	**Criteria: ODWS**
Total Dissolved Solids	387 [382]	2	mg/L	500

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

MDL: Method detection limit or minimum reporting limit.

[ ]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

ICPMS Dustfall Insoluble: The ICPMS Dustfall Insoluble Portion method analyzes only the particulate matter from the Dustfall Sampler which is retained on the analysis filter during the Dustfall method.

Regulation Comparisons: Disclaimer: Please note that regulation criteria are provided for comparative purposes, however the onus on ensuring the validity of this comparison rests with the client.

6820 Kitimat Road Unit 4, Mississauga, ON, L5N 5M3
Phone: (905) 821-1112 Fax: (905) 821-2095 Web: www.testmark.ca

CADUCEON™ ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW122568 **REPORT No. B23-02307**

Report To:

Tatham Engineering
115 Sandford Fleming Drive, Suite 200
Collingwood ON L9Y 5A6
Attention: Tecia White

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 03-Mar-23
DATE REPORTED: 07-Mar-23
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.:
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		476537 3rd Line		ODWS	
			Sample I.D.:		B23-02307-1		Objective	Type of Objective
			Date Collected:		27-Feb-23			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Lead	mg/L	0.00002	EPA 200.8	07-Mar-23/O	0.00067		0.01	MAC

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

April 4, 2023

Debbie Fawcett
625293 SR 15
Melancthon, Ontario L9V 1Z5

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mrs. Fawcett:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to continue the on-going domestic water well monitoring program for the Shelburne Quarry. Whitewater Hydrogeology Ltd (Whitewater), which as of January 2023 has fully integrated with Tatham, previously carried out the domestic water well monitoring program.

On October 4th, 2022, Whitewater installed an automatic water level datalogger in your drilled well after you expressed interest in the monitoring program. A water level datalogger is an instrument that automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

The water level data is presented in the hydrograph appended to this letter. The water level is shown in black and has been calibrated to the manual measurement taken at the time the datalogger device was installed. A complete year cycle of groundwater monitoring is not available yet for your well; however, the limited water level data collected to date shows two different trends; 1) a seasonal response: the slow decline in water levels during the fall months; 2) daily trends: the instantaneous drawdown and recovery because of the daily water use and pump activation. These downward spikes in the data represent the times your well is in operation and supplying water to your home and are completely normal. The data suggests that the well has sufficient supply for domestic use.

On October 4th, 2022, a groundwater sample was taken from your water well and tested for various parameters. Results have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 312 mg/L compared to a ODWQS Operational Guideline of 80 to 100 mg/L.

The operational guideline for hardness is set between 80 and 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water that is too soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate (CaCO3) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

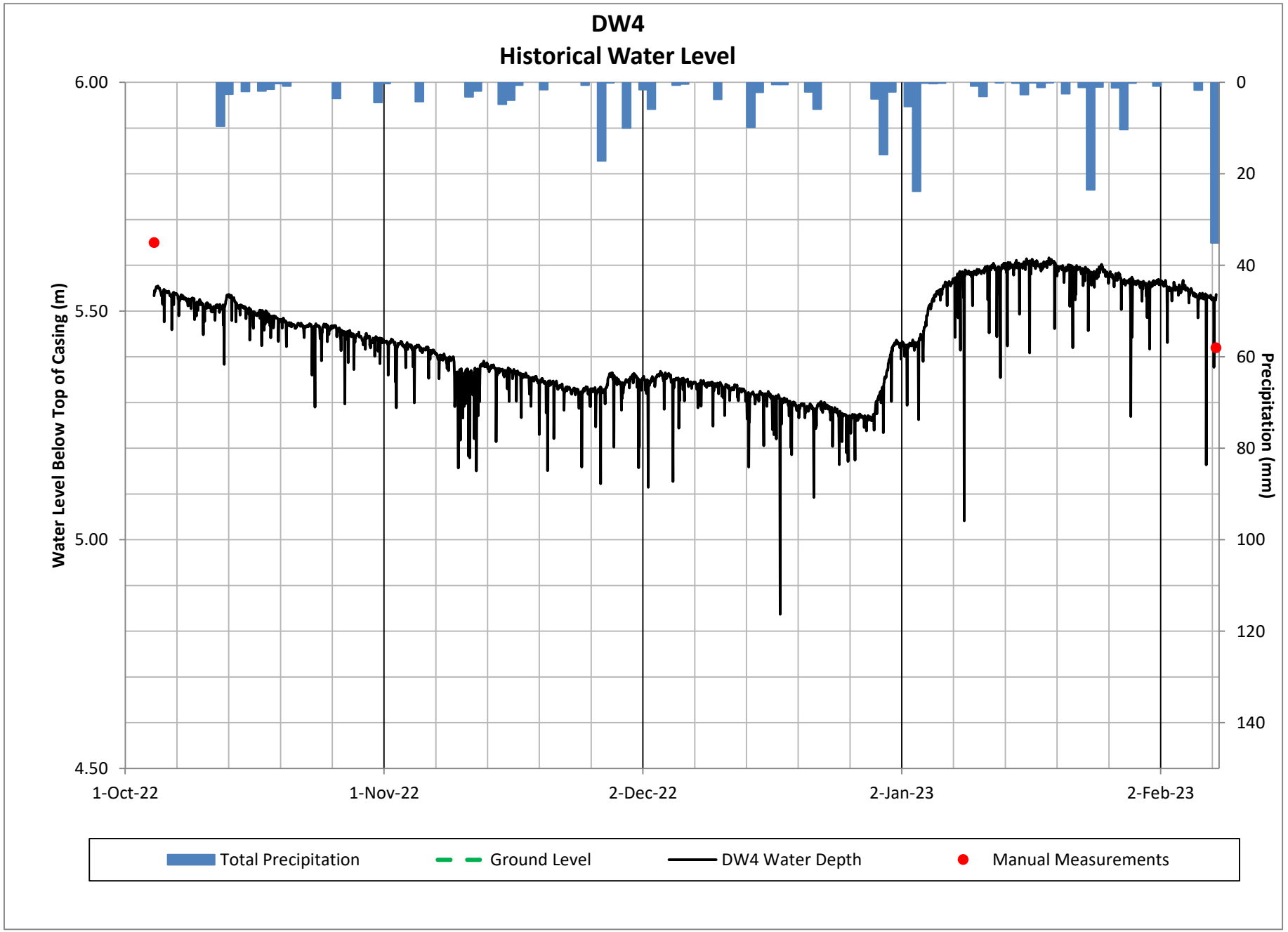
Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Lead - Hydrogeology

Daniel Twigger, B.Sc.Eng., P.Eng.
Manager – Water Resources Engineering

JRM/AK/DT:ha

I:\2023 Projects\123016 - Strada - Shelburne\04 - ARA Submission\Documents\Reports\Domestic Well Reports\Strada Letters\DW4\L - Fawcett (DW4) 2023.docx


DW4
Historical Water Level
6.00
5.50
5.00
4.50
Water Level Below Top of Casing (m)
0
20
40
60
80
100
120
140
Precipitation (mm)
1-Oct-22
1-Nov-22
2-Dec-22
2-Jan-23
2-Feb-23
Total Precipitation
Ground Level
DW4 Water Depth
Manual Measurements

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G111051

REPORT No. B22-31359

Rev. 8

Report To:

Whitewater Hydrogeology Ltd
8537 36/37 Nottawasaga Side Rd,
Collingwood Ontario L94 3Y9 Canada
Attention: Tecia White

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 05-Oct-22
DATE REPORTED: 29-Mar-23
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Strada Domestic
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		#625293		ODWS	
			Sample I.D.:		B22-31359-4		Objective	Type of Objective
			Date Collected:		04-Oct-22			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	07-Oct-22/O	257		30-500	OG
Carbonate (as CaCO3)	mg/L	5	SM 2320B	07-Oct-22/O	< 5			
Bicarbonate(as CaCO3)	mg/L	5	SM 2320B	07-Oct-22/O	257			
Conductivity @25°C	µmho/cm	1	SM 2510B	07-Oct-22/O	606			
pH @25°C	pH Units		SM 4500H	07-Oct-22/O	7.95		6.5-8.5	OG
Chloride	mg/L	0.5	SM4110C	07-Oct-22/O	13.6		250	AO
Nitrite (N)	mg/L	0.1	SM4110C	07-Oct-22/O	< 0.1		1	MAC
Nitrate (N)	mg/L	0.1	SM4110C	07-Oct-22/O	9.0		10	MAC
Sulphate	mg/L	1	SM4110C	07-Oct-22/O	23		500	AO
Phosphorus-Total	mg/L	0.01	E3516.2	12-Oct-22/K	0.01			
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	12-Oct-22/K	0.1			
TDS (Calc. from Cond.)	mg/L	1	Calc.	12-Oct-22	314		500	AO
Hardness (as CaCO3)	mg/L	1	SM 3120	11-Oct-22/O	**312**		500,80-100	ODWO,OG
Aluminum	mg/L	0.01	SM 3120	11-Oct-22/O	0.02		0.1	OG
Arsenic	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02		0.01	MAC
Boron	mg/L	0.005	SM 3120	11-Oct-22/O	0.014		5	MAC
Barium	mg/L	0.001	SM 3120	11-Oct-22/O	0.023		1	MAC
Beryllium	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002			
Bismuth	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02			
Calcium	mg/L	0.02	SM 3120	11-Oct-22/O	84.5			
Cadmium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005		0.005	MAC
Chromium	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002		0.05	MAC
Cobalt	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Copper	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002		1	AO

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G111051

REPORT No. B22-31359

Rev. 8

Report To:

Whitewater Hydrogeology Ltd
8537 36/37 Nottawasaga Side Rd,
Collingwood Ontario L94 3Y9 Canada
Attention: Tecia White

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 05-Oct-22
DATE REPORTED: 29-Mar-23
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Strada Domestic
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		#625293		ODWS	
			Sample I.D.:		B22-31359-4		Objective	Type of Objective
			Date Collected:		04-Oct-22			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Iron	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005		0.3	AO
Lead	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02		0.01	MAC
Lithium	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Magnesium	mg/L	0.02	SM 3120	11-Oct-22/O	24.6			
Manganese	mg/L	0.001	SM 3120	11-Oct-22/O	< 0.001		0.05	AO
Molybdenum	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Nickel	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Phosphorus	mg/L	0.1	SM 3120	11-Oct-22/O	< 0.1			
Potassium	mg/L	0.1	SM 3120	11-Oct-22/O	2.6			
Silica	mg/L	0.02	SM 3120	11-Oct-22/O	6.93			
Silicon	mg/L	0.01	SM 3120	11-Oct-22/O	3.24			
Silver	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Sodium	mg/L	0.2	SM 3120	11-Oct-22/O	3.3		200,20	AO,WL
Strontium	mg/L	0.001	SM 3120	11-Oct-22/O	0.094			
Tin	mg/L	0.05	SM 3120	11-Oct-22/O	< 0.05			
Titanium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Tungsten	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Vanadium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Yttrium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Zinc	mg/L	0.005	SM 3120	11-Oct-22/O	0.062		5	AO
Zirconium	mg/L	0.003	SM 3120	11-Oct-22/O	< 0.003			

1 . Revised report to add guidelines as per client request.

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
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R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

April 4, 2023

Kevin McGriskin
477084 3rd Line
Melancthon, Ontario L0N 1S6

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mr. McGriskin:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to continue the on-going domestic water well monitoring program for the Shelburne Quarry. Whitewater Hydrogeology Ltd (Whitewater), which as of January 2023 has fully integrated with Tatham, previously carried out the domestic water well monitoring program.

On October 4th, 2022, Whitewater installed an automatic water level datalogger in your drilled well after you expressed interest in the monitoring program. A water level datalogger is an instrument that automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

The water level data is presented in the hydrograph appended to this letter. The water level is shown in black and has been calibrated to the manual measurement taken at the time the datalogger device was installed. A complete year cycle of groundwater monitoring is not available yet for your well; however, the limited water level data collected to date shows two different trends; 1) a seasonal response: the slow decline in water levels during the fall months; 2) daily trends: the instantaneous drawdown and recovery because of the daily water use and pump activation. These downward spikes in the data represent the times your well is in operation and supplying water to your home and are completely normal. The data suggests the well has sufficient supply for domestic use.

On October 4th, 2022, a groundwater sample was taken from your water well and tested for various parameters. Results have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 287 mg/L compared to an ODWQS Operational Guideline of

80 to 100 mg/L, and manganese with a measured concentration of 0.07 mg/L compared to an ODWQS Aesthetic Objective of 0.05 mg/L.

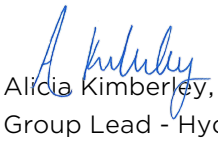
The operational guideline for hardness is set between 80 and 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water that is too soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate (CaCO3) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

The aesthetic guideline for manganese in drinking water is set to 0.05 mg/L (ODWQS, 2006). Manganese found in higher concentrations then this can lead to black staining on laundry and fixtures and a foul taste in very excessive concentrations. Your water has only exceeded this aesthetic guideline by 0.02 mg/L and should offer little to no issues at this time. Levels should be monitored and if any staining occurs then you may want to consider treatment options.

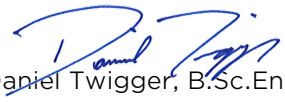
Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

Yours truly,
Tatham Engineering Limited



Alicia Kimberley, MSc., P.Geo.
Group Lead - Hydrogeology



Daniel Twigger, B.Sc.Eng, P.Eng.
Manager – Water Resources Engineering

JRM/AK/DT:ha
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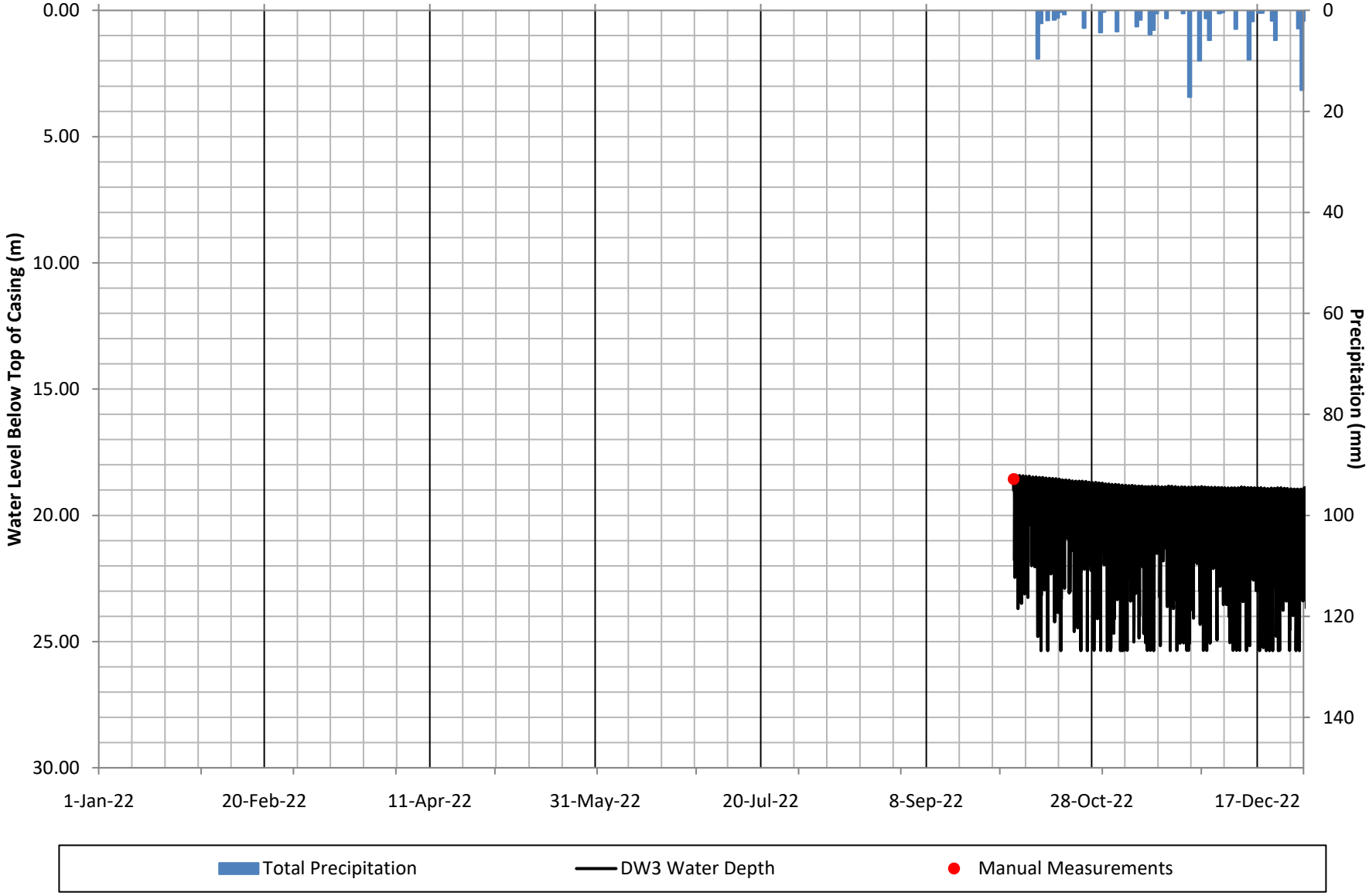
TATHAM ENGINEERING

DW3
Water Levels for 2022



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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G111051

REPORT No. B22-31359

Rev. 7

Report To:

Whitewater Hydrogeology Ltd
8537 36/37 Nottawasaga Side Rd,
Collingwood Ontario L94 3Y9 Canada
Attention: Tecia White

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 05-Oct-22
DATE REPORTED: 29-Mar-23
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Strada Domestic
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		#477084		ODWS	
			Sample I.D.:		B22-31359-3		Objective	Type of Objective
			Date Collected:		04-Oct-22			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	07-Oct-22/O	246		30-500	OG
Carbonate (as CaCO3)	mg/L	5	SM 2320B	07-Oct-22/O	< 5			
Bicarbonate(as CaCO3)	mg/L	5	SM 2320B	07-Oct-22/O	246			
Conductivity @25°C	µmho/cm	1	SM 2510B	07-Oct-22/O	564			
pH @25°C	pH Units		SM 4500H	07-Oct-22/O	7.95		6.5-8.5	OG
Chloride	mg/L	0.5	SM4110C	07-Oct-22/O	11.8		250	AO
Nitrite (N)	mg/L	0.1	SM4110C	07-Oct-22/O	< 0.1		1	MAC
Nitrate (N)	mg/L	0.1	SM4110C	07-Oct-22/O	7.4		10	MAC
Sulphate	mg/L	1	SM4110C	07-Oct-22/O	22		500	AO
Phosphorus-Total	mg/L	0.01	E3516.2	12-Oct-22/K	0.01			
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	12-Oct-22/K	< 0.1			
TDS (Calc. from Cond.)	mg/L	1	Calc.	12-Oct-22	292		500	AO
Hardness (as CaCO3)	mg/L	1	SM 3120	11-Oct-22/O	**287**		500,80-100	ODWO,OG
Aluminum	mg/L	0.01	SM 3120	11-Oct-22/O	0.02		0.1	OG
Arsenic	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02		0.01	MAC
Boron	mg/L	0.005	SM 3120	11-Oct-22/O	0.008		5	MAC
Barium	mg/L	0.001	SM 3120	11-Oct-22/O	0.057		1	MAC
Beryllium	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002			
Bismuth	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02			
Calcium	mg/L	0.02	SM 3120	11-Oct-22/O	78.5			
Cadmium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005		0.005	MAC
Chromium	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002		0.05	MAC
Cobalt	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Copper	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002		1	AO

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

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Final Report

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Rev. 7

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Whitewater Hydrogeology Ltd
8537 36/37 Nottawasaga Side Rd,
Collingwood Ontario L94 3Y9 Canada
Attention: Tecia White

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 05-Oct-22
DATE REPORTED: 29-Mar-23
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Strada Domestic
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		#477084		ODWS	
			Sample I.D.:		B22-31359-3		Objective	Type of Objective
			Date Collected:		04-Oct-22			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Iron	mg/L	0.005	SM 3120	11-Oct-22/O	0.019		0.3	AO
Lead	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02		0.01	MAC
Lithium	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Magnesium	mg/L	0.02	SM 3120	11-Oct-22/O	22.2			
Manganese	mg/L	0.001	SM 3120	11-Oct-22/O	**0.070**		0.05	AO
Molybdenum	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Nickel	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Phosphorus	mg/L	0.1	SM 3120	11-Oct-22/O	< 0.1			
Potassium	mg/L	0.1	SM 3120	11-Oct-22/O	2.4			
Silica	mg/L	0.02	SM 3120	11-Oct-22/O	8.68			
Silicon	mg/L	0.01	SM 3120	11-Oct-22/O	4.06			
Silver	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Sodium	mg/L	0.2	SM 3120	11-Oct-22/O	3.5		200,20	AO,WL
Strontium	mg/L	0.001	SM 3120	11-Oct-22/O	0.172			
Tin	mg/L	0.05	SM 3120	11-Oct-22/O	< 0.05			
Titanium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Tungsten	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Vanadium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Yttrium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Zinc	mg/L	0.005	SM 3120	11-Oct-22/O	0.074		5	AO
Zirconium	mg/L	0.003	SM 3120	11-Oct-22/O	< 0.003			

1 . Revised report to add guidelines as per client request.

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

TATHAM ENGINEERING

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

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E info@tathameng.com
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File 123016

April 4, 2023

Dan and Jennifer Robertson
1 Ashlea Lane
Melancthon, Ontario L9V 3M9

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mr. and Mrs. Robertson:

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates to continue the on-going domestic water well monitoring program for the Shelburne Quarry. Whitewater Hydrogeology Ltd (Whitewater), which as of January 2023 has fully integrated with Tatham, previously carried out the domestic water well monitoring program.

On October 4th, 2022, Whitewater installed an automatic water level datalogger in your drilled well after you expressed interest in the monitoring program. A water level datalogger is an instrument that automatically and continuously records fluctuations in water level. Water level data logs are stored in the datalogger's memory and are downloaded for analysis.

The water level data is presented in the hydrograph appended to this letter. The water level is shown in black and has been calibrated to the manual measurement taken at the time the datalogger device was installed. A complete year cycle of groundwater monitoring is not available yet for your well; however, the limited water level data collected to date shows two different trends; 1) a seasonal response: the slow decline in water levels during the fall months; 2) daily trends: the instantaneous drawdown and recovery because of the daily water use and pump activation. These downward spikes in the data represent the times your well is in operation and supplying water to your home and are completely normal. The data suggests that the well has sufficient supply for domestic use.

On October 4th, 2022, a groundwater sample was taken from your water well and tested for various parameters. Results have been compared against Ontario Drinking Water Quality Standards (ODWQS) for both health and aesthetic maximums. The results of this test are appended.

The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 303 mg/L compared to a ODWQS Operational Guideline of 80 to 100 mg/L.

The operational guideline for hardness is set between 80 and 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium

carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water that is too soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate (CaCO3) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

Please keep this information on file for your reference. Tatham will be providing a similar letter report to update you annually (or more frequently, if requested).

If you have any questions, feel free to call or email at any time.

Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Lead - Hydrogeology

Daniel Twigger, B.Sc.Eng., P.Eng.
Manager – Water Resources Engineering

JRM/AK/DT:ha
I:\2023 Projects\123016 - Strada - Shelburne\04 - ARA Submission\Documents\Reports\Domestic Well Reports\Strada Letters\DW2\L - Robertson (DW2) 2023.docx

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G111051

REPORT No. B22-31359

Rev. 5

Report To:

Whitewater Hydrogeology Ltd
8537 36/37 Nottawasaga Side Rd,
Collingwood Ontario L94 3Y9 Canada
Attention: Tecia White

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 05-Oct-22
DATE REPORTED: 29-Mar-23
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Strada Domestic
P.O. NUMBER:
WATERWORKS NO.

							ODWS	
			Client I.D.:		1 Ashlea Lane		**Objective**	**Type of Objective**
			Sample I.D.:		B22-31359-1			
			Date Collected:		04-Oct-22			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	07-Oct-22/O	275		30-500	OG
Carbonate (as CaCO3)	mg/L	5	SM 2320B	07-Oct-22/O	< 5			
Bicarbonate(as CaCO3)	mg/L	5	SM 2320B	07-Oct-22/O	275			
Conductivity @25°C	µmho/cm	1	SM 2510B	07-Oct-22/O	569			
pH @25°C	pH Units		SM 4500H	07-Oct-22/O	8.00		6.5-8.5	OG
Chloride	mg/L	0.5	SM4110C	07-Oct-22/O	11.1		250	AO
Nitrite (N)	mg/L	0.1	SM4110C	07-Oct-22/O	< 0.1		1	MAC
Nitrate (N)	mg/L	0.1	SM4110C	07-Oct-22/O	4.0		10	MAC
Sulphate	mg/L	1	SM4110C	07-Oct-22/O	13		500	AO
Phosphorus-Total	mg/L	0.01	E3516.2	12-Oct-22/K	0.01			
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	12-Oct-22/K	< 0.1			
TDS (Calc. from Cond.)	mg/L	1	Calc.	12-Oct-22	295		500	AO
Hardness (as CaCO3)	mg/L	1	SM 3120	11-Oct-22/O	**303**		500,80-100	ODWO,OG
Aluminum	mg/L	0.01	SM 3120	11-Oct-22/O	0.03		0.1	OG
Arsenic	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02		0.01	MAC
Boron	mg/L	0.005	SM 3120	11-Oct-22/O	0.008		5	MAC
Barium	mg/L	0.001	SM 3120	11-Oct-22/O	0.032		1	MAC
Beryllium	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002			
Bismuth	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02			
Calcium	mg/L	0.02	SM 3120	11-Oct-22/O	86.5			
Cadmium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005		0.005	MAC
Chromium	mg/L	0.002	SM 3120	11-Oct-22/O	< 0.002		0.05	MAC
Cobalt	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Copper	mg/L	0.002	SM 3120	11-Oct-22/O	0.013		1	AO

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

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Final Report

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Whitewater Hydrogeology Ltd
8537 36/37 Nottawasaga Side Rd,
Collingwood Ontario L94 3Y9 Canada
Attention: Tecia White

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 05-Oct-22
DATE REPORTED: 29-Mar-23
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Strada Domestic
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		1 Ashlea Lane		ODWS	
			Sample I.D.:		B22-31359-1		Objective	Type of Objective
			Date Collected:		04-Oct-22			
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Iron	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005		0.3	AO
Lead	mg/L	0.02	SM 3120	11-Oct-22/O	< 0.02		0.01	MAC
Lithium	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Magnesium	mg/L	0.02	SM 3120	11-Oct-22/O	21.1			
Manganese	mg/L	0.001	SM 3120	11-Oct-22/O	< 0.001		0.05	AO
Molybdenum	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Nickel	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Phosphorus	mg/L	0.1	SM 3120	11-Oct-22/O	< 0.1			
Potassium	mg/L	0.1	SM 3120	11-Oct-22/O	1.3			
Silica	mg/L	0.02	SM 3120	11-Oct-22/O	8.00			
Silicon	mg/L	0.01	SM 3120	11-Oct-22/O	3.74			
Silver	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Sodium	mg/L	0.2	SM 3120	11-Oct-22/O	3.6		200,20	AO,WL
Strontium	mg/L	0.001	SM 3120	11-Oct-22/O	0.112			
Tin	mg/L	0.05	SM 3120	11-Oct-22/O	< 0.05			
Titanium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Tungsten	mg/L	0.01	SM 3120	11-Oct-22/O	< 0.01			
Vanadium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Yttrium	mg/L	0.005	SM 3120	11-Oct-22/O	< 0.005			
Zinc	mg/L	0.005	SM 3120	11-Oct-22/O	0.040		5	AO
Zirconium	mg/L	0.003	SM 3120	11-Oct-22/O	< 0.003			

1 . Revised report to add guidelines as per client request.

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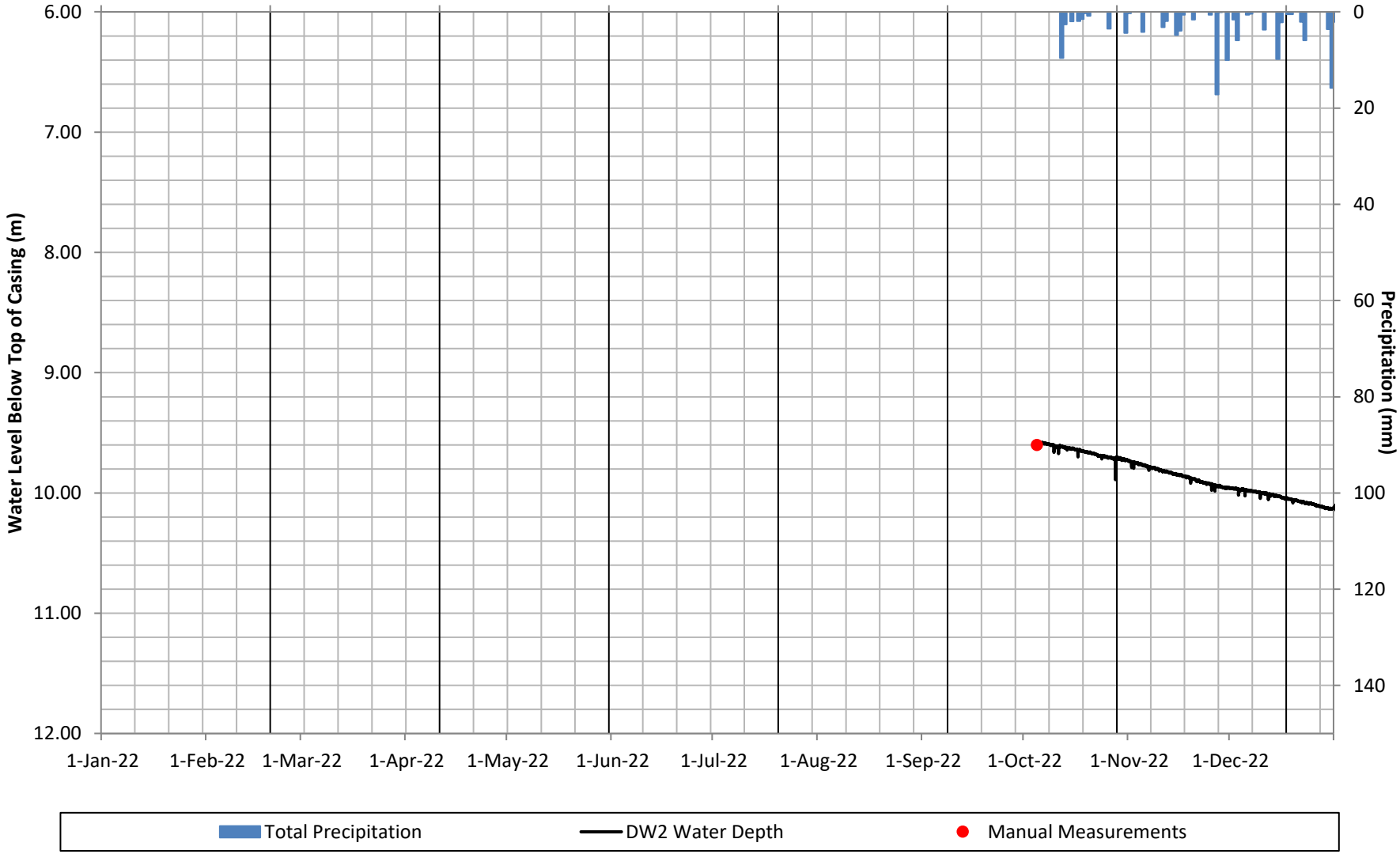
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Christine Burke
Lab Manager

TATHAM ENGINEERING

DW2
Water Levels for 2022



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115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
E info@tathameng.com
tathameng.com

File 123016

June 23, 2023

Rick Wallace
625007 SR 15
Melancthon, Ontario L0N 1S6
rwallace65@sympatico.ca

Re: Strada Aggregates, Shelburne Quarry
Domestic Well Monitoring Program

Dear Mr. Wallace:

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The water sample indicated compliance with the ODWQS for the parameters tested with the exception of hardness with a measured concentration of 333 mg/L compared to a ODWQS Operational Guideline of 80 to 100 mg/L.

The operational guideline for hardness is set between 80 and 100 mg/L (ODWQS, 2006). Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate. When heated, hard water tends to form scale deposits and can form excessive scum with regular soaps. However, there are certain detergents, which are largely unaffected by hardness. Conversely, water that is too soft may result in accelerated corrosion of water pipes. Hardness levels between 80 and 100 mg/L as calcium carbonate (CaCO3) is considered an acceptable balance between corrosion and incrustation. Water supplies with hardness greater then 200 mg/L are considered poor but tolerable. Hardness more than 500 mg/L in drinking water is unacceptable for most domestic purposes.

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Yours truly,
Tatham Engineering Limited

Alicia Kimberley, MSc., P.Geo.
Group Lead - Hydrogeology

Daniel Twigger, B.Sc.Eng., P.Eng.
Manager – Water Resources Engineering

JRM/AK/DT:ha

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