

To: Stephen May and Andreanne Simard From: Aaron Warkentin / Stephen Di Biase
CBM Aggregates - Lands Manager - Stantec Consulting Ltd.
Western Region
Project/File: 160961457 Date: February 13, 2026

Reference: Maximum Predicted Water Table Technical Memorandum, Proposed Anthony Aggregate Pit, 4454 Victoria Road South, Puslinch, Ontario

CBM Aggregates a division of St. Marys Cement Inc. (Canada) (CBM) retained Stantec Consulting Ltd. (Stantec) to provide environmental services in support of a proposed new aggregate pit near Aberfoyle, Ontario. The property for the proposed aggregate pit development, shown in purple on Figure 1 (Appendix A) is approximately 23.37 hectares (ha.) in size and located at 4454 Victoria Road South, in the Township of Puslinch, Wellington County. The area to be licensed as the Anthony Aggregate Pit (the Site) is approximately 18.03 ha and shown in red on Figure 1. The legal description of the Site is Lot 22, Concession 8, Geographic Township of Puslinch, Wellington County.

This technical memorandum has been prepared to:

- Assess applicable reporting requirements for an Aggregate Resources Act (Class A) license application.
- Assess the elevation of the maximum predicted water table at the Site based on available site monitoring data.

Figures and Tables referenced in this memorandum are provided in Attachments A and B, respectively. Curriculum Vitae for the report writers are provided in Attachment C.

1 Site Background

The Site is used currently for agricultural purposes and includes a private residential building near Victoria Road South, with existing wetlands and wooded areas situated on the Site (Figure 1).

The Site is situated southwest of Victoria Road South that borders the former CBM Tikal Pit (Tikal Pit) Site (28 hectares in size) that had been operated by CBM until 2011, and an existing aggregate pit owned and operated by Dufferin Aggregates (a division of CRH Canada Group Inc.), referred to as The Dufferin Pit Site. Additional gravel pit operations being operated under Class A Licenses are also located within Puslinch Township, located approximately 3 km southwest of the Site. Land use surrounding the remainder of the Site is mainly agricultural lands, with provincially significant wetland area situated to the west and south-southwest and private residential buildings to the east and west.

Reference: Maximum Predicted Water Table Technical Memorandum, Proposed Anthony Aggregate Pit, 4454 Victoria Road South, Puslinch, Ontario

Figure 1 shows the proposed above water table (AWT) and below water table (BWT) aggregate extraction plan for the Site. Two BWT pit ponds will result within the southwestern portion of the Site, with the small unevaluated wetland area in the central area of the southern portion of the Site to remain. The total area to be extracted and rehabilitated is 8.77 hectares, which will be organized to include two separate pit ponds (i.e., north pit pond 2.65 hectares and south pit pond 1.87 hectares). The total depth of the ponds will be approximately 17.5 m (304 masl). Excavated overburden will be stockpiled to allow for drainage of captured groundwater back to the resulting pit ponds.

2 Aggregate Resource Act

This technical memorandum has been prepared in accordance with the Provincial Standards in support of a Class A license application under the ARA, supporting an aggregate pit that intends to extract aggregate material from above and below the established groundwater table. A Class A license is required to remove more than 20,000 tonnes of aggregate annually from a private land pit under the ARA. An application must be filed with the Ministry of Natural Resources (MNR).

It is understood that the provincial standards of the ARA require that a summary statement accompanying an application for a Class A aggregate license involving an above and below water table pit site must be signed by the author and provide information on the following:

- Provide details of how the maximum predicted water table is identified in metres above sea level, relative to the proposed depth of excavation at the Site (approximately 17.5 m (304 masl)).
- Determine the number of drill holes and seasonal monitoring frequency by a qualified person based on site conditions.
- Determine the maximum predicted water table by monitoring the ground water table at the site for a minimum of one (1) year to account for seasonal variations and influences due to precipitation, unless alternative information already exists (e.g. previous hydrogeological study, existing well data) to support a determination of the maximum predicted water table by a qualified person.

This technical memorandum provides details of the maximum predicted water table based on the Site topography/drainage and groundwater monitoring results obtained over a 4-year monitoring period as detailed below.

Reference: Maximum Predicted Water Table Technical Memorandum, Proposed Anthony Aggregate Pit, 4454 Victoria Road South, Puslinch, Ontario

3 Maximum Predicted Water Table

3.1 Topography And Drainage

Figure 2 provides the ground surface elevation contours within the vicinity of the Site. Local topography is hummocky to gently rolling. The Site straddles the upland area between two branches (North and South) of Aberfoyle Creek. Total topographic relief across the Site is approximately 7 m, ranging from approximately 329 masl at Victoria Road to approximately 322 masl at the southern limit of the Site.

3.2 Monitoring Well Installations

Stantec supervised the drilling of geological boreholes at five locations on the Site (MW21-1 through MW21-5; Figure 1), between November 1 and 8, 2021. Table 1 (Attachment B) summarizes the monitor completion details. Boreholes at the Site were advanced using 6-inch (152.4 mm) outer diameter sonic drill rods. The boreholes were advanced to depths ranging from 20.1 m to 23.8 m below existing grade.

Each borehole was instrumented with a 2-inch (50 mm) diameter PVC monitoring well. The base of the monitoring wells reflect a 1.5 m long, 10-slot well screen; seated at the base of the boreholes. The annular space of the monitoring wells were backfilled with silica sand to a height of approximately 1 m above the well screen. Above the sand pack, the annular space was backfilled with a bentonite slurry, up to ground surface. The monitoring wells were secured with a 4" x 4" lockable protective cover. Details of monitoring well construction are summarized in Table 1. The monitoring wells have been registered with the MECP in accordance with Ontario Regulation (O.Reg.) 903. It is noted that one additional shallow monitoring well (referred to as MW06-ORG; Figure 1) was observed to be pre-existing at the Site; located in the southeastern portion of the Site and completed to depth of 4.31 m BGS. Each monitoring well was instrumented with an automated water level recorder (datalogger) to develop a continuous record of water level monitoring. A monitoring program was established with quarterly monitoring for groundwater levels being conducted.

A total of four (4) shallow drive point piezometers were installed within wetland areas located across the Site and referred to as DP21-01 to DP21-04 (see Figure 1). Each piezometer was driven to a depth of approximately 1.5 m BGS and instrumented with a datalogger (GW) to monitor groundwater levels at the drive point. A perforated 25 mm diameter PVC pipe was installed next to each piezometer and equipped with a datalogger (SW) to monitor the elevation of ponded water within the wetland areas. Table 1 provides a summary of the drive point construction details.

Ground surface elevations and top of pipe reference point elevations at the five (5) monitoring wells and four (4) shallow drive point piezometers were surveyed by Stantec using a Trimble R10 GPS rover. Table 1 provides the GPS coordinate and elevation survey results.

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3.3 Groundwater Monitoring Results

Groundwater elevation monitoring was carried out at the stations described above from November 2021 through November 2024. Automated water level recorders (dataloggers) were installed in each of the field study instruments, as described above, to provide a continuous record of water level measurements. Hydrographs for each monitoring location, inclusive of both manual and datalogger measurements and compared to precipitation and ambient temperature data from the nearby Waterloo Airport Climate Station No. 6144239 (Environment Canada, 2026), are shown on Figure 3.

All hydrographs show consistent trends, with approximately 1 m of seasonal variation annually. These seasonal fluctuations reflect a cyclical pattern that is common within shallow groundwater systems of southern Ontario. High water table conditions generally occur in the winter and spring (i.e., late December to mid-May) due to lower evapotranspiration losses and a melting snowpack, which provide a greater volume of water for recharge. Low water table conditions occur in the late summer to early fall as more water is drawn from the subsurface over this period to meet evapotranspiration demands. The hydrographs on Figure 3 also show a direct response to precipitation events. Hydrograph spikes are occasionally observed during the summer months, in response to major storm events (e.g., precipitation 30 mm or greater). The spikes themselves may not be representative of broad water table rise, but a reflection of increased infiltration due to localized ponding at surface. Stantec has therefore relied on manual readings to confirm the highest water table observed on record, which is July 25, 2024.

Groundwater elevation contours representing the highest water table observations (July 25, 2024) are shown on Figure 4. The maximum observed water table elevation (i.e., over the 4-year monitoring period) within the Site ranges from a high of about 322.7 masl as measured at MW21-03 to 320.3 masl as measured at MW21-02.

4 Summary And Closure

CBM is applying for a Class A license under the Aggregate Resources Act, for extraction of aggregate material from above and below the established groundwater table at the proposed Anthony Aggregate Pit.

Based on the above noted understanding, it is estimated that the maximum predicted groundwater table within the limit of extraction at the Site is about 322.7 m masl in the northeastern corner to 320.3 masl in the southwestern corner. These historical high results obtained on July 25, 2024 have been confirmed based on 4 years (from November 2021 through November 2025) of on-site monitoring data collection, as detailed above.

Should you have any questions, or require further information, please do not hesitate to contact the undersigned.

Reference: Maximum Predicted Water Table Technical Memorandum, Proposed Anthony Aggregate Pit, 4454 Victoria Road South, Puslinch, Ontario

5 Limitations

This document entitled, Maximum Predicted Water Table Technical Memorandum, Proposed Anthony Aggregate Pit, 4454 Victoria Road South, Puslinch, Ontario was prepared by Stantec Consulting Ltd. ("Stantec") for the account of CBM (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Sincerely,

Stantec Consulting Ltd.

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Senior Hydrogeologist
Phone: 226-339-3175
Aaron.Warkentin@stantec.com

Stephen Di Biase P.Geo.
Senior Hydrogeologist
Phone: 647-282-0563
Stephen.dibiase@stantec.com

Attachment:

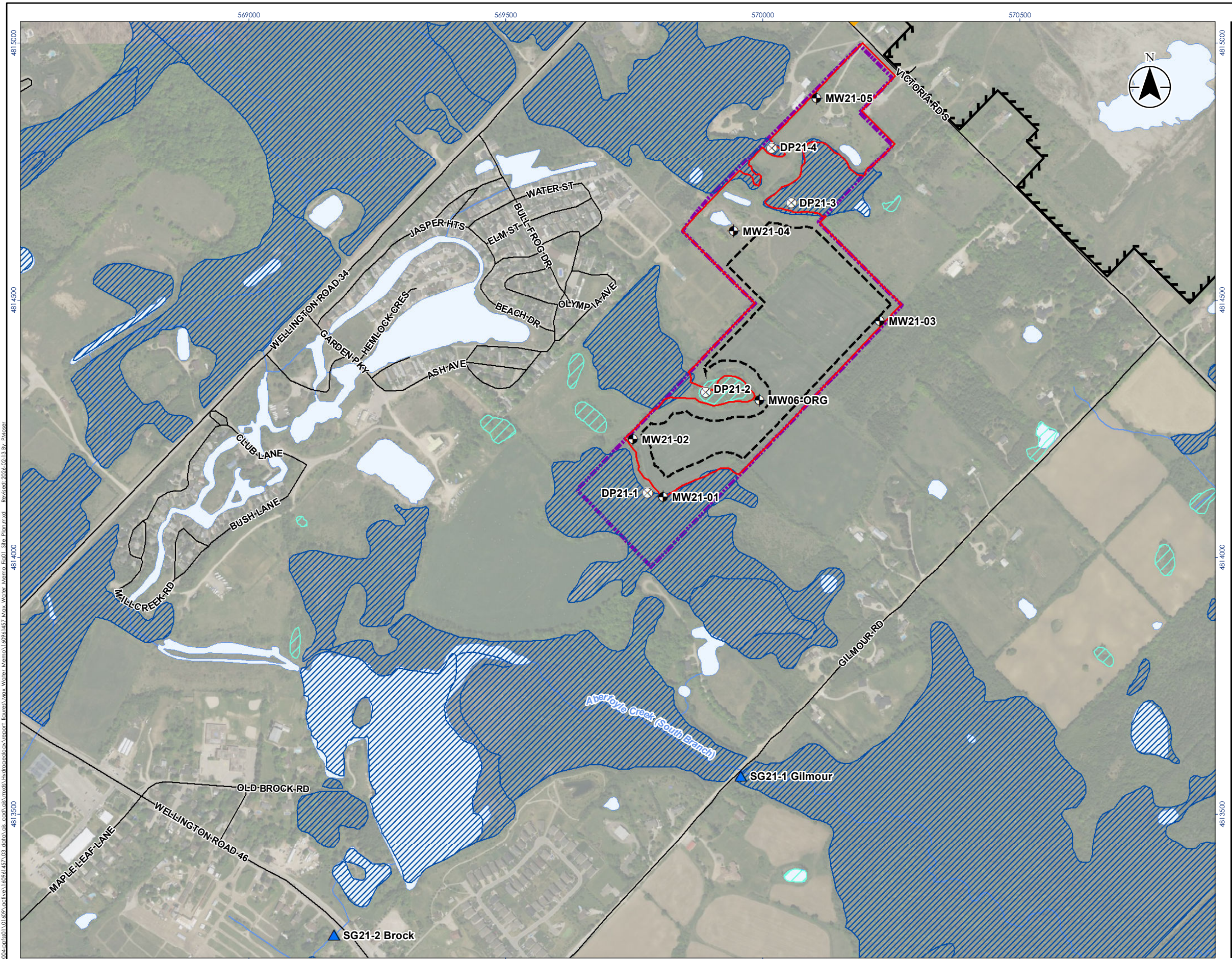
Attachment A Figures
Attachment B Tables
Attachment C Curriculum Vitae

c. Neal DeRuyter, MHBC

February 13, 2025
Stephen May, CBM Aggregates - Lands Manager -Western Region

Reference: Maximum Predicted Water Table Technical Memorandum, Proposed Anthony Aggregate Pit, 4454 Victoria Road South, Puslinch, Ontario

Attachment A Figures

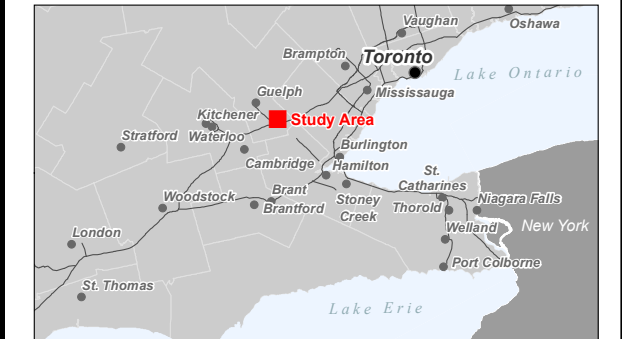


Legend

- Site
- 4454 Victoria Road South
- Monitoring Well
- Drive-point Piezometer
- Surface Water Monitoring Location
- Road
- Watercourse
- Waterbody
- Wetland - Evaluated (Provincial)
- Wetland - Not evaluated per Ontario Wetland Evaluation System
- Dufferin Aggregate Pit
- Area of Extraction Footprint

0 100 200 metres
1:7,500 (At original document size of 11x17)

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.
 3. Orthoimagery ©



Project Location: Puslinch, ON
160961457 REVA
Prepared by PRM on 2026-02-13
Technical Review by SMD on 2026-02-13

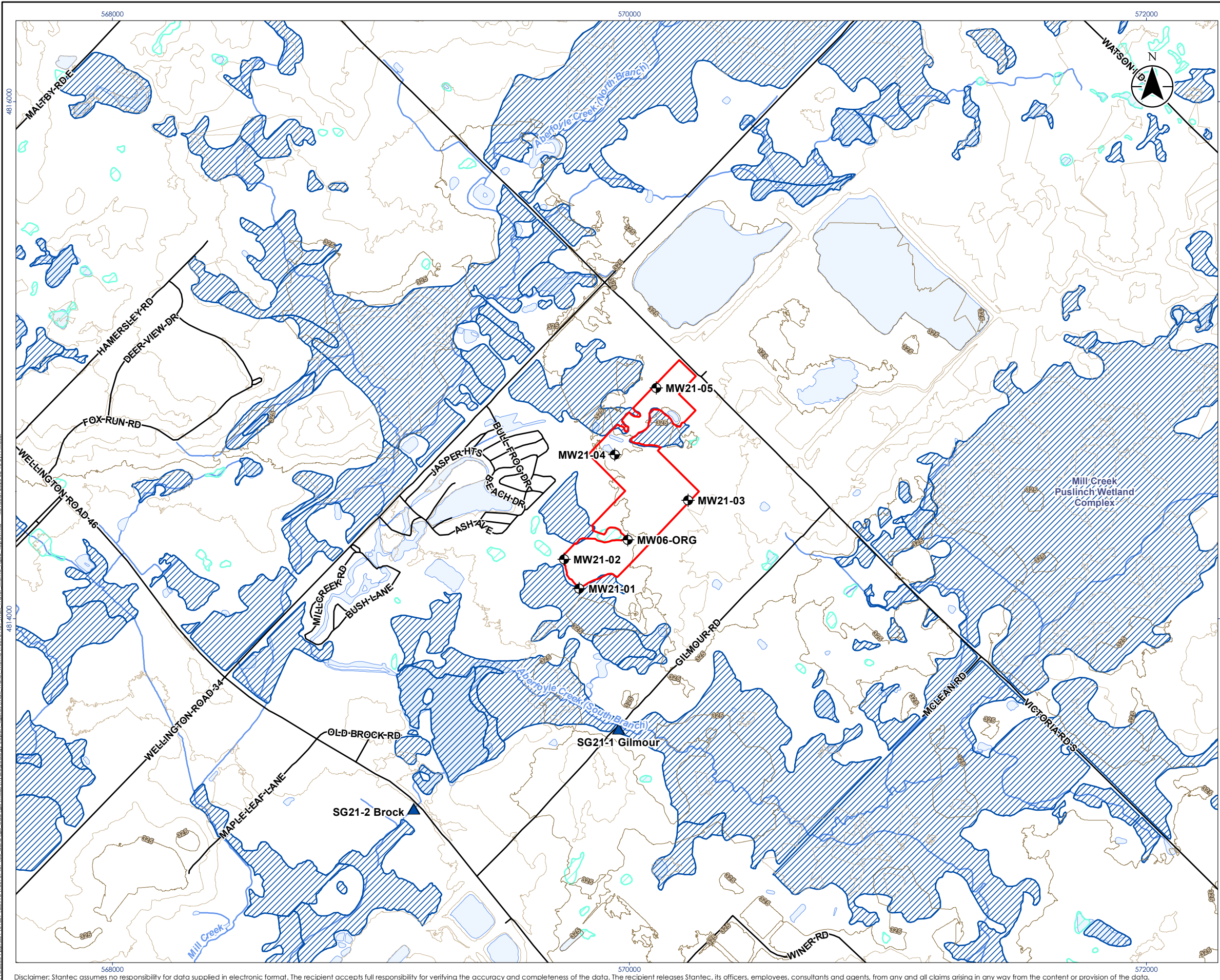
Client/Project: MAXIMUM WATER TABLE TECHNICAL MEMORANDUM, PROPOSED ANTHONY AGGREGATE PIT, 4454 VICTORIA ROAD SOUTH, PUSLINCH, ONTARIO

Figure No.

1

Title

Site Plan



- Legend
- Site
 - Monitoring Well
 - Staff Gauge
 - Road
 - Topographic Contour (m AMSL) - 25m Interval
 - Topographic Contour (m AMSL) - 5m Interval
 - Watercourse
 - Waterbody
 - Wetland - Evaluated (Provincial)
 - Wetland - Not evaluated per Ontario Wetland Evaluation System

0 250 500 metres
1:15,000 (At original document size of 11x17)

- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.
 3. Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 228.



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Puslinch, ON Prepared by PRM on 2026-02-13
Technical Review by SMD on 2026-02-13

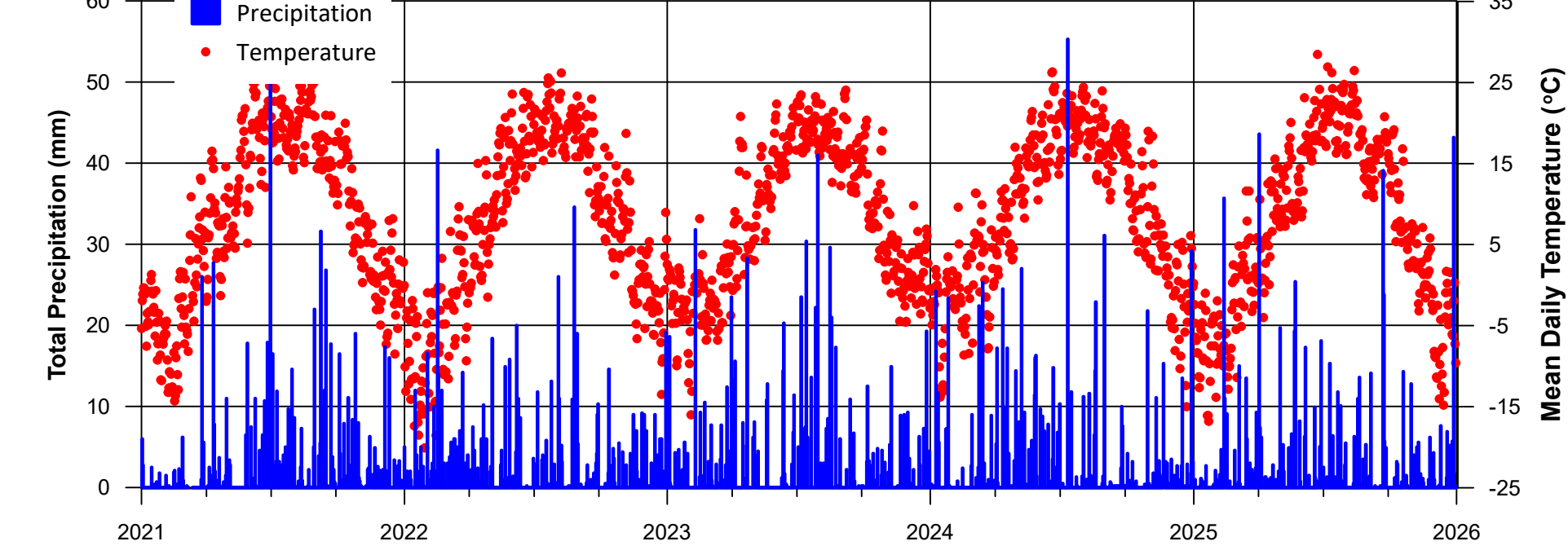
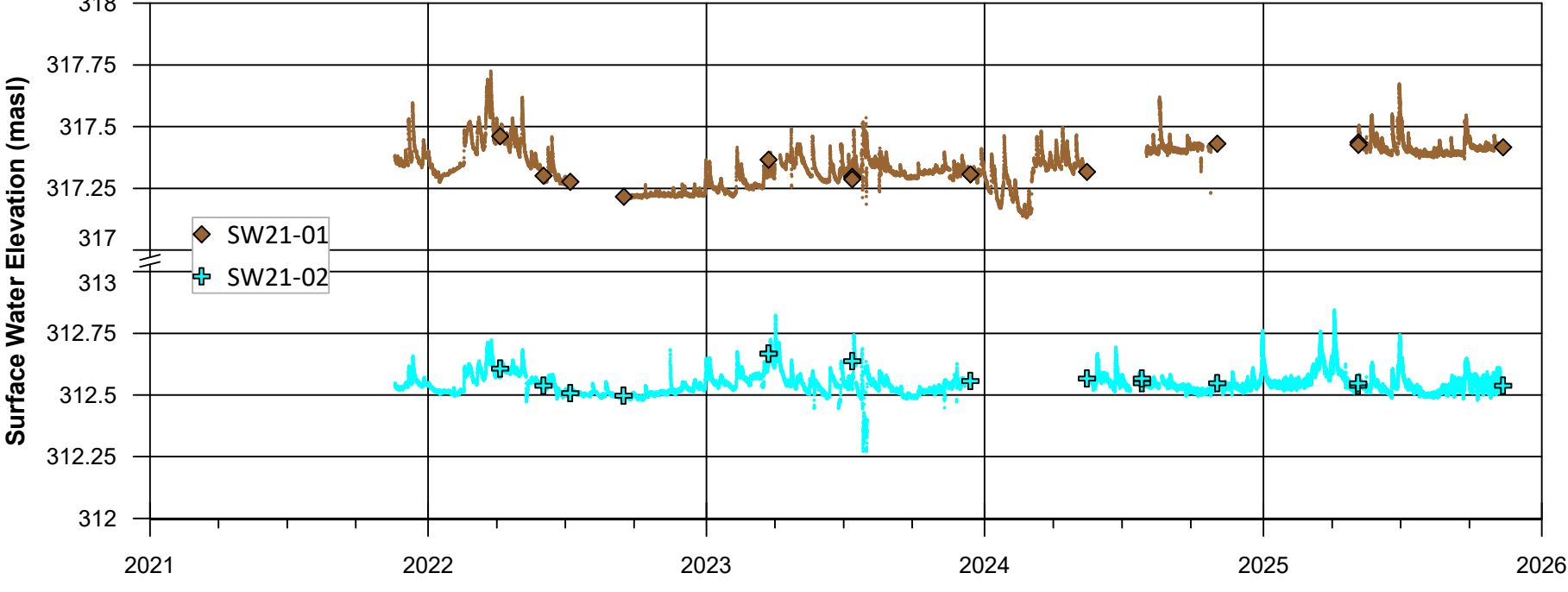
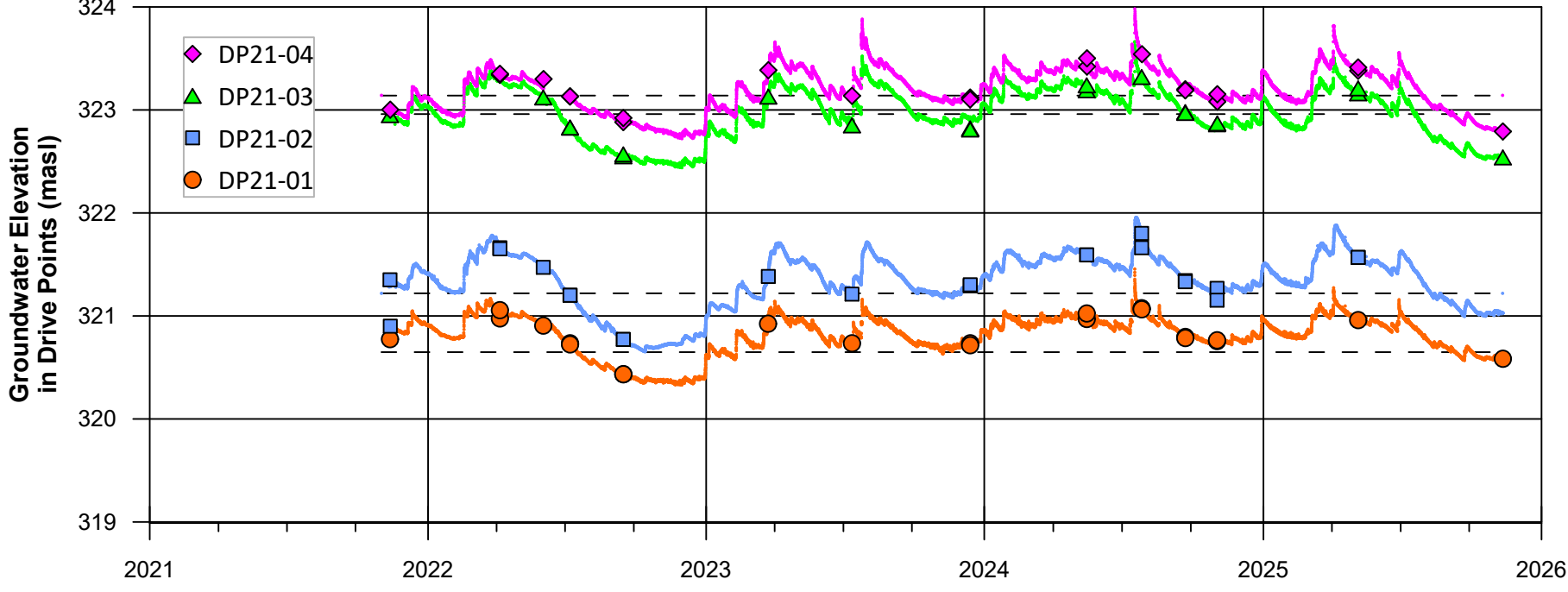
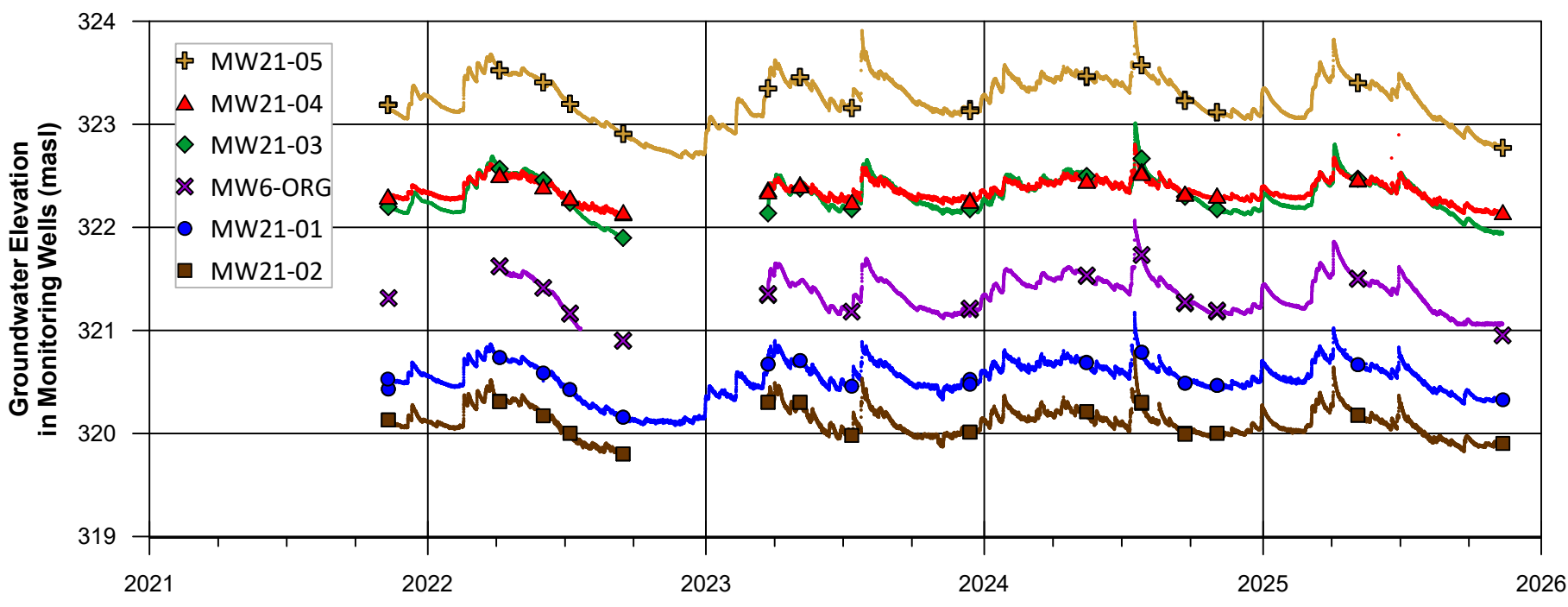
Client/Project
MAXIMUM WATER TABLE TECHNICAL MEMORANDUM,
PROPOSED ANTHONY AGGREGATE PIT,
4454 VICTORIA ROAD SOUTH, PUSLINCH, ONTARIO

Figure No.

2

Title

Topography and Drainage

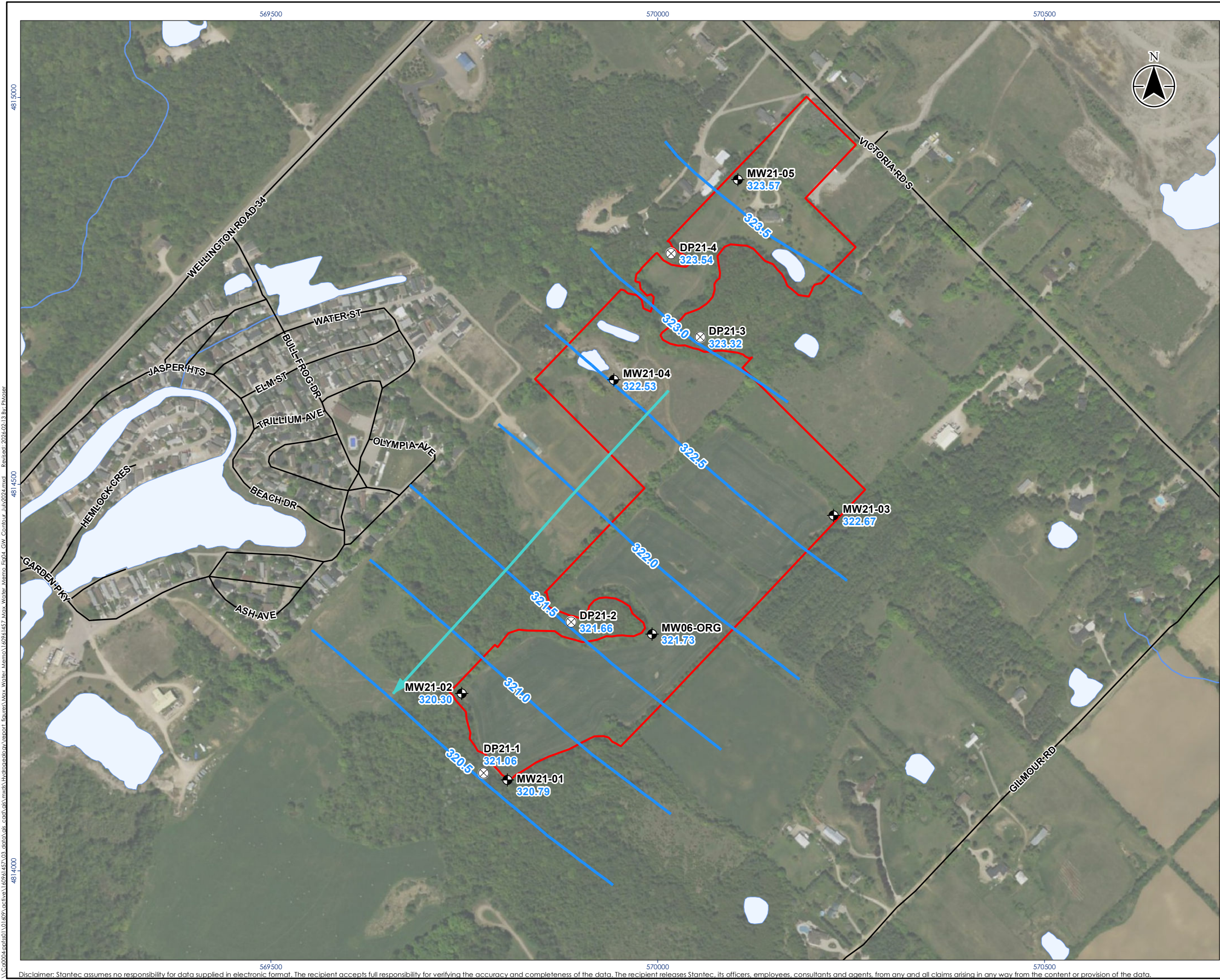


Notes:

- - - - - indicates grade elevation at Drive Point locations (below which wetland areas are dry)

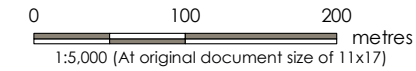
Precipitation / Temperature data obtained from the Environment Canada Station No. 6144239, Region of Waterloo Airport Climate Station

Water Level Monitoring Data		
DRAWN: DG	APPROVED: SMD	DATE: January 2026
PROJECT NUMBER: 160961457		FIGURE: 3

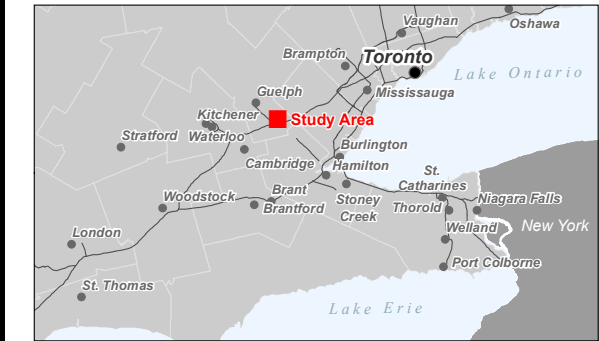


Legend

- Site
- Observed Groundwater Elevation (masl), July 25, 2024
- Monitoring Well
- Drive-point Piezometer
- Road
- Interpreted Groundwater Flow Direction
- Interpreted Groundwater Elevation Contour (masl)
- Watercourse
- Waterbody



- Notes**
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 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.
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Client/Project
MAXIMUM WATER TABLE TECHNICAL MEMORANDUM,
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4454 VICTORIA ROAD SOUTH, PUSLINCH, ONTARIO

Figure No.
4
Title
**High Groundwater Table Elevations –
July 25, 2024**

February 13, 2025
Stephen May, CBM Aggregates - Lands Manager -Western Region

Reference: Maximum Predicted Water Table Technical Memorandum, Proposed Anthony Aggregate Pit, 4454 Victoria Road South, Puslinch, Ontario

Attachment B Tables

Table 1
Monitor Completion Details
Maximum Water Table Technical Memorandum
Proposed Anthony Aggregate Pit

Monitor ID	Location	Installation Date	Coordinates		Elevation		Stick-up (m AGS)	Borehole Depth (m BGS)	Screen Diameter (mm)	Screened Interval				Screened Unit
			Easting	Northing	Ground Surface m AMSL	Top of Casing m AMSL				Bottom of Screen/Open Hole (m BGS) (m AMSL)		Top of Screen/Open Hole (m BGS) (m AMSL)		
Monitoring Wells														
MW21-01	Aberfoyle, ON	2021	569805.7	4814118	322.27	323.05	0.78	23.77	50	20.42	301.85	18.90	303.37	Sand/Gravel
MW21-02	Aberfoyle, ON	2021	569746.8	4814230	322.48	323.27	0.79	20.88	50	18.59	303.89	15.54	306.94	Sand/Gravel
MW21-03	Aberfoyle, ON	2021	570227.5	4814460	326.6	327.5	0.90	23.77	50	16.76	309.84	13.72	312.88	Sand/Gravel
MW21-04	Aberfoyle, ON	2021	569943.3	4814635	323.85	324.63	0.78	21.03	50	20.73	303.12	17.68	306.17	Sand/Gravel
MW21-05	Aberfoyle, ON	2021	570103.8	4814894	326.53	327.37	0.84	20.12	50	8.23	318.30	5.18	321.35	Sand/Gravel
MW06-ORG	Aberfoyle, ON	unknown	569992.9	4814306	322.74	323.81	1.07	4.31	50	4.31	318.43	unknown	unknown	Sand/Gravel
Drive-Point Piezometers														
DP21-1	Aberfoyle, ON	2021	569774.9	4814127	320.65	321.73	1.08	1.47	25	1.47	319.18	1.05	319.60	Organics/Sand/Gravel
DP21-2	Aberfoyle, ON	2021	569888.2	4814322	321.22	322.35	1.13	1.42	25	1.42	319.80	1.00	320.22	Organics/Sand/Gravel
DP21-3	Aberfoyle, ON	2021	570055.1	4814690	322.96	323.97	1.01	1.54	25	1.54	321.42	1.12	321.84	Organics/Sand/Gravel
DP21-4	Aberfoyle, ON	2021	570017.5	4814798	323.14	324.2	1.06	1.49	25	1.49	321.65	1.07	322.07	Organics/Sand/Gravel
Staff Gauges														
SG21-1	Aberfoyle, ON	2021	569957.7	4813575	317.17	318.7	1.53	-	-	-	-	-	-	-
SG21-2	Aberfoyle, ON	2021	569165.7	4813266	312.31	313.53	1.22	-	-	-	-	-	-	-

Notes:

- not applicable
- m AGS: metres above ground surface
- m BGS: metres below ground surface
- m AMSL: metres above mean sea level

February 13, 2025
Stephen May, CBM Aggregates - Lands Manager -Western Region

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Attachment C Curriculum Vitae

Senior Hydrogeologist

26 years of experience · Markham, Ontario

Stephen Di Biase is a Senior Hydrogeologist with the Environmental Services division. His 25 years of experience includes hydrogeological investigations in support of large-scale groundwater supply and dewatering projects. He brings extensive knowledge of groundwater exploration, drainage basin surveys, water balance calculations, aquifer mapping, GUDI assessments and development constraint mapping for projects located near sensitive wetlands, headwaters and kettle lake complexes in the vicinity of glacial moraines and the Niagara Escarpment.

EDUCATION

B.Sc. Earth Sciences, University of Waterloo,
Waterloo, Ontario, 1999

M.Sc. Hydrogeology, University of Toronto, Toronto,
Ontario, 2005

CERTIFICATIONS & TRAINING

Construction Dewatering and Groundwater Control
(National Groundwater Assoc.), Waterloo, Ontario,
2005

Project Management (Golder Associates Internal
Training Course), Markham, Ontario, 2005

Contracts and Liability (Golder Associates Internal
Training Course), Markham, Ontario, 2004

Project Management, Queen's University School of
Business, Ontario, 2001

Field Methods in Hydrogeology, University of
Waterloo, Ontario, 2001

Ontario Ministry of Transportation Approved for
Medium Complexity Hydrogeological Projects,
Markham, Ontario, Canada, 2023

MEMBERSHIPS

Member, National Ground Water Association

Member, Ontario Ground Water Association

Canadian National Chapter, International Association
of Hydrogeologists

Hydrogeologist, Professional Geoscientists Ontario

PROJECT EXPERIENCE

GROUNDWATER SUPPLY / WELLS

New Well Exploration Program | Township of Centre
Wellington | Elora, ON, Canada | 2021 - | Project
Manager

Construction of pilot test wells in four target areas
surrounding the communities of Elora and Fergus.
Field studies include bedrock coring, geophysical
logging, packer testing, 7-day pumping tests,
groundwater quality analysis and evaluation GUDI
conditions.

Logan Well Feasibility Assessment | City of Guelph |
Guelph, ON, Canada | 2021 - | Project Manager

Reconstruction and performance testing of a 306 mm
diameter municipal test well. This project included
management of drilling contractor, supporting
permitting applications and supervision of a 3-day
performance test. A feasibility study is being
undertaken to determine if the Logan Well will be a
viable groundwater supply source for the City of
Guelph. Field study and reporting includes an
assessment of GUDI conditions and effects of
groundwater pumping on local environmental
receptors.

Craighurst Groundwater Supply Investigation |
Craighurst Partnership Limited | Craighurst, ON,
Canada | 2020 - 2022 | Project Manager

Hydrogeology task manager responsible for
developing a new groundwater supply source for the
community of Craighurst. This project included the
construction and performance testing of a new 306
mm diameter test production well at 36 L/s. Stantec's
responsibilities for this study included contract
tendering and administration, development of a
groundwater monitoring network, securing provincial
permits to take water, supervision of a 30-day
performance test and a GUDI assessment of the new
well.

Groundwater Supply Class Environmental
Assessment | Town of Orangeville | Orangeville,
Ontario, Canada | 2018 - 2022 | Project Manager

Project Manager for the Town of Orangeville
Groundwater Supply Class Environmental
Assessment. This project included the construction
and performance testing of a new test production well
along the Town's northeastern boundary. The field
investigation included: installation of 1 cored bedrock
borehole, downhole geophysical logging of 6 test
wells, reconstruction of 3 open bedrock boreholes
with multi-level monitoring well nests and a 30-day
groundwater pumping test at 3,629 m³/day. The
effects of groundwater pumping were monitored at a
total of 34 locations, including 16 monitoring well
nests, 3 surface water stations, 5 wetland
piezometers and 10 private wells.

Guelph Water Supply Master Plan* | City of Guelph | Guelph, Ontario | 2013 - 2014 | Task Manager

Hydrogeology Task Manager responsible for the assessment of existing production well capacities. This project included a modelling analysis to assess the performance and effects of municipal well operation during conditions of drought and unforeseen well shut-downs.

Waterloo North Water Supply Class Environmental Assessment* | Region of Waterloo | Waterloo, Ontario | 2008 - 2010 | Task Manager

Hydrogeology task manager for the Waterloo North Water Supply Class Environmental Assessment. This project included the construction of a new test production well and performance testing of three test production wells within the Waterloo North Study Area. Golder's role in the Waterloo North Class EA includes management of the drilling and performance testing contracts, supporting the RMOW applications for access agreements, municipal sewer use permitting, MOE PTTWs, supervision of a 42-day performance test and preparation of an Environmental Study report supporting the test production wells through the EA process.

Southwest Quadrant Water Supply Class Environmental Assessment* | City of Guelph | Guelph, Ontario | 2008 - 2012 | Task Manager

Hydrogeology task manager for the City of Guelph Southwest Quadrant Water Supply Class Environmental Assessment. This project included the construction and performance testing of two new (15 inch diameter) test production wells in the City of Guelph. Performance testing of the new wells required a combined pumping rate of 134 L/s, a 3 km diversion of pumped groundwater, municipal sewer use permits, an Ontario Ministry of Environment Permit To Take Water, access agreements, an extensive groundwater and surface water monitoring program (including approximately 70 groundwater monitoring wells, 10 surface water monitoring stations and two private wells). A challenge during this complicated testing program was ensuring that performance testing of the new production wells did not adversely affect the operation of the existing municipal water supply system or impact surface water flow conditions in the receiving water courses.

Preliminary Design for Stage 2 Expansion of Aquifer Storage and Recovery (ASR) System * | Region of Waterloo | Kitchener, Ontario | 2008 - 2014 | Task Manager

Hydrogeology task manager supporting the preliminary design of the Stage 2 Expansion for the Regional of Waterloo Aquifer Storage and Recovery System. This project included the construction and performance assessment of six test wells at the Mannheim Water Treatment Plant. Groundwater modelling analysis was undertaken to develop a preliminary design plan that would optimize the performance of the expanded system.

Prospect Park Groundwater Supply Study* | Region of Halton | Acton, Ontario | 2011 - 2012 | Project Manager

Project Manager for the Region of Halton Prospect Park Groundwater Supply Study. This project included the analysis of data collected from the Prospect Park Well Field over a 5 year period to assess the potential to develop additional groundwater supply.

Baden-New Hamburg Water Supply Master Plan* | Regional Municipality of Waterloo | New Hamburg and Baden, Ontario | 2008 - 2010 | Task Manager

Hydrogeology Task Manager responsible for the assessment of existing production capacity of three well fields in proximity to the communities of Baden and New Hamburg.

Groundwater Supply Class Environmental Assessment* | Town of Shelburne | Shelburne, Ontario | 2009 - 2012 | Task Manager

Hydrogeology Task Manager responsible for the installation and performance testing of a new groundwater supply well in proximity to the Town of Shelburne. This project included negotiations with the Ontario Ministry of Environment regarding inter-basin transfer within the Great Lakes catchment area and a 72-hour groundwater pumping test. Golder completed an Environmental Study Report to satisfy a Federal Environmental Assessment process as well as a Provincial Class Environmental Assessment.

Aquafarms 93* | Ice River Springs | Feversham, Ontario | 2007 - 2009 | Project Manager

Carried out the field study and reporting requirements of a hydrogeological impact assessment for a commercial water supply operation. This project included aquifer performance testing, geophysical testing of water supply wells, monitoring of local domestic wells, and co-ordination of groundwater, surface water and ecological field studies.

Dagmar Ski Resort* | Dagmar Ski Resort | Glen Major, Ontario | 2003 - 2004 | Hydrogeologist

Evaluated the potential yield and hydrogeologic impact of two high-capacity water supply wells completed in the Oak Ridges Moraine Aquifer to support an application for a PTTW for the resort snow-making system.

DEWATERING AND PUMPING SYSTEMS

Toronto-York Spadina Subway Extension (TYSSE)* | Toronto Transit Commission | Toronto, Ontario, Canada | Hydrogeologist

Hydrogeologist for the Principal Engineering Consultant of the Toronto-York Spadina Subway Extension. This project included hydrogeology investigation and dewatering assessment at 6 proposed subway stations and 25 associated subsurface structures. Responsibilities included preparation of tender contract documents and specifications.

Eglinton Crosstown Light Rail Transit* | Toronto,
Ontario | Hydrogeologist

Hydrogeologist responsible for preparation of dewatering assessment supporting the design of the Yonge and Allen Road Stations of the proposed Eglinton Crosstown Light Rail Transit.

Bayview Avenue Widening* | The Miller Group |
Richmond Hill, Ontario | 2016 - 2018 | Project
Manager

Installed forty (40) 152 mm diameter pressure relief wells to depressurize a confined aquifer and facilitate the construction of a regional sewer main.

Steeles Avenue Widening* | Fermar Paving Ltd. |
Hornby, Ontario, Canada | 2016 - 2017 | Project
Manager

Installed eight (8) 150 mm diameter pressure relief wells to depressurize a confined aquifer and facilitate the construction of bridge footings across water courses.

Nuclear Waste Management Organization* | Fox
Construction Services | Darlington Nuclear Site ,
Ontario | Project Manager

Designed and installed dewatering system in support of upgrades at the Darlington Nuclear Plant

AGGREGATE SERVICES

Nelson Quarry Extension* | Nelson Aggregate Co |
Burlington, ON, Canada | 2006 - 2011 | Project
Hydrogeologist

Hydrogeologist responsible for the development of a field investigation to establish the potential impact of a proposed Quarry extension plan on locally significant environmental features. This field study required liaison with MOE officials, coordination of multi-disciplinary environmental investigations, procurement of testing permits and aquifer performance testing.

Lafarge Canada Inc.* | Lafarge Canada Inc. | Dundas,
Ontario | 2008 - 2010 | Hydrogeologist

Hydrogeologist responsible for the development of a field investigation to establish the potential impact of a proposed Quarry extension plan on locally significant environmental features. This field study required liaison with MOE officials, coordination of multi-disciplinary environmental investigations, procurement of testing permits and aquifer performance testing.

Senior Hydrogeologist, Associate

23 years of experience · Waterloo, Ontario

Aaron is a results-oriented professional and project manager with over 20 years of consulting experience focusing on hydrogeological investigations, landfill compliance and mine/aggregate licensing monitoring and reporting, environmental impact assessment studies, hydrogeological permitting and compliance, and water resources engineering. Aaron possesses a sound understanding and is proficient in the application of hydrogeological principles and field techniques.

Aaron possesses strong project management skills and has acted as project manager and/or project hydrogeologist for numerous projects involving water supply evaluations, groundwater management studies, large-scale multi-year monitoring programs, hydrogeological permitting and compliance, groundwater monitoring and hydrogeological impact investigations for construction development projects, landfill, mining and aggregate monitoring, licensing and compliance, throughout Ontario. Aaron is skilled in the analysis and interpretation of aquifer performance testing data, characterization and logging of geologic formations, evaluating groundwater-surface water interactions, developing groundwater and contaminant models, and has a working knowledge of groundwater protection legislation in Ontario.

Aaron has a strong working knowledge of the Earthsoft EQuIS data management system and portal development applications through project managing the development of these types of custom knowledge management portal solutions. Aaron has extensive experience working on projects in support of proposed construction development and dewatering, including design and implementation of baseline and long-term groundwater monitoring program

EDUCATION

B.A.Sc., University of Waterloo Environmental (Civil) Engineering, Waterloo, Ontario, Canada, 2003

REGISTRATIONS

Professional Engineer #100144791, Professional Engineers Ontario, June 14, 2010

PROJECT EXPERIENCE

HYDROGEOLOGY

Cambridge East and Waterloo North Groundwater and Surface Water Monitoring Programs | Regional Municipality of Waterloo | Cambridge, Ontario | 2021-2023 | Project Hydrogeologist

Per the Region's Water Supply Master Plan and Class EA recommendations additional groundwater and surface water monitors were installed to be included in monitoring programs for the subject areas. Aaron acted as project hydrogeologist and assisted coordination of monitoring well construction and piezometer installations for the Region's Cambridge East and Waterloo North Groundwater and Surface Water Monitoring Program. Coordinated well geophysics and rehabilitation activities. An adaptive management plan is to be developed to document response related to future increased pumping.

Hydrogeologic Assessment, South Strasburg Trunk Sanitary Sewer | City of Kitchener | Kitchener, Ontario | 2017-2021 | Project Hydrogeologist

As part of the detailed design and construction of the South and Middle Strasburg Trunk Sanitary Sewer, Aaron acted as Project Hydrogeologist to prepare the required Hydrogeologic Assessments in support of PTTW and EASR applications for construction dewatering. The assessments detailed expected dewatering locations and volumes, discharge locations, and monitoring as required. Aaron also assisted in preparation of a wetland hydrogeological assessment as required by local conservation authority.

Eagles Nest Golf Course Irrigation Well Supply Assessment | Vaughan, Ontario | 2016-2017 | Project Manager / Project Hydrogeologist

Coordinated and completed new irrigation well installation at golf course, located within secondary buffer area of Keele Valley Landfill. Completion of a hydrogeologic investigation in support of a short term testing under a permit to take water for the irrigation well. Testing included a 72-hour pumping test and water level monitoring within adjacent monitoring wells. Coordinated and attended meetings with the Agencies (City of Toronto and MECP). Completed Permit to Take Water application for the short term pumping test.

Malahide Well Supply Assessment | IGPC | Aylmer, Ontario | 2017 | Project Hydrogeologist

Aaron acted as project hydrogeologist and assisted in a due-diligence assessment of the inactive Malahide Township well as a potential future water supply source for IGPC, Aylmer, ON. Coordinated well rehabilitation activities, and completion of a hydrogeologic investigation in support of a short term testing under a permit to take water for the Malahide Township supply well. Testing included a 24-hour pumping test and water level monitoring within adjacent monitoring wells. Aaron completed MECP permitting requirements for the project.

Greensville Backup Water Supply Project | City of Hamilton | Hamilton, Ontario | 2014 | Project Hydrogeologist

Aaron acted as project hydrogeologist in coordination and completion of production well drilling in bedrock near to the Niagara escarpment, 48-hour pumping tests, groundwater and surface water monitoring, coordination with City of Hamilton and Agencies, and hydrogeological assessment report preparation for permitting.

Fourth Line Well Field Hydrogeological Impact Assessment | Regional Municipality of Halton | Acton, Ontario | 2013-2014 | Project Hydrogeologist

The Region of Halton undertook a study to investigate the potential of expanding the taking from the Fourth Line well field by including a test well. The scope of work was to assess the impacts of increasing the daily taking from the well field above the then existing permitted rate. The environmental impact assessment included assessment of results of a comprehensive well pumping test to determine impacts to groundwater users, and an ecological review of nearby terrestrial and aquatic habitat to determine impacts to natural features. Aaron acted as project hydrogeologist and assisted in completion of the environmental impact assessment for the Region of Halton. Aaron completed background data review, analysis of pumping test data, and groundwater and surface water impact assessment report preparation.

Joe Sams Leisure Park Irrigation Supply Project | City of Hamilton | Waterdown, Ontario | 2011-2013 | Project Hydrogeologist

A water supply evaluation was completed for Joe Sam's Leisure Park within the City of Hamilton and confirmed the need for additional supply to meet sports field irrigation demands. Test drilling was completed in 2011 and an additional groundwater supply well was installed within the bedrock aquifer. Aaron acted as project hydrogeologist and assisted in a hydrogeologic investigation completed in support of a long-term permit to take water including a pumping test and water groundwater and surface water level monitoring.

Water Supply Assessment | City of Hamilton | Waterdown, Ontario | 2011-2013 | Project Hydrogeologist

In 2011, a water supply evaluation was completed for Joe Sam's Leisure Park within the City of Hamilton and confirmed the need for additional supply to meet sports field irrigation demands. Test drilling was completed in 2011 and an additional groundwater supply well was installed within the bedrock aquifer. Aaron acted as project hydrogeologist and assisted in a hydrogeologic investigation completed in support of a long-term permit to take water including a pumping test and water groundwater and surface water level monitoring.

PTTW Applications and Monitoring for Development Sites | Various, Ontario | 2012-present | Project Hydrogeologist / Permitting Coordinator

Aaron acted as Project Hydrogeologist and/or Permitting Coordinator to prepare groundwater permit to take water or environmental activity and sector registry permitting for water takings required as part of construction dewatering for various development projects in Ontario. Projects have included coordination of drilling and well monitoring, analysis of data to determine required permitting approach. The site conditions have ranged from industrial, commercial areas to residential areas, agricultural fields or shallow bedrock. As part of each application, an assessment of hydrogeological conditions was completed to evaluate construction dewatering requirements and evaluate potential interference concerns and mitigation measures. Water quality was reviewed, and discharge locations and a discharge plan determined. Consultation with clients and Agencies as required.

Pond Decommissioning | London, Ontario | Hydrogeologist

Assisted in preparation of MOECC Permit to Take Water reporting and application for dewatering during pond decommissioning in London, Ontario.

Fourth Line Well Field Hydrogeological Impact Assessment | Regional Municipality of Halton | Acton, Ontario | 2013-2014 | Project Hydrogeologist

The Region of Halton undertook a study to investigate the potential of expanding the taking from the Fourth Line well field by including a test well. The scope of work was to assess the impacts of increasing the daily taking from the well field above the then existing permitted rate. The environmental impact assessment included assessment of results of a comprehensive well pumping test to determine impacts to groundwater users, and an ecological review of nearby terrestrial and aquatic habitat to determine impacts to natural features. Aaron acted as project hydrogeologist and assisted in completion of the environmental impact assessment for the Region of Halton. Aaron completed background data review, analysis of pumping test data, and groundwater and surface water impact assessment report preparation.

Hespeler Waste Water Treatment Upgrades | Cambridge, Ontario | Project Hydrogeologist

Coordination of monitoring well testing for Region of Waterloo WWTP construction upgrades project, completed MOECC Permit to Take Water reporting and application.

MINING

Bissett Creek Mine Project | Northern Graphite Corporation | Ottawa, Ontario, Canada | 2018-2021 | Project Hydrogeologist

As part of the development of an open pit mine to access the graphite deposit, Aaron acted as Project Hydrogeologist to prepare the required Hydrogeologic Assessments in support of the PTTW application to facilitate the dewatering of the open pit. The assessments characterized groundwater flow and quality in relation to the open pit, detailed expected dewatering locations and volumes, discharge locations, assessment of potential effects of dewatering on the environment, and monitoring as required.

Greenstone Gold Mine Project | Equinox Gold Greenstone Mine | Geraldton, Ontario, Canada | 2024-Present | Project Manager

Aaron acted as project manager and assisted in coordination of work between multiple disciplines and consultants including hydrogeology, geochemistry, hydrology, terrestrial and aquatic as well as process, treatment plant, and mine engineers. Coordinated with discipline leads to complete agency monitoring and reporting requirements for the open pit mine. Groundwater Conceptual Modelling Hemlo Mine Property Expansion | Barrick Gold Corporation | Hemlo, Ontario, Canada | 2024-Present | Project Manager Aaron acted as project manager and assisted in coordination of work for a conceptual groundwater modelling for a feasibility study of the mine expansion project and intended to assist in permitting requirements.

OIL AND GAS PIPELINES

Hamilton to Milton Pipeline Project | Hamilton/Milton, Ontario | Project Hydrogeologist

Coordination of monitoring well testing and sampling for Union Gas pipeline installation near Milton, ON, attended and presented at meetings with Agencies, completed MOECC Permit to Take Water application and supporting hydrogeological assessment report preparation.

Brantford to Kirkwall Pipeline Project | Hamilton, Ontario | Project Hydrogeologist

Coordination of monitoring well drilling and sampling for Union Gas pipeline installation near Hamilton, ON, completed MOECC Permit to Take Water application and supporting hydrogeological assessment report preparation.

Thunder Bay Pipeline Project | Thunder Bay, Ontario | Project Hydrogeologist

Union Gas pipeline replacement/installation near Thunder Bay, ON, completed MOECC Permit to take Water application and supporting hydrogeological assessment report preparation.

Nanticoke Meter Station | Ancaster, Ontario | Project Hydrogeologist

Coordination of monitoring well testing for TransCanada Pipelines Limited meter station construction project, completed MOECC Environmental Activity and Sector Registry reporting and registration.

PTTW Applications and Monitoring | Various, Ontario | Hydrogeologist / Project Manager

Assisted in preparation of groundwater permit to take water applications for water takings required as part of construction dewatering and pipeline installation. The site conditions have ranged from industrial, commercial areas to residential areas, agricultural fields or shallow bedrock and have crossed creeks, rivers and lakes. As part of each application, an assessment of hydrogeological conditions was completed to evaluate construction dewatering requirements and evaluate potential interference concerns and mitigation measures. Water quality was reviewed and discharge locations considered.

Hydrogeological Report and EASR Application | Toronto, Ontario | Hydrogeologist

For Enbridge Gas Distribution (EGD) sites including Keele St. and Ashtonbee Stations, Assisted in the completion of hydrogeological assessments and Permit To Take Water application / Environmental Activity and Sector Registry (EASR) registration in support of construction dewatering. The hydrogeological review detailed available site conditions, proposed construction activity, dewatering estimates and discharge options. Potential interference concerns were evaluated and mitigation measures recommended.

Trans Mountain Expansion Project Knowledge Management Portal | Trans Mountain Corporation | Calgary, Alberta, Canada | 2021-Present | Project Manager

To facilitate data transfer, storage, and assessment Stantec assisted Trans Mountain in development of a knowledge management portal for the project. Aaron acted as project manager for the knowledge management portal development, coordinating with the various stakeholders, including 3rd party consultants and Stantec personnel. Aaron oversees and coordinates the development of the portal system and database to provide digital custom solutions for data transfer and visualization.