

August 2021

APPENDIX E HYDROGEOLOGY BASELINE CHARACTERIZATION REPORT



March 2, 2021

File: 80018.05 – REV0

Marathon Gold Corporation
10 King Street East, Suite 501
Toronto, ON
M5C 1C3

Attention: Mr. James Powell, M.Eng. P.Eng.
Vice President, Regulatory and Government Affairs

Re: Hydrogeology Baseline Characterization - Update on Long-Term Groundwater Level Monitoring, Marathon Valentine Gold Project, Central Newfoundland

This letter report was prepared by GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) in response to a request for additional long-term groundwater level monitoring data available at the Marathon Valentine Gold Project Site. This letter provides an update on the groundwater level monitoring data that has been collected since February 2020 when the final data was collected for GEMTEC's Hydrogeological Baseline Report (GEMTEC, 2020).

BACKGROUND

During the October 2019 field program in support of the Hydrogeological Baseline Report a total of eight groundwater monitoring wells were installed. Groundwater levels in the monitoring wells were measured manually with a Solinst® water level meter immediately before slug testing and sampling. After sampling was complete, a Solinst® Levellogger® set to record water levels every 24 hours was installed in each well for long-term monitoring purposes. A Solinst® Barologger® was also placed outdoors at a central location on the Site to allow barometric correction of the long-term Levellogger® data. During the follow-up baseline sampling program in February 2020 groundwater levels were measured manually again, and the levellogger and barologger data were downloaded from wells MW2, MW3, MW6, MW7, and MW8; frozen groundwater conditions prevented the collection of groundwater level measurements and the removal of the levelloggers for data retrieval in monitoring wells MW1, MW4, and MW5 at this time. The levelloggers in MW2, MW3, MW6, MW7, and MW8 were not re-deployed after data download in February 2020, but are planned to be re-installed during this upcoming field season. The locations of the baseline 2019 monitoring wells are shown on Figure 1, attached.

During recent site visits in September 2020 and October 2020, monitoring wells MW1, MW4, and MW5 were visited, and manual water level measurements were taken as well as the data downloaded from the levelloggers. Specifically on September 7, 2020 the most recent data download was carried out for monitoring wells MW1 and MW5, and on October 29, 2020 the most recent data download was carried out on monitoring well MW4.

SUMMARY OF RESULTS

The current long-term groundwater level monitoring data set for the Site spans a 12 month period from October 09, 2019 to October 29, 2020 based on measurements collected in monitoring well MW4. A slightly shorter 11 month monitoring period from October 8, 2019 to September 6, 2020 is available for MW1, and a similar 11 month period from October 10, 2019 to September 7, 2020 is available for MW5. A summary of the manual groundwater level measurements collected from monitoring wells MW1, MW4, and MW5 over their monitoring periods is presented below in Table 1, and the groundwater level data recorded by the levelloggers in the three monitoring wells are presented on time series groundwater level hydrographs (attached). Daily total precipitation data was taken from the closest weather station at Burnt Pond (Environment and Climate Change Canada, 2020), located approximately 24 kilometers southwest of the Project site. Each groundwater level hydrograph also contains this daily total precipitation data presented in a millimeter equivalent of rain to identify possible correlation between groundwater levels and precipitation.

Table 1 Summary of Manual Groundwater Level Measurements

Well ID	Surface Elevation (masl)	October 2019		September 2020		October 2020	
		Groundwater Level (mbgs)	Groundwater Elevation (masl)	Groundwater Level (mbgs)	Groundwater Elevation (masl)	Groundwater Level (mbgs)	Groundwater Elevation (masl)
MW1	309.88	-0.23	310.10	-0.13	310.01	-	-
MW4	364.08	-0.04	364.12	-0.28	364.36	-0.41	364.49
MW5	362.76	0.26	362.50	0.26	362.50	-	-

mbgs – meters below ground surface; masl – meters above sea level.

A summary of the groundwater level data collected from the levelloggers over the monitoring period are presented below in Table 2.

Table 2 Summary of Groundwater Level Monitoring (Oct 2019 – Sept/Oct 2020)

Well ID	Highest Observed Groundwater Elevation			Lowest Observed Groundwater Elevation			Mean Groundwater Elevation		Observed Groundwater Elevation Variability (m)
	Depth (mbgs)	Elevation (masl)	Date	Depth (mbgs)	Elevation (masl)	Date	Depth (mbgs)	Elevation (masl)	
MW1	-0.28	310.16	May 2, 2020	0.32	309.56	Aug 25, 2020	-0.17	310.04	0.60
MW4	-0.42	364.50	June 02, 2019	0.35	363.73	Aug 25, 2020	-0.20	364.28	0.77
MW5	-0.06	362.82	Nov 13, 2020	1.06	361.70	Aug 28, 2020	0.17	362.58	1.12

Over the monitoring period, the depth to shallow groundwater as recorded in MW1, MW4, and MW5 ranged from -0.42 mbgs (MW4) to 1.06 mbgs (MW5). Shallow, above ground surface water level readings were recorded in all three wells. While these measurements likely in part reflect near surface water table conditions and levellogger and barologger sensitivities, slight upward hydraulic vertical gradients have been identified in the Site Marathon and Leprechaun deposit areas, and may also be present at these monitoring well locations resulting in artesian conditions. The monitoring well with the highest observed mean groundwater elevation during the monitoring period was MW4 (364.28 masl), while the lowest was observed at MW1 (310.04 masl).

The 11 to 12 month monitoring periods depicted on the groundwater level hydrographs capture a full range of seasonal groundwater level fluctuations, and indicate a transient groundwater system. For all three monitoring wells groundwater levels were typically lower during the winter months prior to spring run-off and in the mid- to late-summer corresponding to a period of relatively lower precipitation. The highest groundwater levels were recorded during spring run-off and during the fall rainy period. Seasonal fluctuations in groundwater levels ranged from 0.6 m in MW1 to 1.12 m in MW5; reflecting typical seasonal groundwater level fluctuations observed in water table aquifers in the region.

Observed day-to-day variability in groundwater levels and the apparent coincidence of these variations with rainfall events at all three monitoring well locations supports the concept that the Site overburden and shallow bedrock aquifer is an unconfined system.

CONCLUSIONS

The long-term monitoring data collected to date span an 11 to 12 month monitoring period, providing a good record of seasonal groundwater level fluctuations at the Site. The monitoring results from the 2019 long-term groundwater monitoring well network have allowed for reasonable spatial characterization of natural conditions at the Site. As long-term groundwater level monitoring in the 2019 monitoring wells continues through Project development, groundwater level patterns and trends observed in the current data set will be better defined and understood. In addition, the Site's long-term monitoring well network was recently expanded to include an additional five monitoring wells equipped with levelloggers installed during the fall 2020 feasibility-level site-wide geotechnical and hydrogeological program. Going forward these new 2020 monitoring wells will enhance the spatial coverage of the long-term groundwater level monitoring data set, and allow for further characterization of groundwater conditions at the Site.

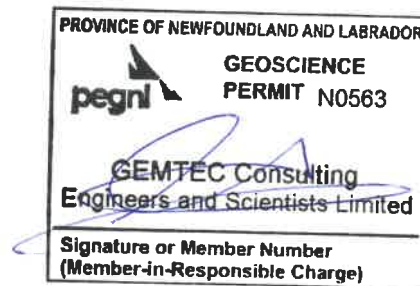
This letter was prepared by Candice Williams, B.A.Sc., and was reviewed by Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo. We trust that this report meets your present requirements. If you have any questions or require additional information, please contact our office at your convenience.

Respectfully submitted,

GEMTEC Consulting Engineers and Scientist Limited



Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo.



REFERENCES

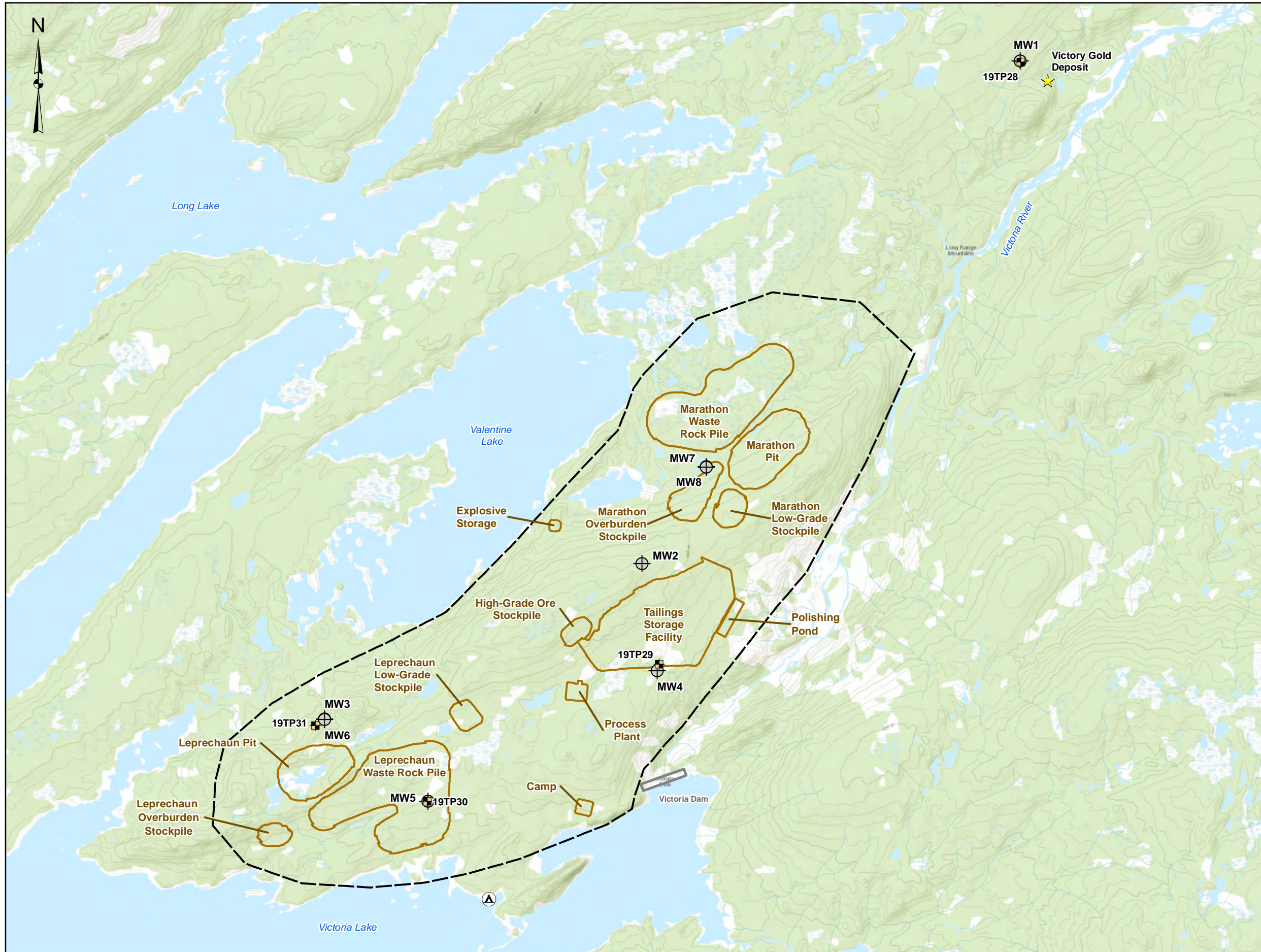
Environment and Climate Change Canada, 2021. Historical Weather Daily for La Scie, NL weather station. Accessed online on 02/26/2020 at https://climate.weather.gc.ca/historical_data/search_historic_data_e.html.







GEMTEC, 2020. Hydrogeology Baseline Report, Marathon Valentine Gold Project, Central Newfoundland. Final report, dated March 18, 2020. GEMTEC Project: 80018.05.



ATTACHMENTS

Figure 1: Site Plan
Time Series Groundwater Level Hydrographs



-  GEMTEC 2019 Monitoring Well
-  GEMTEC 2019 Geotechnical Test Pit
-  Mine Site
-  Proposed Mine Site Infrastructure (previous, since revised)
-  Gold Deposit
-  Existing Exploration Camp

Note

1. This drawing is a schematic representation. Sizes, locations and dimensions are approximate.
2. Coordinate system: NAD83 CSRS UTM Zone 21 North.
3. Mine site layout provided by Marathon Gold Corporation.
4. Basemap: ESRI ArcGIS Online basemaps.

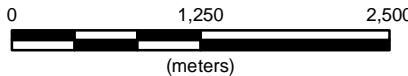
Drawn By	MC	Checked By	CAM
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Date: March 2020

Project: Hydrogeology Baseline Characterization - Update on Long-Term Groundwater Level Monitoring, Marathon Valentine Gold Project, Central Newfoundland

Drawing: Site Plan

Scale: 1:50,000



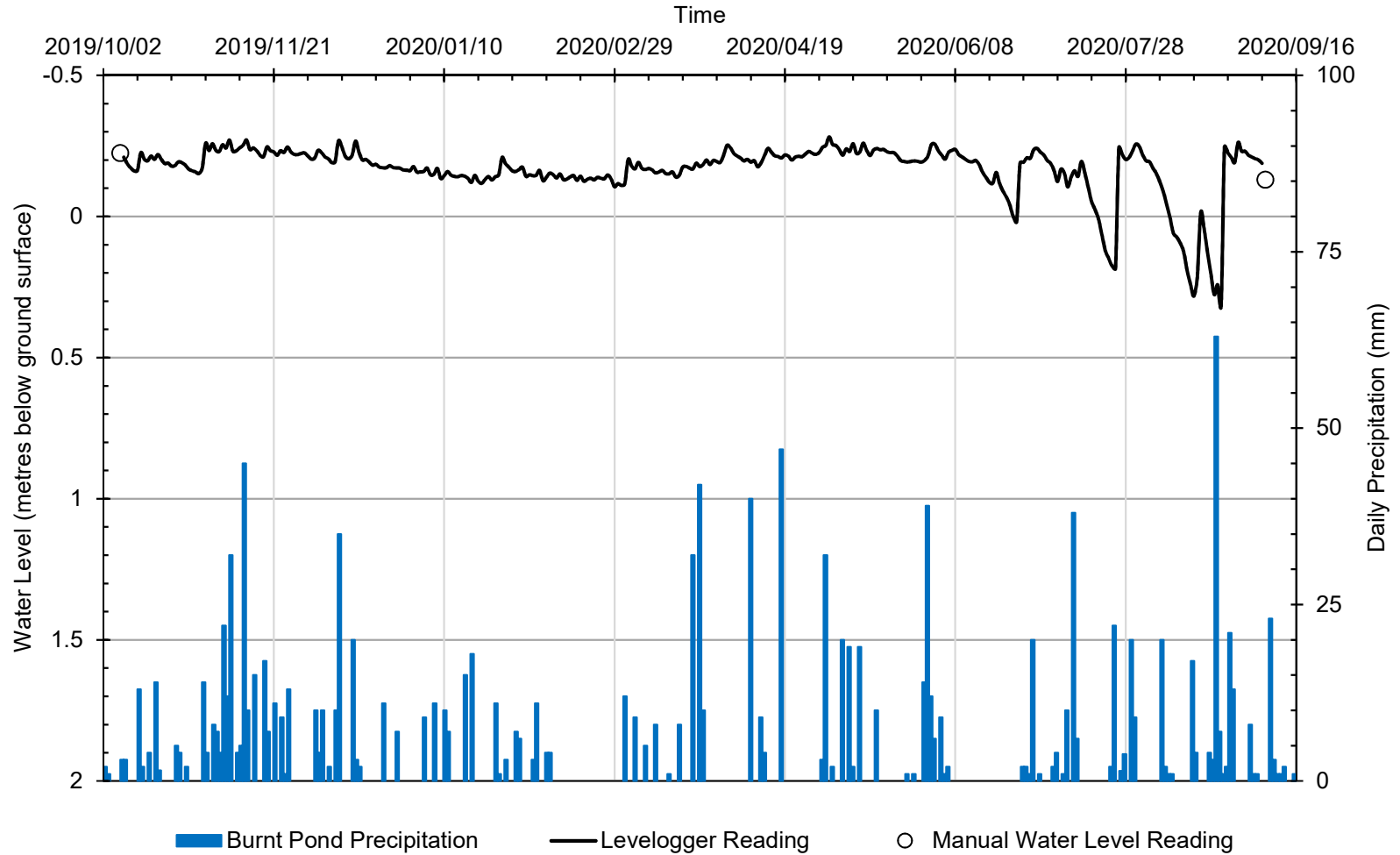
(meters)
NAD83/ UTM Zone 21N

File No. 80018.05	Drawing Figure 1
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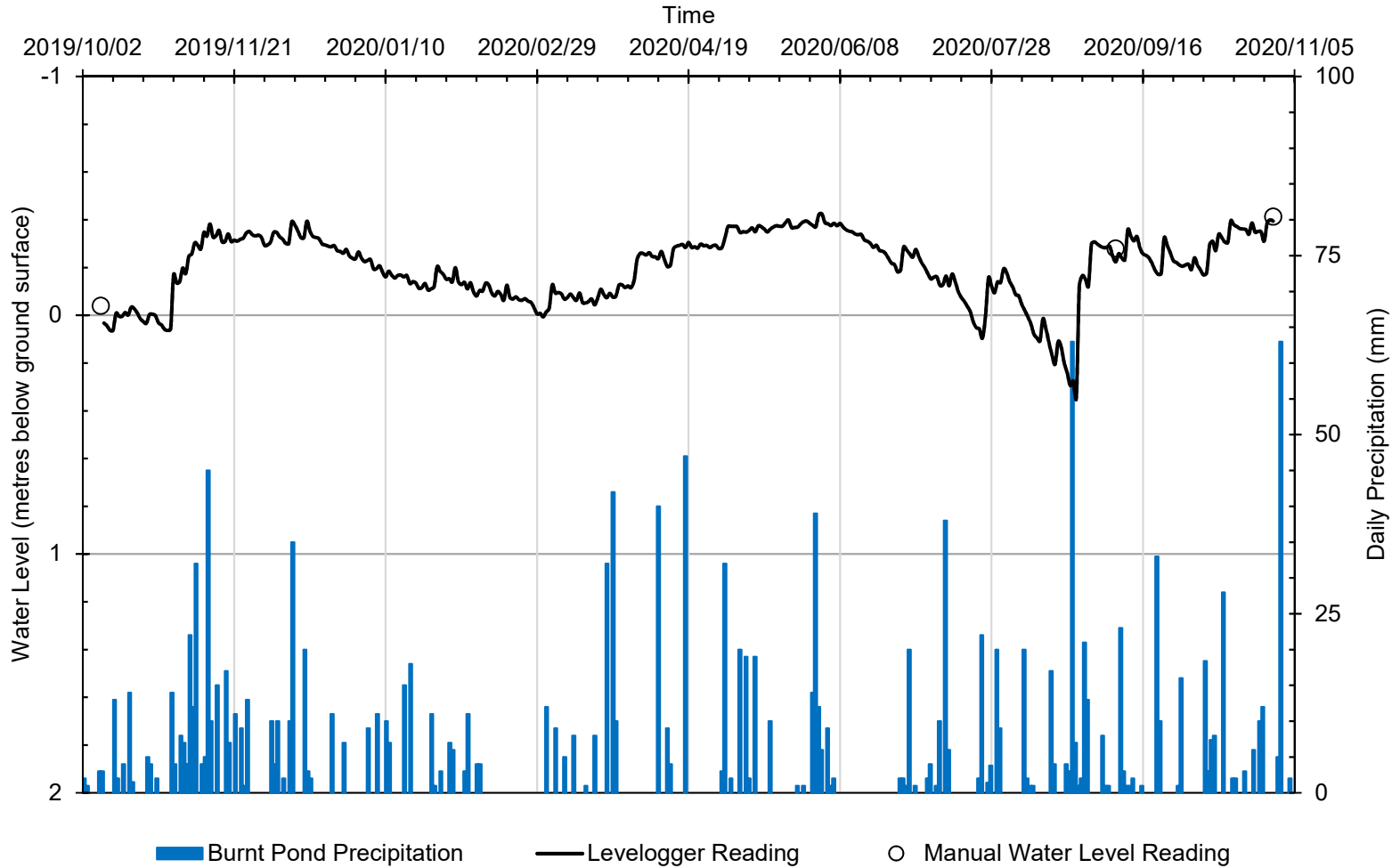
Title: MW1 Long-Term Water Level Data

Project: Long-term Groundwater Level Monitoring: October 2019 to September 2020
Marathon Valentine Gold Project, Central Newfoundland



Title: MW4 Long-Term Water Level Data

Project: Long-term Groundwater Level Monitoring: October 2019 to October 2020
Marathon Valentine Gold Project, Central Newfoundland



Title: MW5 Long-Term Water Level Data

Project: Long-term Groundwater Level Monitoring: October 2019 to September 2020
Marathon Valentine Gold Project, Central Newfoundland

