



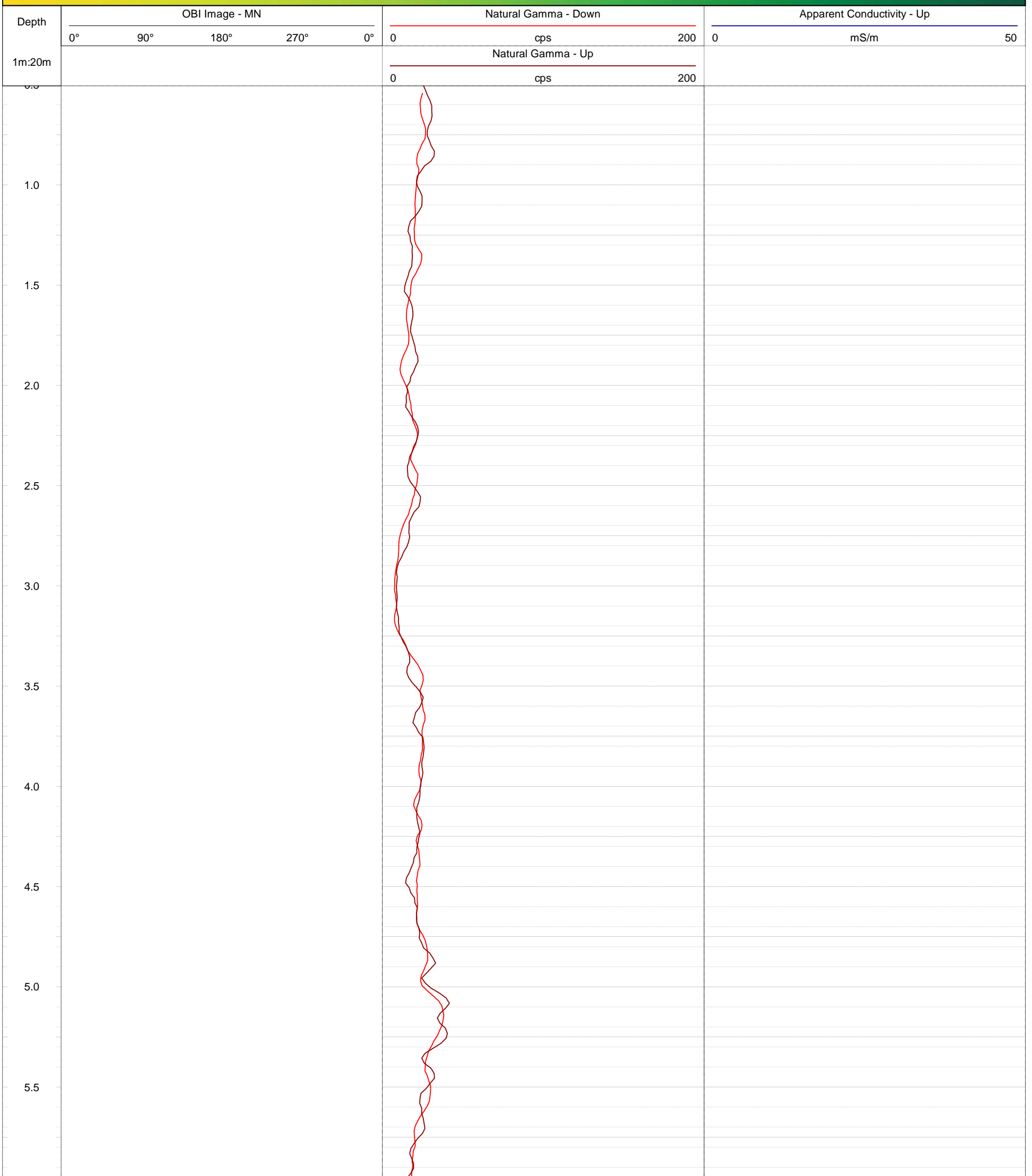
**GOLDER**  
MEMBER OF WSP

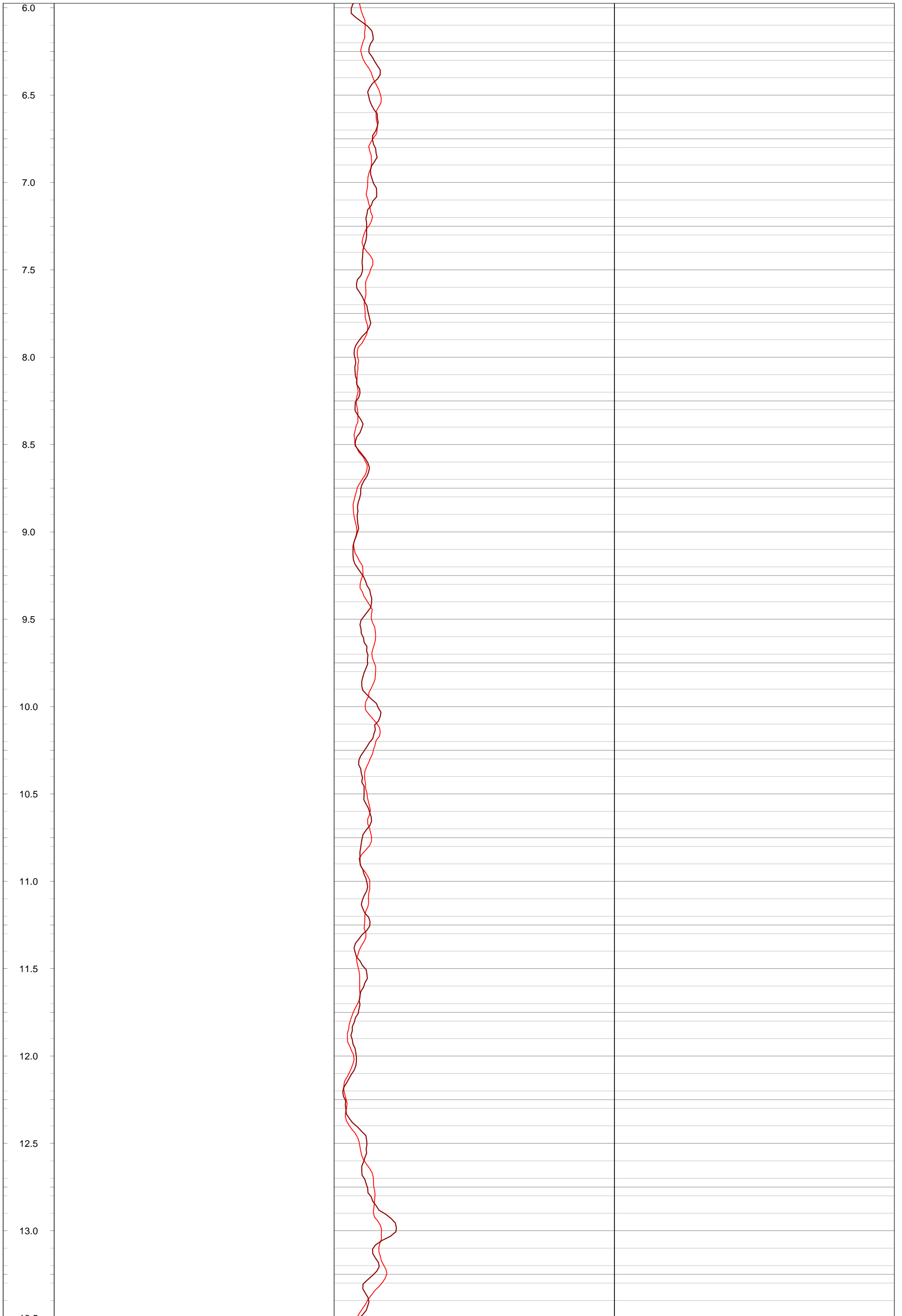
**Geophysical Record of Borehole: BH20-15 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

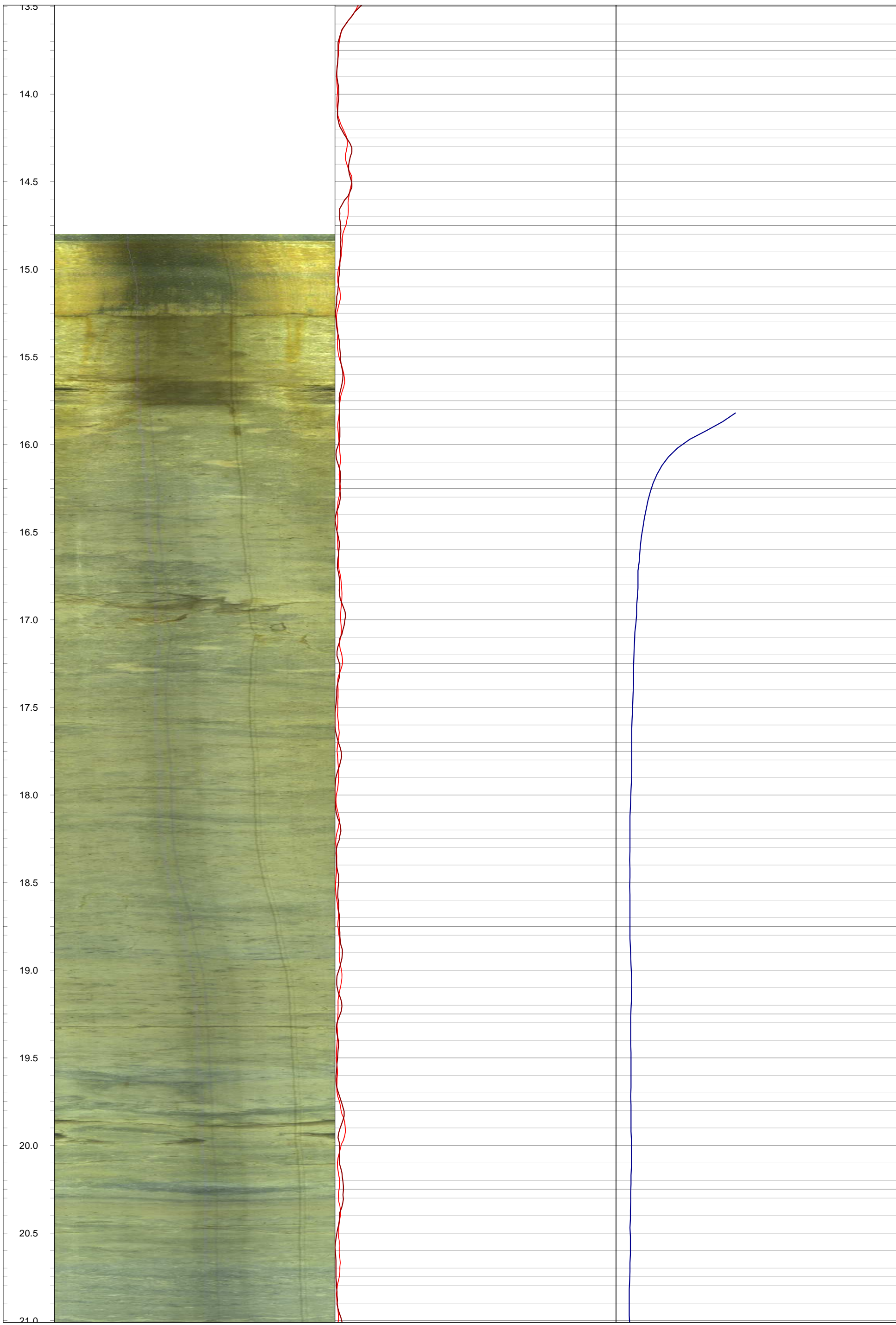
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.26 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576925.21 m    **Drilled Depth:** 34.76 m bgs    **Water Level:** 3.09 m bgs    **Log Date:** Apr-14-2020  
**Northing:** 4854113.14 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 421.52 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.16 m ags

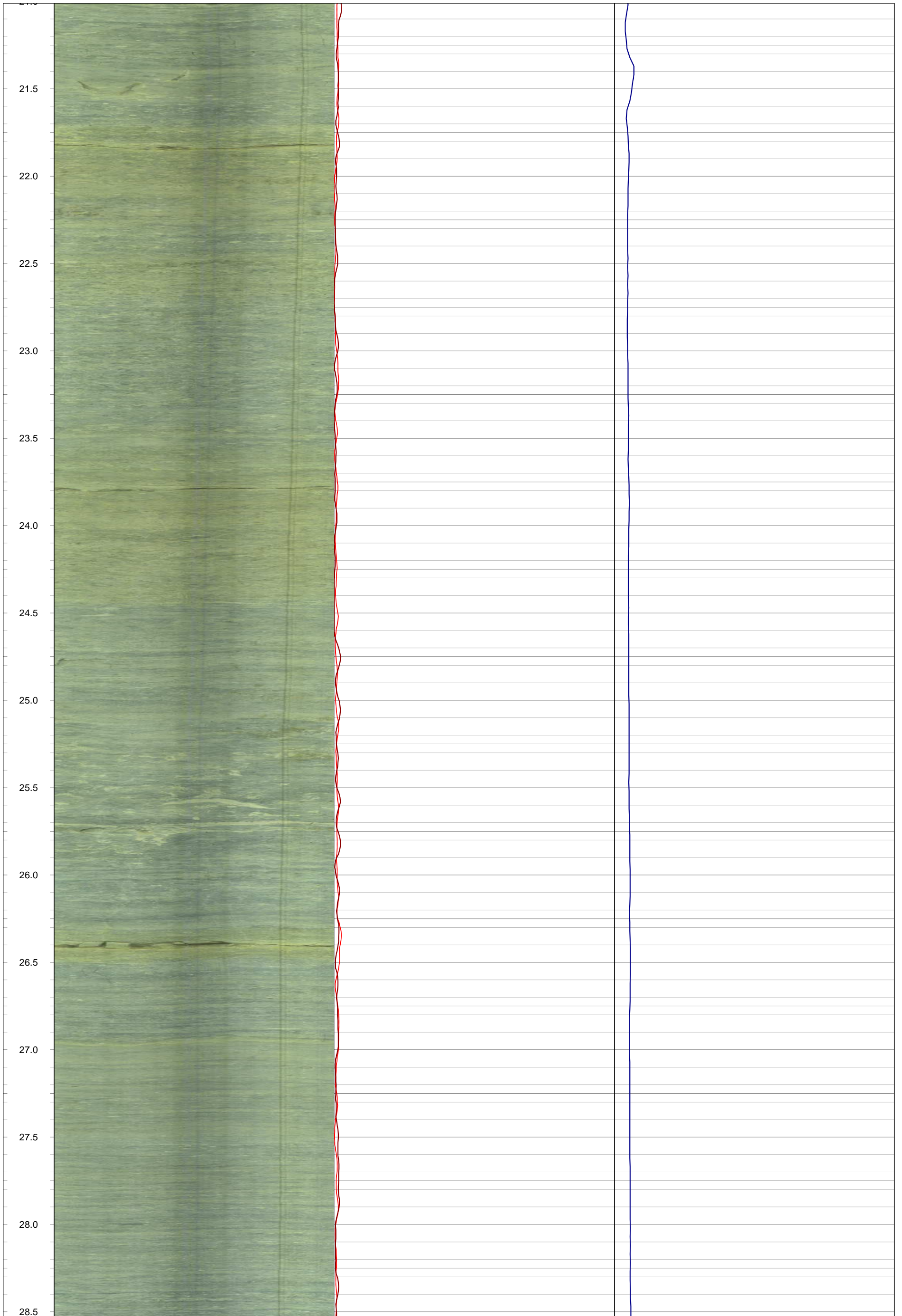
**Notes:**



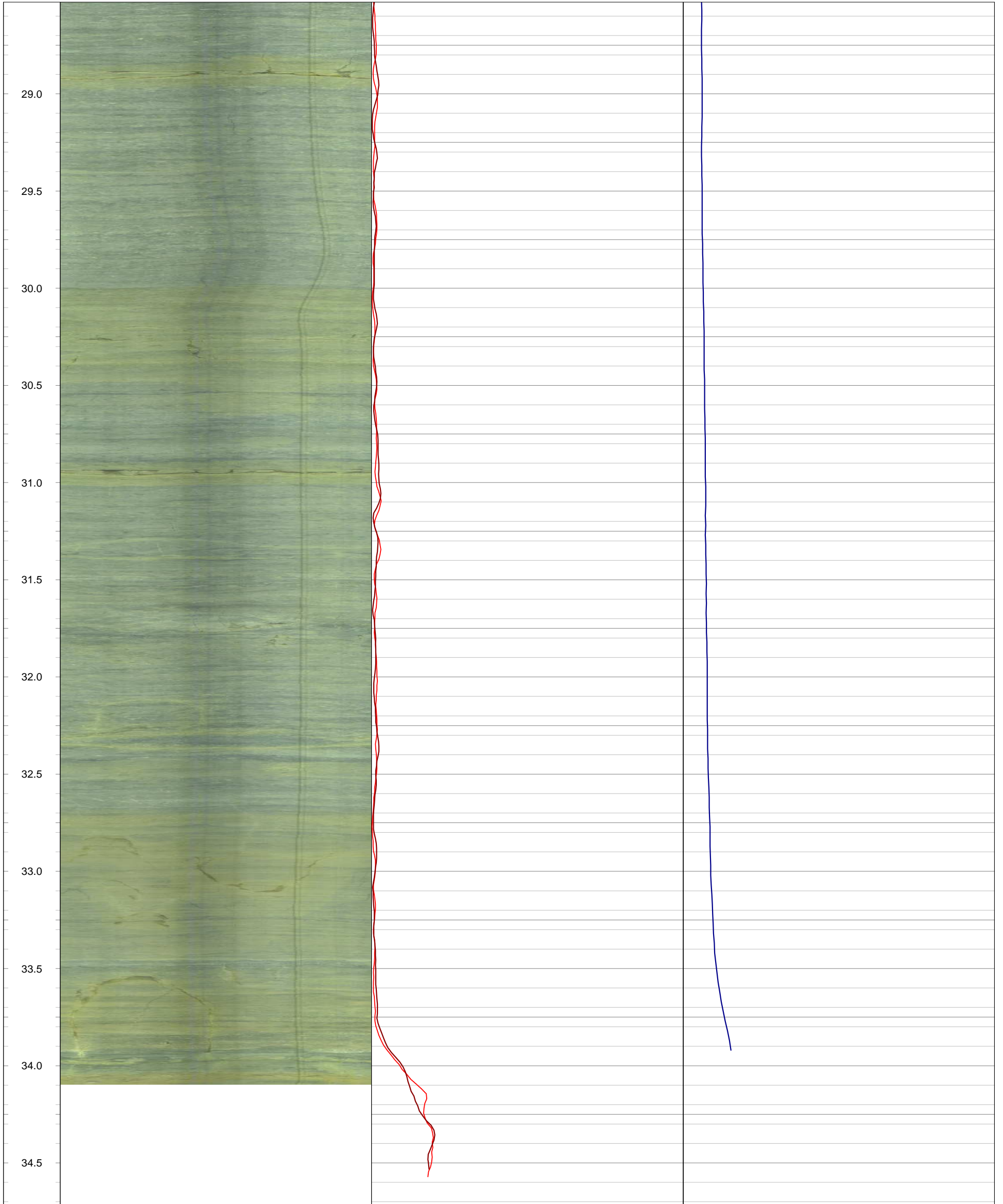














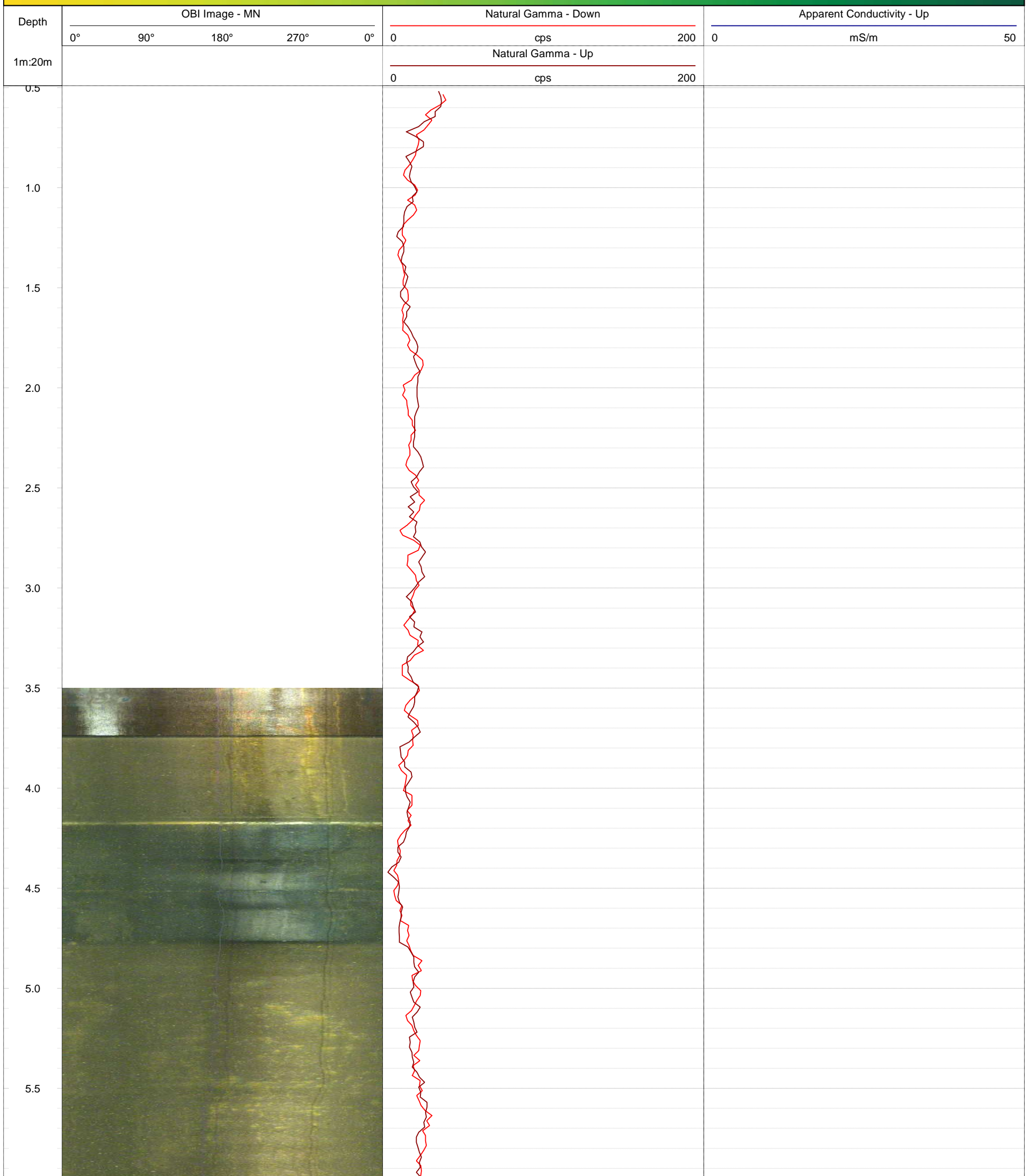
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-16 (CAL)**

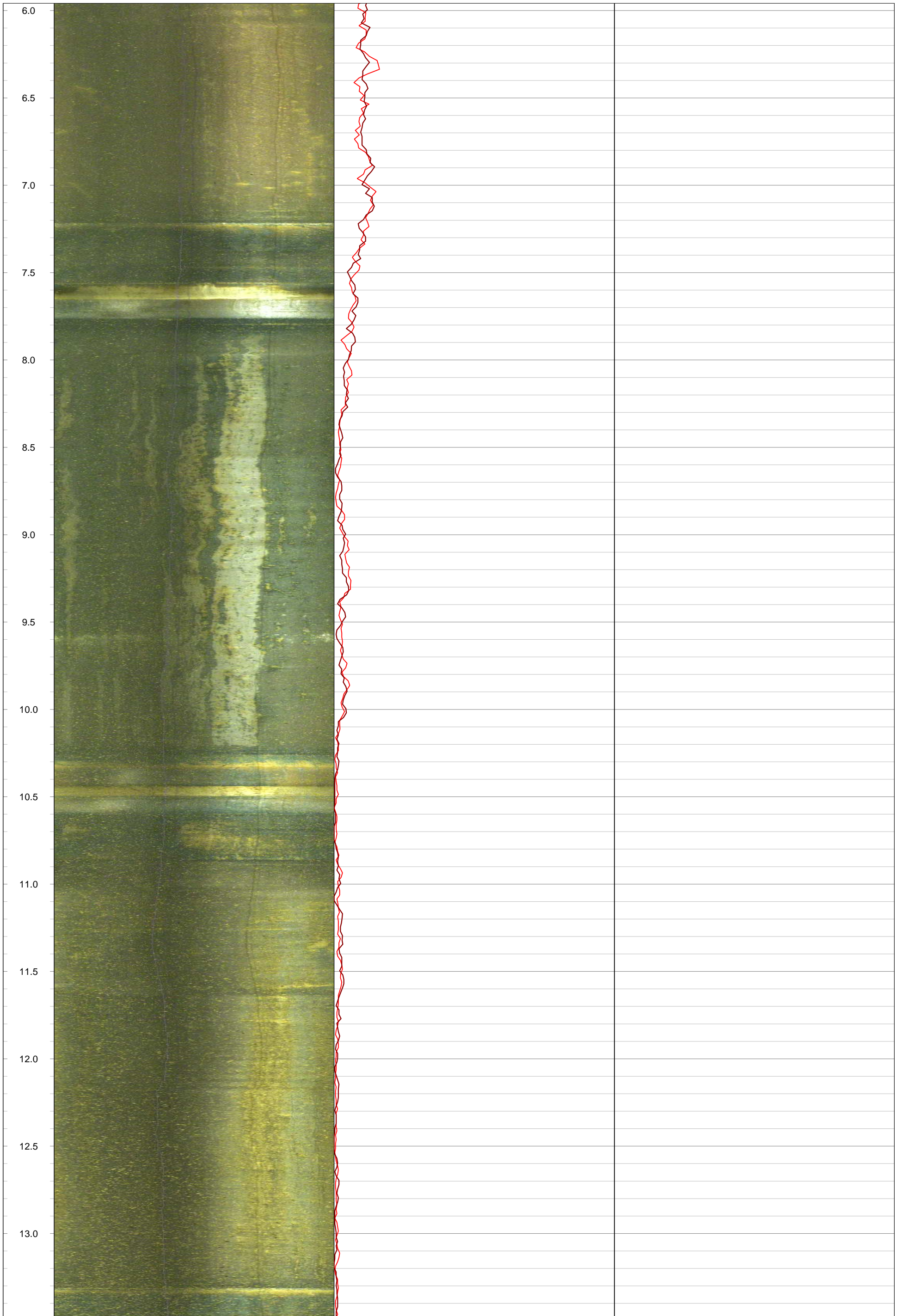
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 13.76 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576991.38 m    **Drilled Depth:** 34.18 m bgs    **Water Level:** 3.60 m bgs    **Log Date:** Apr-21-2020  
**Northing:** 4853859.50 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 420.74 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.17 m ags

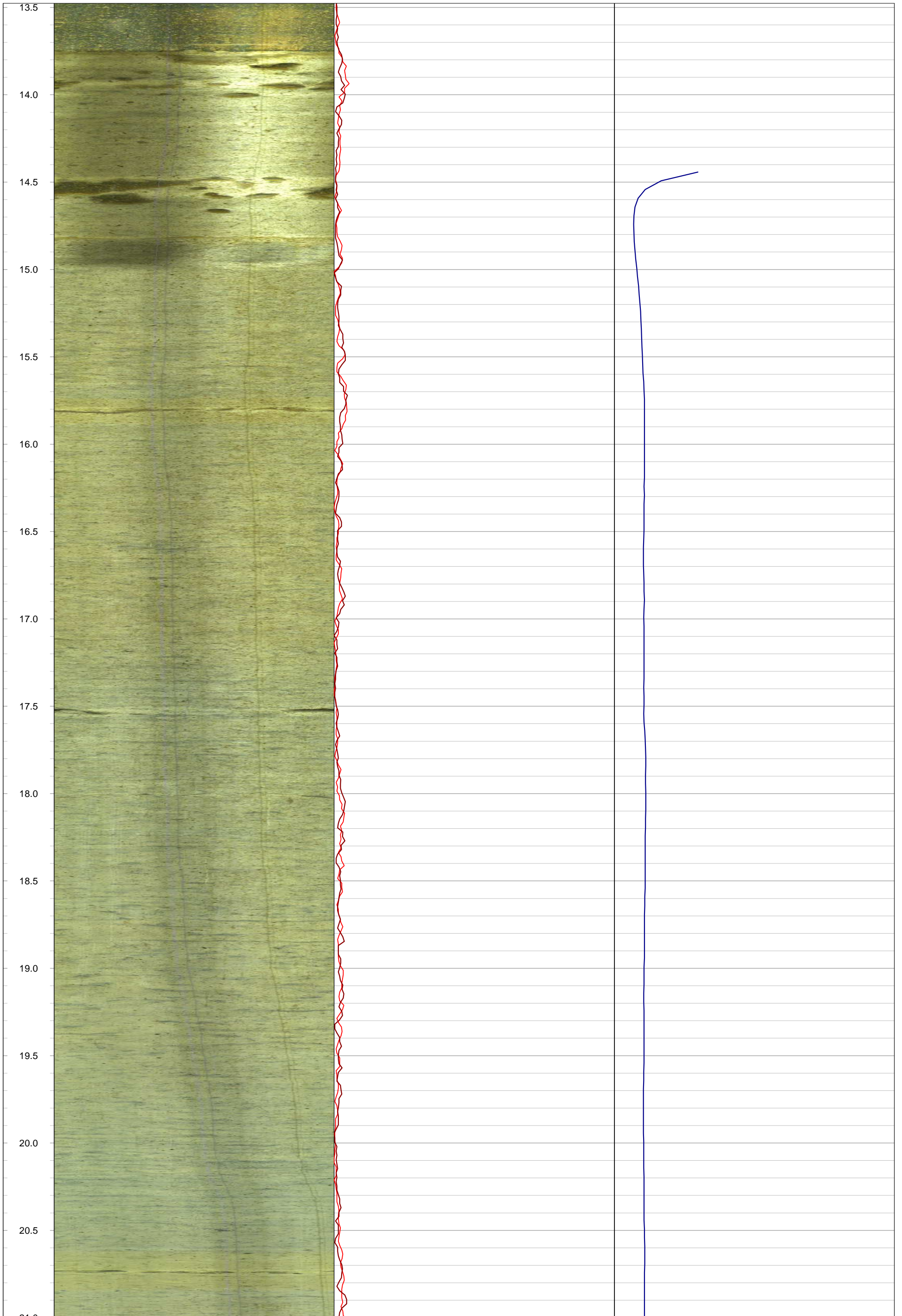
**Notes:**



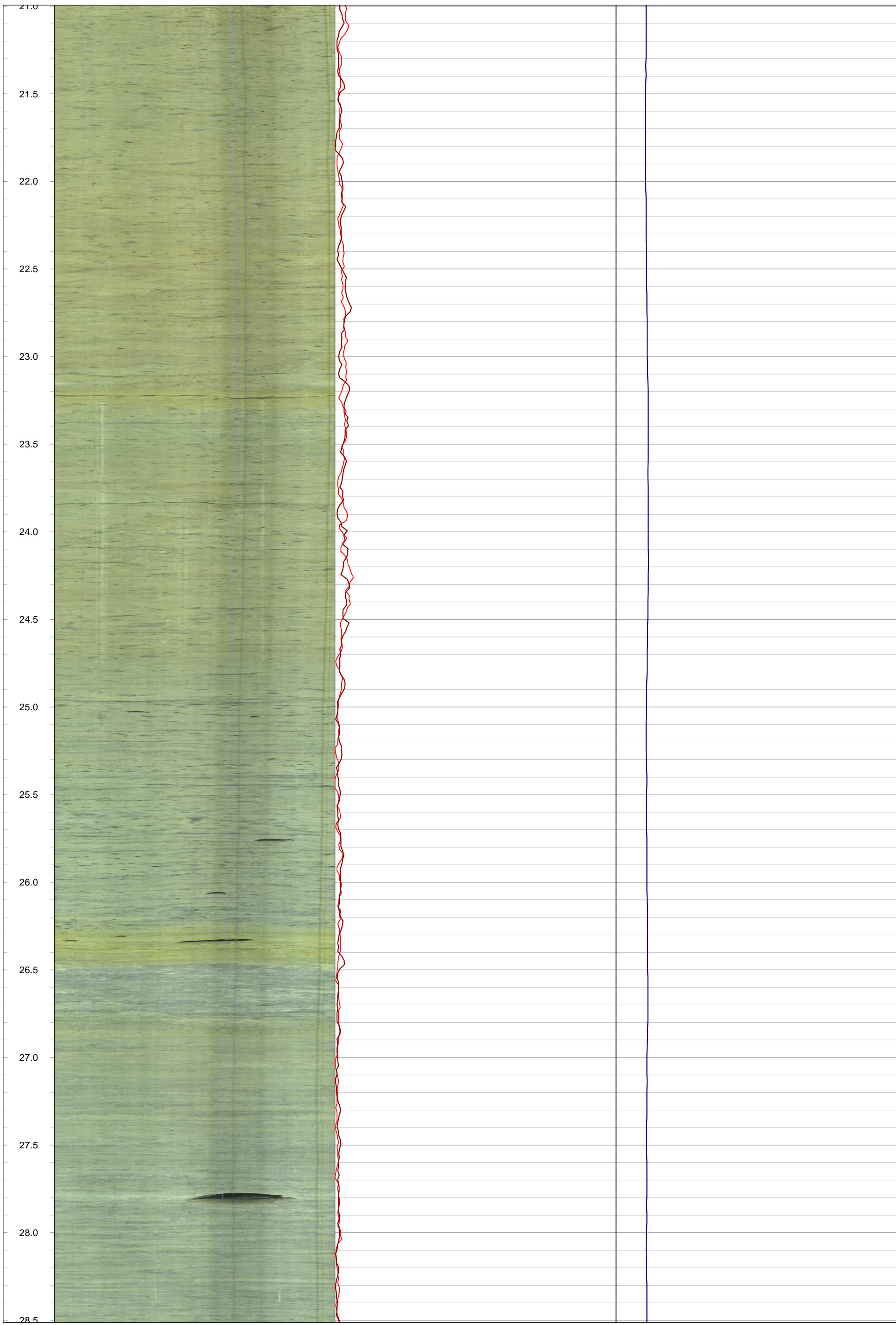


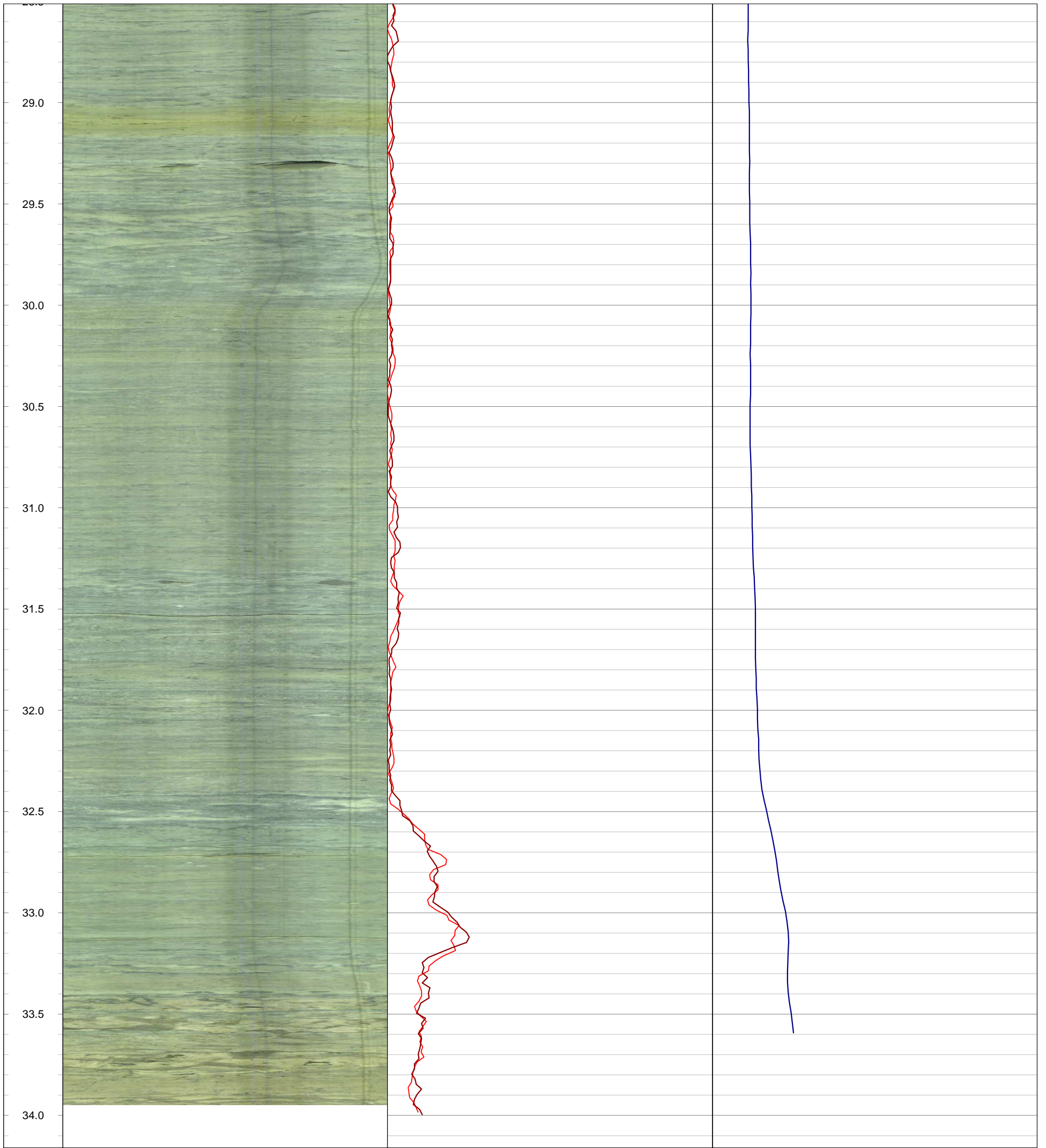
















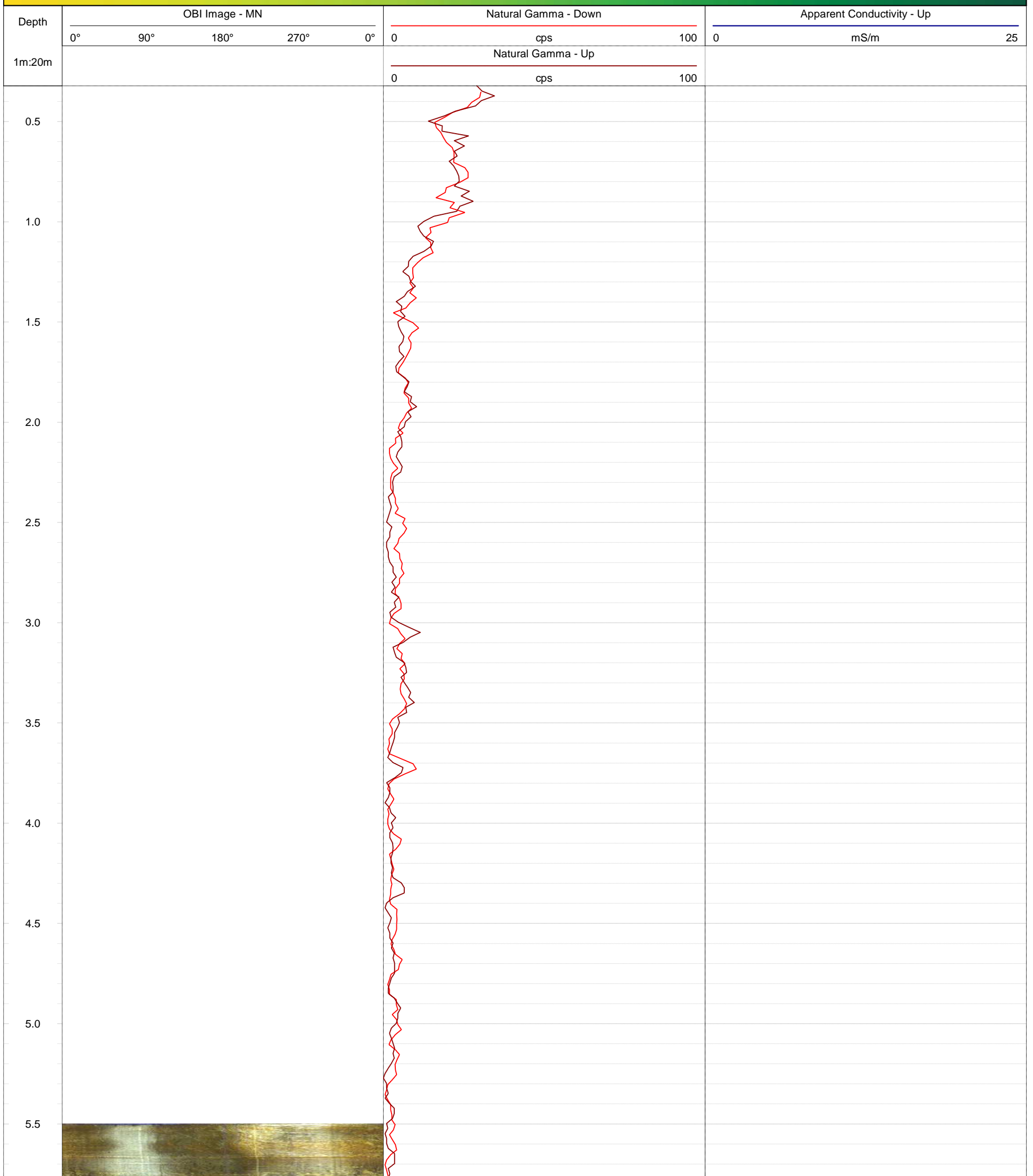
**GOLDER**  
MEMBER OF WSP

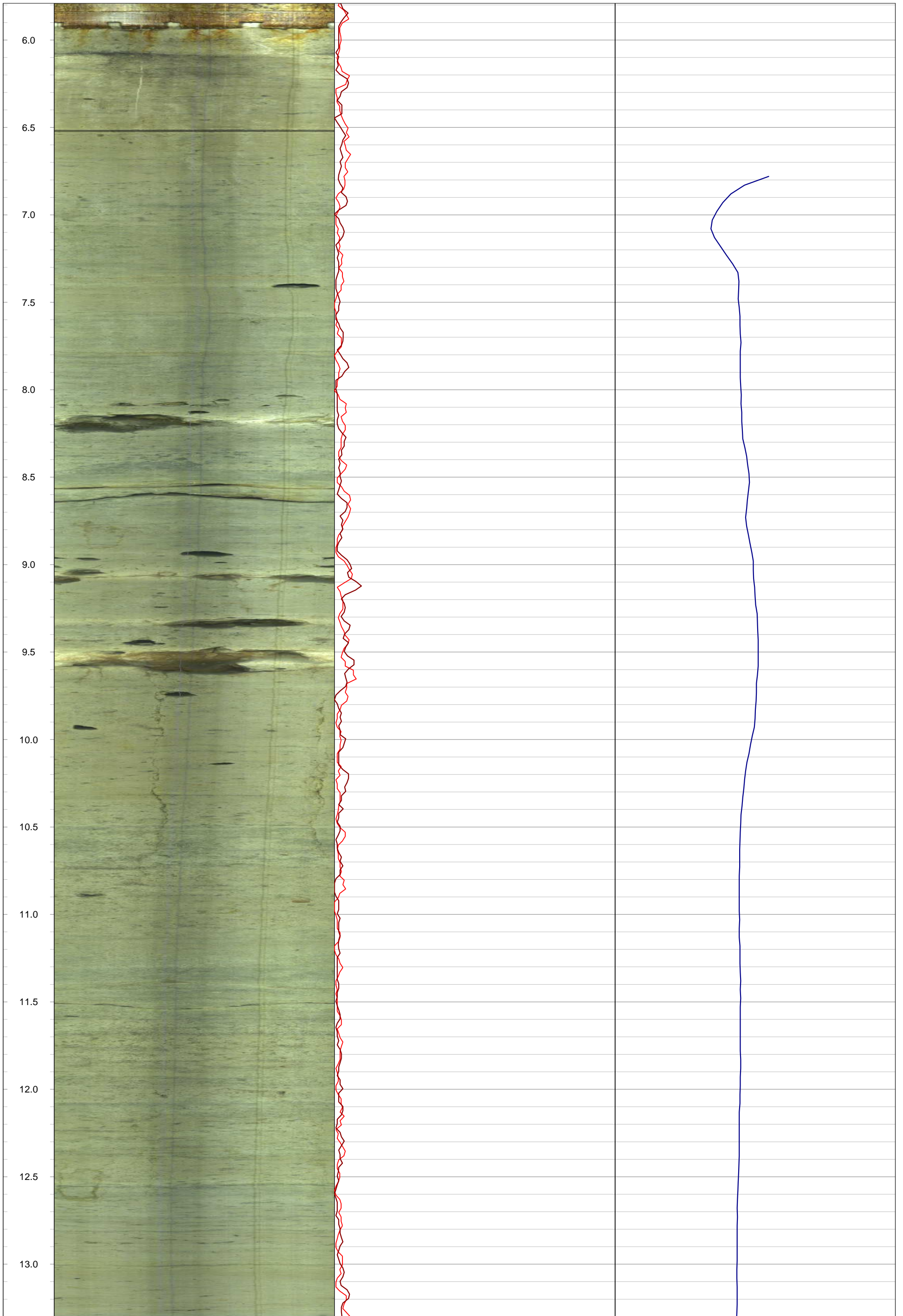
**Geophysical Record of Borehole: BH20-17 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

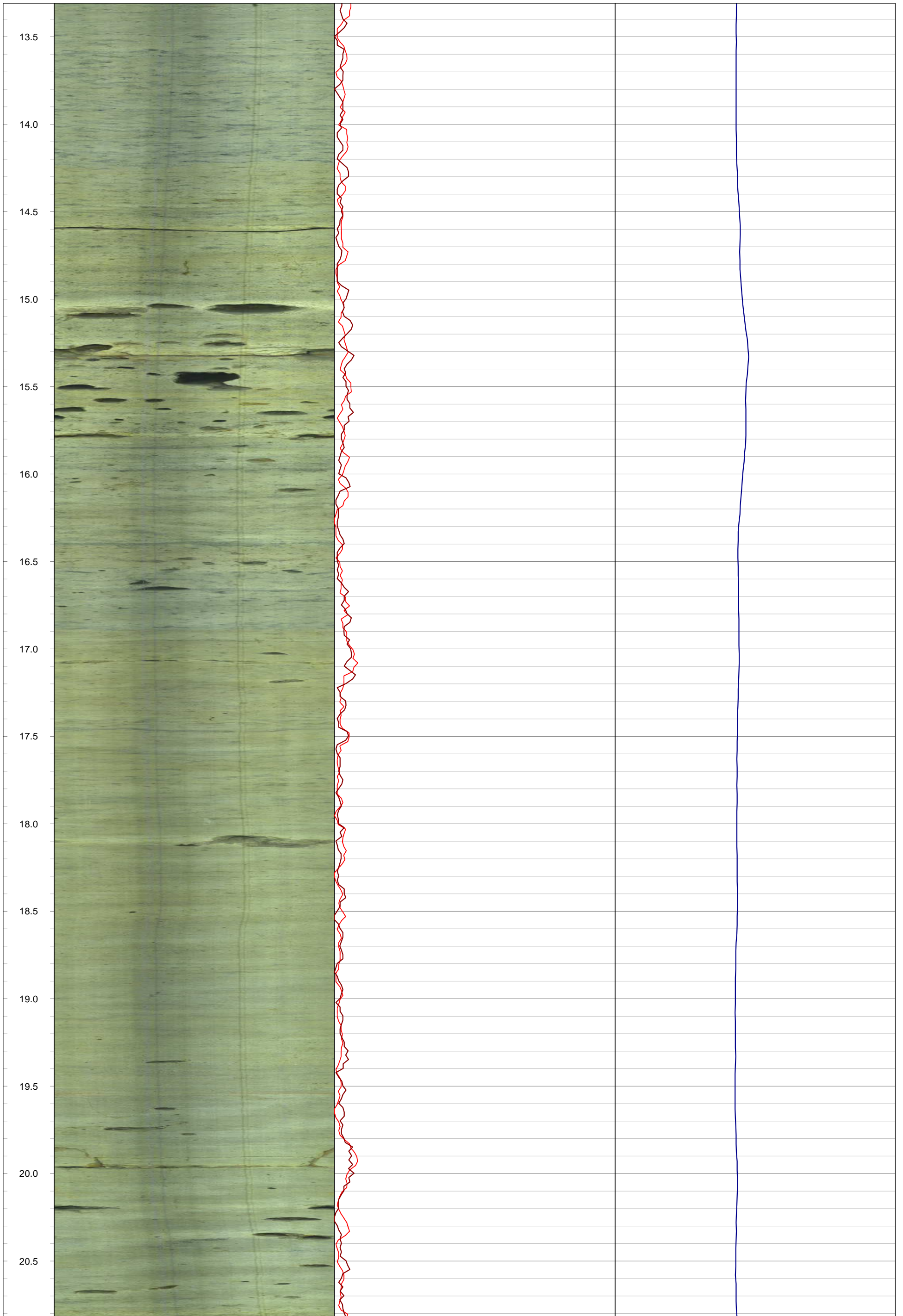
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.92 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577474.67 m    **Drilled Depth:** 28.83 m bgs    **Water Level:** 6.51 m bgs    **Log Date:** Apr-27-2020  
**Northing:** 4853391.65 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 413.06 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.46 m ags

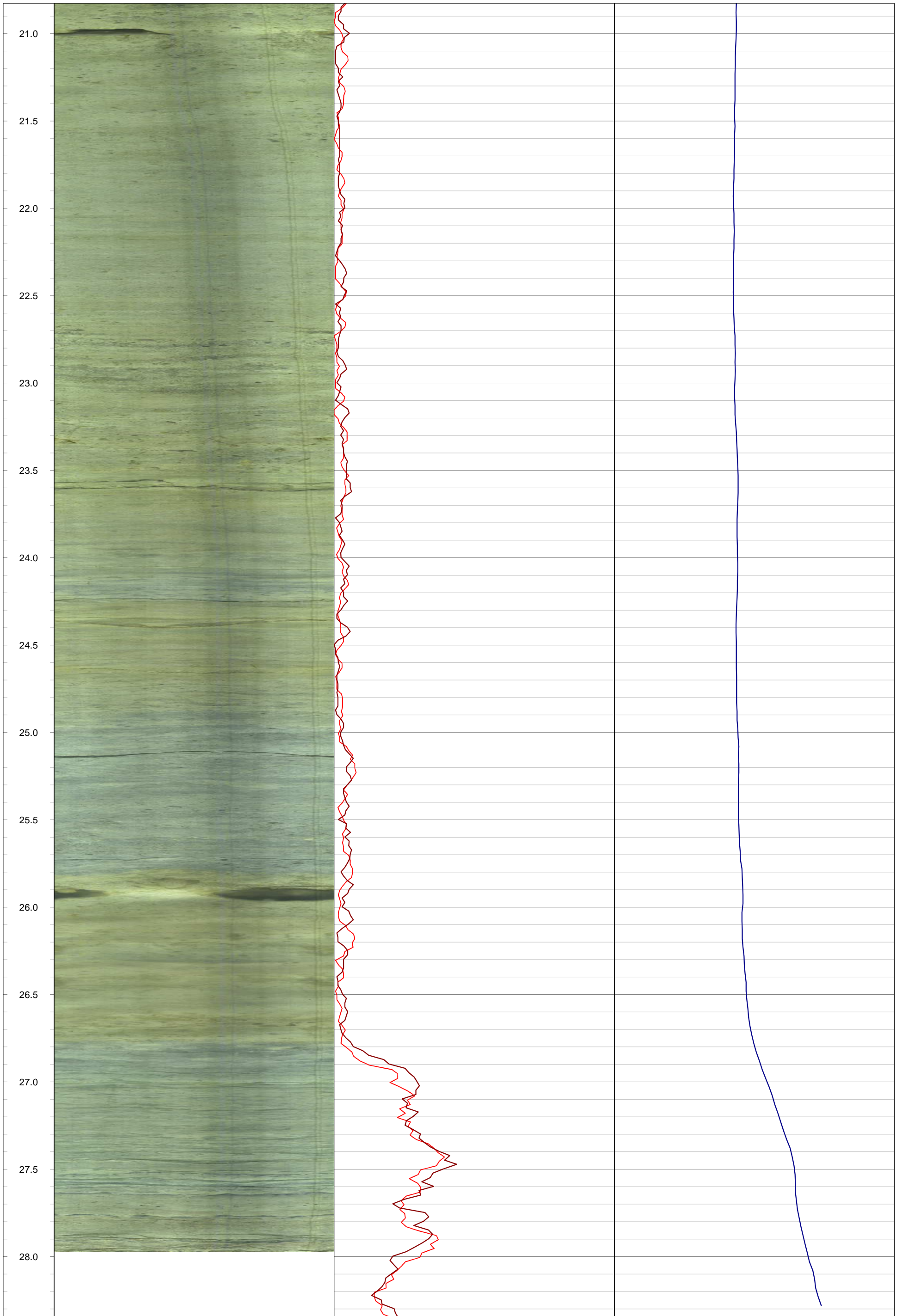
**Notes:**

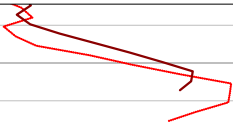










28.5			
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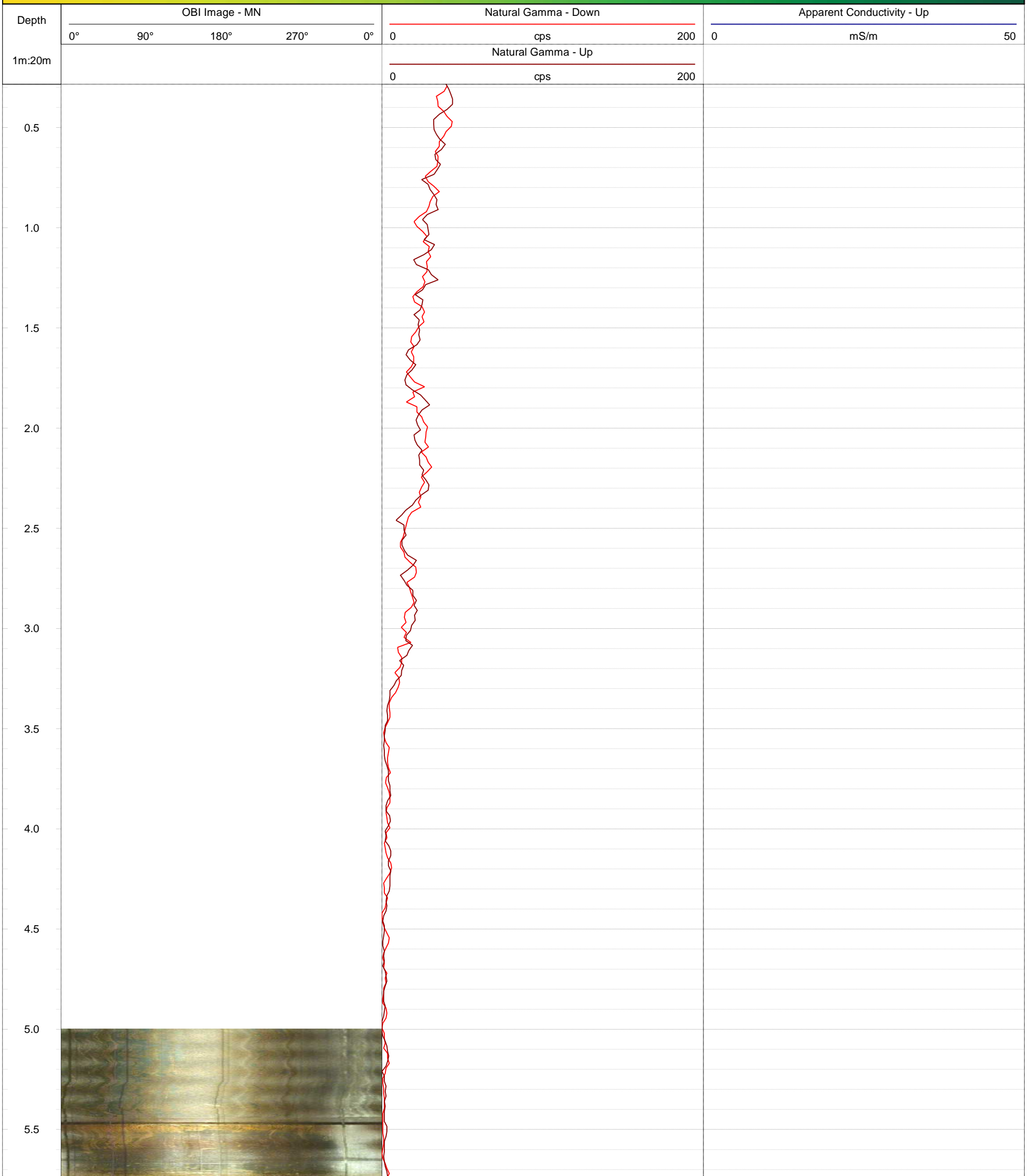
**GOLDER**  
MEMBER OF WSP

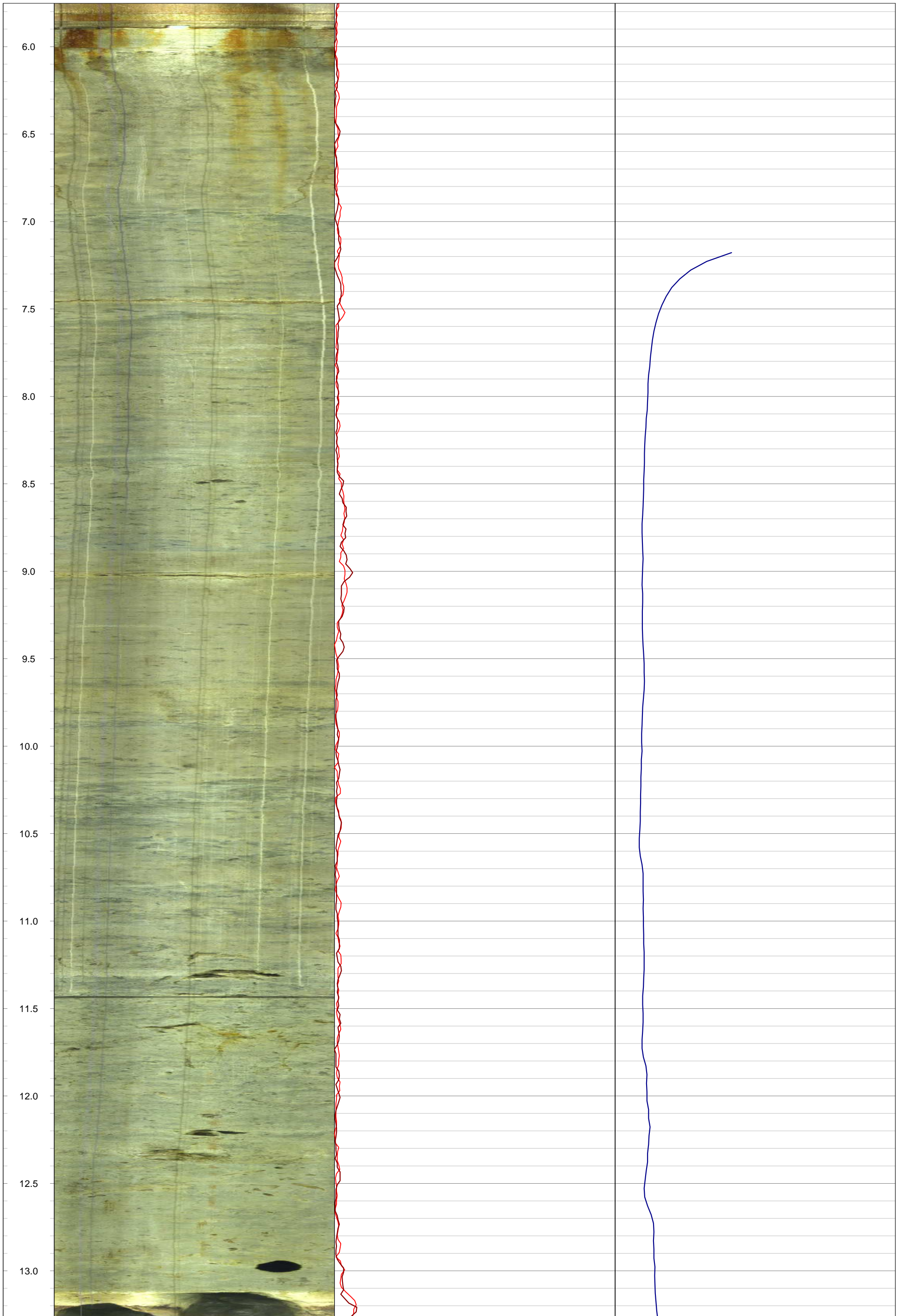
**Geophysical Record of Borehole: BH20-18 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

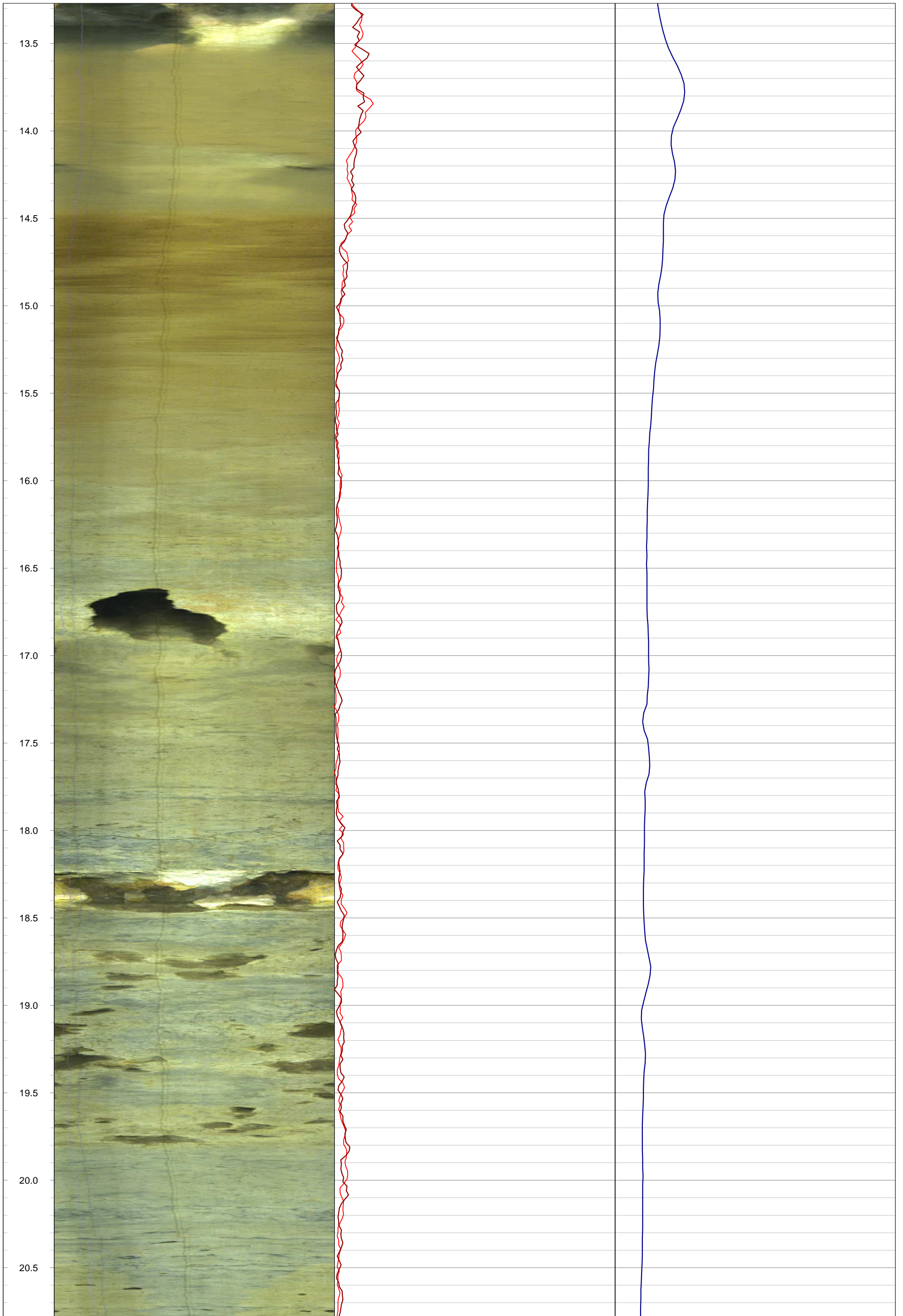
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.90 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577313.39 m    **Drilled Depth:** 31.84 m bgs    **Water Level:** 11.45 m bgs    **Log Date:** Apr-27-2020  
**Northing:** 4853571.83 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 417.53 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.40 m ags

**Notes:** OBI image opaque >31 m bgs

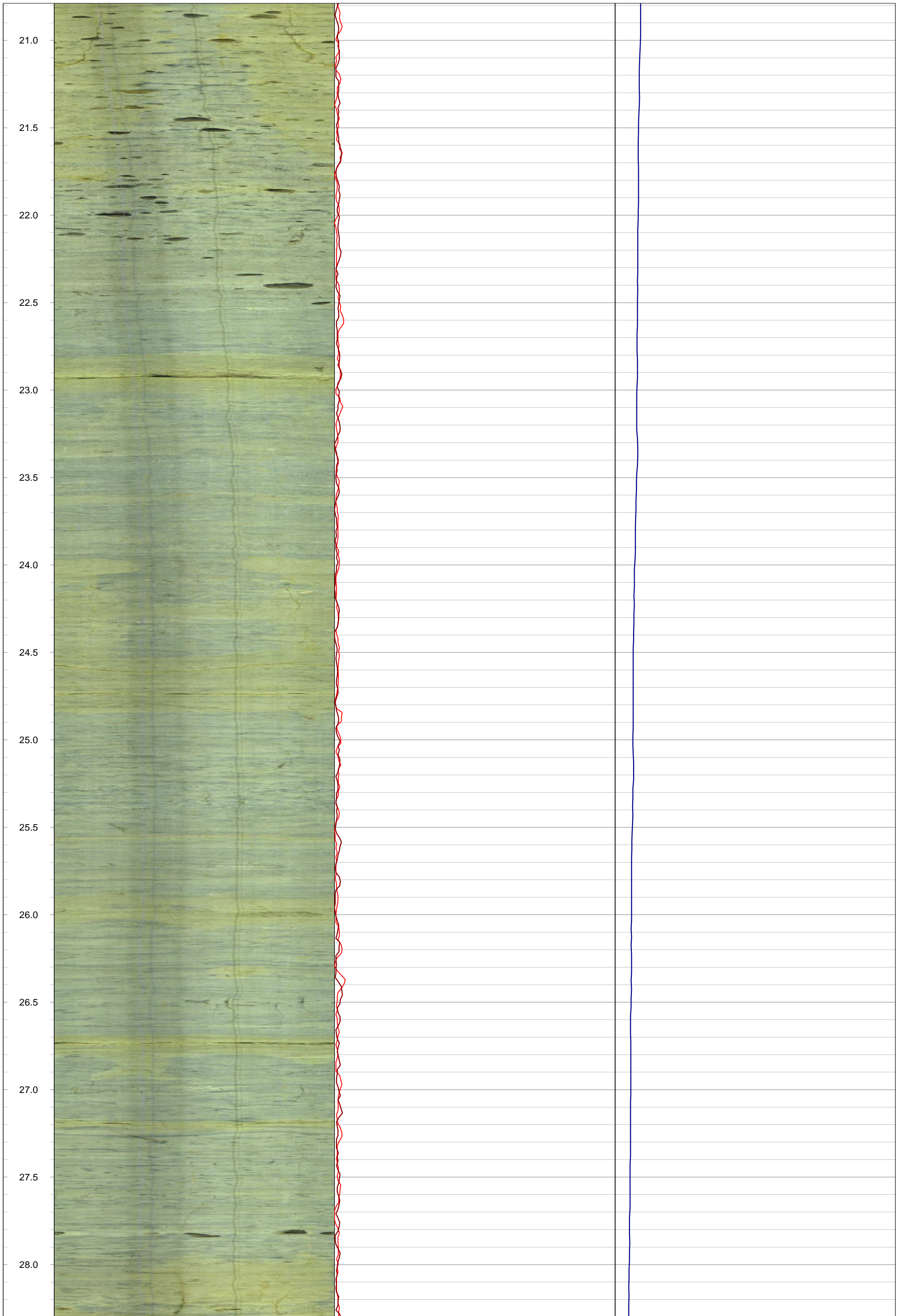










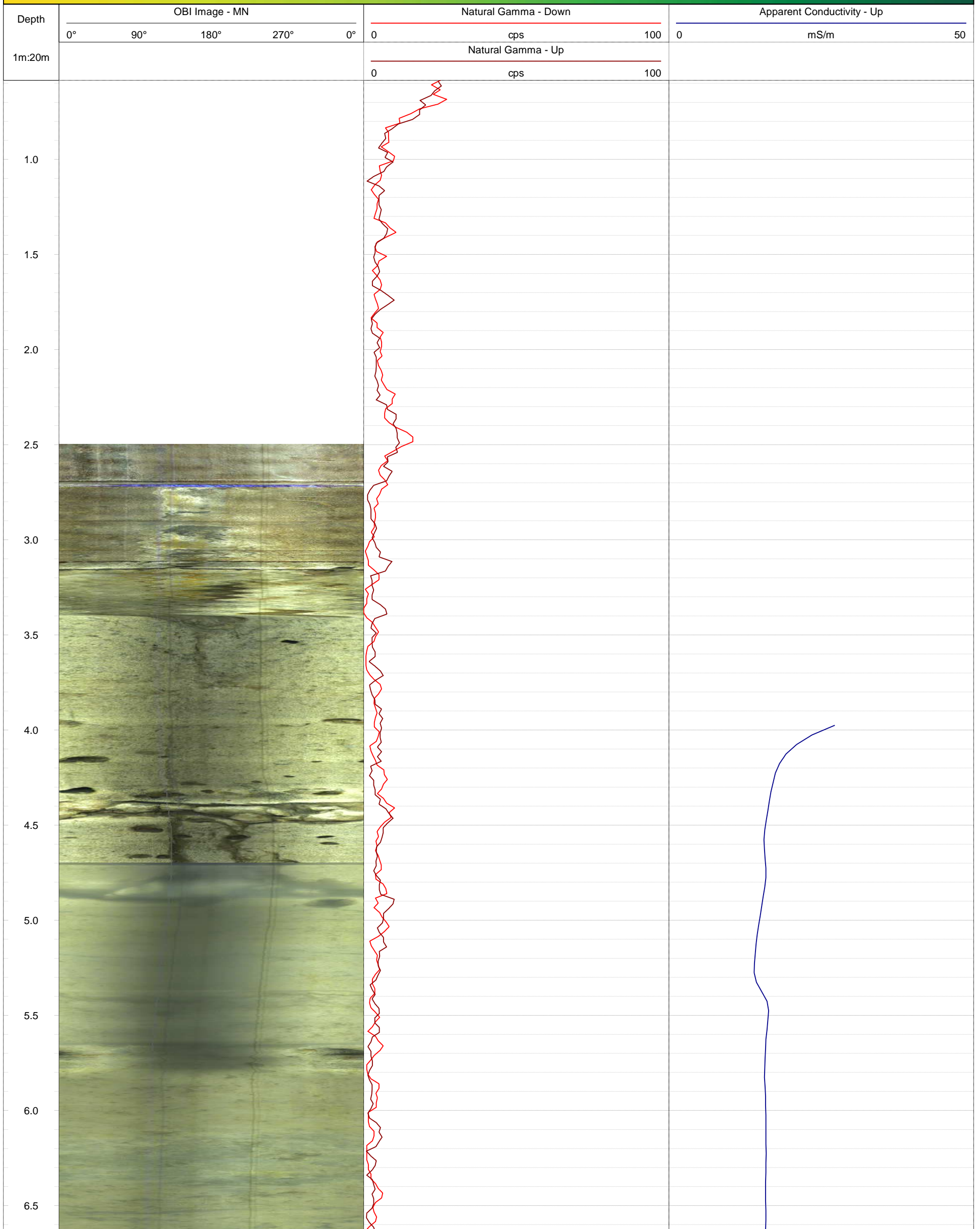




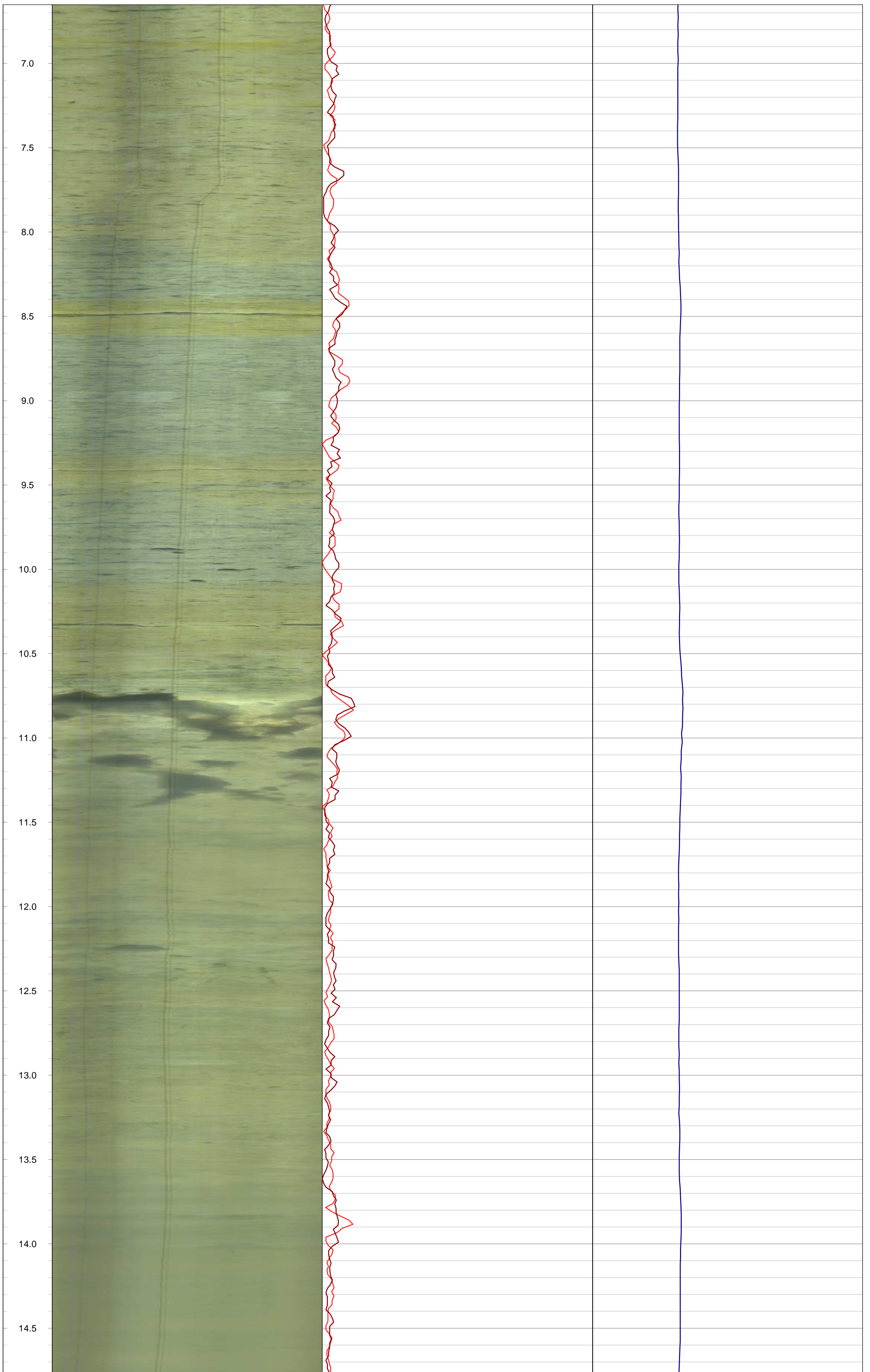
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

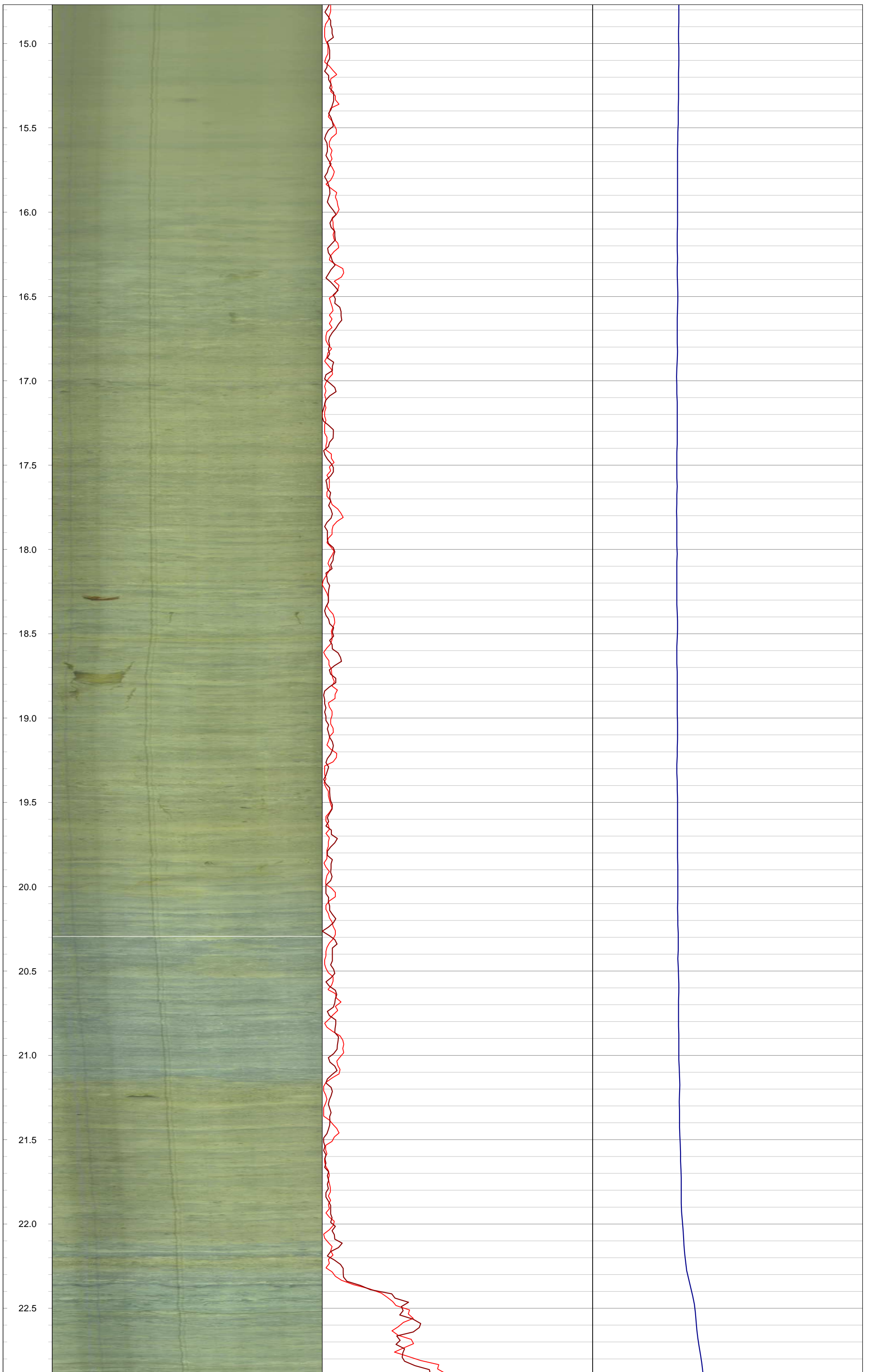
**Datum:** NAD83, UTM Zone 17N      **Depth Reference:** "0" at Ground      **Casing Depth:** 3.15 m bgs      **Location:** Caledon, Ontario  
**Easting:** 577733.06 m      **Drilled Depth:** 24.64 m bgs      **Water Level:** 4.70 m bgs      **Log Date:** Apr-27-2020  
**Northing:** 4853579.97 m      **Borehole Diameter:** HQ      **Borehole Inclination:** 0 degs      **Logged By:** PG  
**Elevation:** 411.42 m asl      **Casing Diameter:** 152 mm      **Casing Stickup:** 0.46 m ags

**Notes:**













**GOLDER**  
MEMBER OF WSP

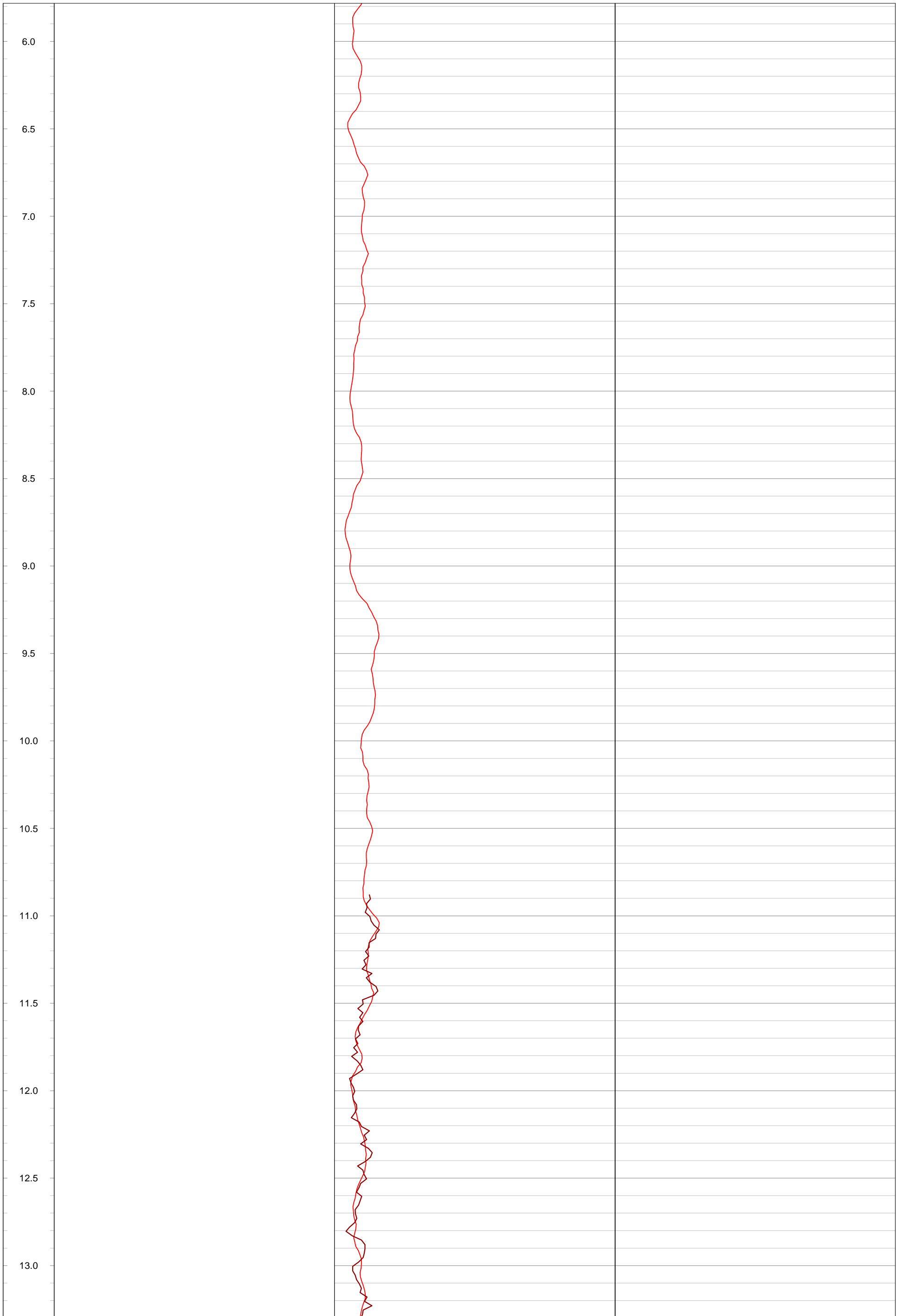
**Geophysical Record of Borehole: BH20-20 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

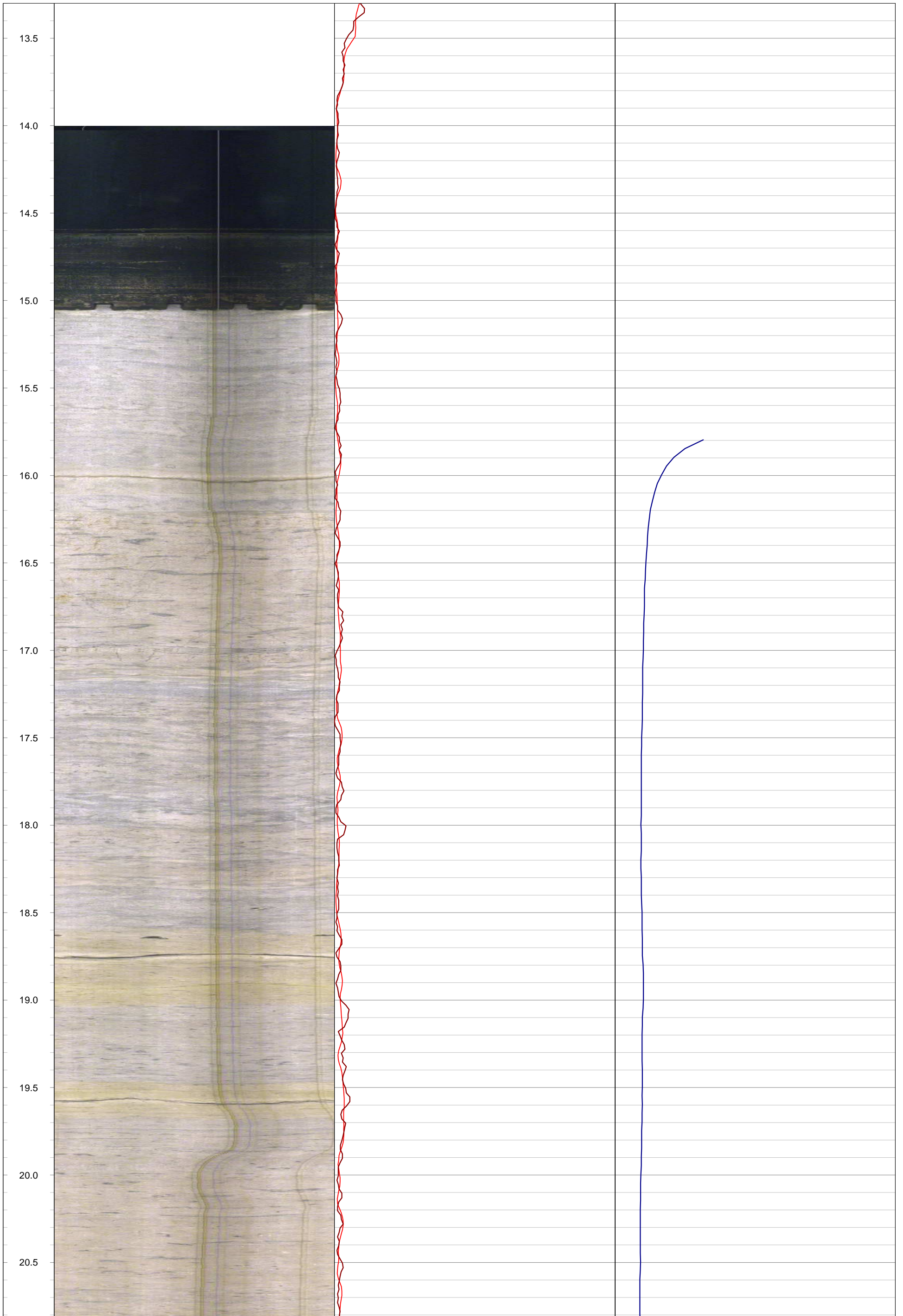
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 15.05 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577031.10 m	<b>Drilled Depth:</b> 40.98 m bgs	<b>Water Level:</b> 11.71 m bgs	<b>Log Date:</b> May-20-2020
<b>Northing:</b> 4853551.56 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 423.60 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.39 m ags	

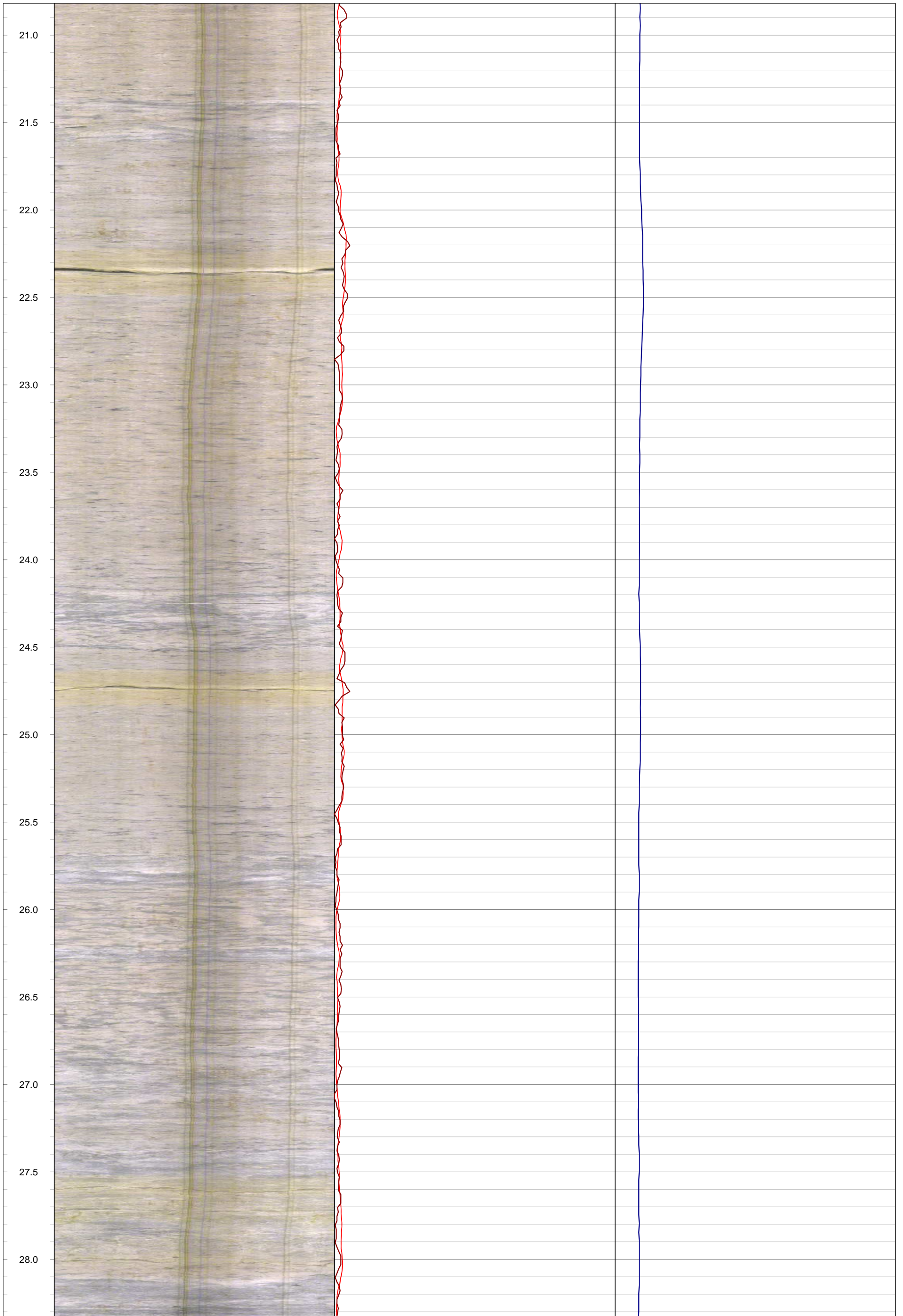
**Notes:** OBI image opaque > 40.78 m bgs

Depth	OBI Image - MN					Natural Gamma - Down		Apparent Conductivity - Up	
	0°	90°	180°	270°	0°	0	200	0	50
1m:20m						Natural Gamma - Up			
					0	cps	200		
0.5									
1.0									
1.5									
2.0									
2.5									
3.0									
3.5									
4.0									
4.5									
5.0									
5.5									

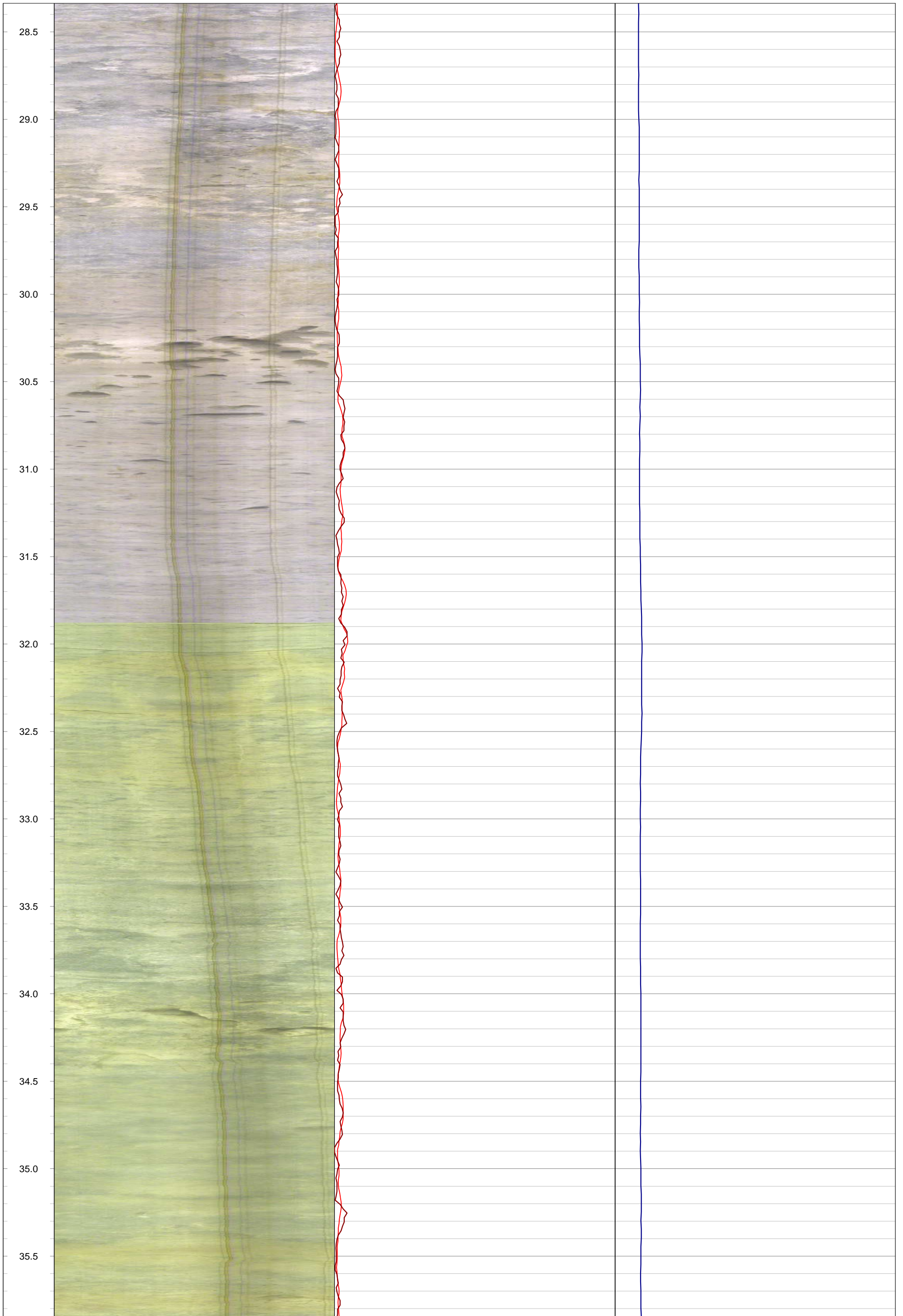


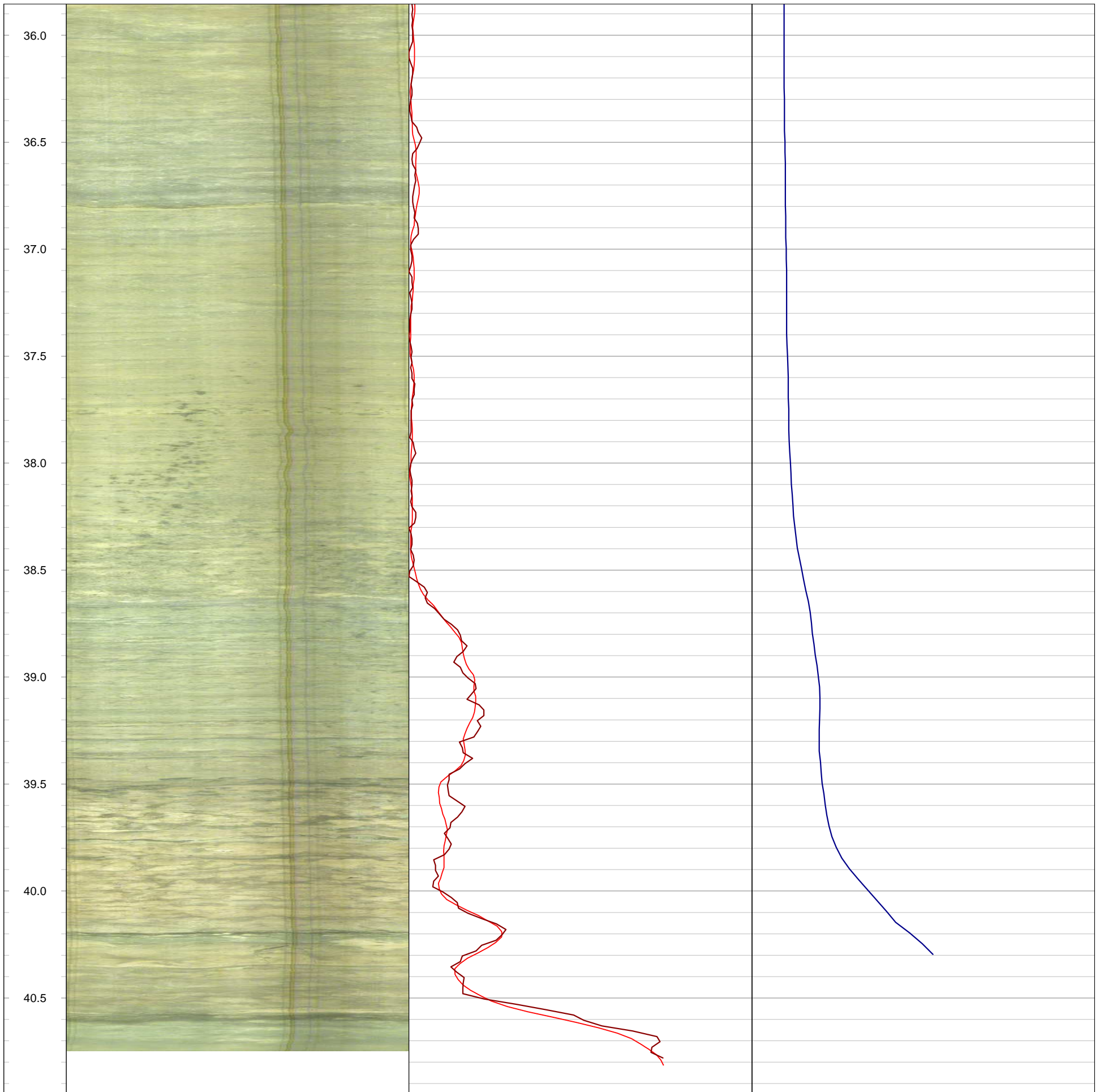














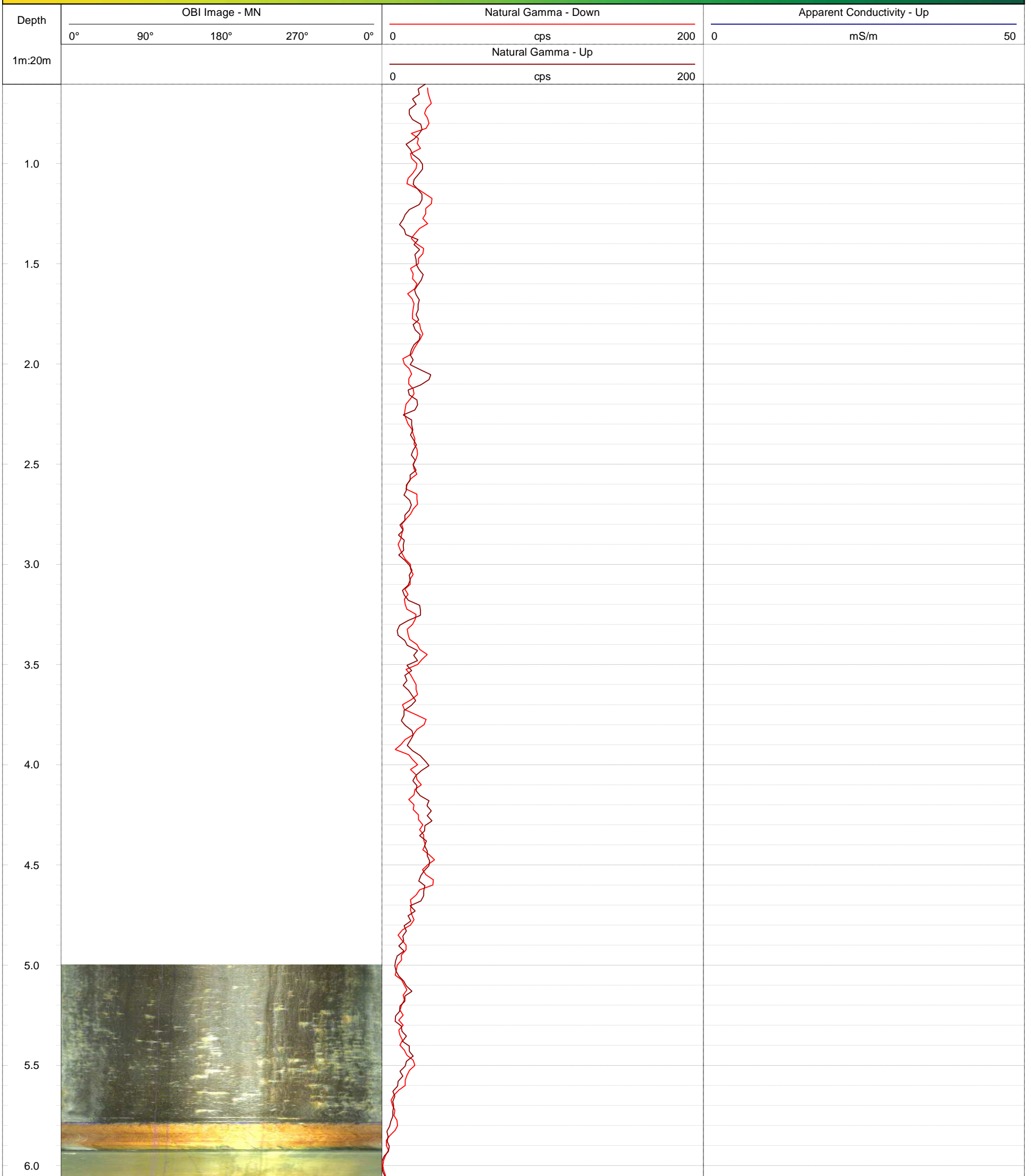
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-21 (CAL)**

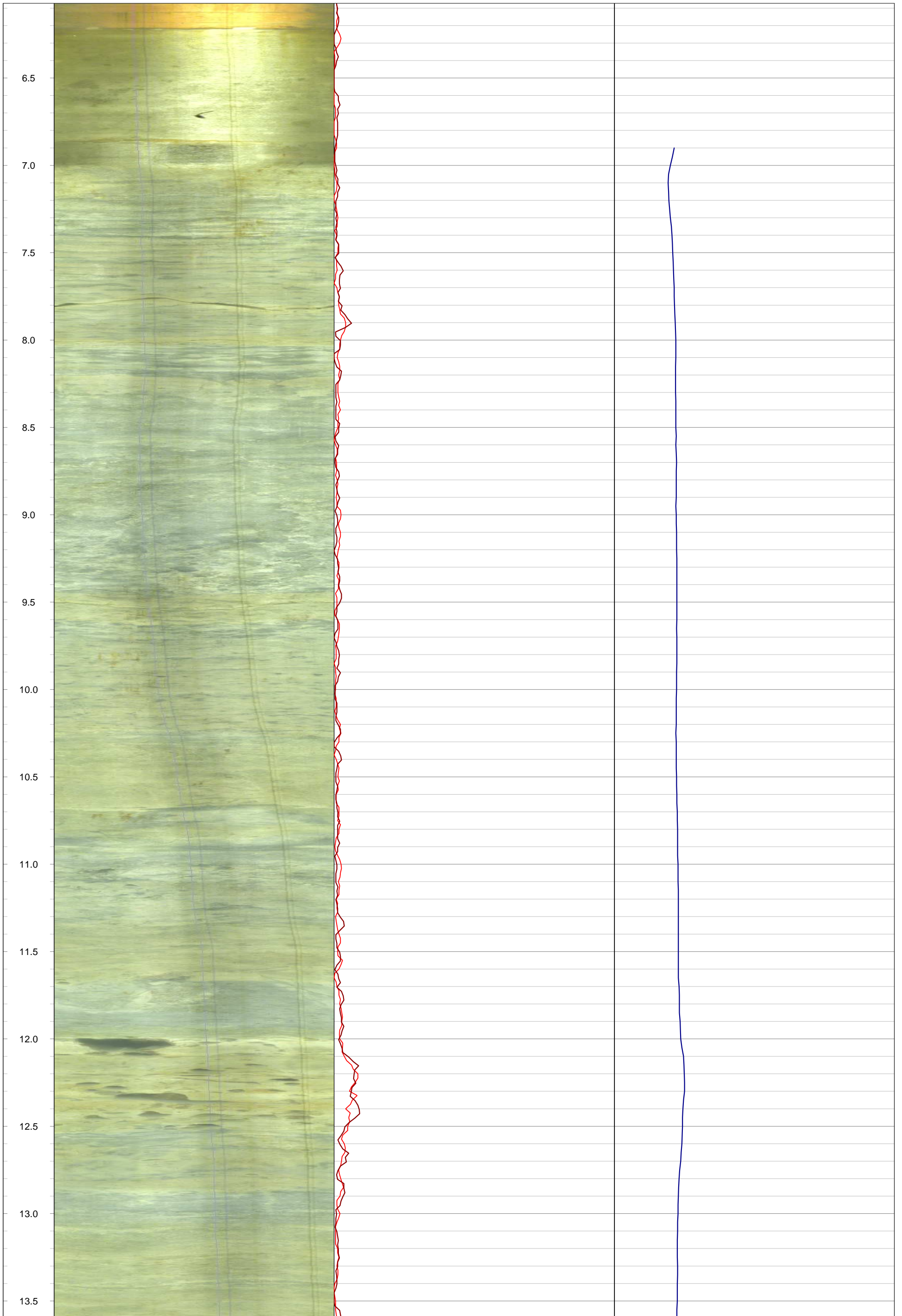
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

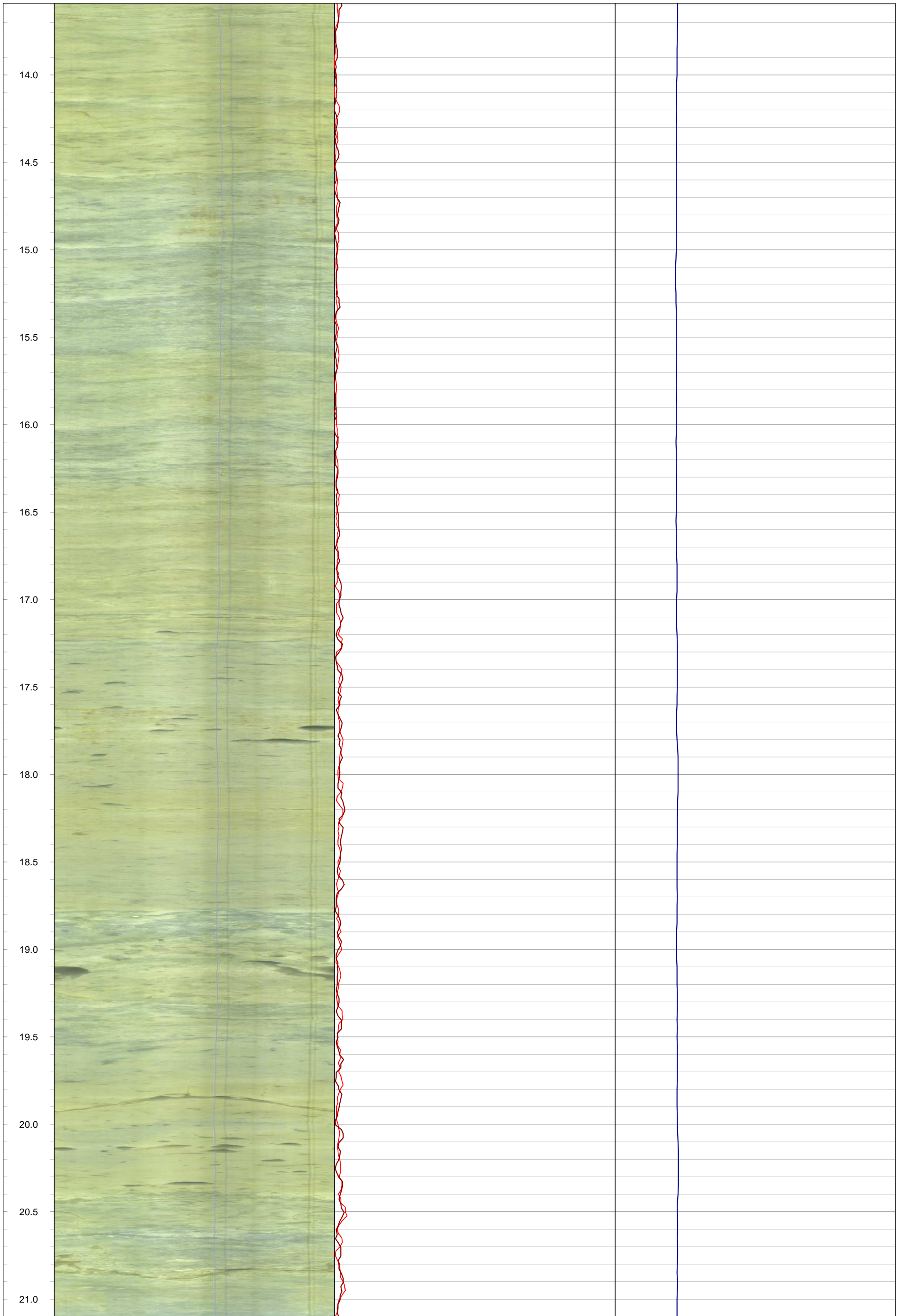
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.21 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576935.66 m    **Drilled Depth:** 33.48 m bgs    **Water Level:** 5.92 m bgs    **Log Date:** May-20-2020  
**Northing:** 4853276.58 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 413.53 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.08 m ags

**Notes:** OBI image opaque > 33.1 m bgs

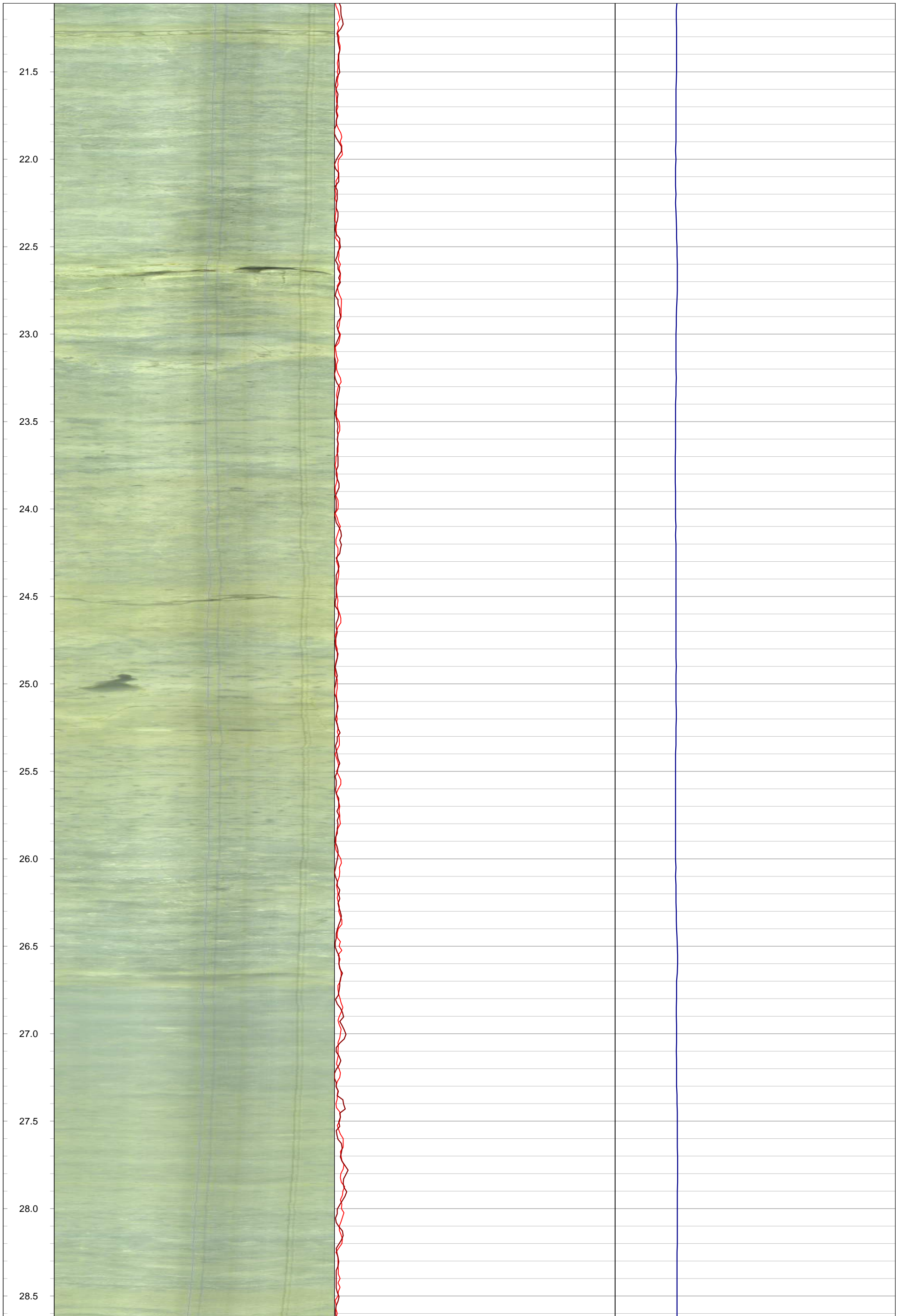




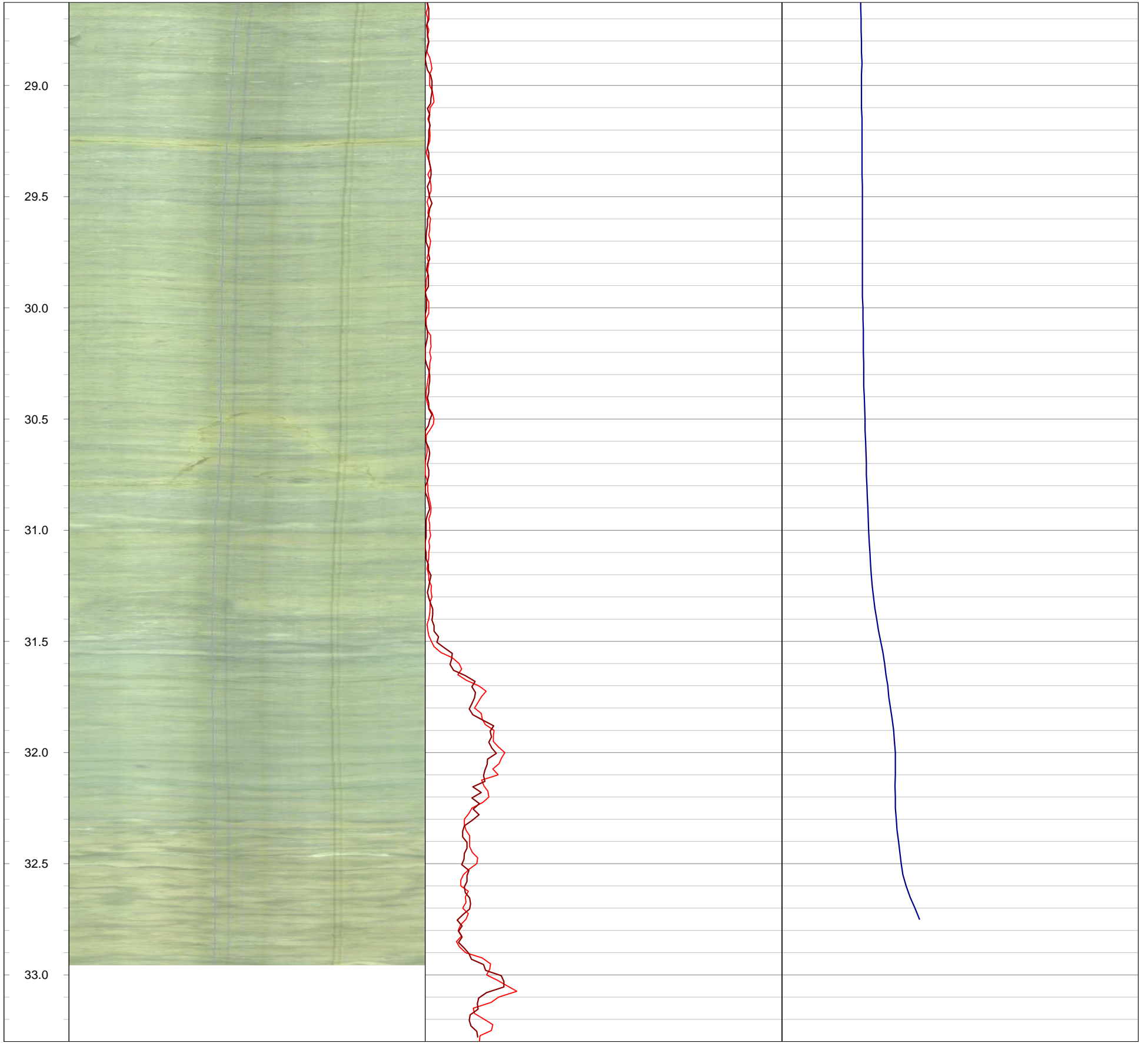














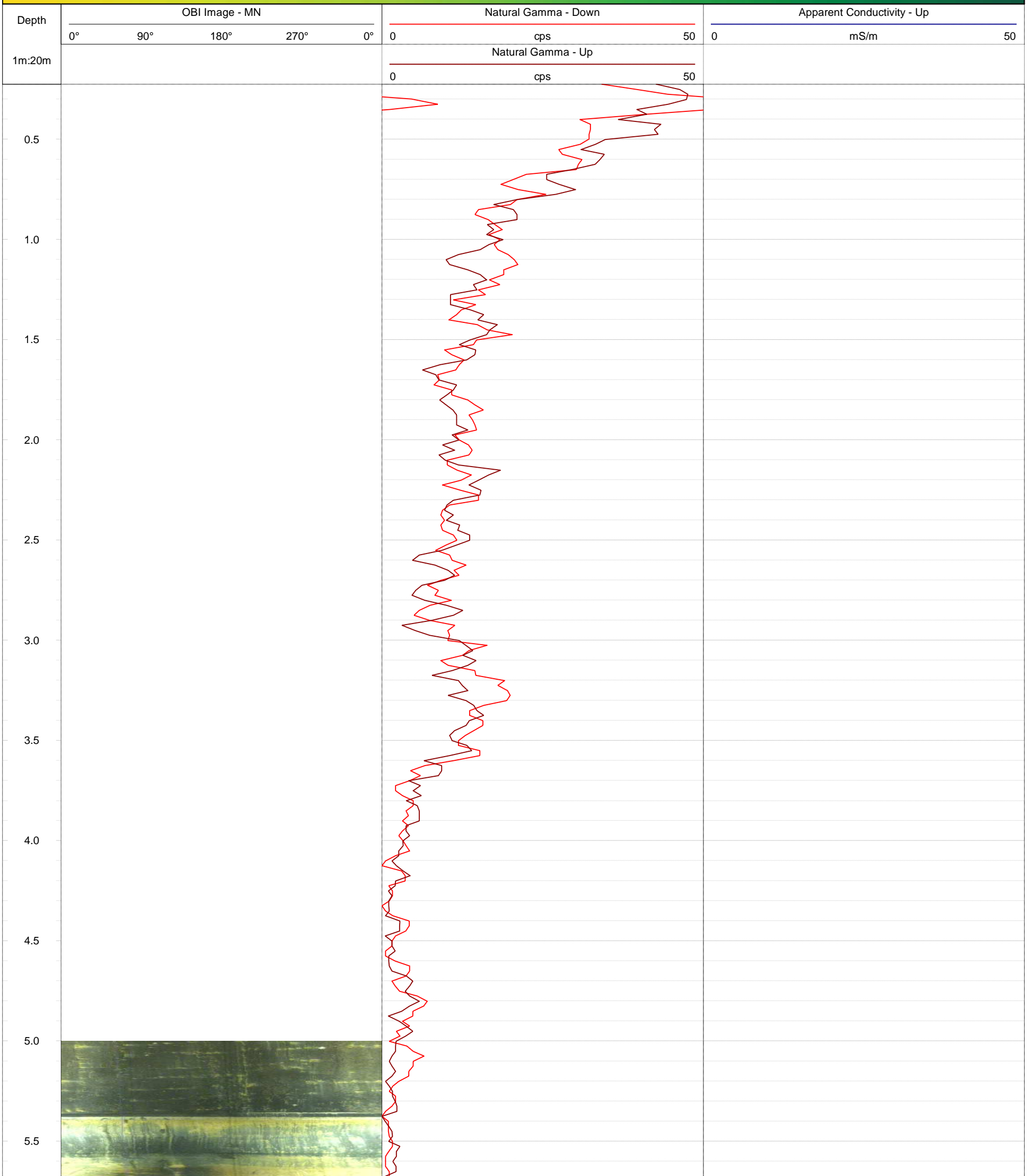
**GOLDER**  
MEMBER OF WSP

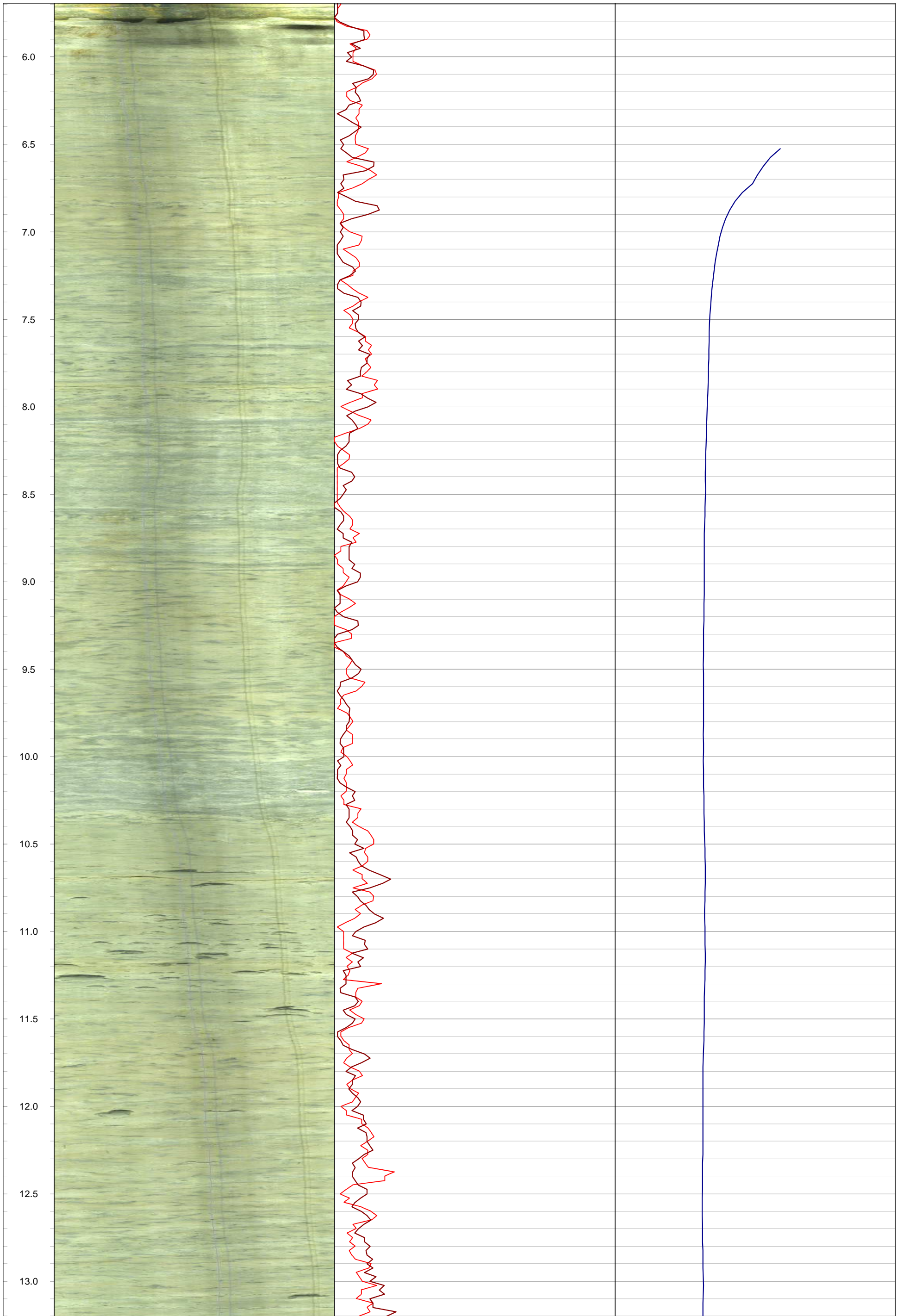
**Geophysical Record of Borehole: BH20-22 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

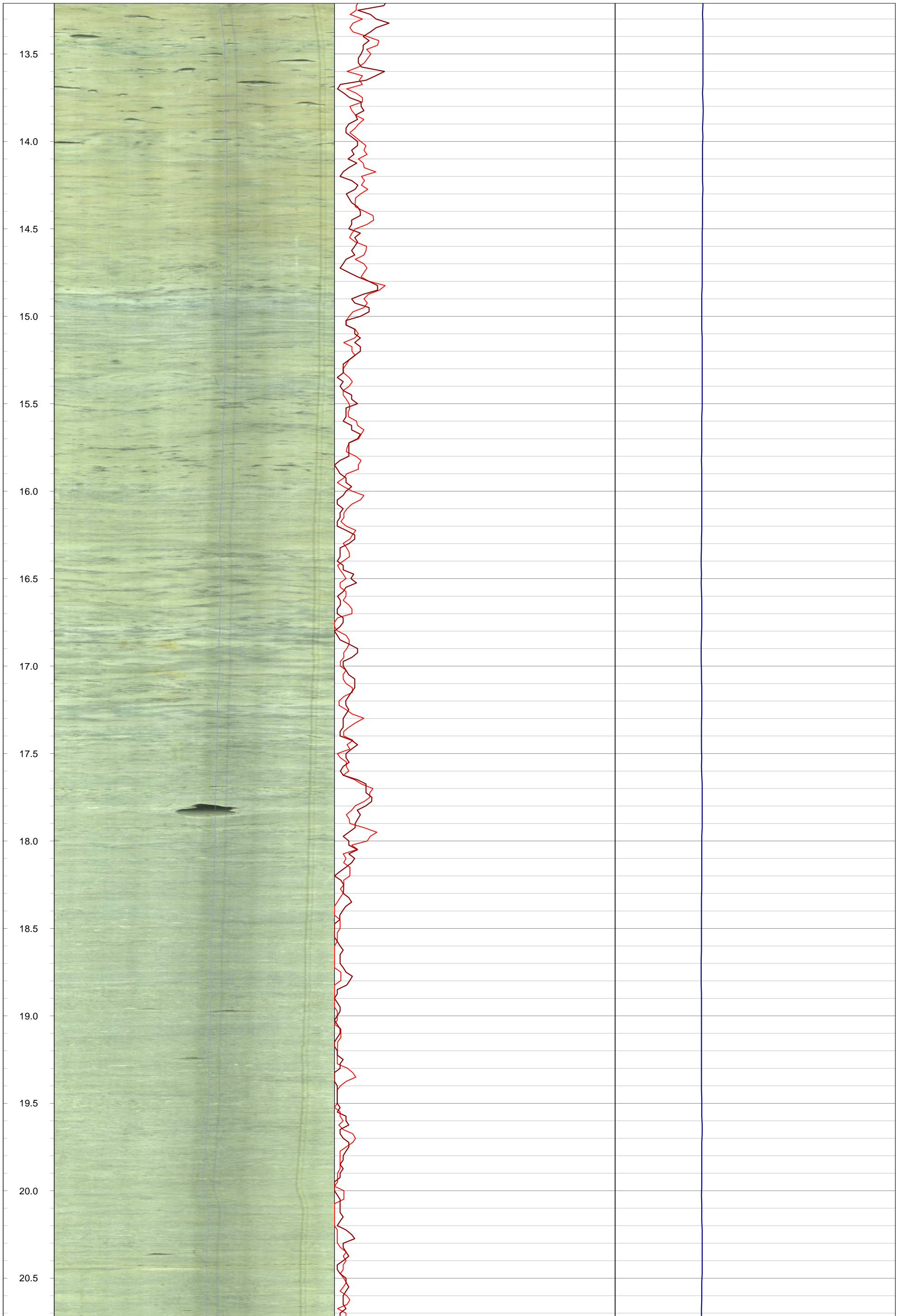
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.77 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576701.79 m	<b>Drilled Depth:</b> 28.61 m bgs	<b>Water Level:</b> 2.88 m bgs	<b>Log Date:</b> May-20-2020
<b>Northing:</b> 4853293.98 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 410.98 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.47 m ags	

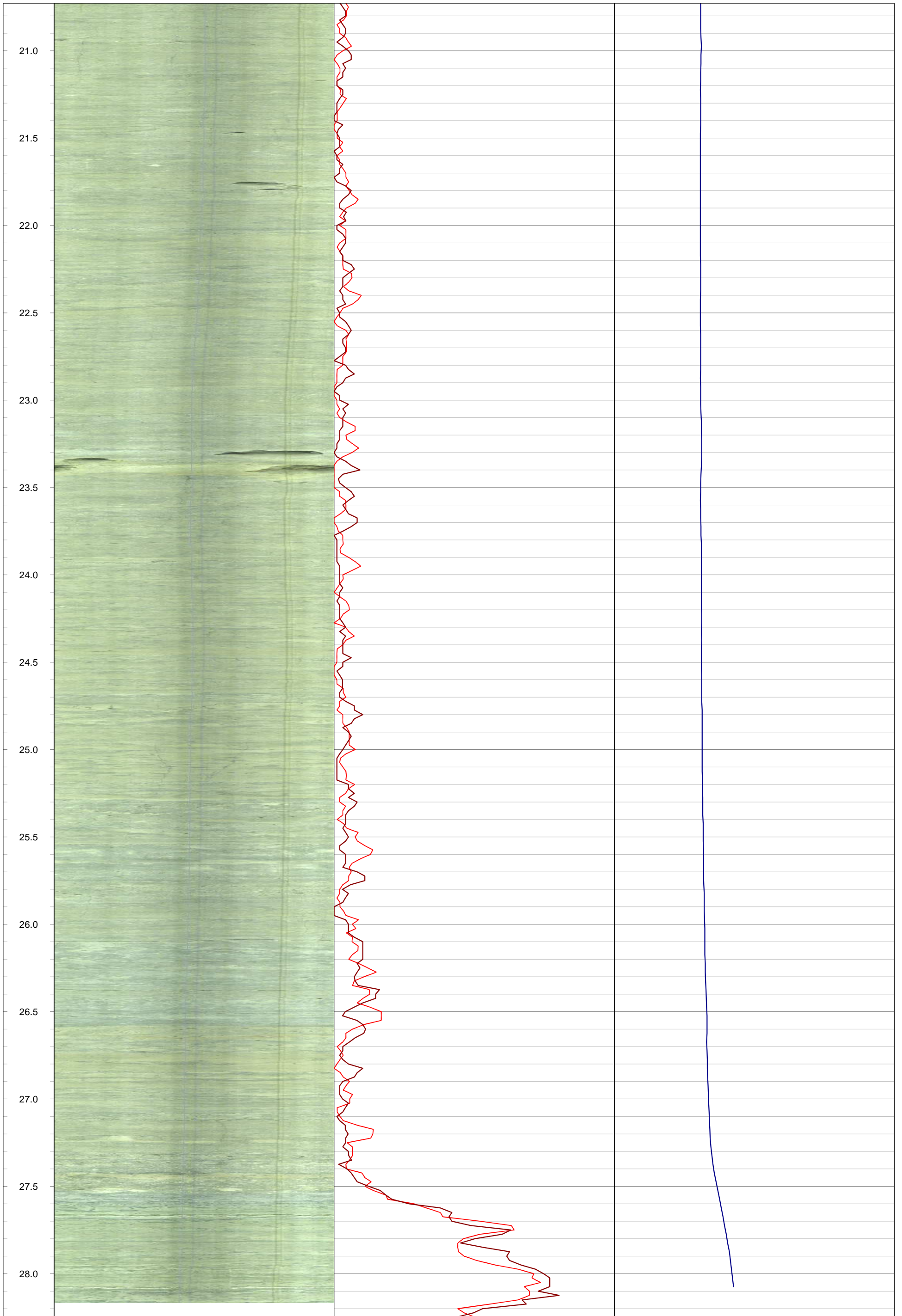
**Notes:**











			
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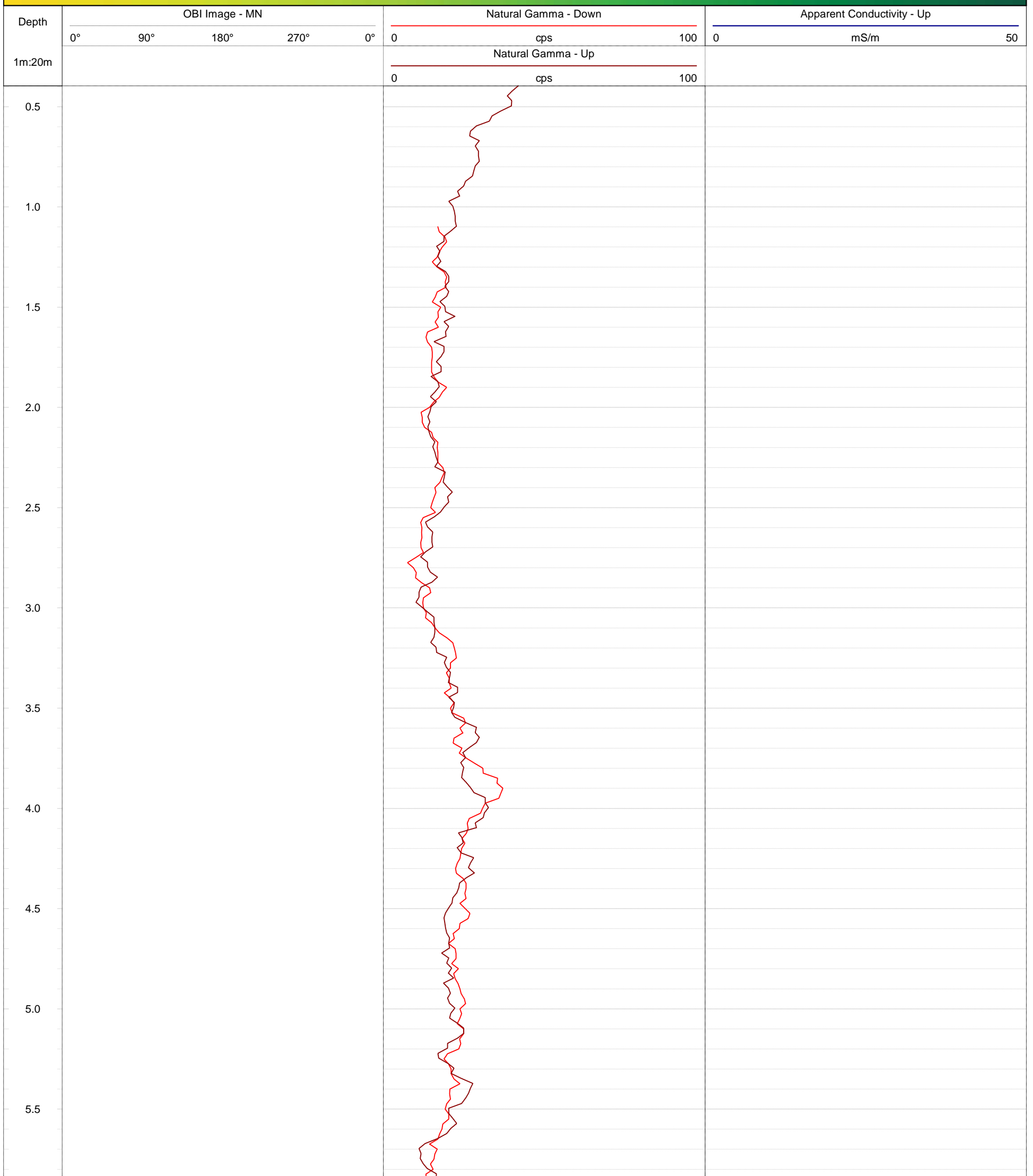
**GOLDER**  
MEMBER OF WSP

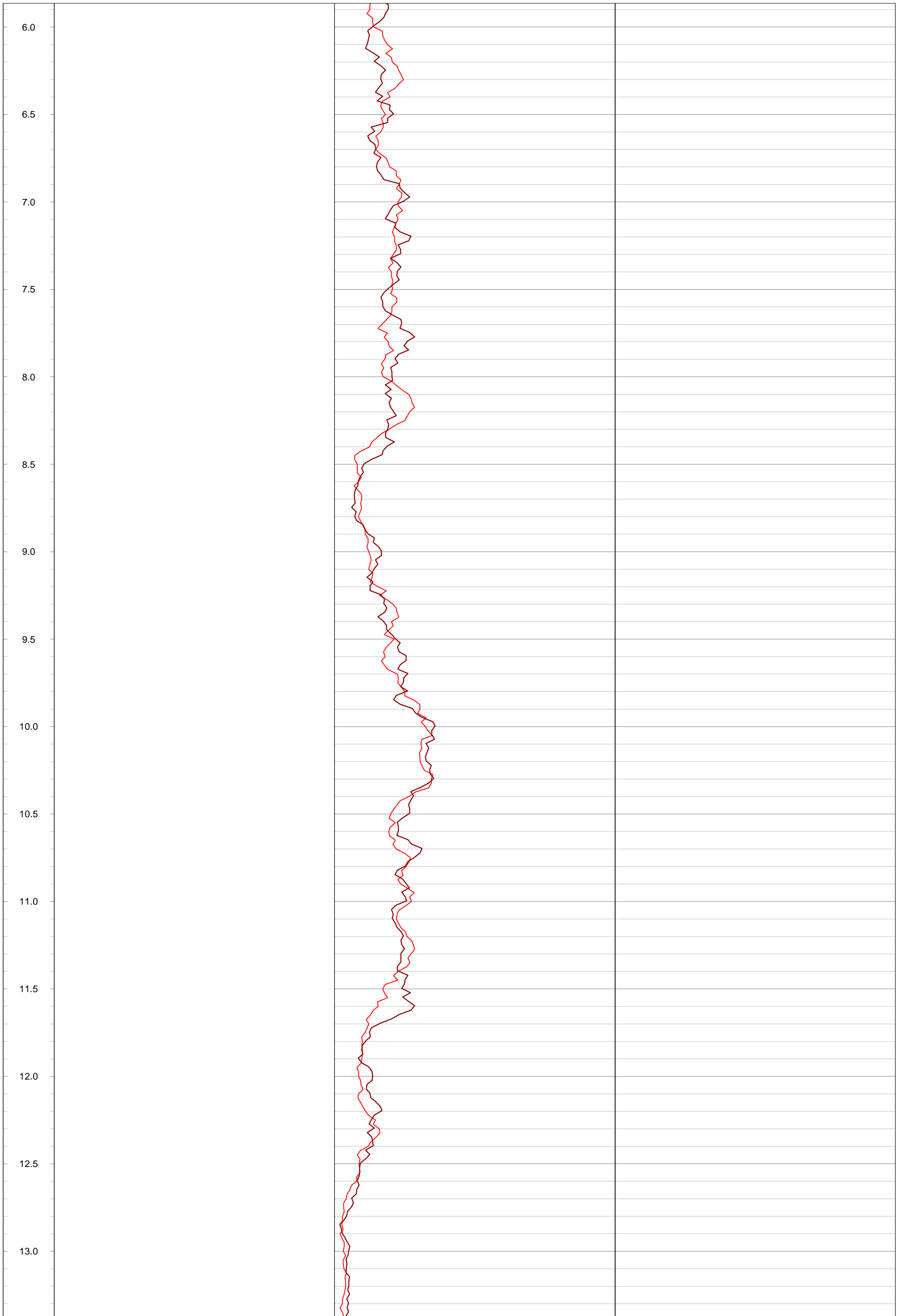
**Geophysical Record of Borehole: BH20-23 (CAL)**

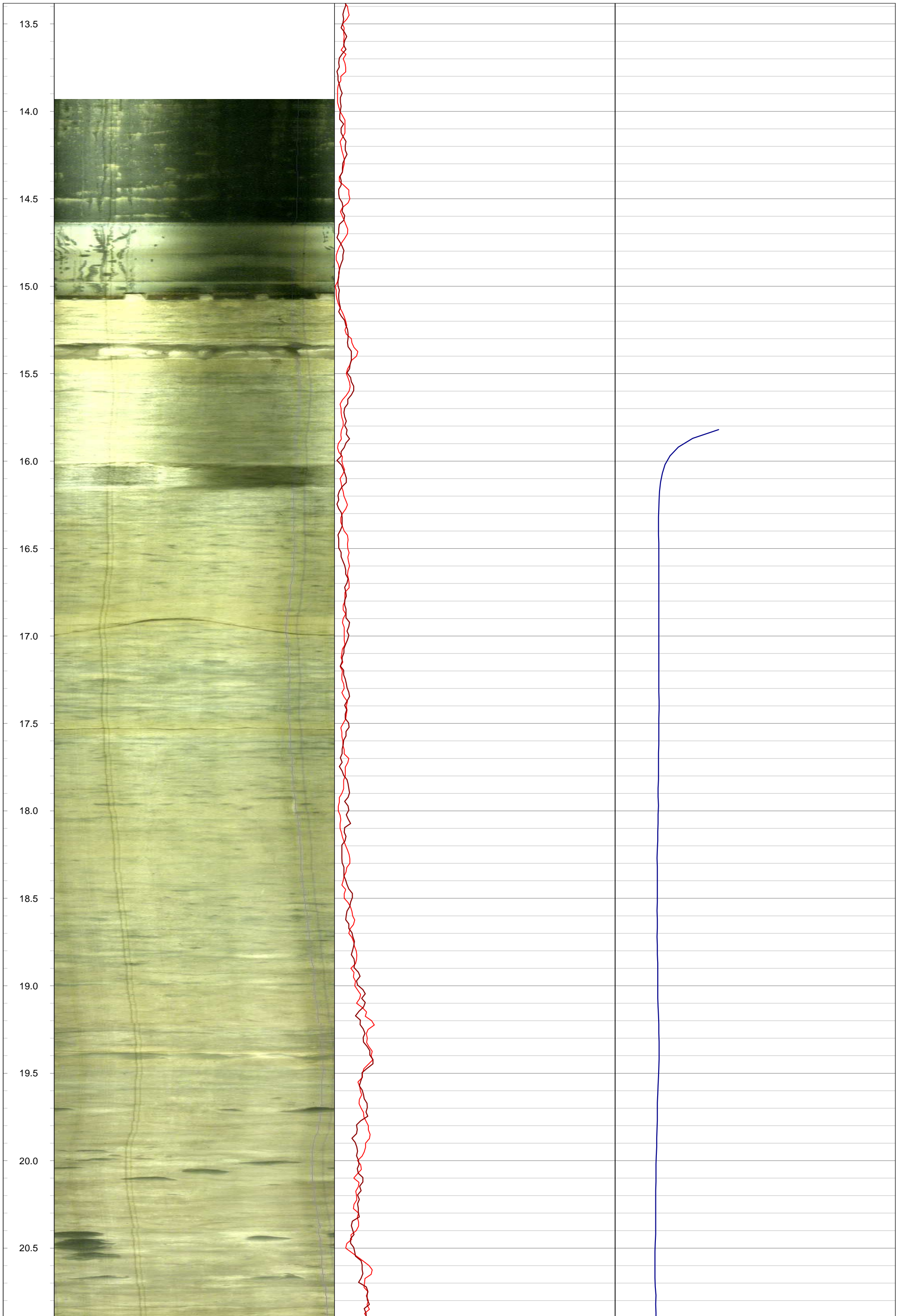
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.08 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576779.85 m    **Drilled Depth:** 37.62 m bgs    **Water Level:** 2.50 m bgs    **Log Date:** May-25-2020  
**Northing:** 4853559.83 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 420.27 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.36 m ags

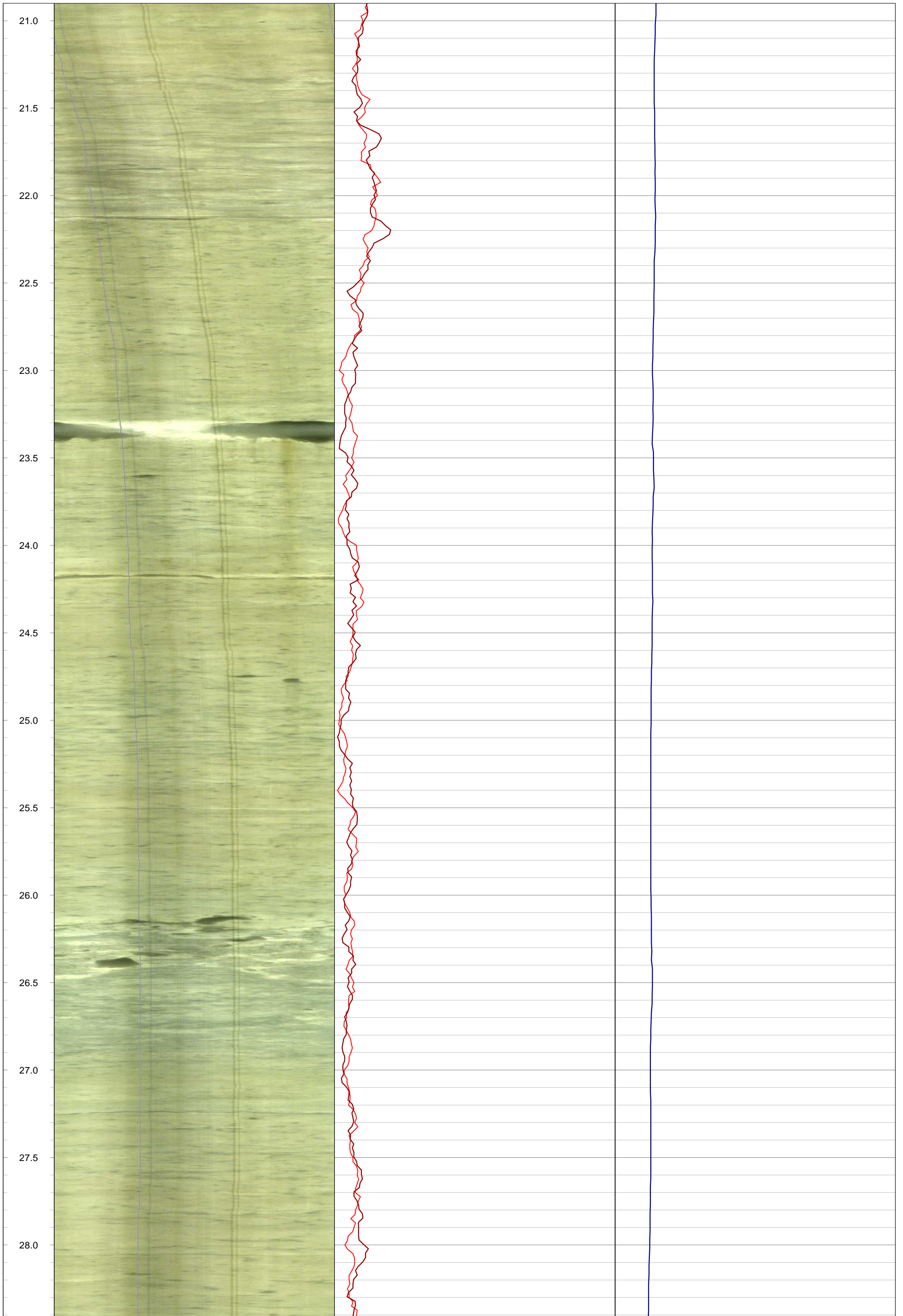
**Notes:** OBI image opaque > 37 m bgs

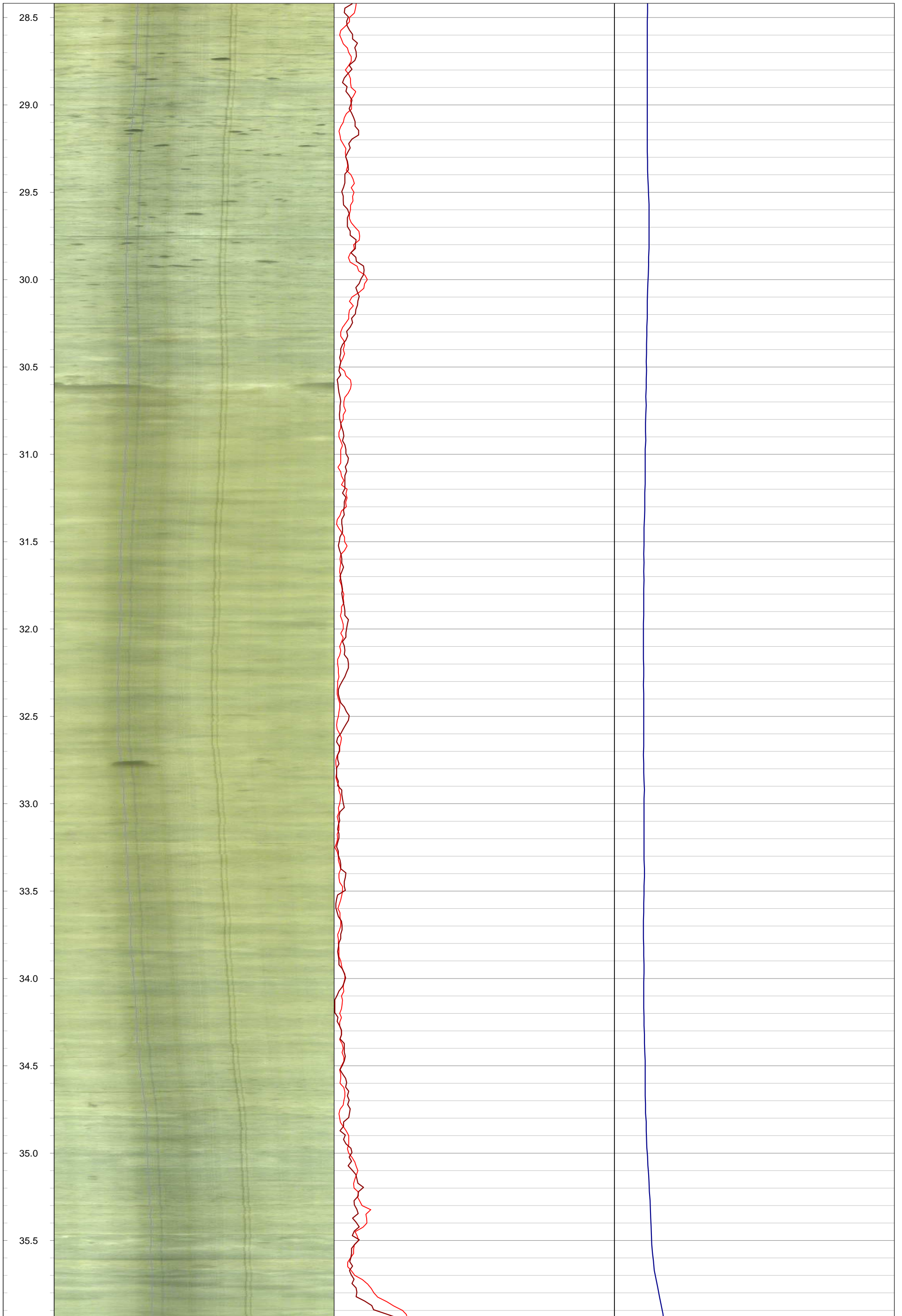


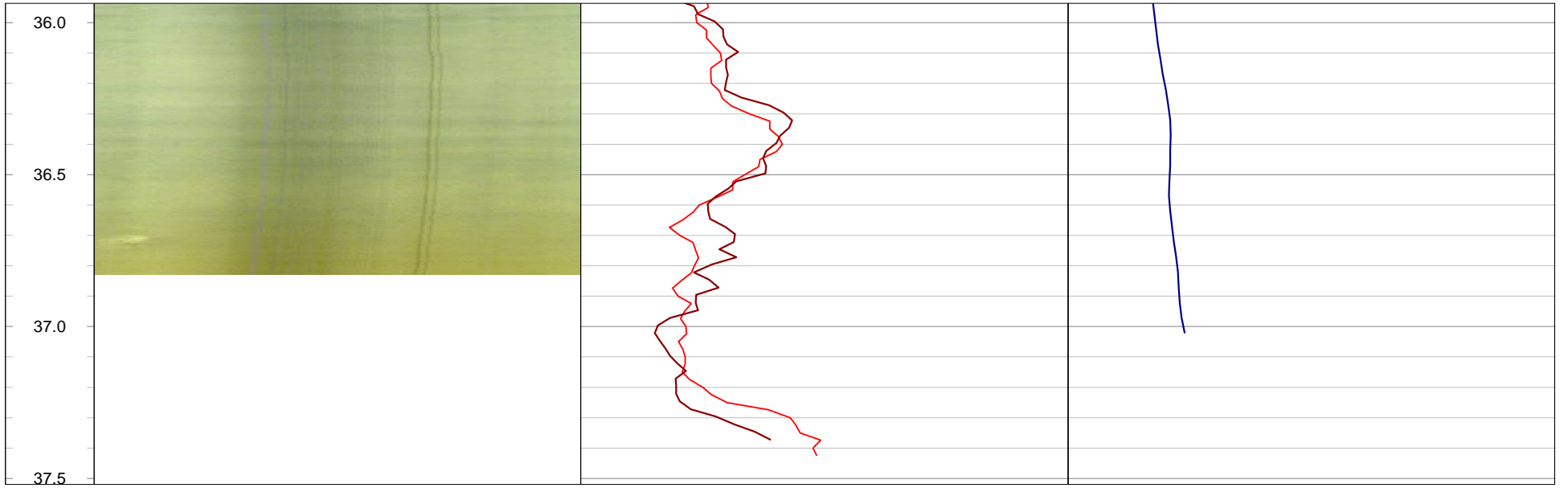
















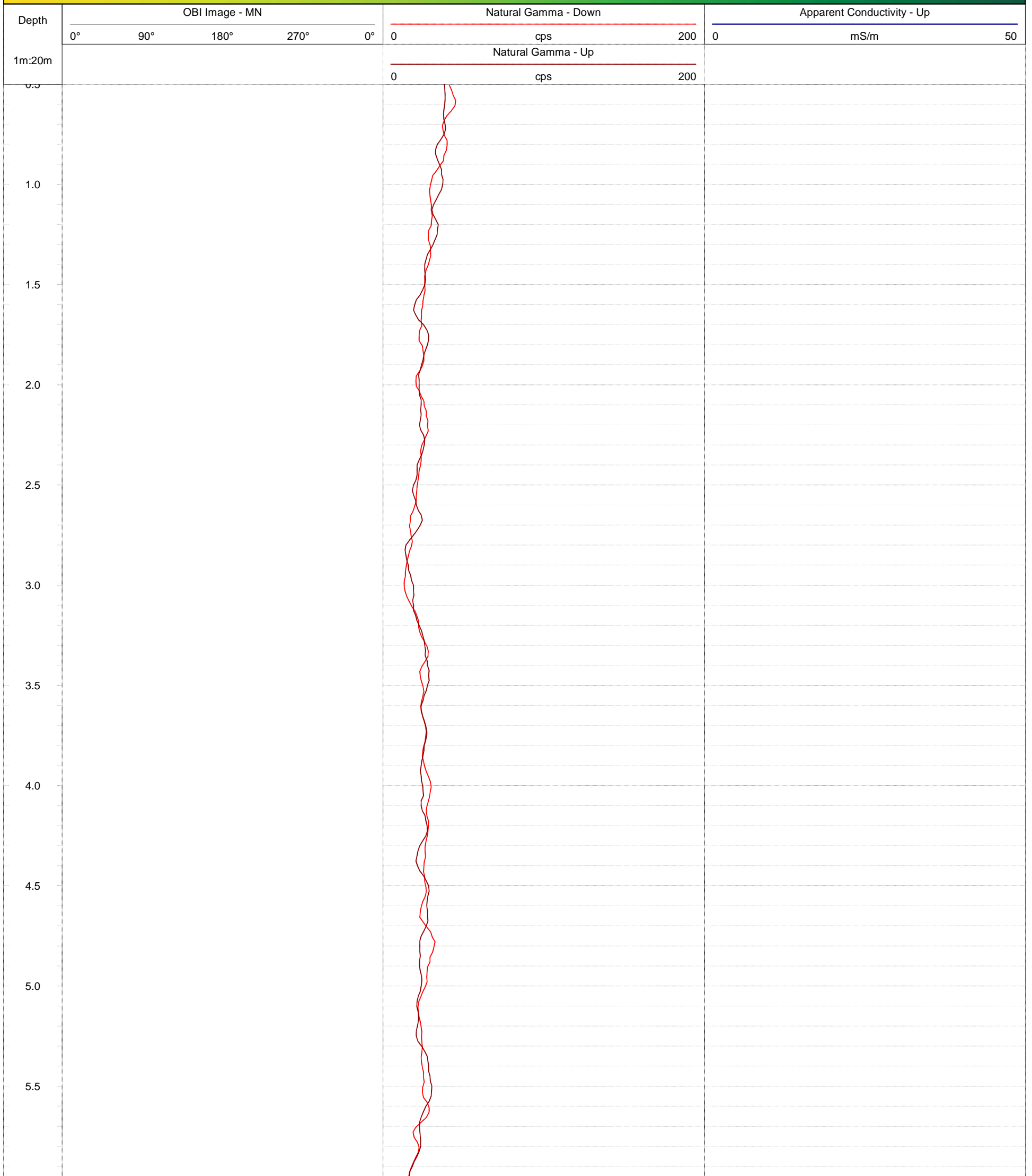
**GOLDER**  
MEMBER OF WSP

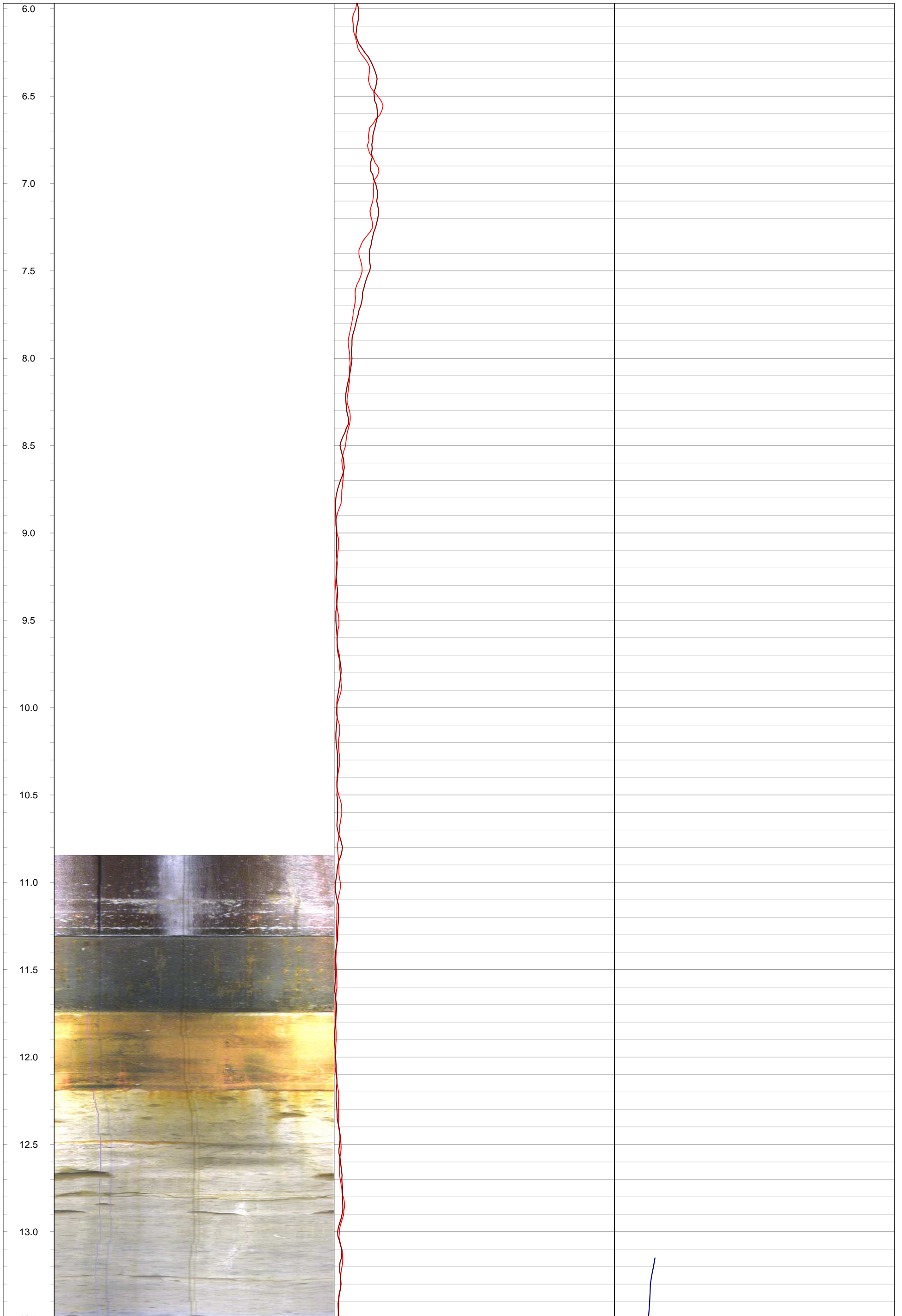
**Geophysical Record of Borehole: BH20-24 (CAL)**

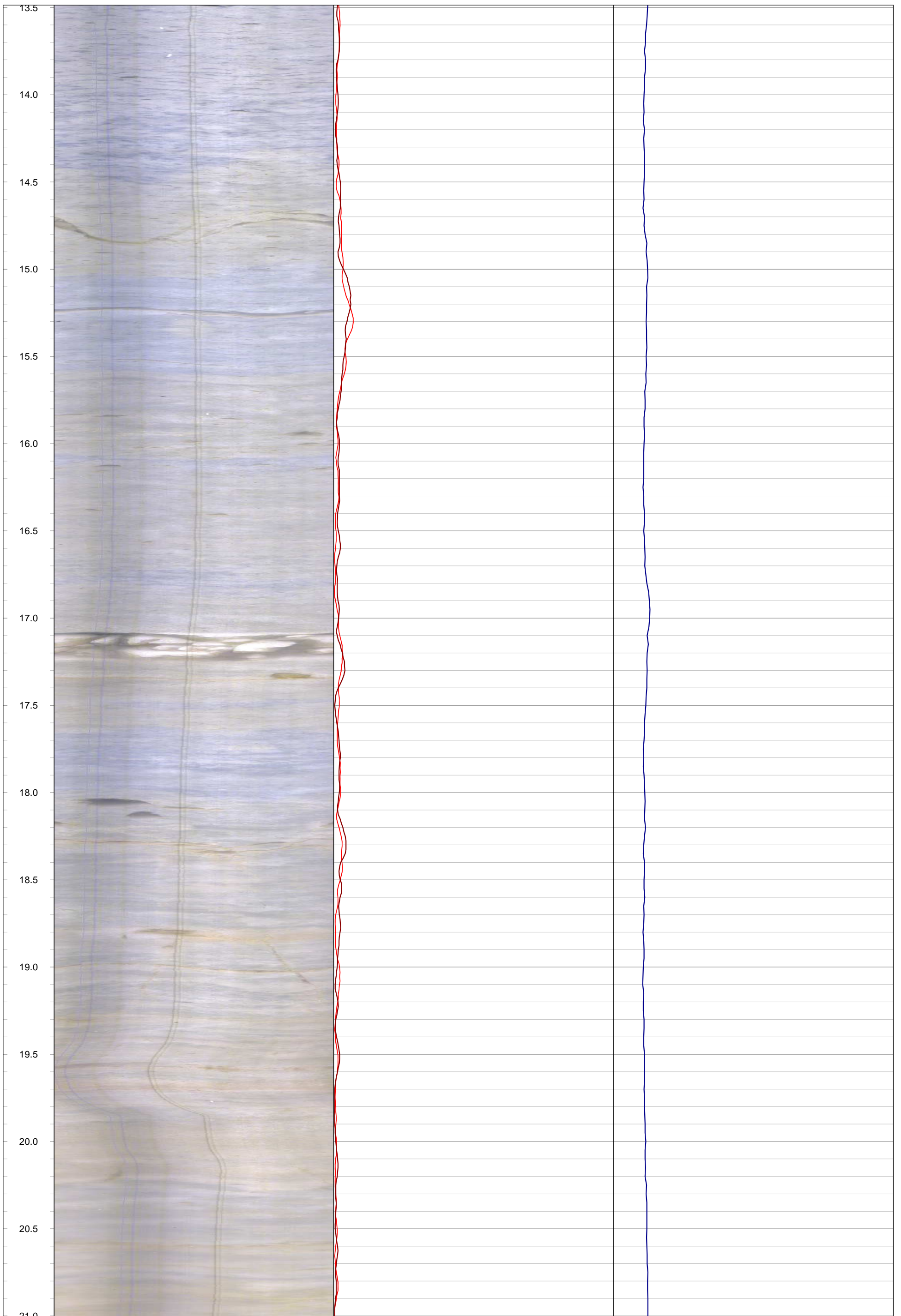
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.20 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577296.02 m    **Drilled Depth:** 22.76 m bgs    **Water Level:** 11.28 m bgs    **Log Date:** Jun-08-2020  
**Northing:** 4852710.32 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 403.60 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.20 m ags

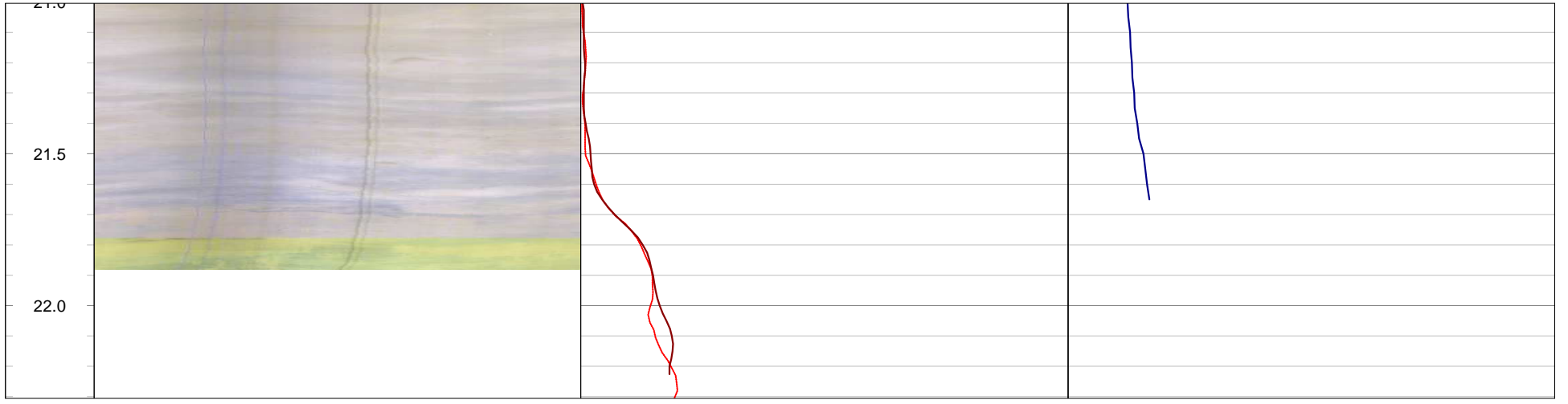
**Notes:**













**GOLDER**  
MEMBER OF WSP

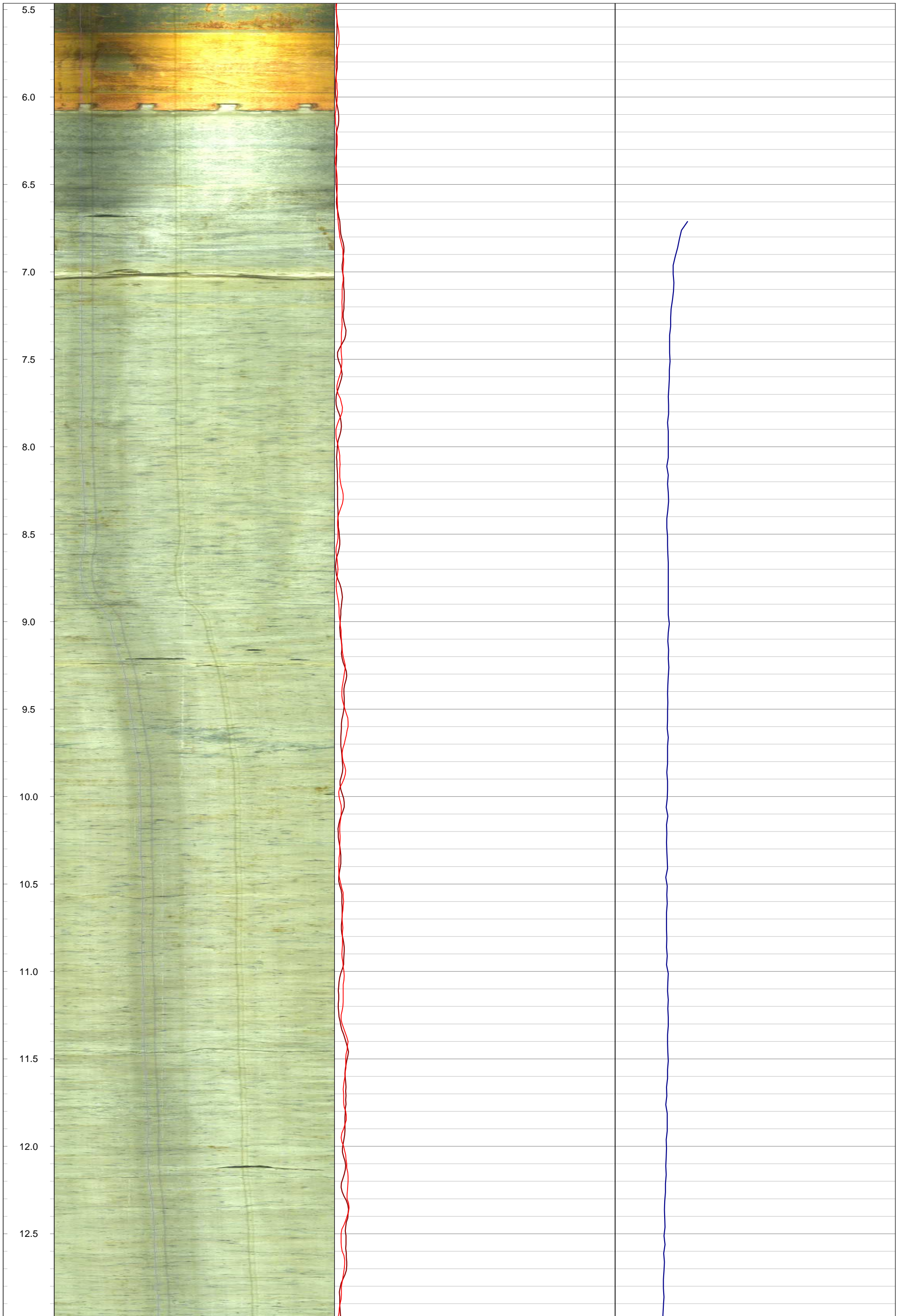
**Geophysical Record of Borehole: BH20-25 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

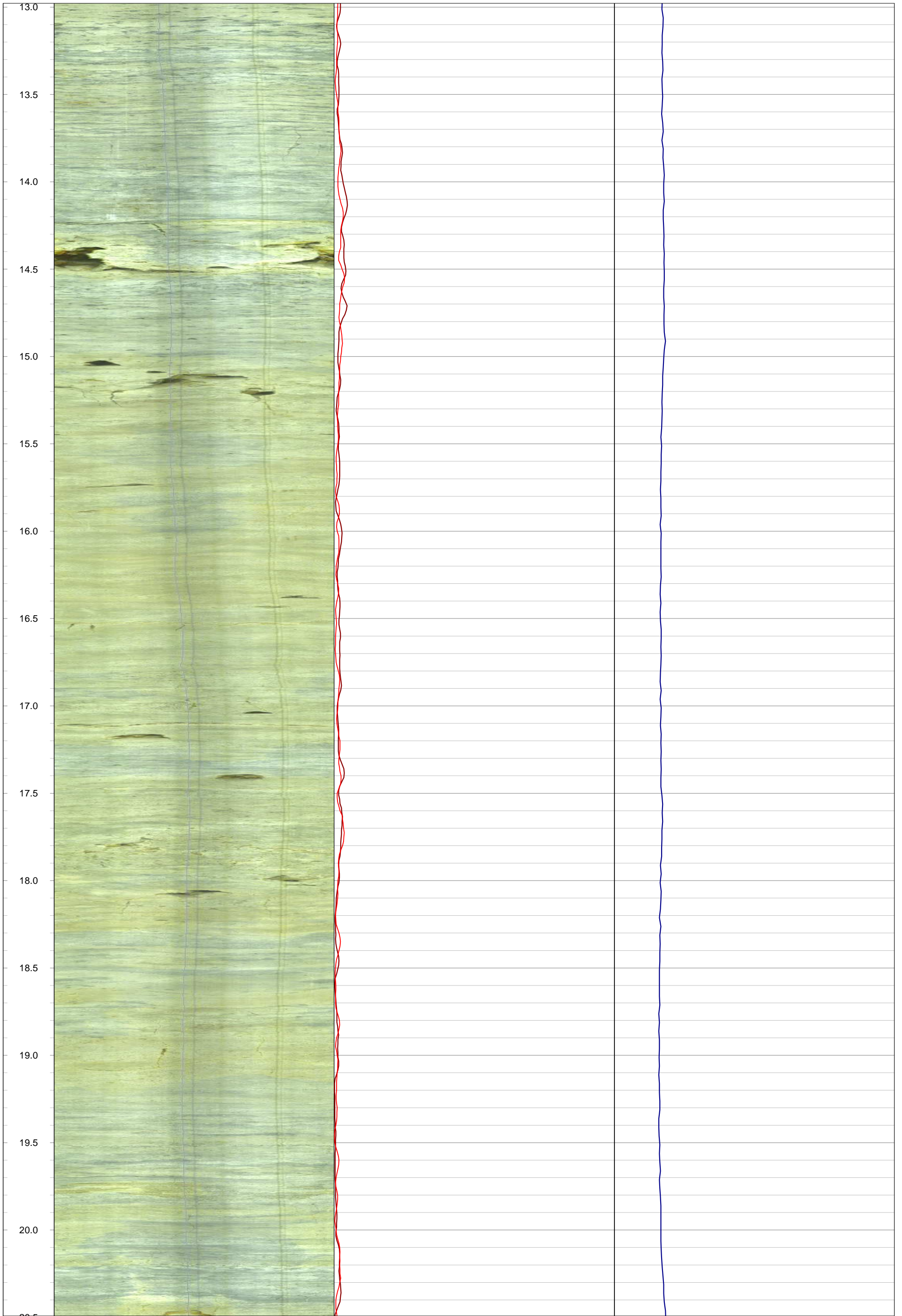
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.08 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577402.13 m    **Drilled Depth:** 22.03 m bgs    **Water Level:** 4.03 m bgs    **Log Date:** Jun-15-2020  
**Northing:** 4852974.96 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 405.48 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.22 m ags

**Notes:**

Depth	OBI Image - MN					Natural Gamma - Up		Apparent Conductivity - Up		
	0°	90°	180°	270°	0°	0	200	0	50	
1m:20m						Natural Gamma - Down				
0.0						0	cps	200		
0.5						Natural Gamma - Down				
1.0						0	cps	200		
1.5						Natural Gamma - Down				
2.0						0	cps	200		
2.5						Natural Gamma - Down				
3.0						0	cps	200		
3.5						Natural Gamma - Down				
4.0						0	cps	200		
4.5						Natural Gamma - Down				
5.0						0	cps	200		











**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-26 (CAL)**

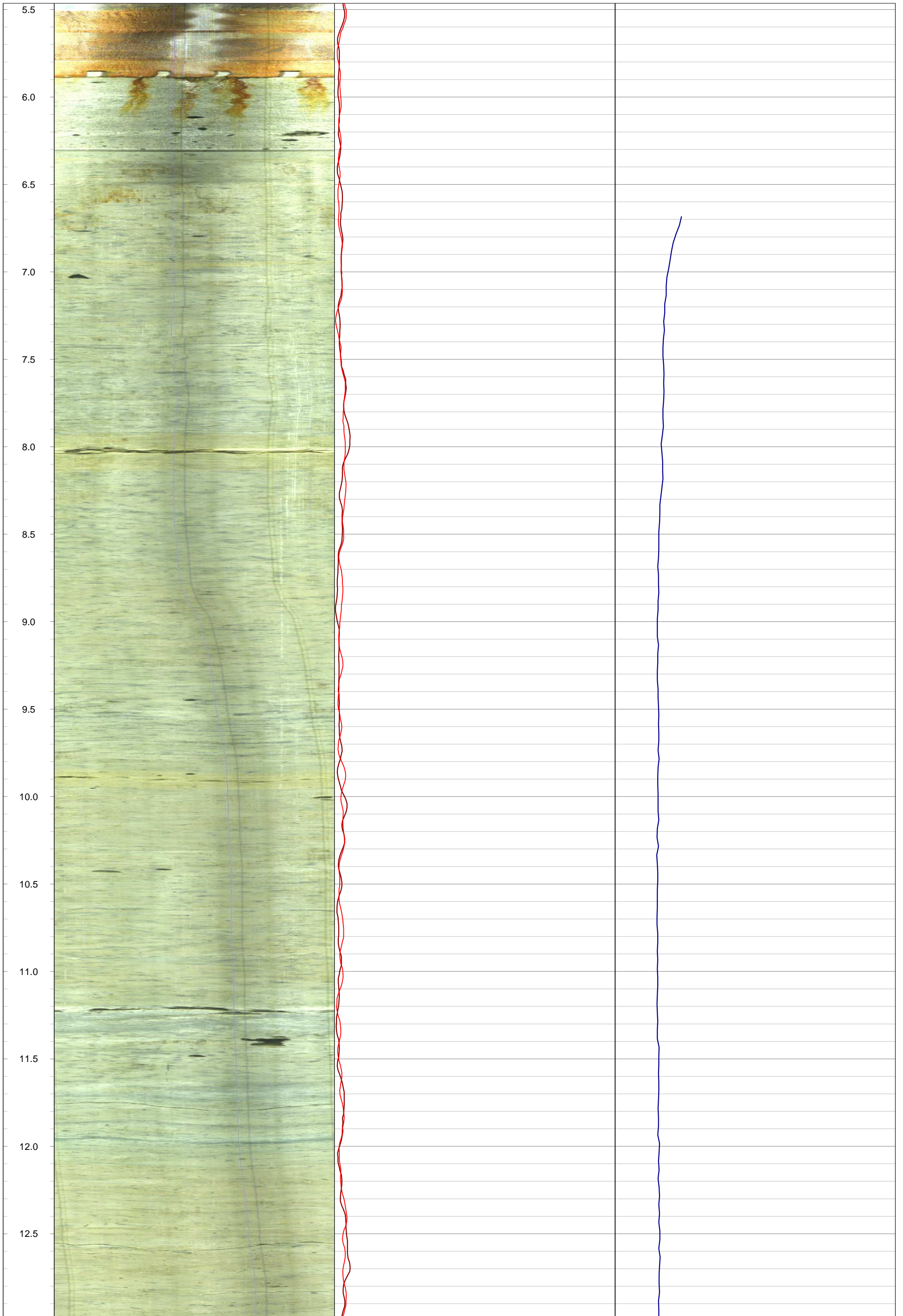
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.89 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577037.86 m    **Drilled Depth:** 22.73 m bgs    **Water Level:** 6.15 m bgs    **Log Date:** Jun-15-2020  
**Northing:** 4852942.75 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 404.82 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.39 m ags

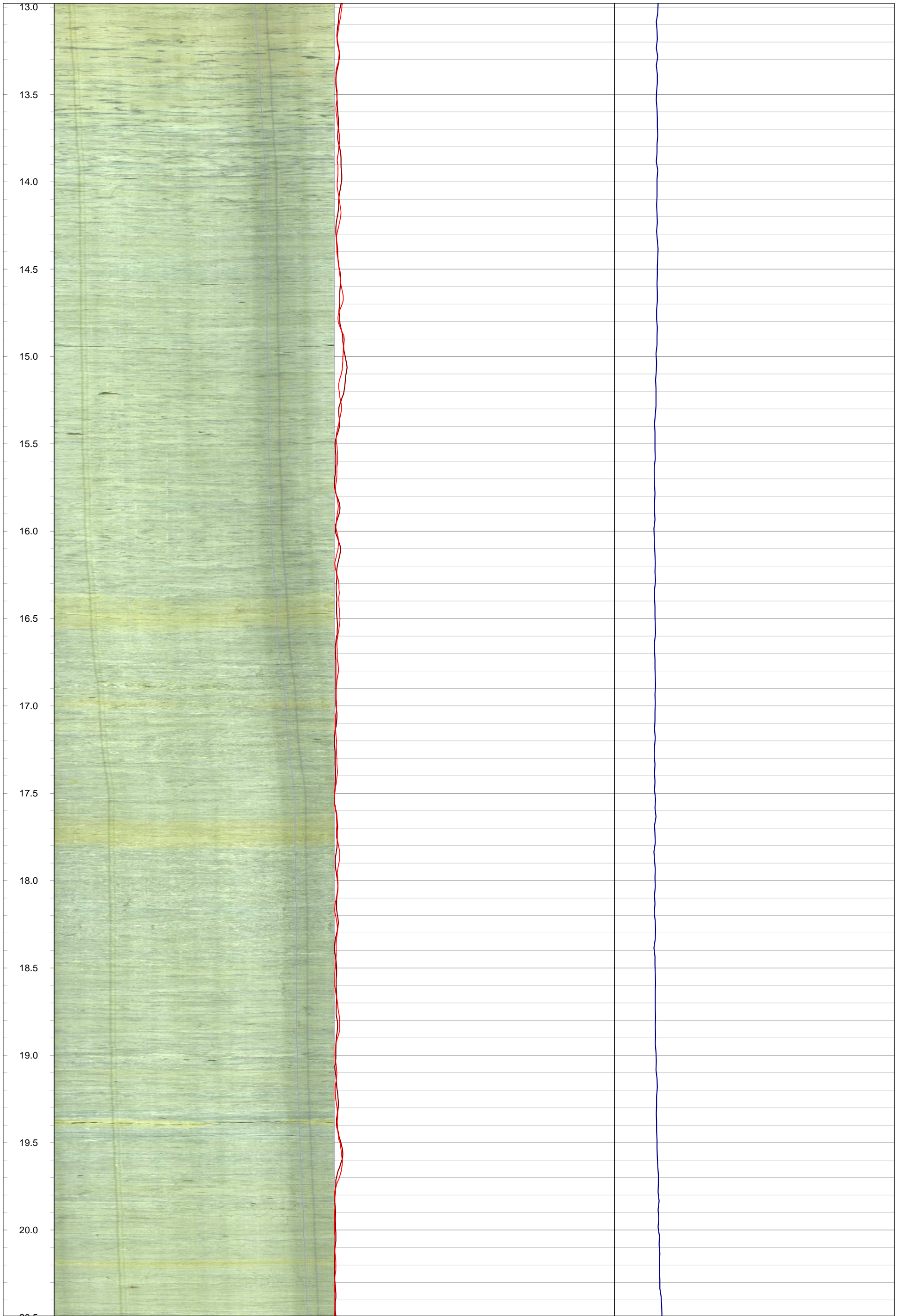
**Notes:**

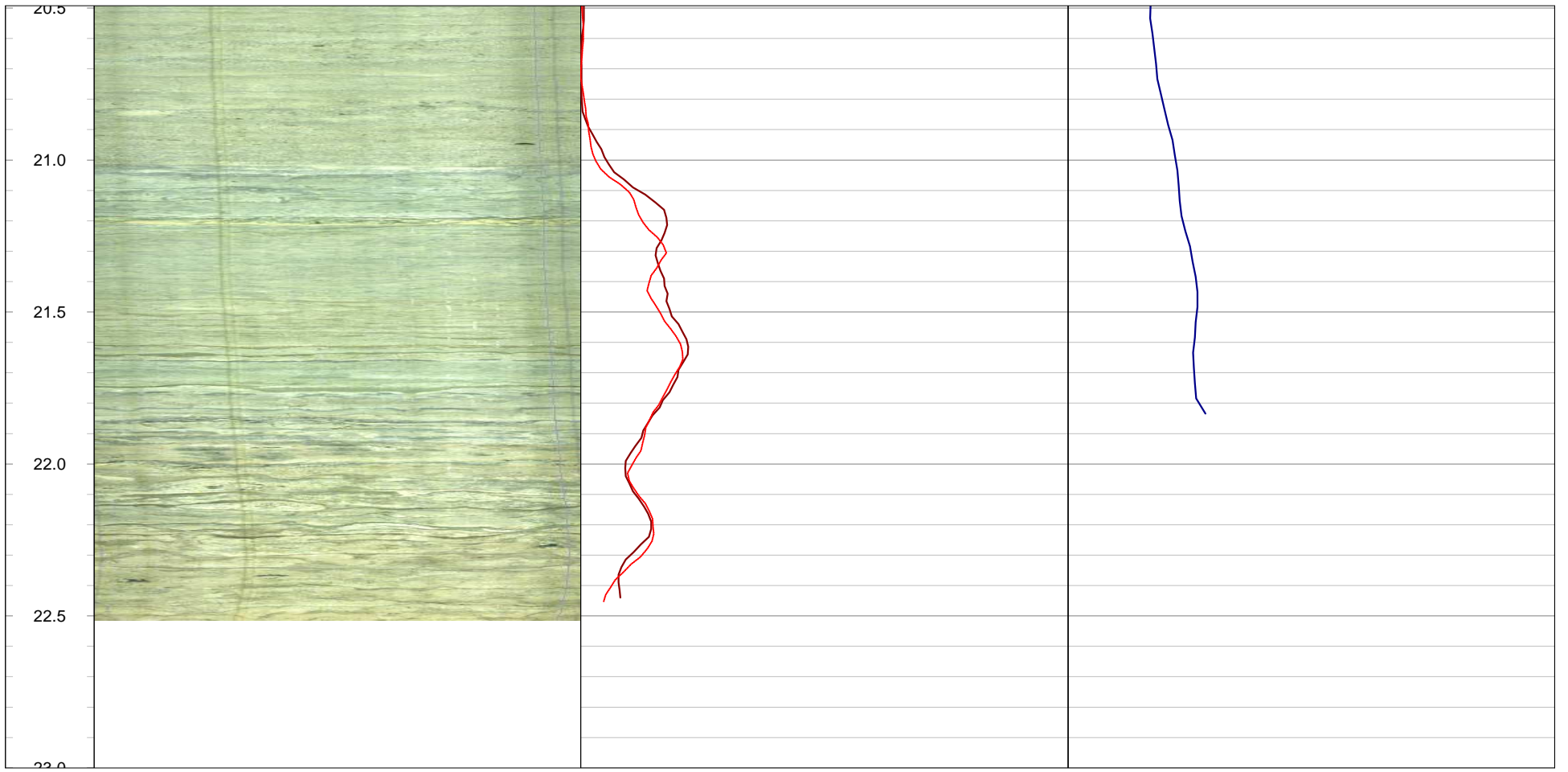
Depth	OBI Image - MN					Natural Gamma - Up		Apparent Conductivity - Up		
	0°	90°	180°	270°	0°	0	200	0	50	
1m:20m						Natural Gamma - Down				
0.0						0	cps	200		
0.5						Natural Gamma - Down				
1.0						0	cps	200		
1.5						Natural Gamma - Down				
2.0						Natural Gamma - Down				
2.5						Natural Gamma - Down				
3.0						Natural Gamma - Down				
3.5						Natural Gamma - Down				
4.0						Natural Gamma - Down				
4.5						Natural Gamma - Down				
5.0						Natural Gamma - Down				















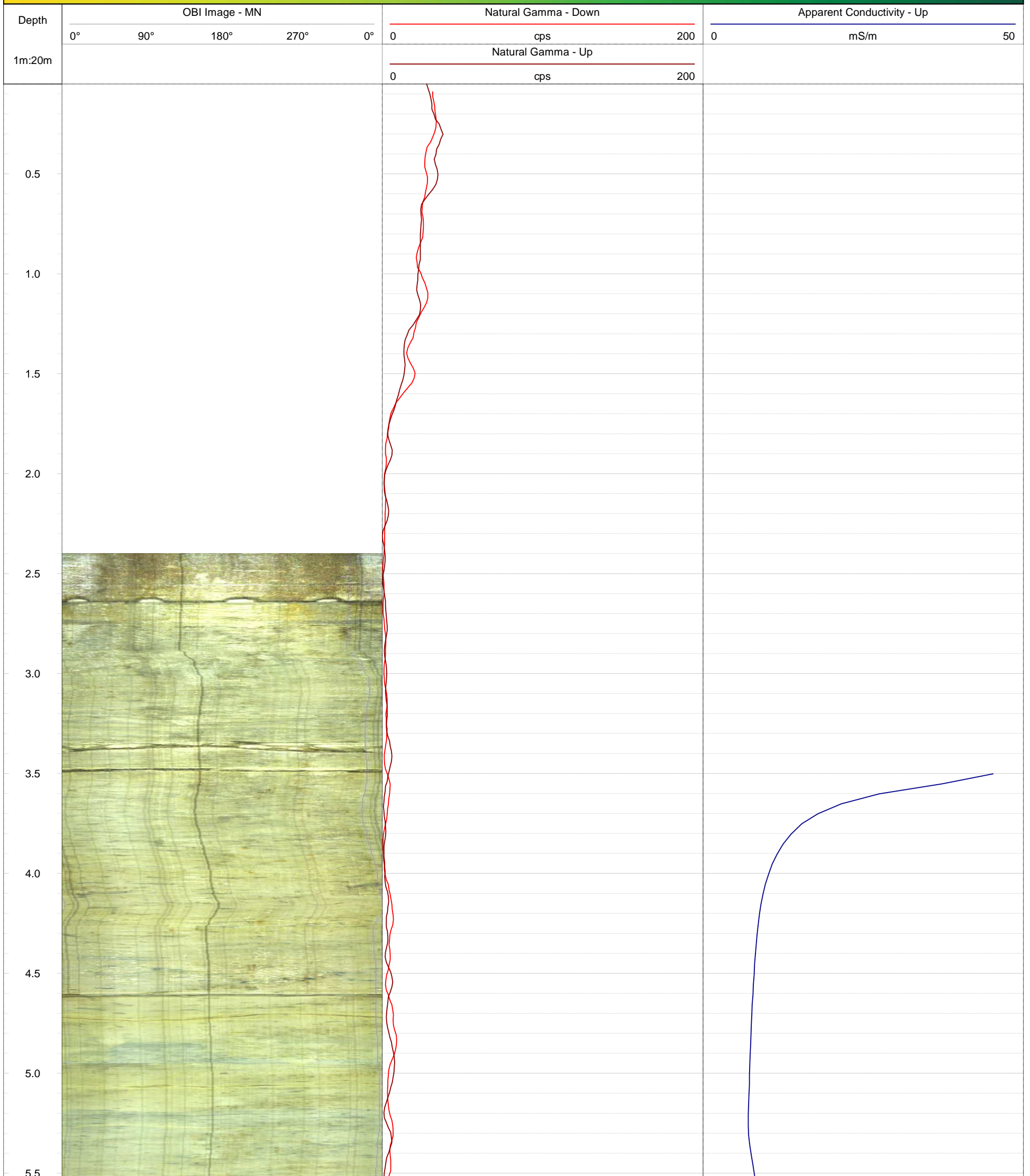
**GOLDER**  
MEMBER OF WSP

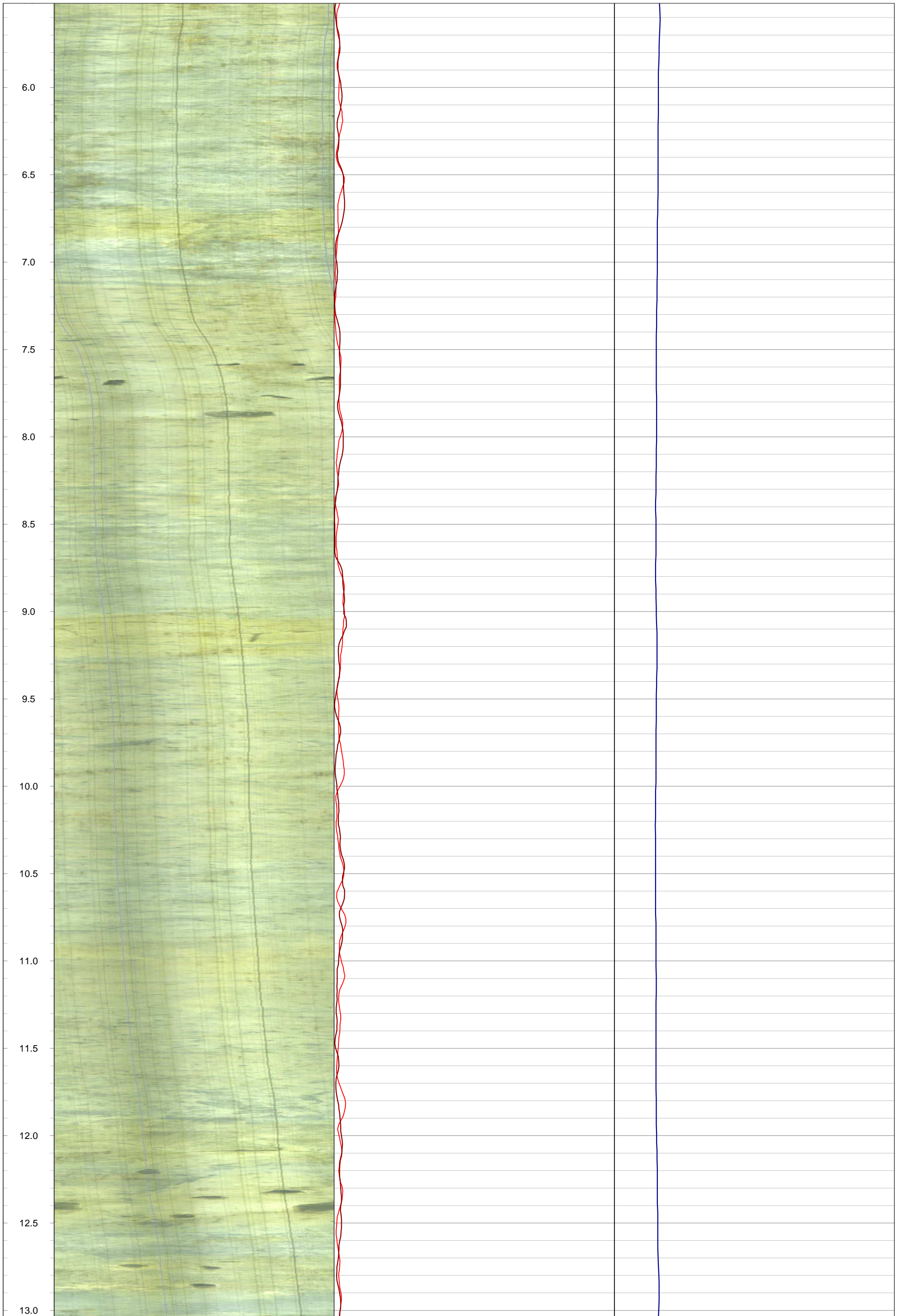
**Geophysical Record of Borehole: BH20-27 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

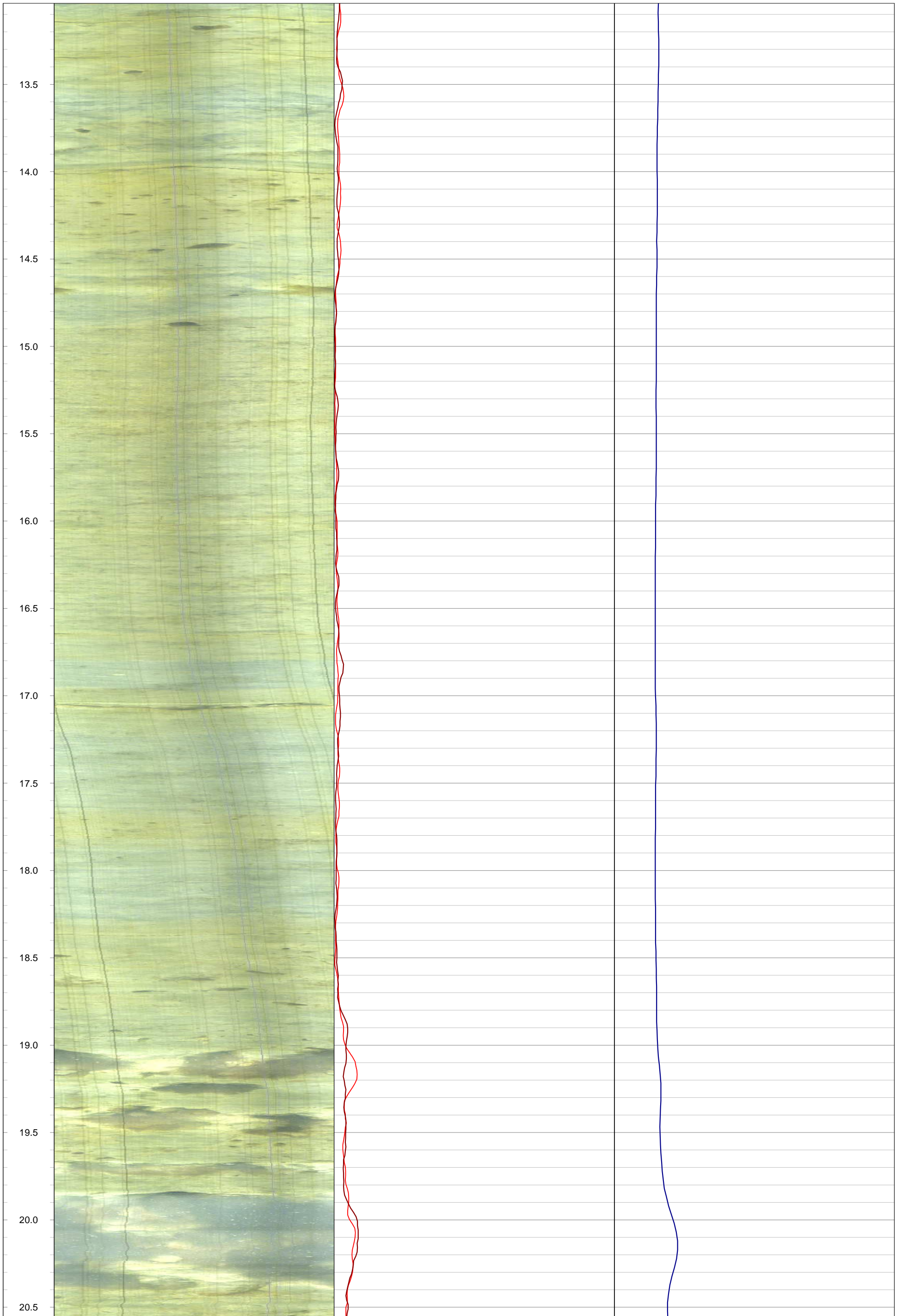
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.64 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577212.29 m    **Drilled Depth:** 27.65 m bgs    **Water Level:** 4.41 m bgs    **Log Date:** Oct-22-2020  
**Northing:** 4853168.73 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 408.64 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.61 m ags

**Notes:** OBI image opaque > 25.35 m bgs

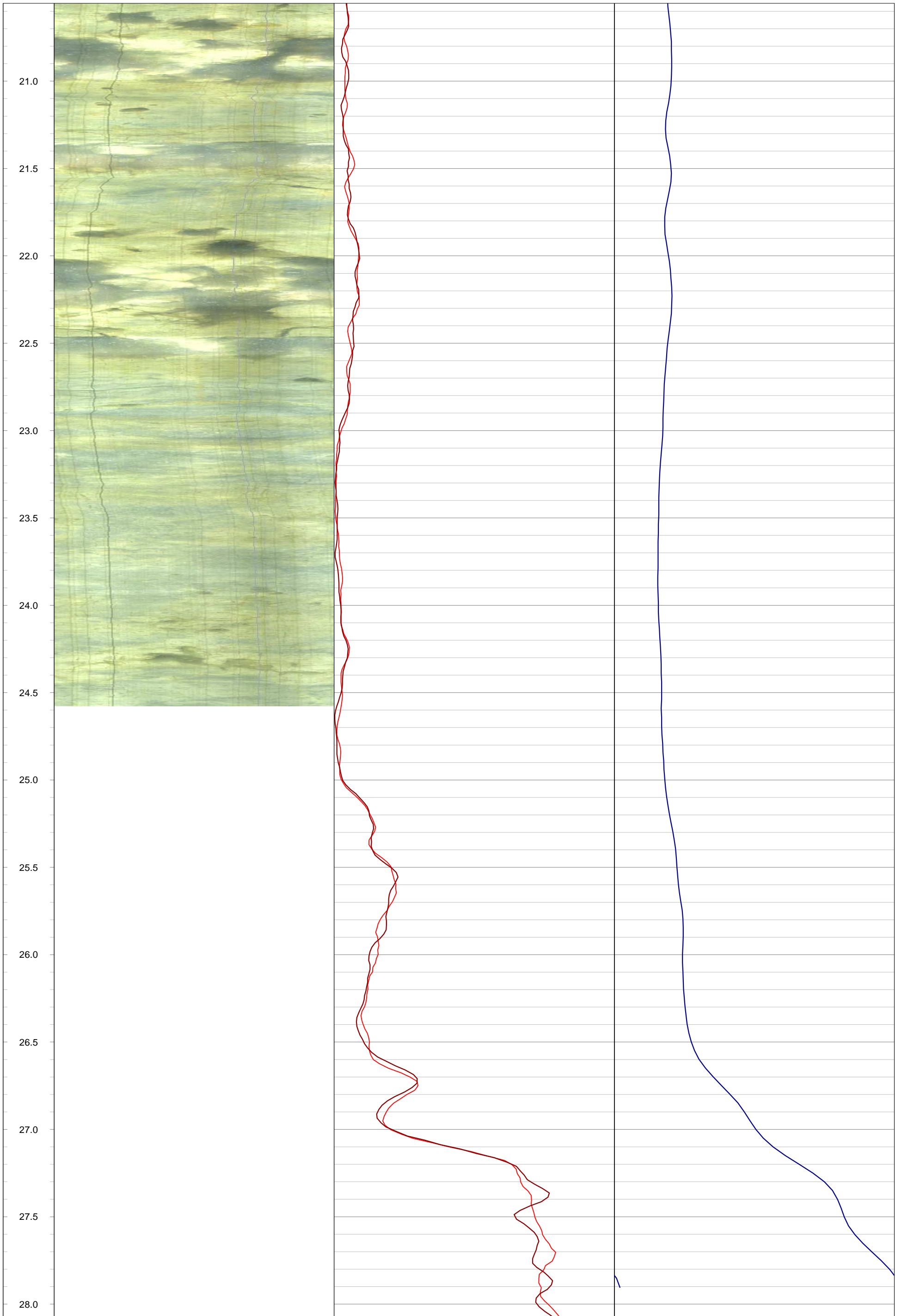














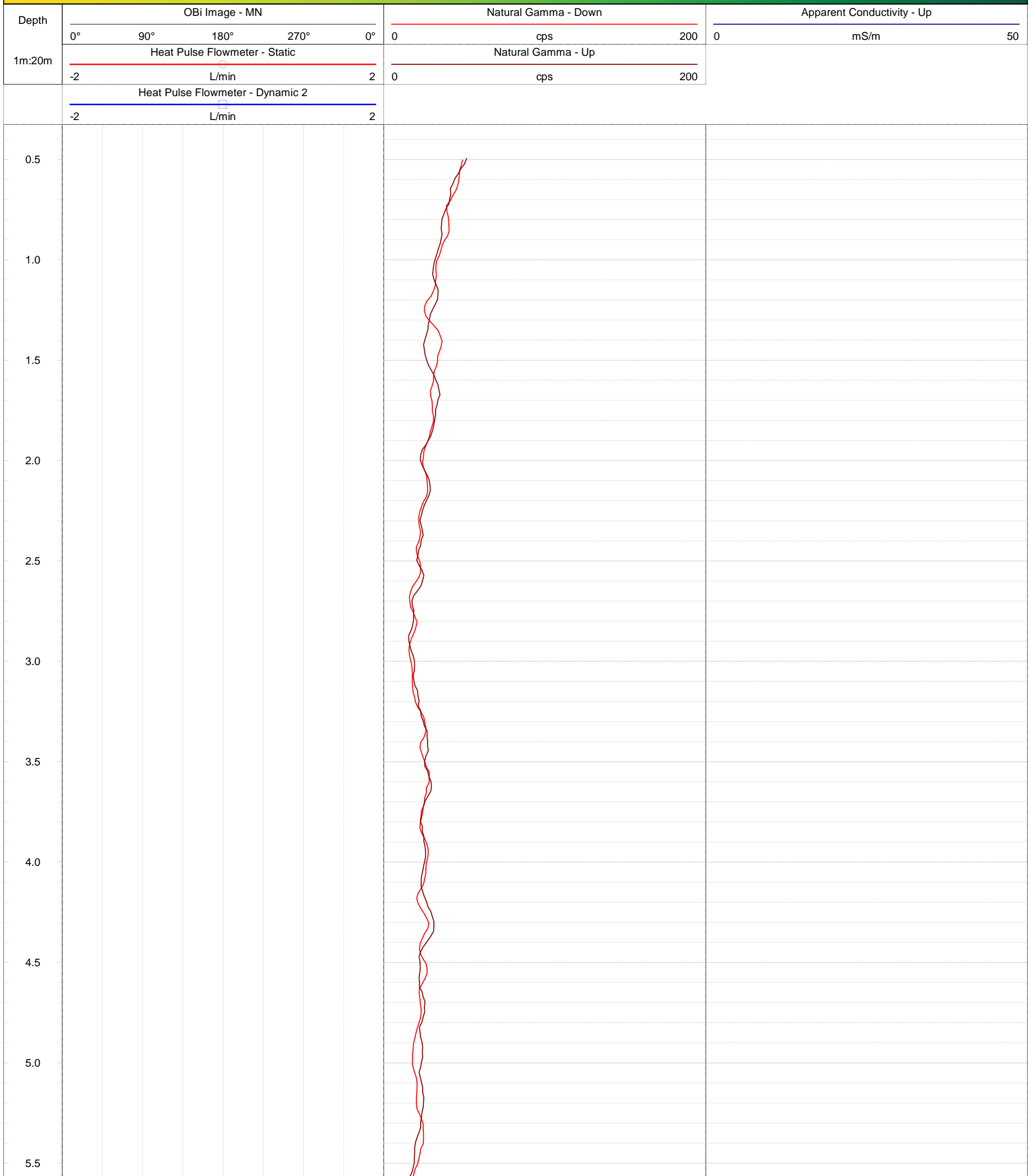

**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-01 (CAL)**

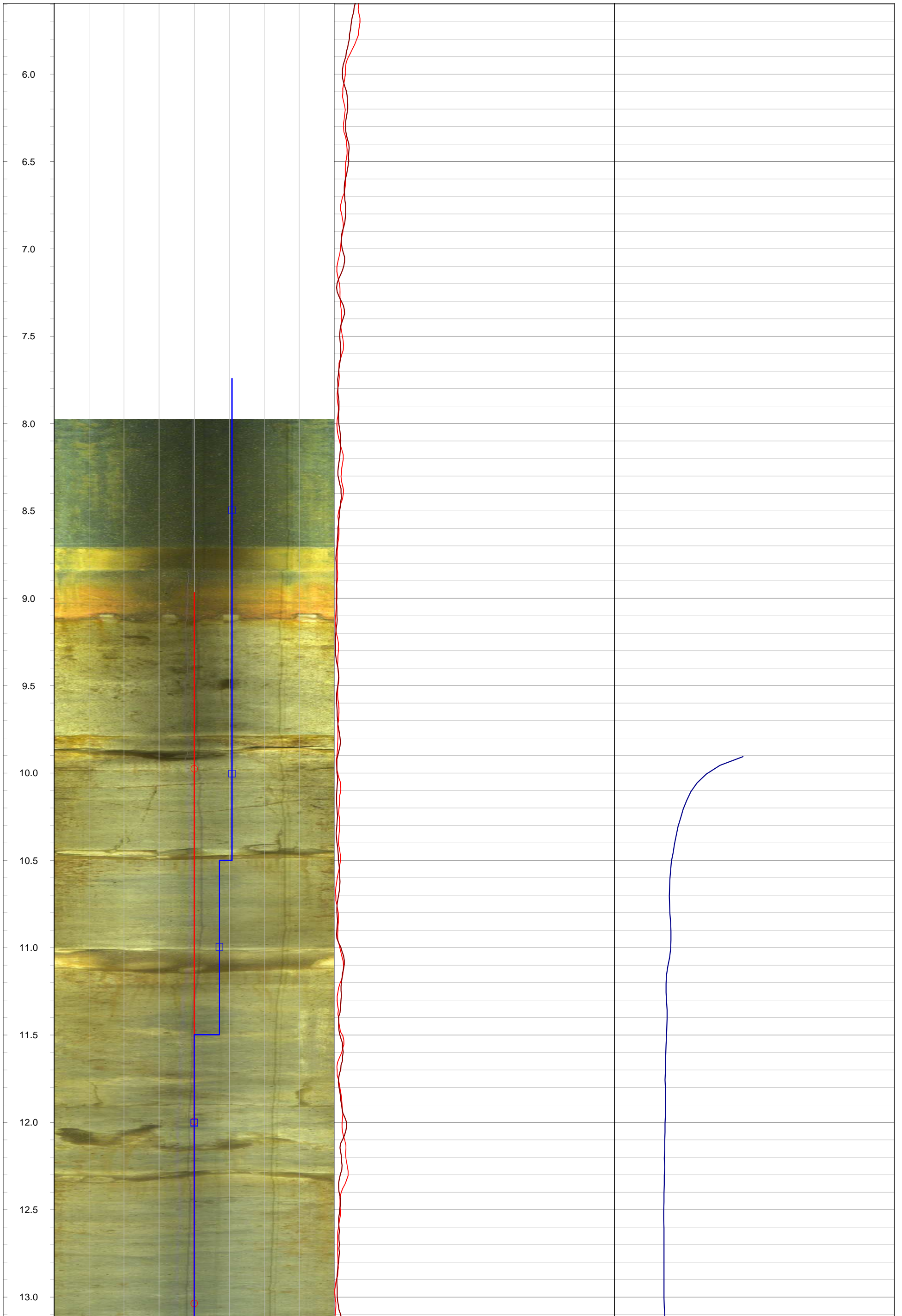
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

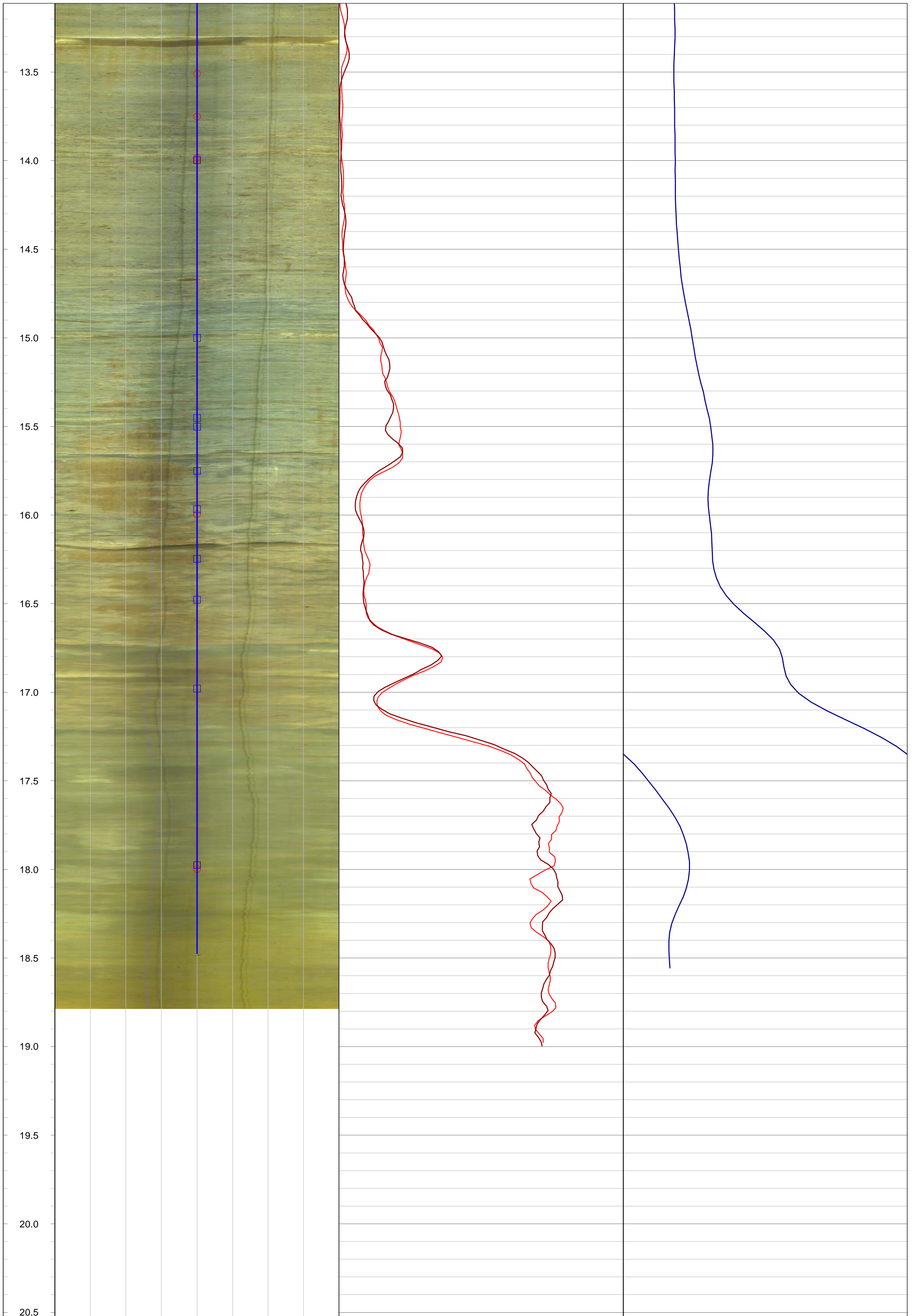
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 9.13 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577458.50 m    **Drilled Depth:** 19.41 m bgs    **Water Level:** 1.91 m bgs    **Log Date:** Mar-13,16-2020  
**Northing:** 4852268.28 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM/PG  
**Elevation:** 395.10 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.20 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 6.0 m below top of casing. Pump rate approximately 2.34 L/min.











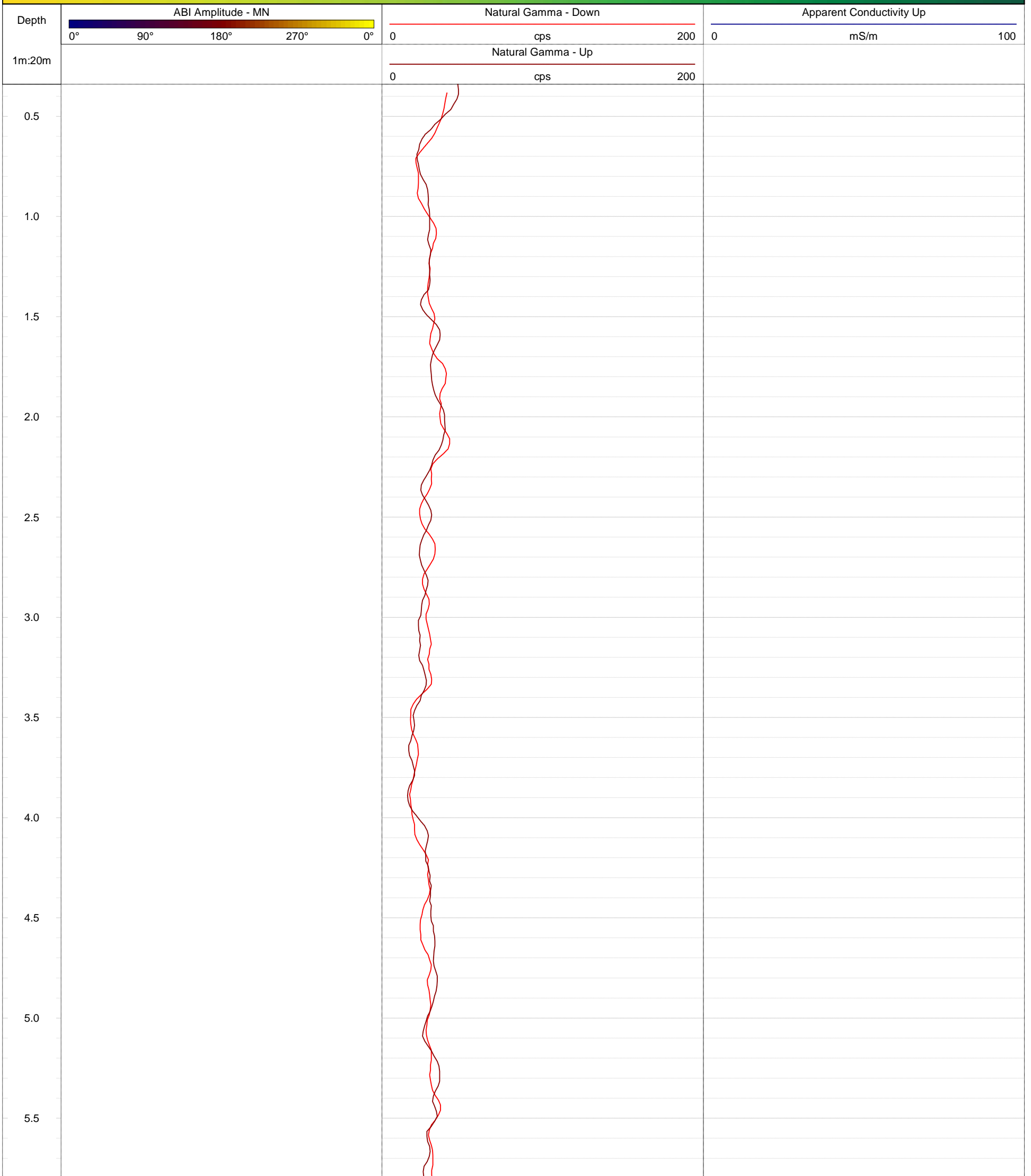
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-02 (CAL)**

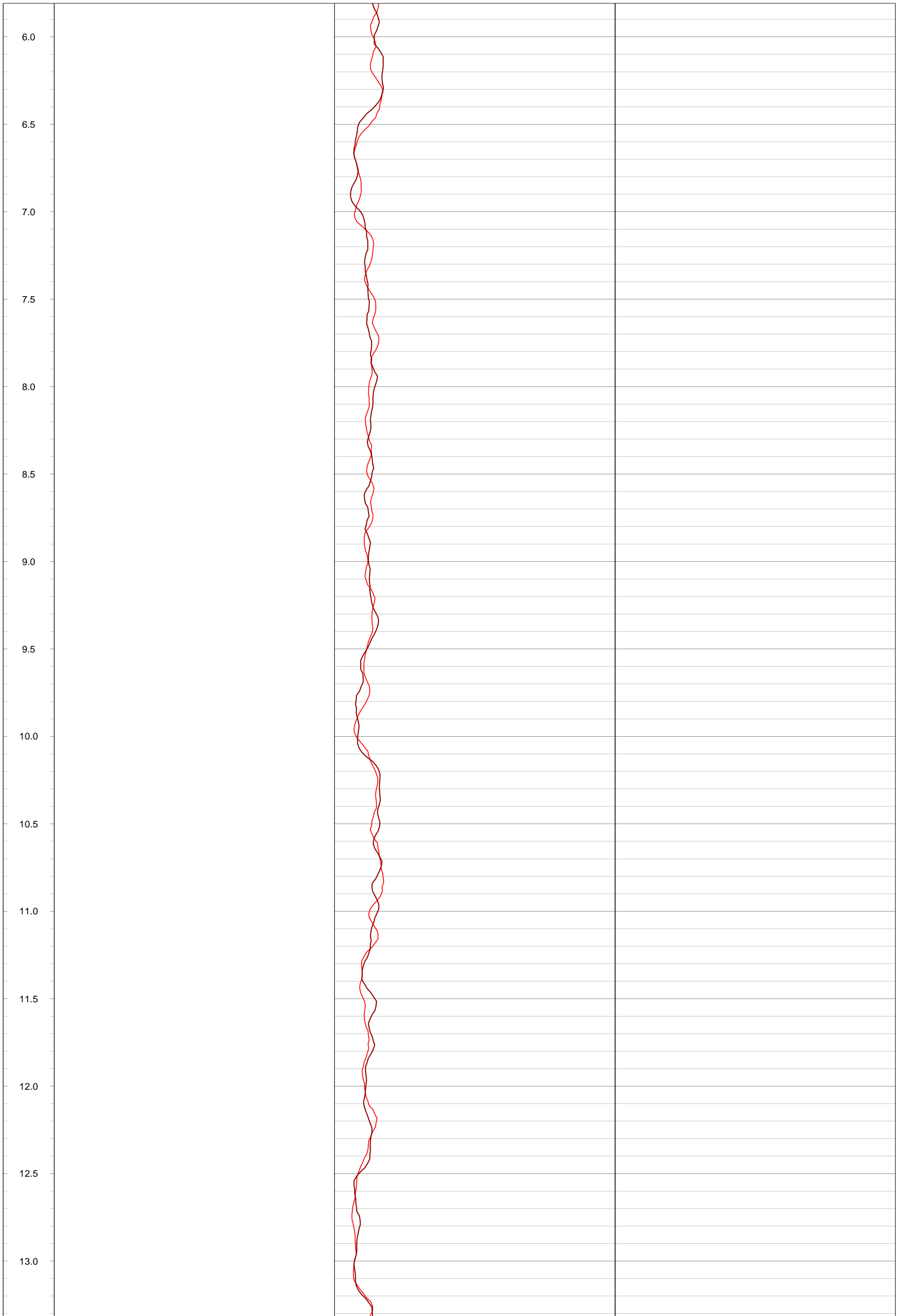
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

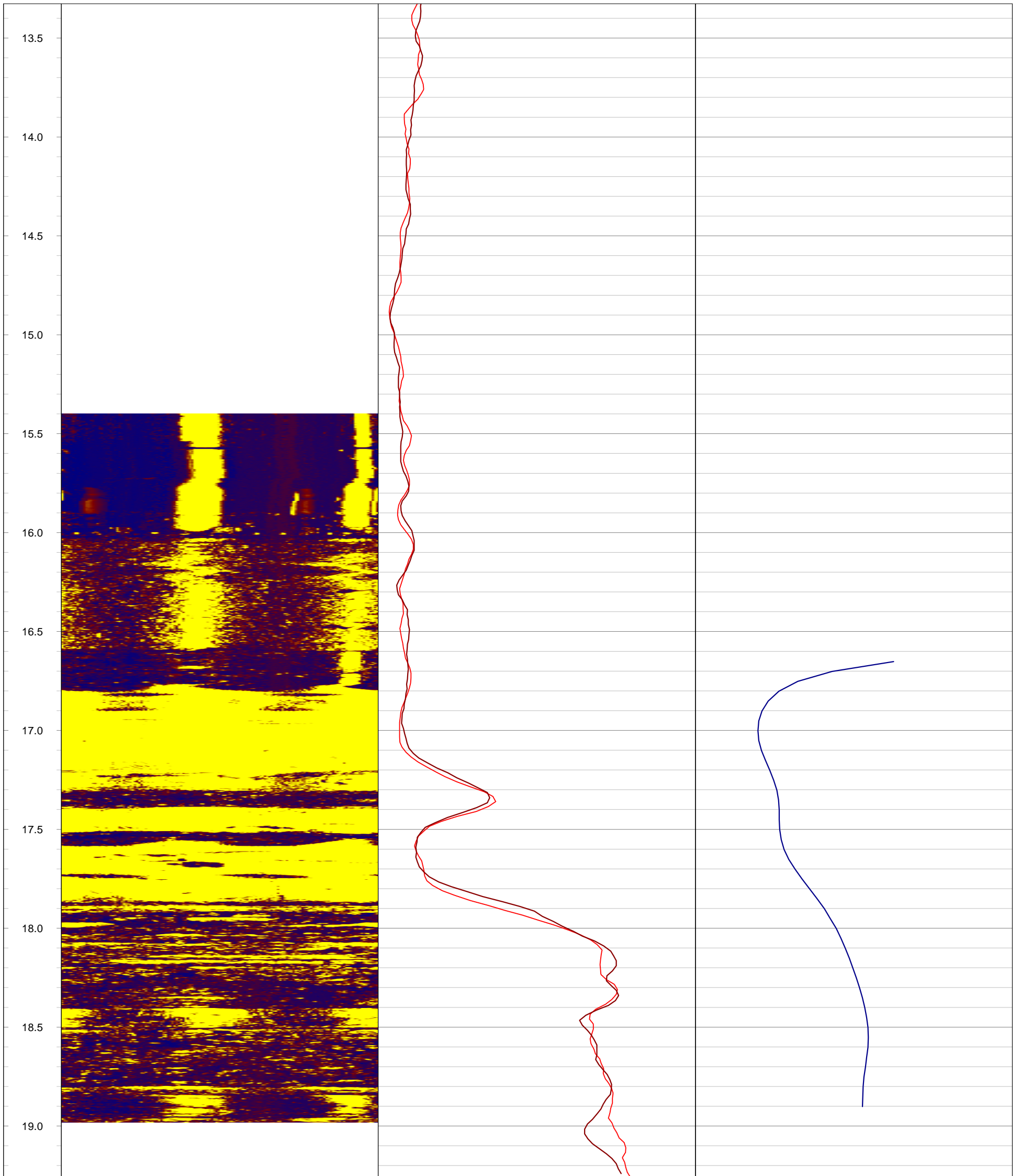
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.91 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577900.04 m    **Drilled Depth:** 19.57 m bgs    **Water Level:** 8.12 m bgs    **Log Date:** Mar-11-2020  
**Northing:** 48522138.37 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 399.63 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.32 m ags

**Notes:** Poor conditions in the borehole. Casing depth is approximate.











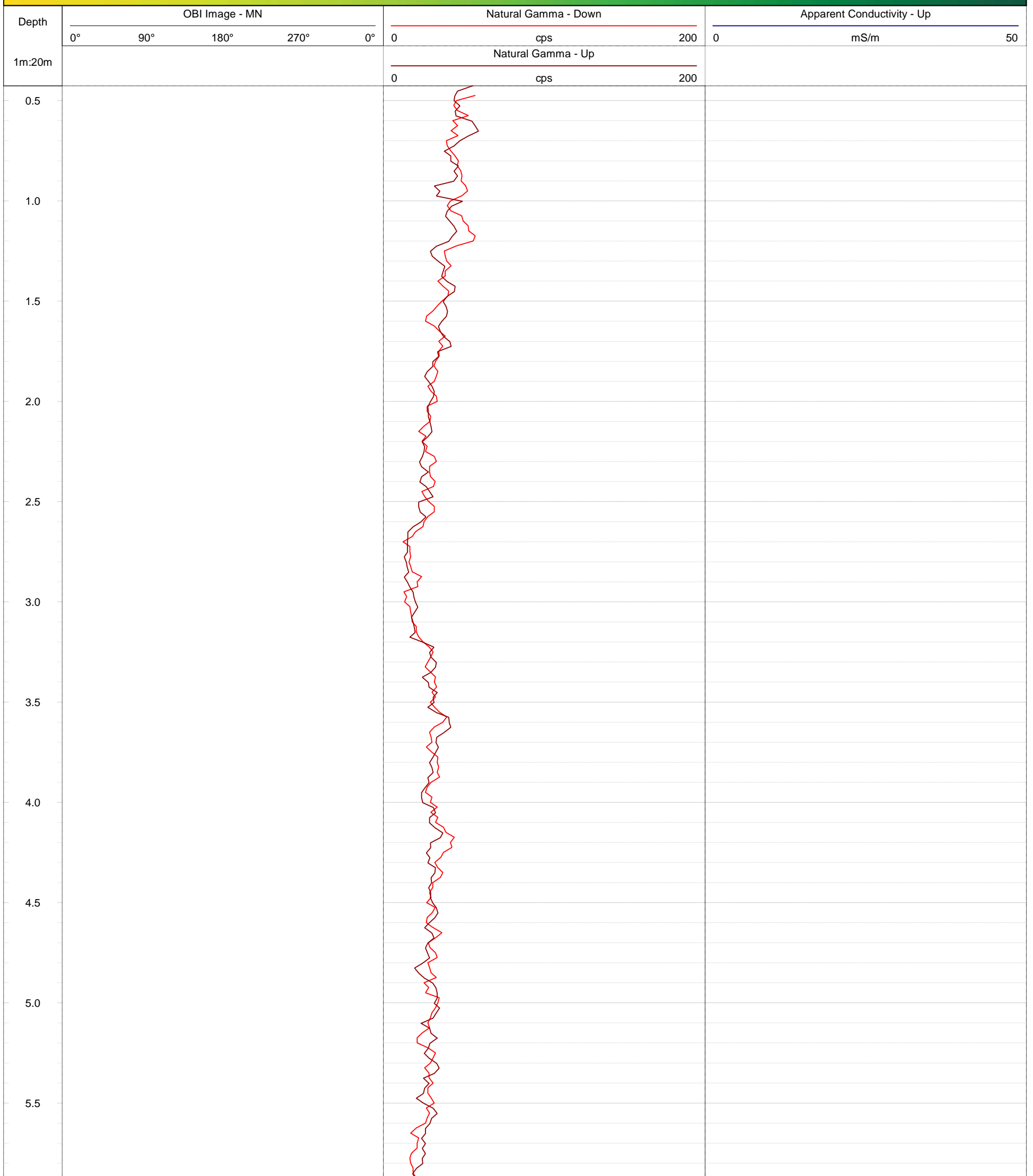
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-04 (CAL)**

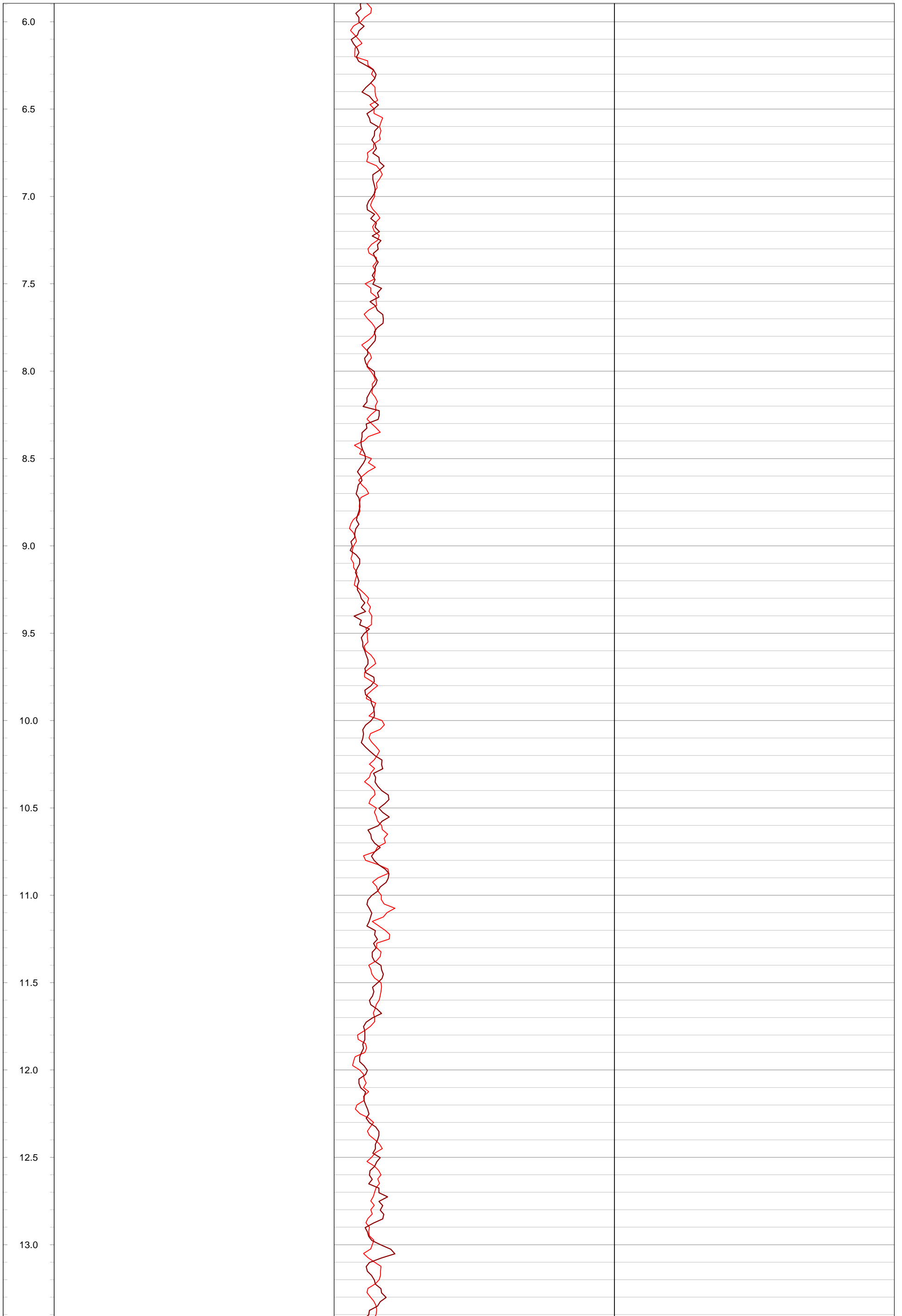
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

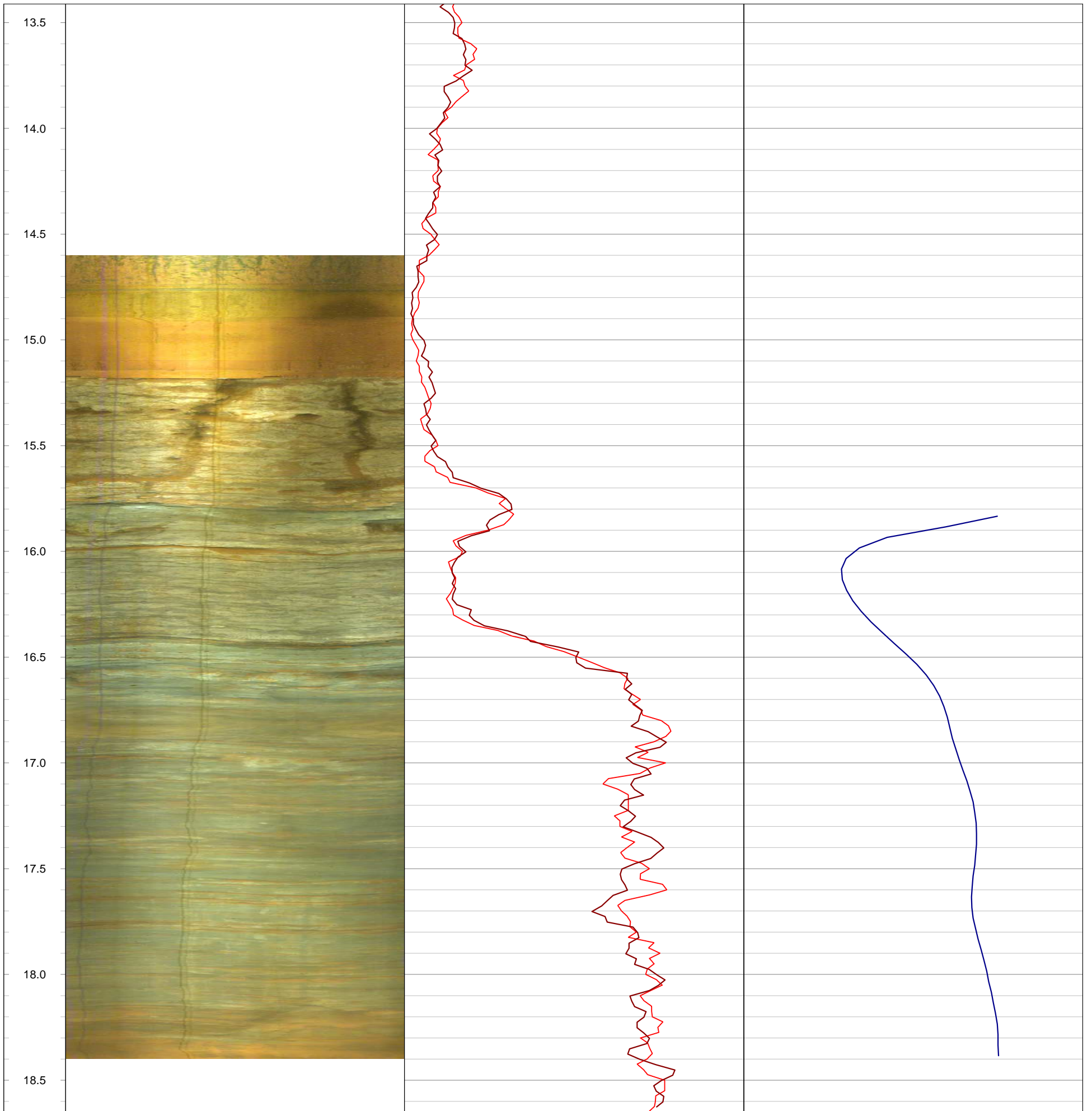
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.17 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578264.75 m    **Drilled Depth:** 18.50 m bgs    **Water Level:** 9.02 m bgs    **Log Date:** Mar-13-2020  
**Northing:** 4852313.19 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 399.46 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.23 m ags

**Notes:**











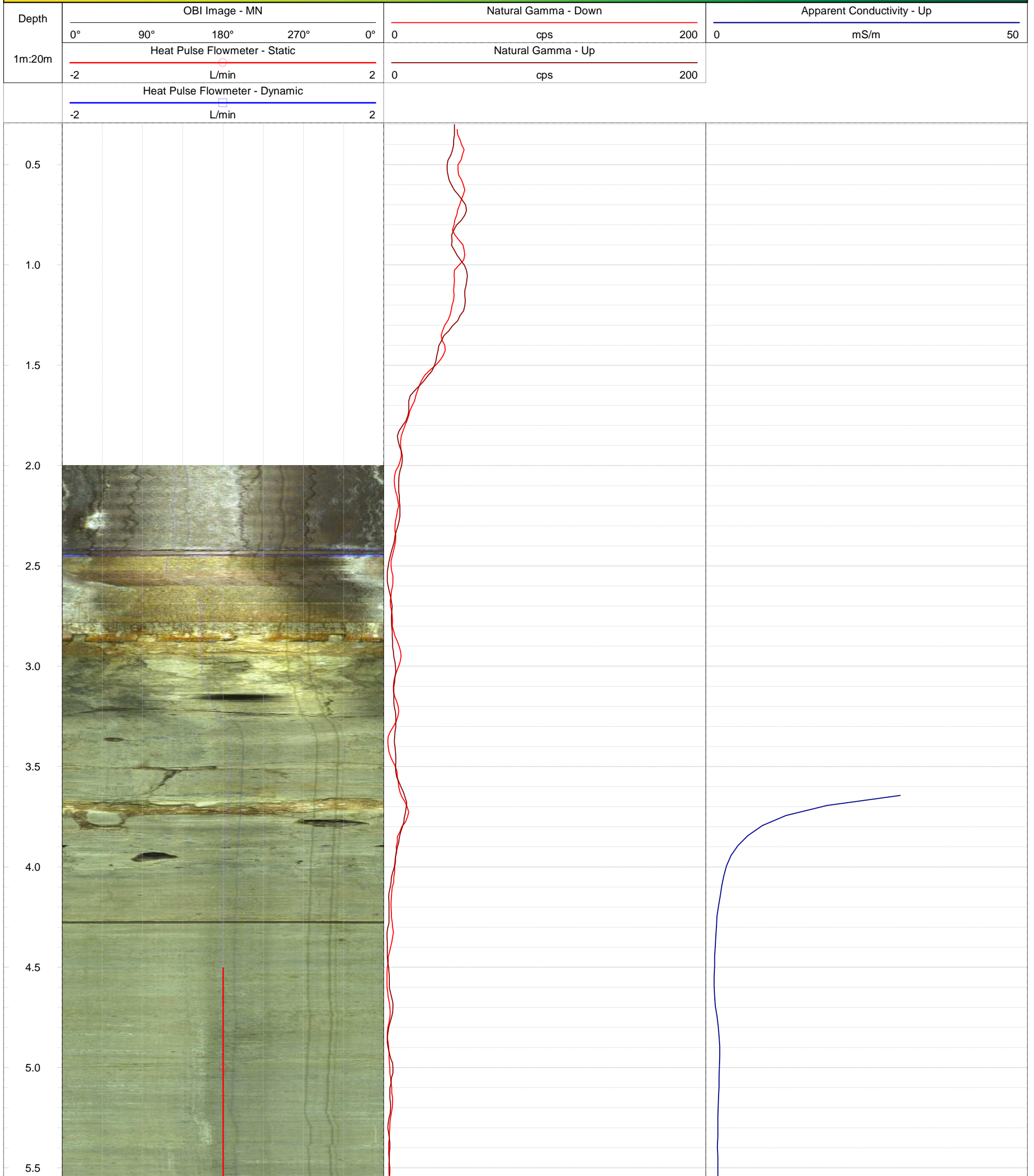
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-05 (CAL)**

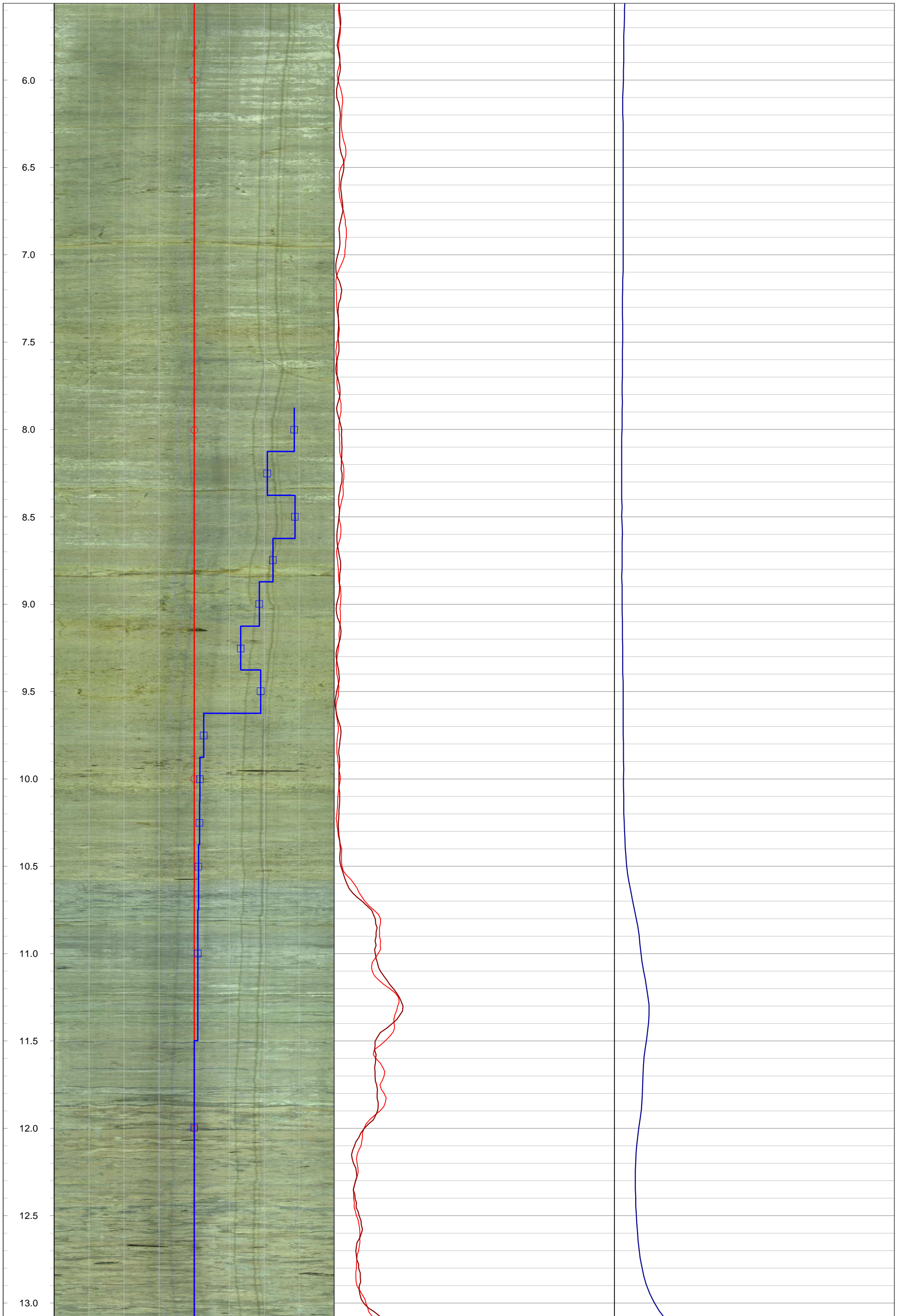
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.87 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578423.10 m    **Drilled Depth:** 14.84 m bgs    **Water Level:** 4.04 m bgs    **Log Date:** Mar-20-2020  
**Northing:** 4852712.60 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 399.63 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.38 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 6.0 m below top of casing. Pump rate approximately 2.25 L/min.













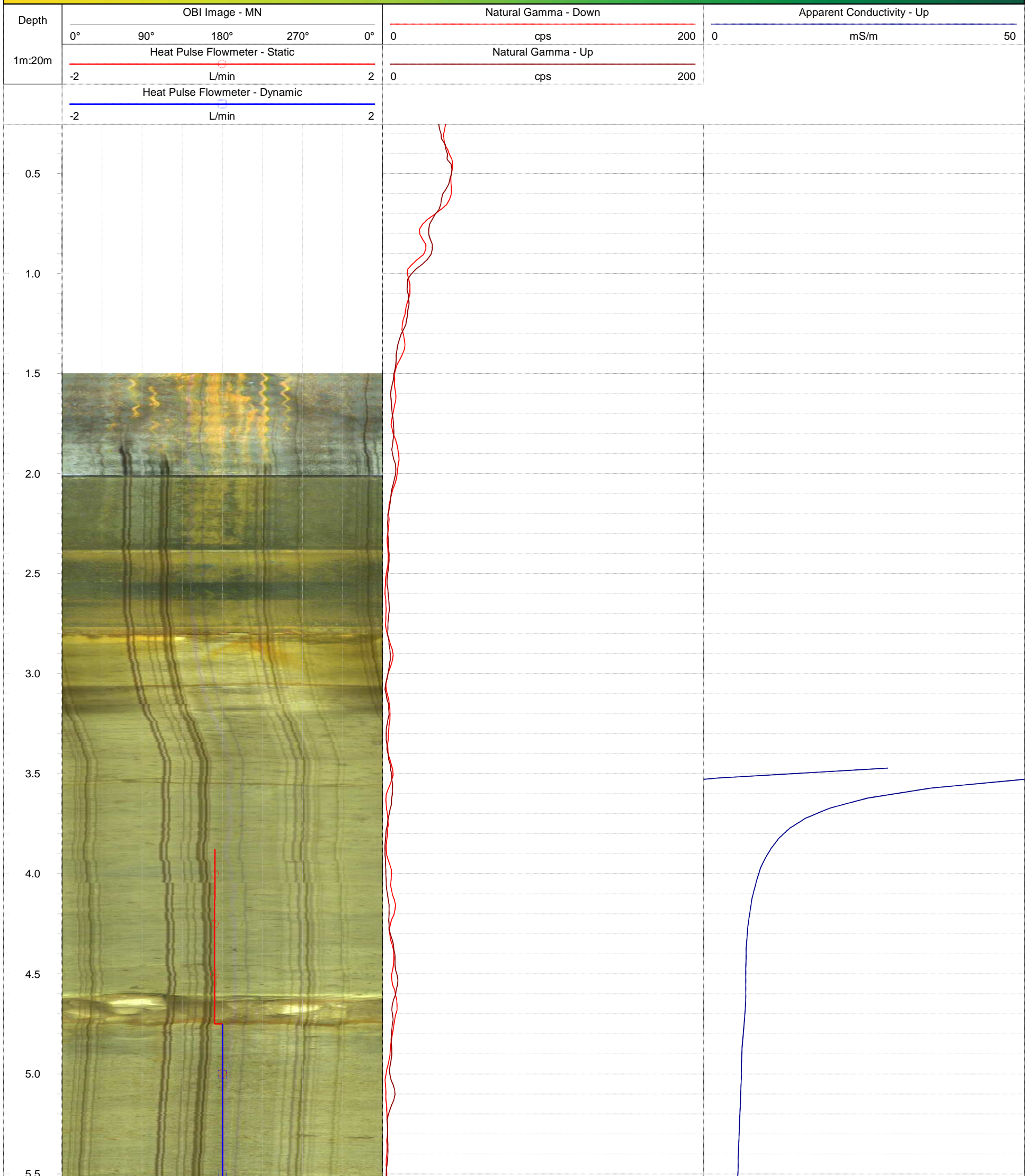
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-06 (CAL)**

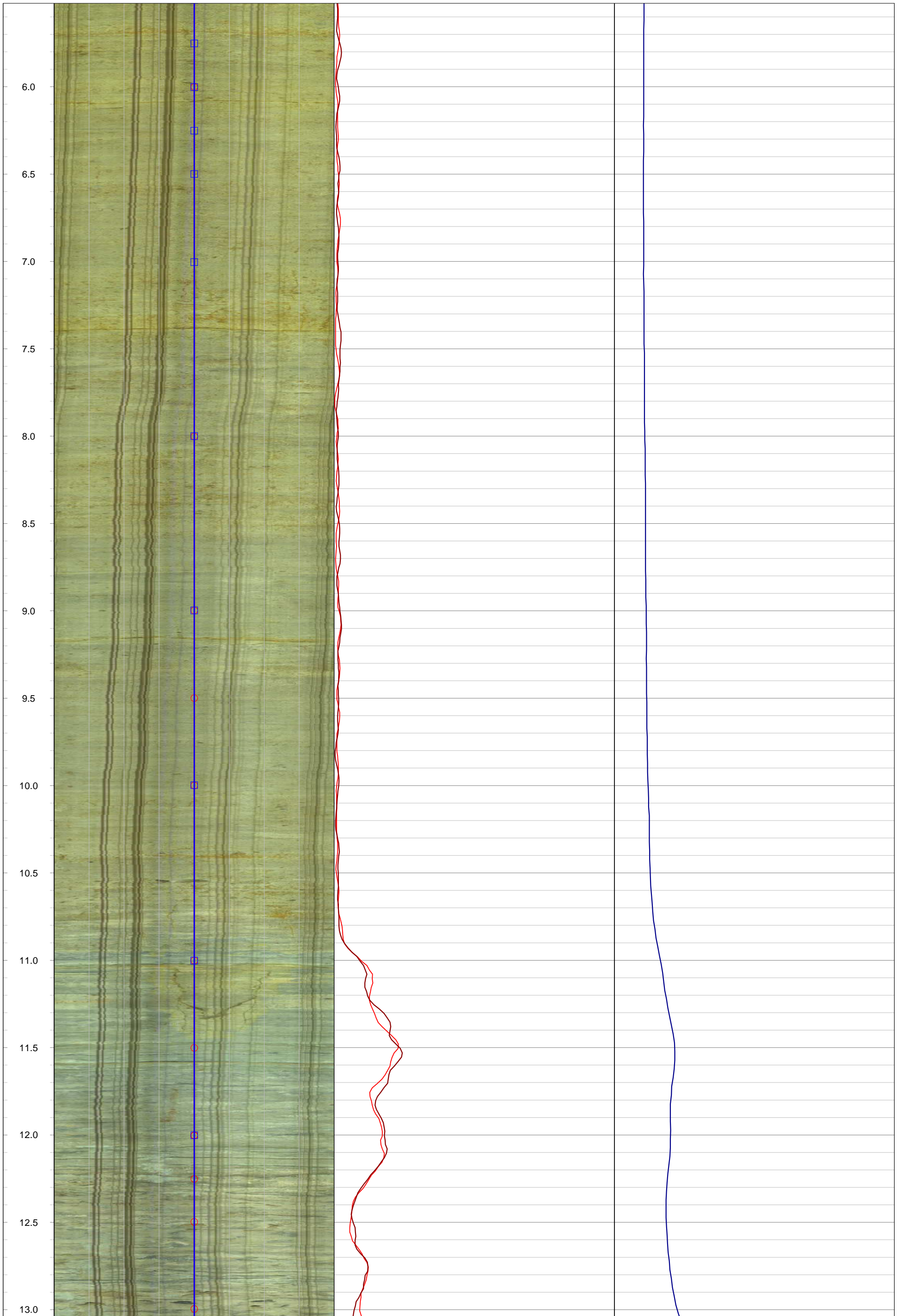
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

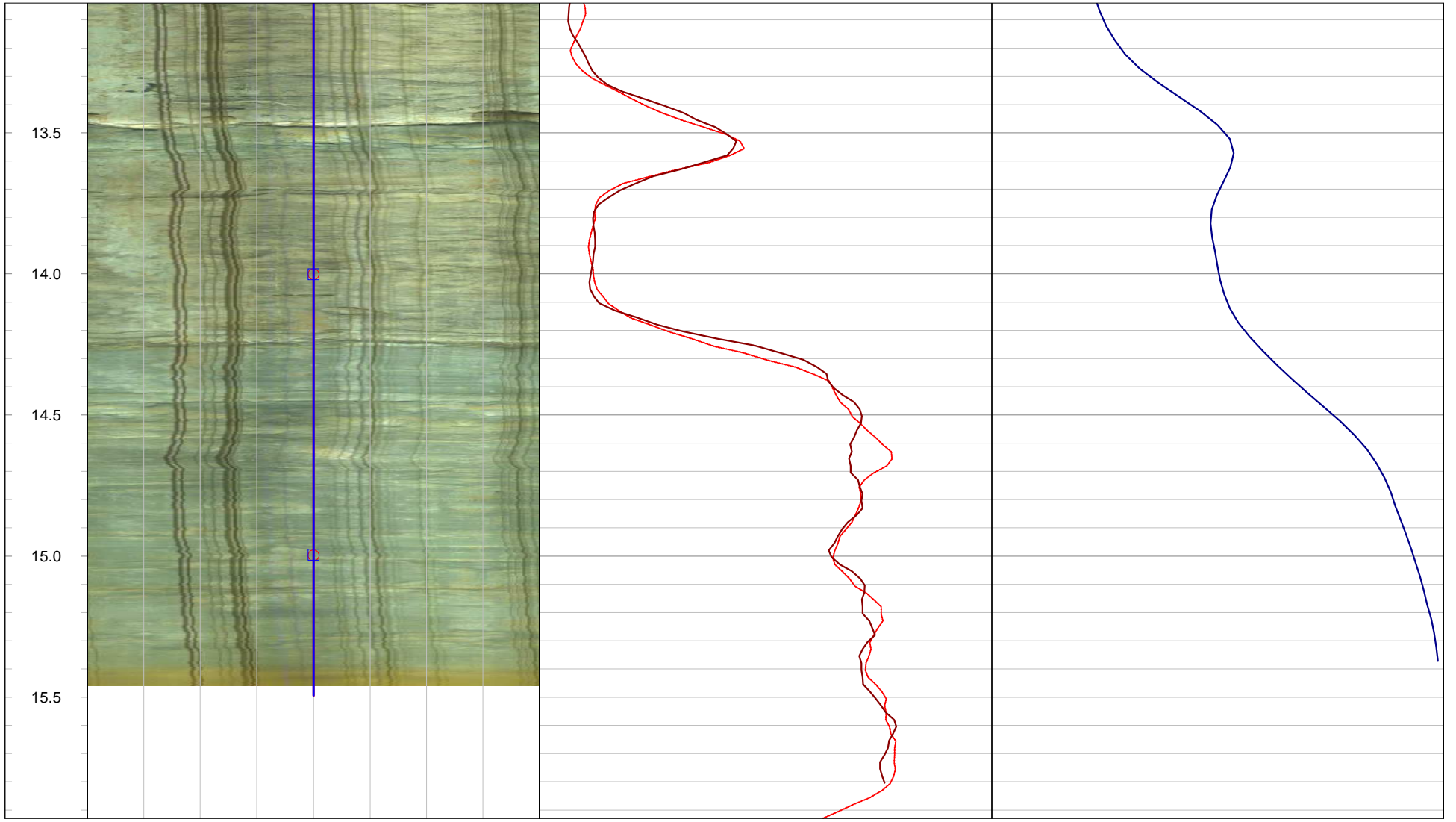
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.38 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578474.24 m    **Drilled Depth:** 16.03 m bgs    **Water Level:** 1.96 m bgs    **Log Date:** Mar-23-2020  
**Northing:** 4852972.59 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 400.15 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.45 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 4.0 m below top of casing. Pump rate approximately 2.75 L/min.













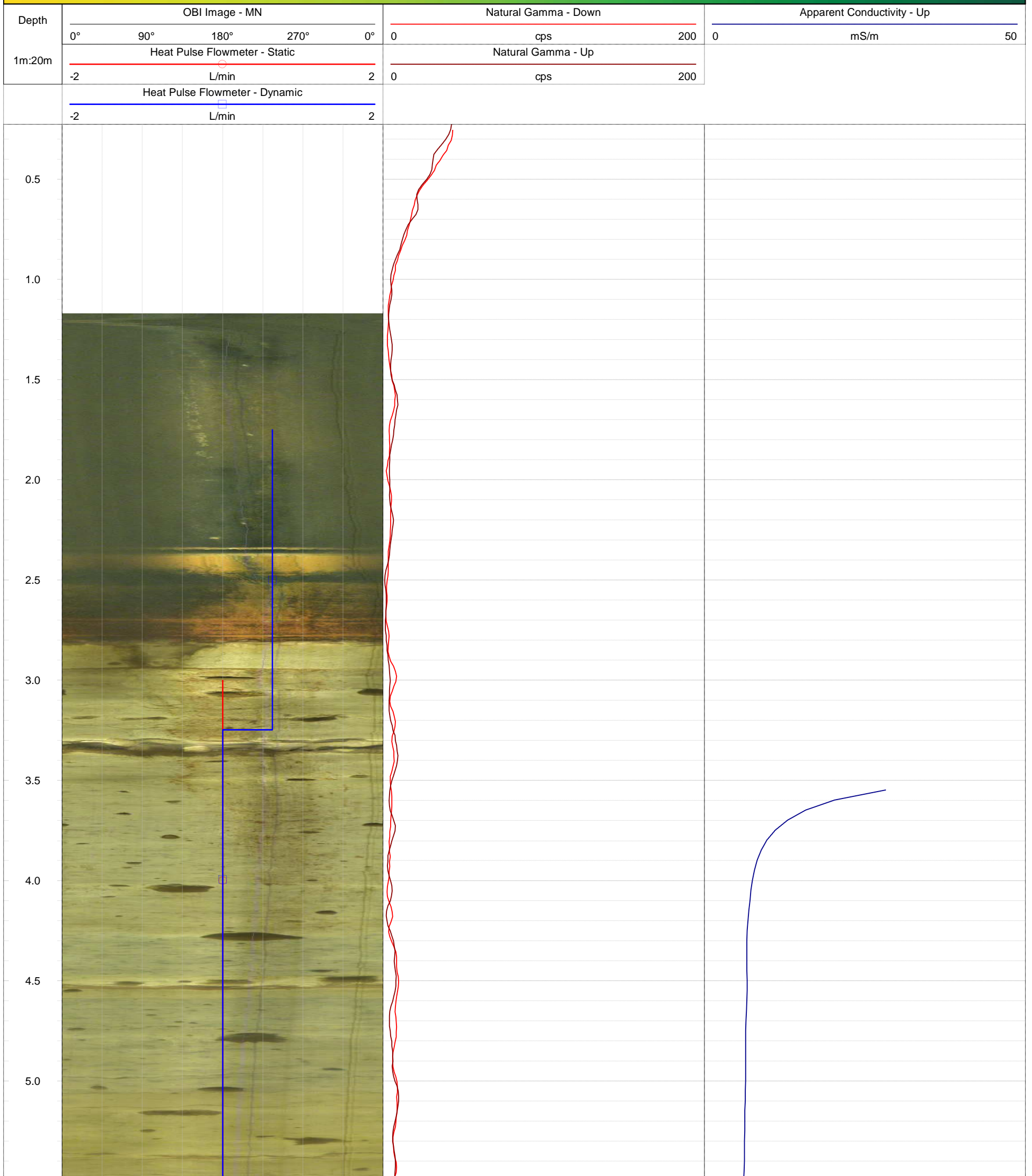
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-07 (CAL)**

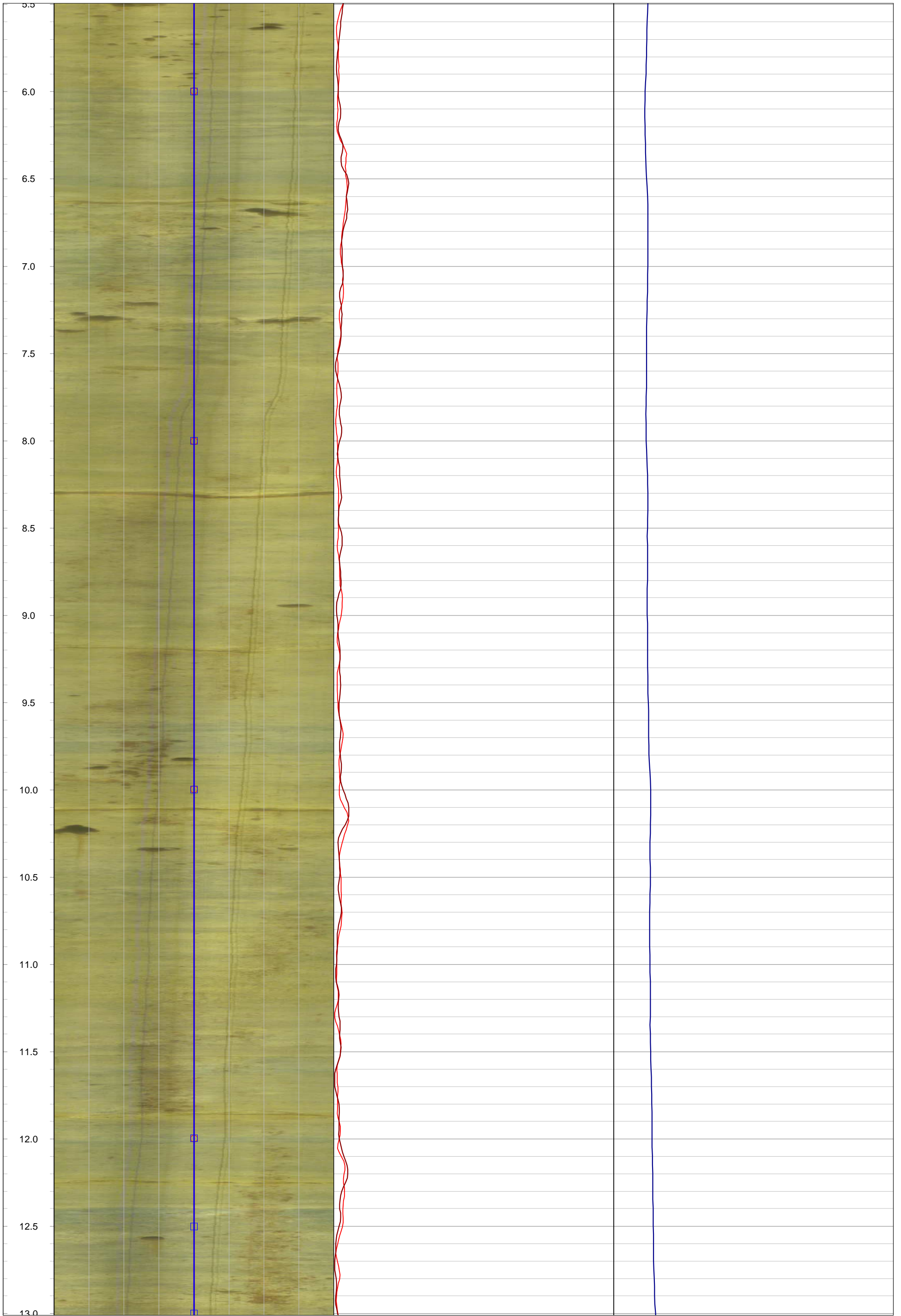
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

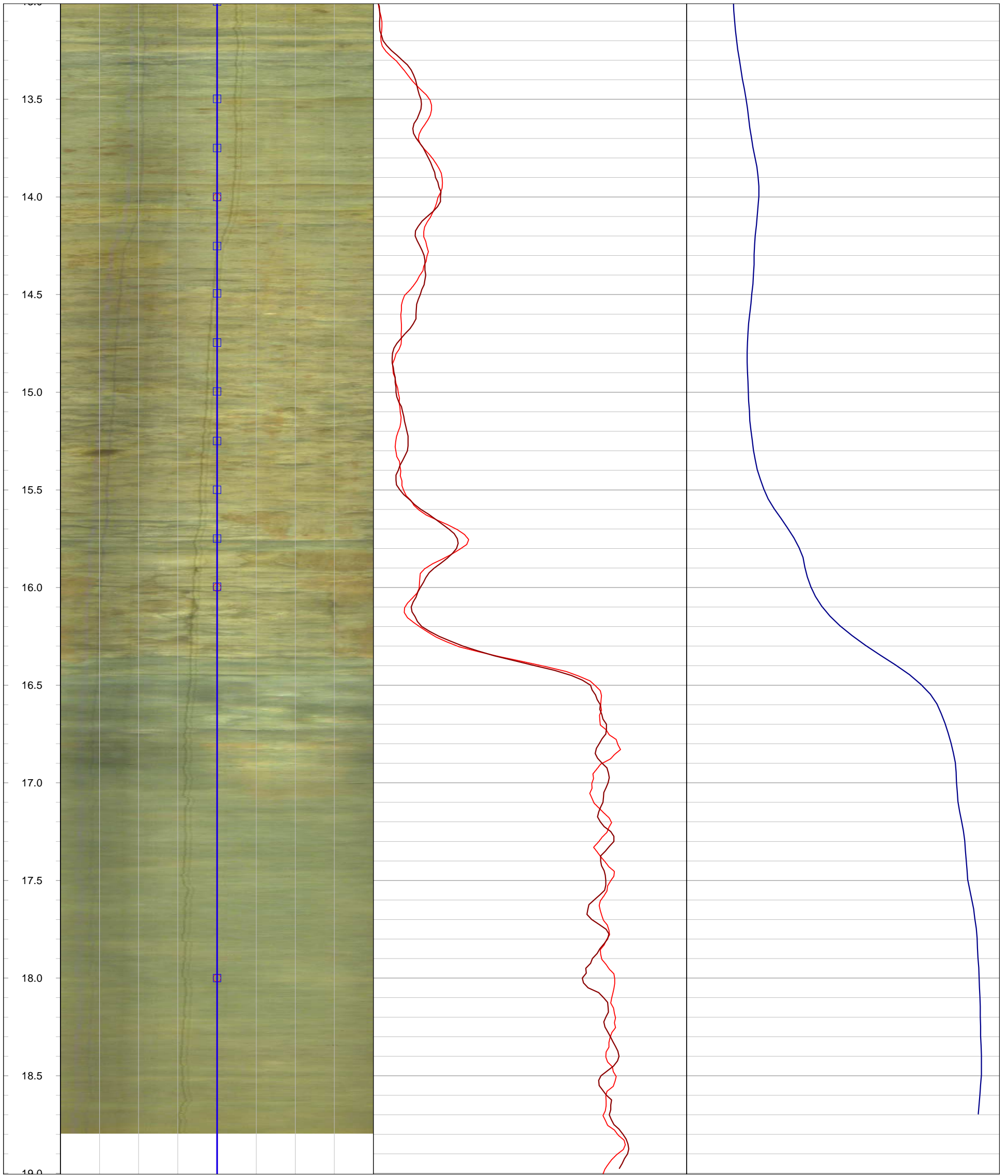
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.80 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578359.89 m    **Drilled Depth:** 19.45 m bgs    **Water Level:** 0.31 m bgs    **Log Date:** Mar-18-2020  
**Northing:** 4853250.44 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 404.07 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.45 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 2.1 m below top of casing.













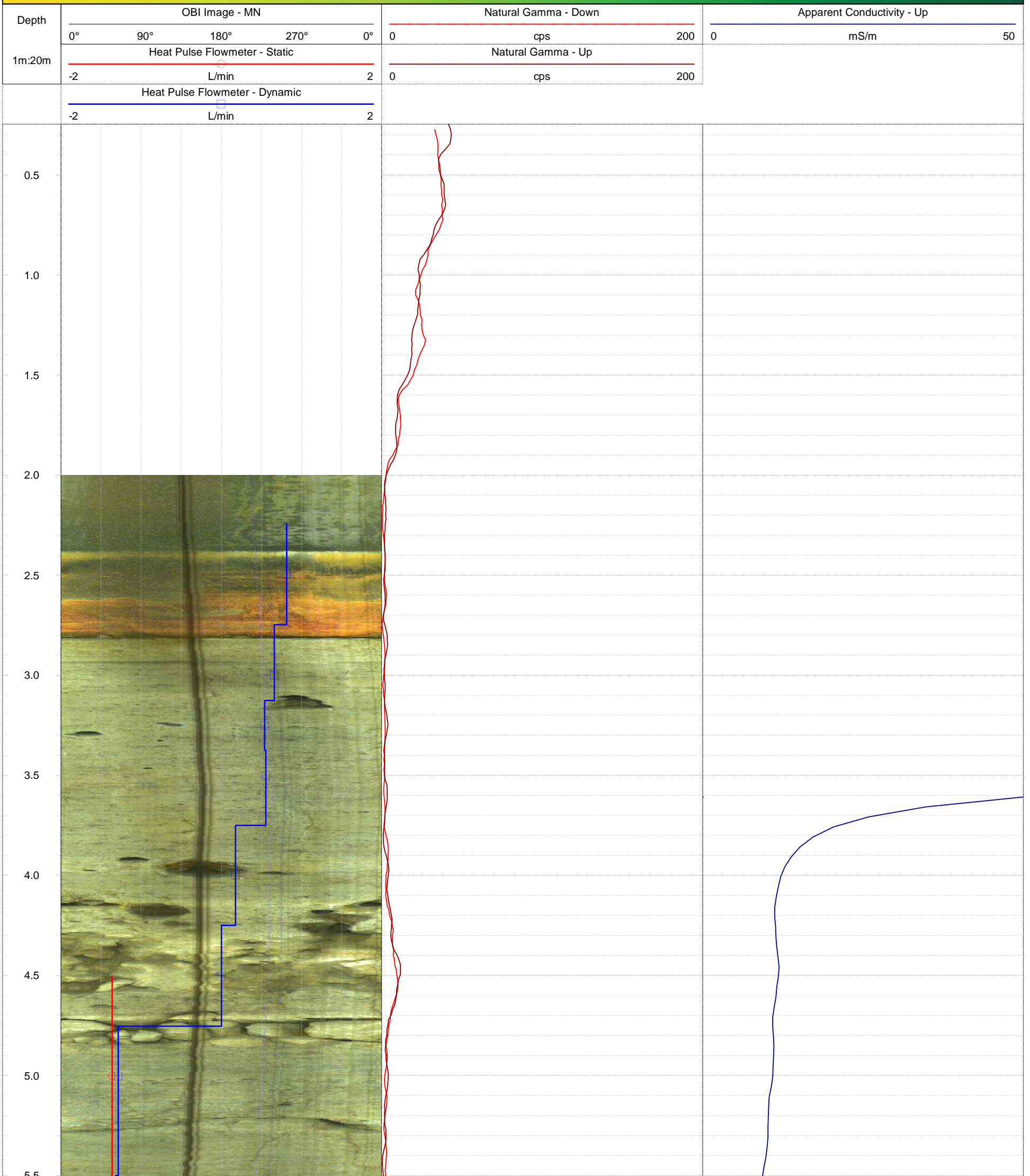
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-08 (CAL)**

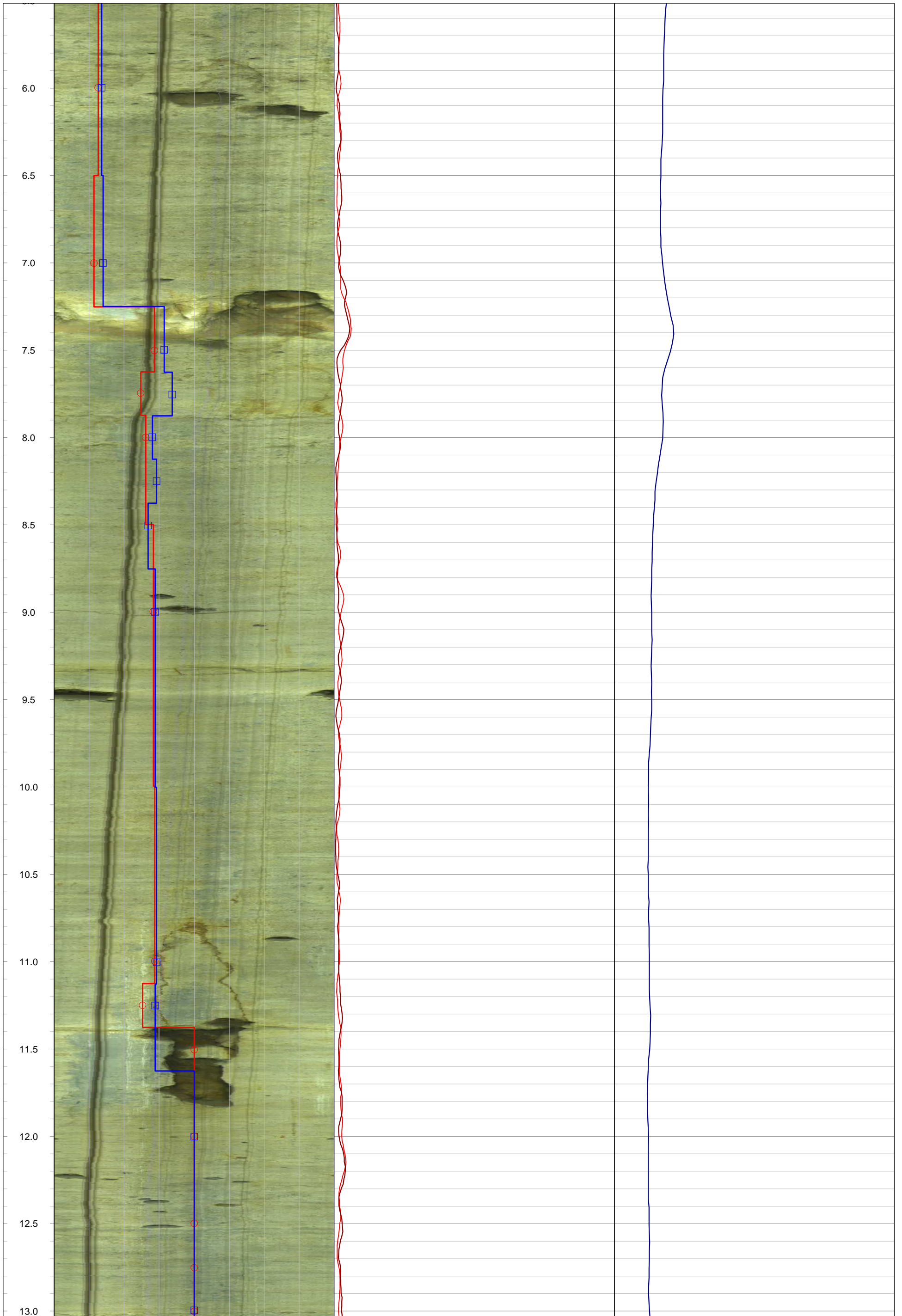
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

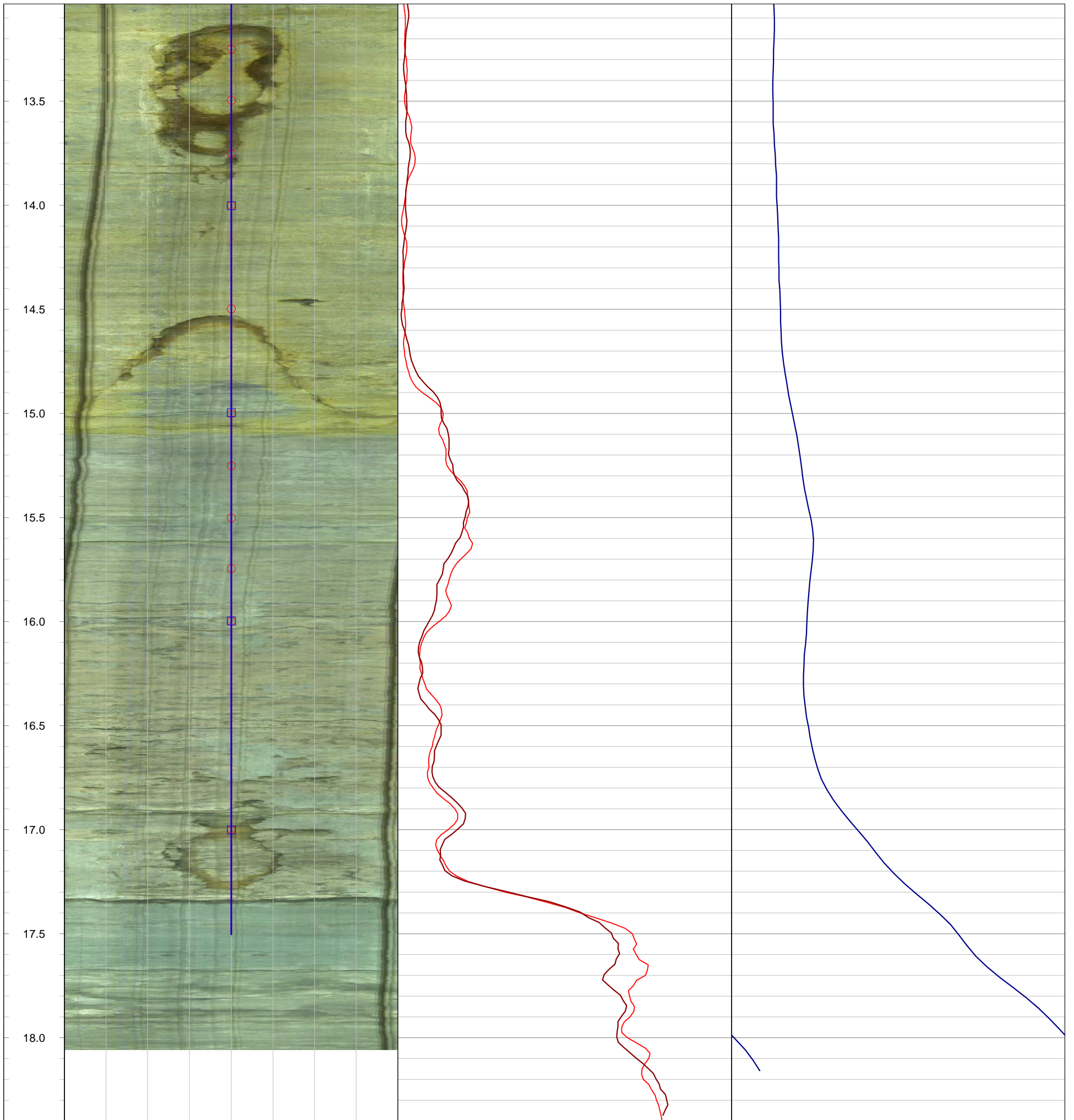
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.81 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578009.81 m    **Drilled Depth:** 18.59 m bgs    **Water Level:** 0.66 m bgs    **Log Date:** Mar-19-2020  
**Northing:** 4853574.83 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 406.93 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.43 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 2.1 m below top of casing.













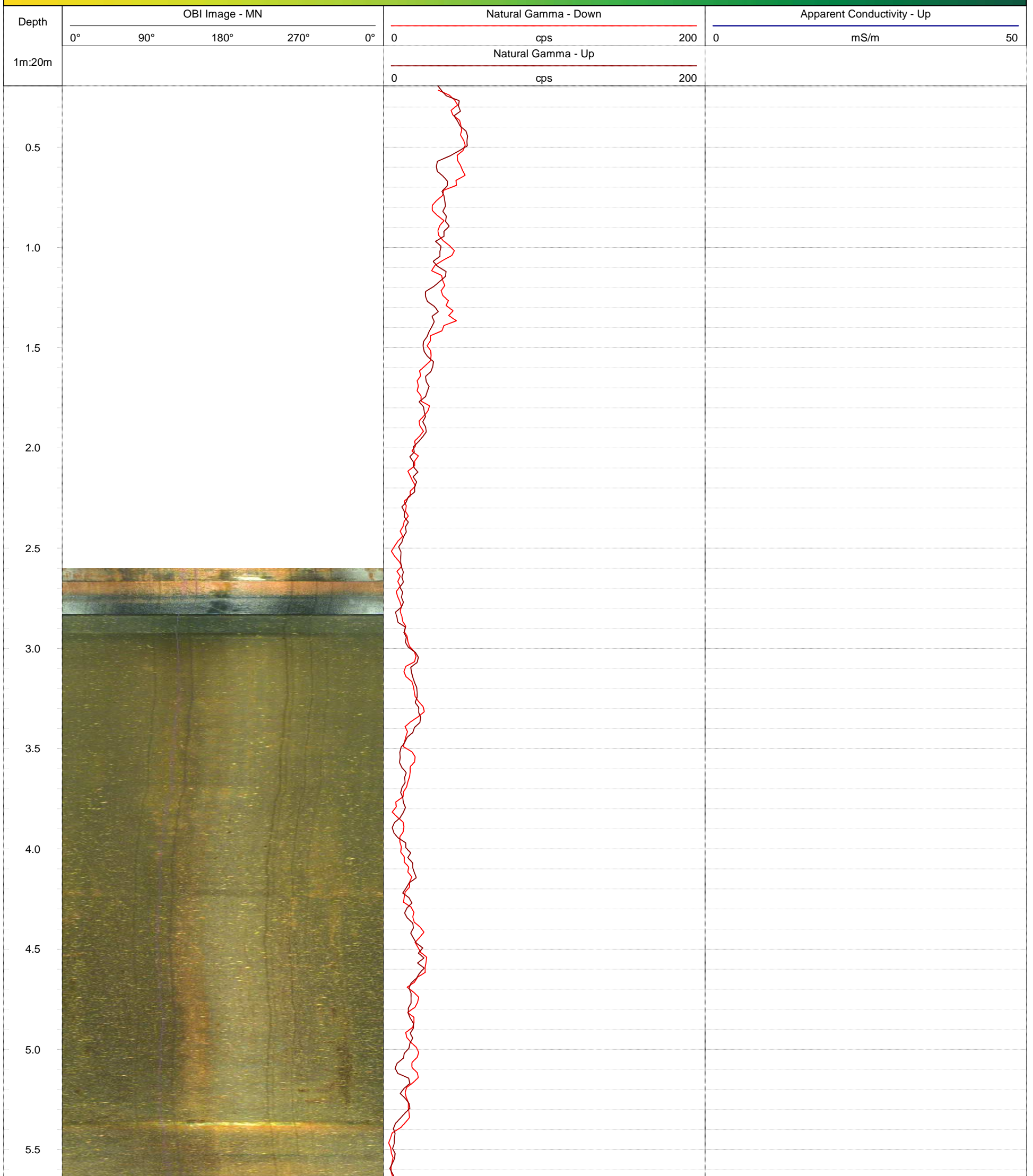
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-09 (CAL)**

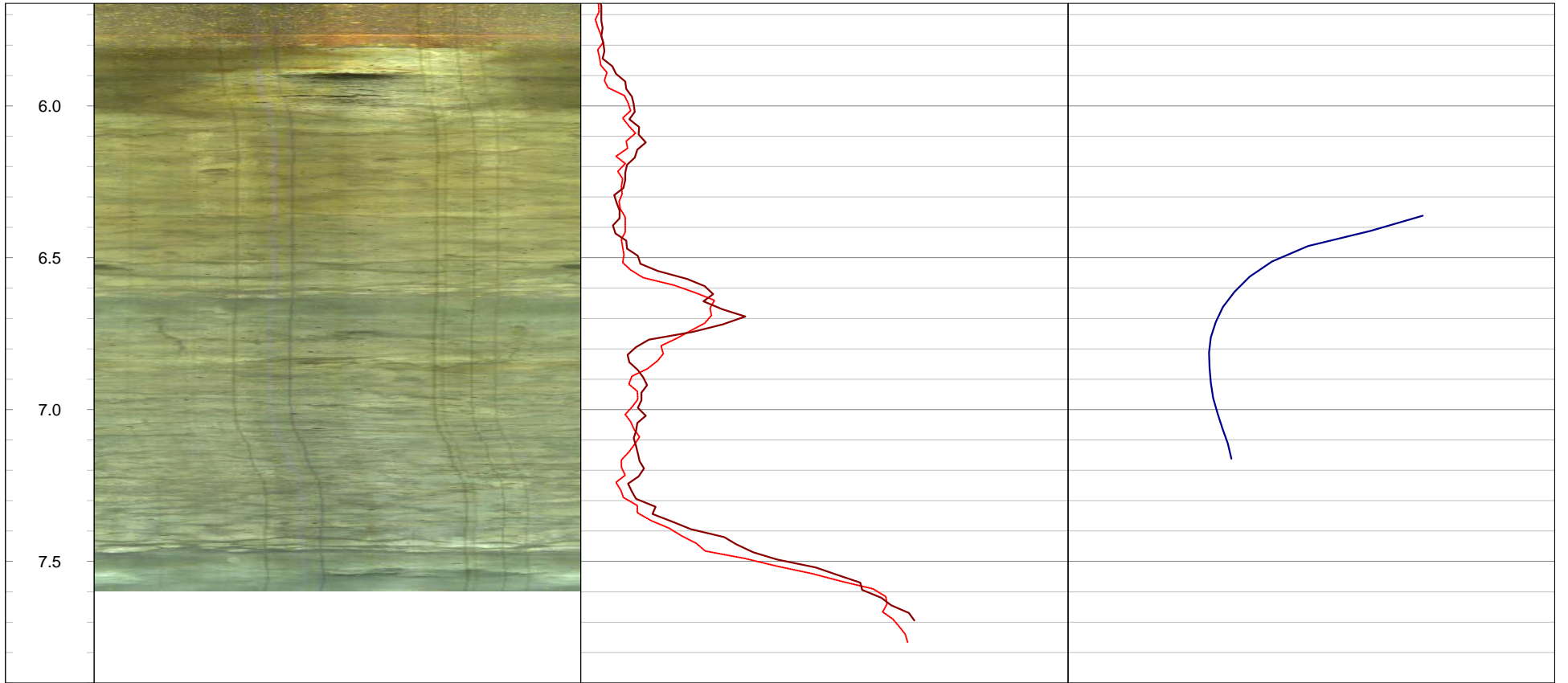
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.81 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578343.84 m    **Drilled Depth:** 9.01 m bgs    **Water Level:** 2.74 m bgs    **Log Date:** Mar-26-2020  
**Northing:** 4854157.49 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 399.95 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.49 m ags

**Notes:** OBI image opaque > 7.65 m bgs









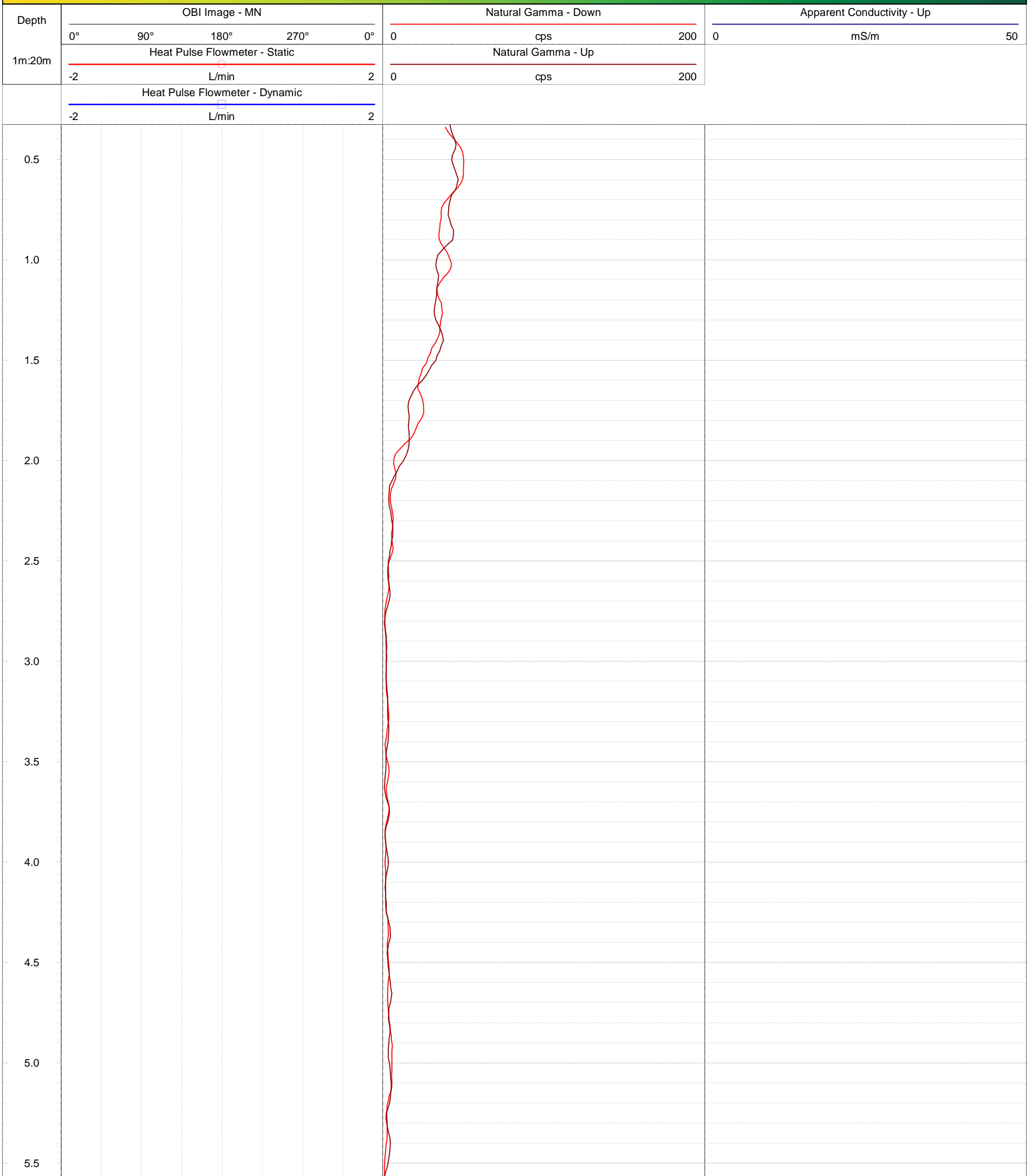
**GOLDER**  
MEMBER OF WSP

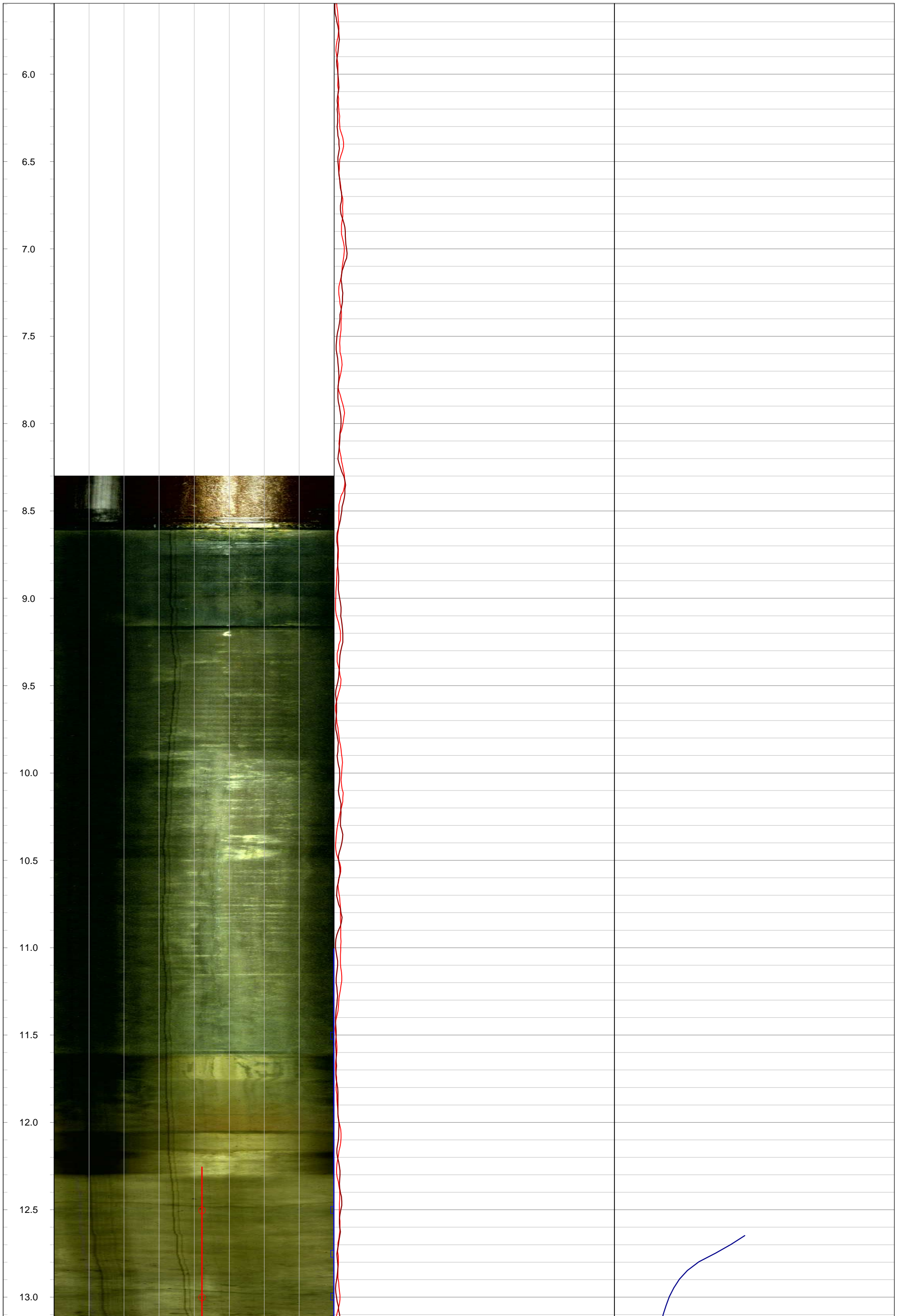
**Geophysical Record of Borehole: MW20-10 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.05 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577837.95 m    **Drilled Depth:** 21.19 m bgs    **Water Level:** 8.33 m bgs    **Log Date:** Mar-24-2020  
**Northing:** 4854407.28 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 411.32 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.35 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 10.5 m below top of casing. Pump rate approximately 2.72 L/min













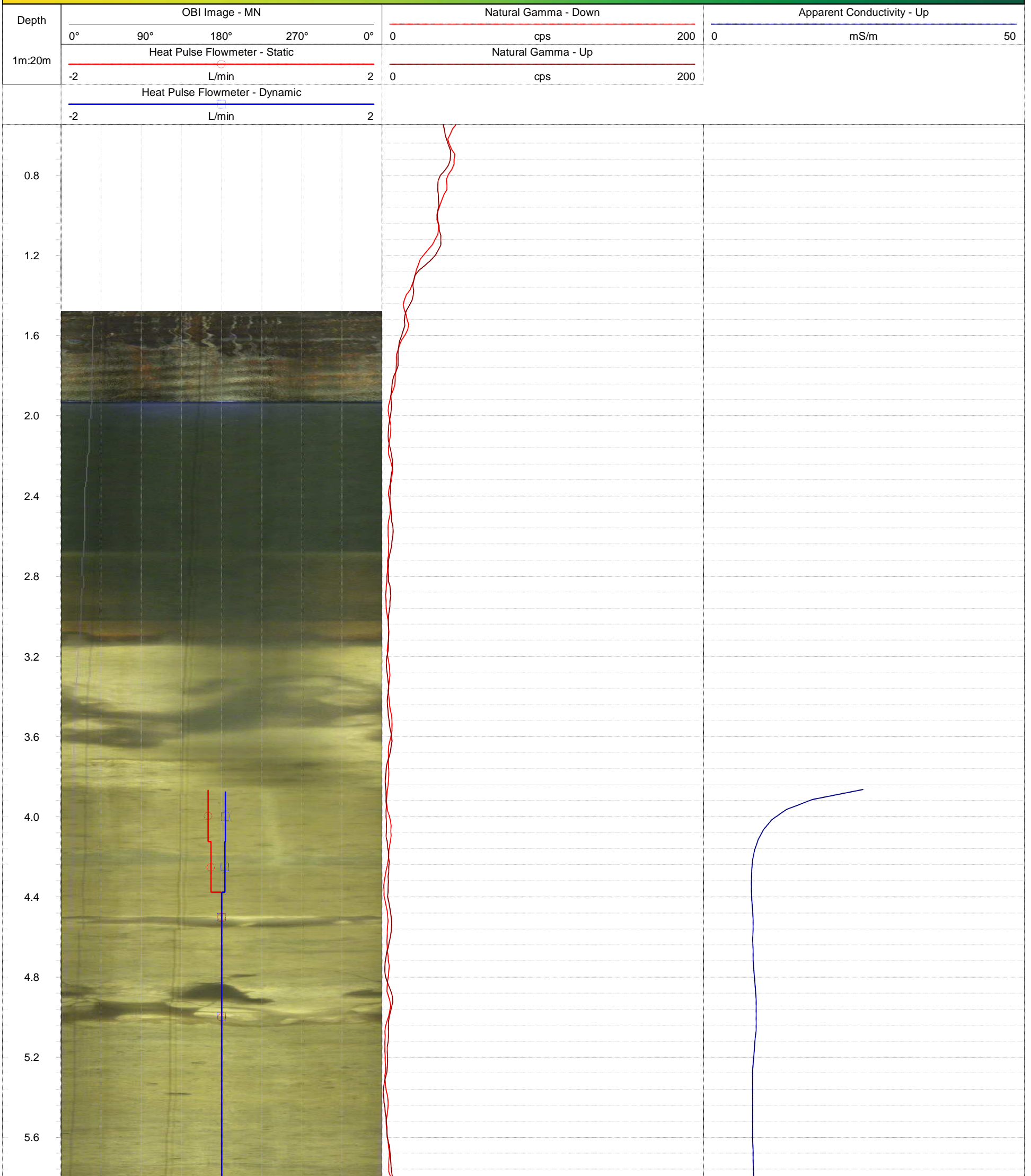
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-11 (CAL)**

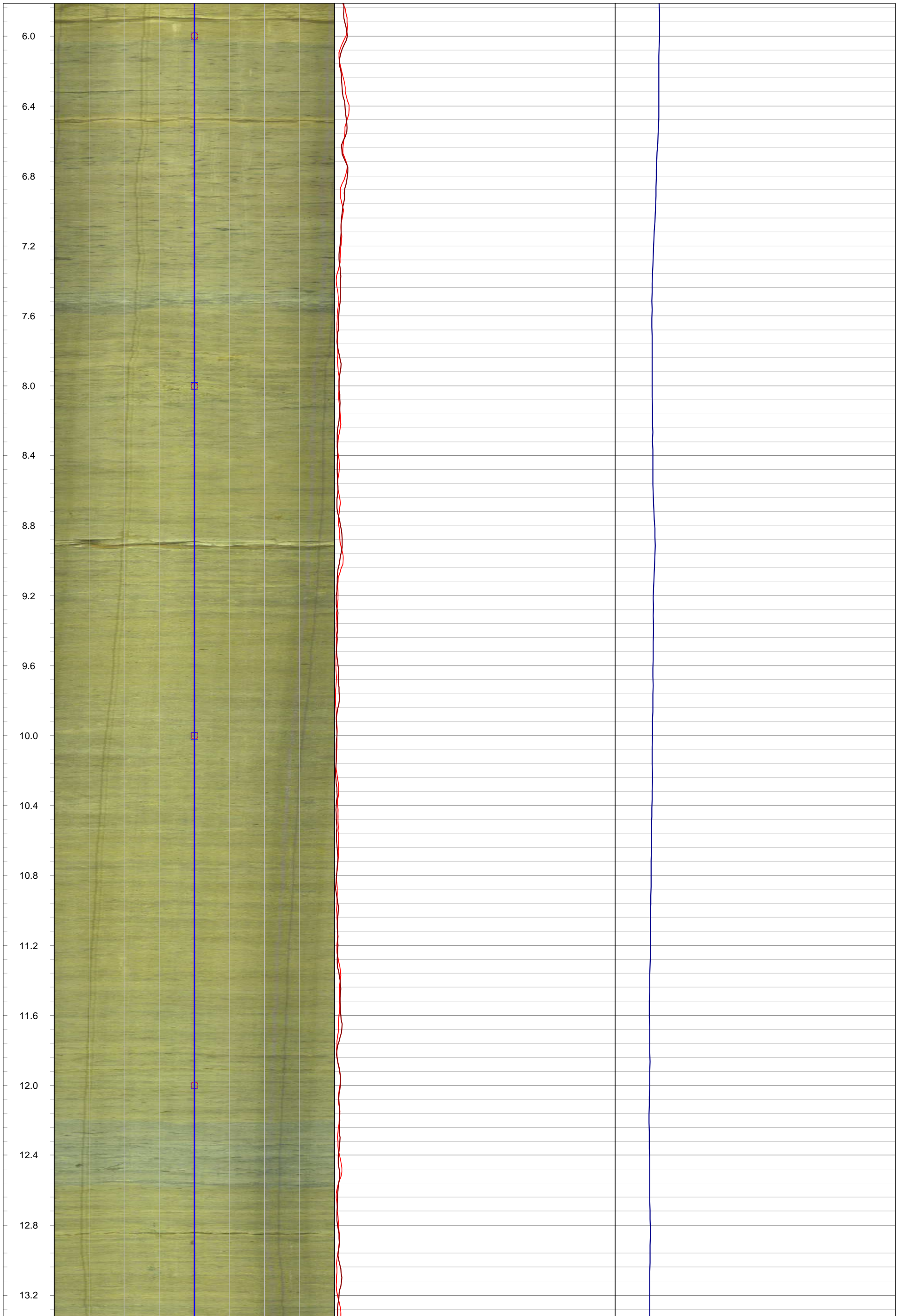
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

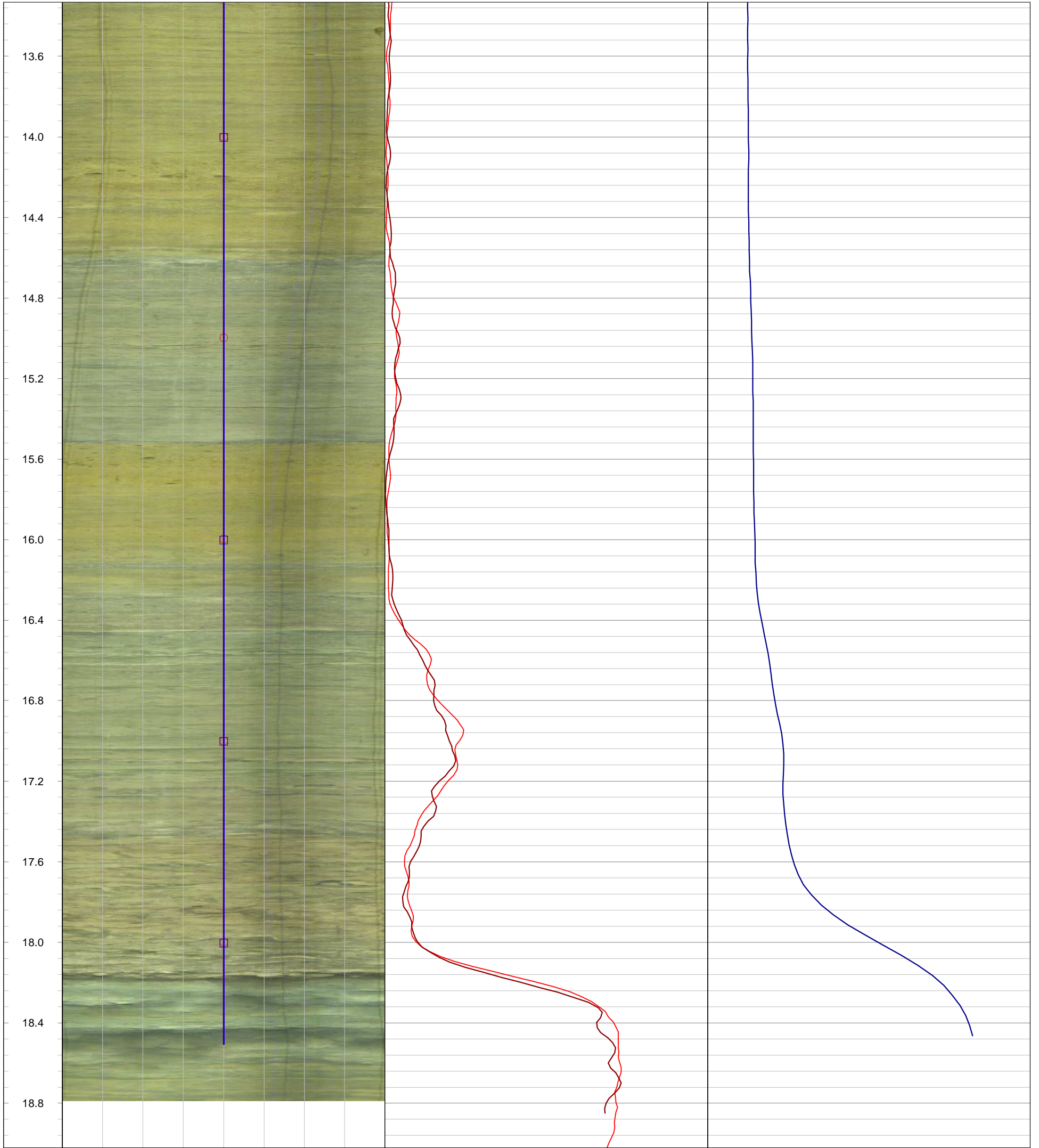
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 3.15 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577671.98 m    **Drilled Depth:** 19.39 m bgs    **Water Level:** 1.93 m bgs    **Log Date:** Apr-06-2020  
**Northing:** 4853921.39 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 409.72 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.14 m ags

**Notes:** OBI image opaque > 18.80 m. Heat Pulse Flowmeter Dynamic pump at 3.1 m below top of casing. Pump rate approximately 2.72 L/min.













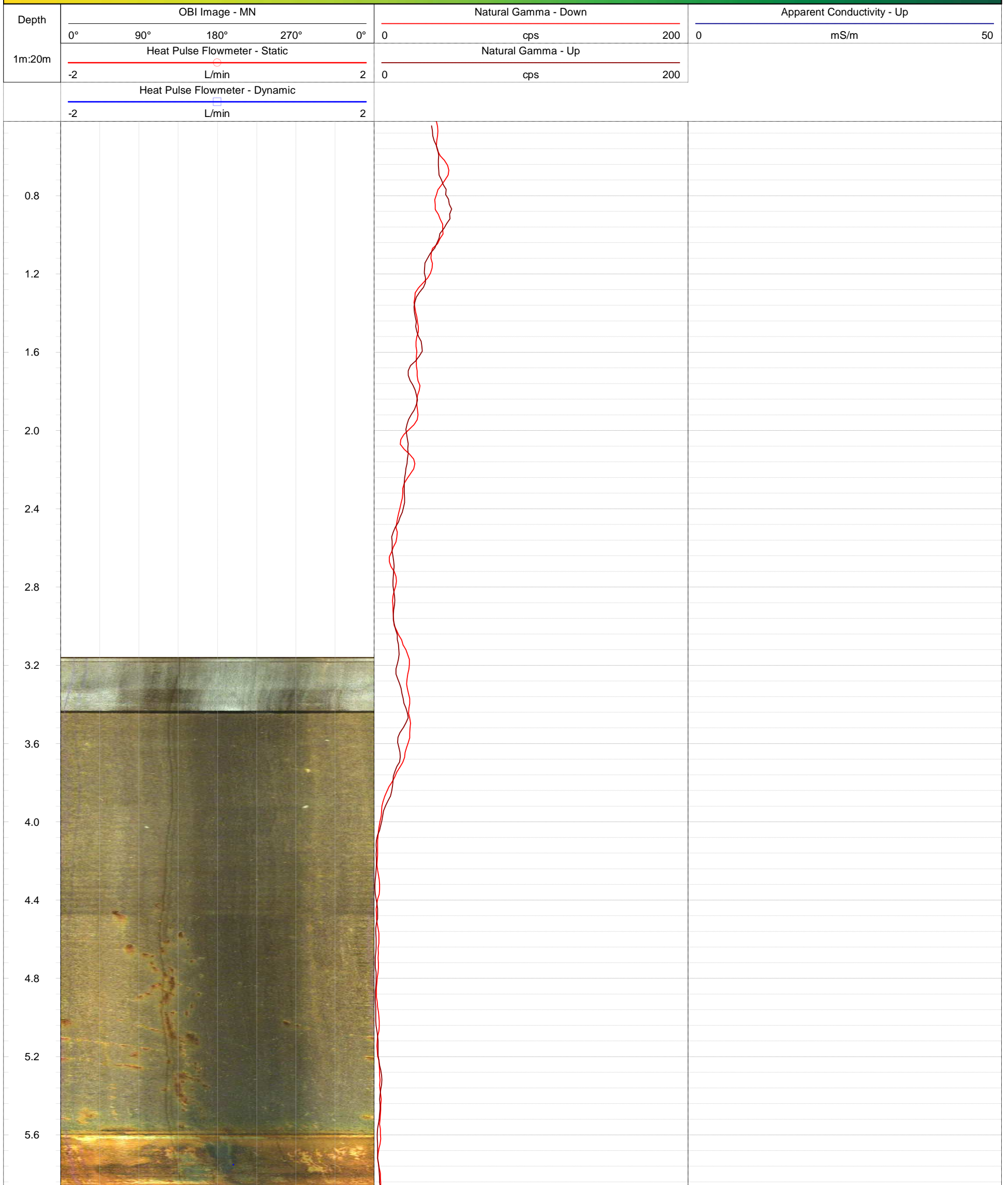
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-12 (CAL)**

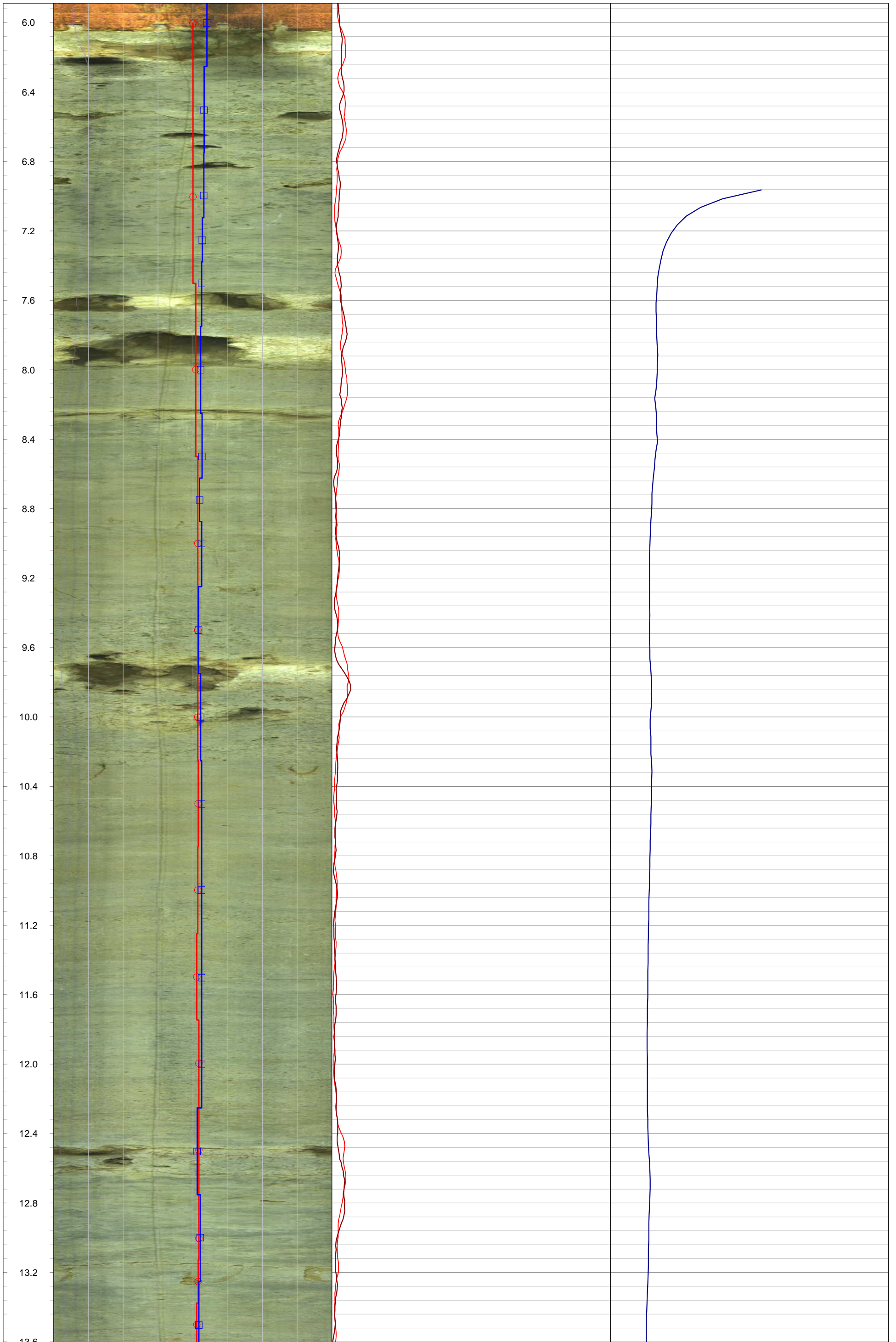
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

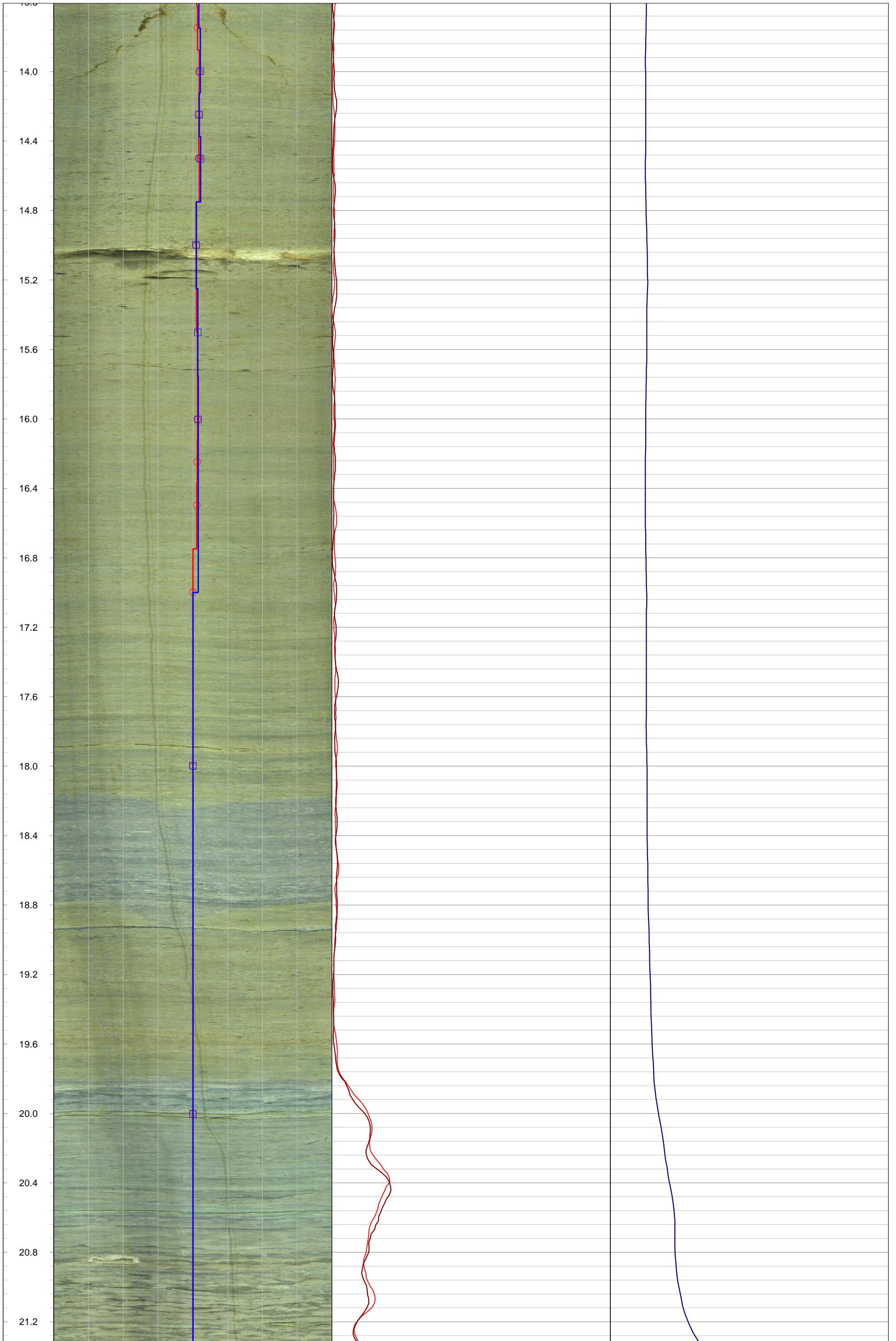
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.05 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577271.90 m    **Drilled Depth:** 22.65 m bgs    **Water Level:** 3.44 m bgs    **Log Date:** Apr-08-2020  
**Northing:** 4854321.42 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 412.43 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.26 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 4.5 m below top of casing. Pump rate approximately 2.30 L/min.

















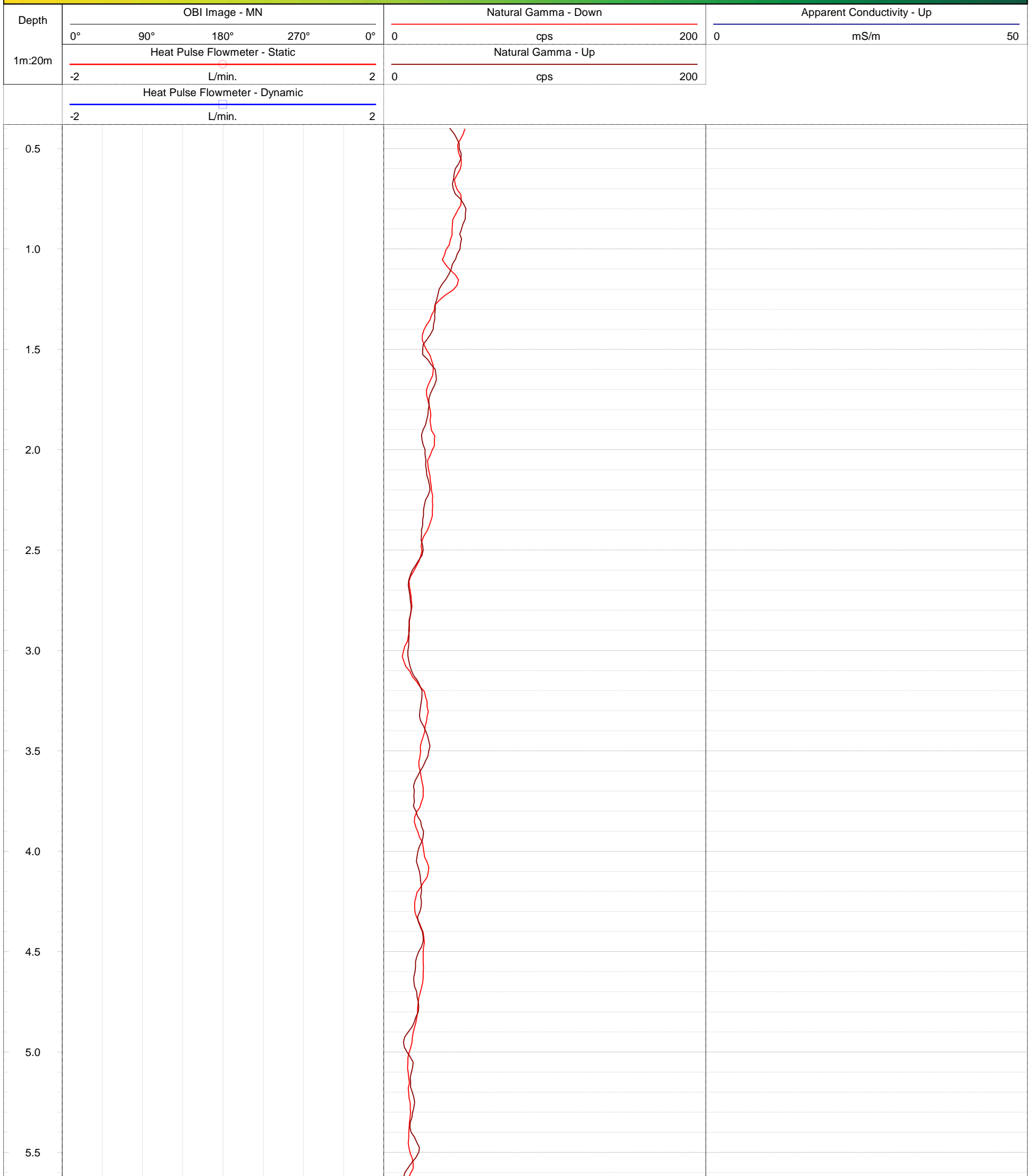
**GOLDER**  
MEMBER OF WSP

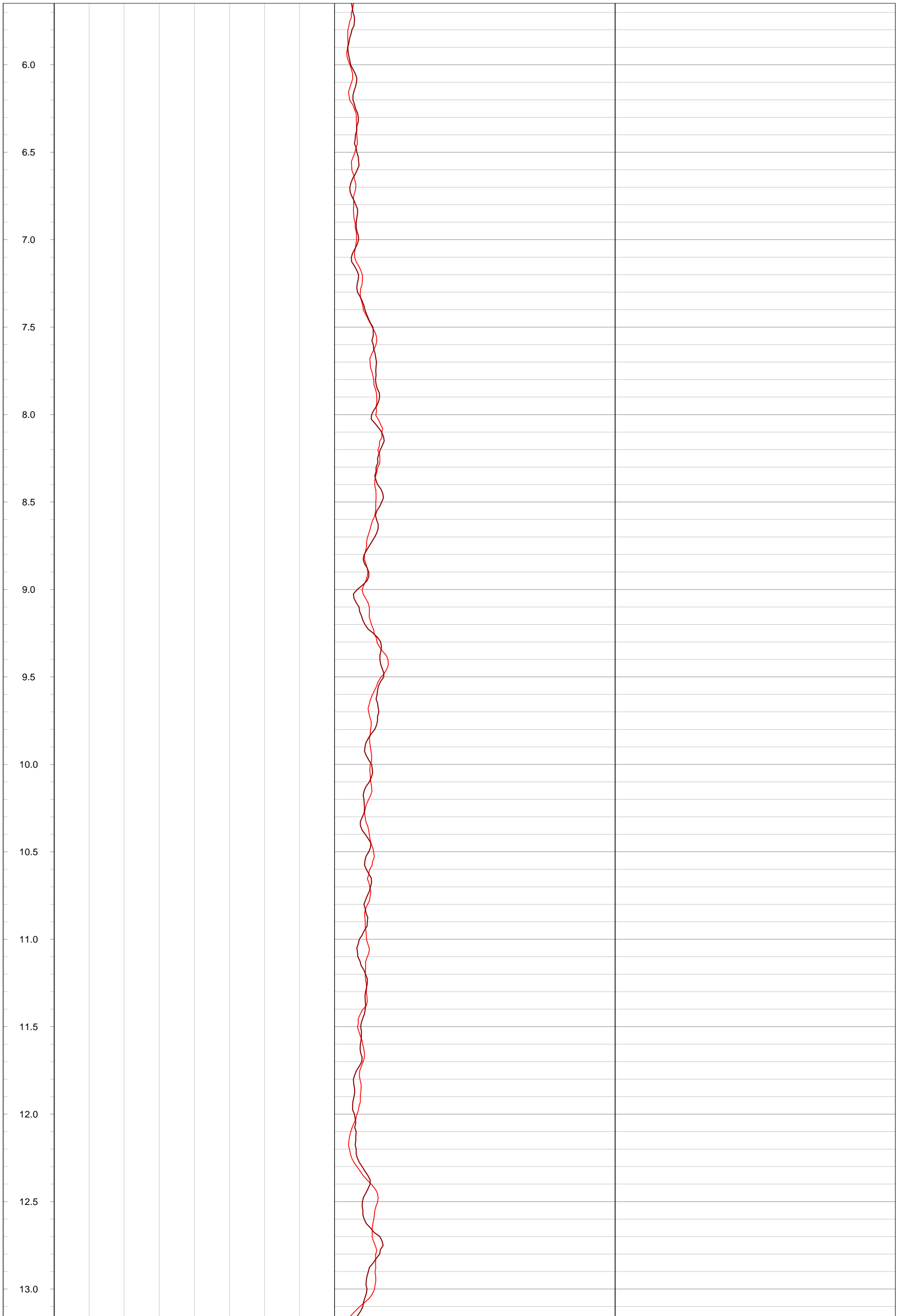
**Geophysical Record of Borehole: MW20-13 (CAL)**

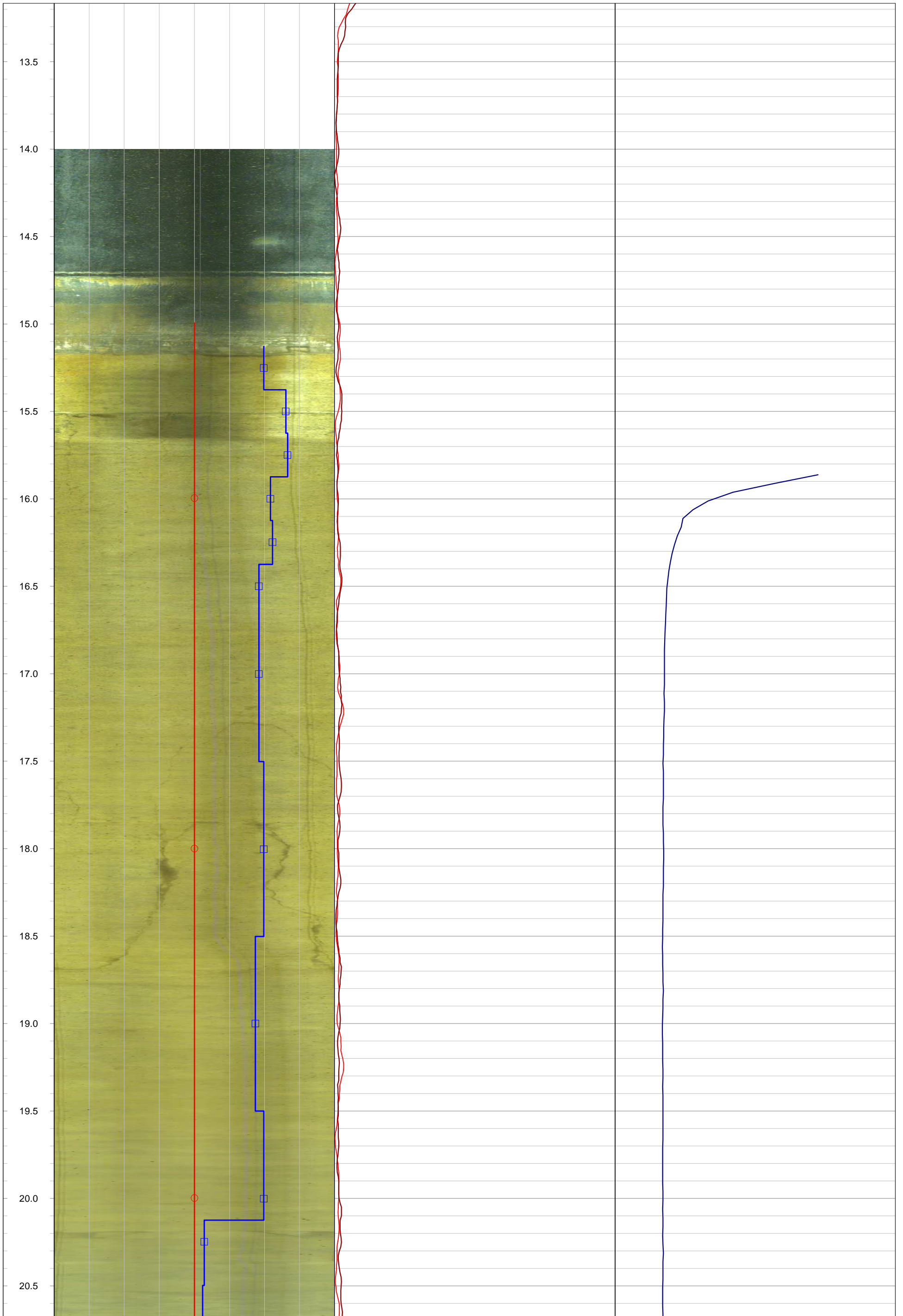
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.16 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576873.11 m    **Drilled Depth:** 28.23 m bgs    **Water Level:** 2.64 m bgs    **Log Date:** Apr-15-2020  
**Northing:** 4854473.14 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.53 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.28 m ags

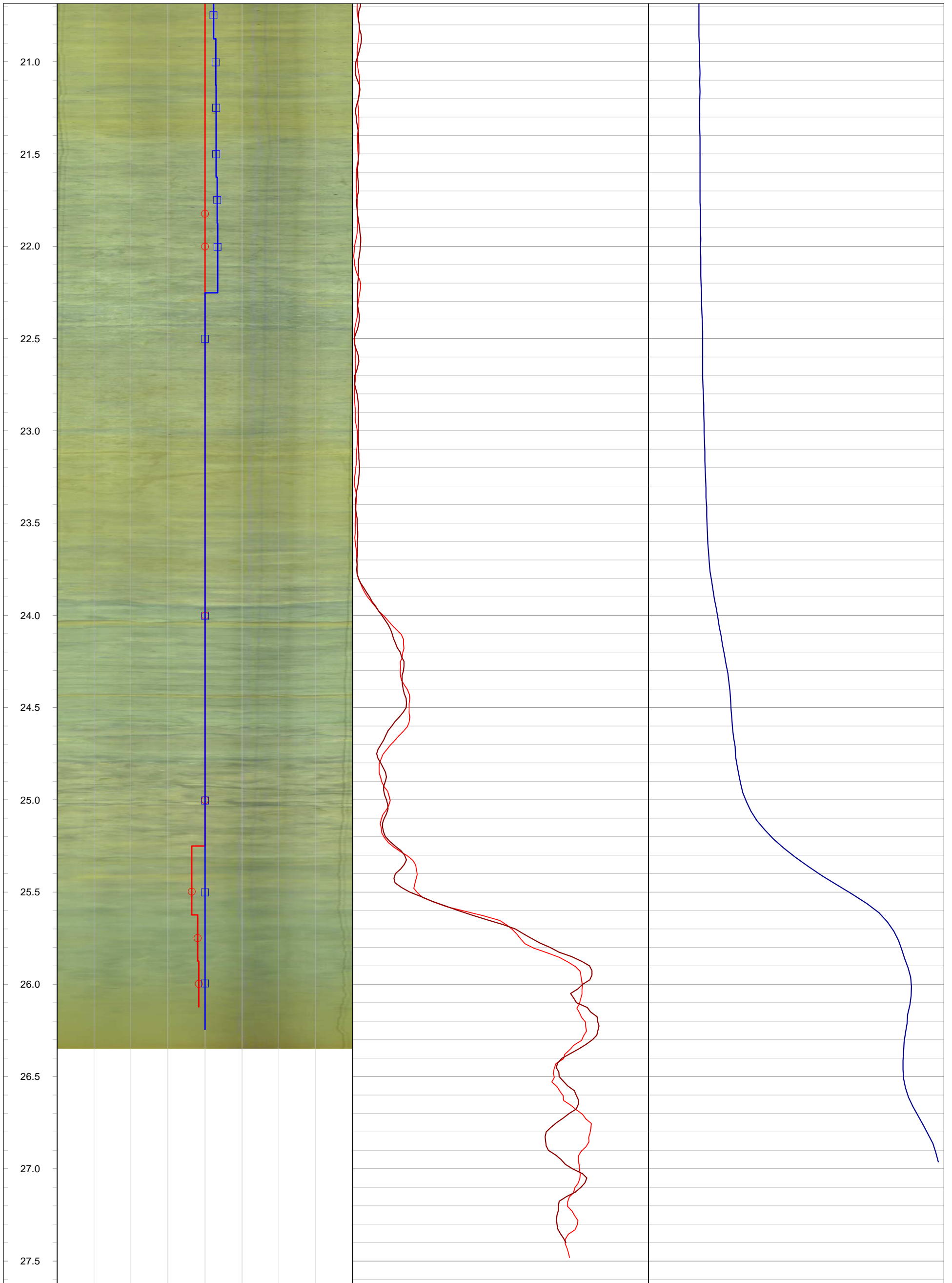
**Notes:** Heat Pulse Flowmeter Dynamic pump at 6.0 m below top of casing. Pump rate approximately 1.40 L/min.













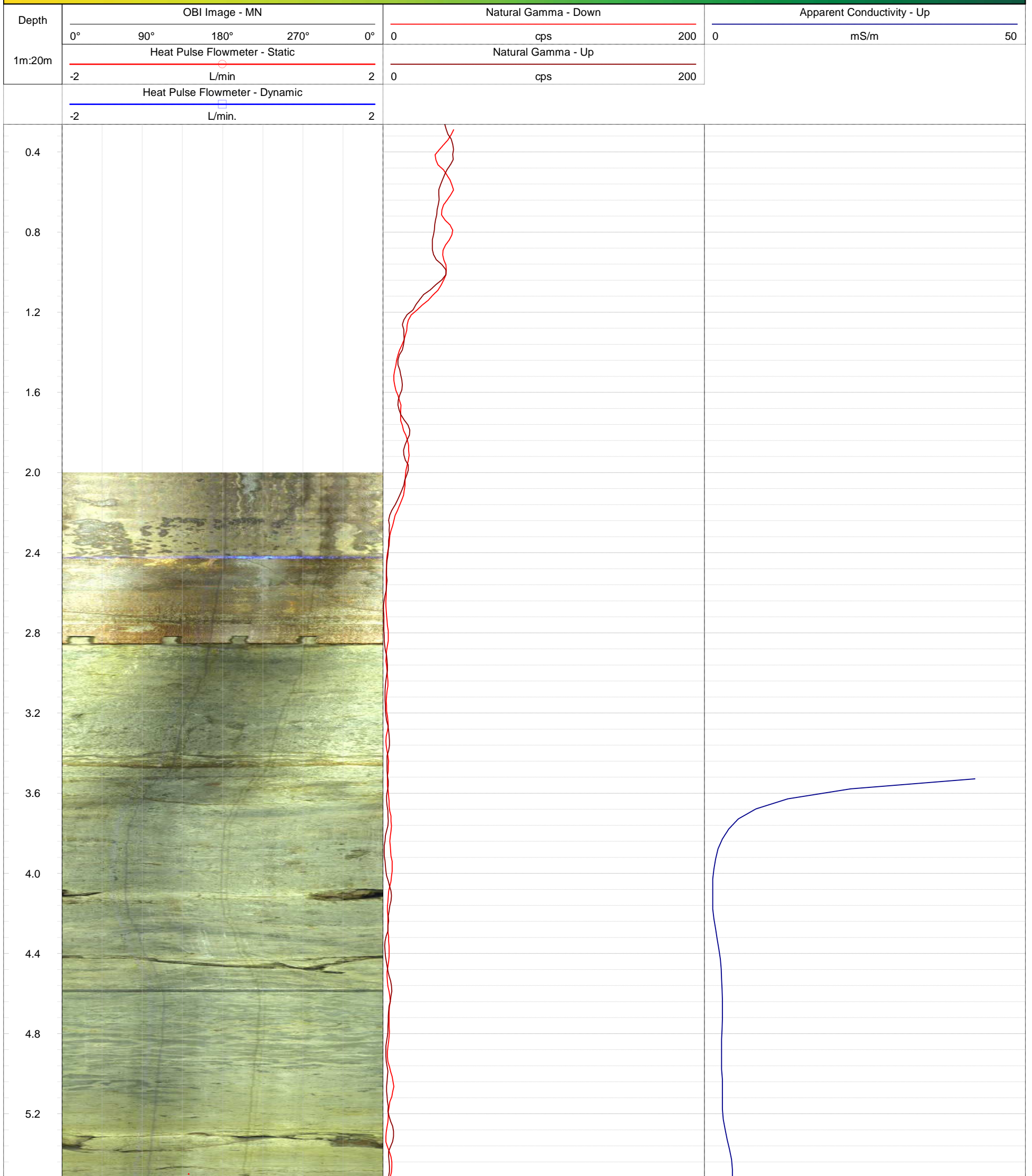
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-14 (CAL)**

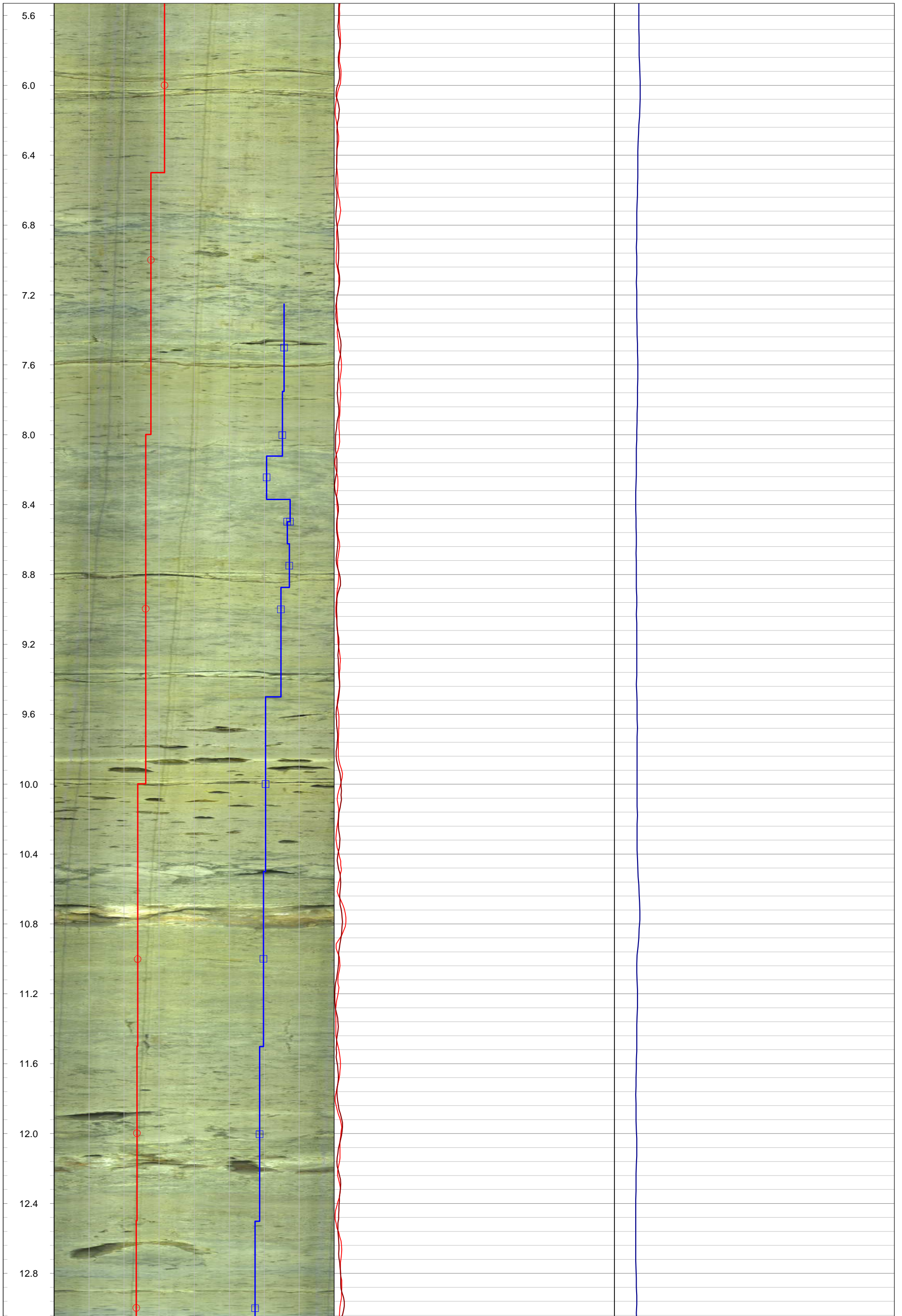
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.85 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577575.99 m    **Drilled Depth:** 26.35 m bgs    **Water Level:** 4.52 m bgs    **Log Date:** May-14-2020  
**Northing:** 4853100.42 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 406.71 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.46 m ags

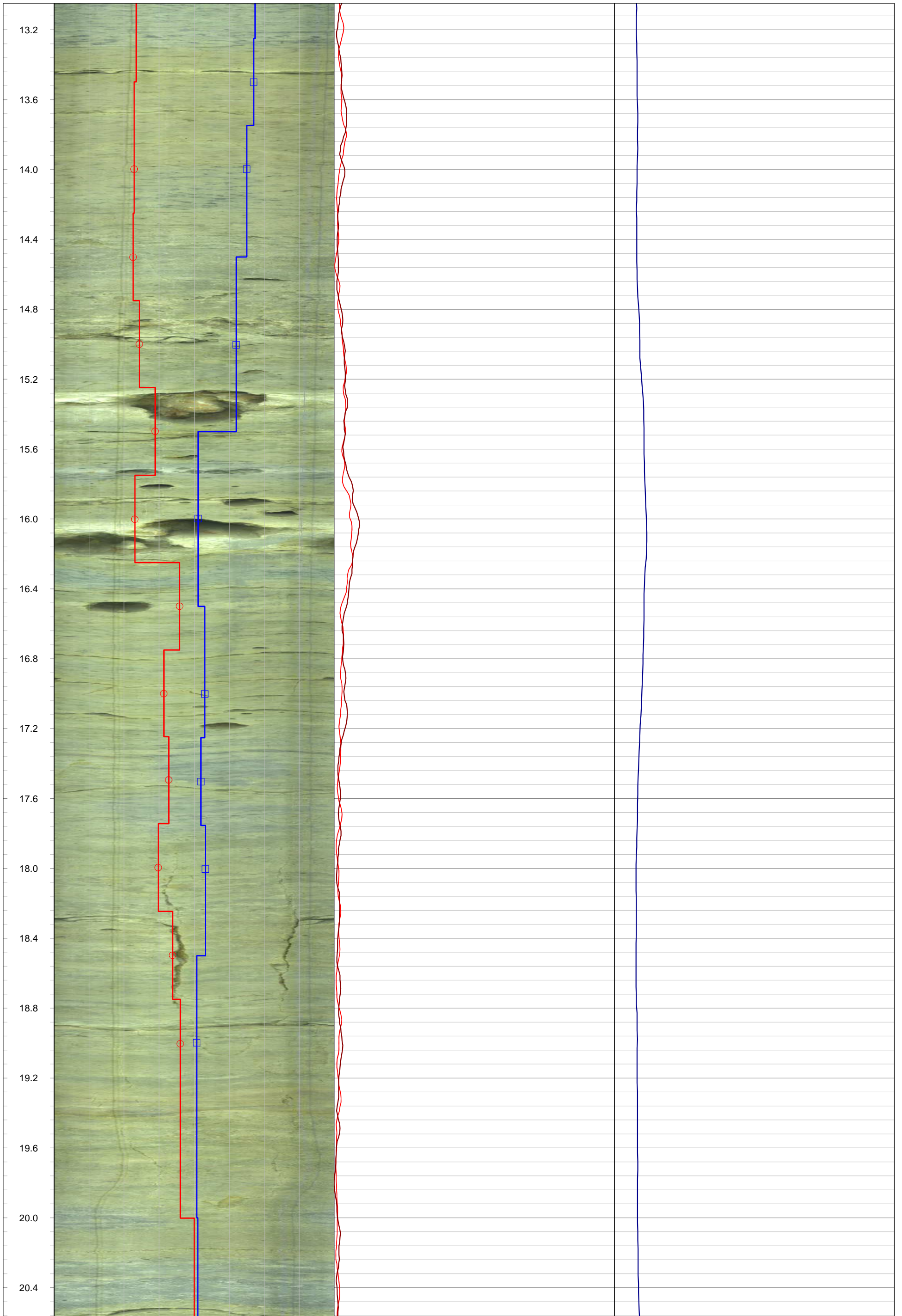
**Notes:** OBI image opaque > 25.90. Heat Pulse Flowmeter Dynamic pump at 5.0 m below top of casing. Pump rate approximately 2.63 L/min.

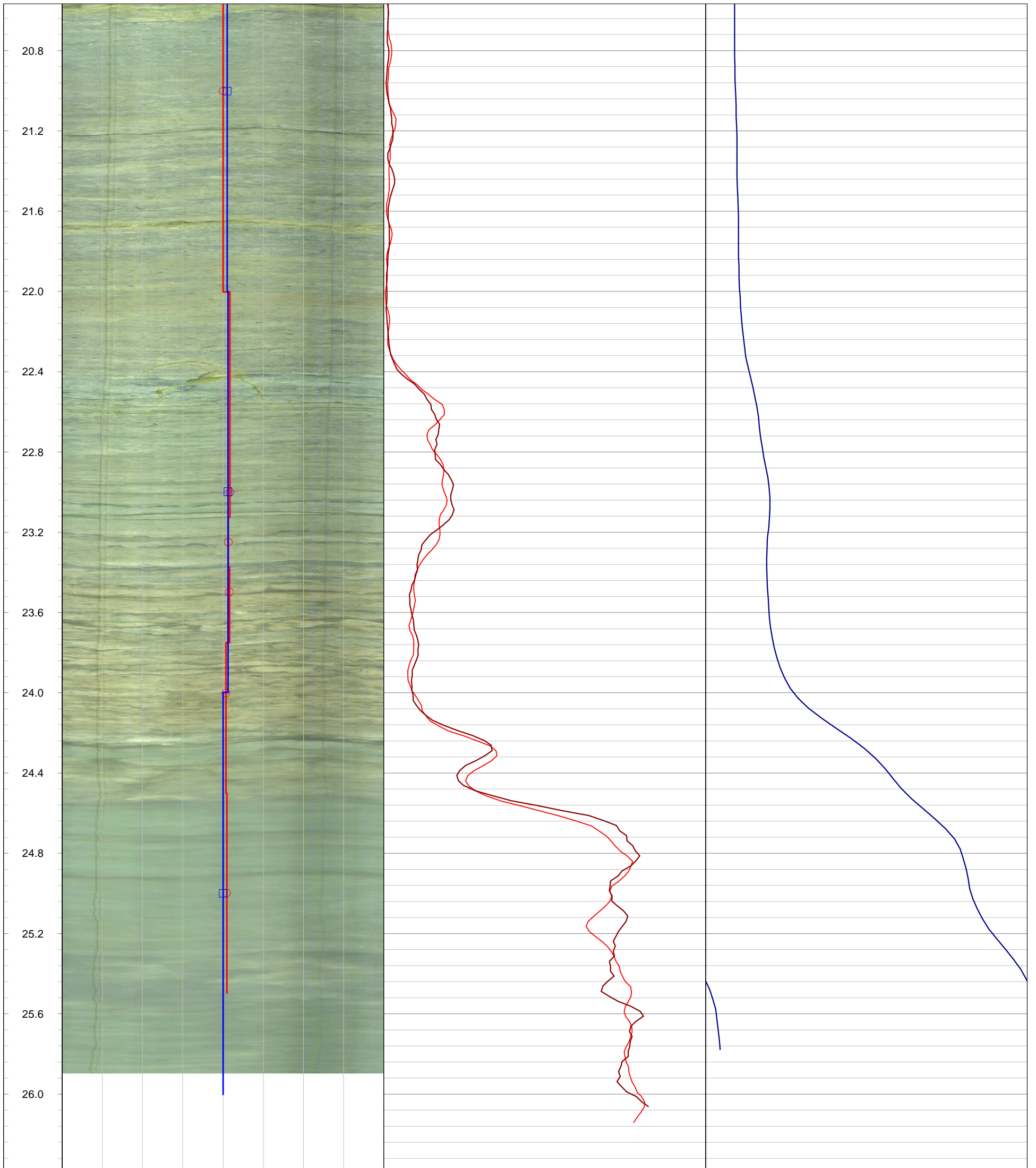














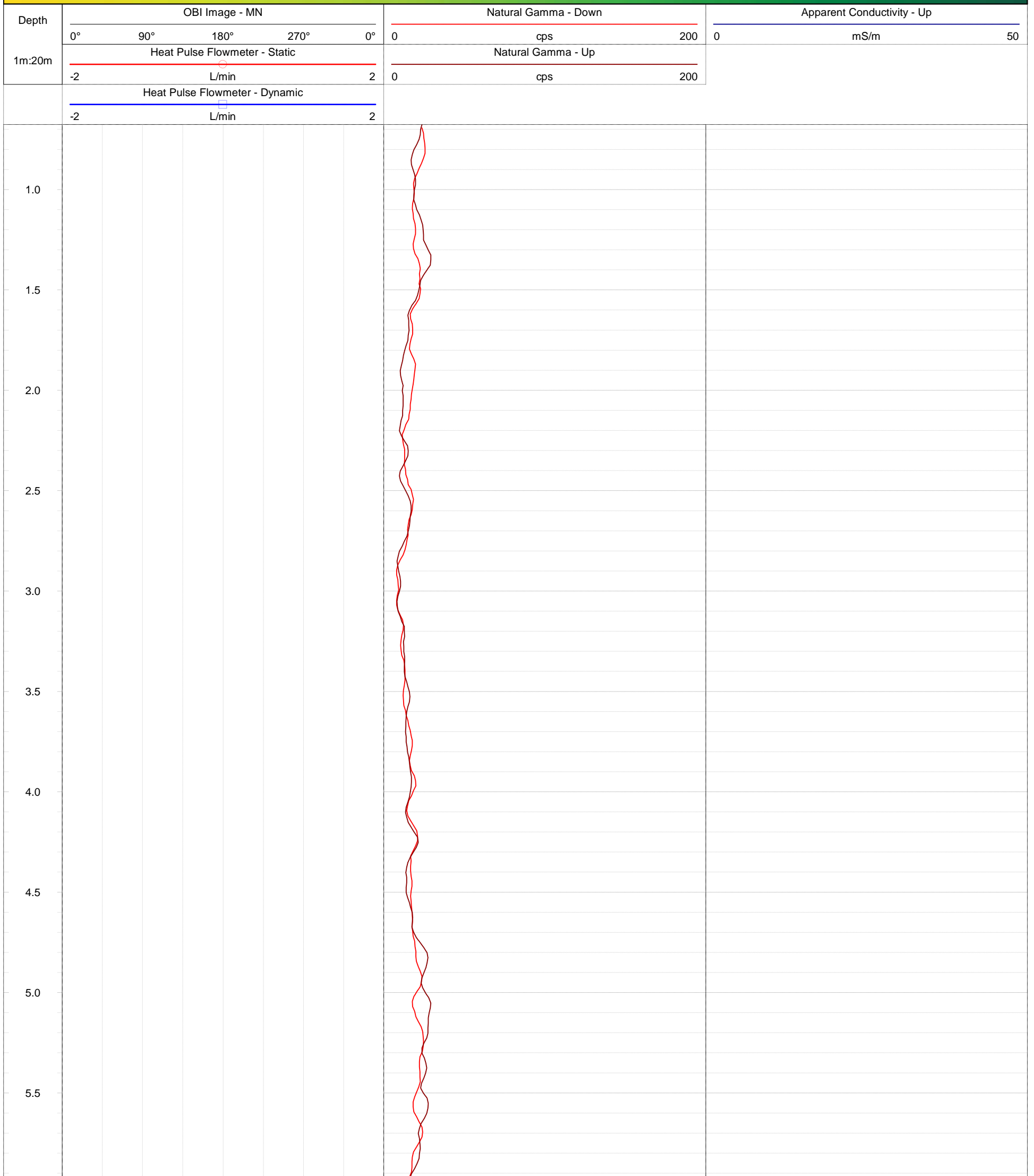
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-15 (CAL)**

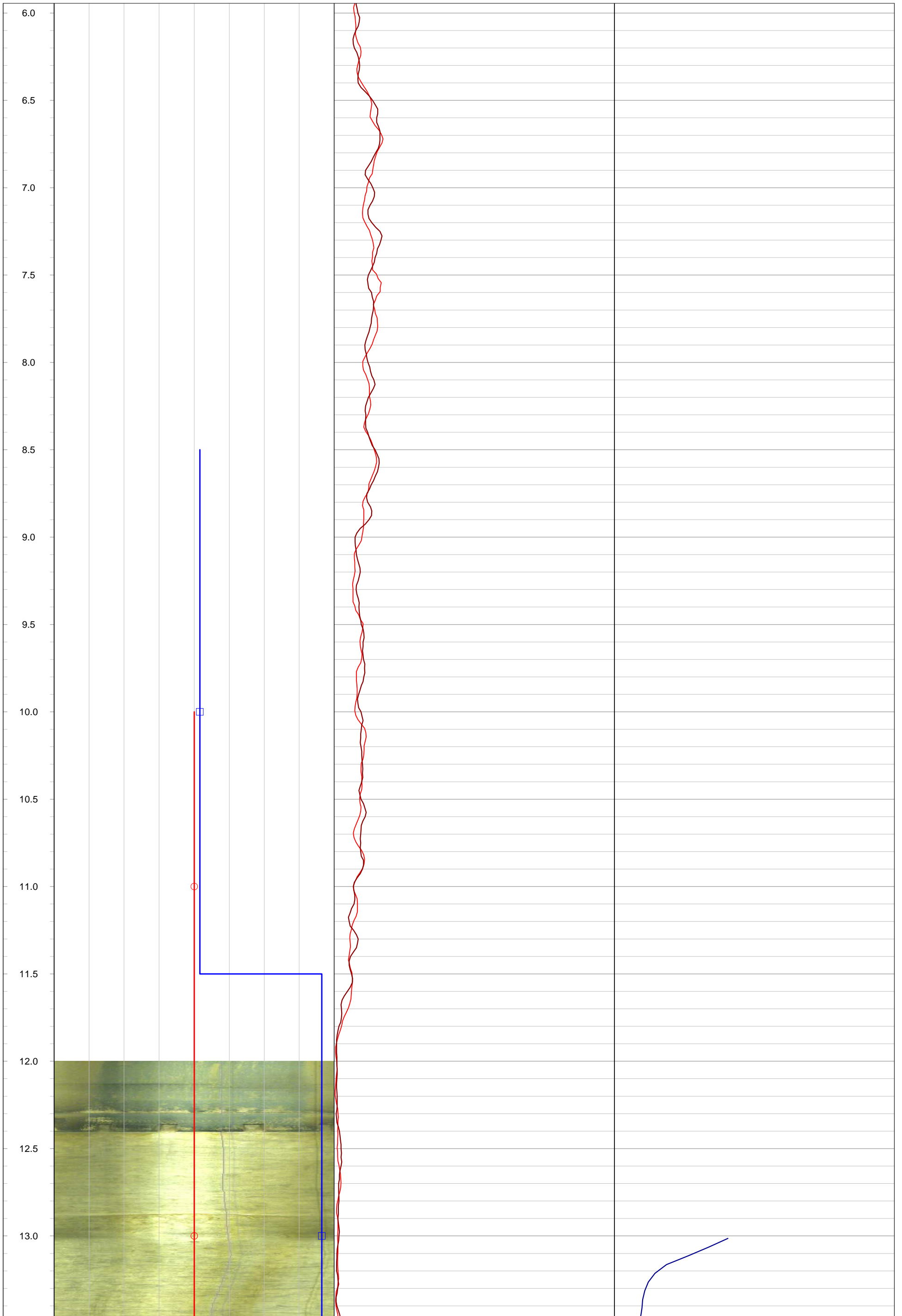
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

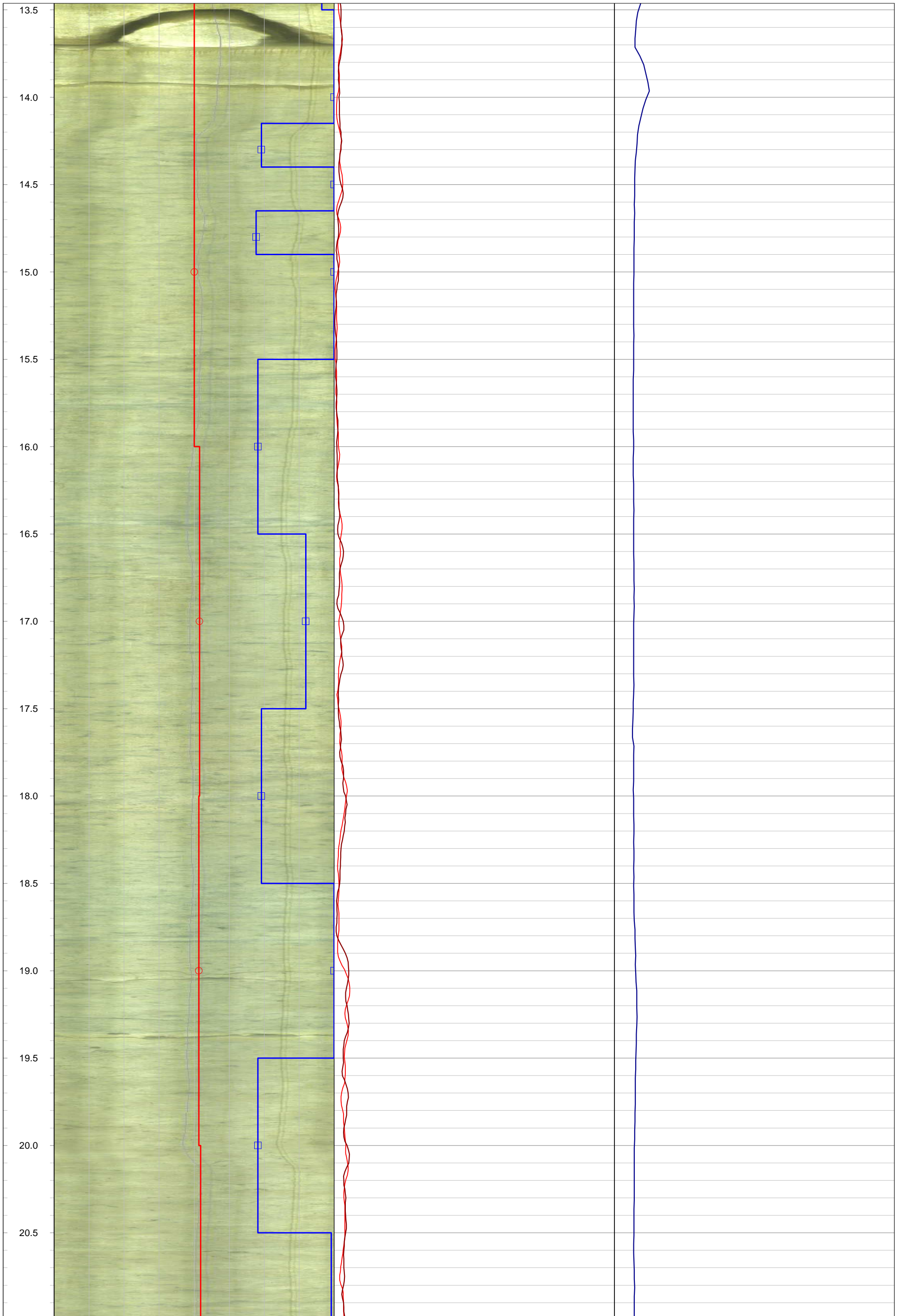
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.40 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576576.79 m    **Drilled Depth:** 37.17 m bgs    **Water Level:** 0.70 m bgs    **Log Date:** May-27-2020  
**Northing:** 4853544.15 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 417.06 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.00 m ags

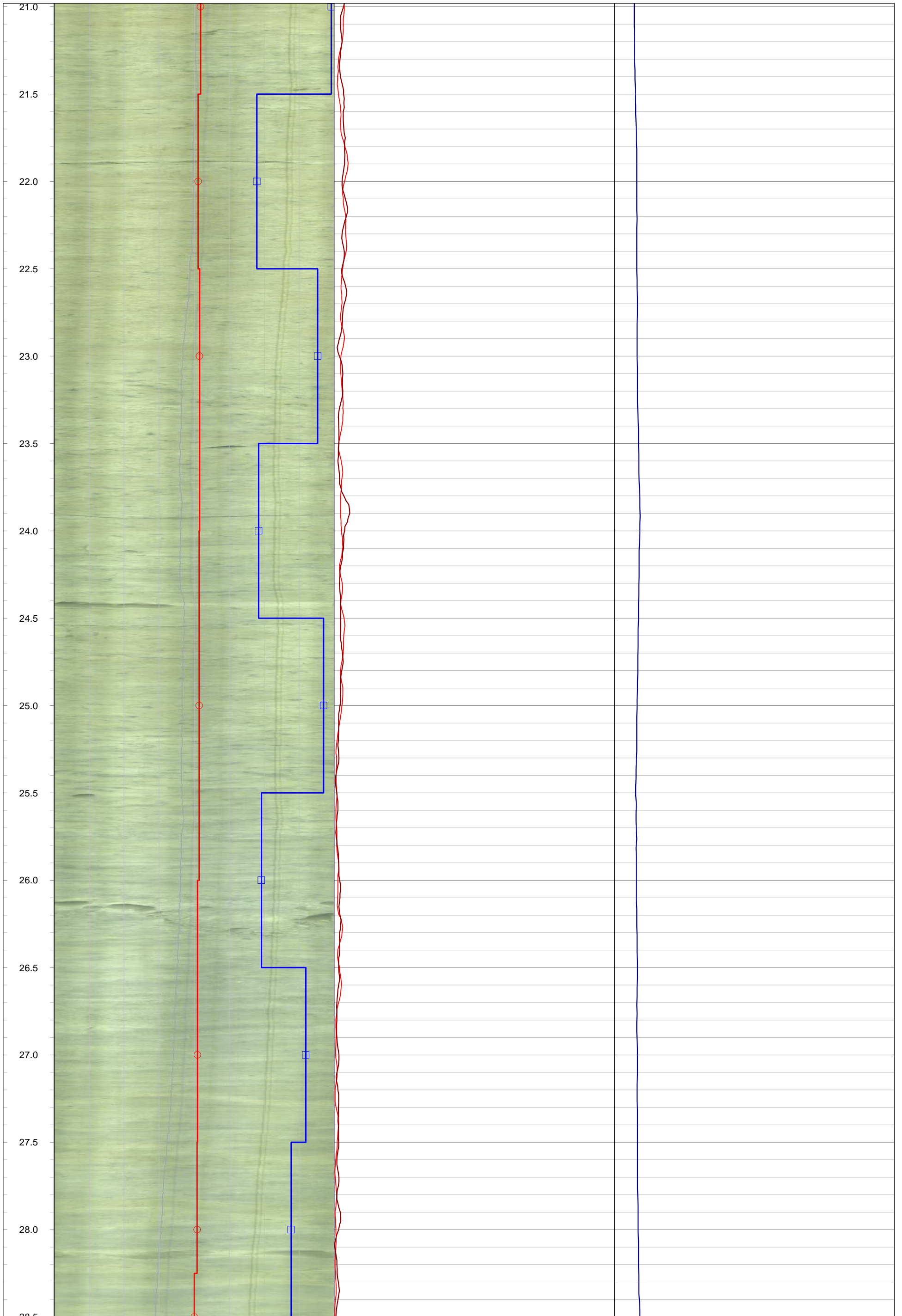
**Notes:** OBI image opaque > 36.6 m bgs



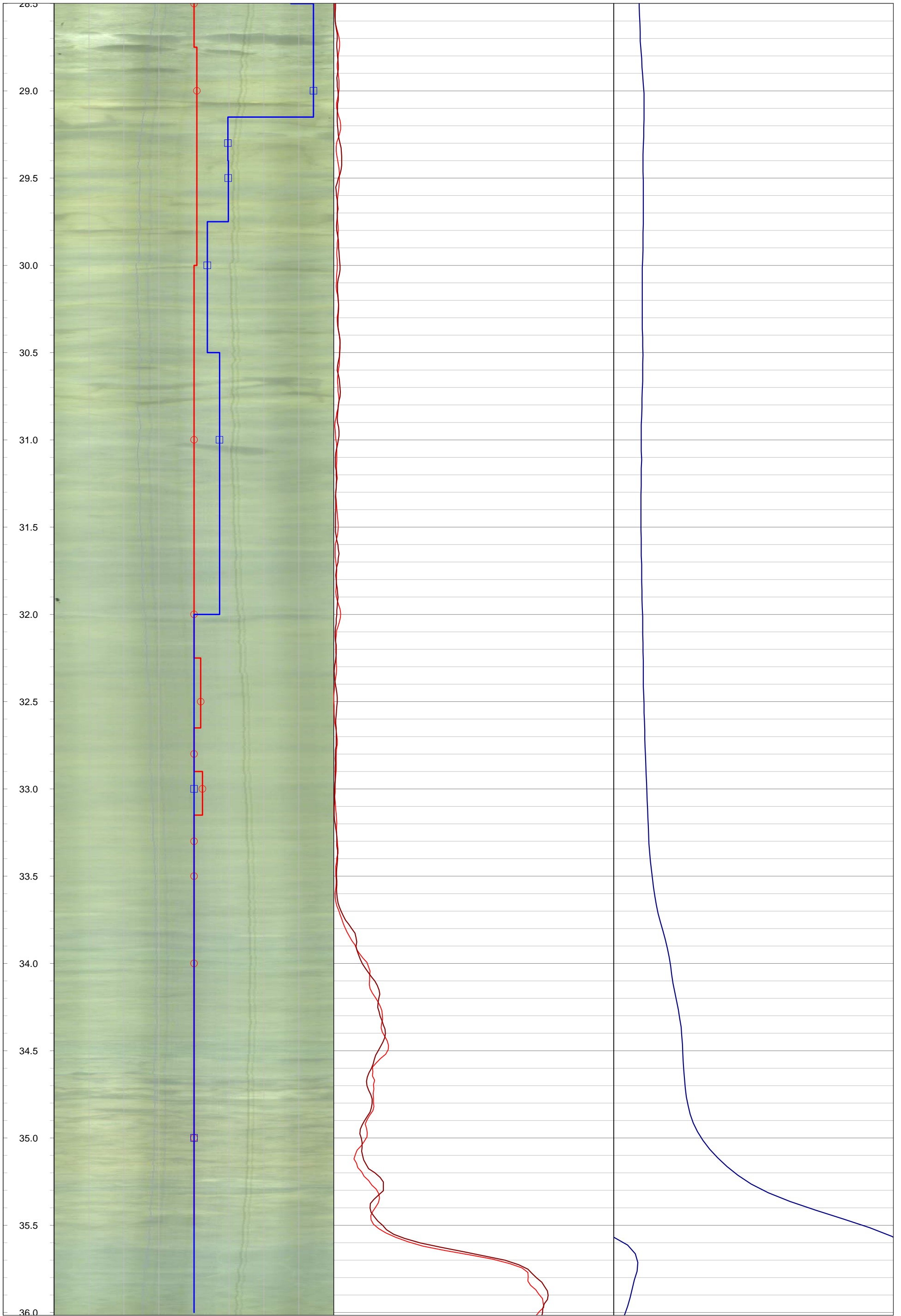
















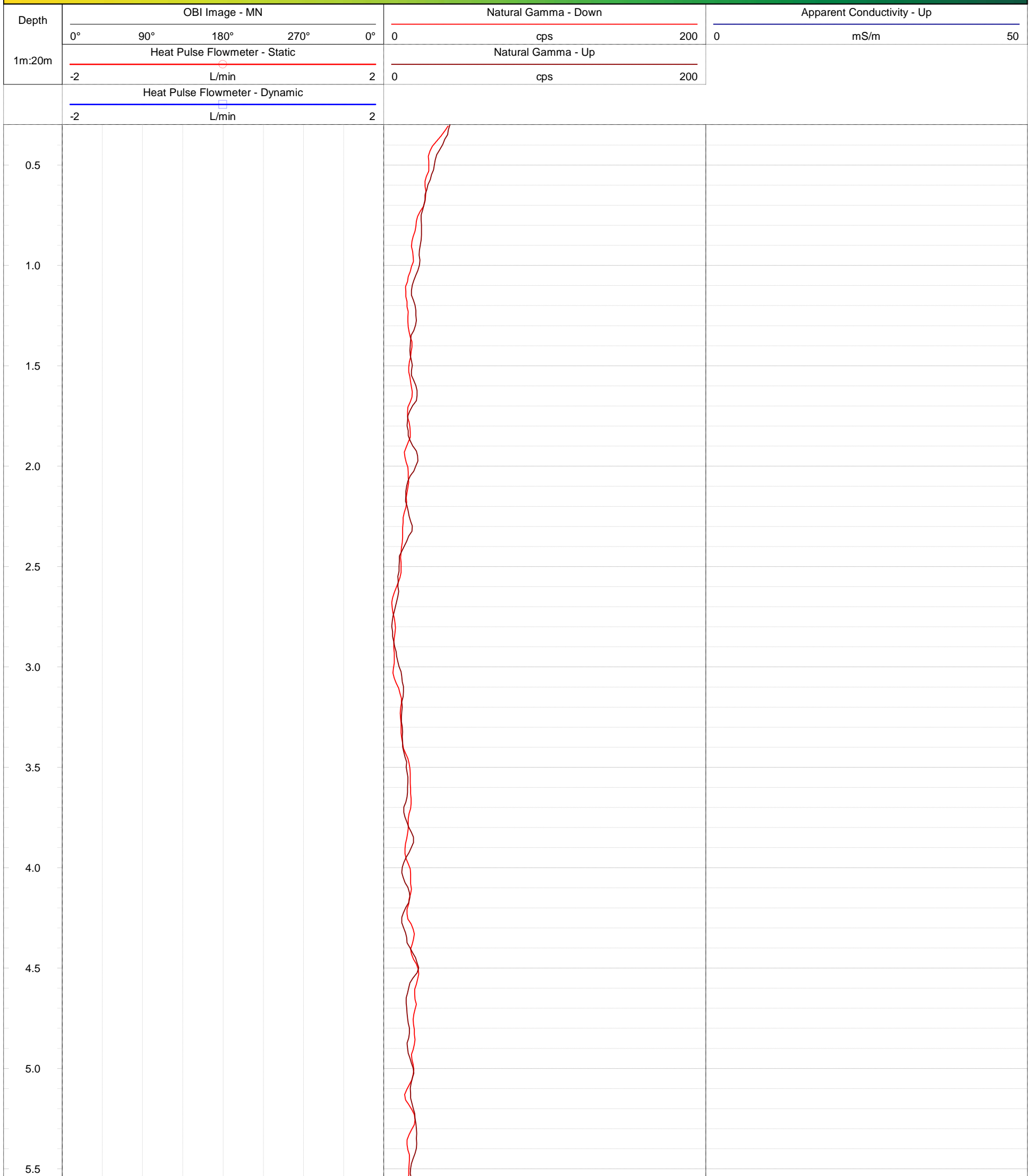
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-16 (CAL)**

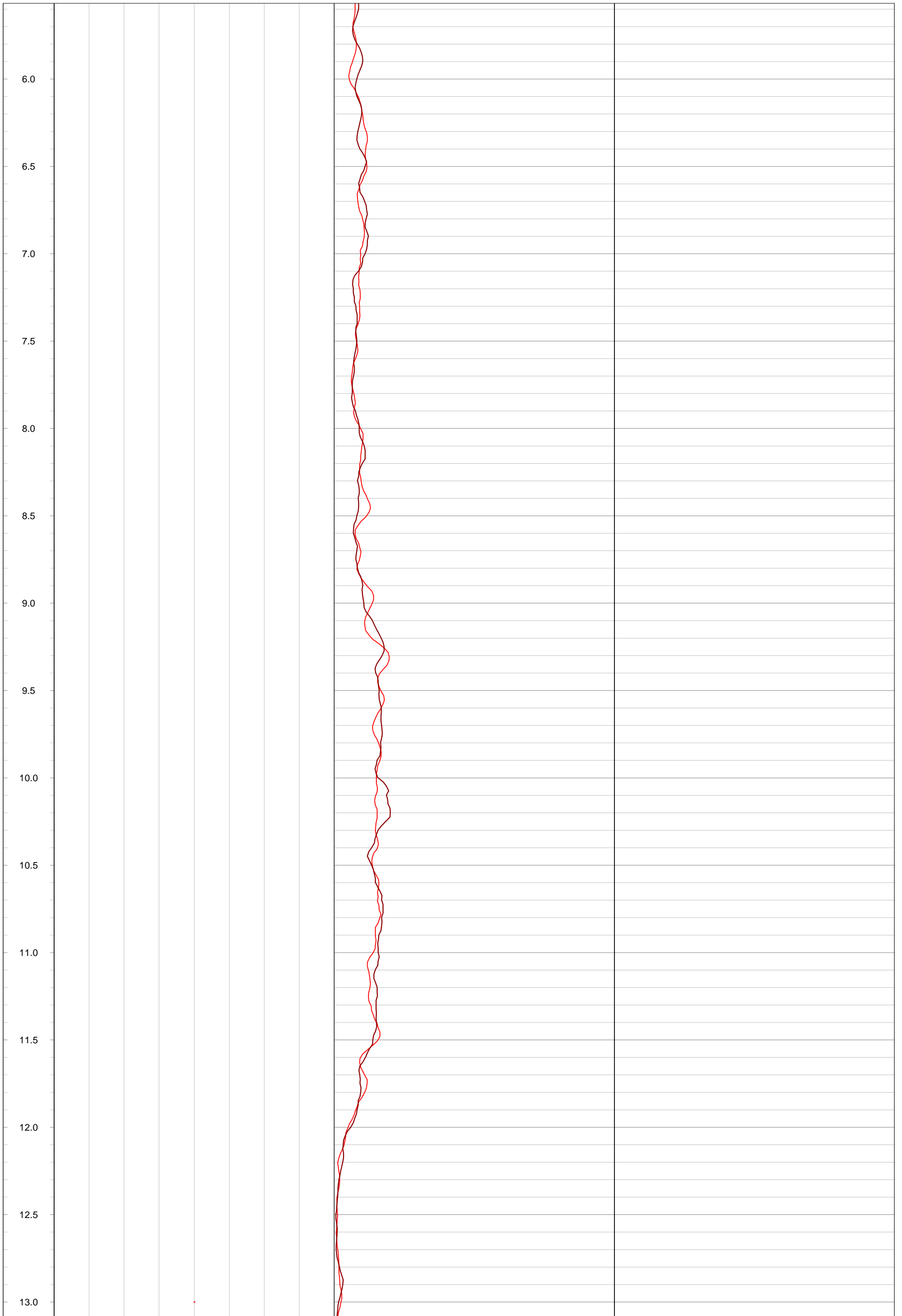
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

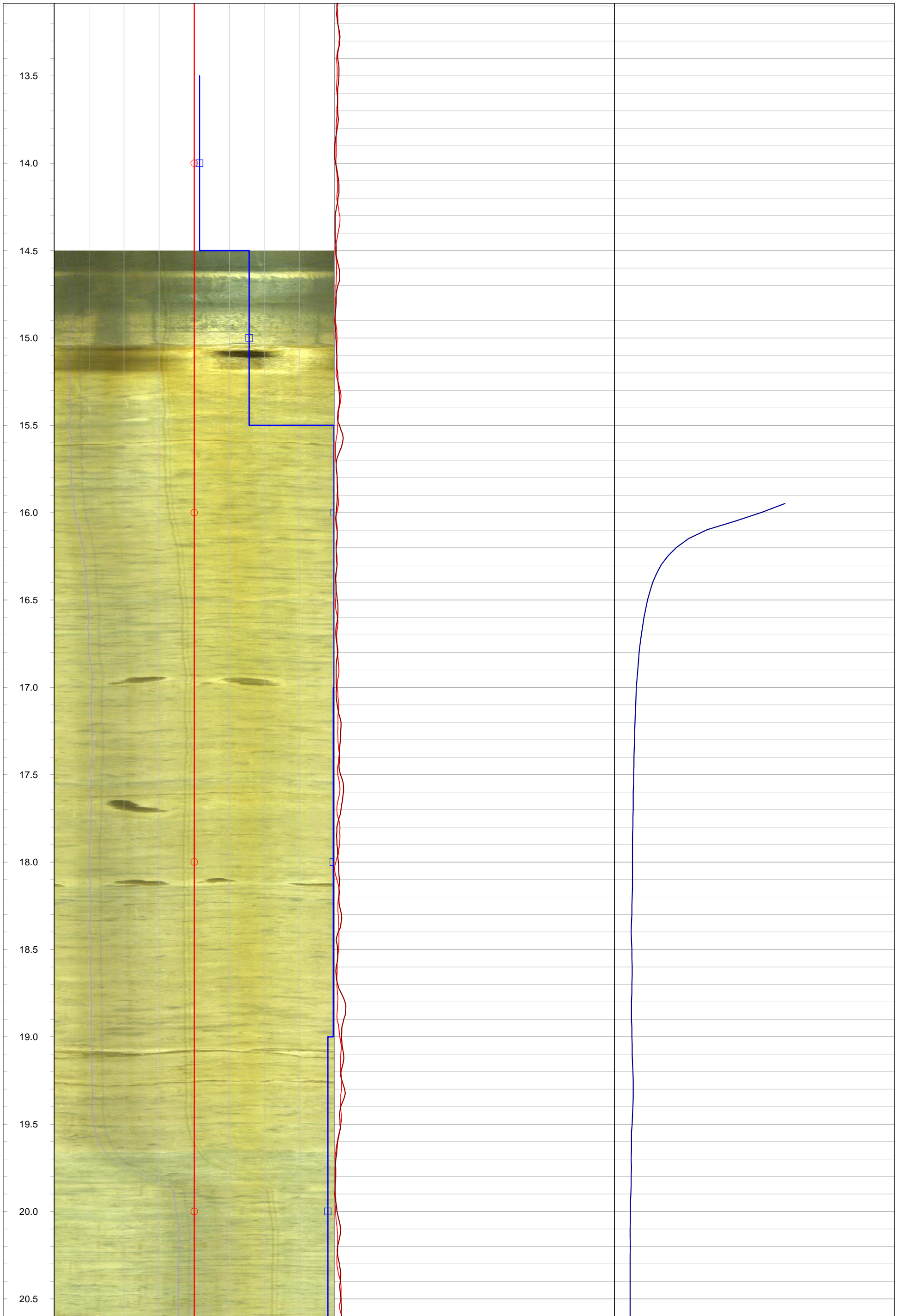
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.04 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576784.58 m    **Drilled Depth:** 39.77 m bgs    **Water Level:** 0.86 m bgs    **Log Date:** May-26-2020  
**Northing:** 4853806.76 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 421.40 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.46 m ags

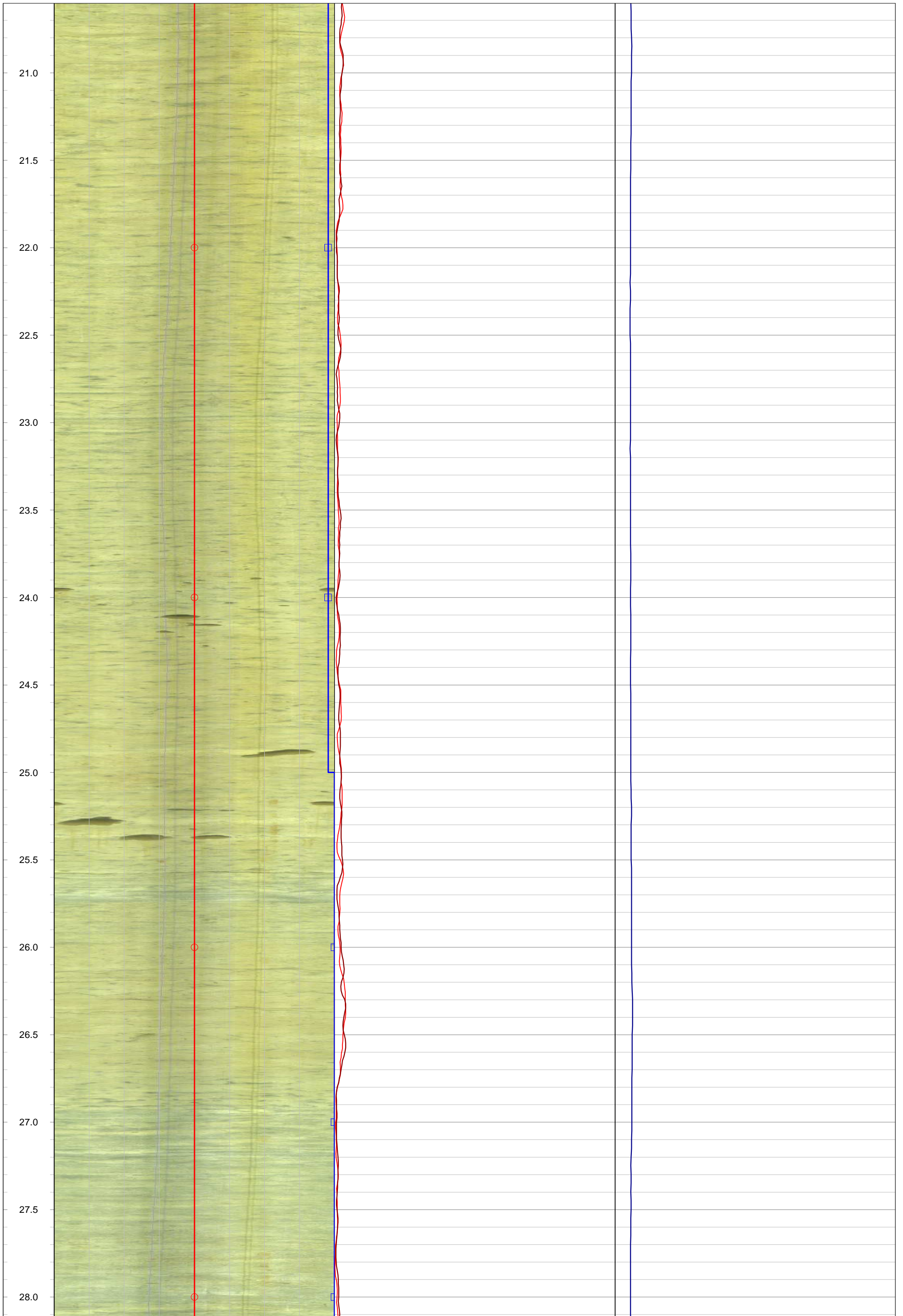
**Notes:** OBI image opaque > 38.60 m bgs



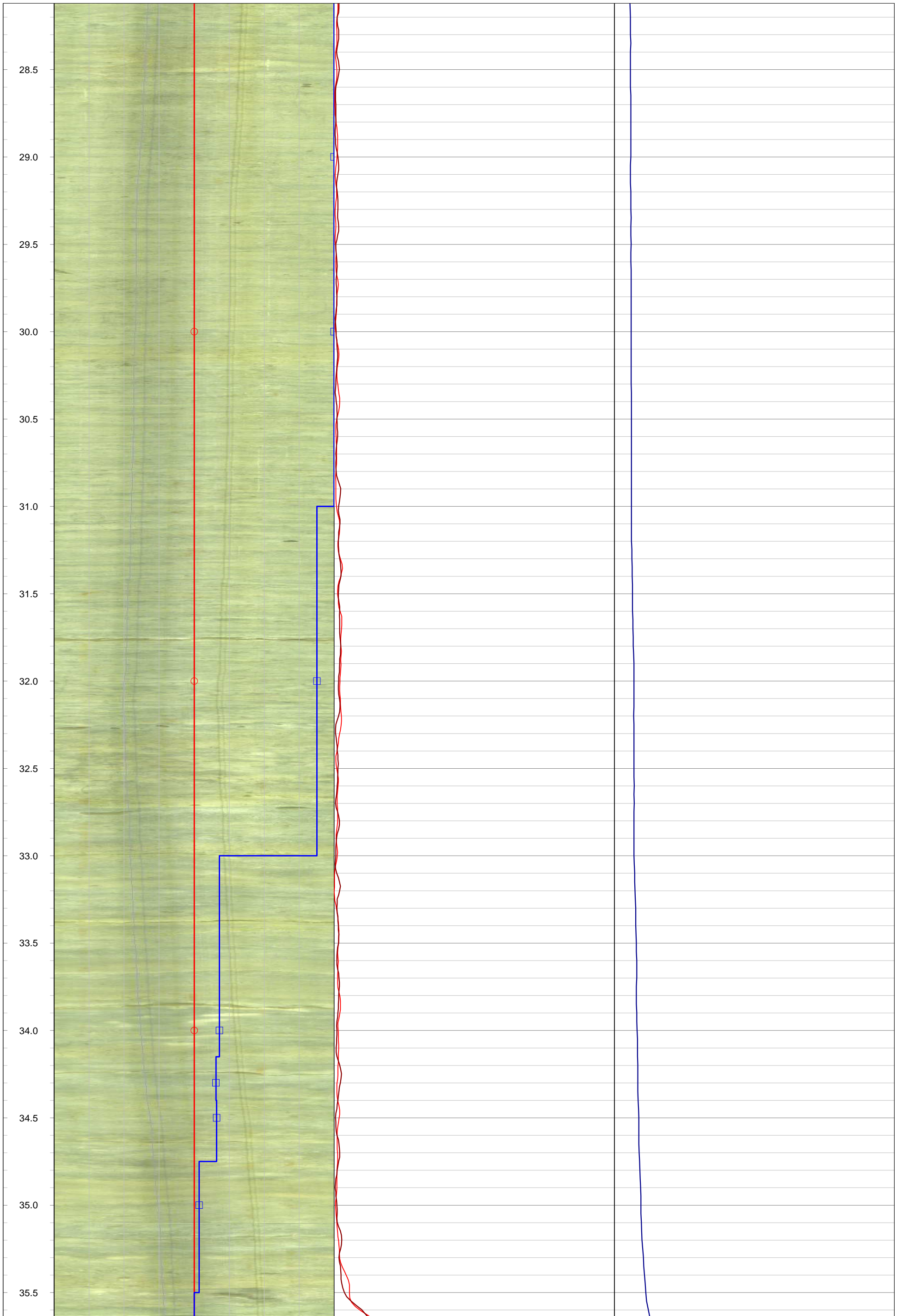


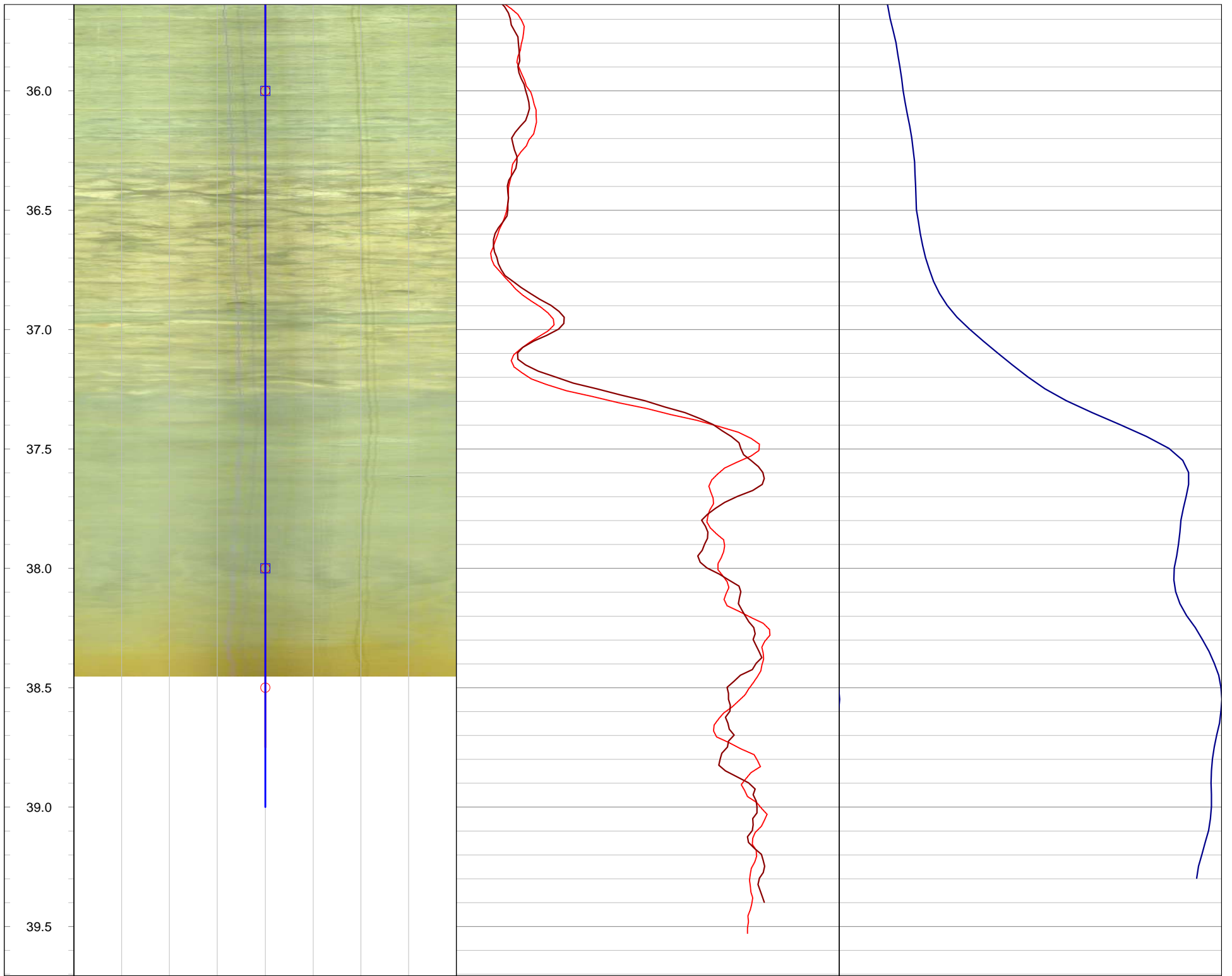










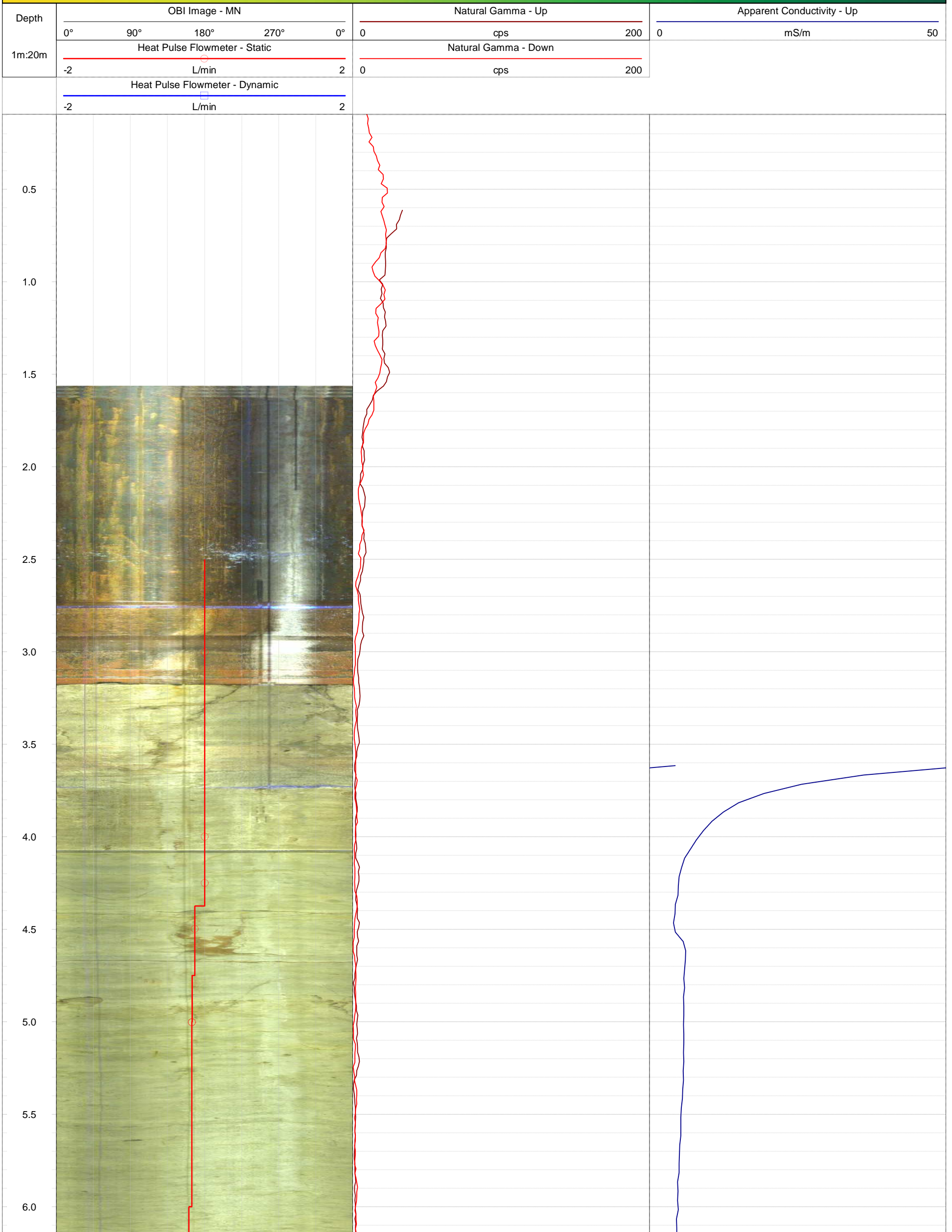




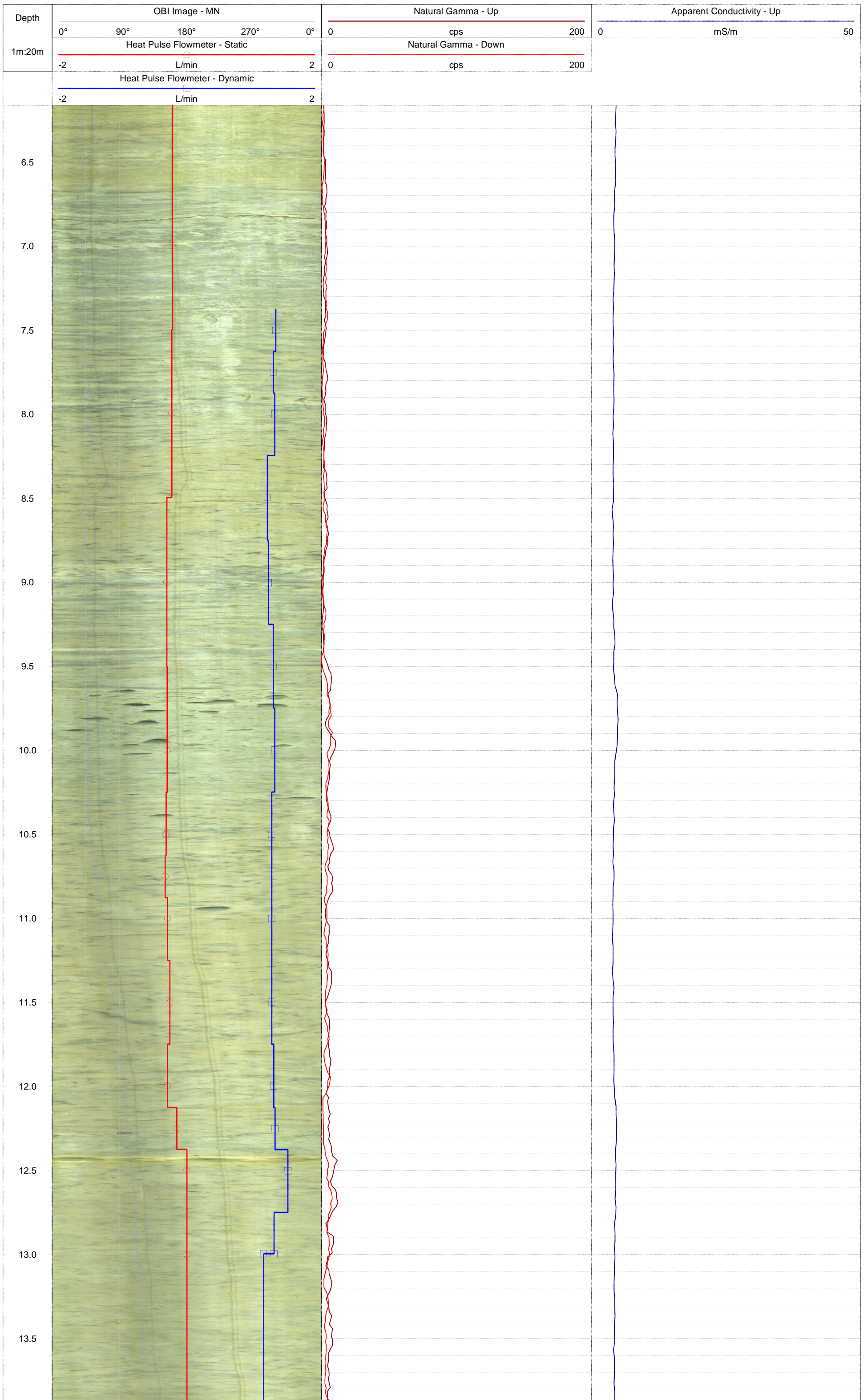
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 3.18 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576752.28 m    **Drilled Depth:** 28.82 m bgs    **Water Level:** 4.02 m bgs    **Log Date:** May-28-2020  
**Northing:** 4852966.36 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 406.64 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.05 m ags

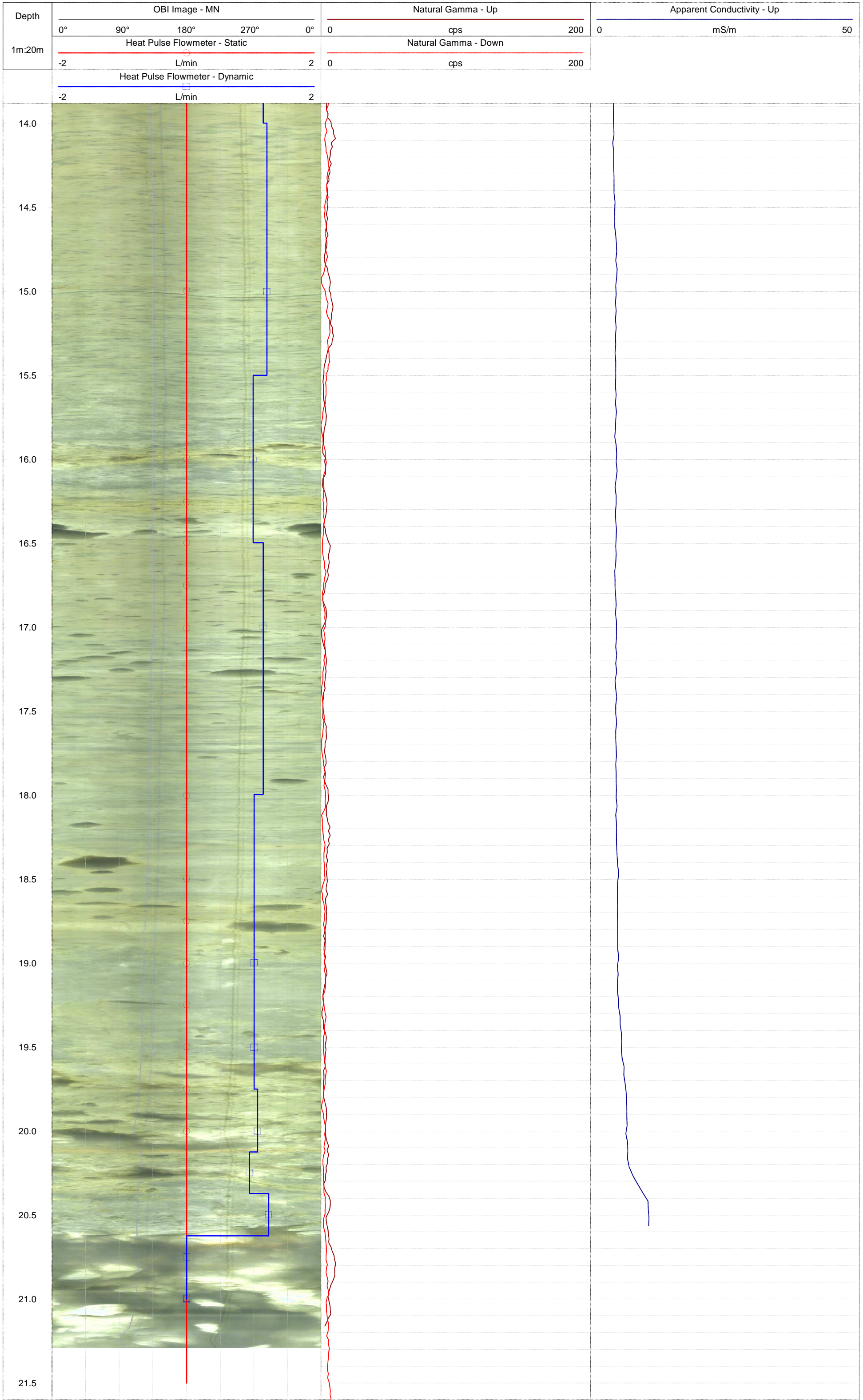
**Notes:** Borehole blocked at depth - logged upper portion. Heat Pulse Flowmeter Dynamic pump at 5.0 m below top of casing. Pump rate approximately 2.63 L/min.

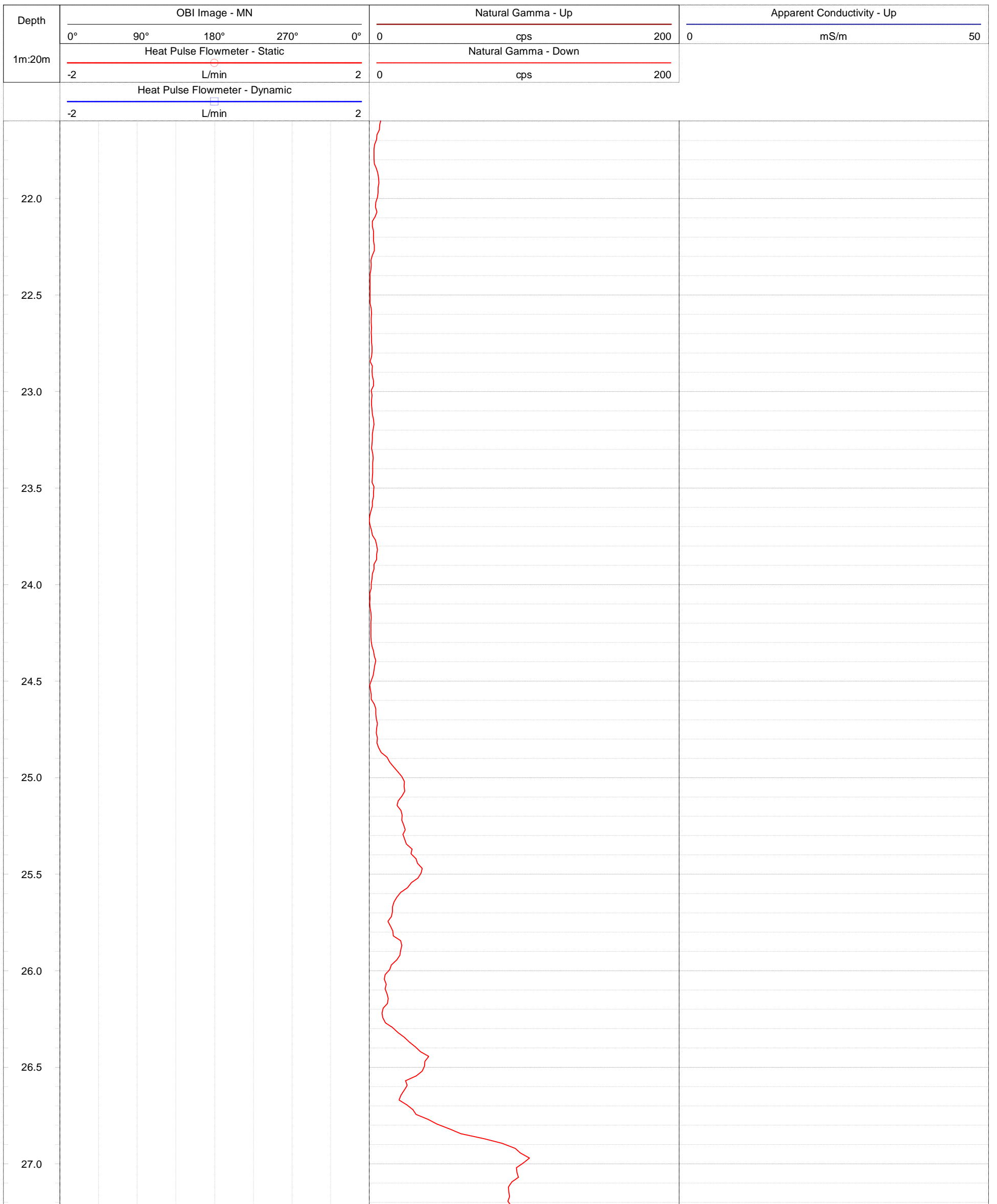












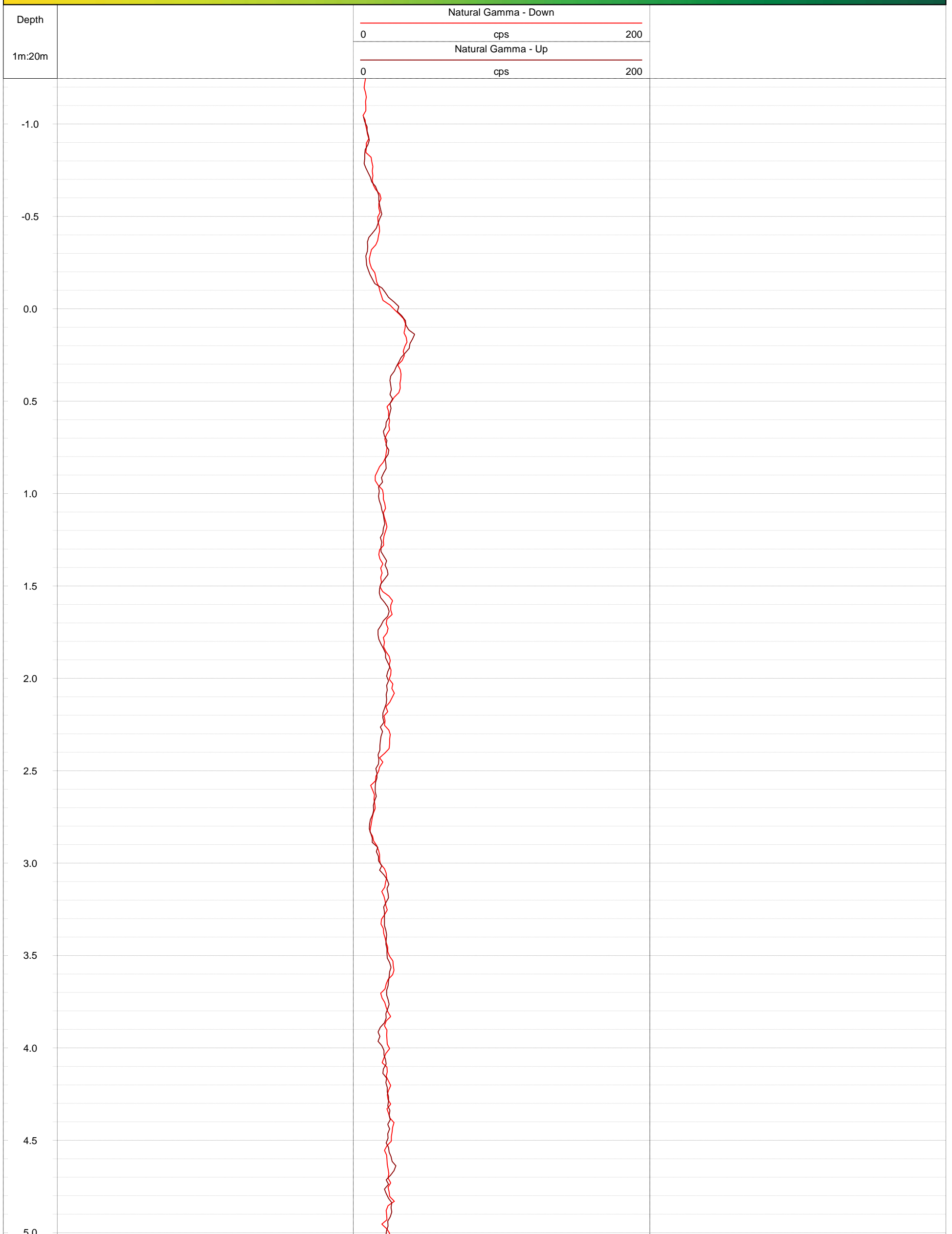


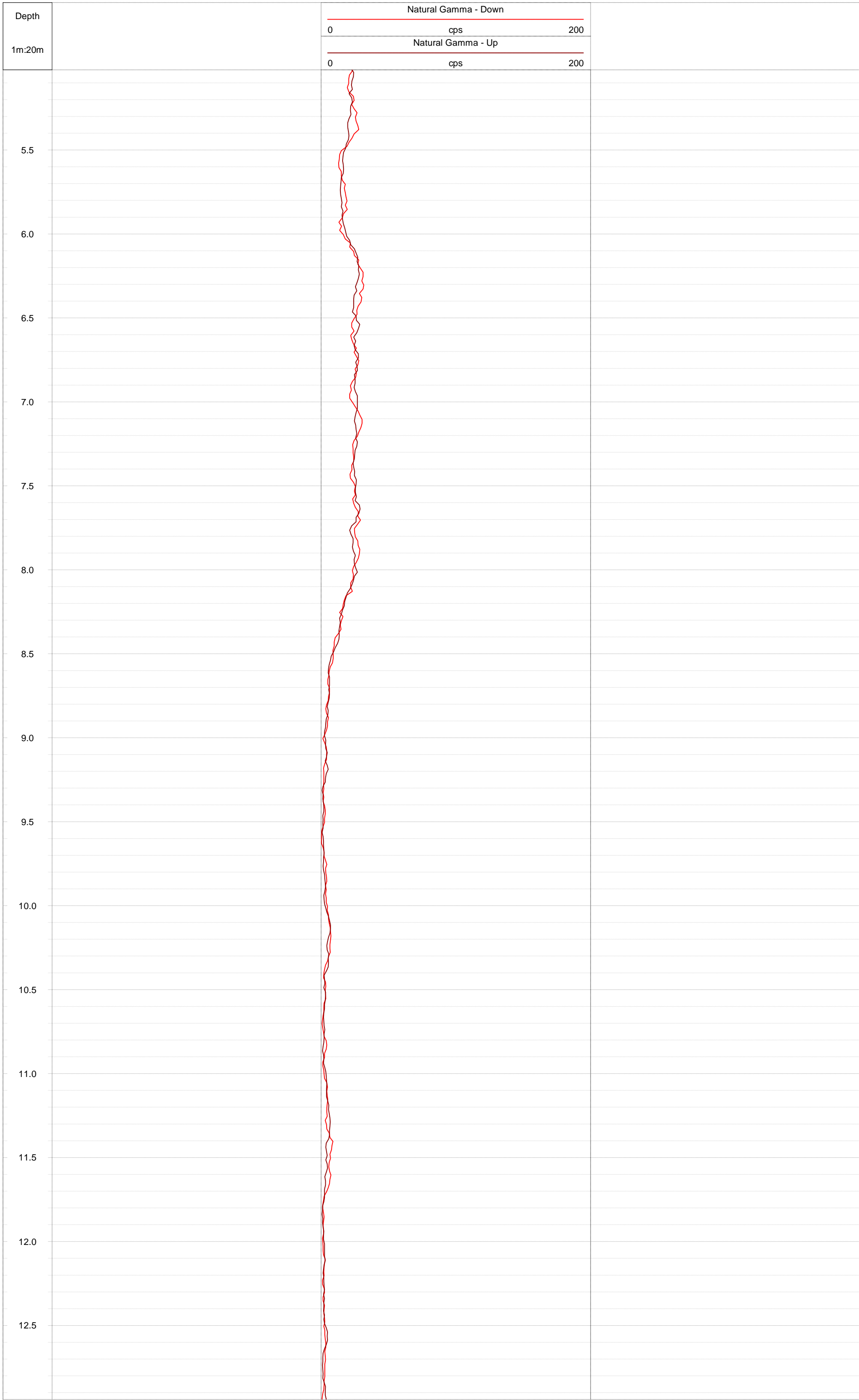


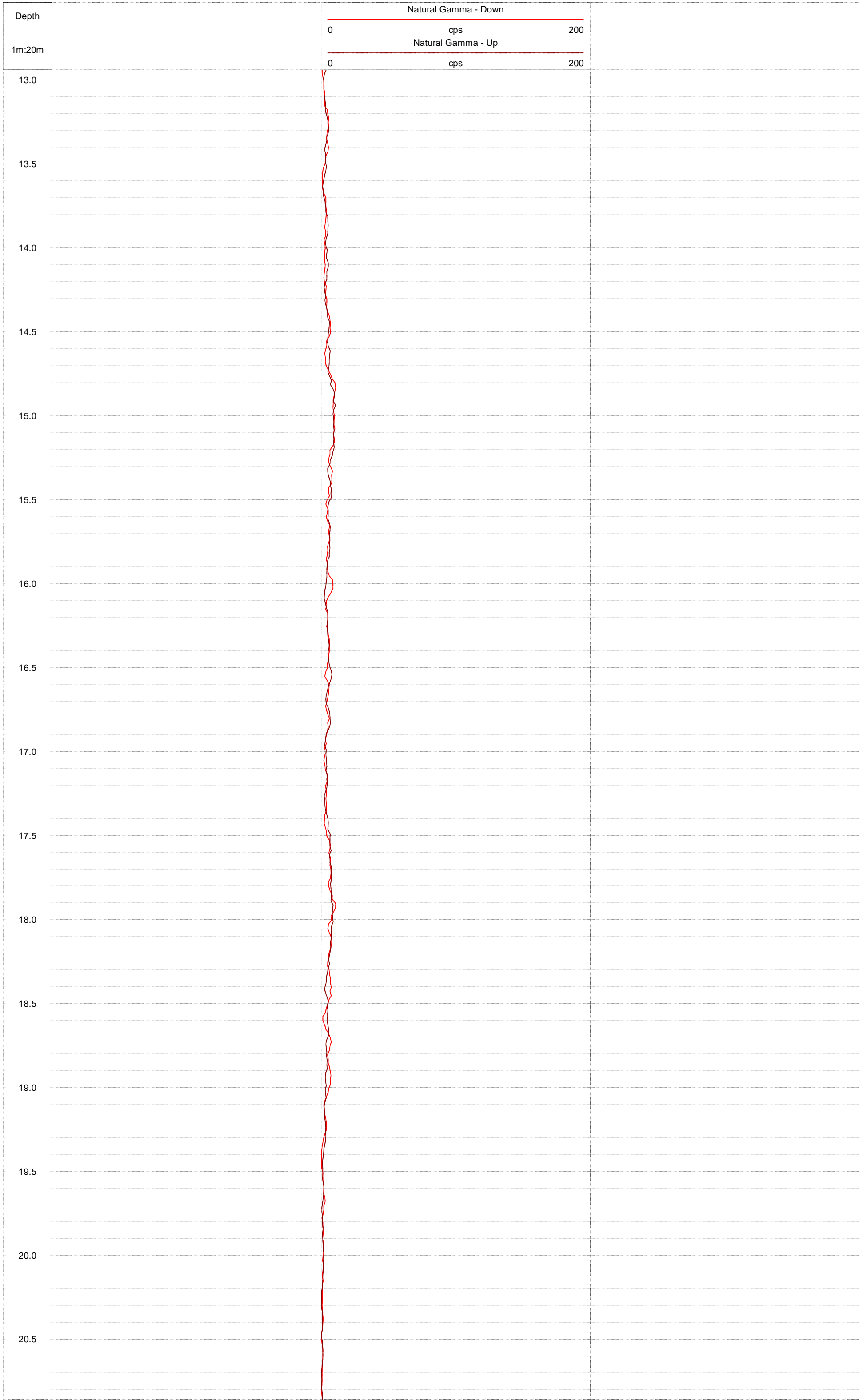
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 12.19 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577058.36 m	<b>Drilled Depth:</b> 28.15 m bgs	<b>Water Level:</b> 12.41 m bgs	<b>Log Date:</b> June-12-2020
<b>Northing:</b> 4852658.80 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 404.29 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 1.69 m ags	

**Notes:** Collapsed hole. Only Gamma logged inside the rods.













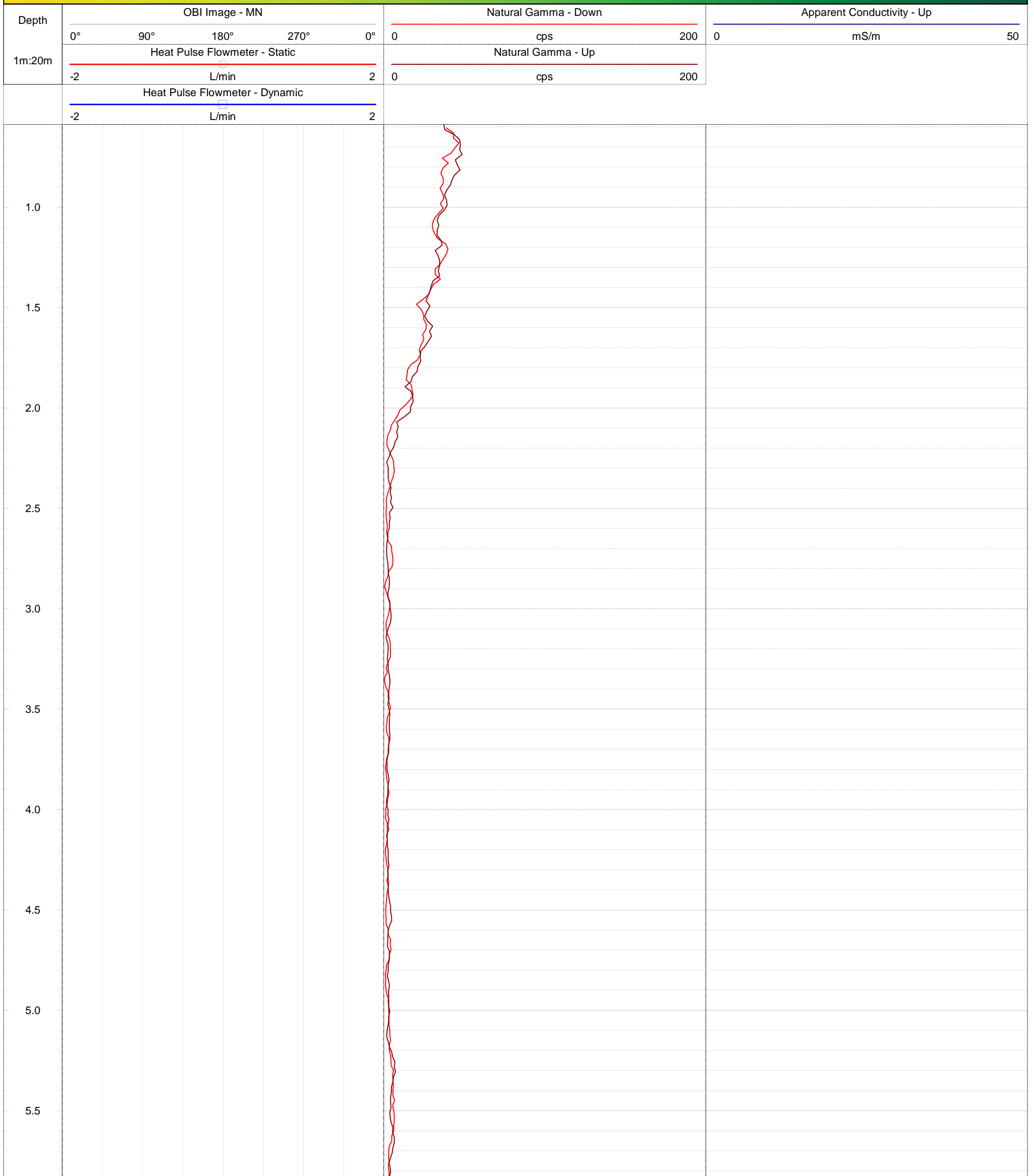
**GOLDER**  
MEMBER OF WSP

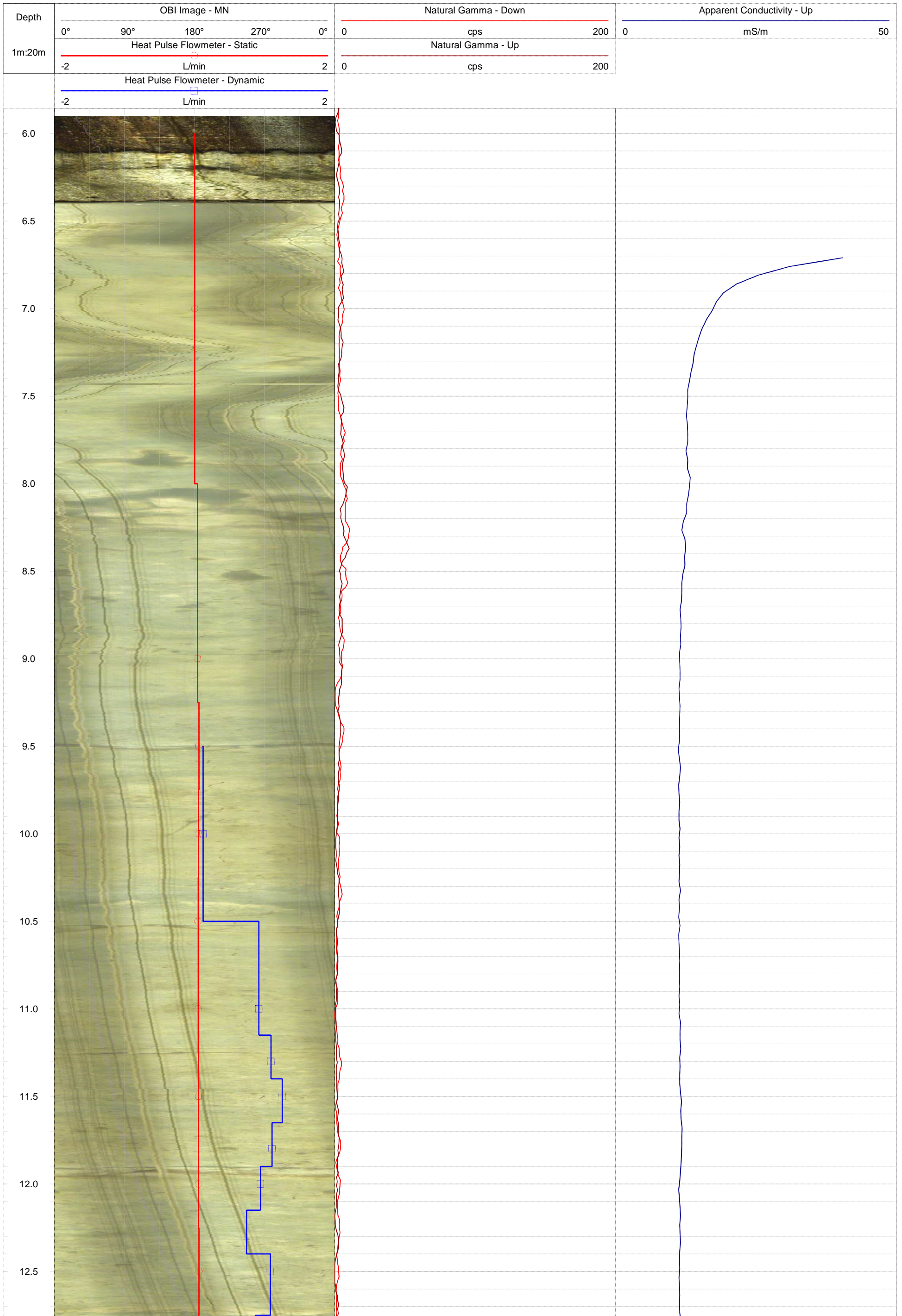
**Geophysical Record of Borehole: MW20-19 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

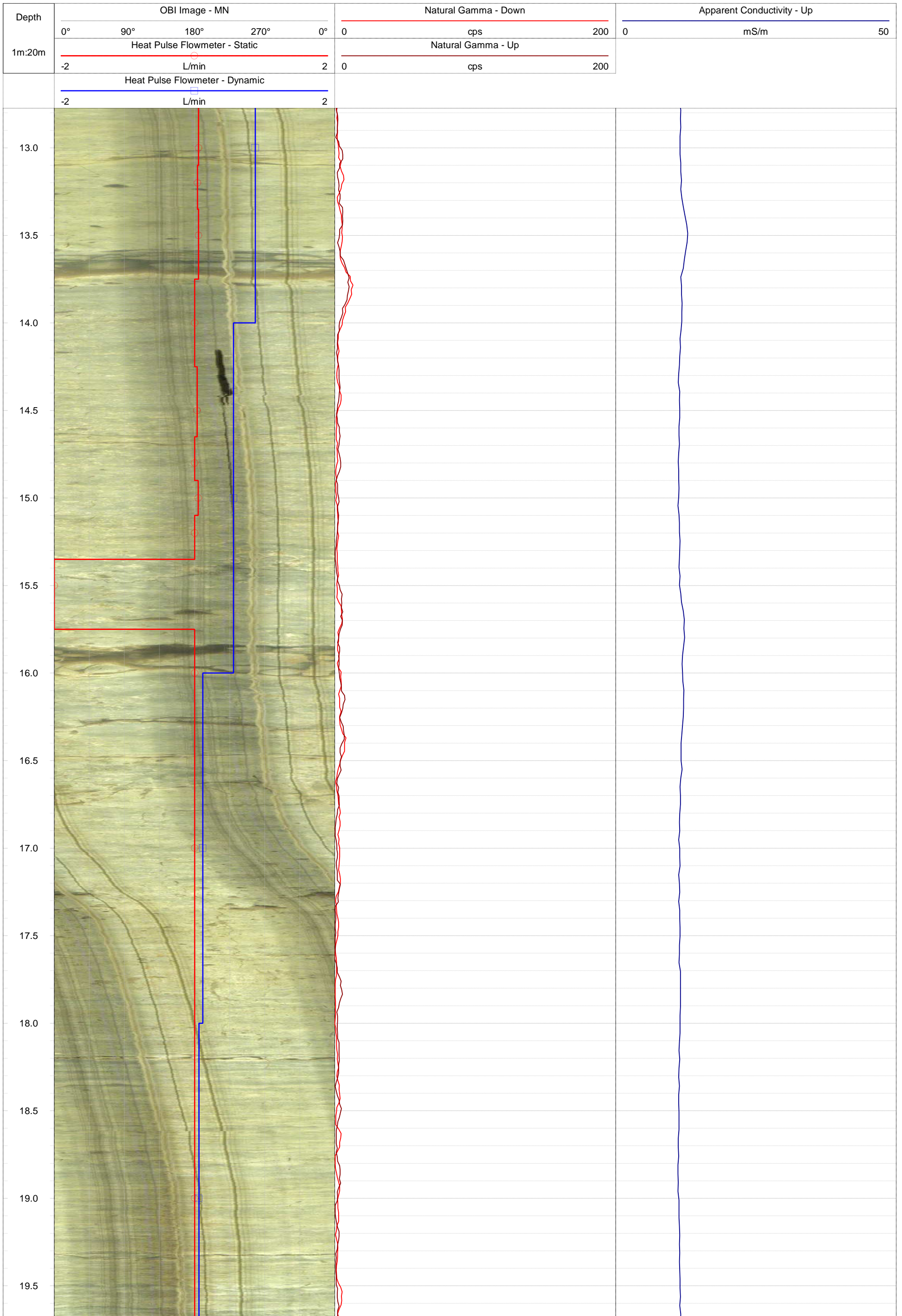
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.10 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576906.96 m    **Drilled Depth:** 27.39 m bgs    **Water Level:** 6.47 m bgs    **Log Date:** Oct-28-2020  
**Northing:** 4851999.96 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 396.98 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.10 m ags

**Notes:**

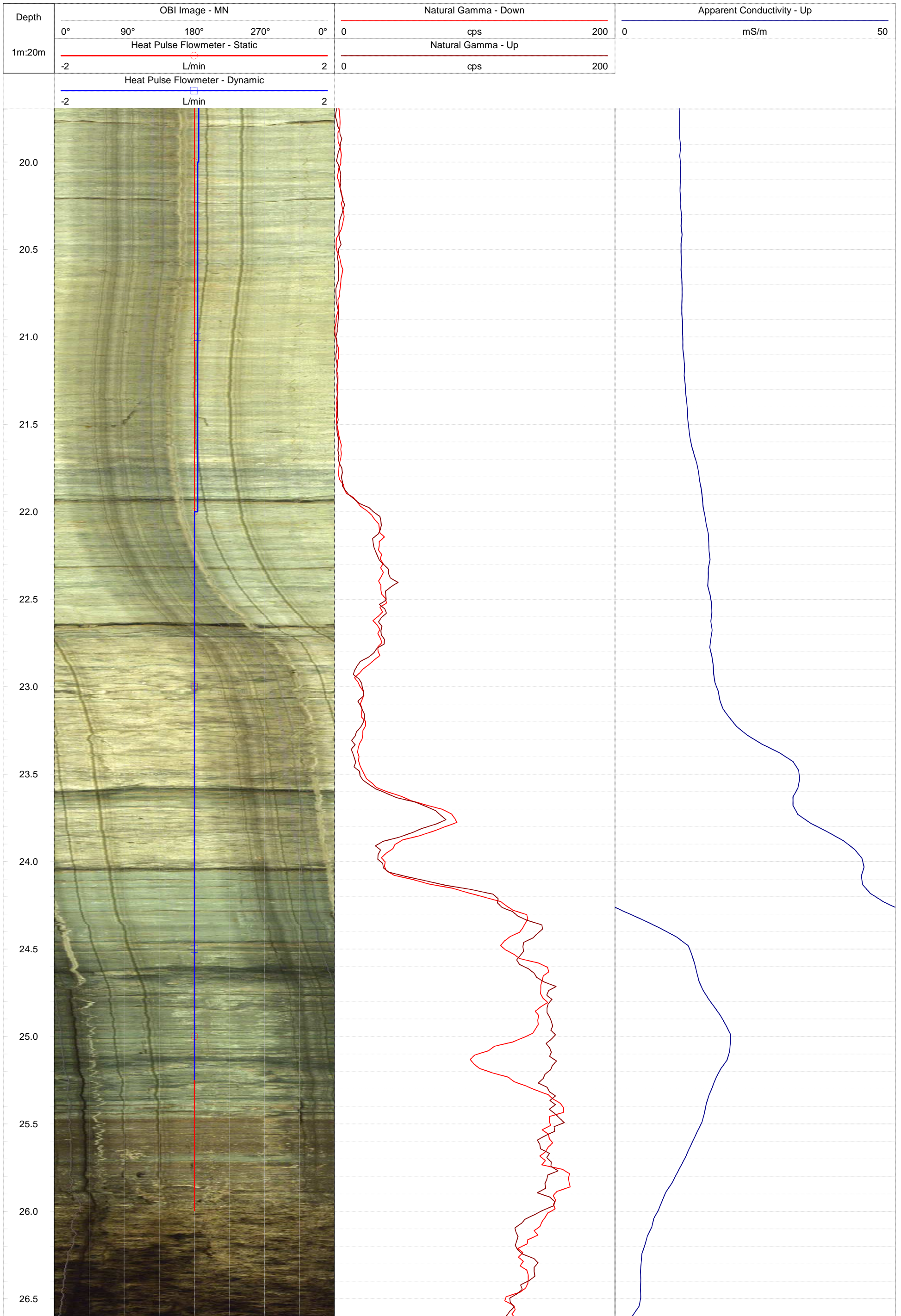












Depth	OBI Image - MN					Natural Gamma - Down		Apparent Conductivity - Up			
	0°	90°	180°	270°	0°	0	cps	200	0	mS/m	50
1m:20m	Heat Pulse Flowmeter - Static					Natural Gamma - Up					
	-2 L/min 2					0 cps 200					
	Heat Pulse Flowmeter - Dynamic										
	-2 L/min 2										
27.0											
27.5											





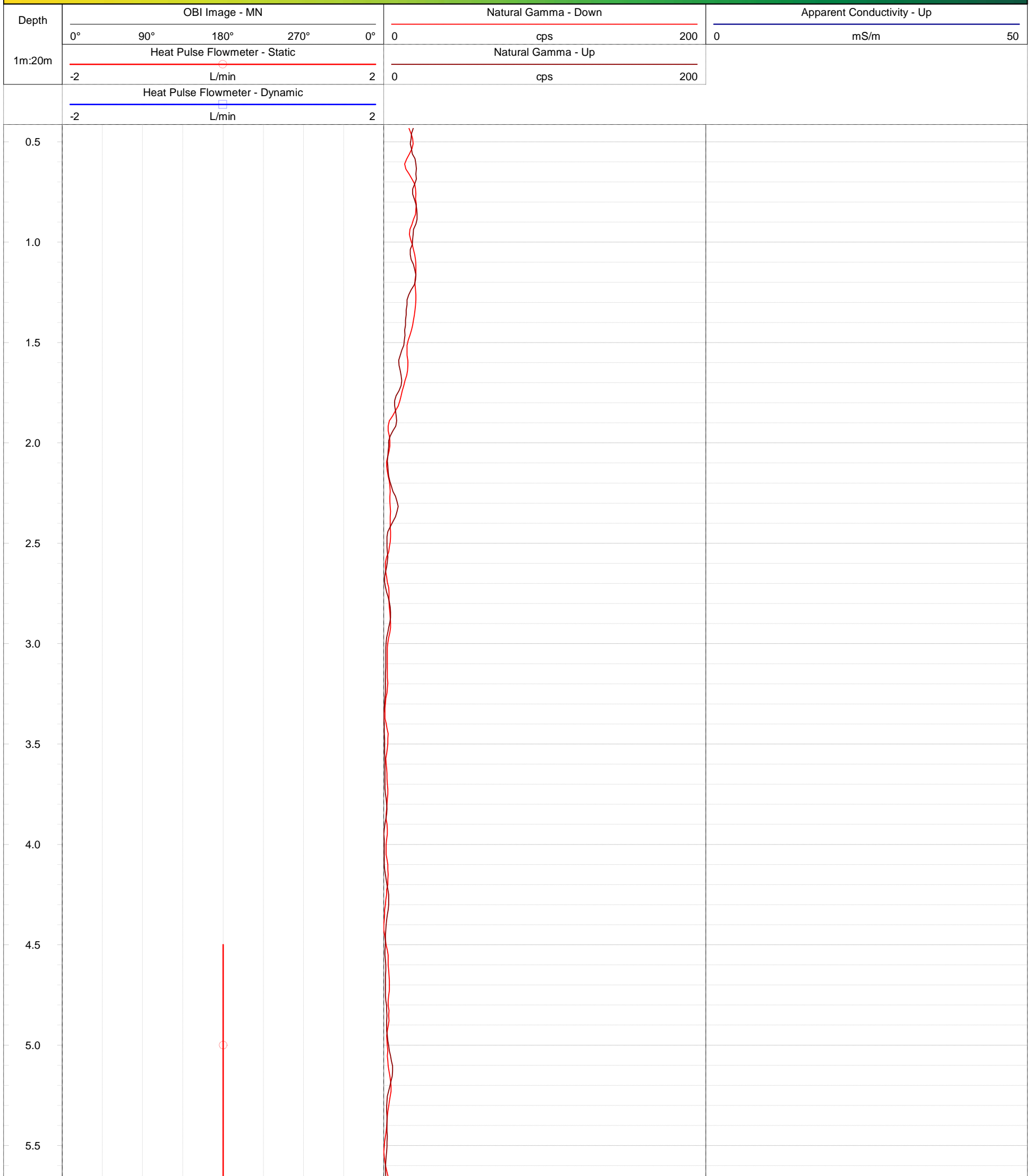
**GOLDER**  
MEMBER OF WSP

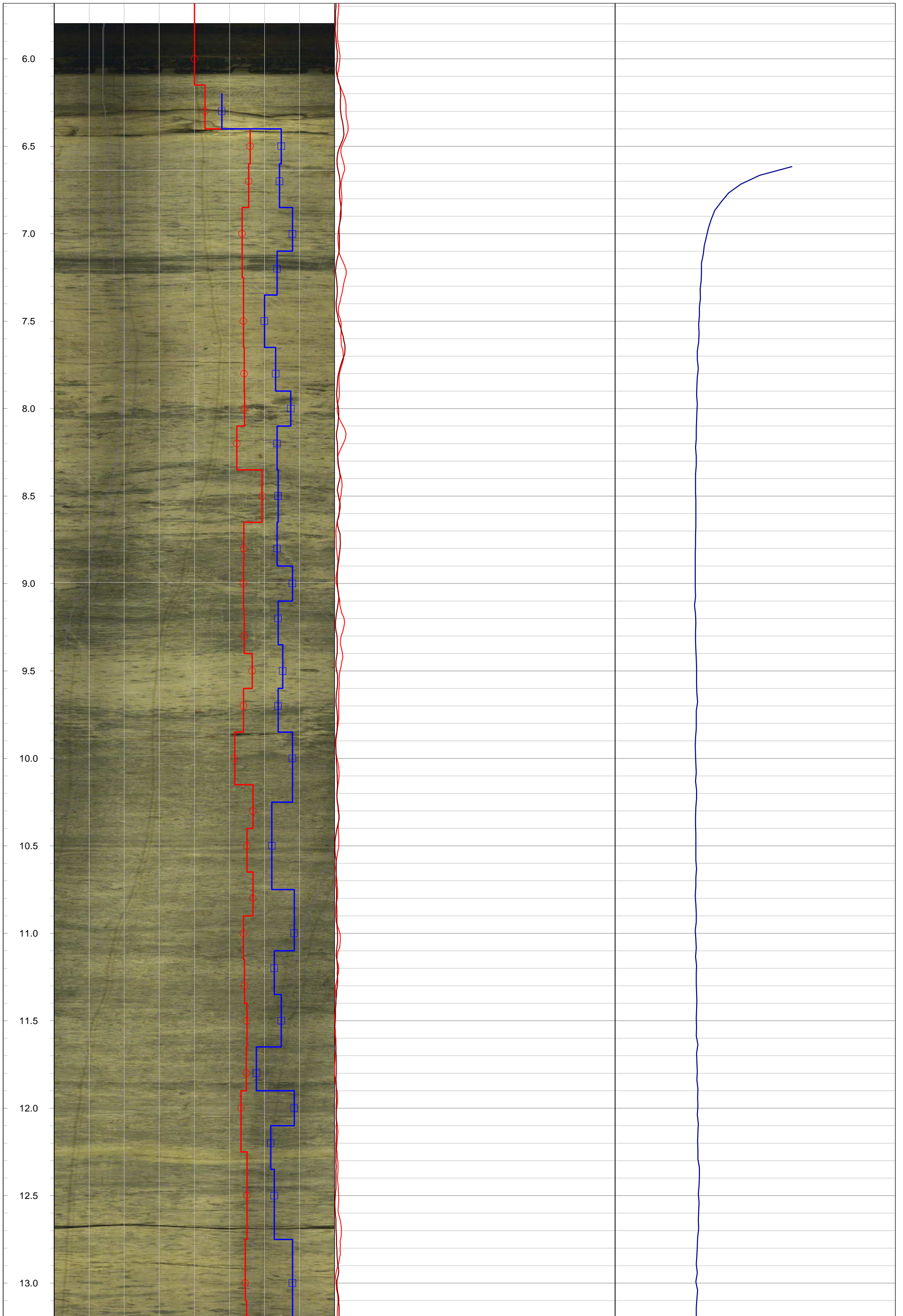
**Geophysical Record of Borehole: MW20-20 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

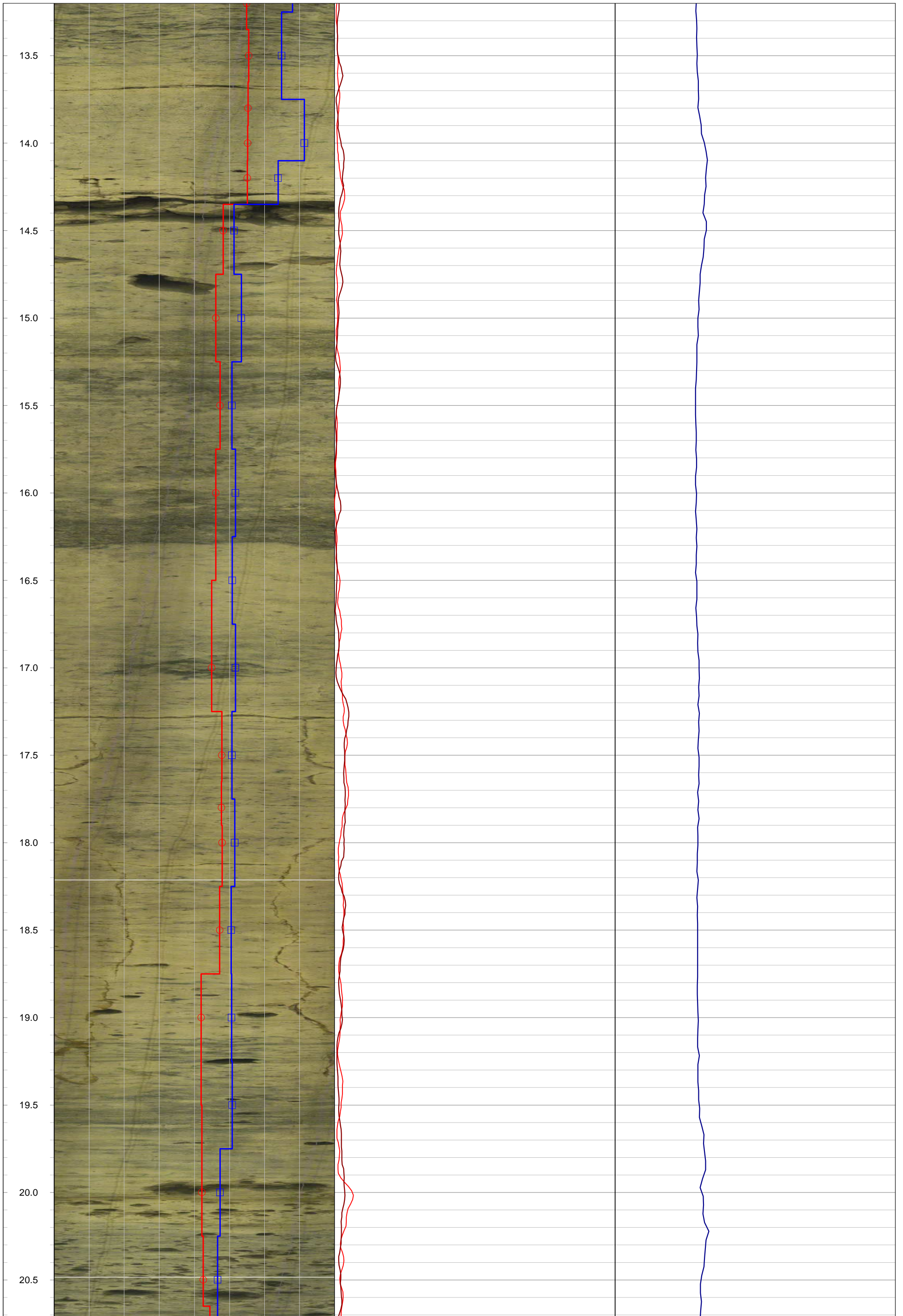
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.08 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576476.35 m    **Drilled Depth:** 27.99 m bgs    **Water Level:** 0.25 m bgs    **Log Date:** Oct-20-2020  
**Northing:** 4852467.69 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 403.00 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.25 m ags

**Notes:**

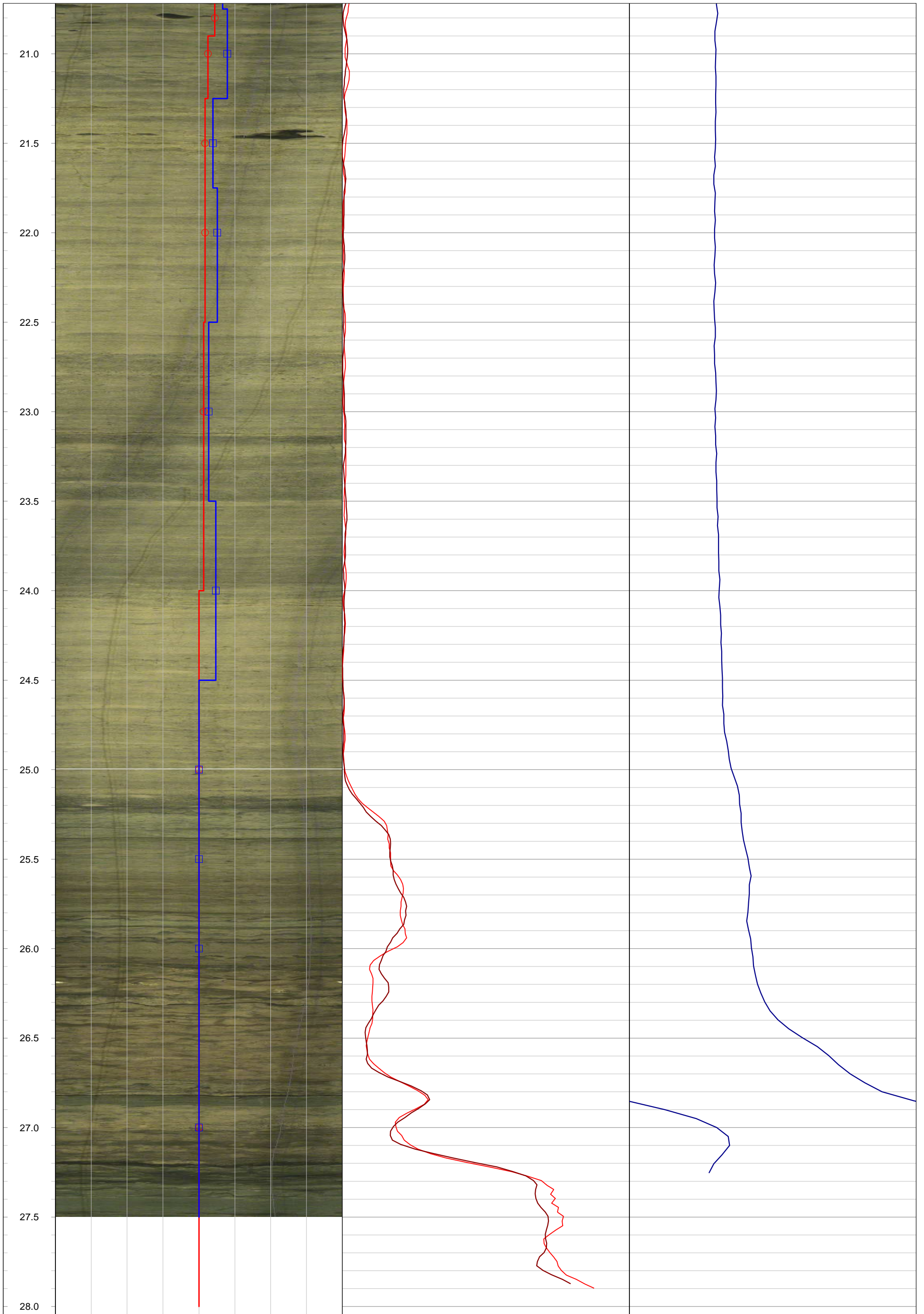














**GOLDER**  
MEMBER OF WSP

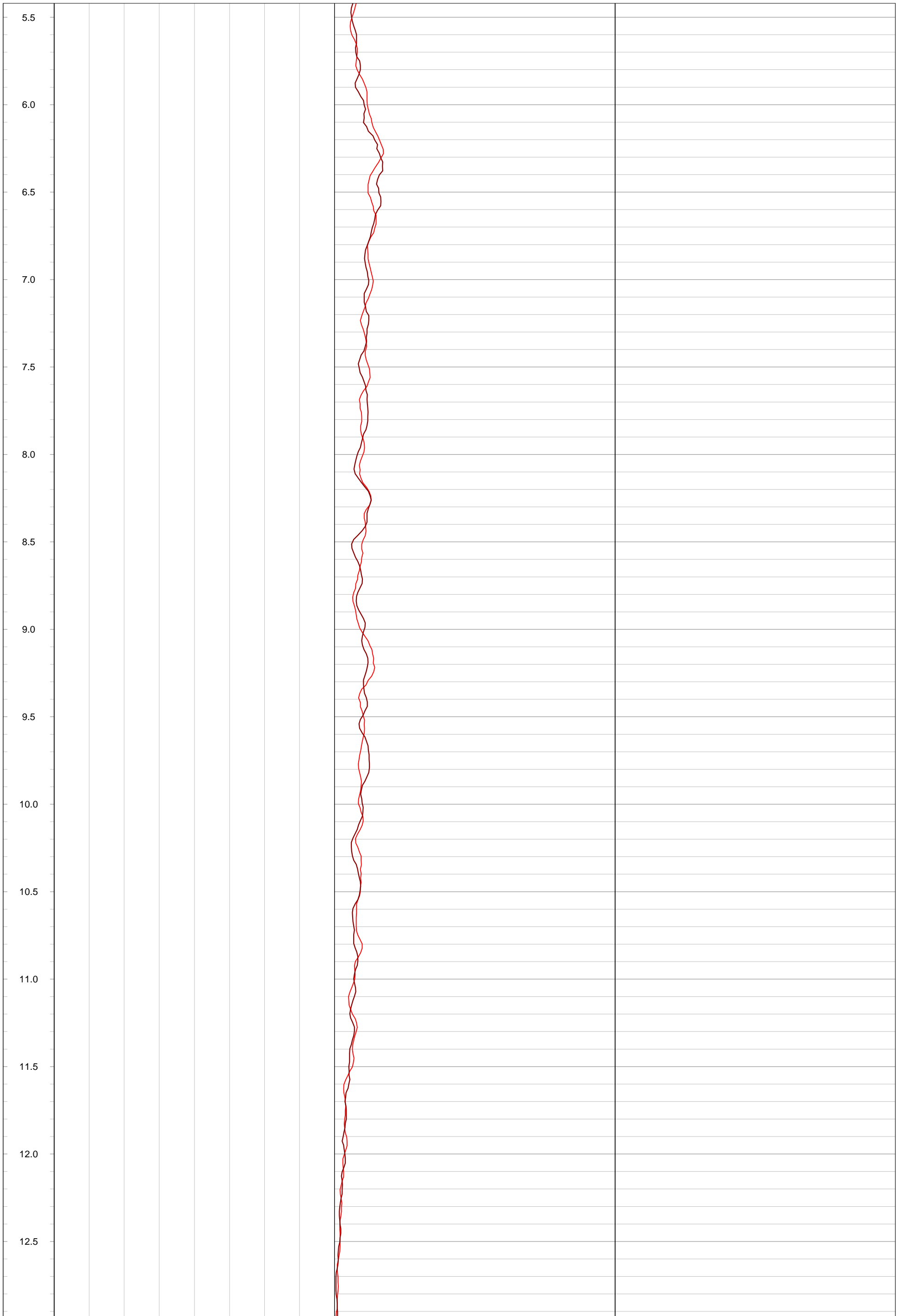
**Geophysical Record of Borehole: MW20-21 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

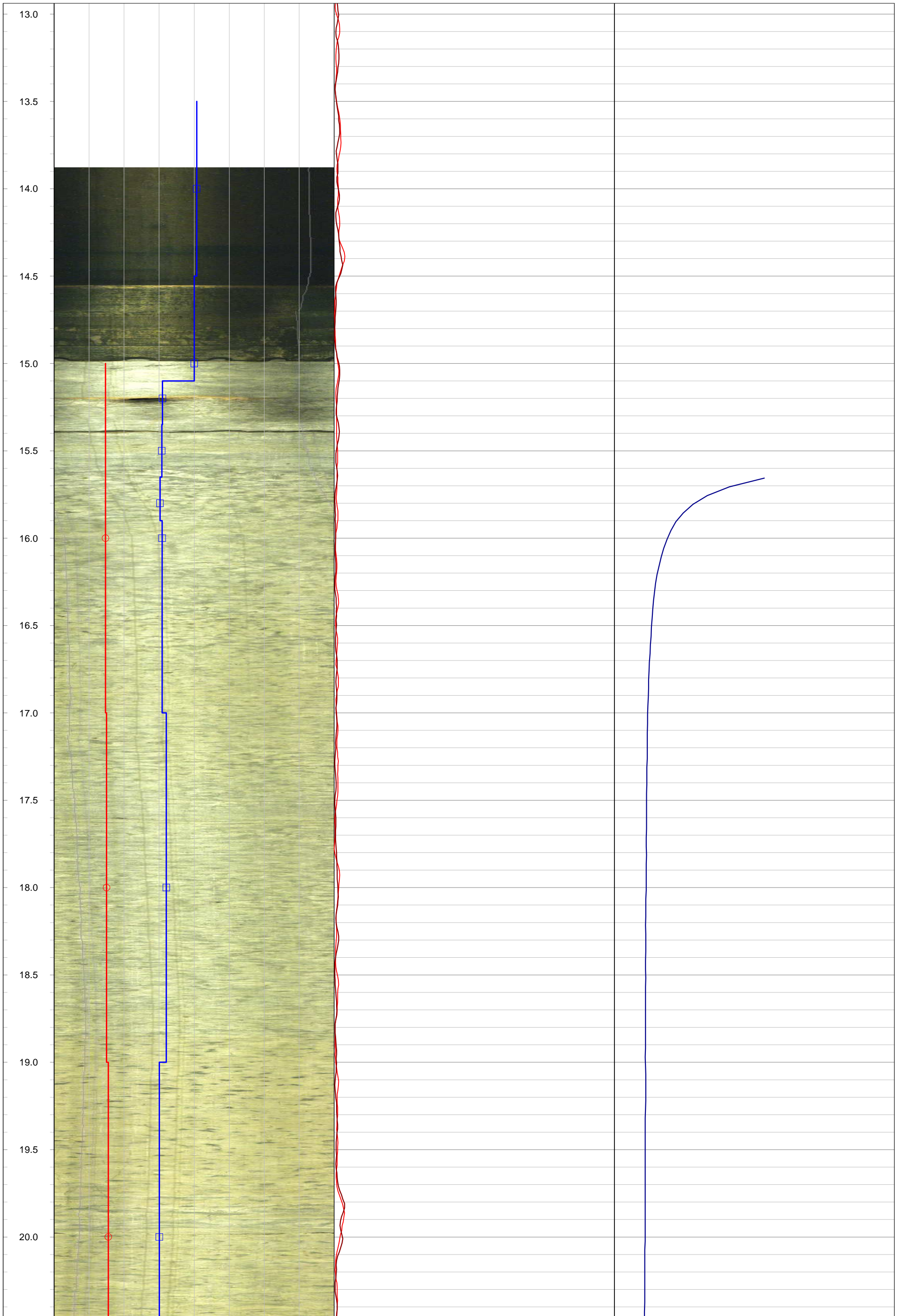
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 14.98 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576014.37 m    **Drilled Depth:** 39.70 m bgs    **Water Level:** 1.54 m bgs    **Log Date:** Nov-5-2020  
**Northing:** 4852839.77 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.23 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.50 m ags

**Notes:** OBI image opaque > 38.90 m bgs

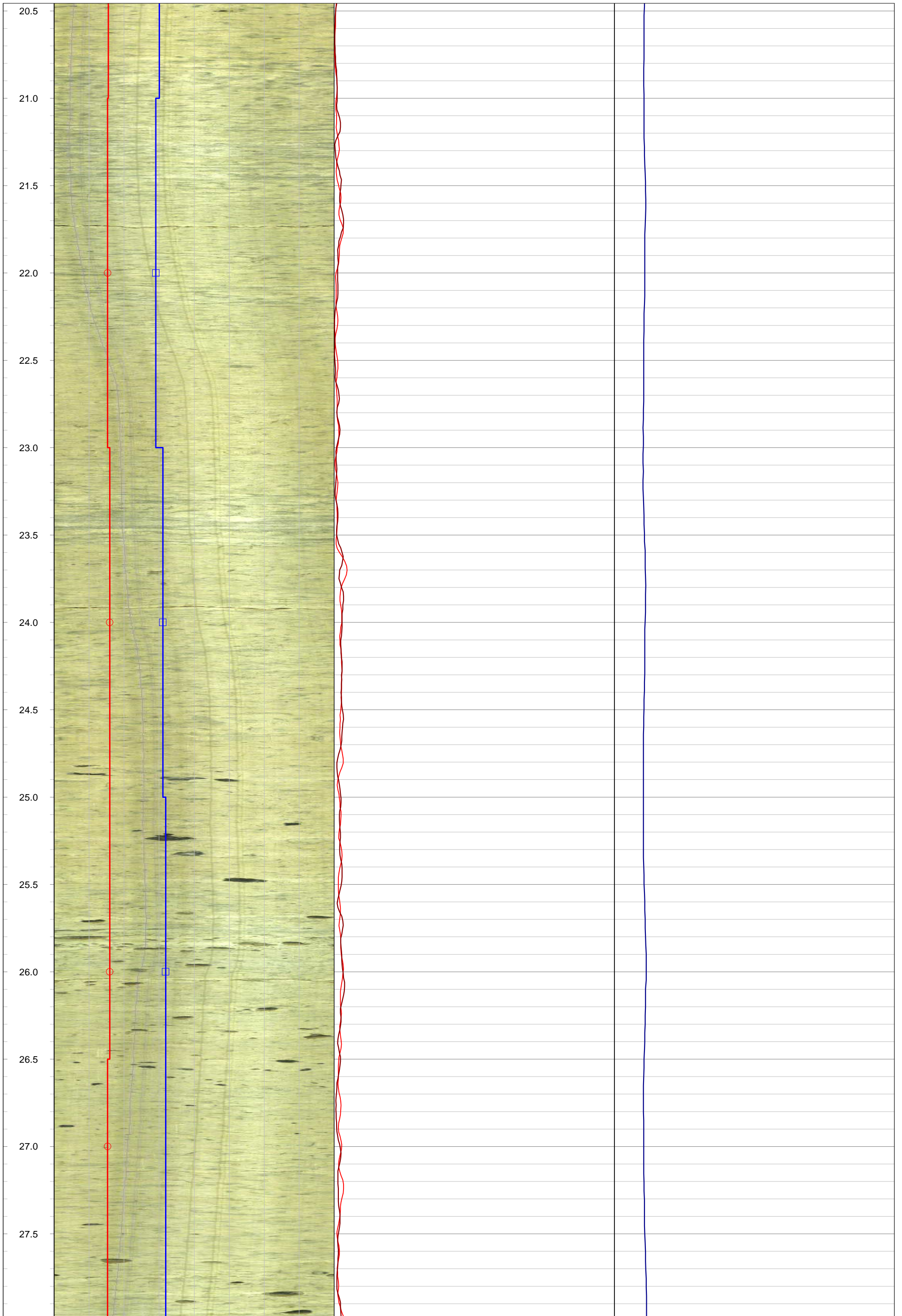
Depth	OBI Image - MN					Natural Gamma - Down		Apparent Conductivity - Up	
	0°	90°	180°	270°	0°	0	200	0	50
1m:20m	Heat Pulse Flowmeter - Static					Natural Gamma - Up			
	-2		L/min		2	0	200		
	Heat Pulse Flowmeter - Dynamic								
	-2		L/min		2				
0.5									
1.0									
1.5									
2.0									
2.5									
3.0									
3.5									
4.0									
4.5									
5.0									



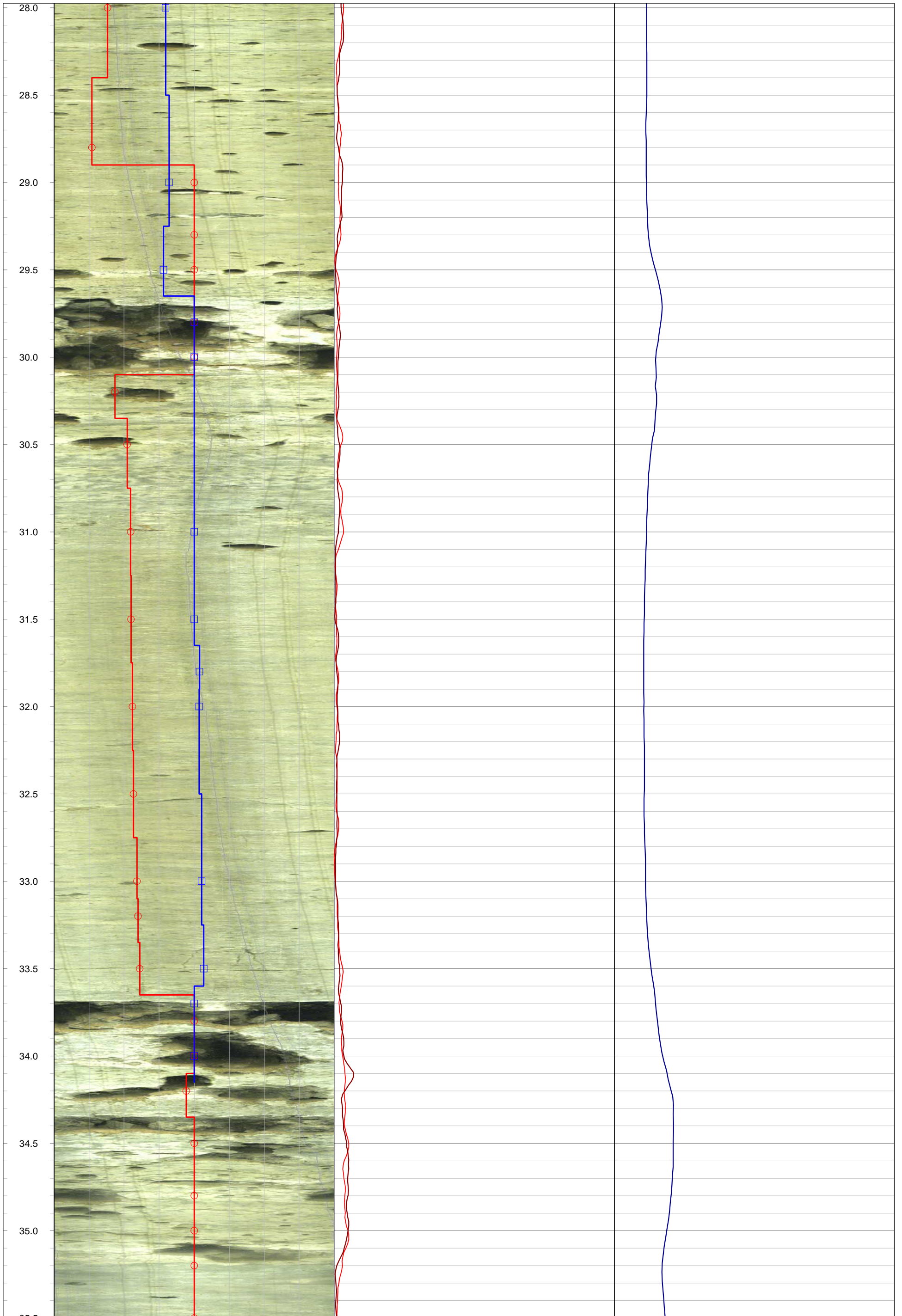




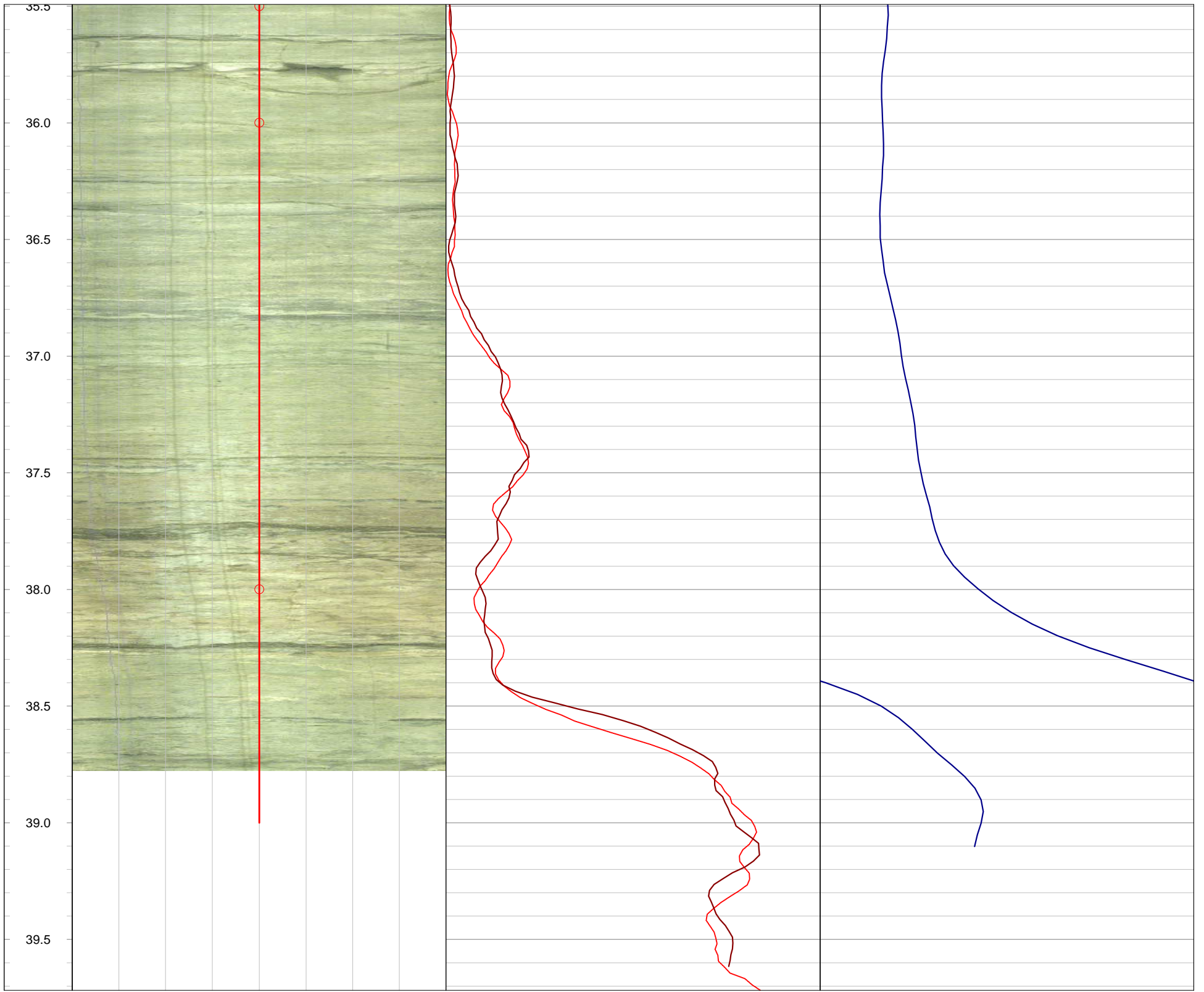














**GOLDER**  
MEMBER OF WSP

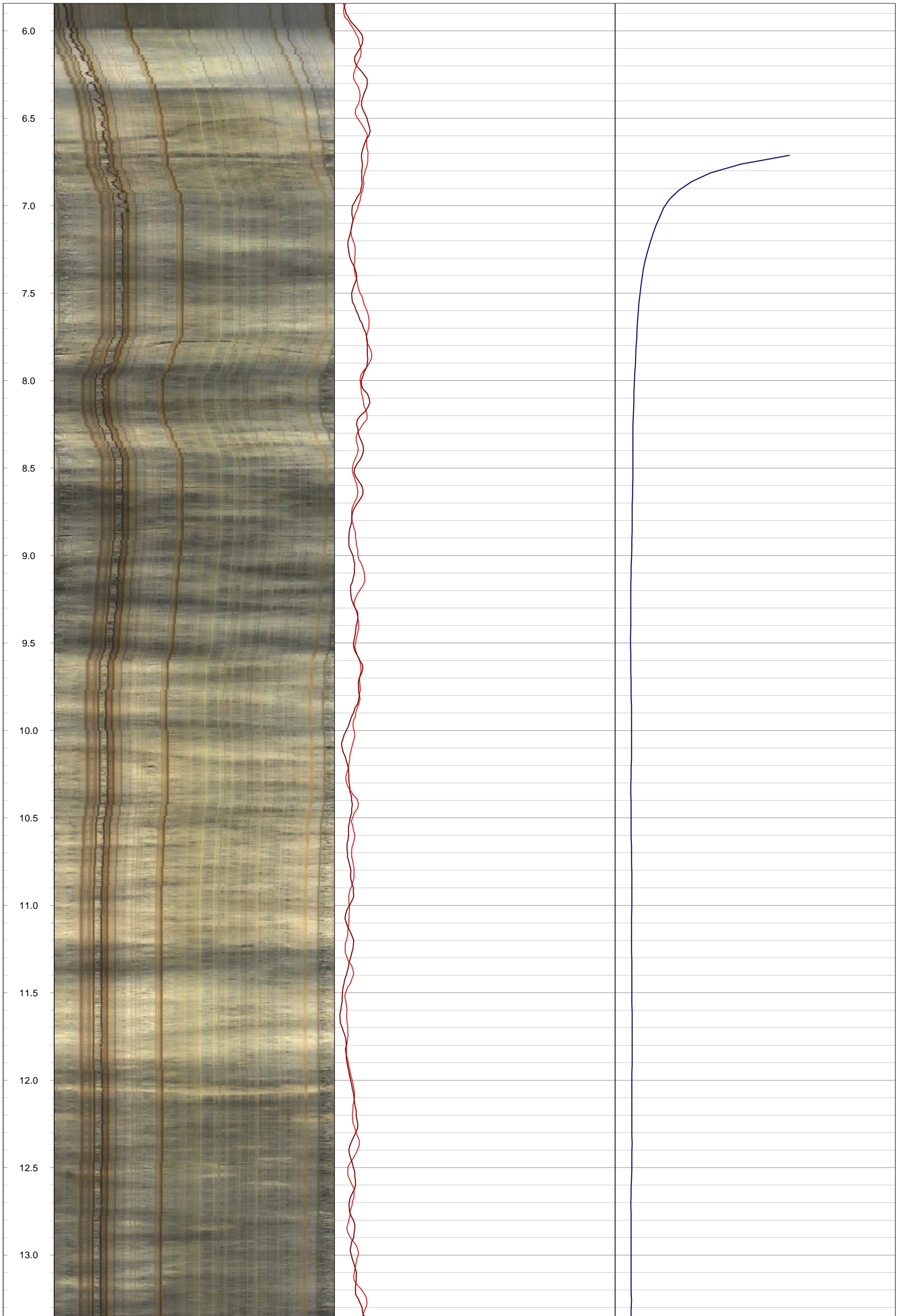
**Geophysical Record of Borehole: MW20-22 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

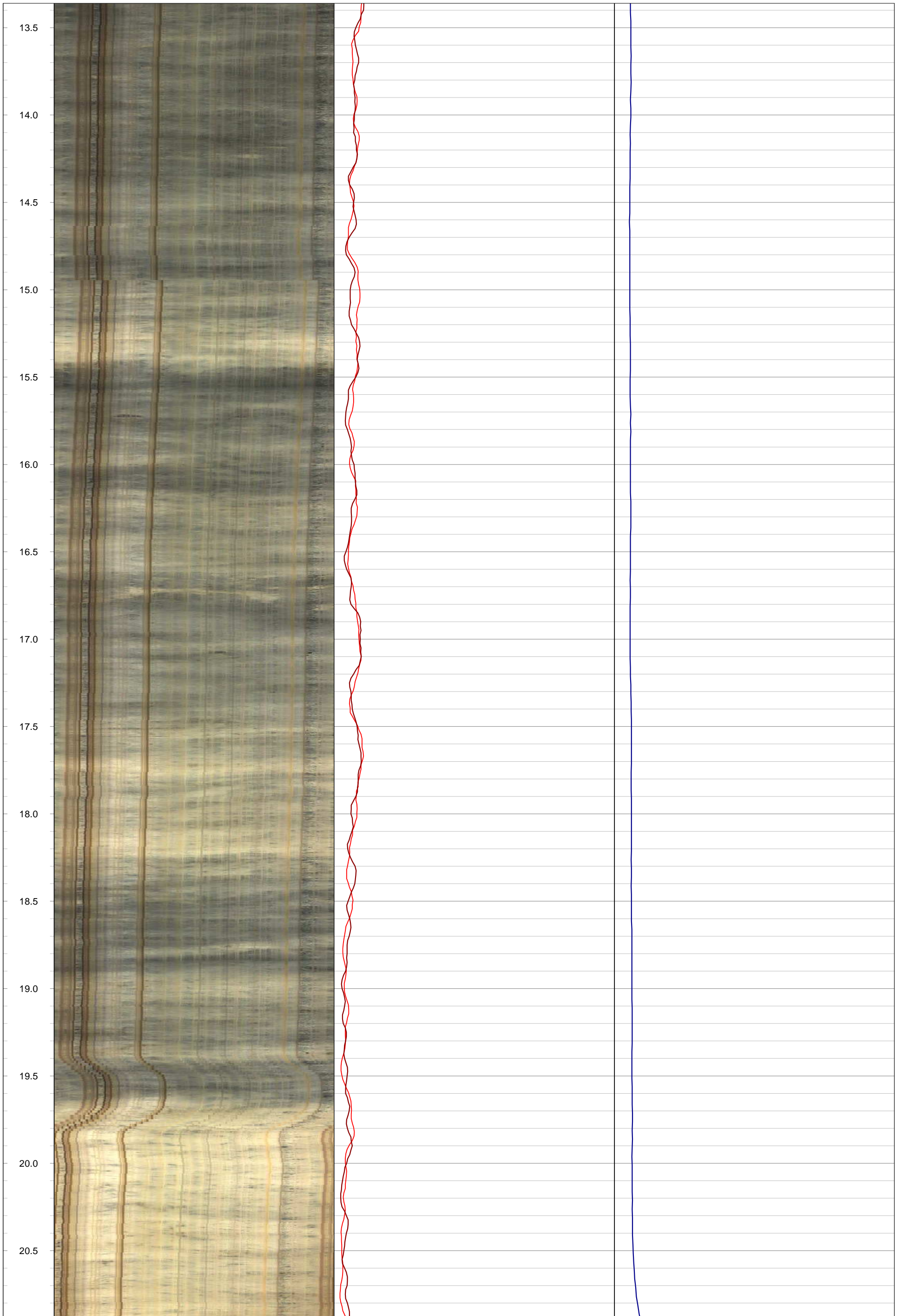
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.99 m bgs    **Location:** Caledon, Ontario  
**Easting:** 575785.36 m    **Drilled Depth:** 30.75 m bgs    **Water Level:** 4.40 m bgs    **Log Date:** Nov-18-2020  
**Northing:** 4851966.28 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 399.27 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.30 m ags

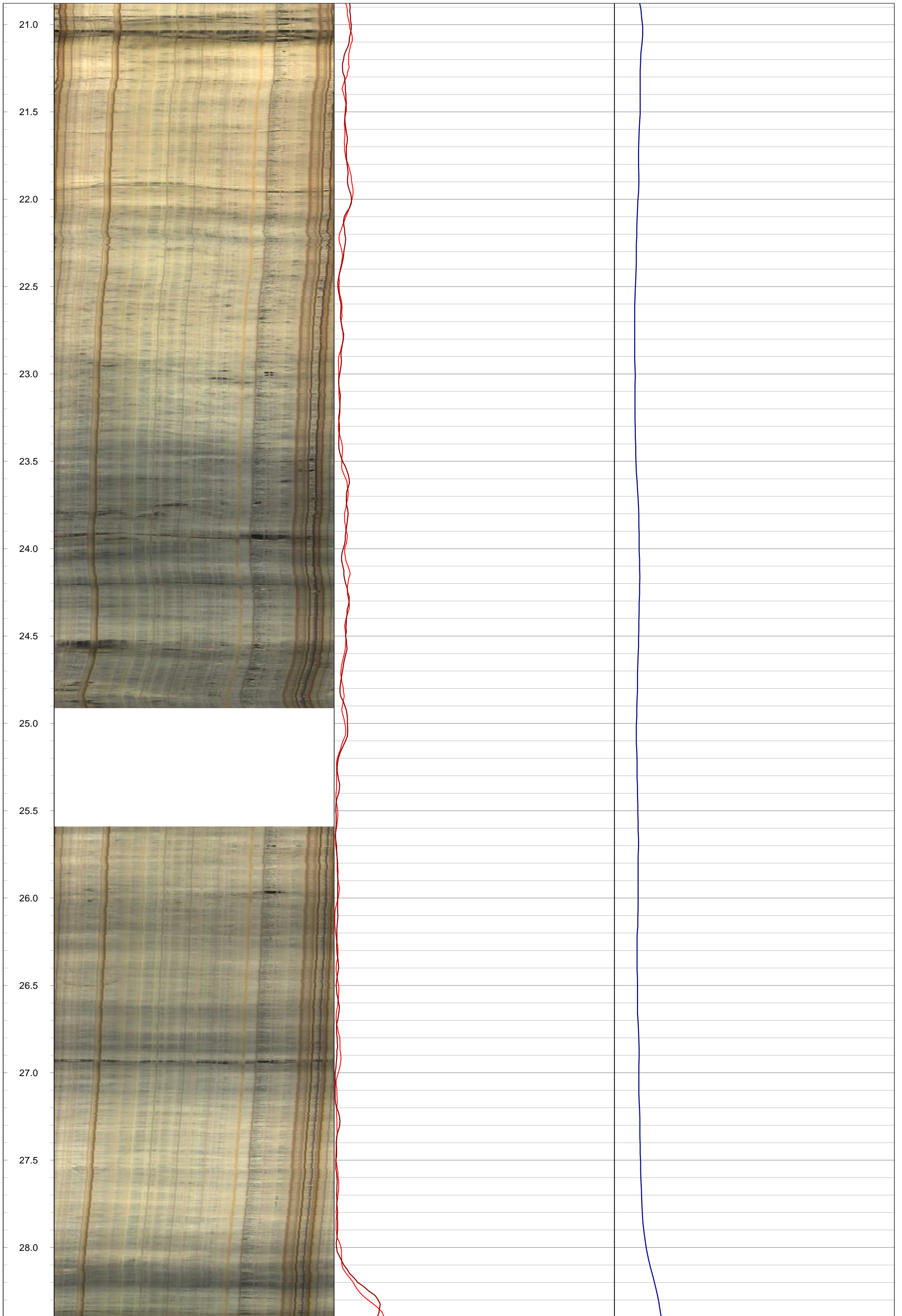
**Notes:** OBI image opaque > 30.5 m bgs

Depth	OBI Image 2 - MN					Natural Gamma - Down		Apparent Conductivity - Up	
	0°	90°	180°	270°	0°	0	200	0	50
1m:20m	OBI Image- MN					Natural Gamma - Up			
	0°	90°	180°	270°	0°	0	200		
0.5									
1.0									
1.5									
2.0									
2.5									
3.0									
3.5									
4.0									
4.5									
5.0									
5.5									

















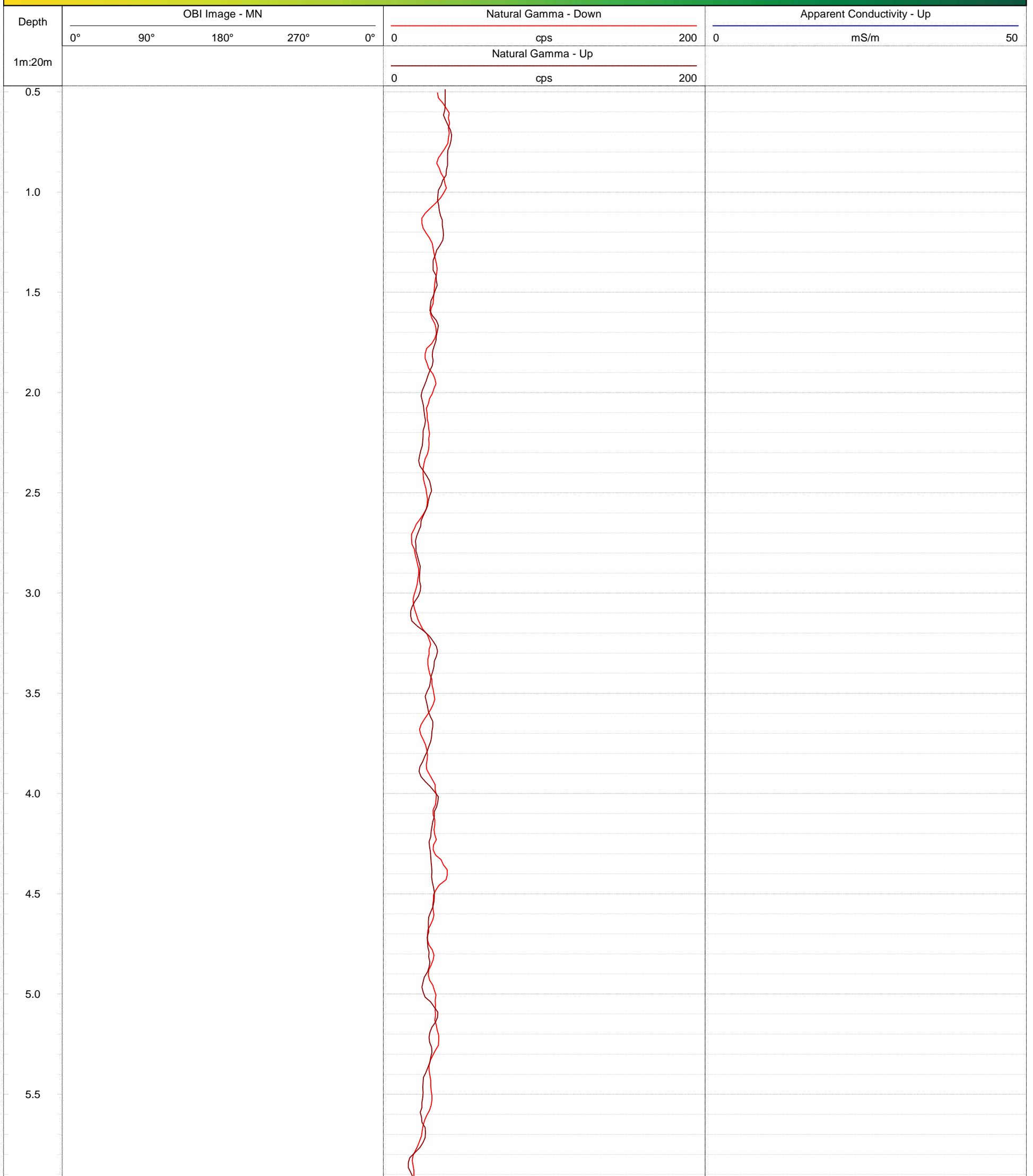
**GOLDER**  
MEMBER OF WSP

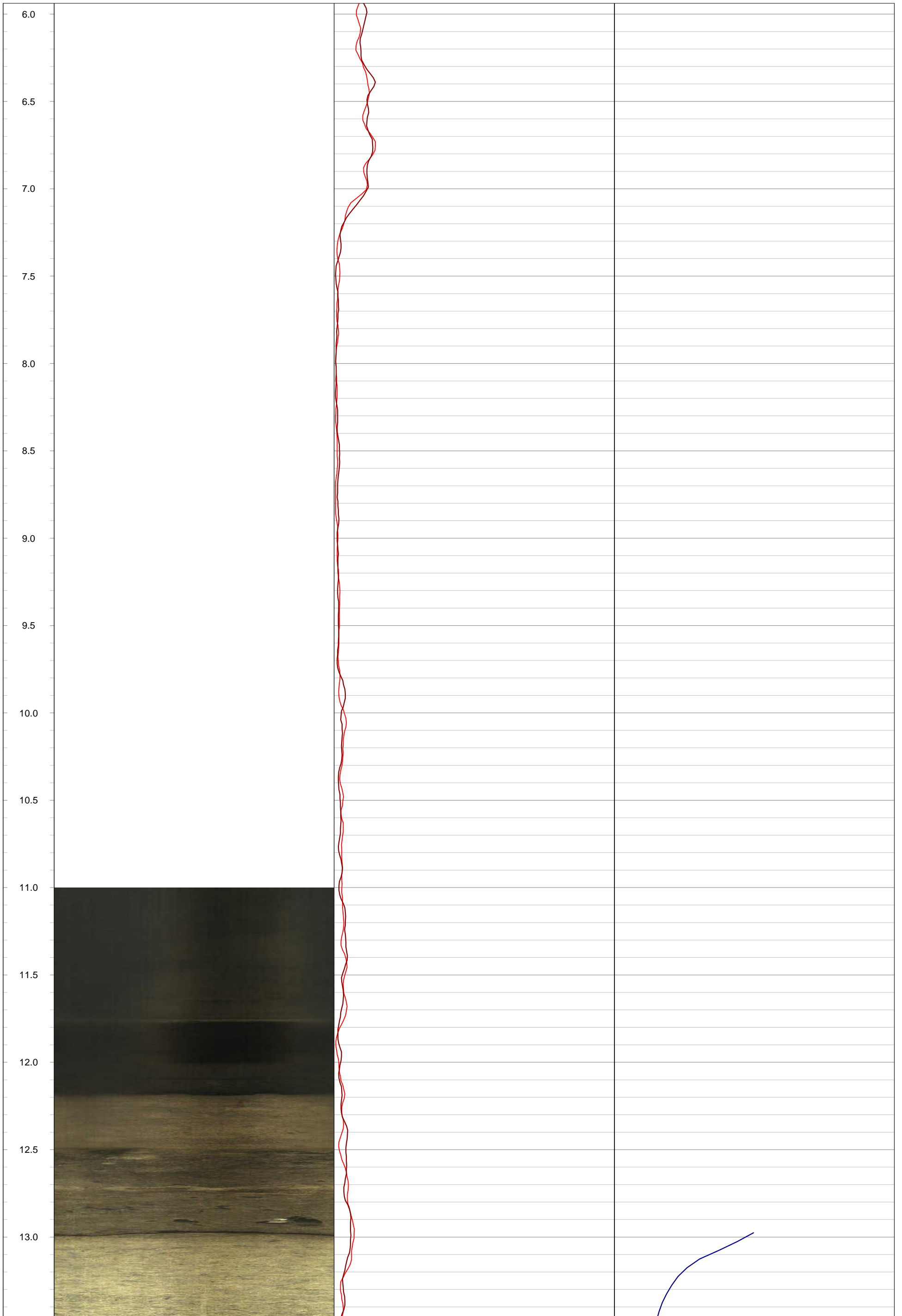
**Geophysical Record of Borehole: MW20-23 (CAL)**

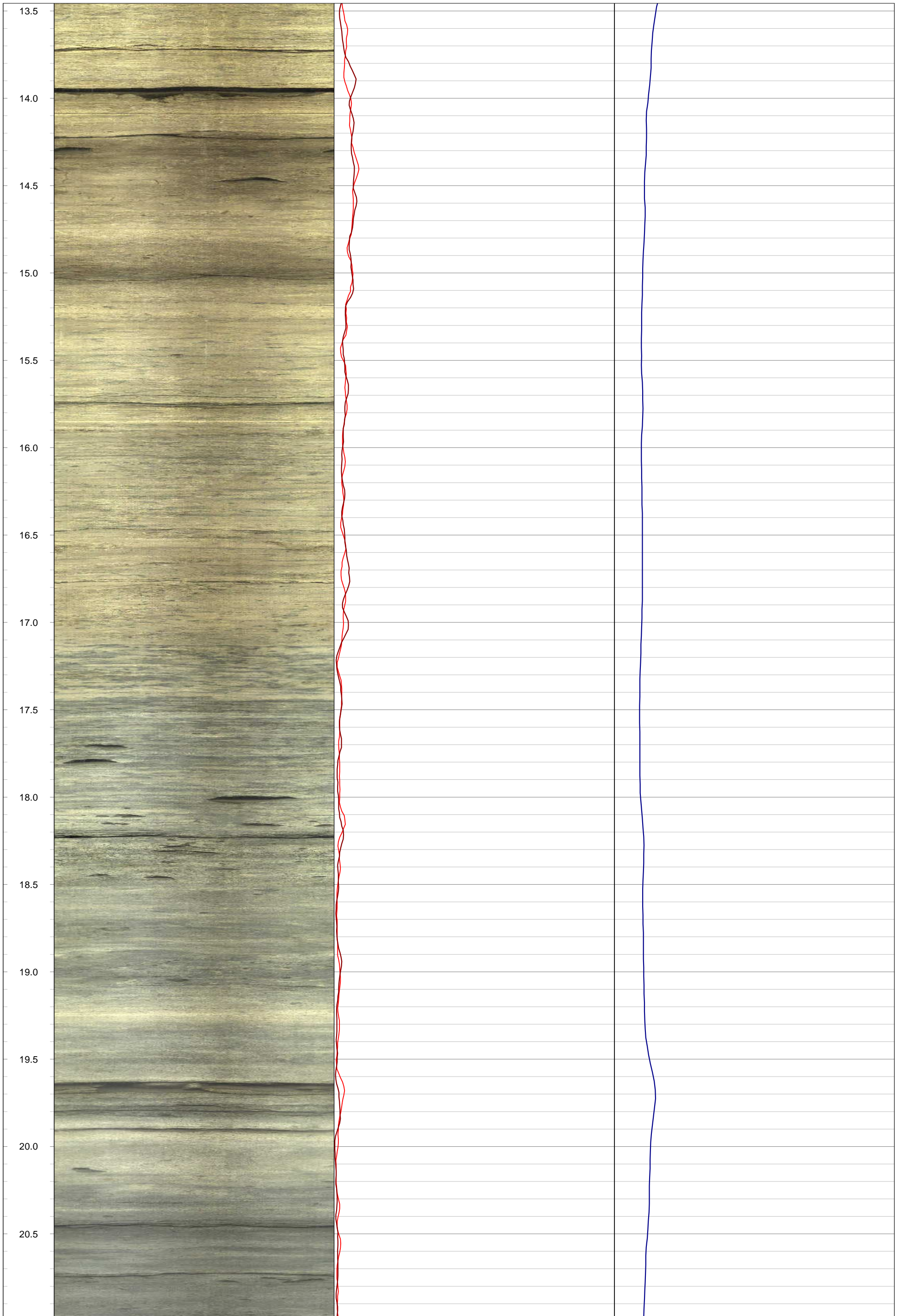
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.19 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576205.53 m    **Drilled Depth:** 26.76 m bgs    **Water Level:** 4.68 m bgs    **Log Date:** Nov-24-2020  
**Northing:** 4851555.91 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 395.05 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.20 m ags

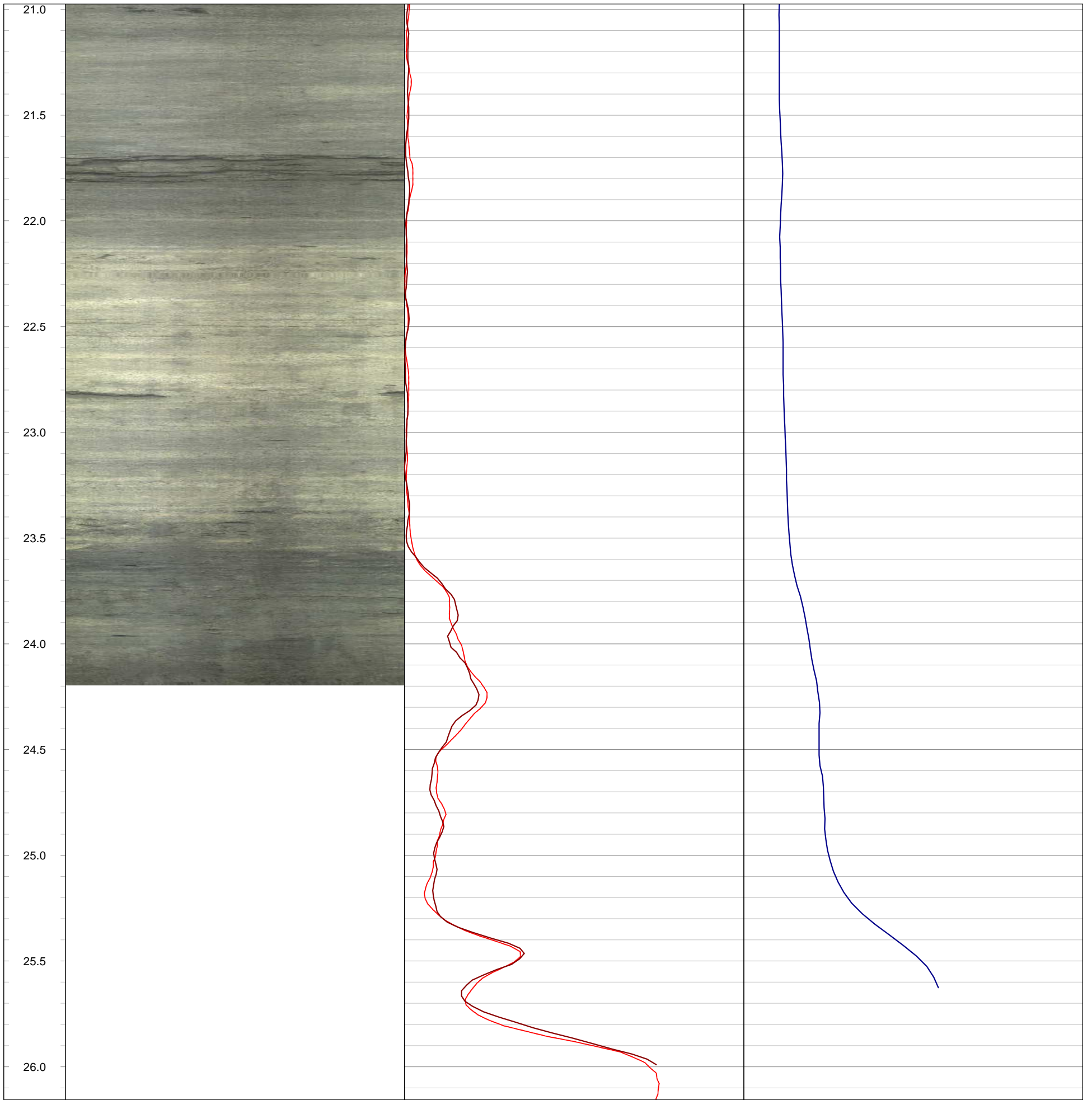
**Notes:** OBI image opaque > 24.4 m bgs













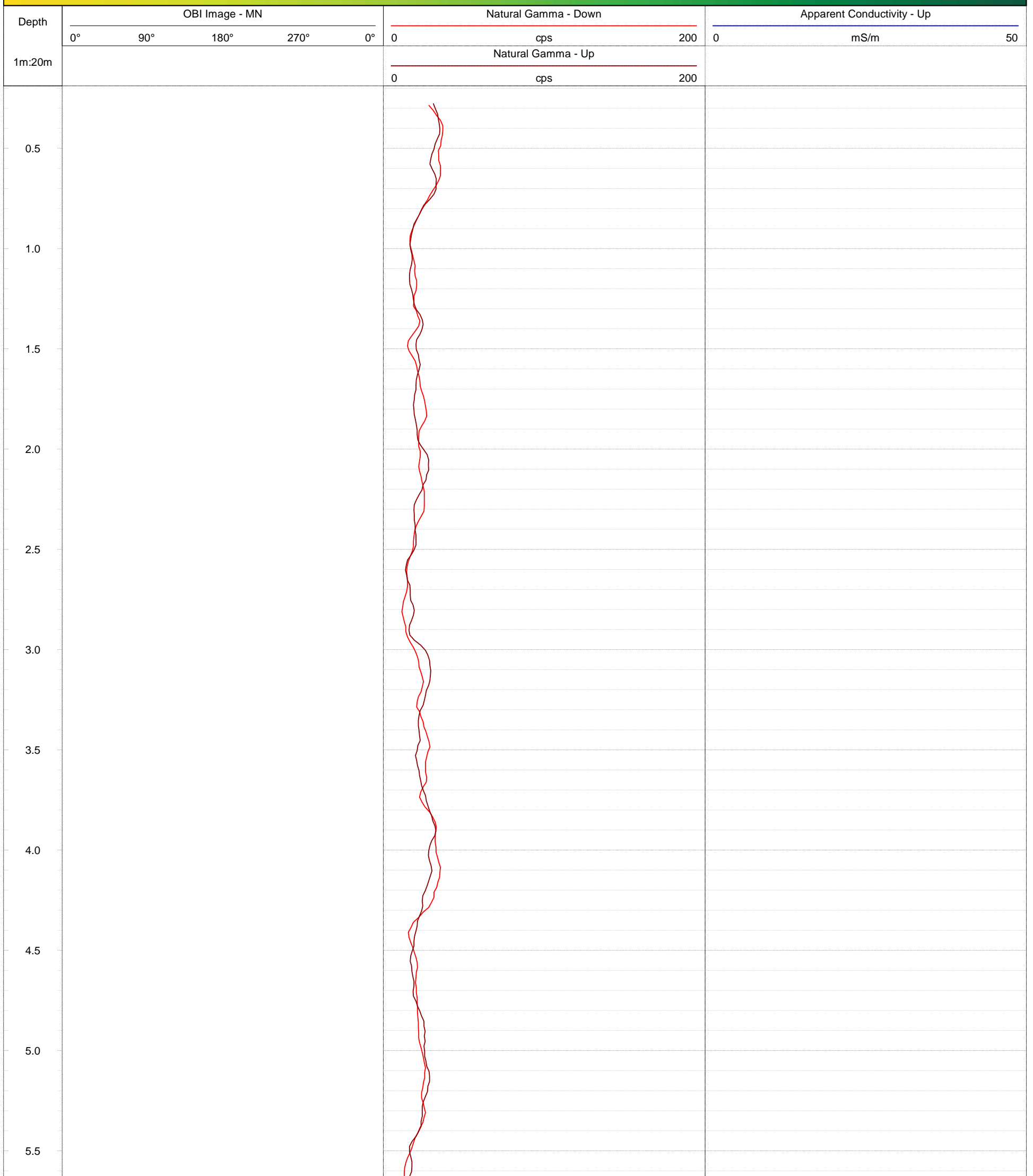
**GOLDER**  
MEMBER OF WSP

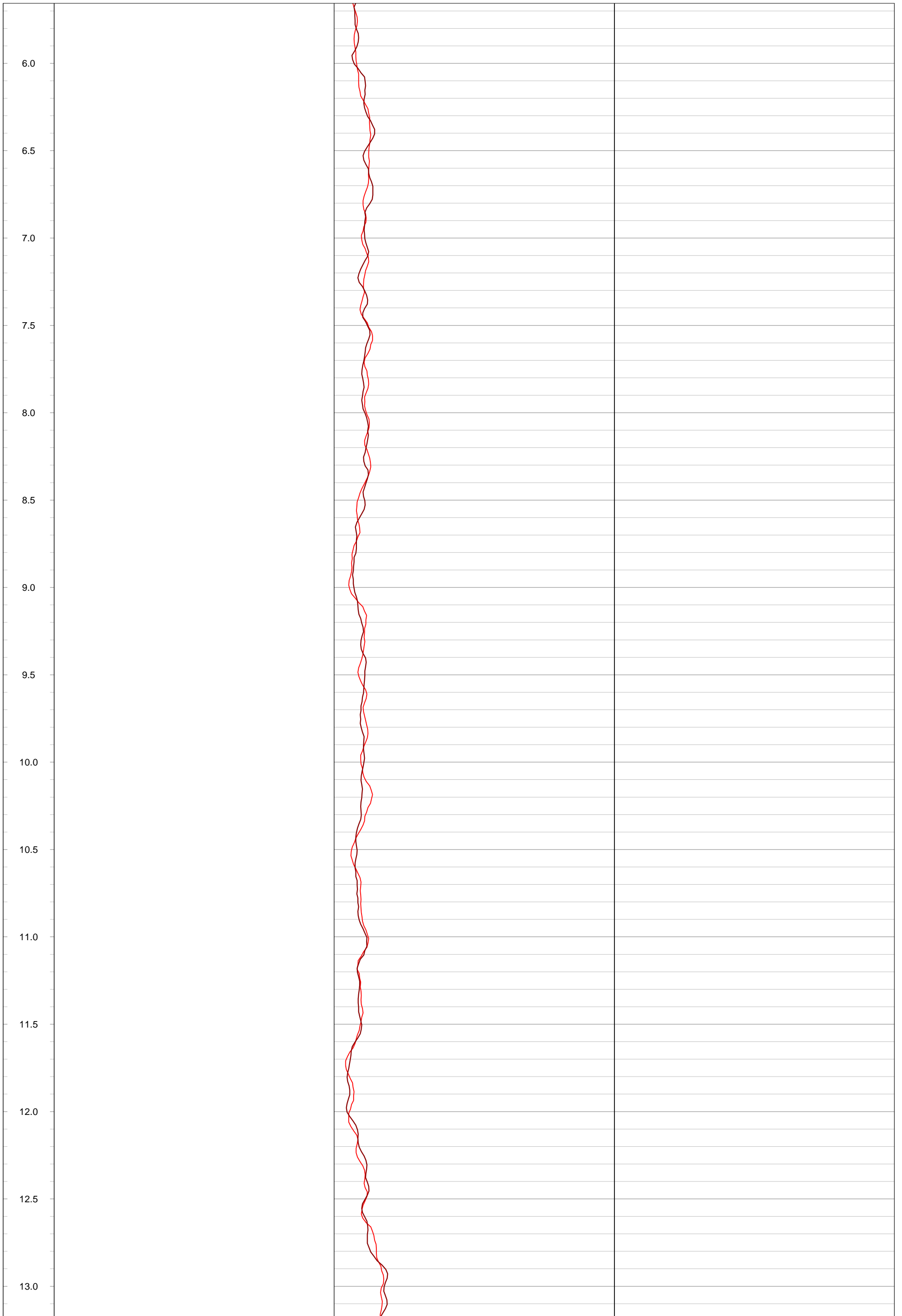
**Geophysical Record of Borehole: MW20-24 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

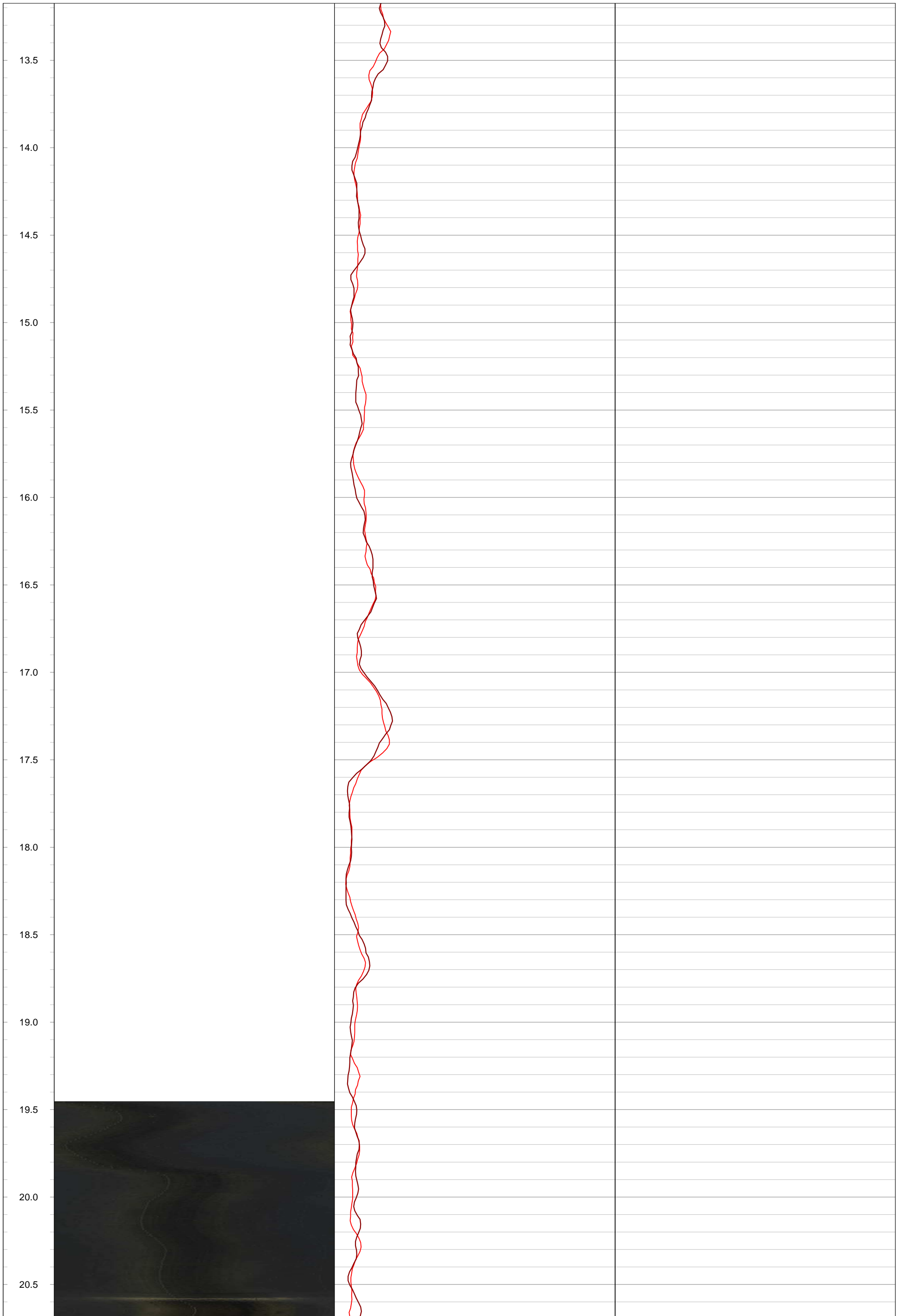
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 20.98 m bgs    **Location:** Caledon, Ontario  
**Easting:** 575337.66 m    **Drilled Depth:** 37.49 m bgs    **Water Level:** 4.46 m bgs    **Log Date:** Dec-04-2020  
**Northing:** 4854341.85 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 437.75 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.51 m ags

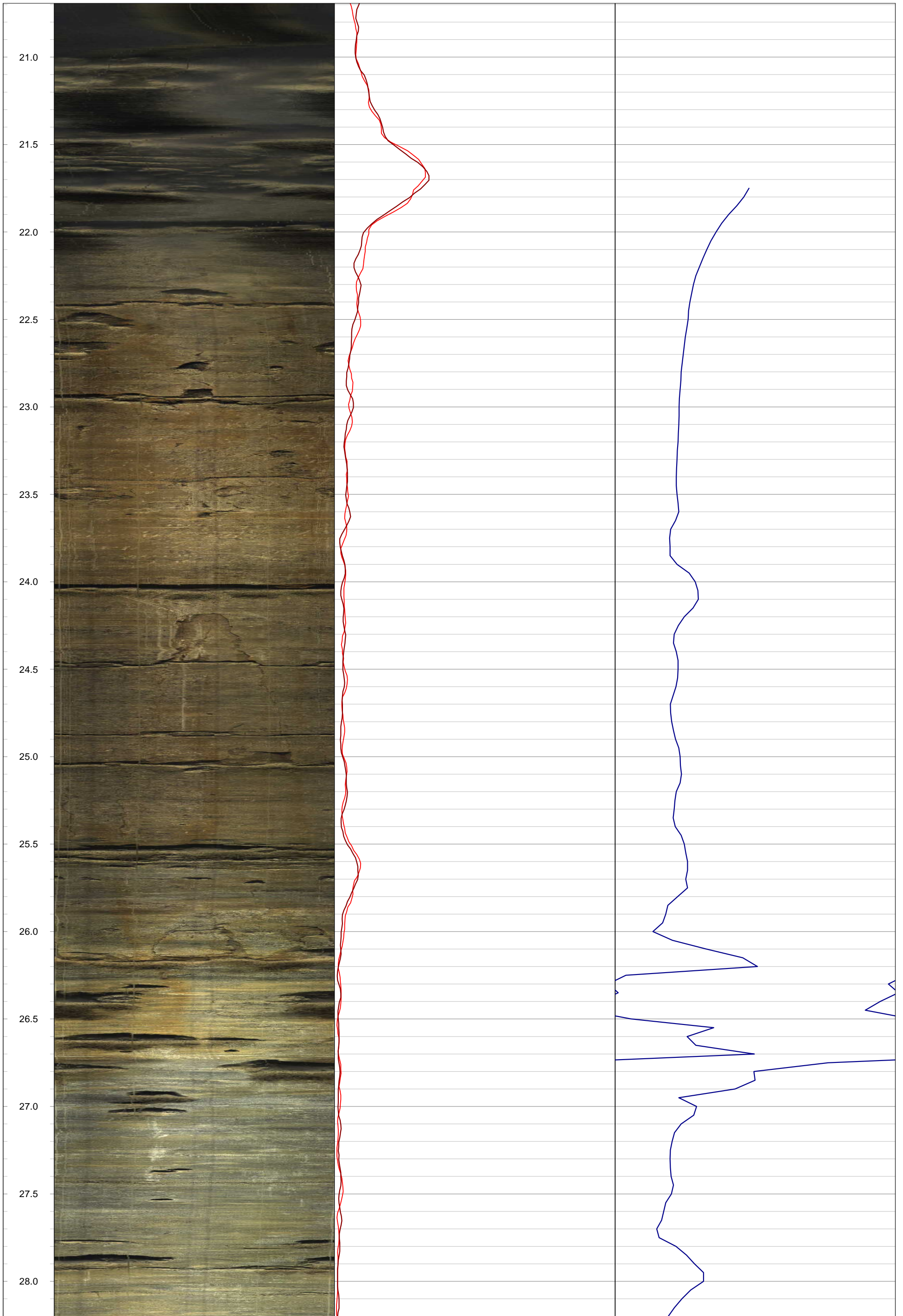
**Notes:** OBI Image opaque > 35 m bgs



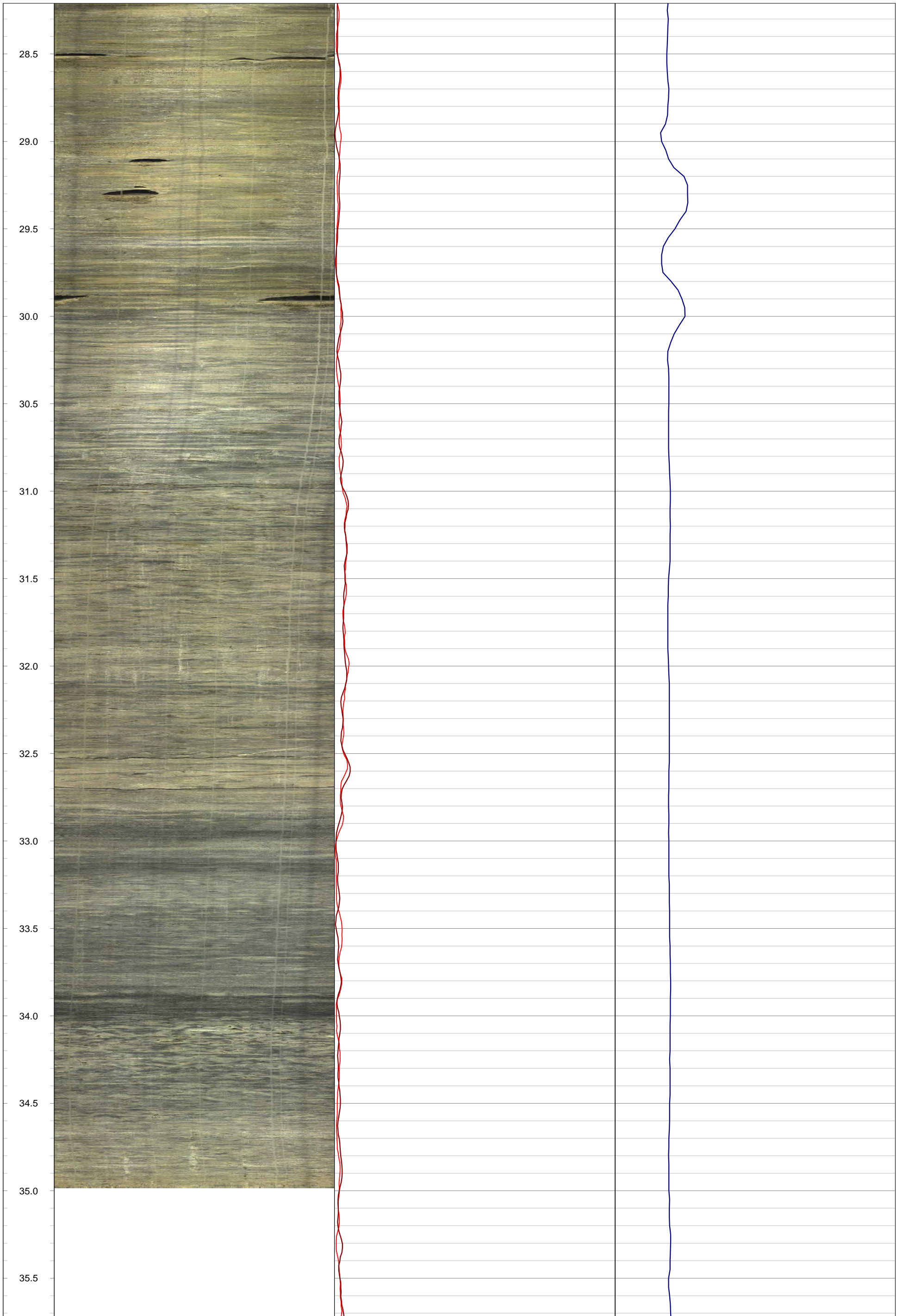


















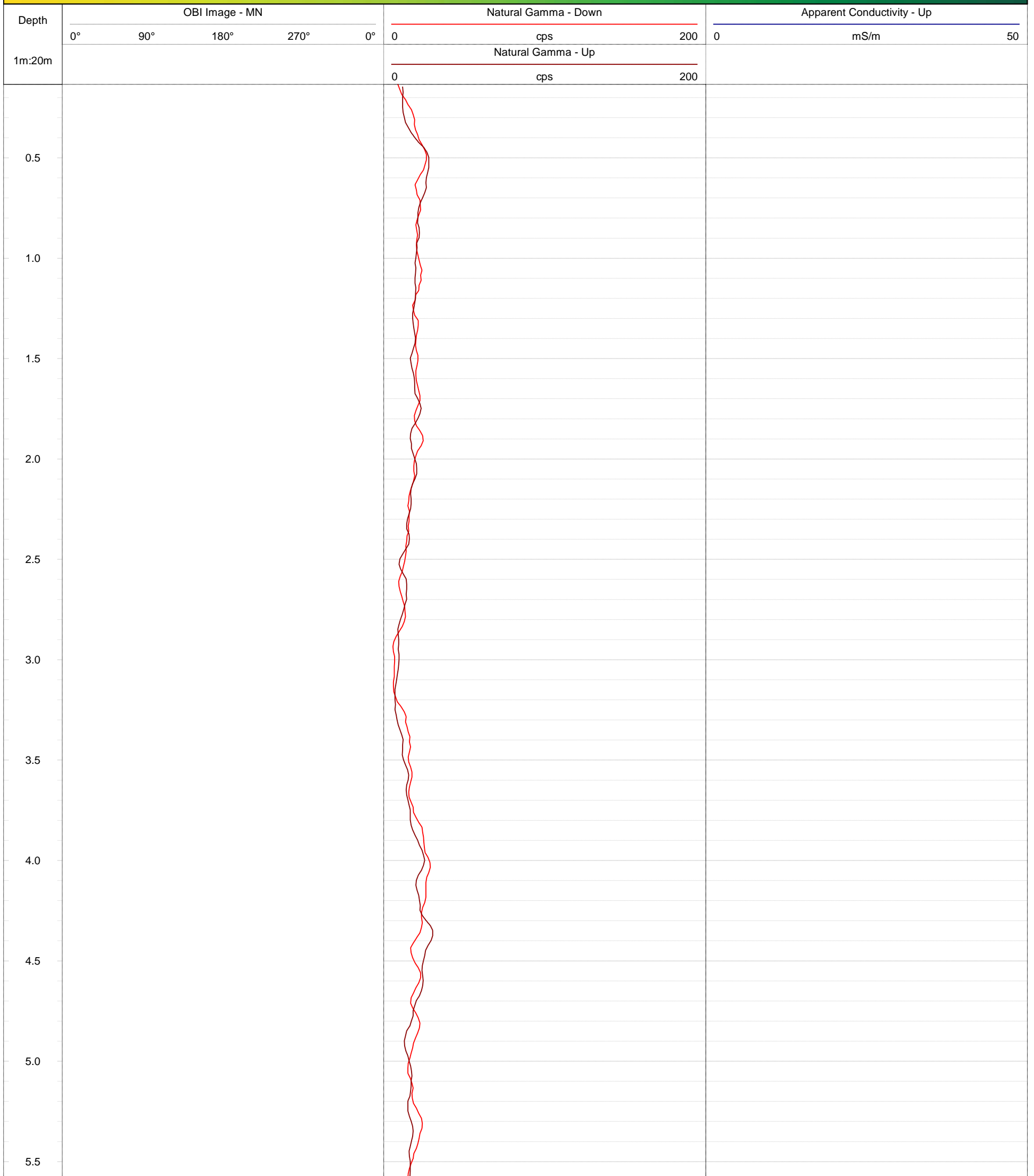
**GOLDER**  
MEMBER OF WSP

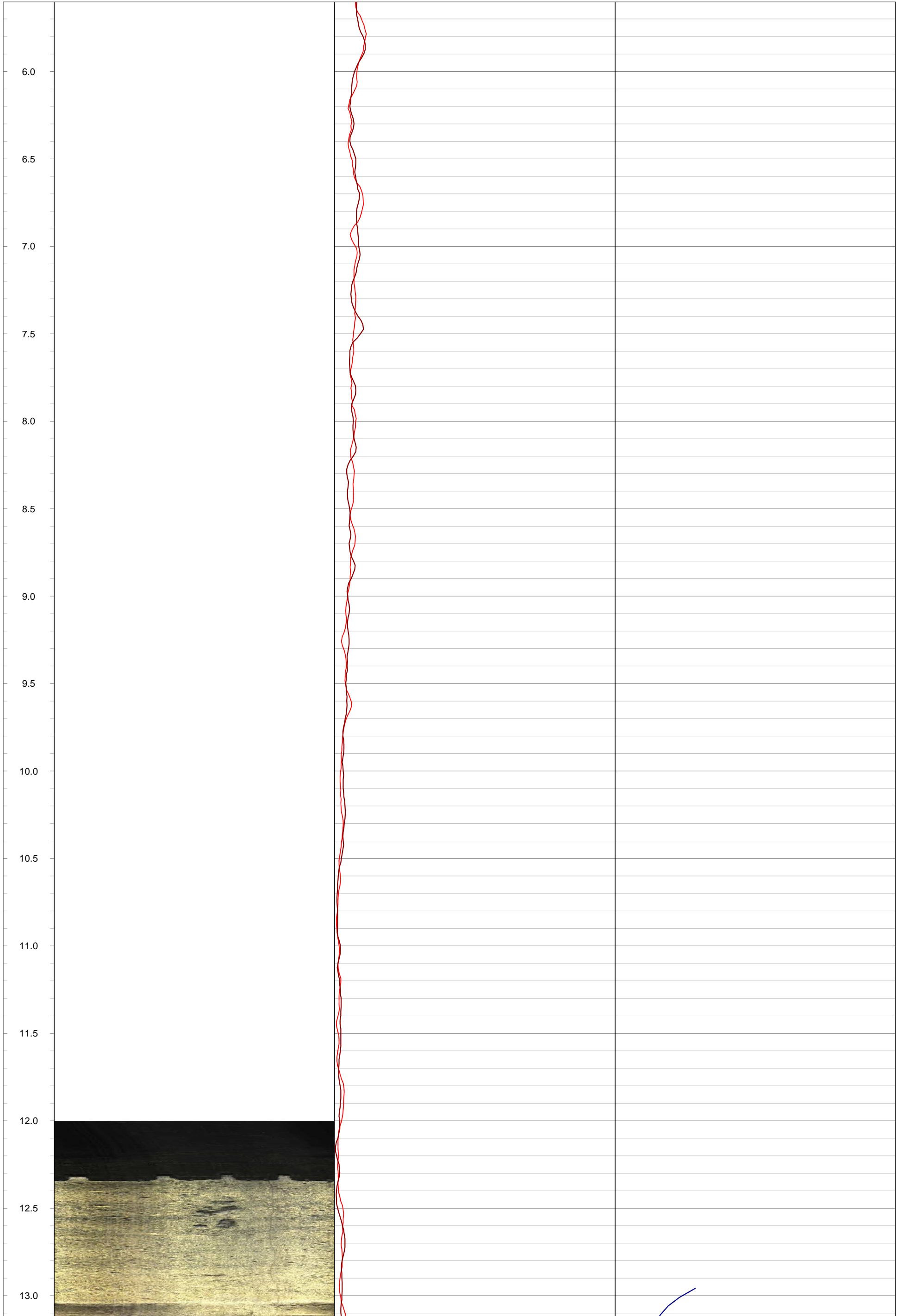
**Geophysical Record of Borehole: MW20-25 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

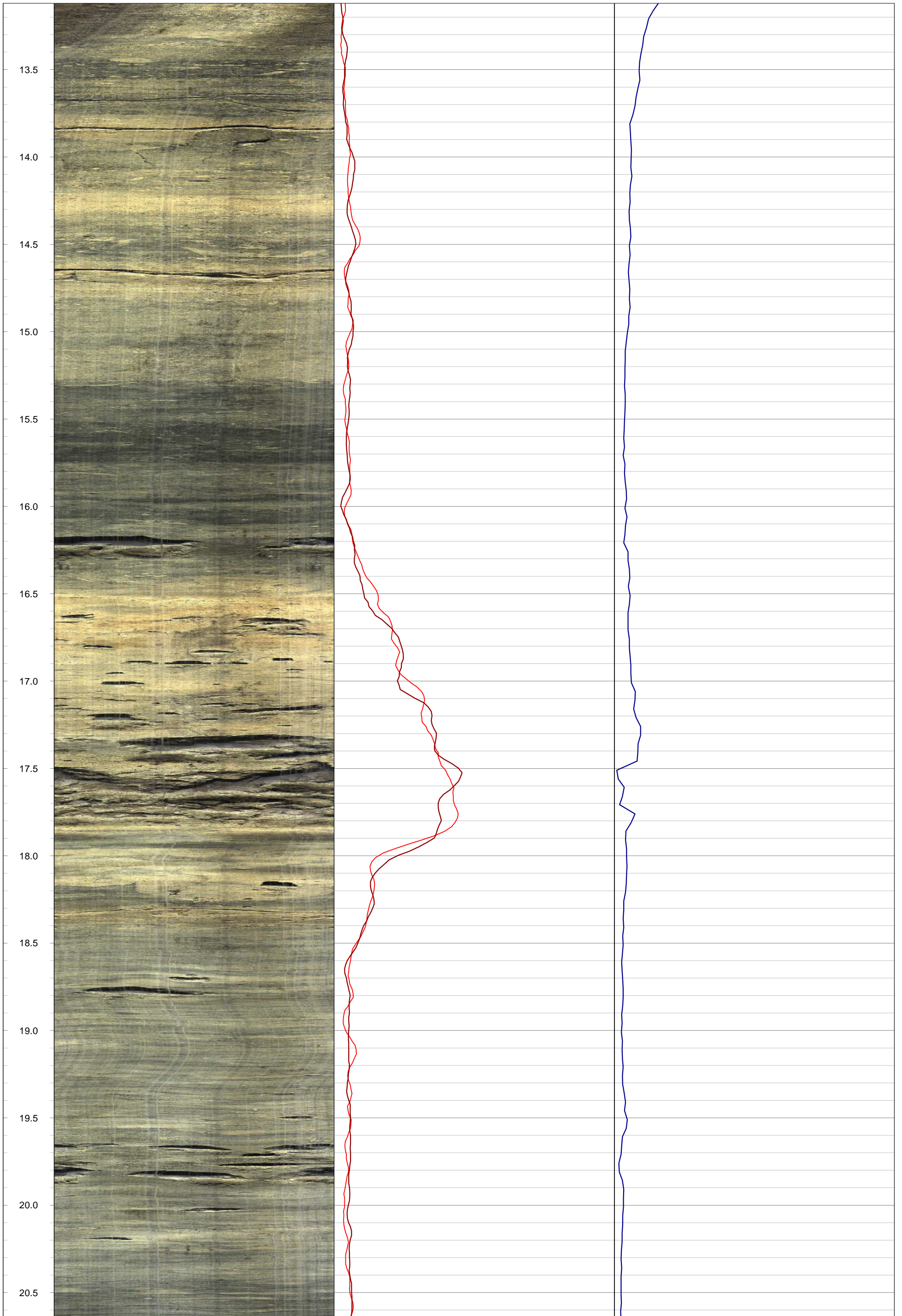
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 12.39 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 574853.76 m	<b>Drilled Depth:</b> 51.82 m bgs	<b>Water Level:</b> -0.83 m bgs	<b>Log Date:</b> Dec-12-2020
<b>Northing:</b> 4852900.48 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 419.02 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.98 m ags	

**Notes:** Artesian well, water slowly rose up to above stick-up casing level during data acquisition. OBI image opaque > 50.2 m bgs

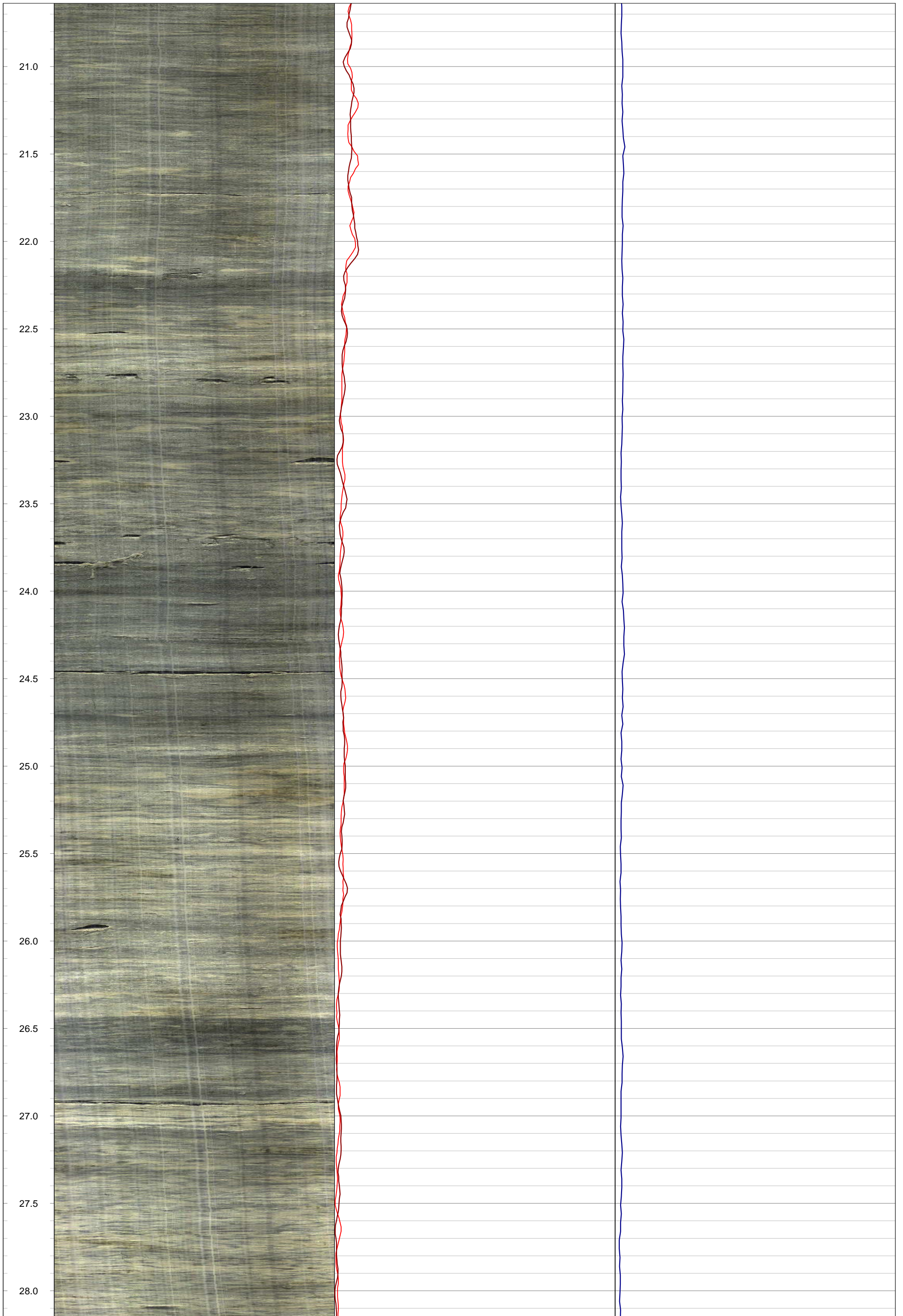




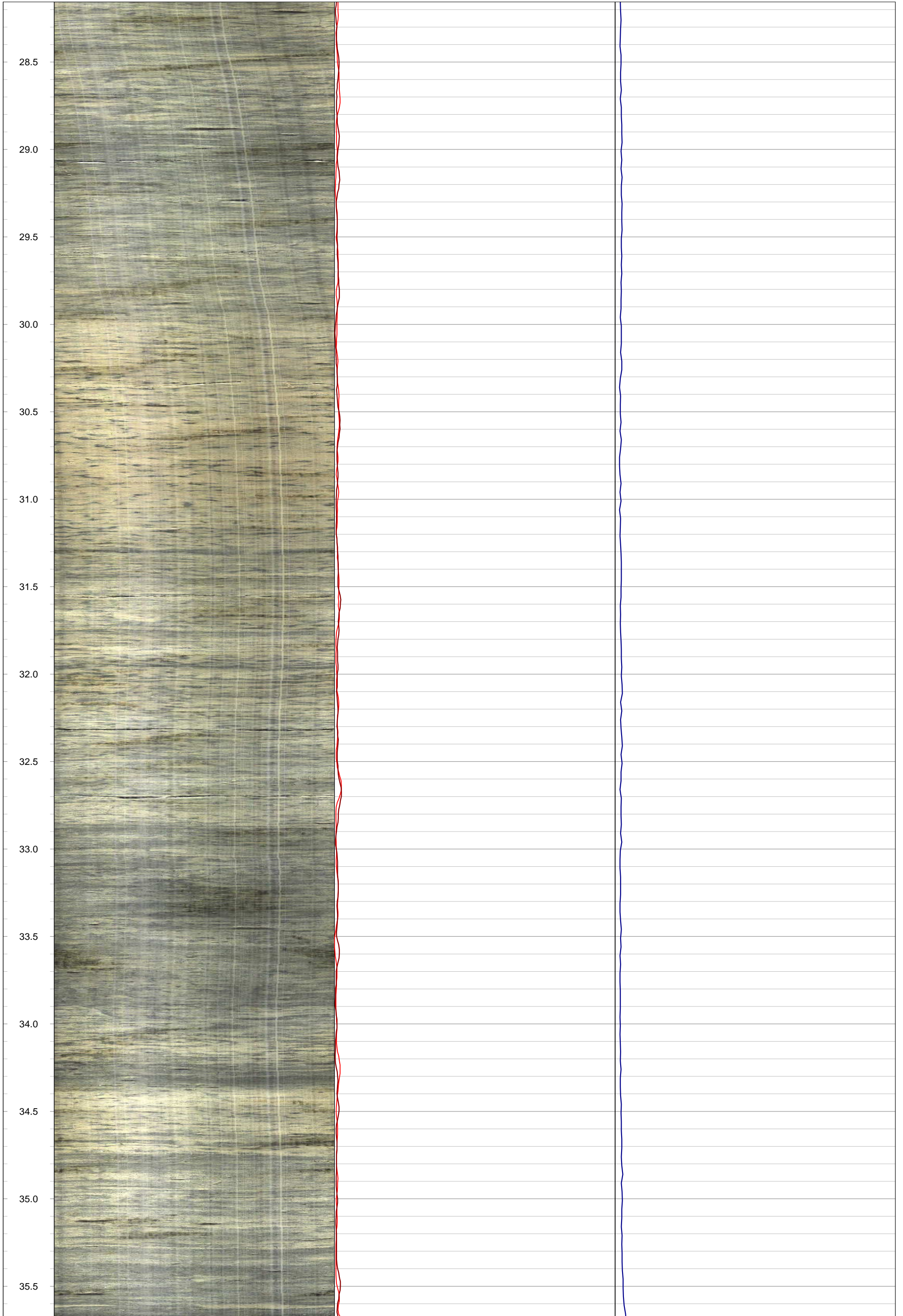




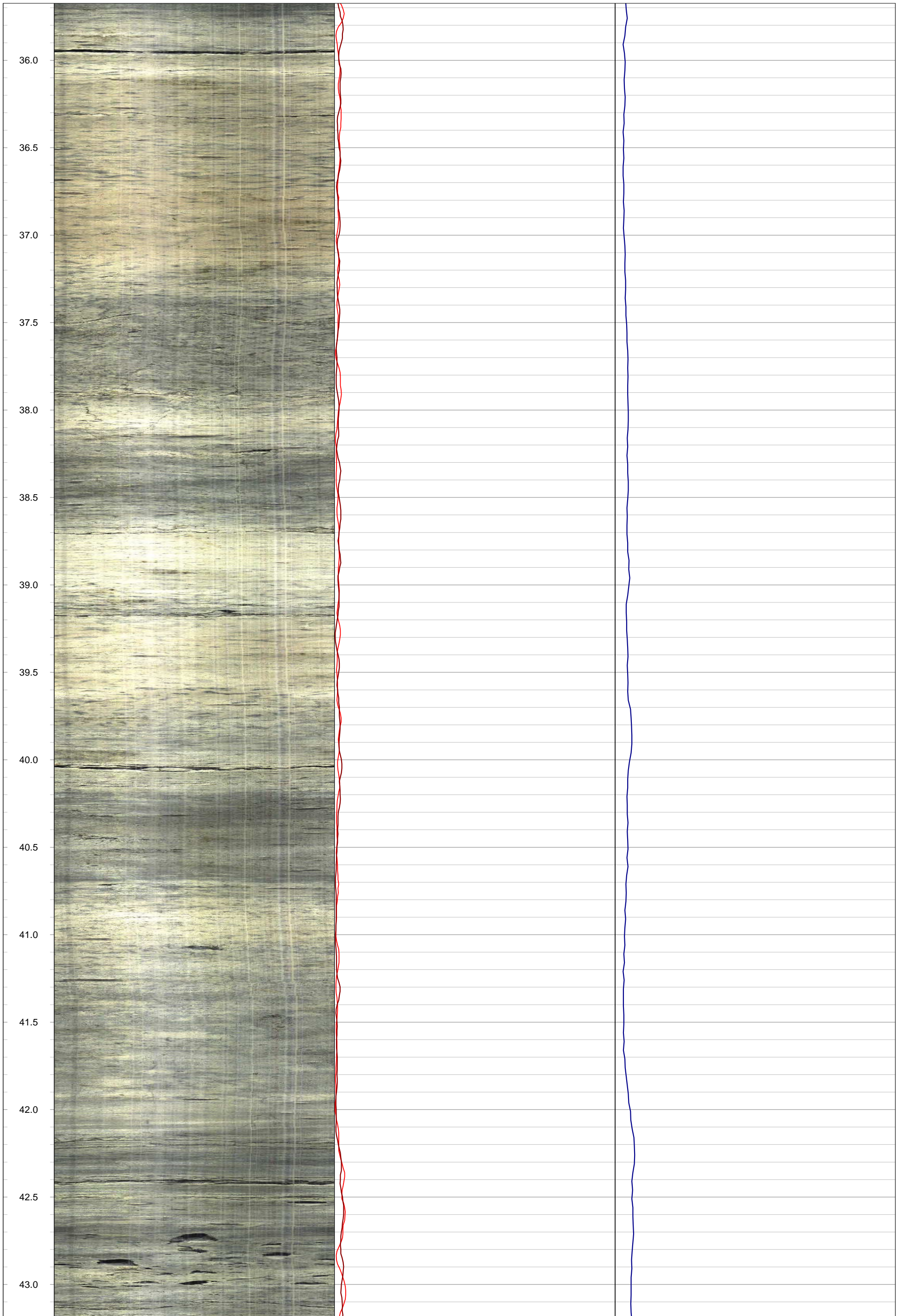




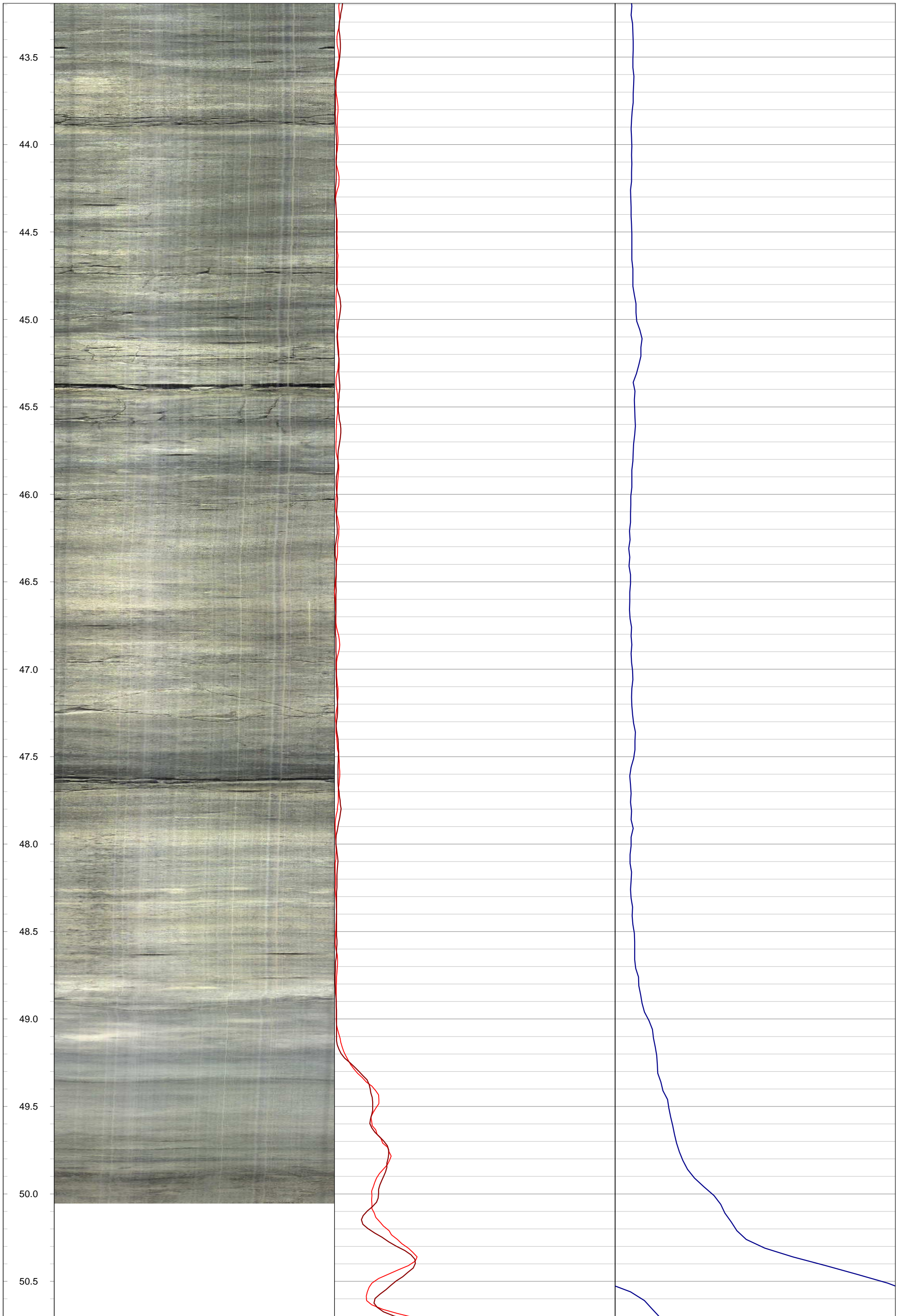


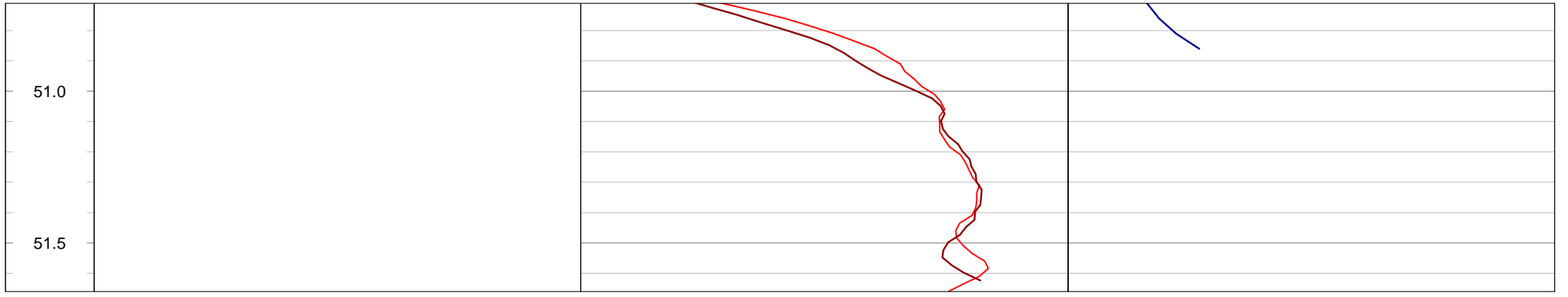
















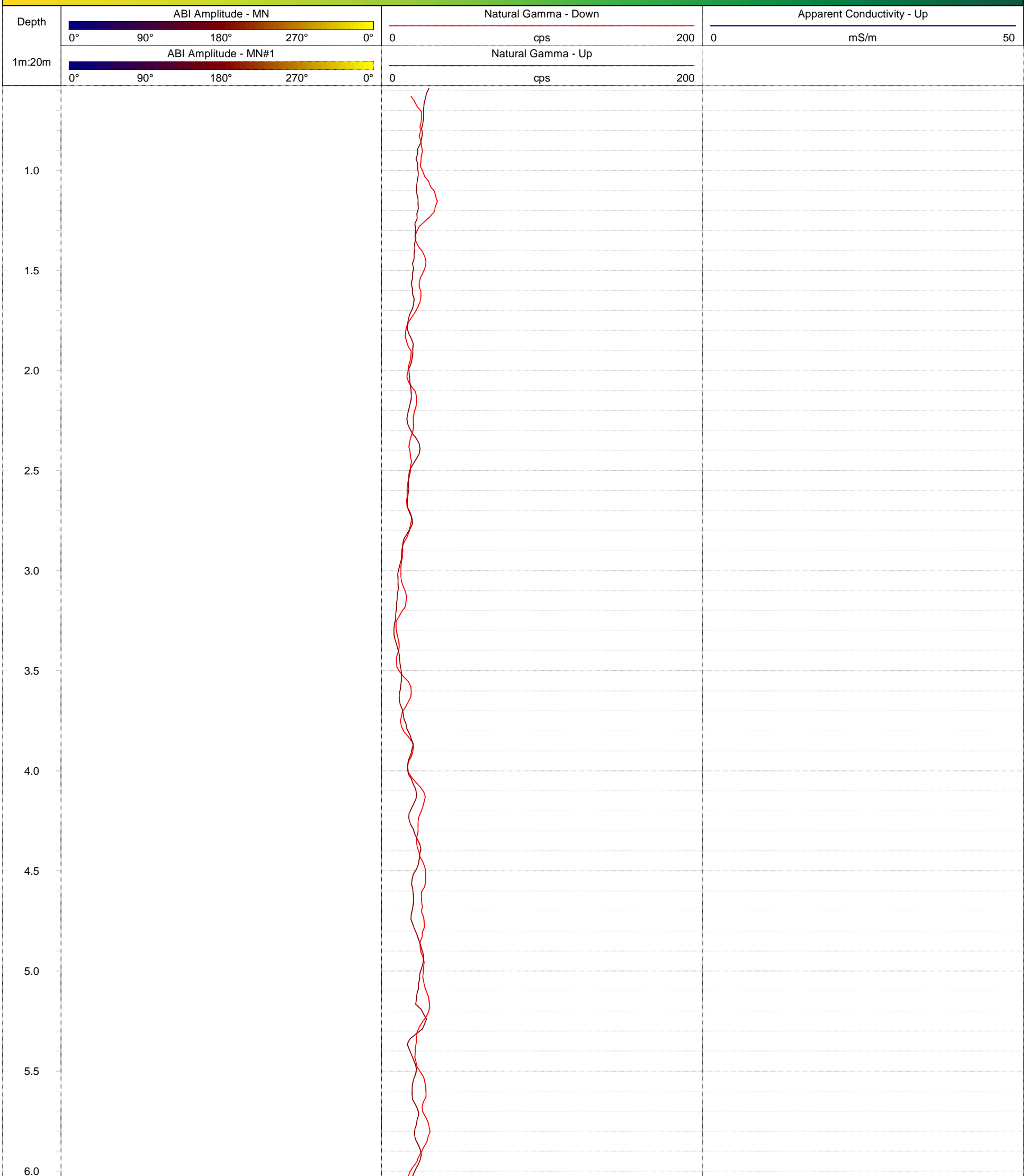
**GOLDER**  
MEMBER OF WSP

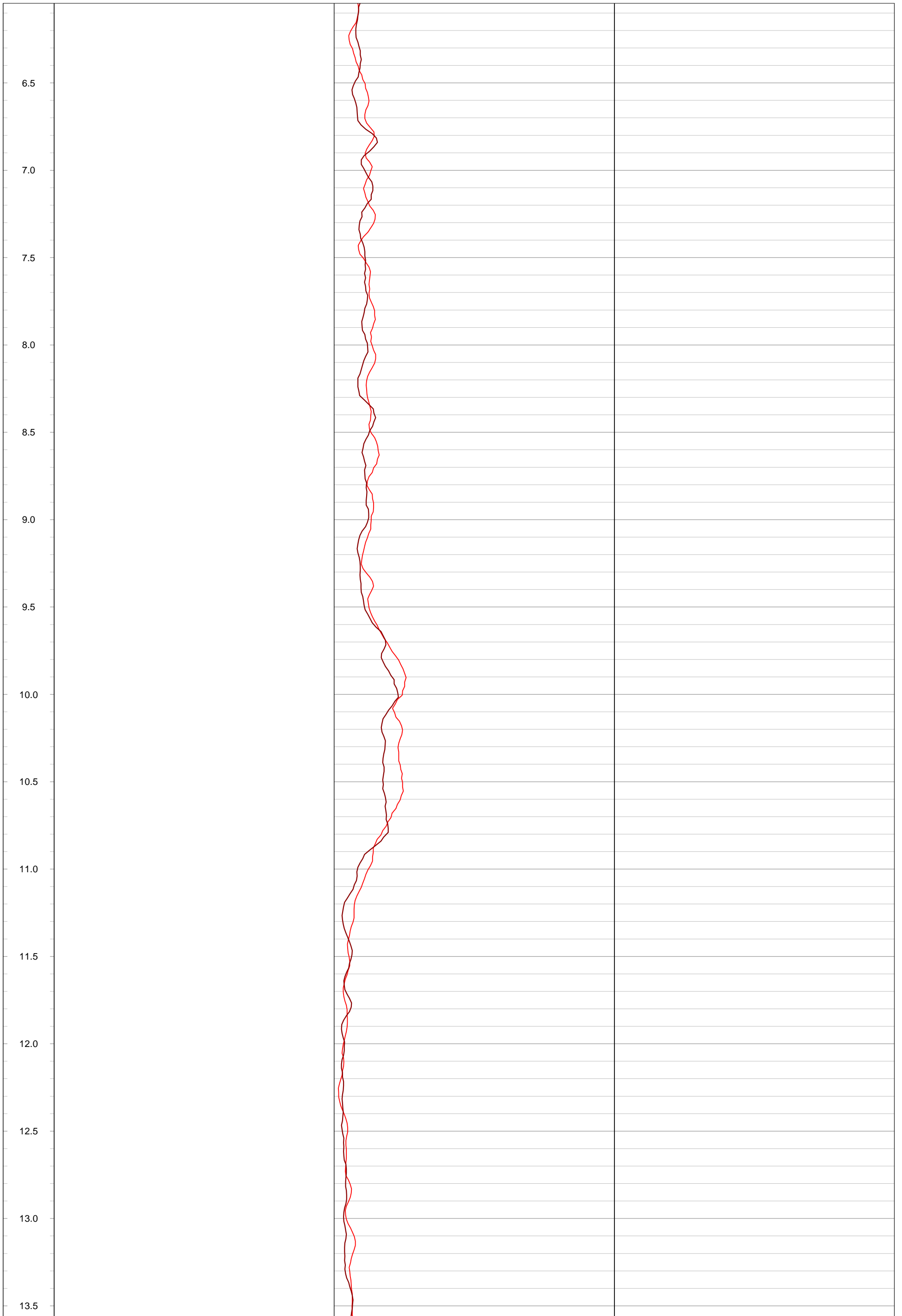
**Geophysical Record of Borehole: MW20-26 (CAL)**

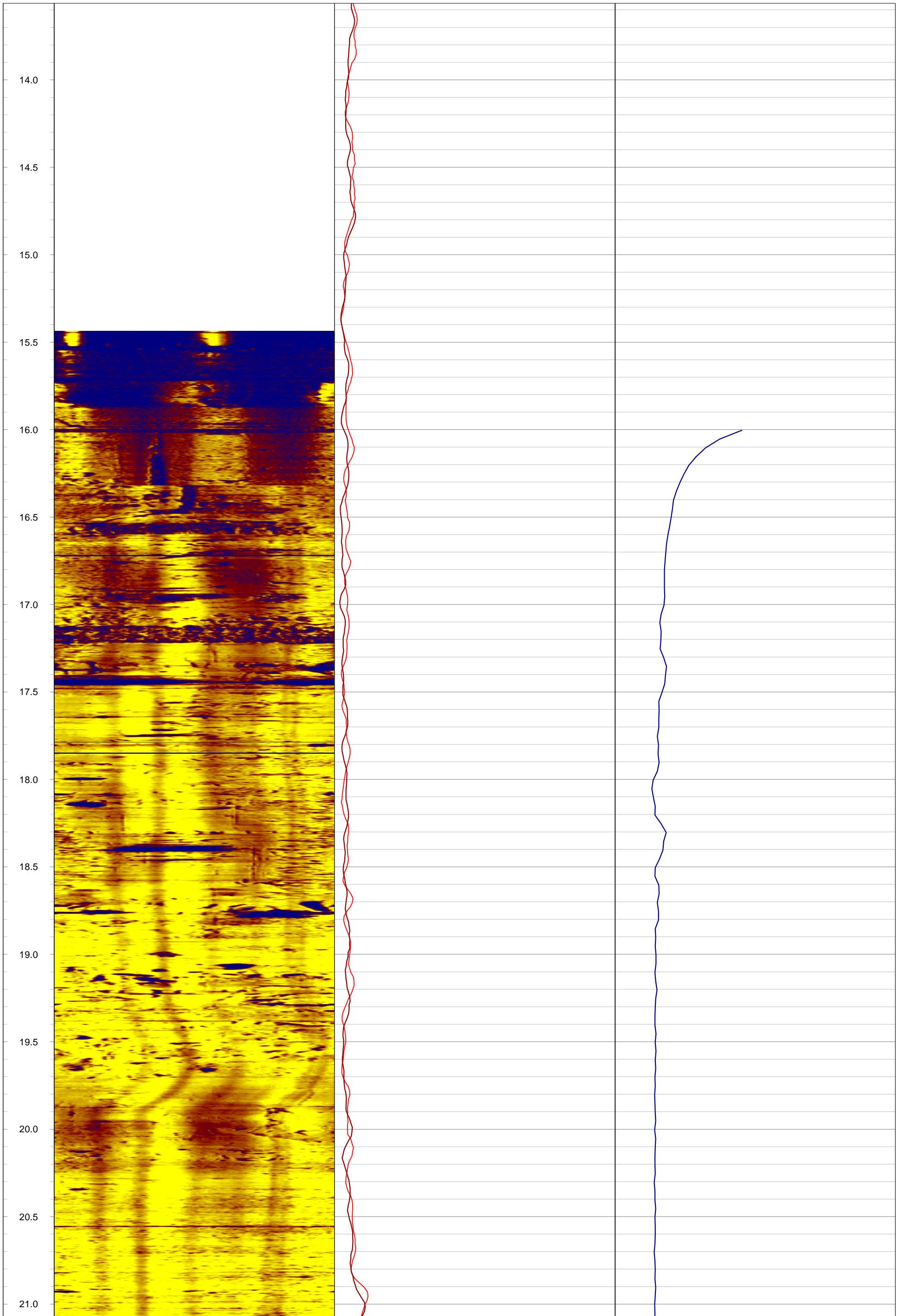
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.53 m bgs    **Location:** Caledon, Ontario  
**Easting:** 574373.86 m    **Drilled Depth:** 66.11 m bgs    **Water Level:** 3.19 m bgs    **Log Date:** Dec-18-2020  
**Northing:** 4853638.42 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 438.89 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.16 m ags

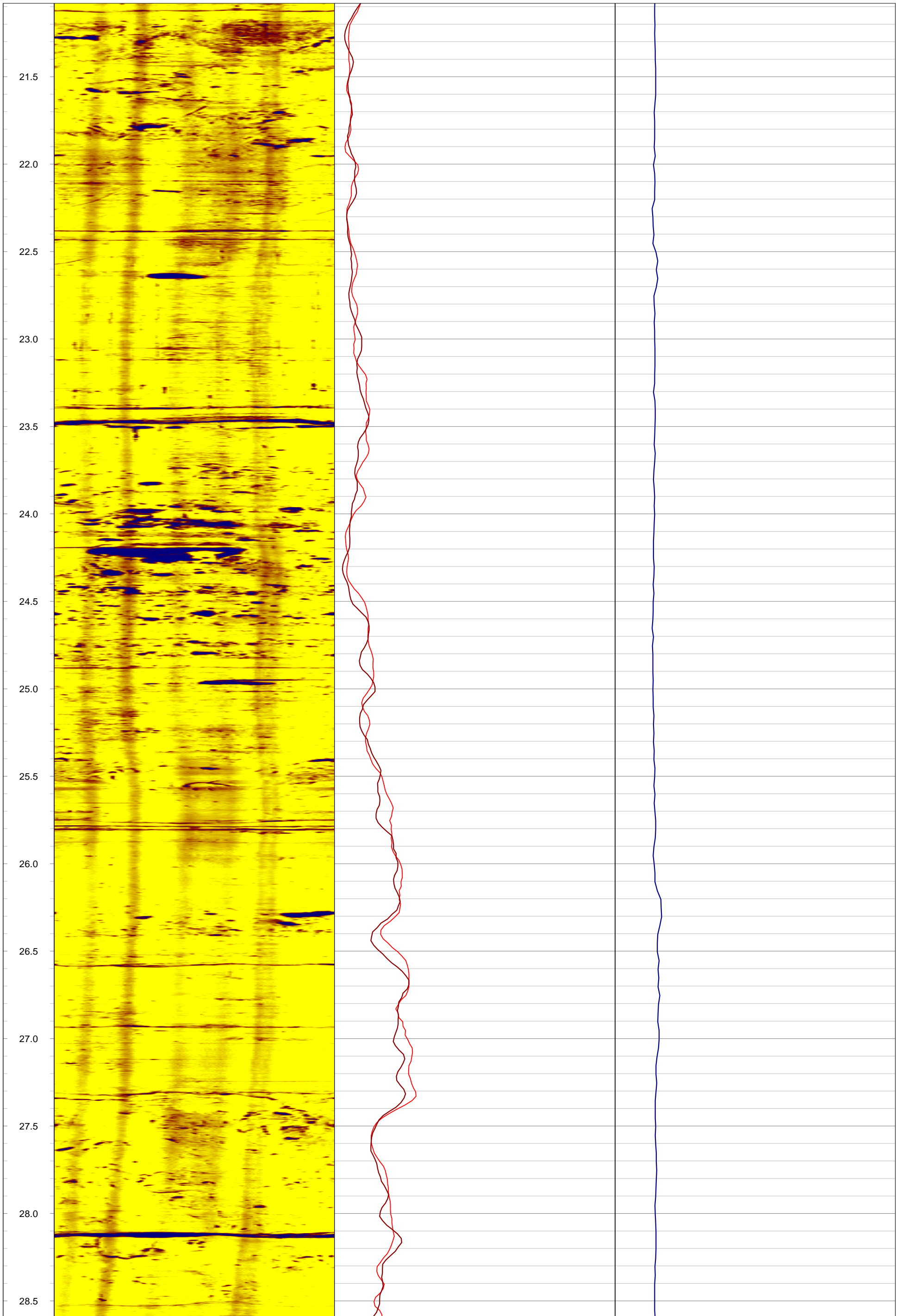
**Notes:** Optical image opaque >52.4 m bgs, collected acoustic imagery in addition to optical.

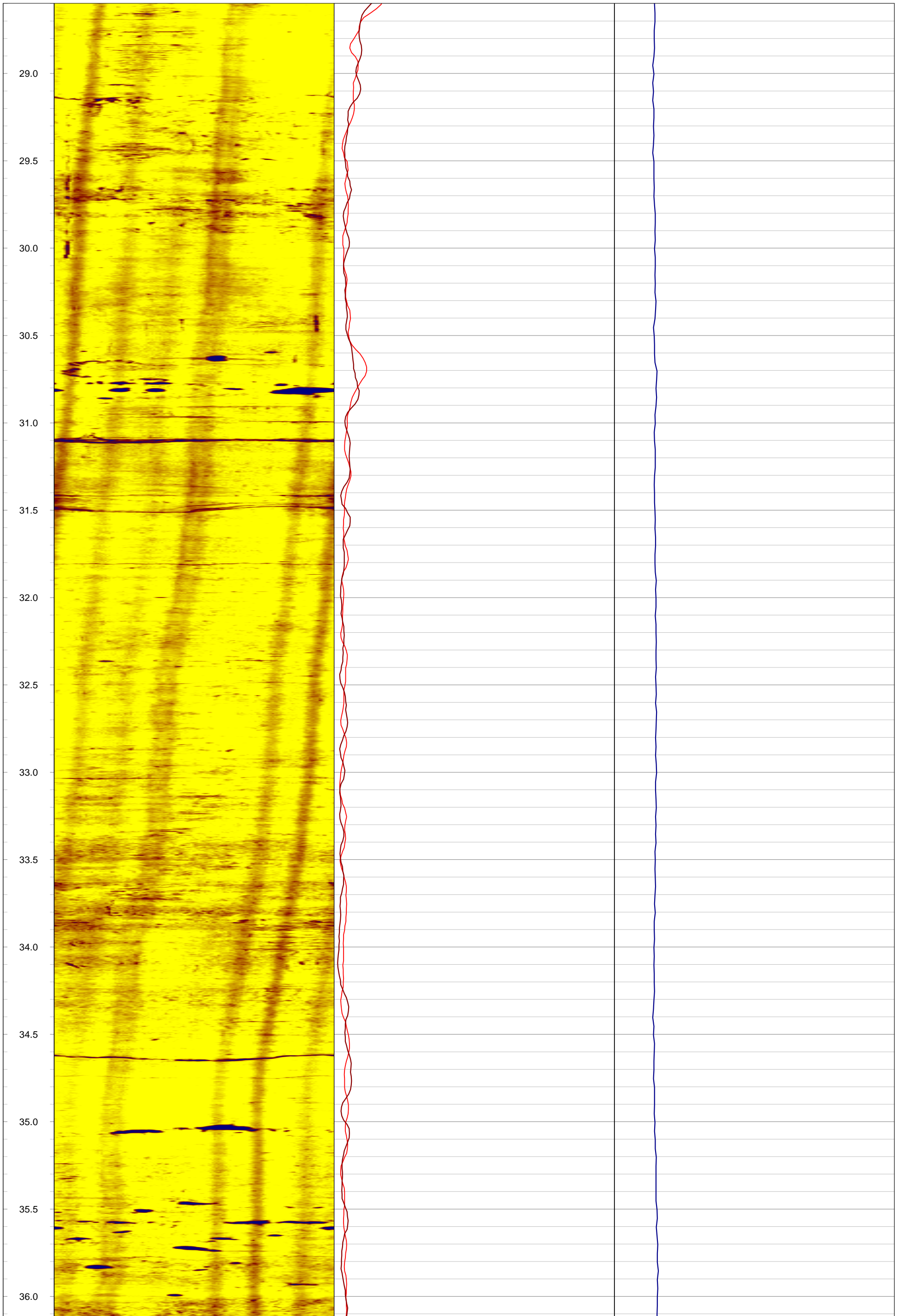




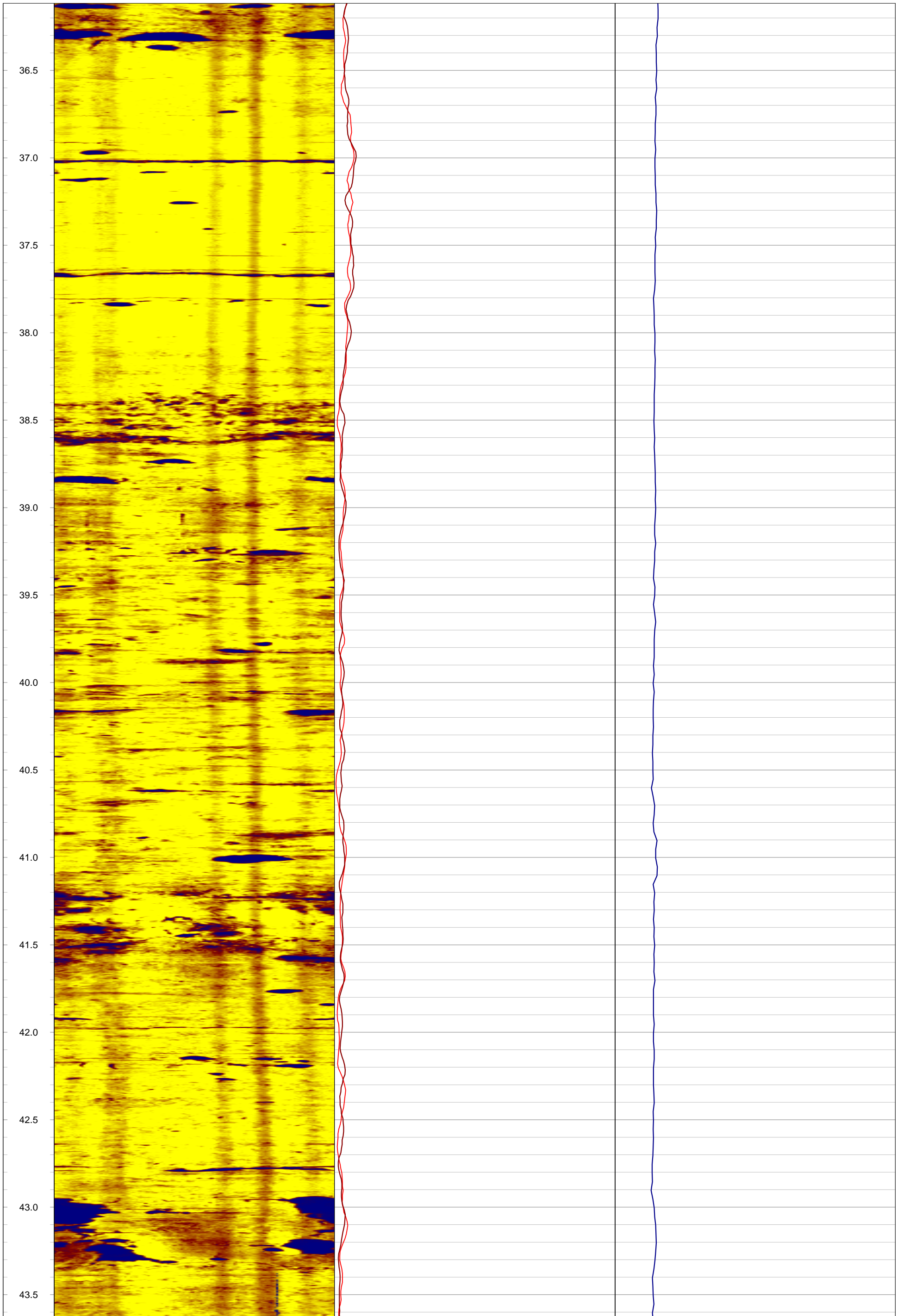




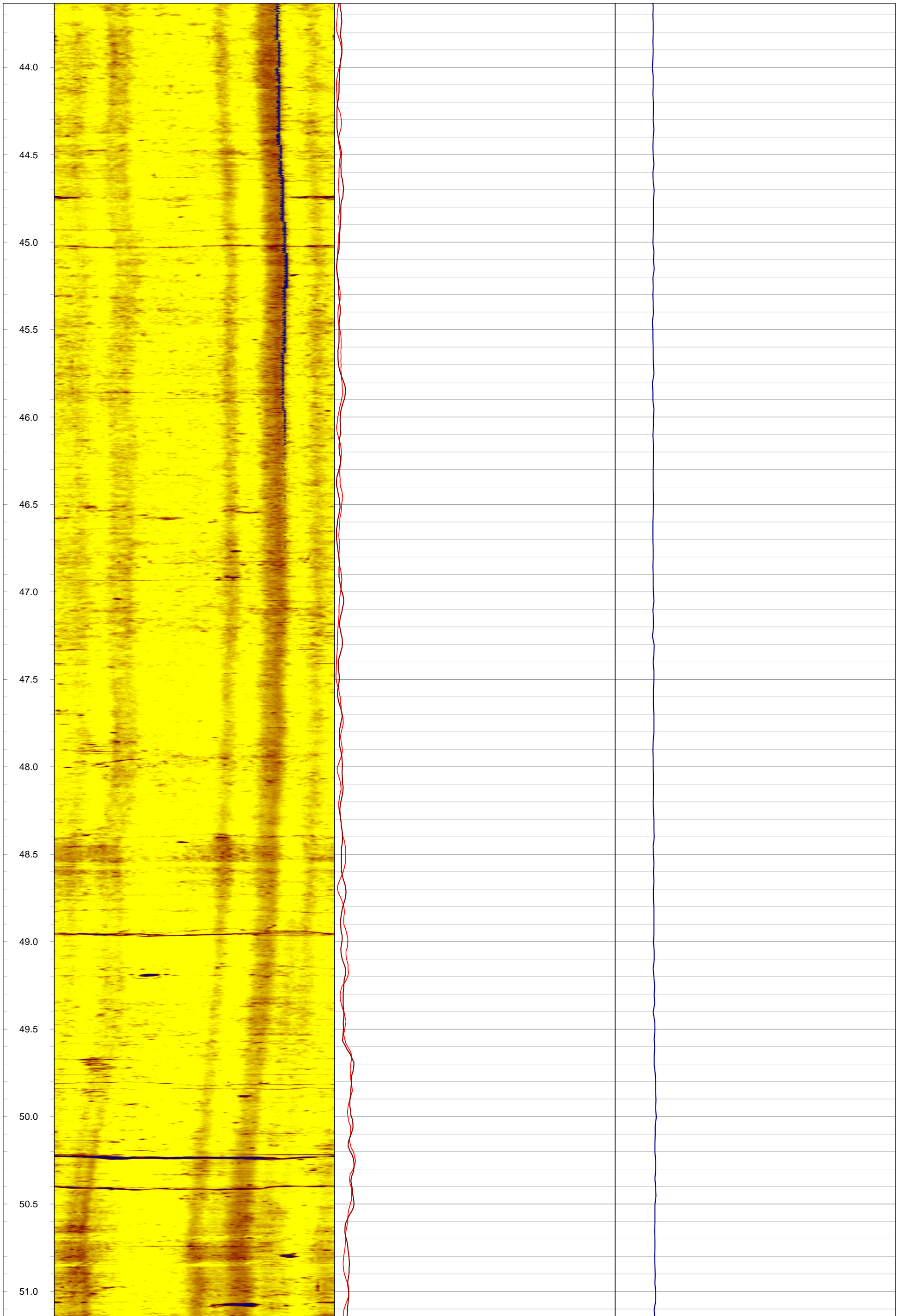


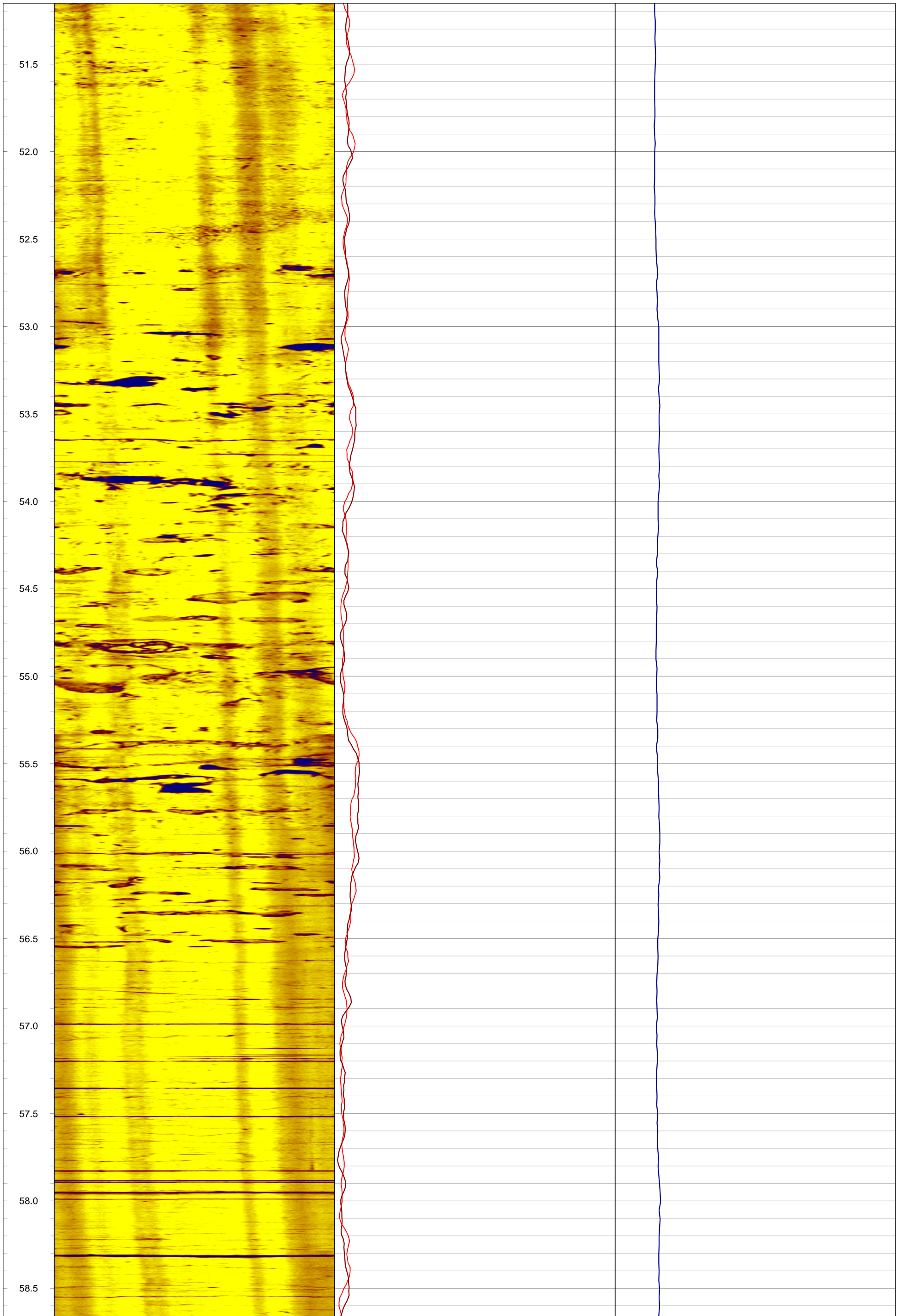


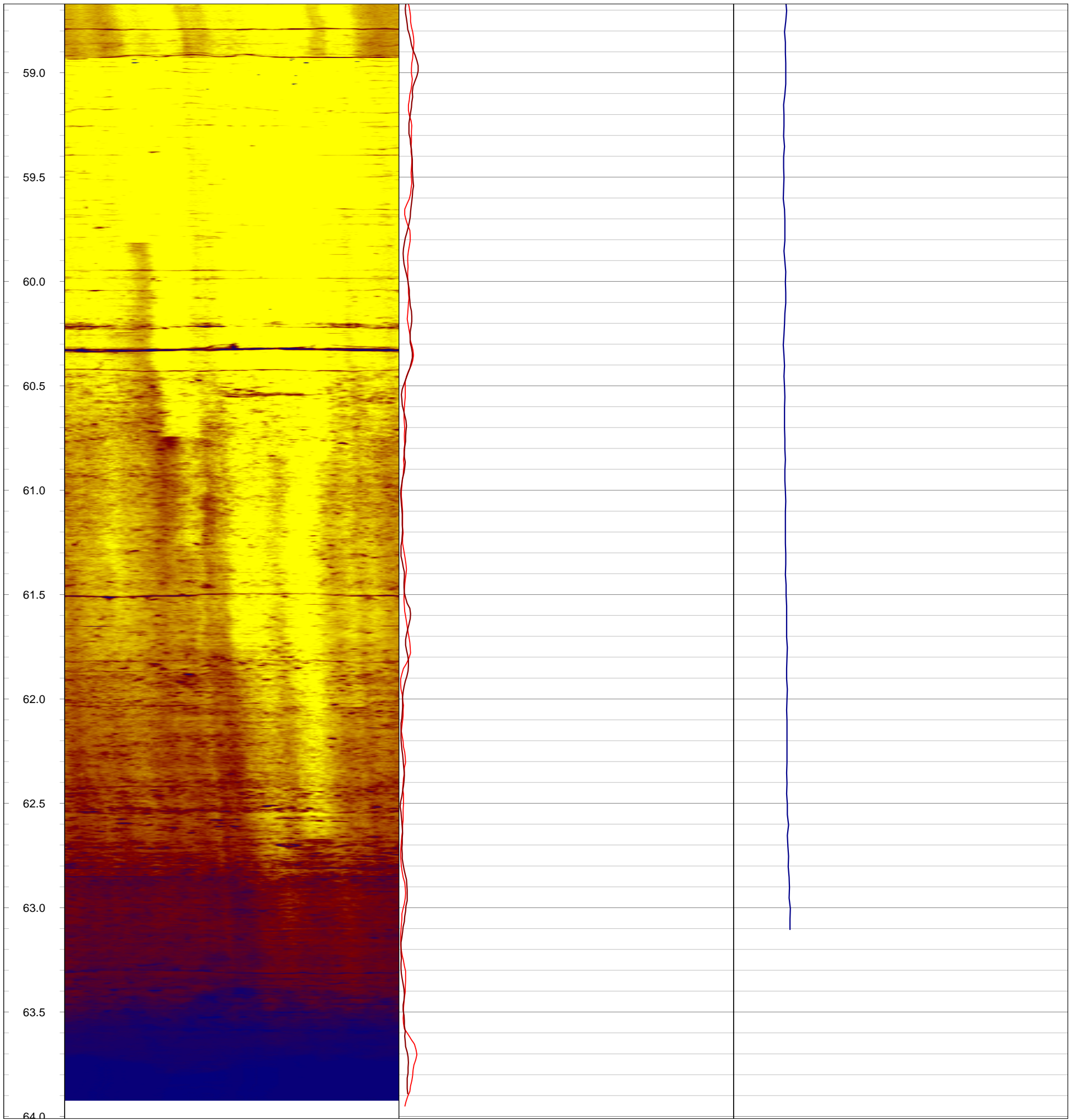
















**GOLDER**  
MEMBER OF WSP

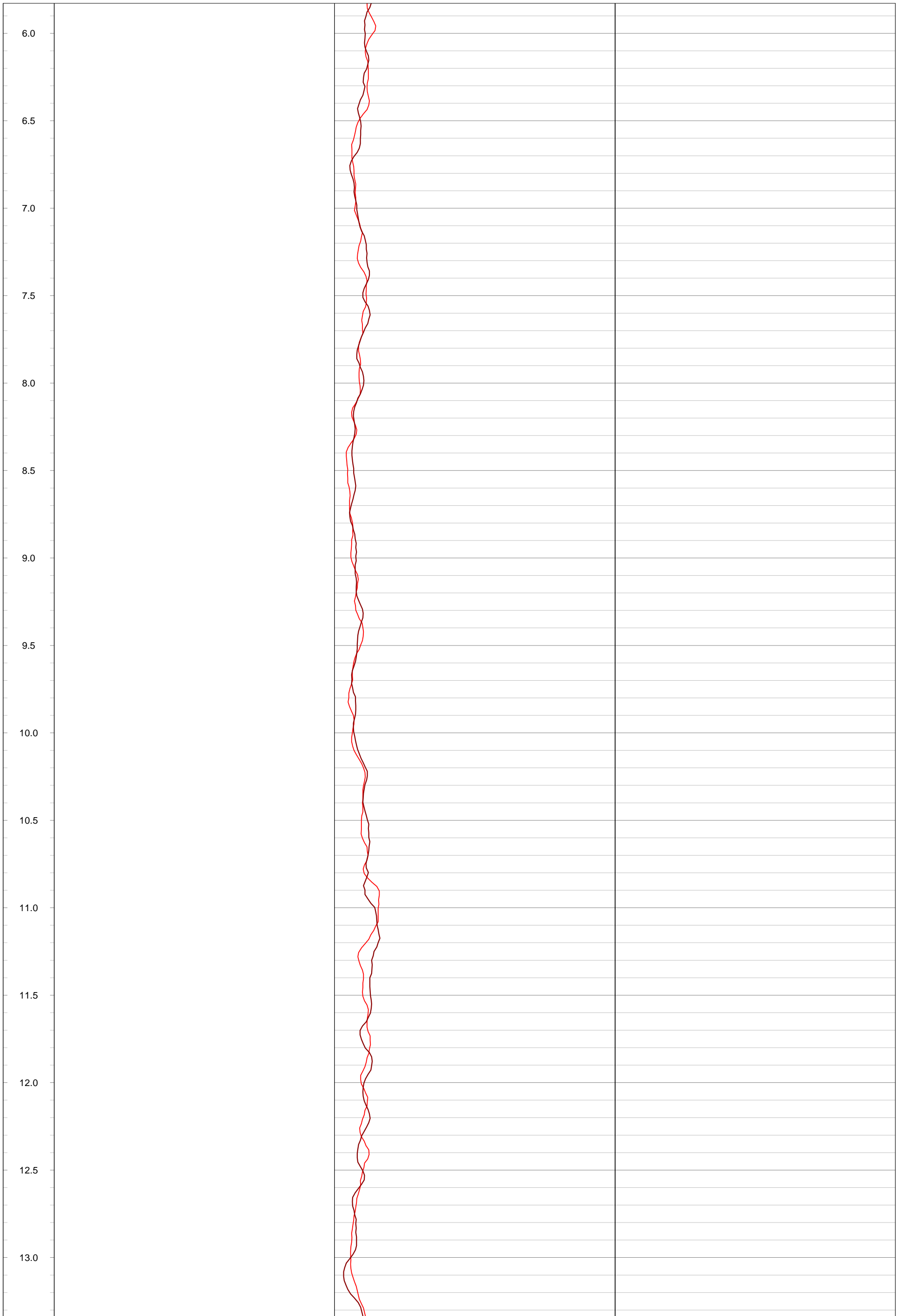
**Geophysical Record of Borehole: MW20-27 (CAL)**

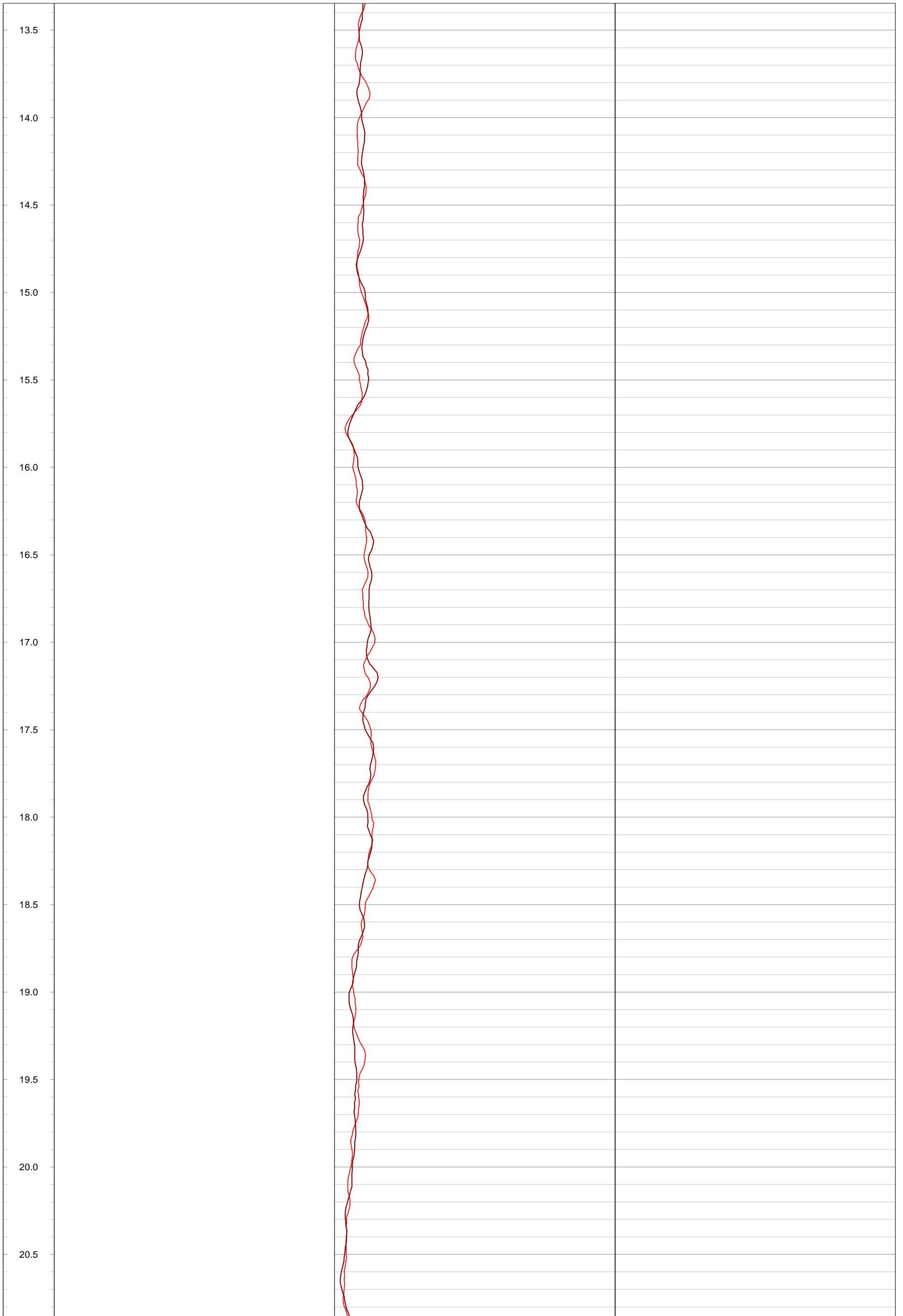
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 31.60 m bgs    **Location:** Caledon, Ontario  
**Easting:** 575953.96 m    **Drilled Depth:** 52.43 m bgs    **Water Level:** 7.62 m bgs    **Log Date:** Feb-17-2021  
**Northing:** 4853770.16 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 431.15 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.30 m ags

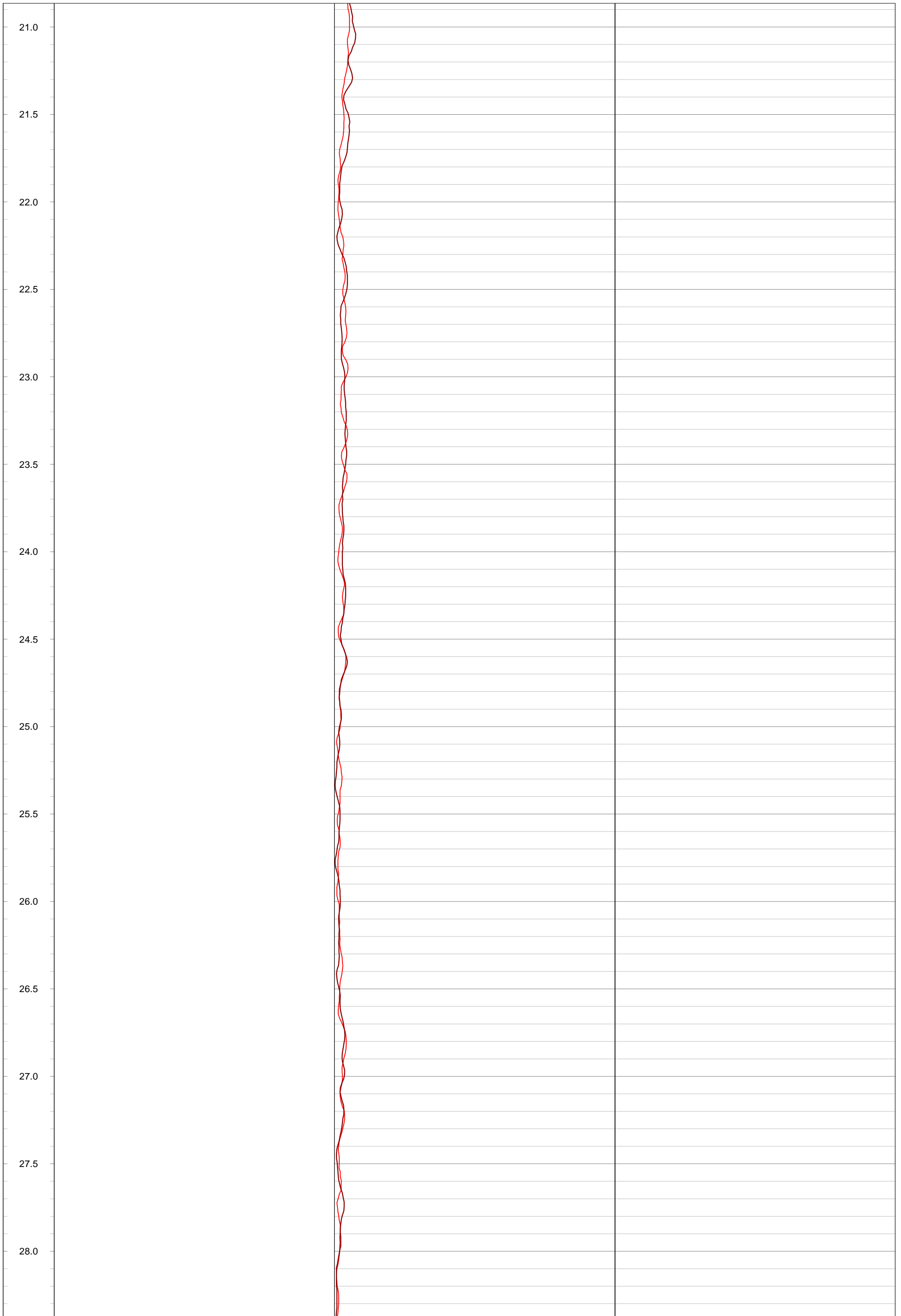
**Notes:** Optical image blurred > 39 m bgs

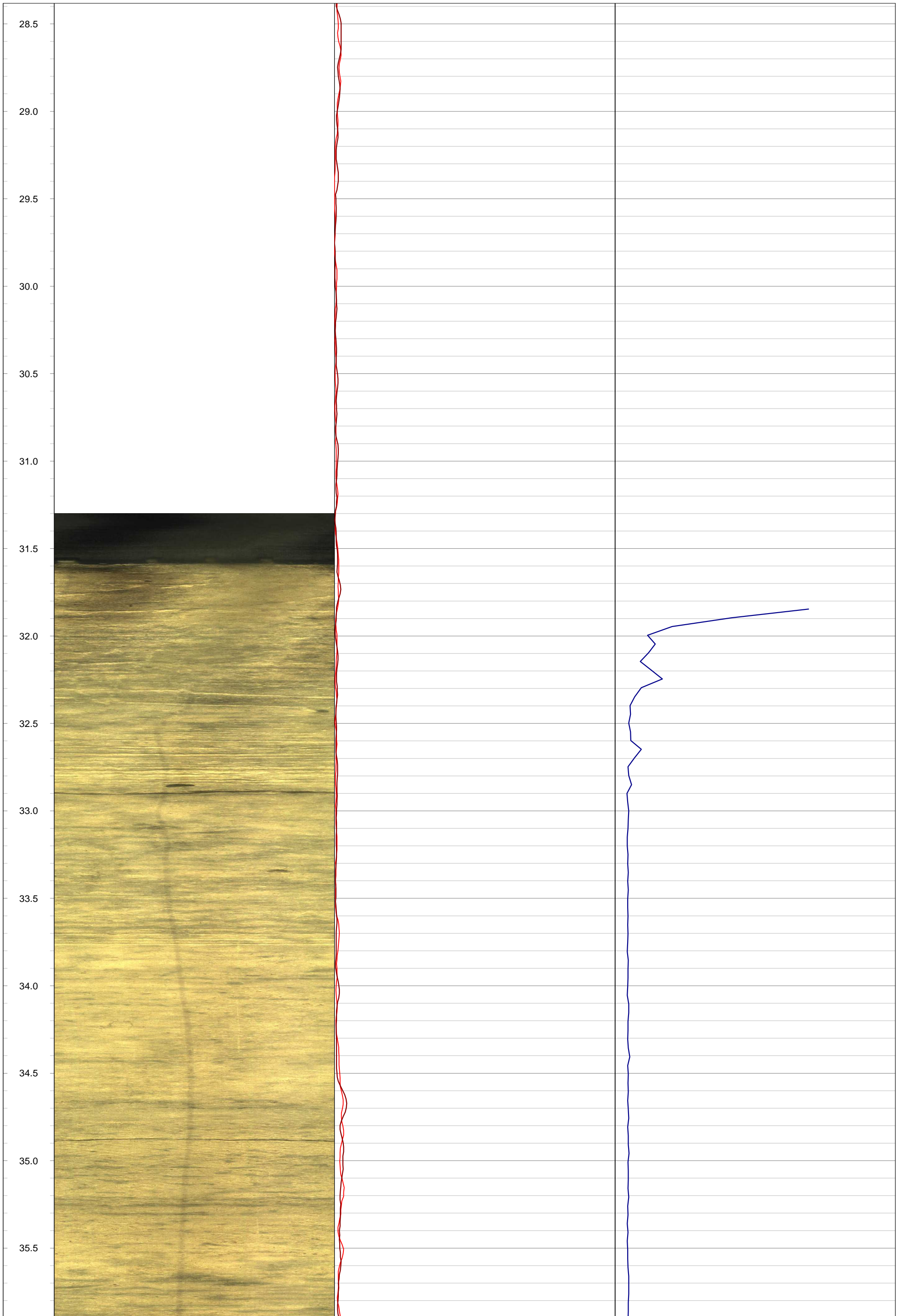
Depth	OBI Image - MN					Natural Gamma - Down		Apparent Conductivity - Up	
	0°	90°	180°	270°	0°	0	200	0	50
1m:20m						Natural Gamma - Up			
						0	200		
0.5						cps		mS/m	
1.0						cps		mS/m	
1.5						cps		mS/m	
2.0						cps		mS/m	
2.5						cps		mS/m	
3.0						cps		mS/m	
3.5						cps		mS/m	
4.0						cps		mS/m	
4.5						cps		mS/m	
5.0						cps		mS/m	
5.5						cps		mS/m	

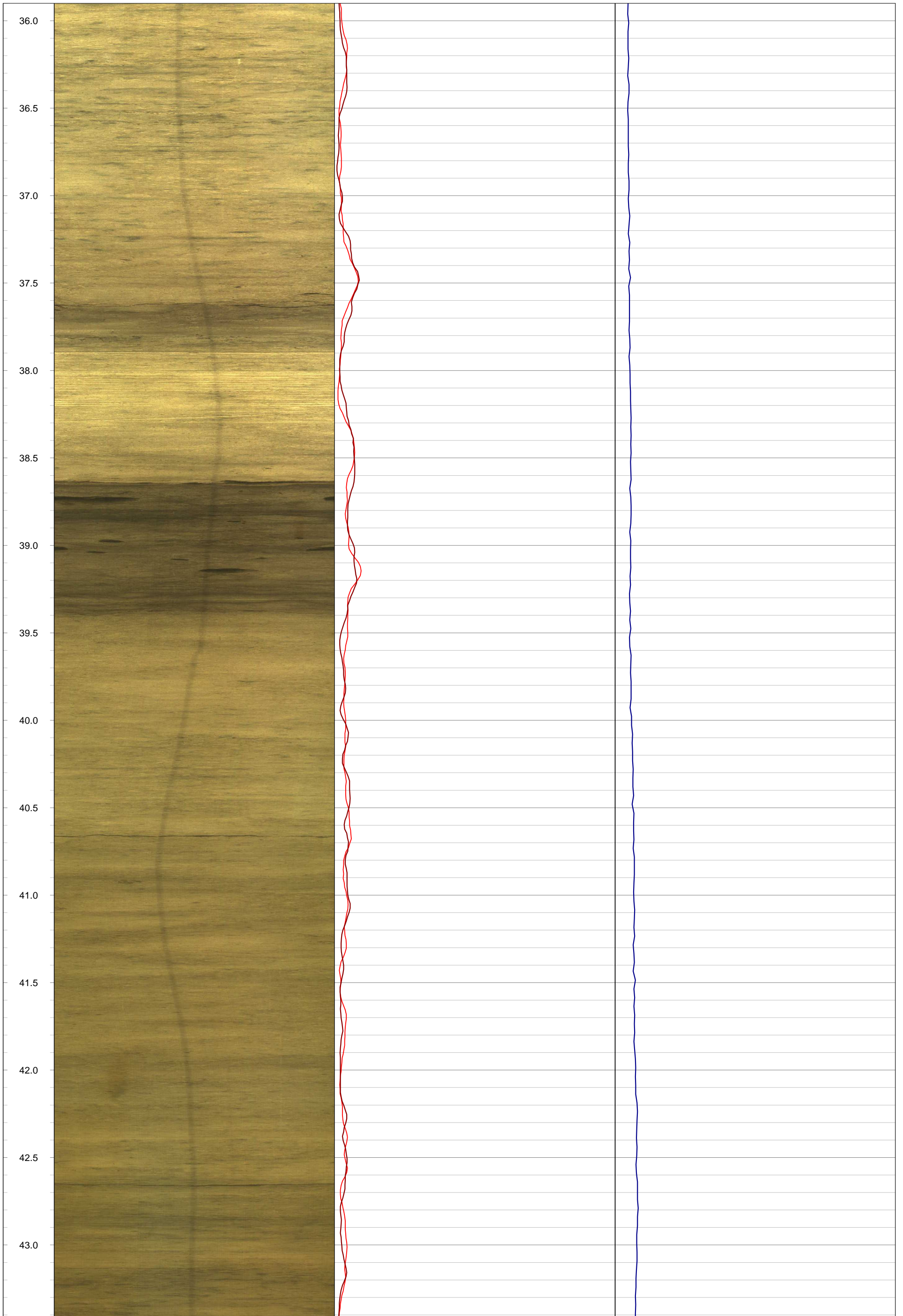




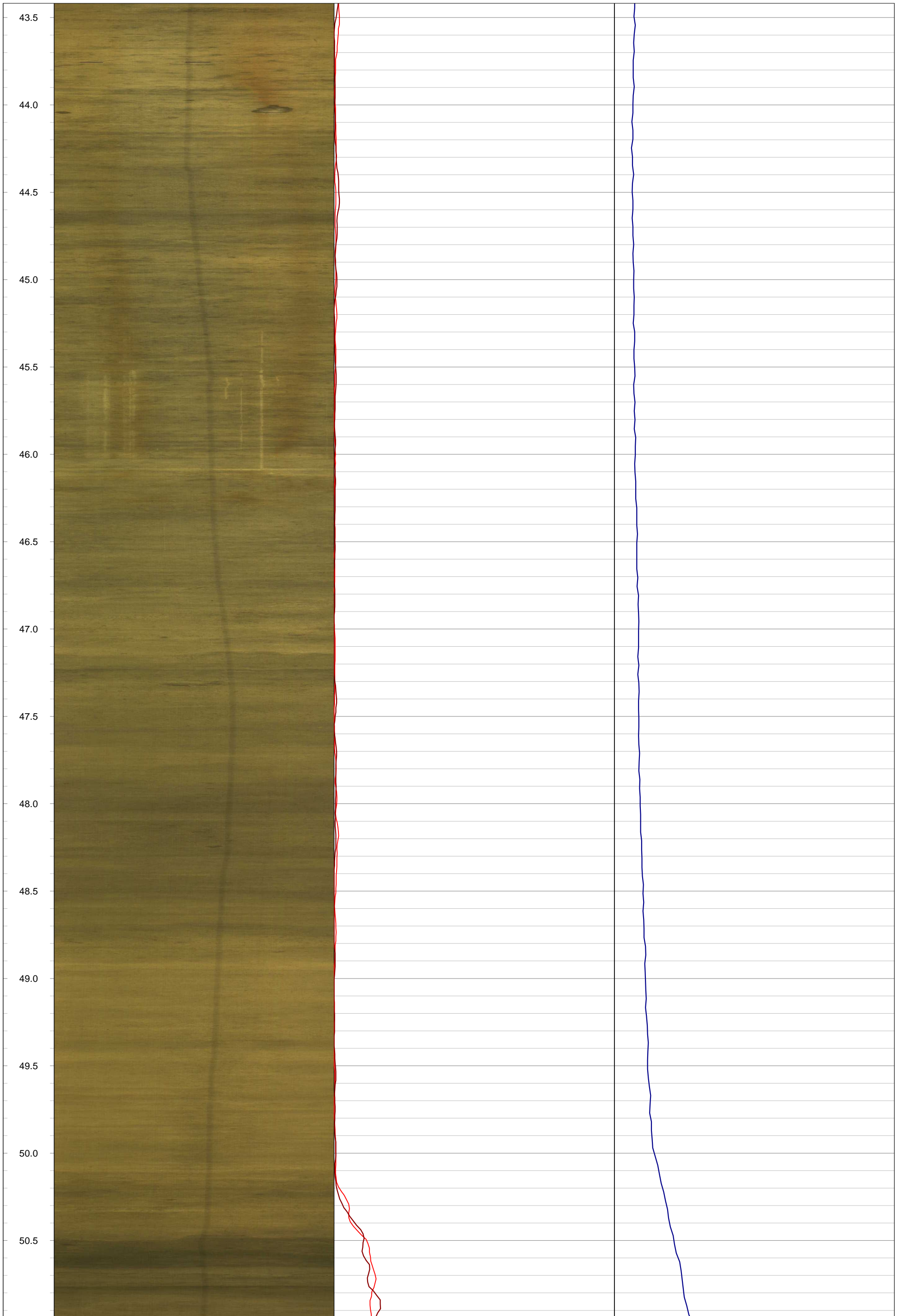


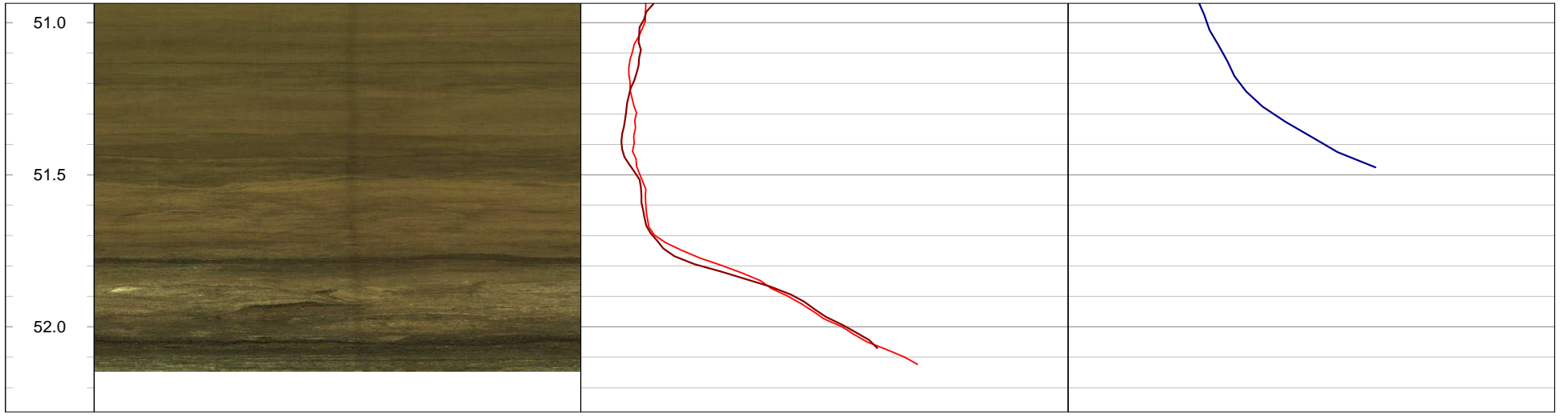














**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-28 (CAL)**

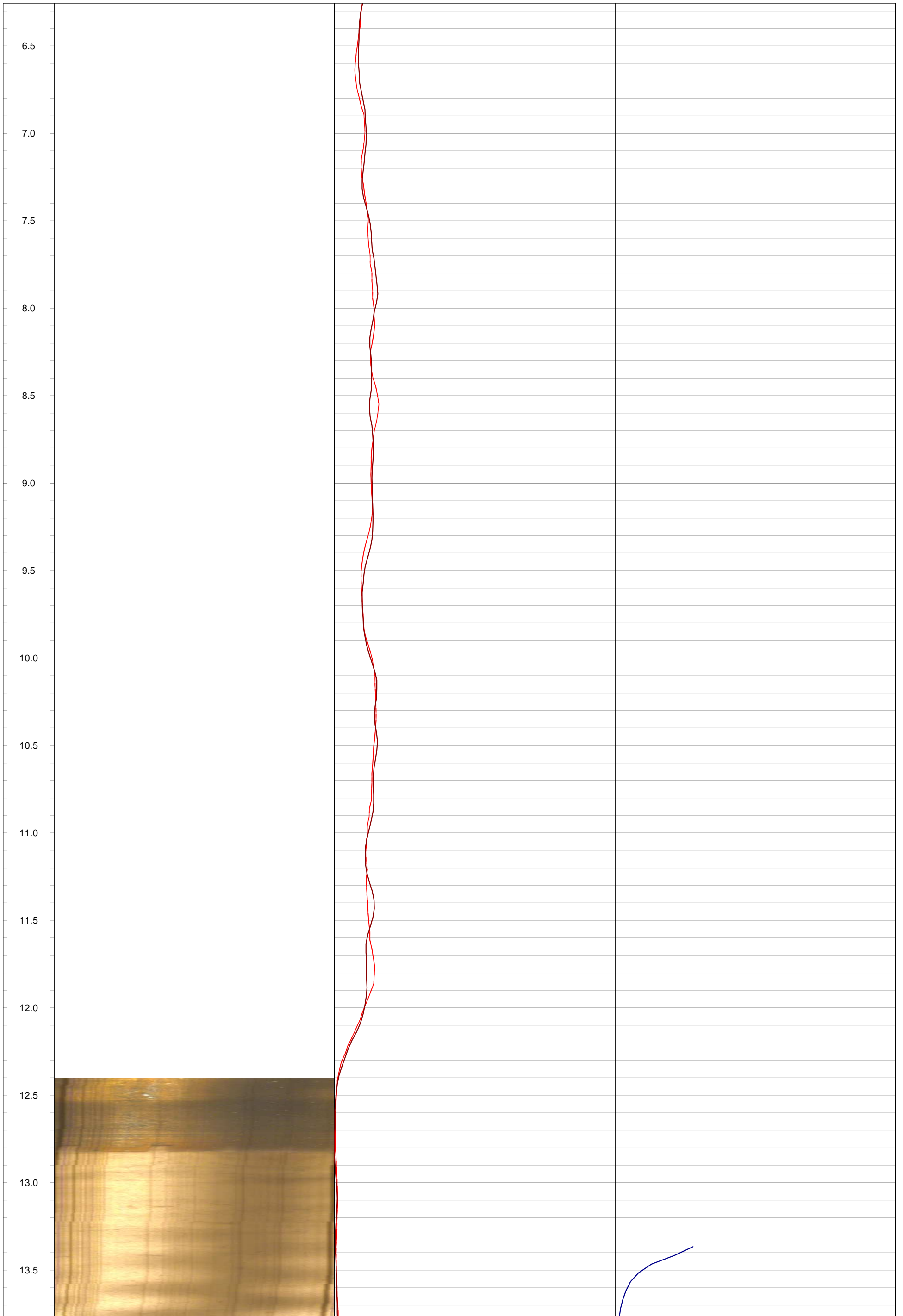
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

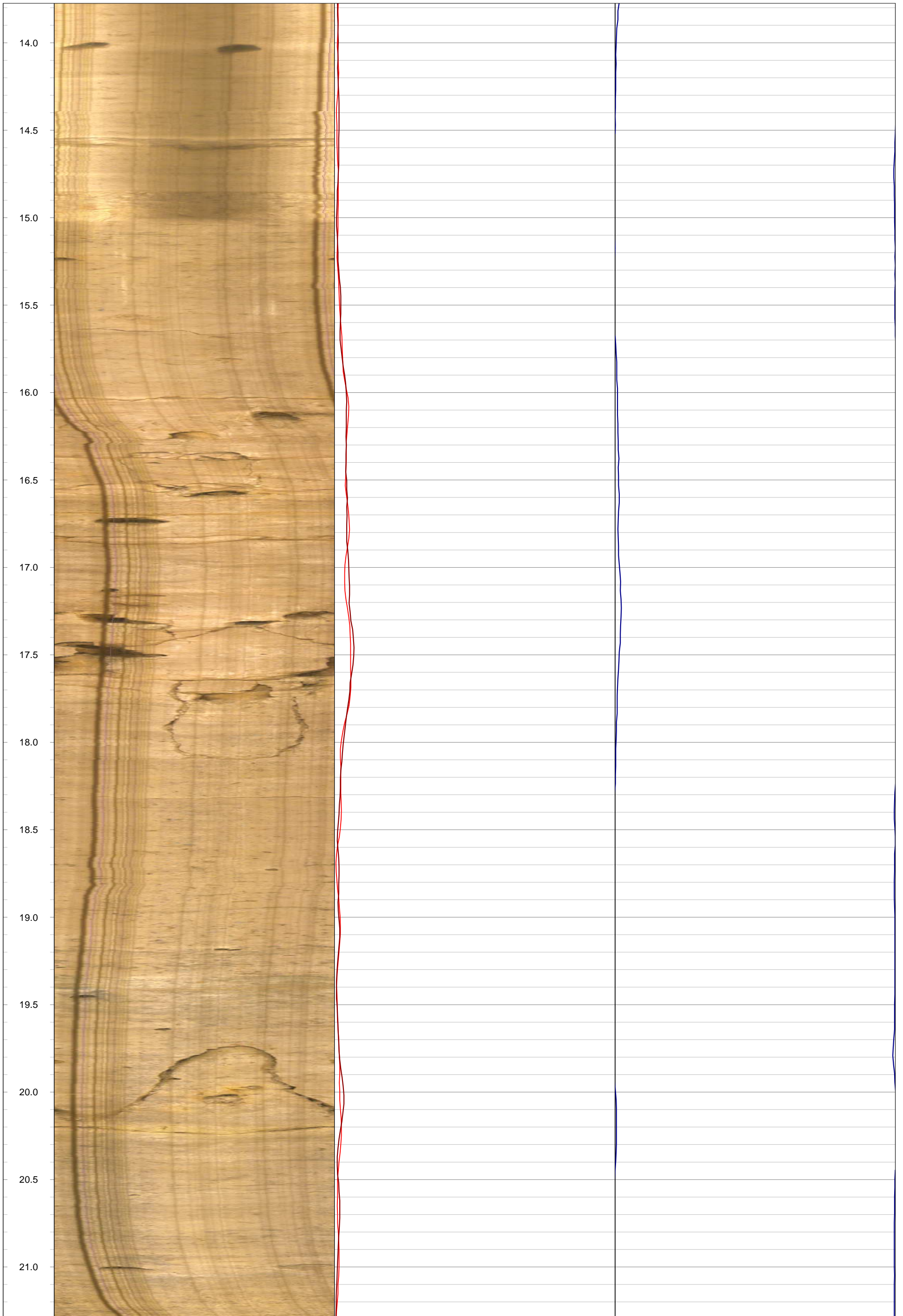
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.80 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576139.79 m    **Drilled Depth:** 30.82 m bgs    **Water Level:** 0 m bgs    **Log Date:** Feb-23-2021  
**Northing:** 4854987.82 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 419.31 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.23 m ags

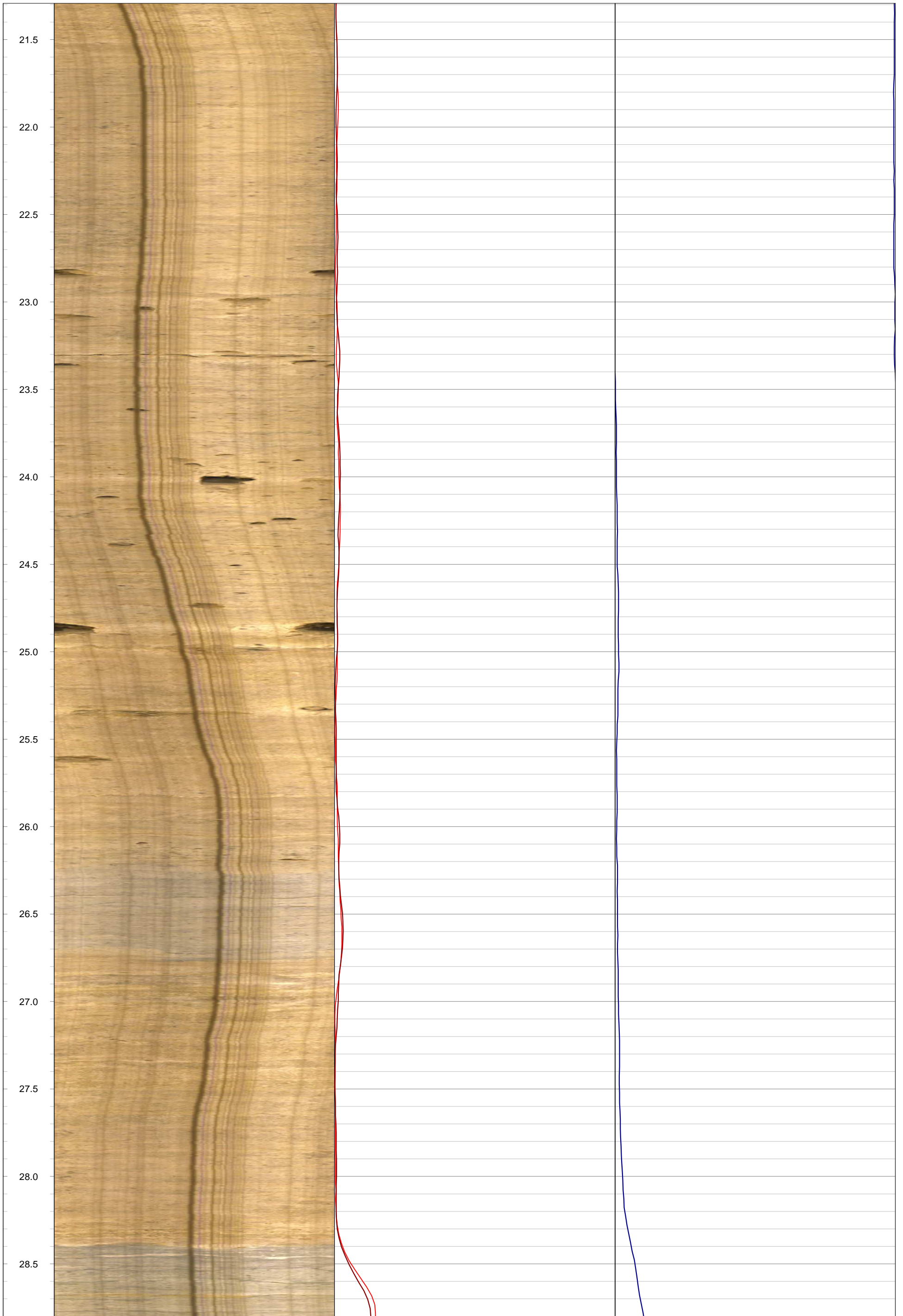
**Notes:**

Depth	OBI Image - MN					Natural Gamma - Down		Apparent Conductivity - Up	
	0°	90°	180°	270°	0°	0	200	0	50
1m:20m						Natural Gamma - Up			
						0	200		
1.0									
1.5									
2.0									
2.5									
3.0									
3.5									
4.0									
4.5									
5.0									
5.5									
6.0									















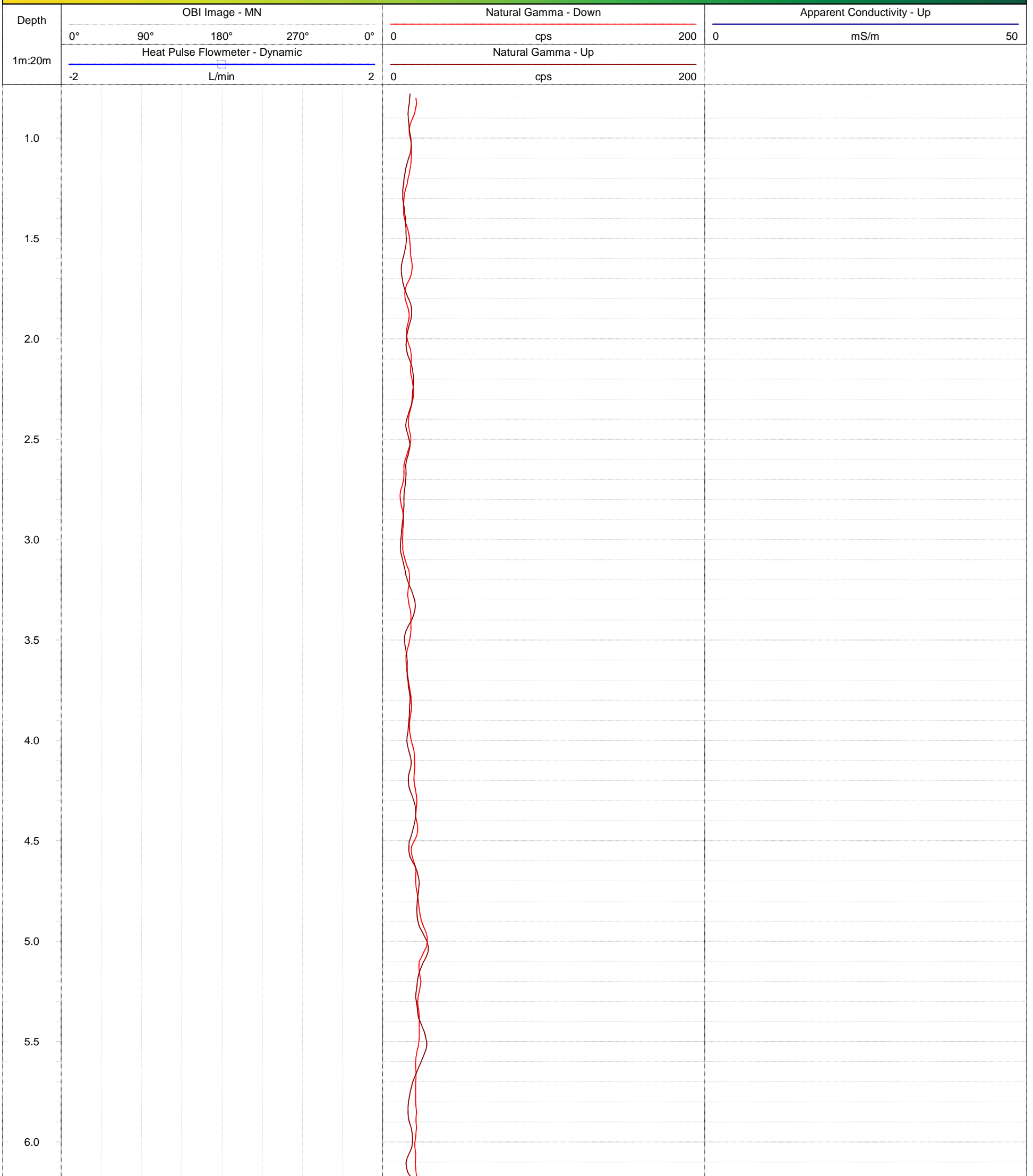
**GOLDER**  
MEMBER OF WSP

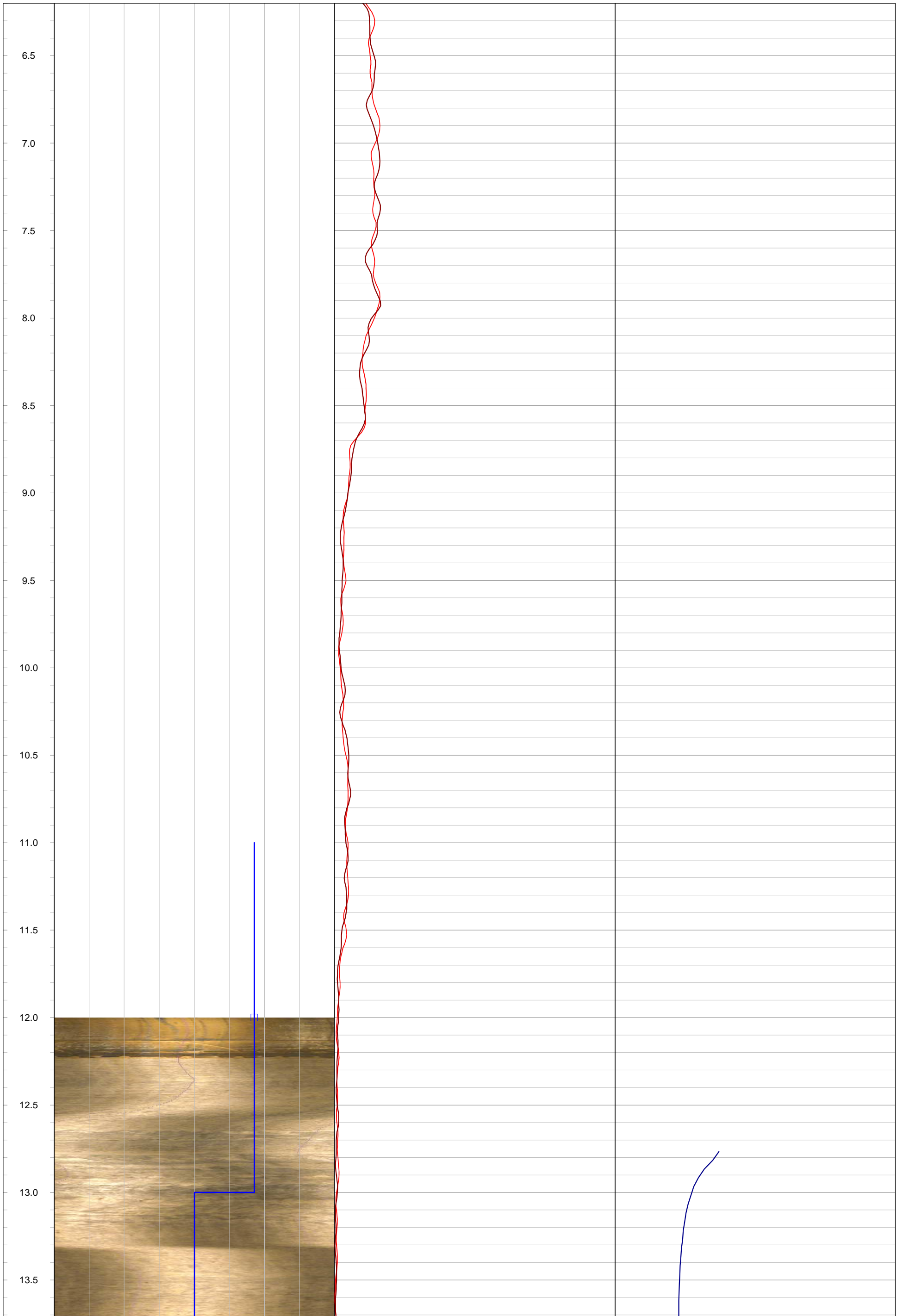
**Geophysical Record of Borehole: MW21-1-1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

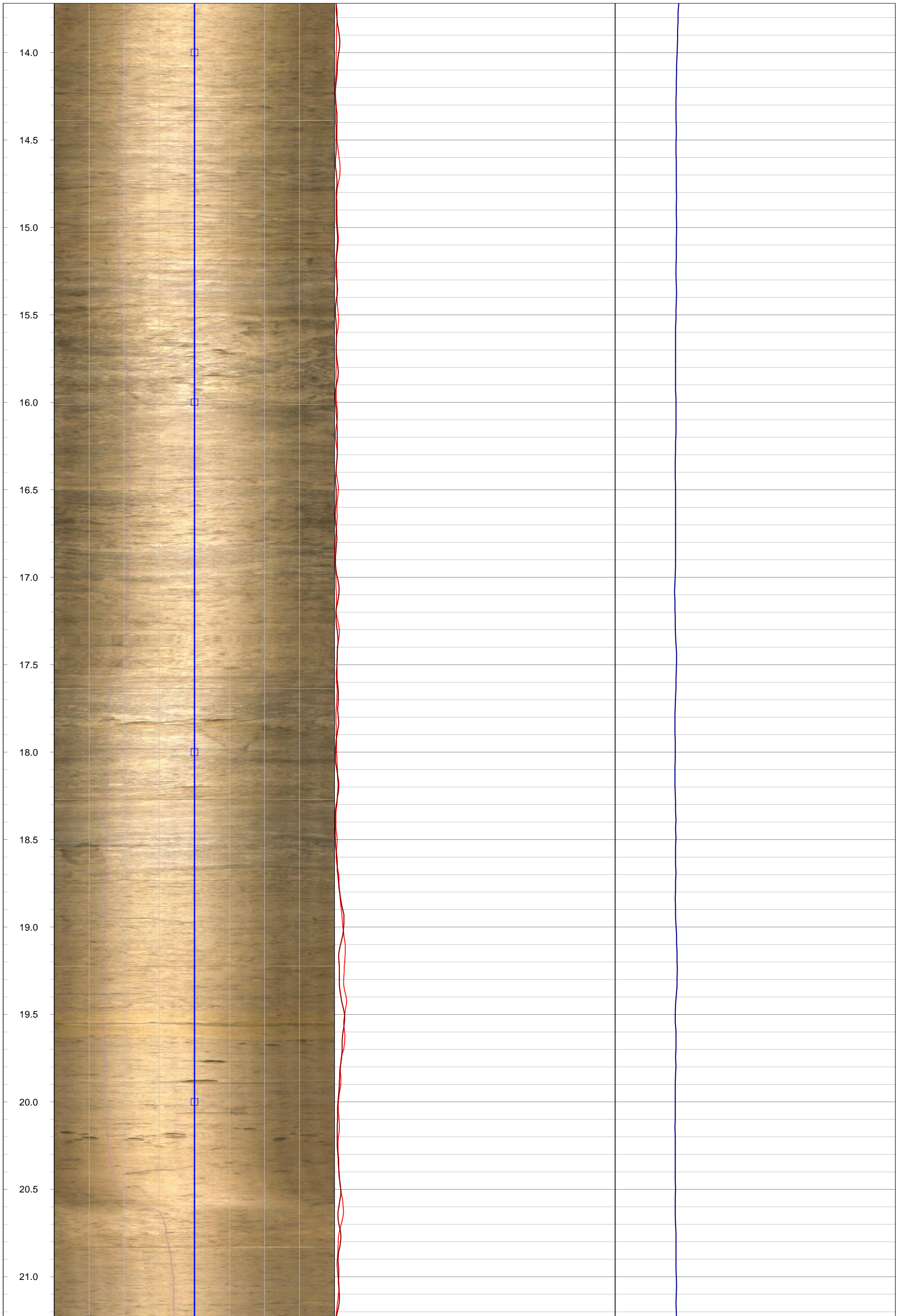
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 11.89 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576882.20 m    **Drilled Depth:** 36.27 m bgs    **Water Level:** 1.80 m bgs    **Log Date:** Mar-4-2021  
**Northing:** 4853485.00 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 418.94 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.20 m ags

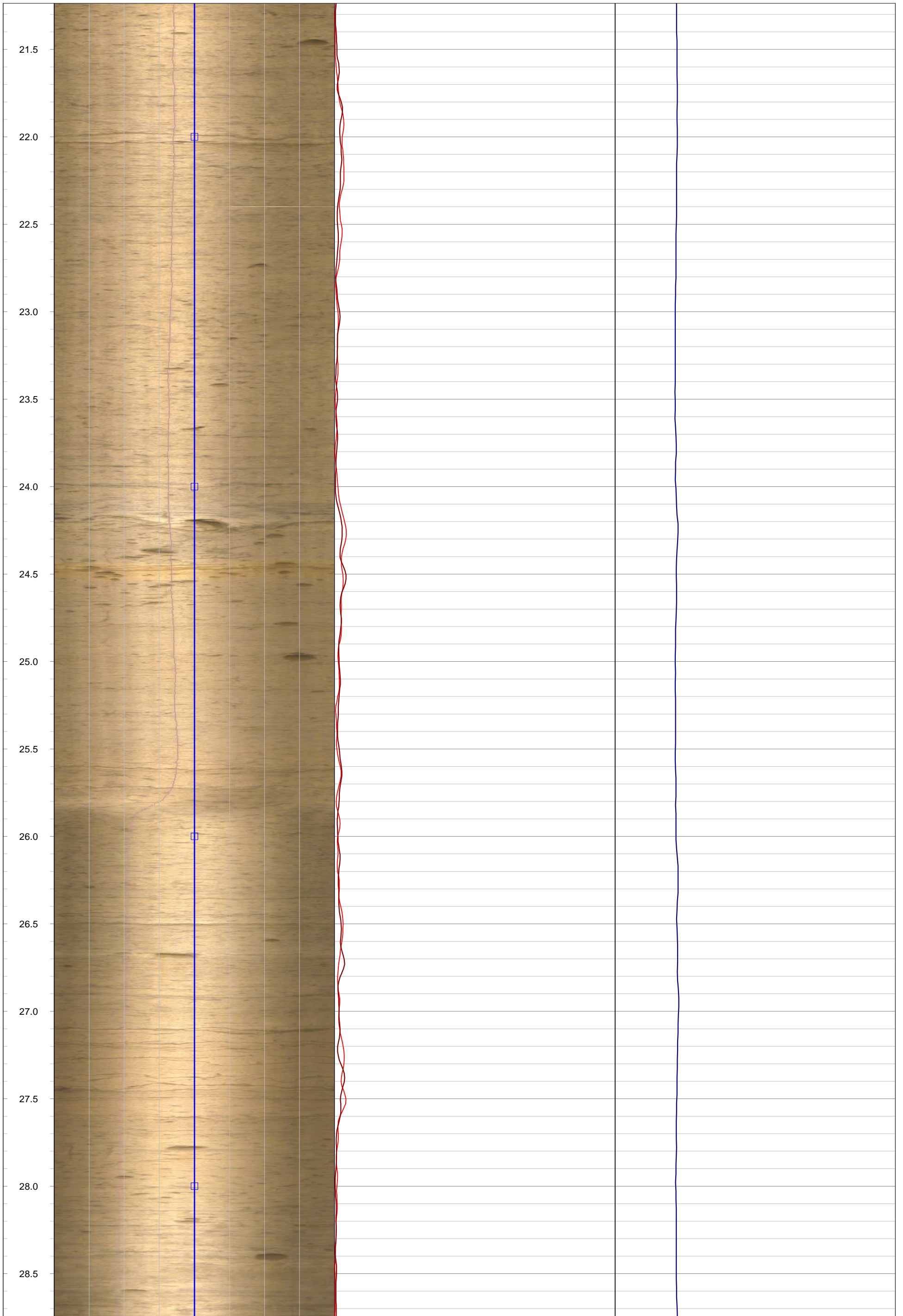
**Notes:** OBI image blurry >30 m. Heat Pulse Flowmeter Dynamic pump at 10 m below top of collar. Pump rate approx. 2 L/min.



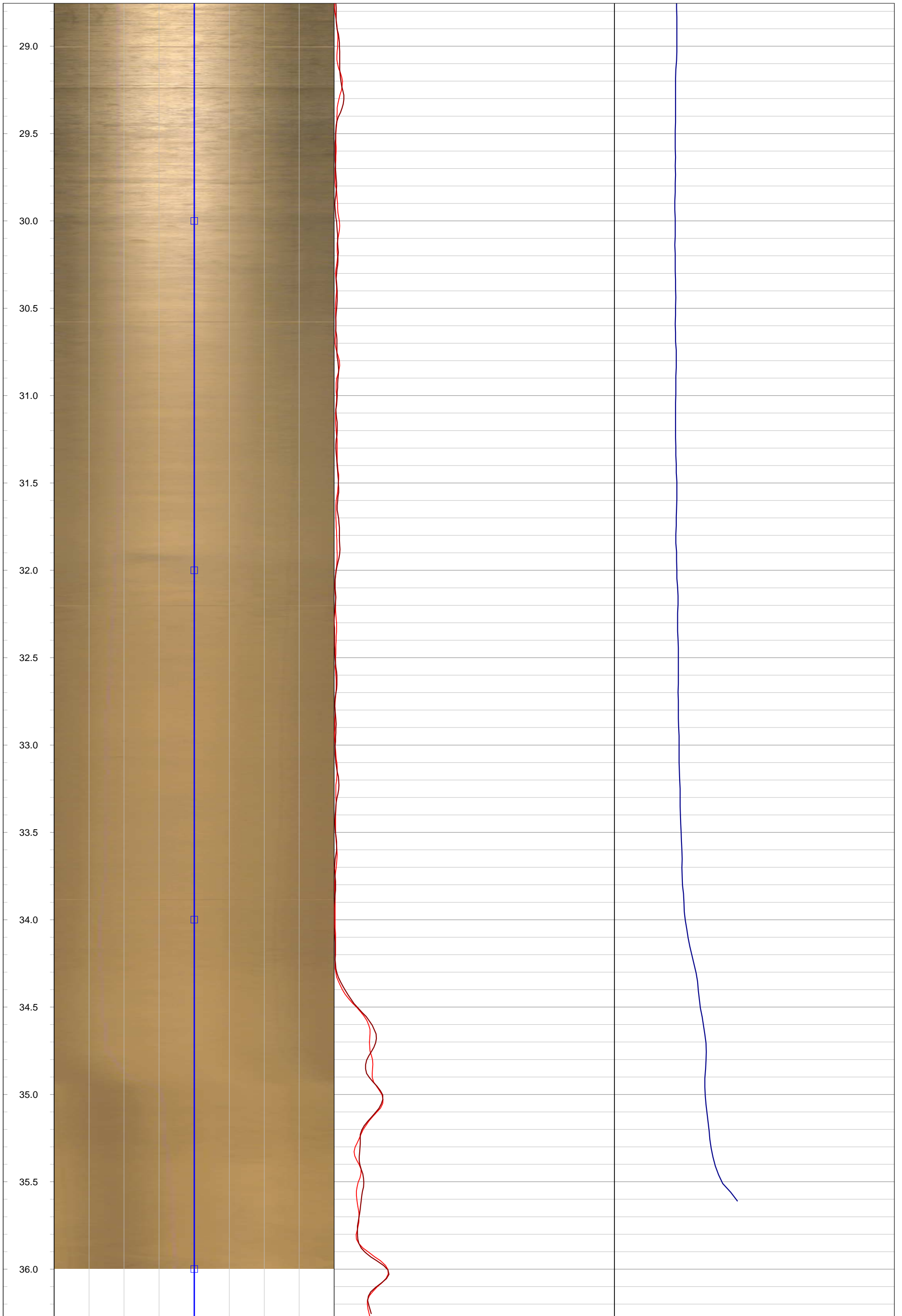


















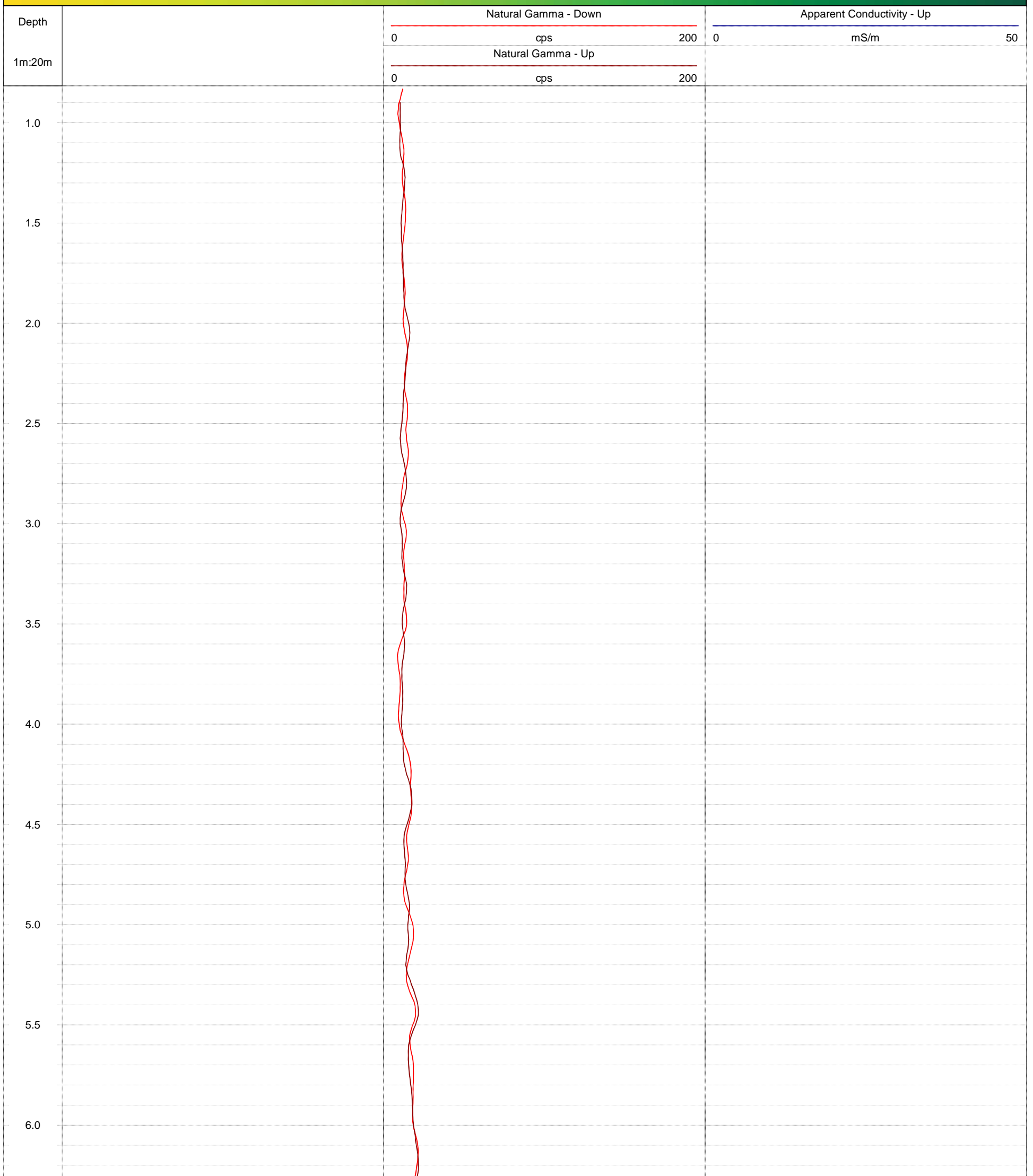
**GOLDER**  
MEMBER OF WSP

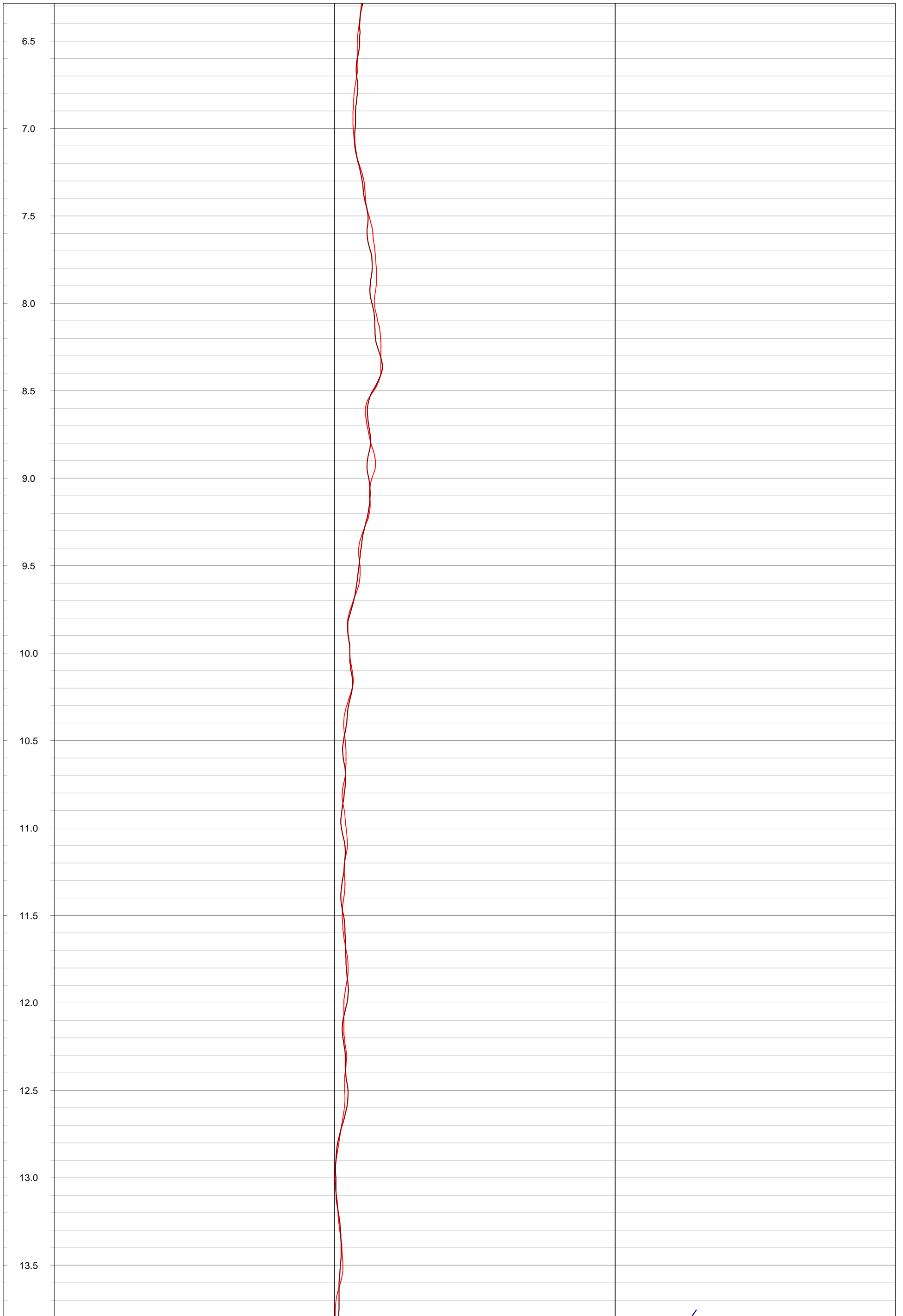
**Geophysical Record of Borehole: MW21-1-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

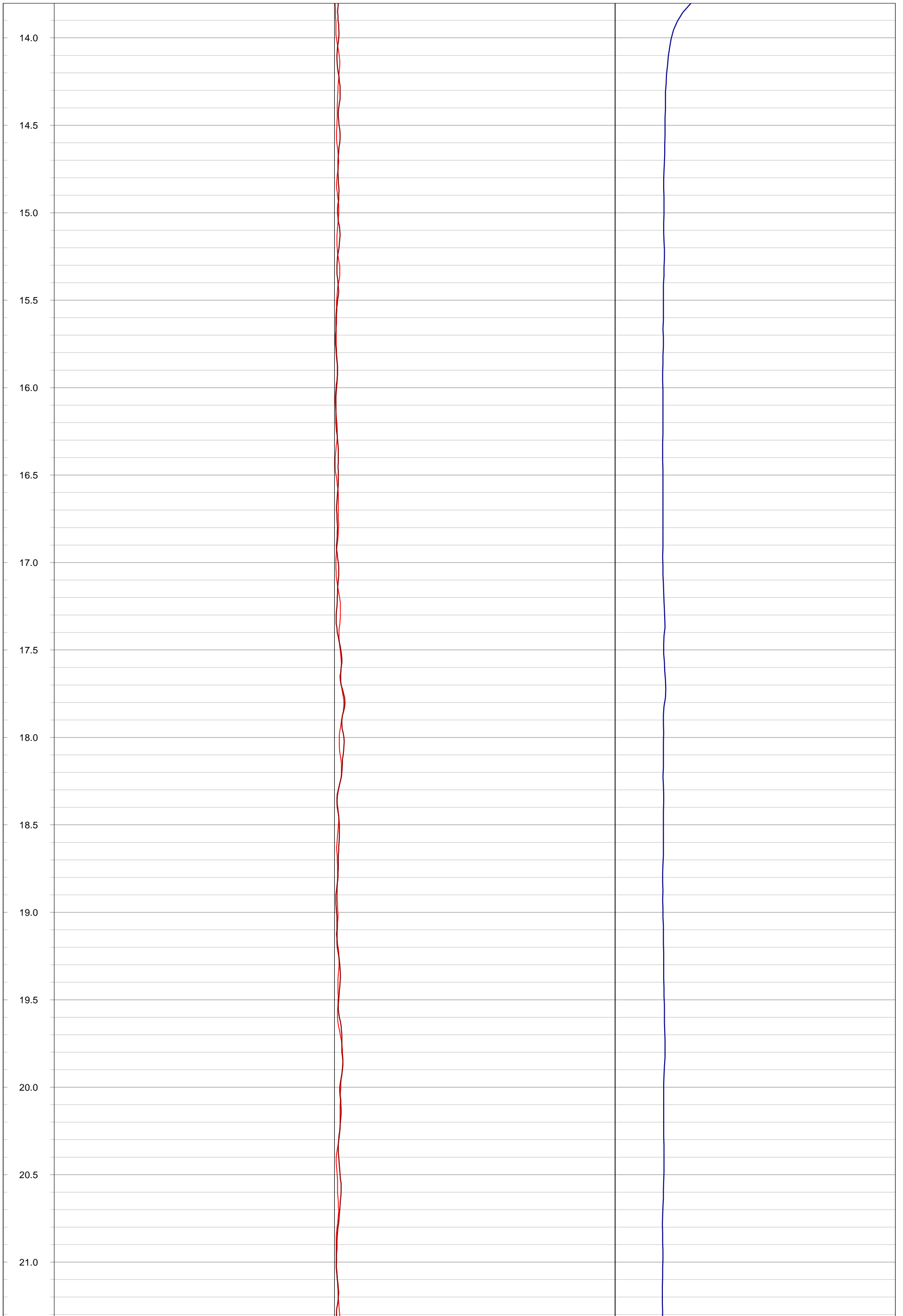
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 13.11 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576909.58 m	<b>Drilled Depth:</b> 36.00 m bgs	<b>Water Level:</b> 1.80 m bgs	<b>Log Date:</b> Mar-3-2021
<b>Northing:</b> 4853505.06 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 420.58 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.20 m ags	

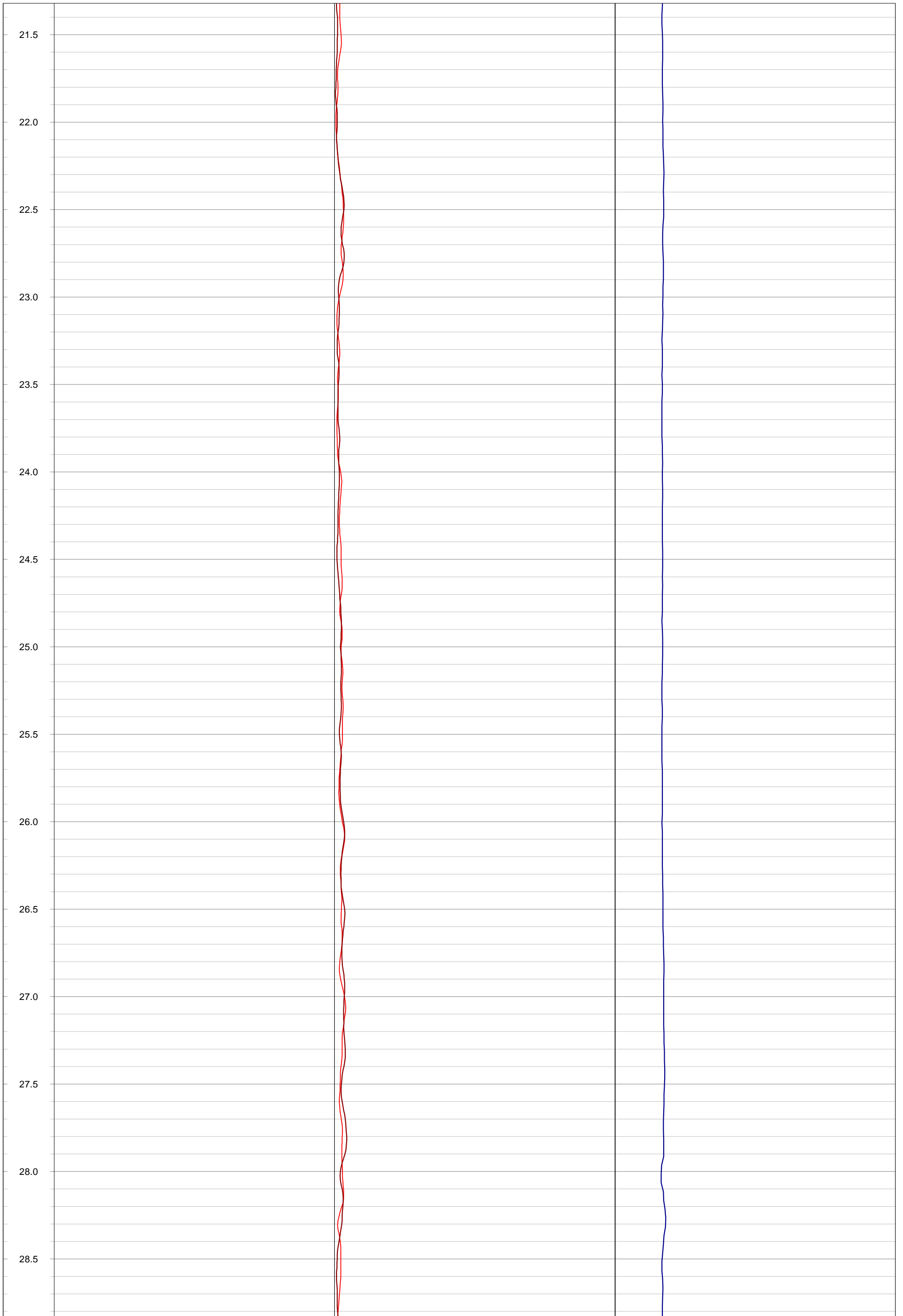
**Notes:**

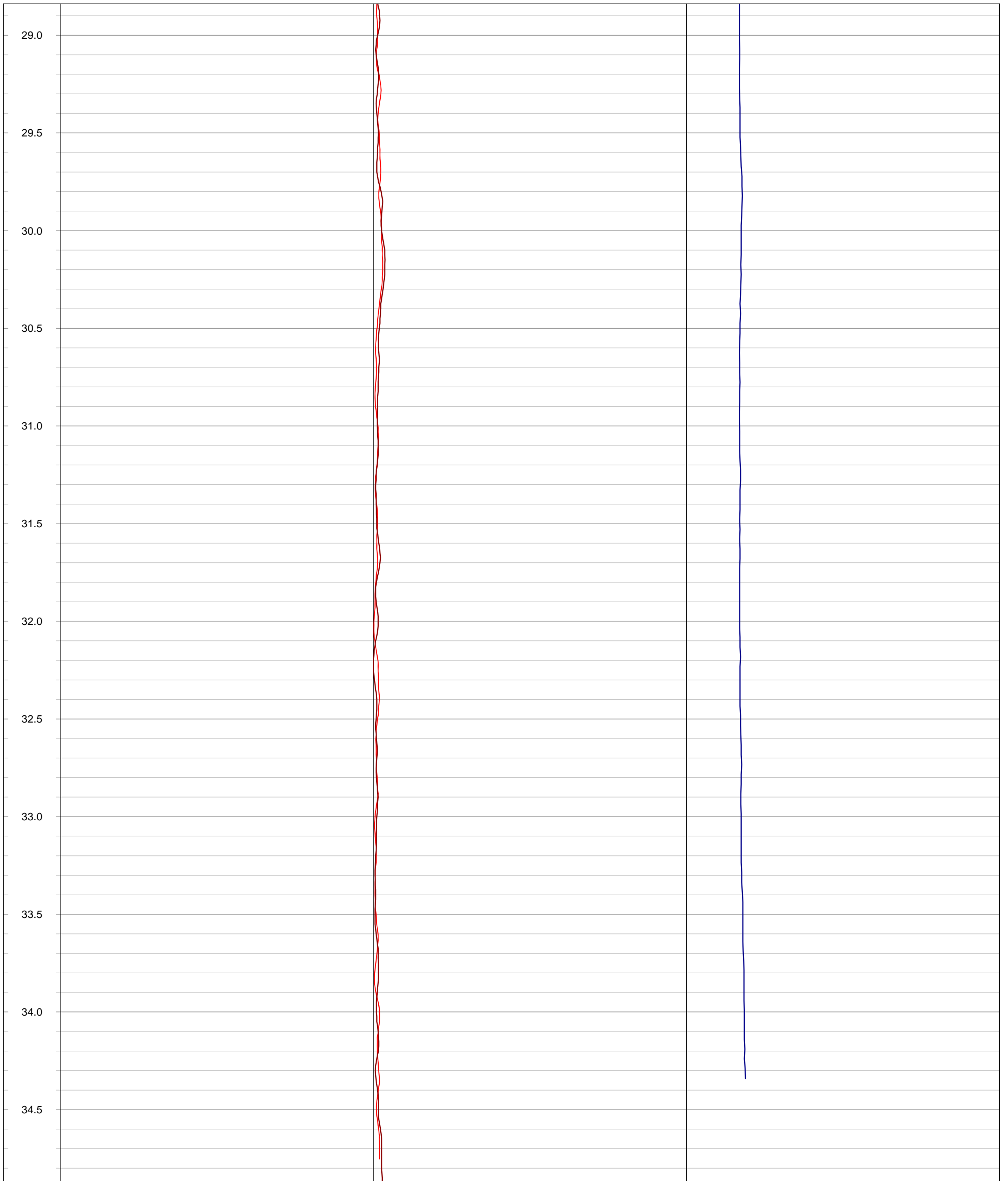
















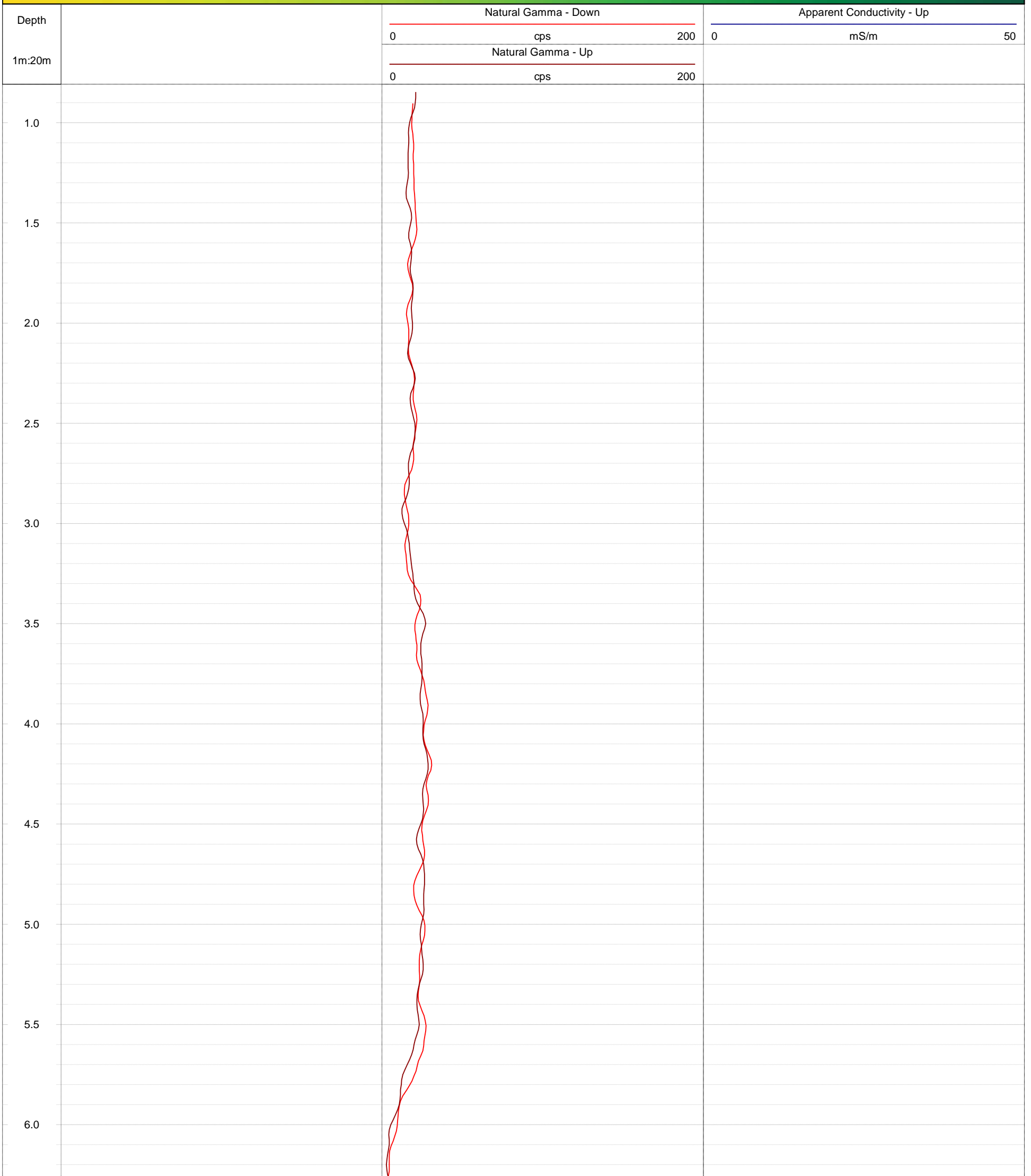
**GOLDER**  
MEMBER OF WSP

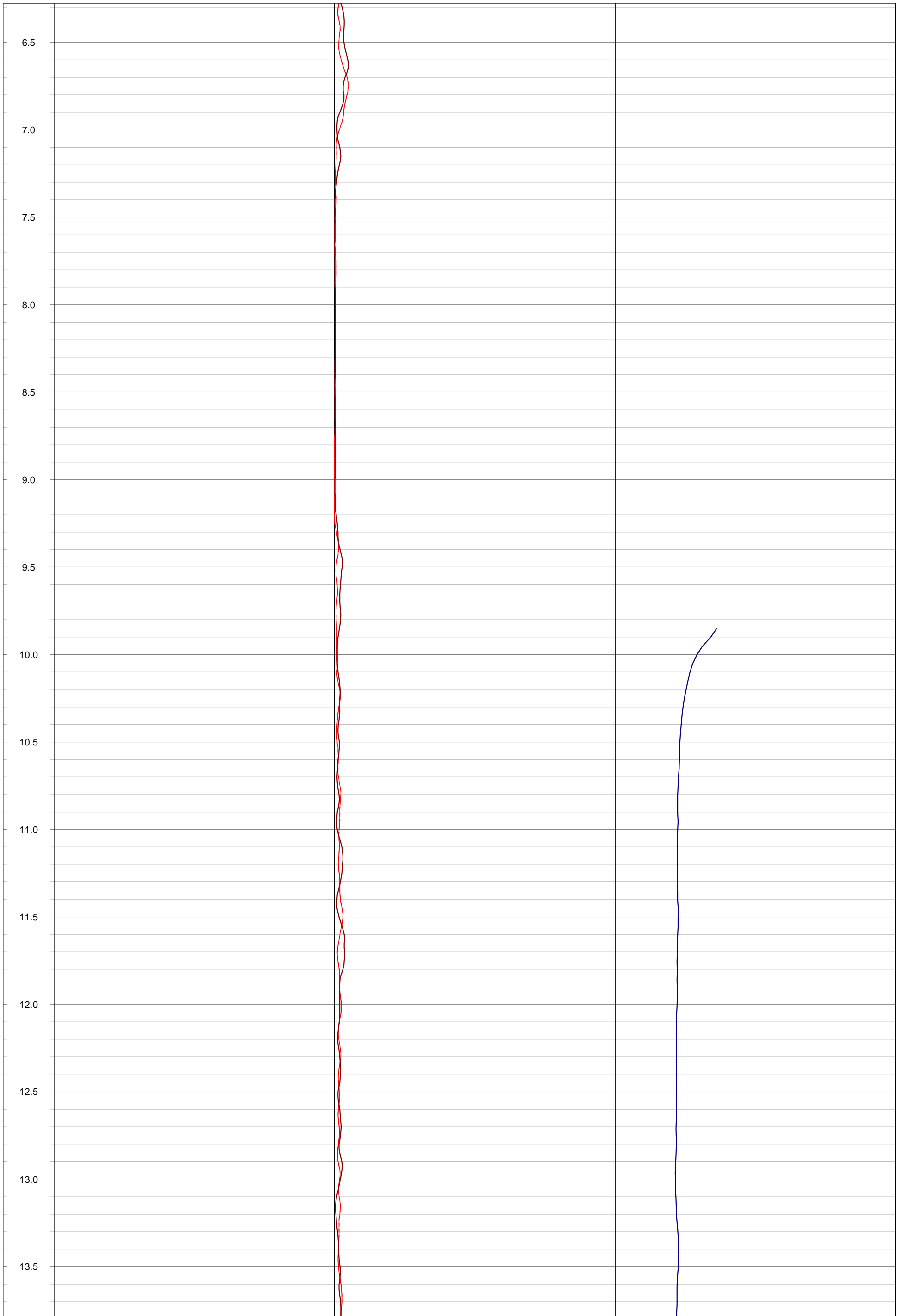
**Geophysical Record of Borehole: MW21-1-3 (CAL)**

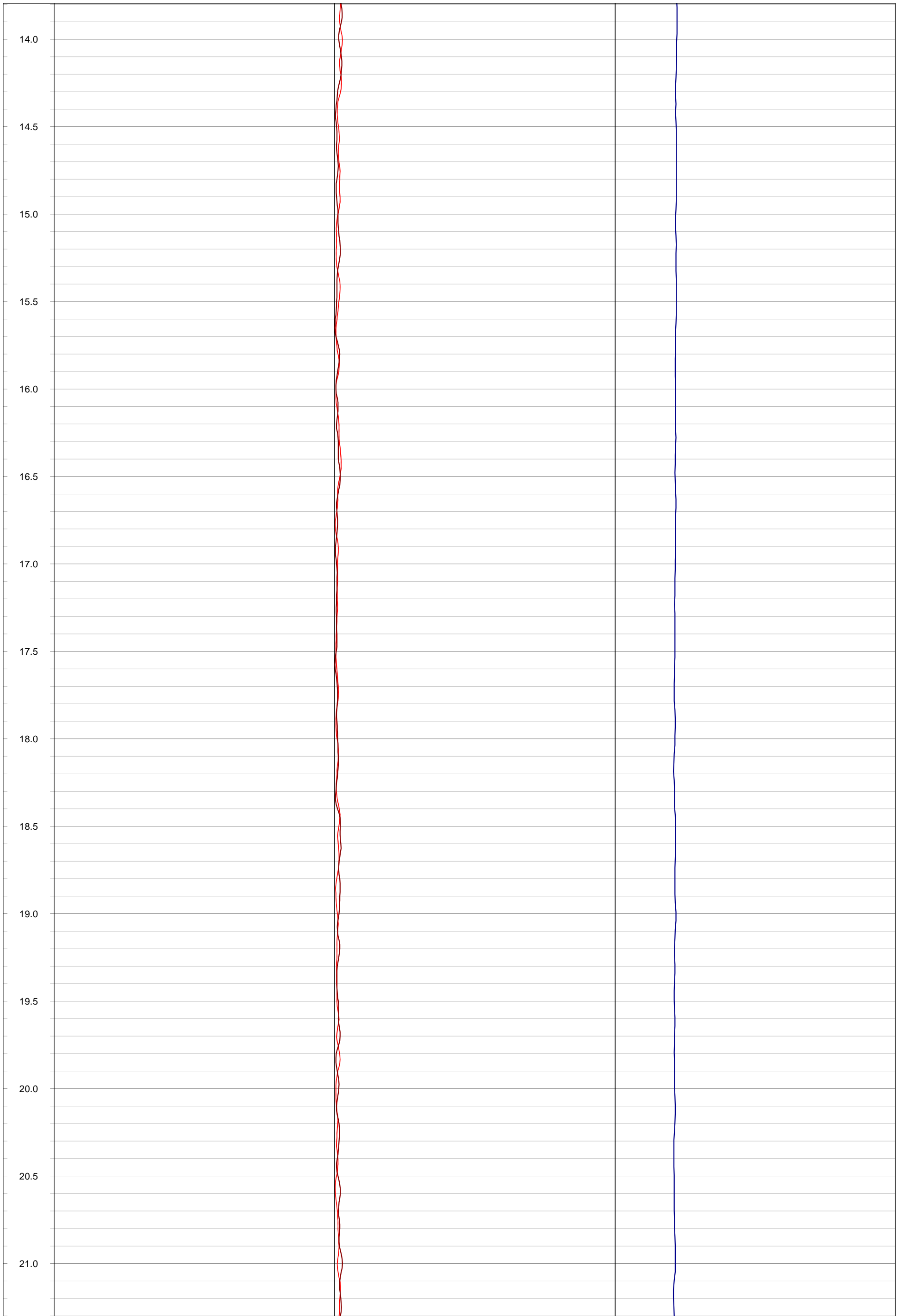
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 8.84 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576965.46 m    **Drilled Depth:** 37.49 m bgs    **Water Level:** 7.00 m bgs    **Log Date:** Mar-3-2021  
**Northing:** 4853420.30 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 417.51 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.13 m ags

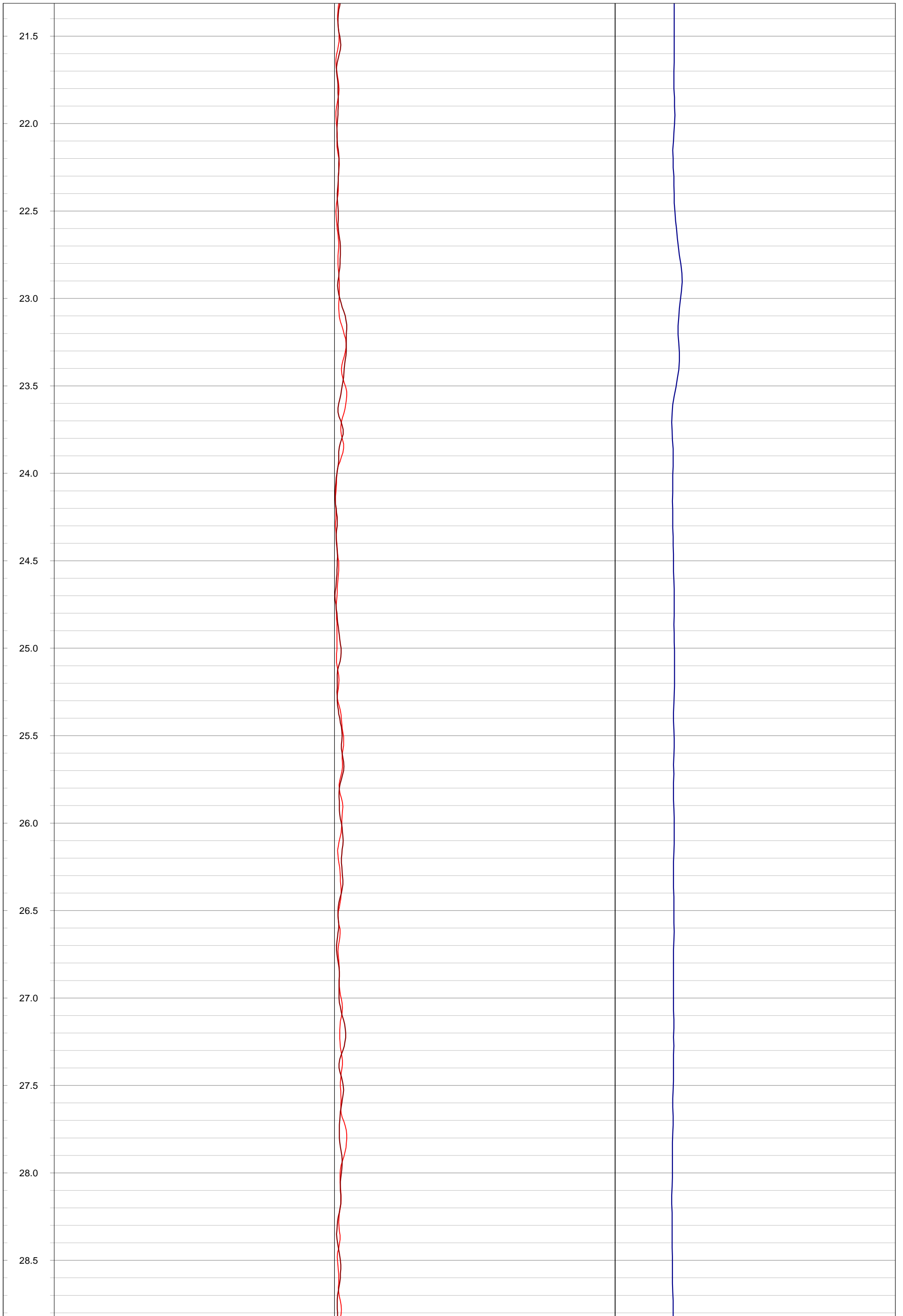
**Notes:**

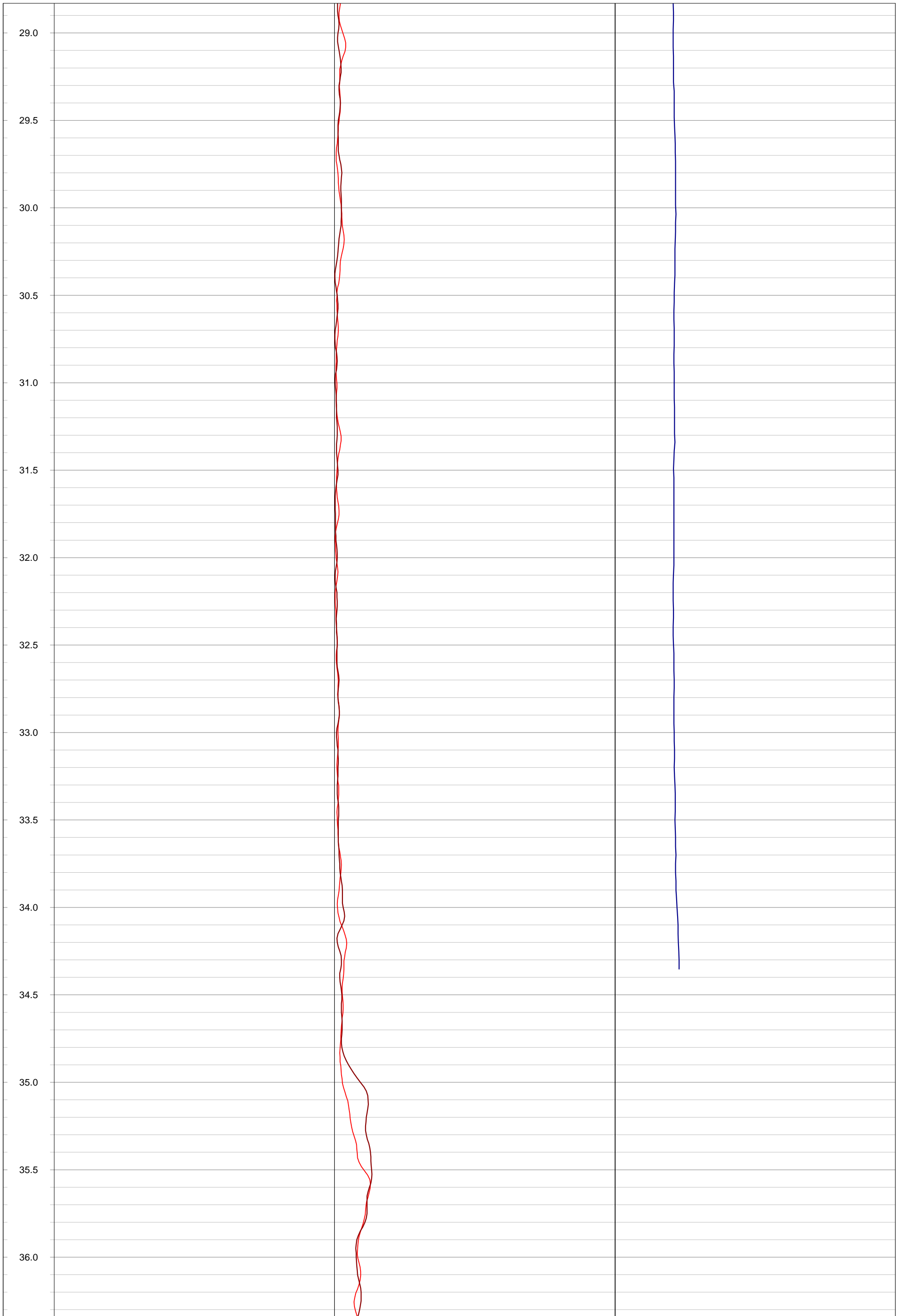












36.5			
37.0			
37.5			





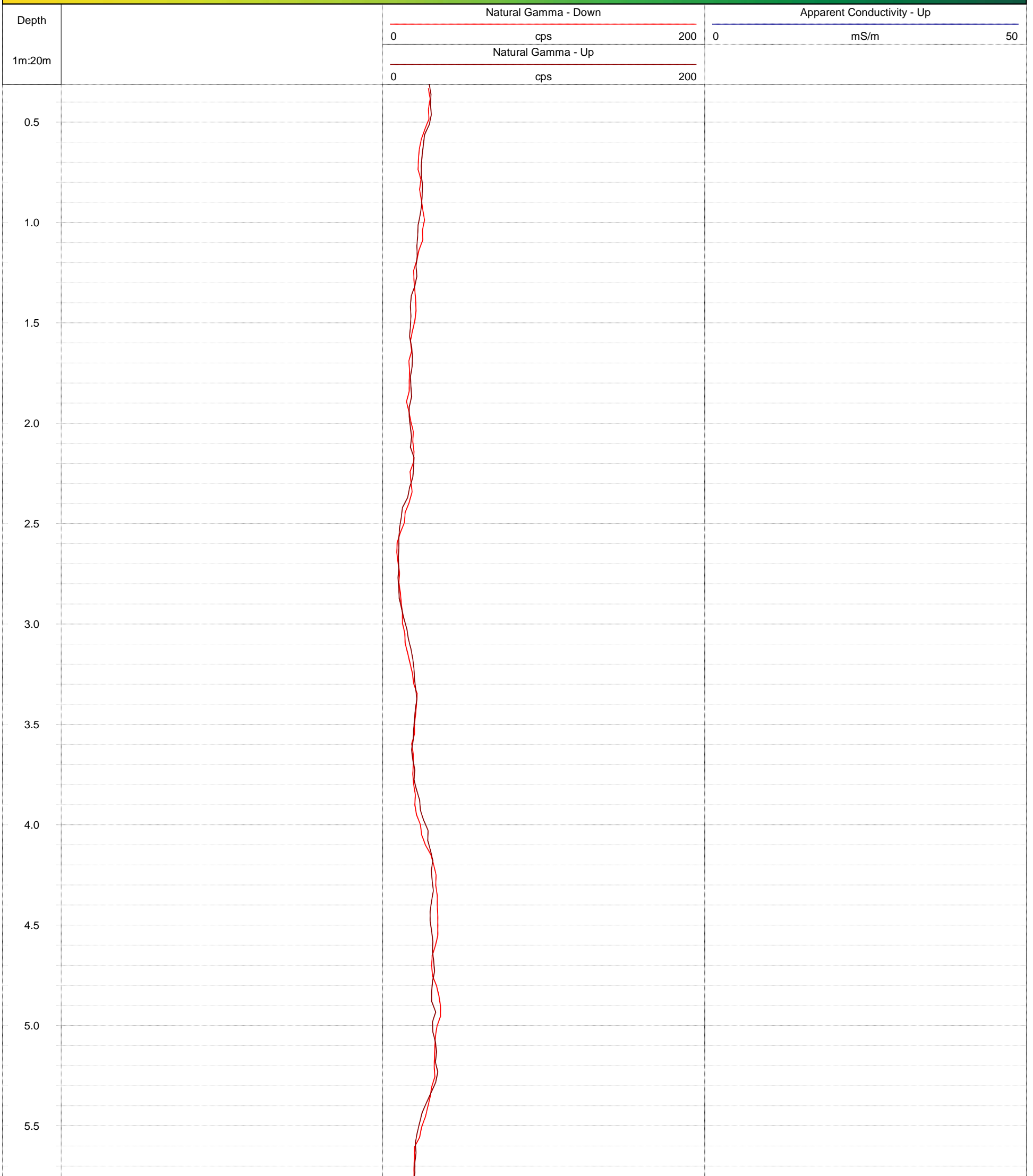
**GOLDER**  
MEMBER OF WSP

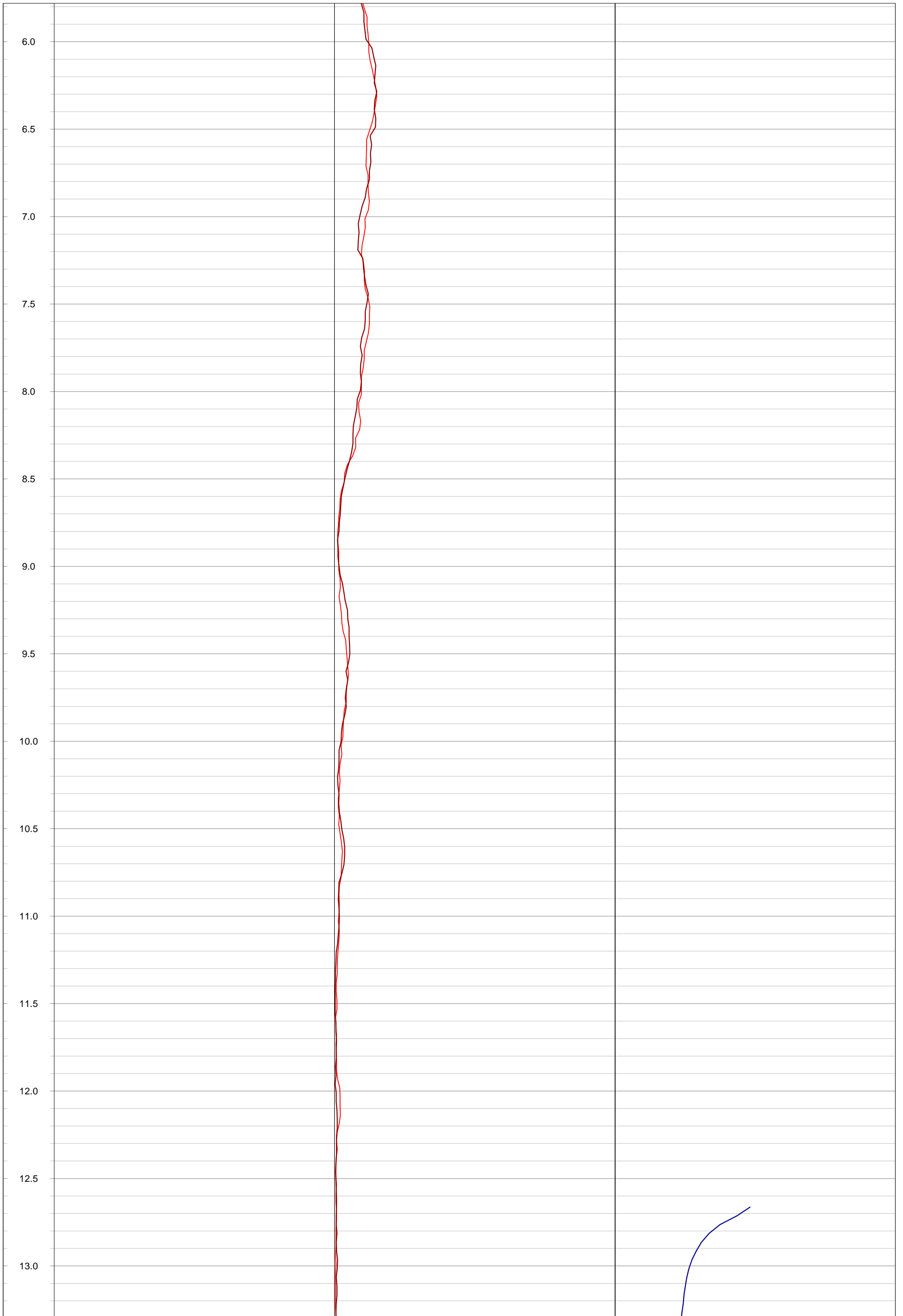
**Geophysical Record of Borehole: MW21-1-4 (CAL)**

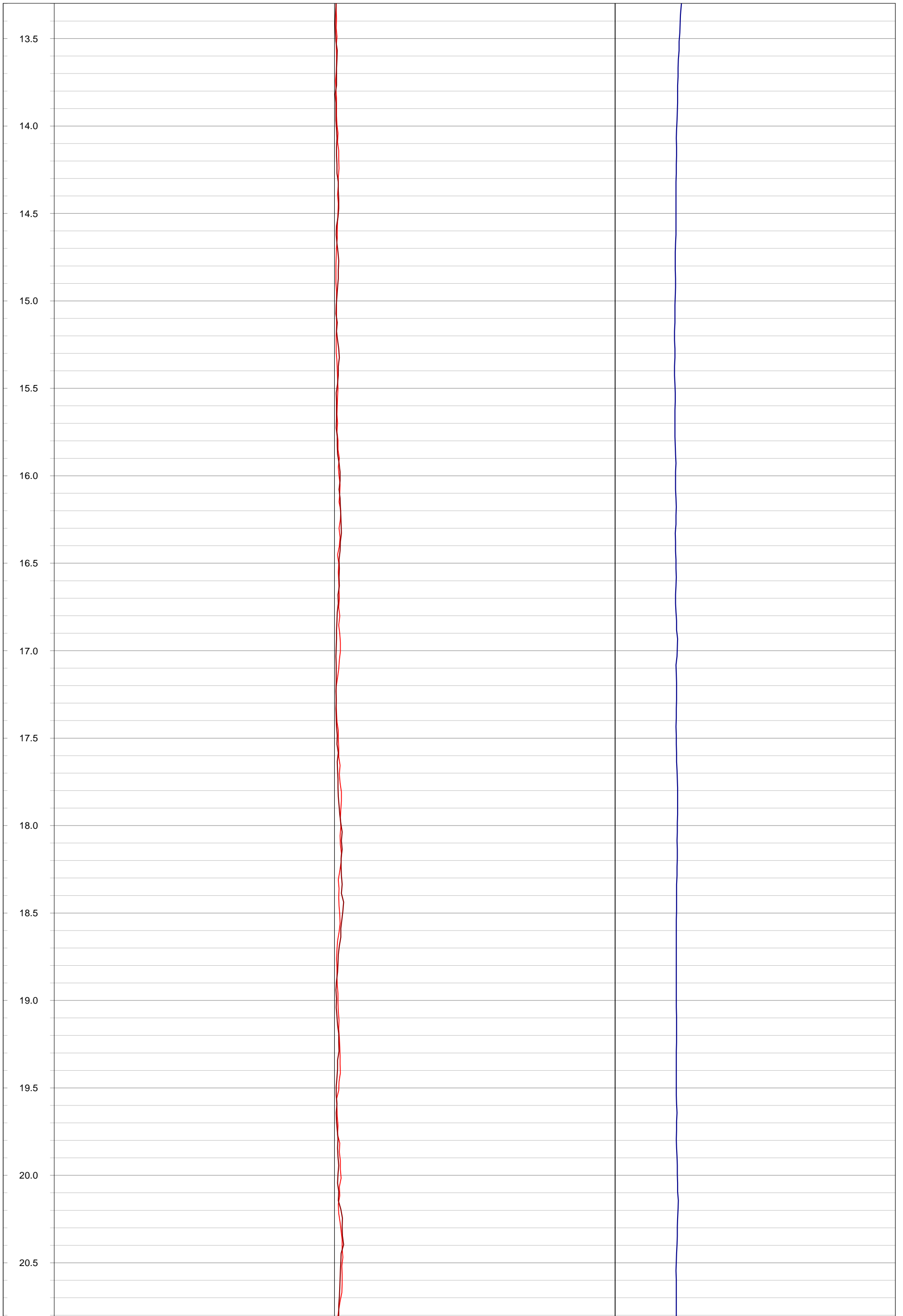
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 11.89m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576866.19 m	<b>Drilled Depth:</b> 35.96 m bgs	<b>Water Level:</b> 1.20 m bgs	<b>Log Date:</b> Mar-5-2021
<b>Northing:</b> 48533450.60 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 417.83 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.43 m ags	

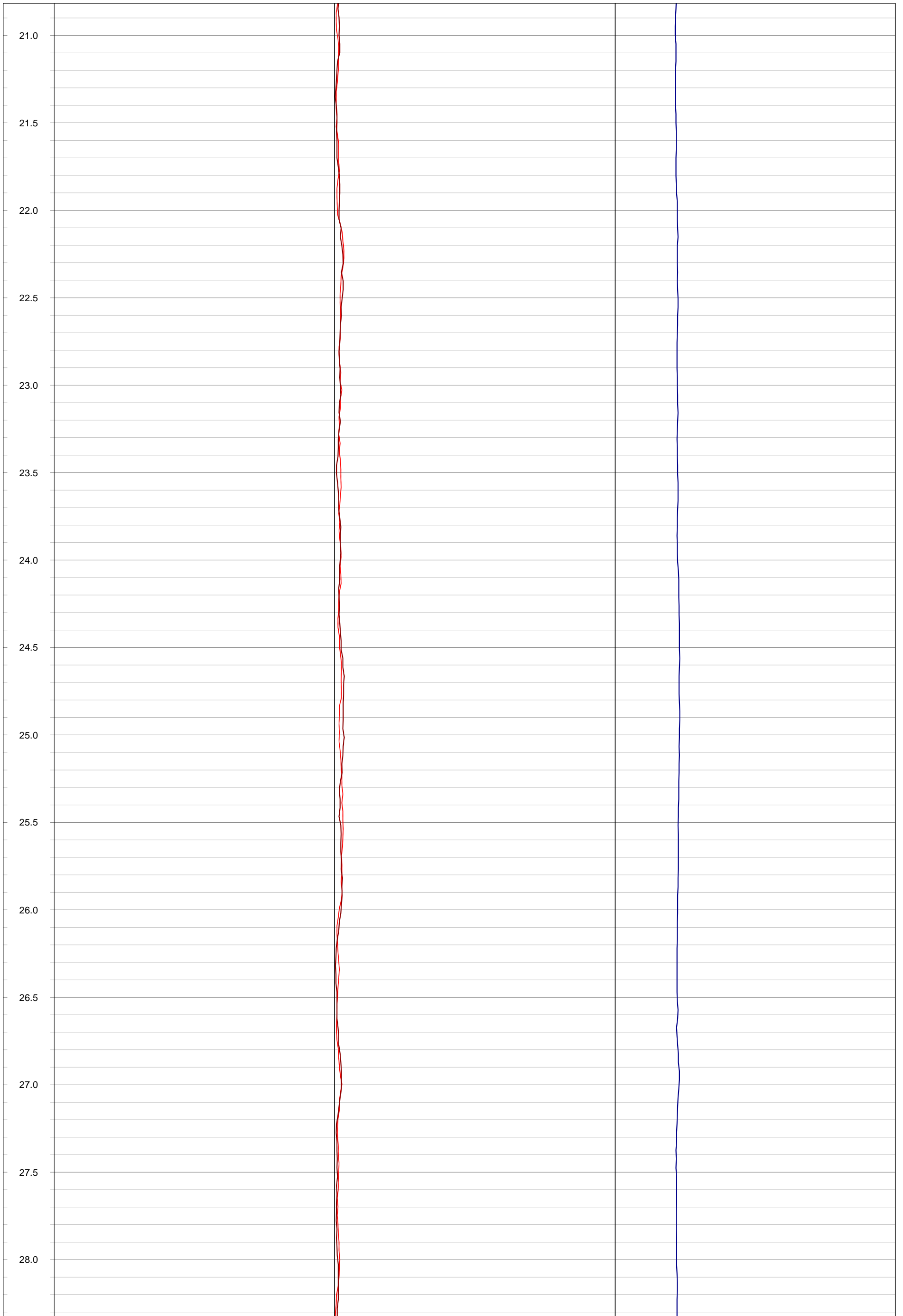
**Notes:**

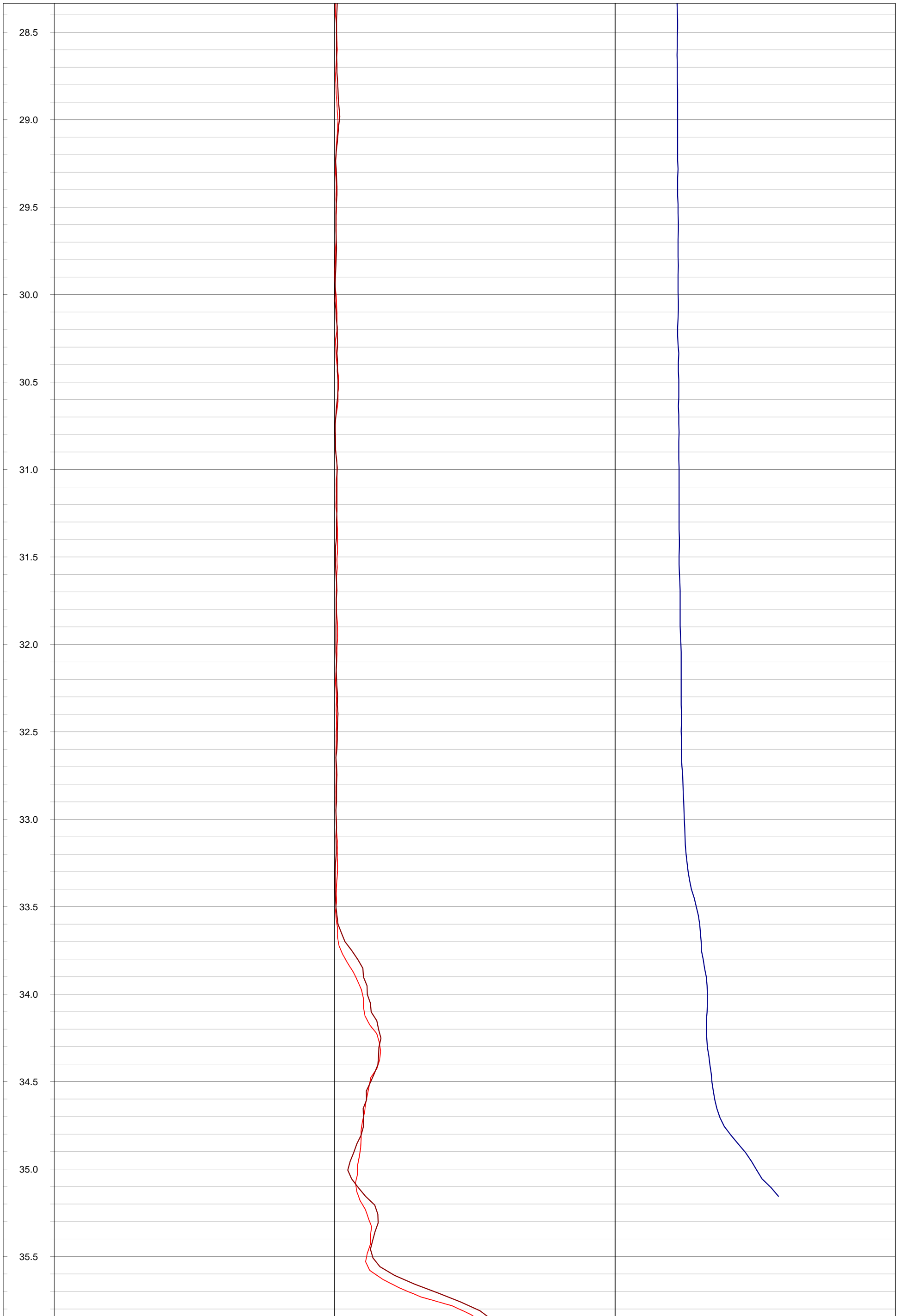












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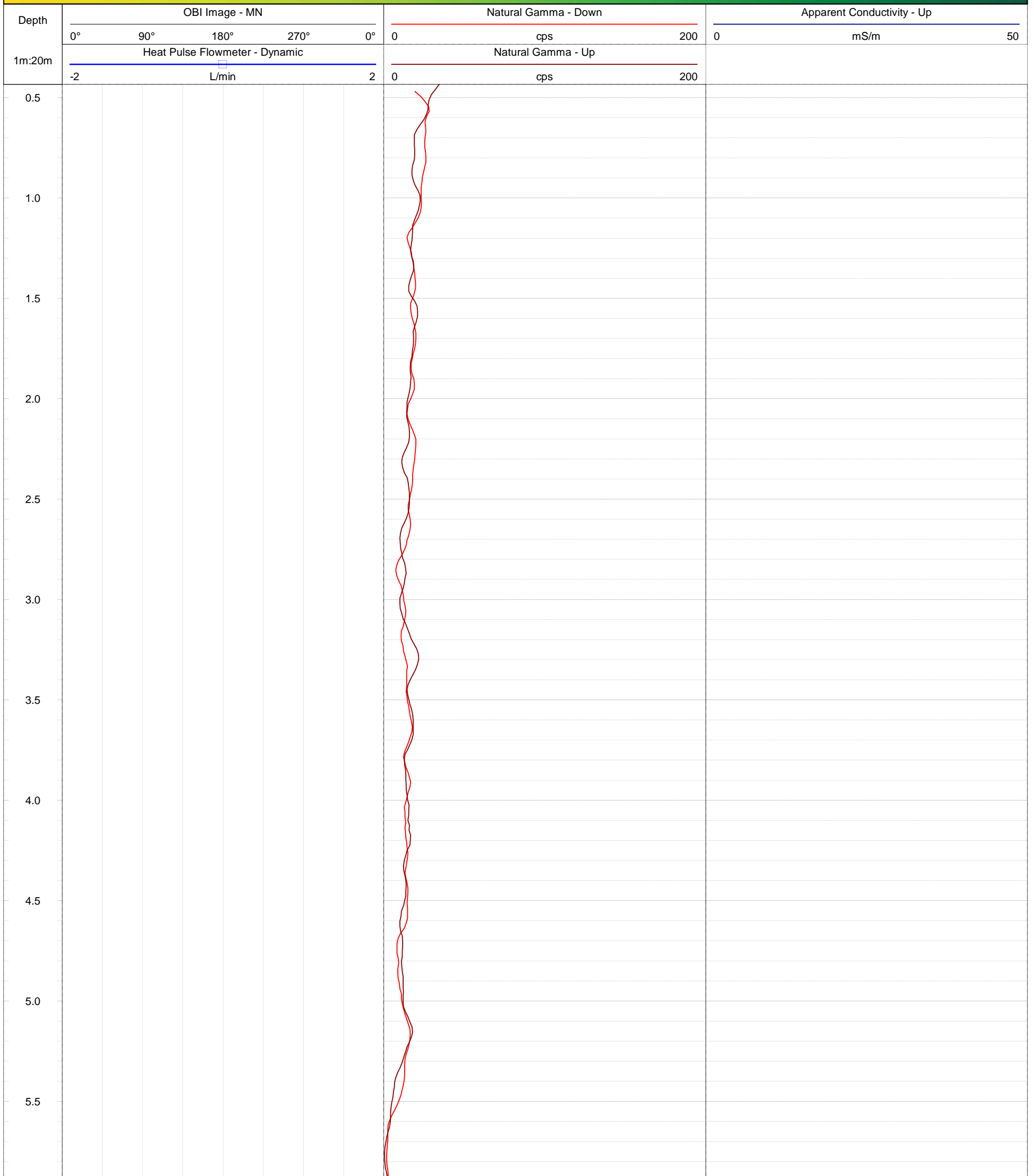
**GOLDER**  
MEMBER OF WSP

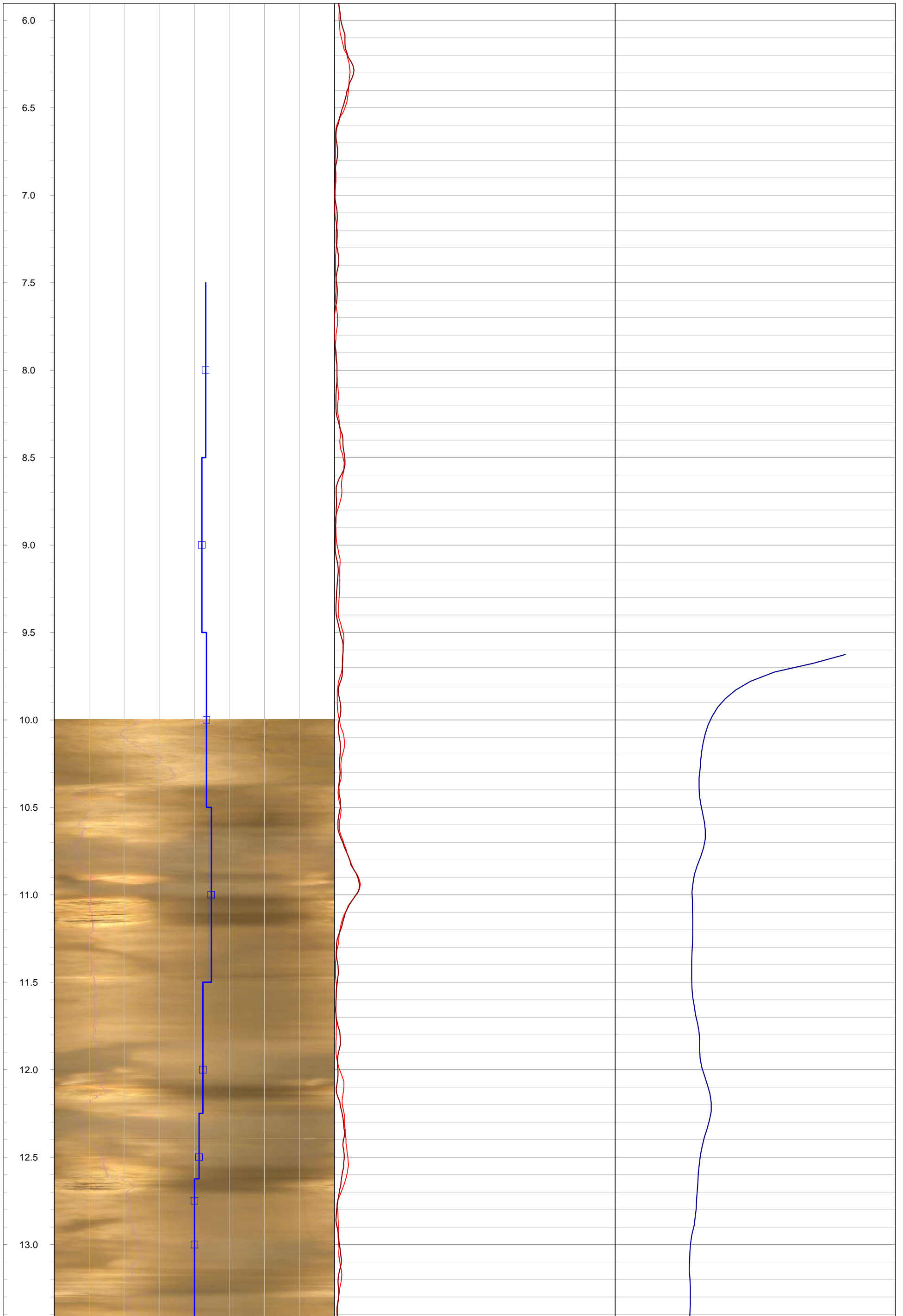
**Geophysical Record of Borehole: MW21-2-1 (CAL)**

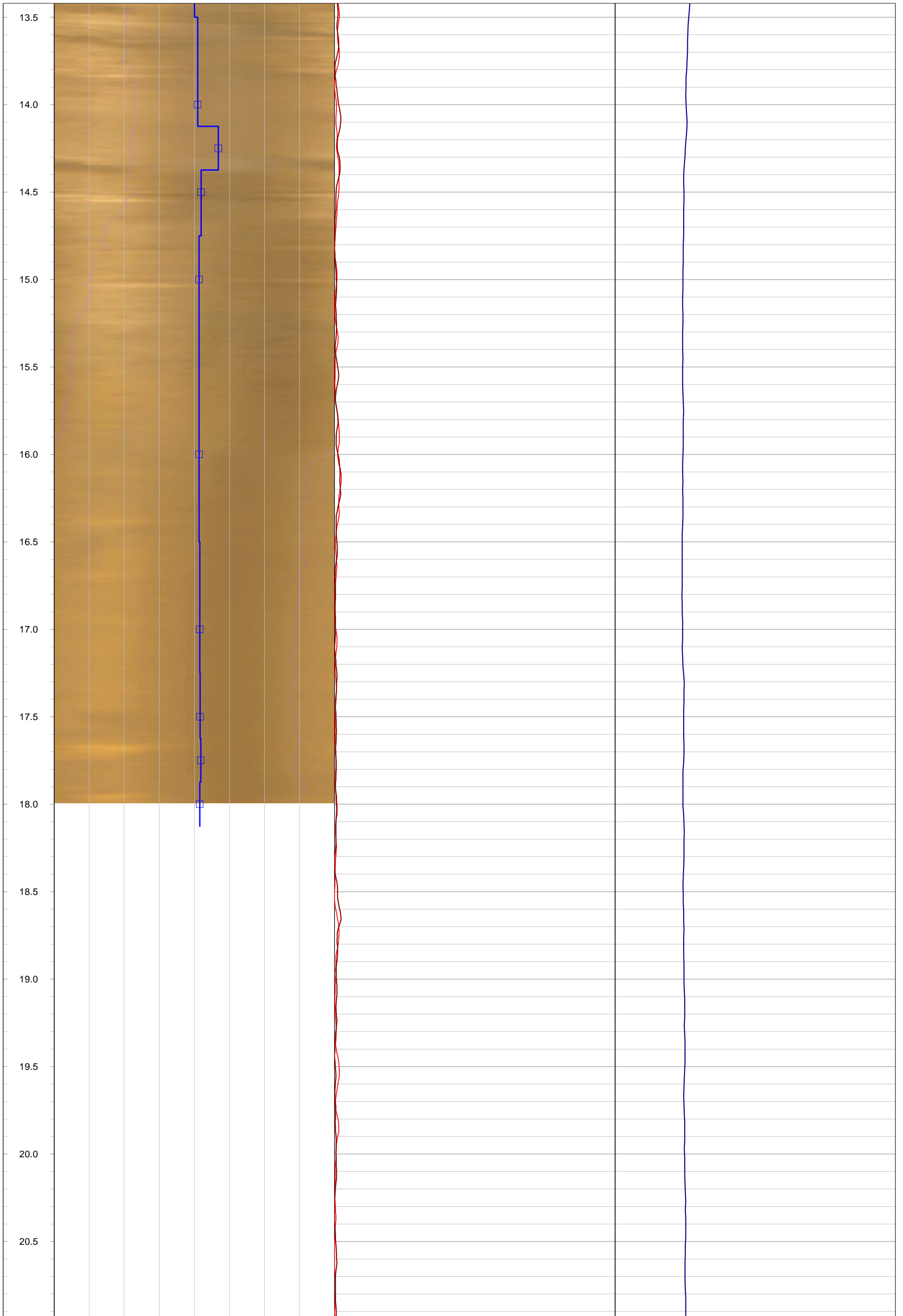
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 8.99 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577279.08 m    **Drilled Depth:** 23.47 m bgs    **Water Level:** 5.20 m bgs    **Log Date:** Mar-17-2021  
**Northing:** 4854021.09 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 413.40 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.21 m ags

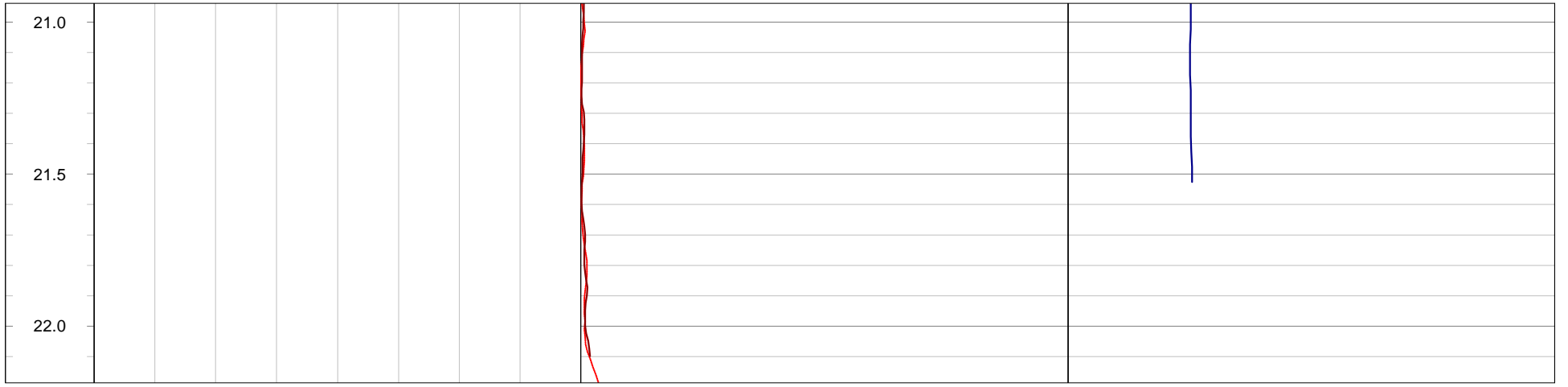
**Notes:** Very murky image. Tried 3 runs with same results. Heat Pulse Flowmeter Dynamic pump at 6.5 m below top of collar. Pump rate approx. 3 L/min.













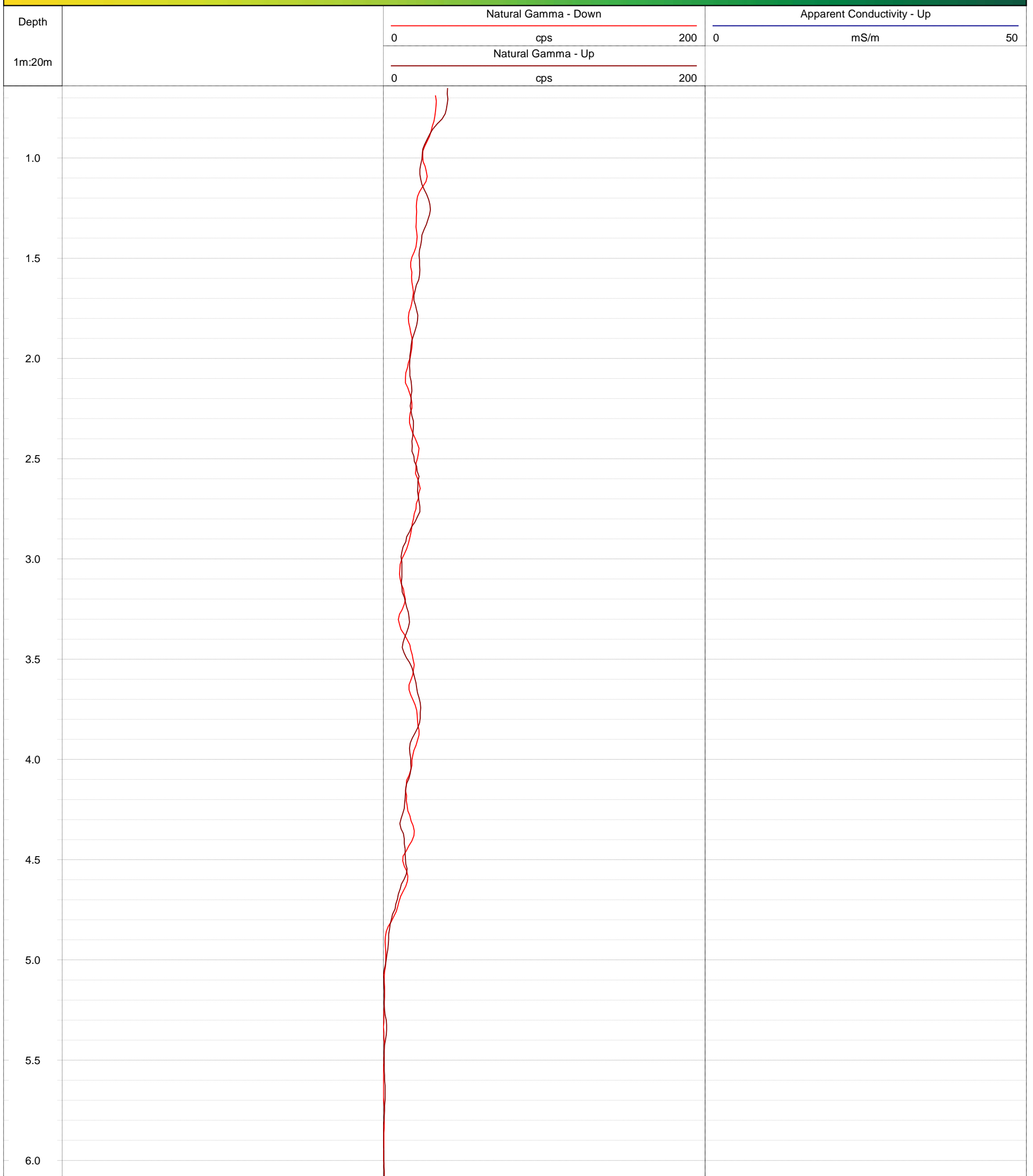
**GOLDER**  
MEMBER OF WSP

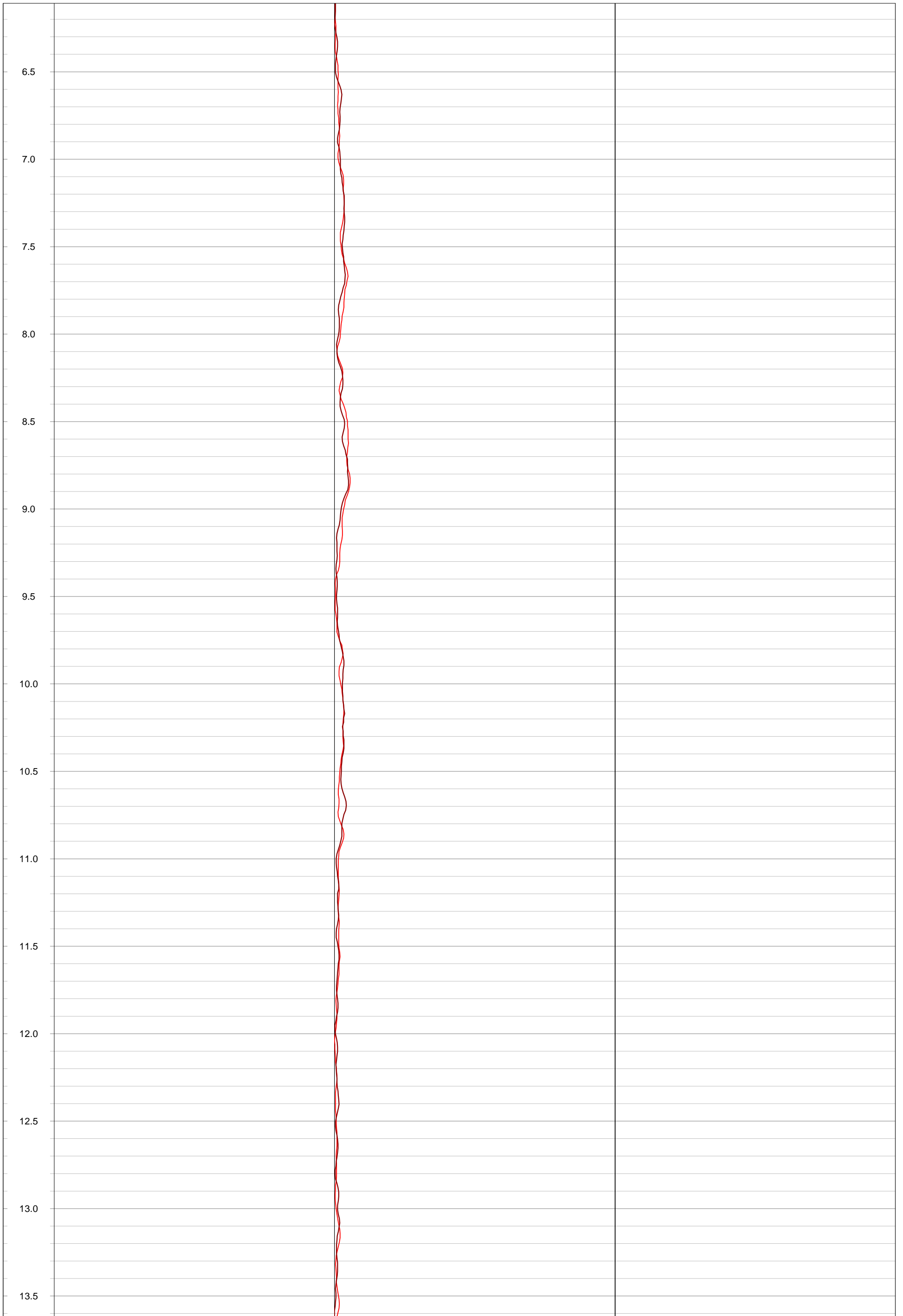
**Geophysical Record of Borehole: MW21-2-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

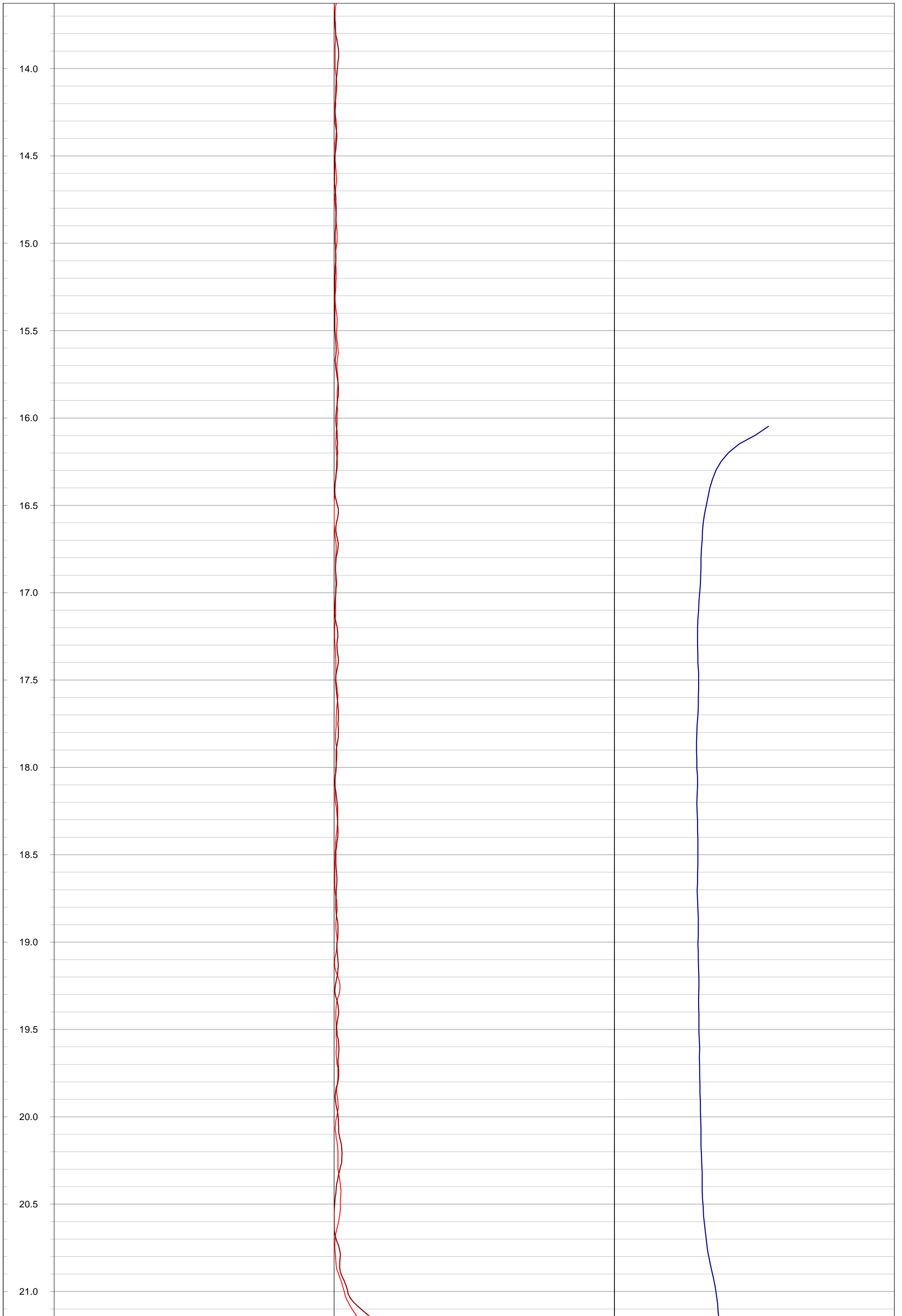
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.38 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577260.02 m    **Drilled Depth:** 23.47 m bgs    **Water Level:** 1.20 m bgs    **Log Date:** Mar-17-2021  
**Northing:** 4854050.91 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 412.64 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.00 m ags

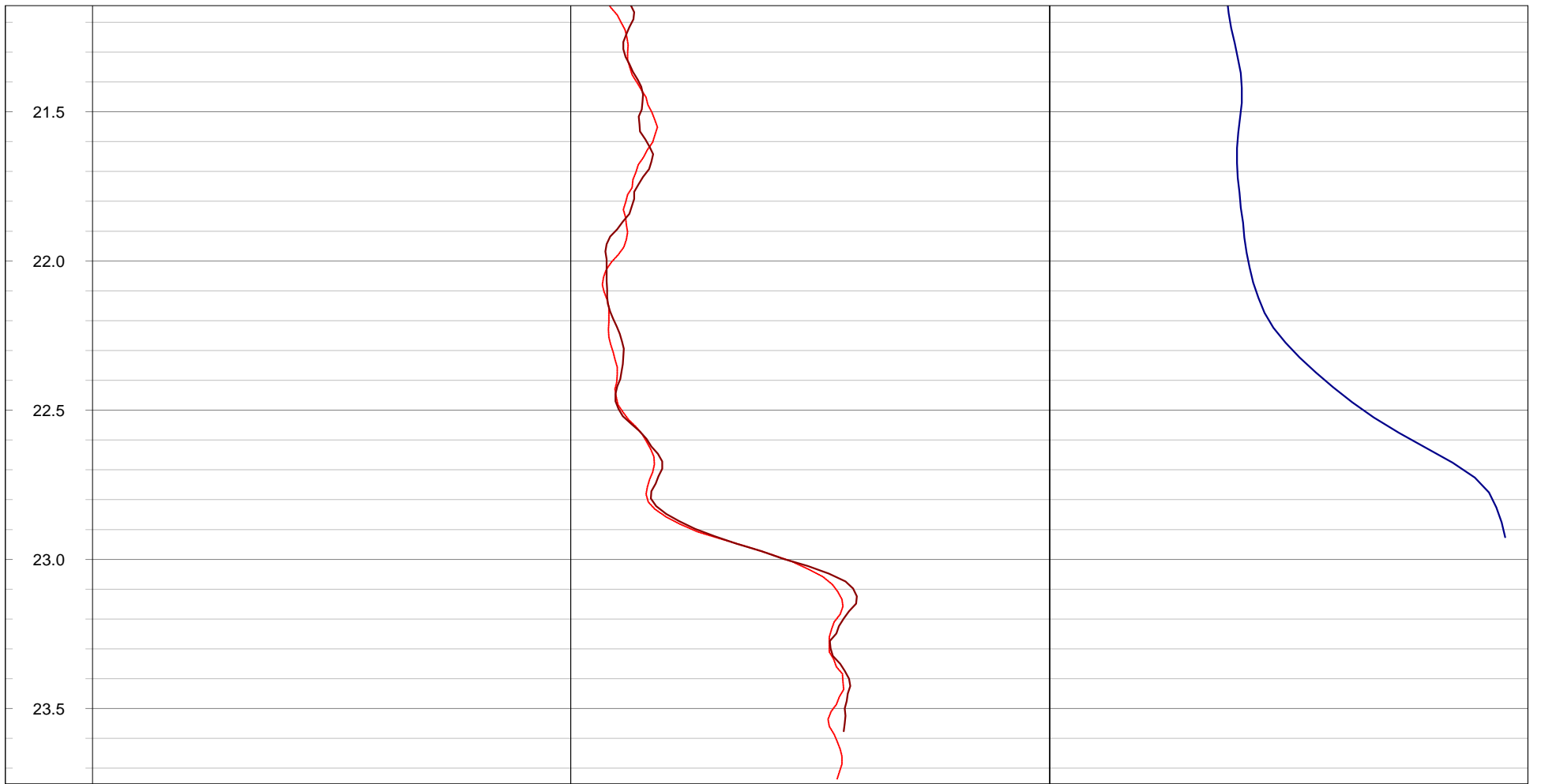
**Notes:**













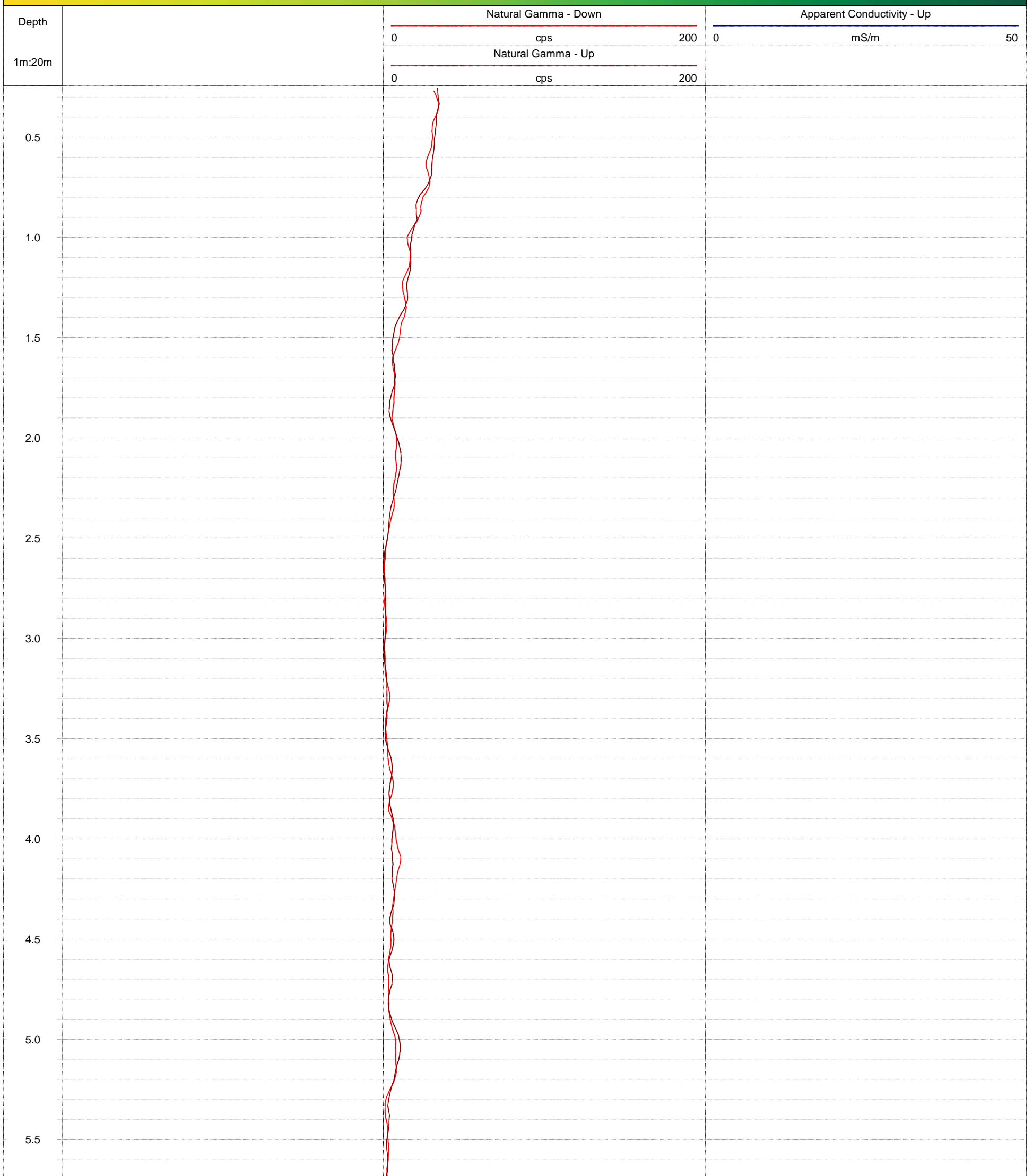
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-2-3 (CAL)**

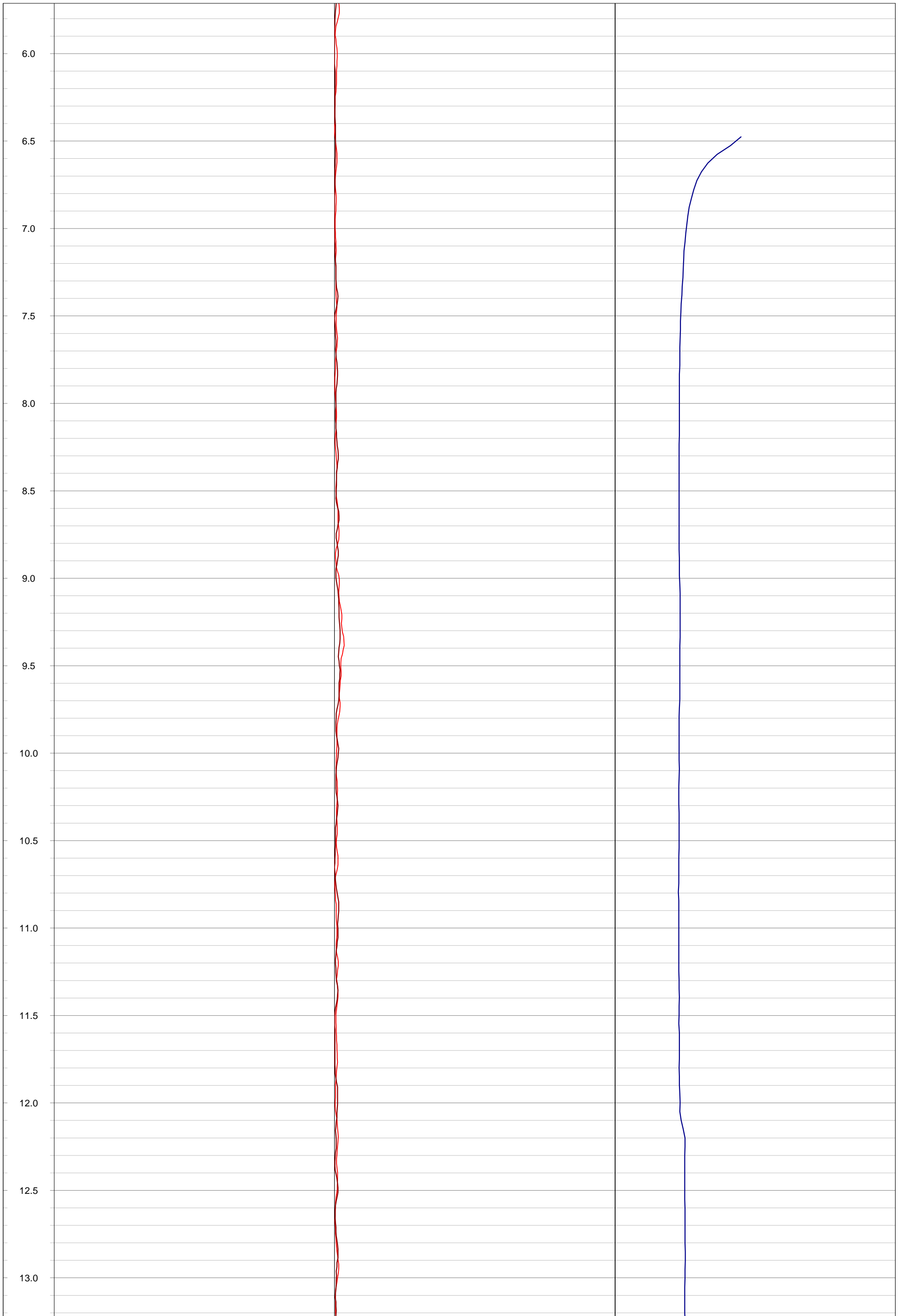
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

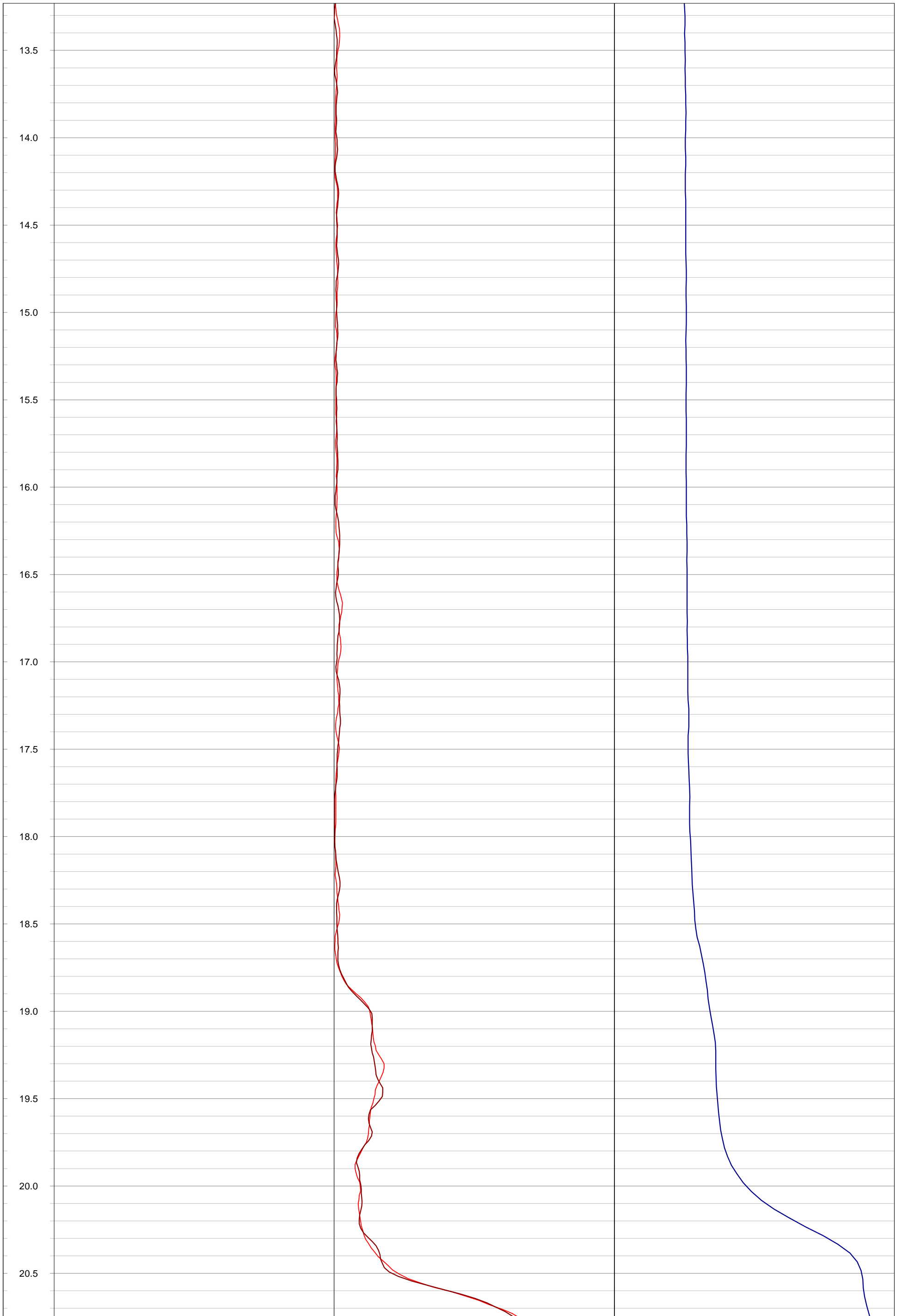
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.64 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577349.69 m	<b>Drilled Depth:</b> 23.77 m bgs	<b>Water Level:</b> 3.90 m bgs	<b>Log Date:</b> Mar-17-2021
<b>Northing:</b> 4854098.46 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 410.76 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.42 m ags	

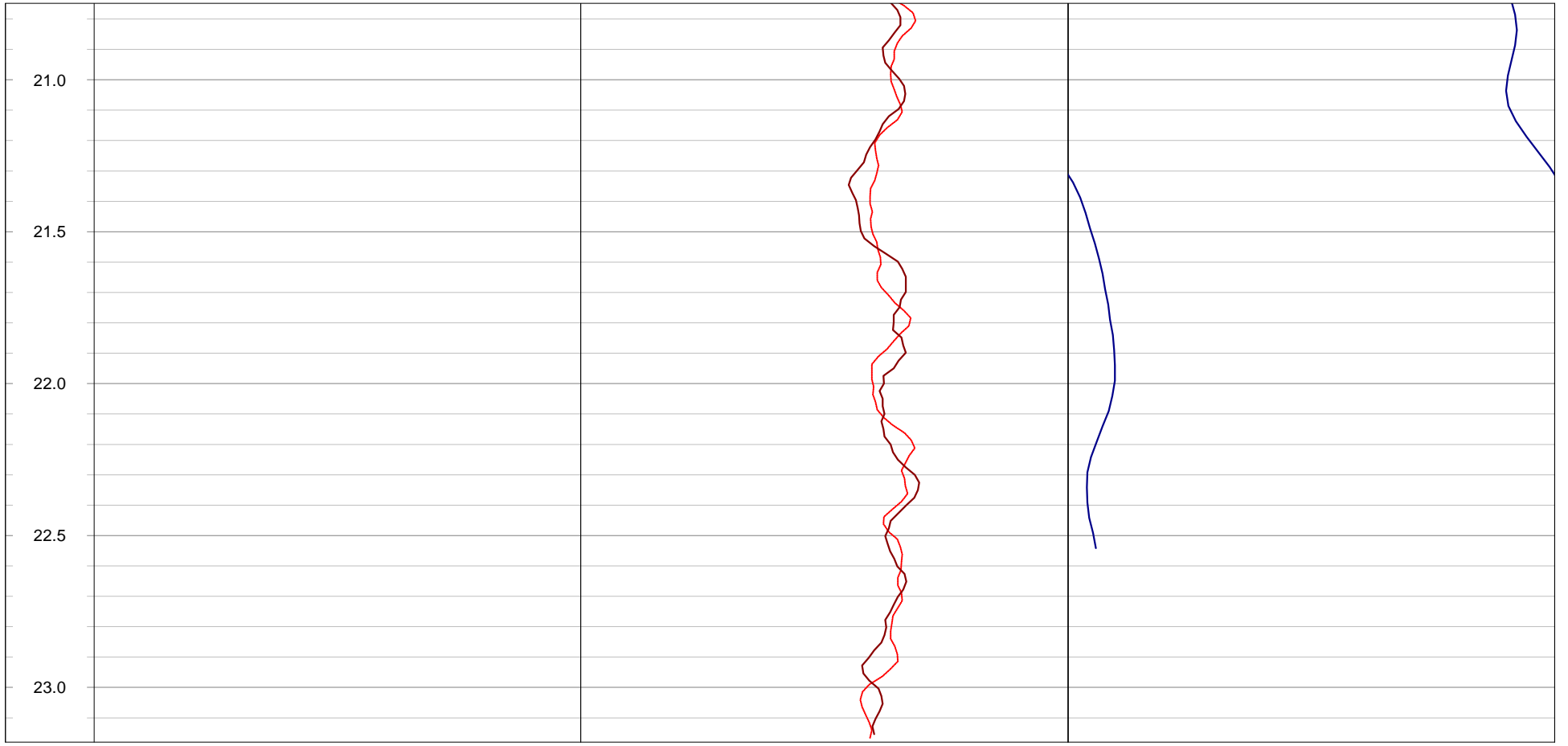
**Notes:**















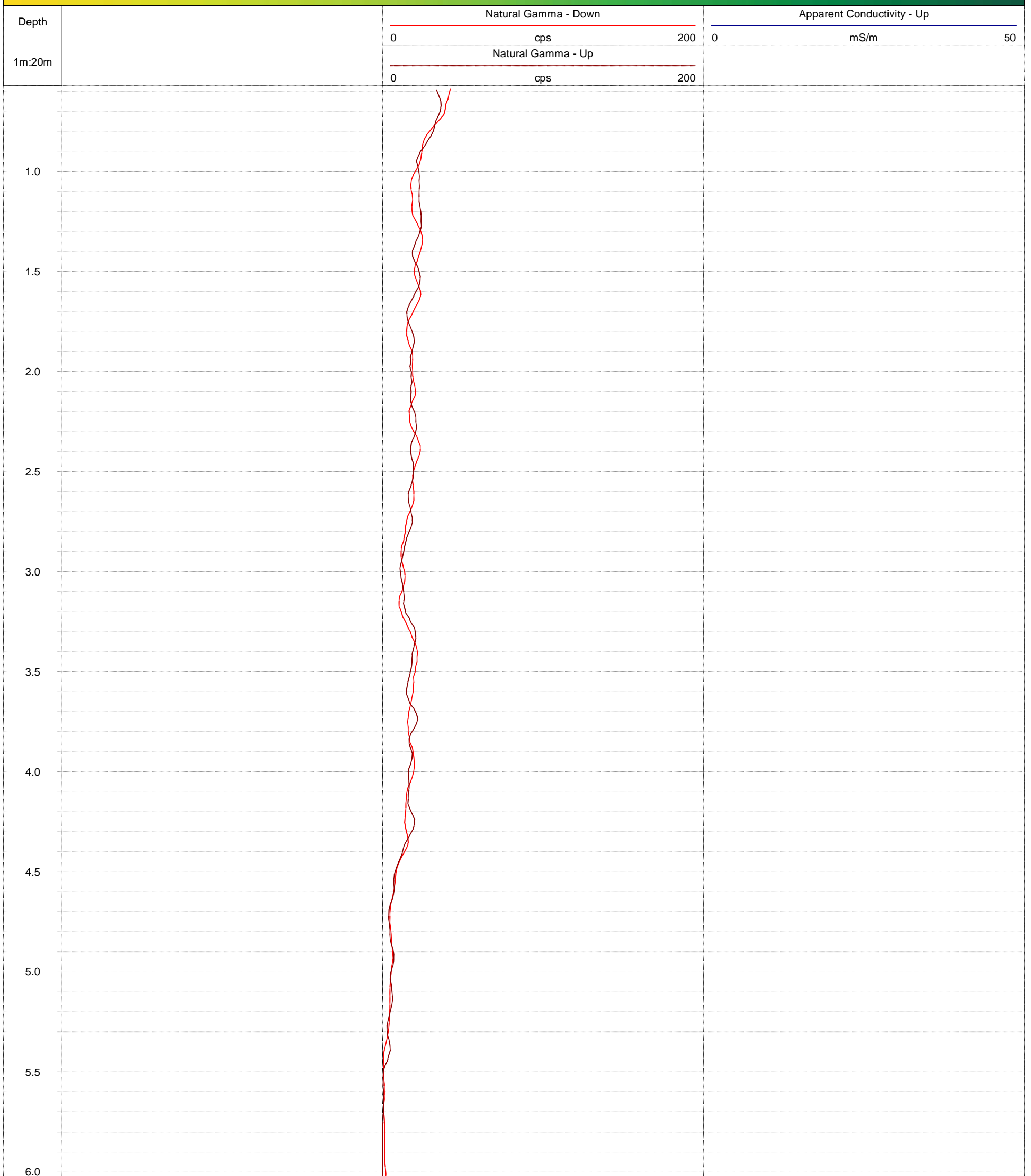
**GOLDER**  
MEMBER OF WSP

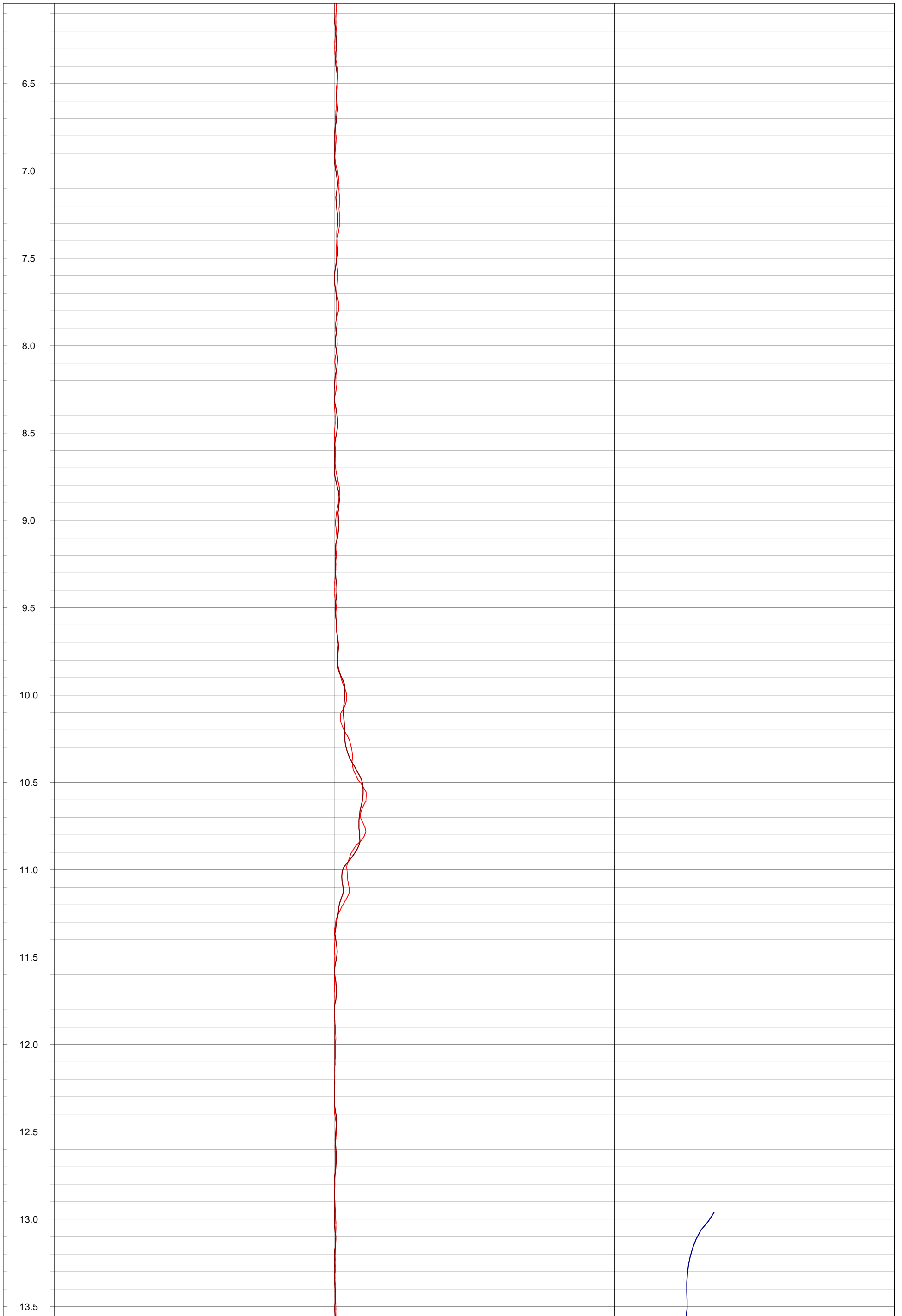
**Geophysical Record of Borehole: MW21-2-4 (CAL)**

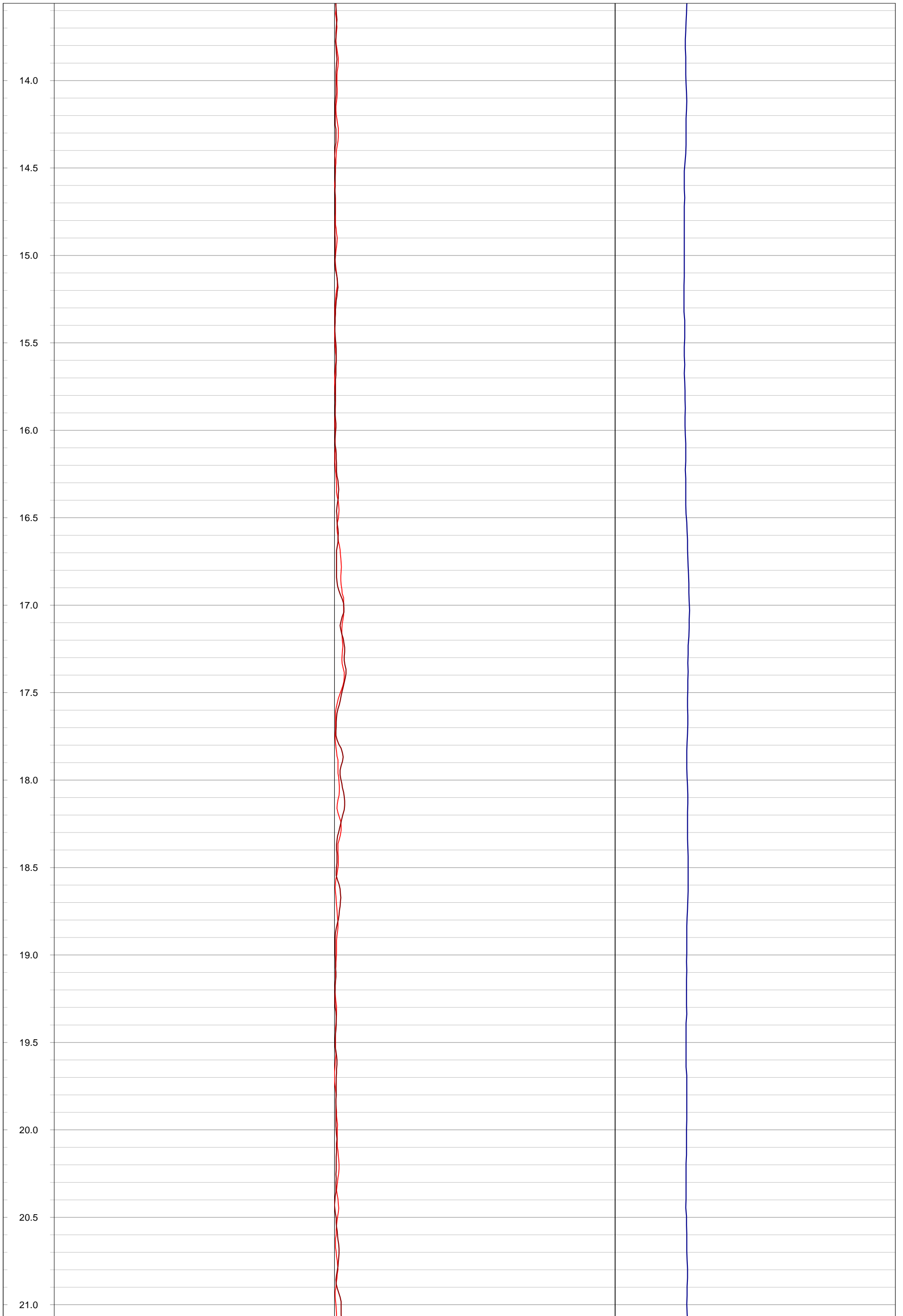
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 12.19 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577297.52 m	<b>Drilled Depth:</b> 26.52 m bgs	<b>Water Level:</b> 5.40 m bgs	<b>Log Date:</b> Mar-17-2021
<b>Northing:</b> 4851001.66 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 413.86 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.09 m ags	

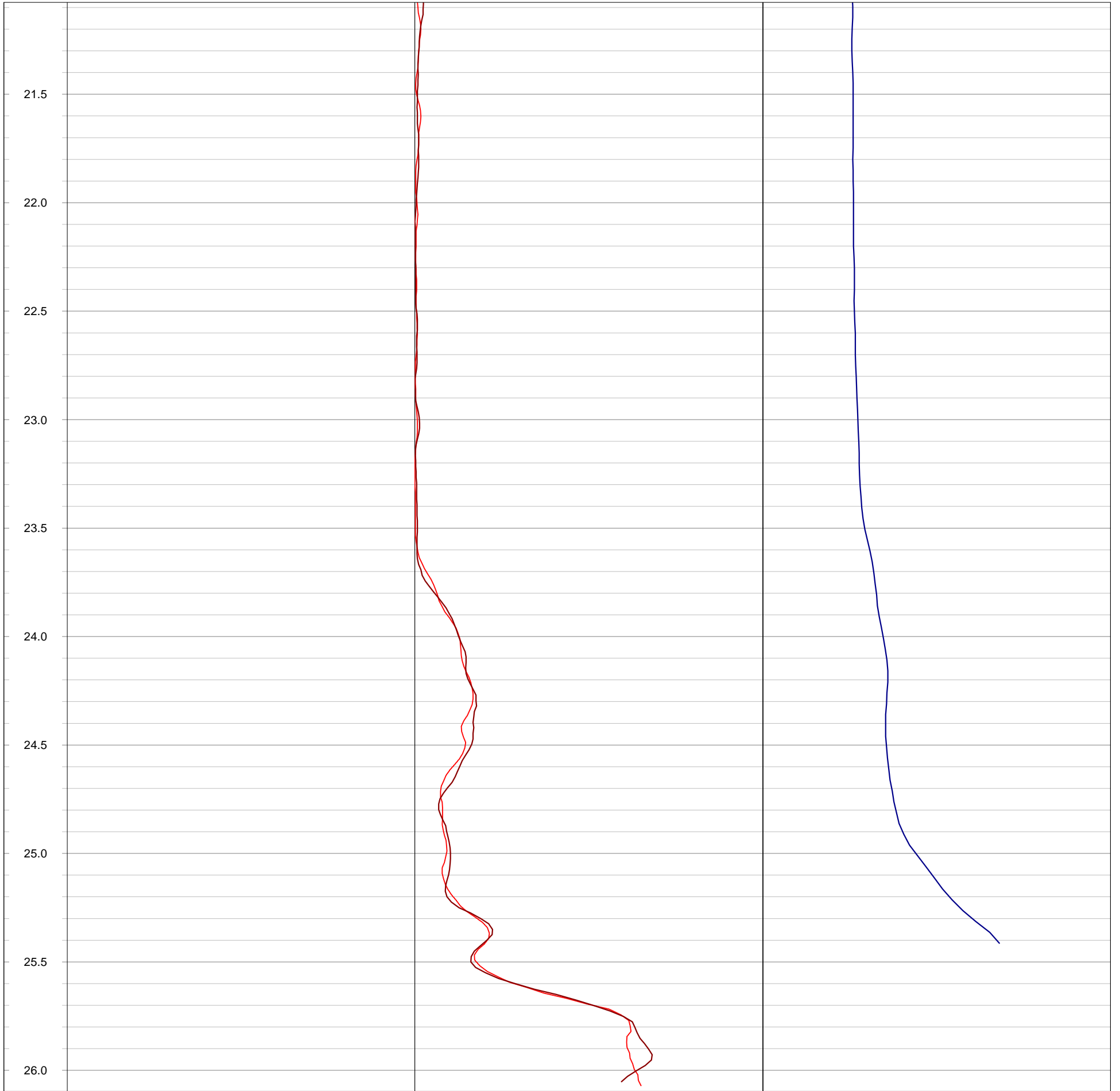
**Notes:**













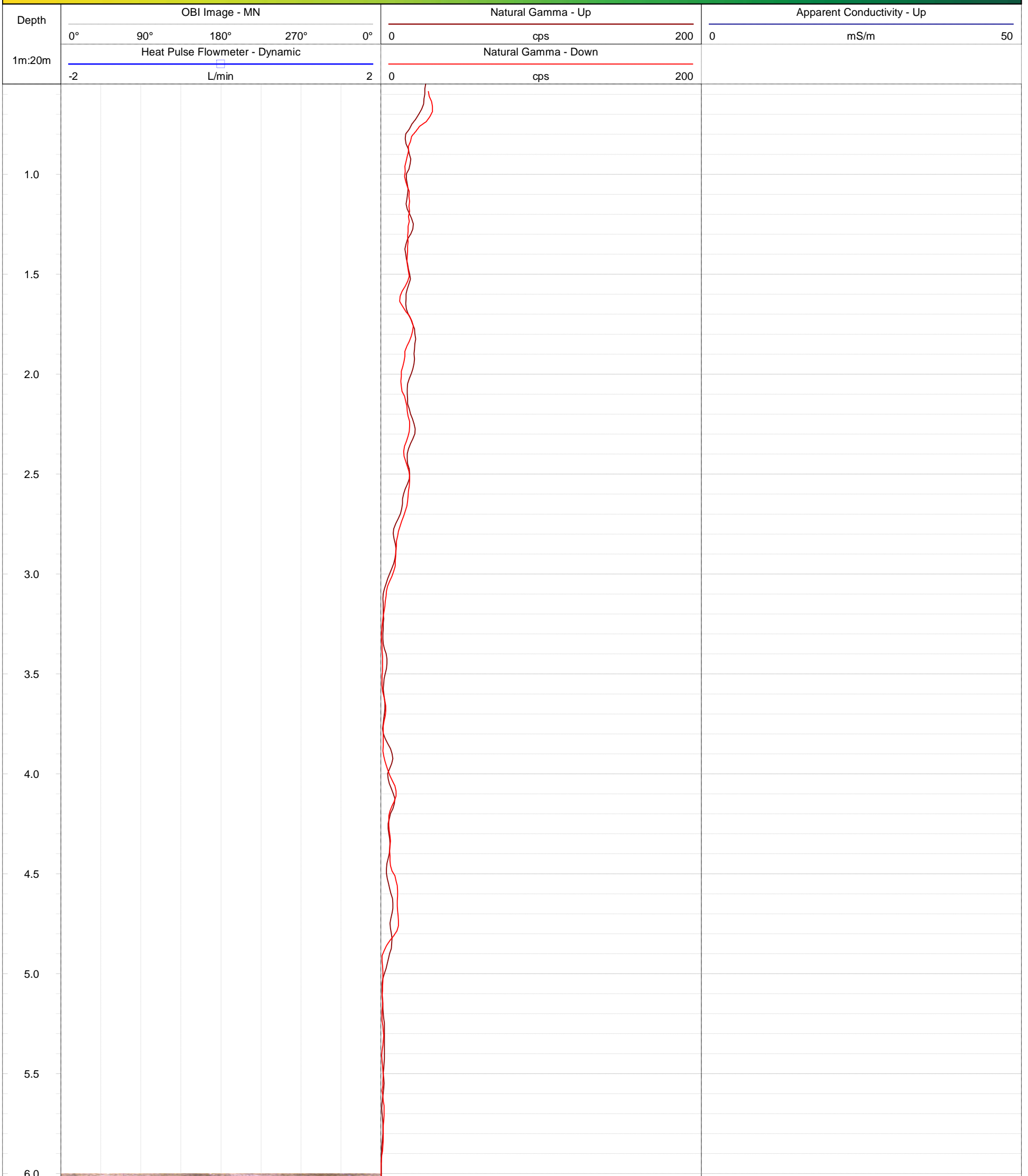
**GOLDER**  
MEMBER OF WSP

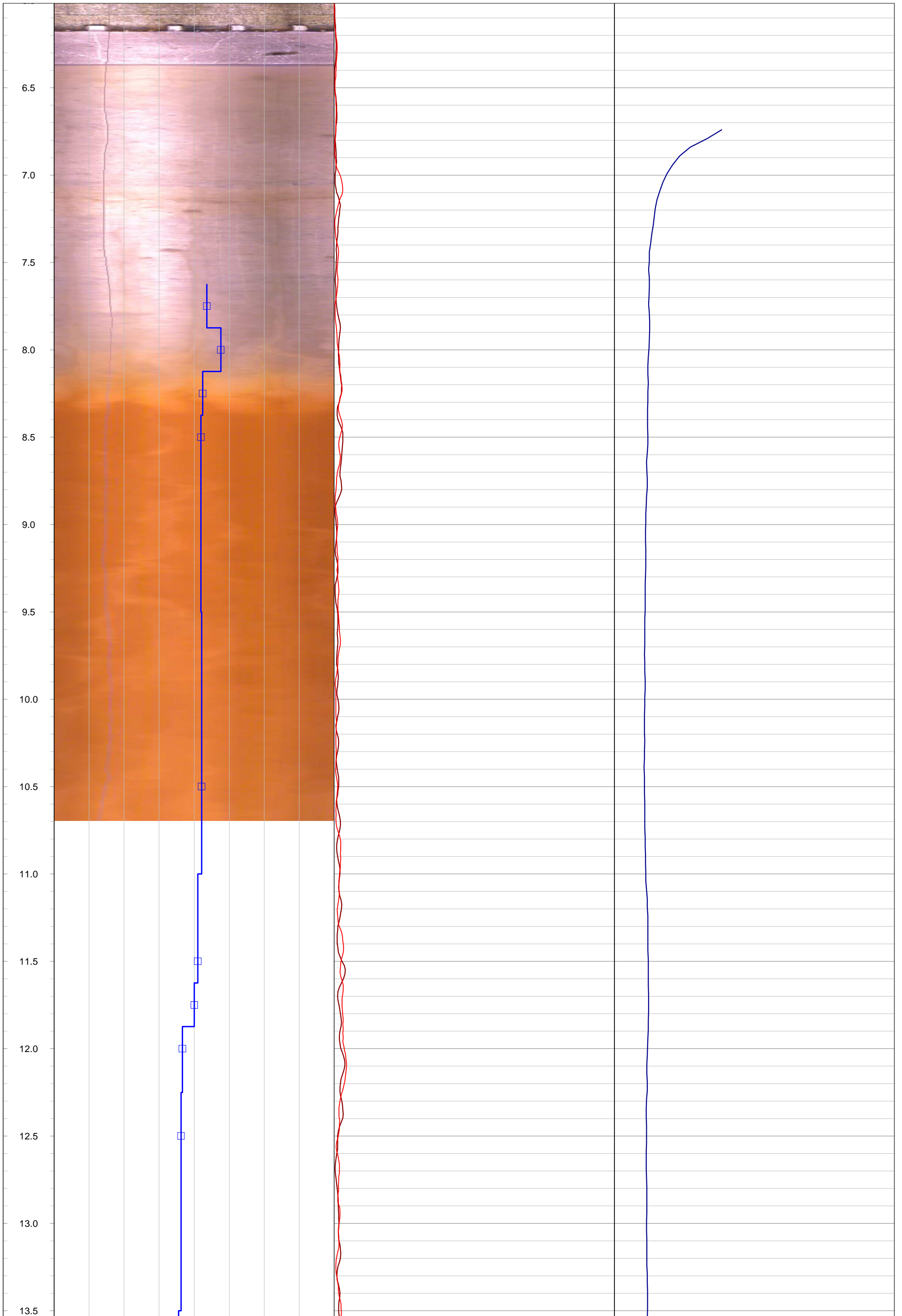
**Geophysical Record of Borehole: MW21-3-1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

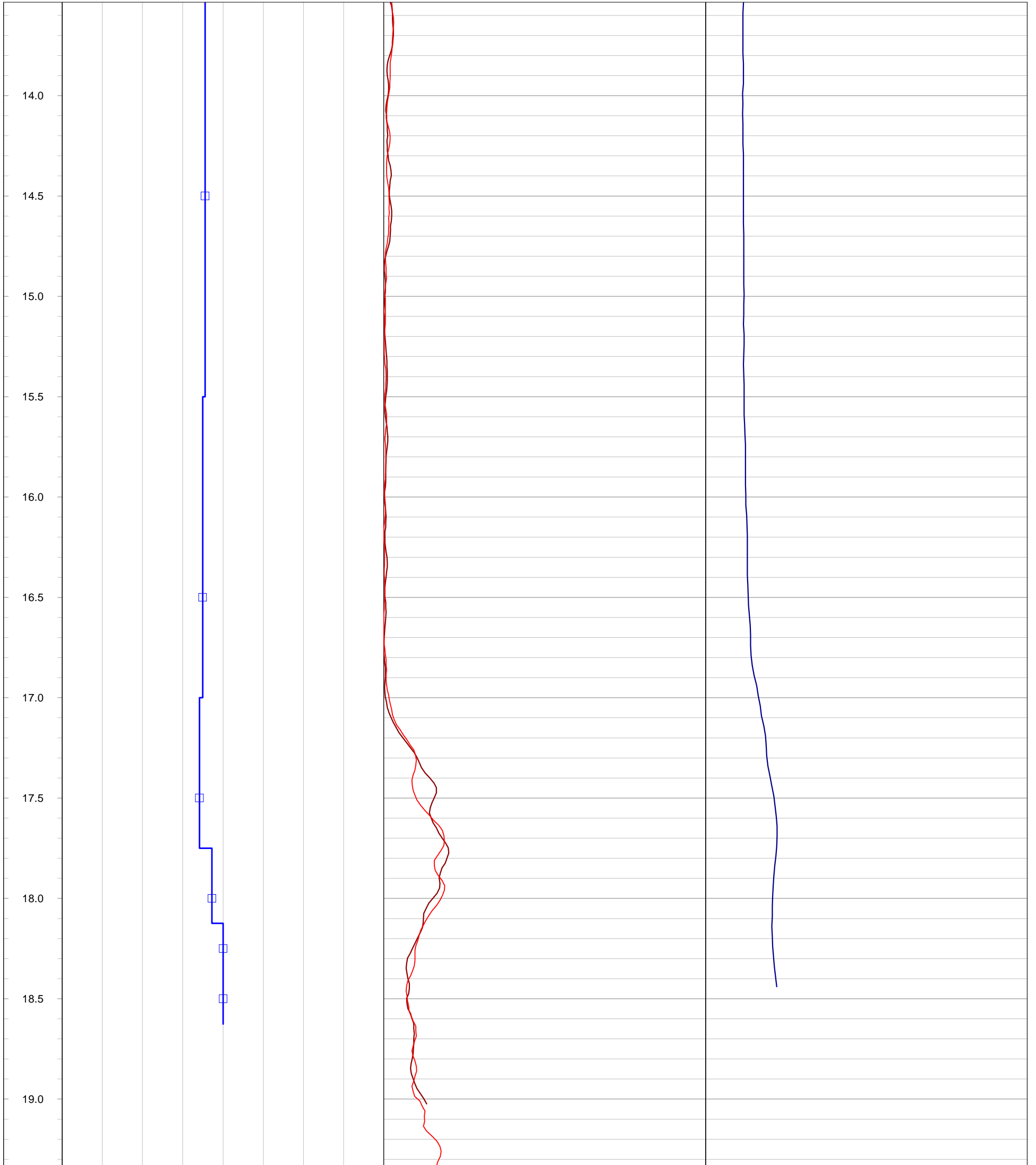
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.16 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577871.84 m    **Drilled Depth:** 21.03 m bgs    **Water Level:** 5.70 m bgs    **Log Date:** Mar-31-2021  
**Northing:** 4852814.09 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 403.69 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.12 m ags

**Notes:** Image orange (rust?) from 8.3 to 10.7 mbgs, opaque > 10.8 m bgs. Heat Pulse Flowmeter Dynamic pump at 7.3 m below top of collar. Pump rate approx. 1 L/min.











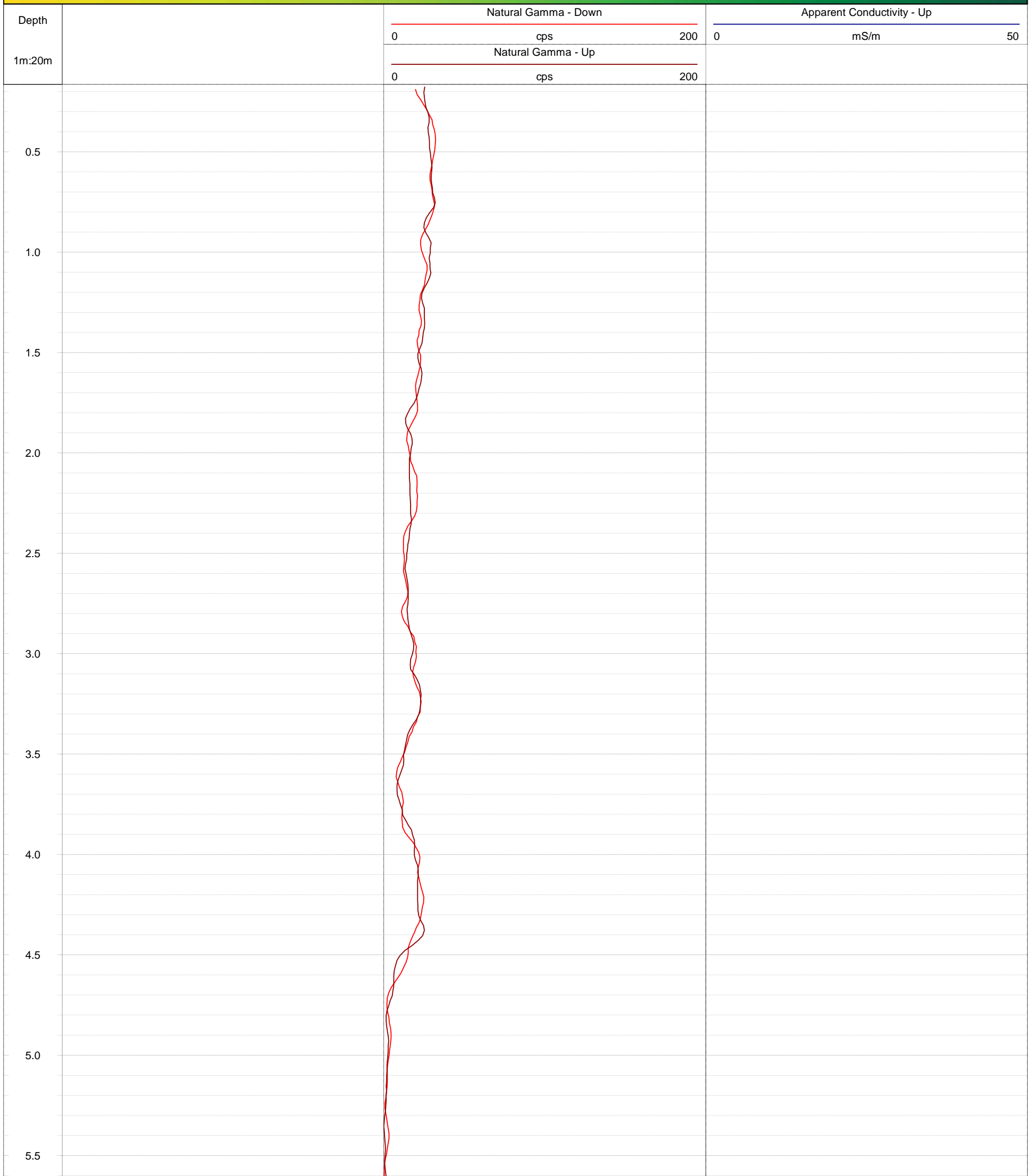
**GOLDER**  
MEMBER OF WSP

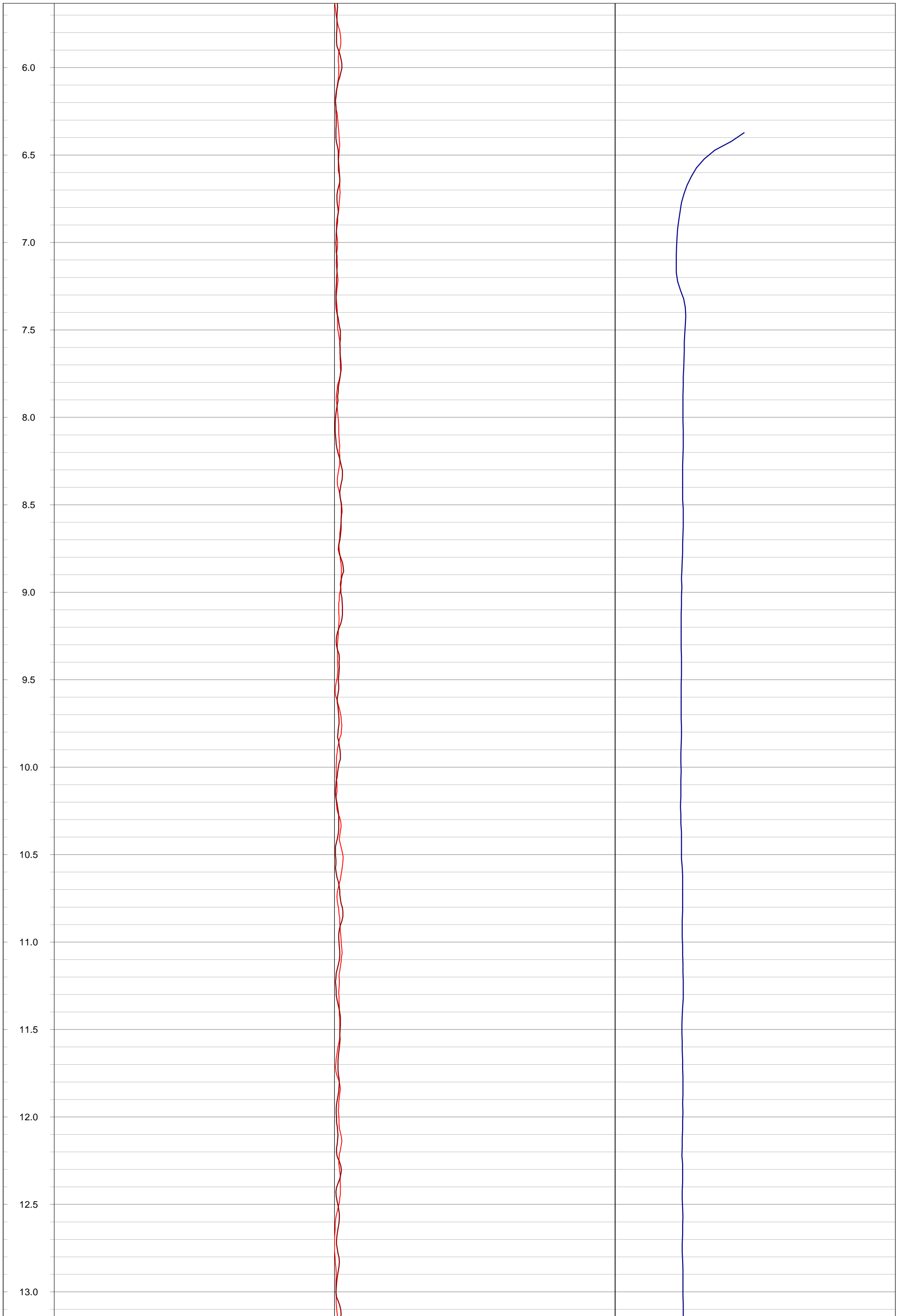
**Geophysical Record of Borehole: MW21-3-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

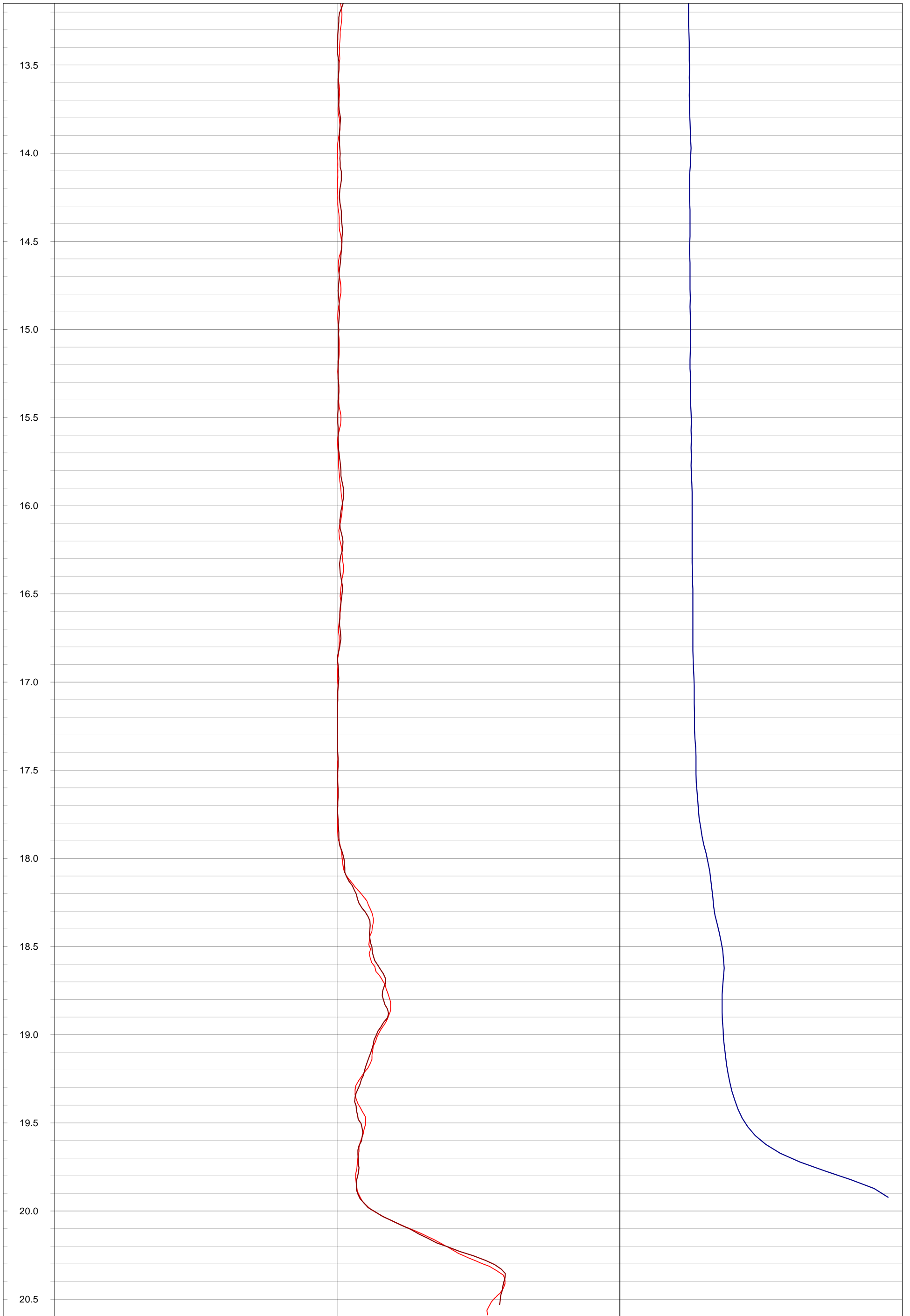
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.79 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577920.27 m    **Drilled Depth:** 21.03 m bgs    **Water Level:** 7.29 m bgs    **Log Date:** Apr-1-2021  
**Northing:** 4852838.38 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 404.87 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.50 m ags

**Notes:**











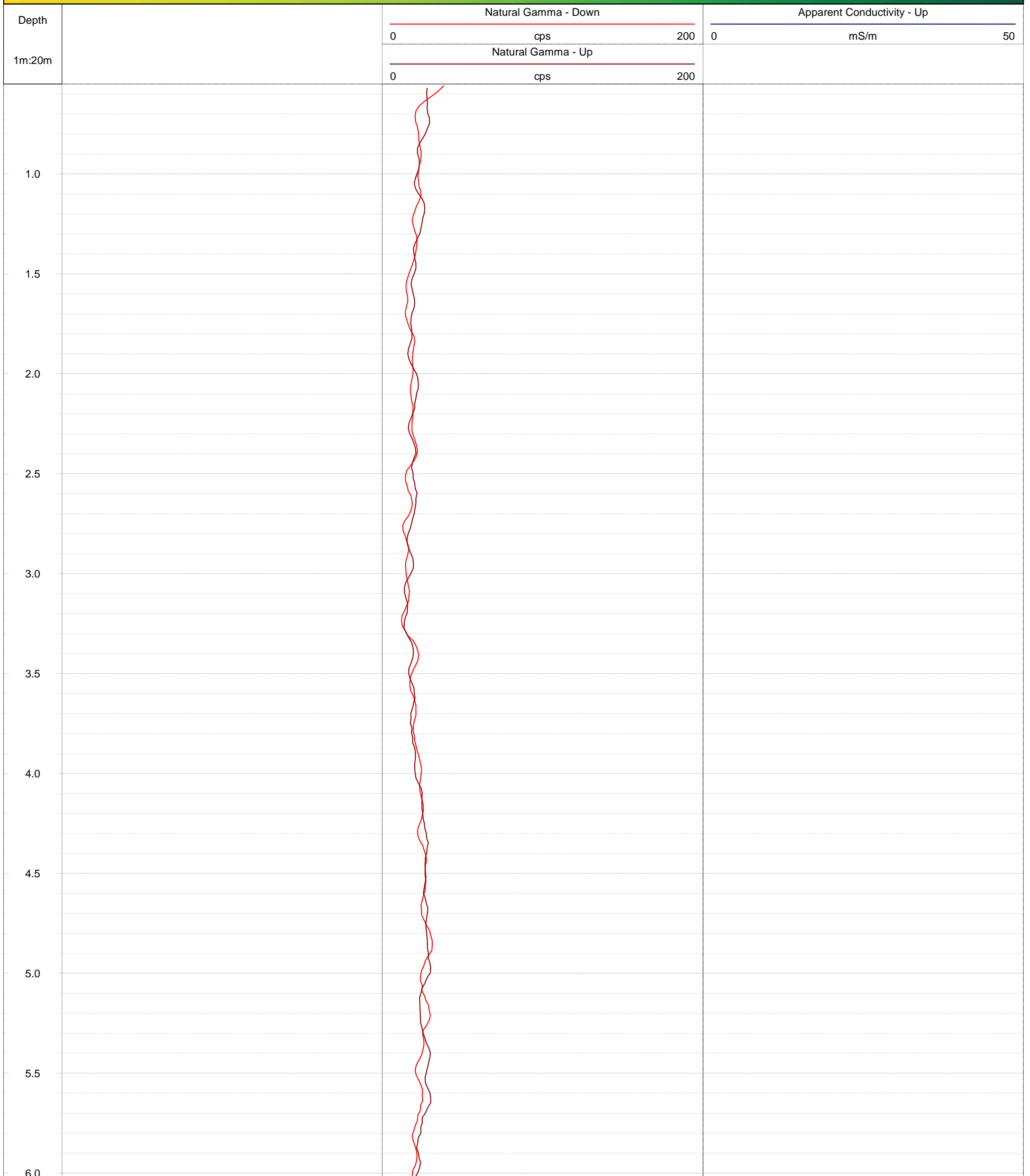
**GOLDER**  
MEMBER OF WSP

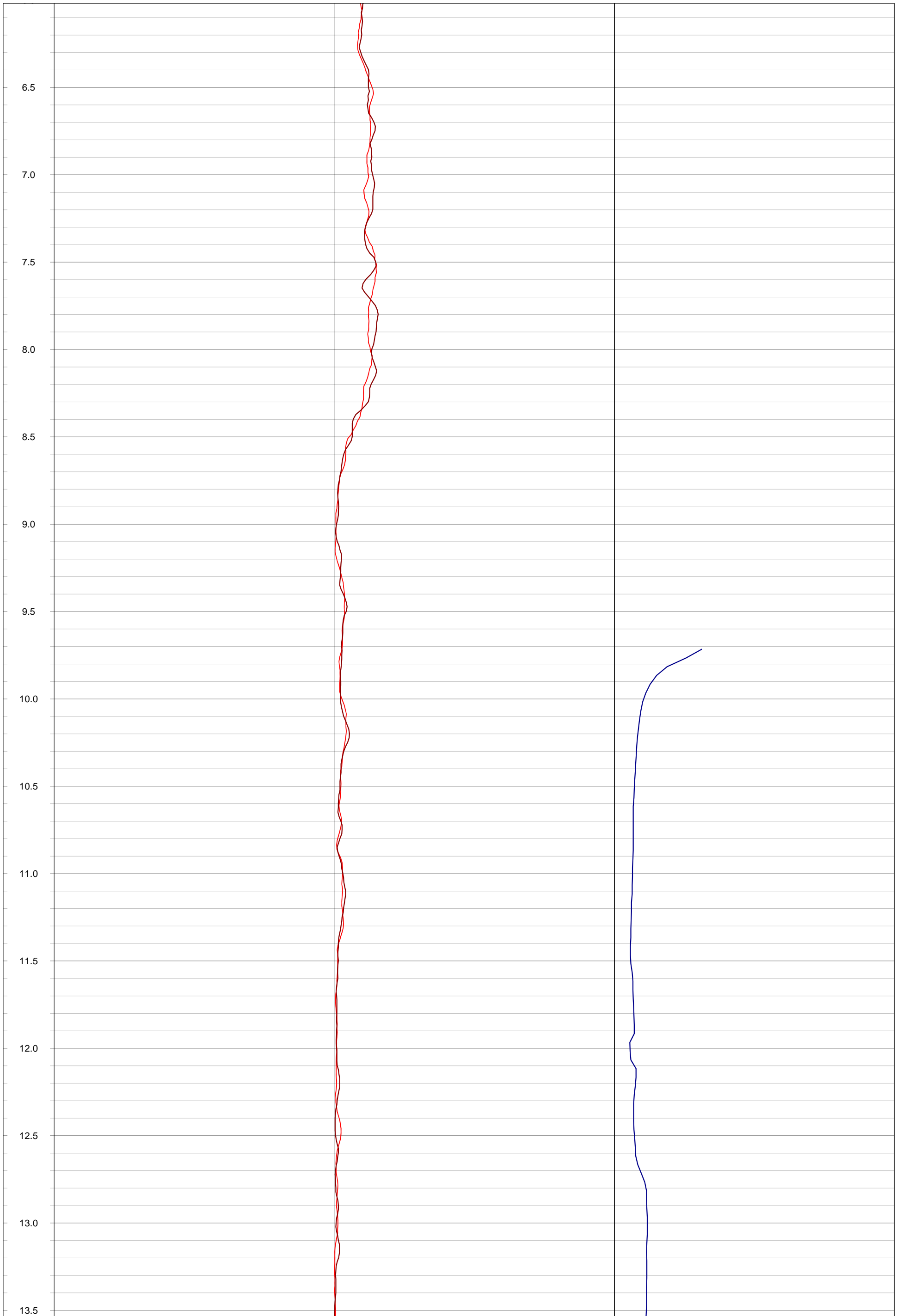
**Geophysical Record of Borehole: MW21-3-3 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

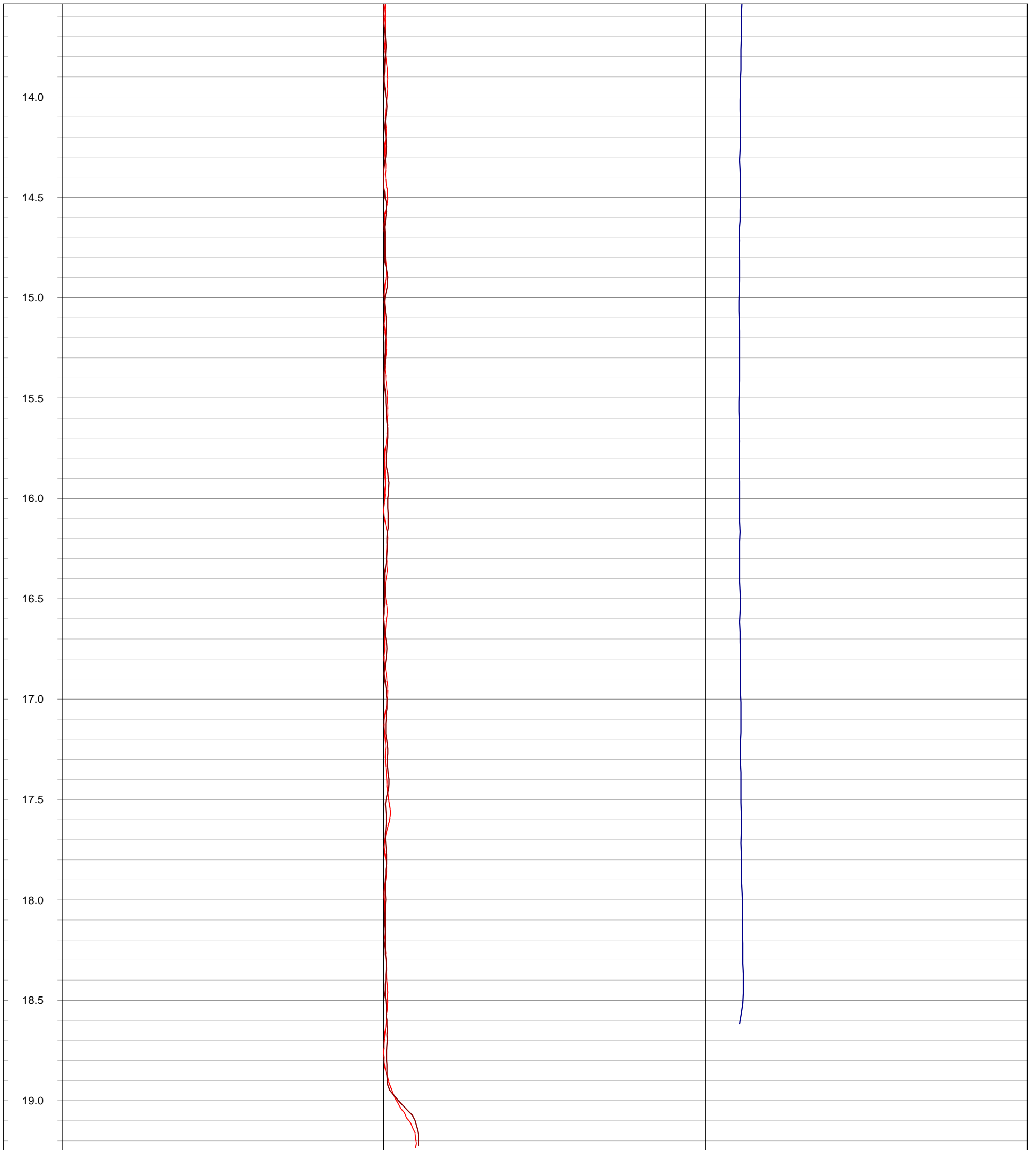
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 8.84 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577935.55 m    **Drilled Depth:** 19.20 m bgs    **Water Level:** 12.37 m bgs    **Log Date:** Mar-31-2021  
**Northing:** 4852730.93 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 405.12 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.13 m ags

**Notes:**











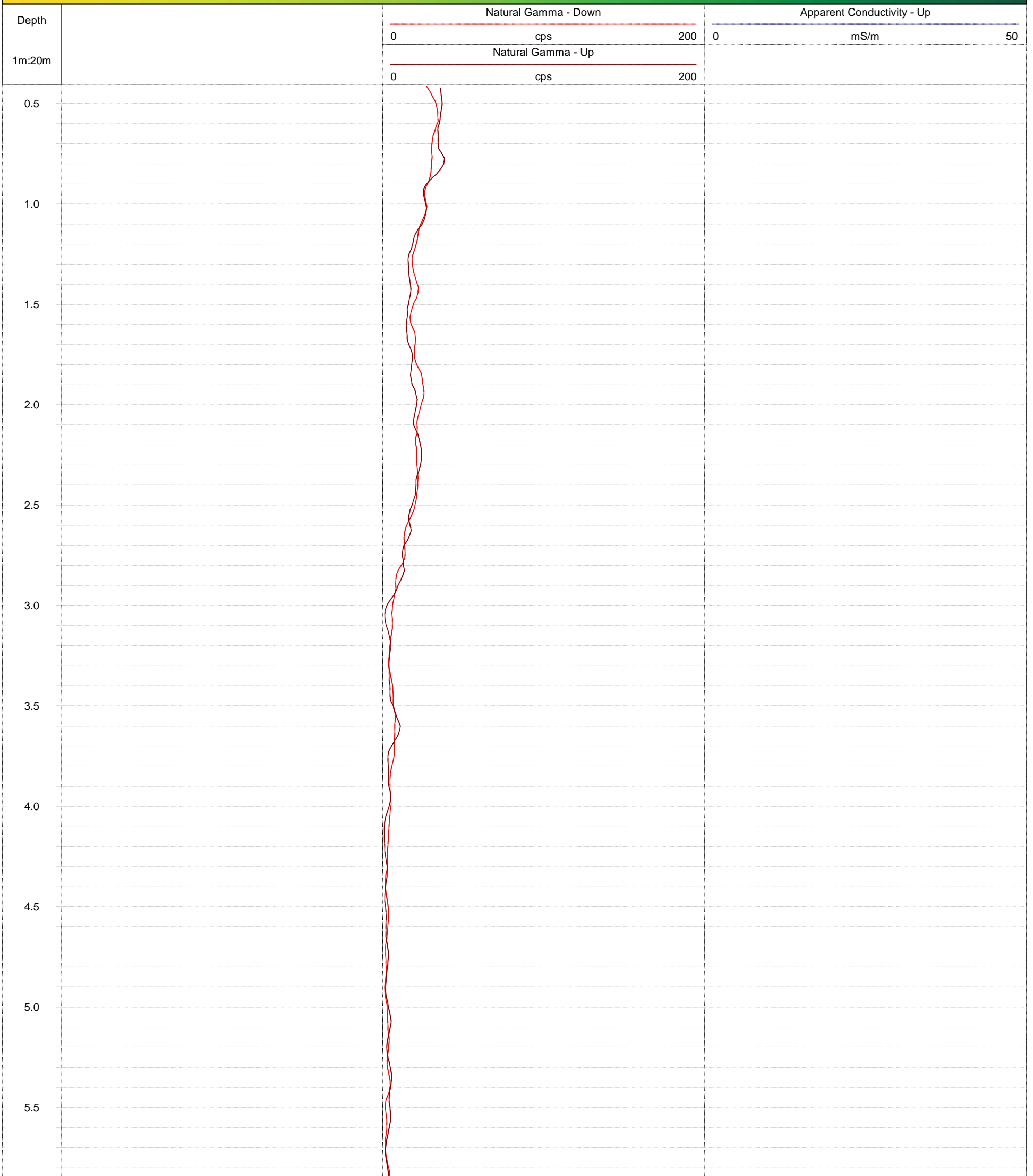
**GOLDER**  
MEMBER OF WSP

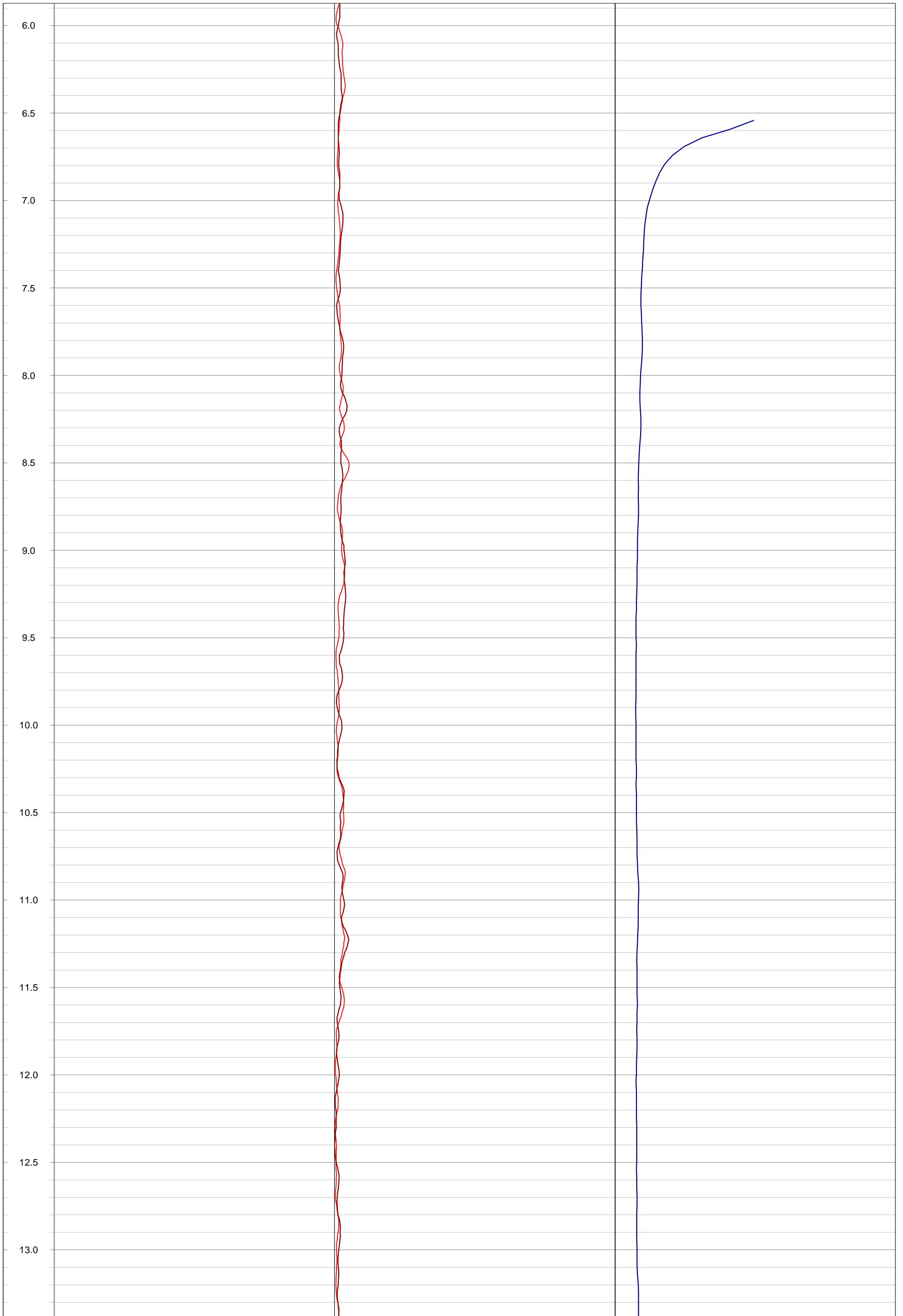
**Geophysical Record of Borehole: MW21-3-4 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

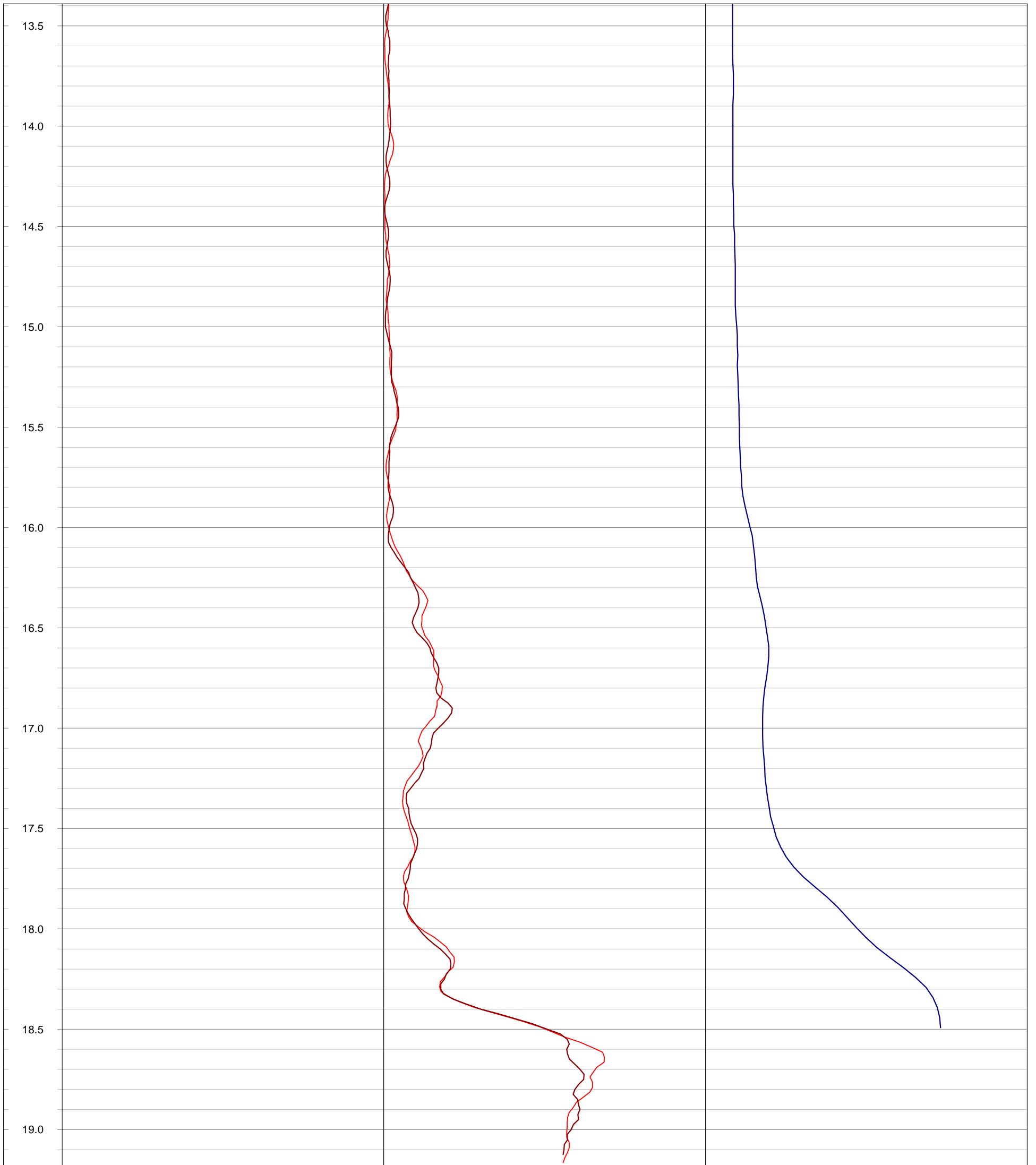
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.94 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577837.91 m	<b>Drilled Depth:</b> 19.20 m bgs	<b>Water Level:</b> 5.25 m bgs	<b>Log Date:</b> Mar-31-2021
<b>Northing:</b> 4852827.25 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 403.16 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.27 m ags	

**Notes:**











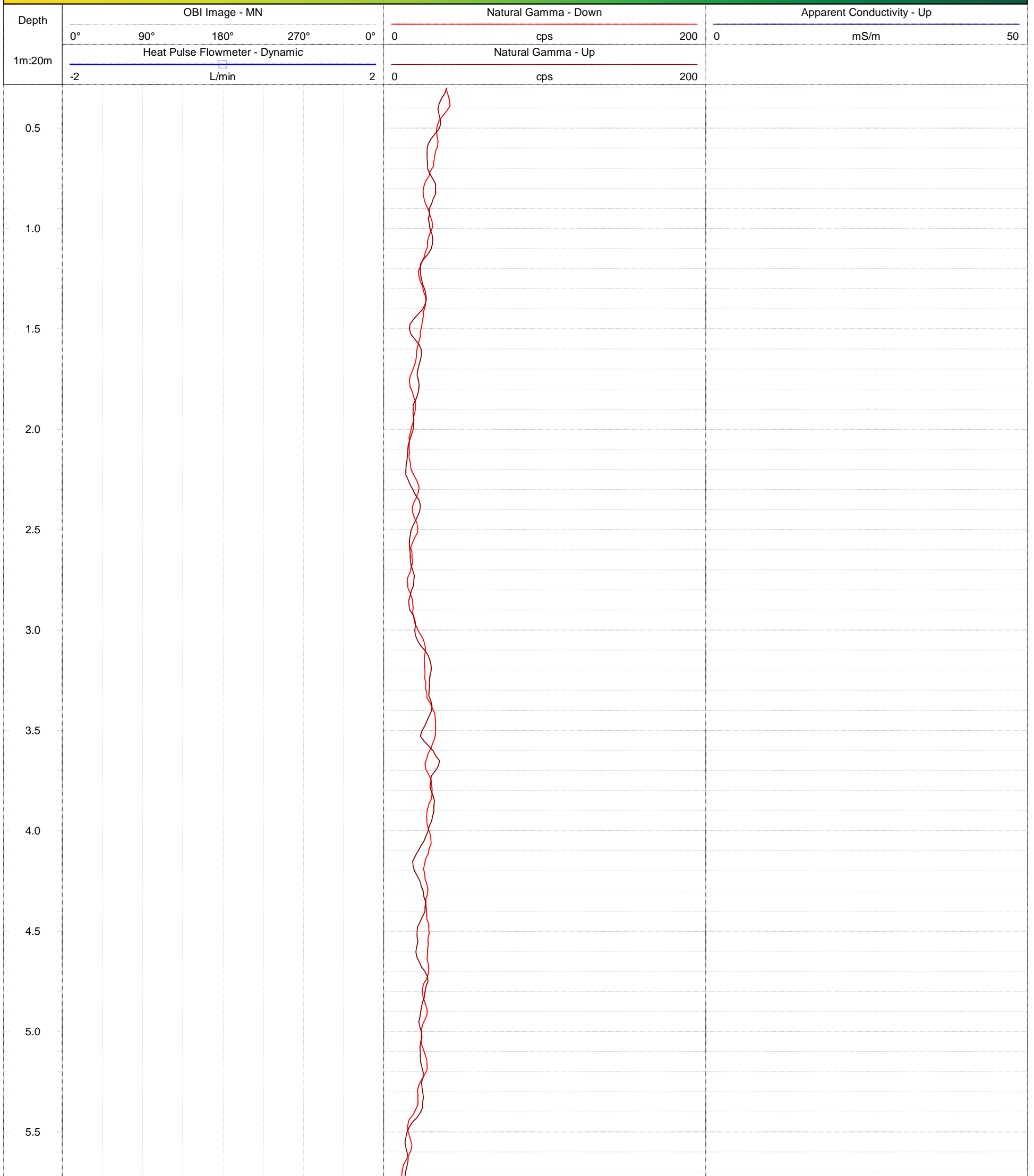
**GOLDER**  
MEMBER OF WSP

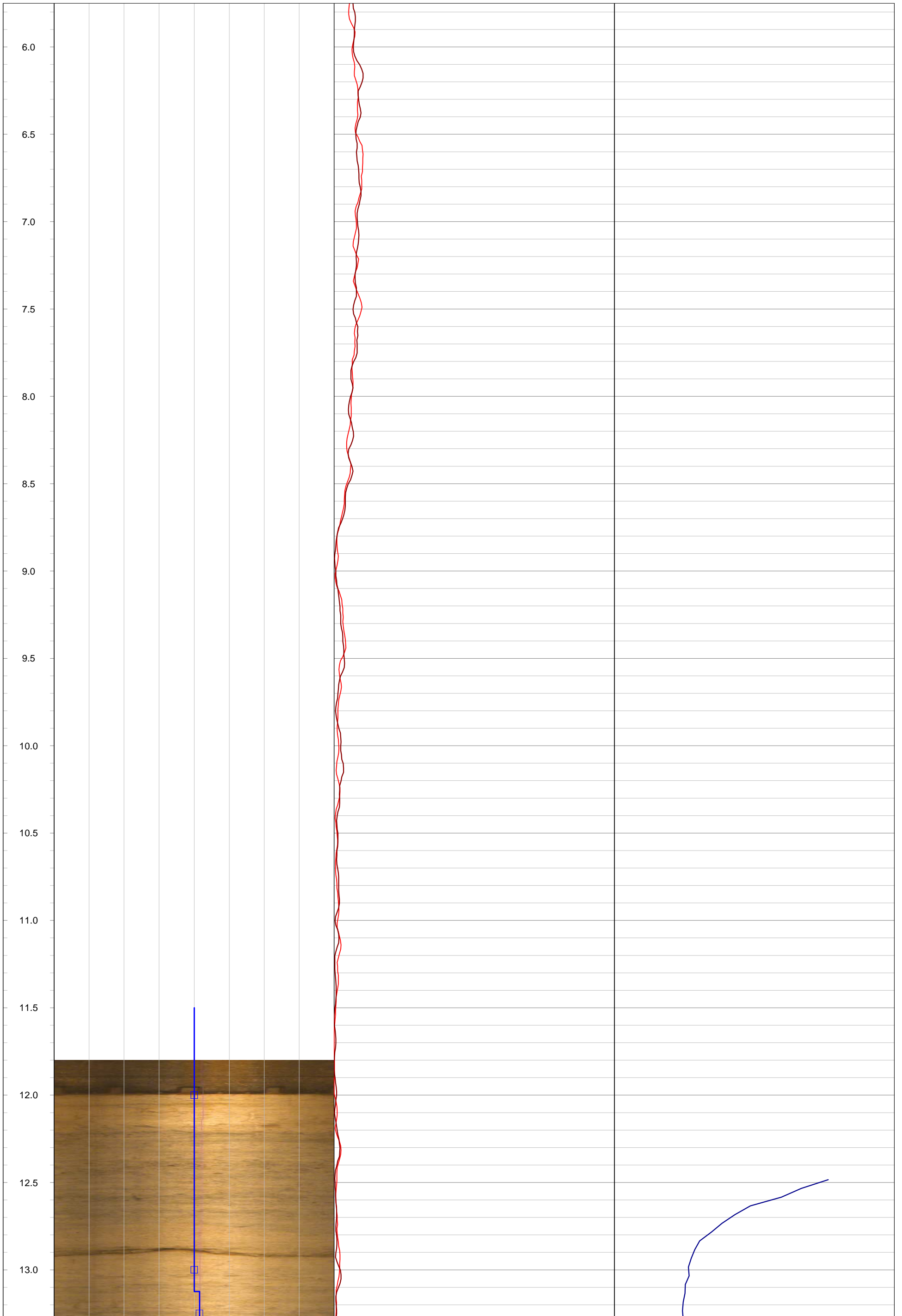
**Geophysical Record of Borehole: MW21-4-1 (CAL)**

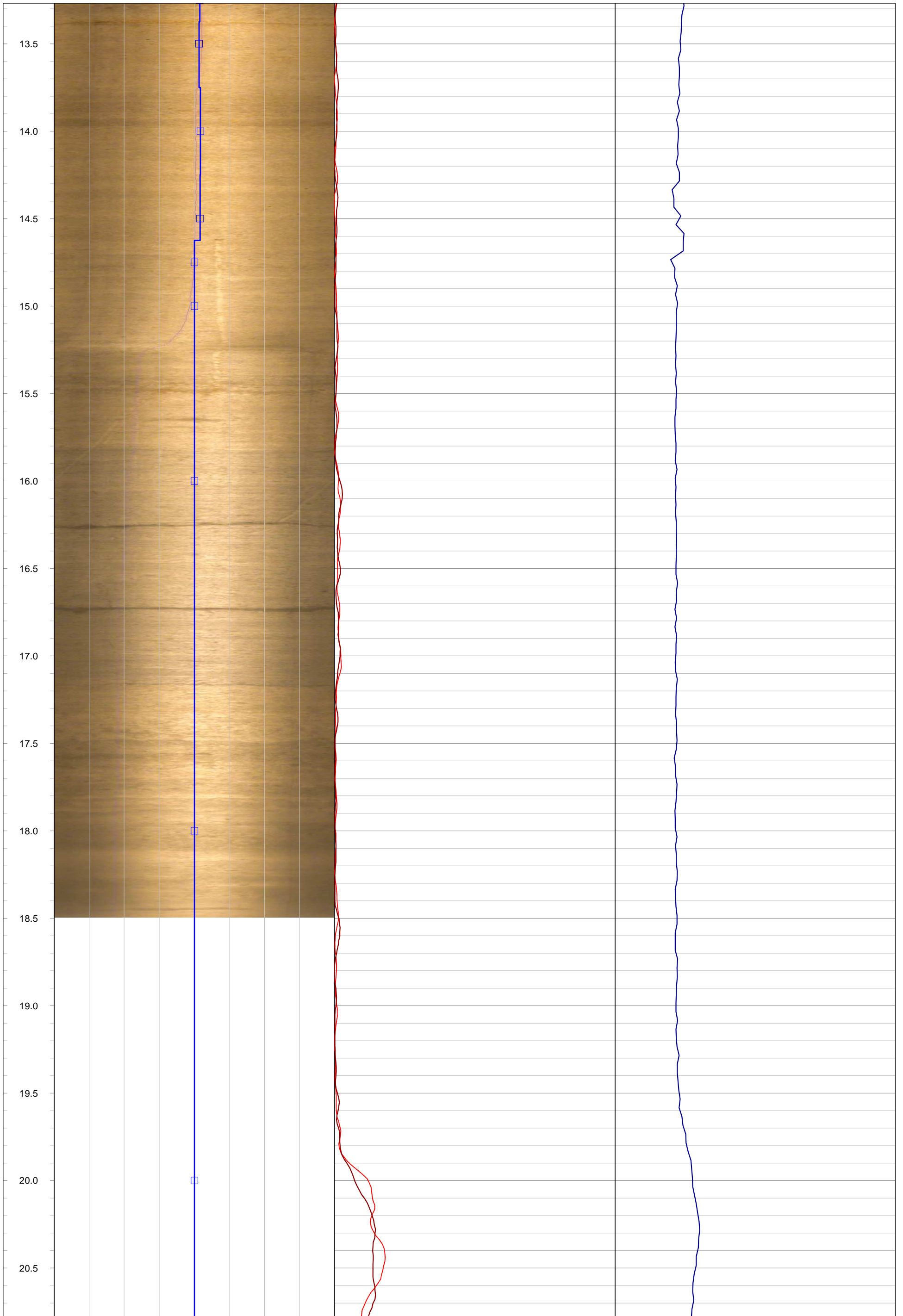
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 11.98 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577793.12 m	<b>Drilled Depth:</b> 23.77 m bgs	<b>Water Level:</b> 9.13 m bgs	<b>Log Date:</b> Mar-23-2021
<b>Northing:</b> 4854211.47 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 415.22 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.37 m ags	

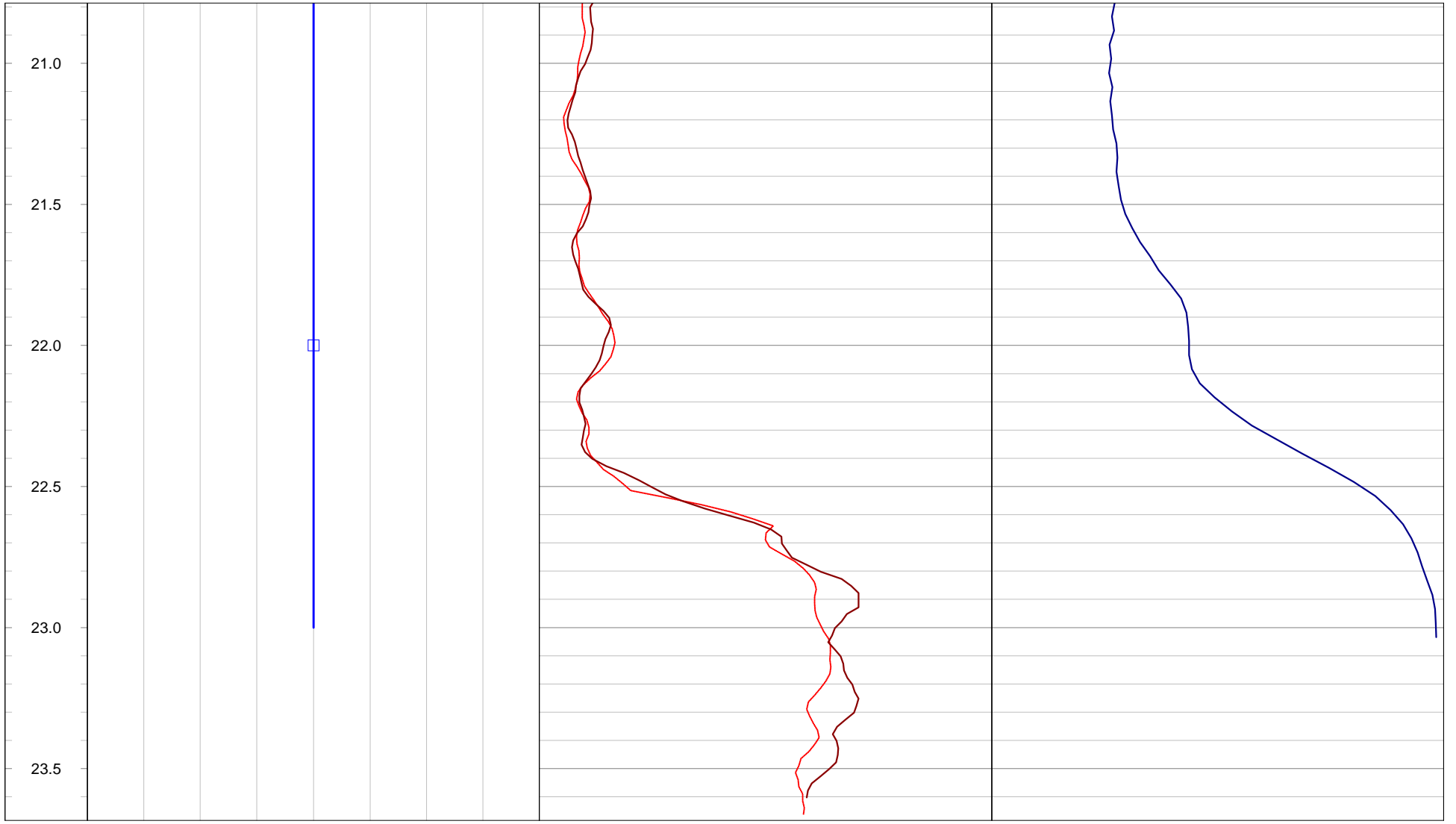
**Notes:** Image opaque > 18.60 m bgs. Heat Pulse Flowmeter Dynamic pump between 10.8/ 11.8 m below top of collar. Pump rate adjusted between 3 L/min. to 0.6 L/min.













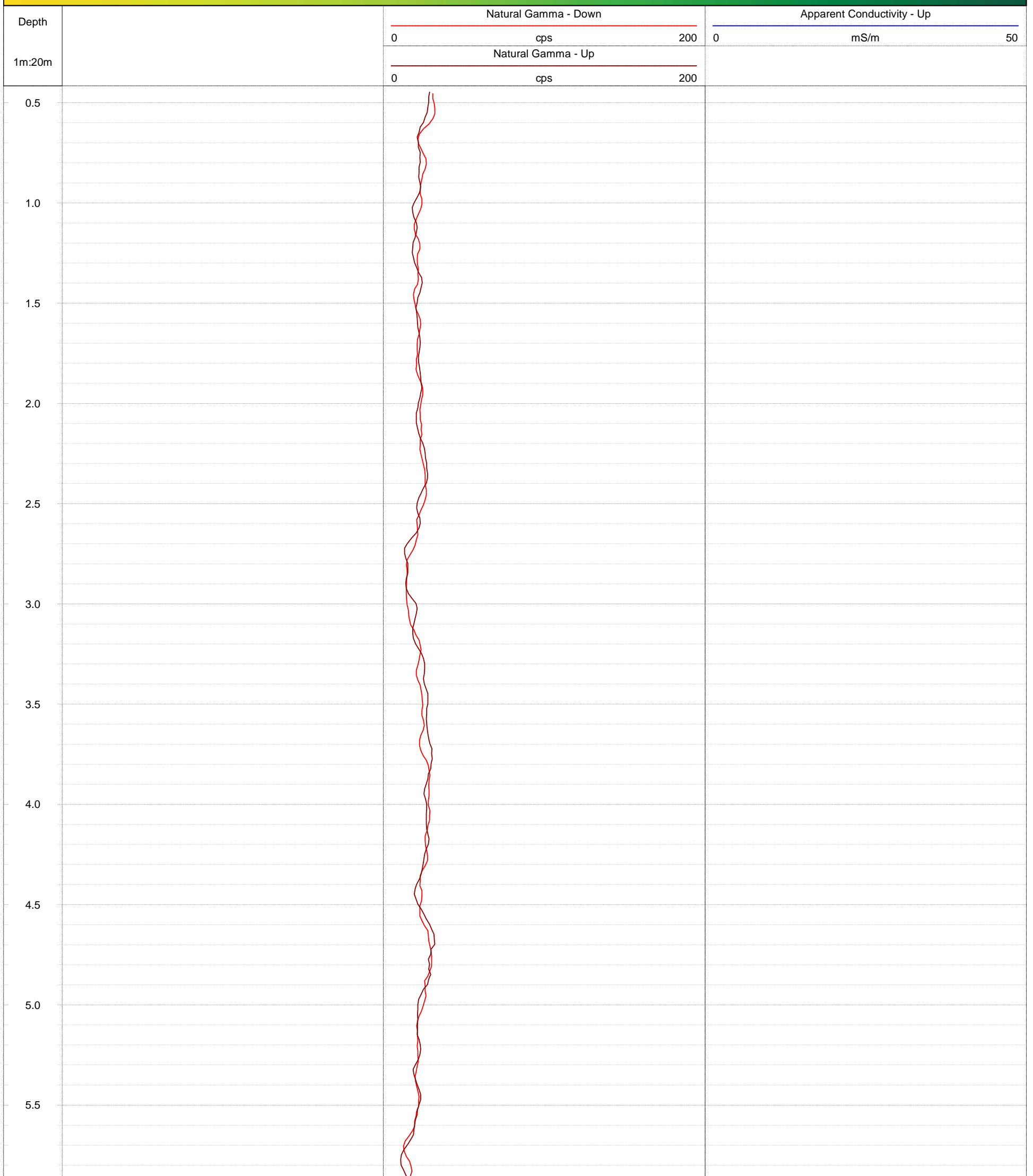
**GOLDER**  
MEMBER OF WSP

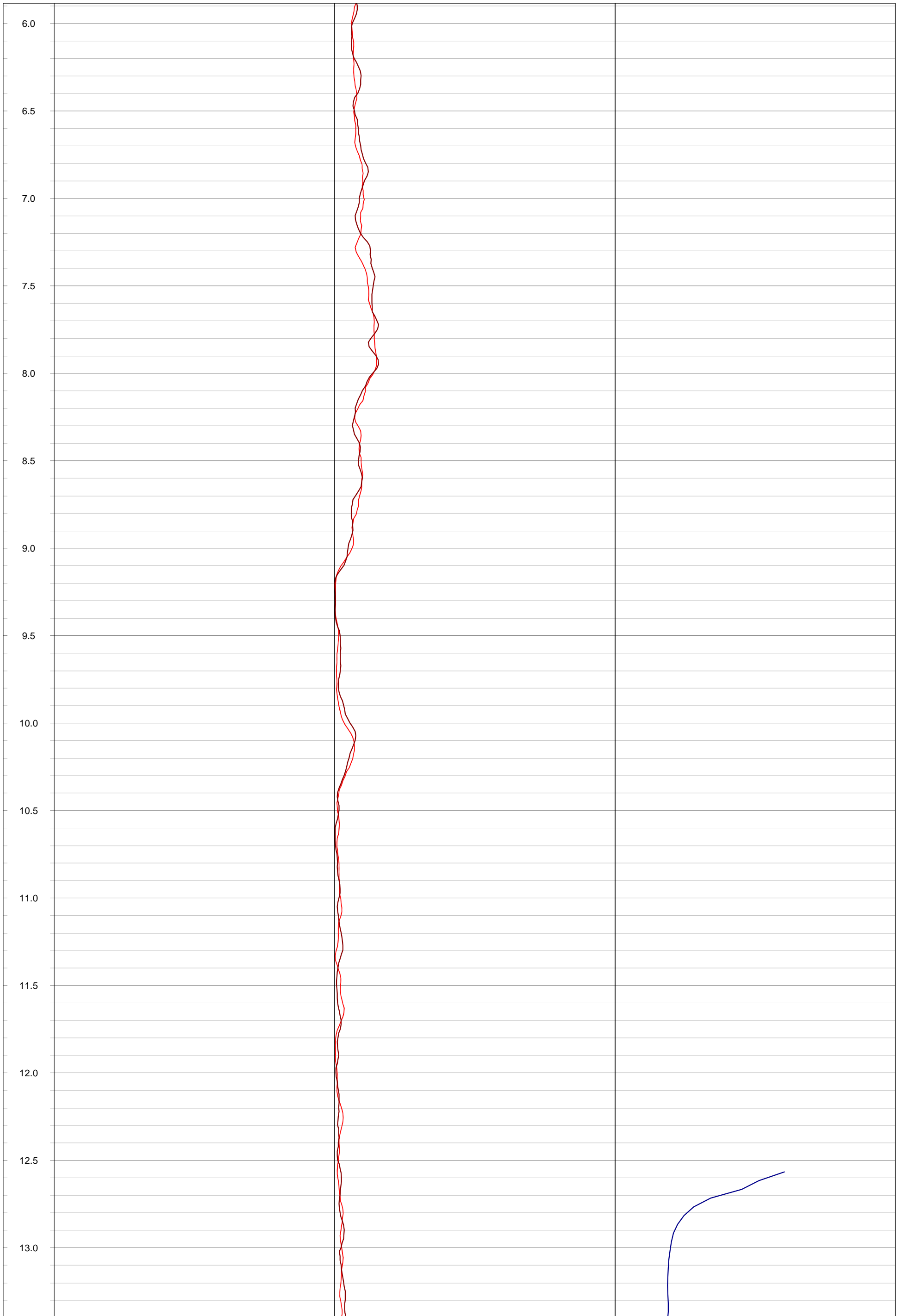
**Geophysical Record of Borehole: MW21-4-2 (CAL)**

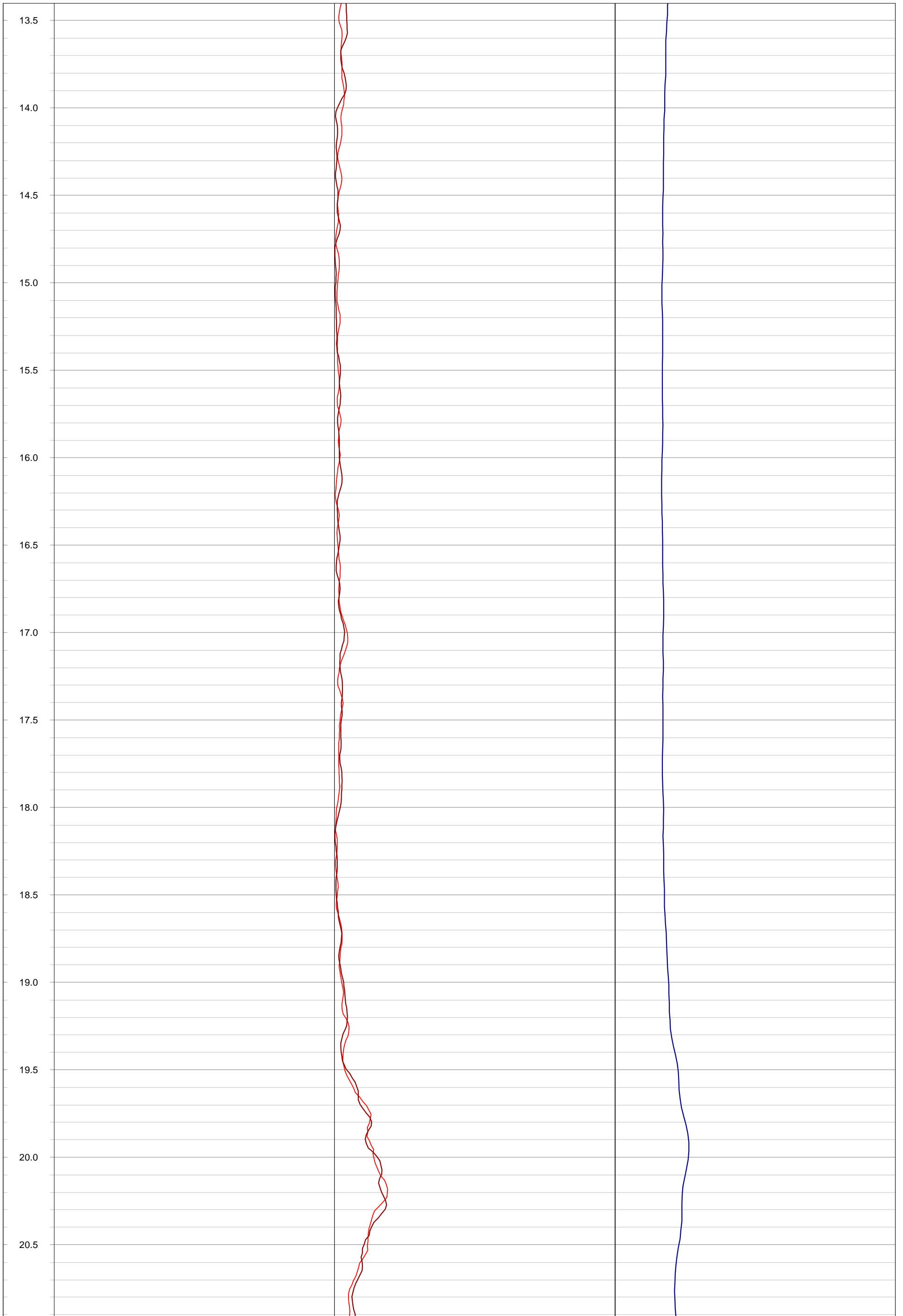
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 11.89 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577790.26 m	<b>Drilled Depth:</b> 23.77 m bgs	<b>Water Level:</b> 7.92 m bgs	<b>Log Date:</b> Mar-23-2021
<b>Northing:</b> 4854247.25 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 415.07 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.24 m ags	

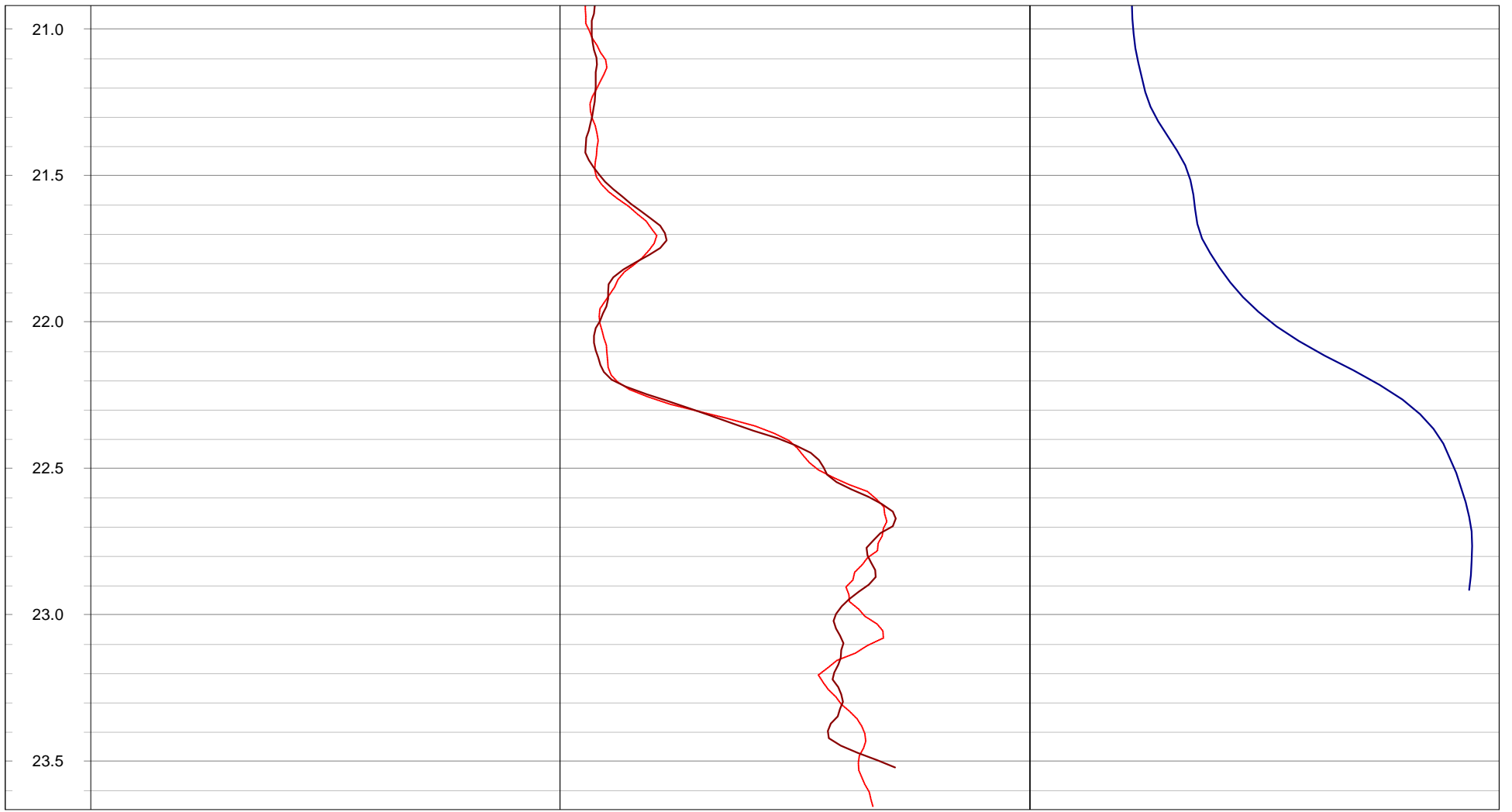
**Notes:**













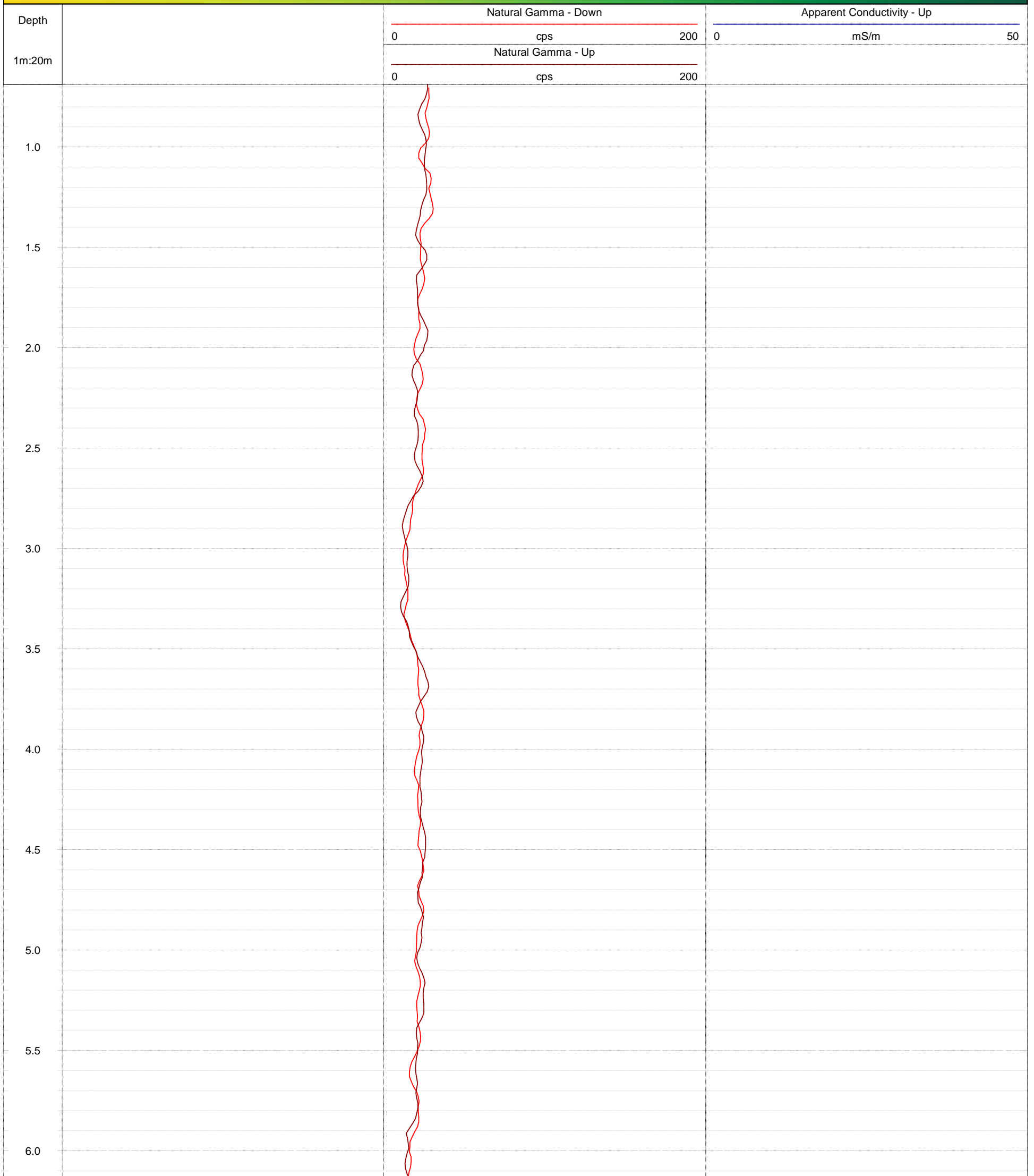
**GOLDER**  
MEMBER OF WSP

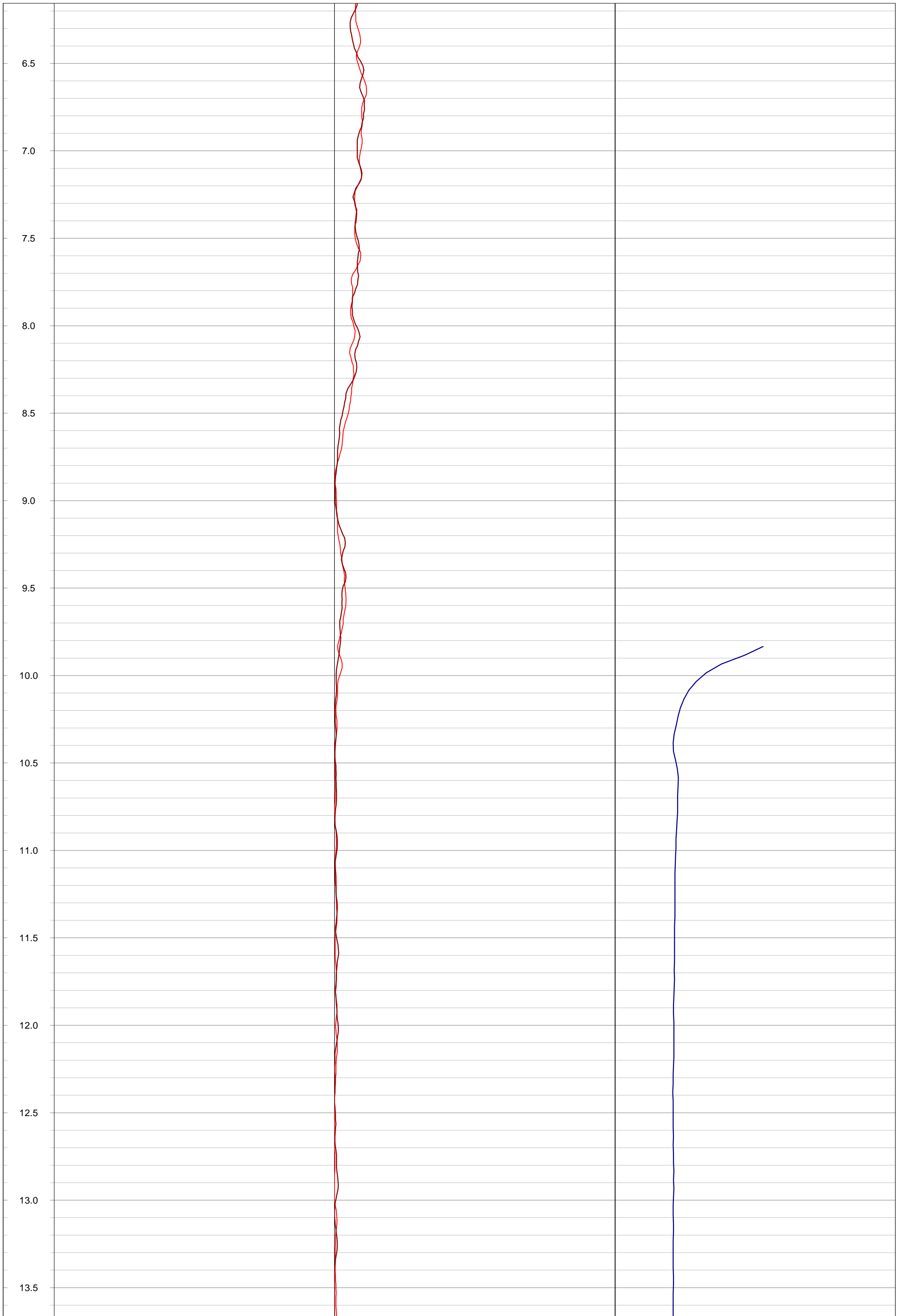
**Geophysical Record of Borehole: MW21-4-3 (CAL)**

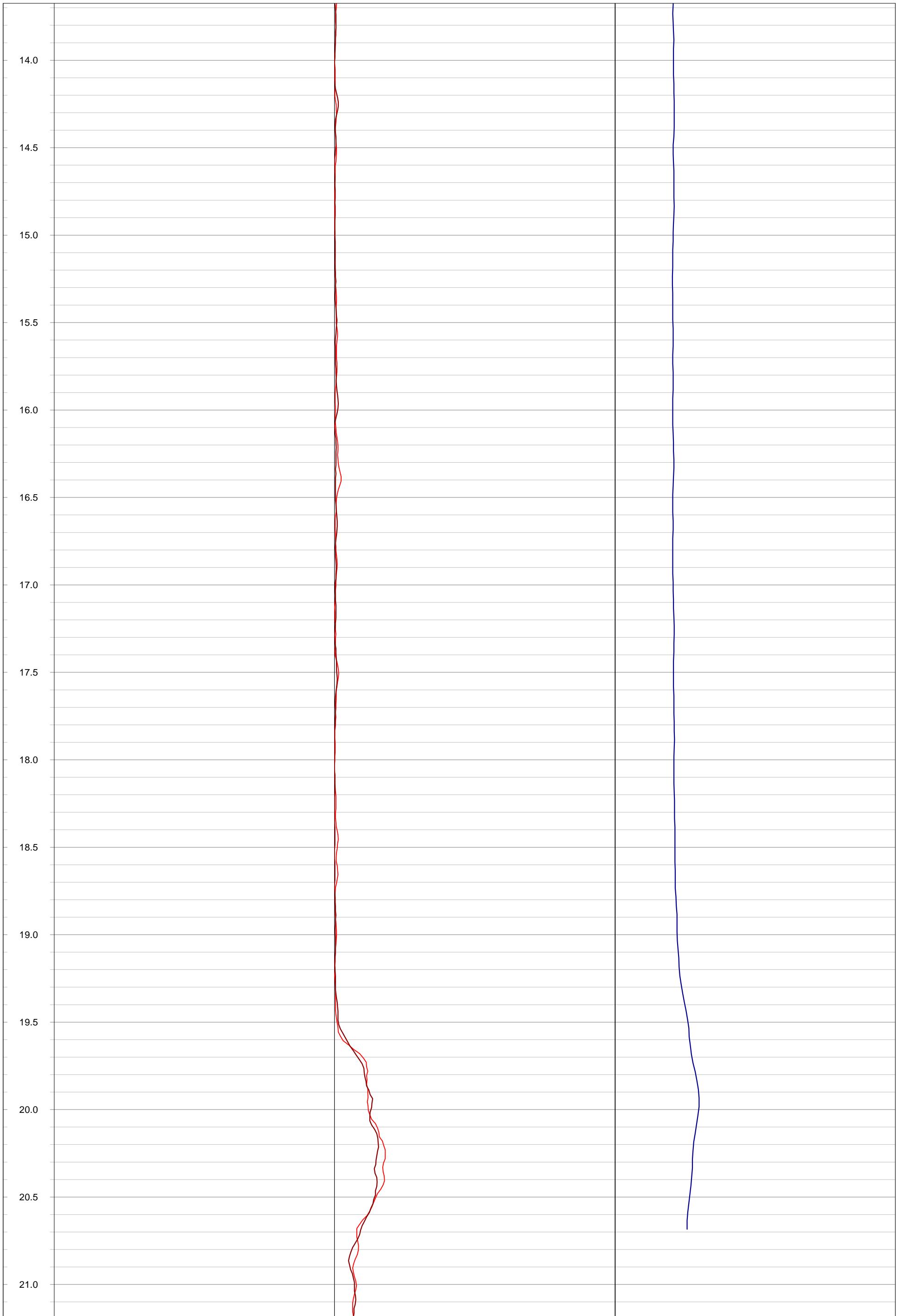
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 9.25 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577813.86 m    **Drilled Depth:** 21.64 m bgs    **Water Level:** n/a    **Log Date:** Mar-24-2021  
**Northing:** 4854182.83 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 414.78 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.05 m ags

**Notes:**









21.5			



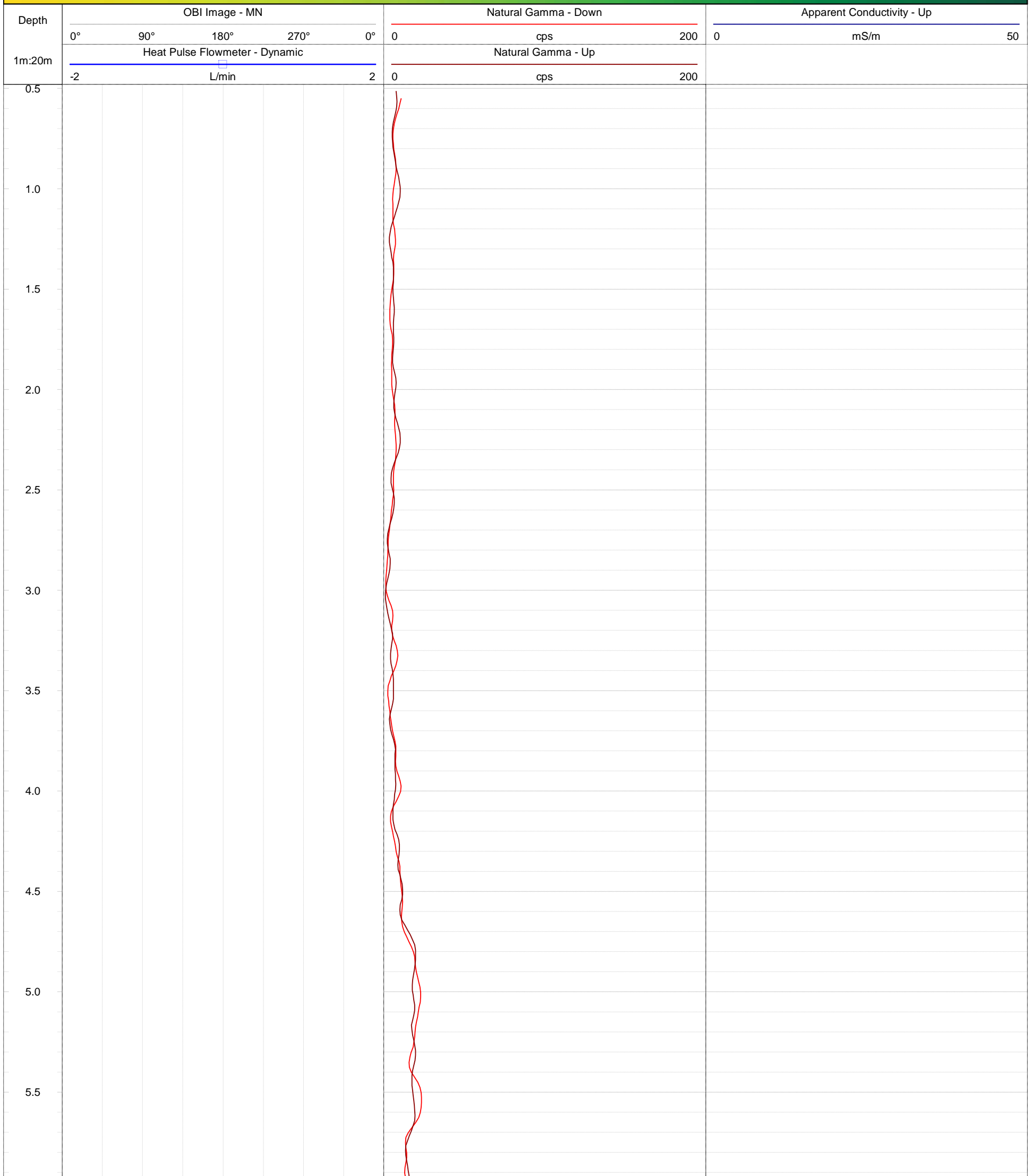
**GOLDER**  
MEMBER OF WSP

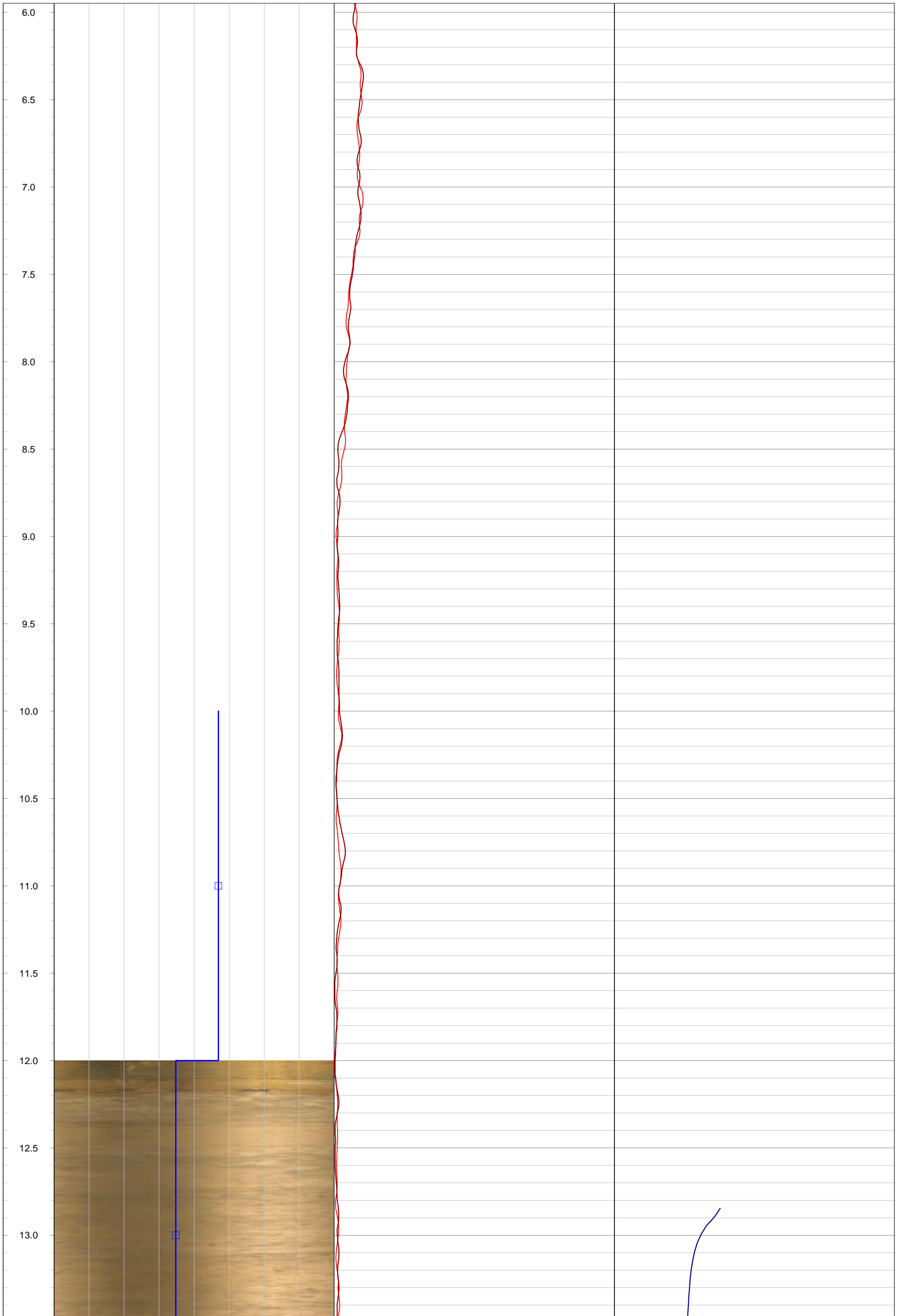
**Geophysical Record of Borehole: PW21-1 (CAL)**

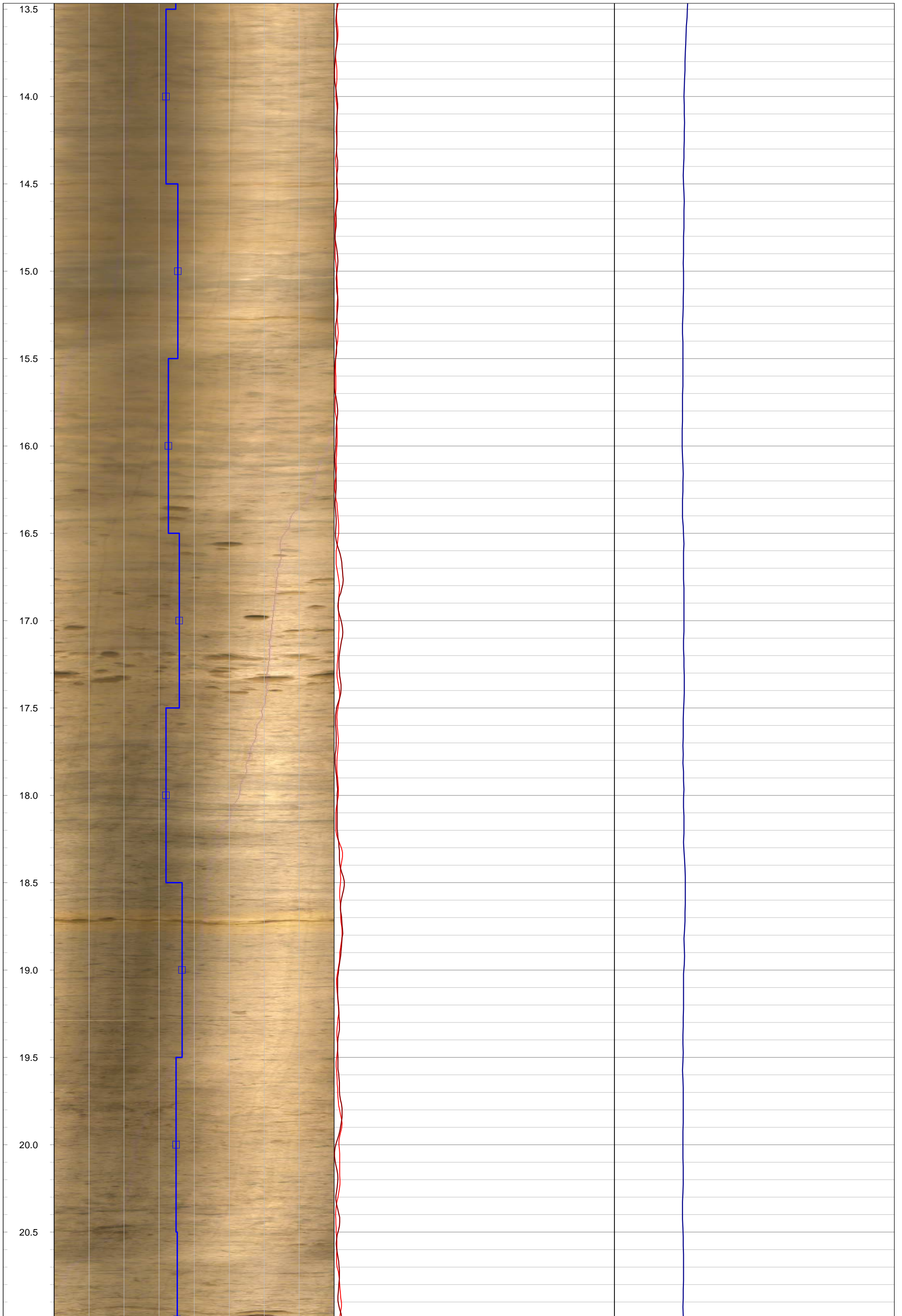
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.19 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576890.23 m    **Drilled Depth:** 38.41 m bgs    **Water Level:** 1.50 m bgs    **Log Date:** Mar-9-2021  
**Northing:** 4853478.69 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 418.76 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.18 m ags

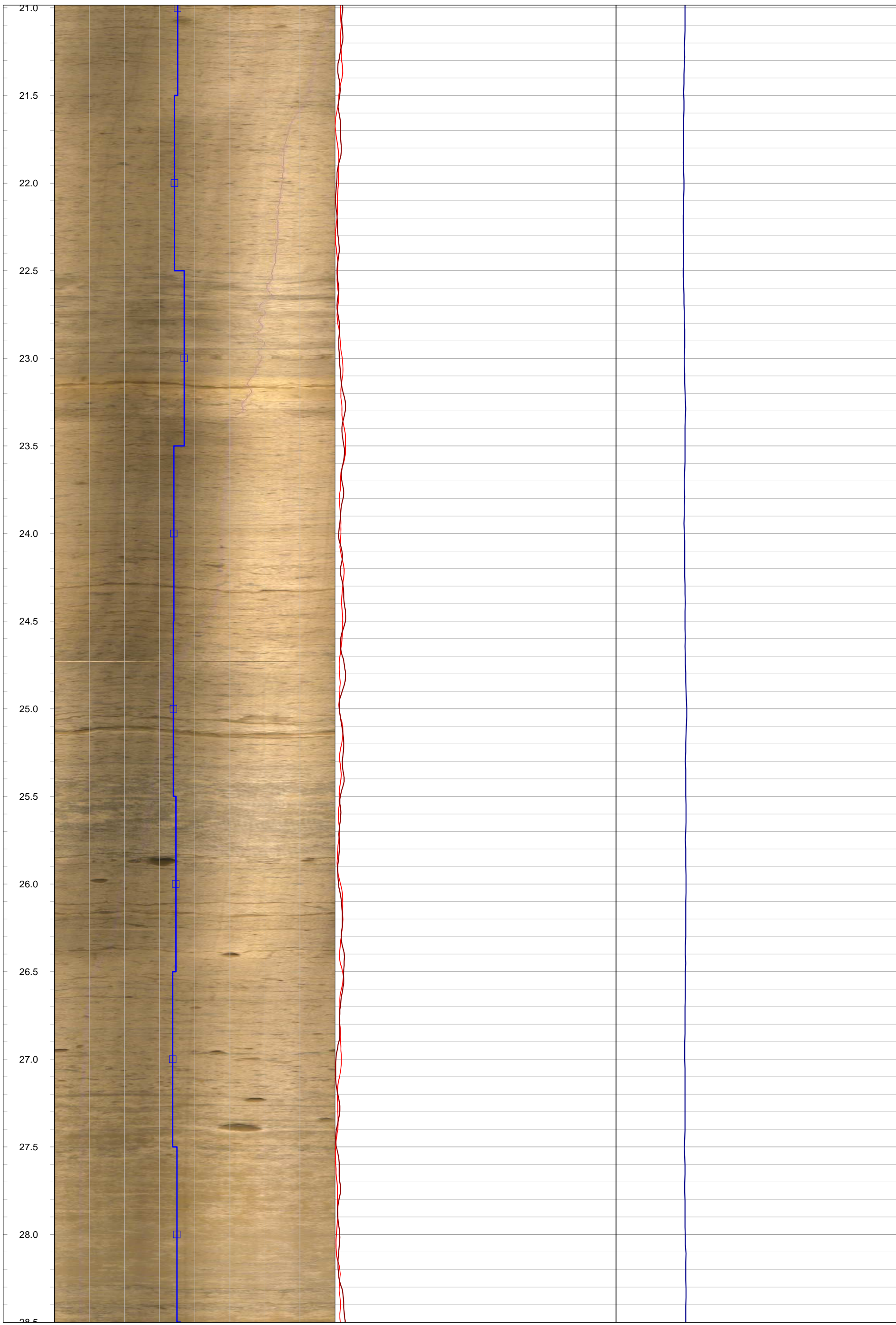
**Notes:** OBI image opaque > 32 m bgs. Heat Pulse Flowmeter Dynamic pump at 10 m below top of collar. Pump rate approx. 4 L/min.

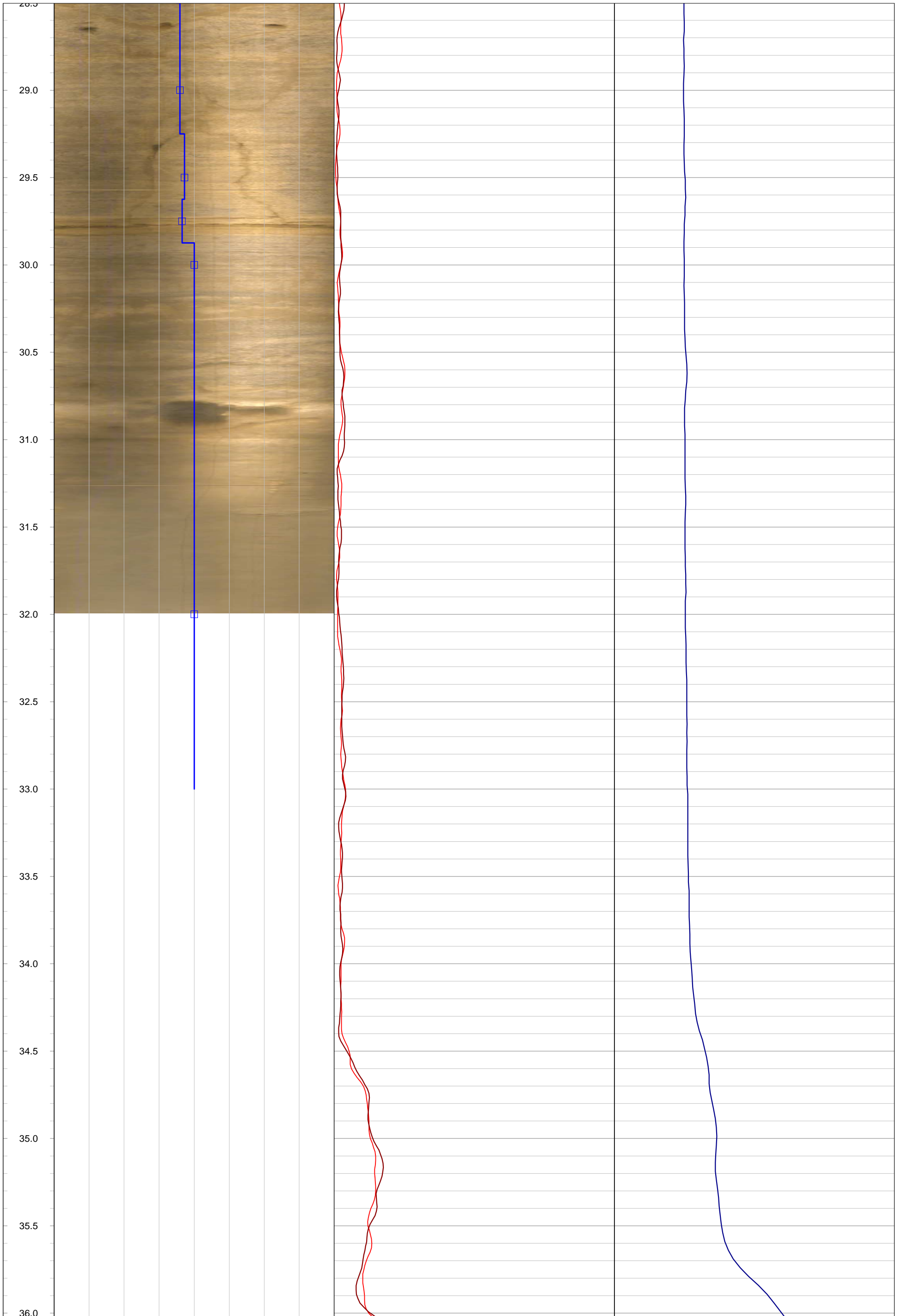


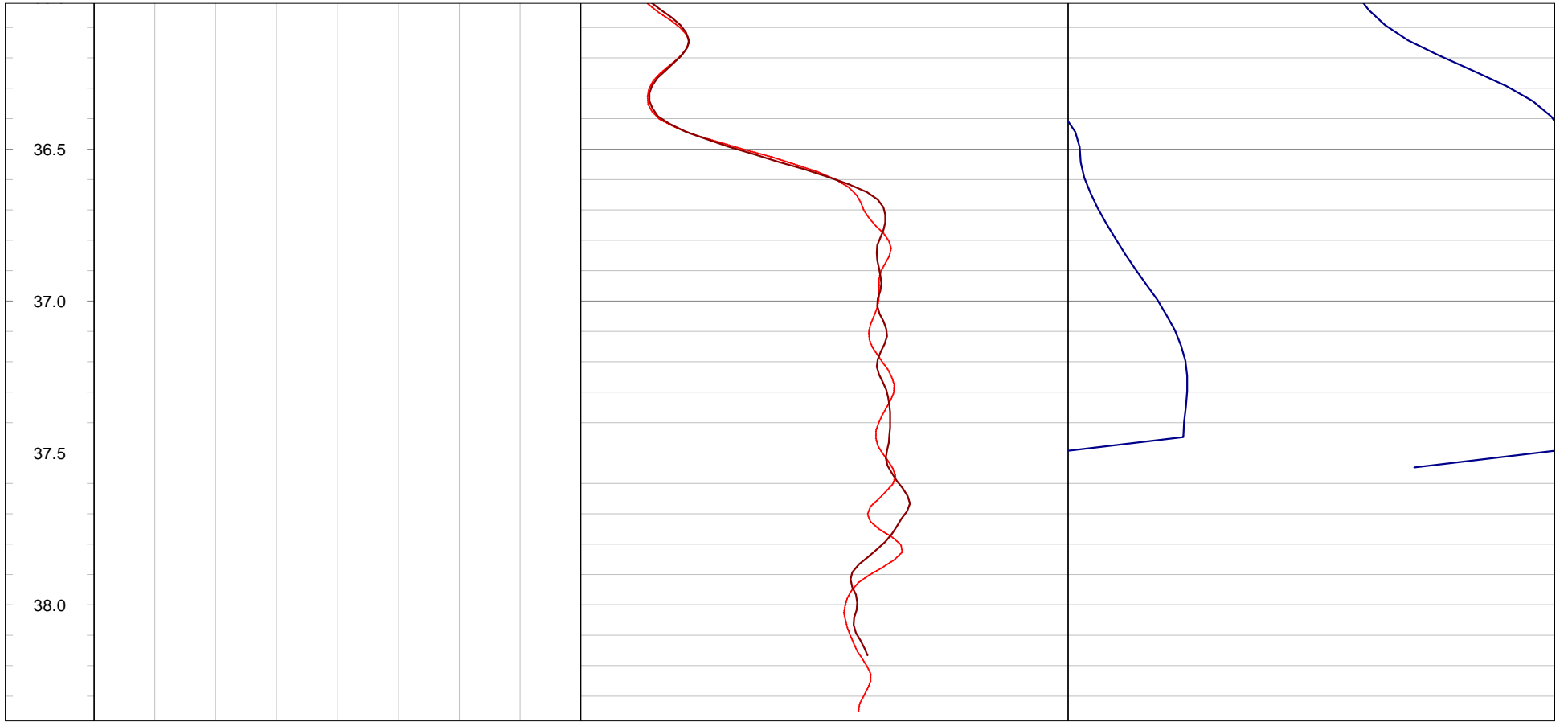














**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: PW21-2 (CAL)**

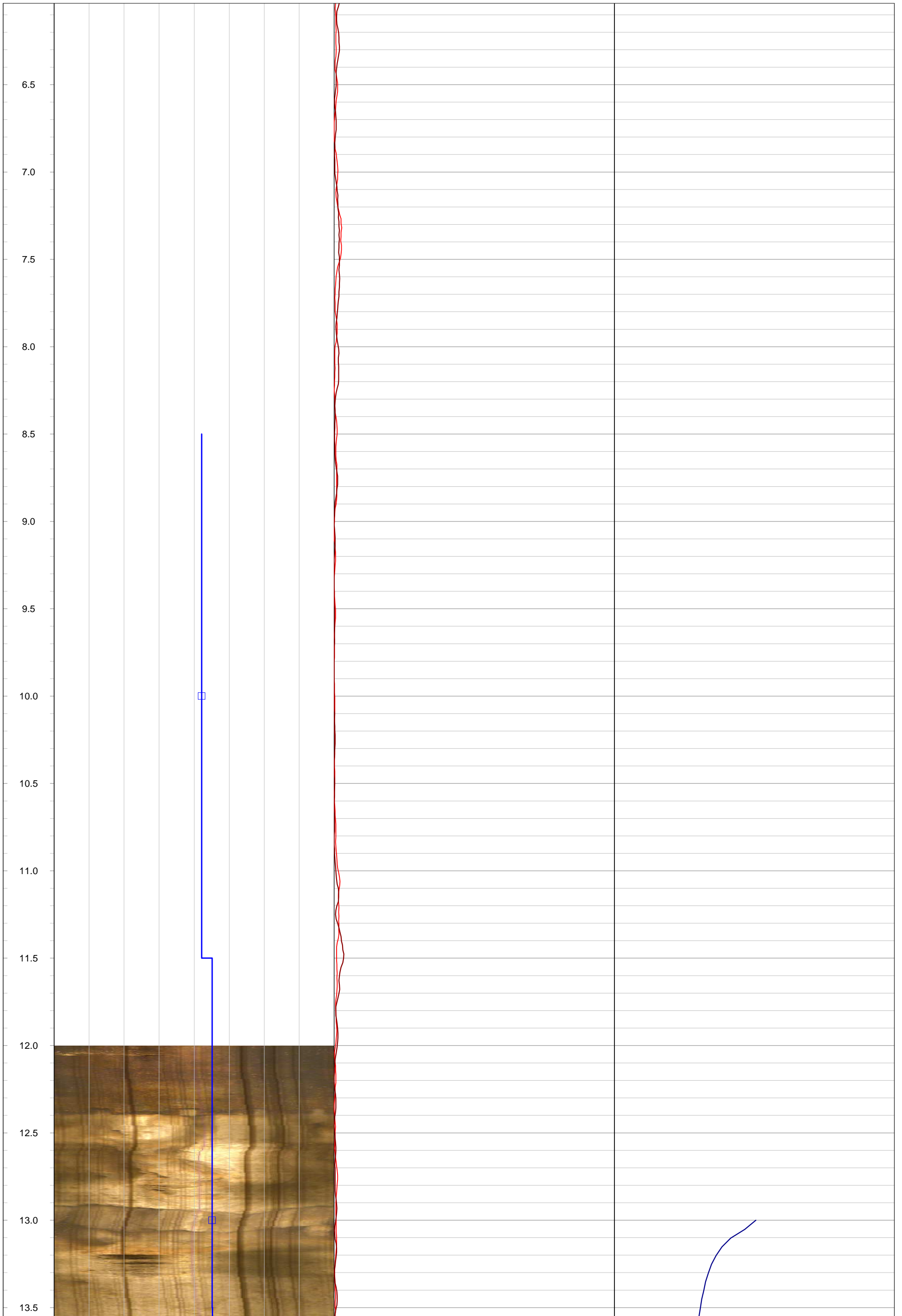
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

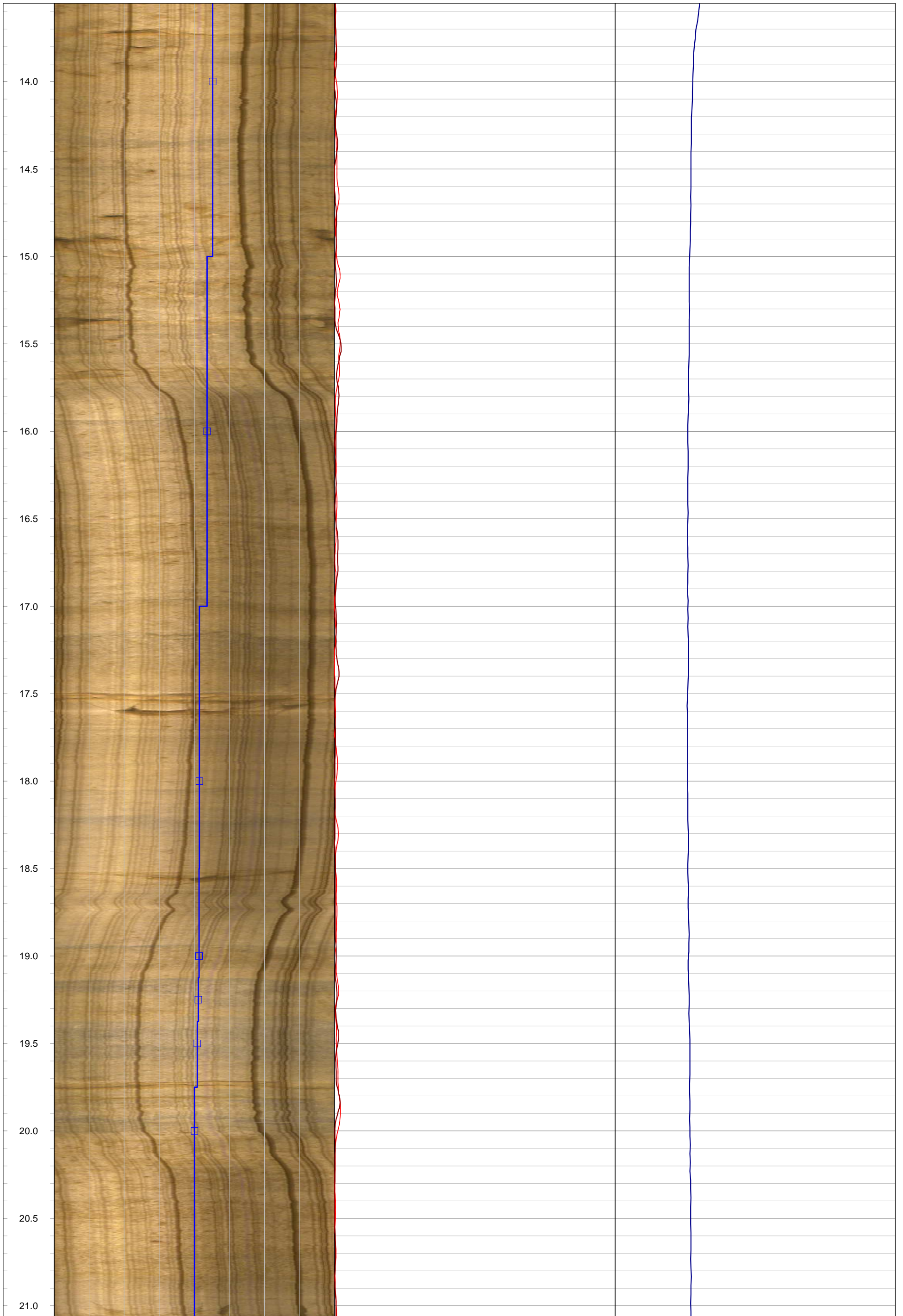
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.19 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577286.29 m    **Drilled Depth:** 25.15 m bgs    **Water Level:** 4.60 m bgs    **Log Date:** Mar-18-2021  
**Northing:** 4854027.50 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 413.07 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.11 m ags

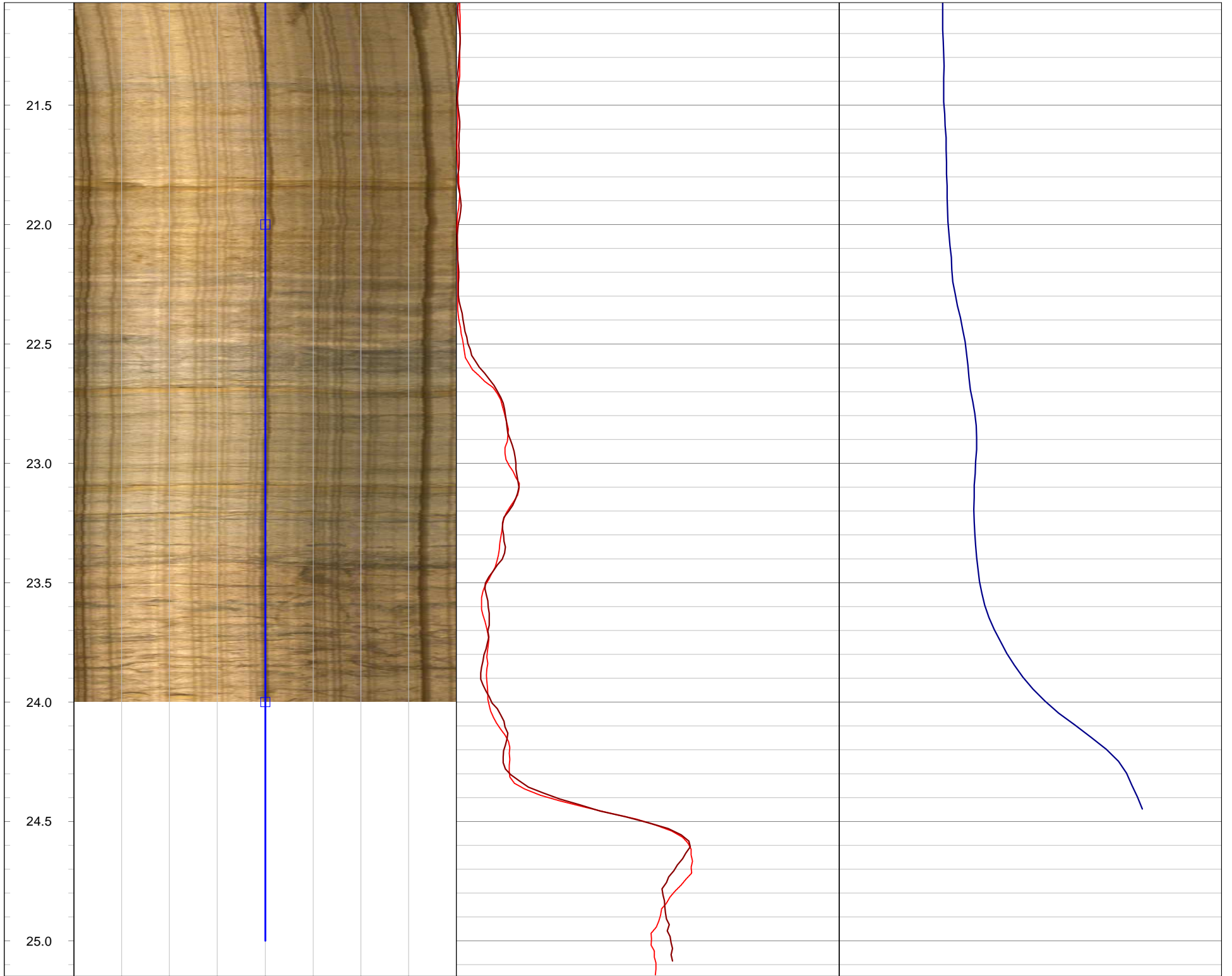
**Notes:** Heat Pulse Flowmeter Dynamic pump at 6 m below top of collar. Pump rate approx. 4 L/min.

Depth	OBI Image - MN					Natural Gamma - Down		Apparent Conductivity - Up	
	0°	90°	180°	270°	0°	0	200	0	50
1m:20m	Heat Pulse Flowmeter - Dynamic					Natural Gamma - Up			
	-2		L/min		2	0	200		
1.0									
1.5									
2.0									
2.5									
3.0									
3.5									
4.0									
4.5									
5.0									
5.5									
6.0									











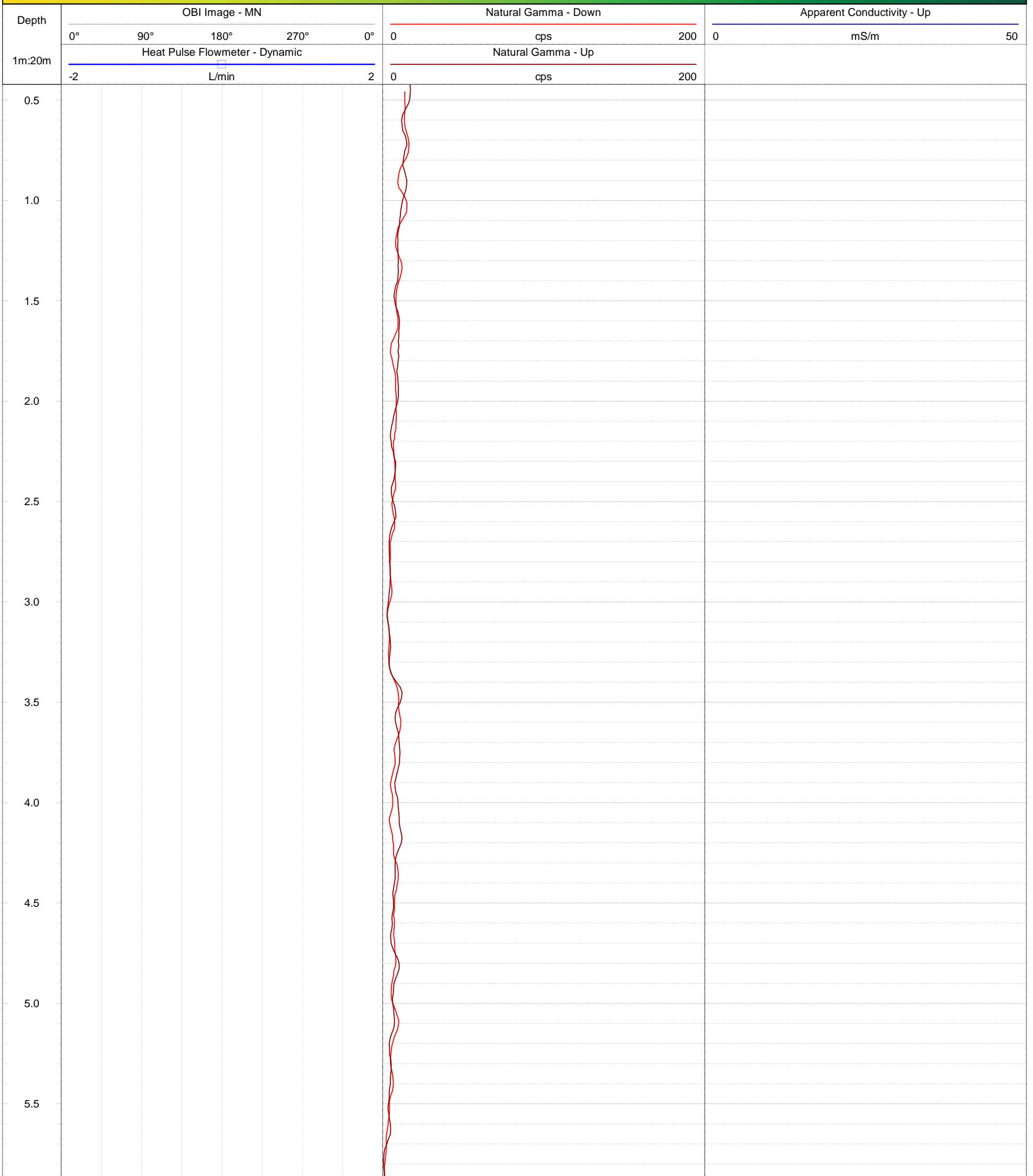
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: PW21-3 (CAL)**

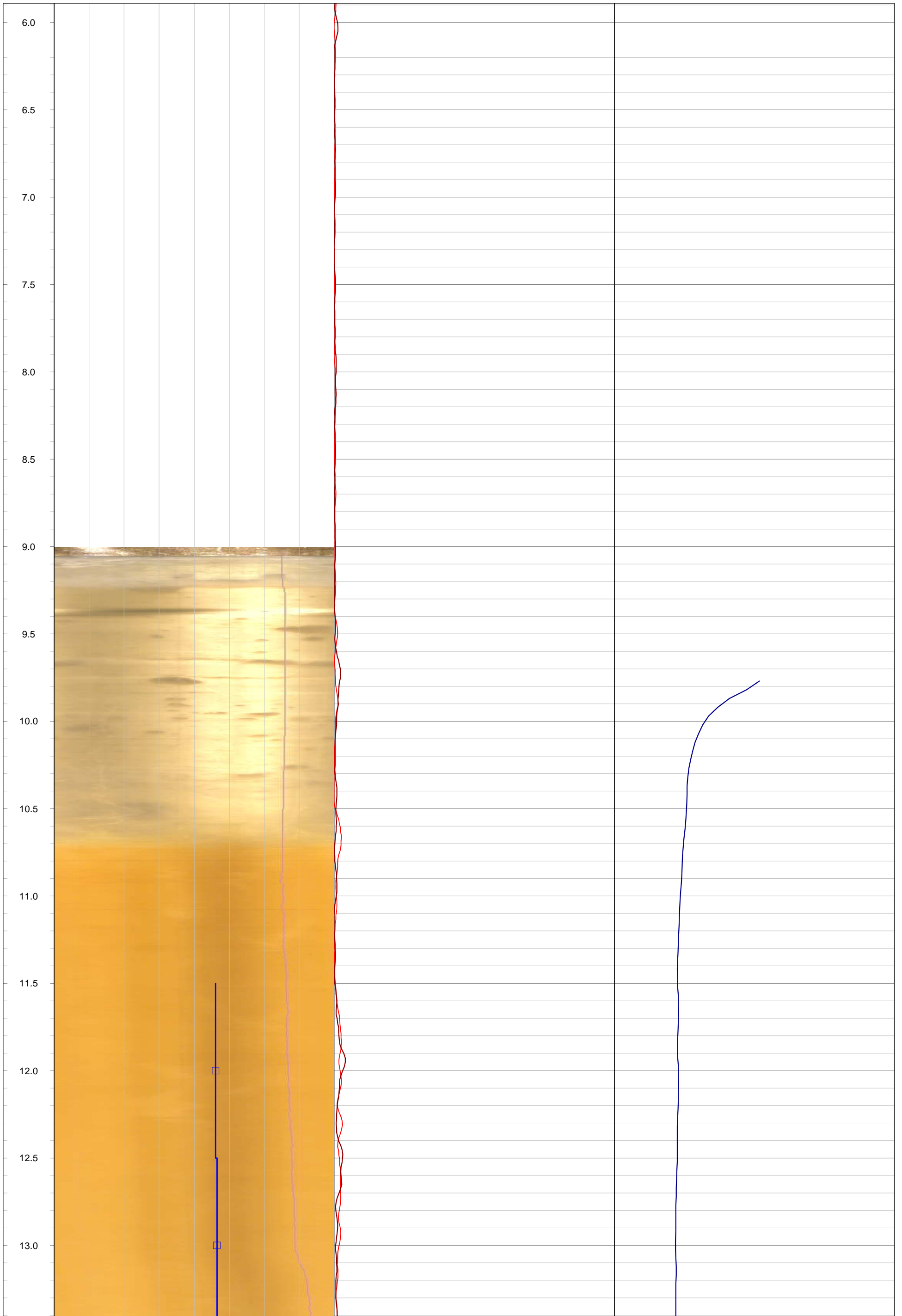
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

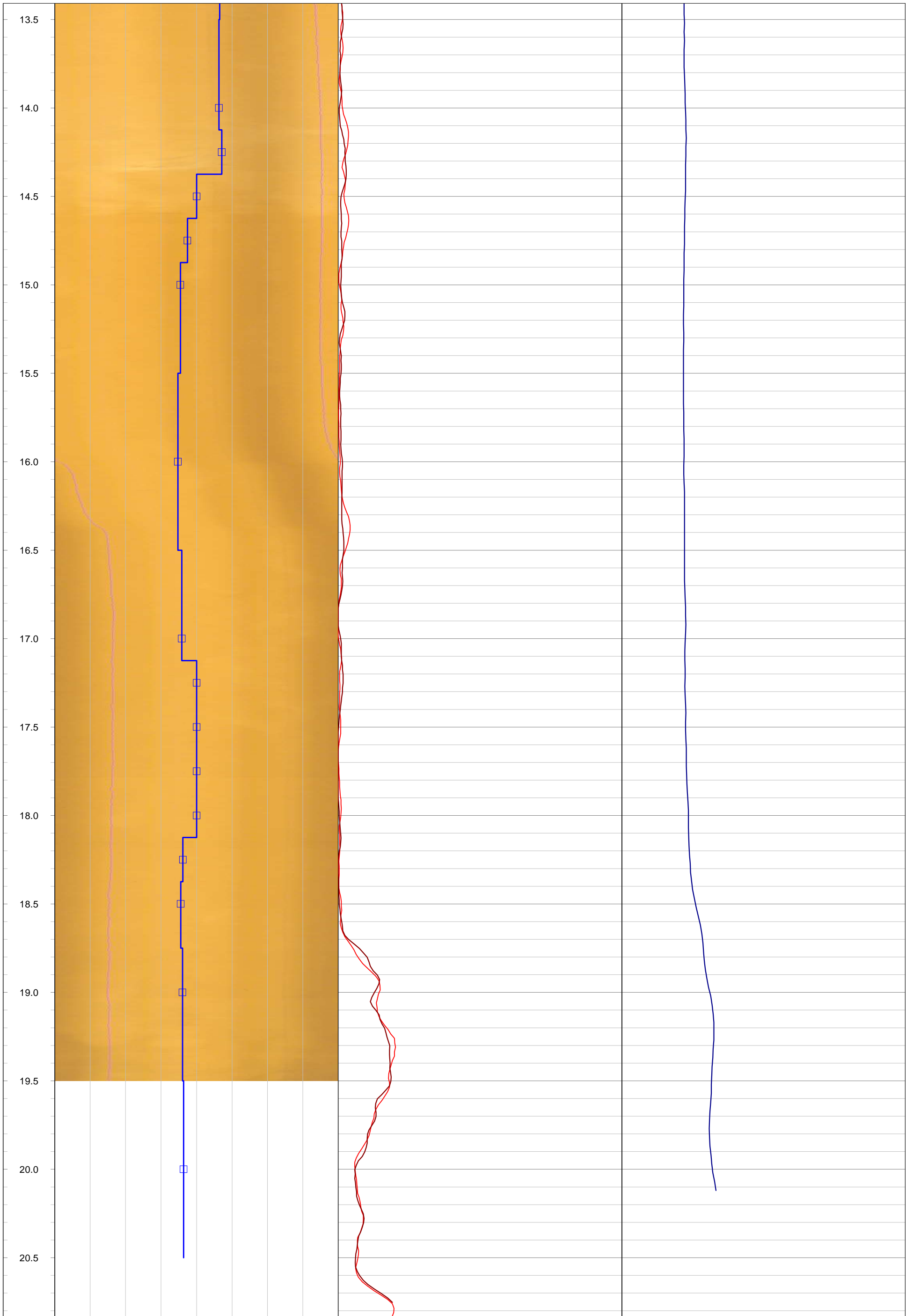
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 9.20 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577875.55 m    **Drilled Depth:** 21.34 m bgs    **Water Level:** 8.99 m bgs    **Log Date:** Apr-01-2021  
**Northing:** 4852797.50 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 405.45 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.24 m ags

**Notes:** Image orange (rust?) 10.7 to 19.5 m bgs, opaque > 19.6 m bgs. Heat Pulse Flowmeter Dynamic pump at 11 m below top of collar. Pump rate approx. 1.7 L/min.











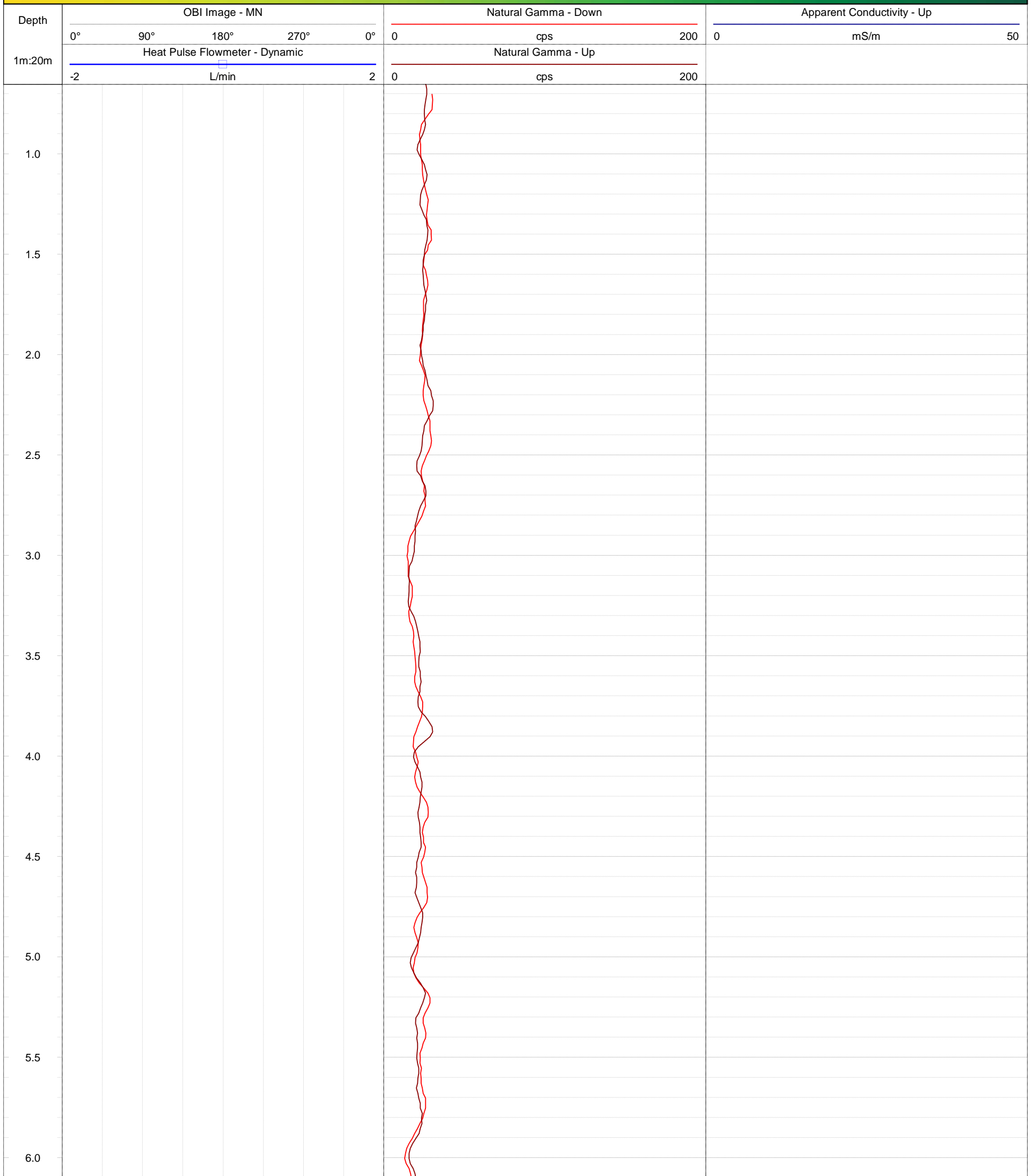
**GOLDER**  
MEMBER OF WSP

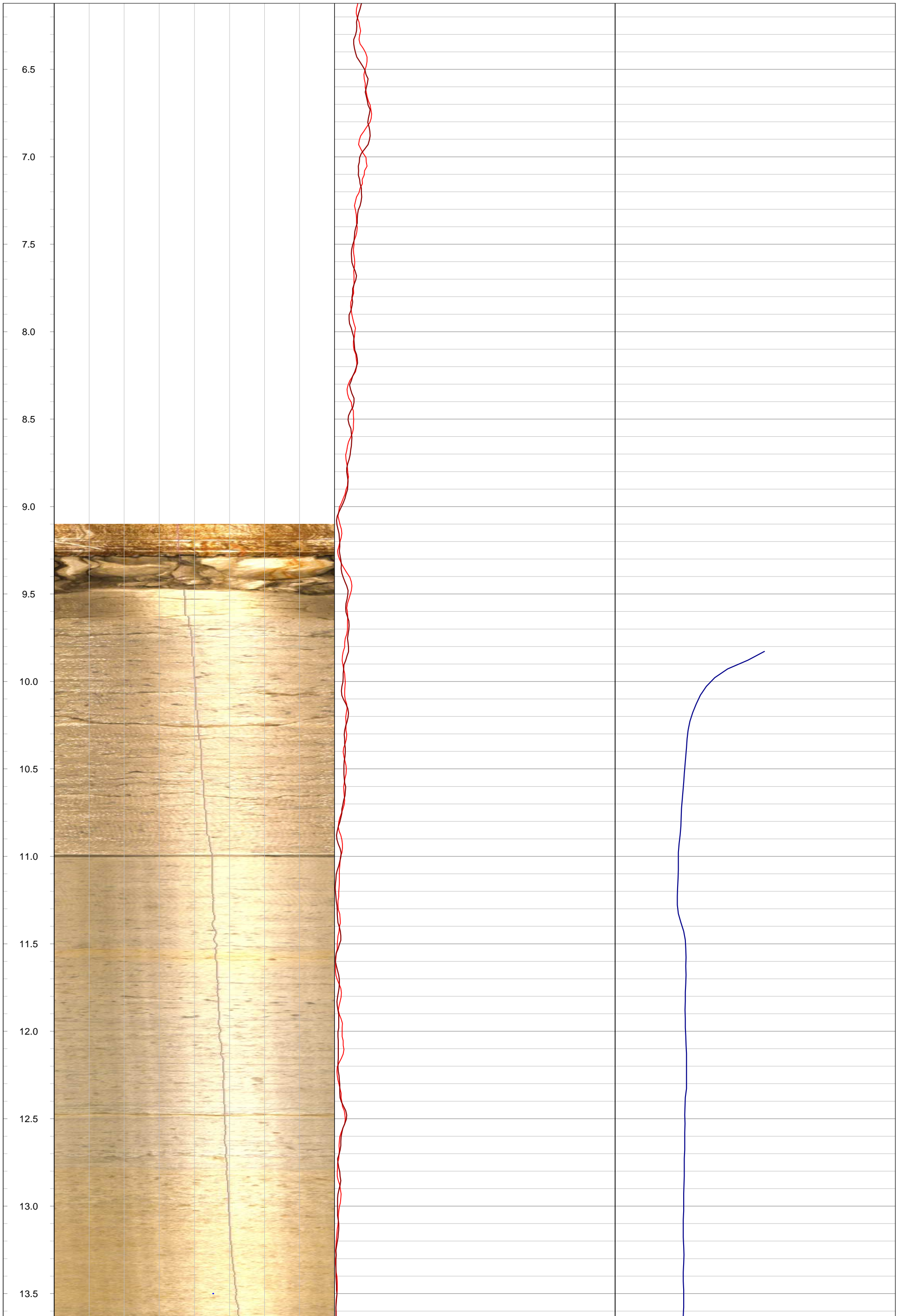
**Geophysical Record of Borehole: PW21-4 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

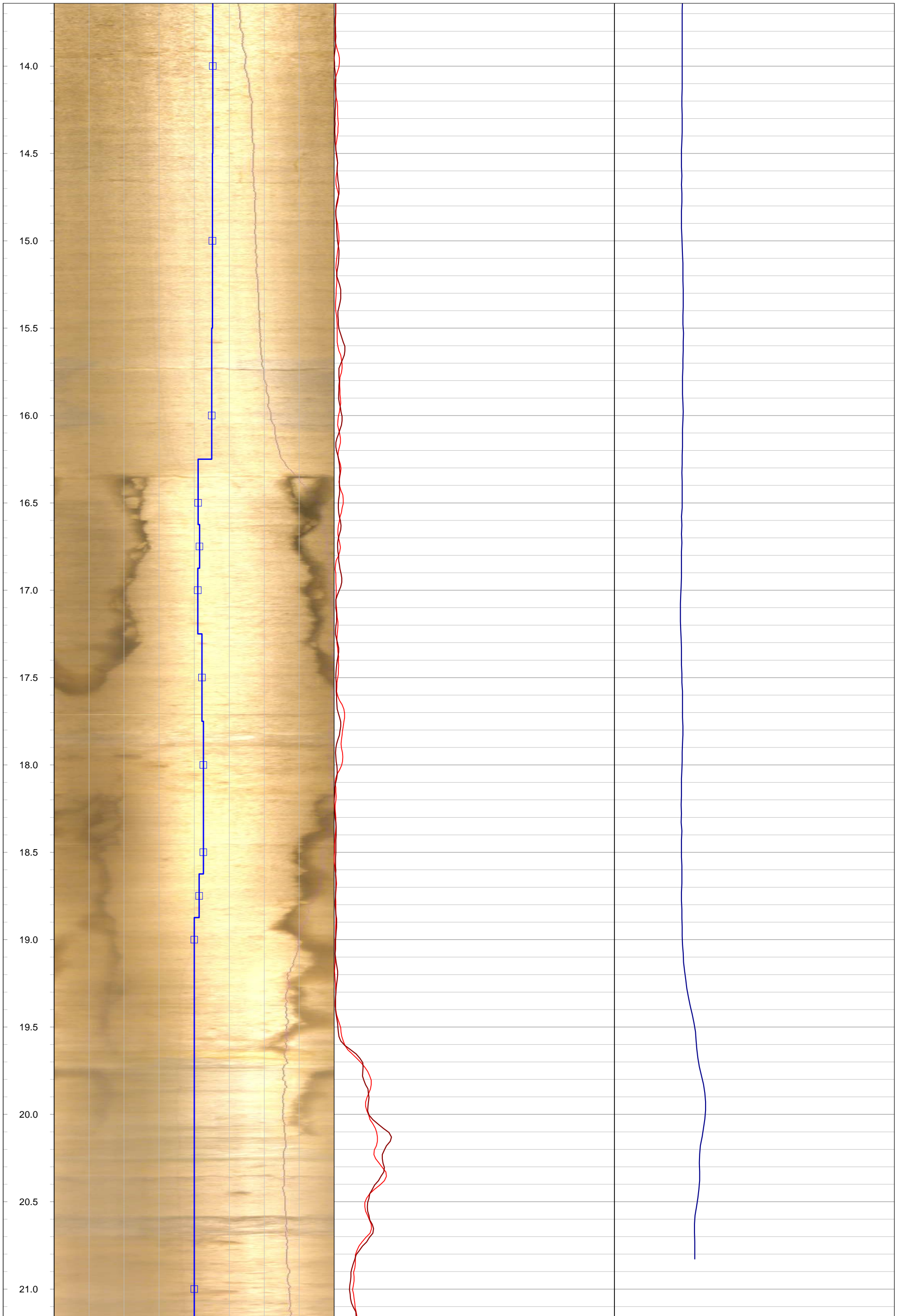
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 9.25 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577802.09 m    **Drilled Depth:** 21.64 m bgs    **Water Level:** 10.95 m bgs    **Log Date:** Mar-24-2021  
**Northing:** 4854214.36 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.08 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.04 m ags


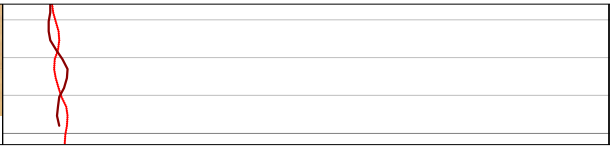
**Notes:** OBI image opaque > 21.5 m bgs. Heat Pulse Flowmeter Dynamic pump at 13 m below top of collar. Pump rate approx. 2L/min.









21.5			
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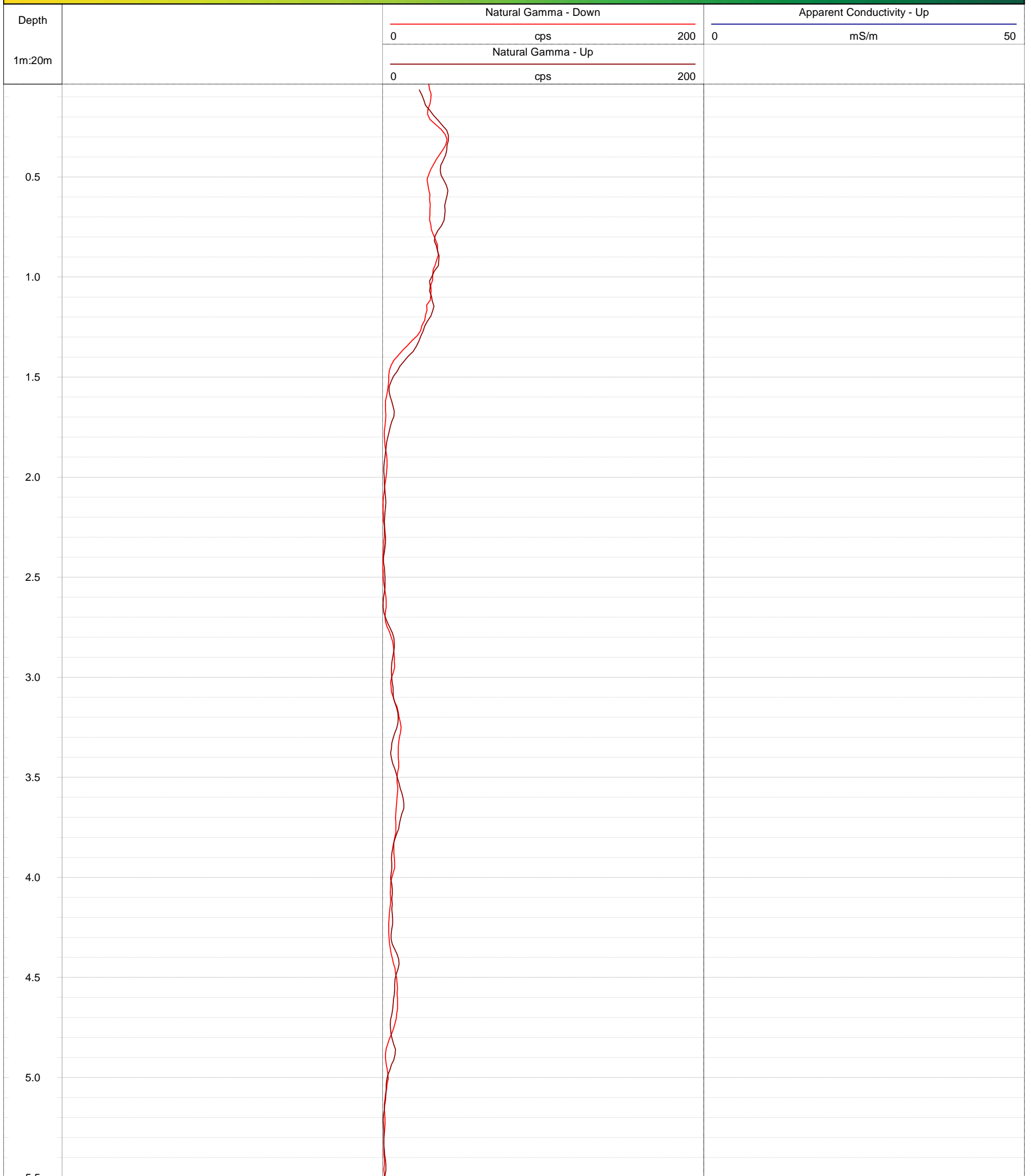
**GOLDER**  
MEMBER OF WSP

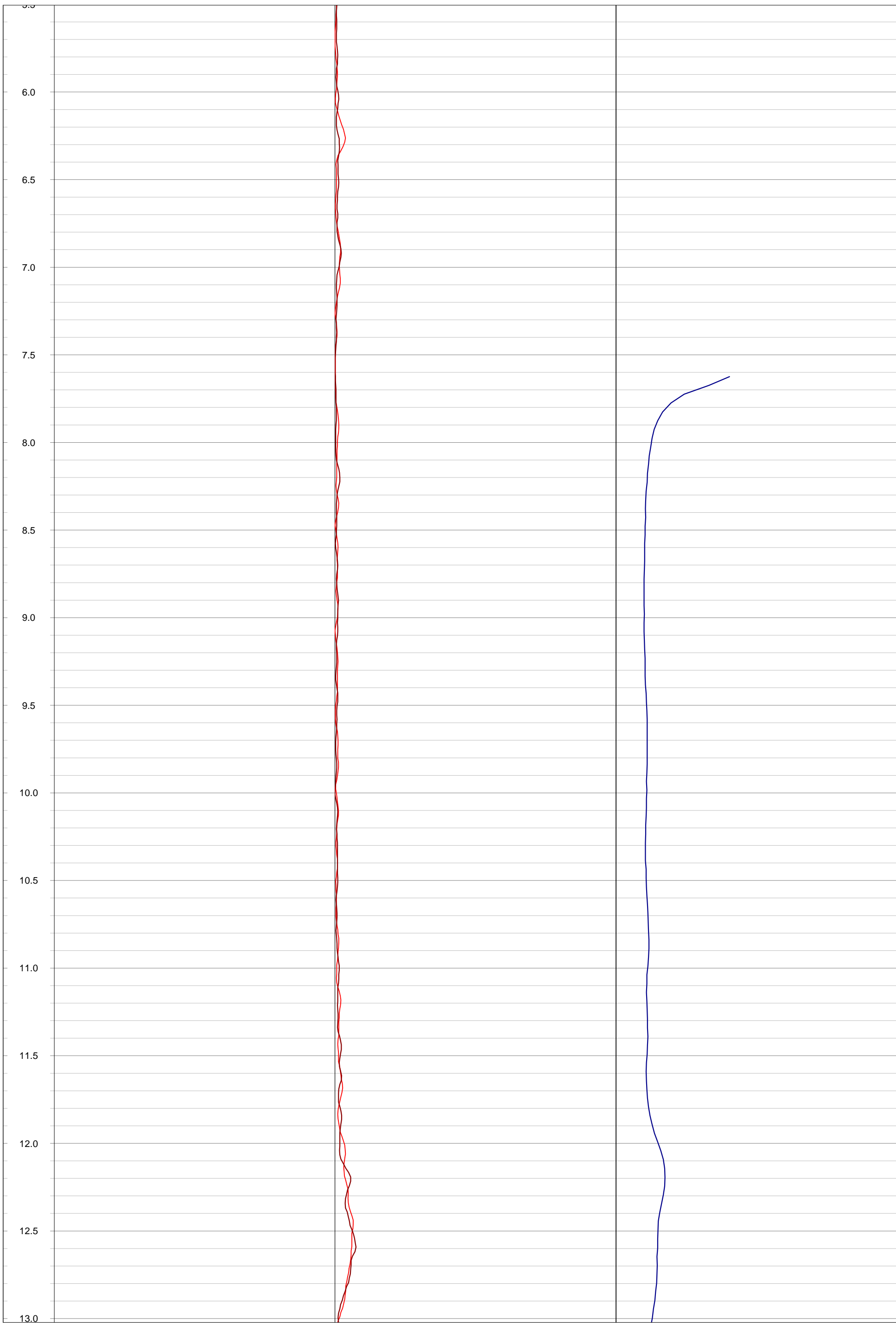
**Geophysical Record of Borehole: JHL-BH1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

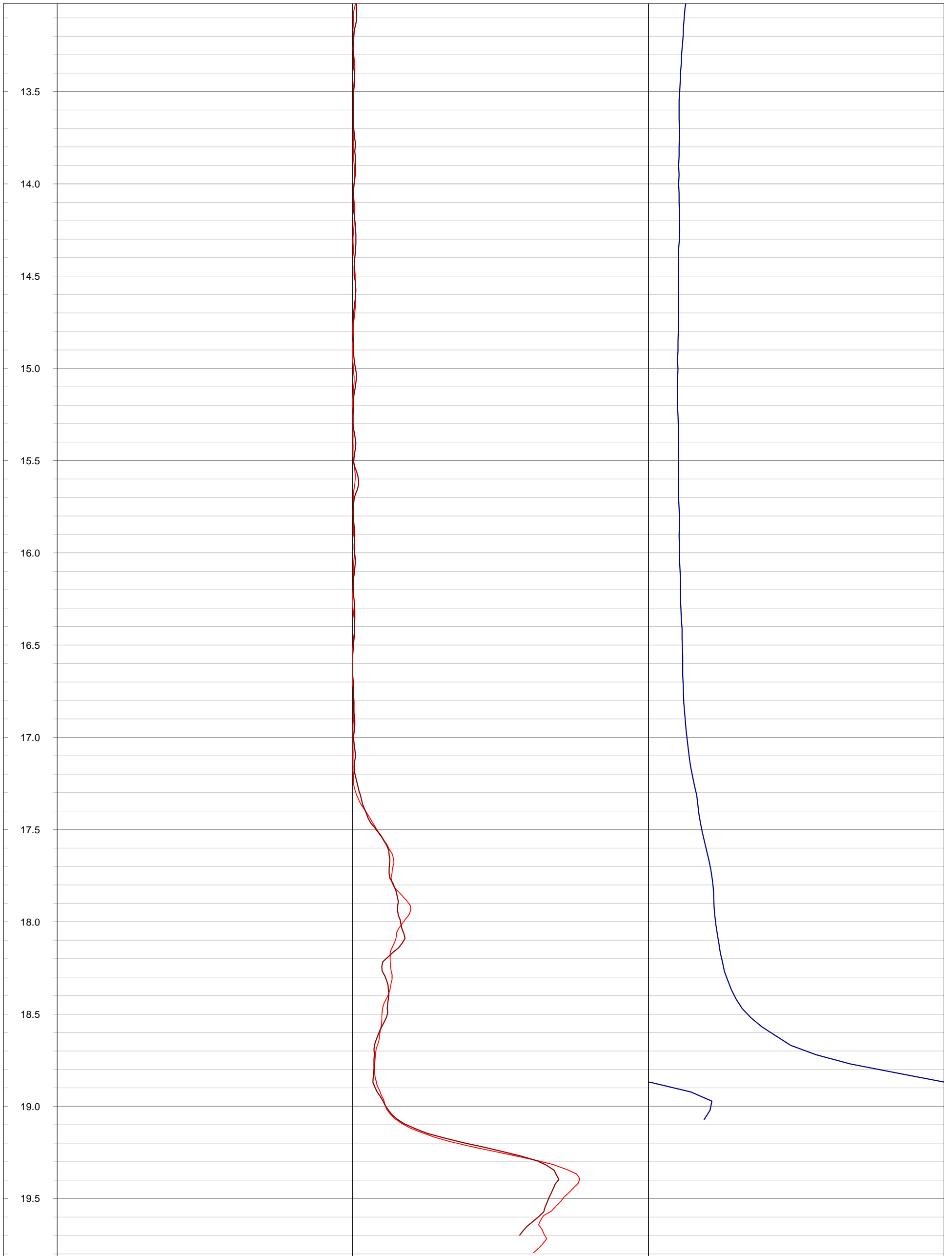
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577246.61 m	<b>Drilled Depth:</b> 19.70 m bgs	<b>Water Level:</b> 3.00 m bgs	<b>Log Date:</b> Apr-14-2021
<b>Northing:</b> 4854243.60 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 410.20 m asl	<b>Casing Diameter:</b> 102 mm	<b>Casing Stickup:</b> 0.65 m ags	

**Notes:**











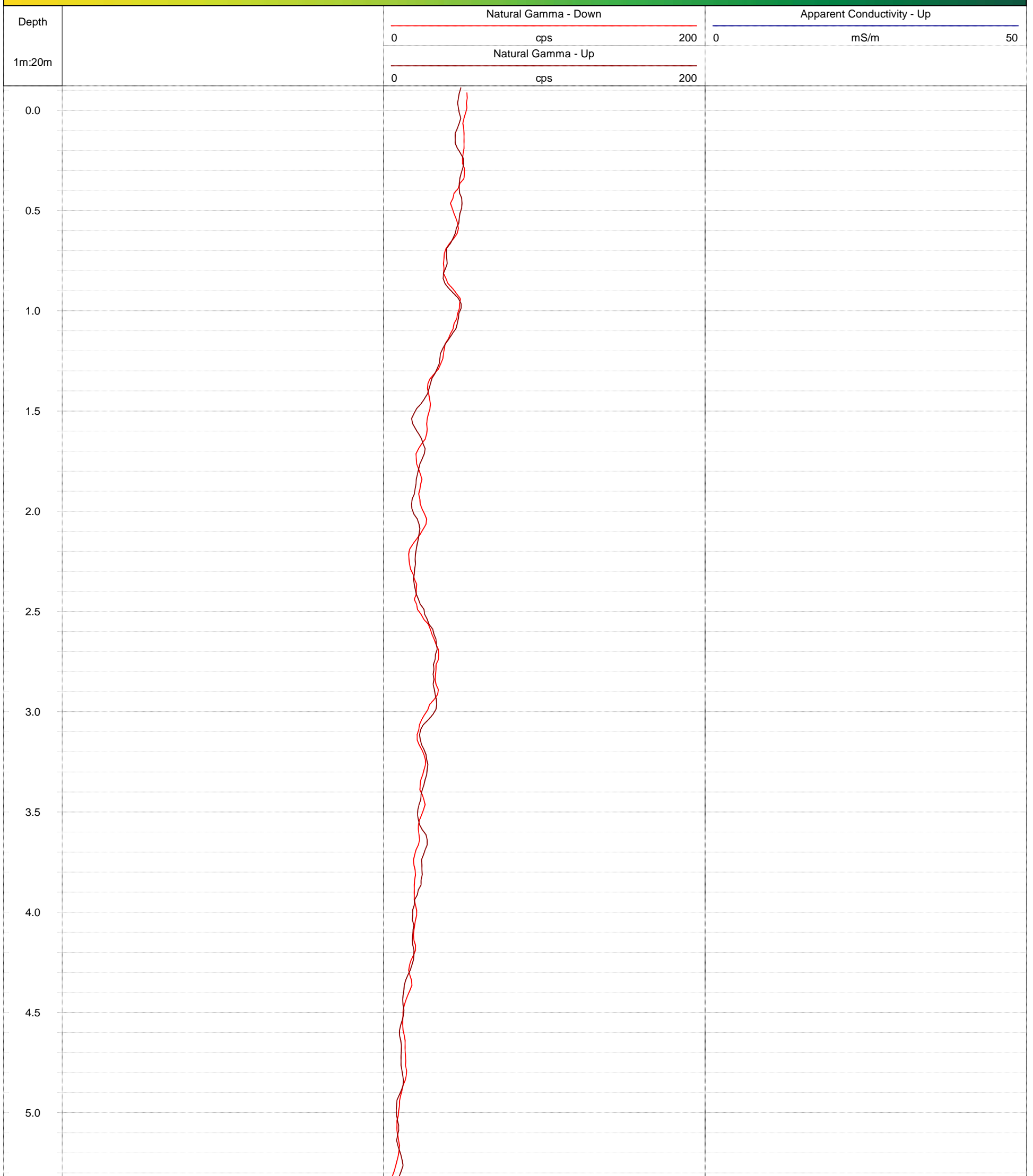
**GOLDER**  
MEMBER OF WSP

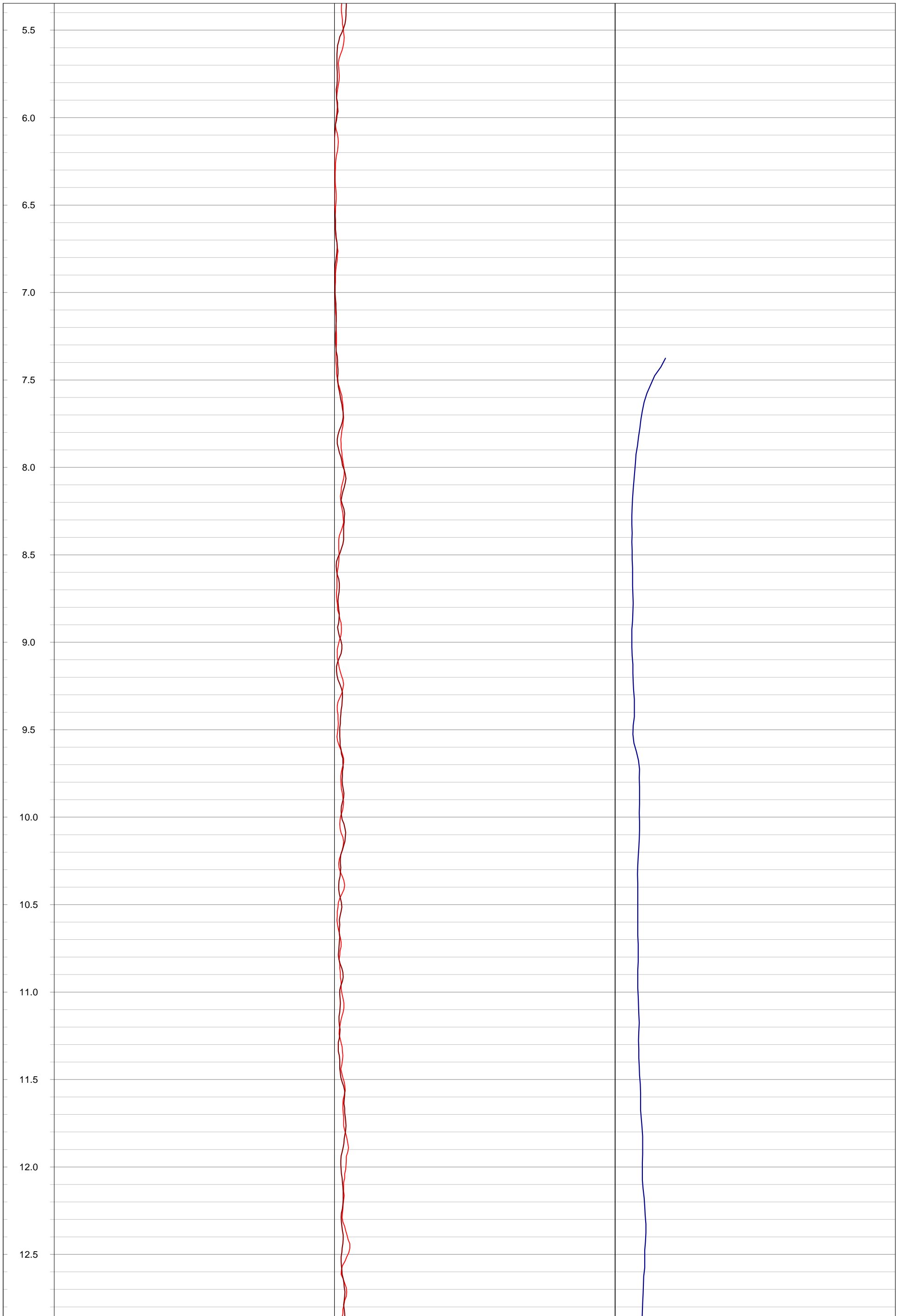
**Geophysical Record of Borehole: JHL-BH16 (CAL)**

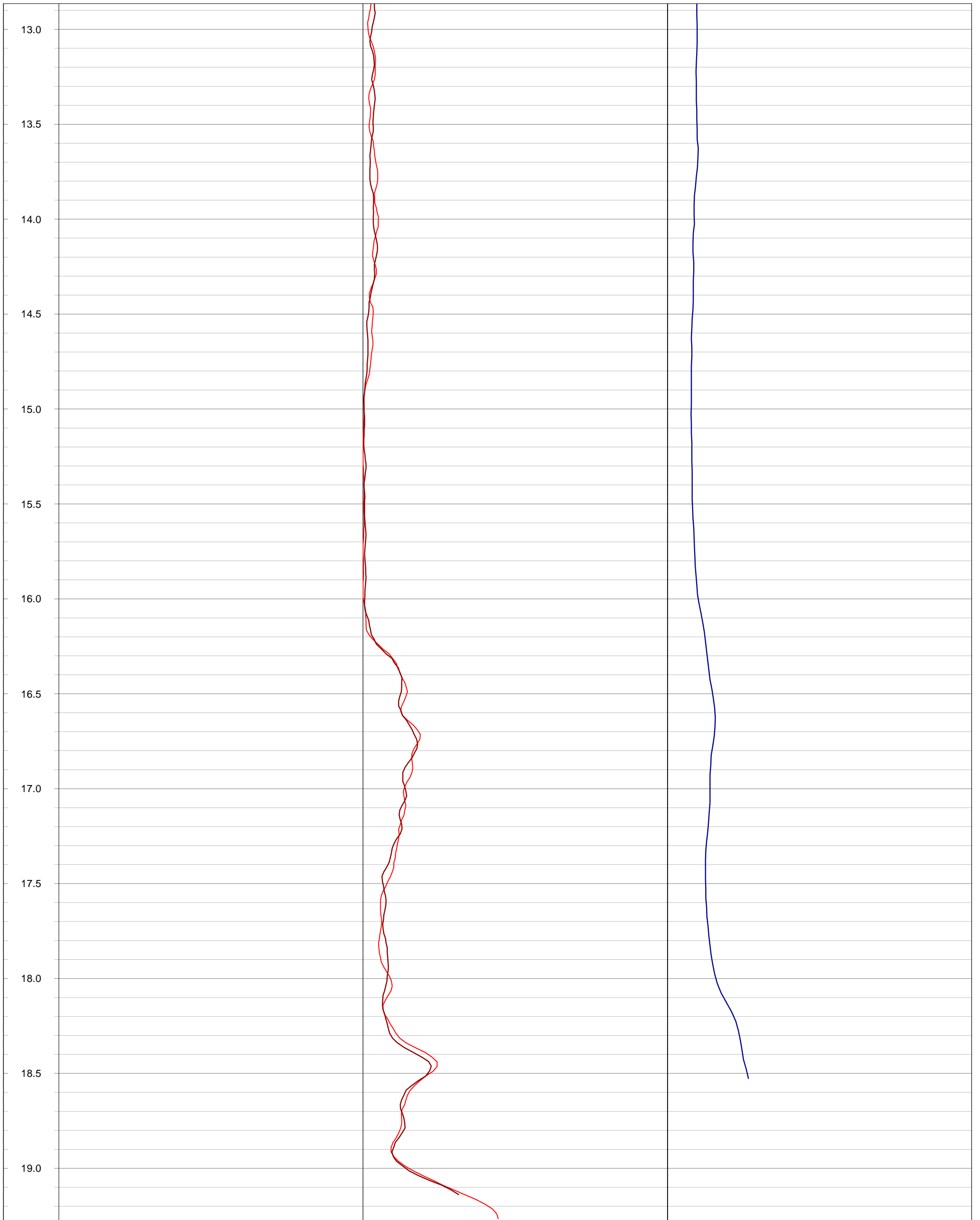
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577894.81 m	<b>Drilled Depth:</b> 19.90 m bgs	<b>Water Level:</b> 9.69 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854252.89 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 411.53 m asl	<b>Casing Diameter:</b> 76 mm	<b>Casing Stickup:</b> 0.46 m ags	

**Notes:**











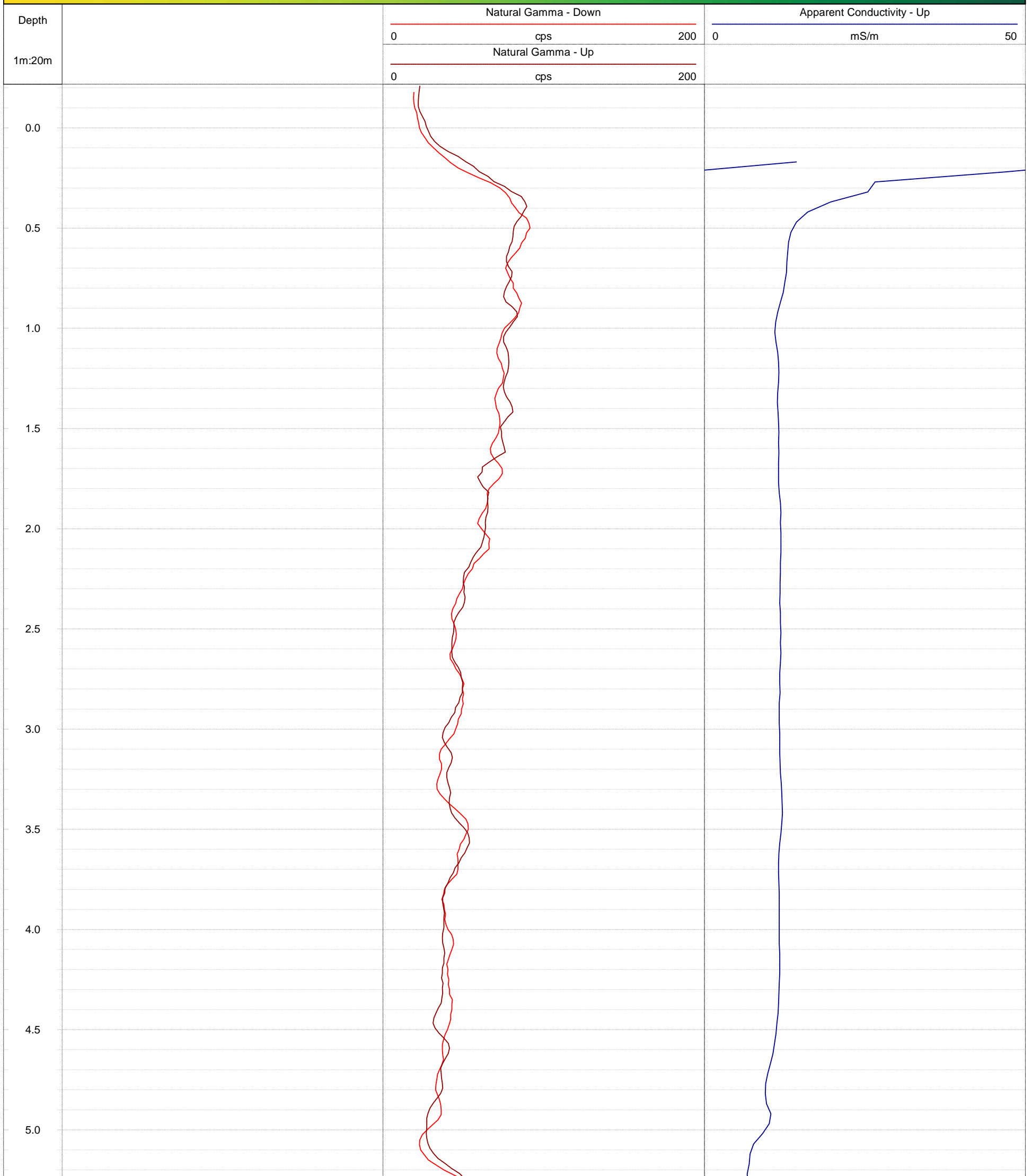
**GOLDER**  
MEMBER OF WSP

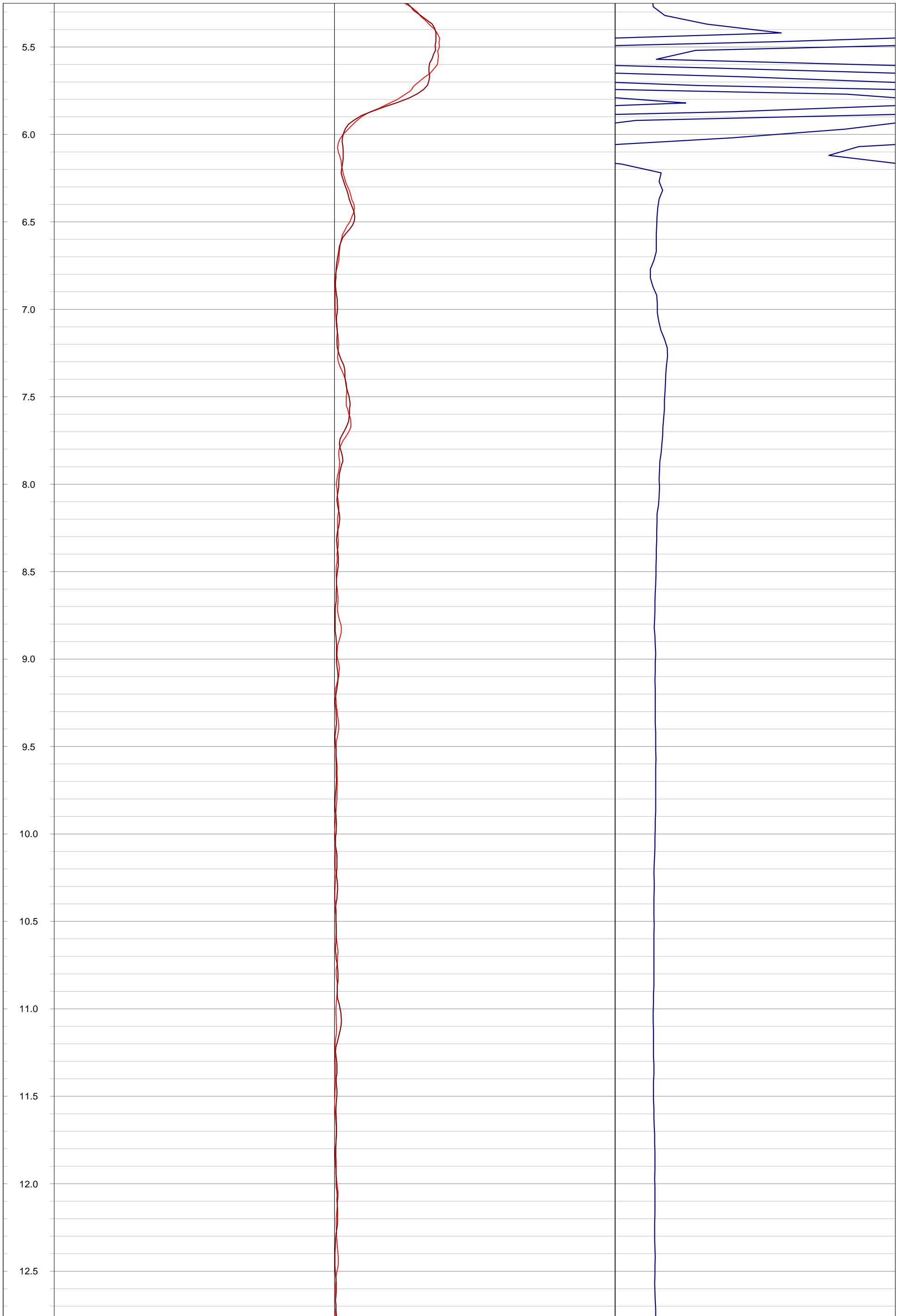
**Geophysical Record of Borehole: JHL-BH17 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578028.61 m	<b>Drilled Depth:</b> 18.85 m bgs	<b>Water Level:</b> 6.58 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854138.05 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 408.11 m asl	<b>Casing Diameter:</b> 51 mm	<b>Casing Stickup:</b> 0.87 m ags	

**Notes:** 2" I.D. PVC pipe visible at surface, suspect some remnants of a metal casing near 5.8 m bgs









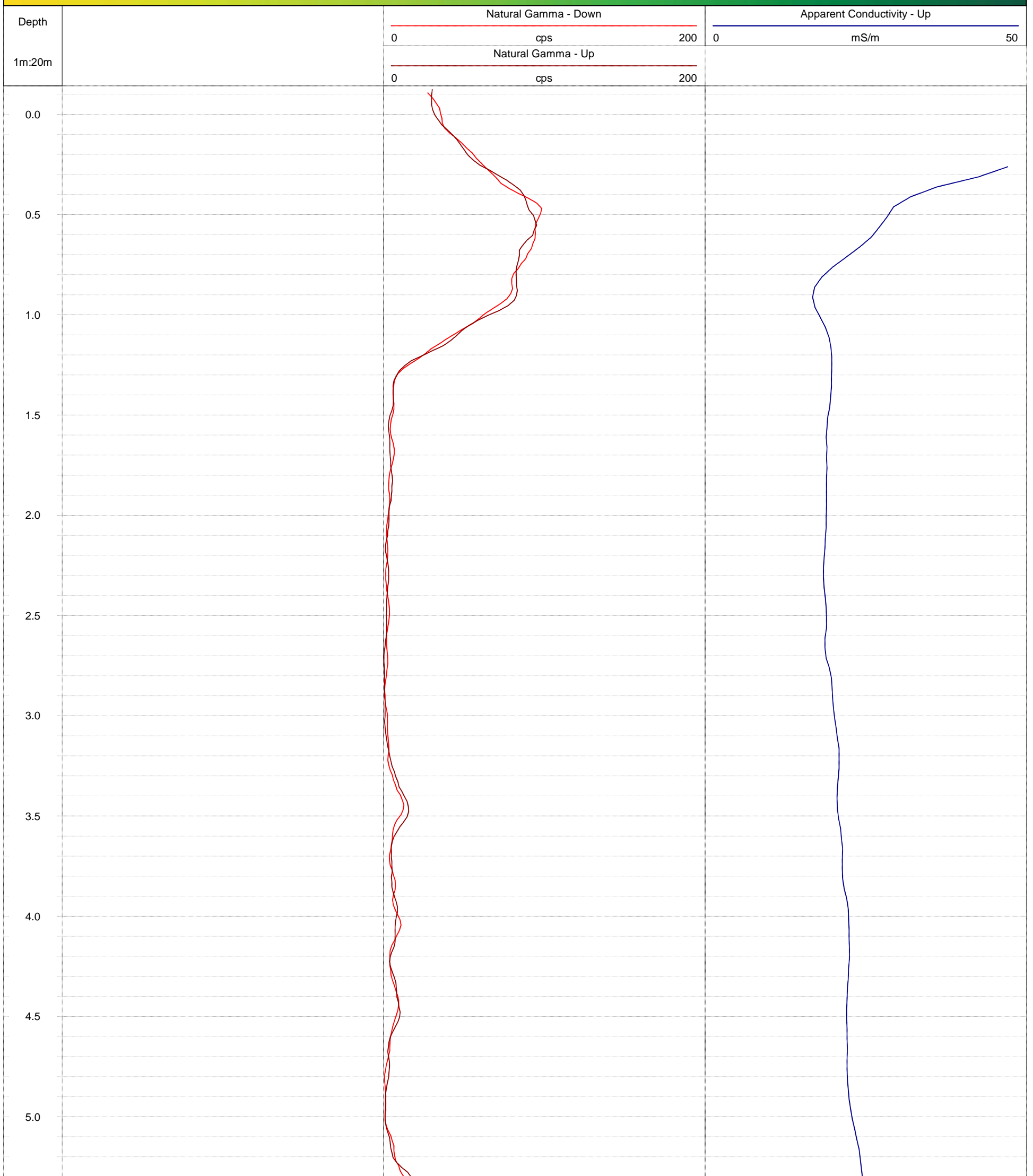
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: JHL-BH18 (CAL)**

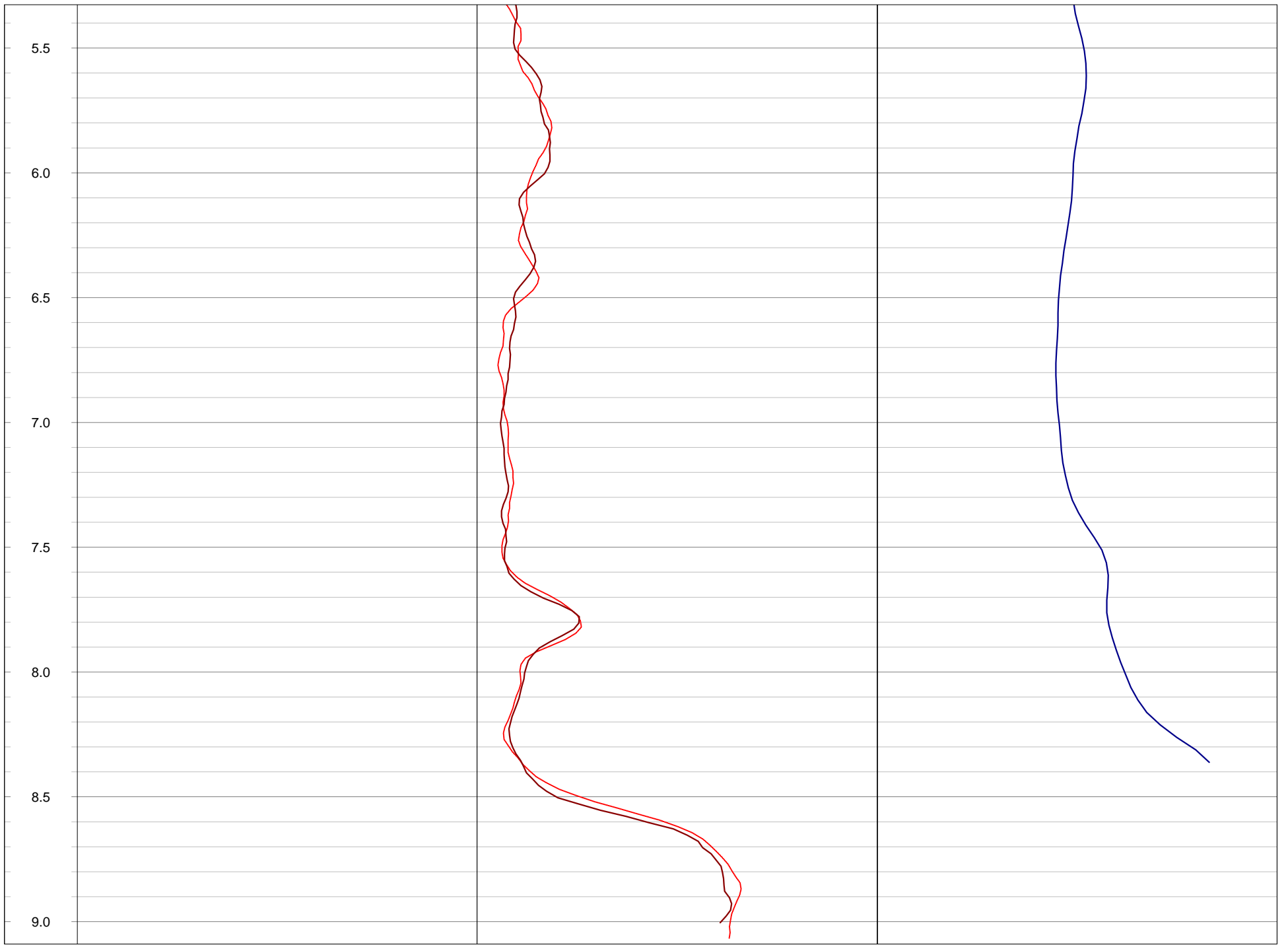
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578153.75 m	<b>Drilled Depth:</b> 9.2 m bgs	<b>Water Level:</b> 3.36 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854324.05 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 400.69 m asl	<b>Casing Diameter:</b> 51 mm	<b>Casing Stickup:</b> 0.79 m ags	

**Notes:** 2" I.D. PVC pipe visible at surface, possible remnants of metal casing near surface.









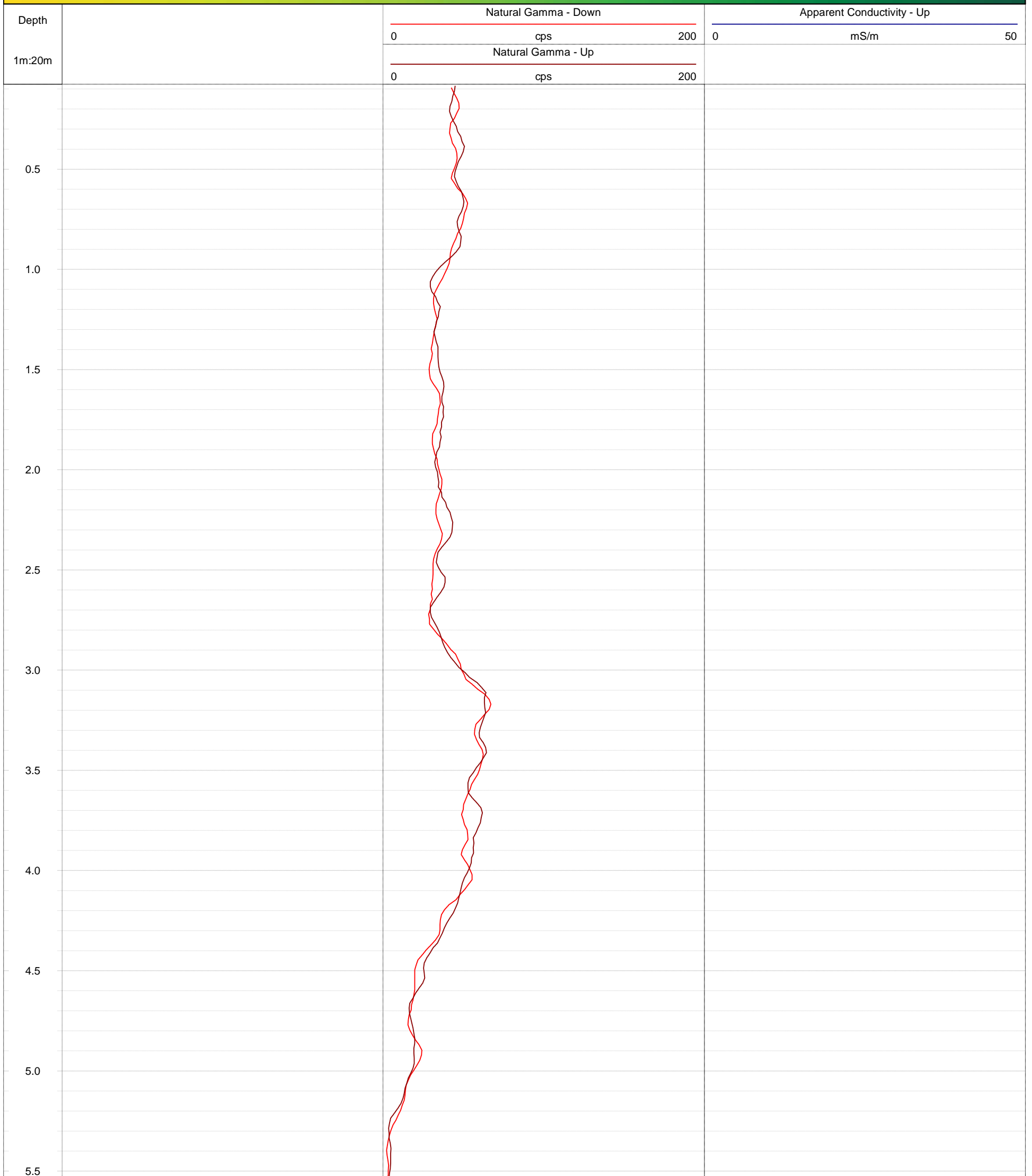
**GOLDER**  
MEMBER OF WSP

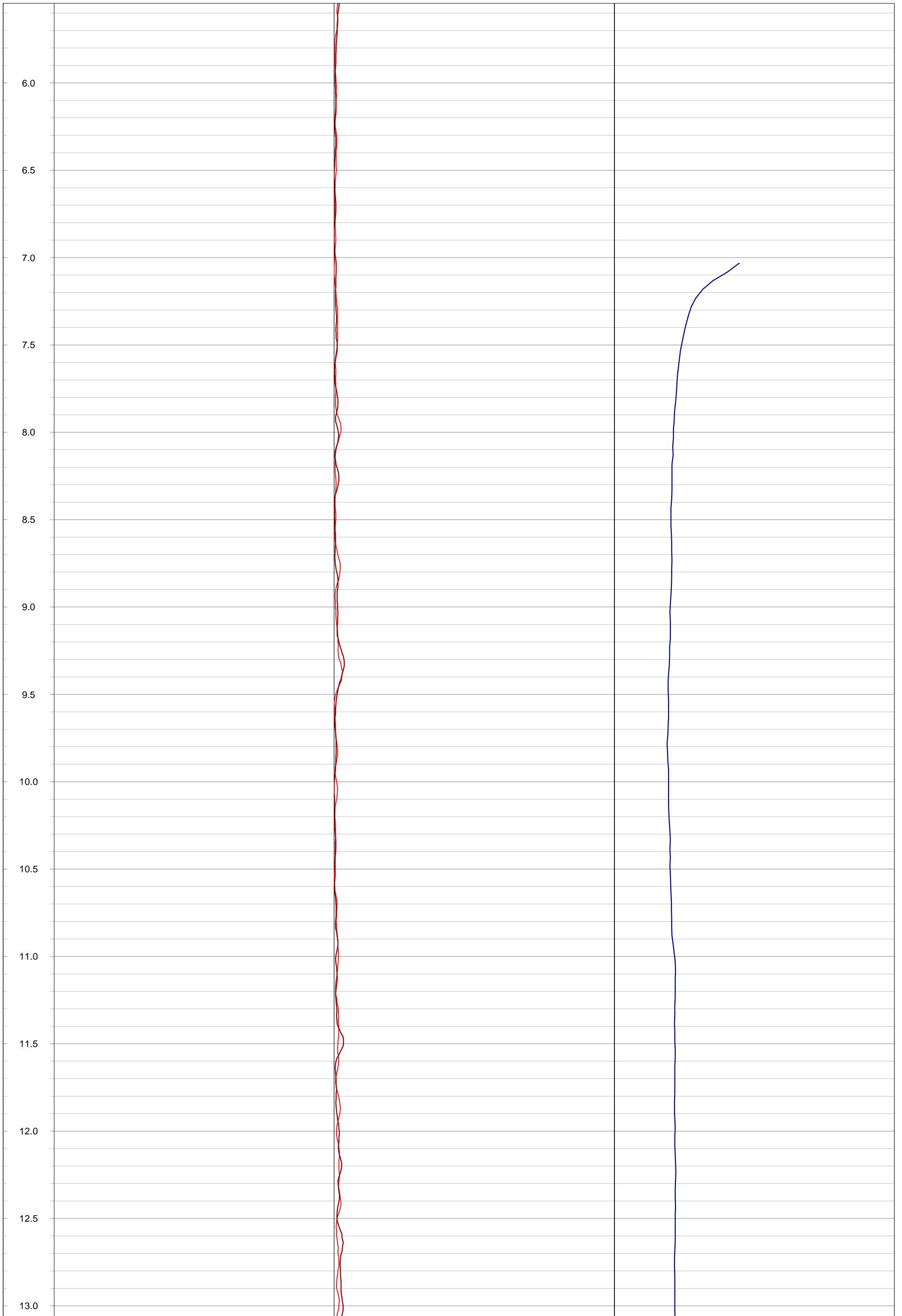
**Geophysical Record of Borehole: JHL-BH19 (CAL)**

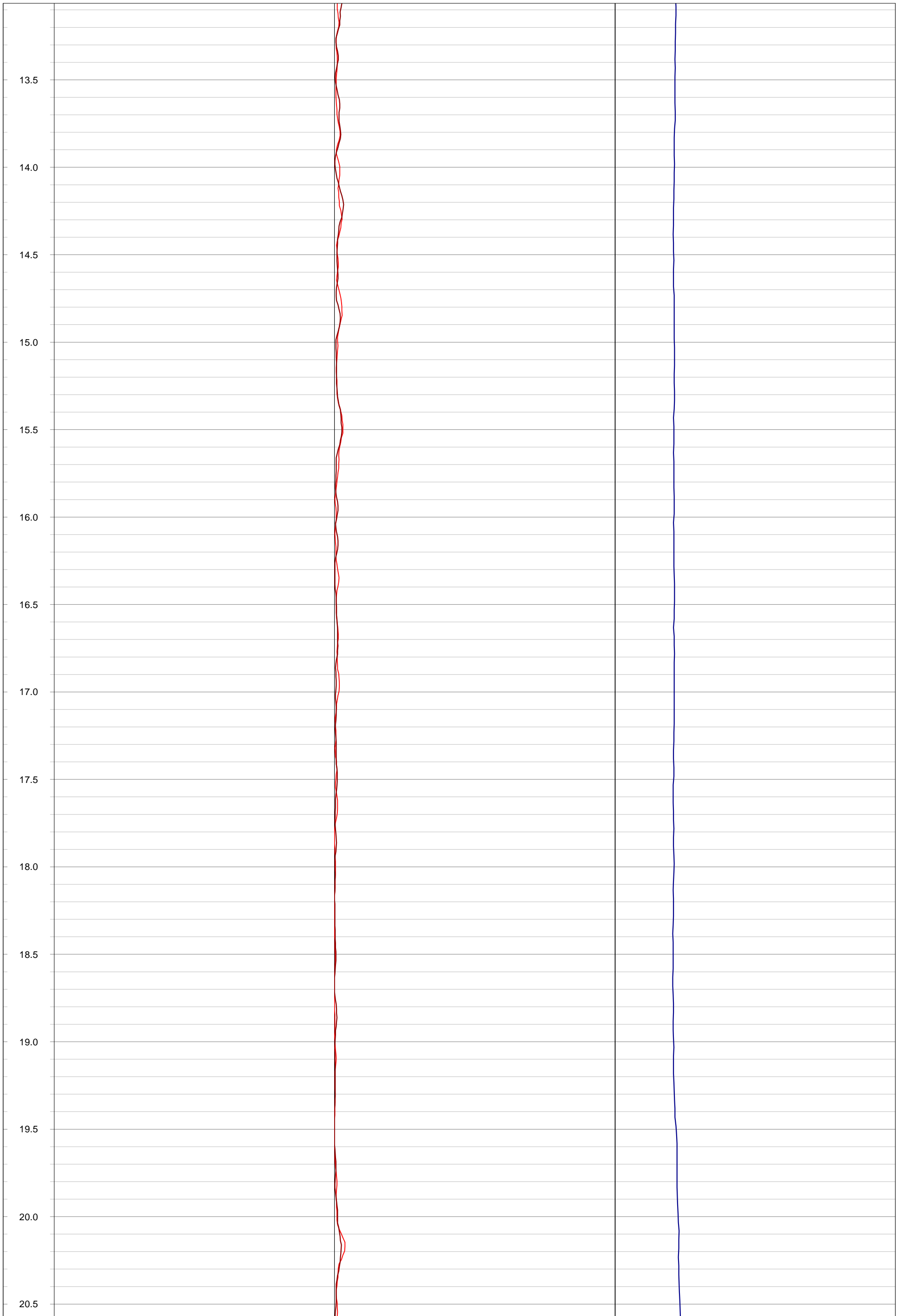
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577482.68 m	<b>Drilled Depth:</b> 24.50 m bgs	<b>Water Level:</b> 11.00 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854486.38 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 414.13 m asl	<b>Casing Diameter:</b> 76 mm	<b>Casing Stickup:</b> 0.60 m ags	

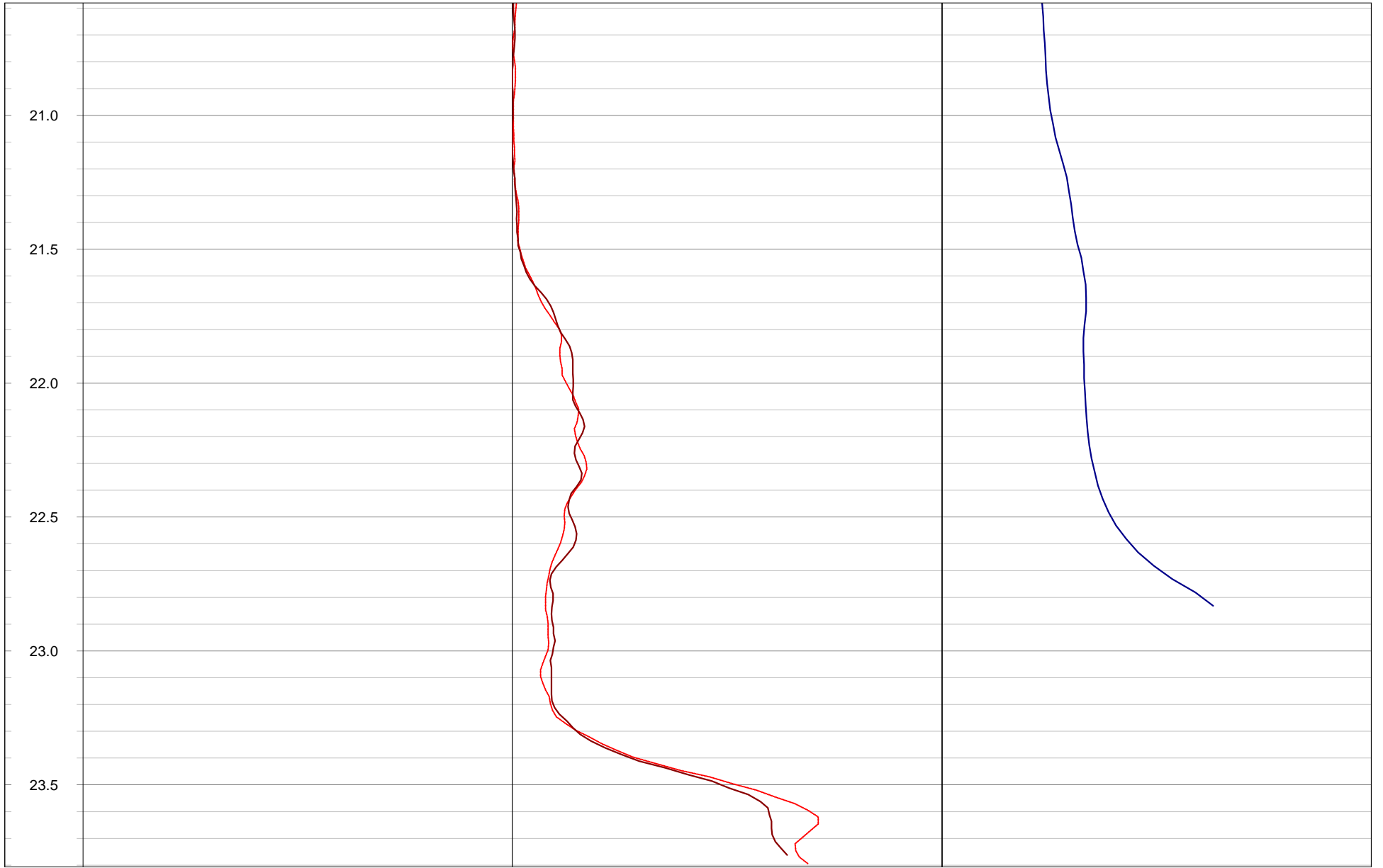
**Notes:**













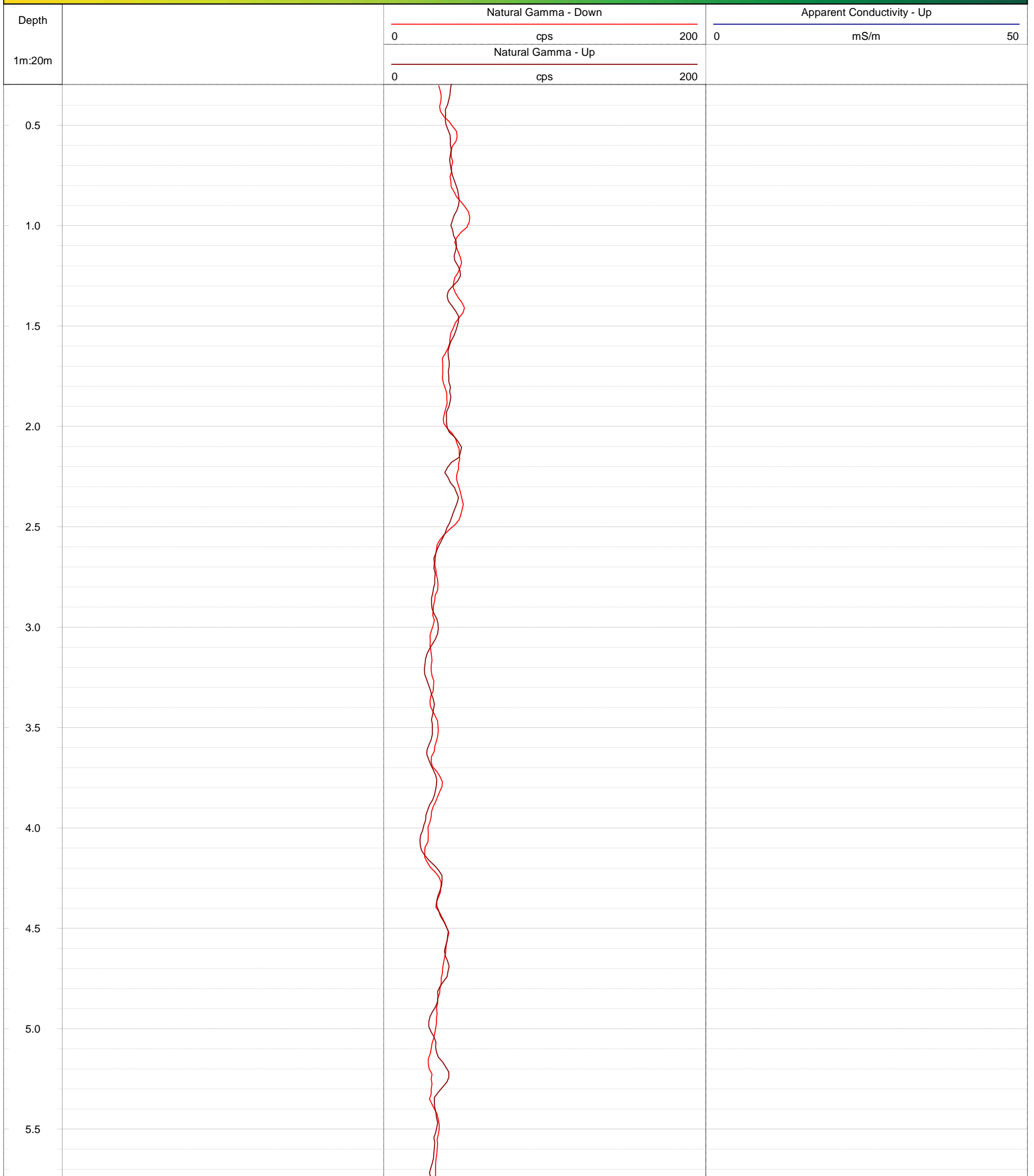
**GOLDER**  
MEMBER OF WSP

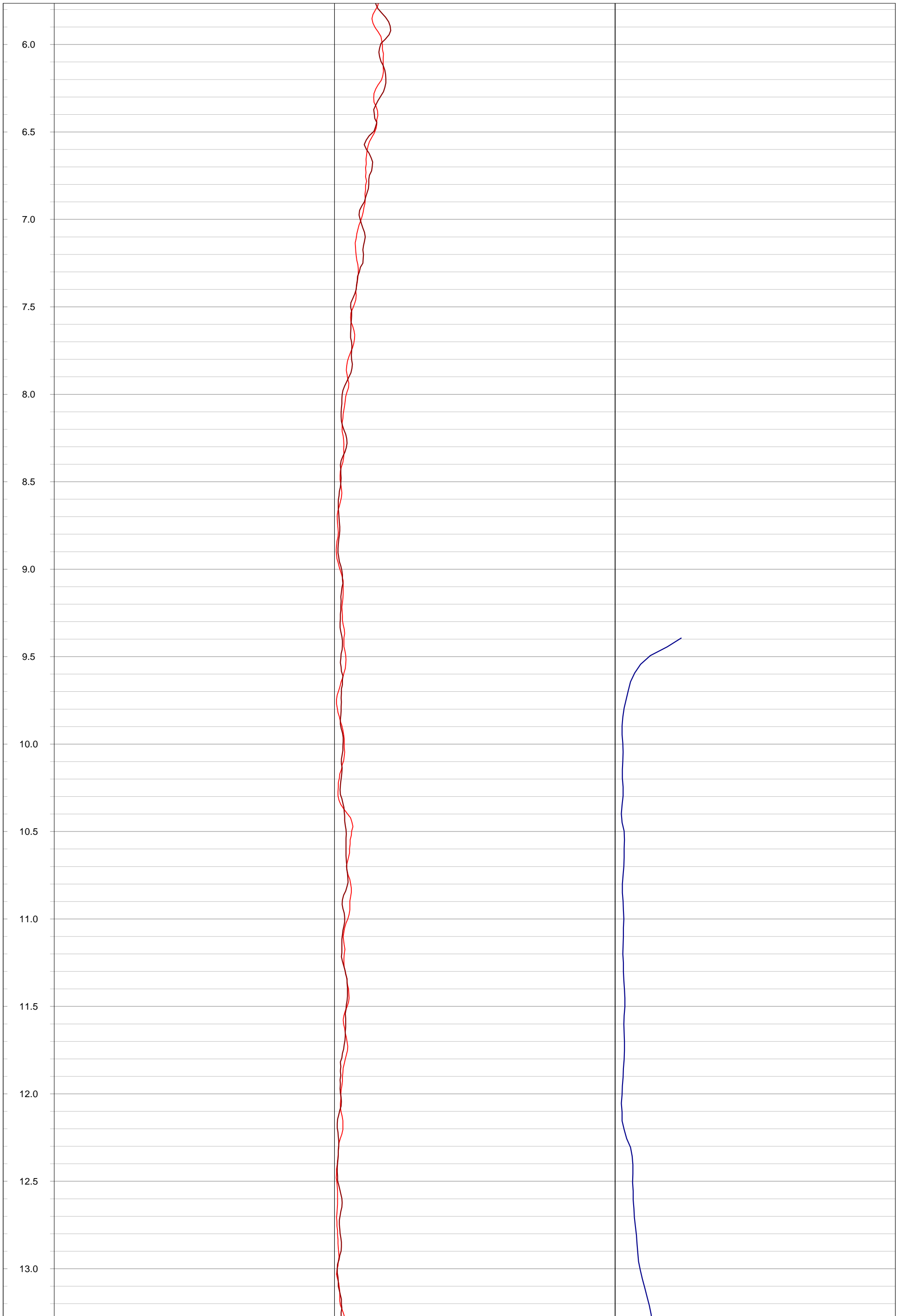
**Geophysical Record of Borehole: Unknown BH2 (CAL)**

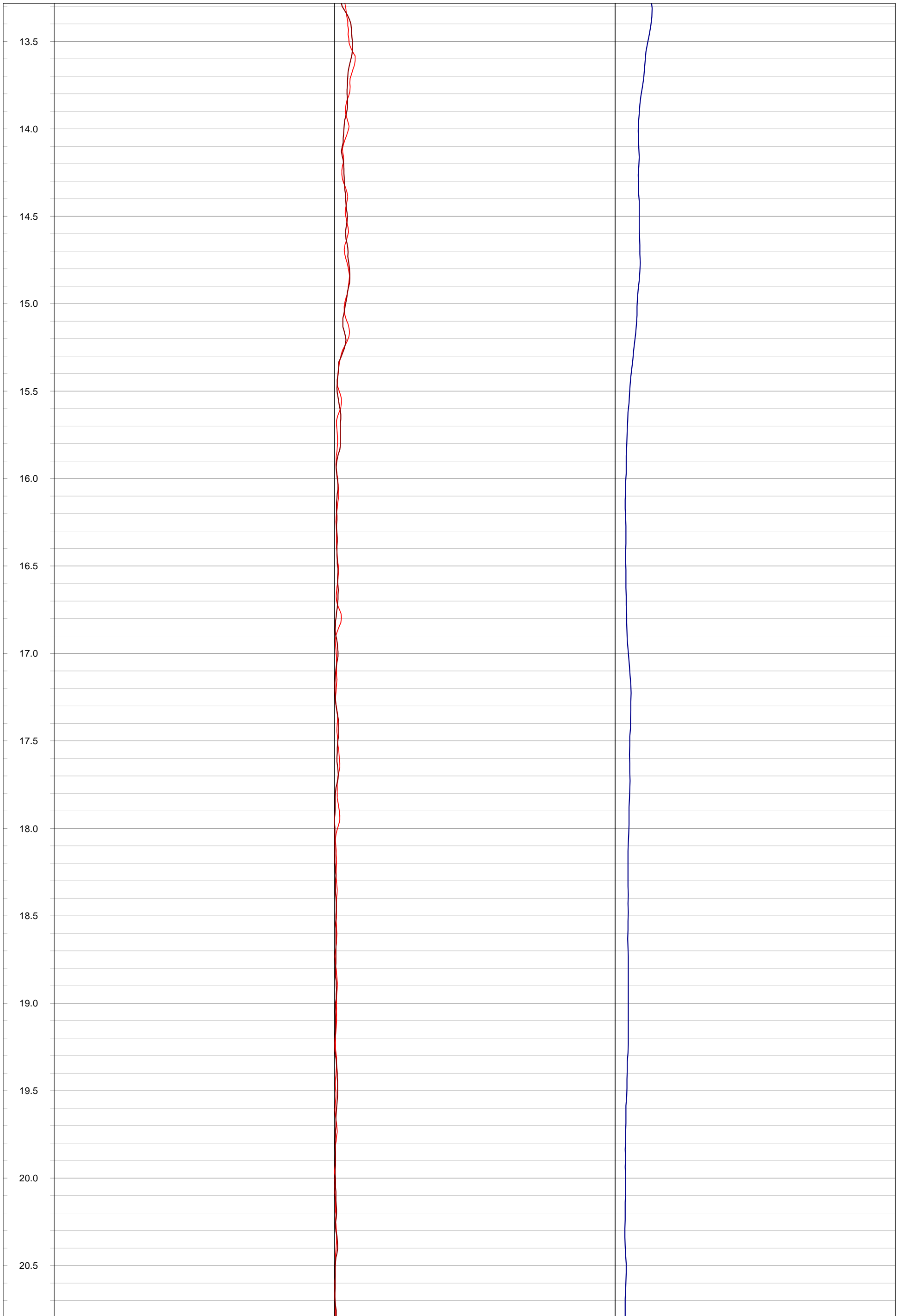
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577689.54 m	<b>Drilled Depth:</b> n/a	<b>Water Level:</b> 11.60 m bgs	<b>Log Date:</b> Apr-14-2021
<b>Northing:</b> 4854266.72 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> n/a	<b>Casing Diameter:</b> 102 mm	<b>Casing Stickup:</b> 0.40 m ags	

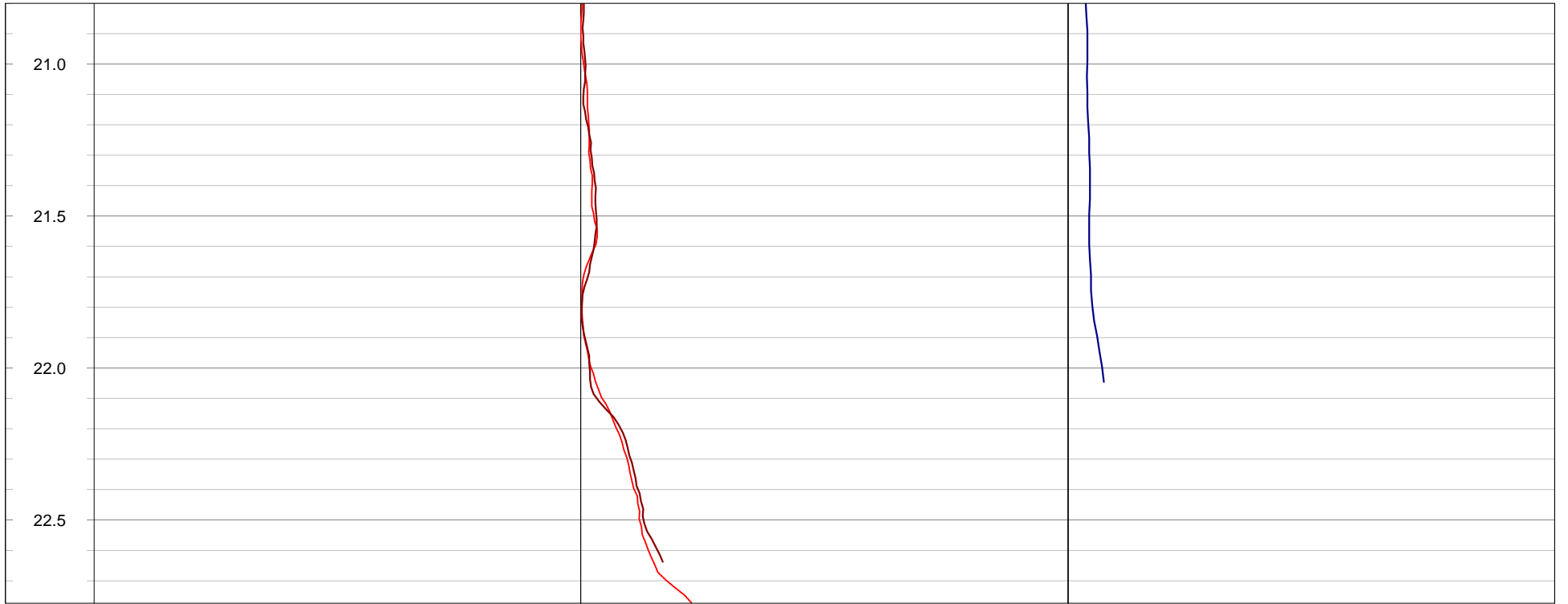
**Notes:**













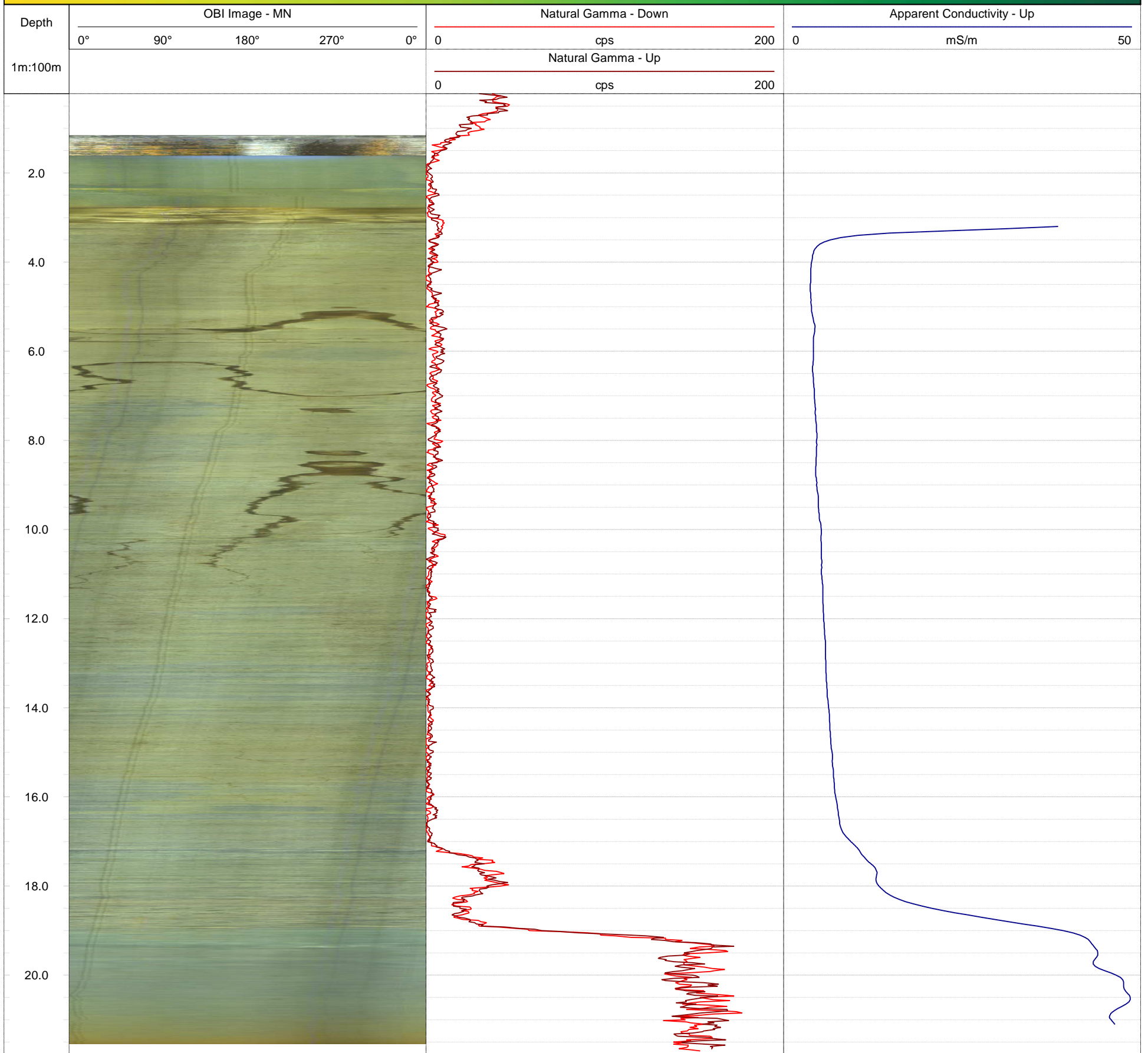
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-01 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 2.75 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578000.61 m	<b>Drilled Depth:</b> 22.07 m bgs	<b>Water Level:</b> 1.6 m bgs	<b>Log Date:</b> Feb-18-2020
<b>Northing:</b> 4853292.80 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 406.80 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.46 m ags	

**Notes:** OBI image is opaque > 21.60m





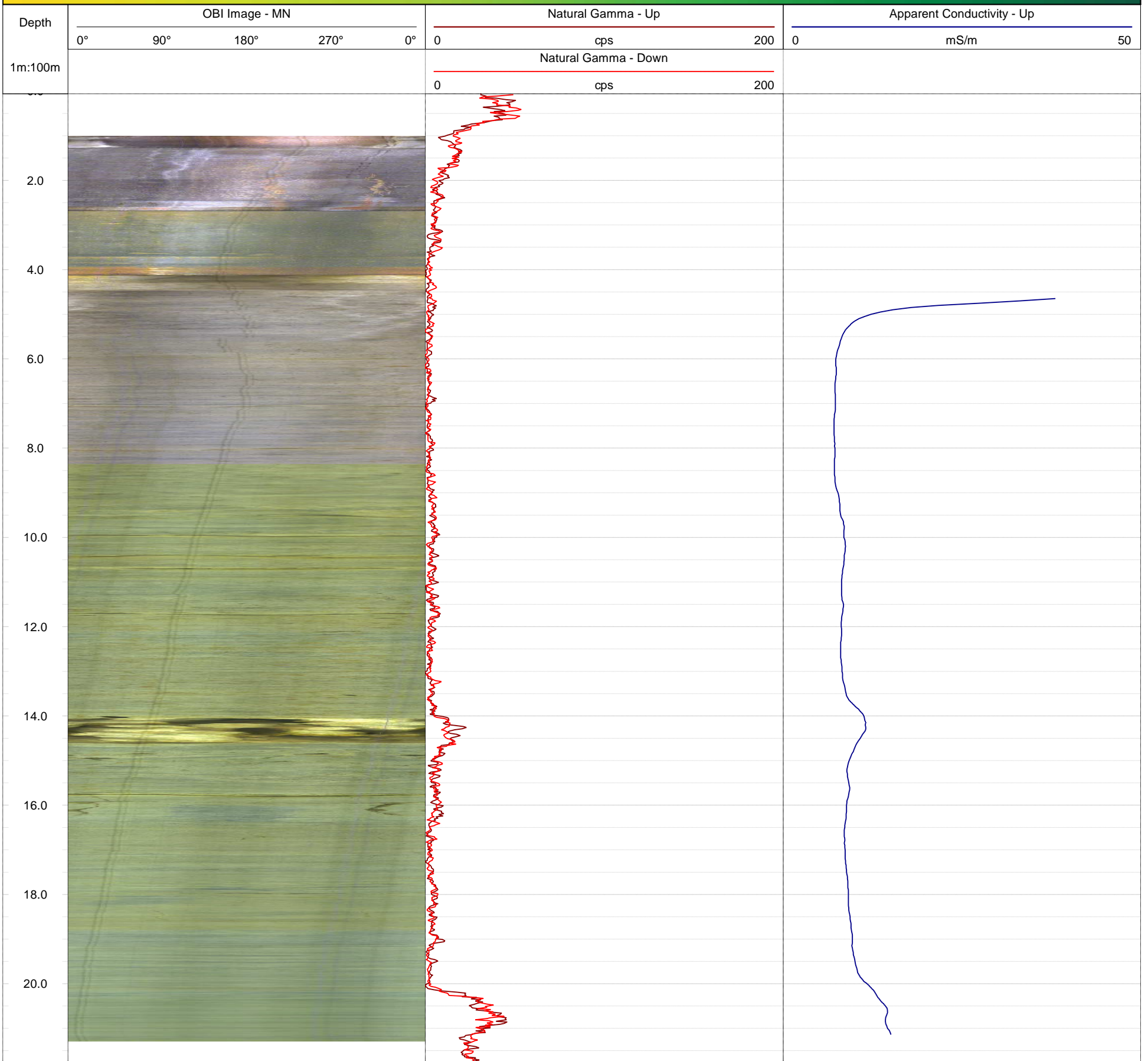
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-02 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 4.11 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577839.36 m	<b>Drilled Depth:</b> 22.02 m bgs	<b>Water Level:</b> 2.70 m bgs	<b>Log Date:</b> Feb-18-2020
<b>Northing:</b> 4853078.92 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 405.52 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.61 m ags	

**Notes:**





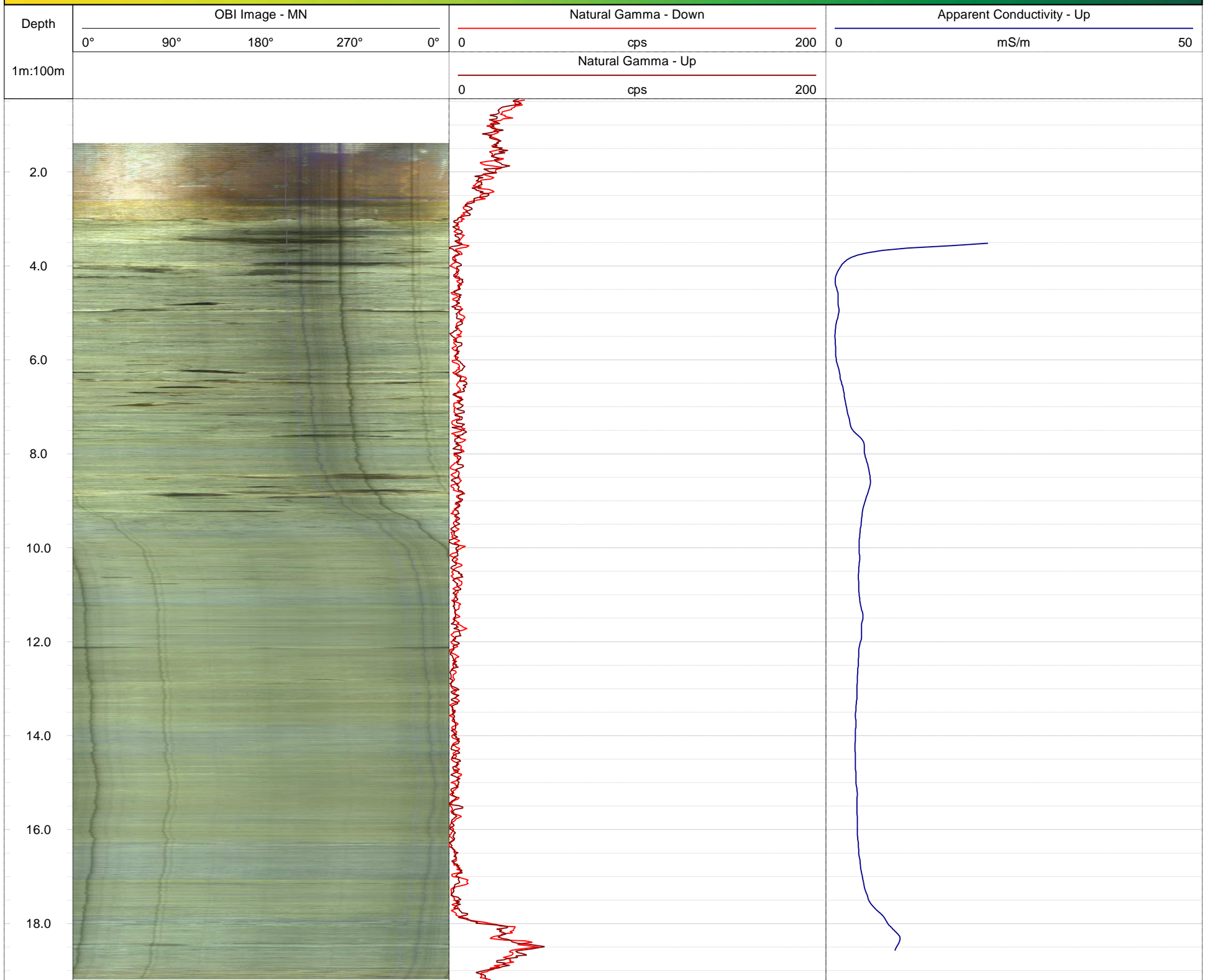
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-03 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 3.03 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577655.12 m	<b>Drilled Depth:</b> 19.33 m bgs	<b>Water Level:</b> 7.14 m bgs	<b>Log Date:</b> Mar-10-2020
<b>Northing:</b> 4852796.26 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 402.91 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.23 m ags	

**Notes:**







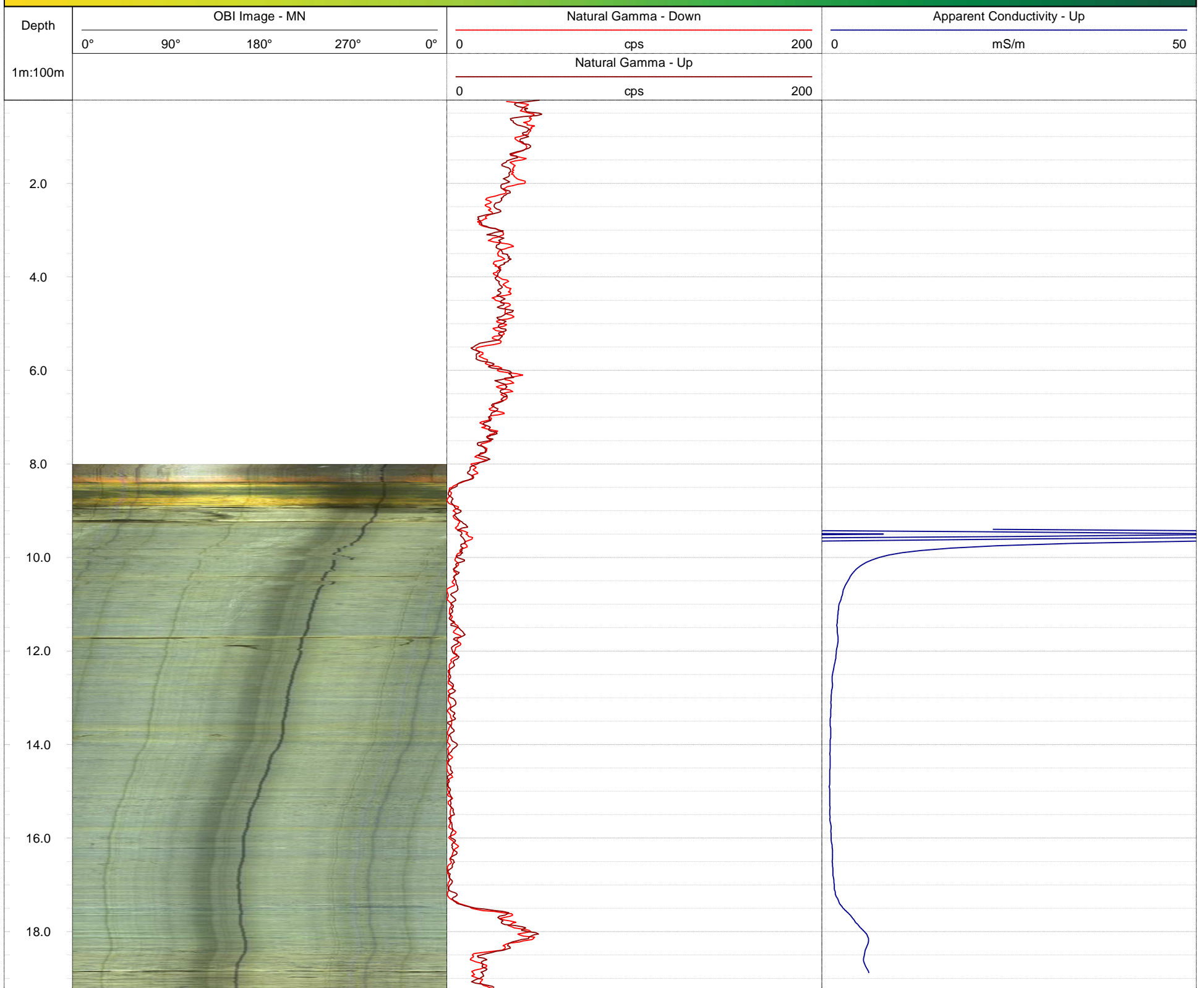
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-04 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 8.89 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577511.78 m	<b>Drilled Depth:</b> 19.57 m bgs	<b>Water Level:</b> 8.31 m bgs	<b>Log Date:</b> Feb-24-2020
<b>Northing:</b> 4852528.07 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 400.81 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.46 m ags	

**Notes:**





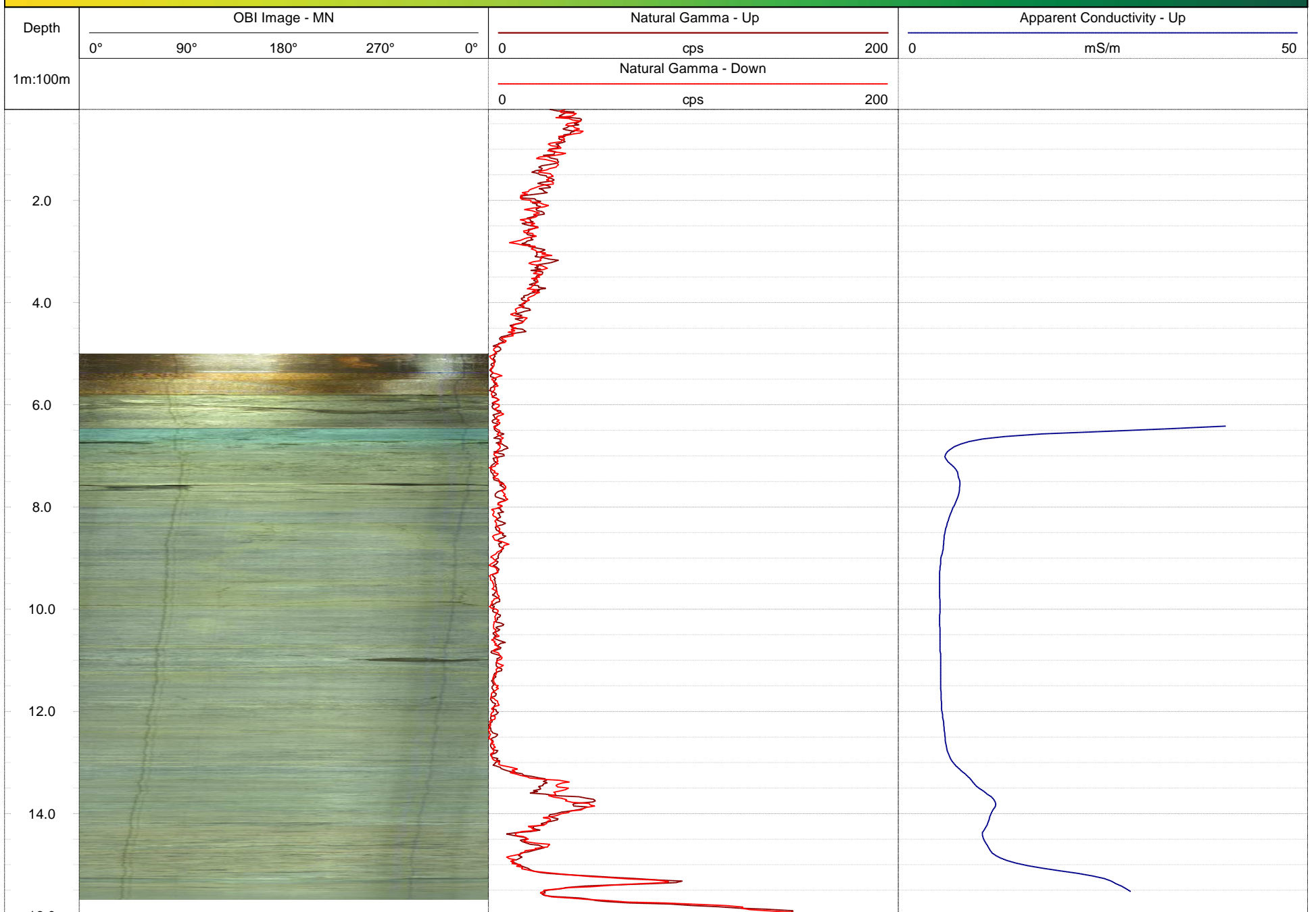
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-05 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.81 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577786.25 m    **Drilled Depth:** 16.35 m bgs    **Water Level:** 6.51 m bgs    **Log Date:** Feb-24-2020  
**Northing:** 4852520.23 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 398.83 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.48 m ags

**Notes:** OBI image dark > 15.5 m bgs





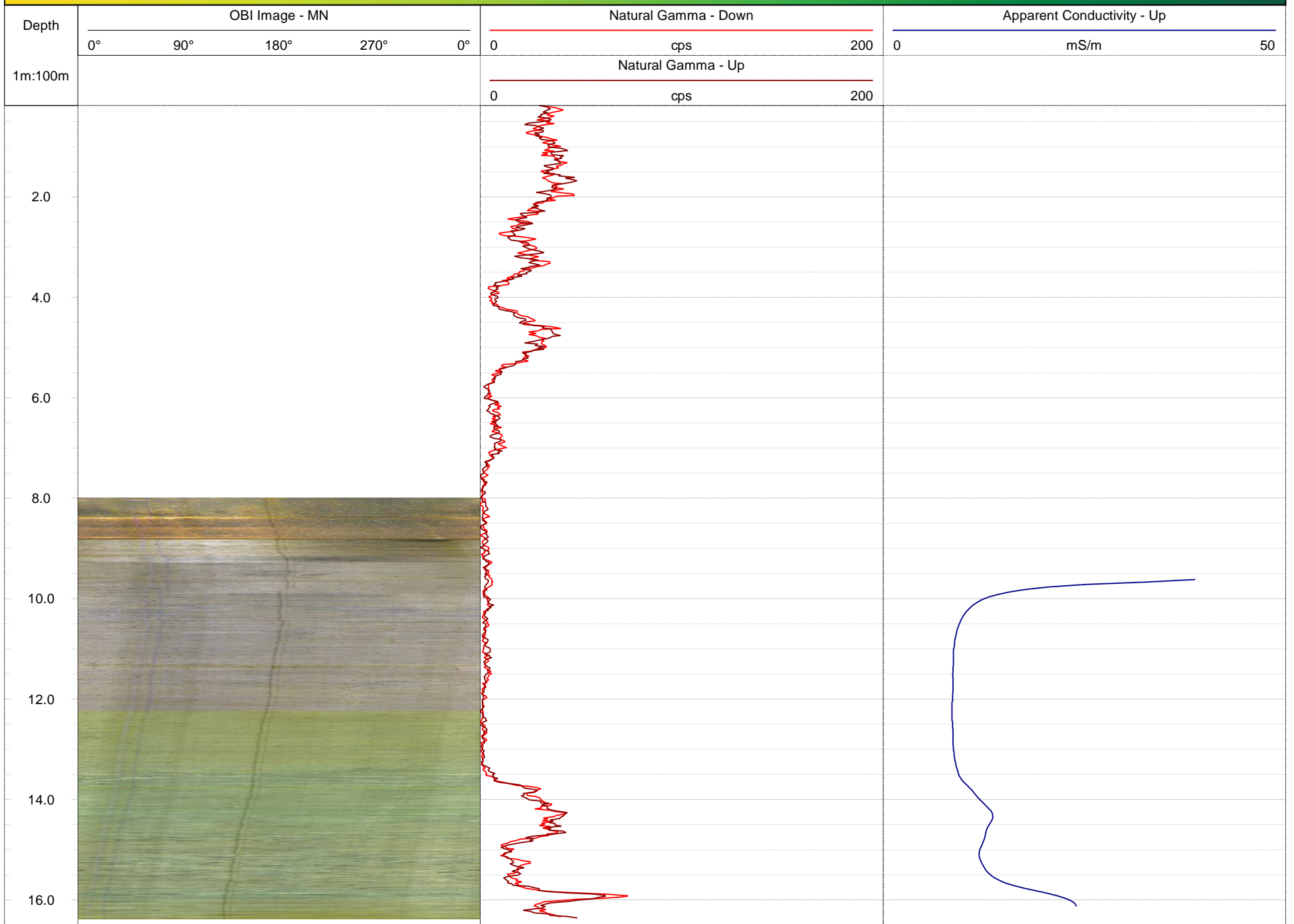
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-06 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 8.83 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578056.45 m	<b>Drilled Depth:</b> 16.60 m bgs	<b>Water Level:</b> 5.49 m bgs	<b>Log Date:</b> Feb-25-2020
<b>Northing:</b> 4852520.24 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 397.70 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.51 m ags	

**Notes:**





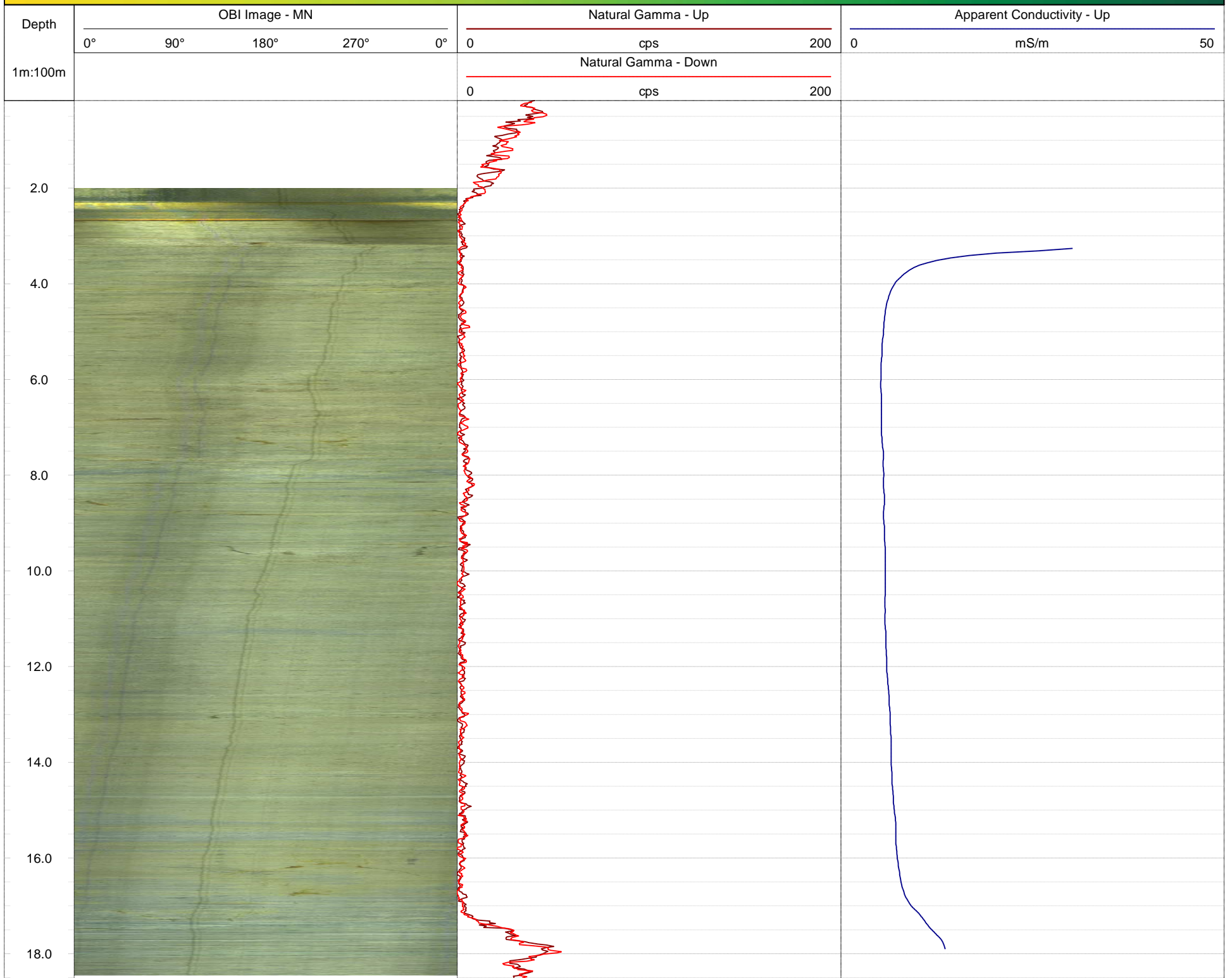
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-07 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 2.69 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578129.13 m	<b>Drilled Depth:</b> 18.67 m bgs	<b>Water Level:</b> 1.40 m bgs	<b>Log Date:</b> Feb-25-2020
<b>Northing:</b> 4853102.34 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 404.73 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.50 m ags	

**Notes:** OBI image is dark >16.40 m bgs







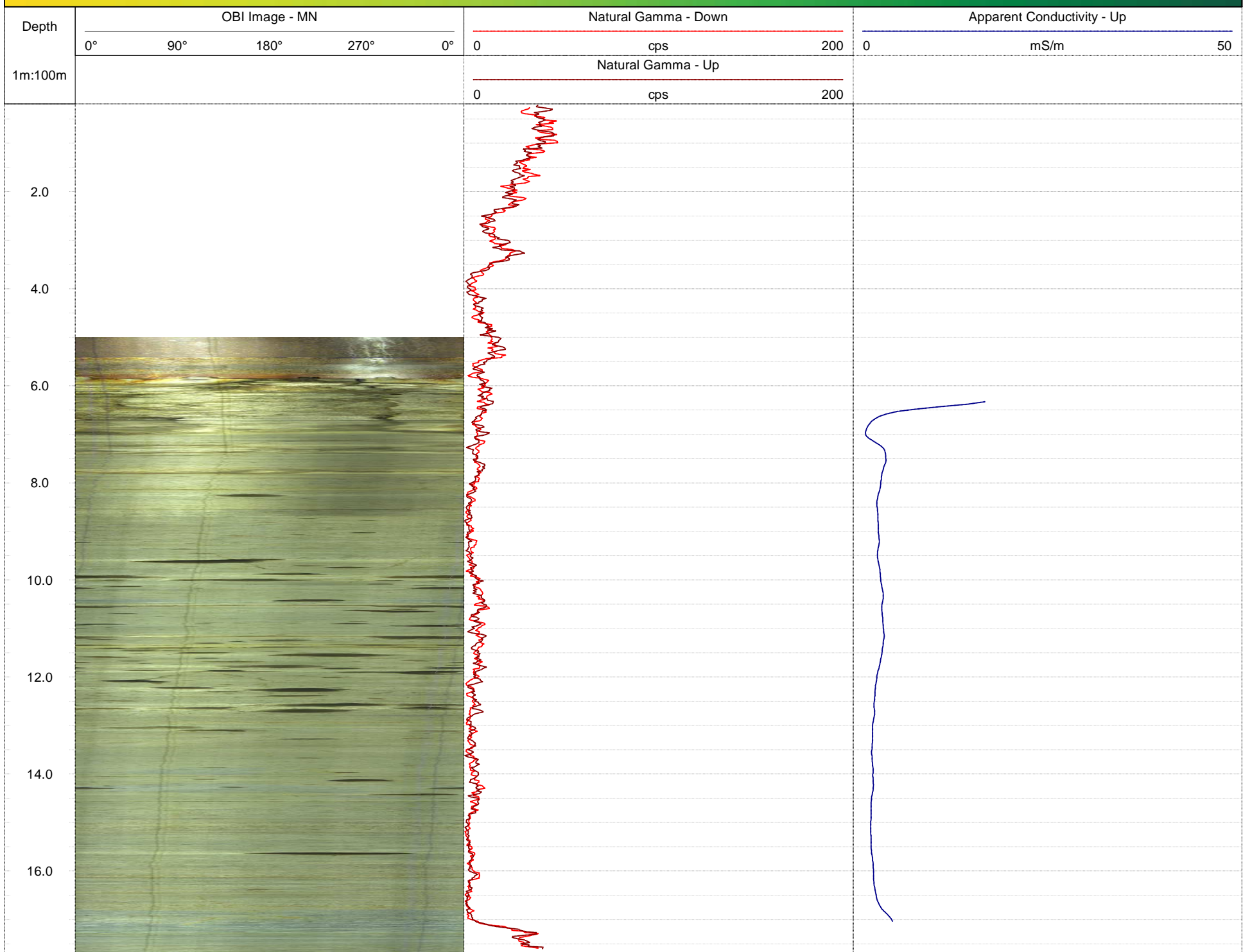
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-08 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.85 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577961.99 m    **Drilled Depth:** 17.90 m bgs    **Water Level:** 6.64 m bgs    **Log Date:** Mar-11-2020  
**Northing:** 4852832.00 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 404.50 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.44 m ags

**Notes:**





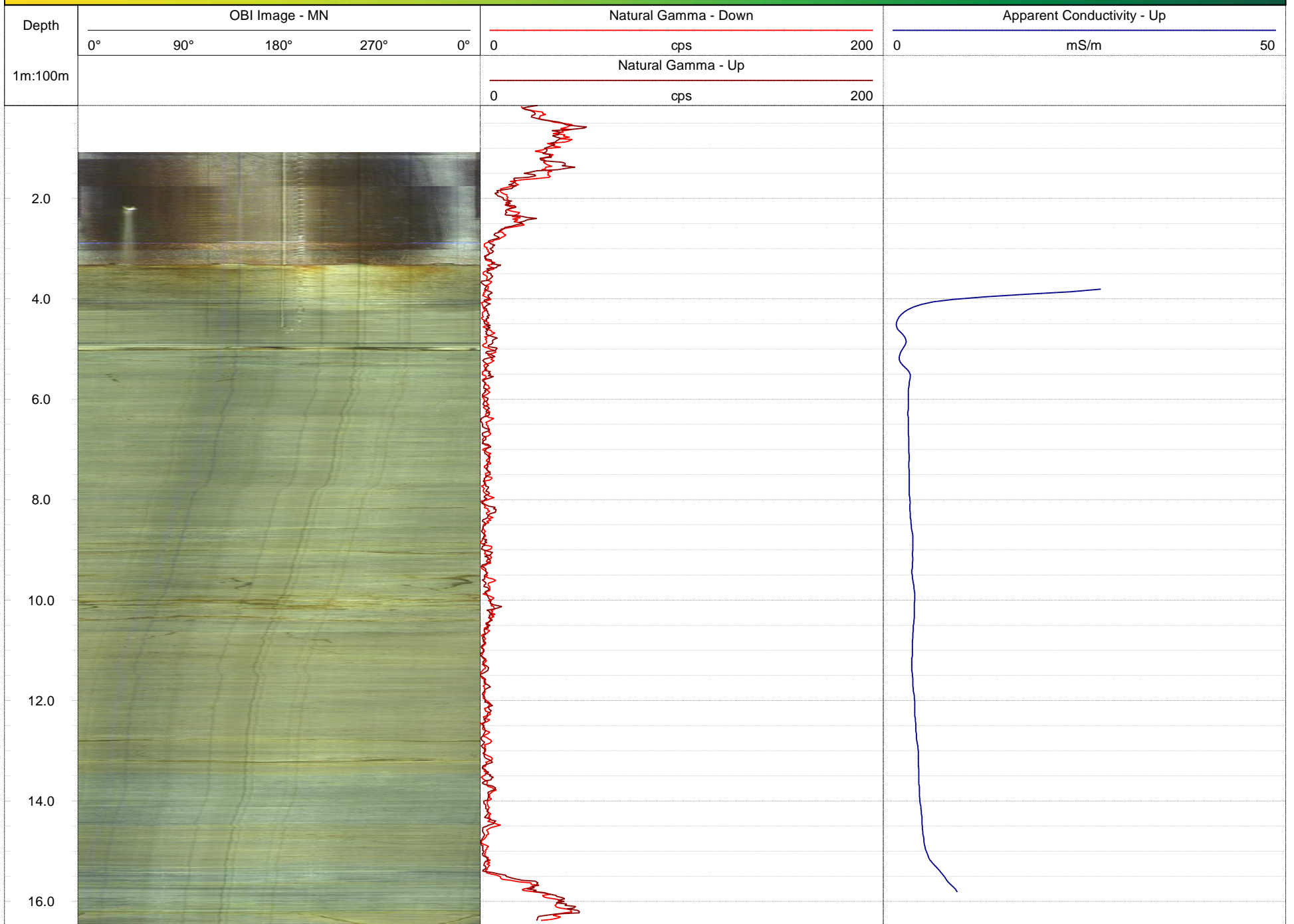
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-09 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 3.33 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578186.33 m	<b>Drilled Depth:</b> 16.77 m bgs	<b>Water Level:</b> 4.95 m bgs	<b>Log Date:</b> Mar-10-2020
<b>Northing:</b> 4852803.00 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 402.26 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.52 m ags	

**Notes:**





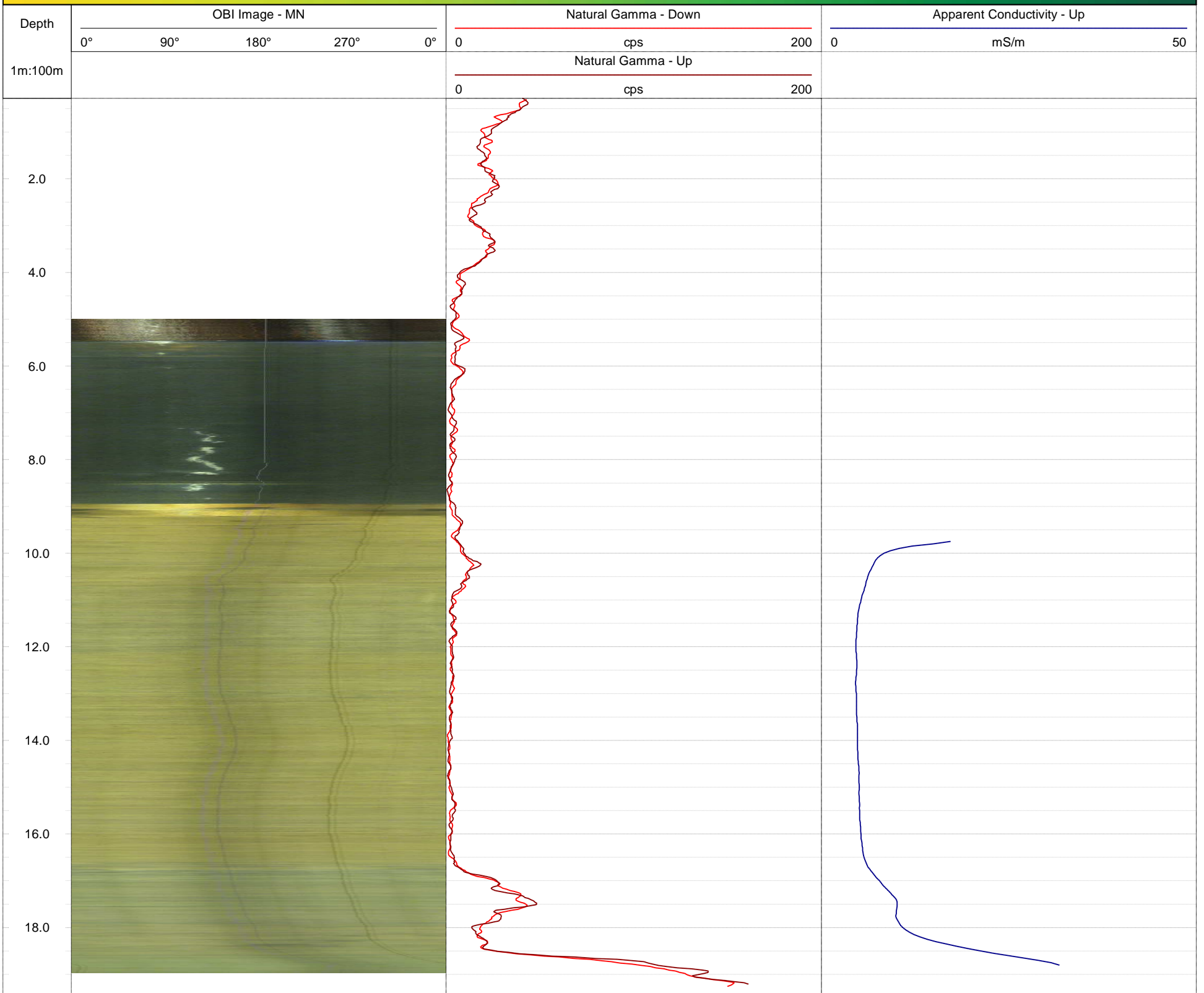
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-10 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 8.94 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577940.09 m    **Drilled Depth:** 19.55 m bgs    **Water Level:** 5.29 m bgs    **Log Date:** Mar-25-2020  
**Northing:** 4853952.34 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 411.07 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.40 m ags

**Notes:**





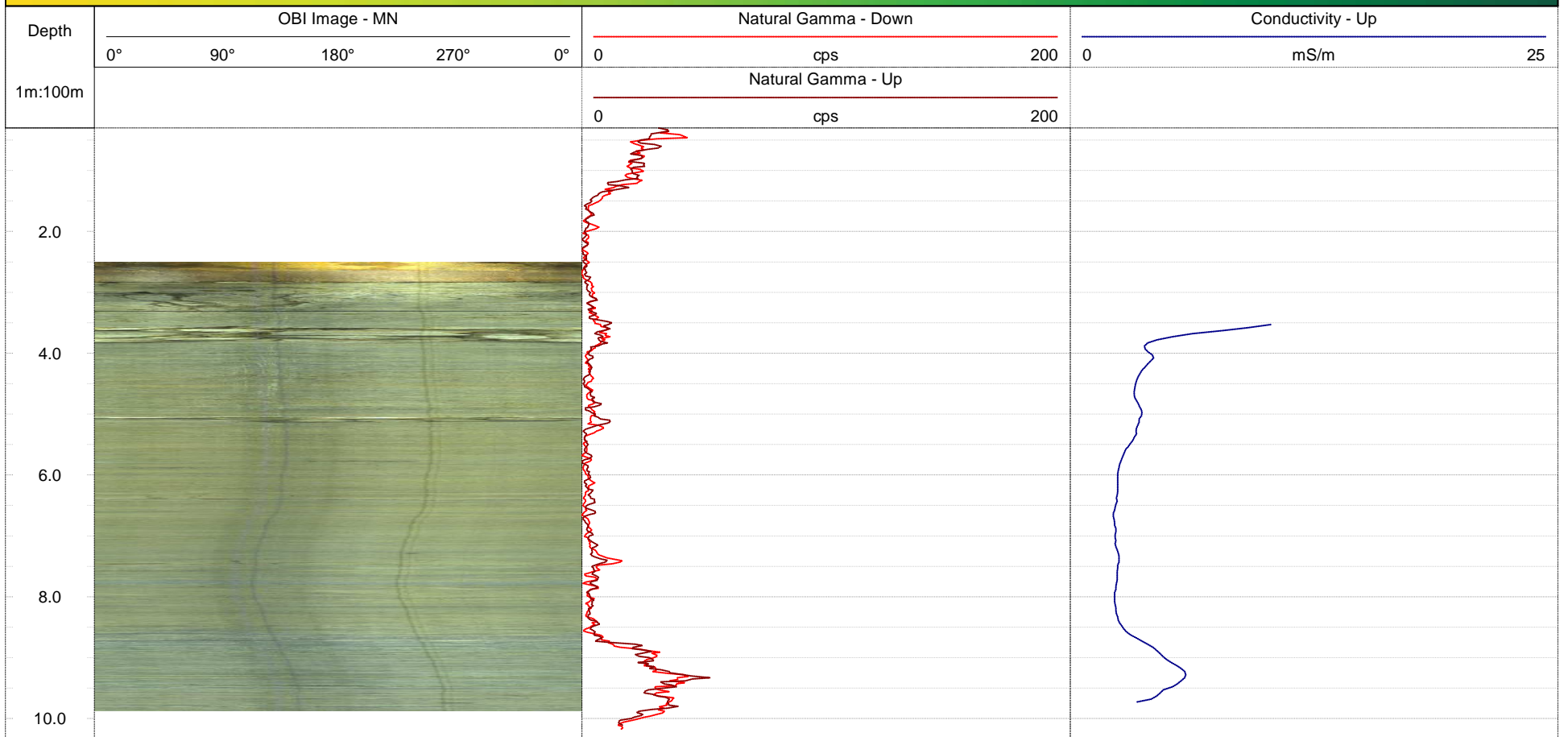
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-11 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.83 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578065.10 m    **Drilled Depth:** 10.20 m bgs    **Water Level:** 3.33 m bgs    **Log Date:** Mar-26-2020  
**Northing:** 4854240.45 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 402.10 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.36 m ags

**Notes:** OBI image opaque > 9.95 m







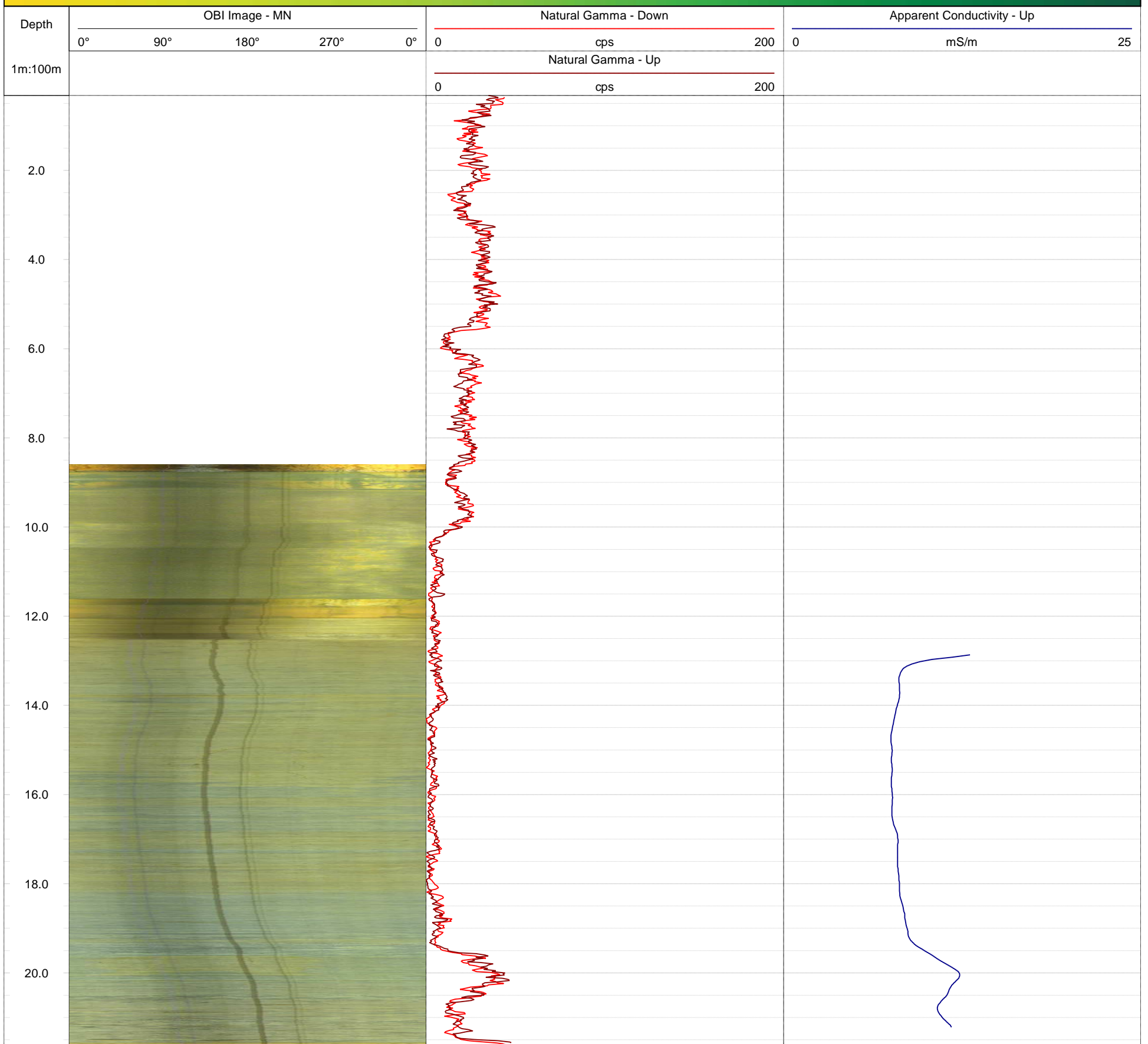
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-12 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.04m bgs    **Location:** Caledon, Ontario  
**Easting:** 577780.56 m    **Drilled Depth:** 21.76 m bgs    **Water Level:** 8.77 m bgs    **Log Date:** Mar-25-2020  
**Northing:** 4854244.92 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.22 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.35 m ags

**Notes:**





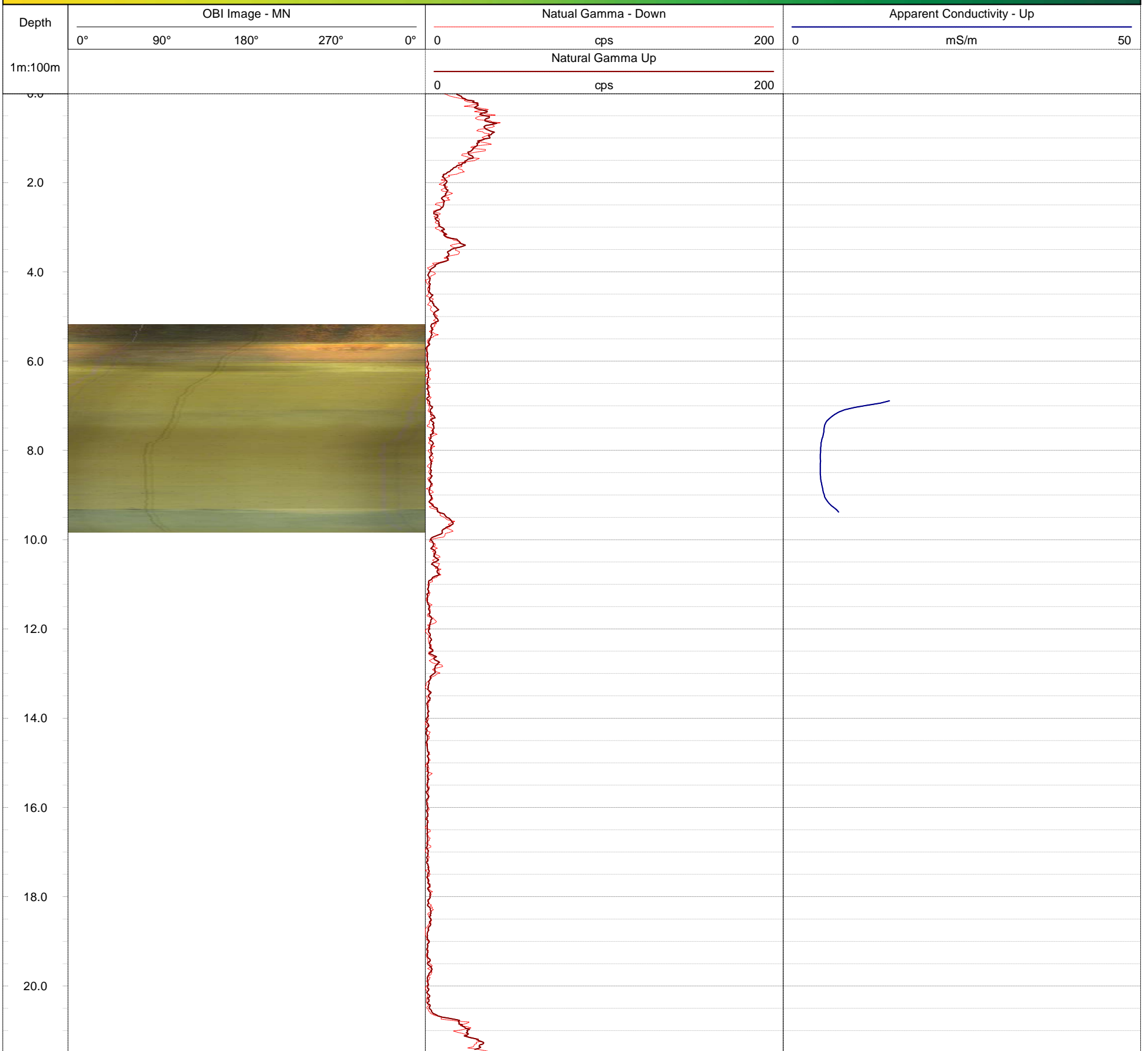
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-13 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.99 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577209.70 m    **Drilled Depth:** 22.80 m bgs    **Water Level:** 3.48 m bgs    **Log Date:** Apr-14,20-2020  
**Northing:** 4854103.25 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 412.94 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.46 m ags

**Notes:** Blockage at 9.84 m. Gamma survey was completed with drill casing in place due to poor hole condtions.





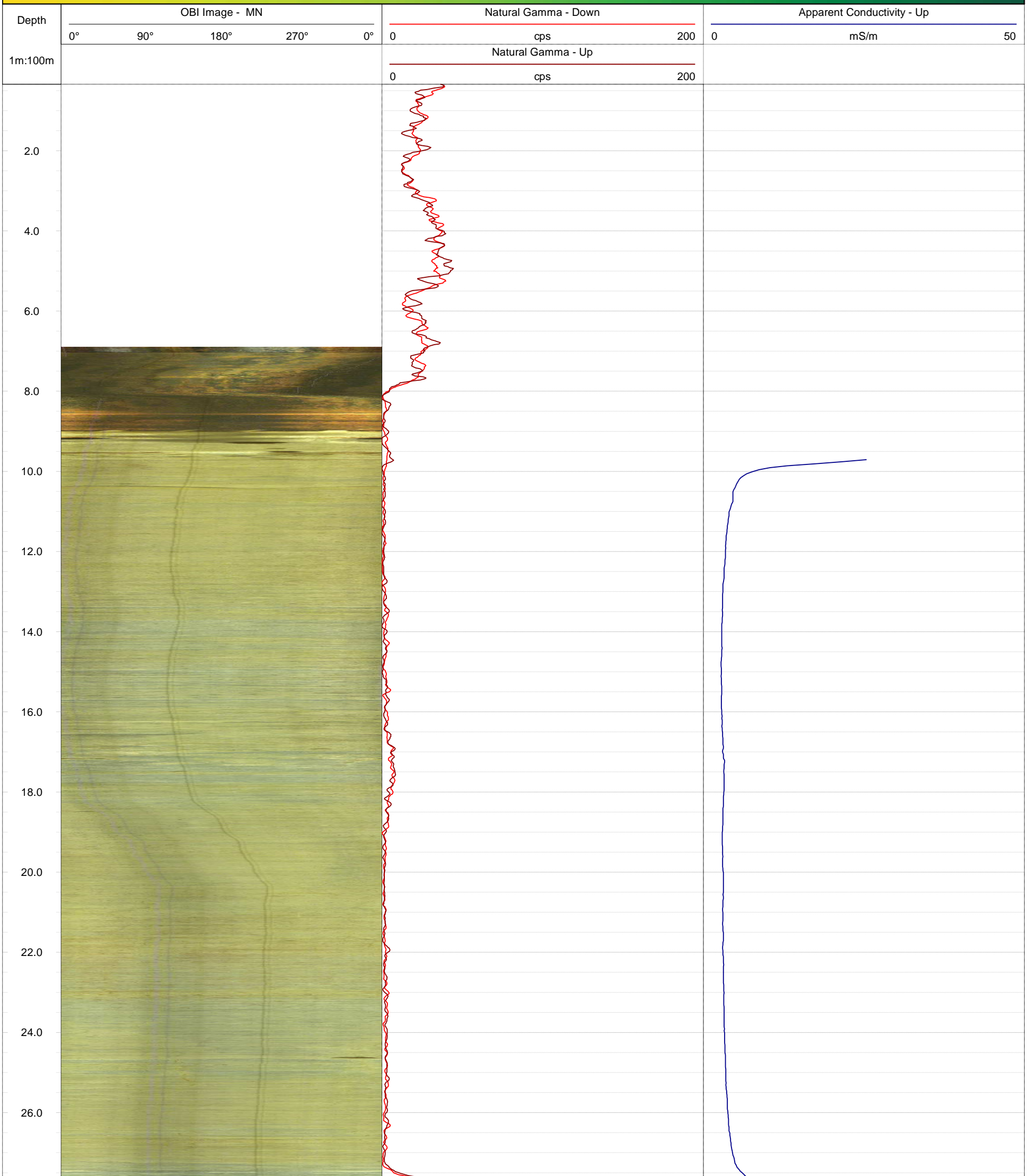
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-14 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 8.99 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577288.55 m    **Drilled Depth:** 31.46 m bgs    **Water Level:** 6.79 m bgs    **Log Date:** Apr-14-2020  
**Northing:** 4853881.70 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 417.27 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.46 m ags

**Notes:**









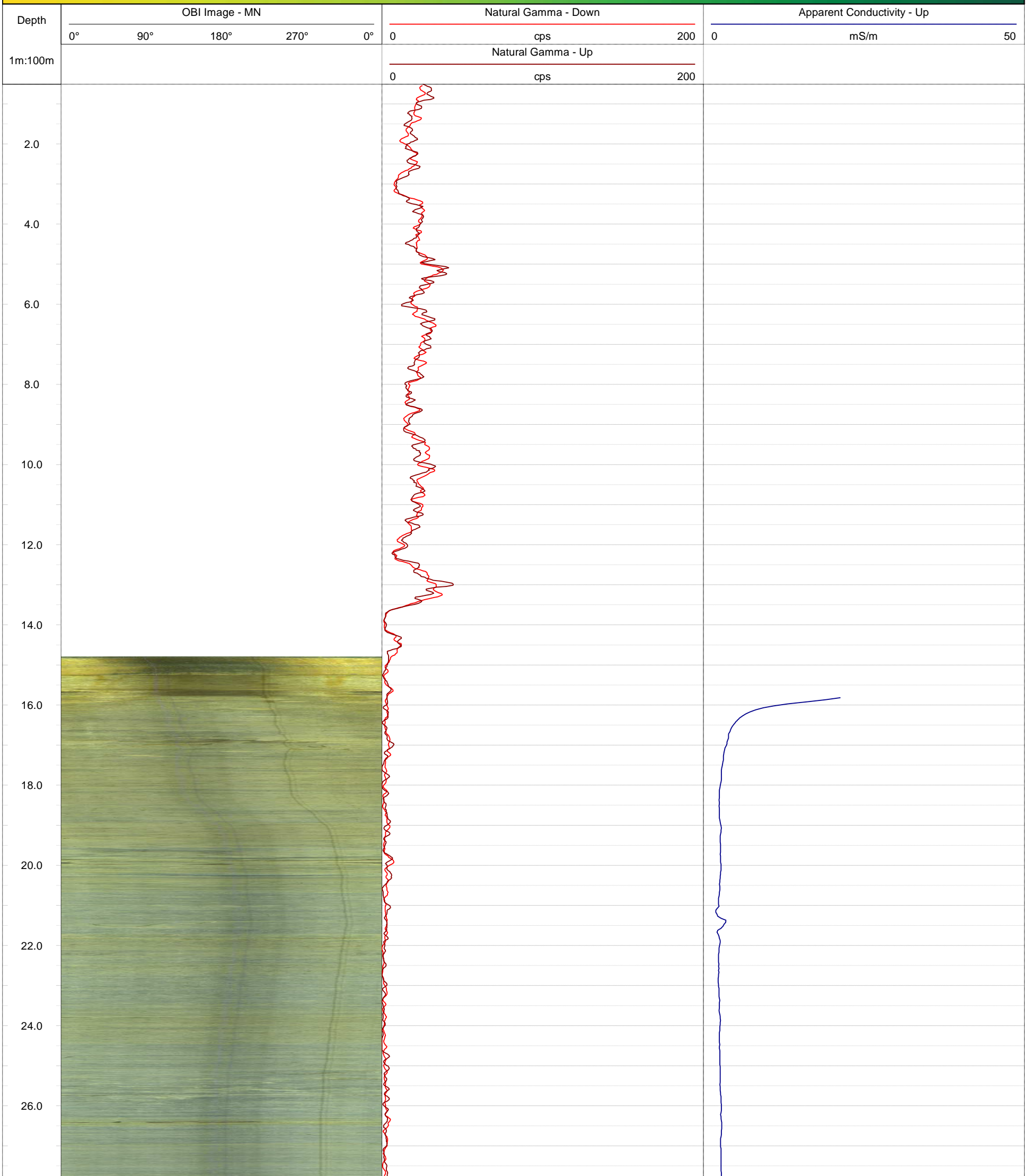
**GOLDER**  
MEMBER OF WSP

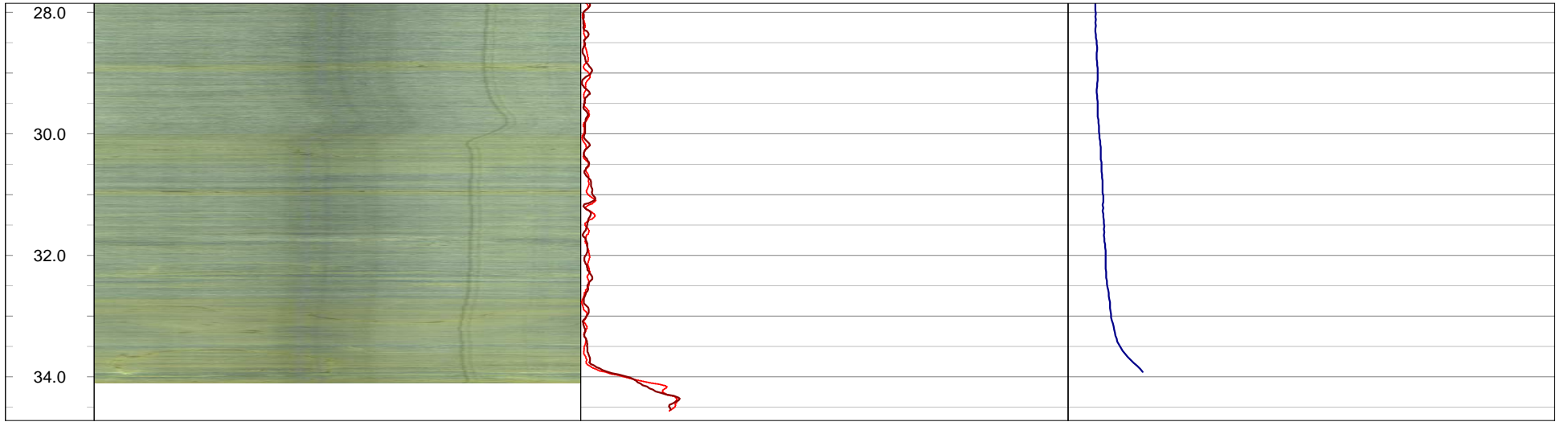
**Geophysical Record of Borehole: BH20-15 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.26 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576925.21 m    **Drilled Depth:** 34.76 m bgs    **Water Level:** 3.09 m bgs    **Log Date:** Apr-14-2020  
**Northing:** 4854113.14 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 421.52 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.16 m ags

**Notes:**







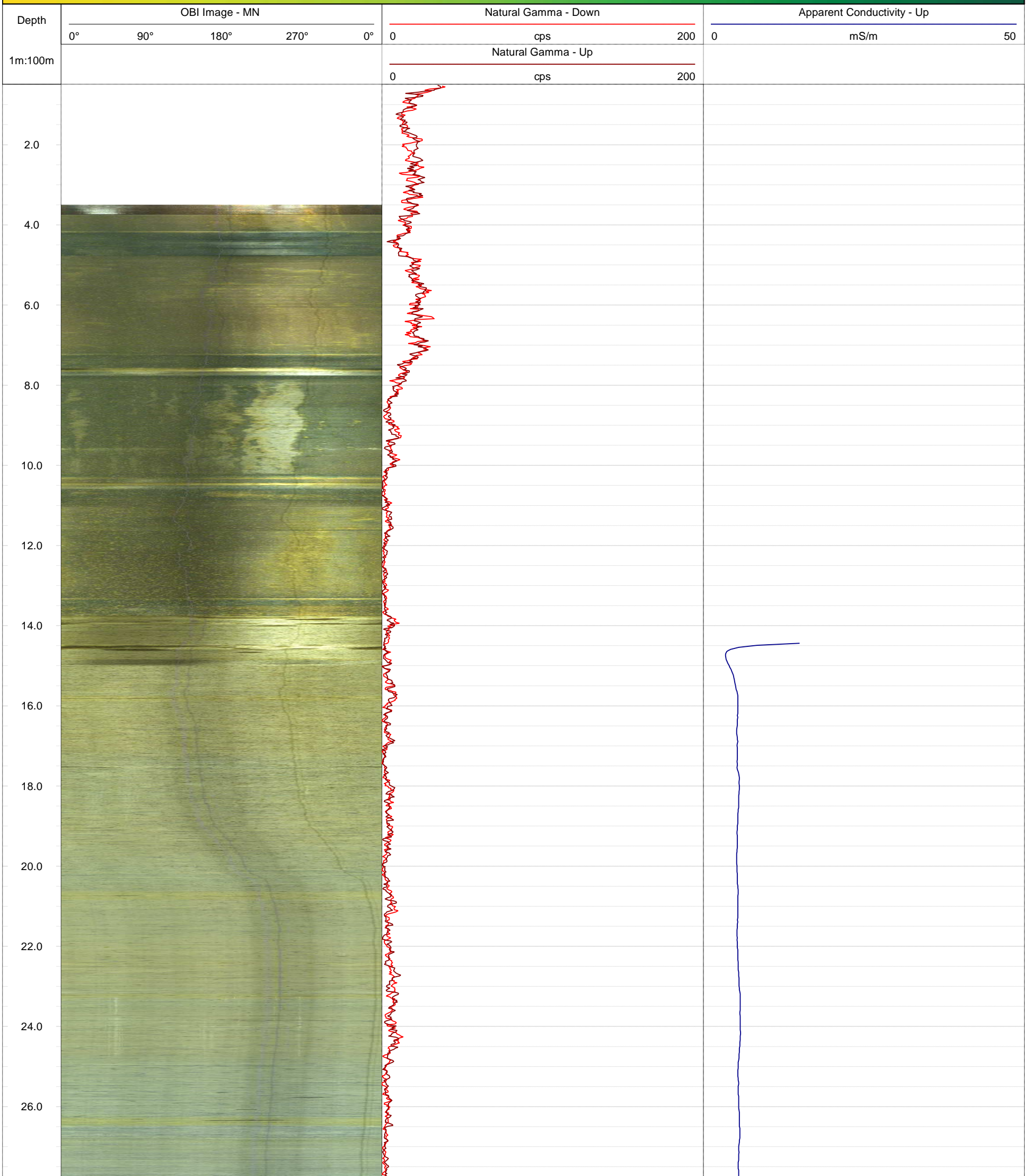
**GOLDER**  
MEMBER OF WSP

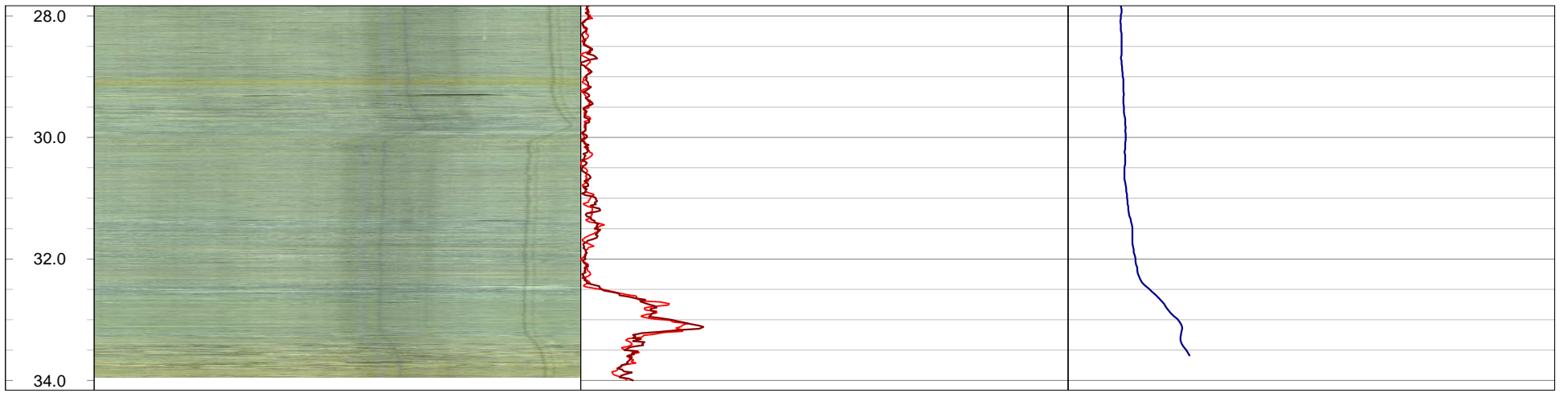
**Geophysical Record of Borehole: BH20-16 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 13.76 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576991.38 m    **Drilled Depth:** 34.18 m bgs    **Water Level:** 3.60 m bgs    **Log Date:** Apr-21-2020  
**Northing:** 4853859.50 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 420.74 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.17 m ags

**Notes:**









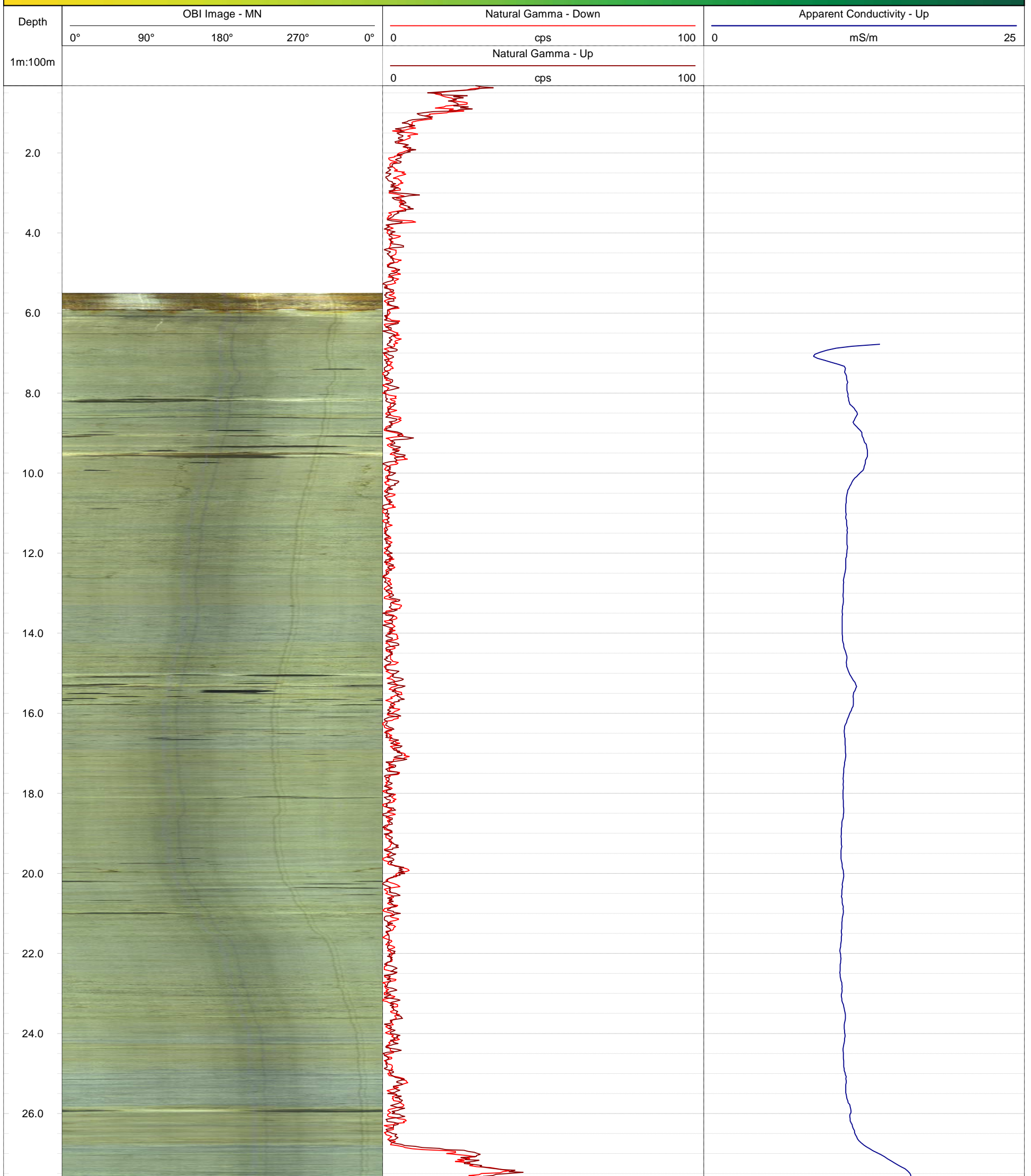
**GOLDER**  
MEMBER OF WSP



**Geophysical Record of Borehole: BH20-17 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.92 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577474.67 m	<b>Drilled Depth:</b> 28.83 m bgs	<b>Water Level:</b> 6.51 m bgs	<b>Log Date:</b> Apr-27-2020
<b>Northing:</b> 4853391.65 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 413.06 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.46 m ags	

**Notes:**



28.0			
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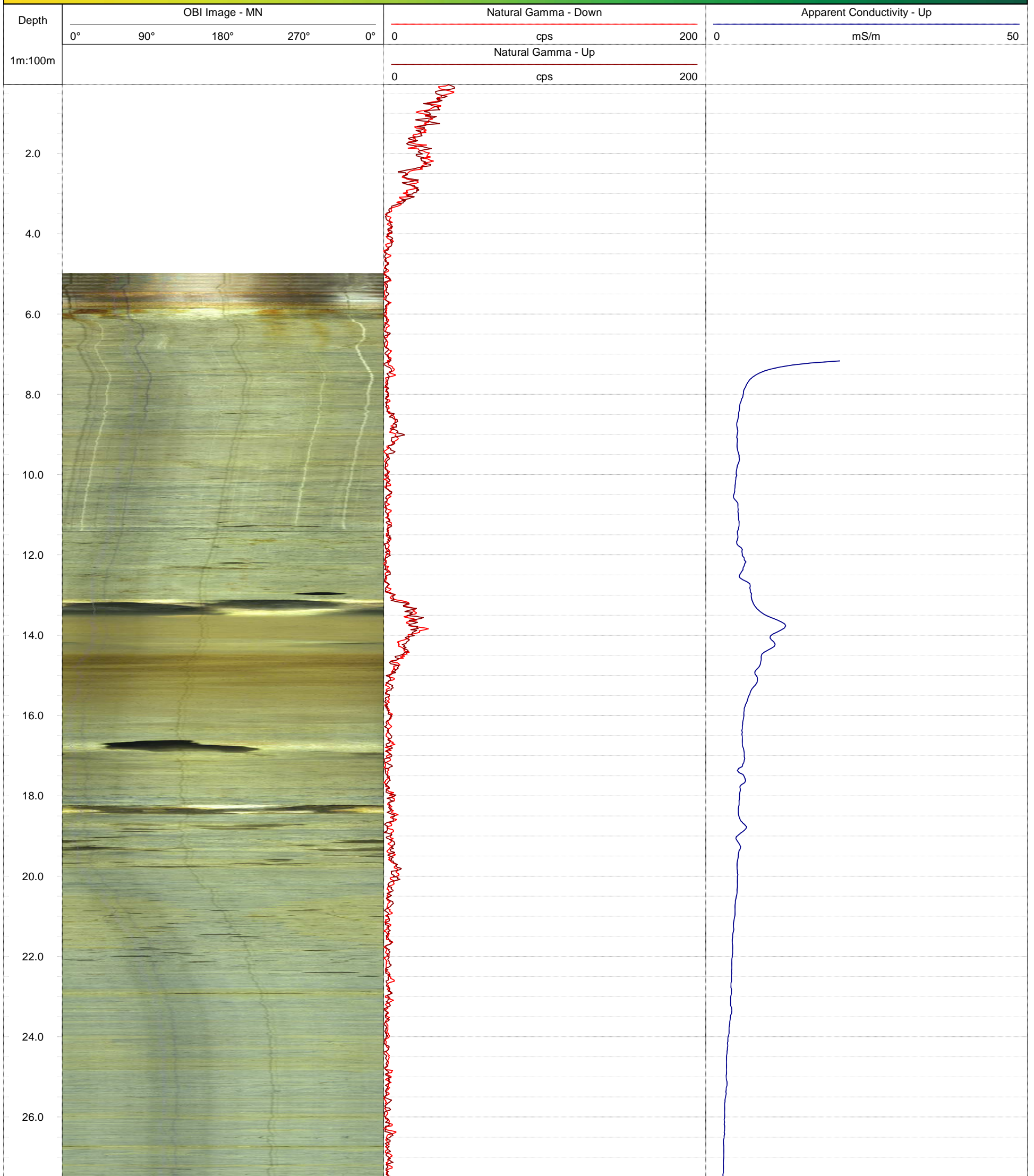
**GOLDER**  
MEMBER OF WSP

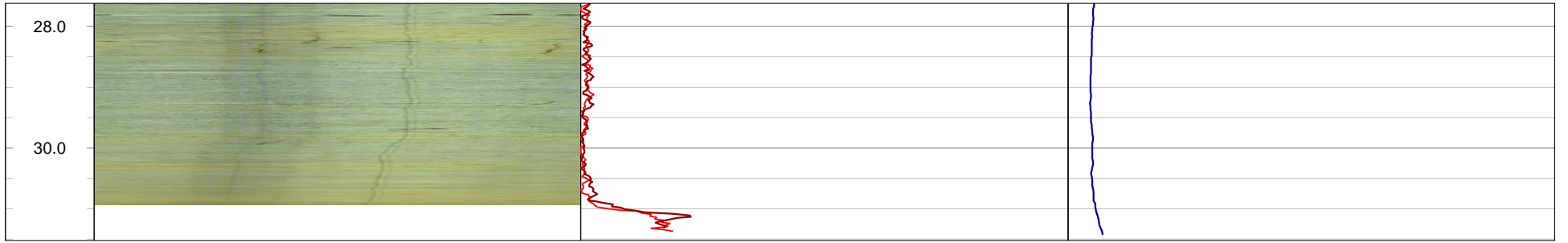
**Geophysical Record of Borehole: BH20-18 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.90 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577313.39 m    **Drilled Depth:** 31.84 m bgs    **Water Level:** 11.45 m bgs    **Log Date:** Apr-27-2020  
**Northing:** 4853571.83 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 417.53 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.40 m ags

**Notes:** OBI Image opaque >31 m bgs





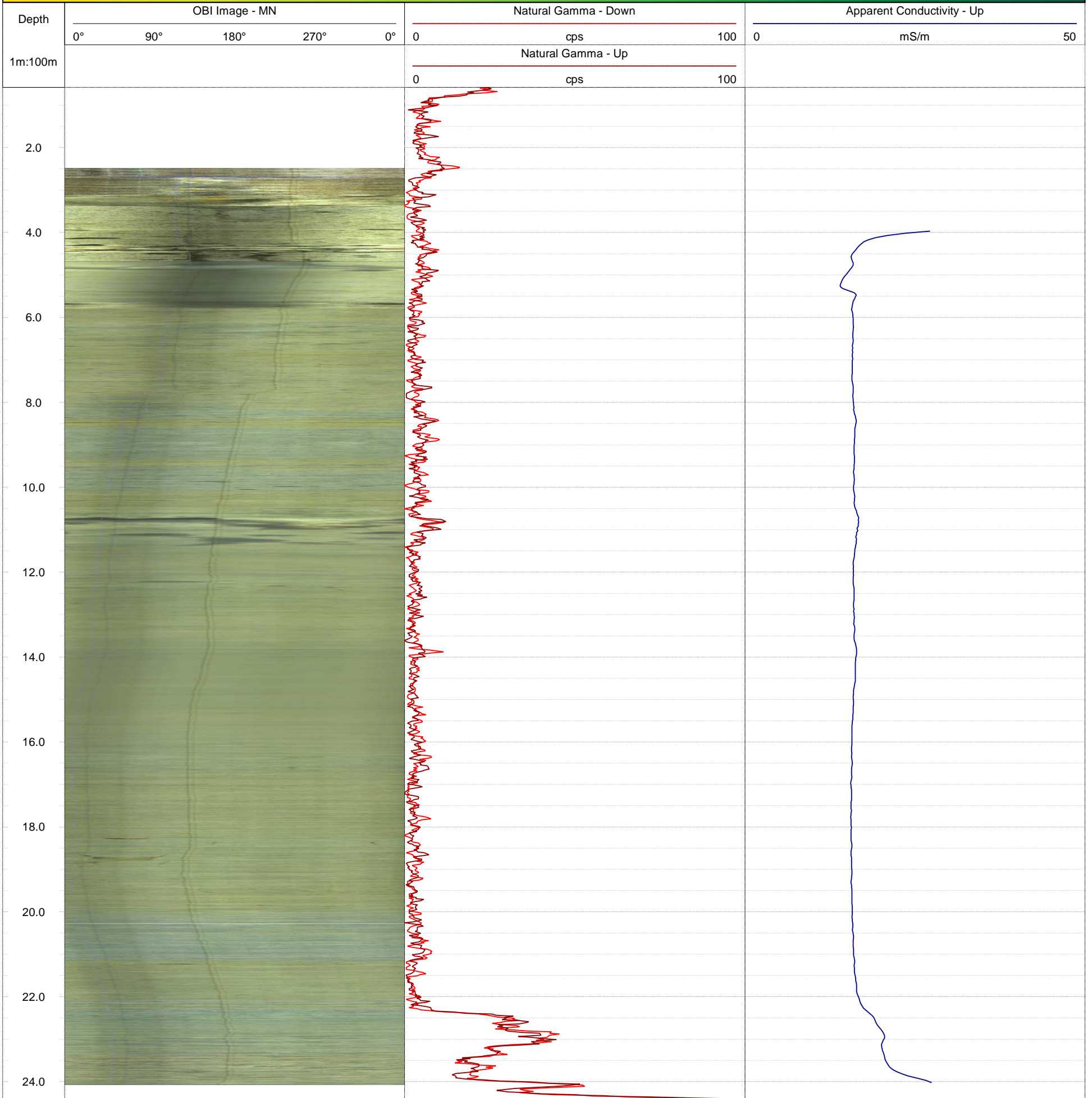




**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 3.15 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577733.06 m	<b>Drilled Depth:</b> 24.64 m bgs	<b>Water Level:</b> 4.70 m bgs	<b>Log Date:</b> Apr-27-2020
<b>Northing:</b> 4853579.97 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 411.42 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.46 m ags	

**Notes:**





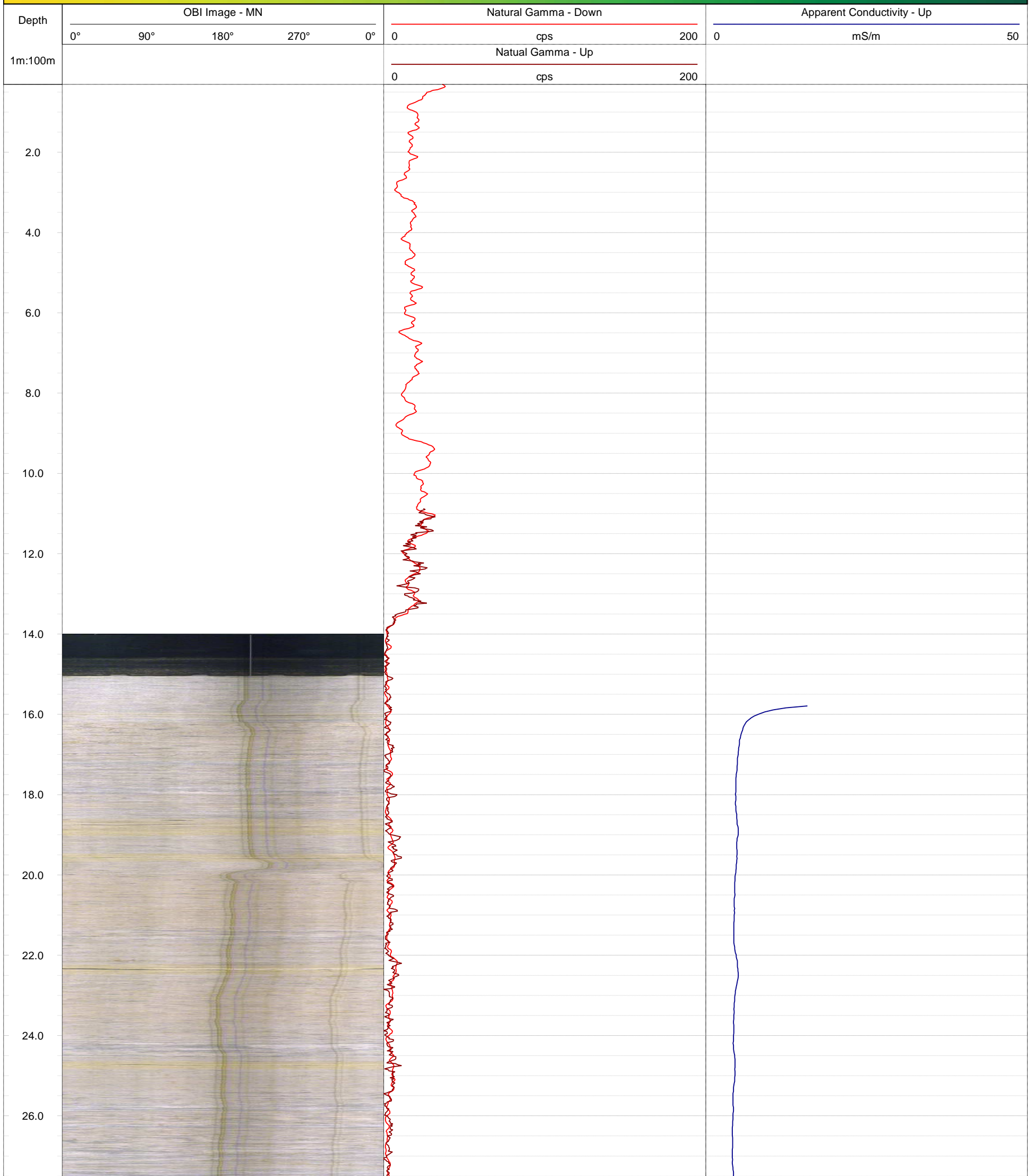
**GOLDER**  
MEMBER OF WSP

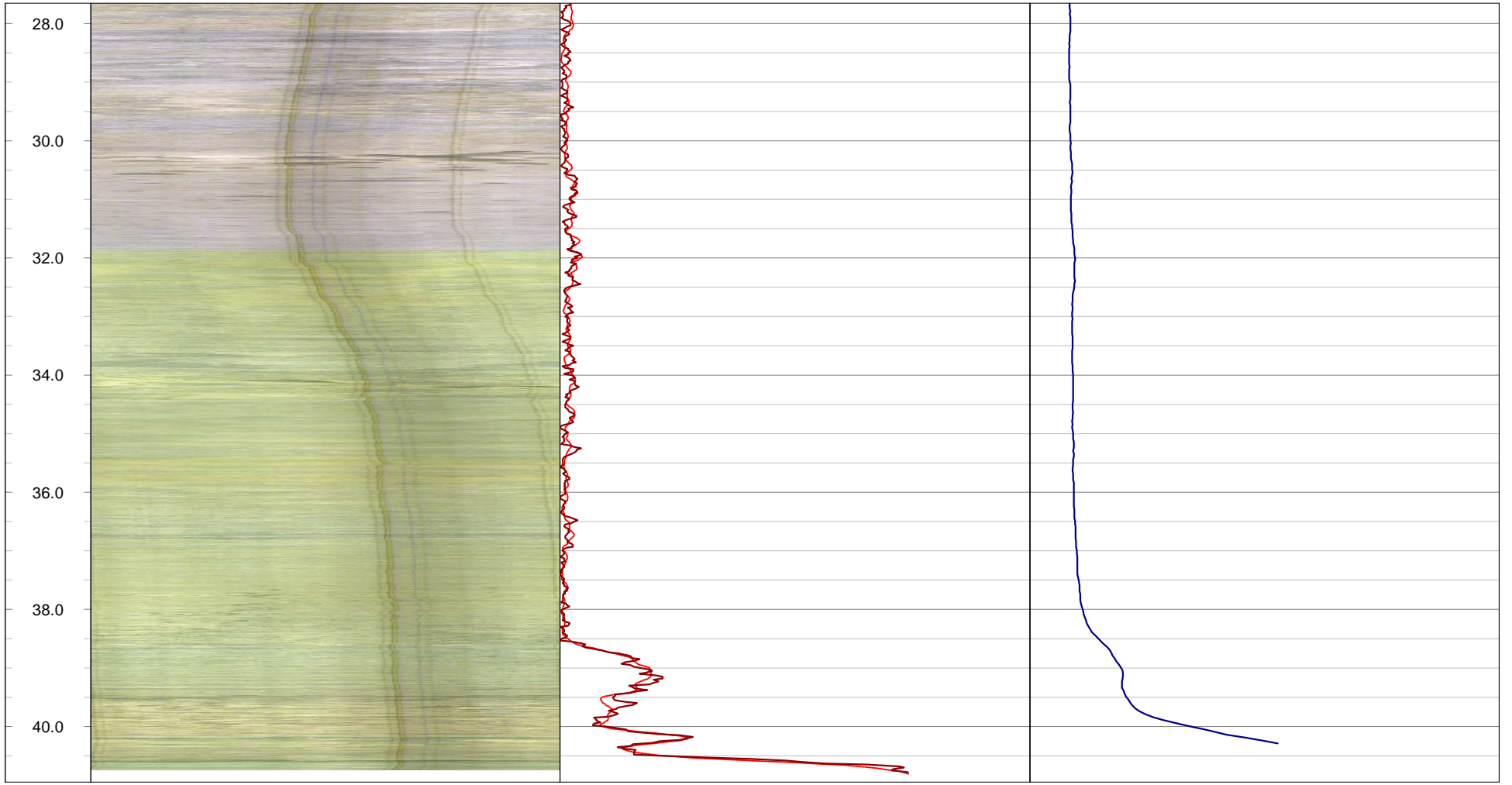
**Geophysical Record of Borehole: BH20-20 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.05 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577031.10 m    **Drilled Depth:** 40.98 m bgs    **Water Level:** 11.71 m bgs    **Log Date:** May-20-2020  
**Northing:** 4853551.56 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 423.60 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.39 m ags

**Notes:** OBI image opaque > 40.78 m bgs









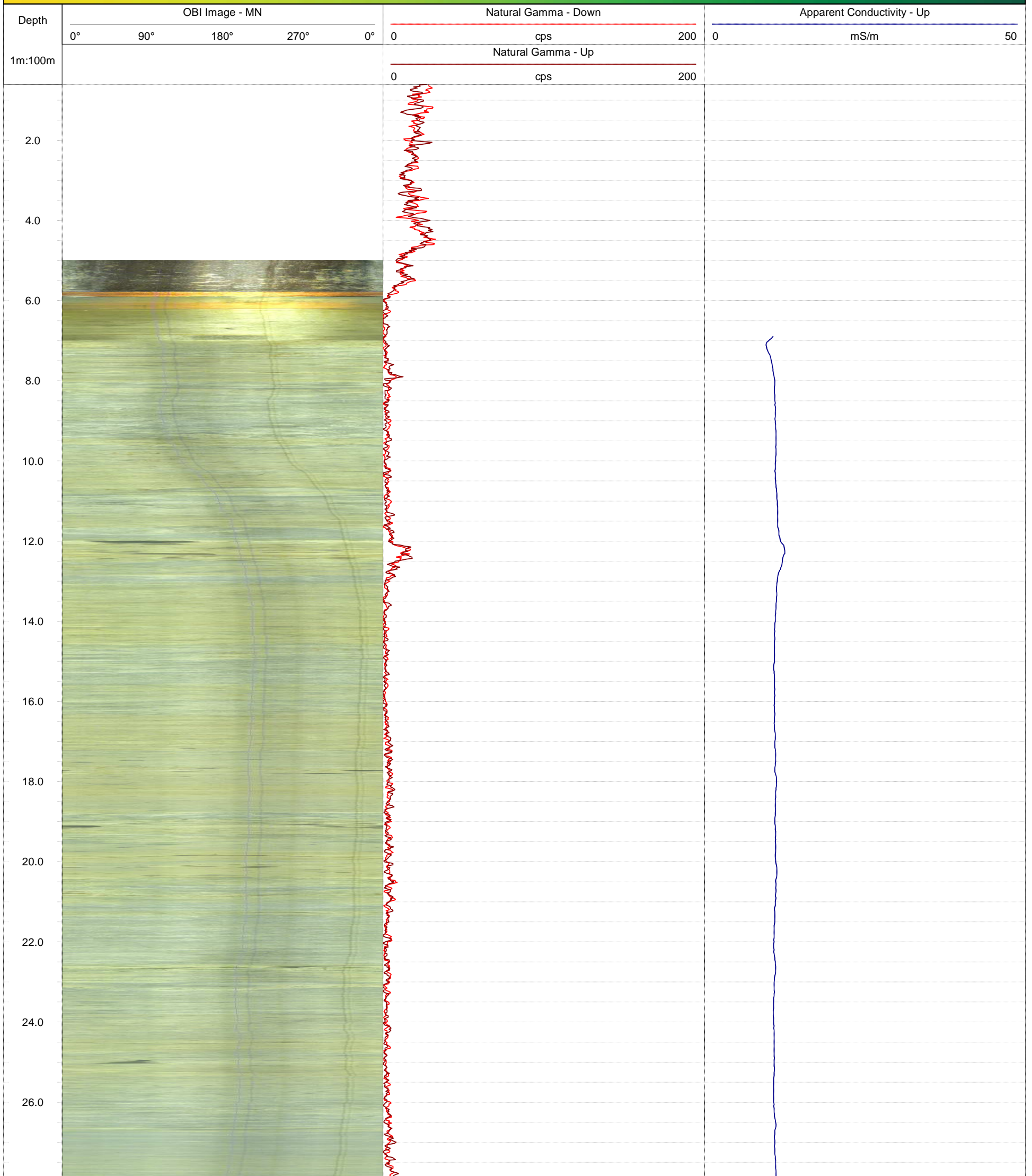
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-21 (CAL)**

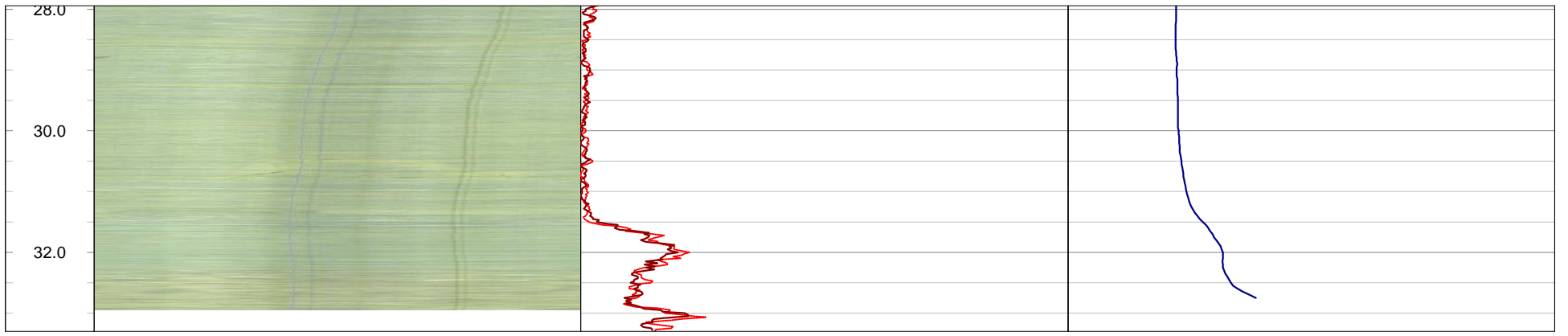
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 6.21 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576935.66 m	<b>Drilled Depth:</b> 33.48 m bgs	<b>Water Level:</b> 5.92 m bgs	<b>Log Date:</b> May-20-2020
<b>Northing:</b> 4853276.58 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 413.53 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.08 m ags	

**Notes:** OBI image opaque > 33.1 m bgs









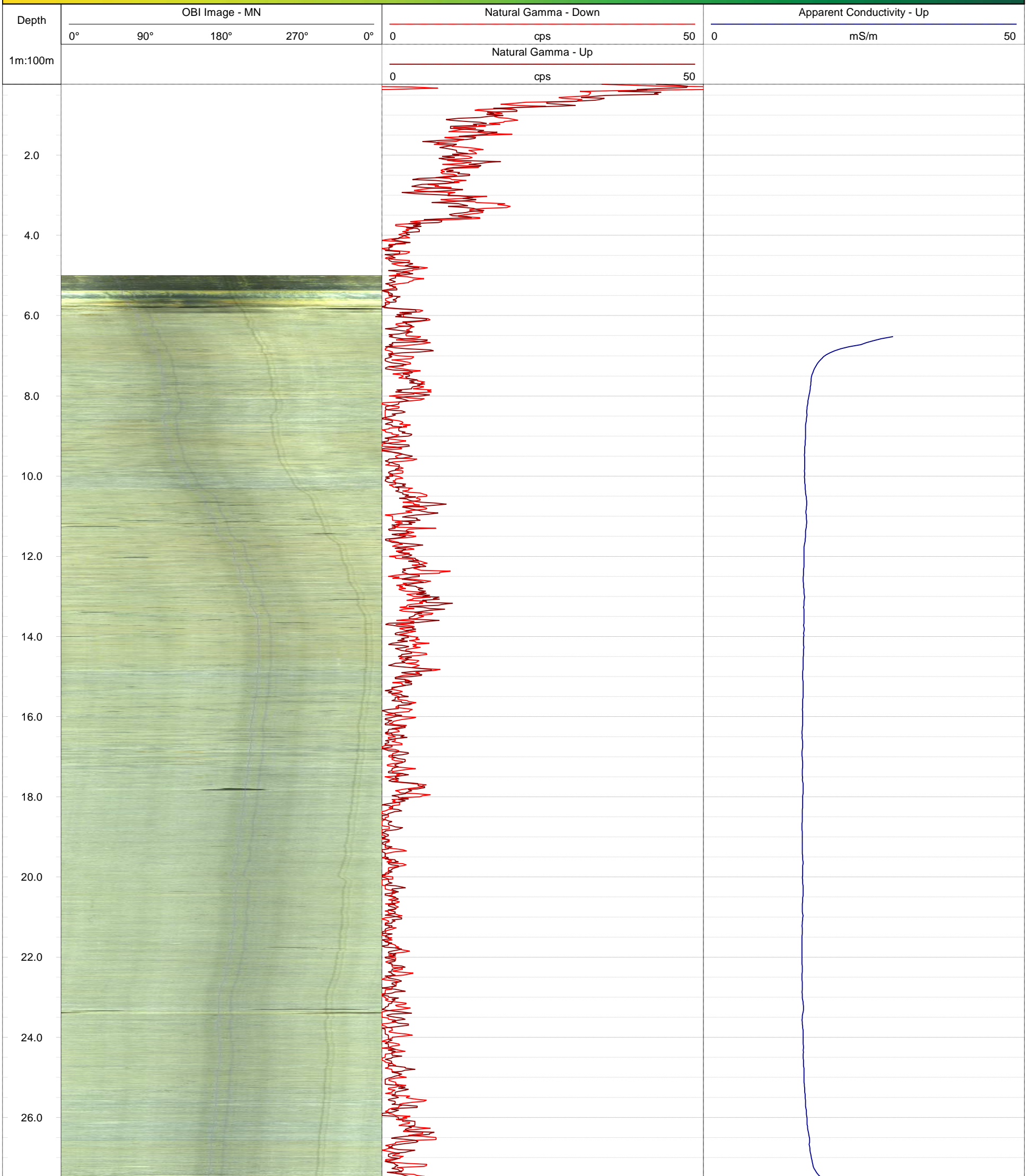
**GOLDER**  
MEMBER OF WSP


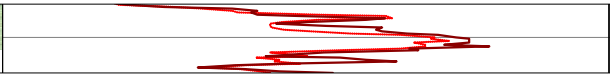

**Geophysical Record of Borehole: BH20-22 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.77 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576701.79 m	<b>Drilled Depth:</b> 28.61 m bgs	<b>Water Level:</b> 2.88 m bgs	<b>Log Date:</b> May-20-2020
<b>Northing:</b> 4853293.98 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 410.98 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.47 m ags	

**Notes:**



28.0			
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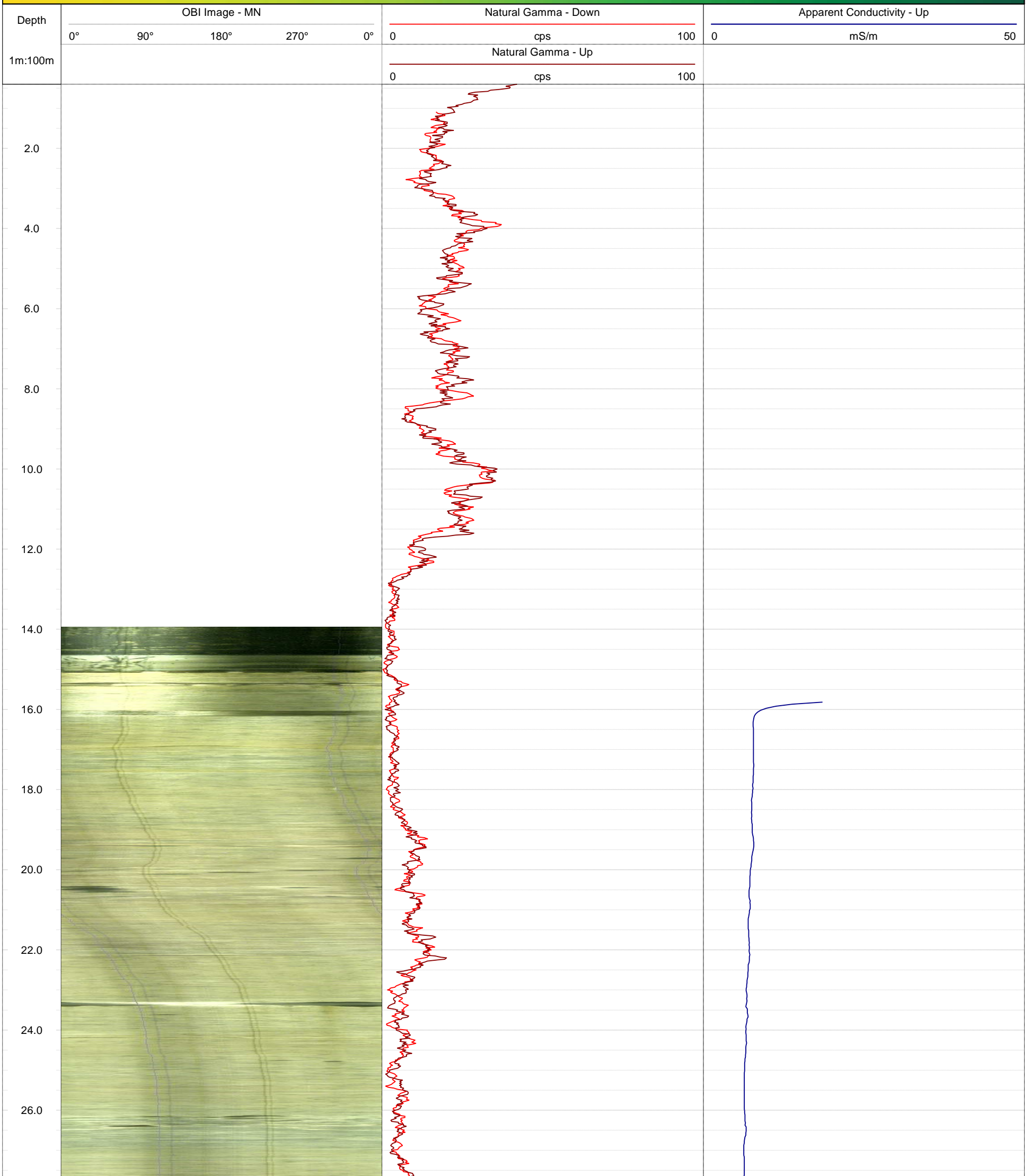
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-23 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.08 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576779.85 m    **Drilled Depth:** 37.62 m bgs    **Water Level:** 2.50 m bgs    **Log Date:** May-25-2020  
**Northing:** 4853559.83 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 420.27 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.36 m ags

**Notes:** OBI image opaque > 37 m bgs









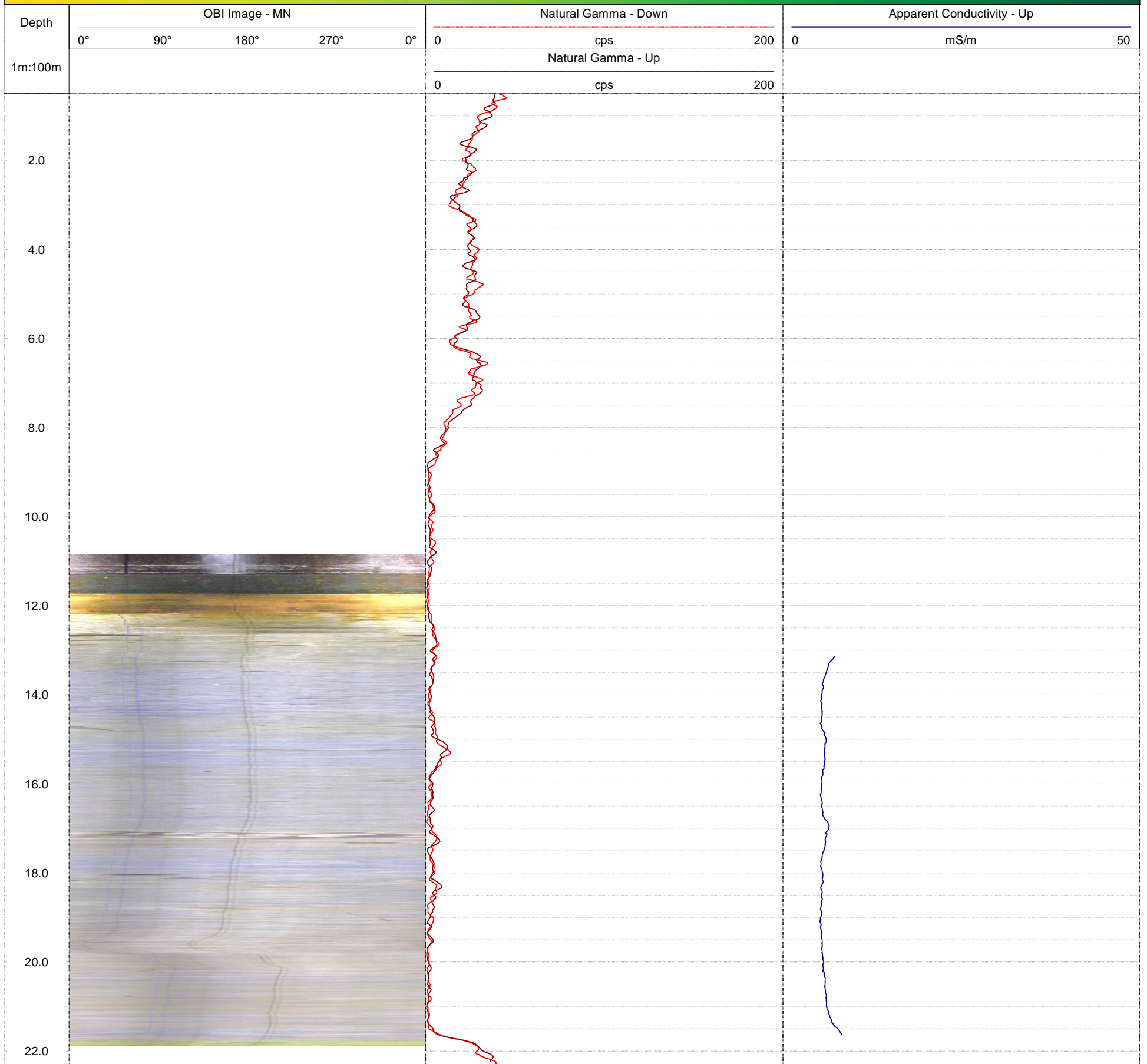
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-24 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.20 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577296.02 m    **Drilled Depth:** 22.76 m bgs    **Water Level:** 11.28 m bgs    **Log Date:** Jun-08-2020  
**Northing:** 4852710.32 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 403.60 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.20 m ags

**Notes:**





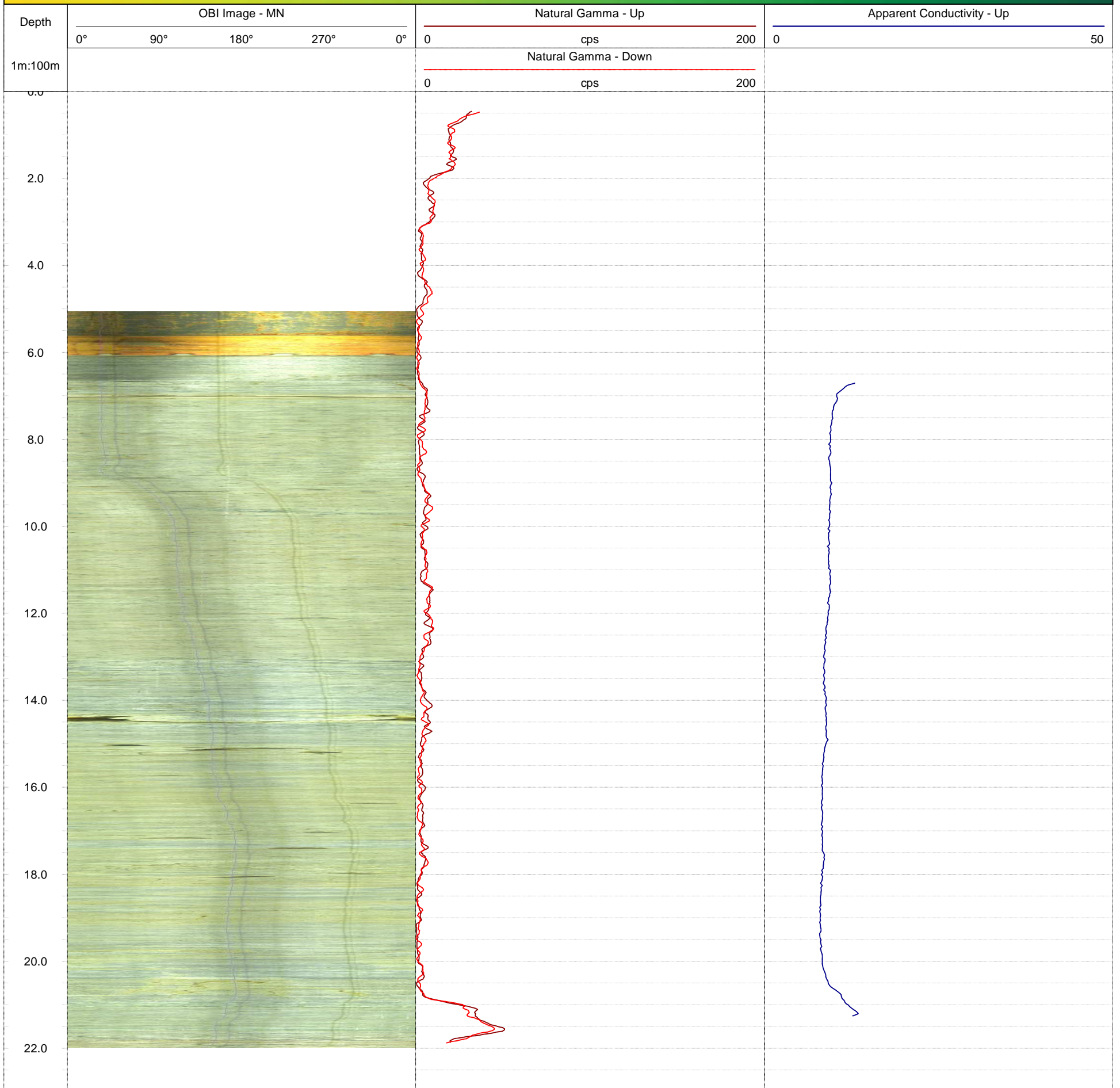
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-25 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.08 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577402.13 m    **Drilled Depth:** 22.03 m bgs    **Water Level:** 4.03 m bgs    **Log Date:** Jun-15-2020  
**Northing:** 4852974.96 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 405.48 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.22 m ags

**Notes:**





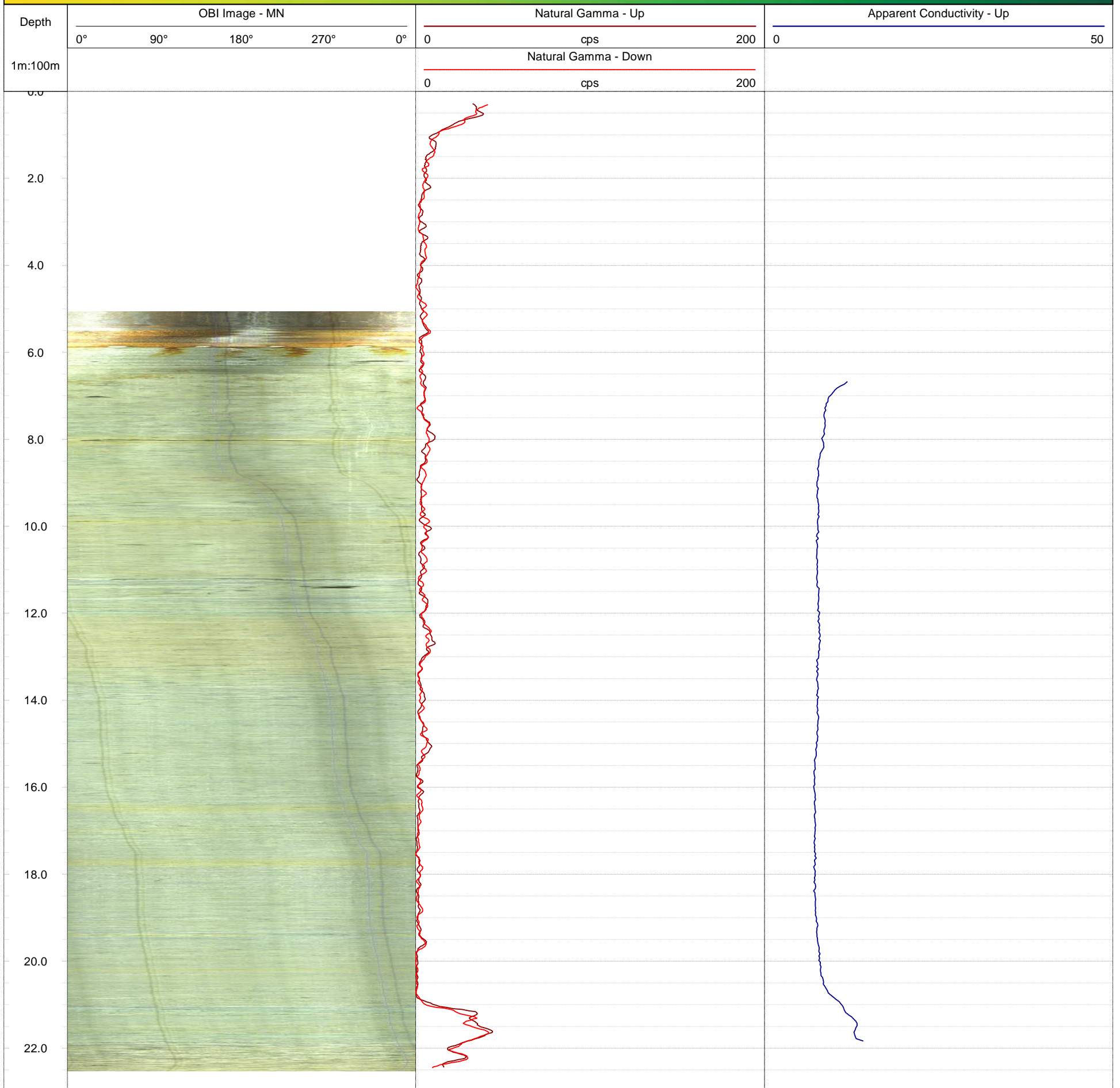
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-26 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.89 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577037.86 m    **Drilled Depth:** 22.73 m bgs    **Water Level:** 6.15 m bgs    **Log Date:** Jun-15-2020  
**Northing:** 4852942.75 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 404.82 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.39 m ags

**Notes:**







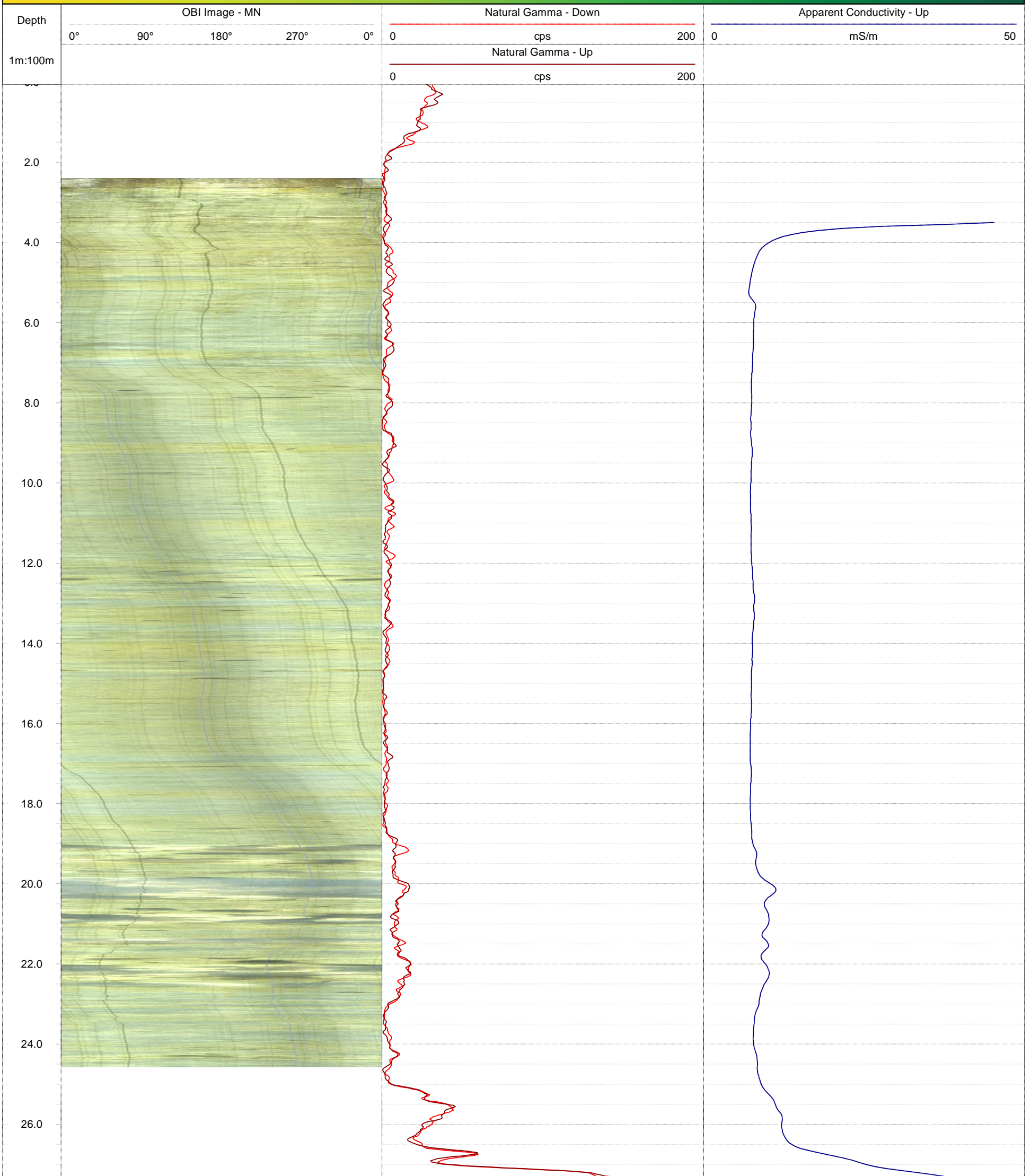
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: BH20-27 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 2.64 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577212.29 m	<b>Drilled Depth:</b> 27.65 m bgs	<b>Water Level:</b> 4.41 m bgs	<b>Log Date:</b> Oct-22-2020
<b>Northing:</b> 4853168.73 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> CM
<b>Elevation:</b> 408.64 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.61 m ags	

**Notes:** OBI image opaque > 25.35 m bgs



28.0			
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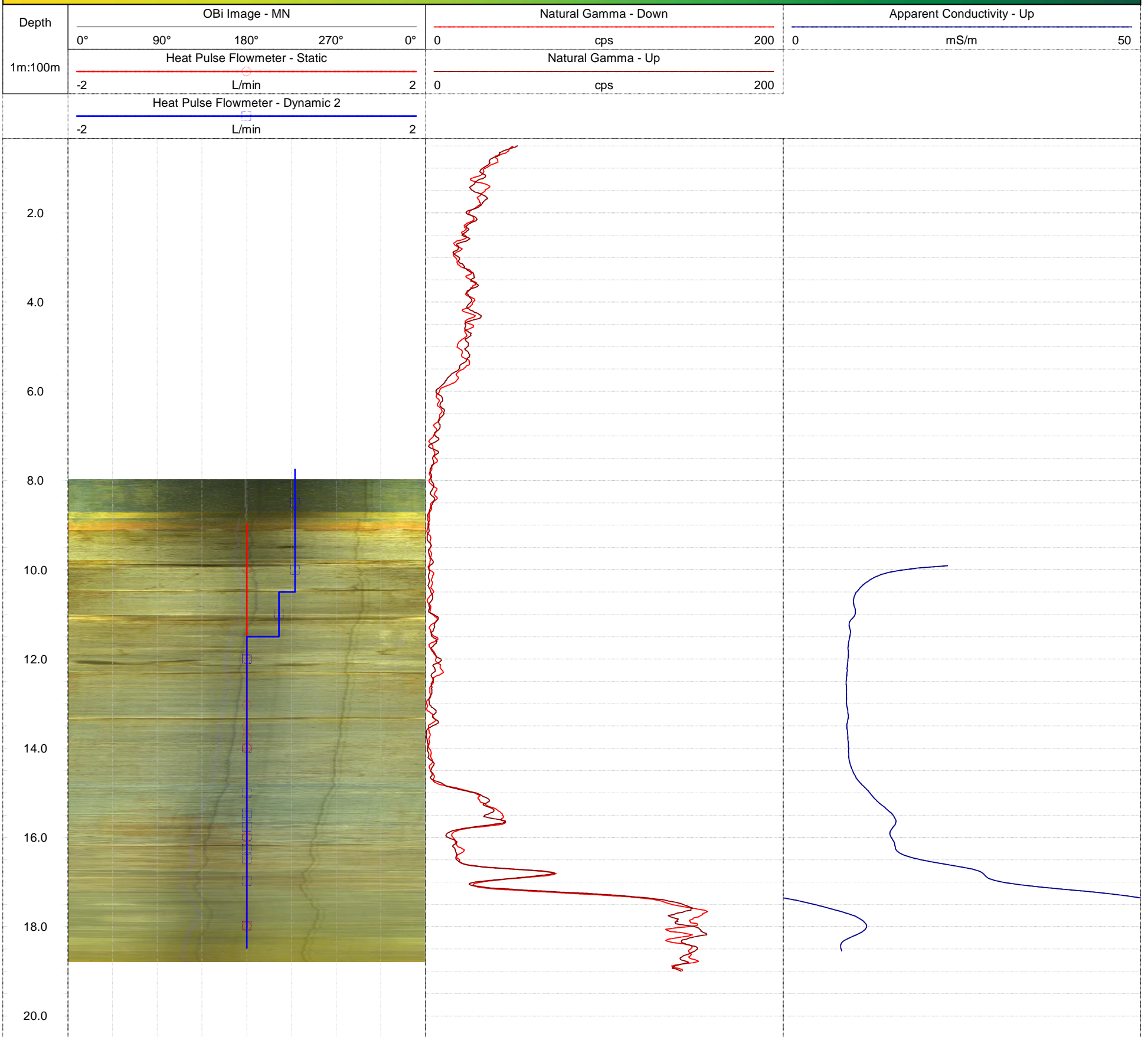
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-01 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 9.13 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577458.50 m    **Drilled Depth:** 19.41 m bgs    **Water Level:** 1.91 m bgs    **Log Date:** Mar-13,16-2020  
**Northing:** 4852268.28 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM/PG  
**Elevation:** 395.10 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.20 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 6.0 m below top of casing. Pump rate approximately 2.34 L/min.





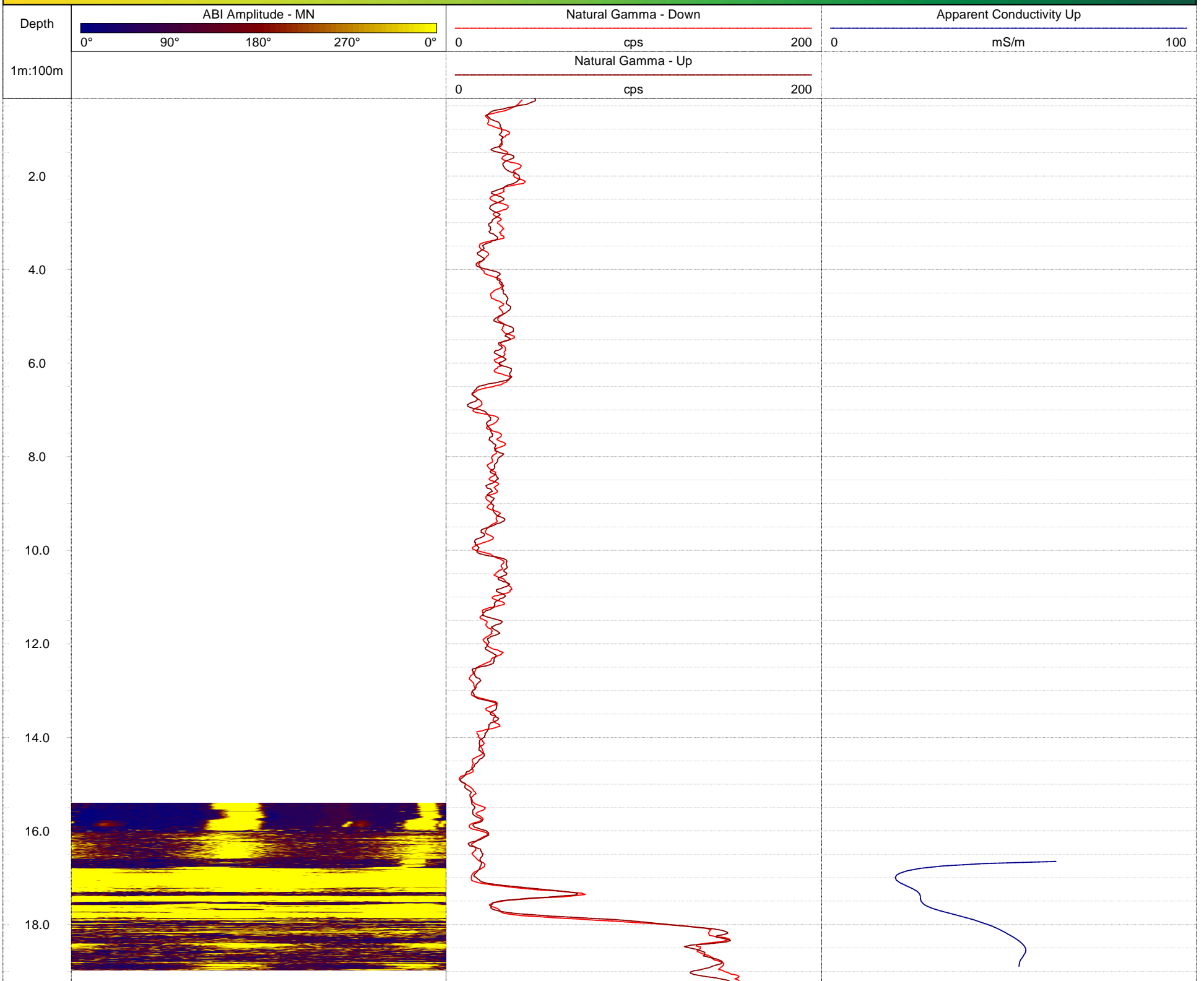
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-02 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.91 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577900.04 m    **Drilled Depth:** 19.57 m bgs    **Water Level:** 8.12 m bgs    **Log Date:** Mar-11-2020  
**Northing:** 48522138.37 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 399.63 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.32 m ags

**Notes:** Poor conditions in the borehole. Casing depth is approximate.







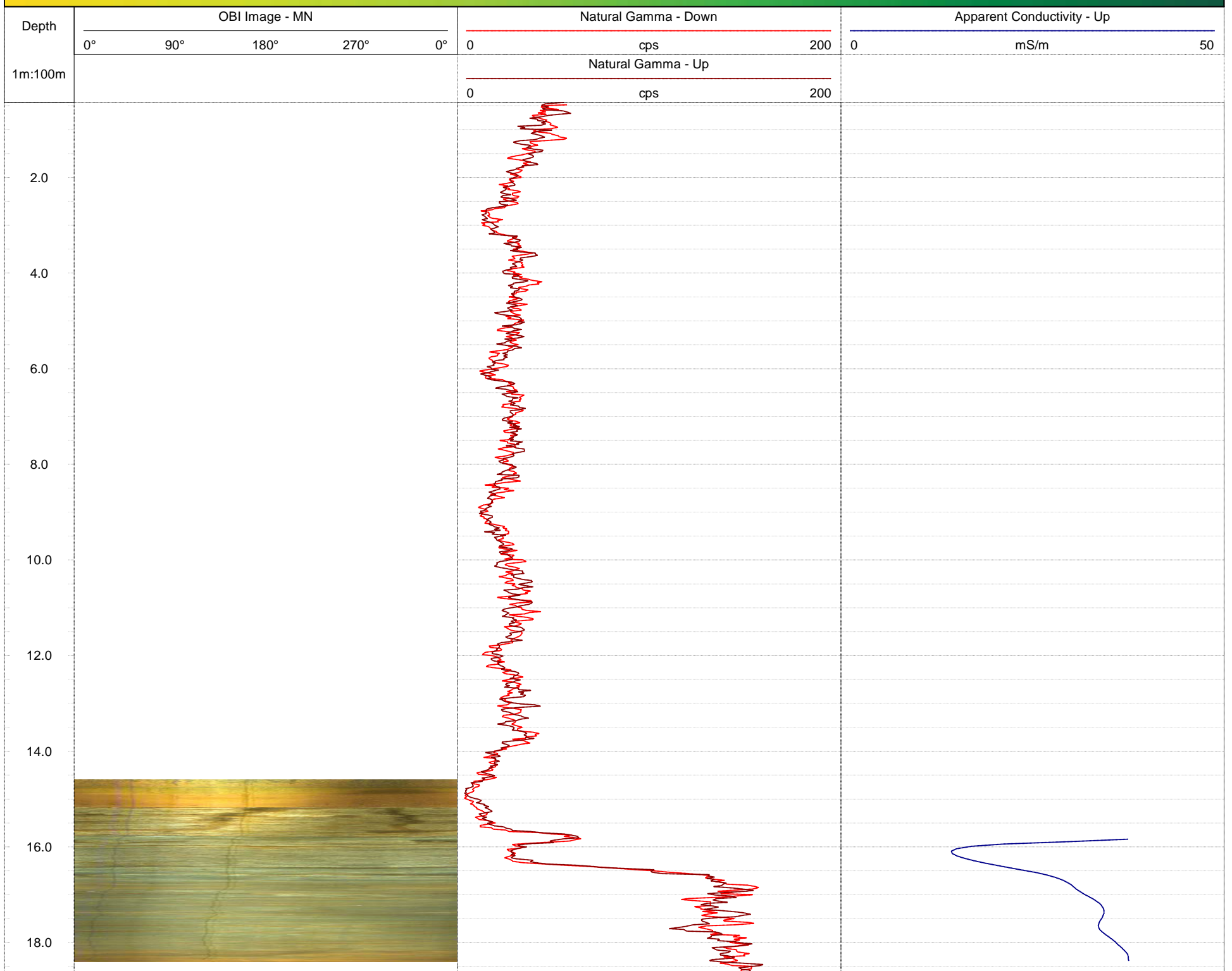
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-04 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.17 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578264.75 m    **Drilled Depth:** 18.50 m bgs    **Water Level:** 9.02 m bgs    **Log Date:** Mar-13-2020  
**Northing:** 4852313.19 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 399.46 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.23 m ags

**Notes:**





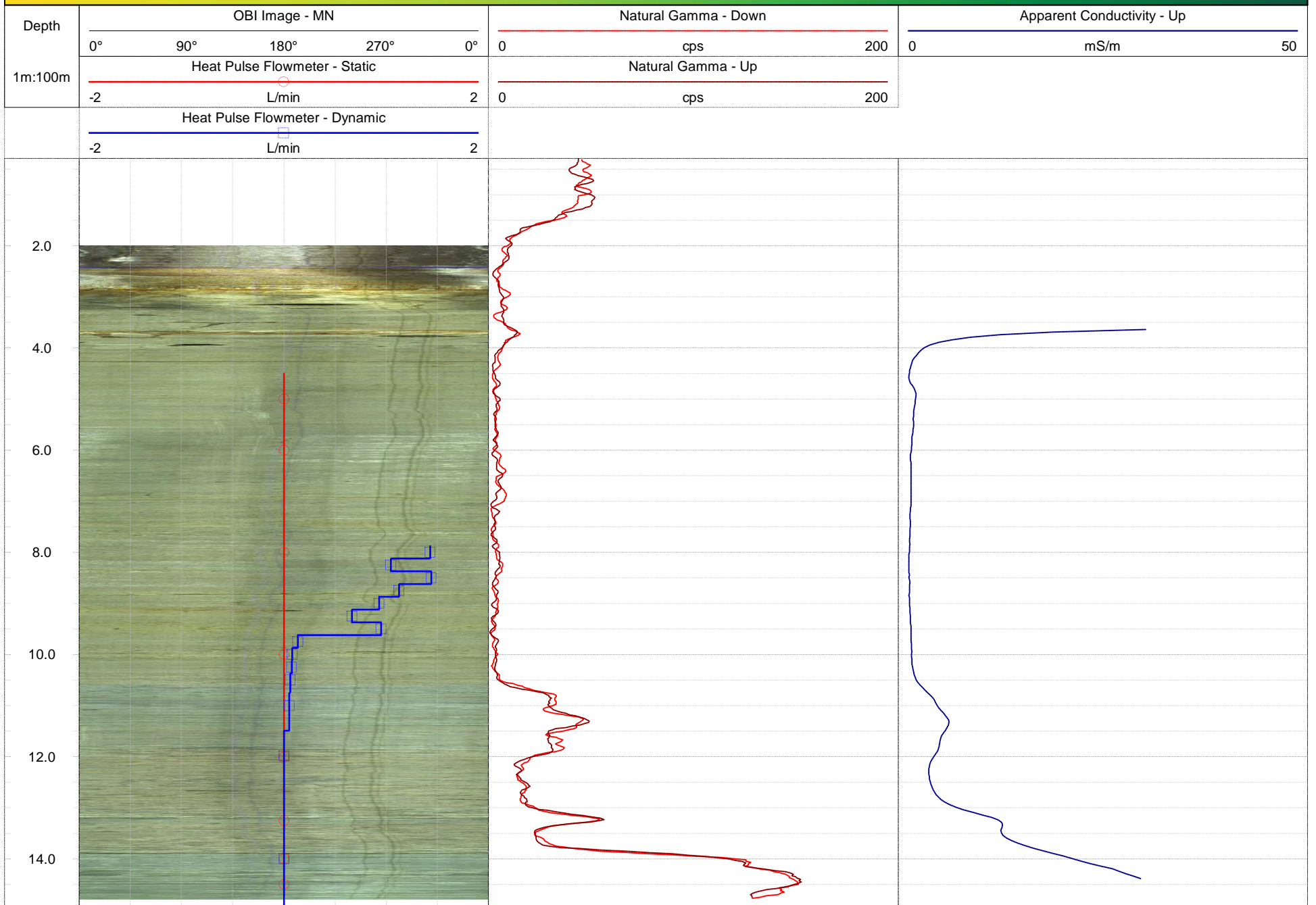
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-05 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.87 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578423.10 m    **Drilled Depth:** 14.84 m bgs    **Water Level:** 4.04 m bgs    **Log Date:** Mar-20-2020  
**Northing:** 4852712.60 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** CM  
**Elevation:** 399.63 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.38 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 6.0 m below top of casing. Pump rate approximately 2.25 L/min.





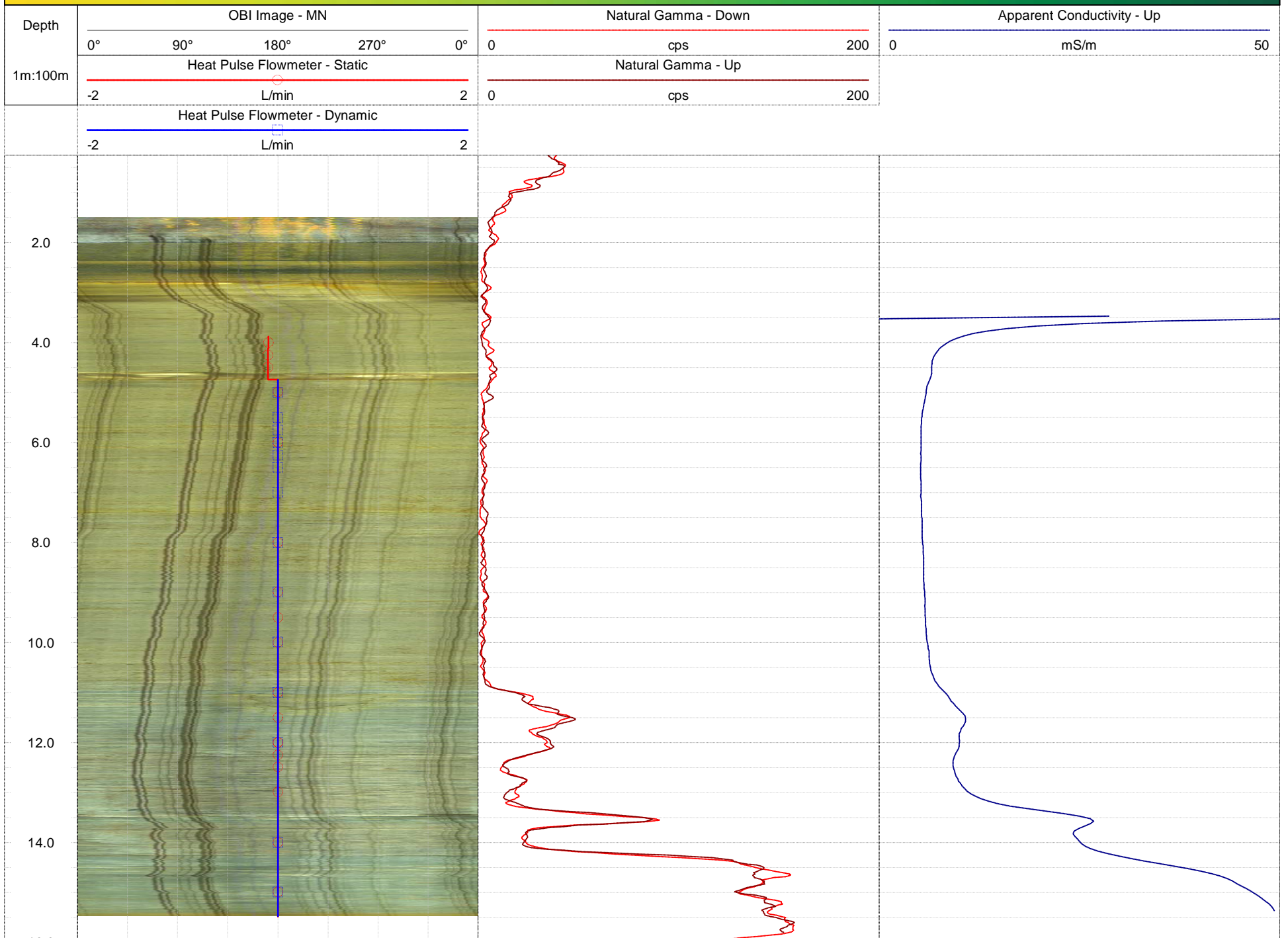
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-06 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.38 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578474.24 m    **Drilled Depth:** 16.03 m bgs    **Water Level:** 1.96 m bgs  
**Northing:** 4852972.59 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Log Date:** Mar-23-2020  
**Elevation:** 400.15 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.45 m ags    **Logged By:** PG

**Notes:** Heat Pulse Flowmeter Dynamic pump at 4.0 m below top of casing. Pump rate approximately 2.75 L/min.







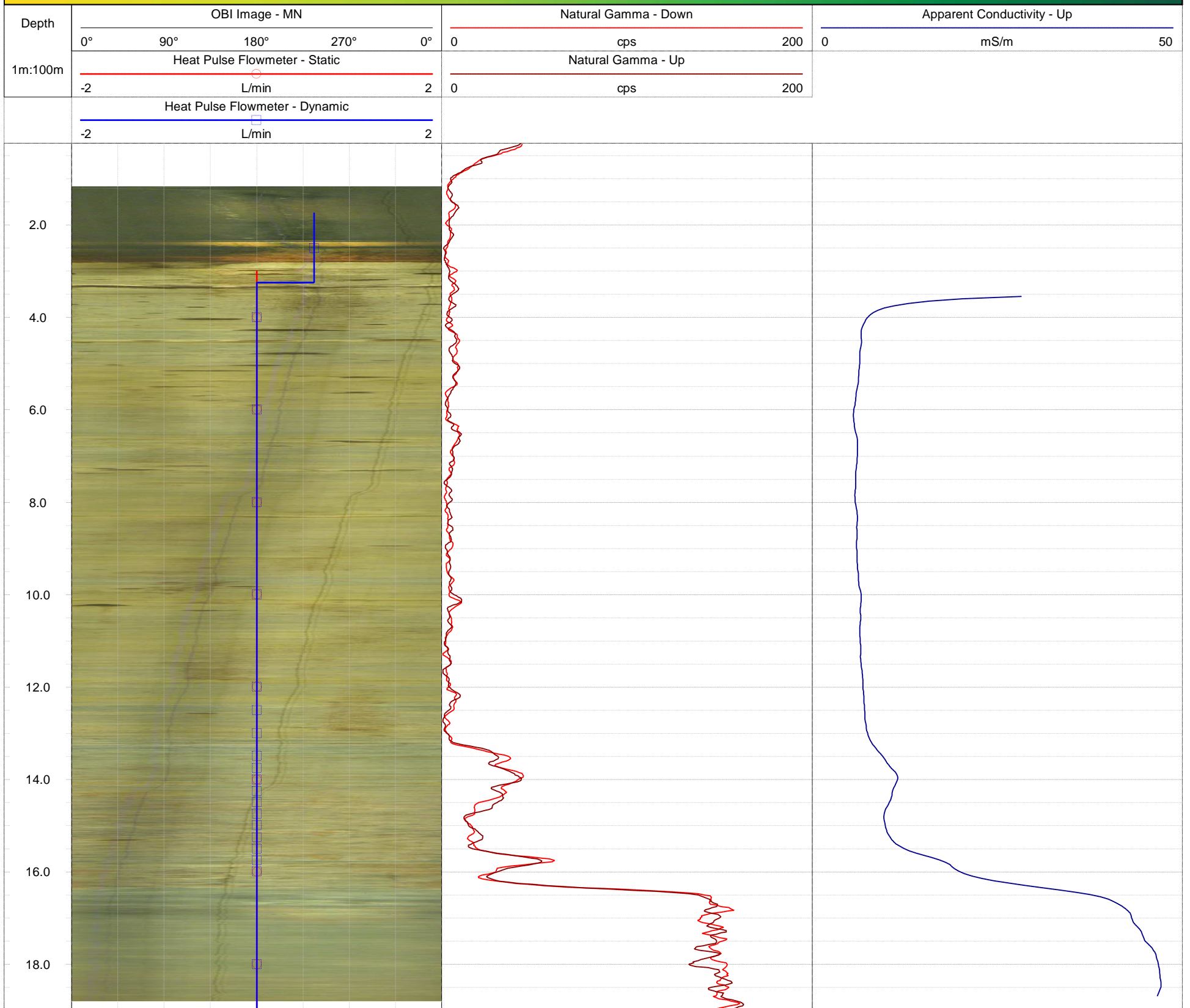
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-07 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.80 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578359.89 m    **Drilled Depth:** 19.45 m bgs    **Water Level:** 0.31 m bgs    **Log Date:** Mar-18-2020  
**Northing:** 4853250.44 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 404.07 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.45 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 2.1 m below top of casing.







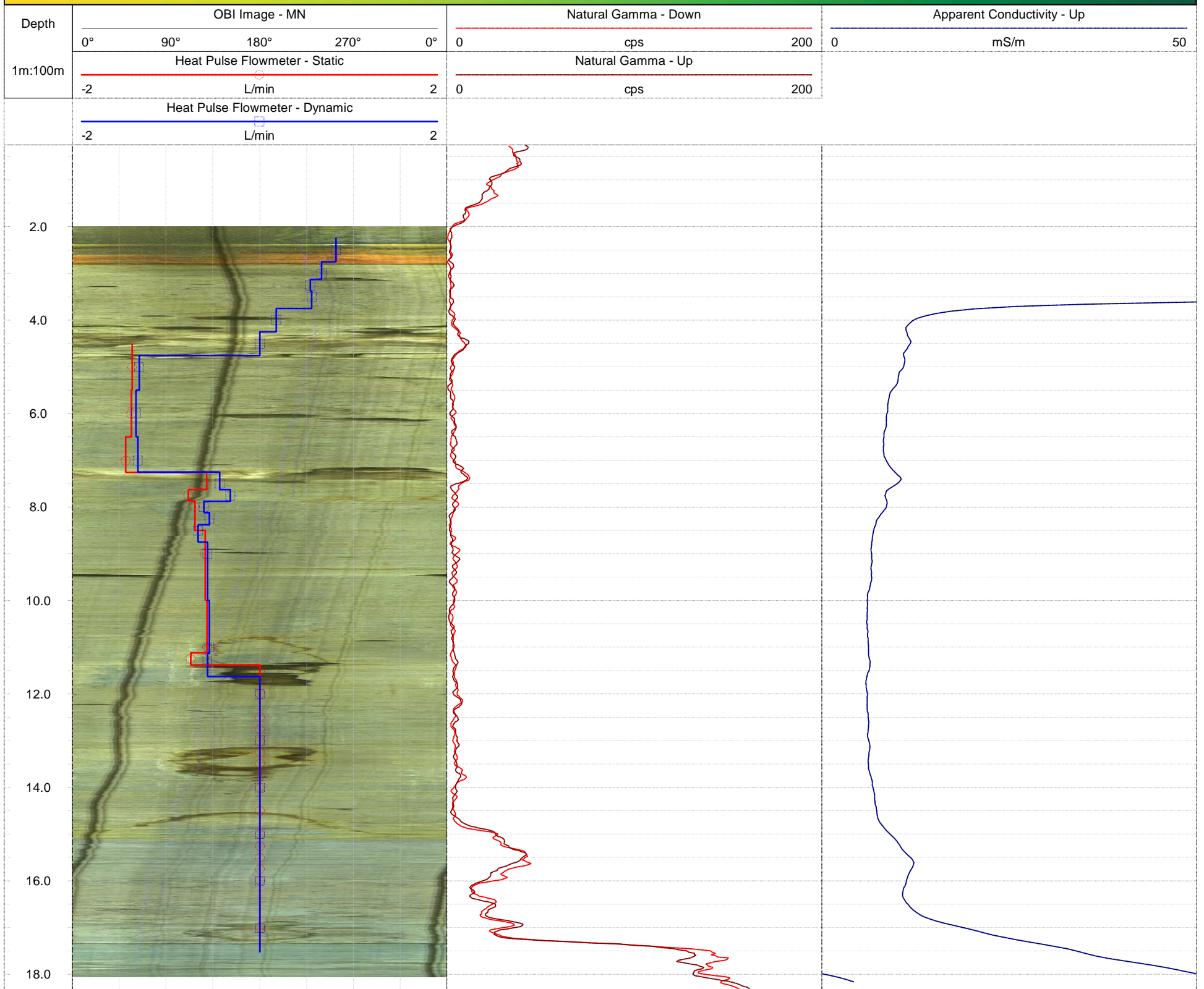
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-08 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.81 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578009.81 m    **Drilled Depth:** 18.59 m bgs    **Water Level:** 0.66 m bgs    **Log Date:** Mar-19-2020  
**Northing:** 4853574.83 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 406.93 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.43 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 2.1 m below top of casing.





**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-09 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.81 m bgs    **Location:** Caledon, Ontario  
**Easting:** 578343.84 m    **Drilled Depth:** 9.01 m bgs    **Water Level:** 2.74 m bgs    **Log Date:** Mar-26-2020  
**Northing:** 4854157.49 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 399.95 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.49 m ags

**Notes:** OBI image opaque > 7.65 m bgs





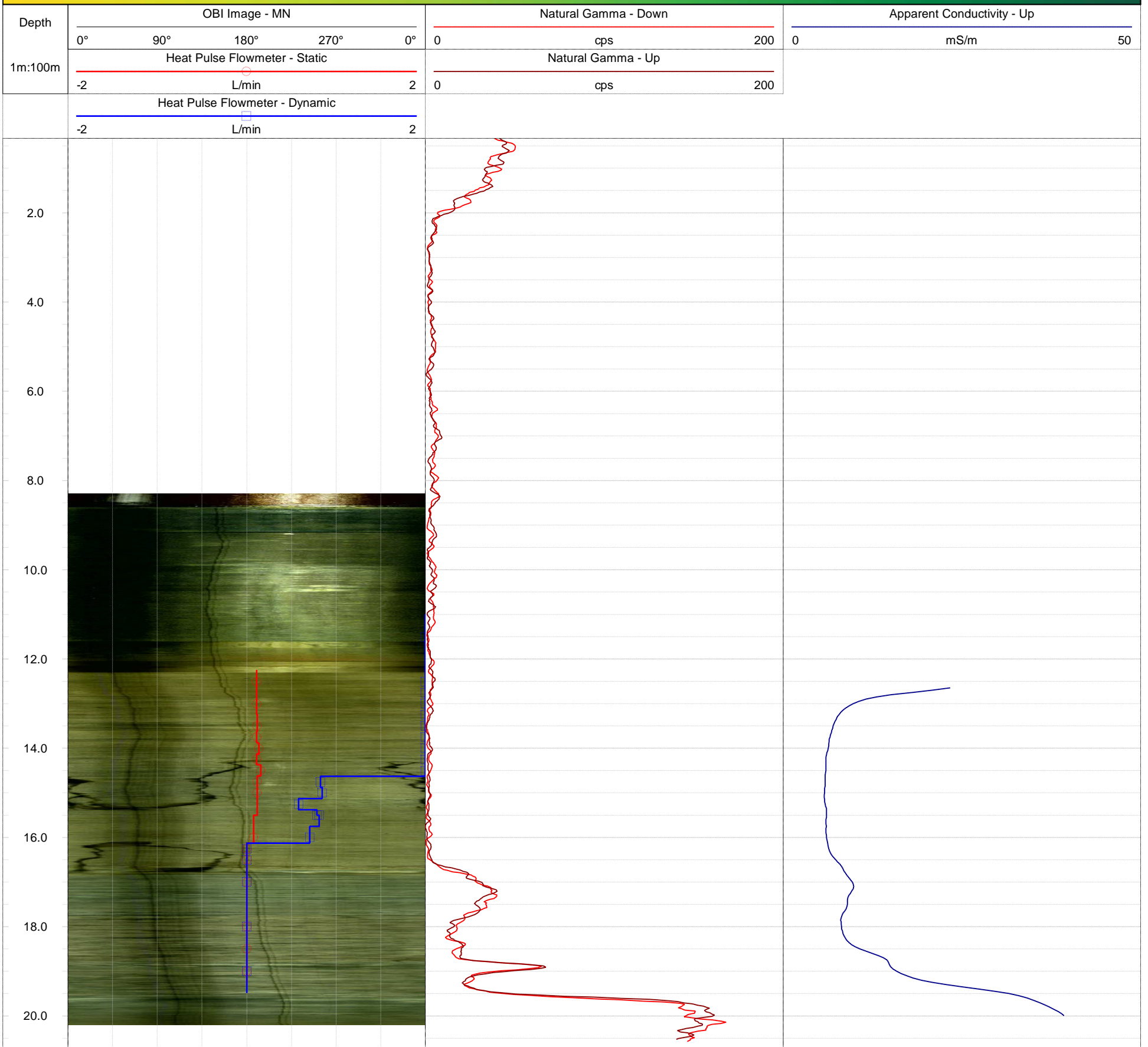
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-10 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.05 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577837.95 m    **Drilled Depth:** 21.19 m bgs    **Water Level:** 8.33 m bgs    **Log Date:** Mar-24-2020  
**Northing:** 4854407.28 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 411.32 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.35 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 10.5 m below top of casing. Pump rate approximately 2.72 L/min







**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-11 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 3.15 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577671.98 m    **Drilled Depth:** 19.39 m bgs    **Water Level:** 1.93 m bgs    **Log Date:** Apr-06-2020  
**Northing:** 4853921.39 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 409.72 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.14 m ags

**Notes:** OBI image opaque > 18.80 m. Heat Pulse Flowmeter Dynamic pump at 3.1 m below top of casing. Pump rate approximately 2.72 L/min.







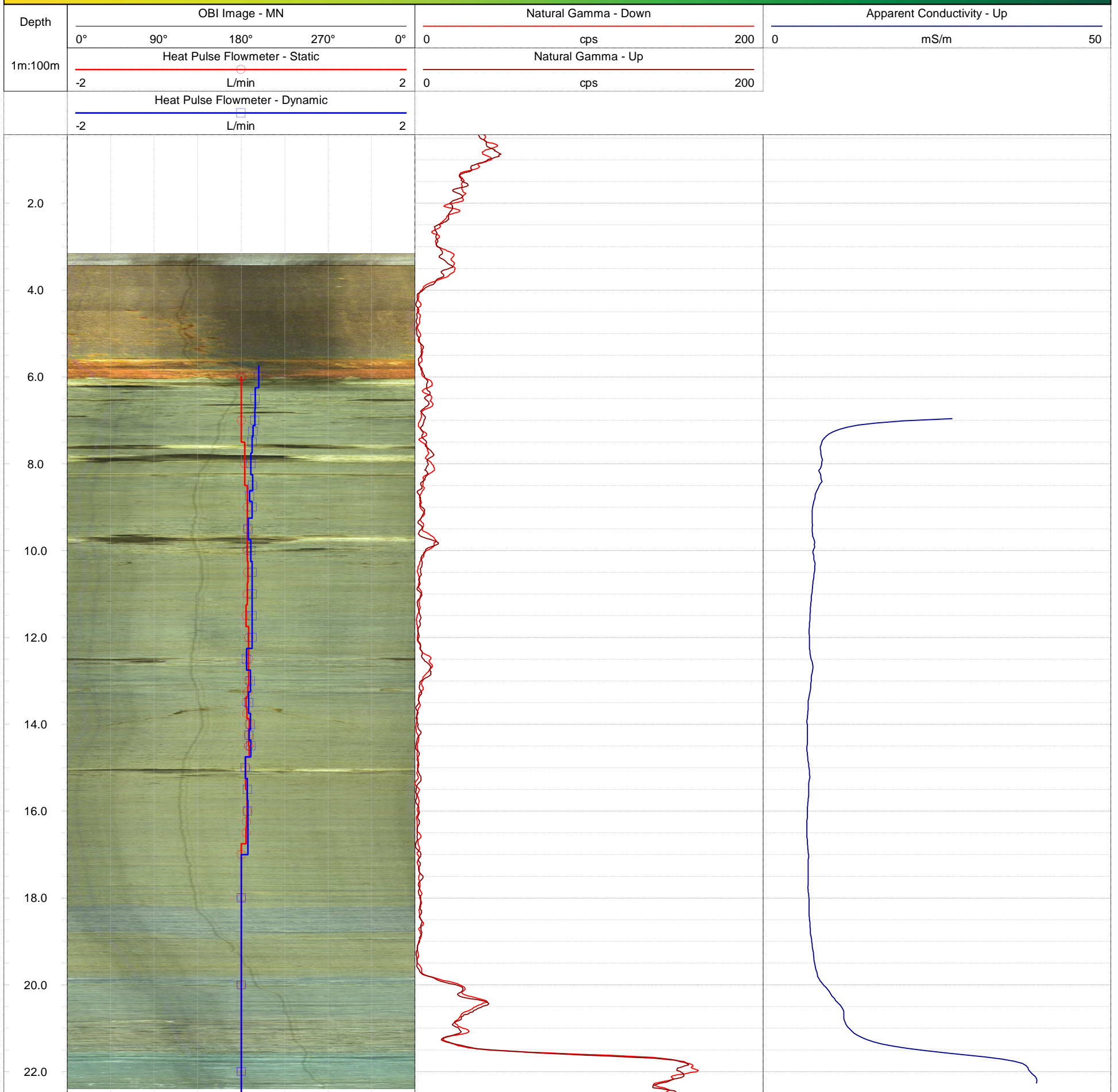
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-12 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.05 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577271.90 m    **Drilled Depth:** 22.65 m bgs    **Water Level:** 3.44 m bgs    **Log Date:** Apr-08-2020  
**Northing:** 4854321.42 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 412.43 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.26 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 4.5 m below top of casing. Pump rate approximately 2.30 L/min.





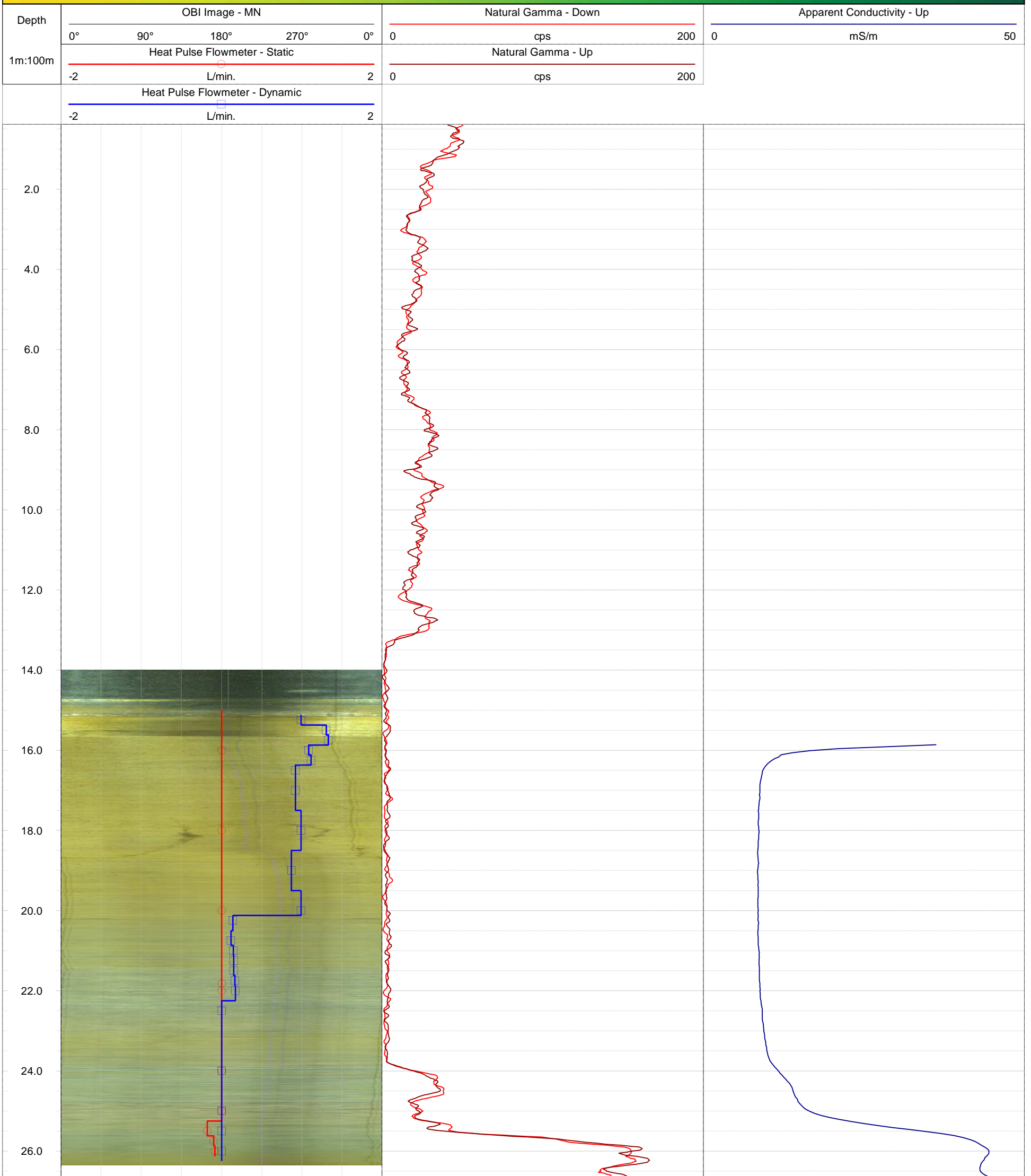
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-13 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.16 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576873.11 m    **Drilled Depth:** 28.23 m bgs    **Water Level:** 2.64 m bgs    **Log Date:** Apr-15-2020  
**Northing:** 4854473.14 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.53 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.28 m ags

**Notes:** Heat Pulse Flowmeter Dynamic pump at 6.0 m below top of casing. Pump rate approximately 1.40 L/min.









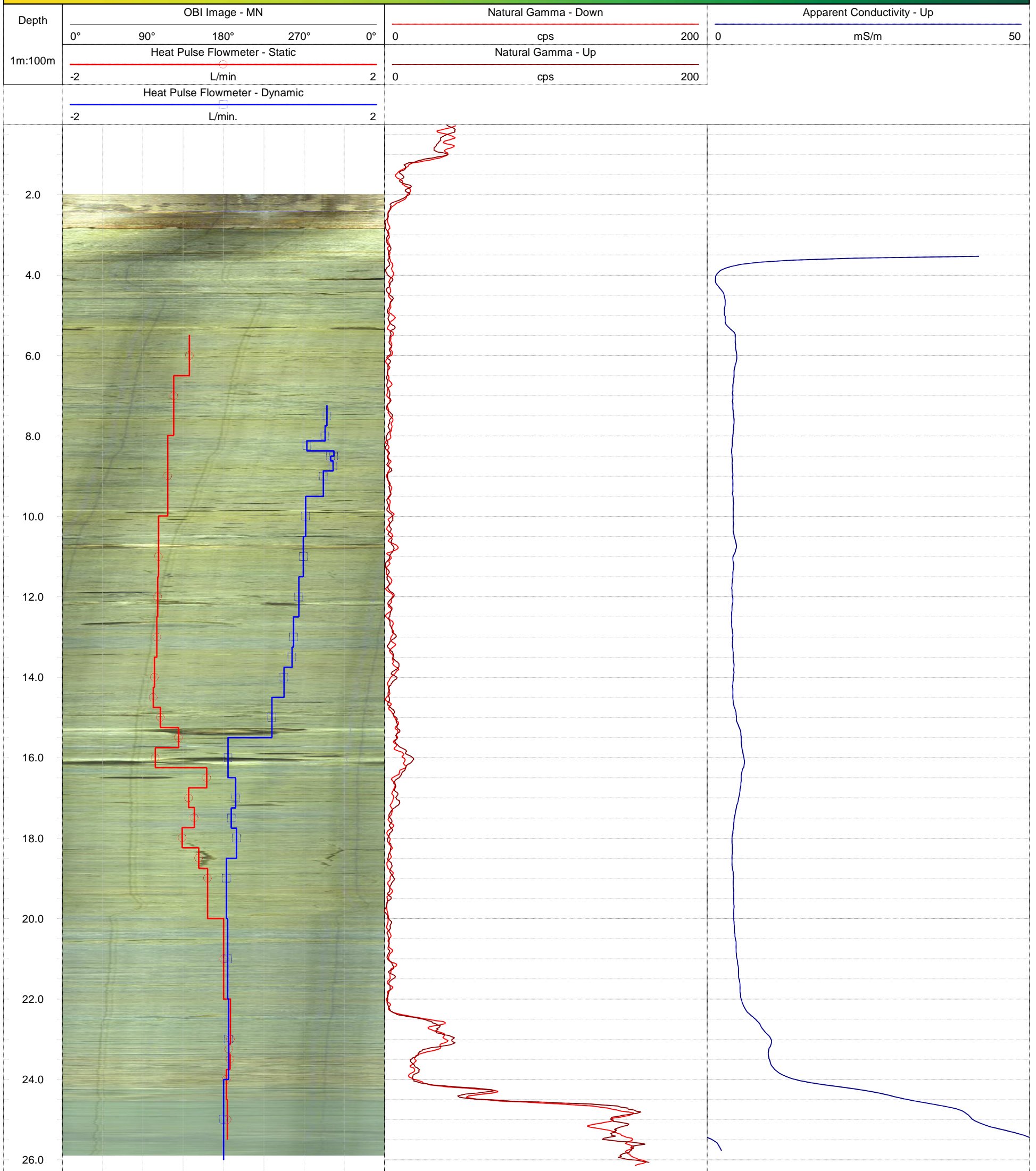
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-14 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 2.85 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577575.99 m    **Drilled Depth:** 26.35 m bgs    **Water Level:** 4.52 m bgs    **Log Date:** May-14-2020  
**Northing:** 4853100.42 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 406.71 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.46 m ags

**Notes:** OBI image opaque > 25.90. Heat Pulse Flowmeter Dynamic pump at 5.0 m below top of casing. Pump rate approximately 2.63 L/min.







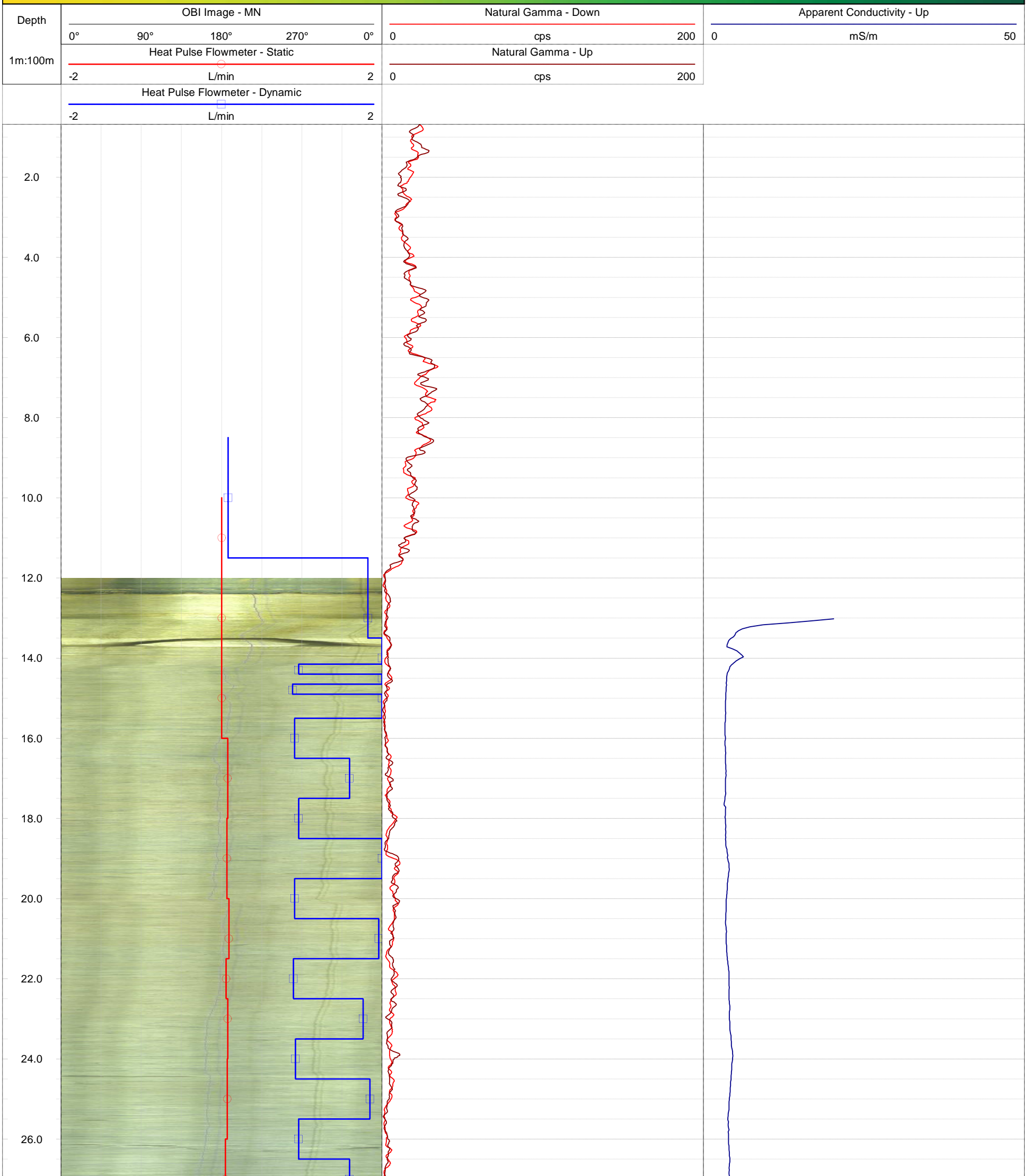
**GOLDER**  
MEMBER OF WSP

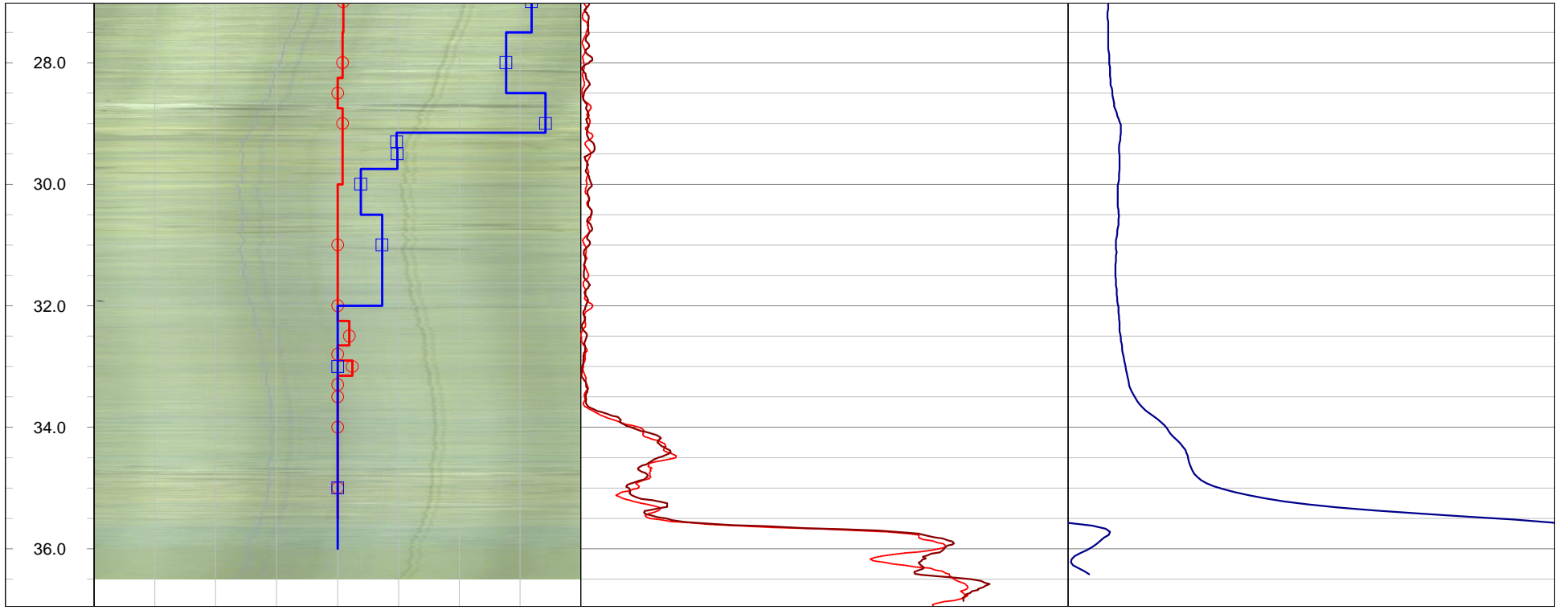
**Geophysical Record of Borehole: MW20-15 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 12.40 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576576.79 m	<b>Drilled Depth:</b> 37.17 m bgs	<b>Water Level:</b> 0.70 m bgs	<b>Log Date:</b> May-27-2020
<b>Northing:</b> 4853544.15 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 417.06 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.00 m ags	

**Notes:** OBI image opaque > 36.6 m bgs







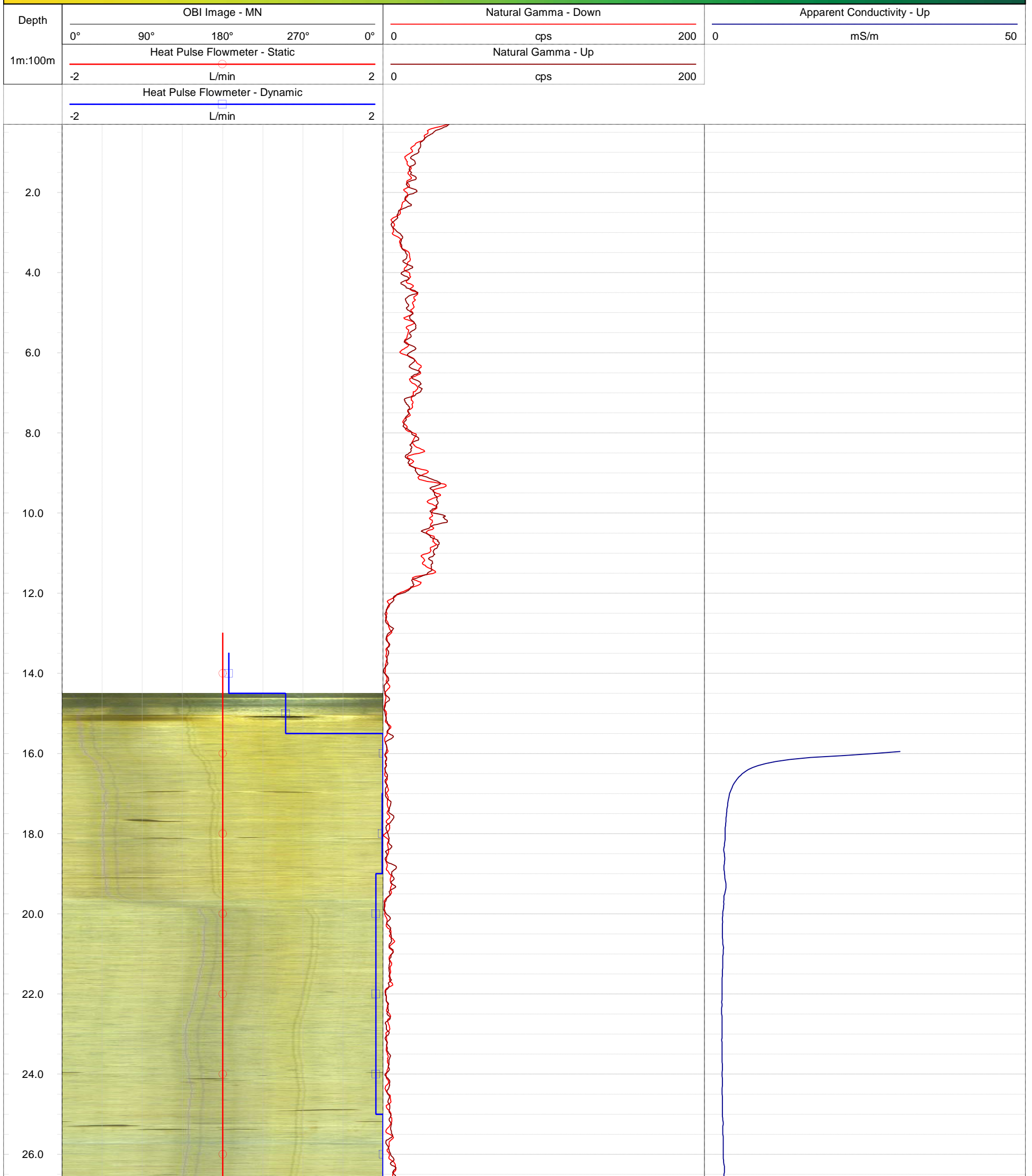
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-16 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.04 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576784.58 m    **Drilled Depth:** 39.77 m bgs    **Water Level:** 0.86 m bgs    **Log Date:** May-26-2020  
**Northing:** 4853806.76 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 421.40 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.46 m ags

**Notes:** OBI image opaque > 38.60 m bgs



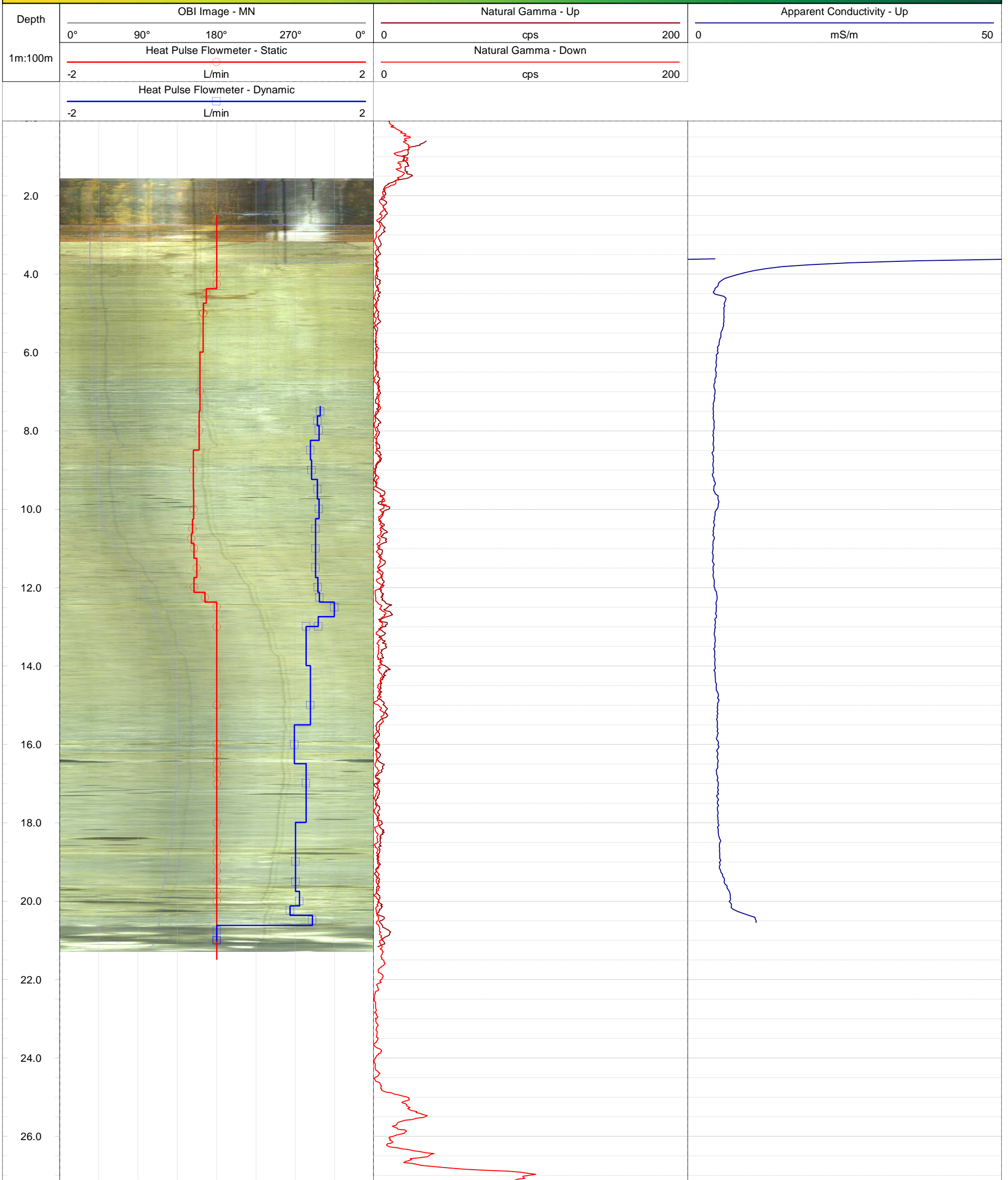




**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 3.18 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576752.28 m    **Drilled Depth:** 28.82 m bgs    **Water Level:** 4.02 m bgs  
**Northing:** 4852966.36 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Log Date:** May-28-2020  
**Elevation:** 406.64 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.05 m ags    **Logged By:** PG

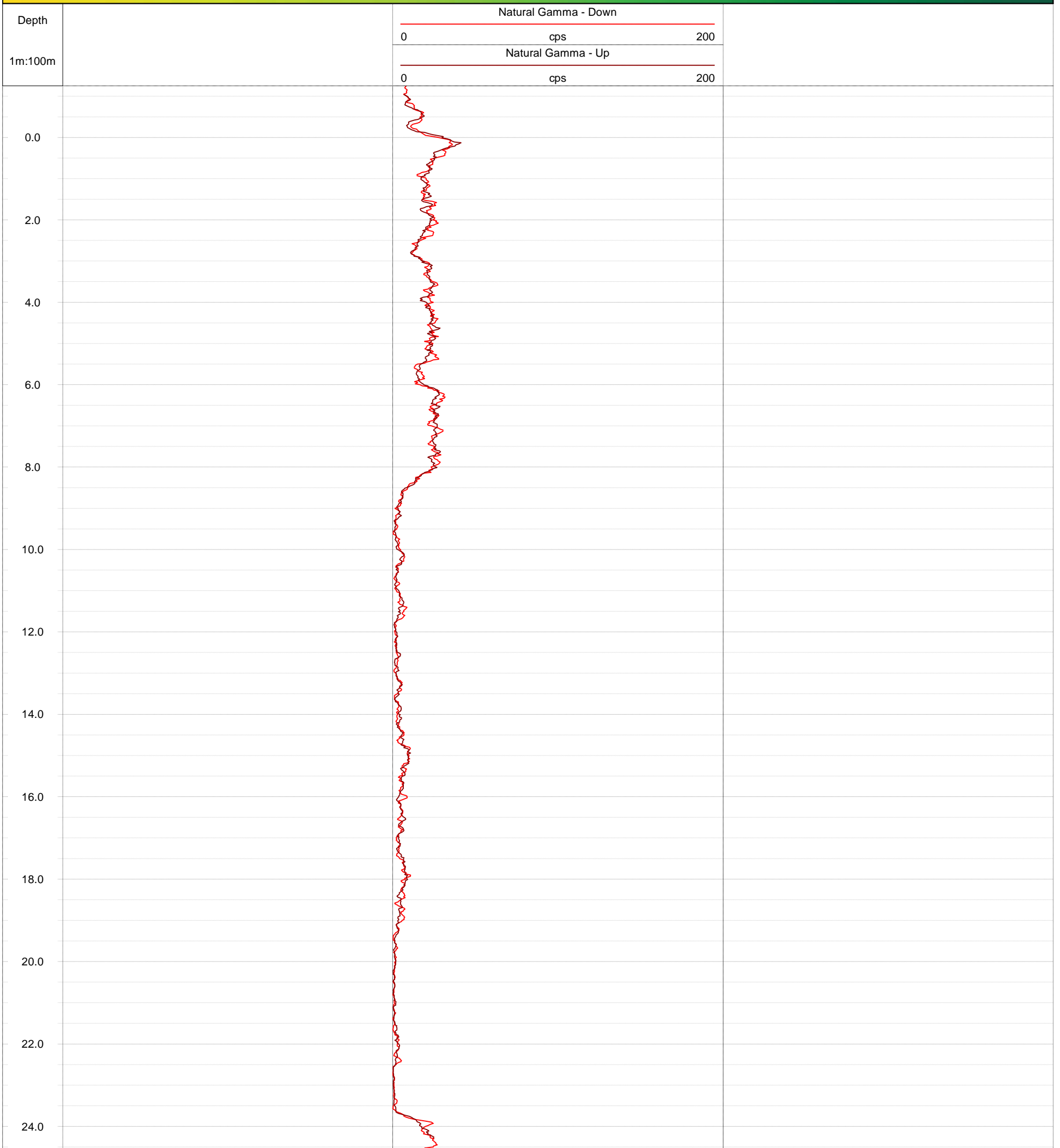
**Notes:** Borehole blocked at depth - logged upper portion. Heat Pulse Flowmeter Dynamic pump at 5.0 m below top of casing. Pump rate approximately 2.63 L/min.



**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 12.19 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577058.36 m	<b>Drilled Depth:</b> 28.15 m bgs	<b>Water Level:</b> 12.41 m bgs	<b>Log Date:</b> June-12-2020
<b>Northing:</b> 4852658.80 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 404.29 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 1.69 m ags	

**Notes:** Collapsed hole. Only Gamma logged inside the rods.





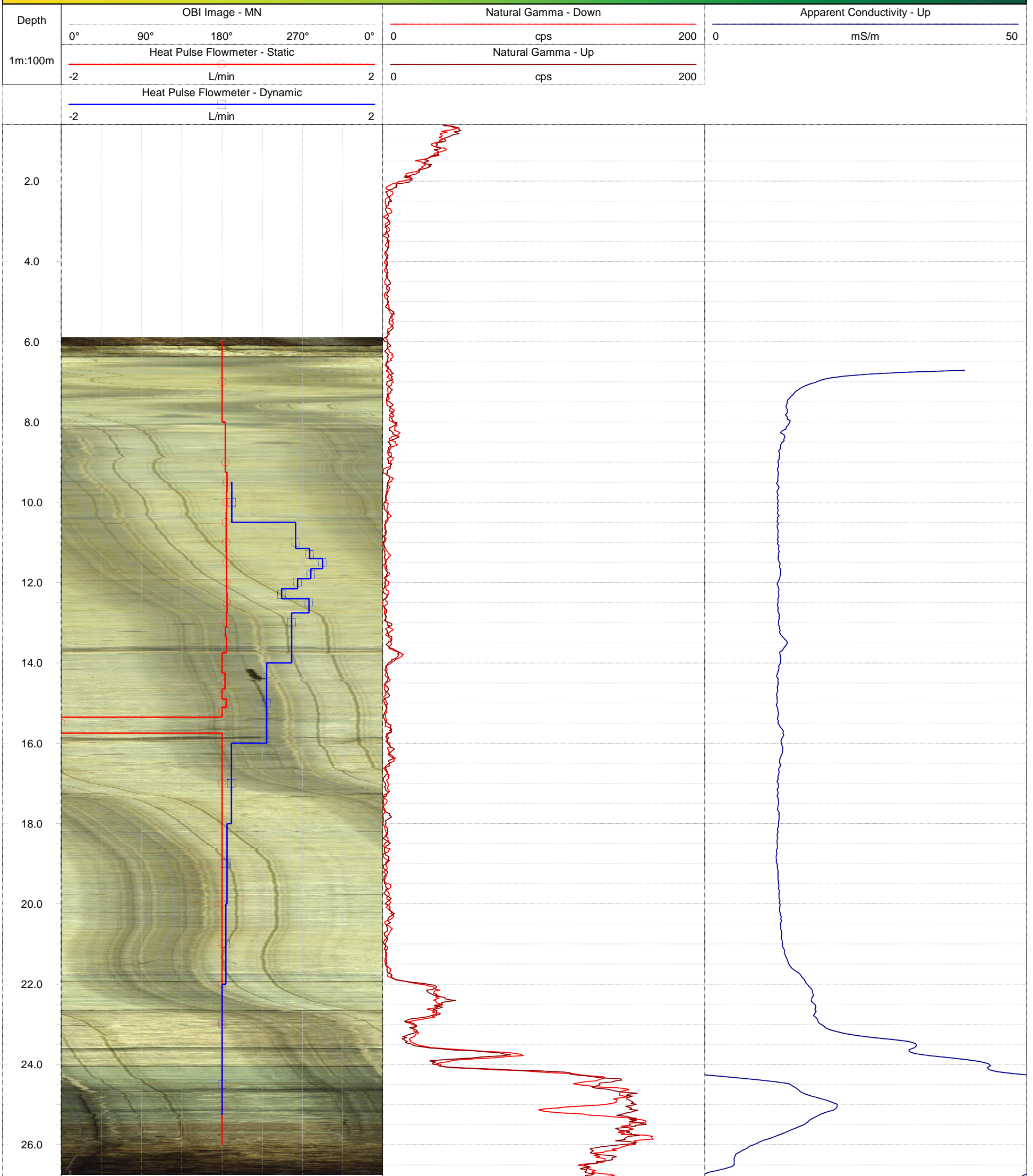
**GOLDER**  
MEMBER OF WSP


**Geophysical Record of Borehole: MW20-19 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 6.10 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576906.96 m	<b>Drilled Depth:</b> 27.39 m bgs	<b>Water Level:</b> 6.47 m bgs	<b>Log Date:</b> Oct-28-2020
<b>Northing:</b> 4851999.96 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 396.98 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.10 m ags	

**Notes:**



Depth	OBI Image - MN					Natural Gamma - Down			Apparent Conductivity - Up		
	0°	90°	180°	270°	0°	0	cps	200	0	mS/m	50
1m:100m	Heat Pulse Flowmeter - Static					Natural Gamma - Up					
	-2		L/min		2	0	cps	200			
	Heat Pulse Flowmeter - Dynamic										
	-2		L/min		2						





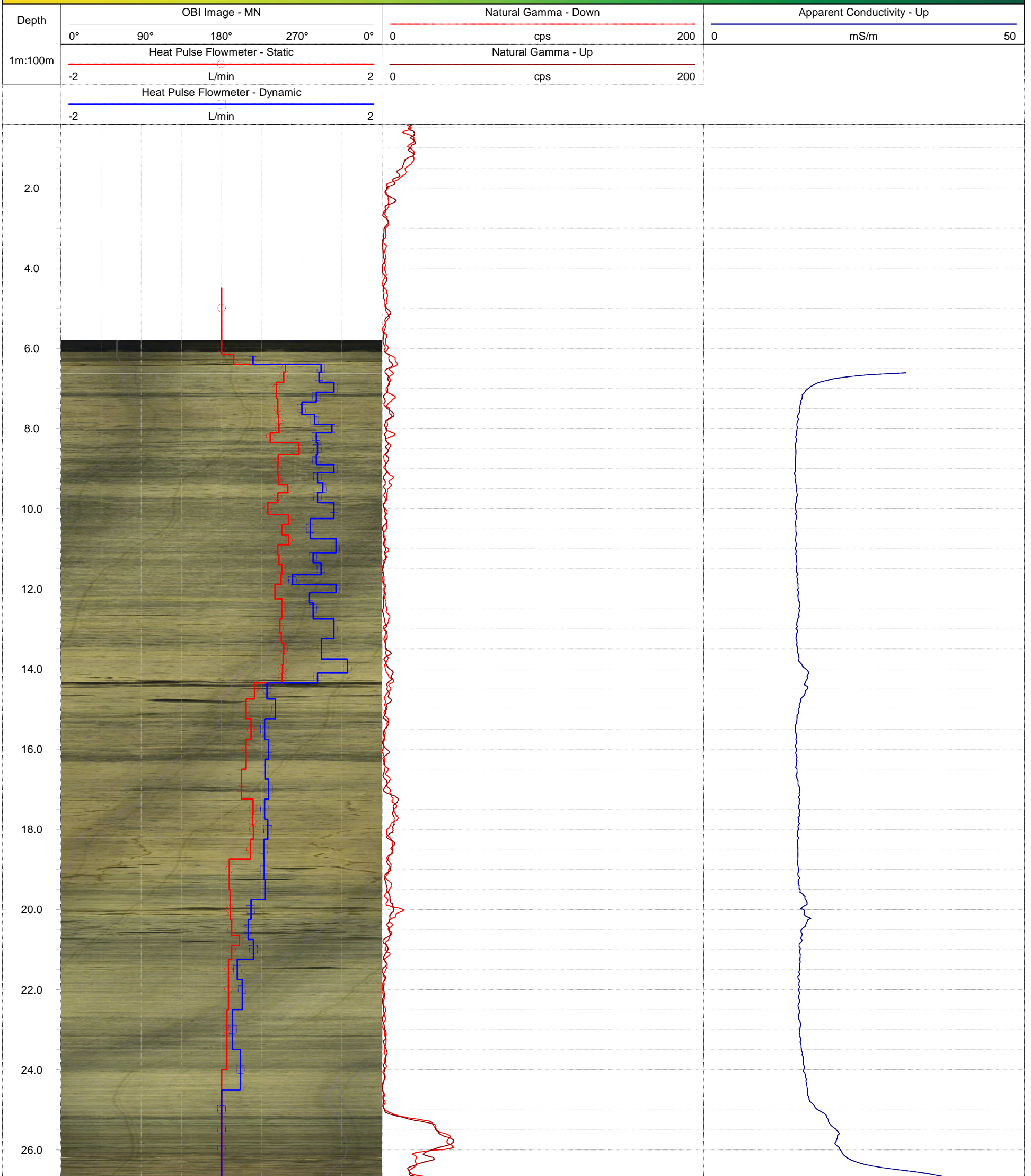
**GOLDER**  
MEMBER OF WSP

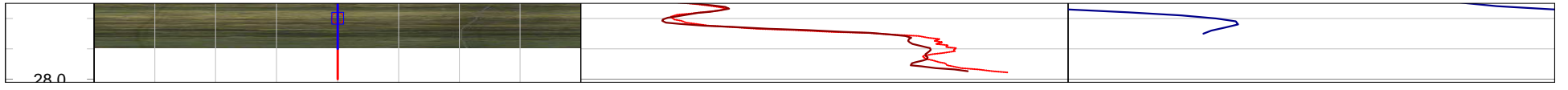
**Geophysical Record of Borehole: MW20-20 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 6.08 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576476.35 m	<b>Drilled Depth:</b> 27.99 m bgs	<b>Water Level:</b> 0.25 m bgs	<b>Log Date:</b> Oct-20-2020
<b>Northing:</b> 4852467.69 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 403.00 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.25 m ags	

**Notes:**

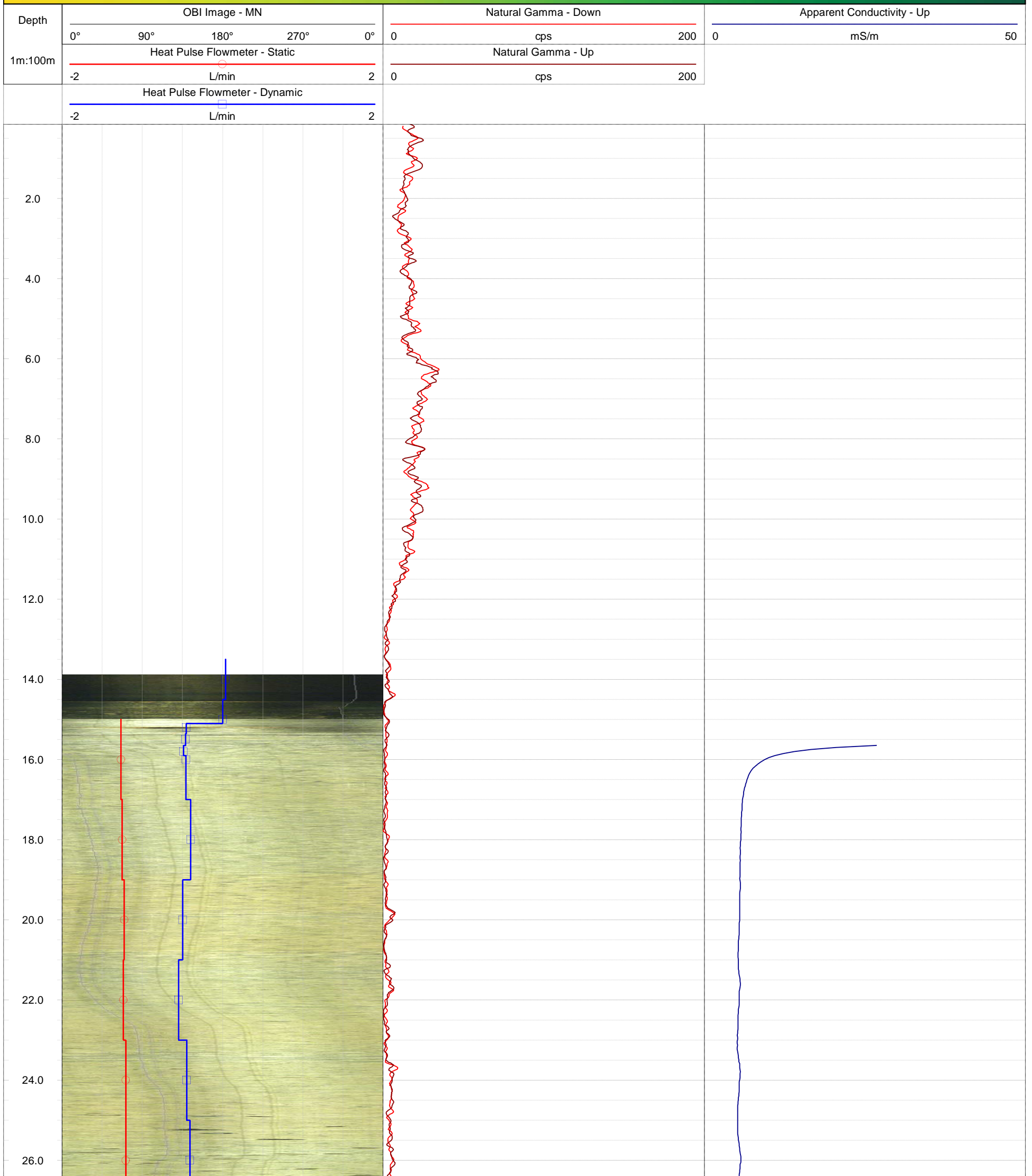




**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 14.98 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576014.37 m    **Drilled Depth:** 39.70 m bgs    **Water Level:** 1.54 m bgs    **Log Date:** Nov-5-2020  
**Northing:** 4852839.77 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.23 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.50 m ags

**Notes:** OBI image opaque > 38.90 m bgs









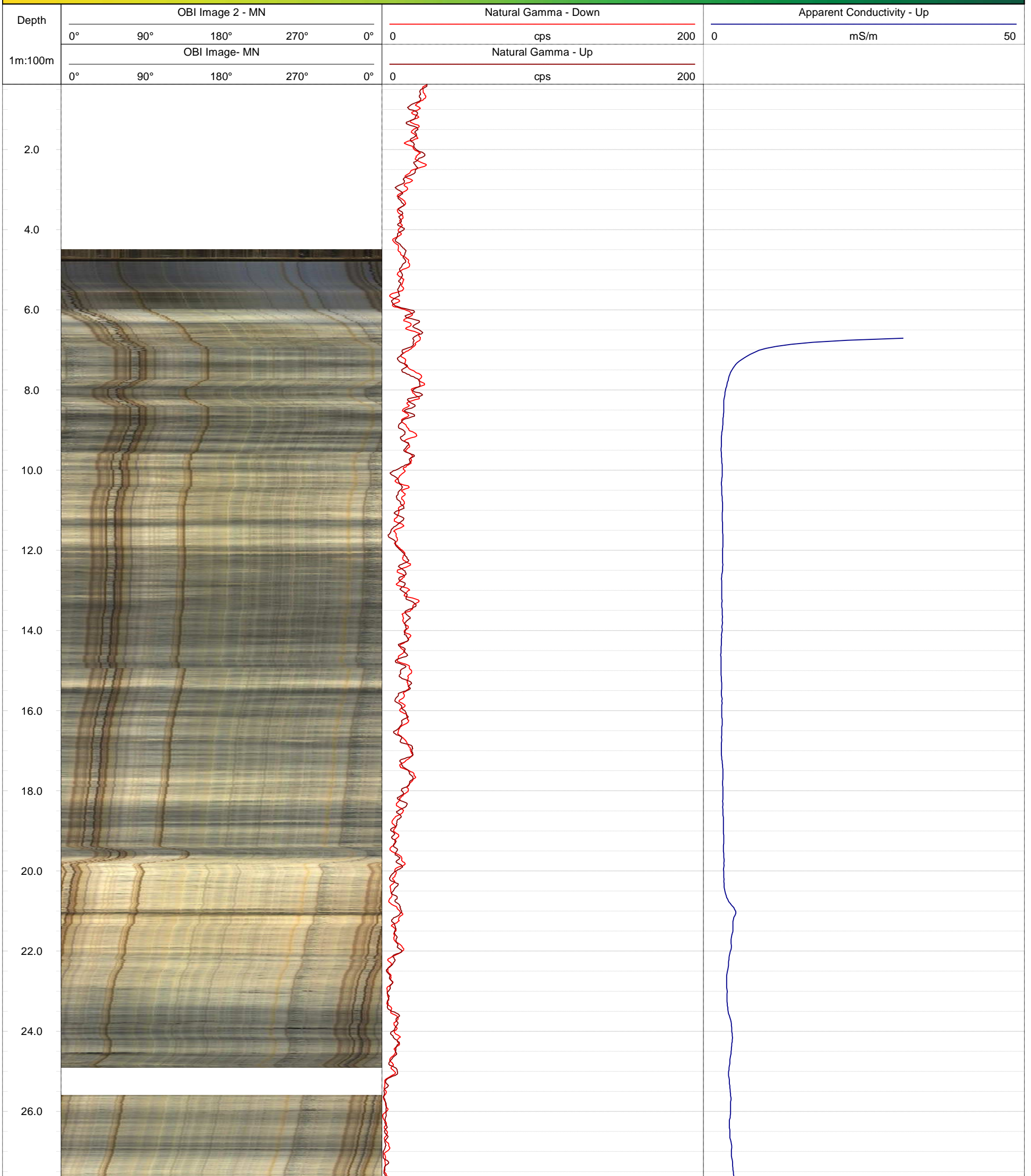
**GOLDER**  
MEMBER OF WSP

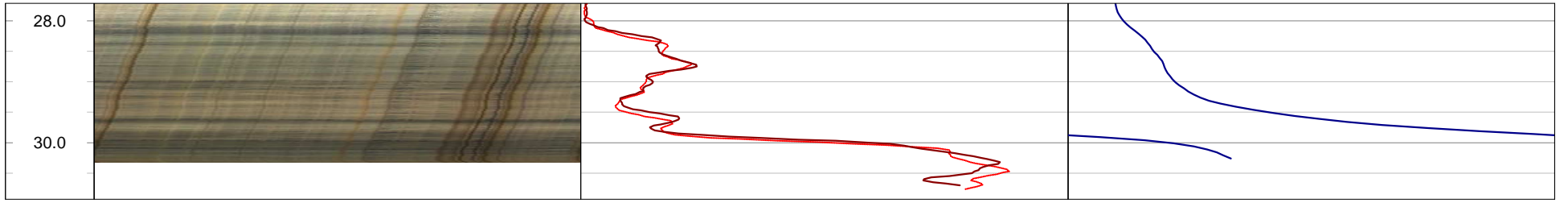
**Geophysical Record of Borehole: MW20-22 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 5.99 m bgs    **Location:** Caledon, Ontario  
**Easting:** 575785.36 m    **Drilled Depth:** 30.75 m bgs    **Water Level:** 4.40 m bgs  
**Northing:** 4851966.28 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Log Date:** Nov-18-2020  
**Elevation:** 399.27 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.30 m ags    **Logged By:** PG

**Notes:** OBI image opaque > 30.5 m bgs







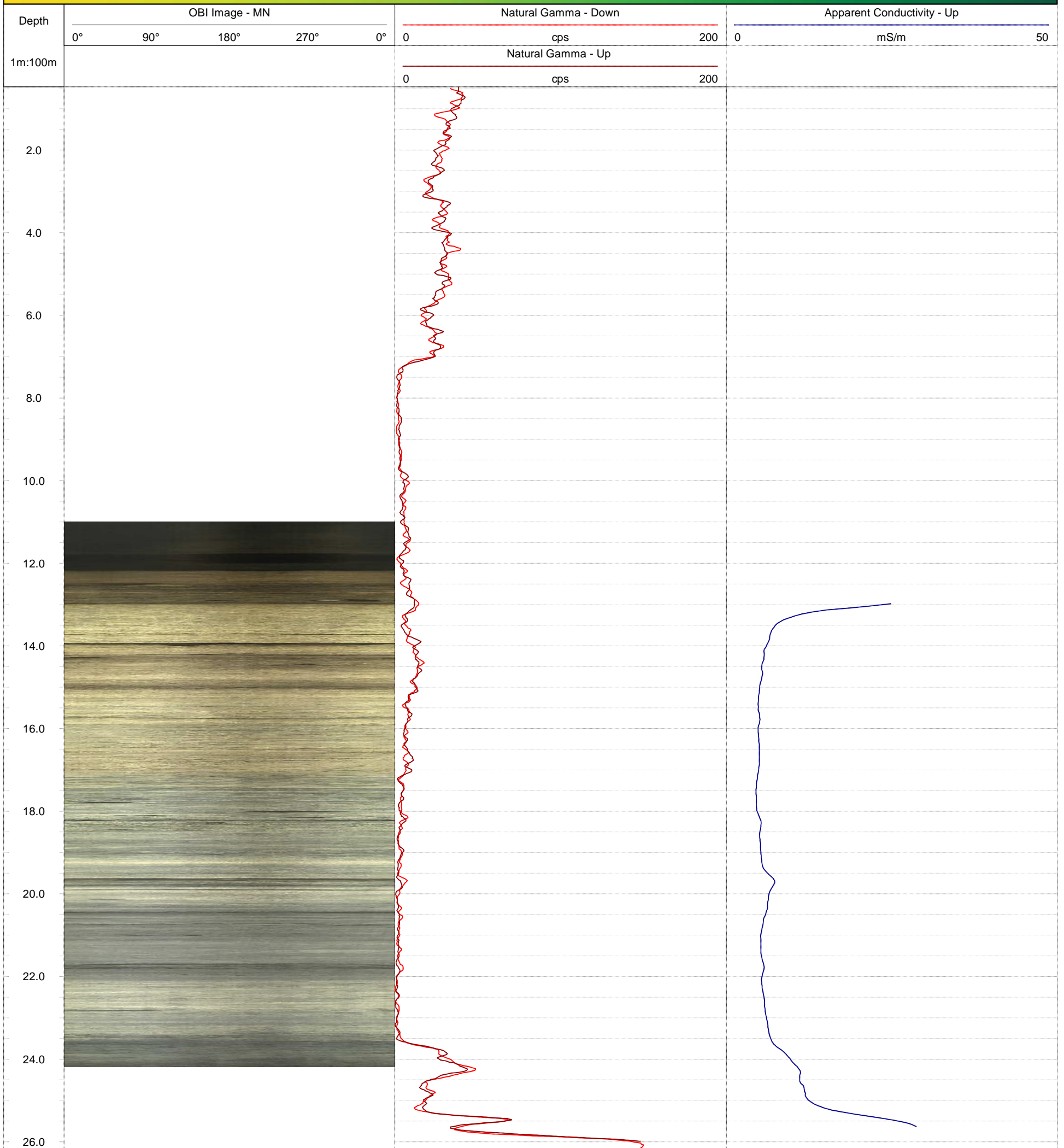
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-23 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.19 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576205.53 m    **Drilled Depth:** 26.76 m bgs    **Water Level:** 4.68 m bgs    **Log Date:** Nov-24-2020  
**Northing:** 4851555.91 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 395.05 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.20 m ags

**Notes:** OBI image opaque > 24.4 m bgs





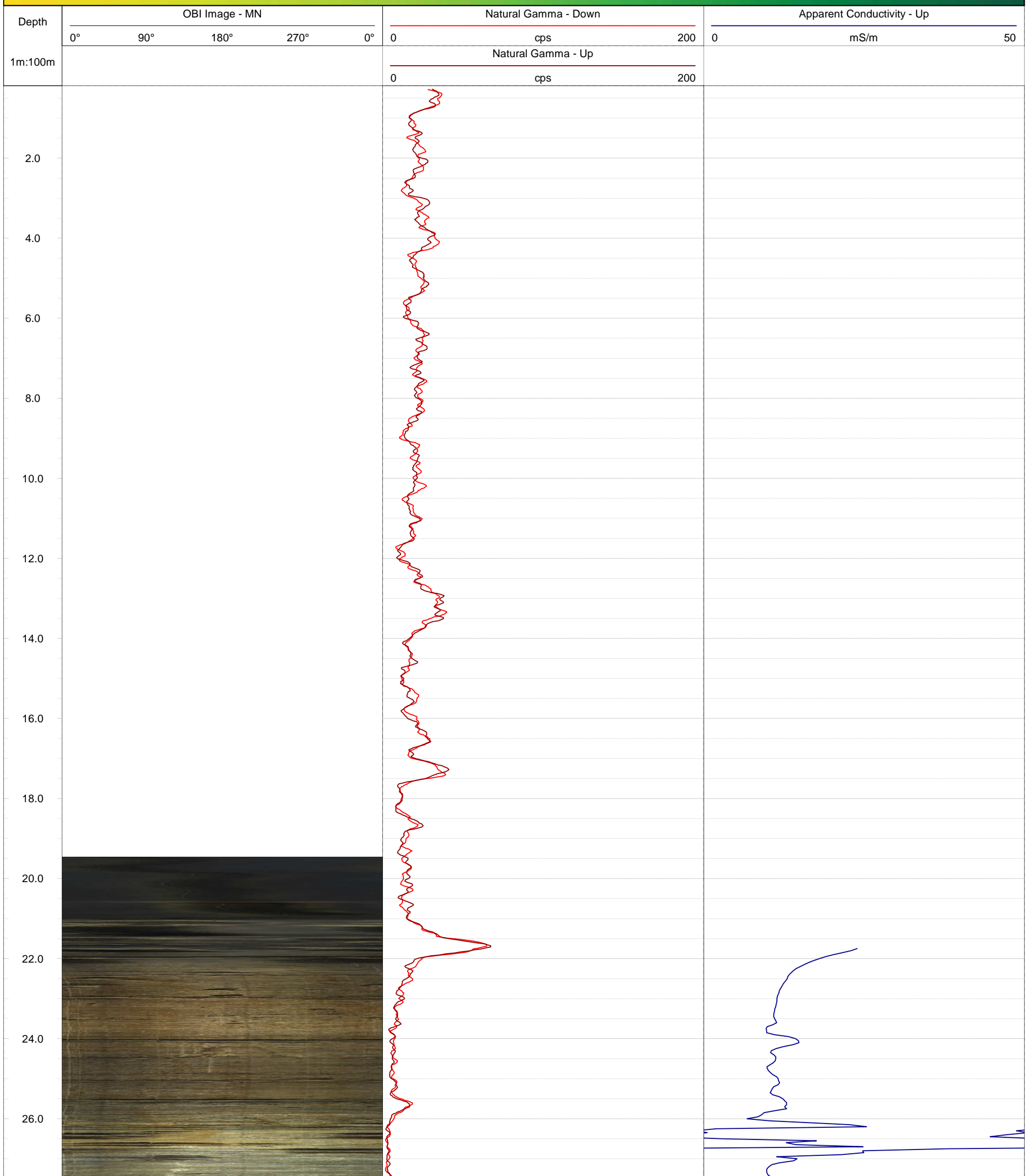
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-24 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 20.98 m bgs    **Location:** Caledon, Ontario  
**Easting:** 575337.66 m    **Drilled Depth:** 37.49 m bgs    **Water Level:** 4.46 m bgs    **Log Date:** Dec-04-2020  
**Northing:** 4854341.85 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 437.75 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.51 m ags

**Notes:** OBI Image opaque > 35 m bgs









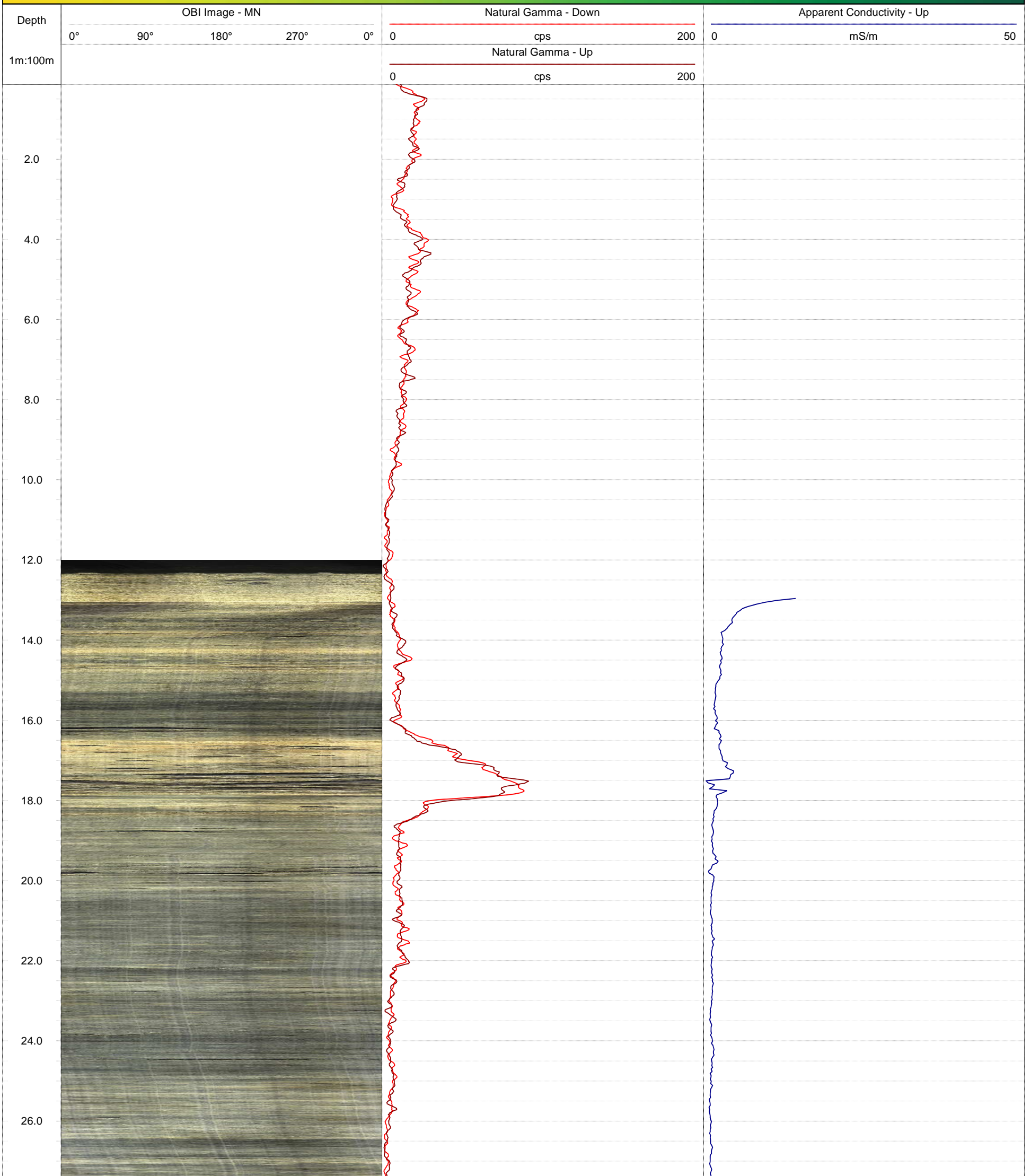
**GOLDER**  
MEMBER OF WSP

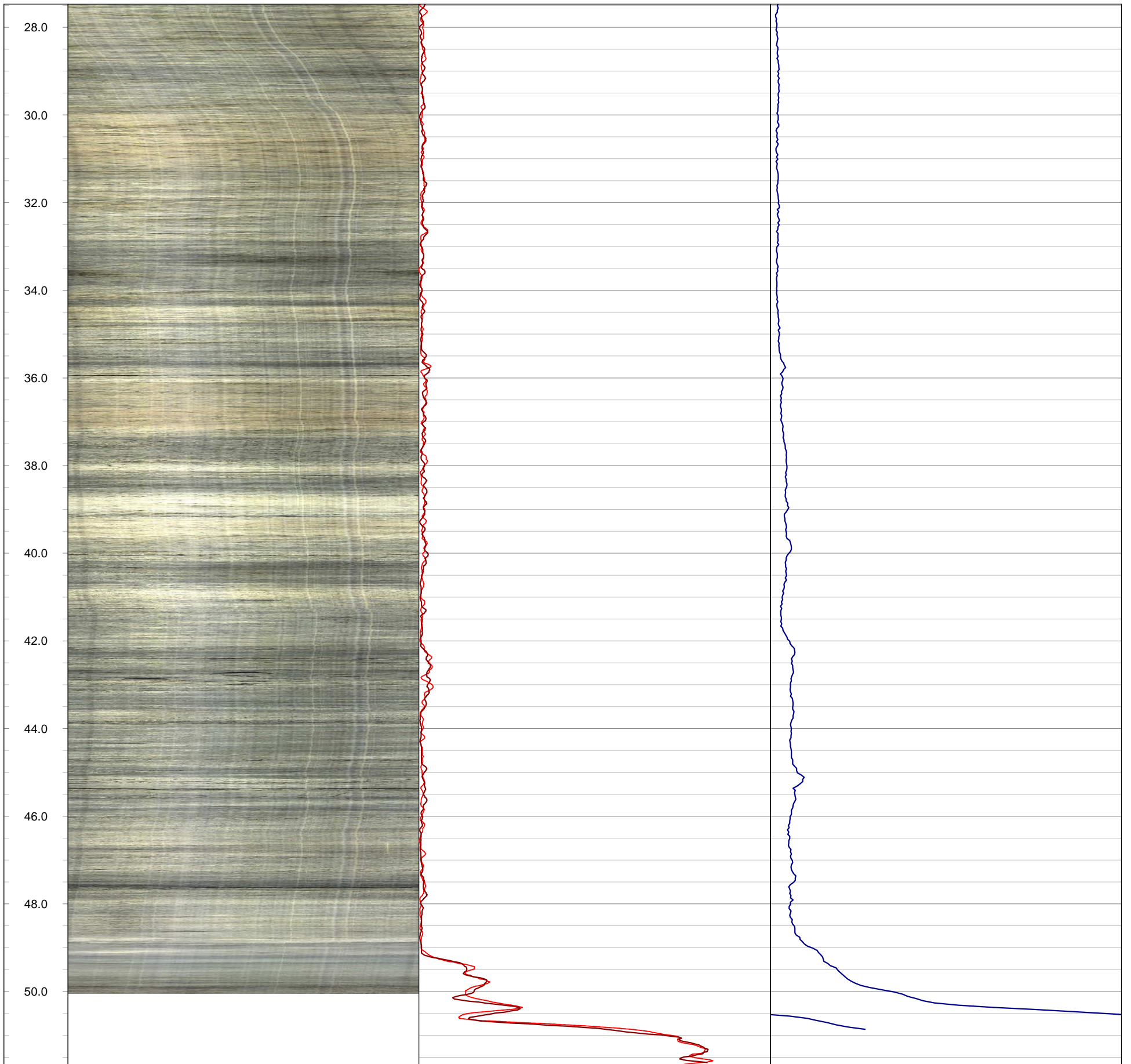
**Geophysical Record of Borehole: MW20-25 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.39 m bgs    **Location:** Caledon, Ontario  
**Easting:** 574853.76 m    **Drilled Depth:** 51.82 m bgs    **Water Level:** -0.83 m bgs    **Log Date:** Dec-12-2020  
**Northing:** 4852900.48 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 419.02 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.98 m ags

**Notes:** Artesian well, water slowly rose up to above stick-up casing level during data acquisition. OBI image opaque > 50.2 m bgs









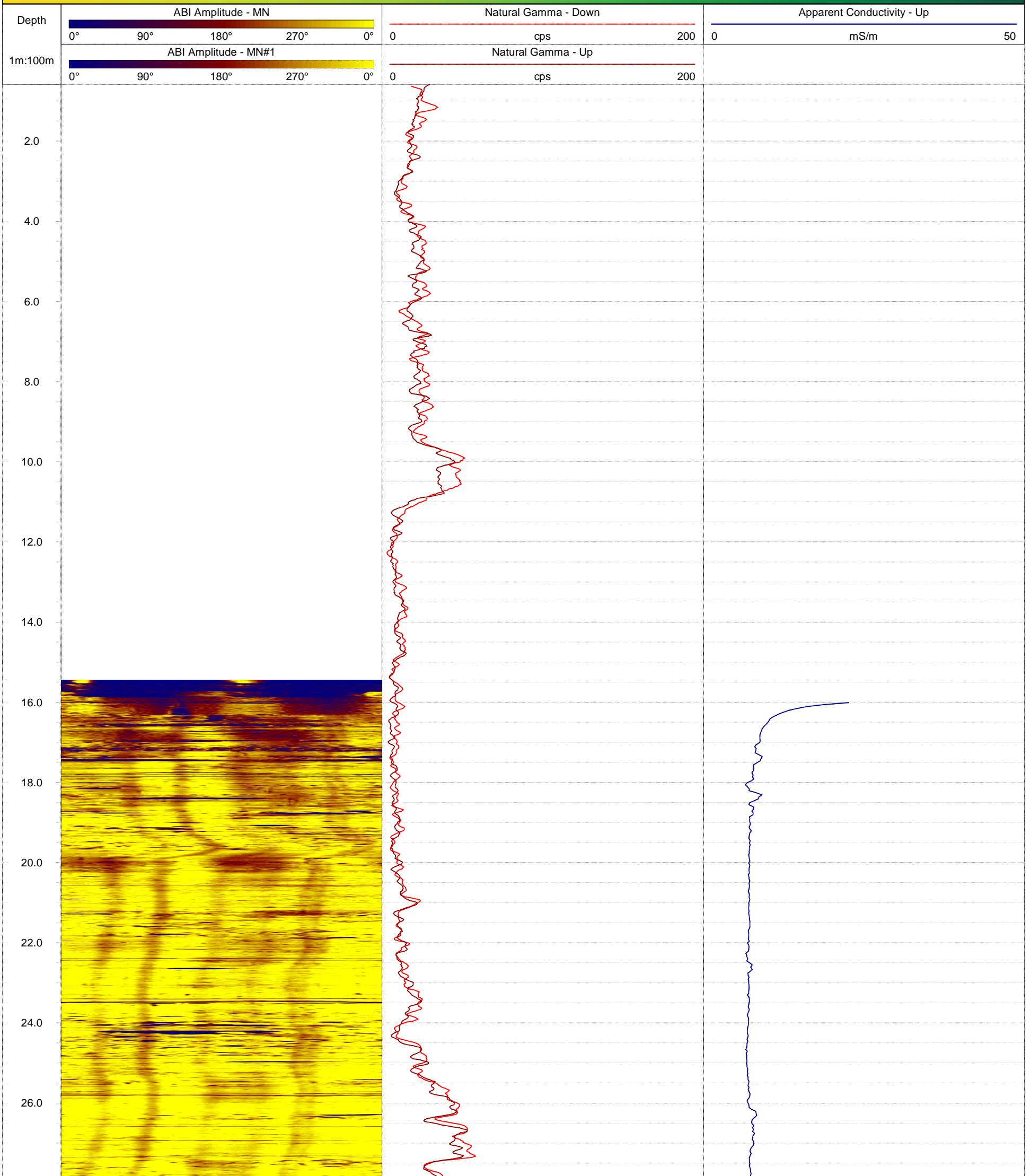
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-26 (CAL)**

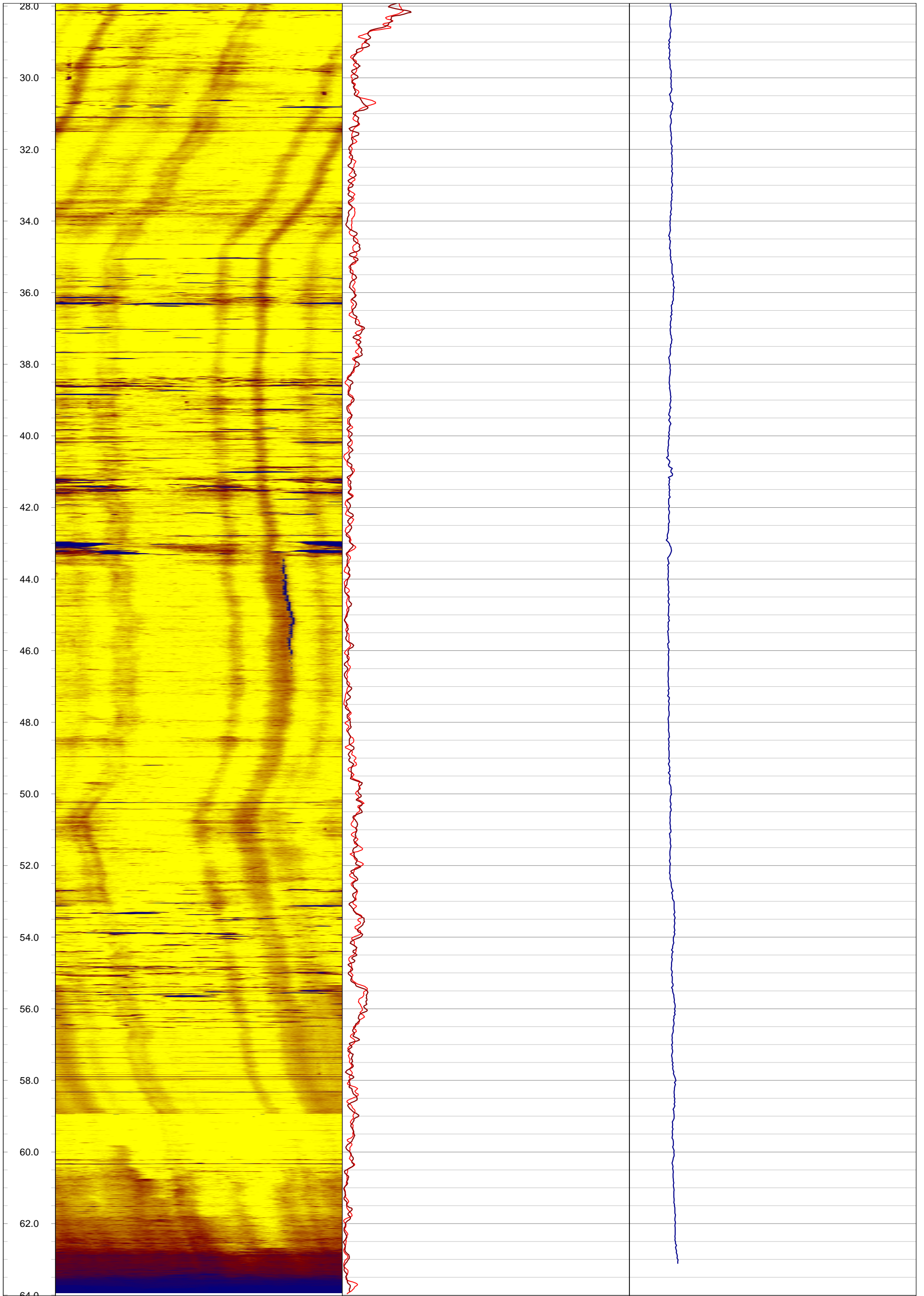
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 15.53 m bgs    **Location:** Caledon, Ontario  
**Easting:** 574373.86 m    **Drilled Depth:** 66.11 m bgs    **Water Level:** 3.19 m bgs    **Log Date:** Dec-18-2020  
**Northing:** 4853638.42 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 438.89 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.16 m ags

**Notes:** Optical image opaque >52.4 m bgs, collected acoustic imagery in addition to optical.









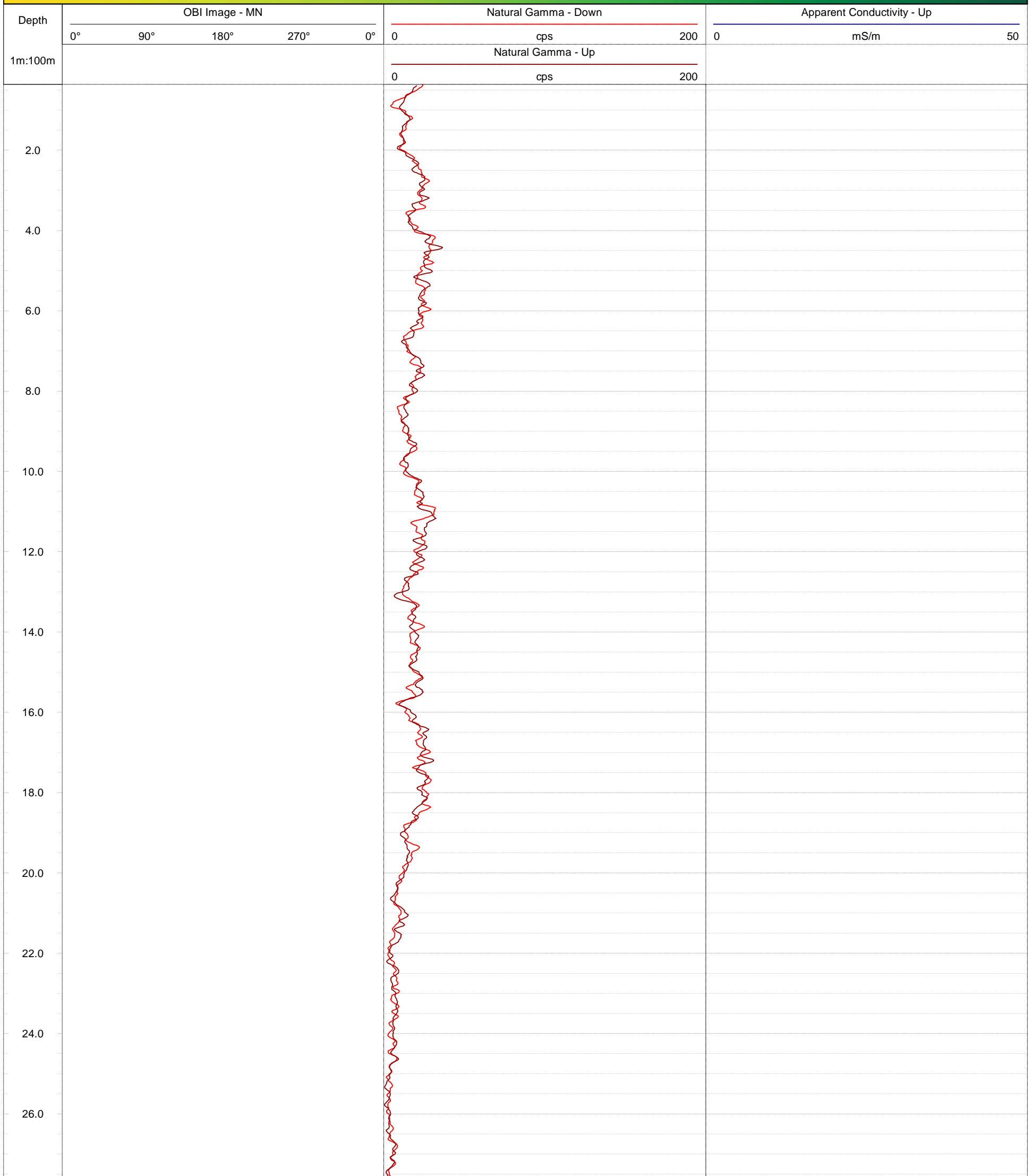
**GOLDER**  
MEMBER OF WSP

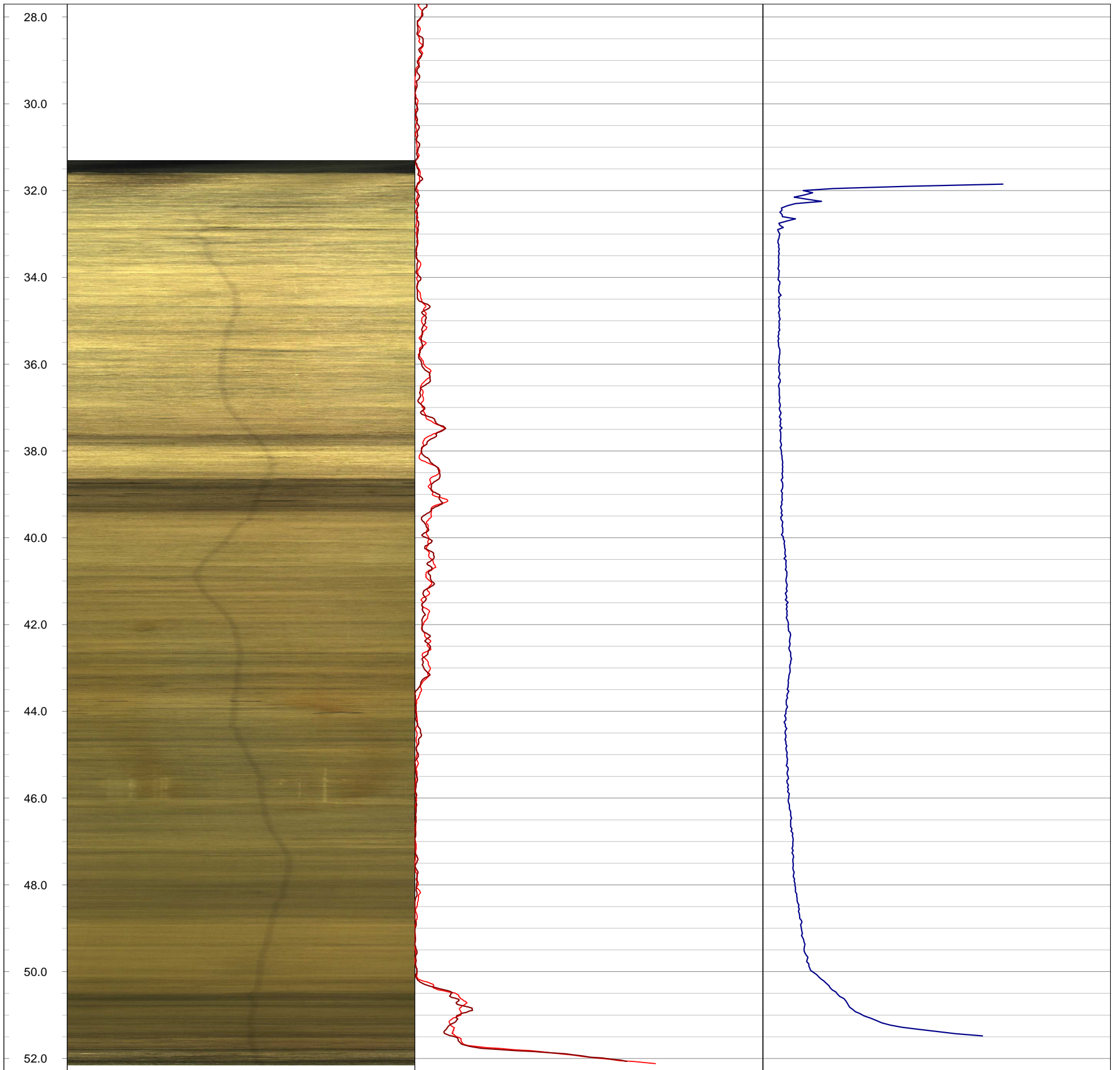
**Geophysical Record of Borehole: MW20-27 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 31.60 m bgs    **Location:** Caledon, Ontario  
**Easting:** 575953.96 m    **Drilled Depth:** 52.43 m bgs    **Water Level:** 7.62 m bgs    **Log Date:** Feb-17-2021  
**Northing:** 4853770.16 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 431.15 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.30 m ags

**Notes:** Optical image blurred > 39 m bgs









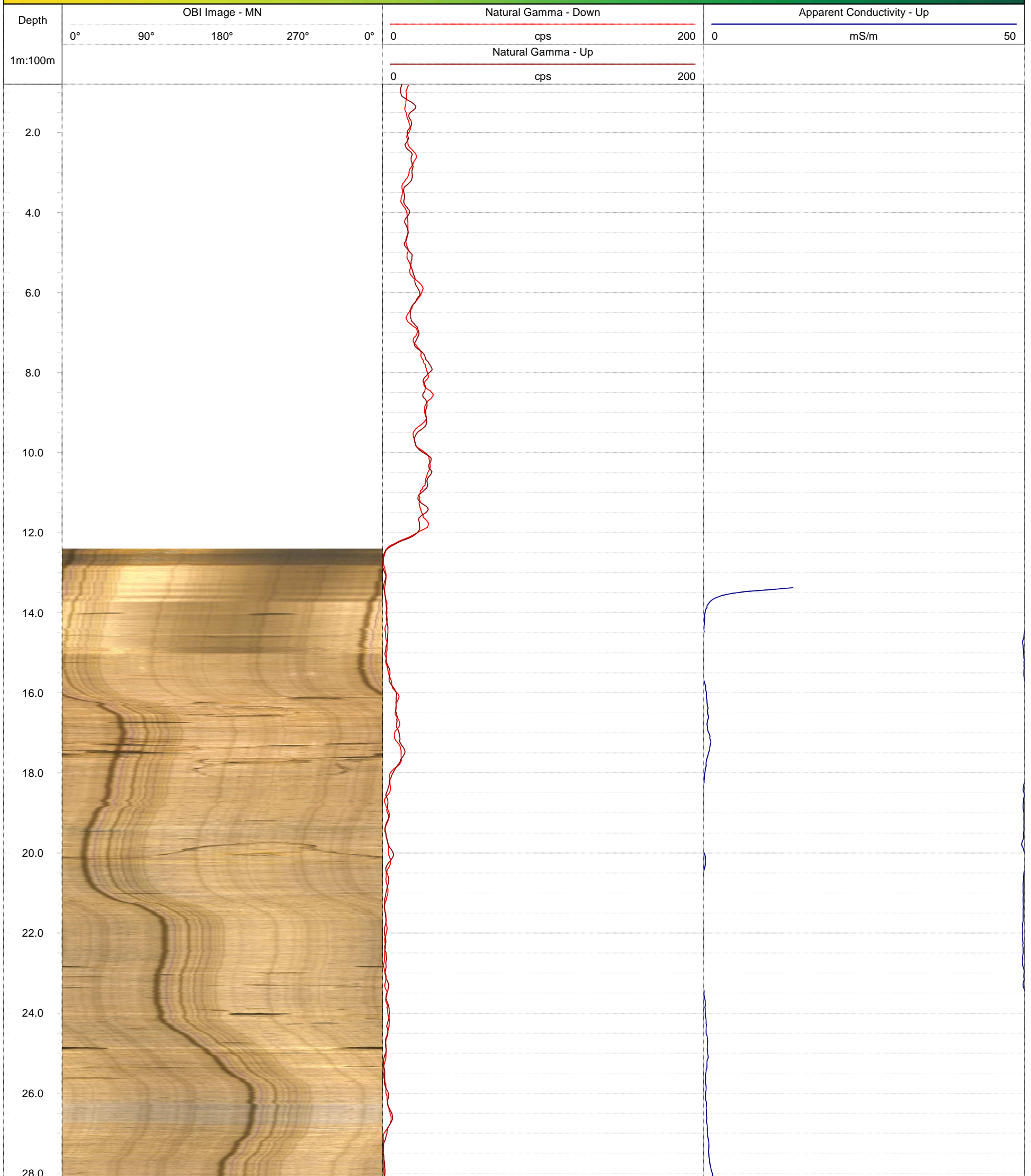
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW20-28 (CAL)**

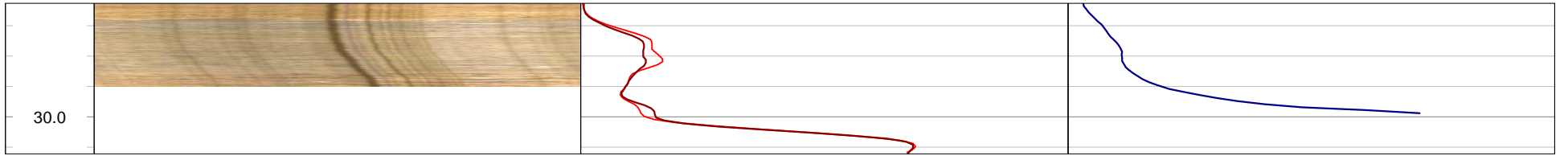
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.80 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576139.79 m    **Drilled Depth:** 30.82 m bgs    **Water Level:** 0 m bgs    **Log Date:** Feb-23-2021  
**Northing:** 4854987.82 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 419.31 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.23 m ags

**Notes:**









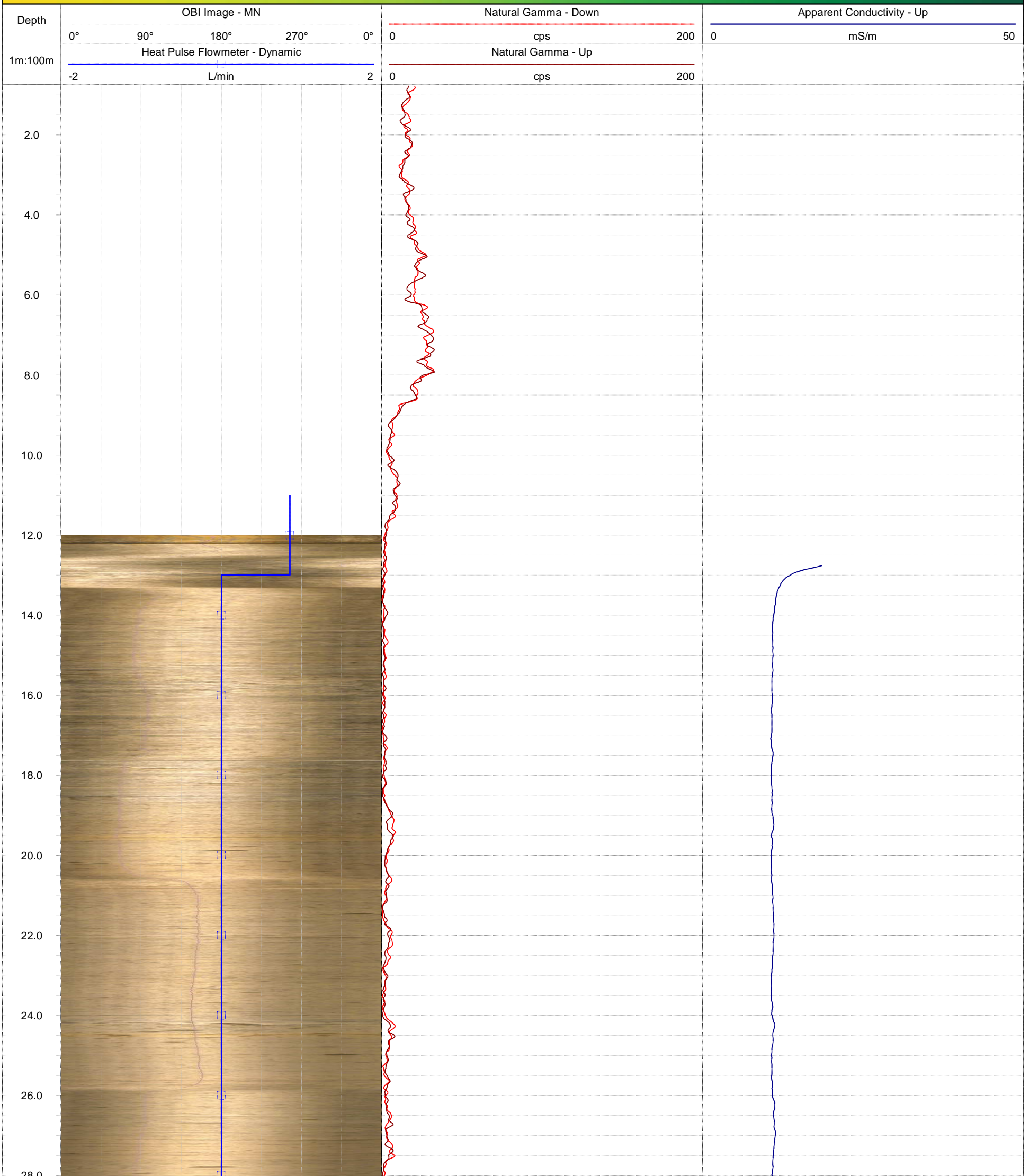
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-1-1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 11.89 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576882.20 m	<b>Drilled Depth:</b> 36.27 m bgs	<b>Water Level:</b> 1.80 m bgs	<b>Log Date:</b> Mar-4-2021
<b>Northing:</b> 4853485.00 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 418.94 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.20 m ags	

**Notes:** OBI image blurry >30 m. Heat Pulse Flowmeter Dynamic pump at 10 m below top of collar. Pump rate approx. 2 L/min.







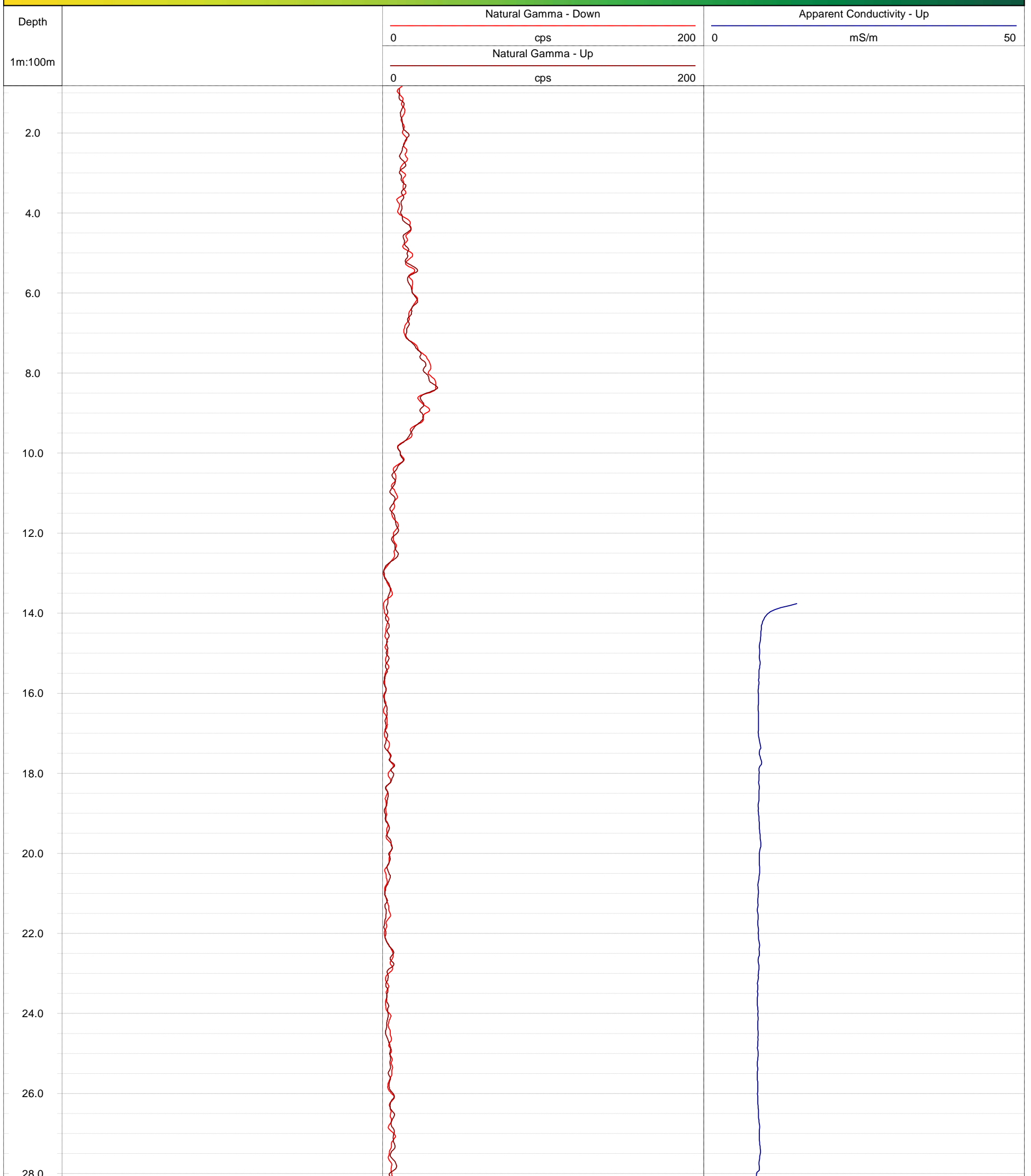
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-1-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 13.11 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576909.58 m	<b>Drilled Depth:</b> 36.00 m bgs	<b>Water Level:</b> 1.80 m bgs	<b>Log Date:</b> Mar-3-2021
<b>Northing:</b> 4853505.06 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 420.58 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.20 m ags	

**Notes:**









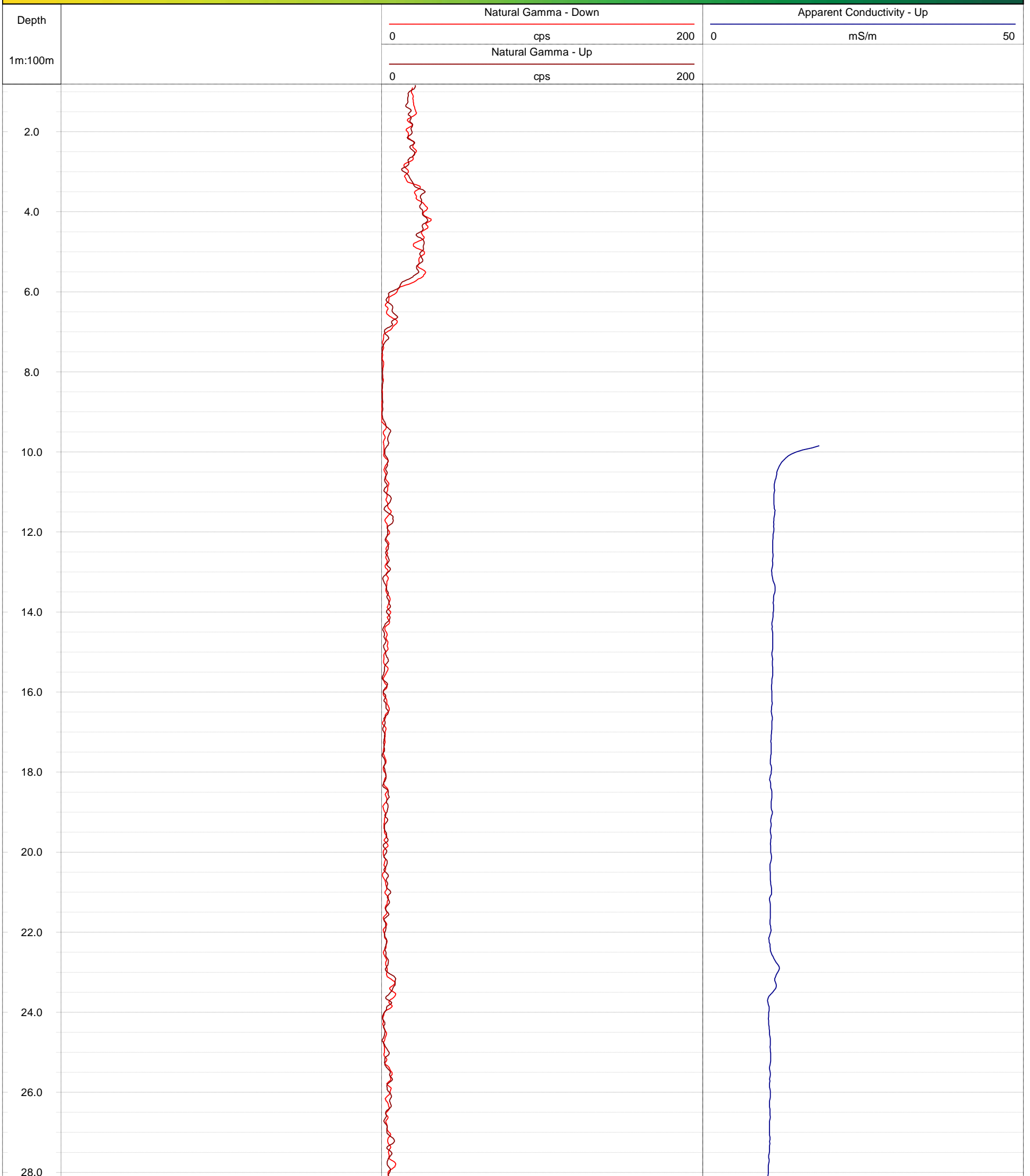
**GOLDER**  
MEMBER OF WSP

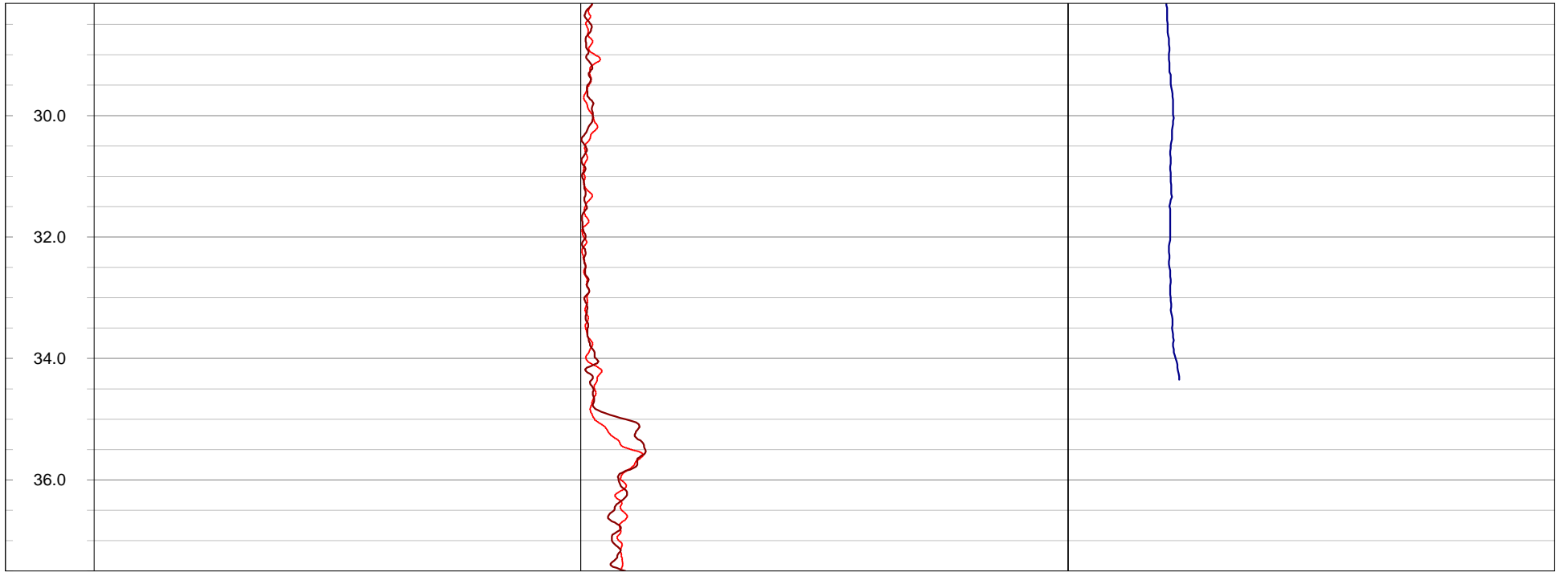
**Geophysical Record of Borehole: MW21-1-3 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 8.84 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576965.46 m	<b>Drilled Depth:</b> 37.49 m bgs	<b>Water Level:</b> 7.00 m bgs	<b>Log Date:</b> Mar-3-2021
<b>Northing:</b> 4853420.30 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 417.51 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.13 m ags	

**Notes:**







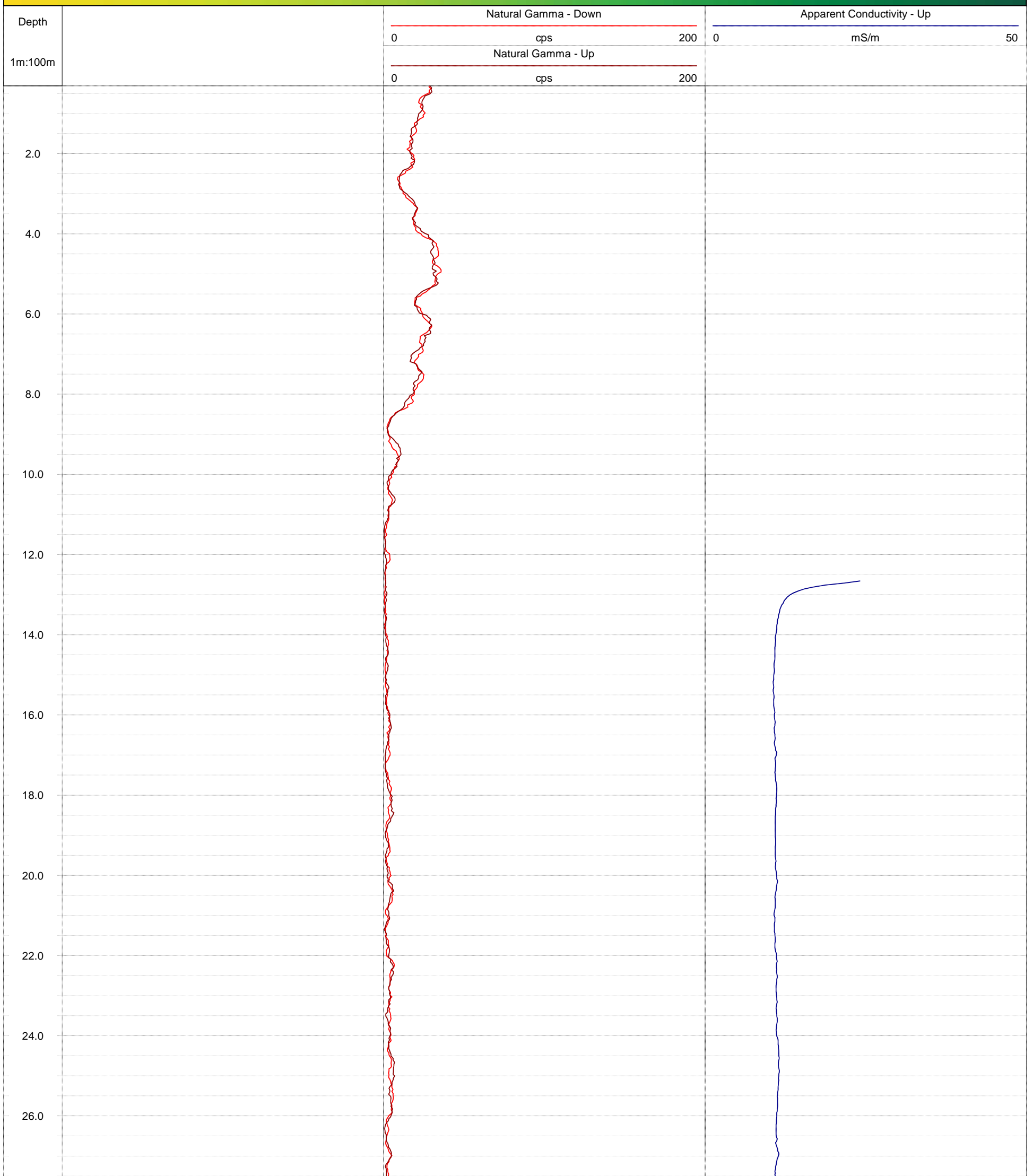
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-1-4 (CAL)**

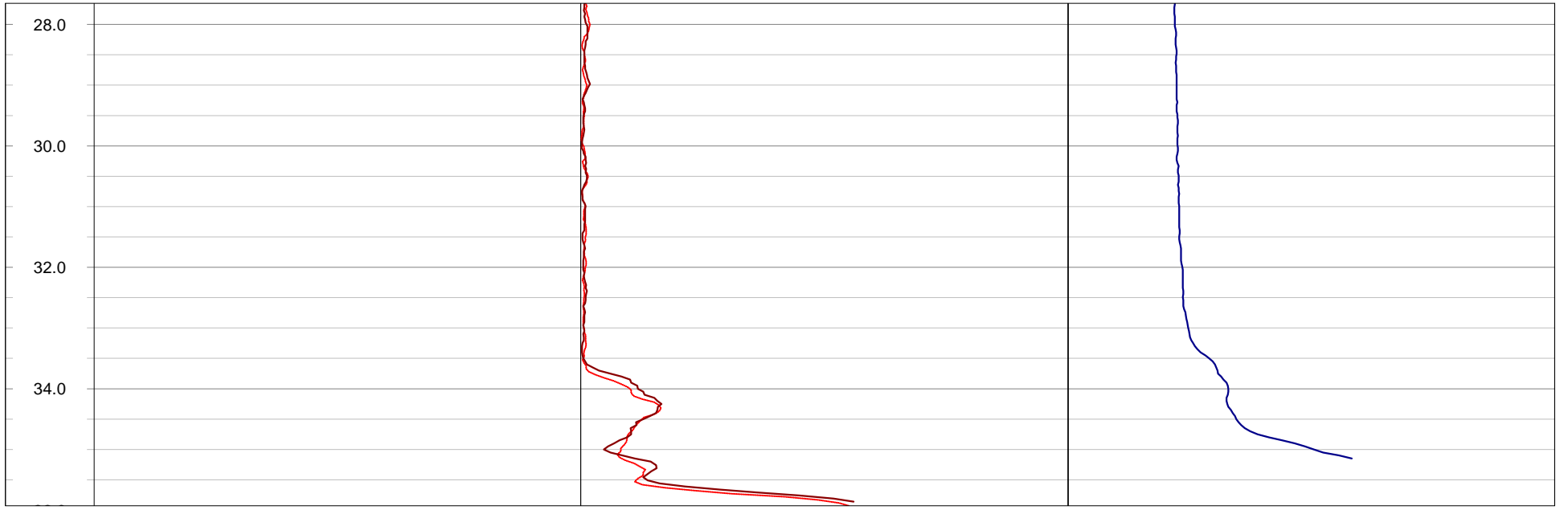
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 11.89m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 576866.19 m	<b>Drilled Depth:</b> 35.96 m bgs	<b>Water Level:</b> 1.20 m bgs	<b>Log Date:</b> Mar-5-2021
<b>Northing:</b> 48533450.60 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 417.83 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.43 m ags	

**Notes:**









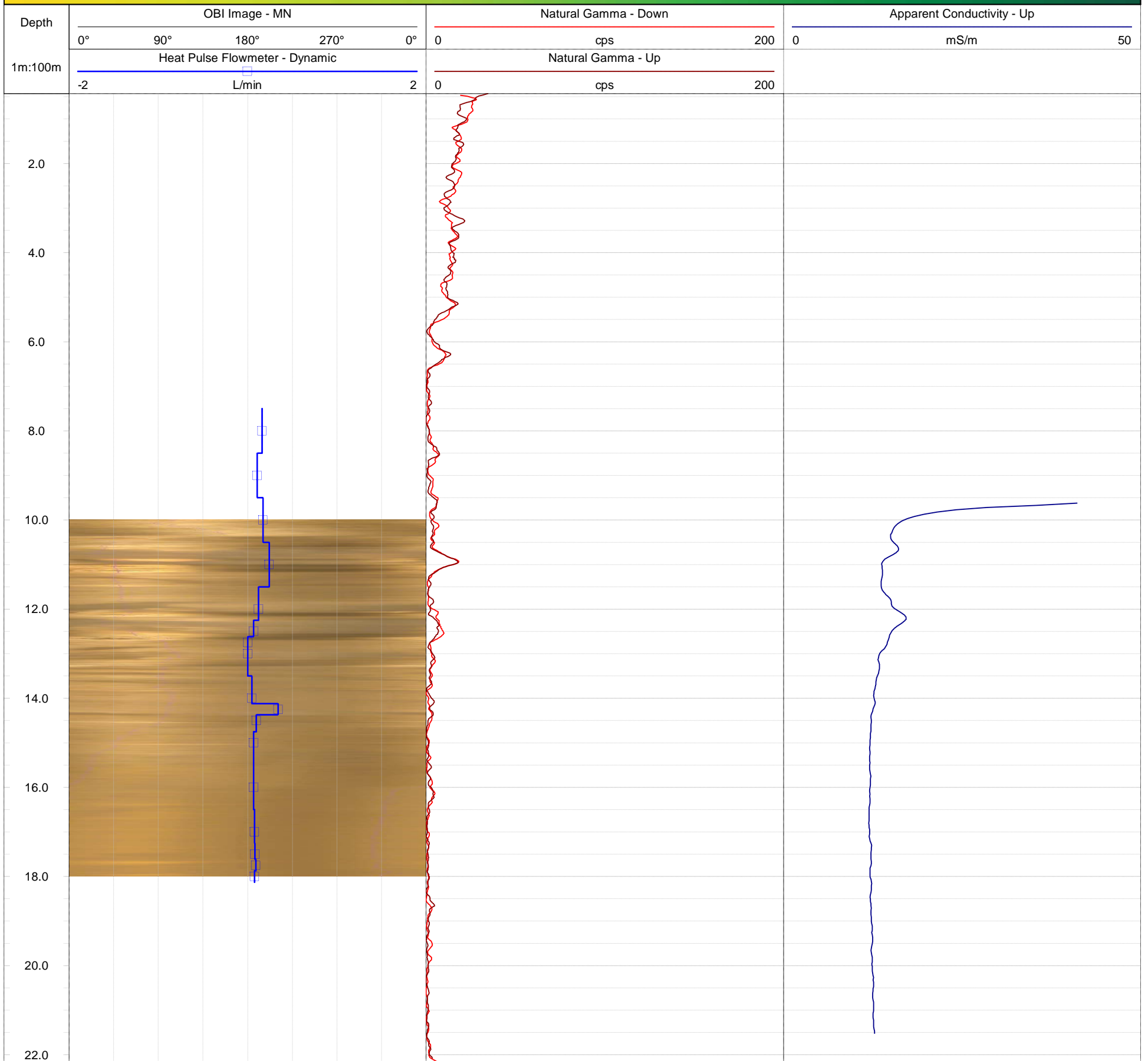
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-2-1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 8.99 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577279.08 m    **Drilled Depth:** 23.47 m bgs    **Water Level:** 5.20 m bgs    **Log Date:** Mar-17-2021  
**Northing:** 4854021.09 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 413.40 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.21 m ags

**Notes:** Very murky image. Tried 3 runs with same results. Heat Pulse Flowmeter Dynamic pump at 6.5 m below top of collar. Pump rate approx. 3 L/min.





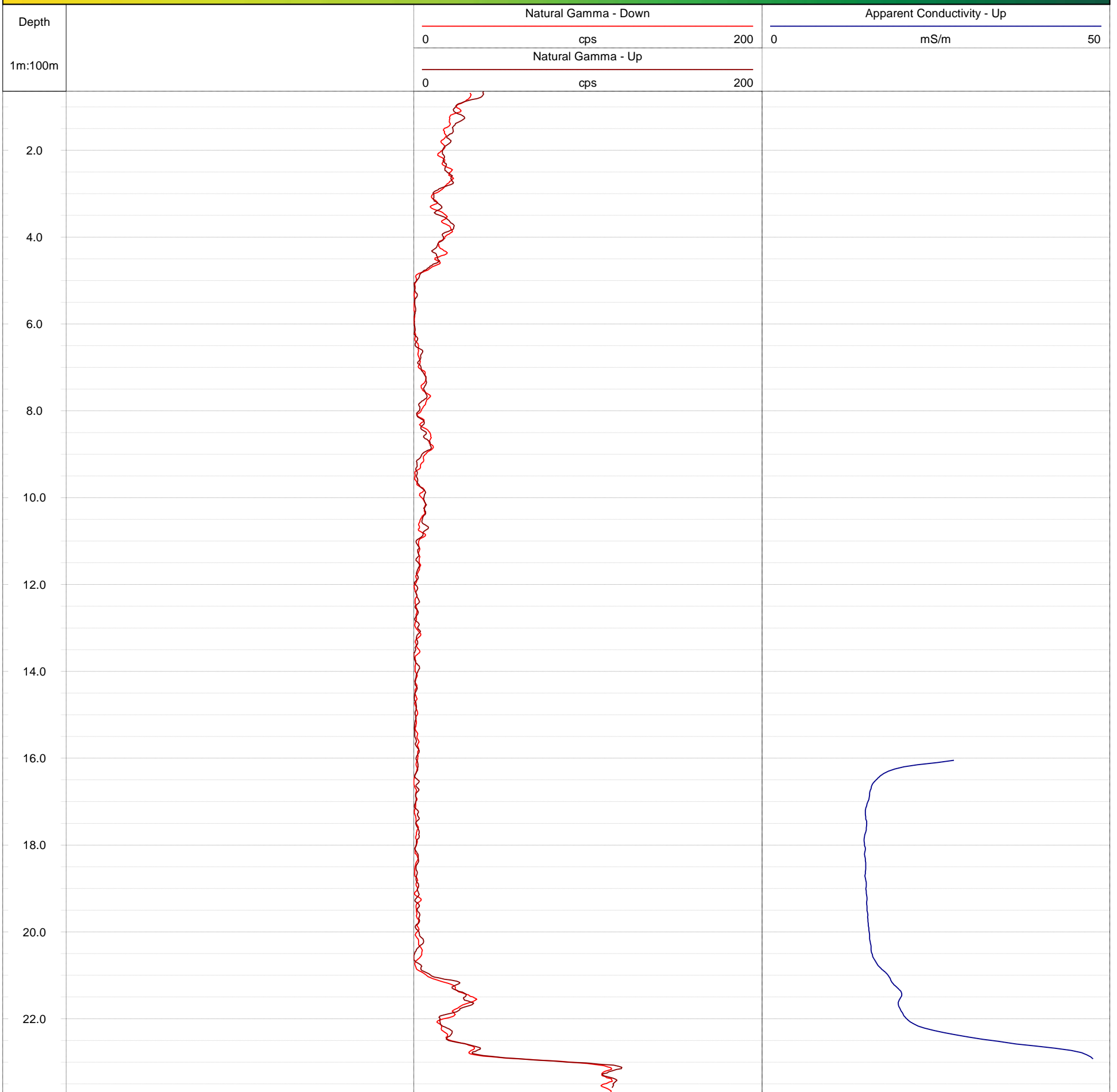
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-2-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 15.38 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577260.02 m	<b>Drilled Depth:</b> 23.47 m bgs	<b>Water Level:</b> 1.20 m bgs	<b>Log Date:</b> Mar-17-2021
<b>Northing:</b> 4854050.91 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 412.64 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.00 m ags	

**Notes:**





**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-2-3 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.64 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577349.69 m	<b>Drilled Depth:</b> 23.77 m bgs	<b>Water Level:</b> 3.90 m bgs	<b>Log Date:</b> Mar-17-2021
<b>Northing:</b> 4854098.46 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 410.76 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.42 m ags	

**Notes:**







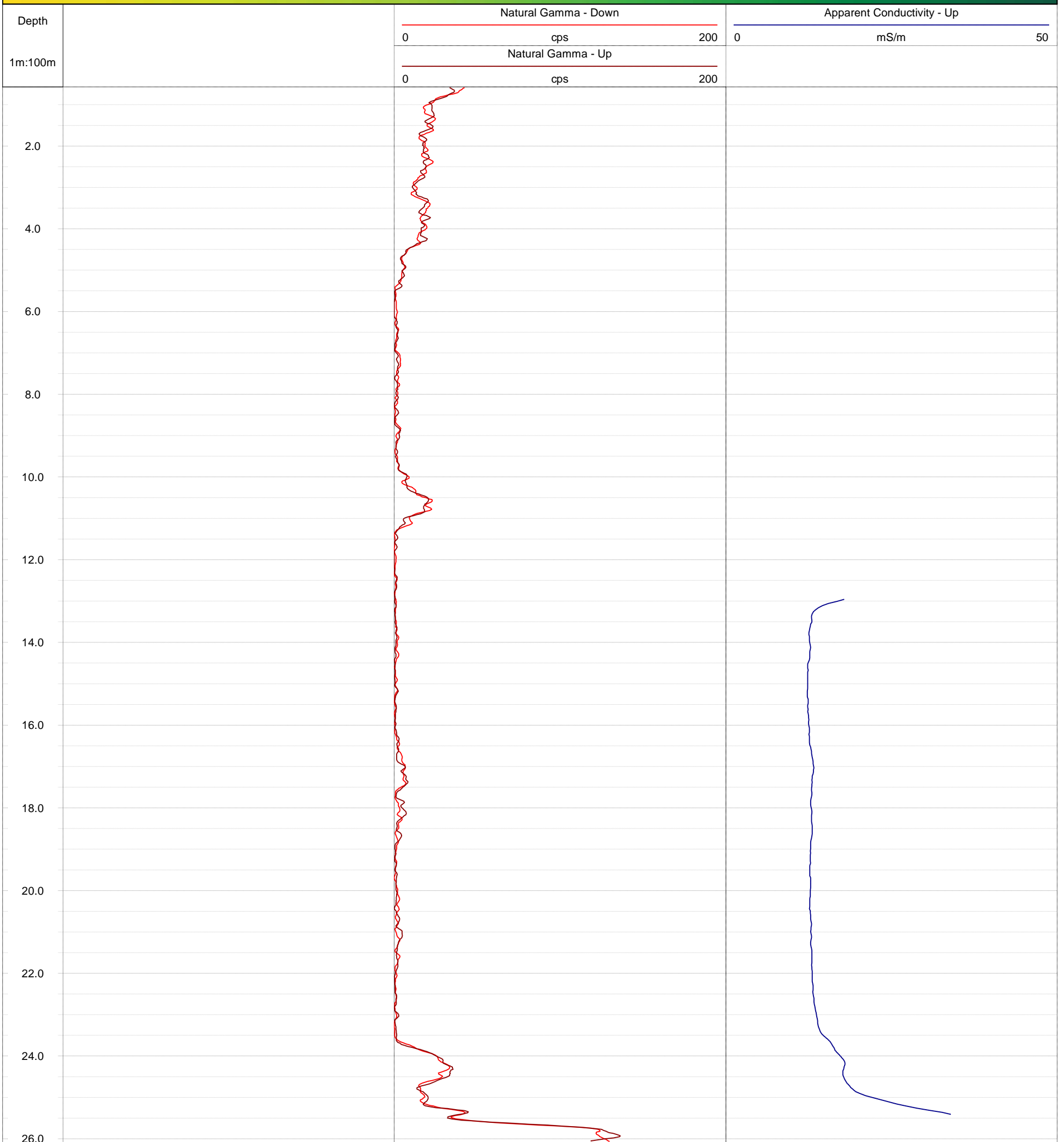
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-2-4 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 12.19 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577297.52 m	<b>Drilled Depth:</b> 26.52 m bgs	<b>Water Level:</b> 5.40 m bgs	<b>Log Date:</b> Mar-17-2021
<b>Northing:</b> 4851001.66 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 413.86 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.09 m ags	

**Notes:**





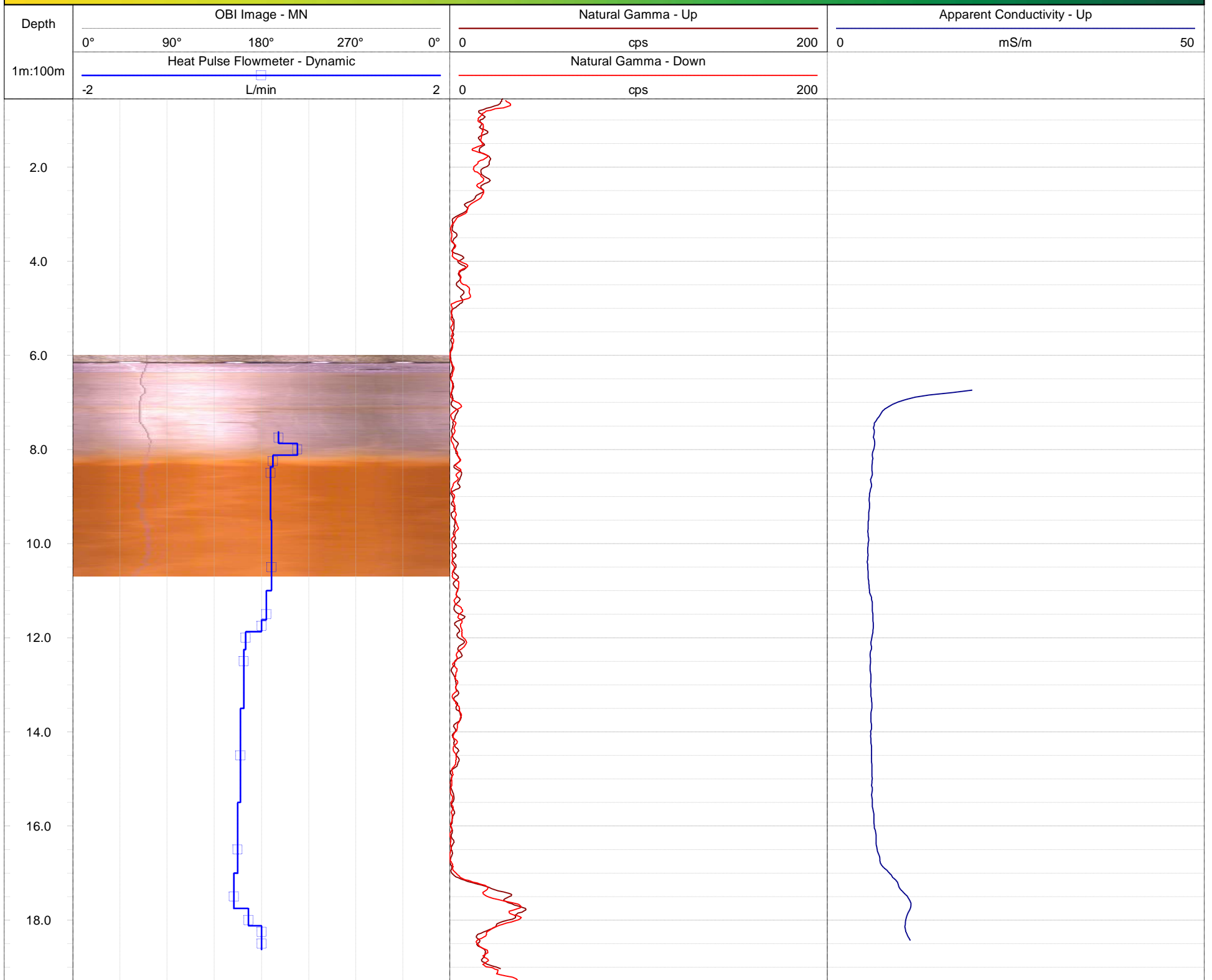
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-3-1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 6.16 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577871.84 m    **Drilled Depth:** 21.03 m bgs    **Water Level:** 5.70 m bgs    **Log Date:** Mar-31-2021  
**Northing:** 4852814.09 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 403.69 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.12 m ags

**Notes:** Image orange (rust?) from 8.3 to 10.7 mbgs, opaque > 10.8 m bgs. Heat Pulse Flowmeter Dynamic pump at 7.3 m below top of collar. Pump rate approx. 1 L/min.





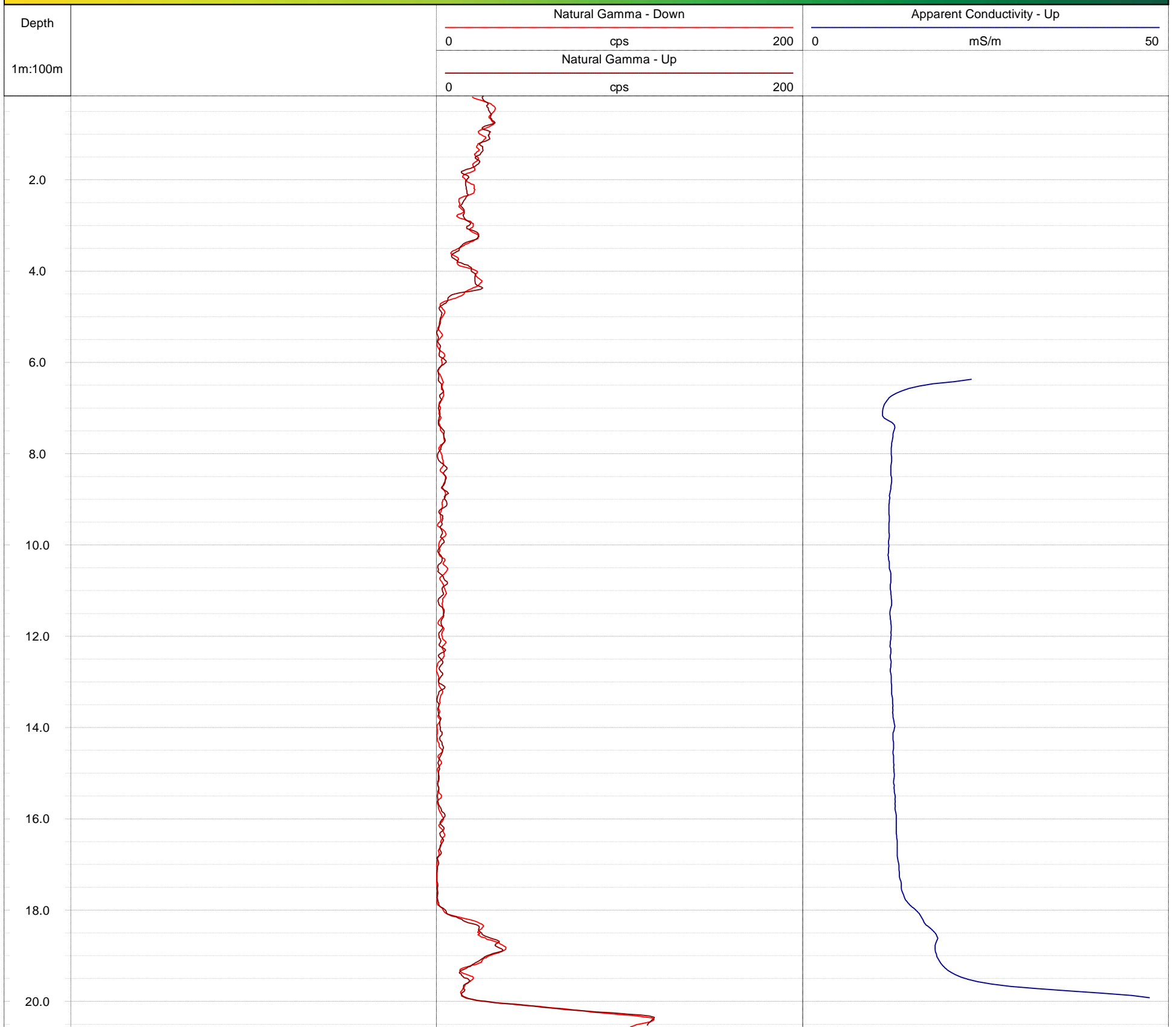
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-3-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.79 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577920.27 m	<b>Drilled Depth:</b> 21.03 m bgs	<b>Water Level:</b> 7.29 m bgs	<b>Log Date:</b> Apr-1-2021
<b>Northing:</b> 4852838.38 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 404.87 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.50 m ags	

**Notes:**





**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-3-3 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 8.84 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577935.55 m	<b>Drilled Depth:</b> 19.20 m bgs	<b>Water Level:</b> 12.37 m bgs	<b>Log Date:</b> Mar-31-2021
<b>Northing:</b> 4852730.93 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 405.12 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.13 m ags	

**Notes:**







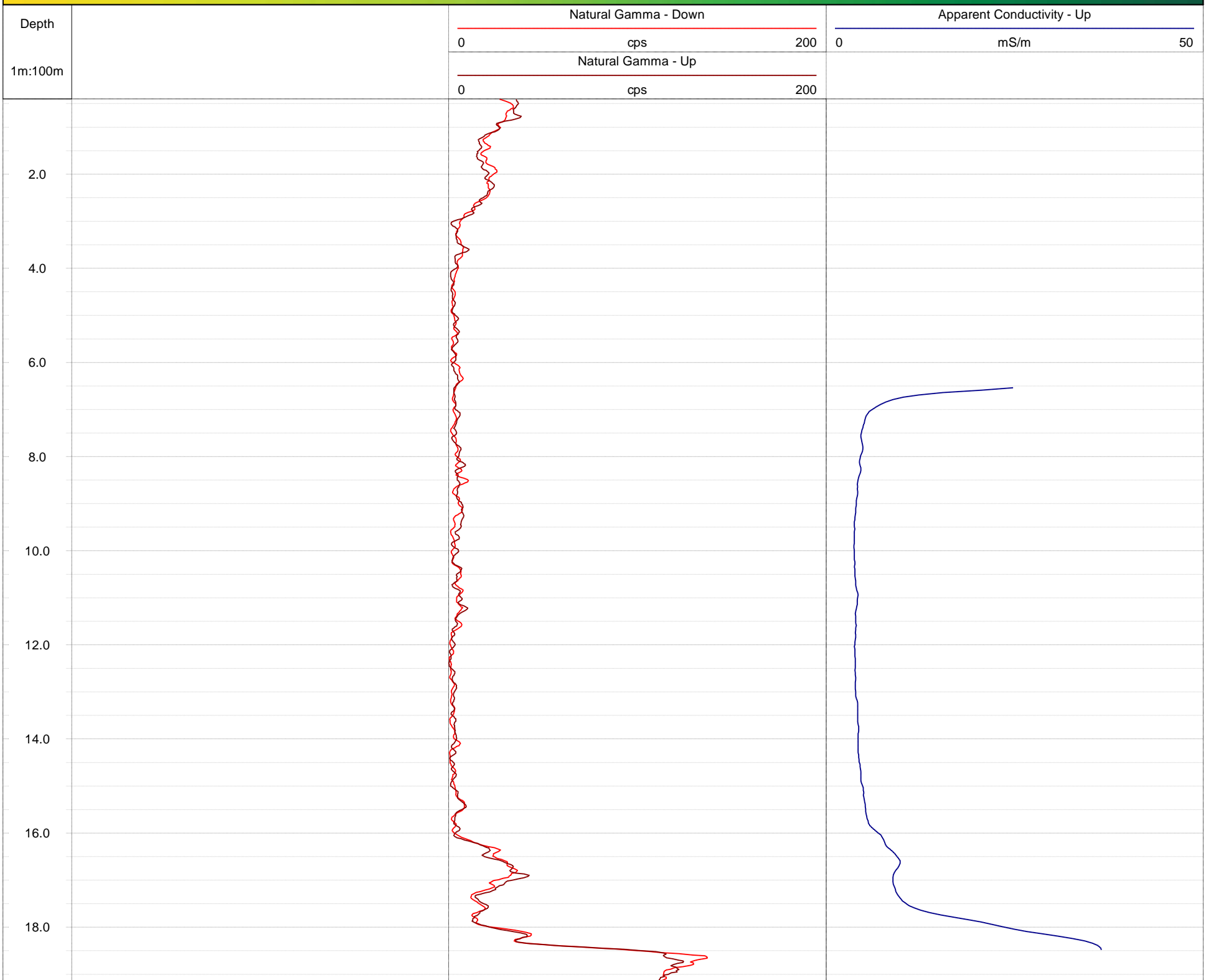
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-3-4 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 5.94 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577837.91 m	<b>Drilled Depth:</b> 19.20 m bgs	<b>Water Level:</b> 5.25 m bgs	<b>Log Date:</b> Mar-31-2021
<b>Northing:</b> 4852827.25 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 403.16 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.27 m ags	

**Notes:**





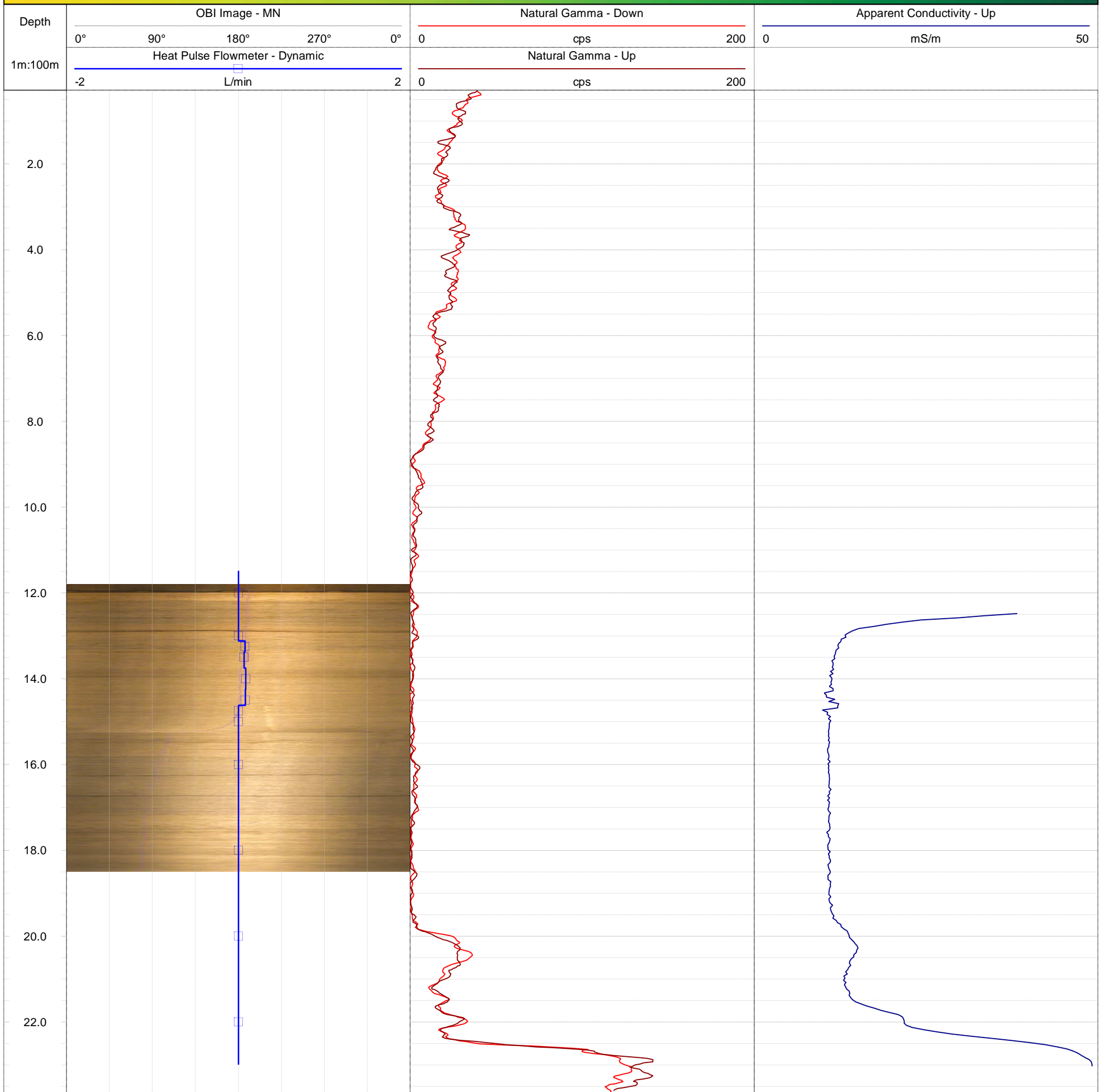
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-4-1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 11.98 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577793.12 m    **Drilled Depth:** 23.77 m bgs    **Water Level:** 9.13 m bgs    **Log Date:** Mar-23-2021  
**Northing:** 4854211.47 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.22 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.37 m ags

**Notes:** Image opaque > 18.60 m bgs. Heat Pulse Flowmeter Dynamic pump between 10.8/ 11.8 m below top of collar. Pump rate adjusted between 3 L/min. to 0.6 L/min.





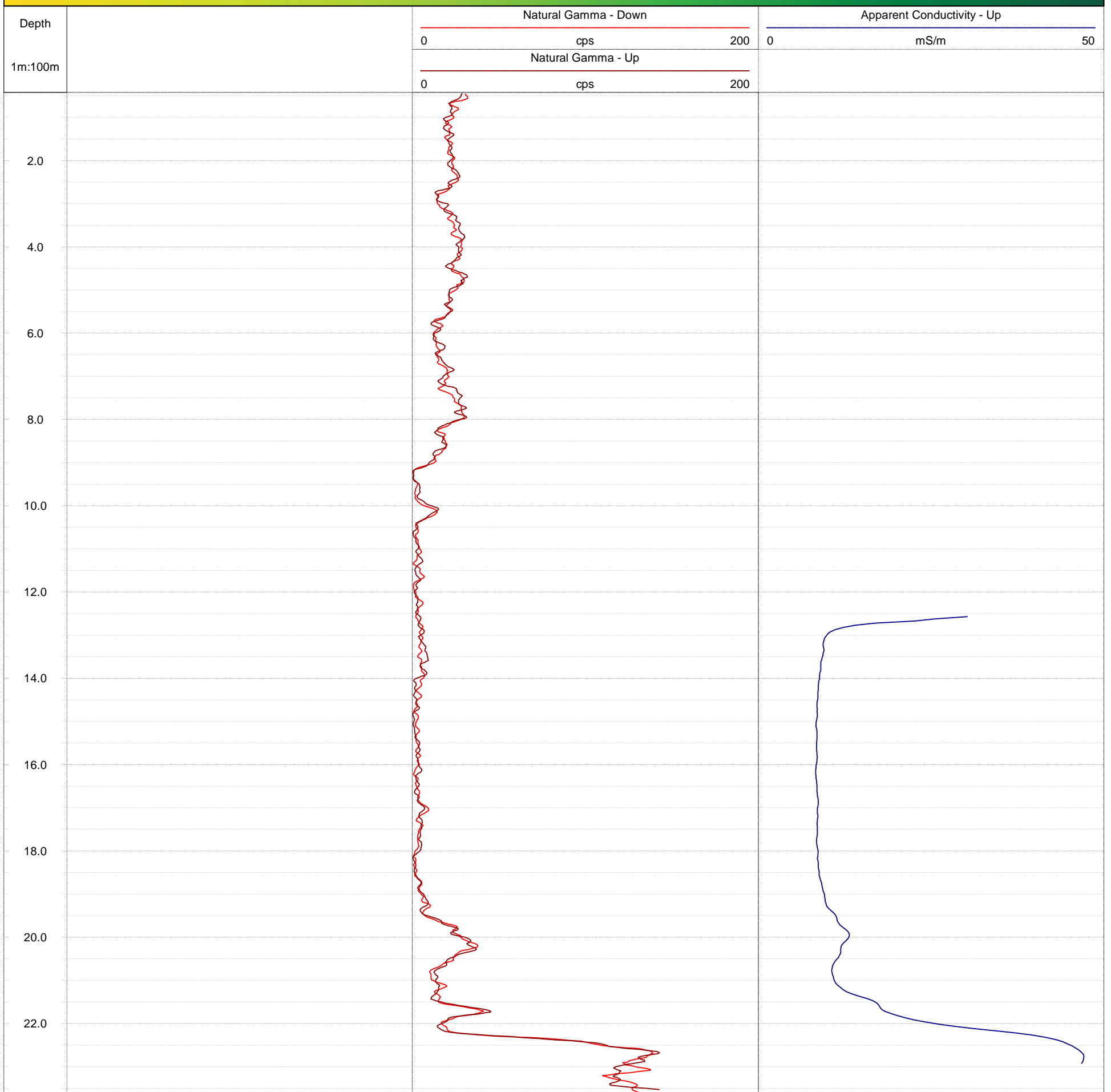
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-4-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 11.89 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577790.26 m	<b>Drilled Depth:</b> 23.77 m bgs	<b>Water Level:</b> 7.92 m bgs	<b>Log Date:</b> Mar-23-2021
<b>Northing:</b> 4854247.25 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 415.07 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.24 m ags	

**Notes:**





**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: MW21-4-3 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 9.25 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577813.86 m	<b>Drilled Depth:</b> 21.64 m bgs	<b>Water Level:</b> n/a	<b>Log Date:</b> Mar-24-2021
<b>Northing:</b> 4854182.83 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 414.78 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.05 m ags	

**Notes:**







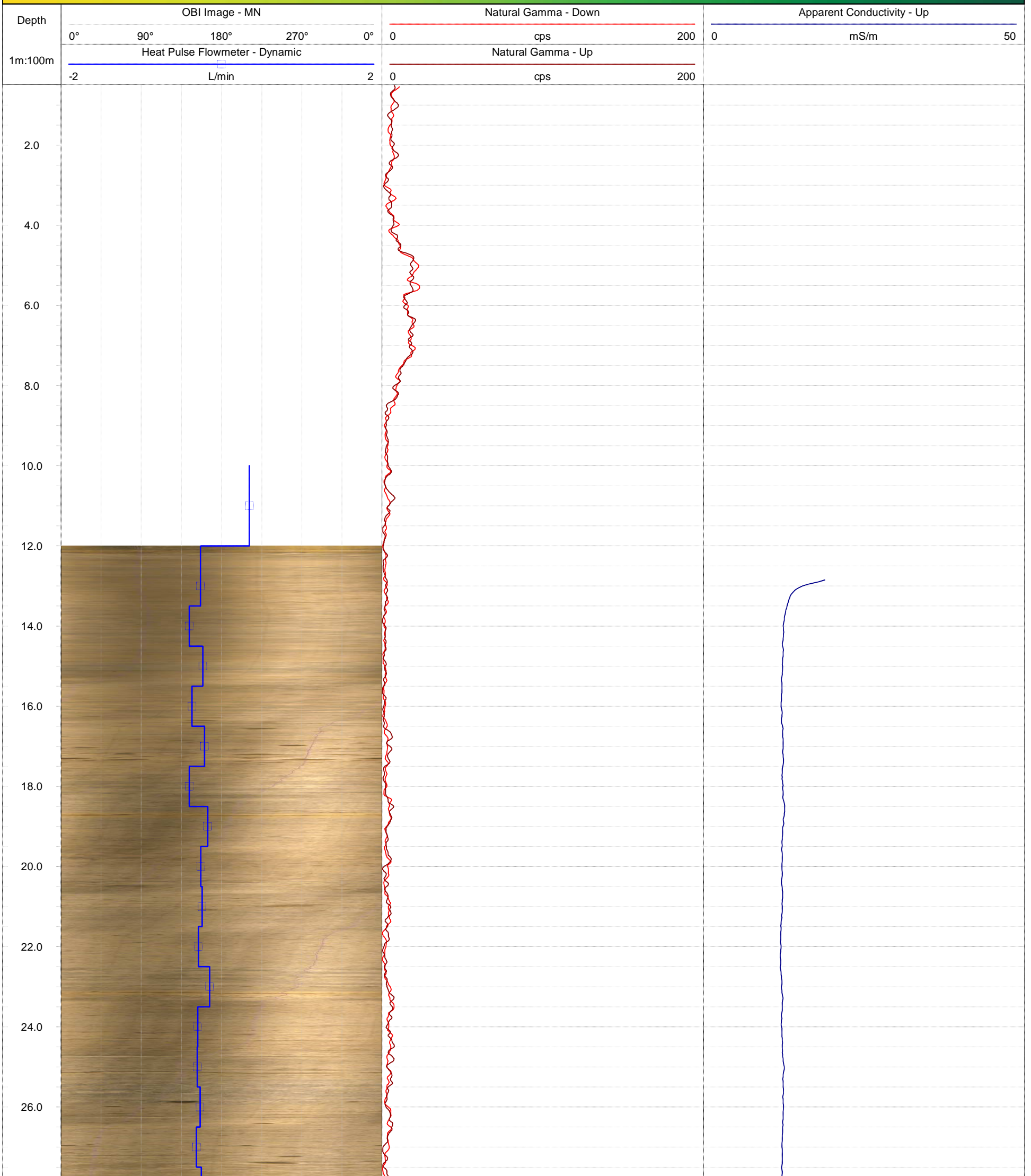
**GOLDER**  
MEMBER OF WSP

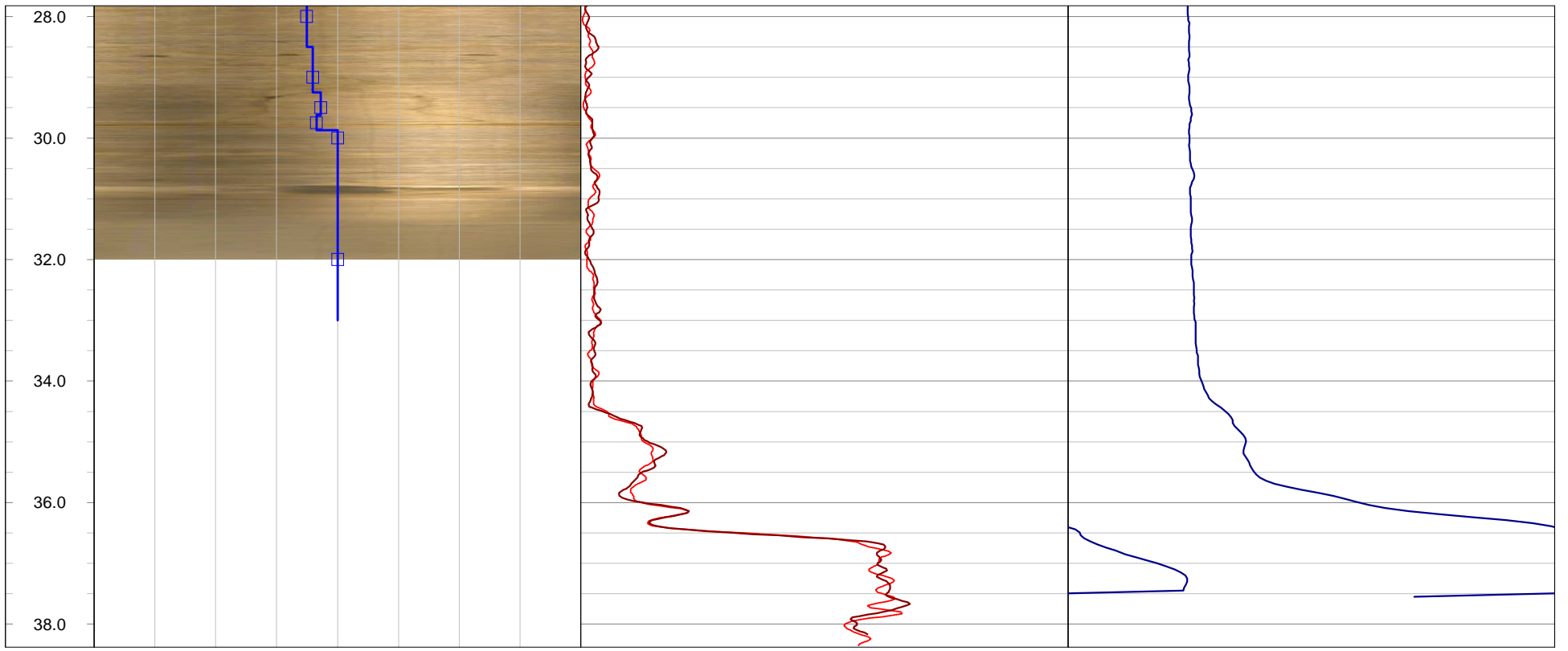
**Geophysical Record of Borehole: PW21-1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 12.19 m bgs    **Location:** Caledon, Ontario  
**Easting:** 576890.23 m    **Drilled Depth:** 38.41 m bgs    **Water Level:** 1.50 m bgs    **Log Date:** Mar-9-2021  
**Northing:** 4853478.69 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PL  
**Elevation:** 418.76 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.18 m ags

**Notes:** OBI image opaque>32 m bgs. Heat Pulse Flowmeter Dynamic pump at 10 m below top of collar. Pump rate approx. 4 L/min.







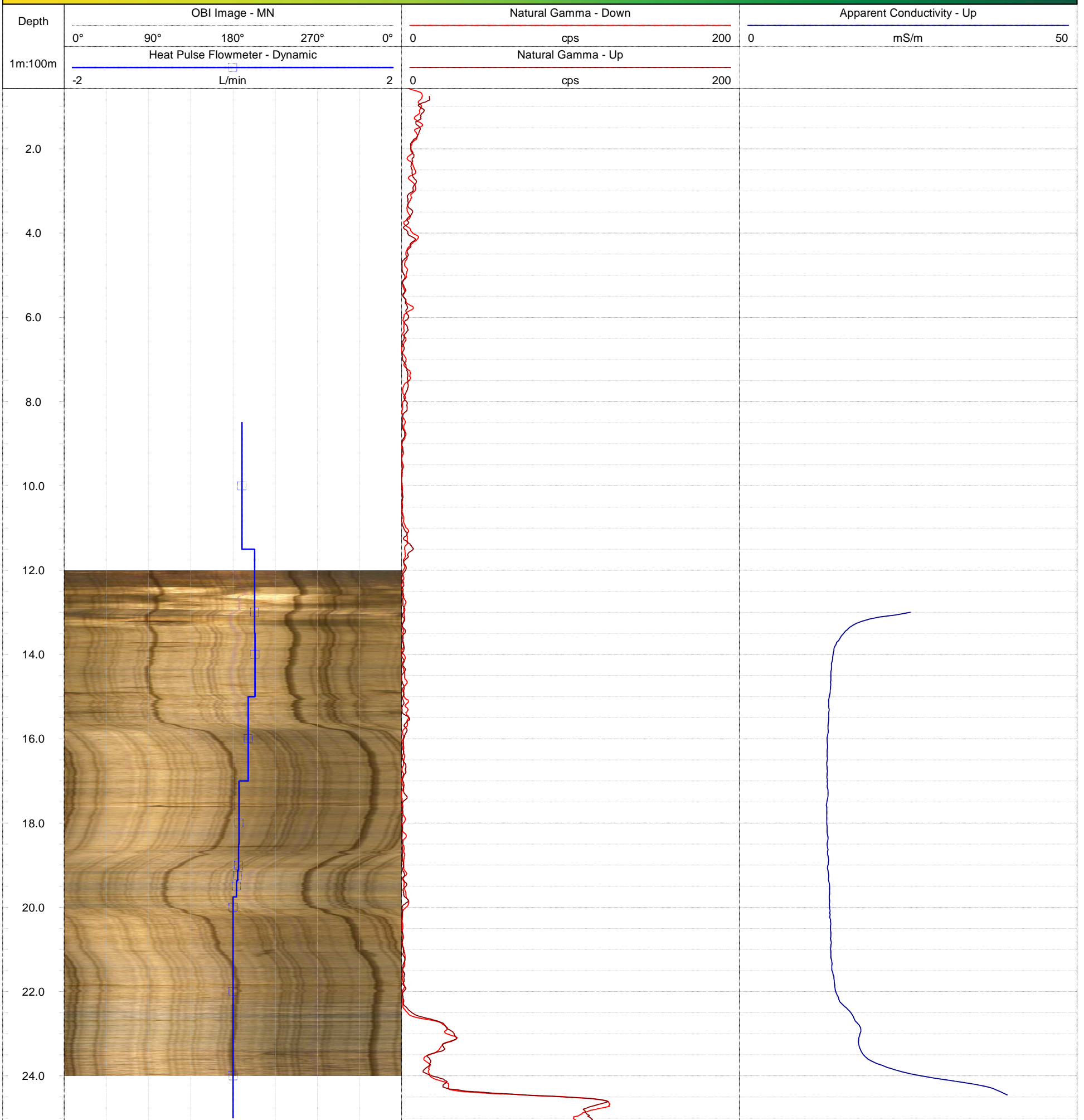
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: PW21-2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 12.19 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577286.29 m	<b>Drilled Depth:</b> 25.15 m bgs	<b>Water Level:</b> 4.60 m bgs	<b>Log Date:</b> Mar-18-2021
<b>Northing:</b> 4854027.50 m	<b>Borehole Diameter:</b> HQ	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PL
<b>Elevation:</b> 413.07 m asl	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.11 m ags	

**Notes:** Heat Pulse Flowmeter Dynamic pump at 6 m below top of collar. Pump rate approx. 4 L/min.





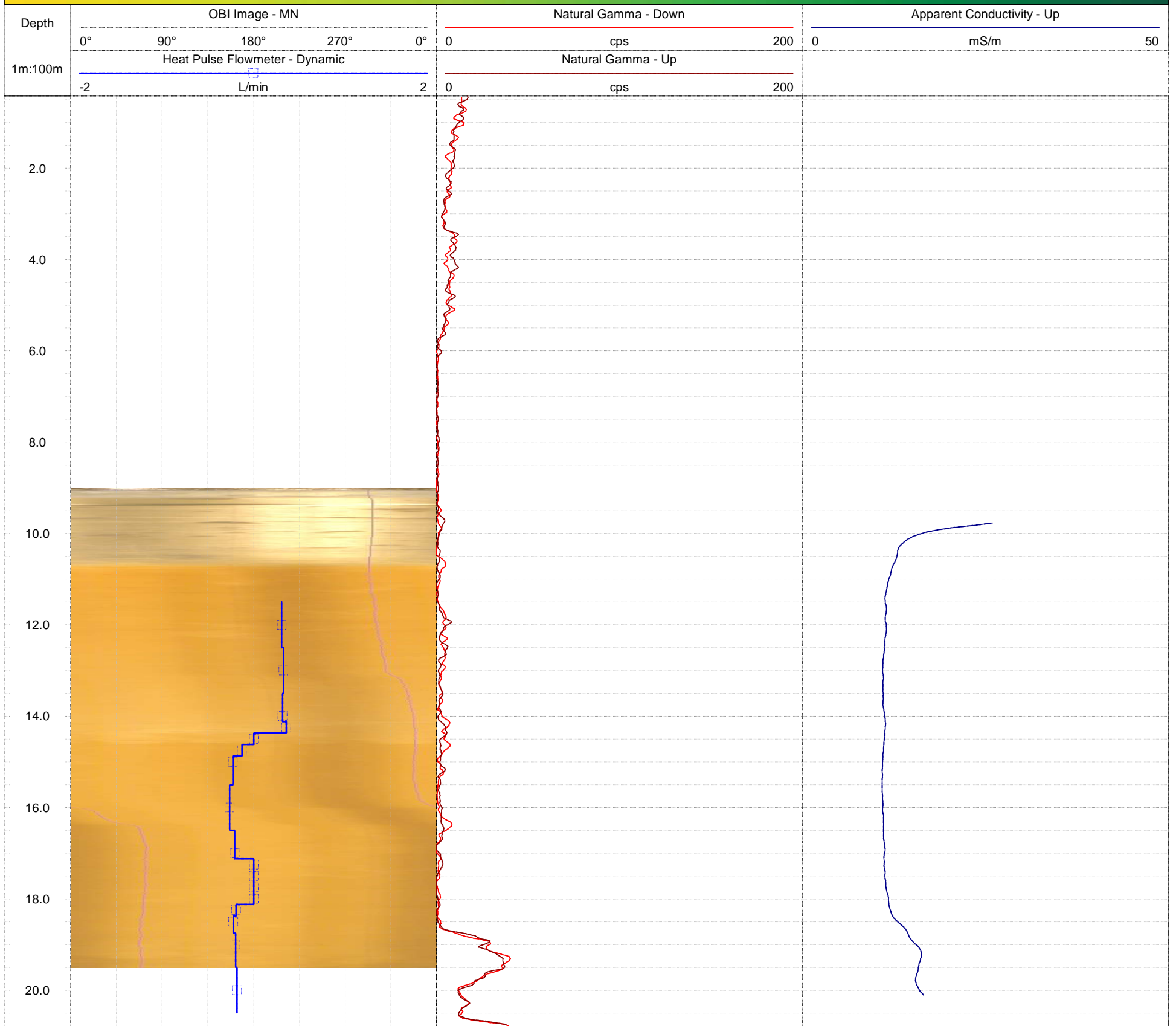
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: PW21-3 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 9.20 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577875.55 m    **Drilled Depth:** 21.34 m bgs    **Water Level:** 8.99 m bgs    **Log Date:** Apr-01-2021  
**Northing:** 4852797.50 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 405.45 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.24 m ags

**Notes:** Image orange (rust?) 10.7 to 19.5 m bgs, opaque>19.6 m bgs. Heat Pulse Flowmeter Dynamic pump at 11 m below top of collar. Pump rate approx. 1.7 L/min.







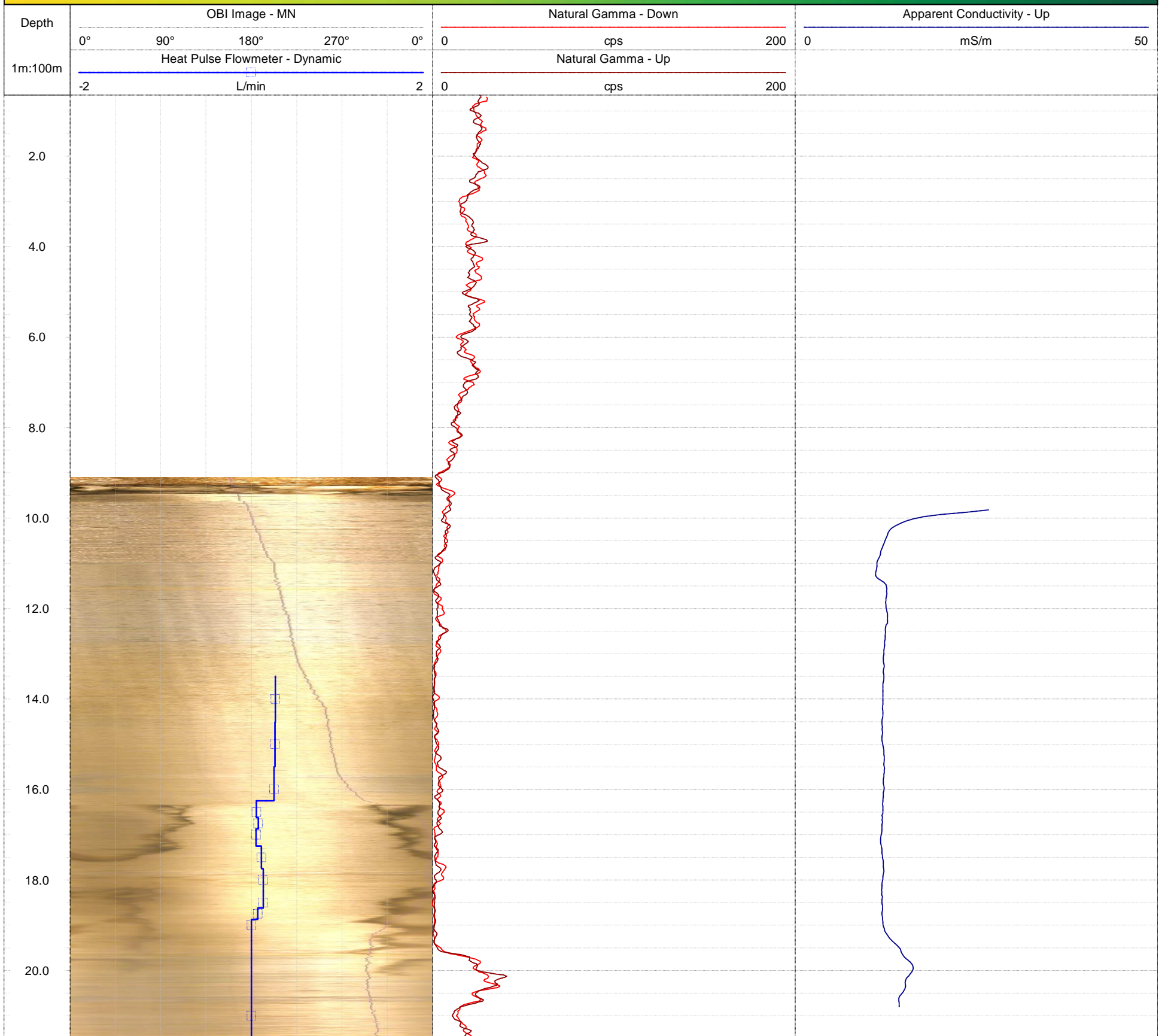
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: PW21-4 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 9.25 m bgs    **Location:** Caledon, Ontario  
**Easting:** 577802.09 m    **Drilled Depth:** 21.64 m bgs    **Water Level:** 10.95 m bgs    **Log Date:** Mar-24-2021  
**Northing:** 4854214.36 m    **Borehole Diameter:** HQ    **Borehole Inclination:** 0 degs    **Logged By:** PG  
**Elevation:** 415.08 m asl    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.04 m ags

**Notes:** OBI image opaque > 21.5 m bgs. Heat Pulse Flowmeter Dynamic pump at 13 m below top of collar. Pump rate approx. 2L/min.





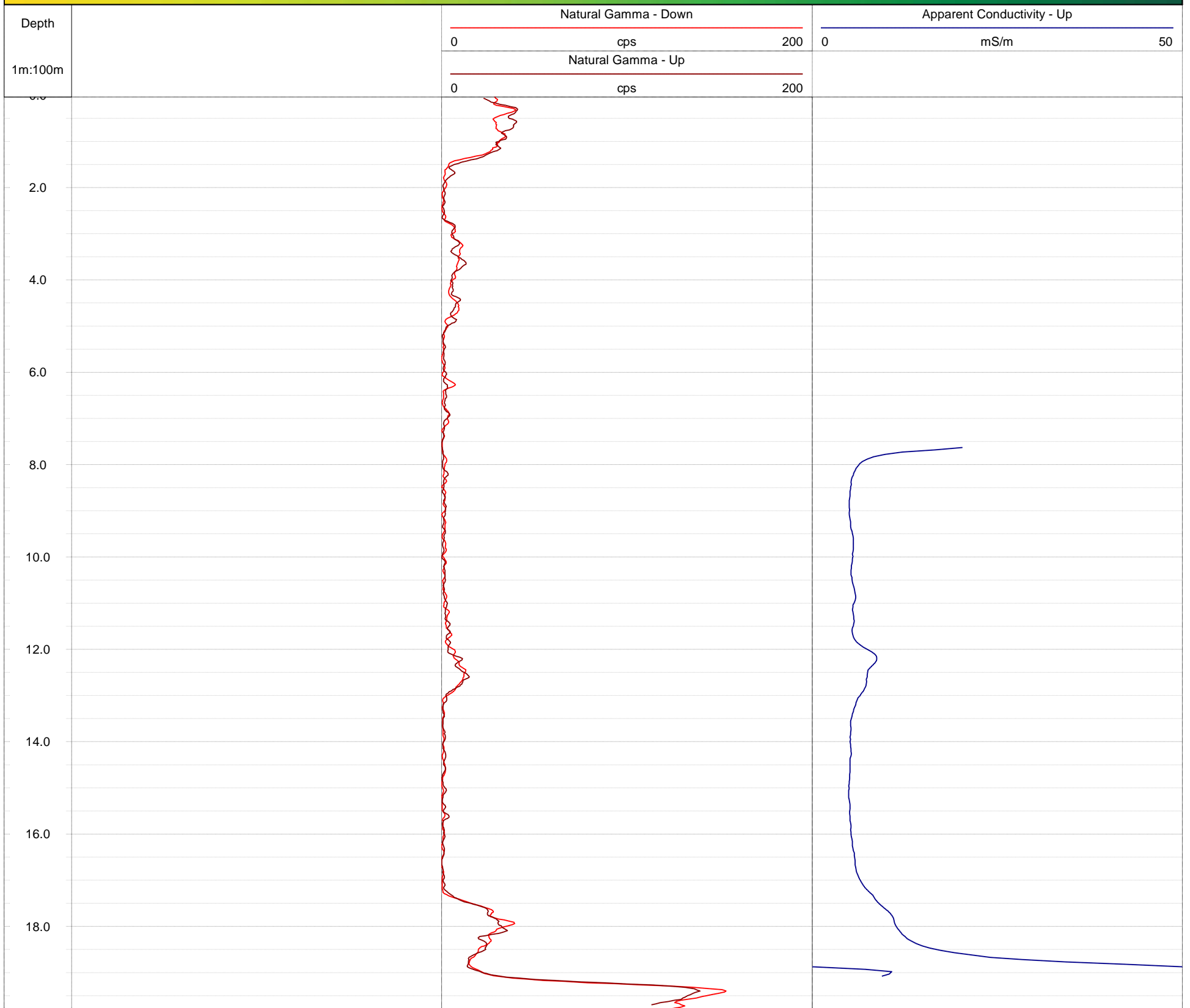
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: JHL-BH1 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577246.61 m	<b>Drilled Depth:</b> 19.70 m bgs	<b>Water Level:</b> 3.00 m bgs	<b>Log Date:</b> Apr-14-2021
<b>Northing:</b> 4854243.60 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 410.20 m asl	<b>Casing Diameter:</b> 102 mm	<b>Casing Stickup:</b> 0.65 m ags	

**Notes:**





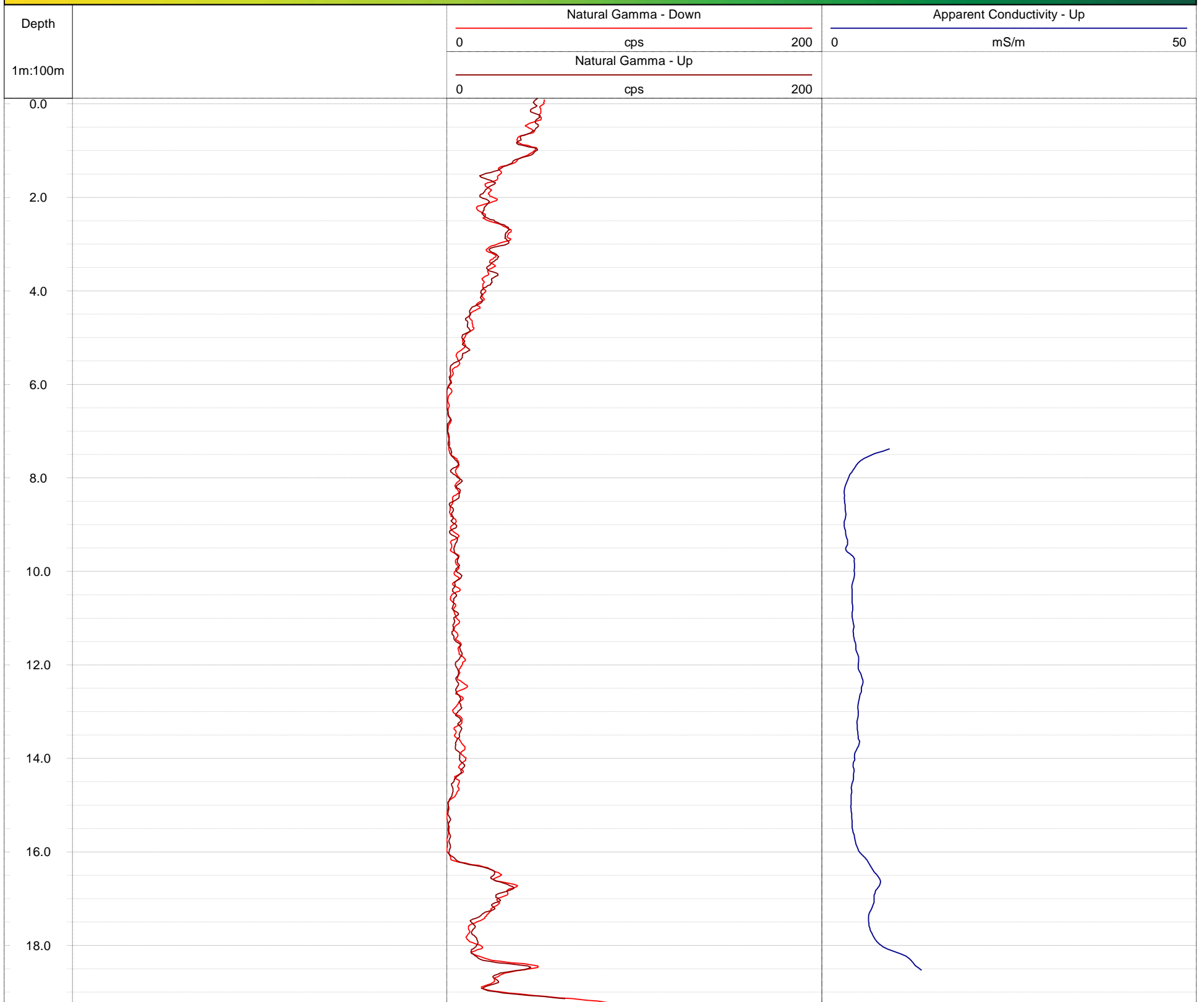
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: JHL-BH16 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577894.81 m	<b>Drilled Depth:</b> 19.90 m bgs	<b>Water Level:</b> 9.69 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854252.89 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 411.53 m asl	<b>Casing Diameter:</b> 76 mm	<b>Casing Stickup:</b> 0.46 m ags	

**Notes:**





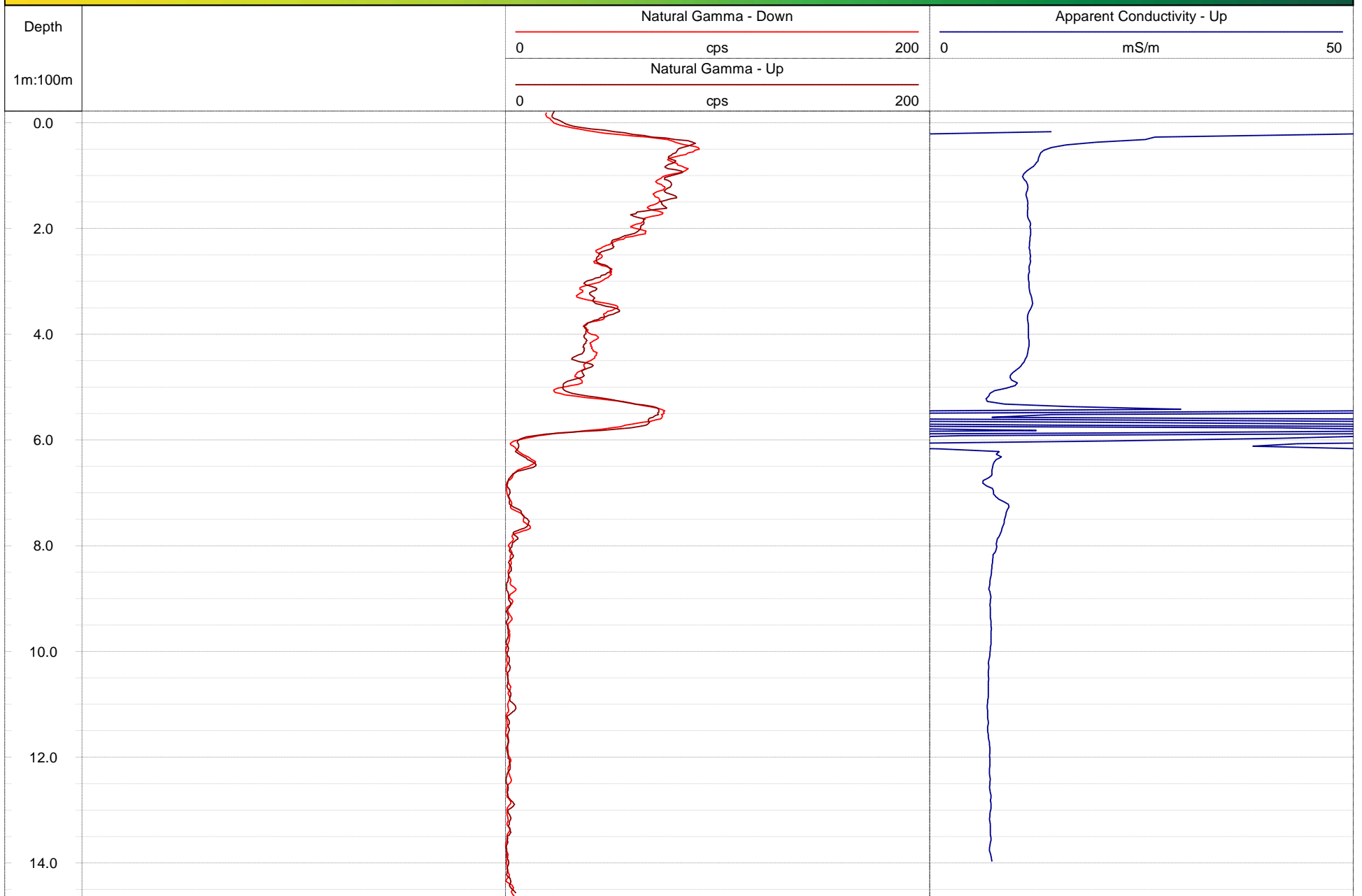
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: JHL-BH17 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578028.61 m	<b>Drilled Depth:</b> 18.85 m bgs	<b>Water Level:</b> 6.58 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854138.05 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 408.11 m asl	<b>Casing Diameter:</b> 51 mm	<b>Casing Stickup:</b> 0.87 m ags	

**Notes:** 2" I.D. PVC pipe visible at surface, suspect some remnants of a metal casing near 5.8 m bgs







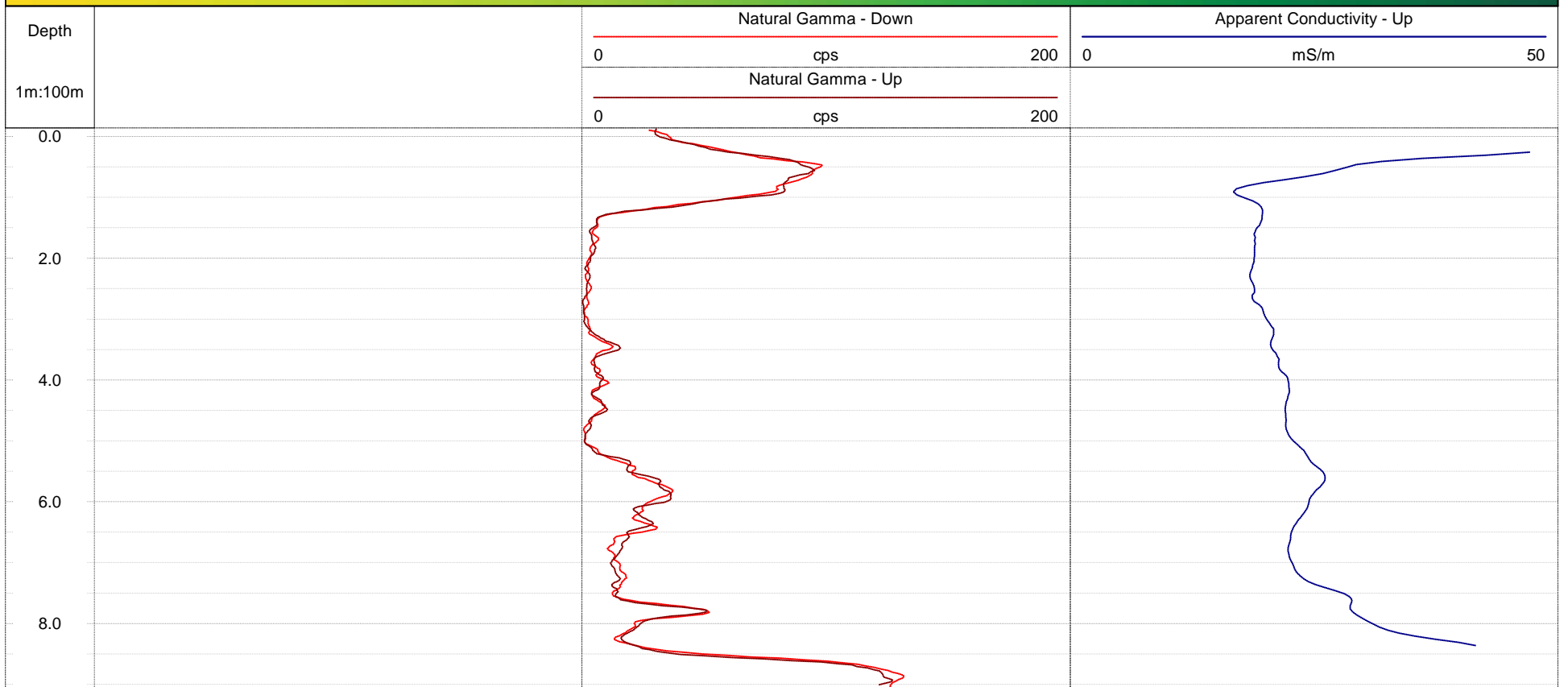
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: JHL-BH18 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 578153.75 m	<b>Drilled Depth:</b> 9.2 m bgs	<b>Water Level:</b> 3.36 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854324.05 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 400.69 m asl	<b>Casing Diameter:</b> 51 mm	<b>Casing Stickup:</b> 0.79 m ags	

**Notes:** 2" I.D. PVC pipe visible at surface, possible remnants of metal casing near surface.





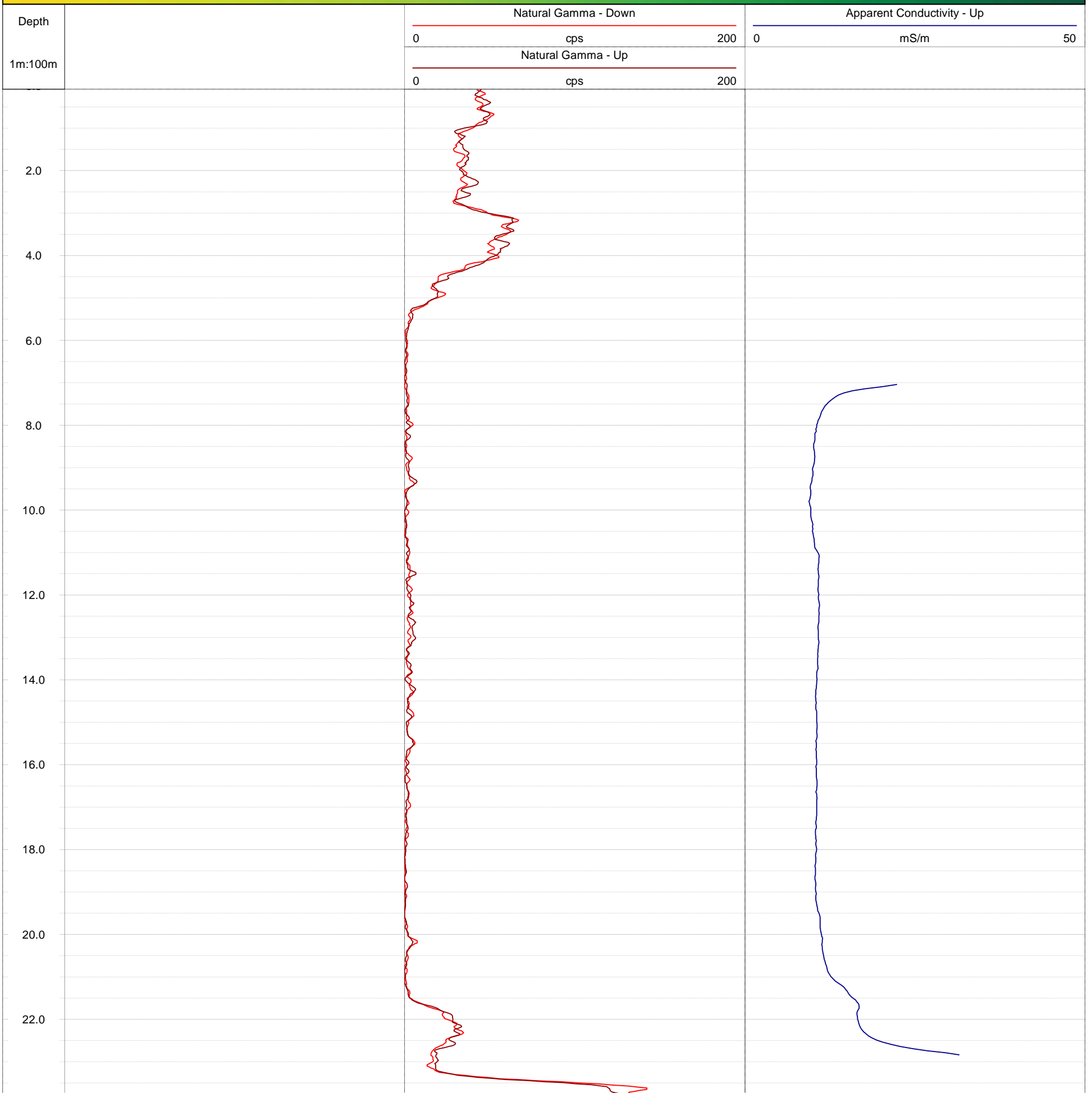
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: JHL-BH19 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577482.68 m	<b>Drilled Depth:</b> 24.50 m bgs	<b>Water Level:</b> 11.00 m bgs	<b>Log Date:</b> Mar-25-2021
<b>Northing:</b> 4854486.38 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> 414.13 m asl	<b>Casing Diameter:</b> 76 mm	<b>Casing Stickup:</b> 0.60 m ags	

**Notes:**





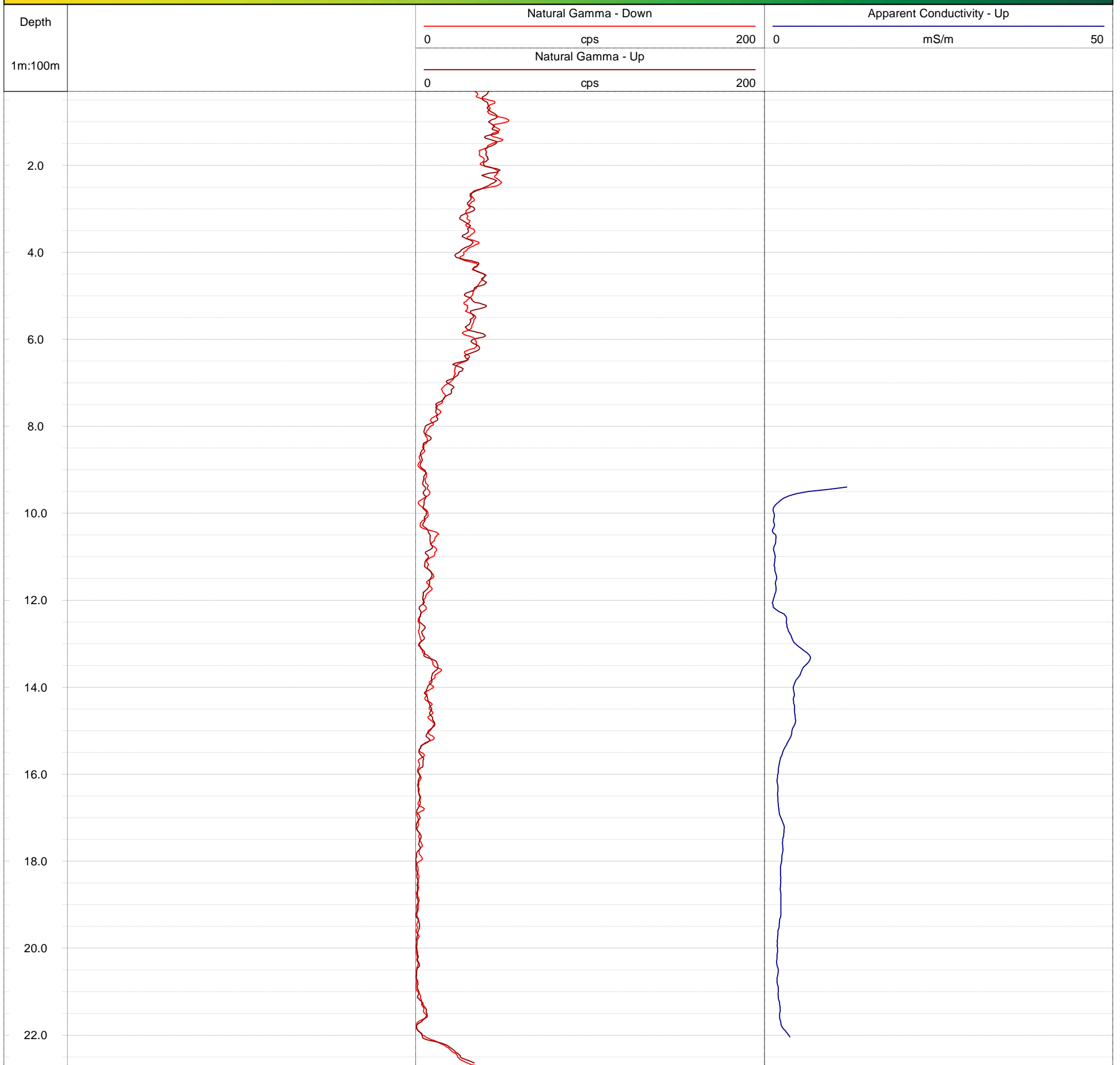
**GOLDER**  
MEMBER OF WSP

**Geophysical Record of Borehole: Unknown BH2 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** October 2021

<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> n/a	<b>Location:</b> Caledon, Ontario
<b>Easting:</b> 577689.54 m	<b>Drilled Depth:</b> n/a	<b>Water Level:</b> 11.60 m bgs	<b>Log Date:</b> Apr-14-2021
<b>Northing:</b> 4854266.72 m	<b>Borehole Diameter:</b> n/a	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> PG
<b>Elevation:</b> n/a	<b>Casing Diameter:</b> 102 mm	<b>Casing Stickup:</b> 0.40 m ags	

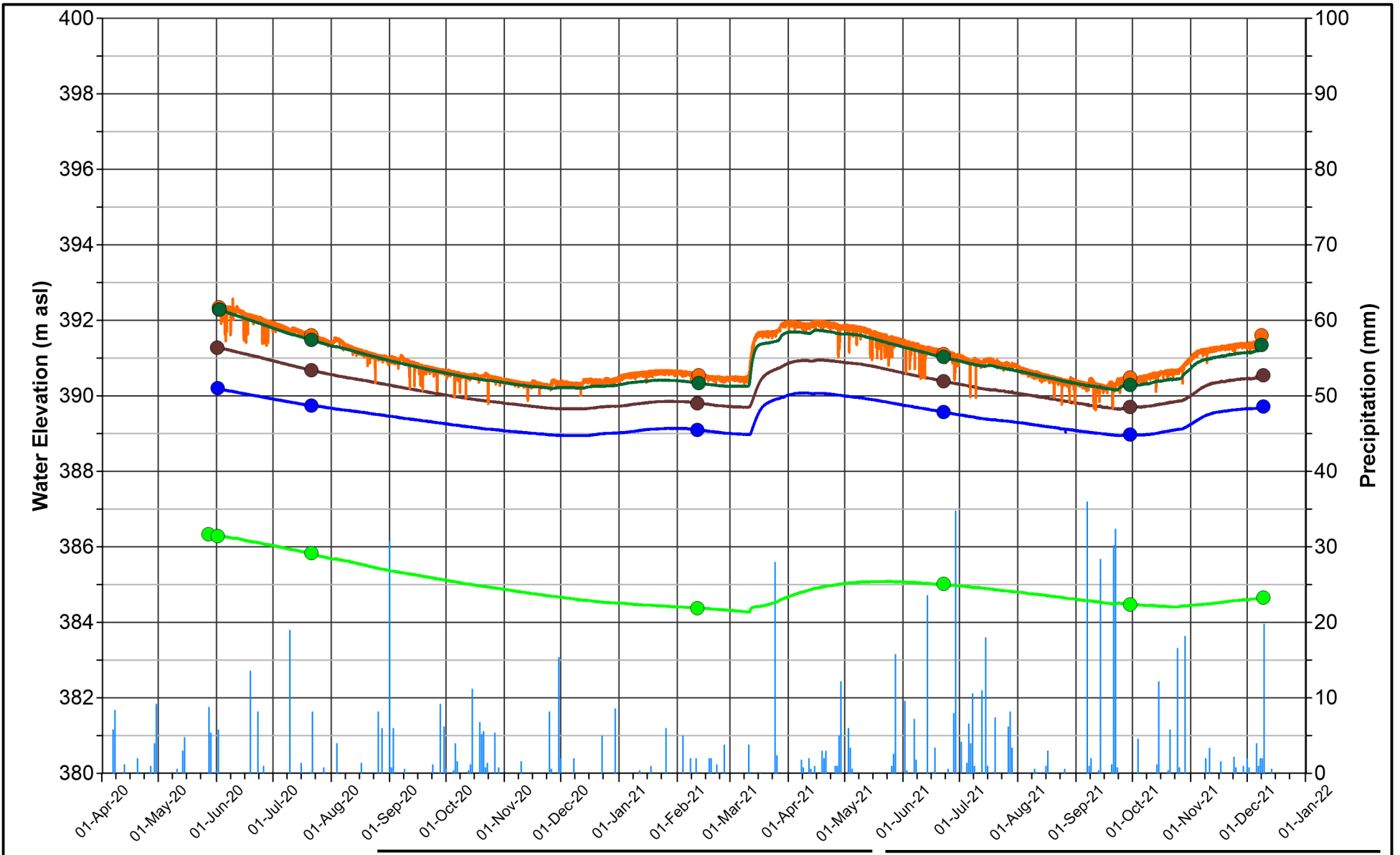
**Notes:**



**APPENDIX E**

# Groundwater Level Monitoring





PROJECT **CBM CALEDON QUARRY**

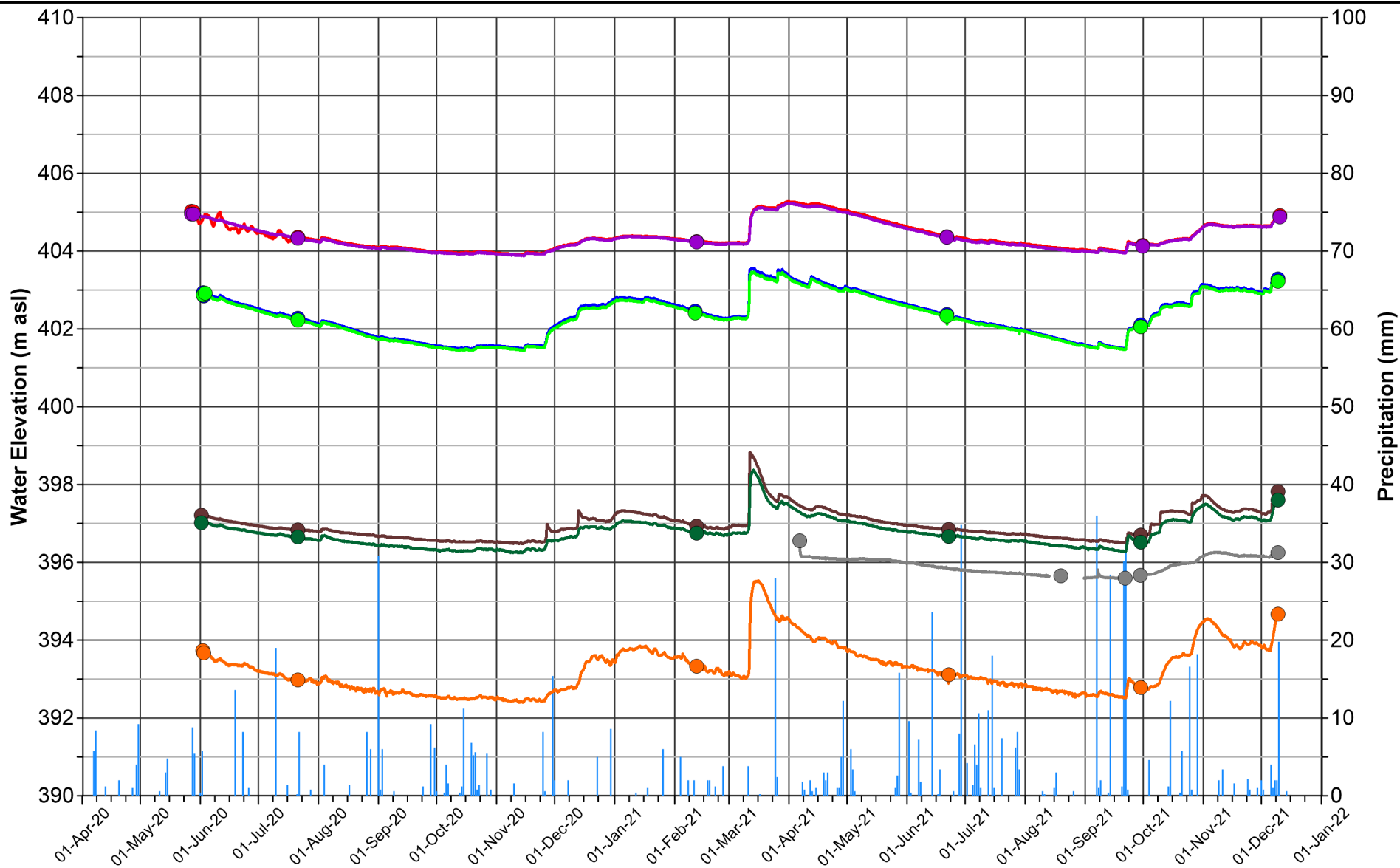
- MW20-01A
- MW20-01B
- MW20-02
- MW20-03
- MW20-04



DATE November 2022  
 DESIGN VRP  
 REVIEW GRP  
 APPROVED GWS

TITLE **GROUNDWATER MONITORING HYDROGRAPHS SOUTHERN AREA**

PROJECT NO. 19129150      REV A      FIGURE E1



PROJECT **CBM CALEDON QUARRY**

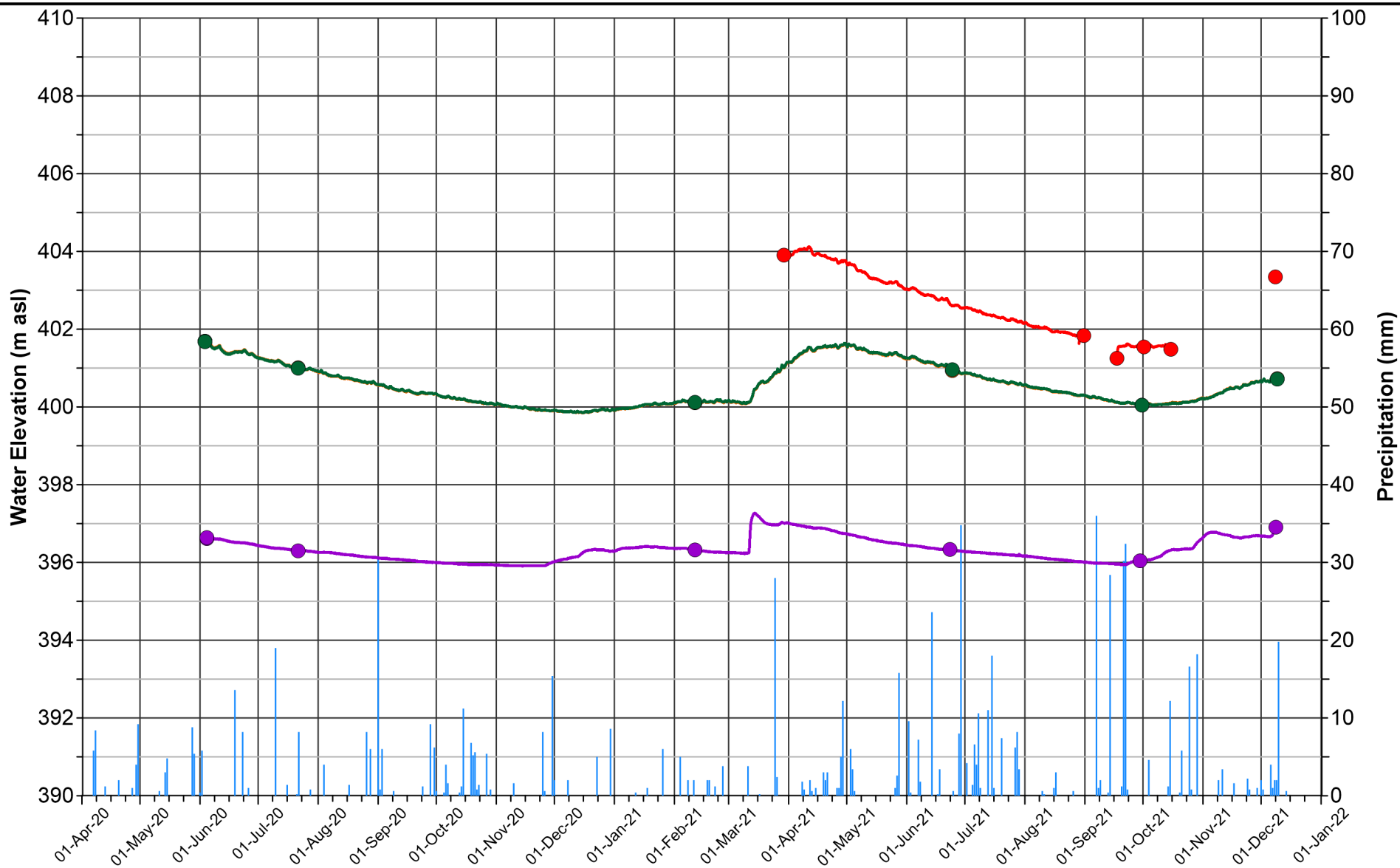
- MW20-05A    — MW20-07B
- MW20-06A    — MW20-08A
- MW20-06B    — MW20-08B
- MW20-07A    — PW21-3



DATE November 2022  
 DESIGN VRP  
 REVIEW GRP  
 APPROVED GWS

TITLE **GROUNDWATER MONITORING HYDROGRAPHS  
 SOUTHEASTERN AREA**

PROJECT NO. 19129150      REV A      FIGURE E2



PROJECT **CBM CALEDON QUARRY**

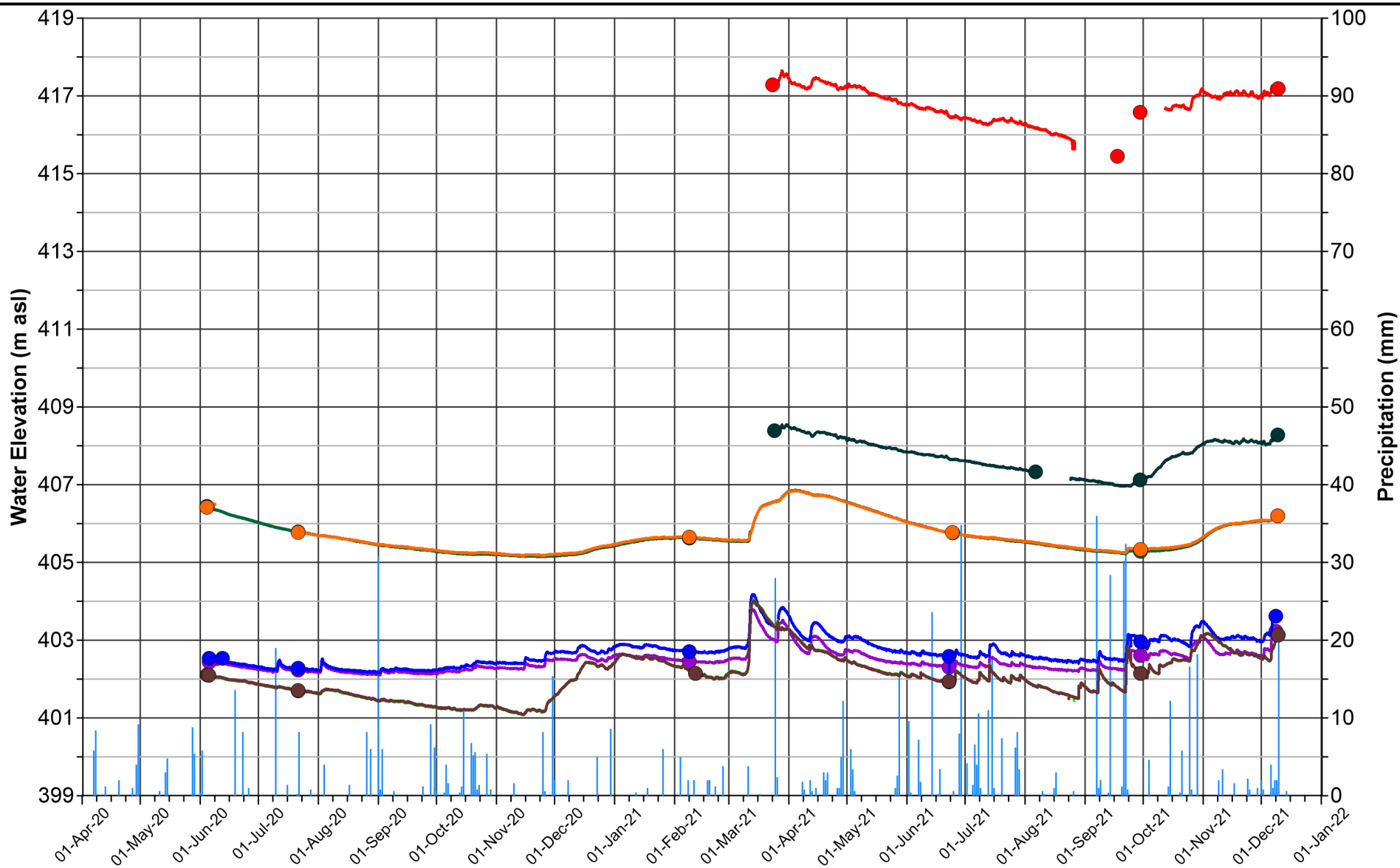
- MW20-09
- MW20-10A
- MW20-10B
- PW21-4



DATE November 2022  
 DESIGN VRP  
 REVIEW GRP  
 APPROVED GWS

TITLE **GROUNDWATER MONITORING HYDROGRAPHS EASTERN AREA**

PROJECT NO. 19129150      REV A      FIGURE E3



PROJECT **CBM CALEDON QUARRY**

- MW20-11A    — MW20-17A
- MW20-11B    — MW20-17B
- MW20-14A    — PW21-1
- MW20-14B    — PW21-2



DATE November 2022  
 DESIGN VRP  
 REVIEW GRP  
 APPROVED GWS

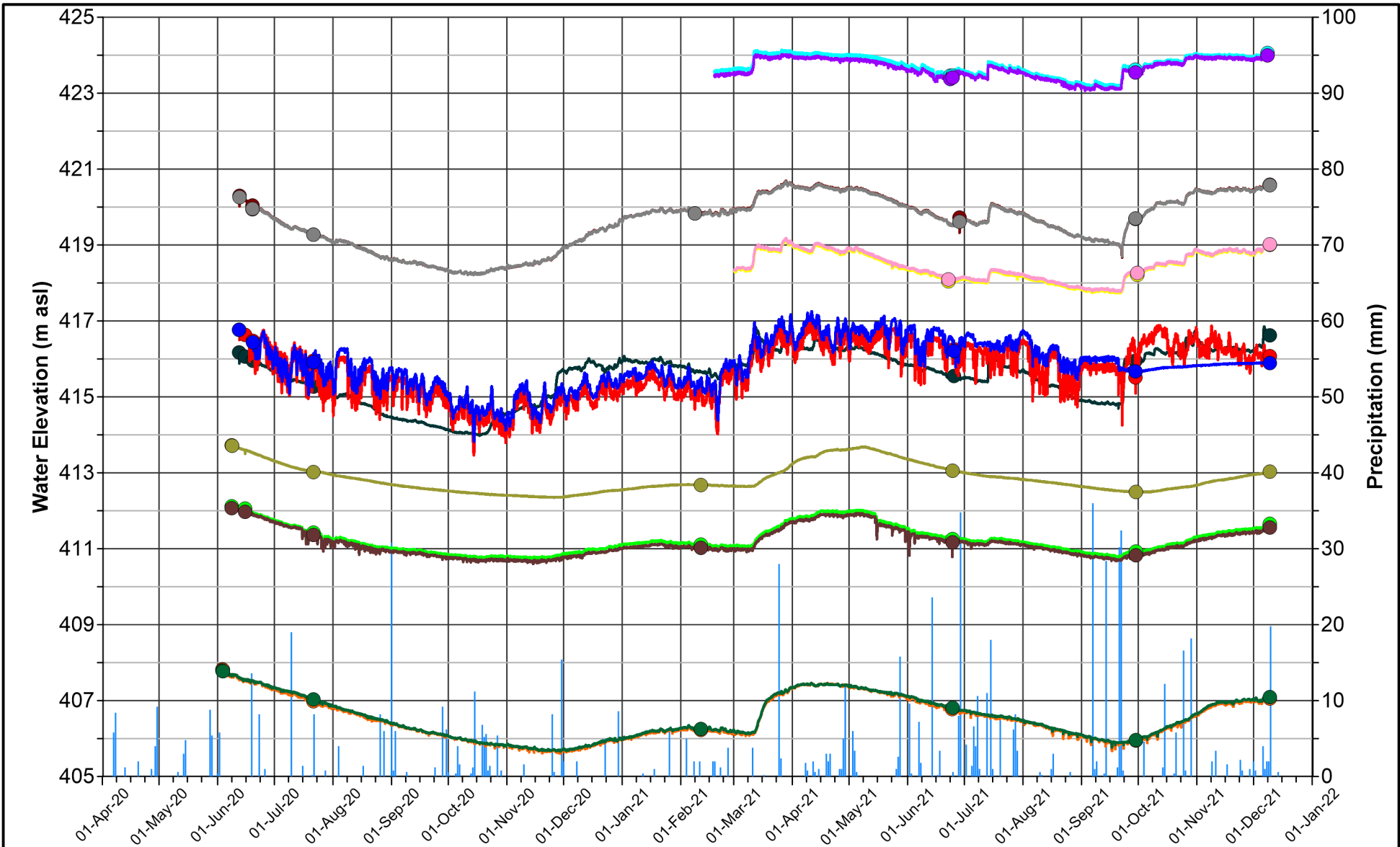
TITLE **GROUNDWATER MONITORING HYDROGRAPHS  
 CENTRAL AREA**

PROJECT NO.  
 19129150

REV  
 A

FIGURE  
 E4





- MW20-12A    — MW20-15C
- MW20-12B    — MW20-16A
- MW20-13A    — MW20-16B
- MW20-13B    — MW20-27A
- MW20-13C    — MW20-27B
- MW20-15A    — MW20-28A
- MW20-15B    — MW20-28B

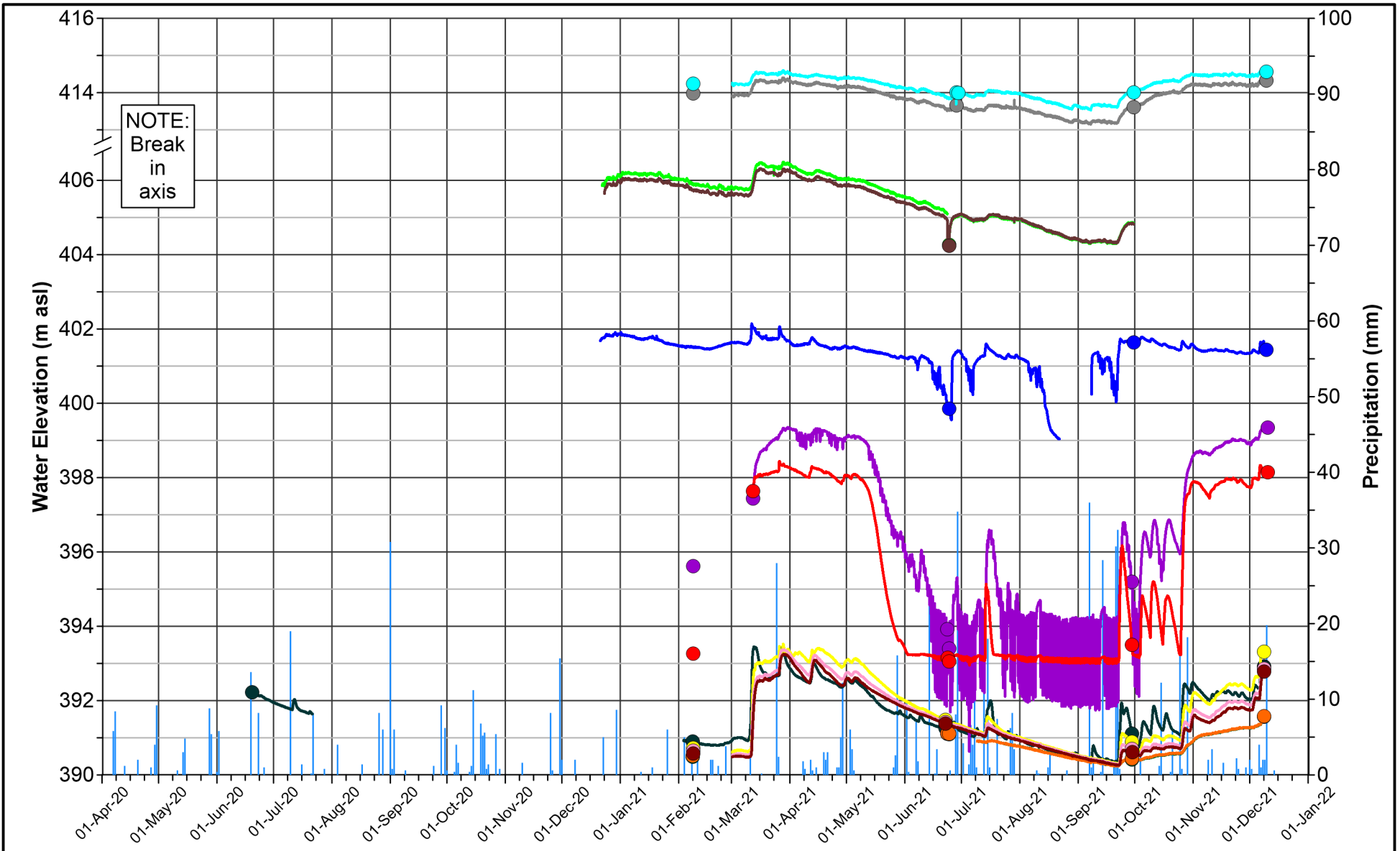


DATE	November 2022
DESIGN	VRP
REVIEW	GRP
APPROVED	GWS

PROJECT **CBM CALEDON QUARRY**

TITLE **GROUNDWATER MONITORING HYDROGRAPHS NORTHERN AREA**

PROJECT NO. 19129150	REV A	FIGURE E5
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- MW20-18
- MW20-19A
- MW20-19B
- MW20-20A
- MW20-20B
- MW20-20C
- MW20-21A
- MW20-21B
- MW20-22A
- MW20-22B
- MW20-23A
- MW20-23B
- MW20-23C



DATE November 2022  
 DESIGN VRP  
 REVIEW GRP  
 APPROVED GWS

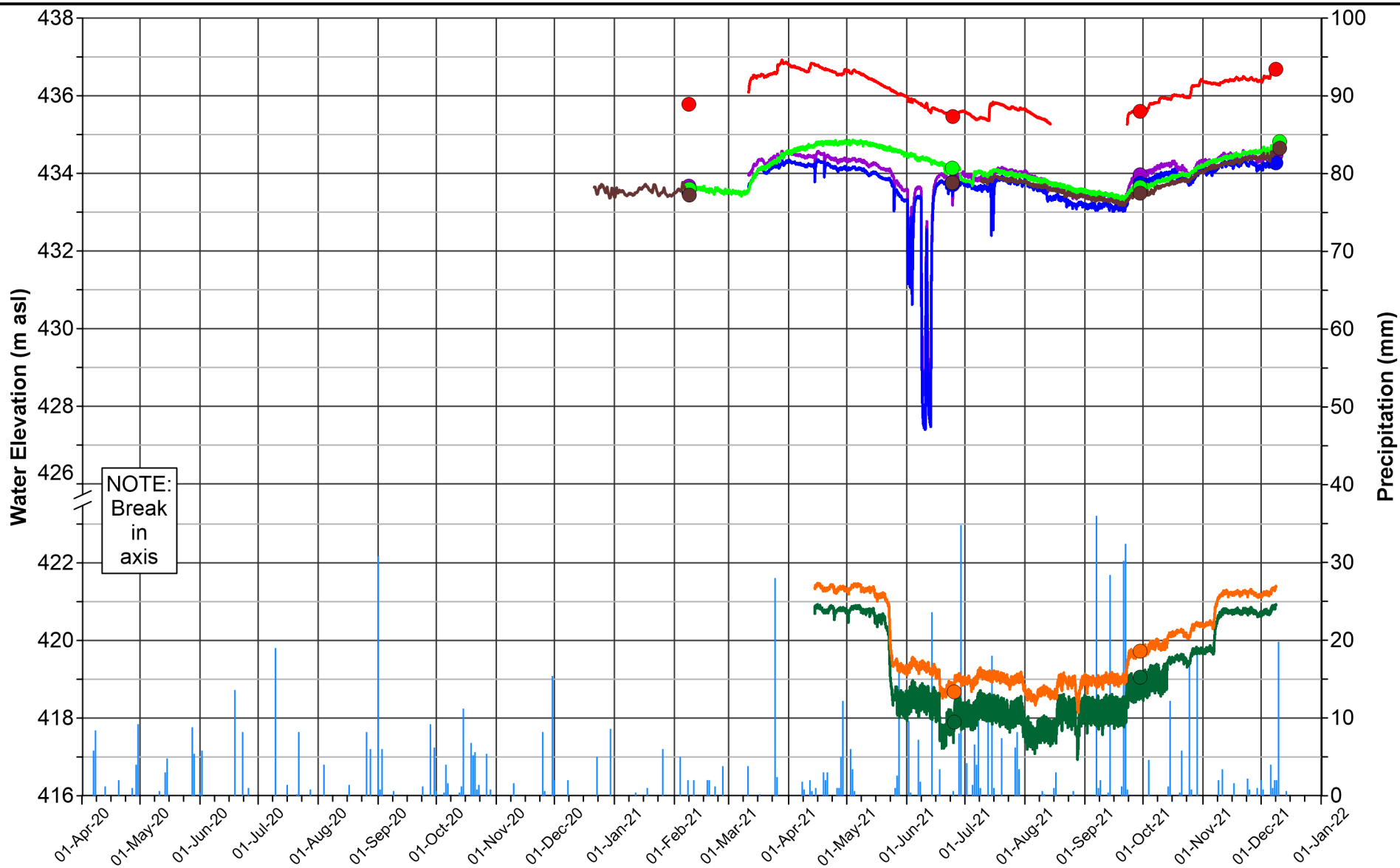
PROJECT **CBM CALEDON QUARRY**

TITLE **GROUNDWATER MONITORING HYDROGRAPHS WESTERN AREA**

PROJECT NO. 19129150

REV A

FIGURE E6



PROJECT  
**CBM CALEDON QUARRY**

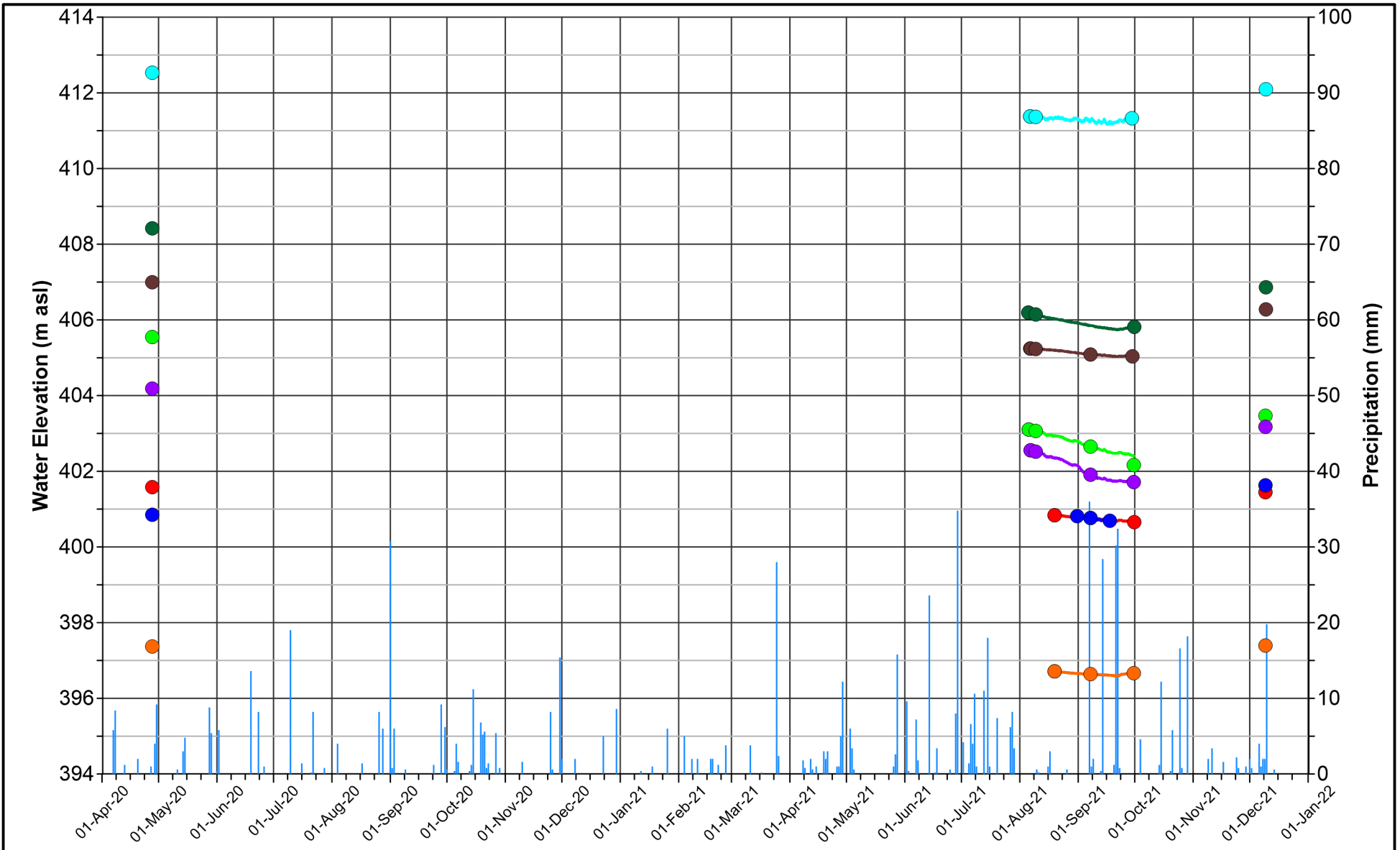
- MW20-24A    — MW20-26A
- MW20-24B    — MW20-26B
- MW20-25A    — MW20-26C
- MW20-25B



DATE    November 2022  
 DESIGN    VRP  
 REVIEW    GRP  
 APPROVED    GWS

TITLE    **GROUNDWATER MONITORING HYDROGRAPHS  
 NORTHWESTERN AREA**

PROJECT NO.    19129150    REV    A    FIGURE    E7



PROJECT **CBM CALEDON QUARRY**

- JHL-BH1    — JHL-BH16
- JHL-BH2    — JHL-BH17
- JHL-BH3    — JHL-BH18
- JHL-BH7    — JHL-BH19

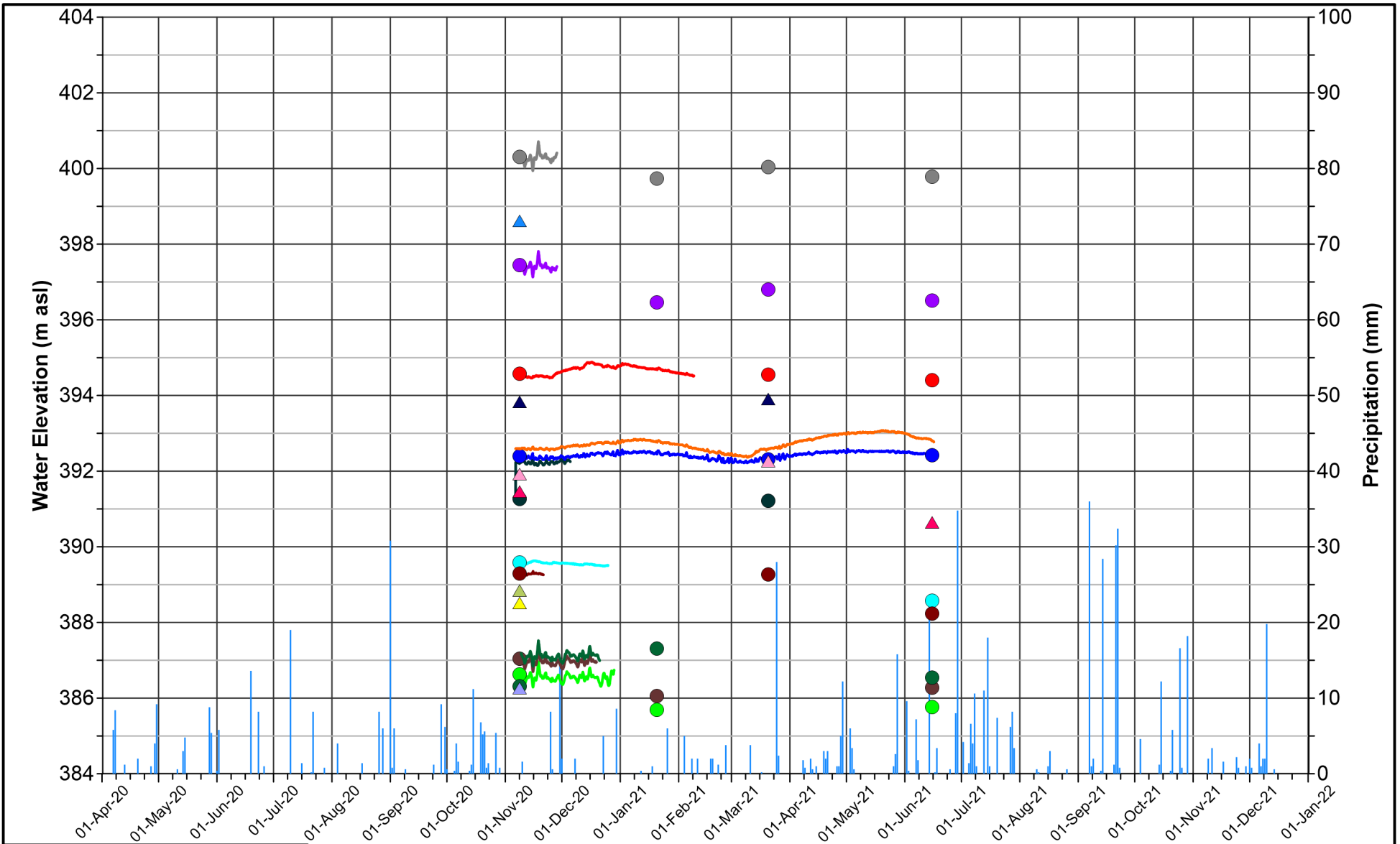


DATE November 2022  
 DESIGN VRP  
 REVIEW GRP  
 APPROVED GWS

TITLE **GROUNDWATER MONITORING HYDROGRAPHS  
 JAGGER HIMES INVESTIGATION WELLS**

PROJECT NO. 19129150      REV A      FIGURE E8



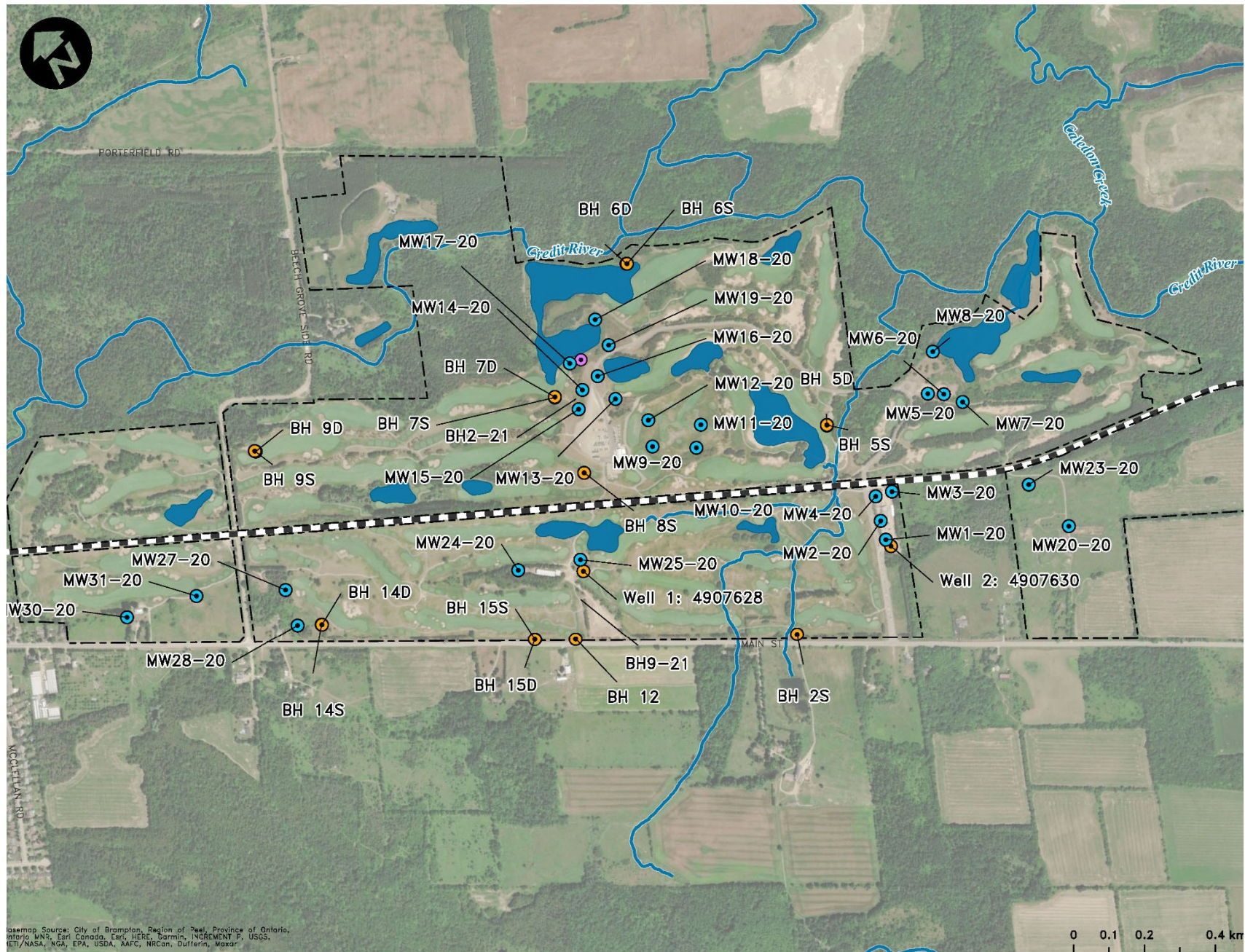


- |               |               |
|---------------|---------------|
| — OVG-MW5-20  | — OVG-MW24-20 |
| — OVG-MW6-20  | — OVG-MW25-20 |
| — OVG-MW7-20  | ▲ OVG-MW9-20  |
| — OVG-MW8-20  | ▲ OVG-MW10-20 |
| — OVG-MW13-20 | ▲ OVG-MW11-20 |
| — OVG-MW14-20 | ▲ OVG-MW12-20 |
| — OVG-MW16-20 | ▲ OVG-MW19-20 |
| — OVG-MW17-20 | ▲ OVG-MW20-20 |
| — OVG-MW18-20 | ▲ OVG-MW23-20 |



DATE	November 2022
DESIGN	VRP
REVIEW	GRP
APPROVED	GWS

PROJECT		
<b>CBM CALEDON QUARRY</b>		
TITLE		
<b>GROUNDWATER MONITORING HYDROGRAPHS OSPREY VALLEY GOLF MONITORING WELLS</b>		
PROJECT NO.	REV	FIGURE
19129150	A	E9



Map Source: City of Brampton, Region of Peel, Province of Ontario, Ontario MNR, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, ETI/NASA, NGA, EPA, USDA, AAFIC, NRCAN, DeLorme, Maxar

Note: figure body from Crozier Consulting Engineers (0129-5521, dated 2021-08-26) as communicated from Osprey Valley Golf Course

ST.MARY'S CEMENT INC. (CANADA)

CALEDON QUARRY



CLIENT	PROJECT
CONSULTANT	TITLE
YYYY-MM-DD	2022-03-15
PREPARED	PGM
DESIGN	PGM
REVIEW	###
APPROVED	

OSPREY VALLEY GOLF COURSE MONITORING WELL LOCATION PLAN

PROJECT NO: 19129150

PHASE: 2300

REV: A

FIGURE: E10

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4

**APPENDIX F**

# Packer Hydraulic Response Tests



**Table F-1. Borehole Hydraulic (Packer) Testing Results  
Caledon Quarry**

BH ID	Figure Number	Top of Test Interval (mbgs)	Bottom of Test Interval (mbgs)	Interval (m)	Formation	Borehole Radius (m)	Test Tubing Radius (m)	Wellbore Storage Coefficient (m <sup>3</sup> /Pa)	Static Storativity (-)	Static Pressure (kPa)	Slug Injection	Constant Rate Injection		Constant Rate	Selected transmissivity			
											Conductivity (m/s)	Q (L/min)	Conductivity (m/s)	Conductivity (m/s)	Selected Phase	Conductivity (m/s)	Flow Model	Comments (5)
BH20-01	F-4	4.3	11.0	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	74.5	9E-06	8	1E-05	1E-05	CRI	1E-05	Homogenous	
BH20-01	F-5	11.0	17.7	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	140.1	2E-06	(3)			SIR	2E-06	Homogenous	
BH20-01	F-6	19.5	22.1	2.6	Cabot Head Fm.	0.048	0.039	4.87E-07	5E-06	159.7	5E-08	(3)			SIR	5E-08	Homogenous	Packer bypass
BH20-02	F-7	6.1	12.7	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	83.1	2E-05	19	2E-05	2E-05	CRIR	2E-05	Homogenous	
BH20-02	F-8	12.9	19.6	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	121.0	1E-05	25	3E-05	3E-05	CRI	3E-05	Homogenous	
BH20-03	F-9	4.9	11.6	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	16.8	(2)	61	1E-04	8E-05	CRI	1E-04	Homogenous	Static water level in test interval
BH20-03	F-10	10.1	16.8	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	78.7	1E-05	18	1E-05	1E-05	CRI	1E-05	Homogenous	
BH20-04	F-11	10.7	14.3	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	15.0	(2)	51	2E-02	3E-02	CRI	2E-02	Homogenous	Static water level in test interval
BH20-04	F-12	13.5	17.0	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	41.6	1E-05	52	4E-04	4E-04	CRI	4E-04	Homogenous	
BH20-05	F-13	7.8	12.8	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	22.1	(2)	64	3E-03	4E-02	CRI	3E-03	Homogenous	
BH20-06	F-14	10.7	14.3	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	105.0	3E-07	(3)			SIR	3E-07	Homogenous	
BH20-07	F-15	4.6	11.3	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	88.2	7E-07	(3)			SIR	7E-07	Homogenous	
BH20-07	F-16	11.1	16.1	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	136.7	2E-06	2	2E-06	2E-06	CRI	2E-06	Homogenous	
BH20-08	F-17	7.0	10.5	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	28.0	2E-05	58	1E-04	9E-05	SIR	2E-05	Homogenous	
BH20-08	F-18	10.5	15.6	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	74.2	6E-06	6	6E-06	6E-06	SIR	6E-06	Homogenous	
BH20-09	F-19	5.3	10.4	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	40.4	2E-05	13	8E-06	1E-05	CRI	1E-05	Homogenous	
BH20-09	F-20	9.2	14.2	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	77.7	1E-05	16	2E-05	3E-05	CRIR	3E-05	Homogenous	
BH20-10	F-21	10.8	14.3	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	73.1	2E-06	(3)			SIR	2E-06	Homogenous	
BH20-10	F-22	13.3	16.9	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	164.5	2E-06	(3)			SIR	2E-06	Homogenous	
BH20-11	F-23	4.7	8.2	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	33.0	1E-04	58	3E-03	3E-03	CRI	3E-03	Homogenous	
BH20-12	F-24	14.1	19.2	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	102.7	3E-08	(3)			SIR	3E-08	Homogenous	
BH20-13	F-25	5.9	22.8	16.9	Gasport Fm.	0.048	0.067	1.44E-06	3E-05	143.7	9E-05	53	2E-04	2E-04	CRI	2E-04	Homogenous	Borehole integrity
BH20-14	F-26	10.8	19.1	8.2	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	100.3	8E-07	(3)			SIR	8E-07	Homogenous	
BH20-14	F-27	19.1	27.3	8.2	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	180.7	2E-06	1	9E-07	9E-07	SIR	2E-06	Homogenous	
BH20-15	F-28	17.2	23.9	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	193.5	1E-05	29	6E-06	6E-06	CRI	6E-06	Two shell composit model	
BH20-15	F-29	23.9	32.1	8.2	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	269.4	4E-06	31	2E-06	2E-06	CRI	2E-06	Two shell composit model	
BH20-16	F-30	15.5	23.7	8.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	199.7	2E-08	(3)			SIR	2E-08	Homogenous	Packer bypass
BH20-16	F-31	23.5	31.6	8.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	265.7	1E-06	(3)			SIR	1E-06	Homogenous with positive skin	
BH20-17	F-32	7.8	17.4	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	99.3	9E-06	21	7E-06	7E-06	CRIR	7E-06	Homogenous	
BH20-17	F-33	16.6	26.3	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	183.7	9E-06	30	1E-05	9E-06	CRIR	9E-06	Homogenous	Packer bypass
BH20-18	F-34	12.2	20.3	8.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	74.7	(4)	48	2E-04	6E-04	CRI	2E-04	Homogenous with negative skin	Small test pressure differential
BH20-18	F-35	20.6	28.7	8.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	169.2	5E-06	11	5E-06	4E-06	CRIR	4E-06	Homogenous	
BH20-19	F-36	5.0	13.1	8.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	69.7	3E-05	33	9E-05	8E-05	CRI	9E-05	Homogenous	
BH20-19	F-37	12.5	22.1	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	160.2	1E-05	22	2E-05	2E-05	CRIR	2E-05	Homogenous	
BH20-20	F-38	16.9	28.2	11.3	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	145.3	2E-07	(3)			SIR	2E-07	Homogenous	
BH20-20	F-39	27.3	38.5	11.3	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	246.2	2E-06	13	4E-06	4E-06	CRIR	4E-06	Homogenous	
BH20-21	F-40	8.3	19.5	11.3	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	125.9	9E-06	24	1E-05	1E-05	CRIR	1E-05	Two shell composit model	
BH20-21	F-41	19.5	30.8	11.3	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	231.7	4E-06	33	9E-07	9E-07	CRIR	9E-07	Two shell composit model	
BH20-22	F-42	7.6	17.4	9.8	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	130.9	2E-06	3	3E-06	2E-06	CRIR	2E-06	Homogenous	
BH20-22	F-43	16.4	26.2	9.8	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	216.0	4E-06	5	4E-06	4E-06	CRIR	4E-06	Homogenous	
BH20-23	F-44	16.9	25.1	8.2	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	207.0	4E-06	4	4E-06	4E-06	CRI	4E-06	Homogenous	
BH20-23	F-45	25.1	34.9	9.8	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	302.0	2E-06	3	1E-06	1E-06	CRIR	1E-06	Homogenous	
BH20-24	F-46	14.0	17.7	3.7	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	49.3	1E-04	40	2E-04	2E-04	CRI	2E-04	Homogenous	Static water level in packer mandrel
BH20-24	F-47	16.7	20.3	3.7	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	75.0	1E-04	32	2E-04	2E-04	CRI	2E-04	Homogenous	
BH20-25	F-48	7.9	13.1	5.2	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	75.6	4E-07	(3)			SIR	4E-07	Homogenous	
BH20-25	F-49	12.9	19.6	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	138.4	5E-06	7	4E-06	4E-06	CRI	4E-06	Homogenous with negative skin	



**Table F-1. Borehole Hydraulic (Packer) Testing Results  
Caledon Quarry**

BH ID	Figure Number	Top of Test Interval (mbgs)	Bottom of Test Interval (mbgs)	Interval (m)	Formation	Borehole Radius (m)	Test Tubing Radius (m)	Wellbore Storage Coefficient (m3/Pa)	Static Storativity (-)	Static Pressure (kPa)	Slug Injection	Constant Rate Injection		Constant Rate	Selected transmissivity					
											Conductivity (m/s)	Q (L/min)	Conductivity (m/s)	Conductivity (m/s)	Selected Phase	Conductivity (m/s)	Flow Model	Comments (5)		
BH20-26	F-50	7.7	14.4	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	77.8	1E-07	(3)		SIR	1E-07	Homogenous				
BH20-26	F-51	13.6	20.3	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	132.4	6E-06	4	7E-06	2E-05	SIR	6E-06	Homogenous			
BH20-27	F-52	4.4	14.2	9.8	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	85.7	2E-06	5	2E-06	2E-06	CRI	2E-06	Homogenous			
BH20-27	F-53	13.8	23.5	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	169.1	3E-06	39	4E-06	4E-06	CRIR	4E-06	Two shell composit model			
MW20-01	F-54	10.9	14.5	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	113.1	5E+00	41	3E-03	2E-03	CRI	3E-03	Homogenous	Small test pressure differential		
MW20-01	F-55	14.9	19.4	4.5	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	9E-06	130.8	3E-06	(3)		SIR	2E-06	Homogenous				
MW20-02		Insufficient rock to test																		
MW20-03		Insufficient rock to test																		
MW20-04		Insufficient rock to test																		
MW20-05	F-56	4.7	8.3	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	25.7	(2)	3	4E-06	4E-06	CRI	4E-06	Homogenous			
MW20-05	F-57	6.9	10.5	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	49.2	8E-06	6	7E-06	7E-06	CRI	7E-06	Homogenous			
MW20-05	F-58	10.6	14.8	4.2	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	8E-06	87.9	5E-07	(3)		SIR	5E-07	Homogenous	Pressure oscillation			
MW20-06	F-59	4.3	7.9	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	41.4	2E-05	12	3E-05	4E-05	CRI	3E-05	Homogenous			
MW20-06	F-60	7.2	10.8	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	68.3	2E-06	(3)		SIR	2E-06	Homogenous				
MW20-06	F-61	10.9	16.0	5.1	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	1E-05	115.8	2E-08	(3)		SIR	2E-08	Homogenous				
MW20-07	F-62	4.6	8.1	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	67.0	5E-07	(3)		SIR	5E-07	Homogenous with negative skin				
MW20-07	F-63	8.0	13.1	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	112.1	2E-06	2	4E-06	4E-06	CRIR	4E-06	Homogenous			
MW20-07	F-64	13.2	16.8	3.6	Shaley Dolostone	0.048	0.039	4.87E-07	7E-06	150.1	3E-07	(3)		SIR	3E-07	Homogenous				
MW20-08	F-65	4.1	9.2	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	71.3	2E-04	33	2E-03	1E-03	CRI	2E-03	Homogenous	Small test pressure differential		
MW20-08	F-66	8.4	15.1	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	127.7	2E-05	19	3E-05	4E-05	SIR	2E-05	Homogenous with positive skin			
MW20-08	F-67	15.2	18.6	3.4	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	7E-06	164.4	1E-06	(3)		SIR	1E-06	Homogenous				
MW20-09		Insufficient rock to test																		
MW20-10	F-68	13.9	17.4	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	71.9	1E-04	43	4E-04	3E-04	CRIR	3E-04	Homogenous			
MW20-10	F-69	16.9	21.2	4.3	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	8E-06	100.7	6E-05	36	2E-04	2E-04	CRI	2E-04	Homogenous with positive skin			
MW20-11	F-70	4.8	10.0	5.2	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	61.8	2E-05	15	2E-05	2E-05	SIR	2E-05	Homogenous			
MW20-11	F-71	9.7	16.4	6.7	Gasport Fm.	0.048	0.039	1.40E-06	1E-05	125.0	4E-06	6	5E-06	5E-06	SIR	4E-06	Homogenous			
MW20-11	F-72	16.4	19.4	3.0	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	6E-06	159.7	1E-06	(3)		SIR	1E-06	Homogenous				
MW20-12	F-73	7.5	14.2	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	90.1	1E-05	3	2E-06	8E-06	SIR	1E-05	Homogenous			
MW20-12	F-74	14.2	19.3	5.1	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	140.8	1E-05	11	1E-05	1E-05	SIR	1E-05	Homogenous			
MW20-12	F-75	19.8	22.7	2.9	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	6E-06	179.9	2E-07	(3)		SIR	2E-07	Homogenous				
MW20-13	F-76	17.0	20.6	3.6	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	166.5	3E-06	2	7E-06	2E-06	SIR	3E-06	Homogenous with negative skin			
MW20-13	F-77	20.2	23.9	3.7	Gasport Fm.	0.048	0.039	4.87E-07	7E-06	198.2	4E-06	3	7E-06	2E-06	SIR	4E-06	Homogenous with negative skin			
MW20-13	F-78	23.9	28.2	4.3	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	8E-06	229.7	3E-06	2	3E-06	2E-06	SIR	3E-06	Homogenous	Packer bypass		
MW20-14	F-79	4.6	14.4	9.8	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	83.6	7E-05	43	3E-05	3E-05	CRIR	3E-05	Homogenous			
MW20-14	F-80	14.2	22.4	8.2	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	133.0	2E-05	40	6E-05	2E-05	CRI	6E-05	Homogenous			
MW20-14	F-81	22.4	26.4	4.0	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	8E-06	167.6	6E-05	23	5E-05	6E-05	SIR	6E-05	Homogenous			
MW20-15	F-82	14.3	24.1	9.8	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	221.3	2E-06	(3)		SIR	2E-06	Homogenous				
MW20-15	F-83	24.1	33.8	9.8	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	314.9	5E-06	9	1E-05	1E-05	CRI	1E-05	Homogenous with negative skin			

**Table F-1. Borehole Hydraulic (Packer) Testing Results  
Caledon Quarry**

BH ID	Figure Number	Top of Test Interval (mbgs)	Bottom of Test Interval (mbgs)	Interval (m)	Formation	Borehole Radius (m)	Test Tubing Radius (m)	Wellbore Storage Coefficient (m <sup>3</sup> /Pa)	Static Storativity (-)	Static Pressure (kPa)	Slug Injection	Constant Rate Injection		Constant Rate	Selected transmissivity			
											Conductivity (m/s)	Q (L/min)	Conductivity (m/s)	Conductivity (m/s)	Selected Phase	Conductivity (m/s)	Flow Model	Comments (5)
MW20-15	F-84	33.8	37.2	3.3	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	7E-06	349.5	2E-08	(3)		SIR	2E-08	Homogenous		
MW20-16	F-85	16.9	26.5	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	238.3	9E-08	(3)		SIR	9E-08	Homogenous		
MW20-16	F-86	25.8	35.4	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	324.1	2E-05	13	1E-05	1E-05	CRI	1E-05	Homogenous with positive skin	
MW20-16	F-87	35.5	39.8	4.3	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	8E-06	358.9	2E-06	(3)		SIR	2E-06	Homogenous		
MW20-17	F-88	5.0	11.7	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	64.5	2E-06	2	2E-06	2E-06	CRI	2E-06	Homogenous	
MW20-17	F-89	11.7	18.4	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	127.1	1E-05	17	8E-06	7E-06	CRI	8E-06	Homogenous with negative skin	
MW20-17	F-90	18.4	27.5	9.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	162.9	1E-05	25	3E-06	3E-06	CRIR	3E-06	Two shell composit model	
MW20-18	F-91	14.0	28.2	14.1	Gasport Fm.	0.048	0.039	4.87E-07	3E-05	43.7	2E-05	44	2E-04	2E-04	CRI	2E-04	Homogenous	Borehole integrity, Small test pressure differential
MW20-19	F-92	8.0	16.2	8.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	81.7	(2)	66	8E-05	7E-05	CRI	8E-05	Homogenous with negative skin	Static water level in packer mandrel
MW20-19	F-93	15.4	22.1	6.7	Gasport Fm.	0.048	0.039	4.87E-07	1E-05	149.8	2E-05	77	2E-04	1E-04	CRI	2E-04	Homogenous	
MW20-19	F-94	22.1	27.4	5.3	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	1E-05	171.2	6E-06	6	5E-06	5E-06	SIR	6E-06	Homogenous	
MW20-20	F-95	7.8	17.5	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	186.7	2E-05	7	3E-05	2E-05	SIR	2E-05	Homogenous	Transient formation pressure
MW20-20	F-96	17.0	25.2	8.1	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	254.2	9E-06	10	2E-05	2E-05	CRI	2E-05	Homogenous	Transient formation pressure
MW20-20	F-97	25.2	28.0	2.8	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	6E-06	259.4	5E-09	(3)		SIR	5E-09	Homogenous		
MW20-21	F-98	16.9	26.6	9.7	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	230.7	3E-06	(3)		SIR	3E-06	Homogenous		
MW20-21	F-99	25.6	36.7	11.2	Gasport Fm.	0.048	0.039	4.87E-07	2E-05	329.1	1E-05	81	3E-04	2E-04	CRI	3E-04	Homogenous	
MW20-21	F-100	36.7	39.7	3.0	Shaley Dolostone/ Cabot Head Fm.	0.048	0.039	4.87E-07	6E-06	363.4	4E-07	(3)		SIR	4E-07	Homogenous		

Note:

- 1) Results calculated as transmissivity, and conductivity calculated as  $k = T/\text{interval length}$ .
- 2) Slug injection recovery occurs in multiple tubing diameters. Phase not analyzed.
- 3) Due to slow response of formation, only a slug injection was prepared.
- 4) Slug injection recovery was too rapid for analysis.
- 5) Refer to Section 7.1 of accompanying report for discussion of comments.

## Test Specific Notes to Accompany Table F-1

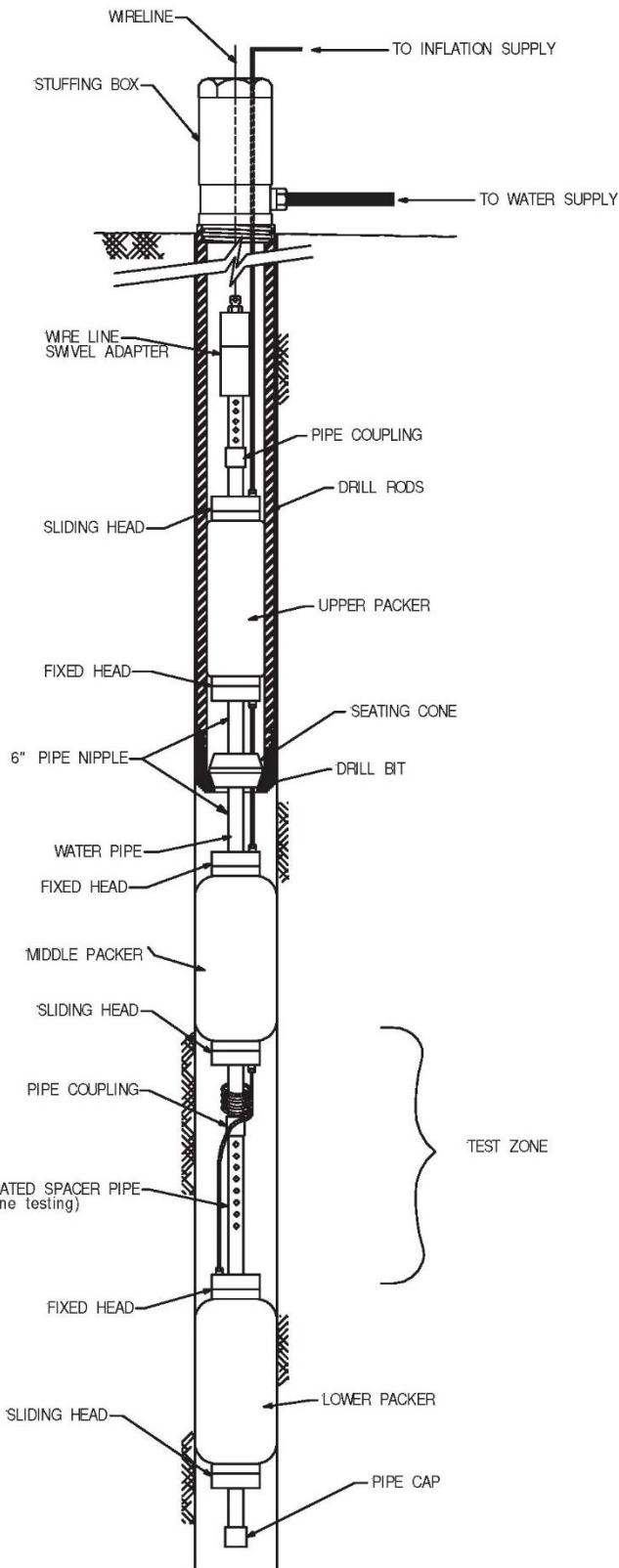
The packer testing report subsection provides a generalized description of field methods, analysis, and the results of the borehole hydraulic testing program. However, specific field conditions impacted the data collection and analysis methods for a number of tests, as commented in Table F-1, including:

- Small test pressure differential: Some intervals had hydraulic conductivity approaching the upper limit of the tool. To create a test pressure differential, the ability of the pumps and tubing to convey water to the interval must be relatively large to compared to the ability of the interval to conduct the water into the formation. In the following cases, only a small test pressure differential was achieved using the maximum injection rate of the tool: MW20-01 upper (0.1 m), MW20-08 upper (0.1 m), MW20-18 (0.4 m), BH20-18 upper (0.3 m). In these cases, the hydraulic conductivity can only be estimated to within an order of magnitude and should be considered a lower bound for the actual interval hydraulic conductivity.
- Static water level in test interval or packer mandrel: In cases where the static water level was in the test interval or in the packer mandrel, the testing method was modified to exclude the falling head test which would not yield valuable information and a CRI test was performed as is typically described in Section 5. Tests BH20-03 upper (WL in interval), BH20-04 upper (WL in interval), BH20-24 (water level in packer mandrel), and MW20-19 upper (water level in packer mandrel), followed this methodology. Tests with this additional source of uncertainty should only be relied upon as an order of magnitude estimate of transmissivity.
- Packer bypass: During the packer seating test when water was added (typically 5 m) to the annular space above the upper packer, a pressure response was observed in the interval indicating bypass of the upper packer for the following tests: BH20-01 lower (0.3m), BH20-16 upper (0.3m), BH20-17 lower (0.3m), and MW20-13 lower (0.2m response). The bypass of the upper packer for these tests was likely occurring through fractures in the formation. In these cases, the estimated transmissivity should be considered an upper limit.
- Borehole integrity: In two cases, borehole integrity limited the depth to which the packer testing tool could be deployed. In BH20-13 a single open hole test was performed to test the bedrock. In this case the interval length was considered to be from the bottom of casing to the end of the borehole and the casing was used as the test tubing. Most of the length of borehole MW20-18 was inaccessible due borehole instability, so a single packer tool configuration was implemented to test the borehole.
- Pressure oscillation: While testing MW20-05 lower portion, a small pressure oscillation was observed in the test interval. This may have been the result of a small nitrogen leak at the top of the test interval, resulting in small pressure oscillations as the nitrogen bubbled up the test tubing. A portion of the test interval may have experienced variable saturation and the nitrogen bubbles may have a small impact on WBS; therefore, the accuracy of the bulk transmissivity estimate of the interval should be considered an order of magnitude.
- Transient formation pressure: While testing the upper and middle portions of MW20-20, changes in the static interval pressure were noted during the test. In the upper interval (upper Gasport Formation) the static level increased approximately 1 m during the test and the middle interval (lower Gasport Formation) fell by approximately 0.3 m.

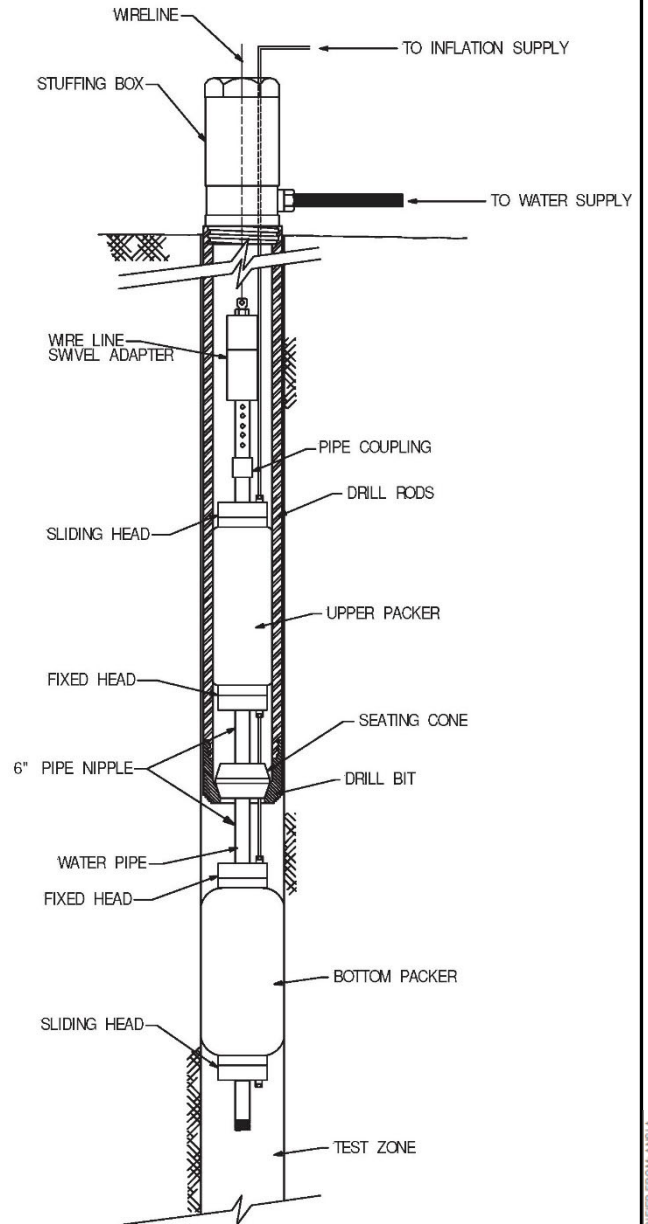
- Variable injection rate: Some CRI tests experienced variations of the pumping rate during the test, either as a result of operational decisions to avoid the water level exceeding the height of the test tubing or due to variation of the pump performance. The average pump rate and late time pressure data were applied for the analysis. In tests where the injection rate varied significantly during the CRI, SIR or CRIR phases were selected for transmissivity analysis.



**Figure 3a) Typical Straddle Packer Configuration Schematic Diagram**



**Figure 3b) Typical Single Packer Configuration Schematic Diagram**



(RST Instruments Inc., 2019)

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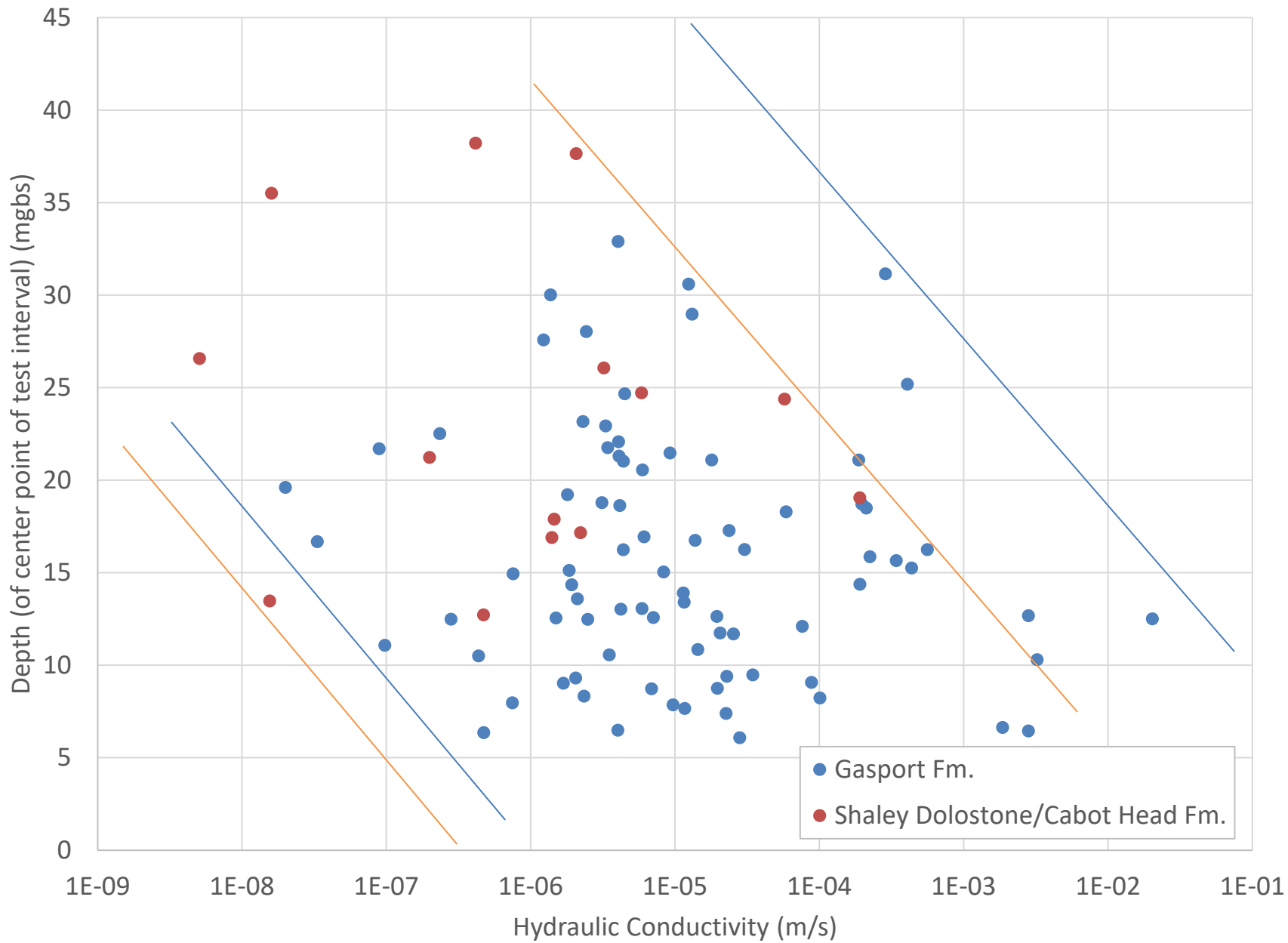
PROJECT  
**CALEDON QUARRY**

CONSULTANT	YYYY-MM-DD	2022-03-14
PREPARED	PGM	
DESIGN	ML	
REVIEW	###	
APPROVED		

TITLE	<b>TYPICAL PACKER TESTING TOOL SCHEMATIC DIAGRAMS</b>	
PROJECT No.	PHASE	Rev.
19129150	2300	A
		FIGURE
		<b>F-1</b>



1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



ST.MARY'S CEMENT INC. (CANADA)

CALEDON PIT AND QUARRY



CLIENT: ST.MARY'S CEMENT INC. (CANADA)  
 PROJECT: CALEDON PIT AND QUARRY  
 PREPARED: 2022-03-14  
 DESIGN: PGM  
 REVIEW: ML  
 APPROVED: GWS

TITLE: PACKER TEST HYDRAULIC CONDUCTIVITY VERSUS DEPTH

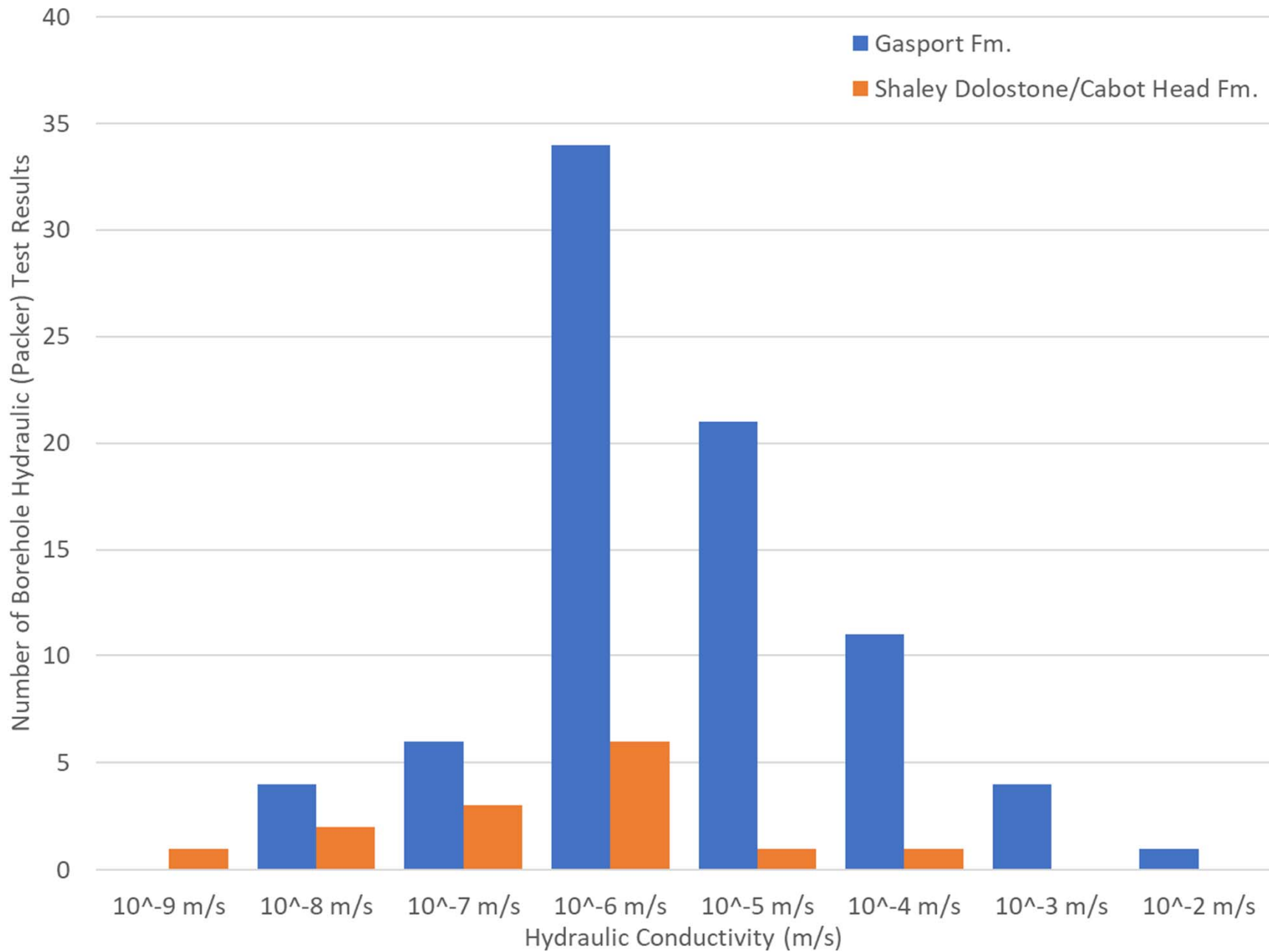
PROJECT No: 19129150

PHASE: 2300

Rev: A

FIGURE: F-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4



ST.MARY'S CEMENT INC. (CANADA)

CALEDON PIT AND QUARRY

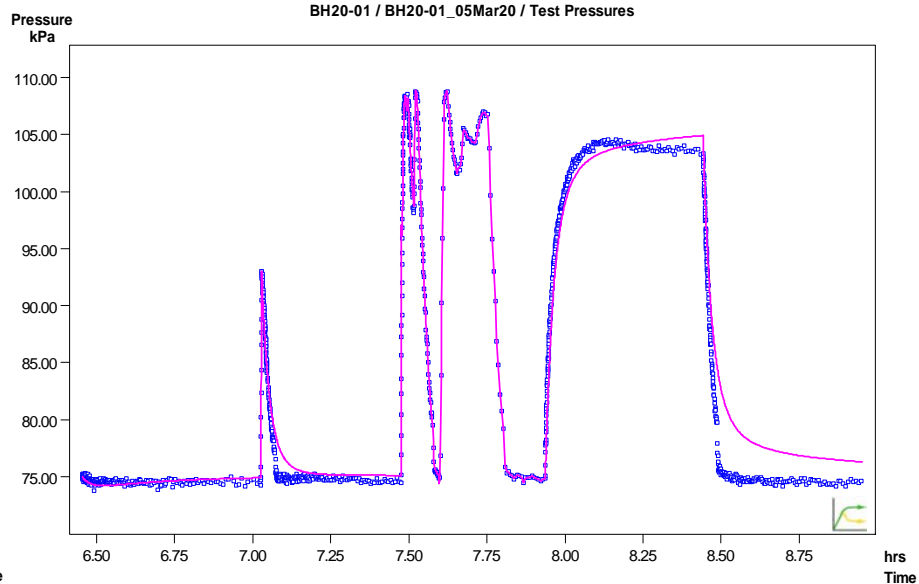
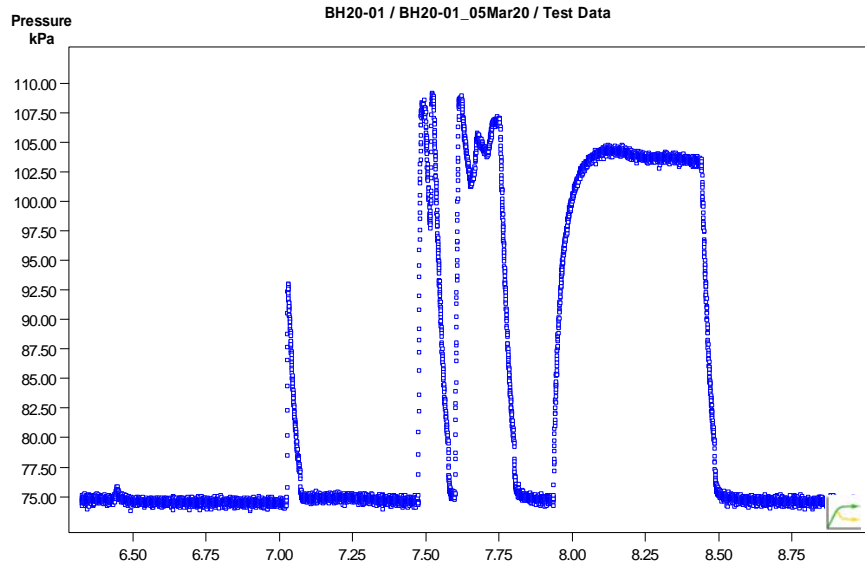


CLIENT: ST.MARY'S CEMENT INC. (CANADA)  
 PROJECT: CALEDON PIT AND QUARRY  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: GWS  
 APPROVED: GWS

PACKER TEST HYDRAULIC CONDUCTIVITY HISTOGRAM

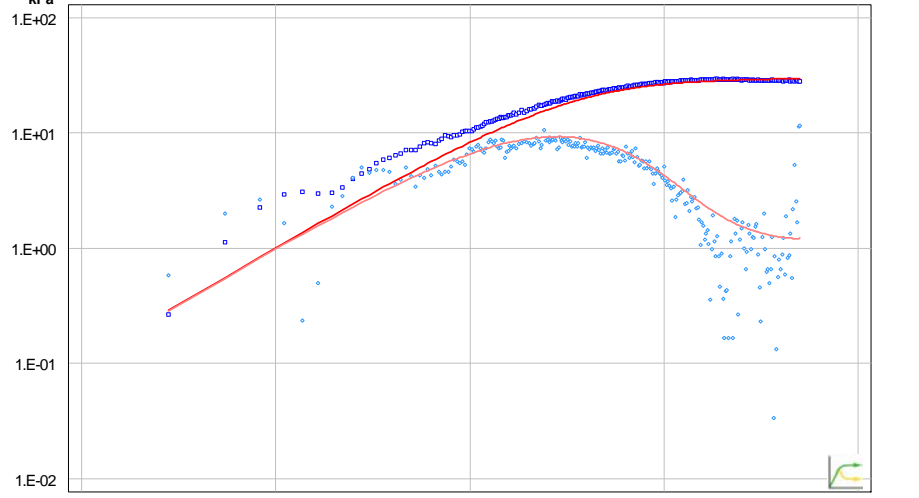
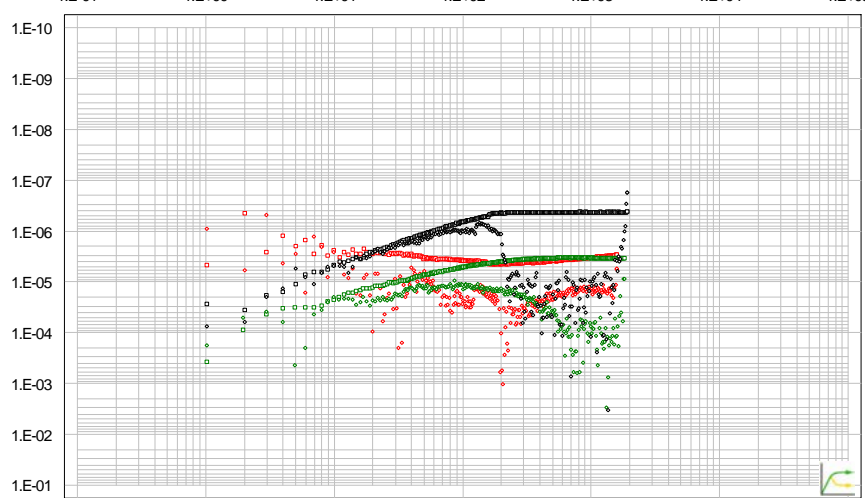
PROJECT NO: 19129150 PHASE: 2300 Rev: A FIGURE: F-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4 TO 11x17 INCHES



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Transm. **BH20-01 / BH20-01\_05Mar20 / LogLog Diagnosis - CRI**

- Pressure Observation SI
- Pressure Observation CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative SI
- ◆ Pressure Derivative CRI
- ◆ Pressure Derivative CRIR

Time **BH20-01 / BH20-01\_05Mar20 / CRI: LogLog Plot**

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)** PROJECT **CALEDON PIT / QUARRY**

CONSULTANT **GOLDER MEMBER OF WSP**

YYYY-MM-DD	2022-02-14
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

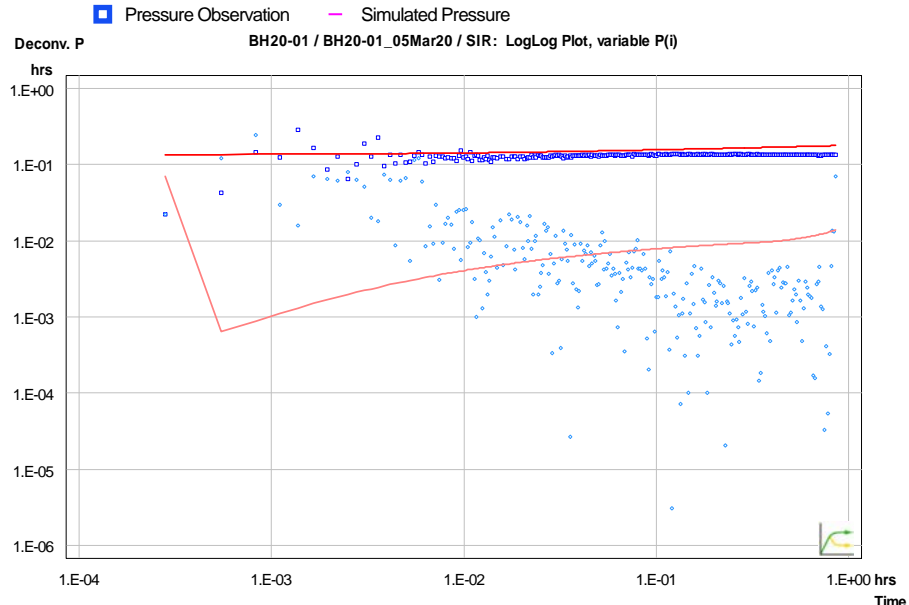
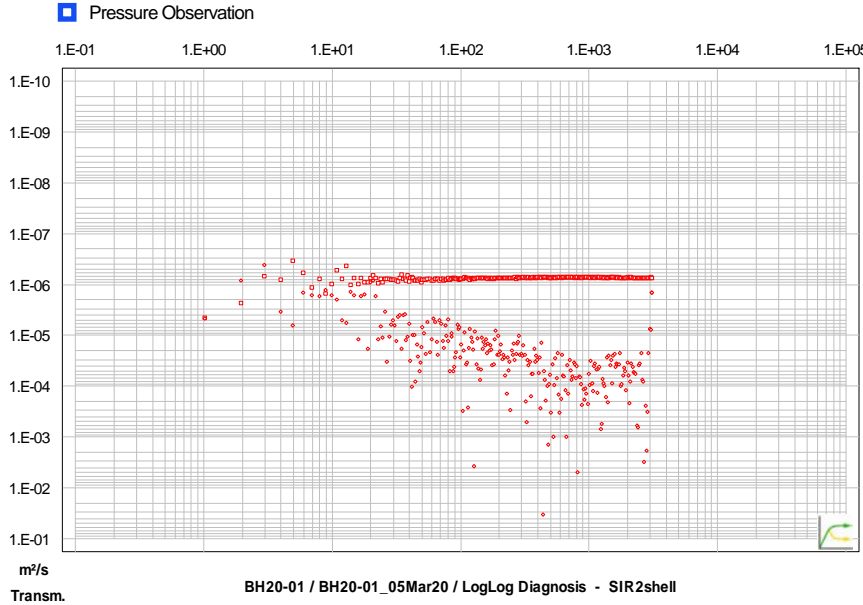
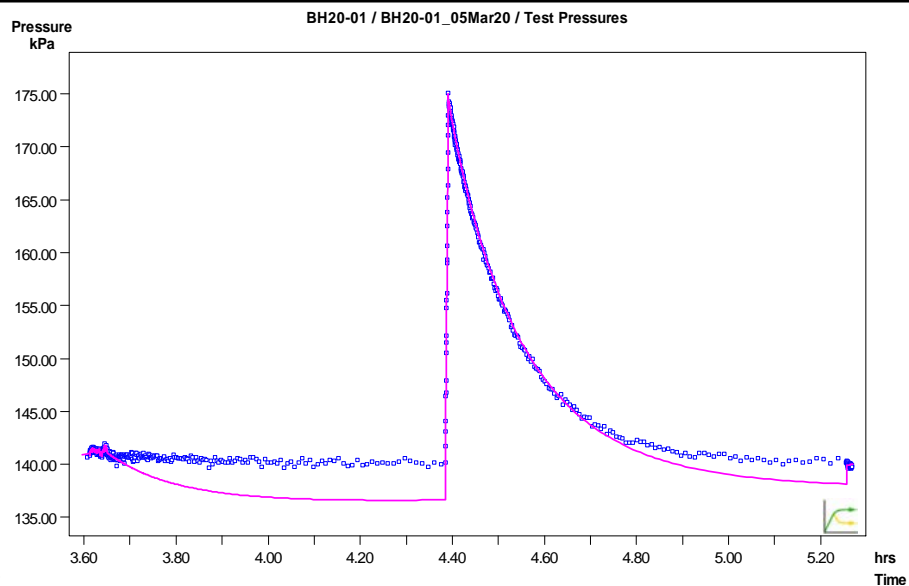
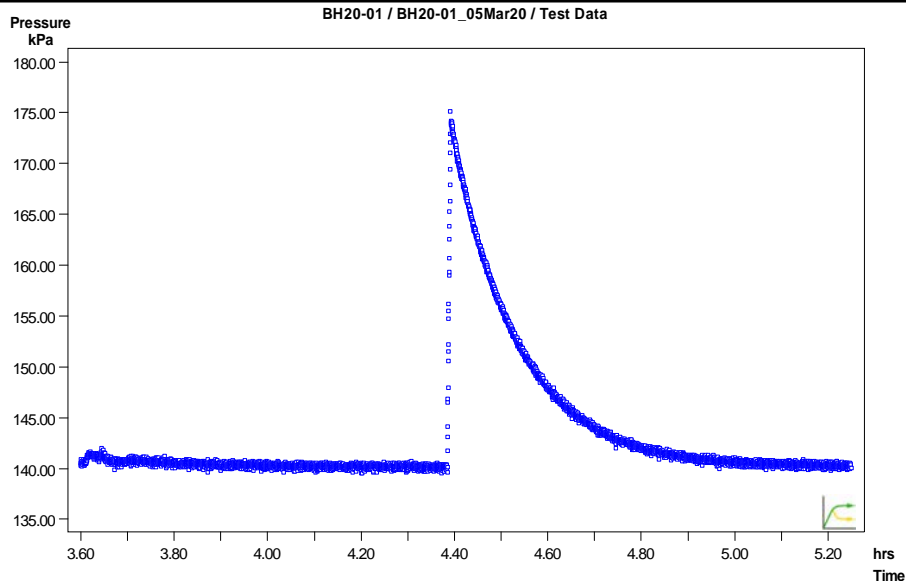
TITLE **PACKER TEST RESULTS BH20-01 UPPER INTERVAL (4.3 to 11.0 mbgs)**

PROJECT No.	19129150	PHASE	2300	Rev.	A
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FIGURE **F-004**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

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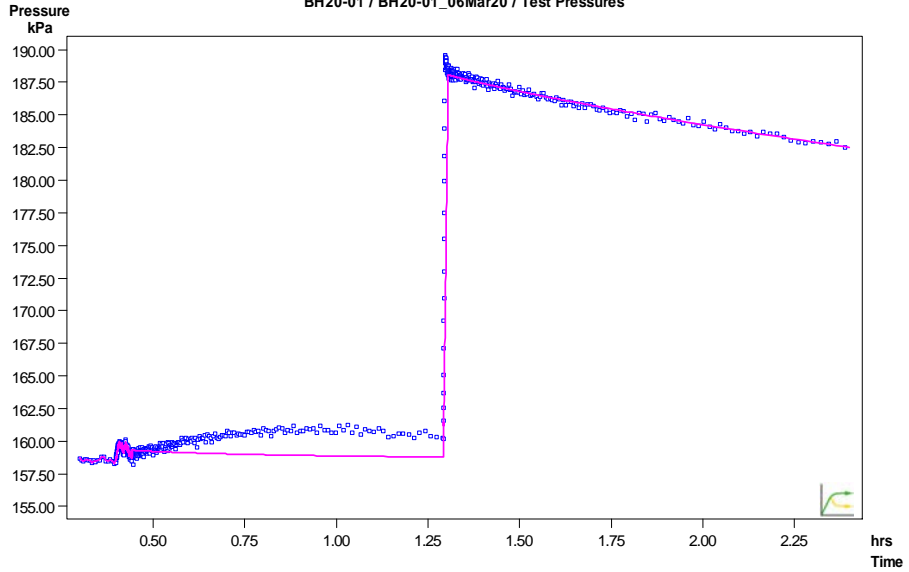
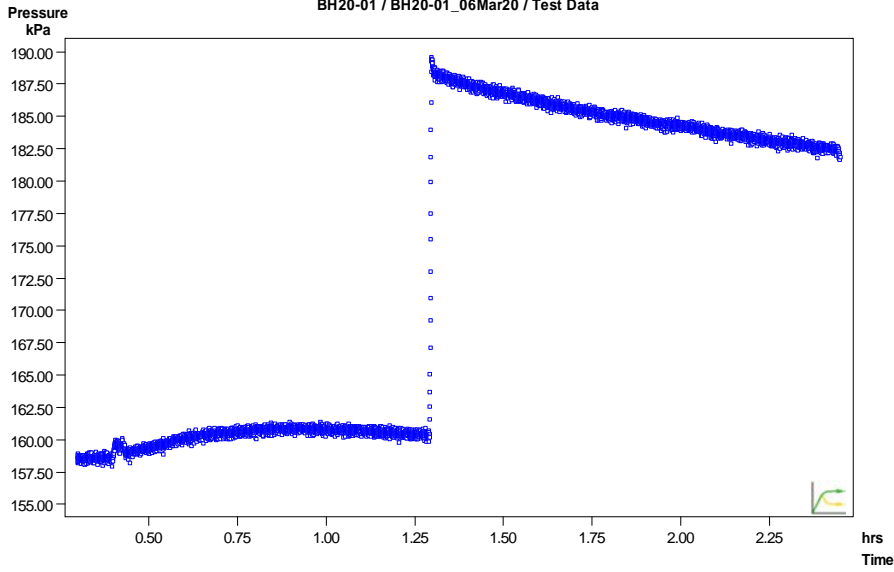
YYYY-MM-DD 2022-02-14  
 PREPARED PGM  
 DESIGN ML  
 REVIEW ###  
 APPROVED

TITLE

**PACKER TEST RESULTS BH20-01 MIDDLE INTERVAL (11.0 to 17.7 mbgs)**

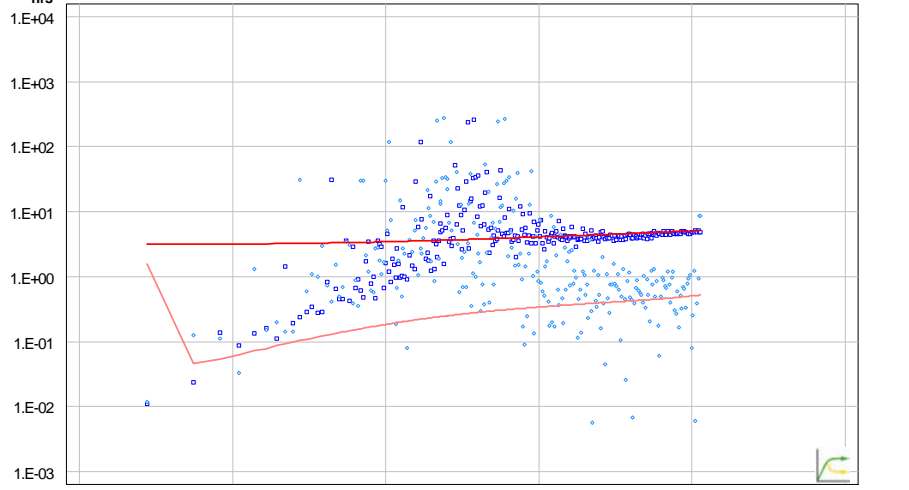
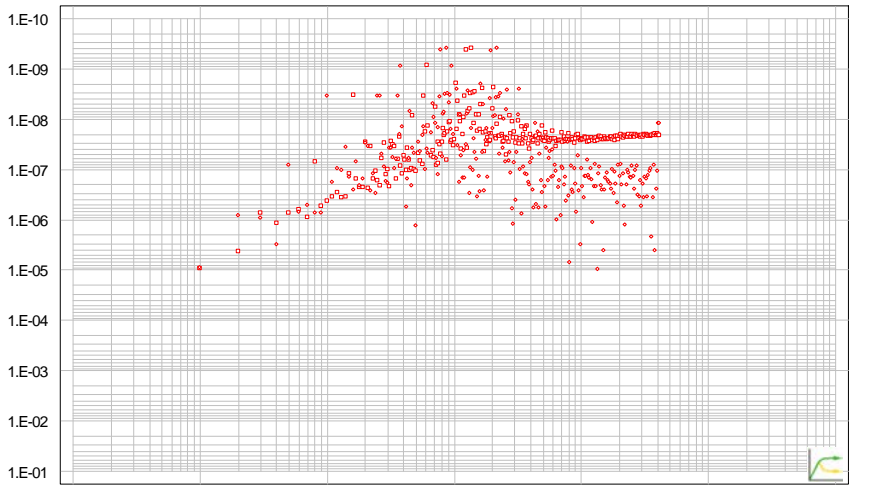
PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE F-005

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

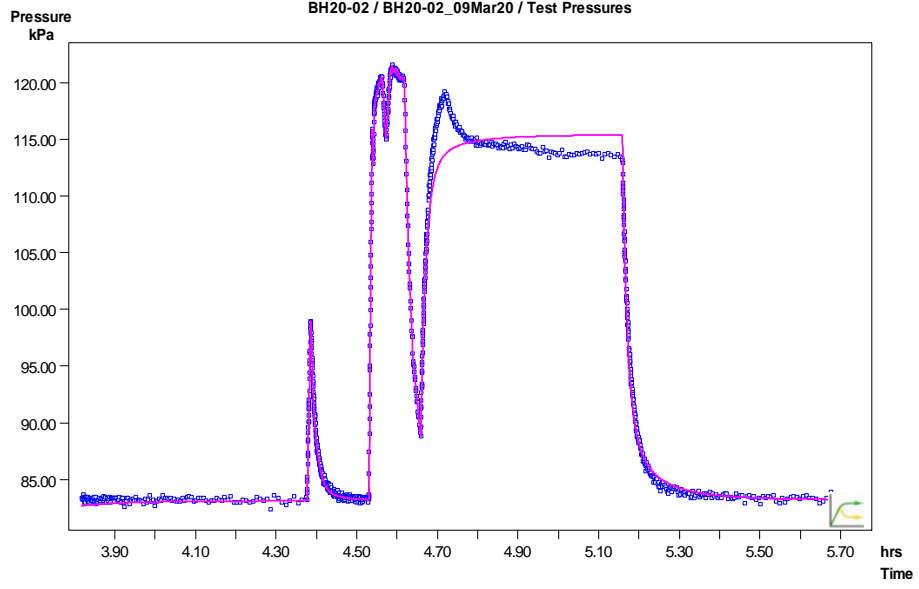
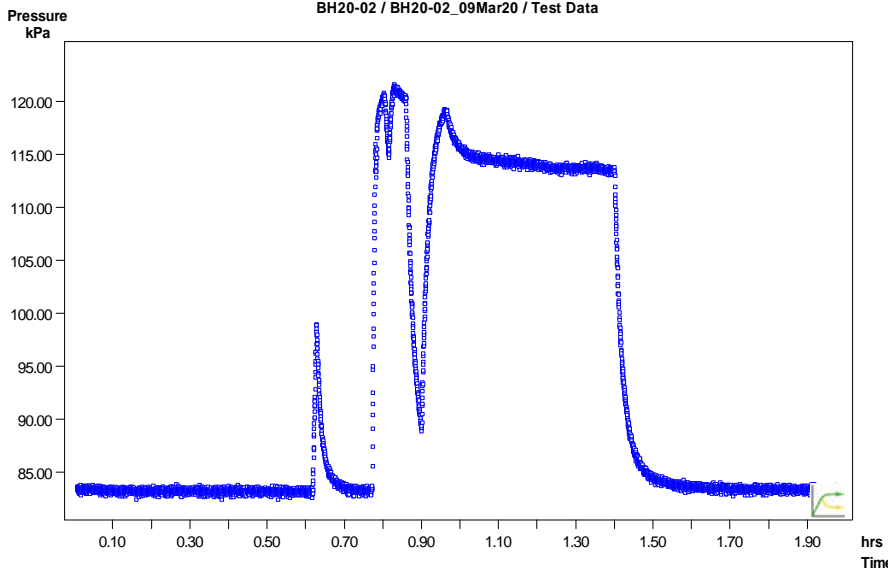
PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  

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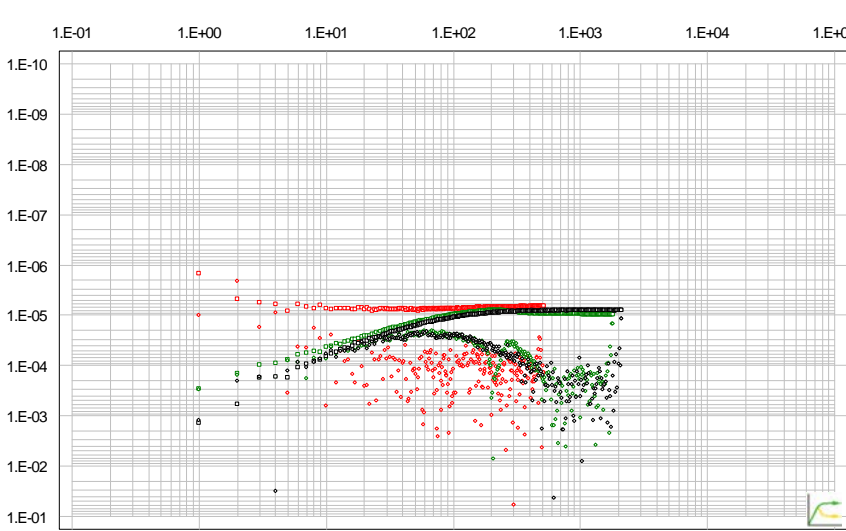
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**PACKER TEST RESULTS BH20-01 LOWER INTERVAL (19.5 to 22.1 mbgs)**  
 PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-006

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

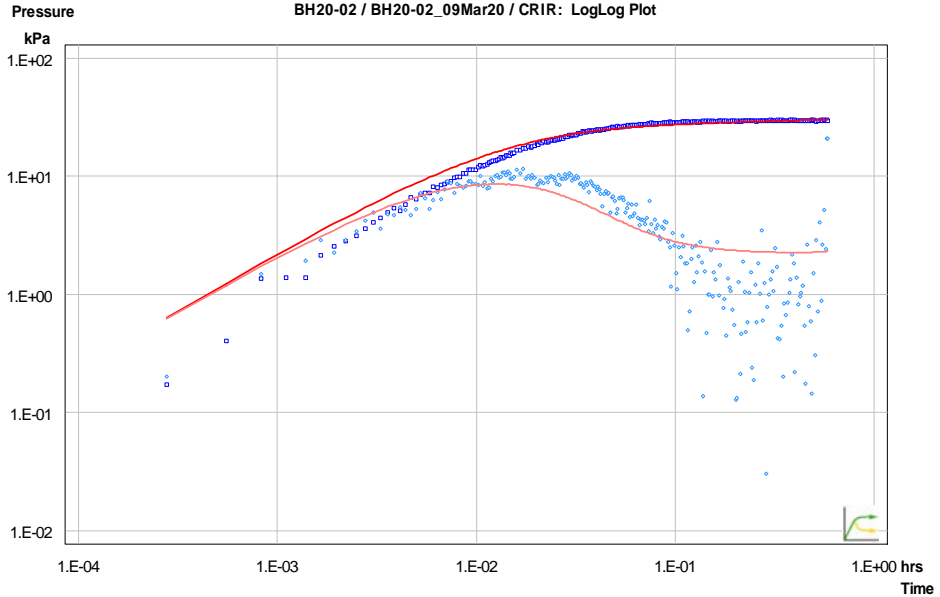


■ Pressure Observation

■ Pressure Observation — Simulated Pressure



BH20-02 / BH20-02\_09Mar20 / LogLog Diagnosis - Fit All



■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

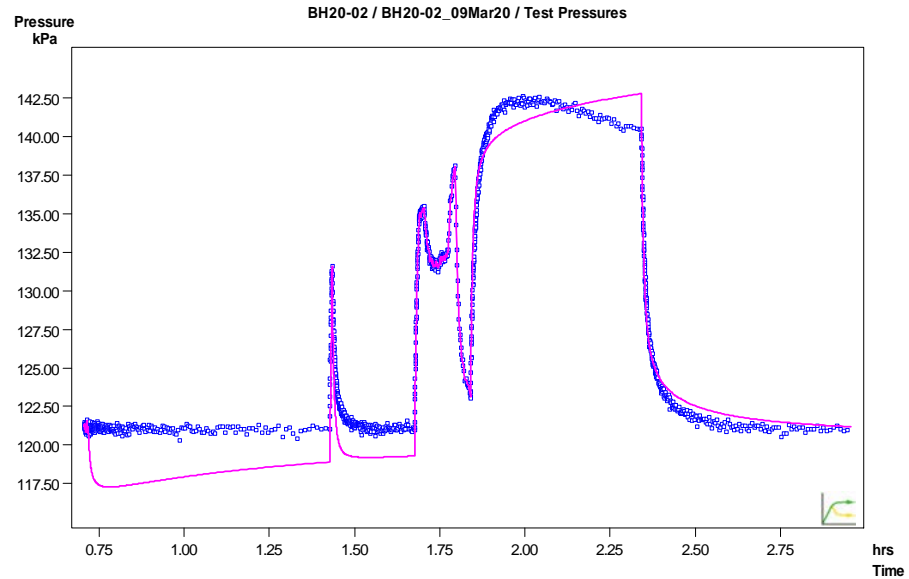
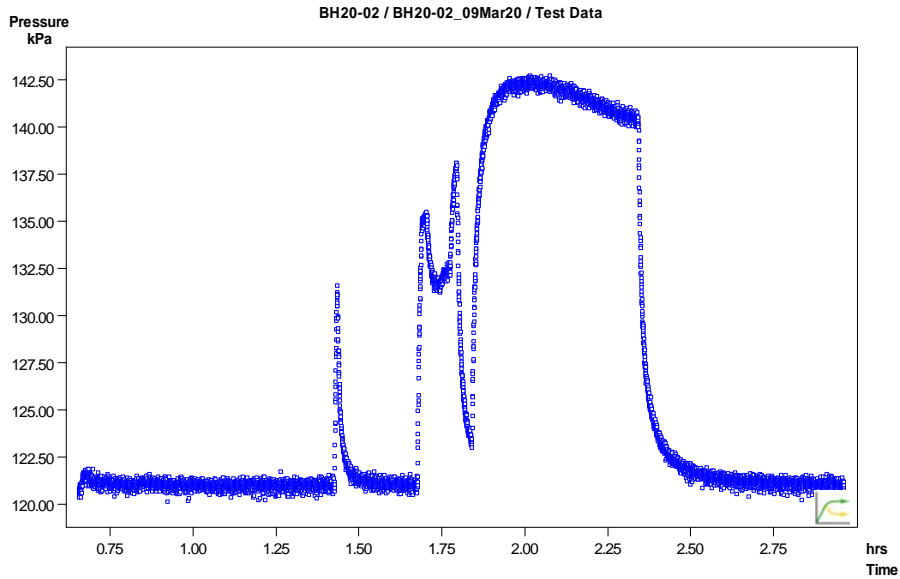


YYYY-MM-DD	2022-02-14
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

TITLE  
**PACKER TEST RESULTS BH20-02 UPPER INTERVAL (6.1 to 12.7 mbgs)**

PROJECT No. **19129150**    PHASE **2300**    Rev. **A**    FIGURE **F-007**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI

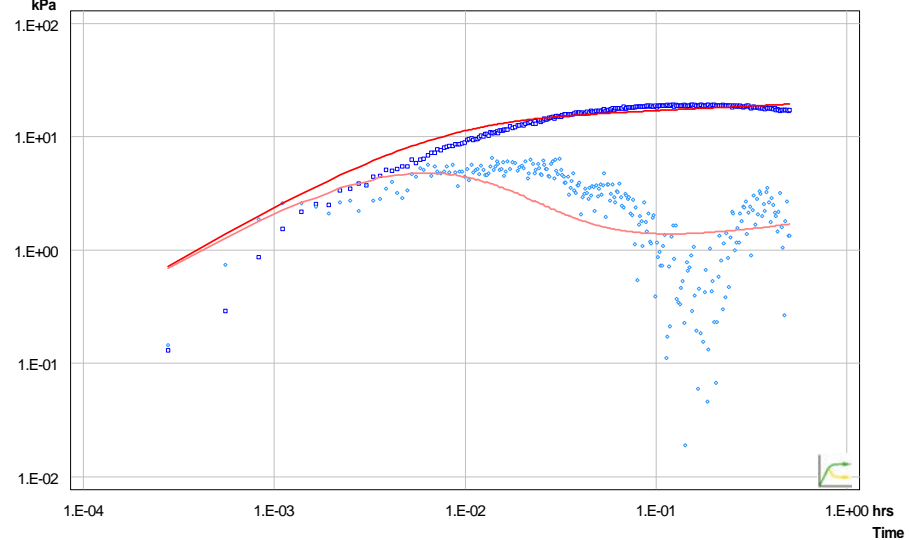
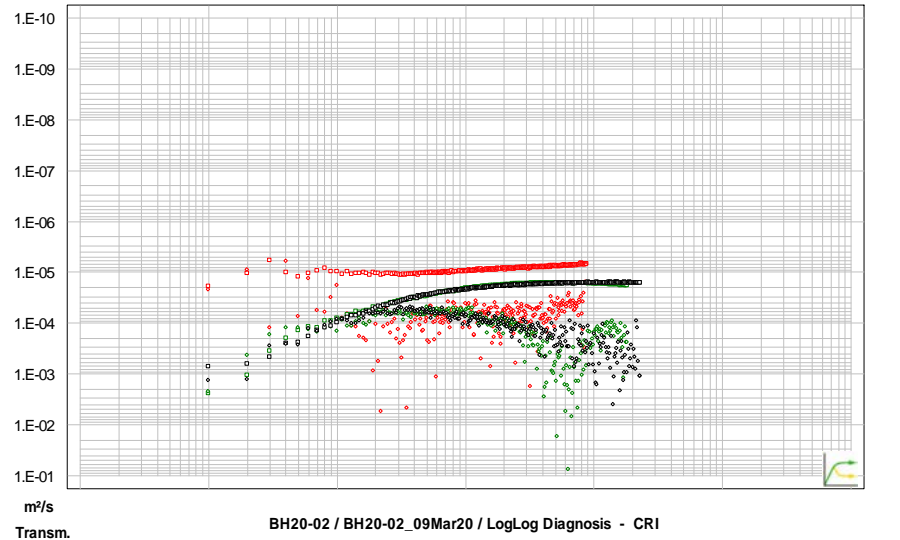


■ Pressure Observation

Time  
1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure

Pressure  
BH20-02 / BH20-02\_09Mar20 / CRI: LogLog Plot



- Pressure Observation SI
- Pressure Observation CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative SI
- ◆ Pressure Derivative CRI
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**

YYYY-MM-DD: 2022-02-14

PREPARED: PGM

DESIGN: ML

REVIEW: ###

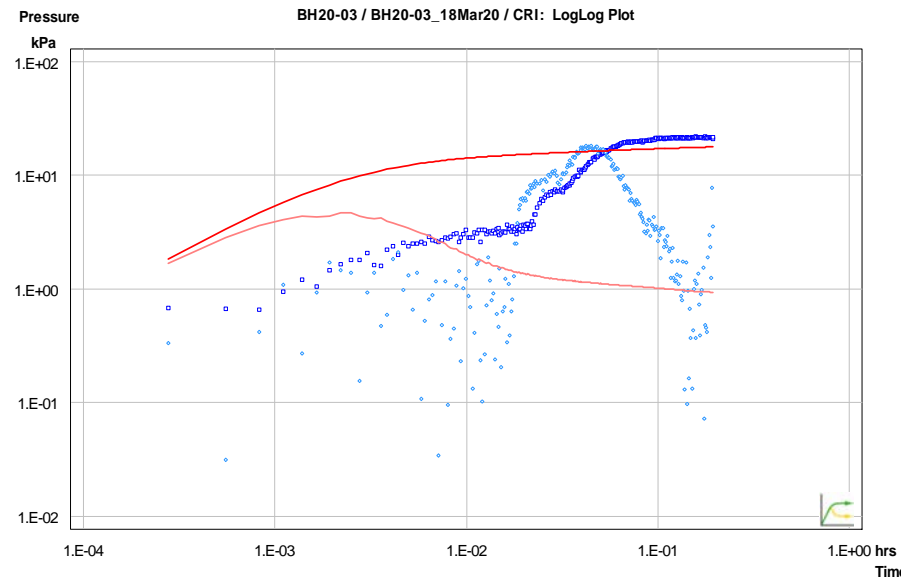
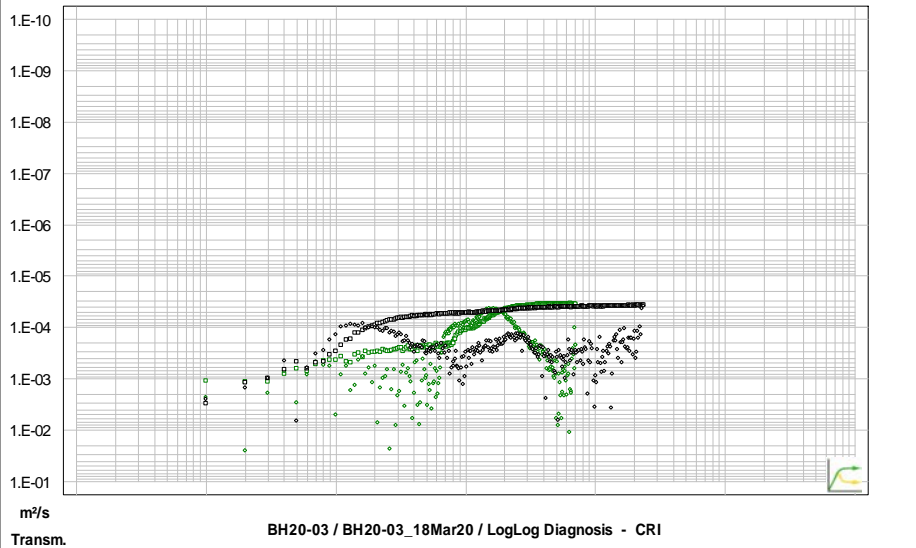
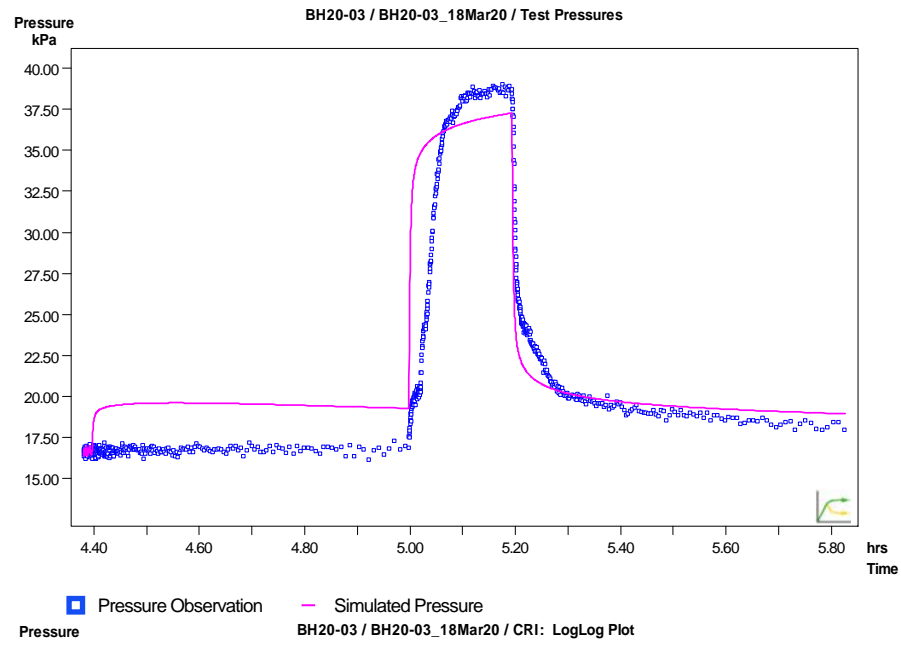
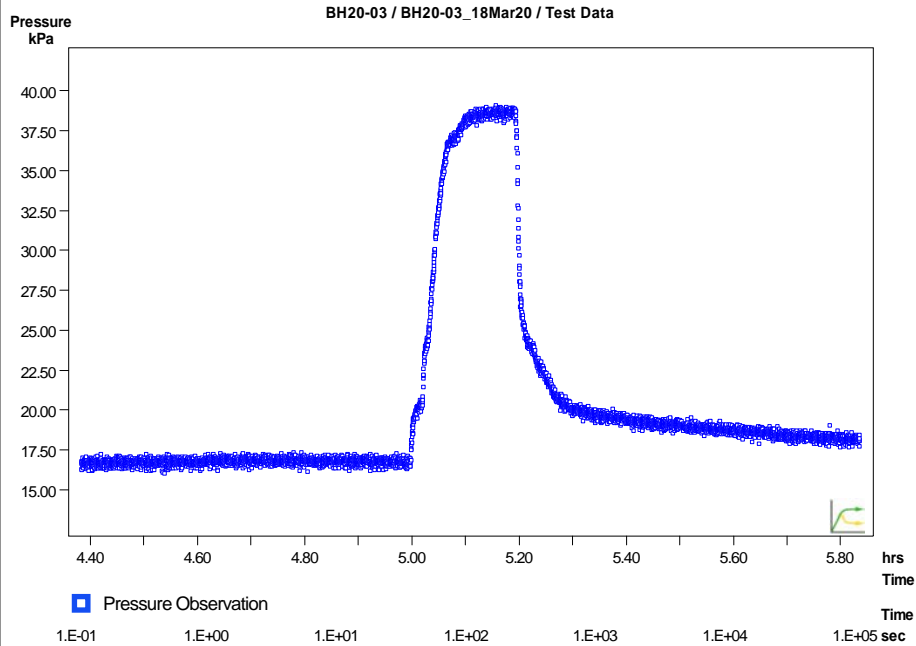
APPROVED: \_\_\_\_\_

TITLE: **PACKER TEST RESULTS BH20-02 LOWER INTERVAL (12.9 to 19.6 mbgs)**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE F-008

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD    2022-02-14

PREPARED    PGM

DESIGN    ML

REVIEW    ###

APPROVED

TITLE

**PACKER TEST RESULTS BH20-03 UPPER INTERVAL (4.9 to 11.6 mbgs)**

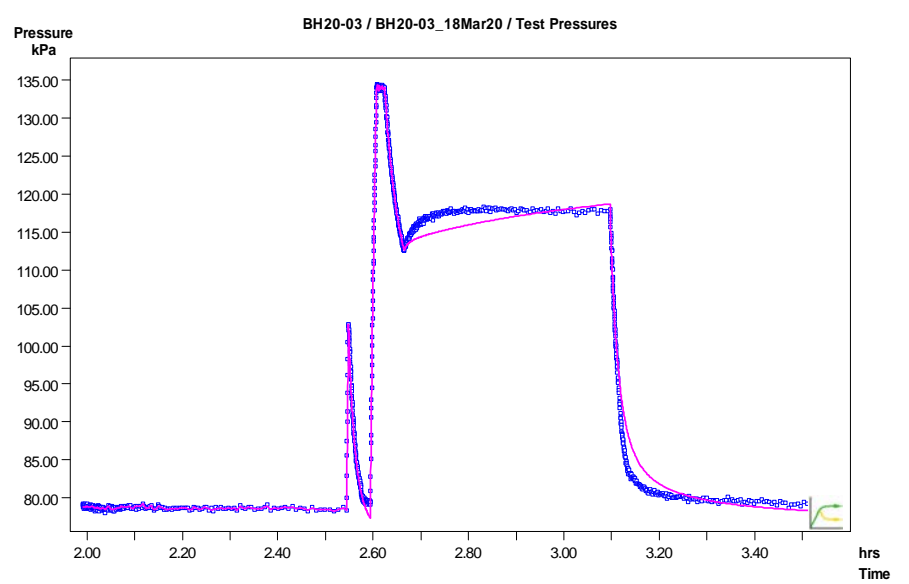
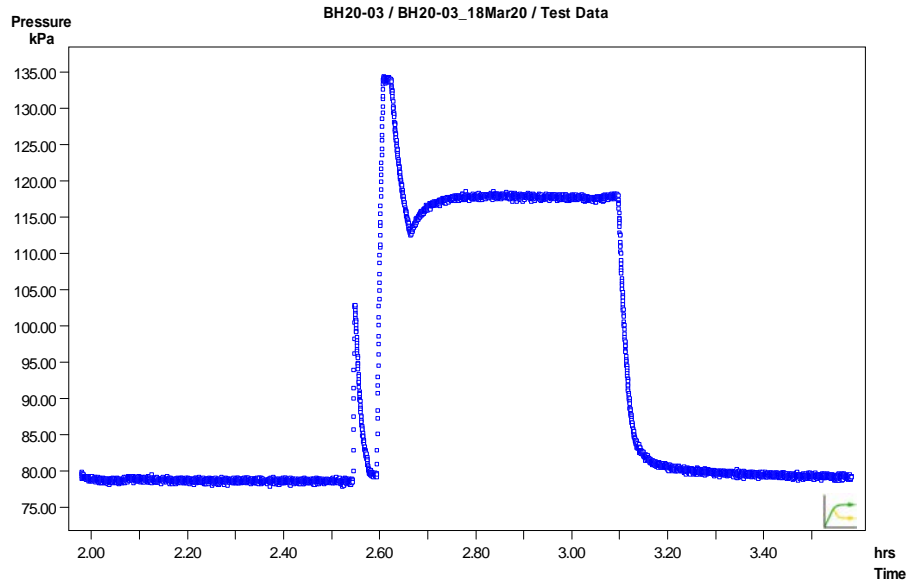
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

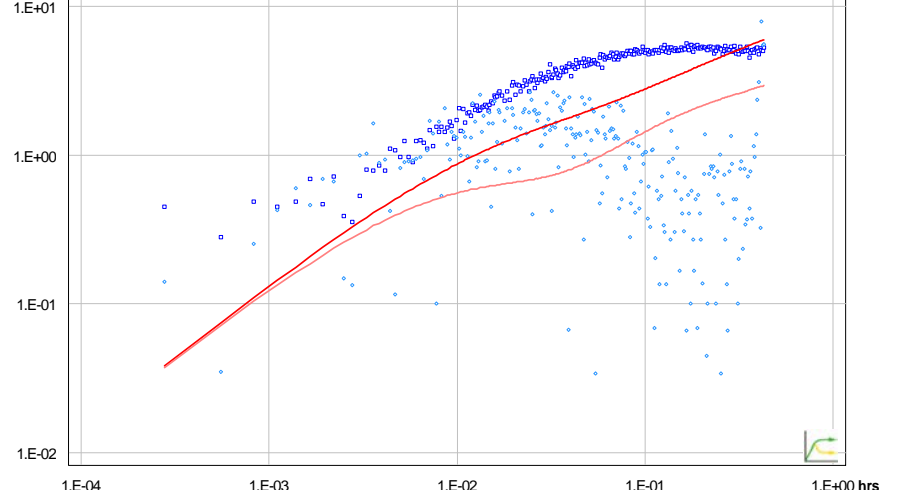
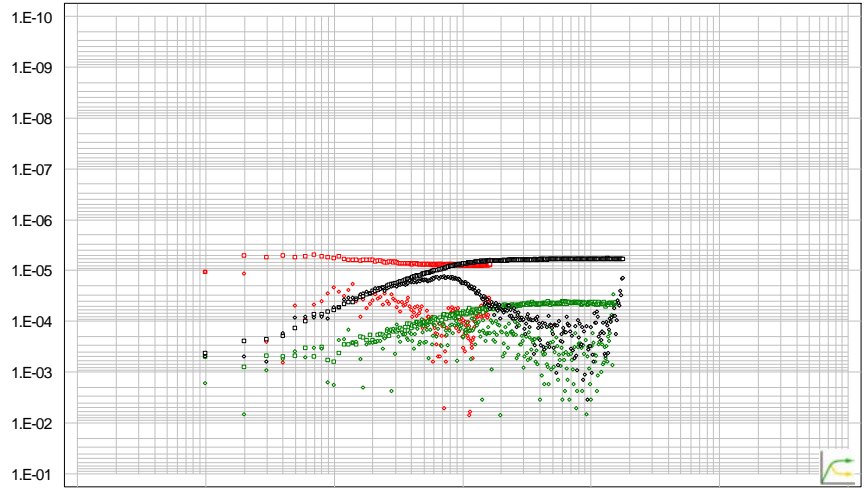
FIGURE  
**F-009**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation  
 Time  
 1.E-01    1.E+00    1.E+01    1.E+02    1.E+03    1.E+04    1.E+05 sec

■ Pressure Observation    — Simulated Pressure  
 Pressure  
 BH20-03 / BH20-03\_18Mar20 / CRI: LogLog Plot



m²/s  
 Transm.  
 BH20-03 / BH20-03\_18Mar20 / LogLog Diagnosis - CRI  
■ Pressure Observation SI    ◆ Pressure Derivative SI  
■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

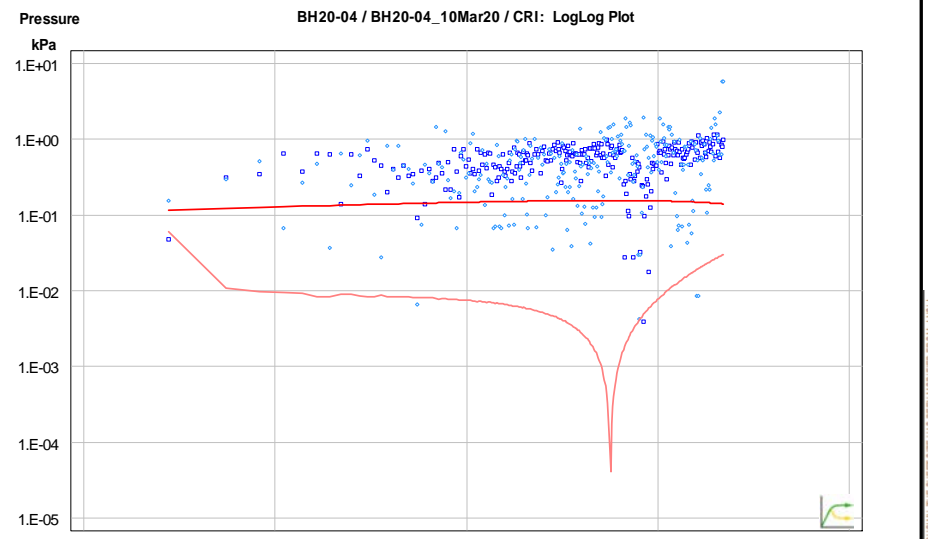
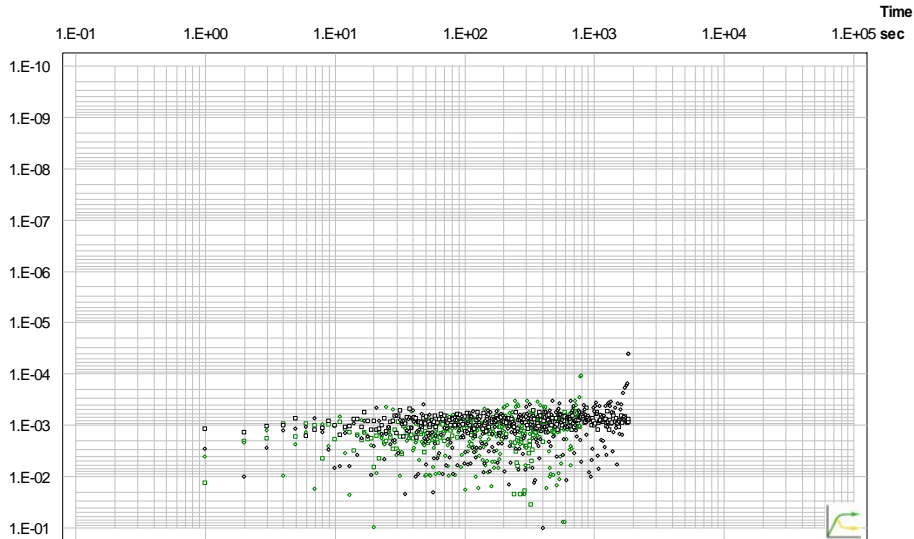
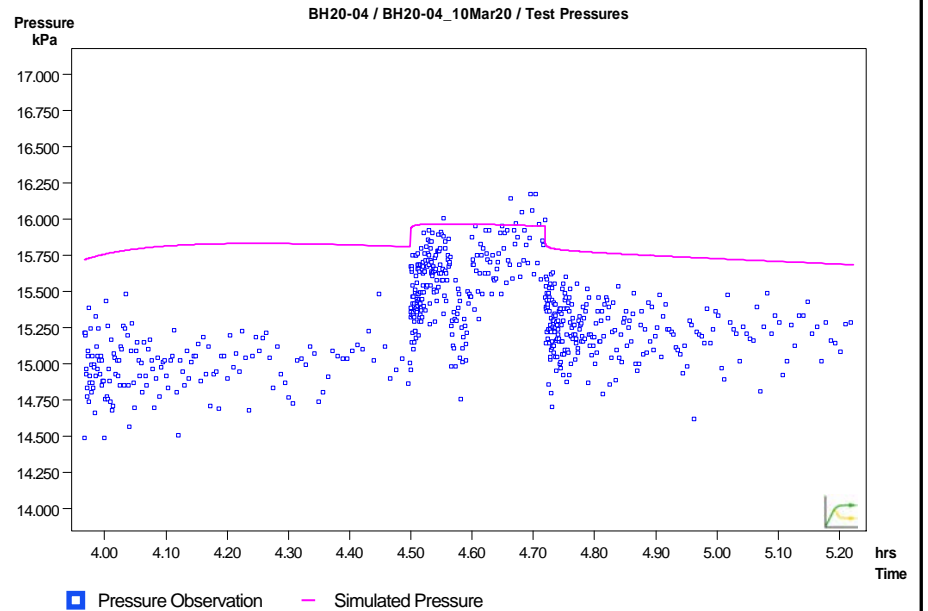
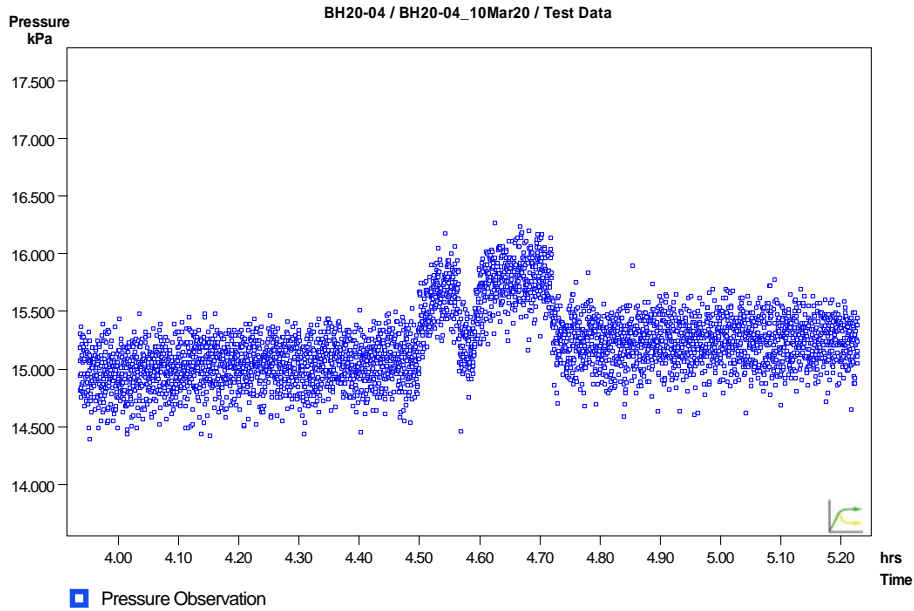
■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
— Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**      PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**  
 YYYY-MM-DD: 2022-02-17  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

TITLE: **PACKER TEST RESULTS BH20-03 LOWER INTERVAL (10.1 to 16.8 mbgs)**  
 PROJECT No. **19129150**      PHASE **2300**      Rev. **A**      FIGURE **F-010**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT

**GOLDER**  
MEMBER OF WSP

YYYY-MM-DD 2022-02-14

PREPARED PGM

DESIGN ML

REVIEW ###

APPROVED

PROJECT

**CALEDON PIT / QUARRY**

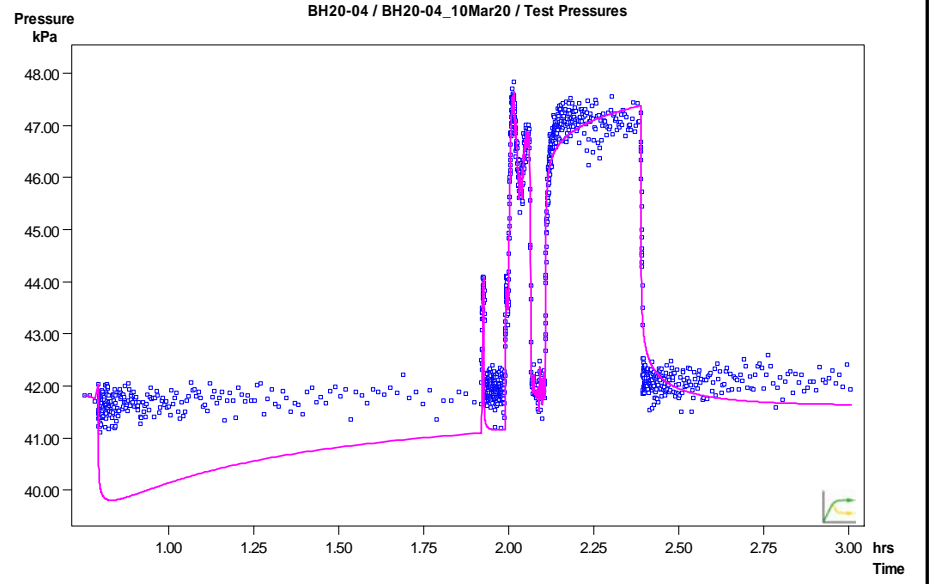
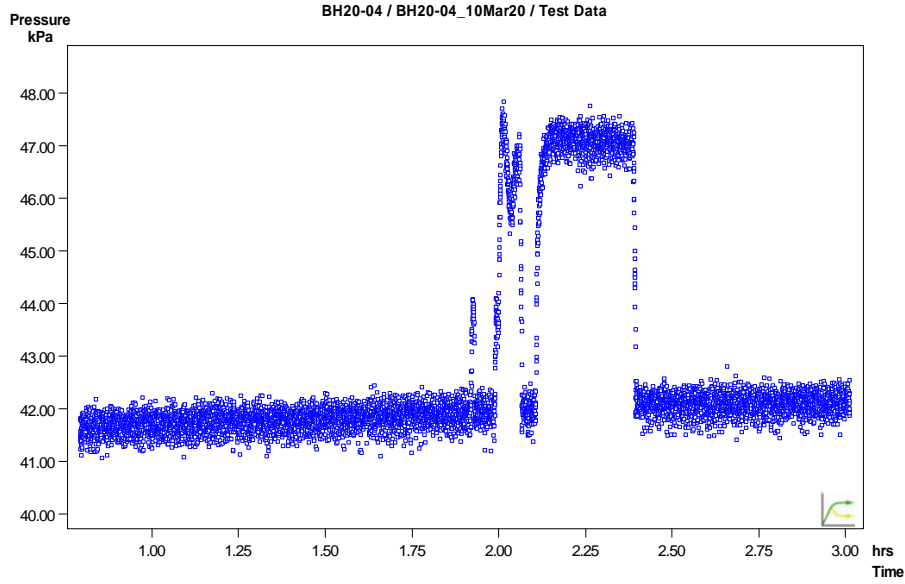
TITLE

**PACKER TEST RESULTS BH20-04 UPPER INTERVAL (10.7 to 14.3 mbgs)**

PROJECT No. 19129150

PHASE 2300

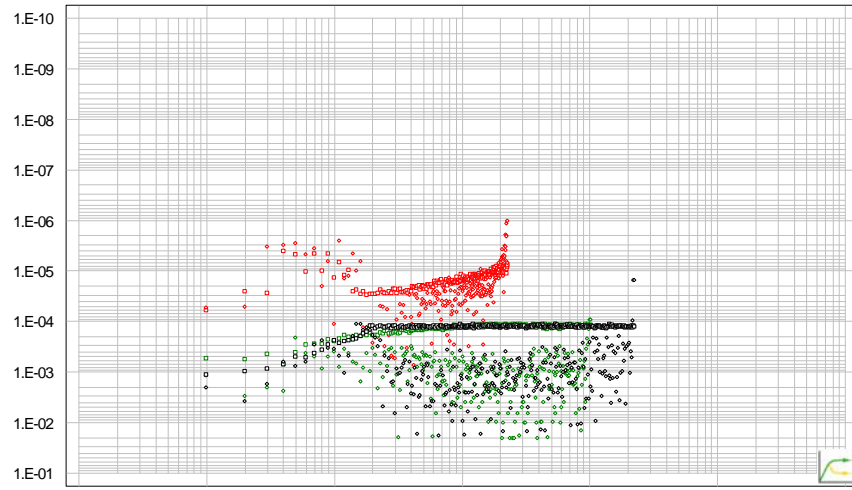
Rev. A



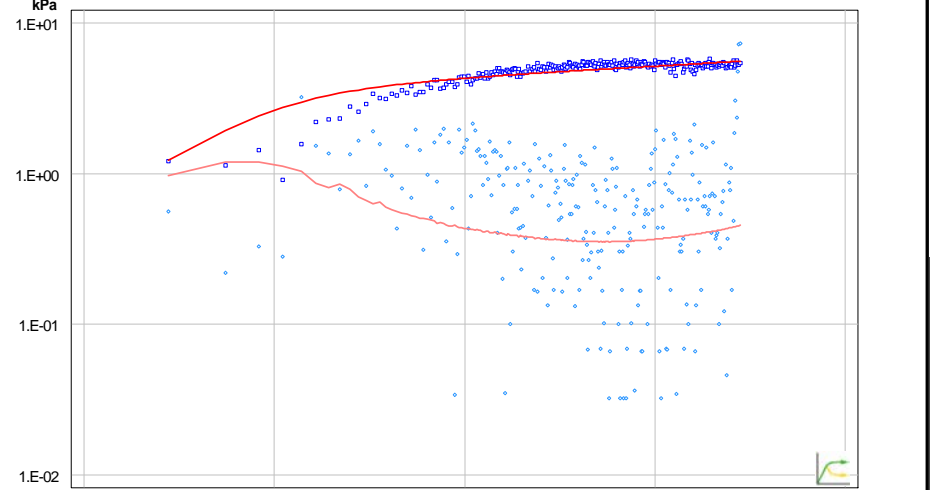
■ Pressure Observation

Time  
1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure



BH20-04 / BH20-04\_10Mar20 / CRI: LogLog Plot



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  

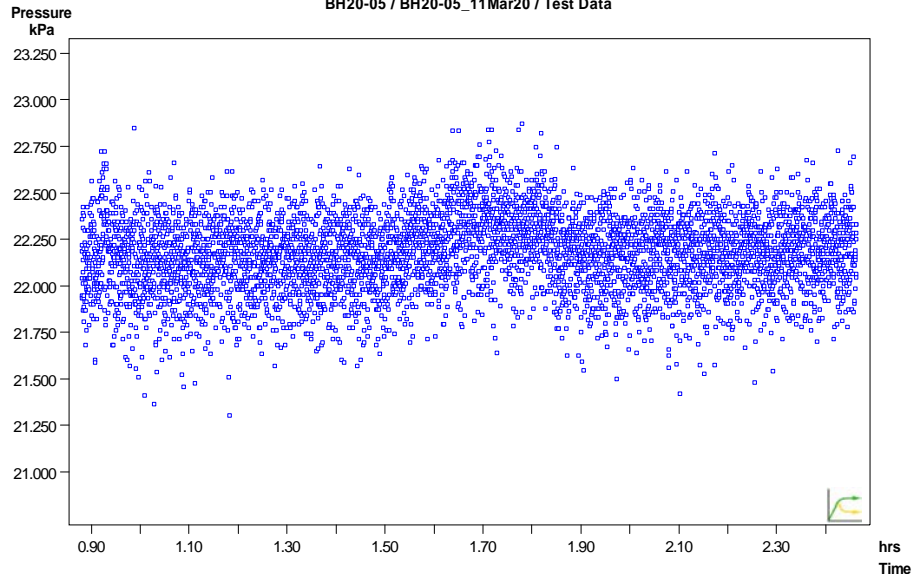
 YYYY-MM-DD    2022-02-14  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS BH20-04 LOWER INTERVAL (13.5 to 17.0 mbgs)**

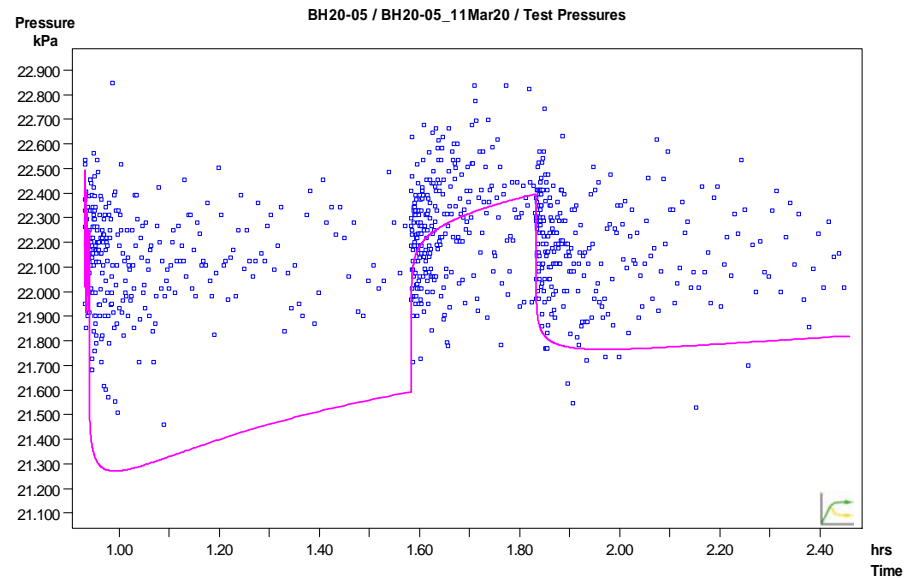
PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-012

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4

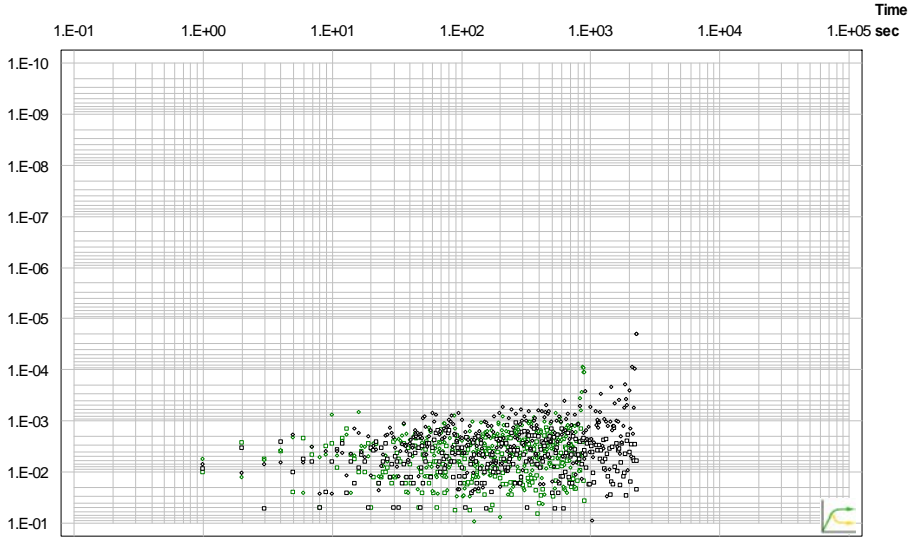




■ Pressure Observation

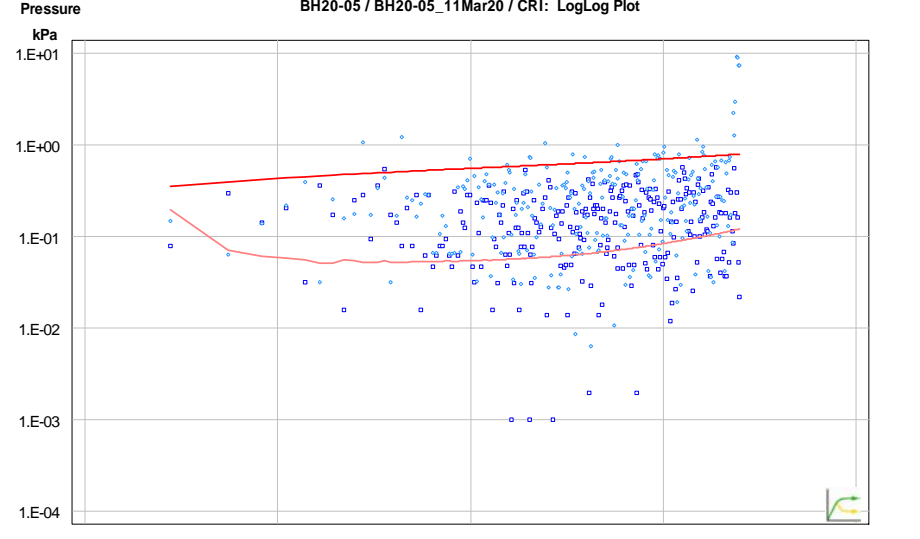


■ Pressure Observation    — Simulated Pressure



BH20-05 / BH20-05\_11Mar20 / LogLog Diagnosis - CRI

- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR



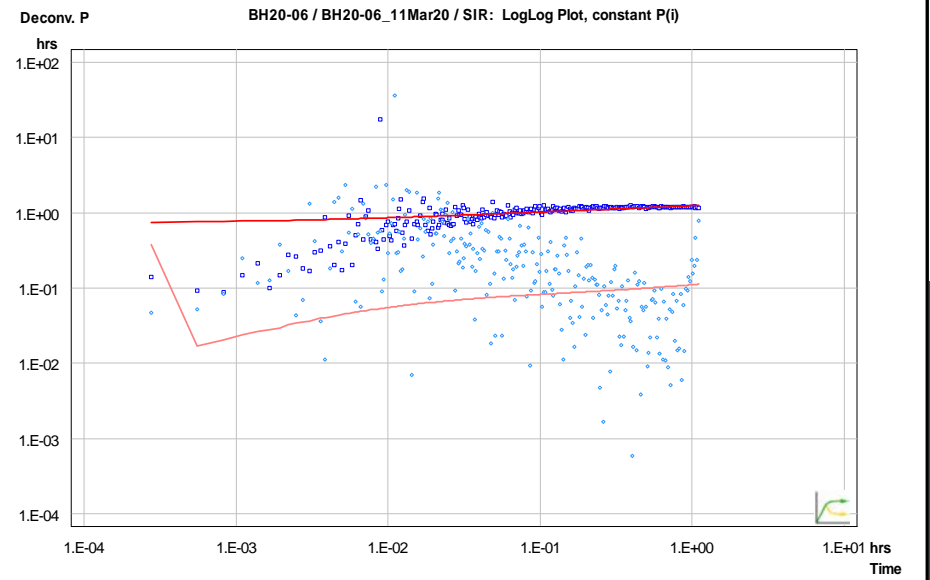
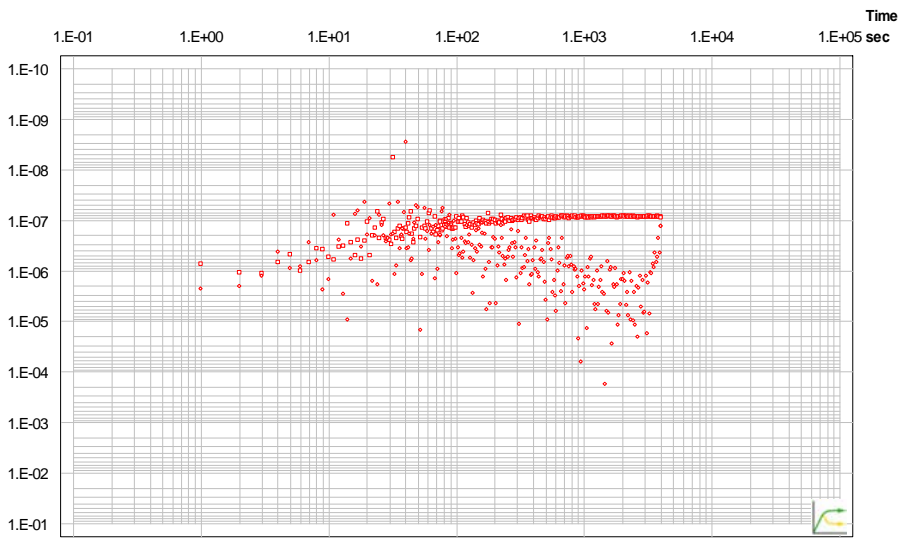
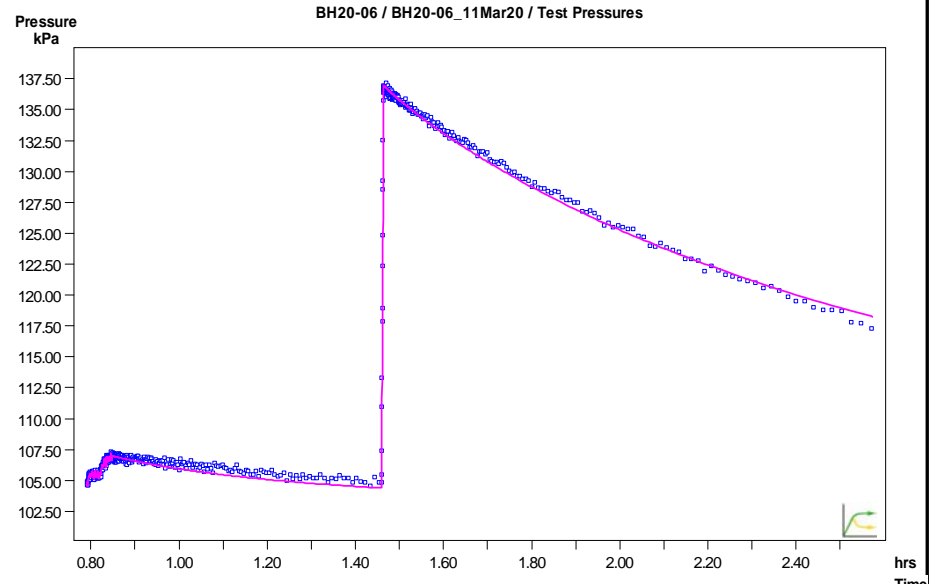
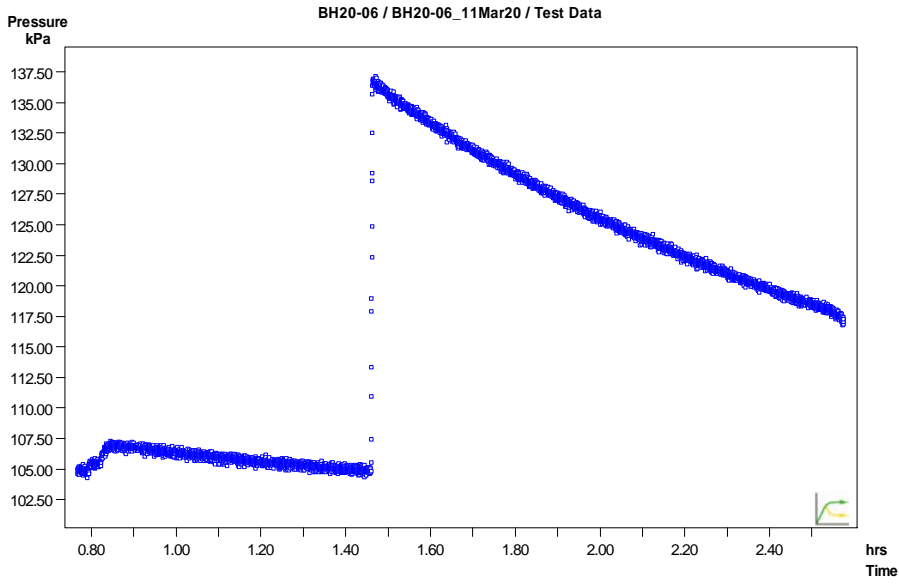
- Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase
- Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**      PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**      YYYY-MM-DD: 2022-02-14  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED: \_\_\_\_\_

TITLE: **PACKER TEST RESULTS BH20-05 SINGLE INTERVAL (7.8 to 12.8 mbgs)**  
 PROJECT No.: **19129150**      PHASE: **2300**      Rev.: **A**      FIGURE: **F-013**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



Transm. **BH20-06 / BH20-06\_11Mar20 / LogLog Diagnosis - SIR**

- Pressure Observation SI      ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR   ◆ Pressure Derivative CRIR

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

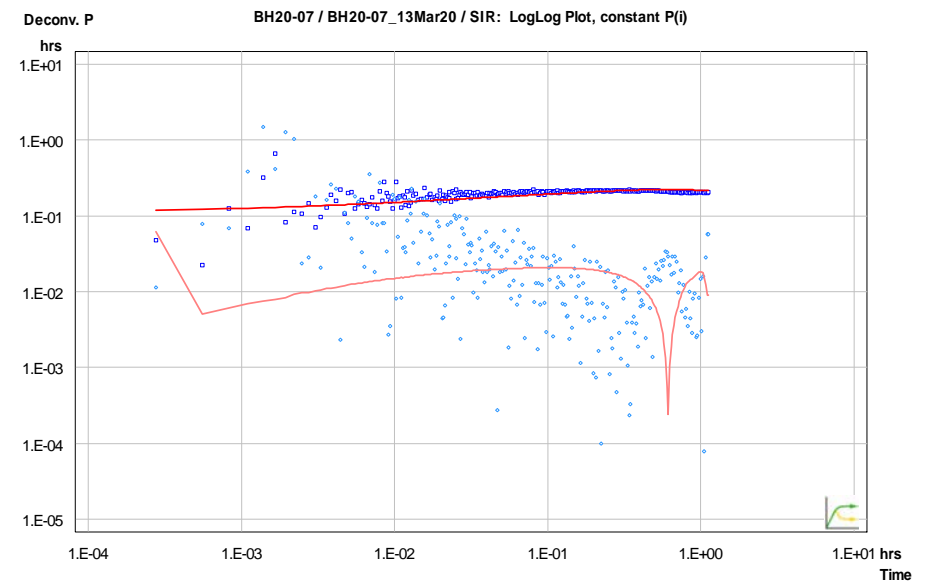
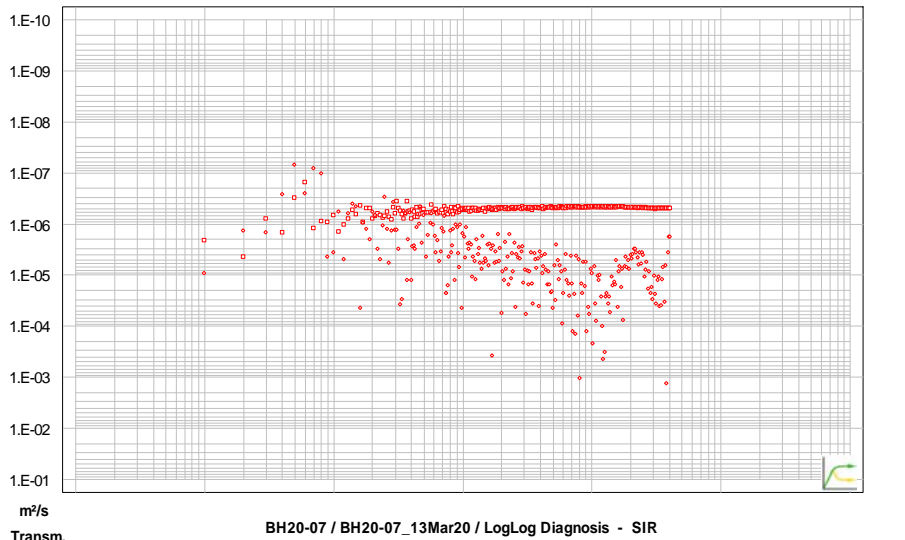
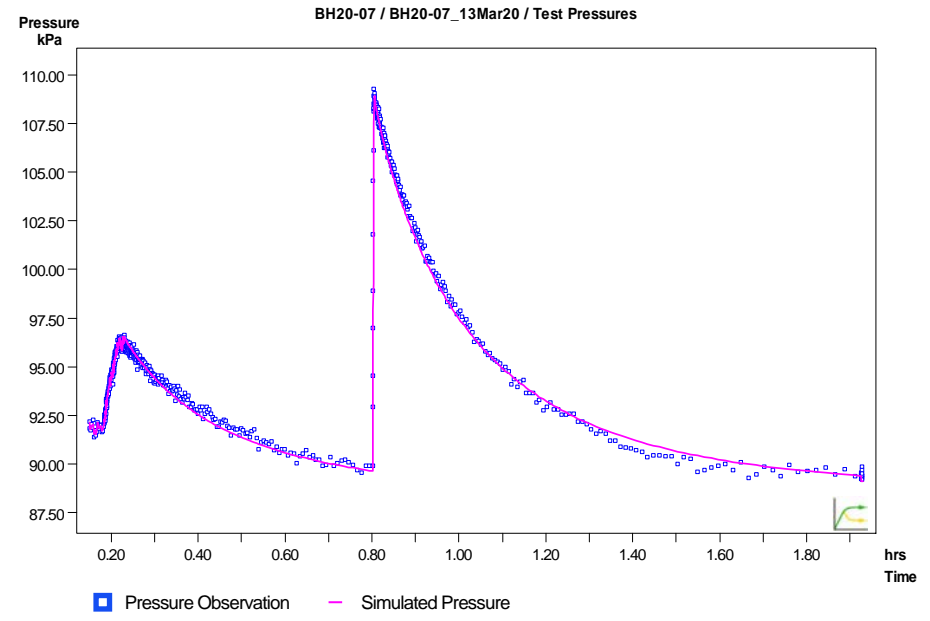
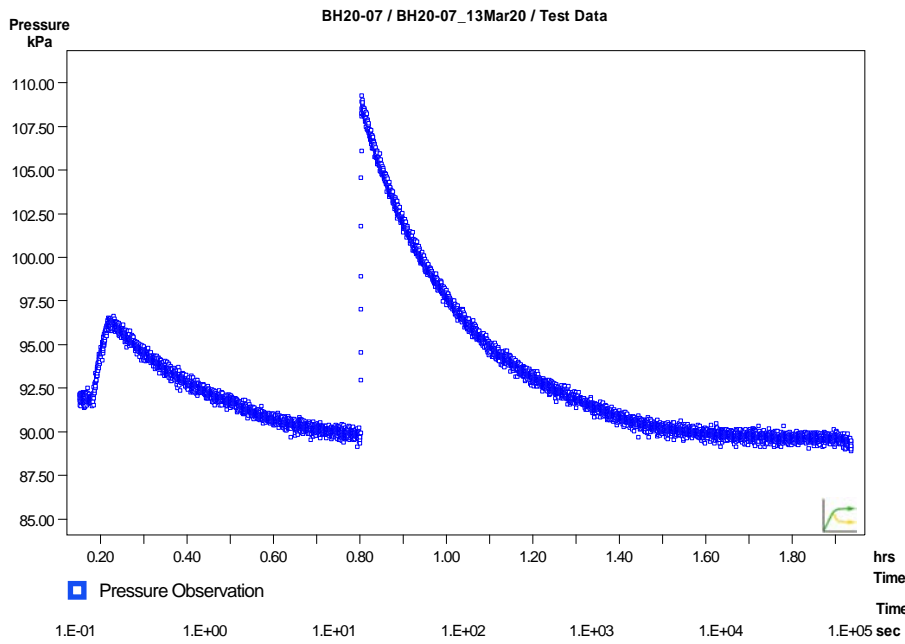
CONSULTANT **GOLDER** MEMBER OF WSP

YYYY-MM-DD	2022-02-14
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

TITLE  
**PACKER TEST RESULTS BH20-06 SINGLE INTERVAL (10.7 to 14.3 mbgs)**

PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-014

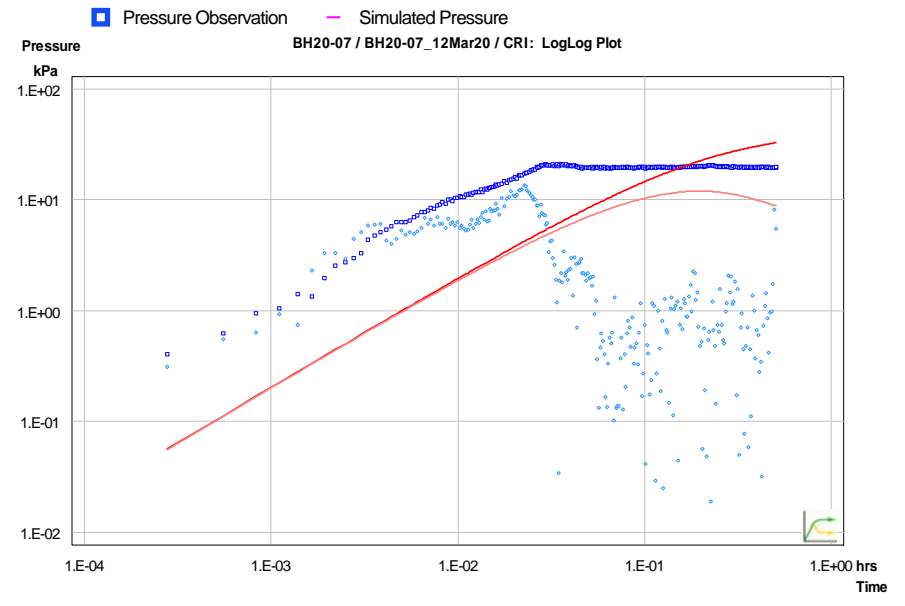
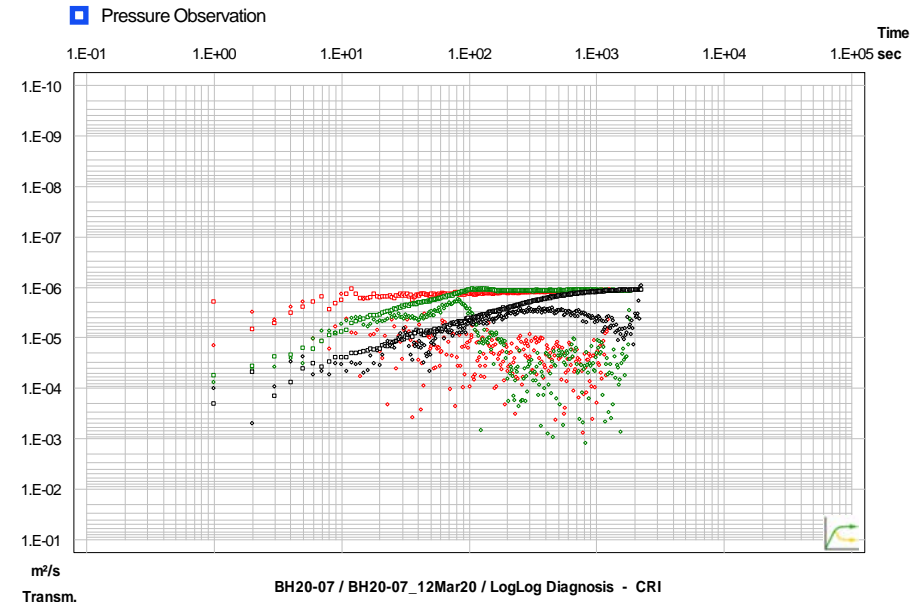
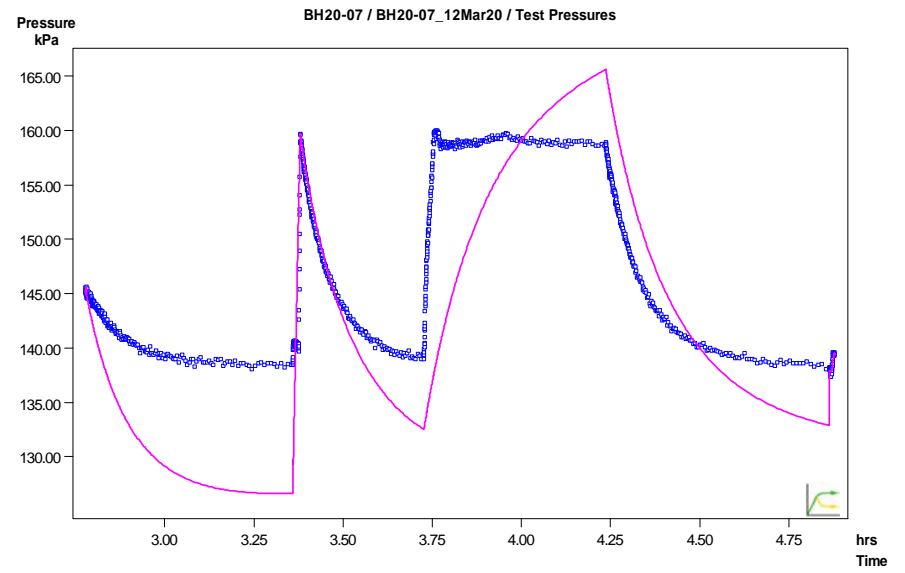
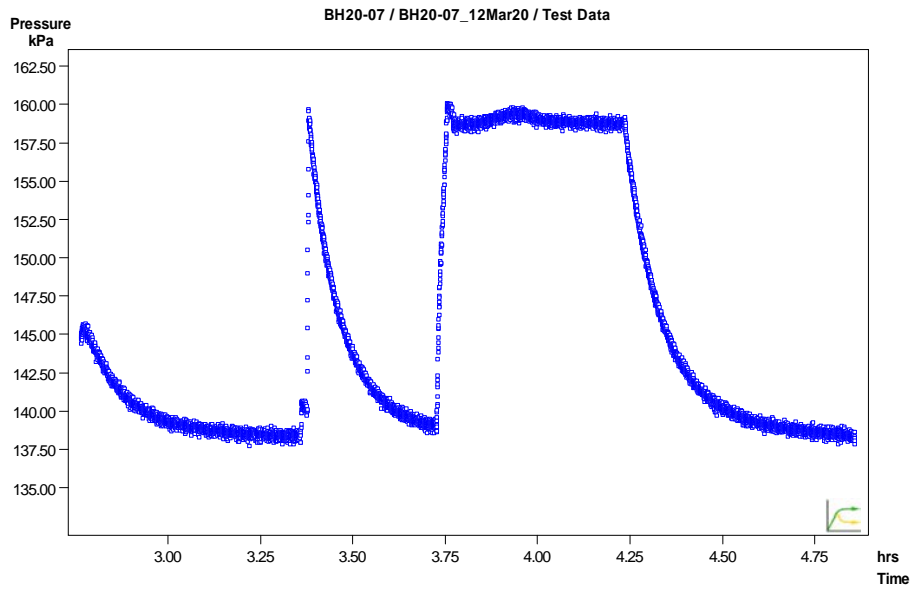
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

<p>CLIENT</p> <p><b>CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)</b></p> <p>CONSULTANT</p>	<p>PROJECT</p> <p><b>CALEDON PIT / QUARRY</b></p> <p>TITLE</p> <p><b>PACKER TEST RESULTS BH20-07 UPPER INTERVAL (4.6 to 11.3 mbgs)</b></p> <p>PROJECT No. <b>19129150</b>      PHASE <b>2300</b>      Rev. <b>A</b></p>
<p>YYYY-MM-DD      2022-02-14</p> <p>PREPARED      PGM</p> <p>DESIGN      ML</p> <p>REVIEW      ###</p> <p>APPROVED</p>	<p>FIGURE</p> <p><b>F-015</b></p>

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



- Pressure Observation SI      ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase      ◆ Pressure Derivative Selected Phase
- Simulated Response      — Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD      2022-02-14

PREPARED      PGM

DESIGN      ML

REVIEW      ###

APPROVED

TITLE

PACKER TEST RESULTS BH20-07 LOWER INTERVAL (11.1 to 16.1 mbgs)

PROJECT No.  
19129150

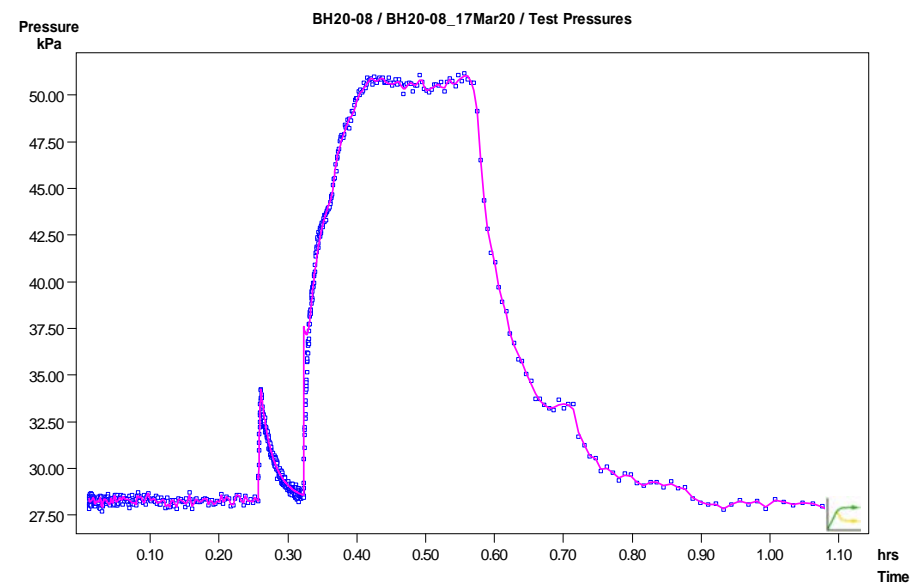
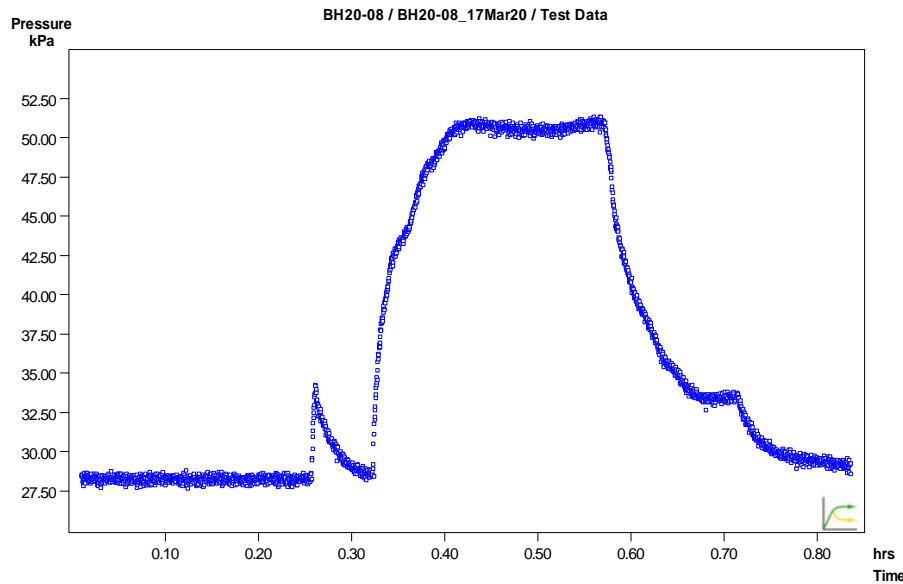
PHASE  
2300

Rev.  
A

FIGURE  
F-016

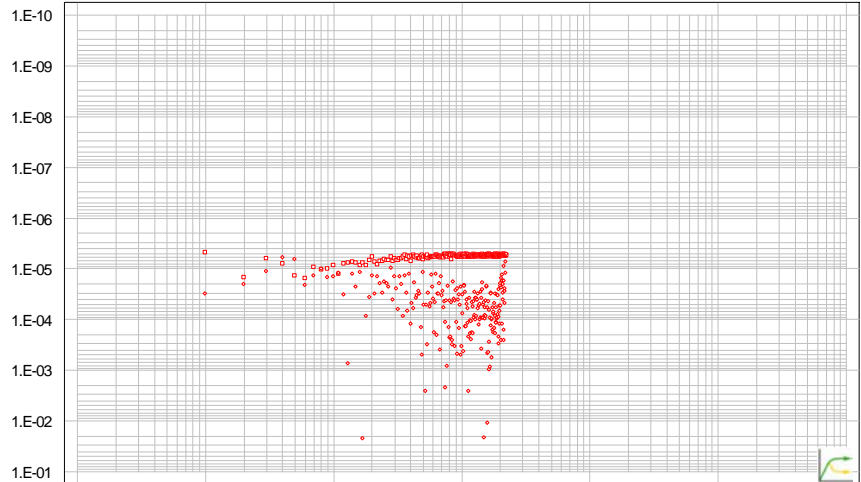
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



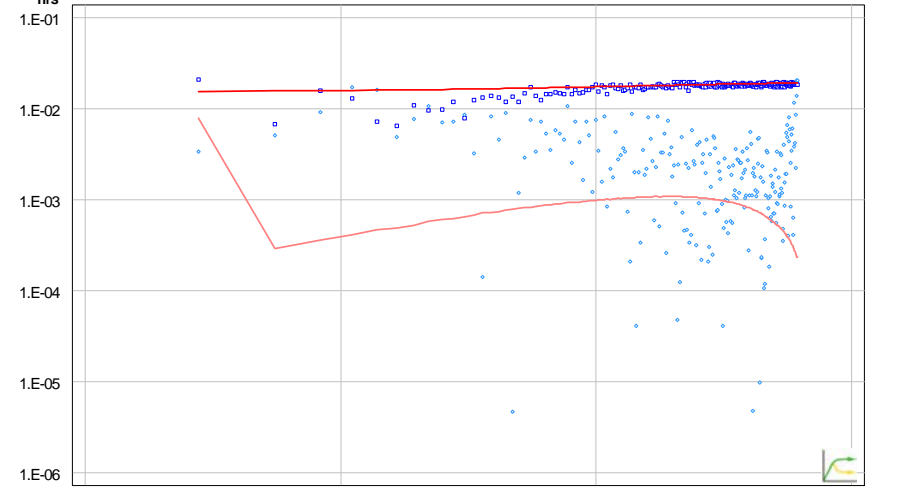


■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Deconv. P BH20-08 / BH20-08\_17Mar20 / SIR: LogLog Plot, constant P(i)



m<sup>2</sup>/s  
Transm. BH20-08 / BH20-08\_17Mar20 / LogLog Diagnosis - SIR

1.E-04 1.E-03 1.E-02 1.E-01 hrs  
Time

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)** PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**

DATE: 2022-02-14

PREPARED: PGM

DESIGN: ML

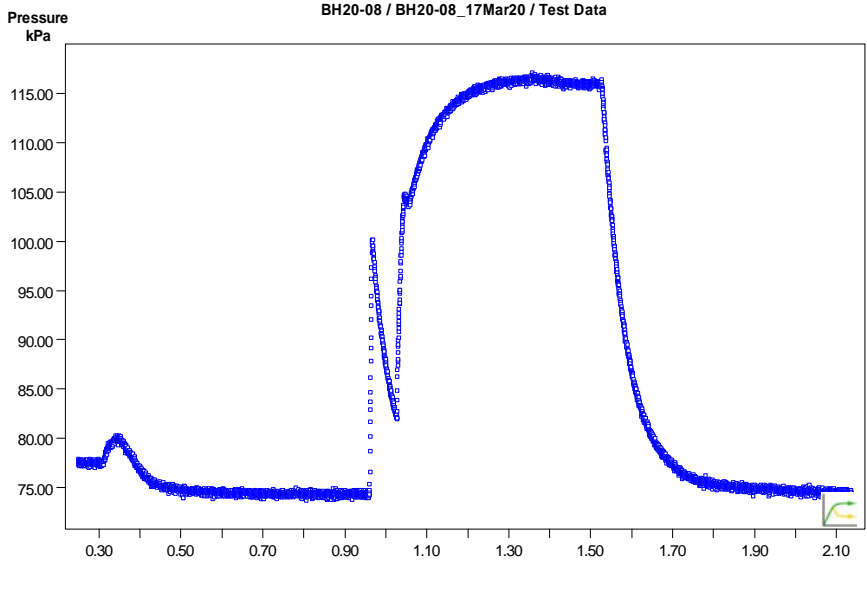
REVIEW: ###

APPROVED: \_\_\_\_\_

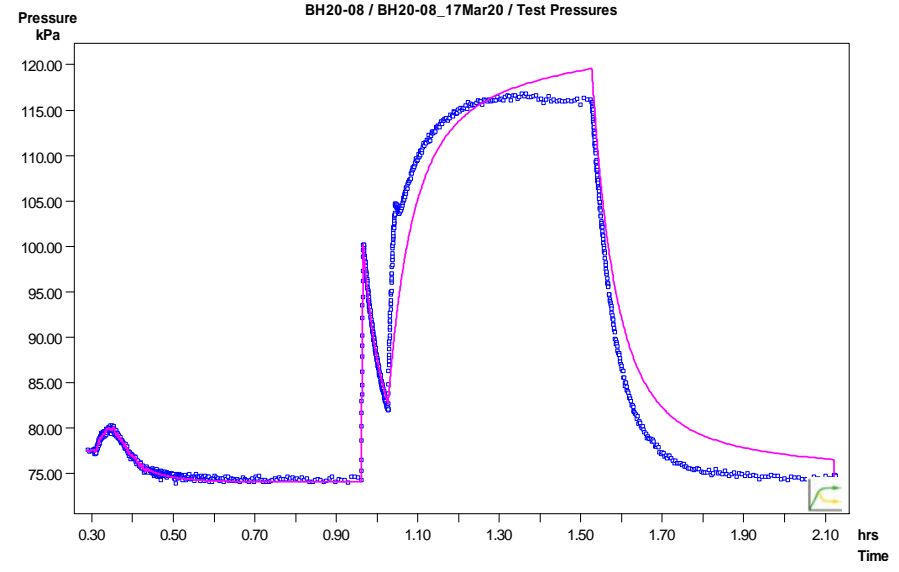
TITLE: **PACKER TEST RESULTS BH20-08 UPPER INTERVAL (7.0 to 10.5 mbgs)**

PROJECT No. **19129150** PHASE **2300** Rev. **A** FIGURE **F-017**

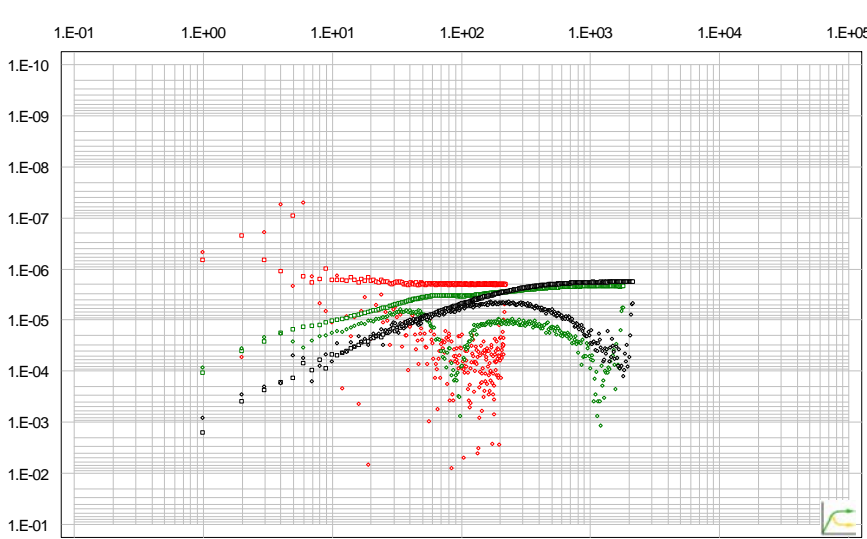
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



■ Pressure Observation

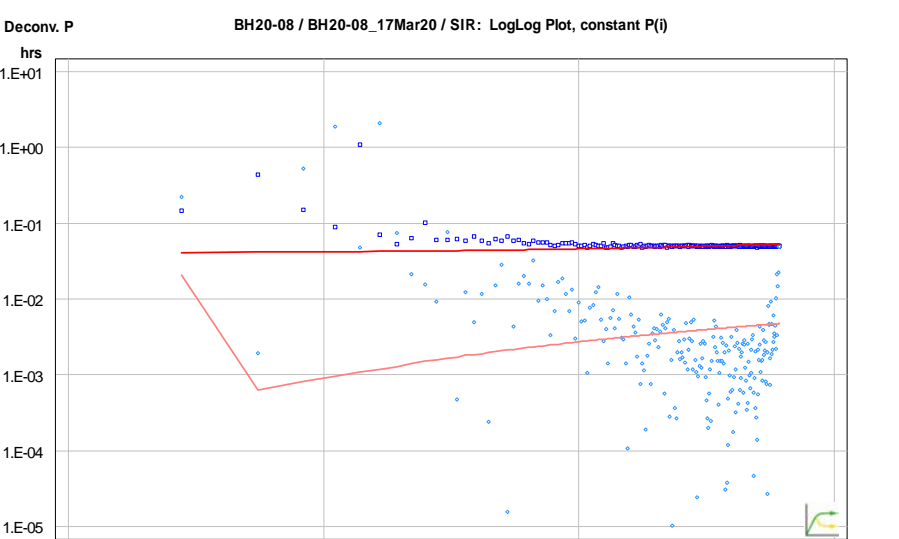


■ Pressure Observation    — Simulated Pressure



BH20-08 / BH20-08\_17Mar20 / LogLog Diagnosis - SIR

- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR



- Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase
- Simulated Response    — Simulated Response Derivative

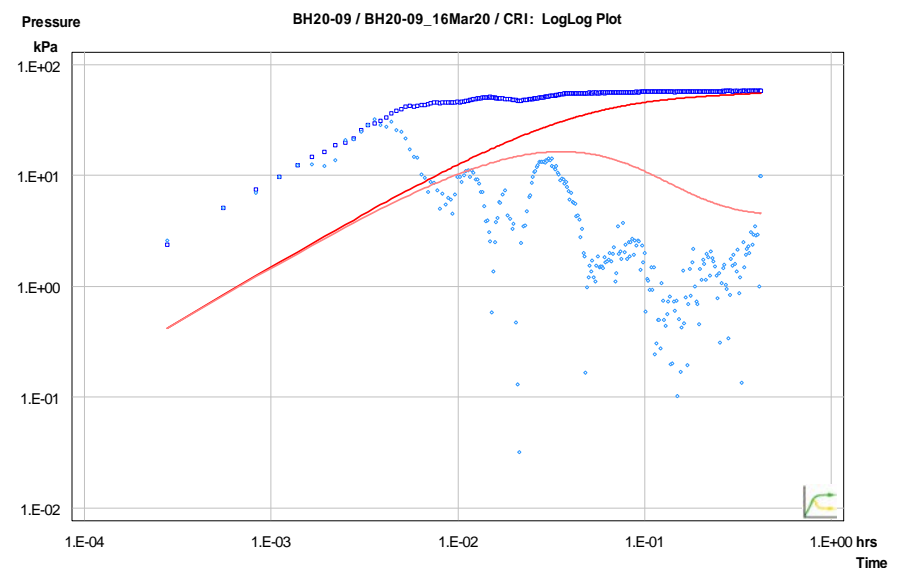
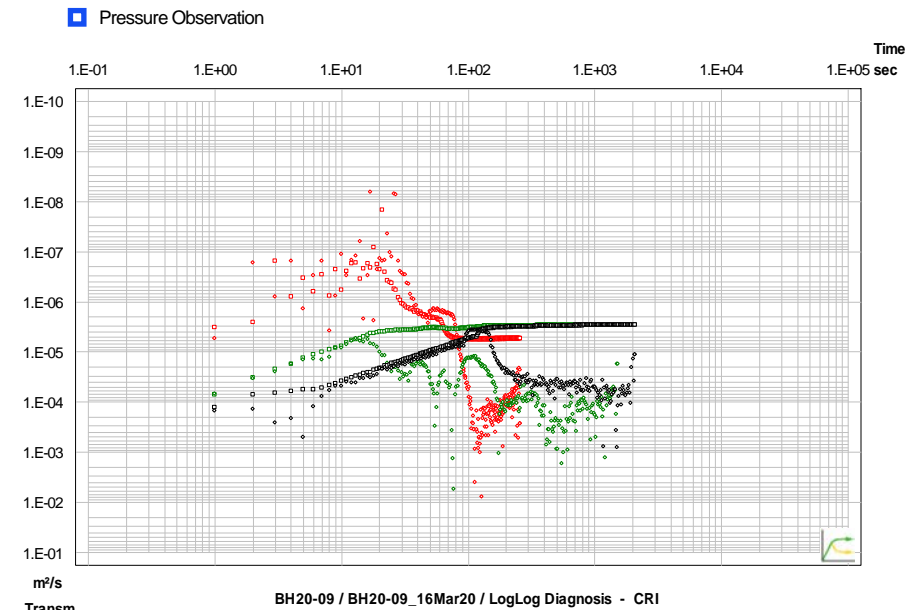
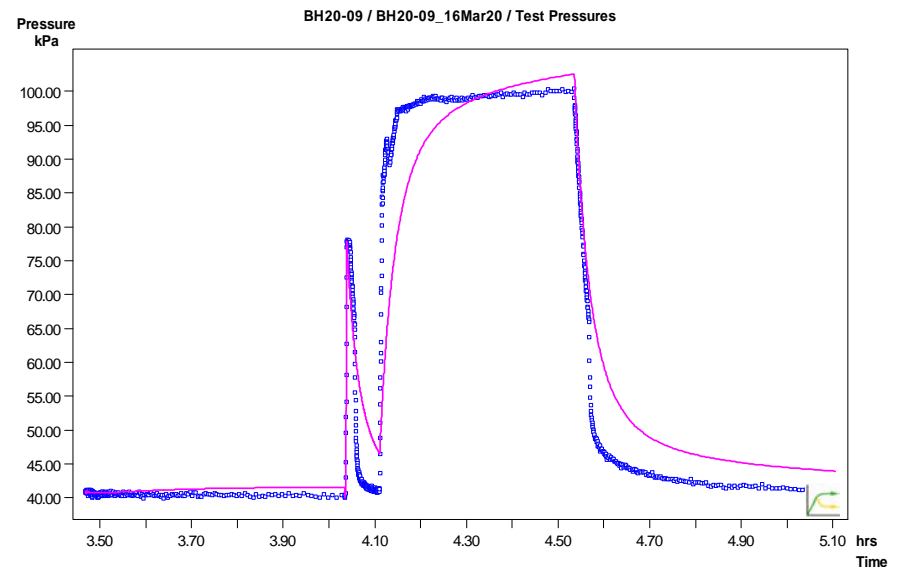
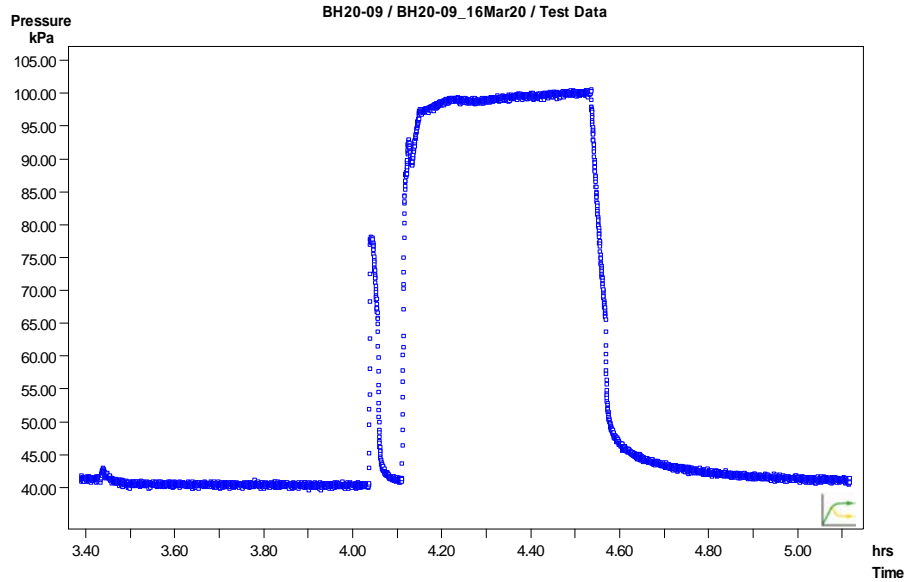
CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-14
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE	<b>PACKER TEST RESULTS BH20-08 LOWER INTERVAL (10.5 to 15.6 mbgs)</b>		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-018

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2022-02-14

PREPARED PGM

DESIGN ML

REVIEW ###

APPROVED

TITLE

**PACKER TEST RESULTS BH20-09 UPPER INTERVAL (5.3 to 10.4 mbgs)**

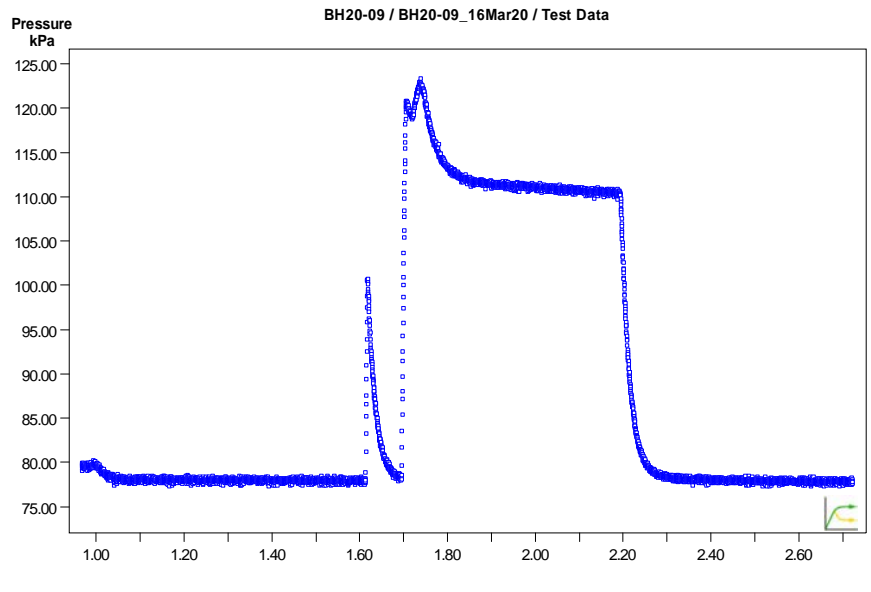
PROJECT No.  
**19129150**

PHASE  
**2300**

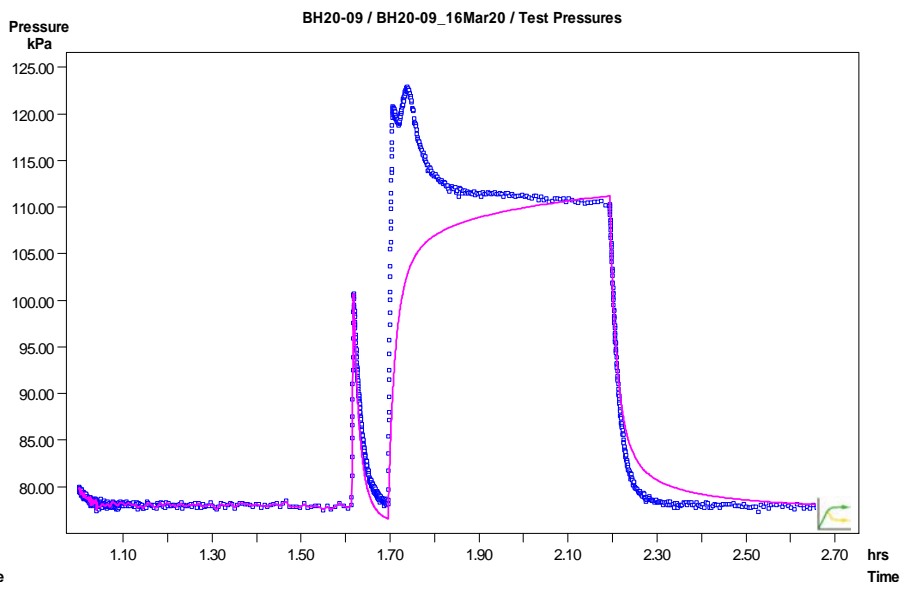
Rev.  
**A**

FIGURE  
**F-019**

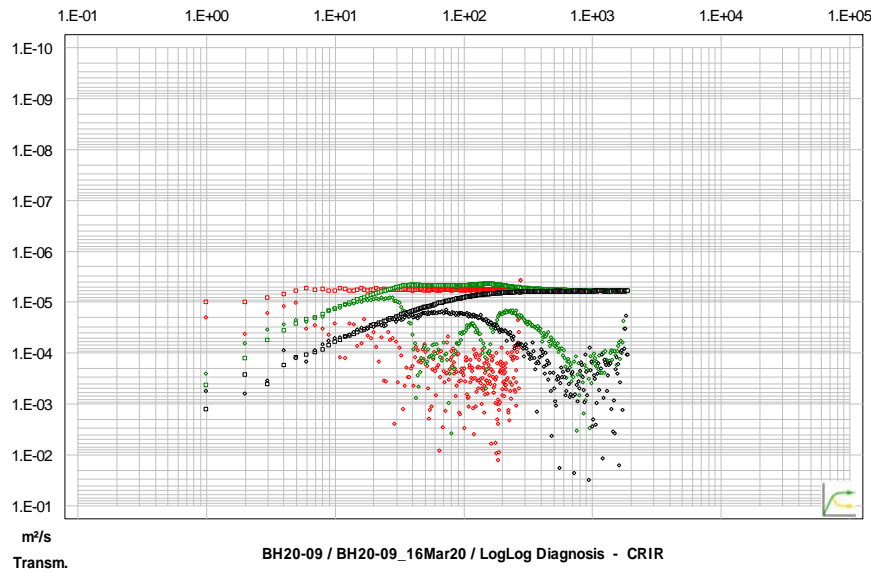
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



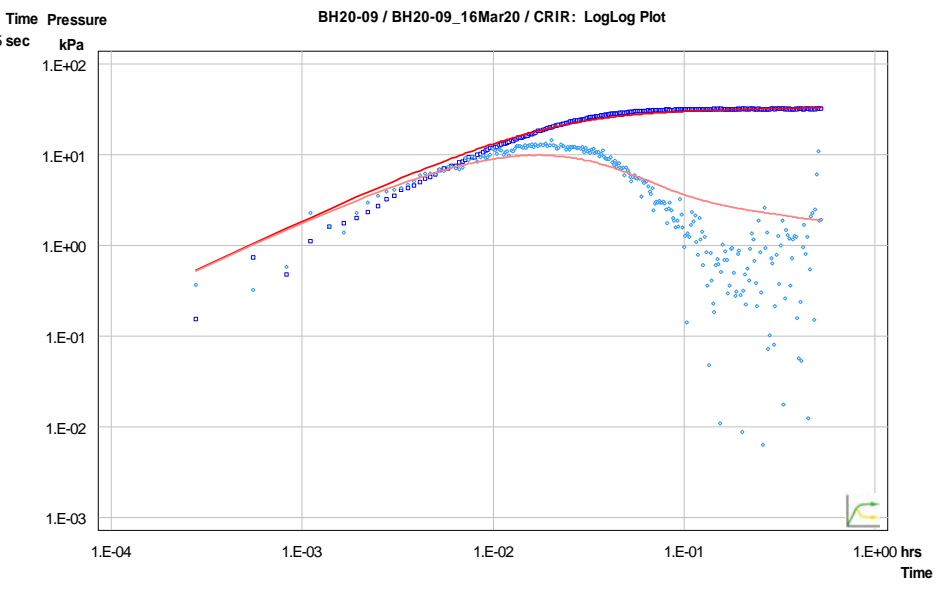
■ Pressure Observation



■ Pressure Observation    — Simulated Pressure



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR



■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-14
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

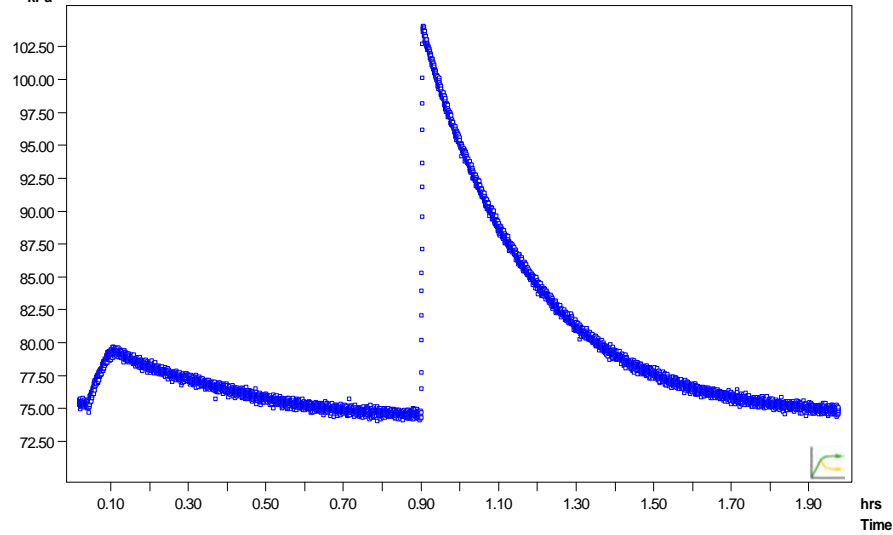
TITLE	<b>PACKER TEST RESULTS BH20-09 LOWER INTERVAL (9.2 to 14.2 mbgs)</b>		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-020

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4

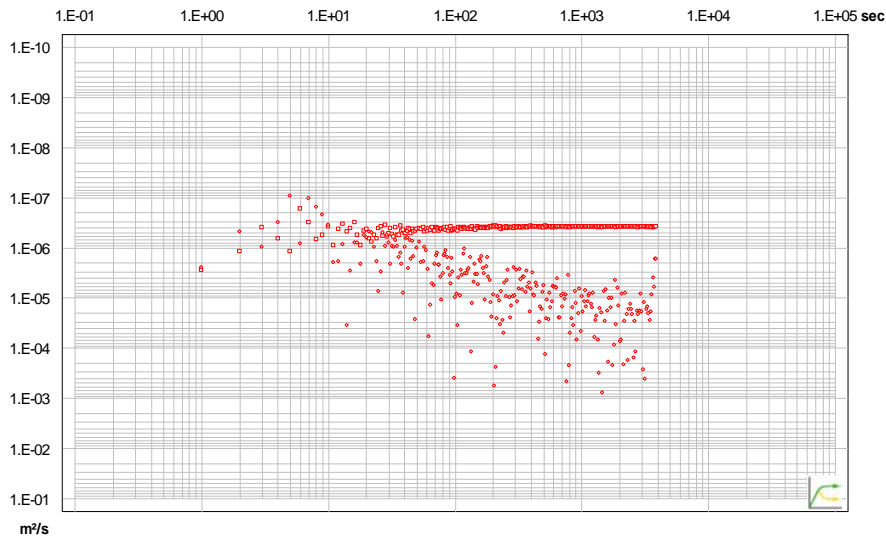


Pressure  
kPa

BH20-10 / BH20-10\_06Apr20 / Test Data



■ Pressure Observation



BH20-10 / BH20-10\_06Apr20 / LogLog Diagnosis - SIR

- Pressure Observation SI      ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR   ◆ Pressure Derivative CRIR

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

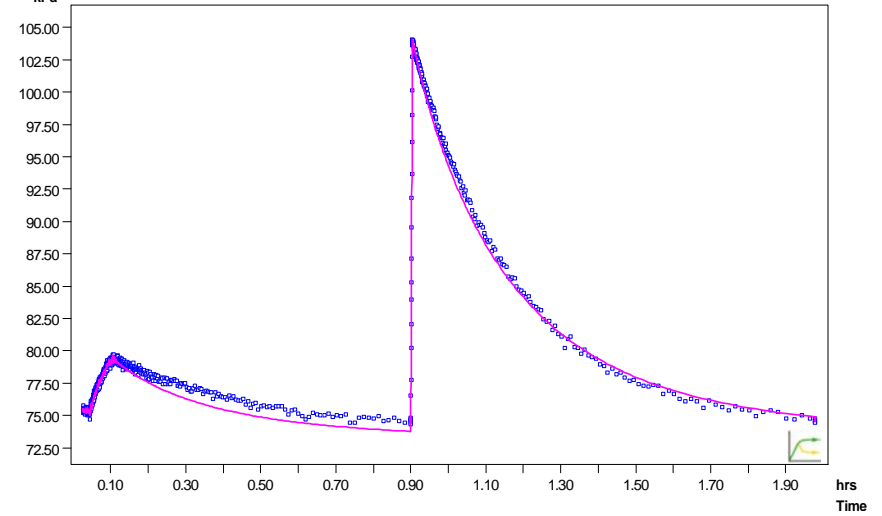
CONSULTANT



YYYY-MM-DD      2022-02-15  
 PREPARED      PGM  
 DESIGN      ML  
 REVIEW      ###  
 APPROVED

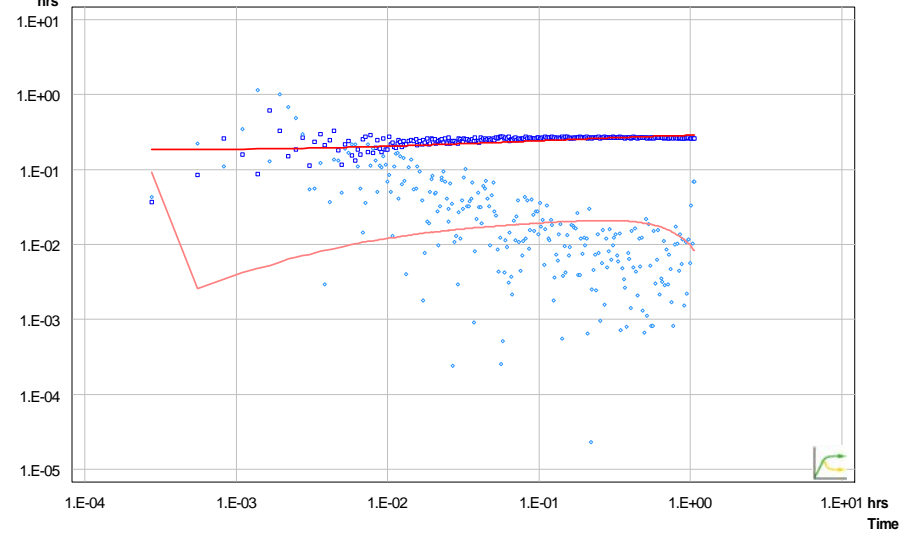
Pressure  
kPa

BH20-10 / BH20-10\_06Apr20 / Test Pressures



■ Pressure Observation      — Simulated Pressure

Deconv. P      BH20-10 / BH20-10\_06Apr20 / SIR: LogLog Plot, constant P(i)



- Pressure Observation Selected Phase      ◆ Pressure Derivative Selected Phase
- Simulated Response      — Simulated Response Derivative

PROJECT

CALEDON PIT / QUARRY

TITLE

PACKER TEST RESULTS BH20-10 UPPER INTERVAL (10.8 to 14.3 mbgs)

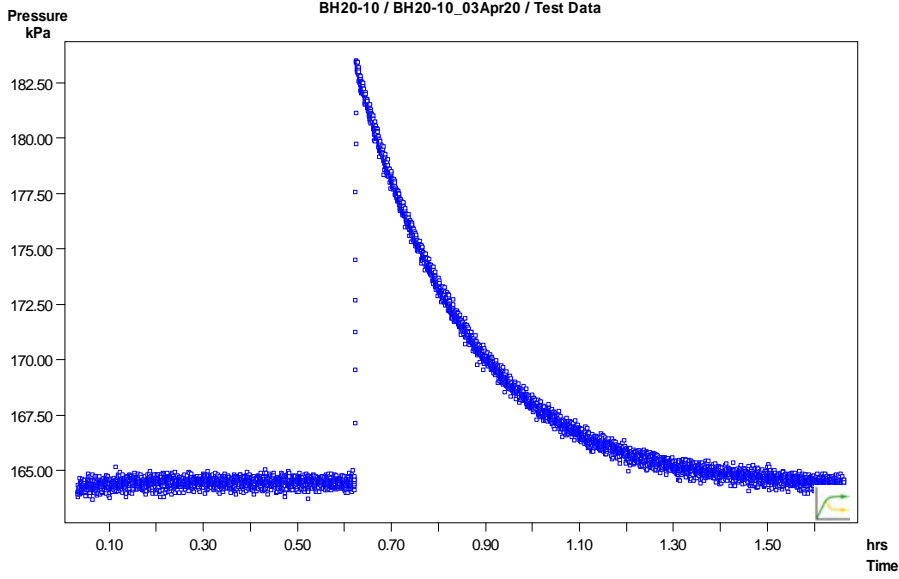
PROJECT No.  
19129150

PHASE  
2300

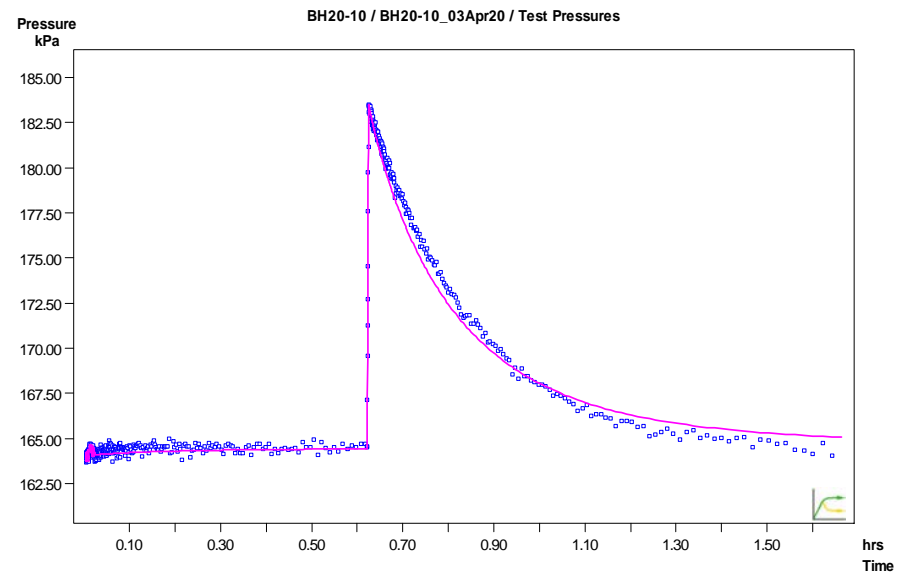
Rev.  
A

FIGURE  
F-021

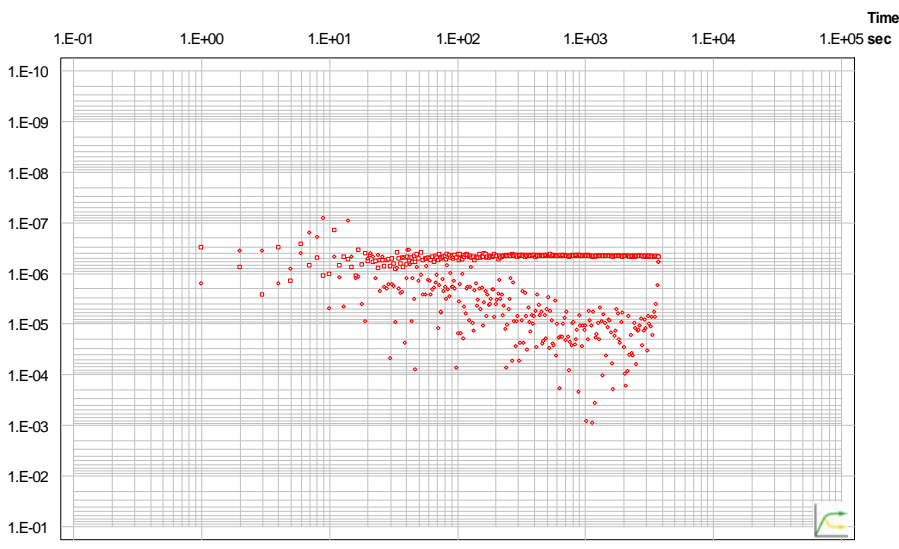
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

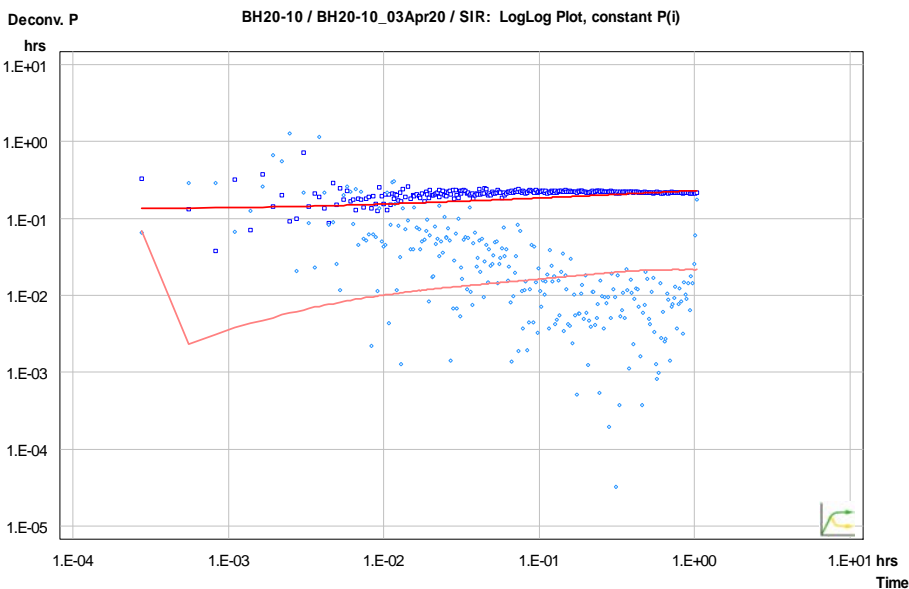


■ Pressure Observation — Simulated Pressure



m<sup>2</sup>/s  
Transm. BH20-10 / BH20-10\_03Apr20 / LogLog Diagnosis - SIR

- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR



- Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase
- Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**      PROJECT: **CALEDON PIT / QUARRY**

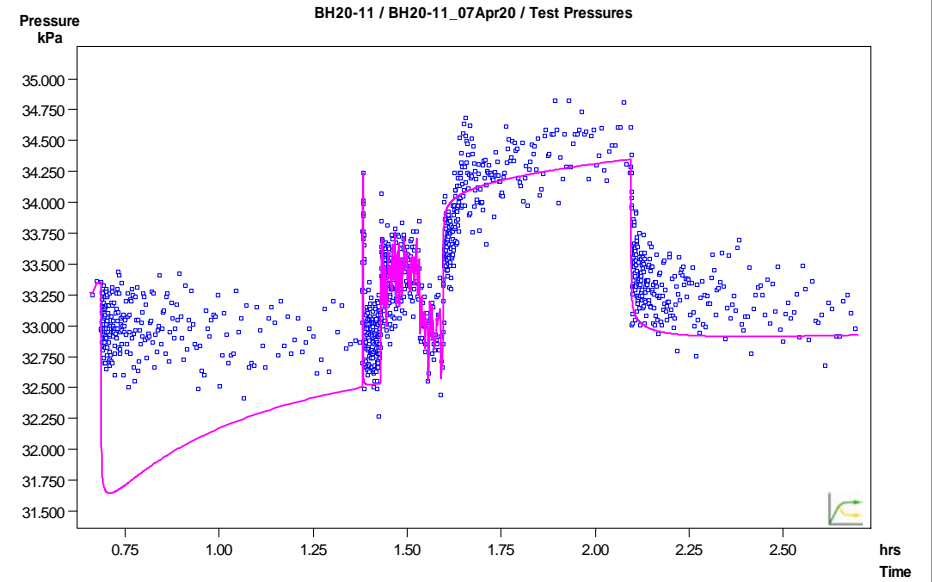
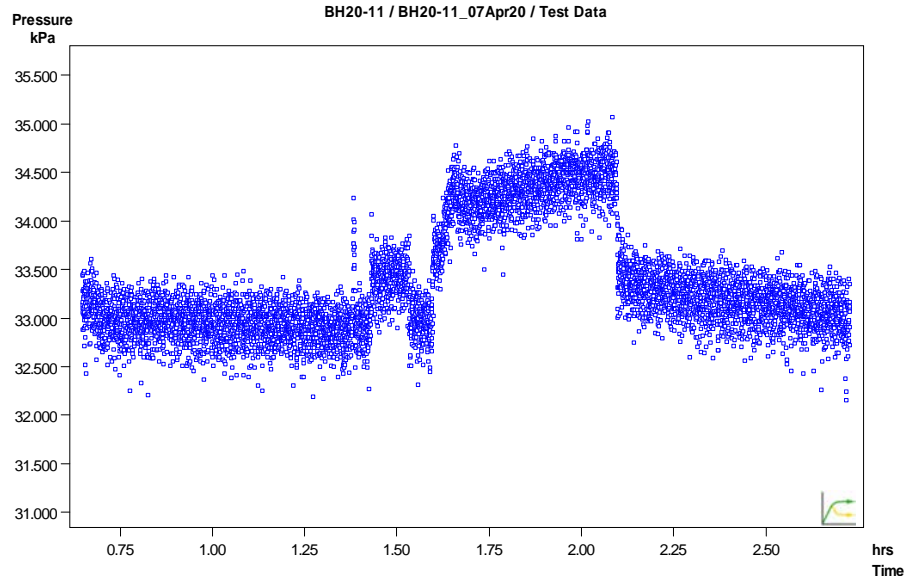
CONSULTANT: **GOLDER MEMBER OF WSP**

YYYY-MM-DD	2022-02-15
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

TITLE: **PACKER TEST RESULTS BH20-10 LOWER INTERVAL (13.3 to 16.9 mbgs)**

PROJECT No.	19129150	PHASE	2300	Rev.	A	FIGURE	F-022
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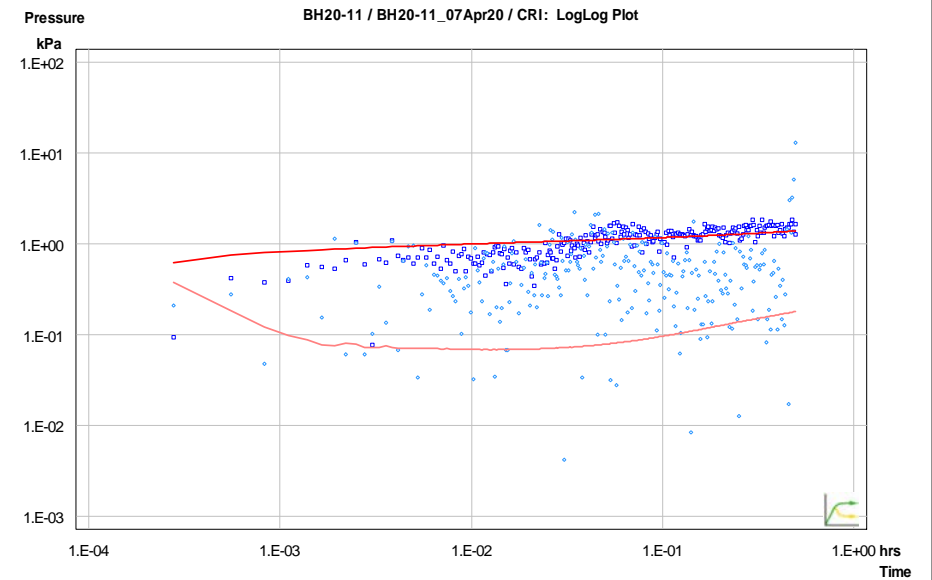
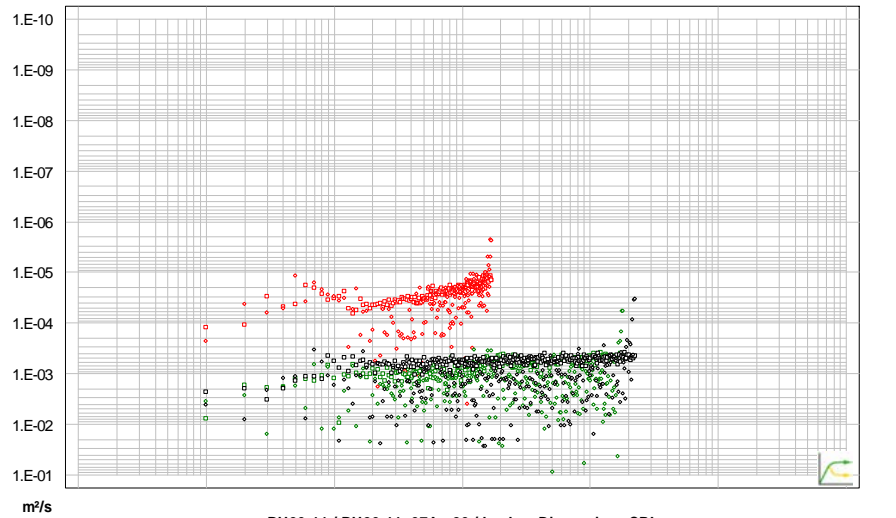
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

Time  
1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure



m<sup>2</sup>/s  
Transm. BH20-11 / BH20-11\_07Apr20 / LogLog Diagnosis - CRI

- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase
- Simulated Response     — Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-15

PREPARED PGM  
DESIGN ML  
REVIEW ###  
APPROVED

TITLE

PACKER TEST RESULTS BH20-11 SINGLE INTERVAL (4.7 to 8.2 mbgs)

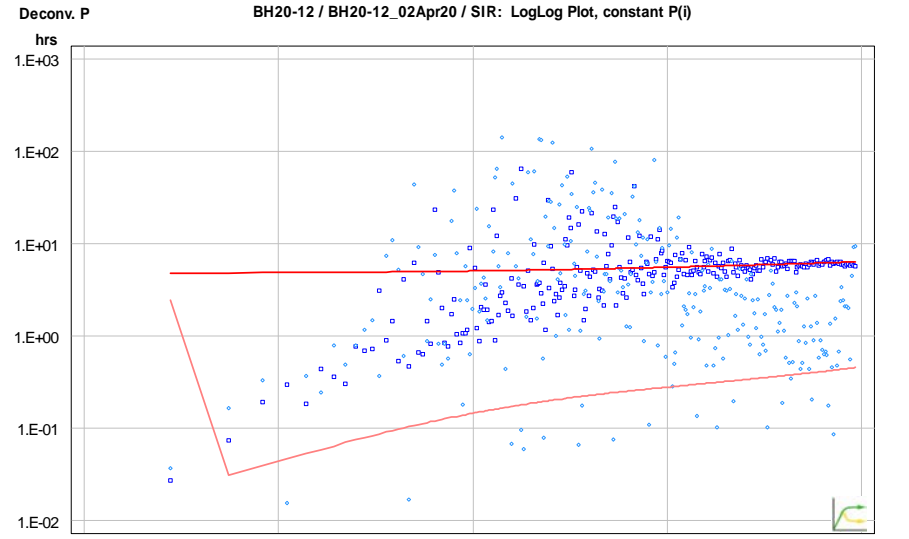
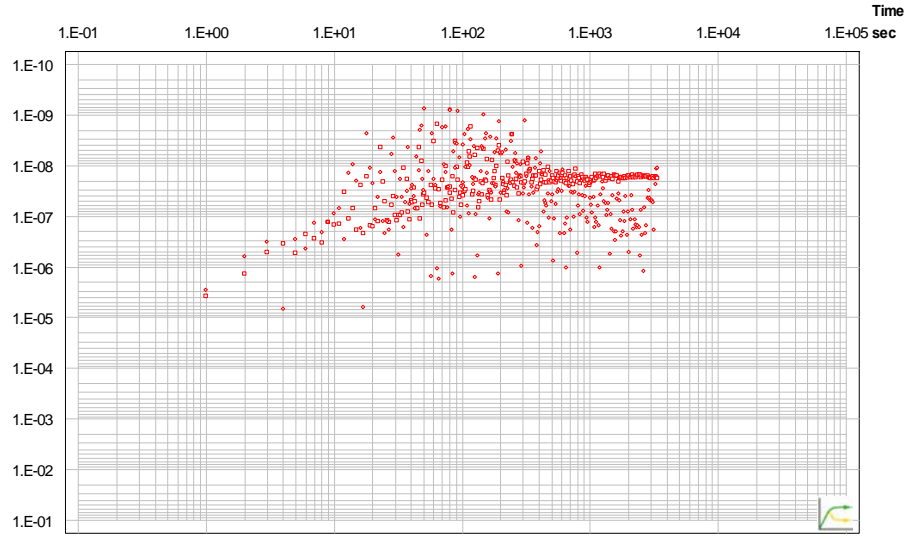
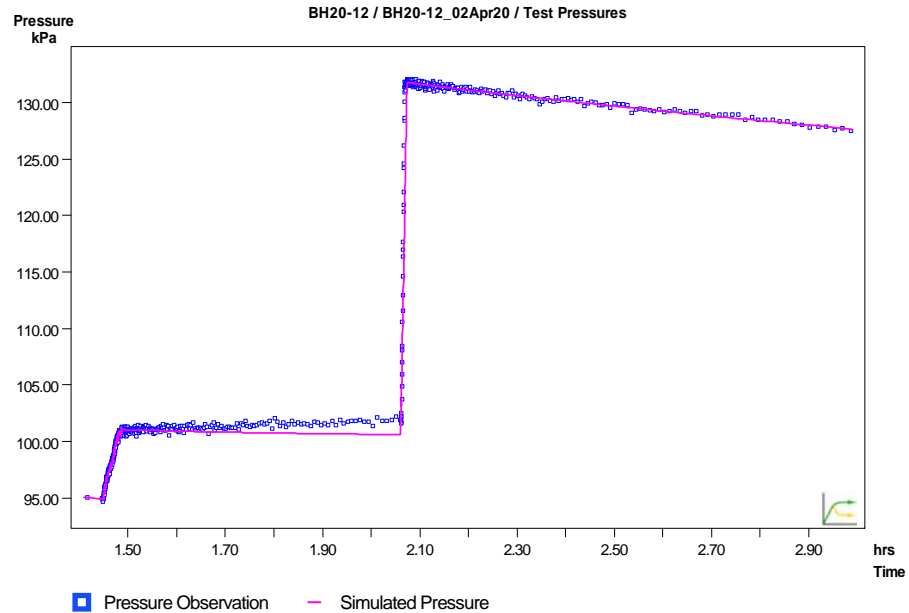
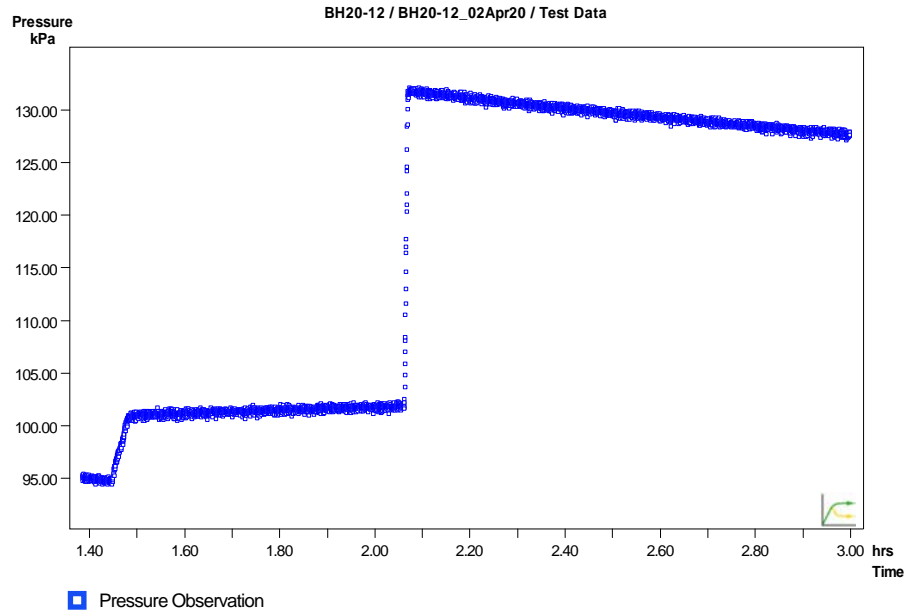
PROJECT No.  
19129150

PHASE  
2300

Rev.  
A

FIGURE  
F-023

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT

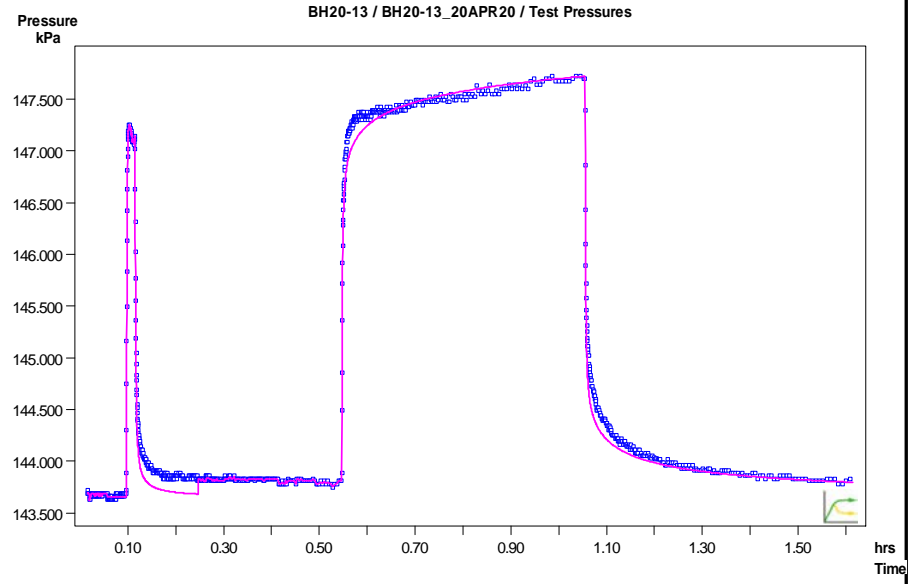
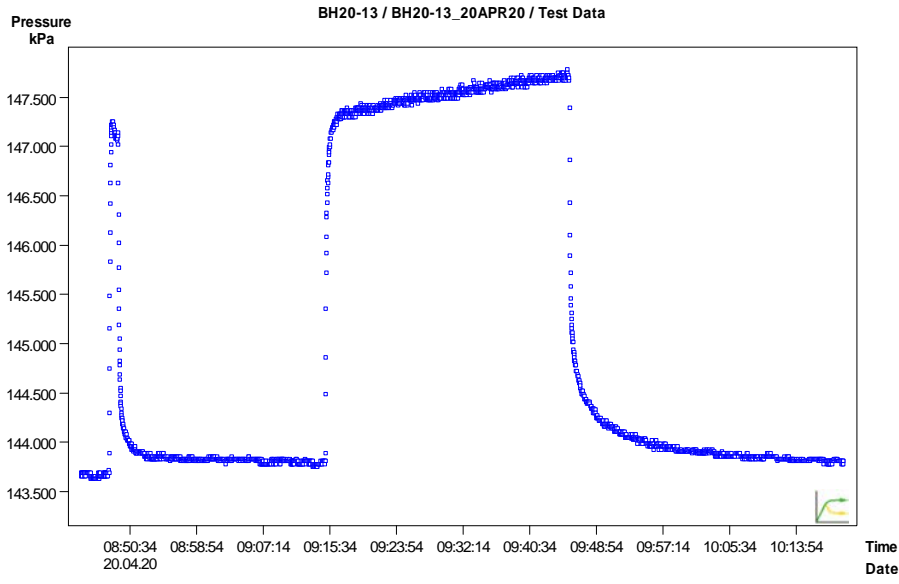
	YYYY-MM-DD	2022-02-15
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE  
**PACKER TEST RESULTS BH20-12 SINGLE INTERVAL (14.1 to 19.2 mbgs)**

PROJECT No.	PHASE	Rev.	FIGURE
<b>19129150</b>	<b>2300</b>	<b>A</b>	<b>F-024</b>

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





■ Pressure Observation

Time Date

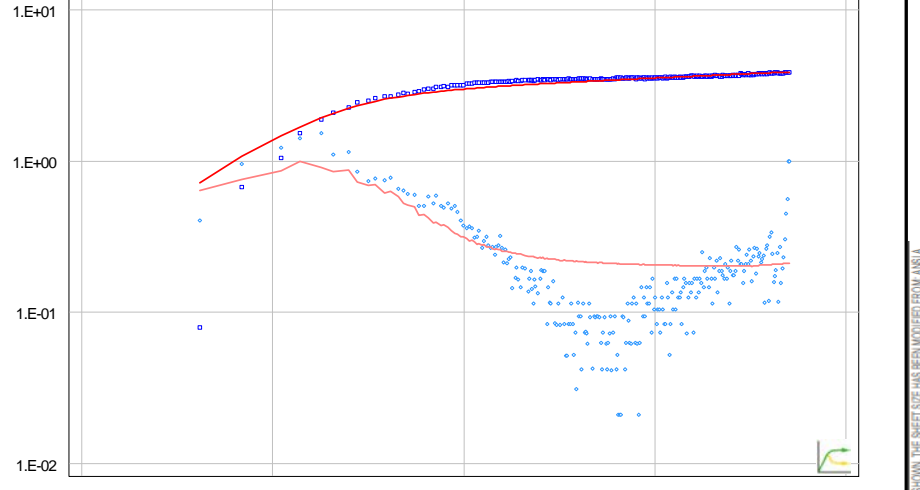
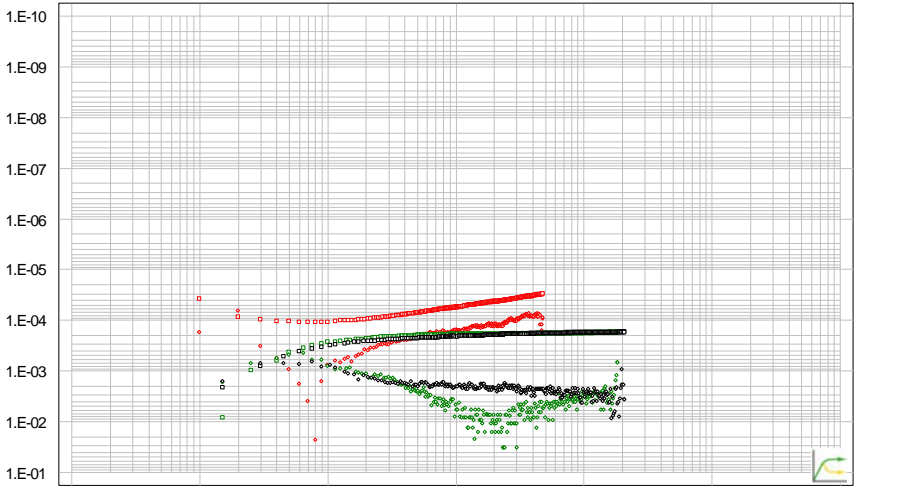
Time

1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure

Pressure

BH20-13 / BH20-13\_20APR20 / CRI: LogLog Plot



Transm.

BH20-13 / BH20-13\_20APR20 / LogLog Diagnosis - CRI

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase

— Simulated Response    — Simulated Response Derivative

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

CONSULTANT

**GOLDER**  
MEMBER OF WSP

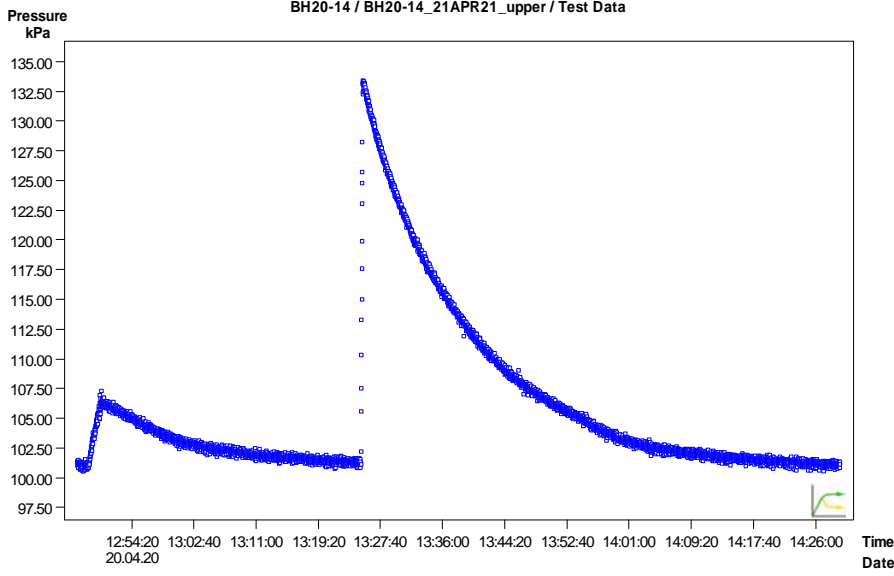
YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE

**PACKER TEST RESULTS BH20-13 OPEN BOREHOLE (5.9 to 22.8 mbgs)**

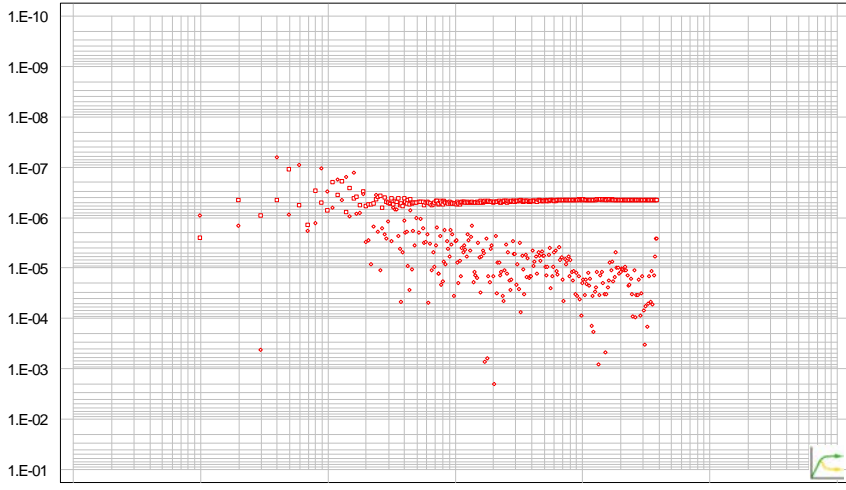
PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-025

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



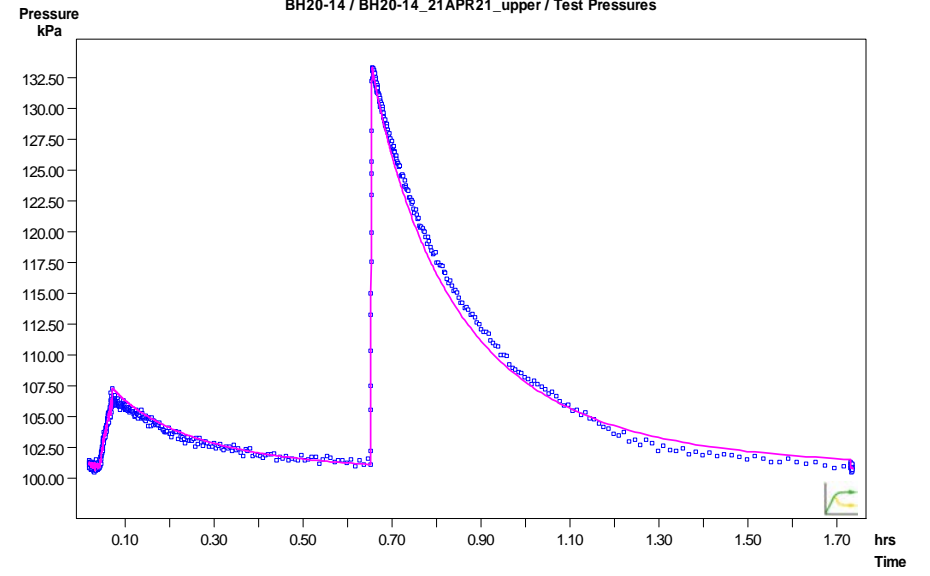
■ Pressure Observation

Time Date  
1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec



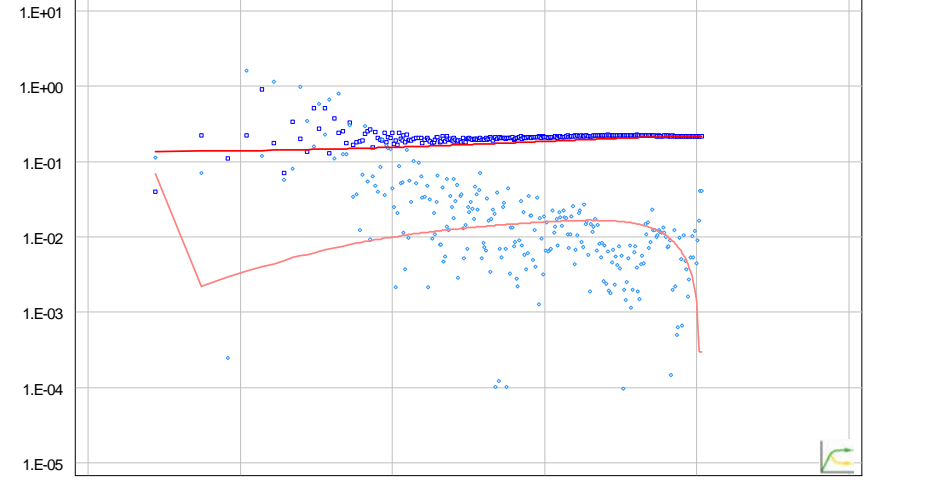
m³/s  
Transm. BH20-14 / BH20-14\_21APR21\_upper / LogLog Diagnosis - SIR

- Pressure Observation SI
- Pressure Observation CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative SI
- ◆ Pressure Derivative CRI
- ◆ Pressure Derivative CRIR



■ Pressure Observation — Simulated Pressure

Deconv. P  
BH20-14 / BH20-14\_21APR21\_upper / SIR: LogLog Plot, constant P(i)



- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT  
CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT  
CALEDON PIT / QUARRY

CONSULTANT

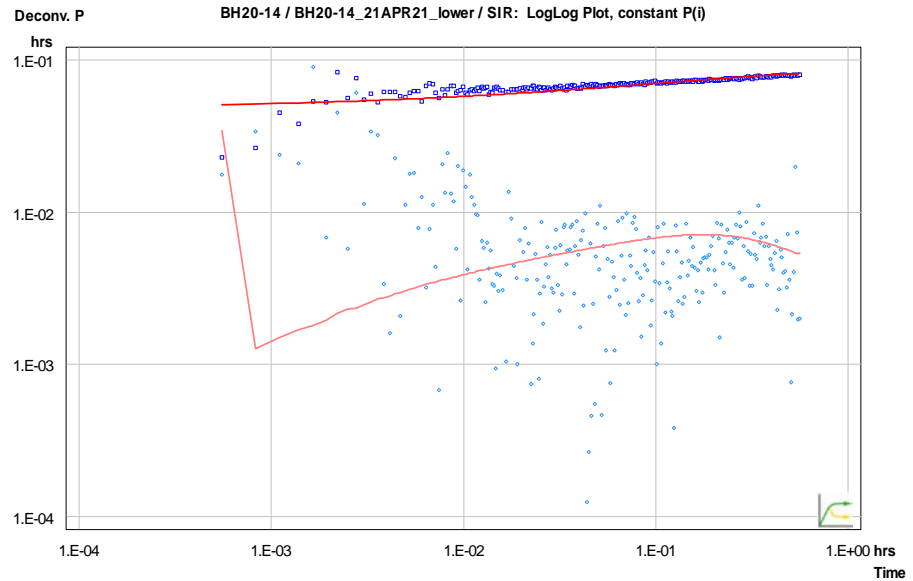
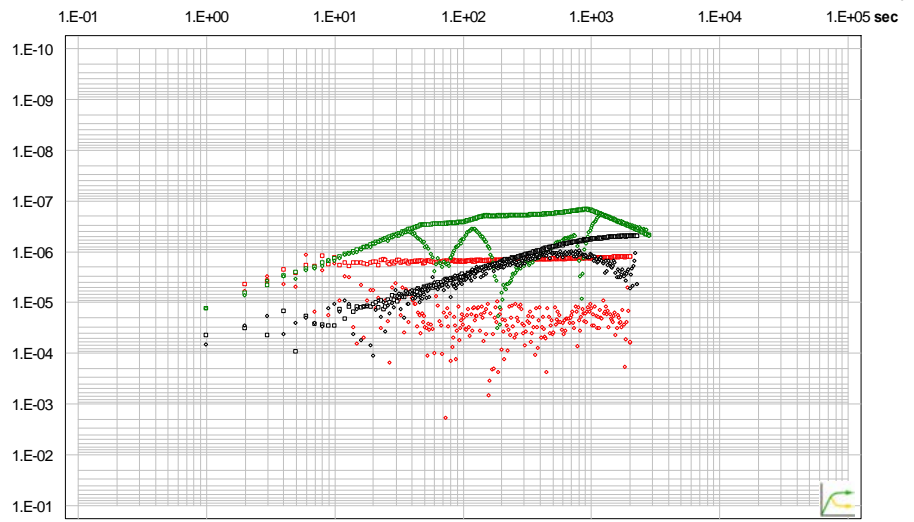
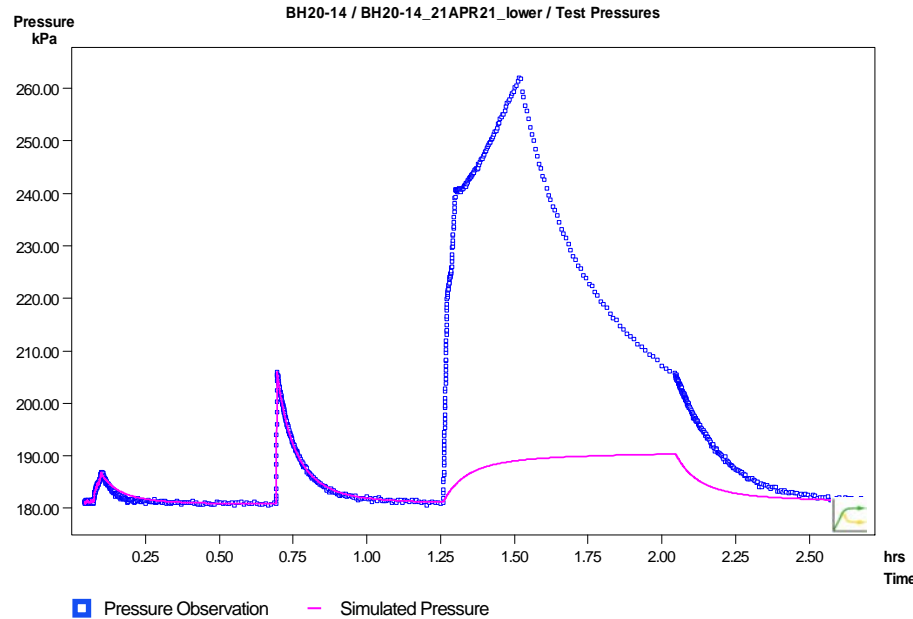
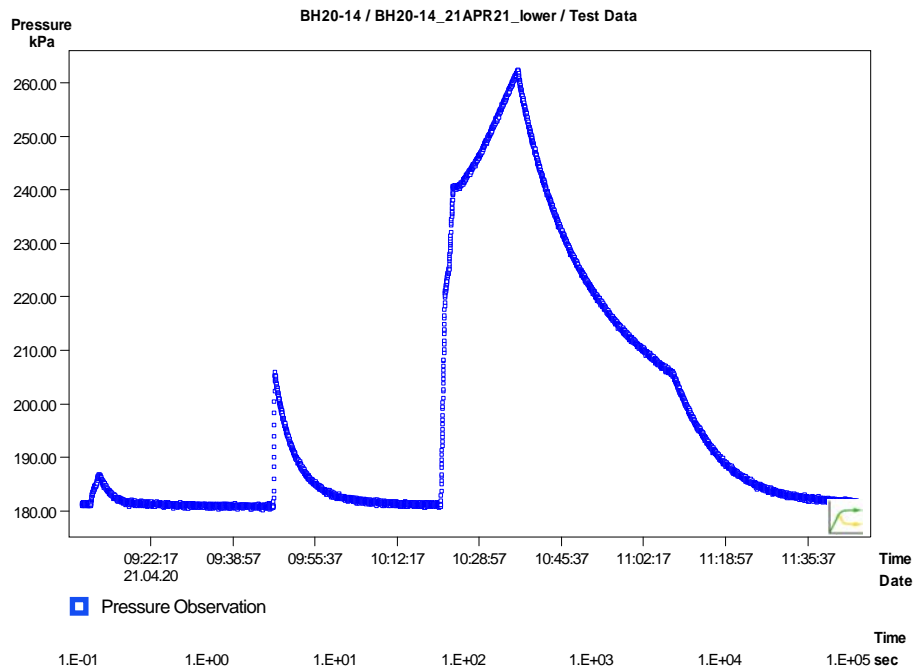
YYYY-MM-DD 2022-02-15  
 PREPARED PGM  
 DESIGN ML  
 REVIEW ###  
 APPROVED

TITLE  
PACKER TEST RESULTS BH20-14 UPPER INTERVAL (10.8 to 19.1 mbgs)

PROJECT No. 19129150 PHASE 2300 Rev. A

FIGURE F-026

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

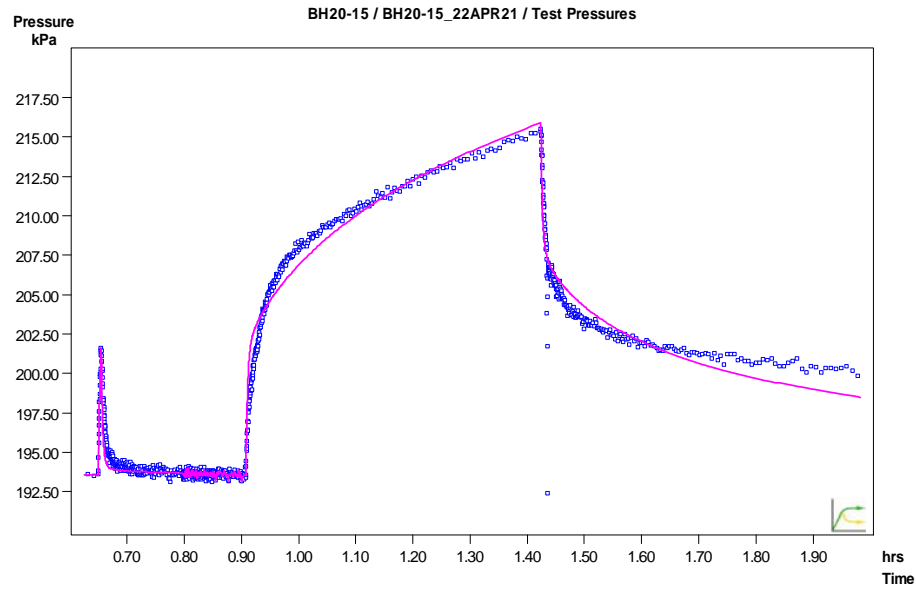
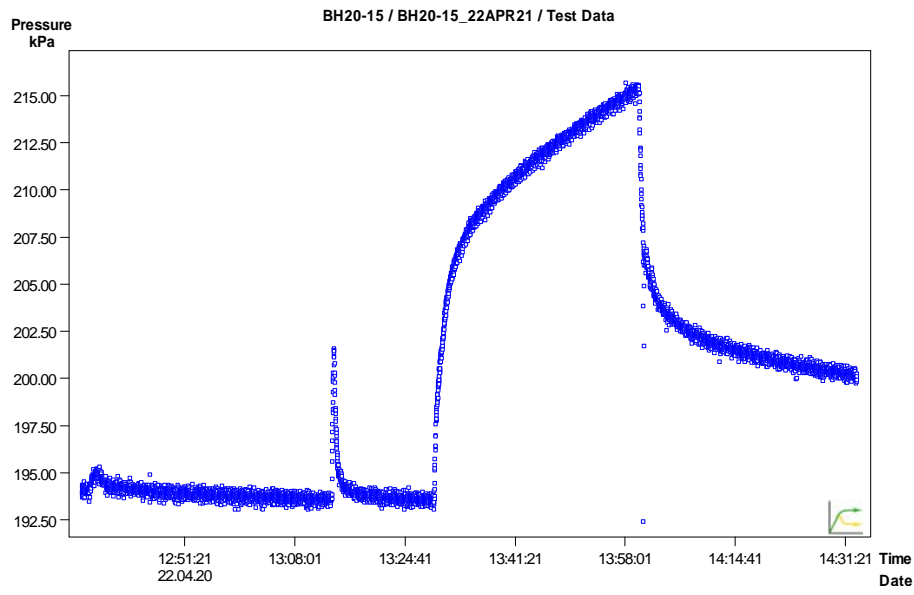
YYYY-MM-DD	2022-02-15
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS BH20-14 LOWER INTERVAL (19.1 to 27.3 mbgs)**

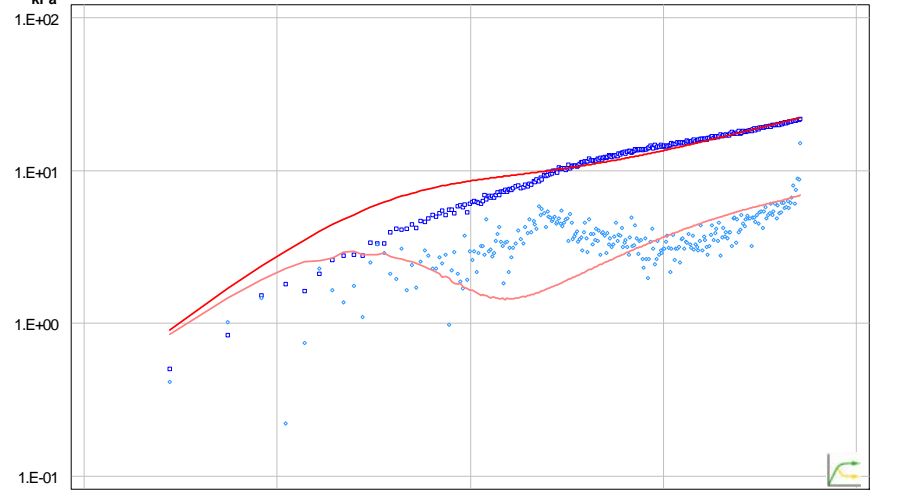
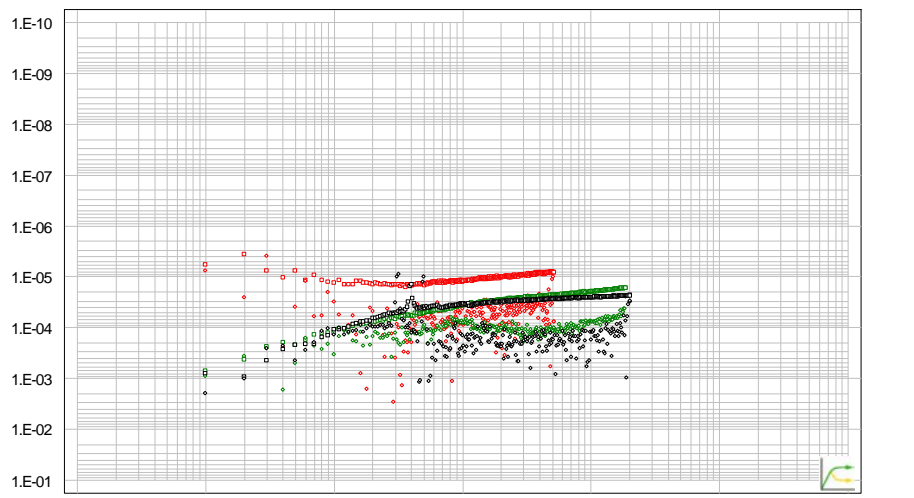
PROJECT No.	19129150	PHASE	2300	Rev.	A	FIGURE	F-027
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1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Transm. **BH20-15 / BH20-15\_22APR21 / LogLog Diagnosis - CRI/CRIR-2 shell**

- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase

— Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT

YYYY-MM-DD    2022-03-14

PREPARED    PGM

DESIGN    ML

REVIEW    ###

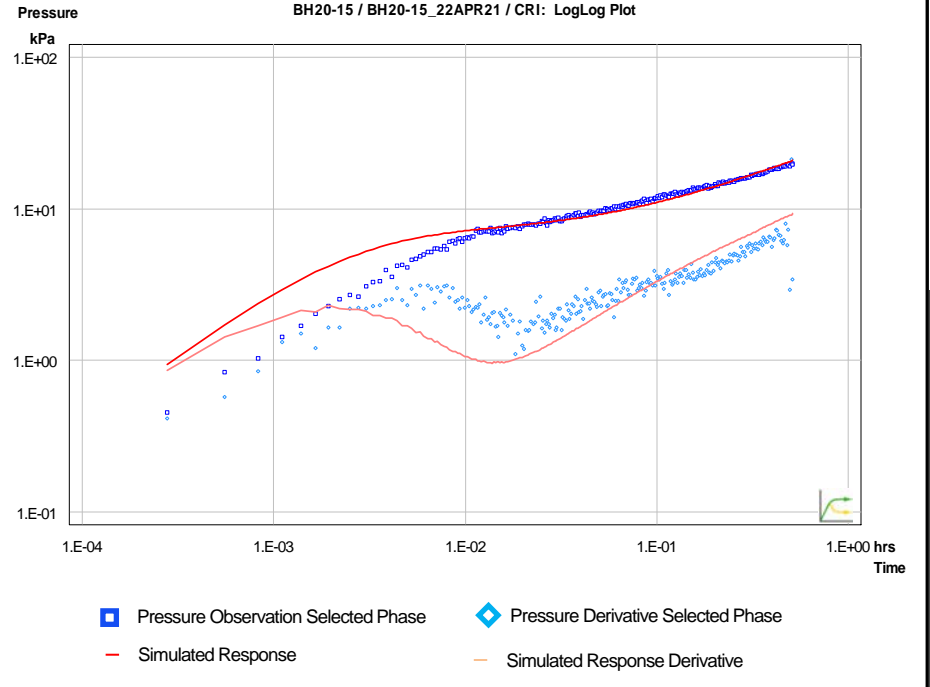
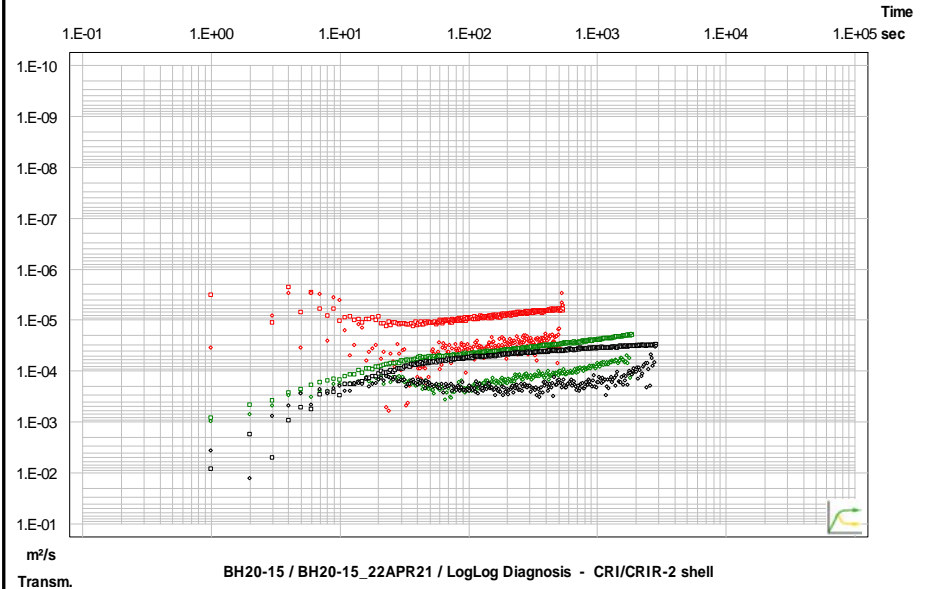
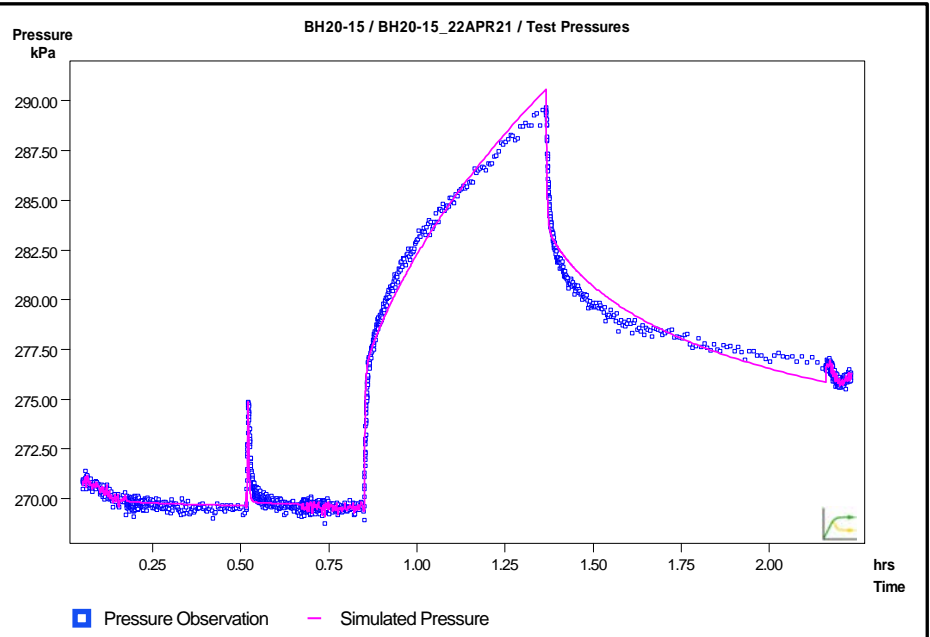
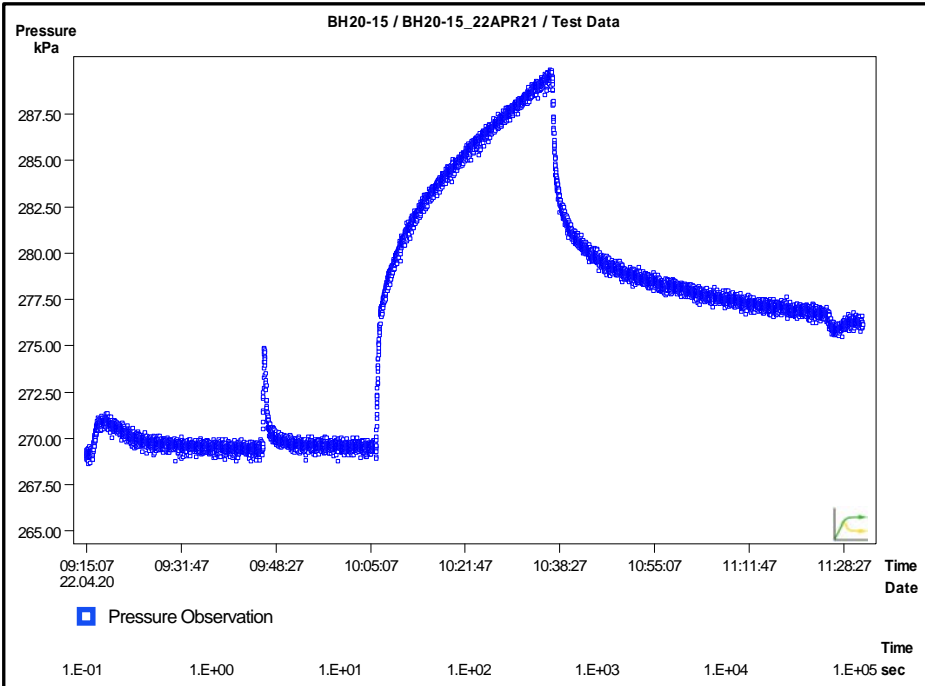
APPROVED

TITLE  
**PACKER TEST RESULTS BH20-15 UPPER INTERVAL (17.2 to 23.9 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-028

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





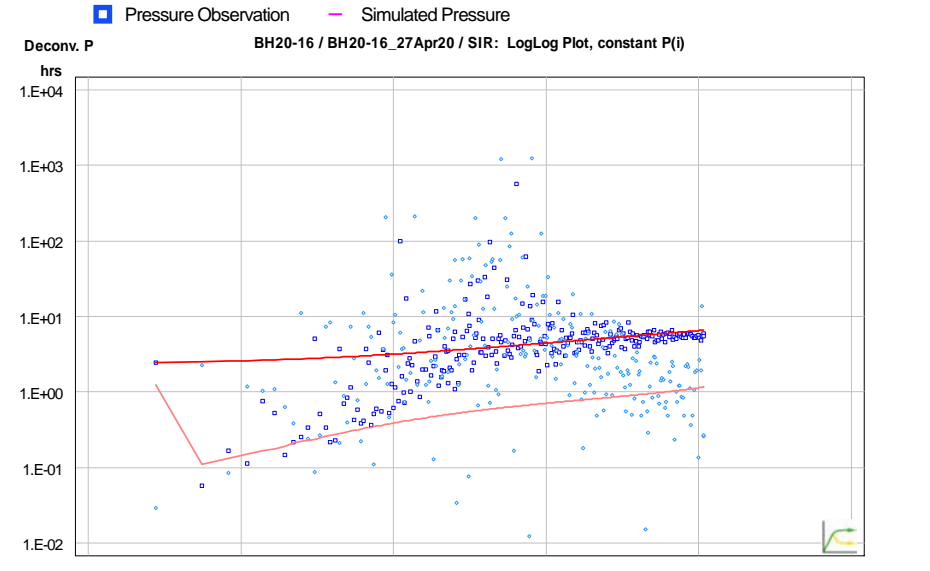
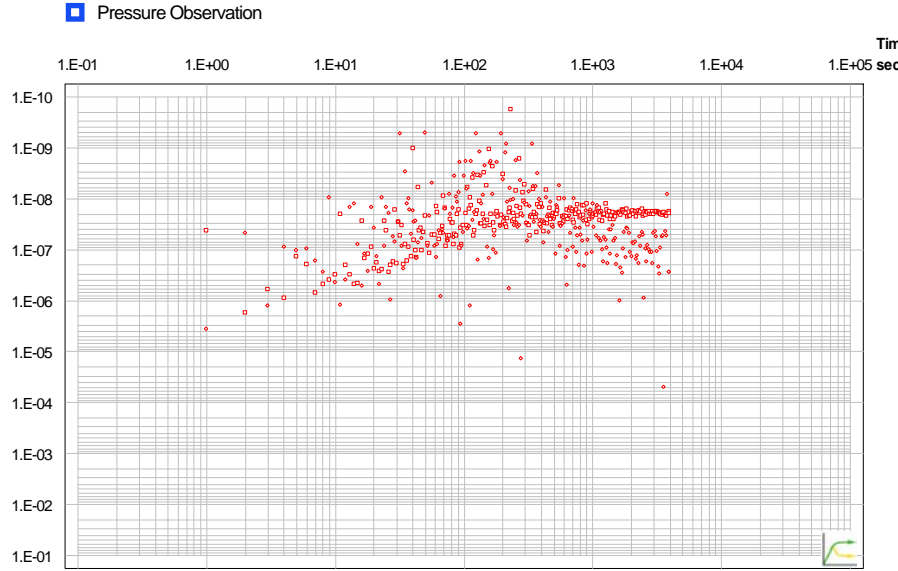
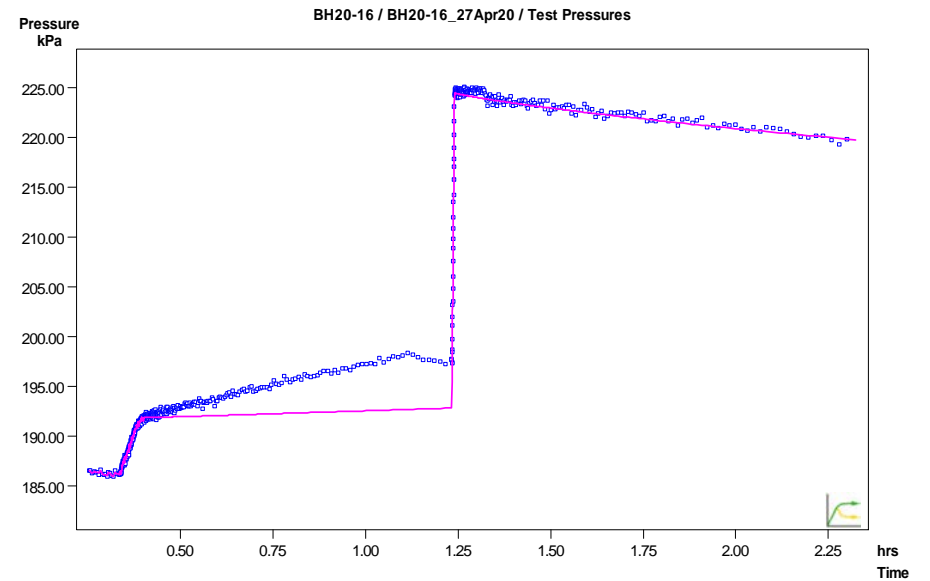
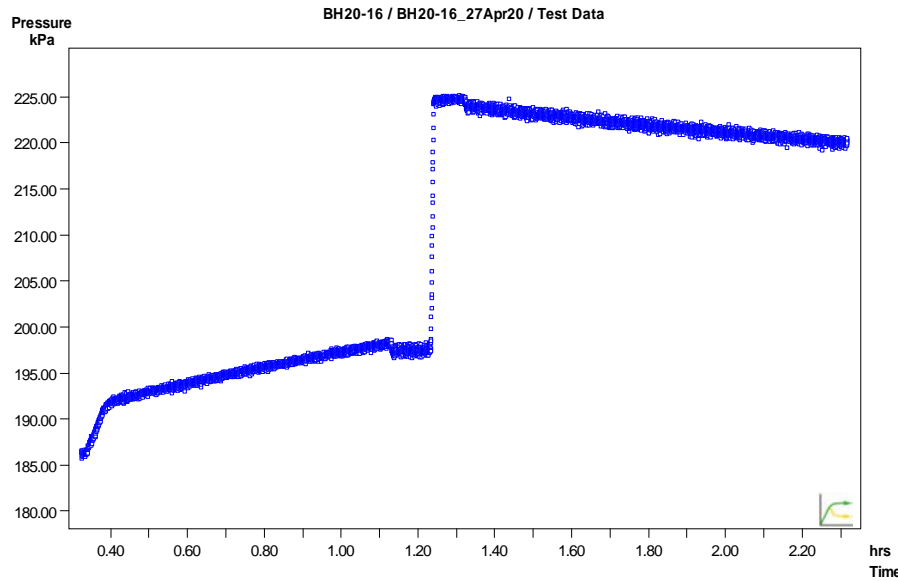
CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON QUARRY**

CONSULTANT	YYYY-MM-DD	2022-03-14
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE	<b>PACKER TEST RESULTS BH20-15 LOWER INTERVAL (23.9 to 32.1 mbgs)</b>		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-029

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

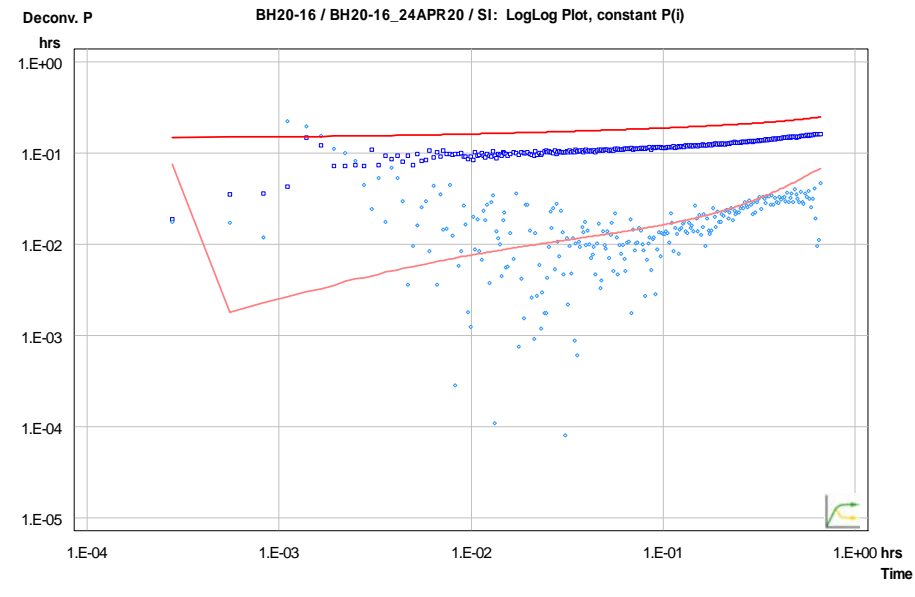
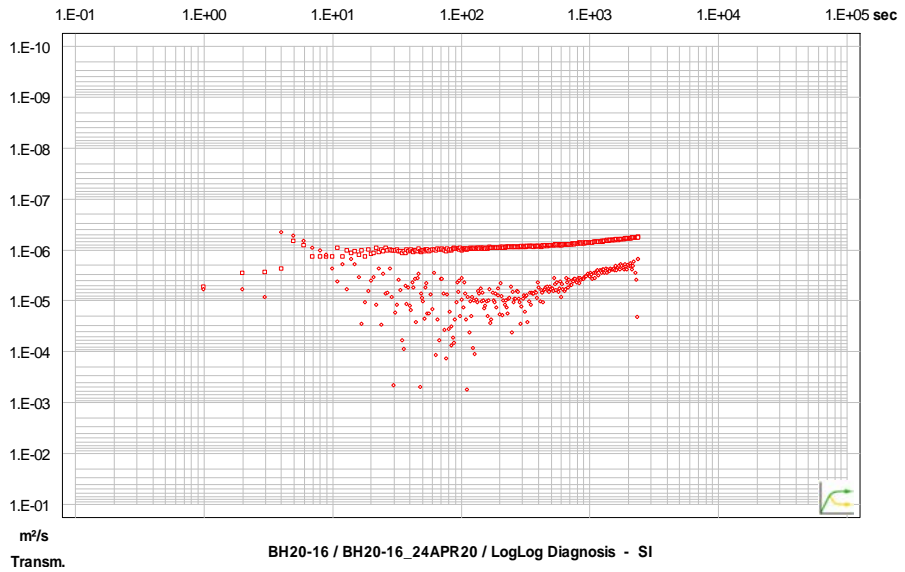
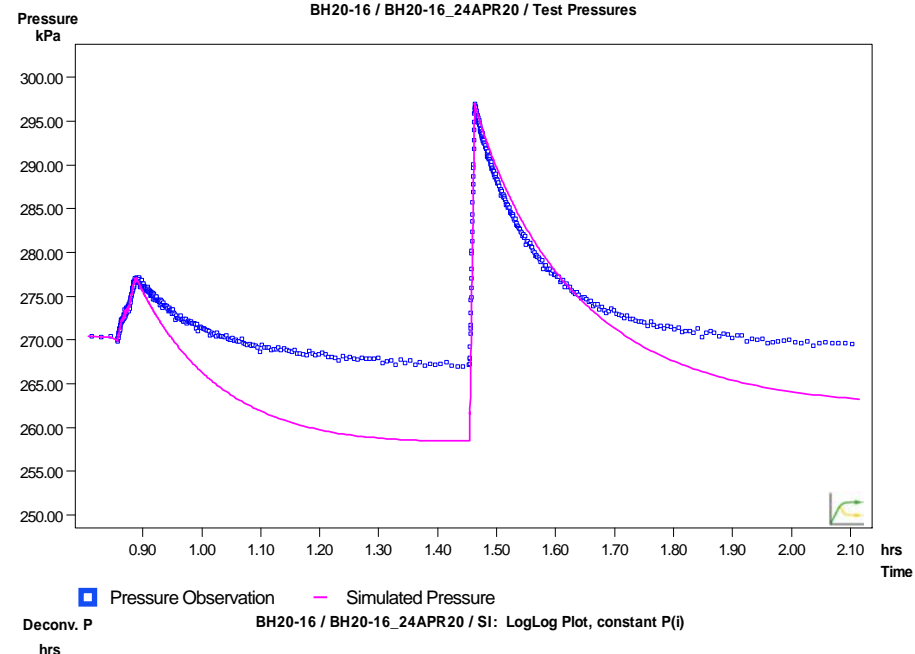
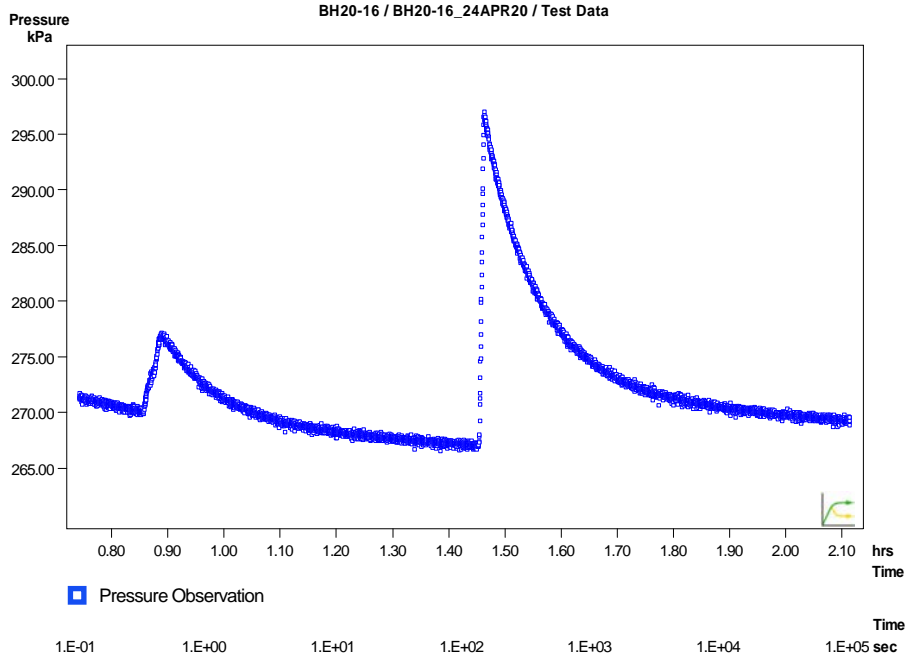
PROJECT  
**CALEDON PIT / QUARRY**



YYYY-MM-DD	2022-02-15
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

TITLE  
**PACKER TEST RESULTS BH20-16 UPPER INTERVAL (15.5 to 23.7 mbgs)**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

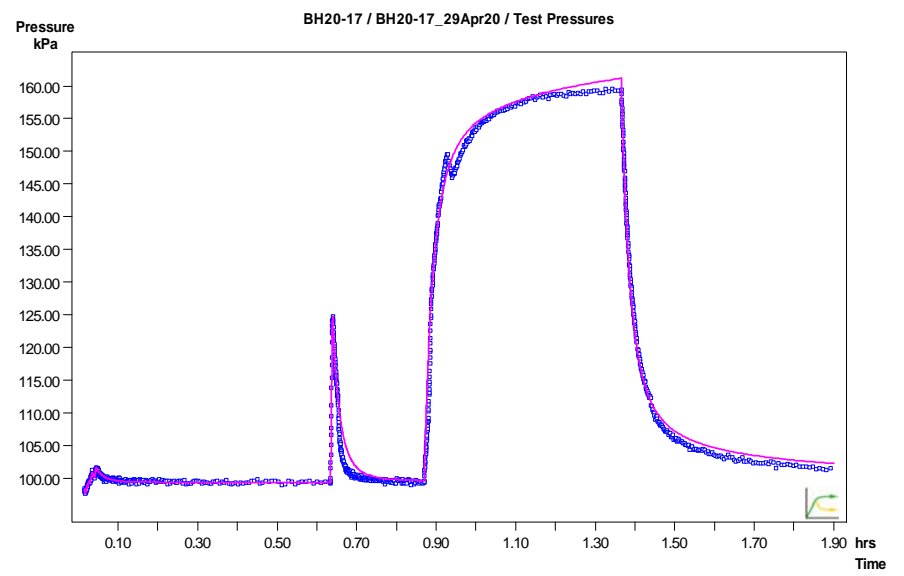
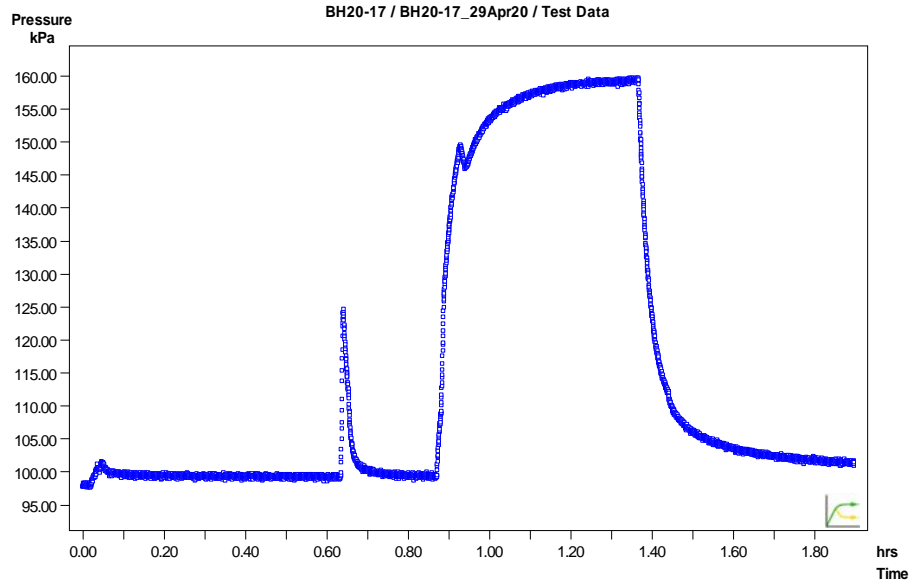


- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase
- Simulated Response     — Simulated Response Derivative

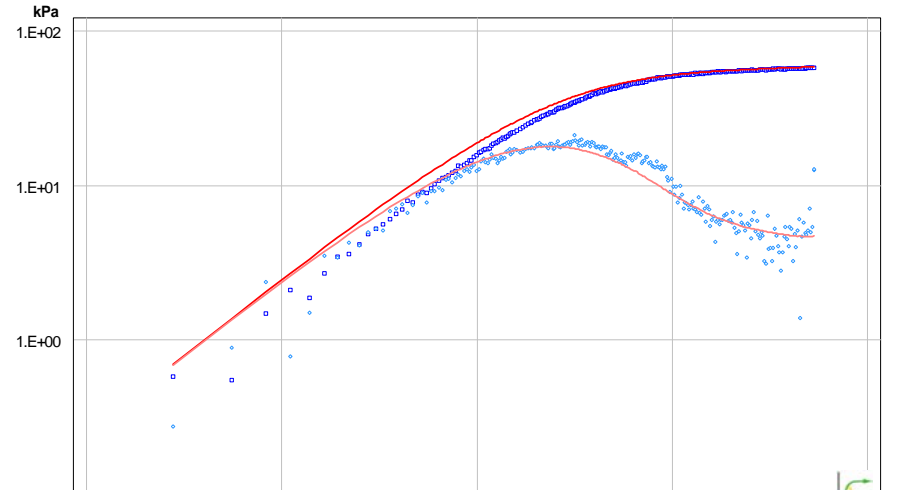
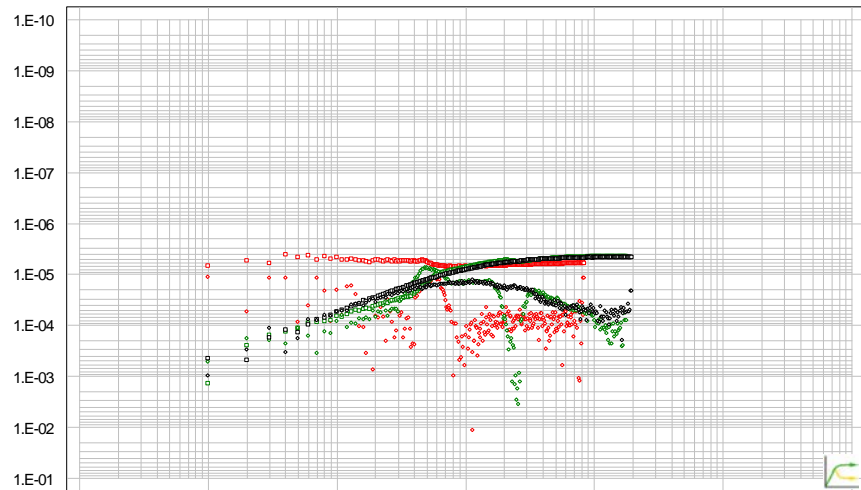
<p>CLIENT <b>CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)</b></p> <p>CONSULTANT <b>GOLDER</b> MEMBER OF WSP</p> <p>YYYY-MM-DD     2022-02-15</p> <p>PREPARED     PGM</p> <p>DESIGN     ML</p> <p>REVIEW     ###</p> <p>APPROVED</p>	<p>PROJECT <b>CALEDON PIT / QUARRY</b></p> <p>TITLE <b>PACKER TEST RESULTS BH20-16 LOWER INTERVAL (23.5 to 31.6 mbgs)</b></p> <p>PROJECT No.     19129150     PHASE     2300     Rev.     A     FIGURE     F-031</p>
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1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation  
 1.E-01    1.E+00    1.E+01    1.E+02    1.E+03    1.E+04    1.E+05 sec

■ Pressure Observation    — Simulated Pressure  
 Pressure    BH20-17 / BH20-17\_29Apr20 / CRIR: LogLog Plot



Transm.    BH20-17 / BH20-17\_29Apr20 / LogLog Diagnosis - CRIR

1.E-04    1.E-03    1.E-02    1.E-01    1.E+00 hrs  
 Time

- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase
- Simulated Response    — Simulated Response Derivative

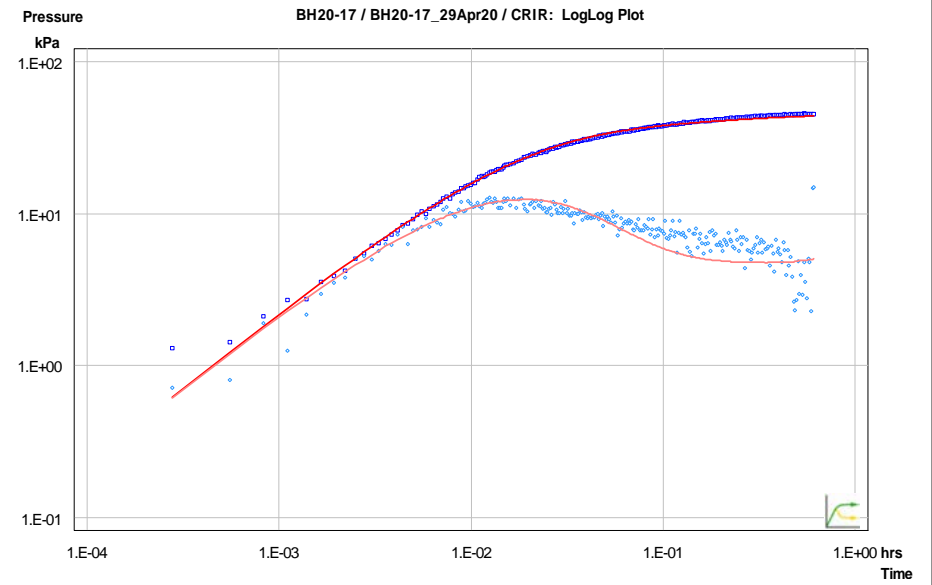
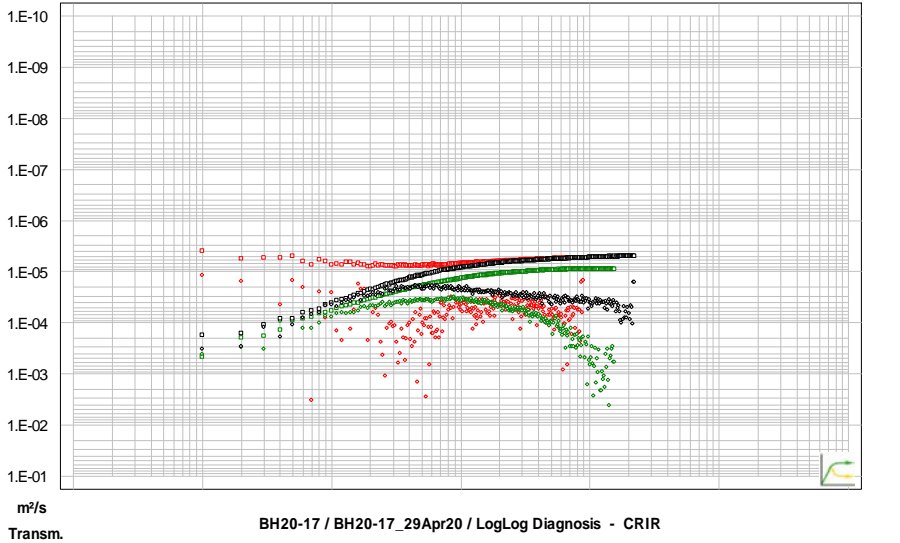
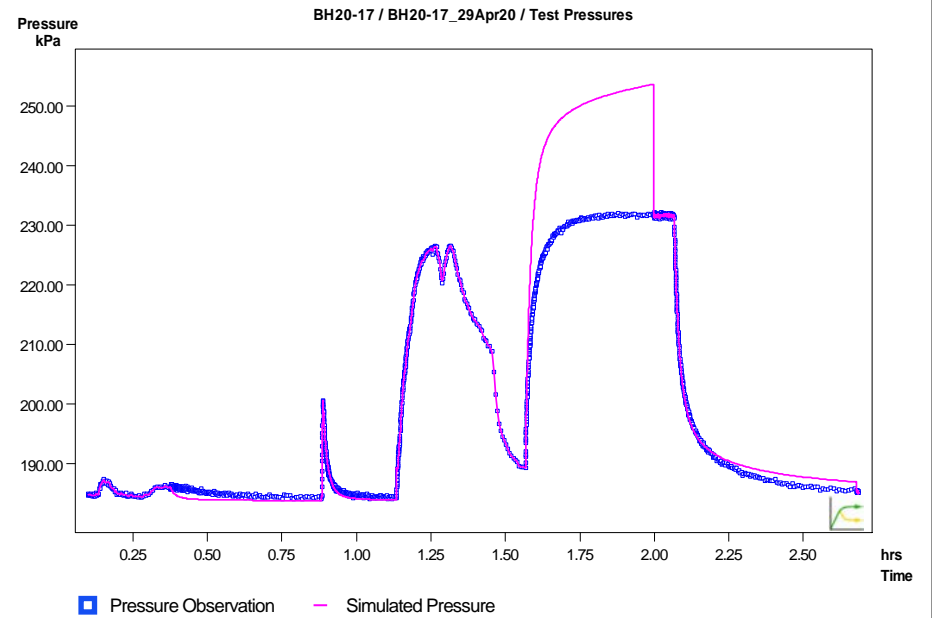
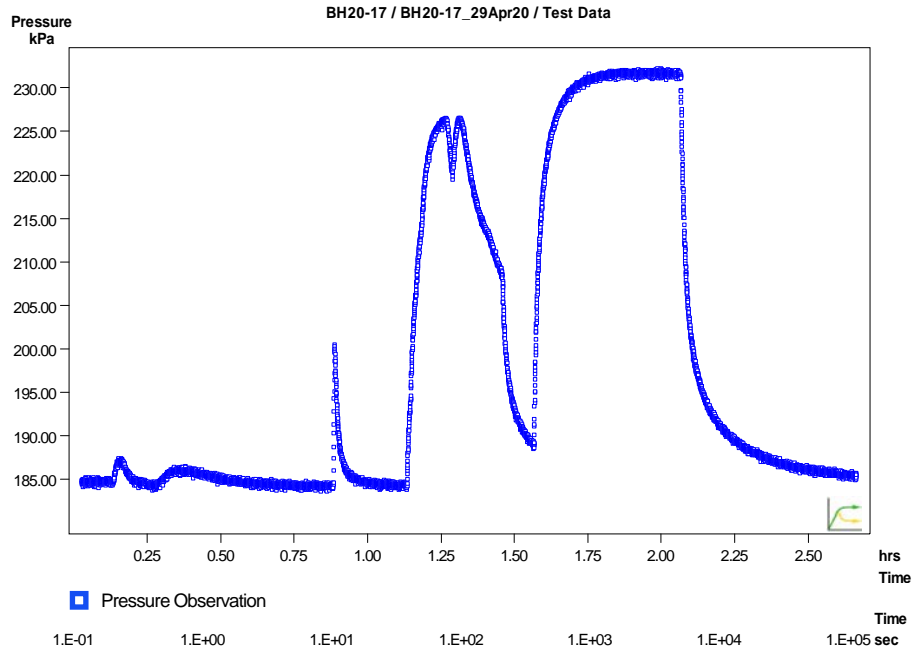
CLIENT    PROJECT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**    **CALEDON PIT / QUARRY**

CONSULTANT    YYY-MM-DD    2022-02-15  
**GOLDER**    PREPARED    PGM  
 MEMBER OF WSP    DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE    PROJECT No.    PHASE    Rev.    FIGURE  
**PACKER TEST RESULTS BH20-17 UPPER INTERVAL (7.8 to 17.4 mbgs)**    19129150    2300    A    F-032

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI 11in





- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD    2022-02-15

PREPARED    PGM

DESIGN    ML

REVIEW    ###

APPROVED

TITLE

**PACKER TEST RESULTS BH20-17 LOWER INTERVAL (16.6 to 26.3 mbgs)**

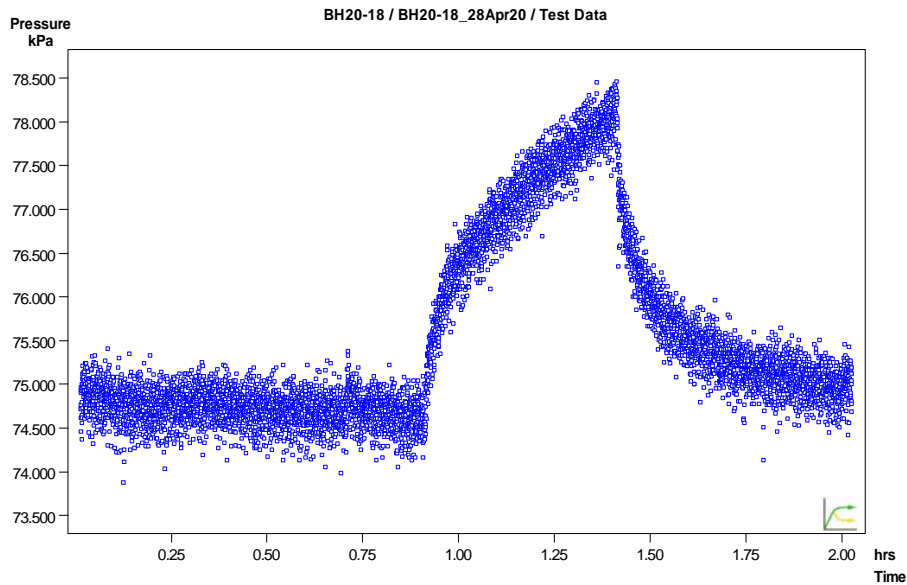
PROJECT No.  
**19129150**

PHASE  
**2300**

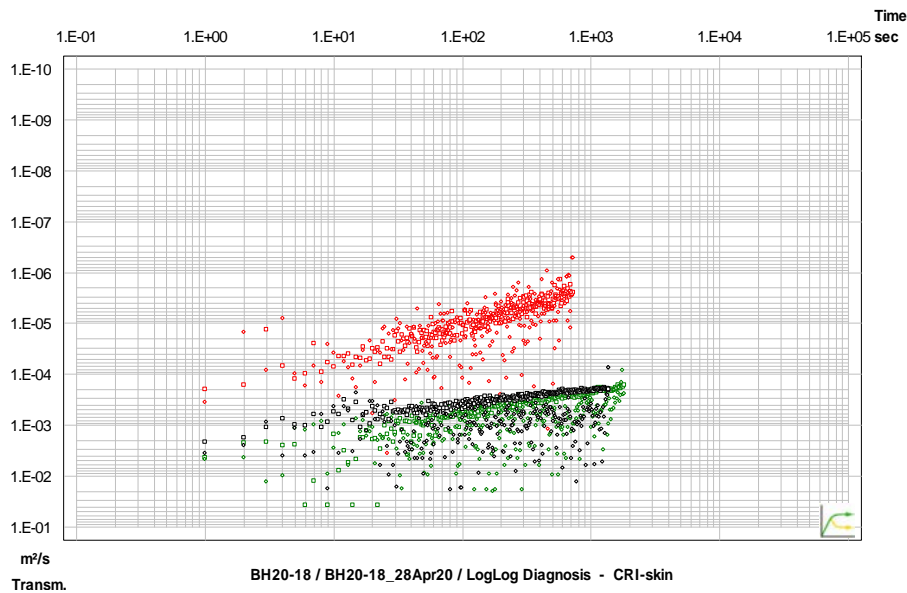
Rev.  
**A**

FIGURE  
**F-033**

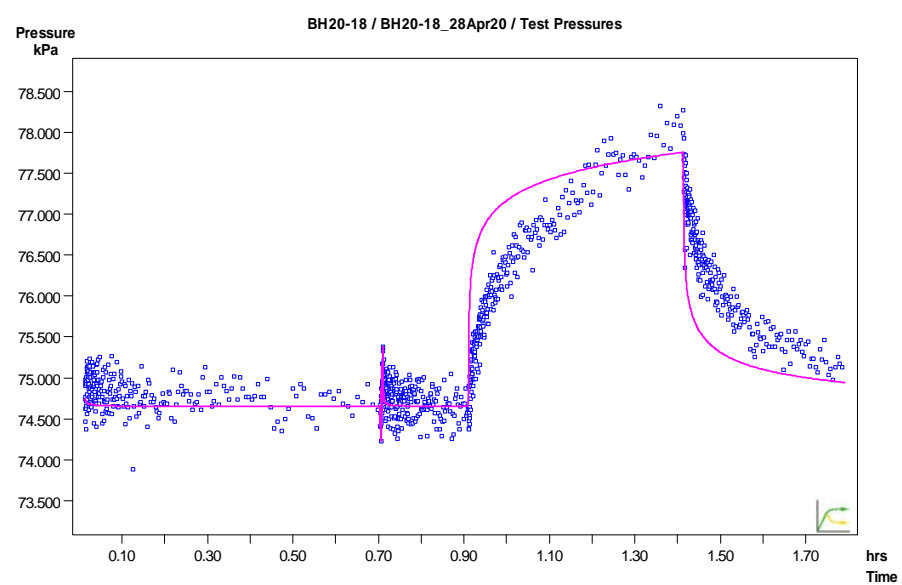
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



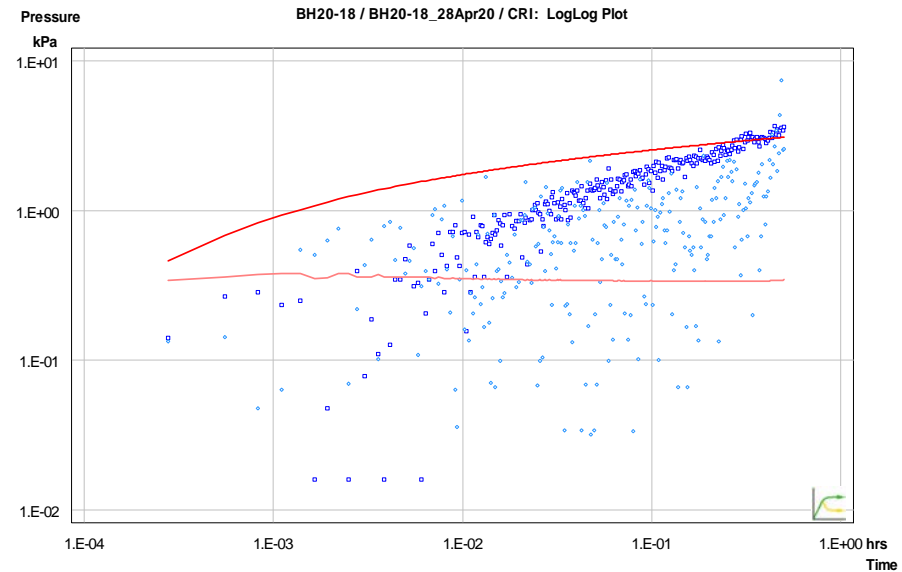
■ Pressure Observation



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR



■ Pressure Observation    — Simulated Pressure



■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD    2022-02-17

PREPARED    PGM

DESIGN    ML

REVIEW    ###

APPROVED

TITLE

PACKER TEST RESULTS BH20-18 UPPER INTERVAL (12.2 to 20.3 mbgs)

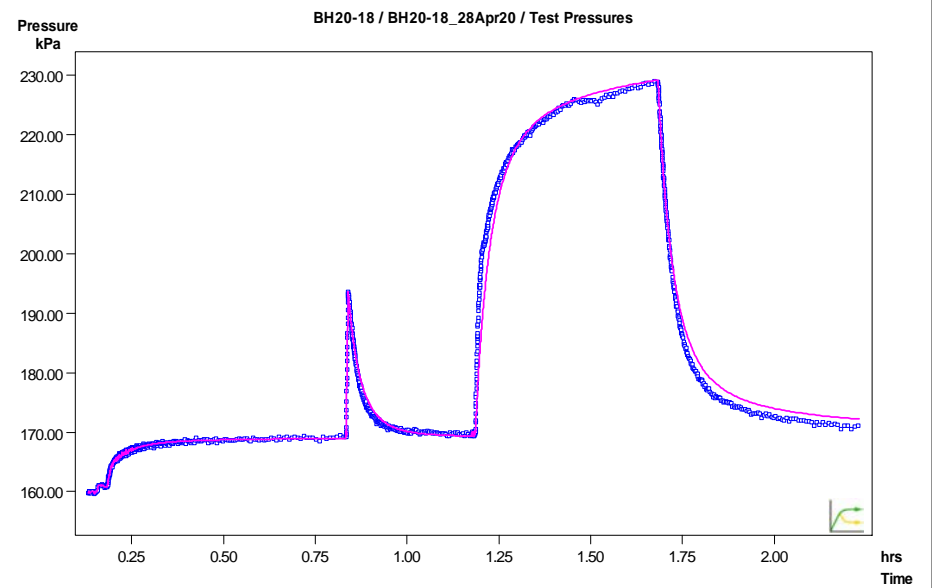
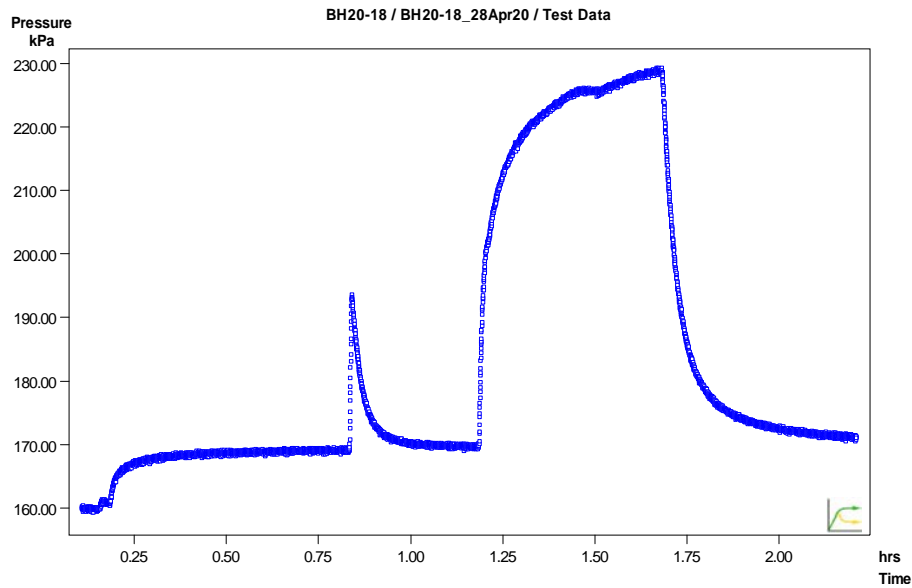
PROJECT No.  
19129150

PHASE  
2300

Rev.  
A

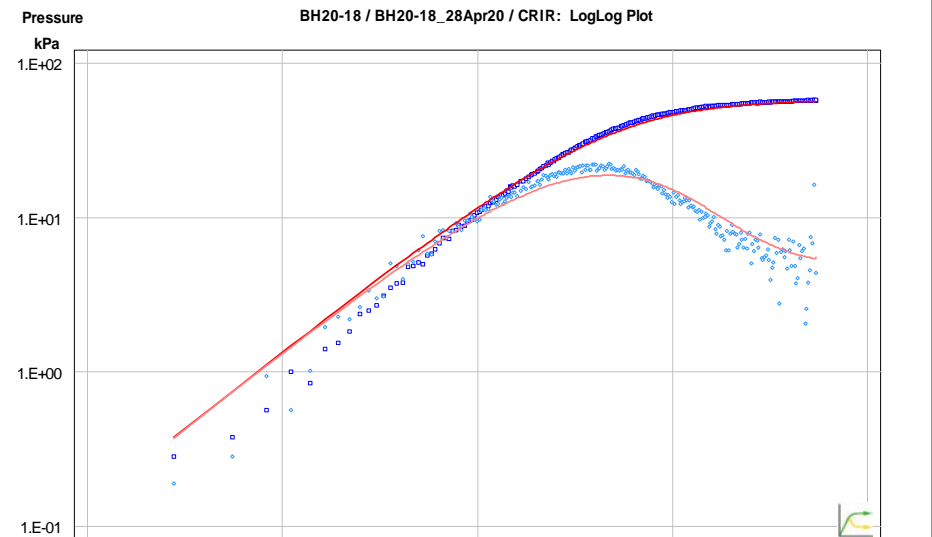
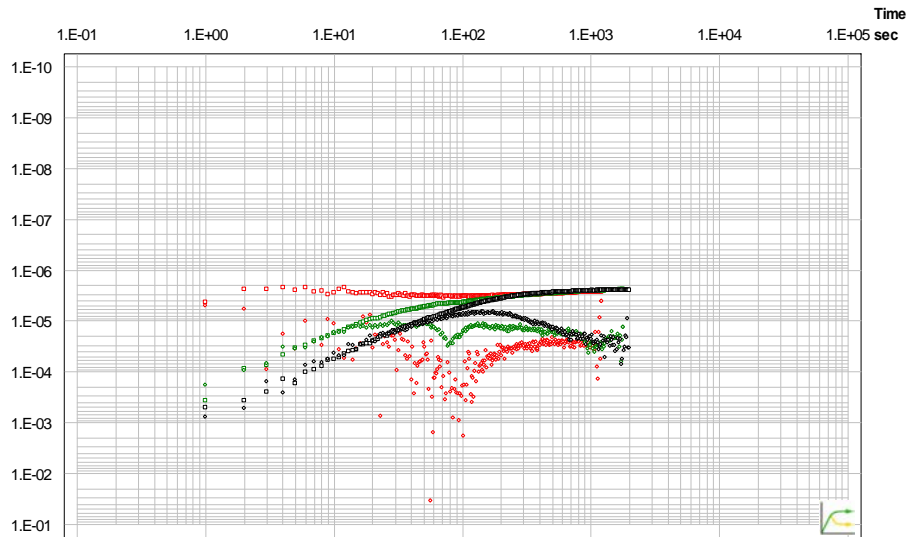
FIGURE  
F-034

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANS/A



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



m<sup>3</sup>/s  
Transm. BH20-18 / BH20-18\_28Apr20 / LogLog Diagnosis - CRIR

- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI     ◆ Pressure Derivative CRI
- Pressure Observation CRIR     ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase
- Simulated Response     — Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-15  
 PREPARED PGM  
 DESIGN ML  
 REVIEW ###  
 APPROVED

TITLE

PACKER TEST RESULTS BH20-18 LOWER INTERVAL (20.6 to 28.7 mbgs)

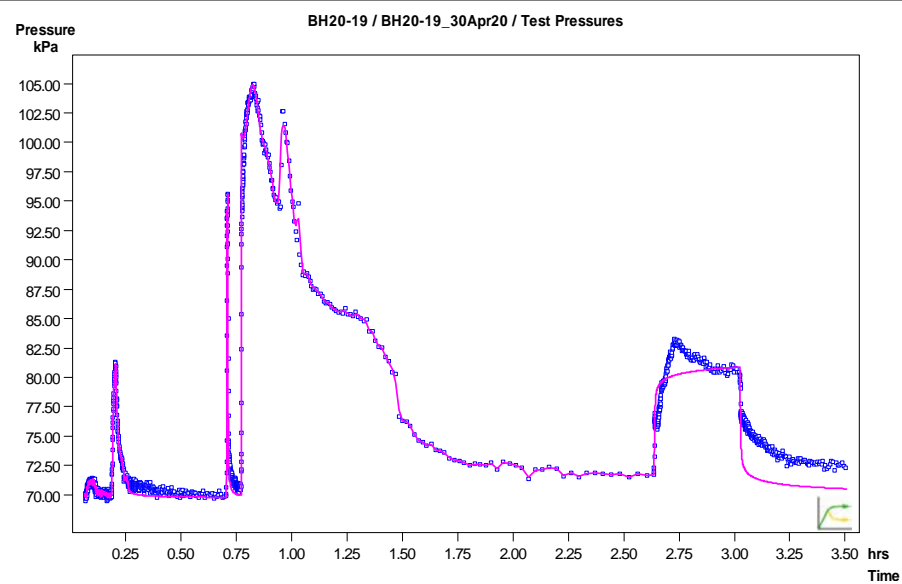
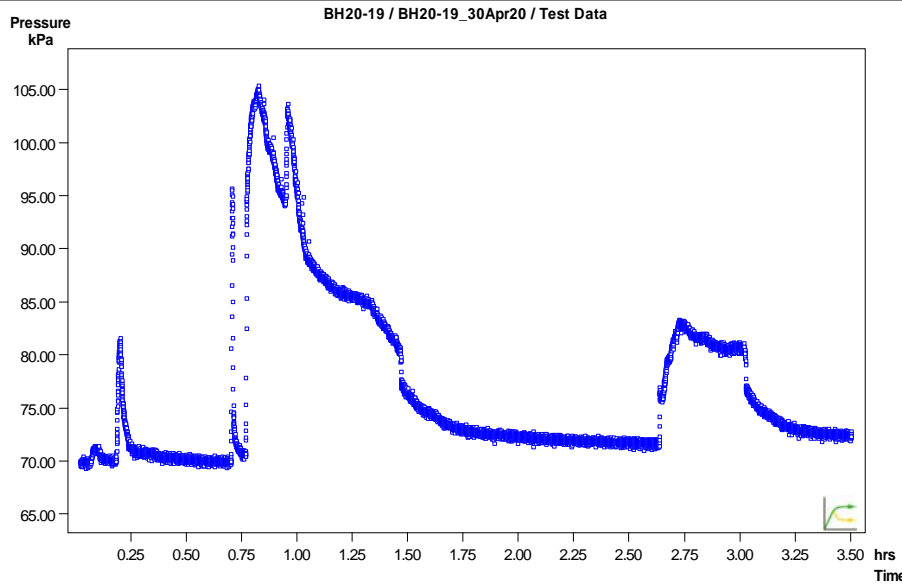
PROJECT No. 19129150

PHASE 2300

Rev. A

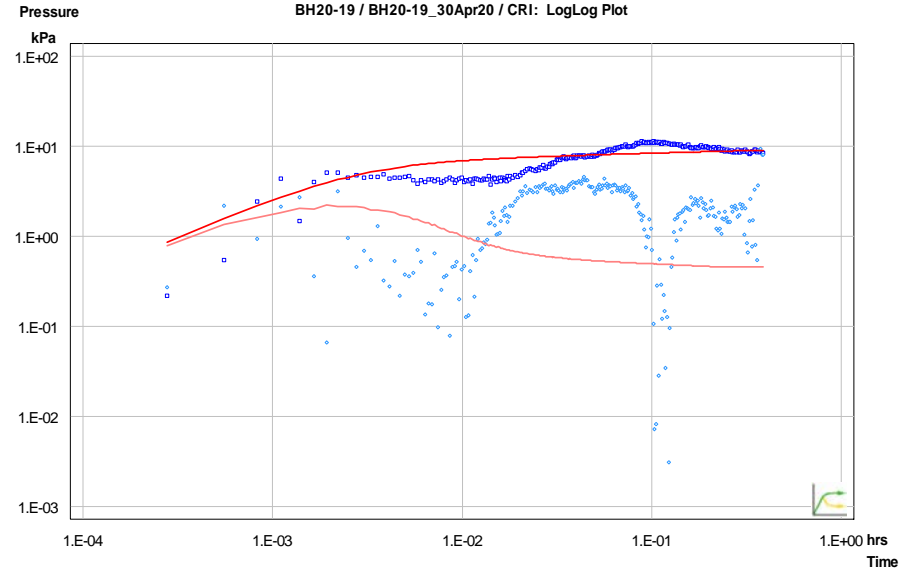
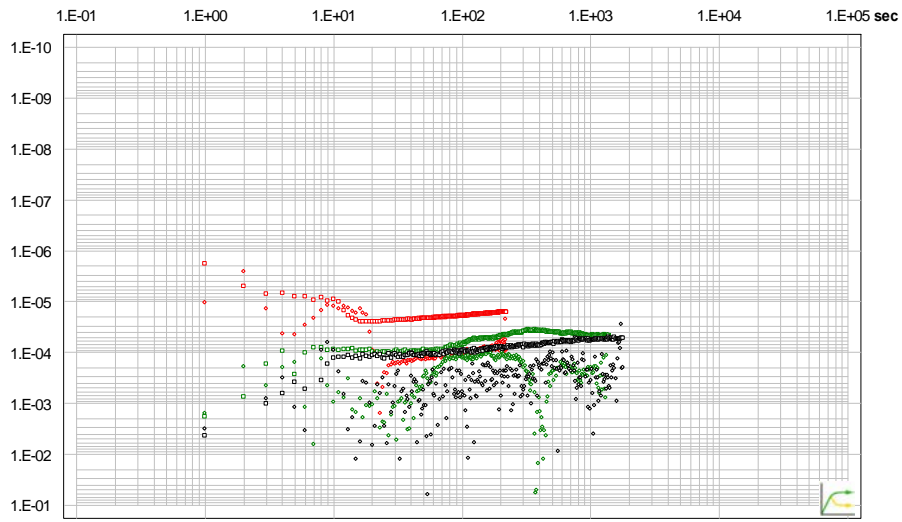
FIGURE F-035

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

■ Pressure Observation    — Simulated Pressure



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

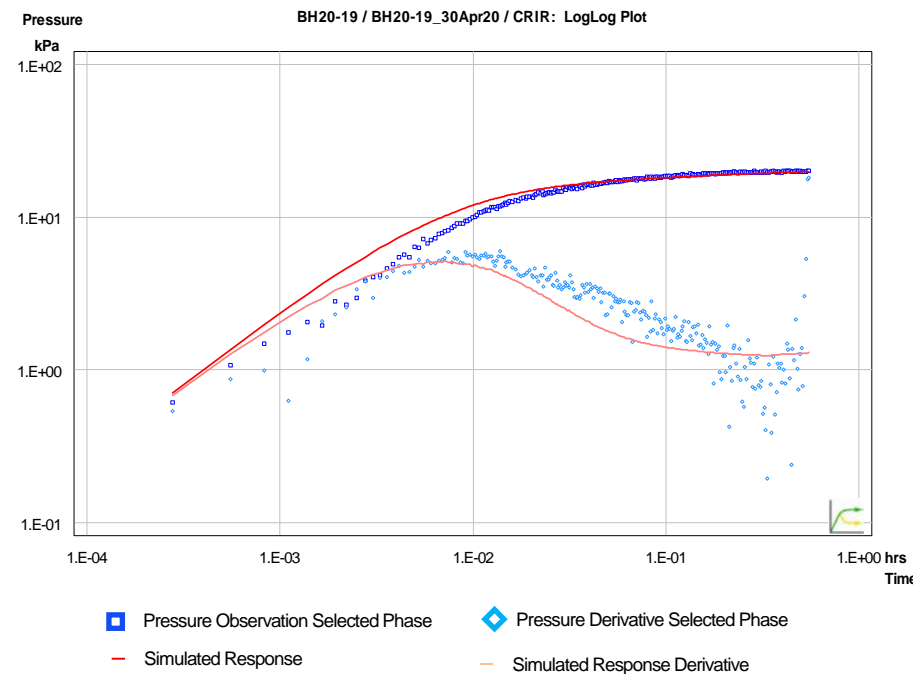
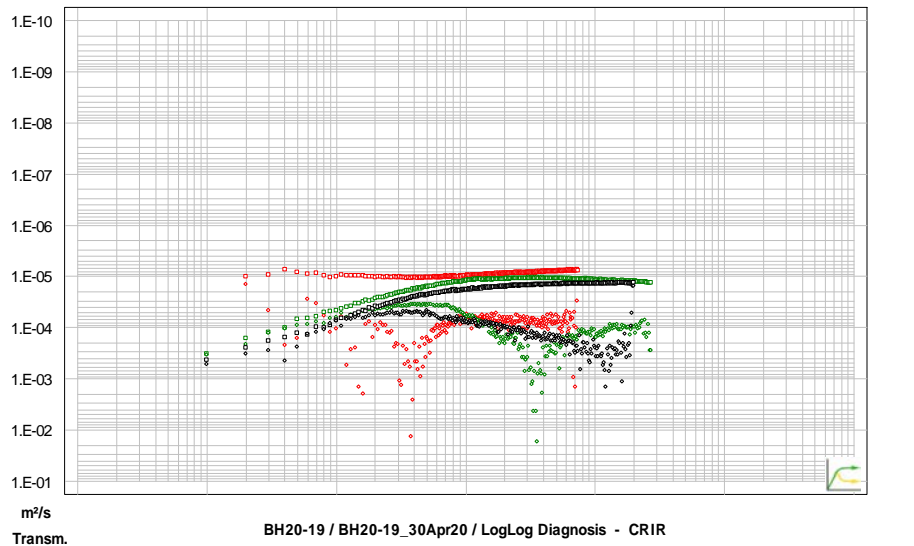
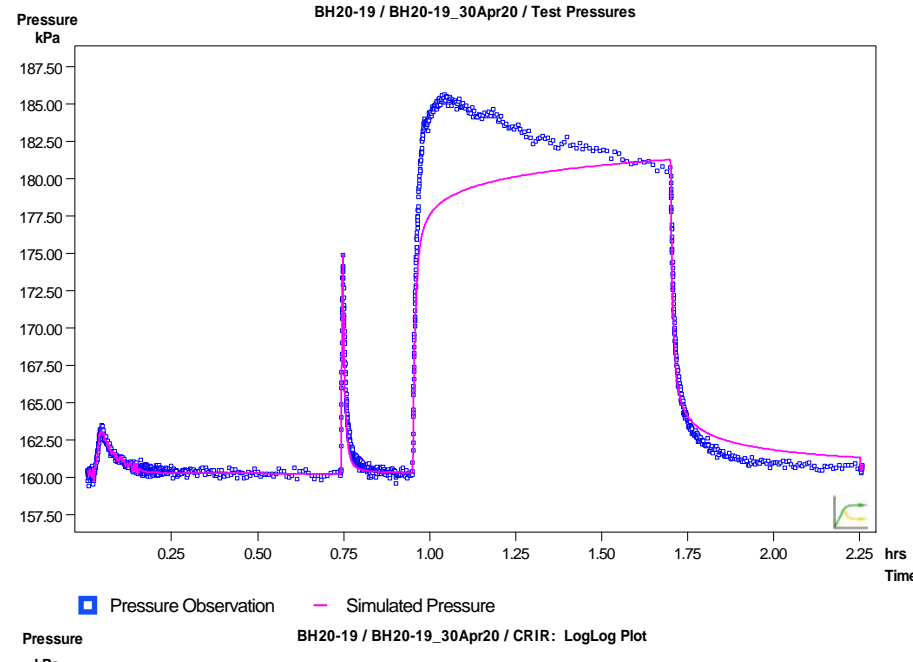
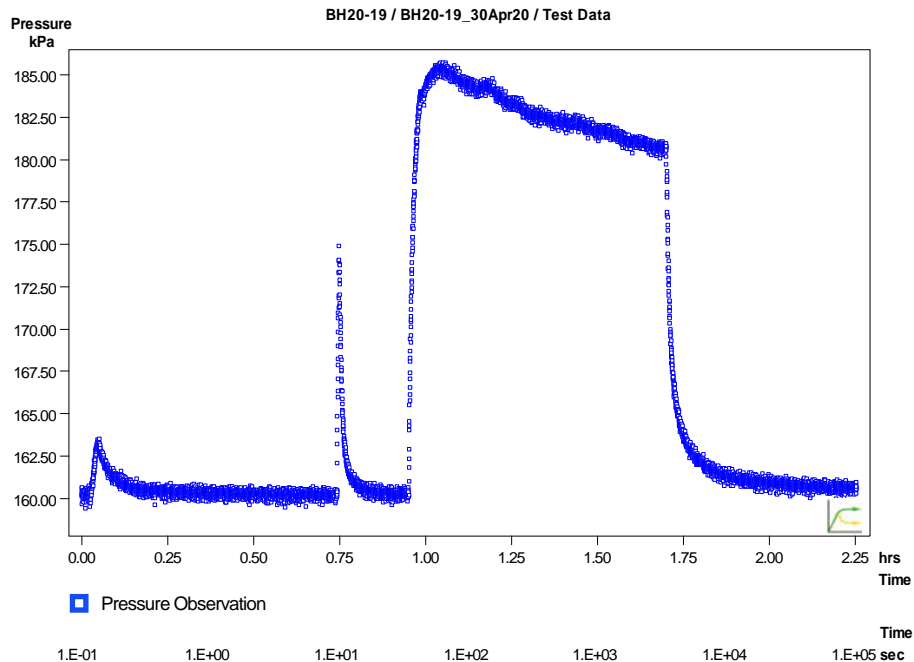
YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS BH20-19 UPPER INTERVAL (5.0 to 13.1 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-036

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI

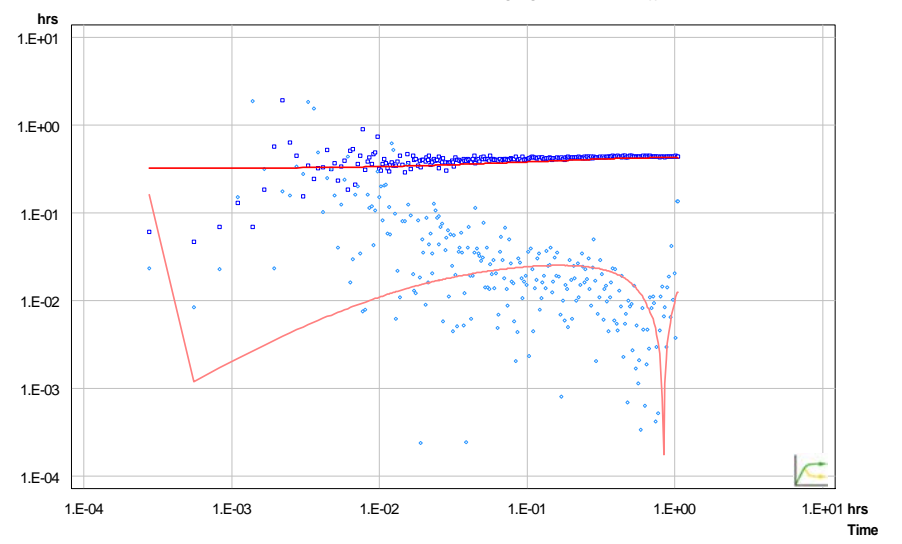
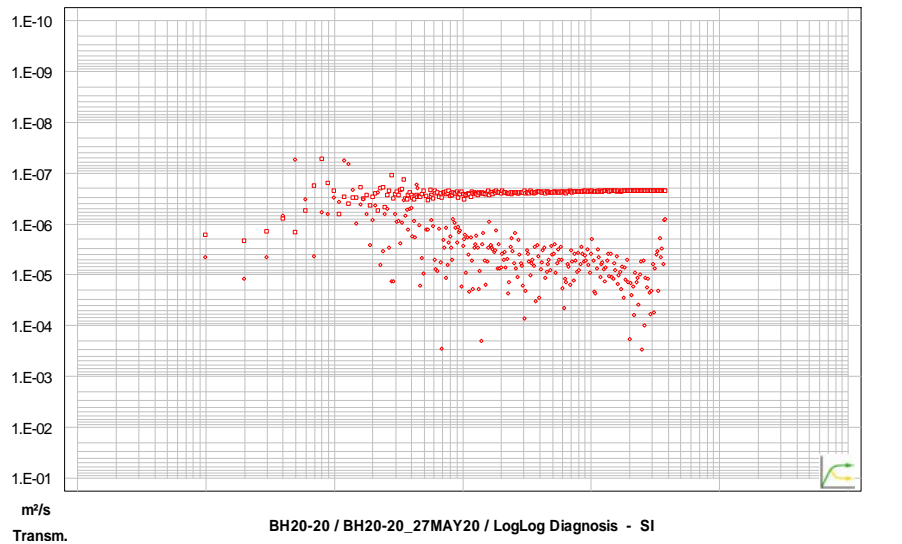
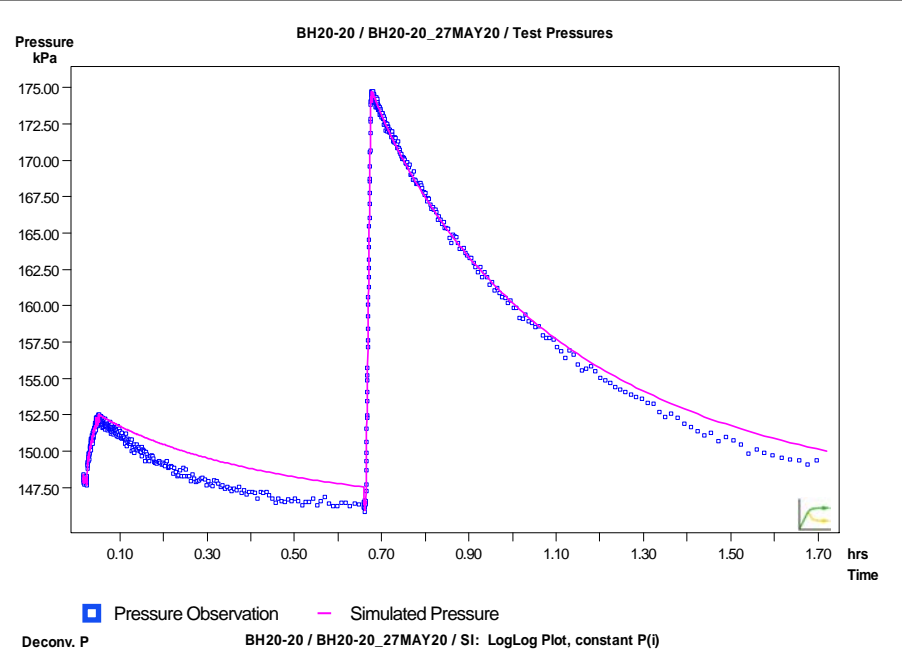
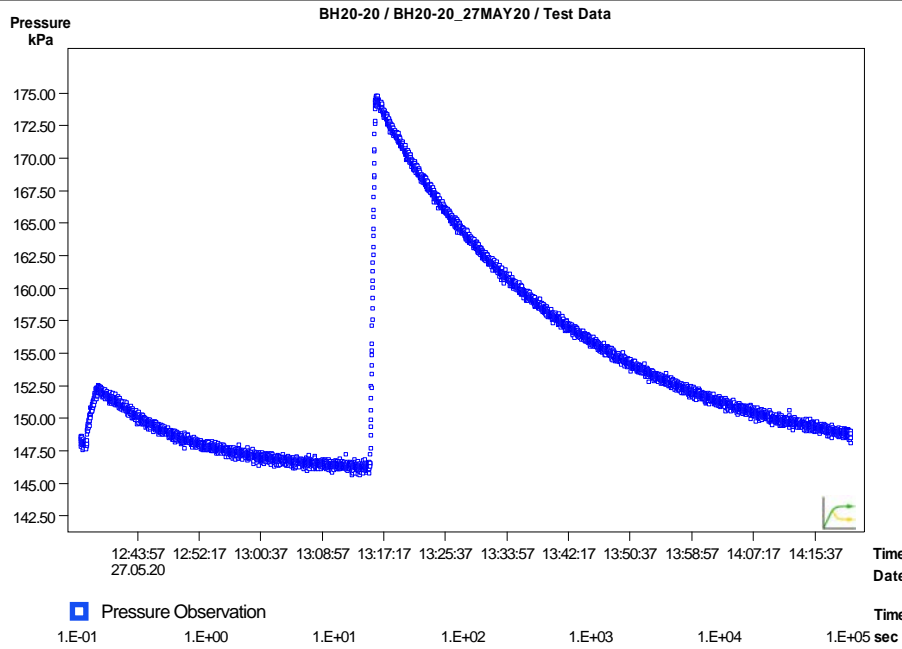




- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI     ◆ Pressure Derivative CRI
- Pressure Observation CRIR     ◆ Pressure Derivative CRIR

CLIENT		PROJECT	
CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)		CALEDON PIT / QUARRY	
CONSULTANT		TITLE	
GOLDER MEMBER OF WSP		PACKER TEST RESULTS BH20-19 LOWER INTERVAL (12.5 to 22.1 mbgs)	
YYYY-MM-DD	2022-02-15	PROJECT No.	19129150
PREPARED	PGM	PHASE	2300
DESIGN	ML	Rev.	A
REVIEW	###	FIGURE	F-037
APPROVED			

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



- Pressure Observation SI ◆ Pressure Derivative SI
- Pressure Observation CRI ◆ Pressure Derivative CRI
- Pressure Observation CRIR ◆ Pressure Derivative CRIR

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT



YYYY-MM-DD 2022-02-15

PREPARED PGM

DESIGN ML

REVIEW ###

APPROVED

PROJECT

**CALEDON PIT / QUARRY**

TITLE

**PACKER TEST RESULTS BH20-20 UPPER INTERVAL (16.9 to 28.2 mbgs)**

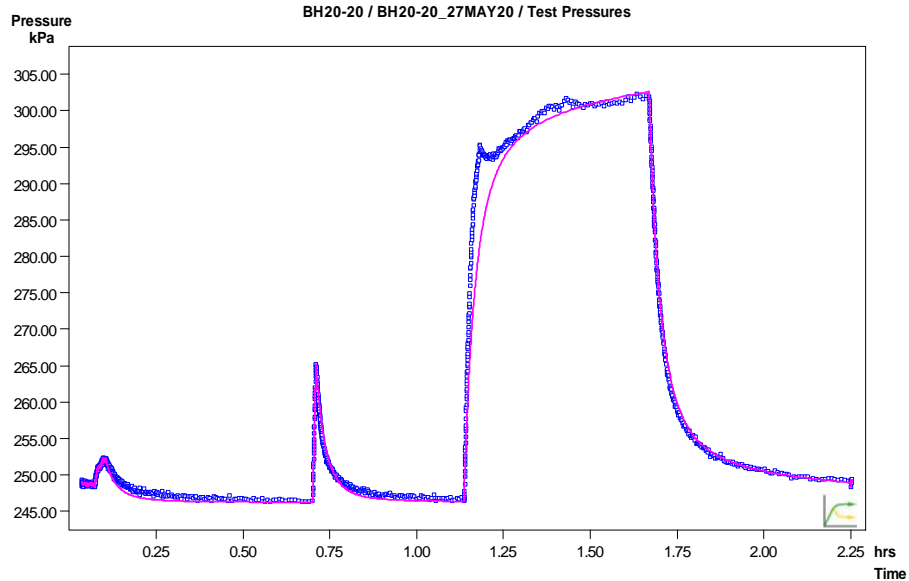
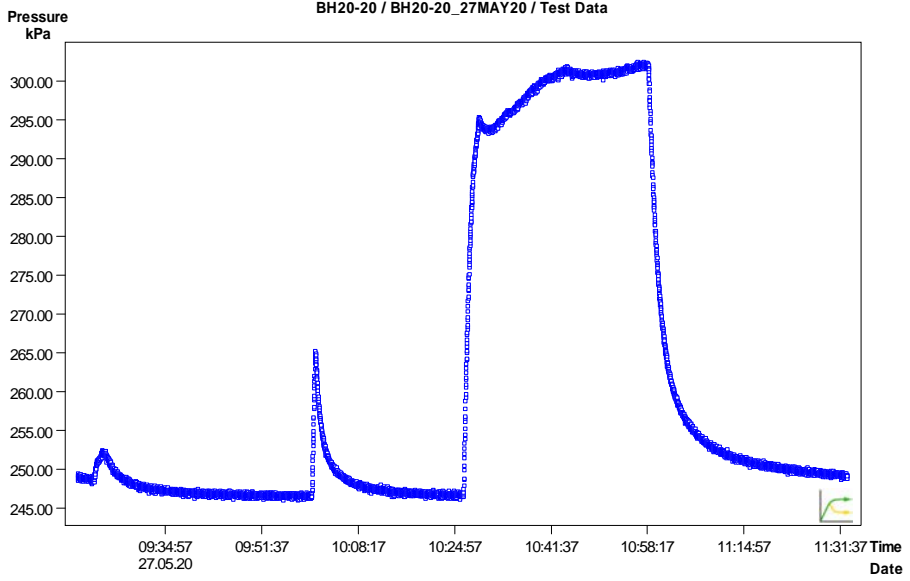
PROJECT No. 19129150

PHASE 2300

Rev. A

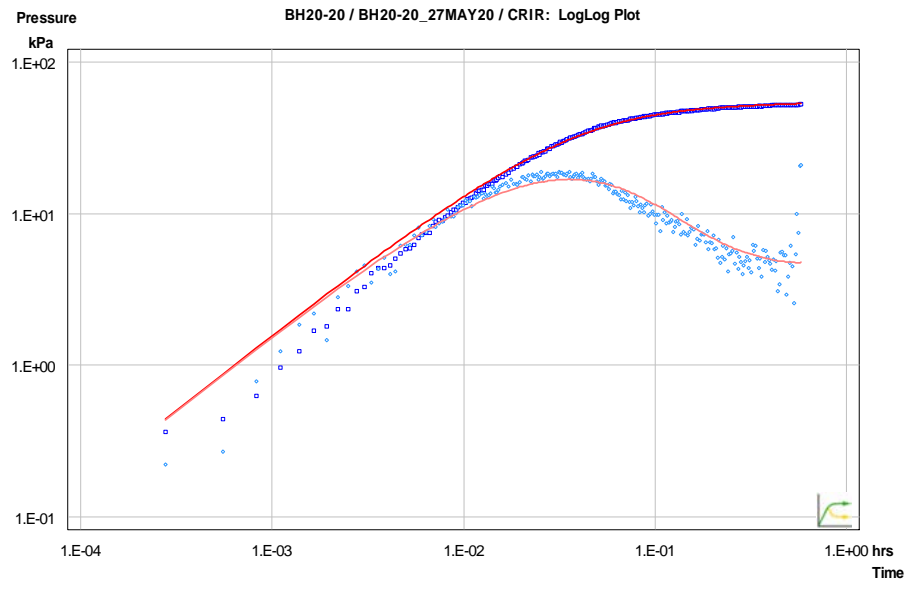
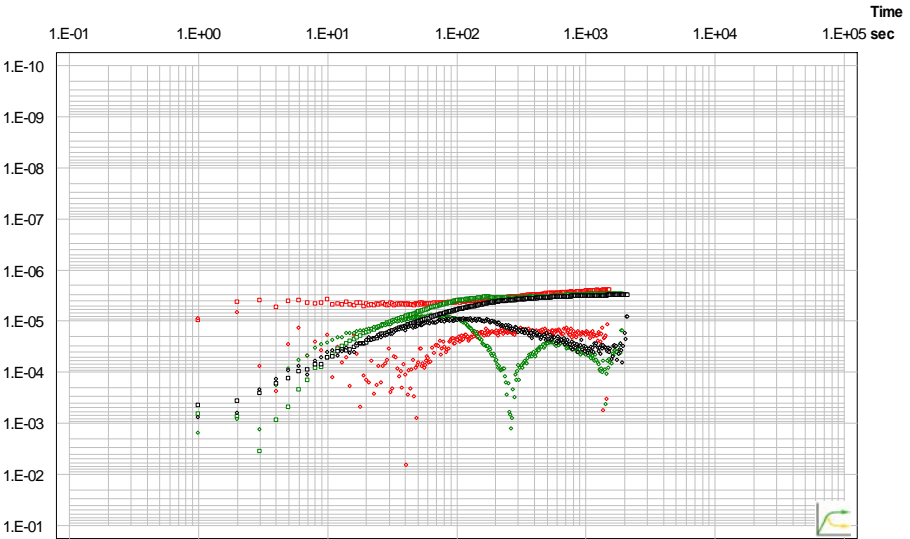
FIGURE F-038

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

■ Pressure Observation    — Simulated Pressure



Transm.      **BH20-20 / BH20-20\_27MAY20 / LogLog Diagnosis - CRIR**

■ Pressure Observation SI      ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response                      — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

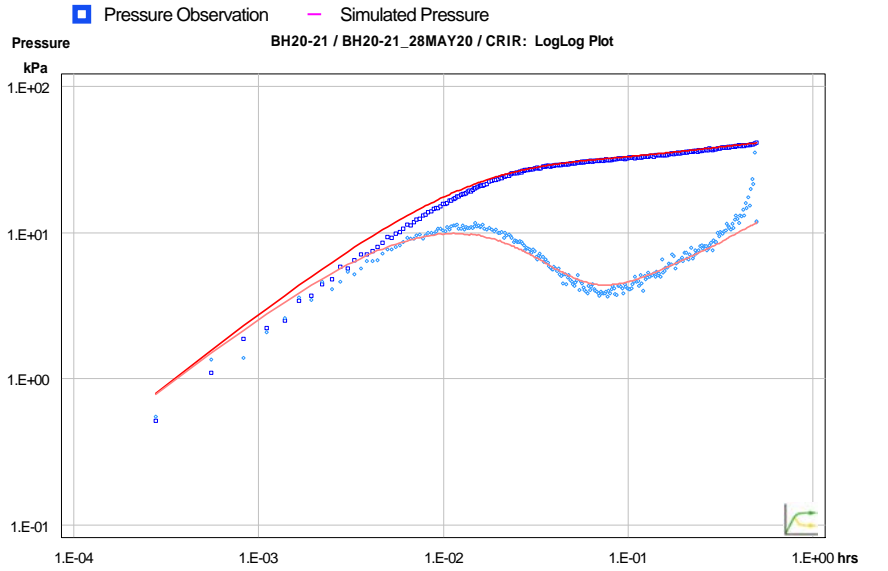
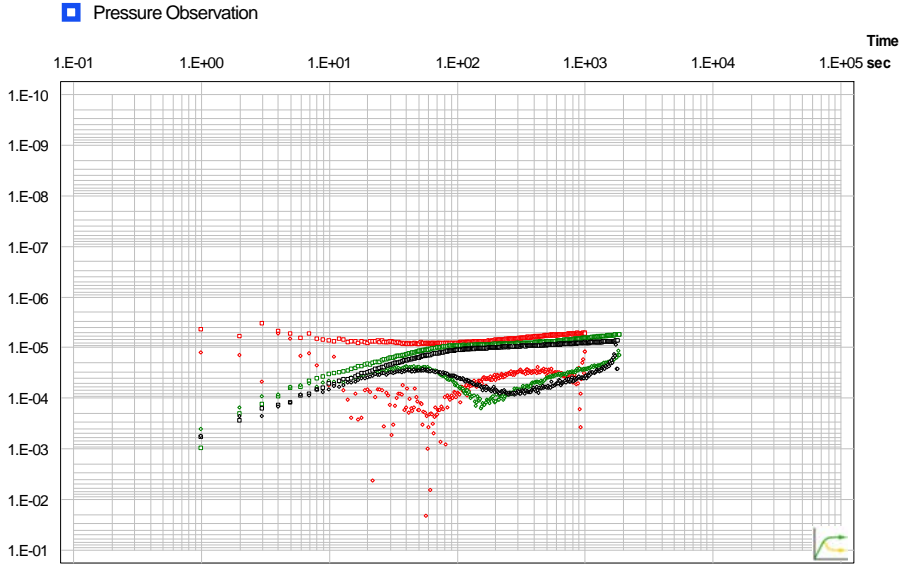
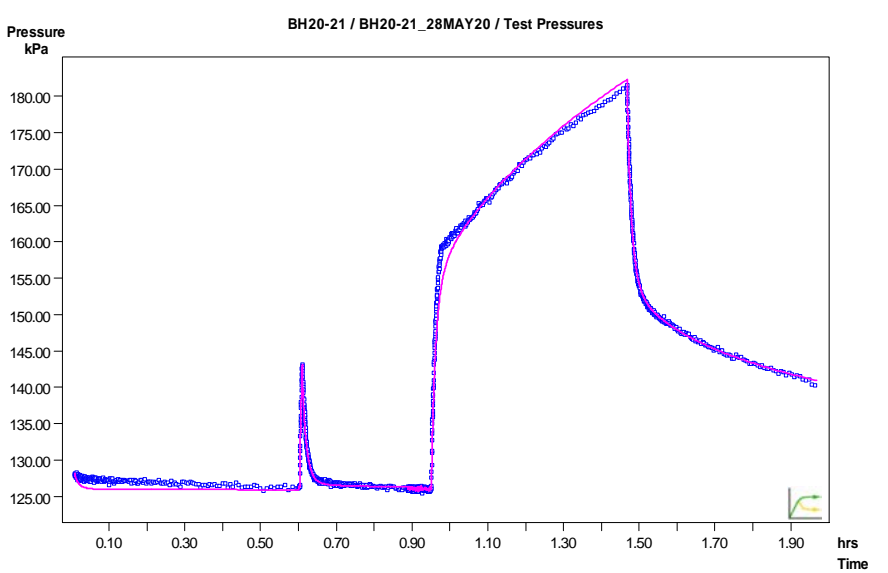
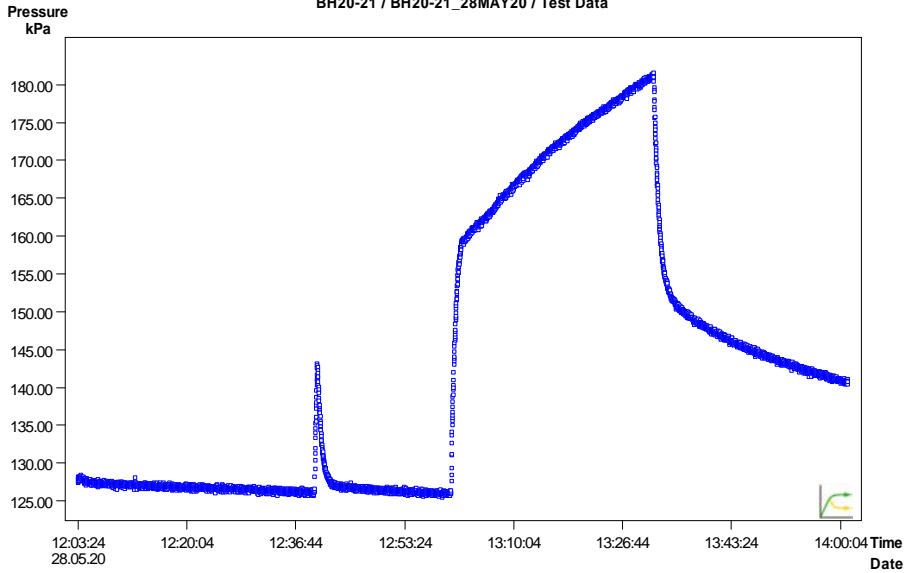
CONSULTANT  

 YYYY-MM-DD      2022-02-15  
 PREPARED          PGM  
 DESIGN             ML  
 REVIEW             ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS BH20-20 LOWER INTERVAL (27.3 to 38.5 mbgs)**

PROJECT No.      PHASE                      Rev.                      FIGURE  
**19129150                      2300                      A                      F-039**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT

YYYY-MM-DD	2022-02-15
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

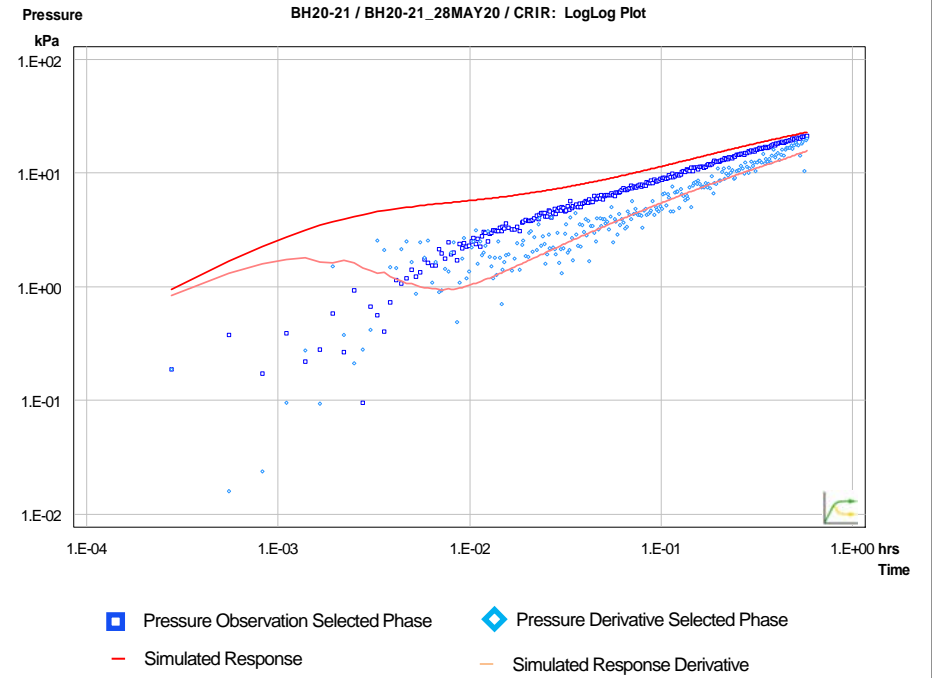
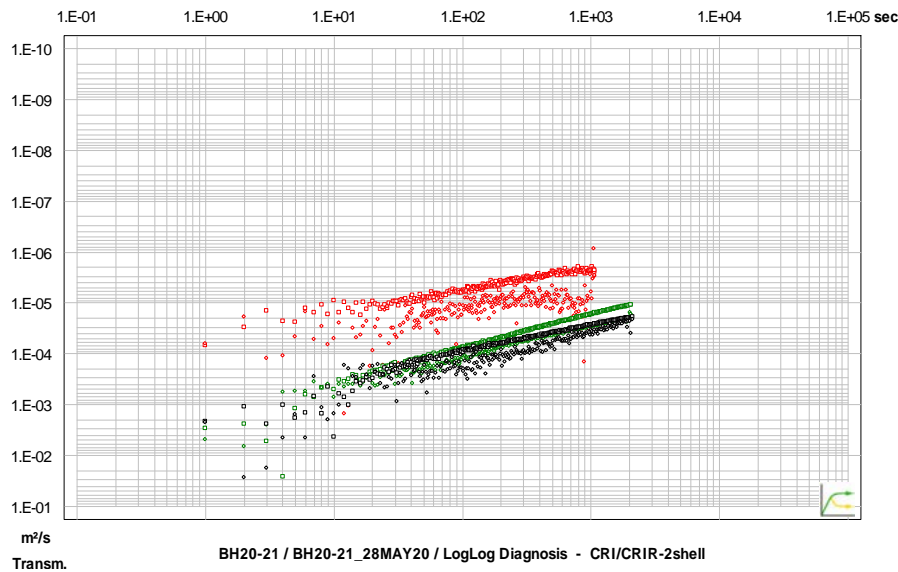
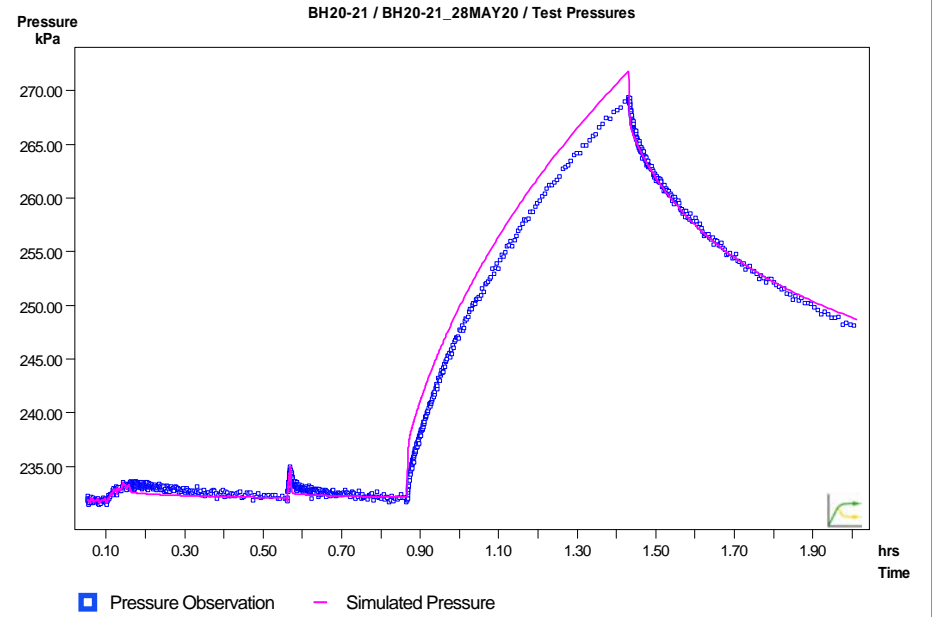
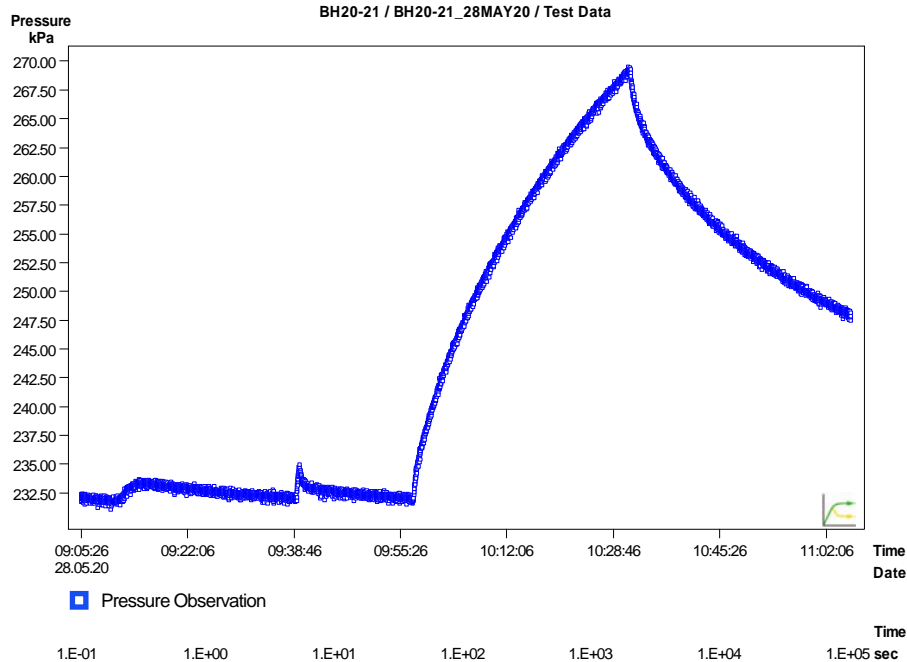
PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS BH20-21 UPPER INTERVAL (8.3 to 19.5 mbgs)**

PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-040

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A





CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**



CONSULTANT

YYYY-MM-DD    2022-03-14

PREPARED    PGM

DESIGN    ML

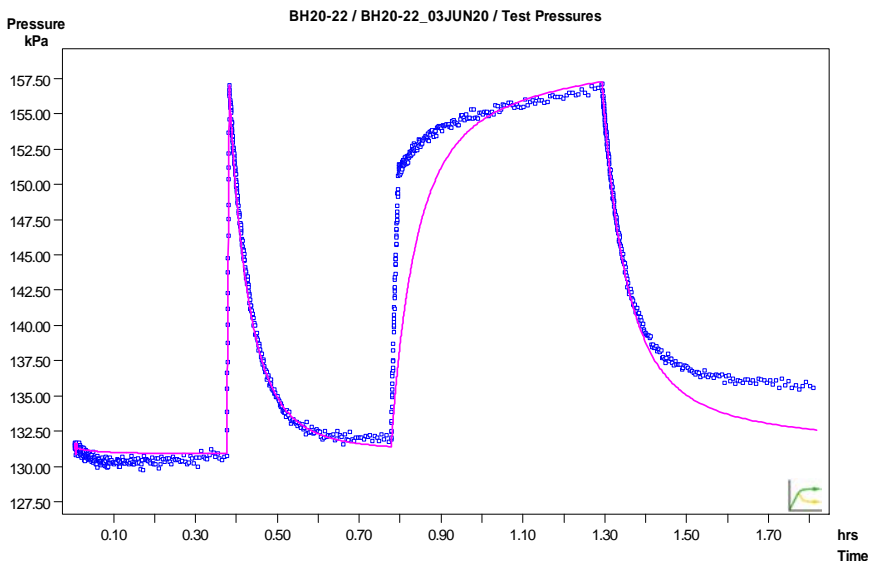
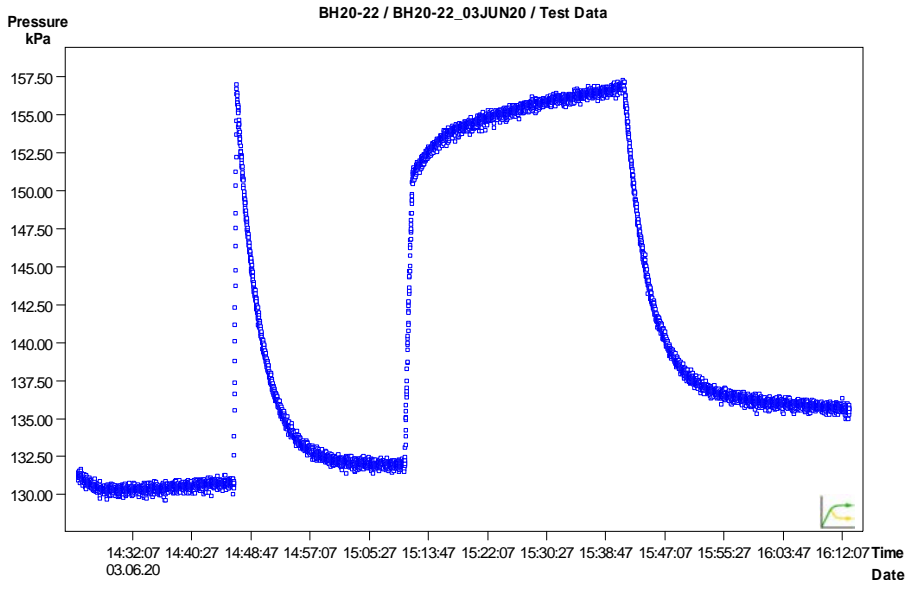
REVIEW    ###

APPROVED

TITLE  
**PACKER TEST RESULTS BH20-21 LOWER INTERVAL (19.5 to 30.8 mbgs)**

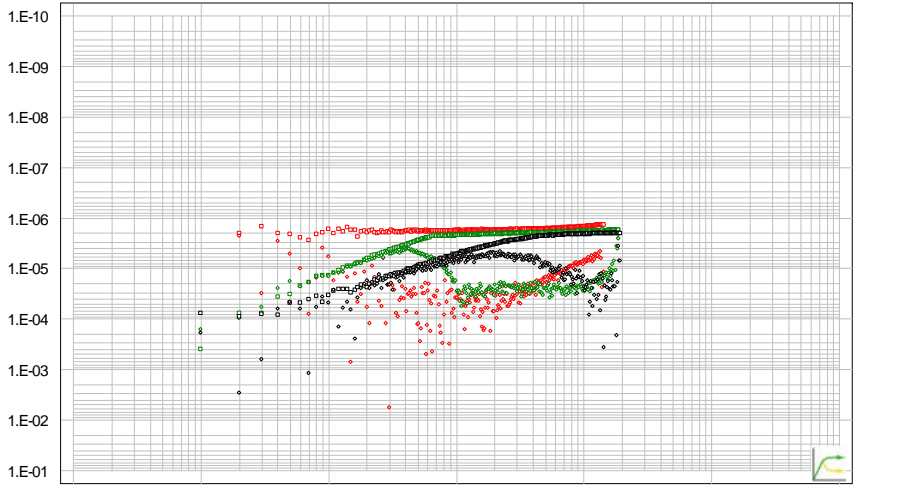
PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-041

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

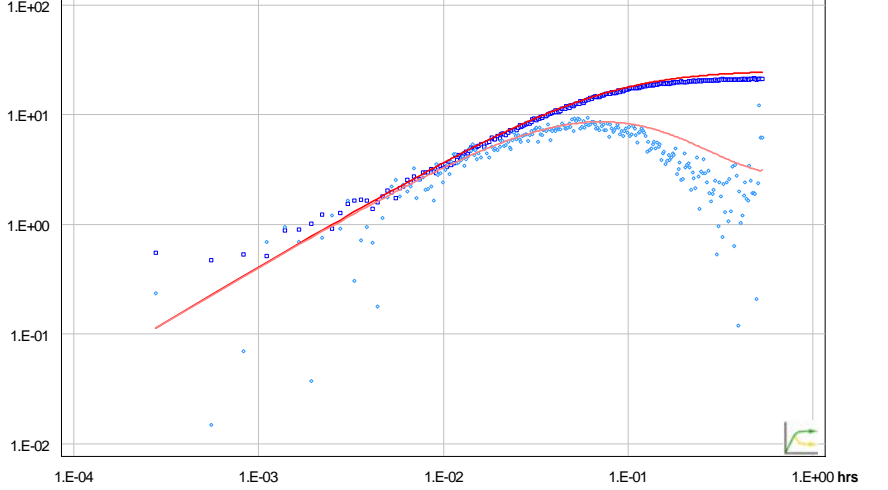


■ Pressure Observation

■ Pressure Observation — Simulated Pressure



BH20-22 / BH20-22\_03JUN20 / CRIR: LogLog Plot



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

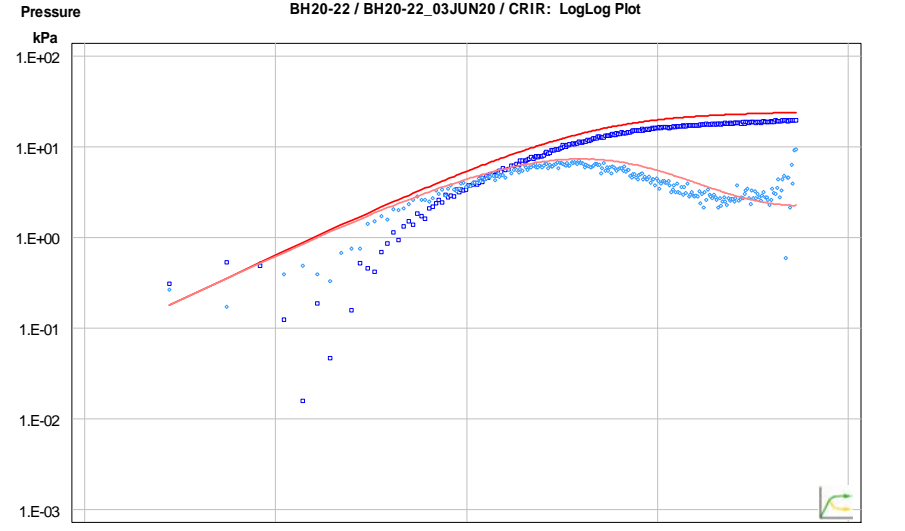
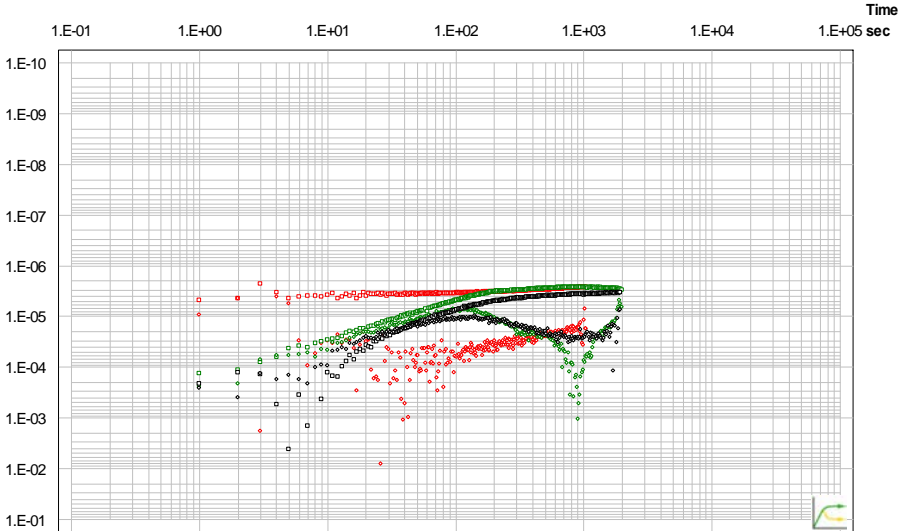
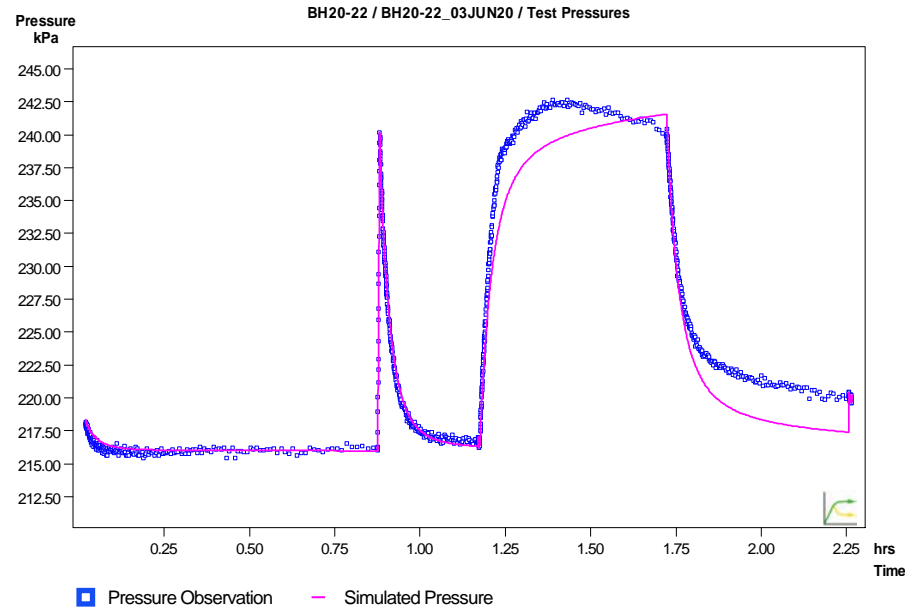
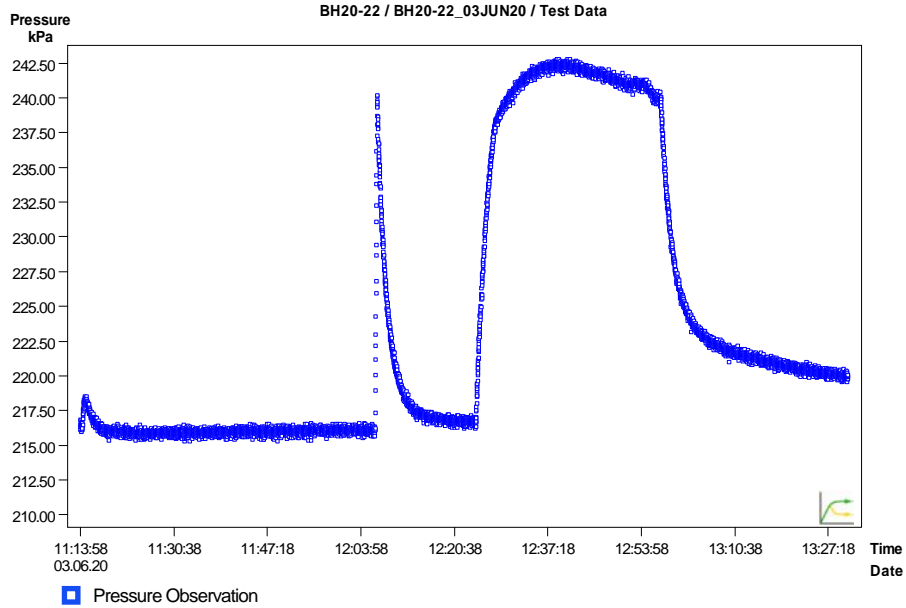
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS BH20-22 UPPER INTERVAL (7.6 to 17.4 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



Transm. **BH20-22 / BH20-22\_03JUN20 / LogLog Diagnosis - CRIR**

- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR   ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase
- Simulated Response     — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

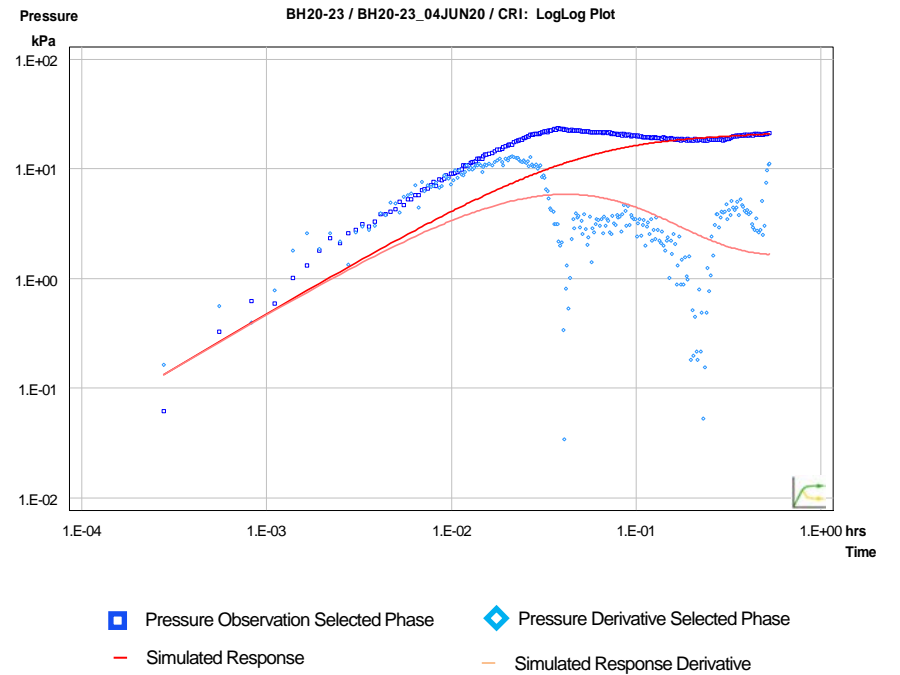
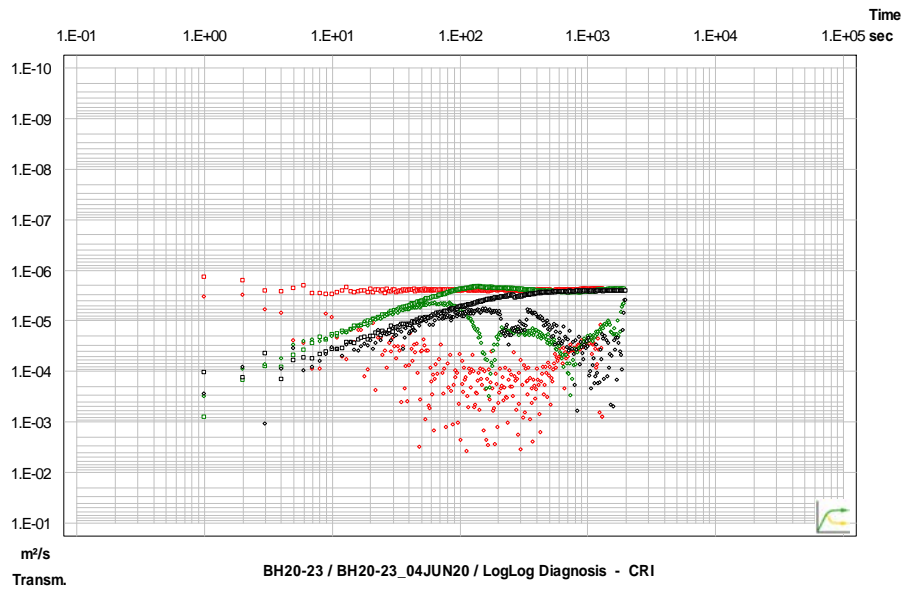
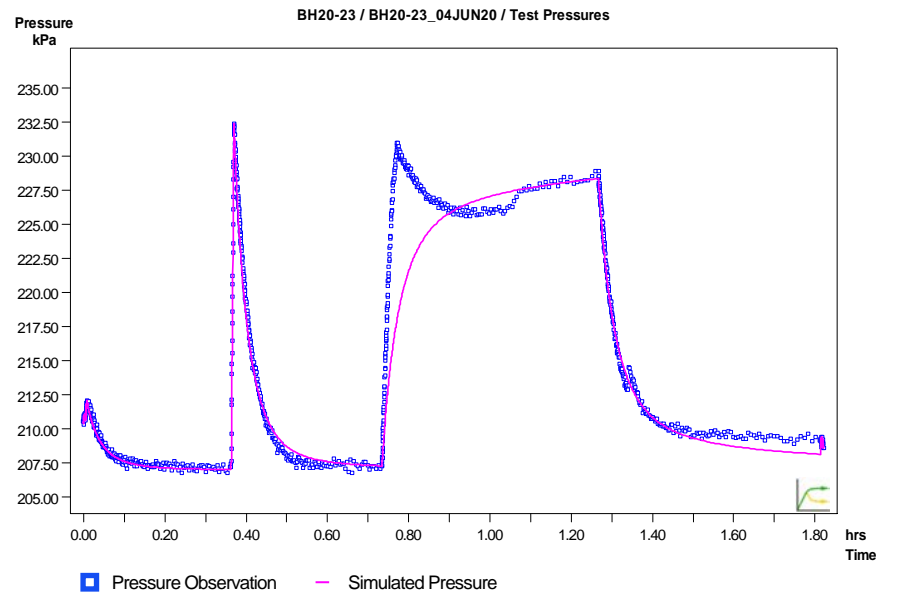
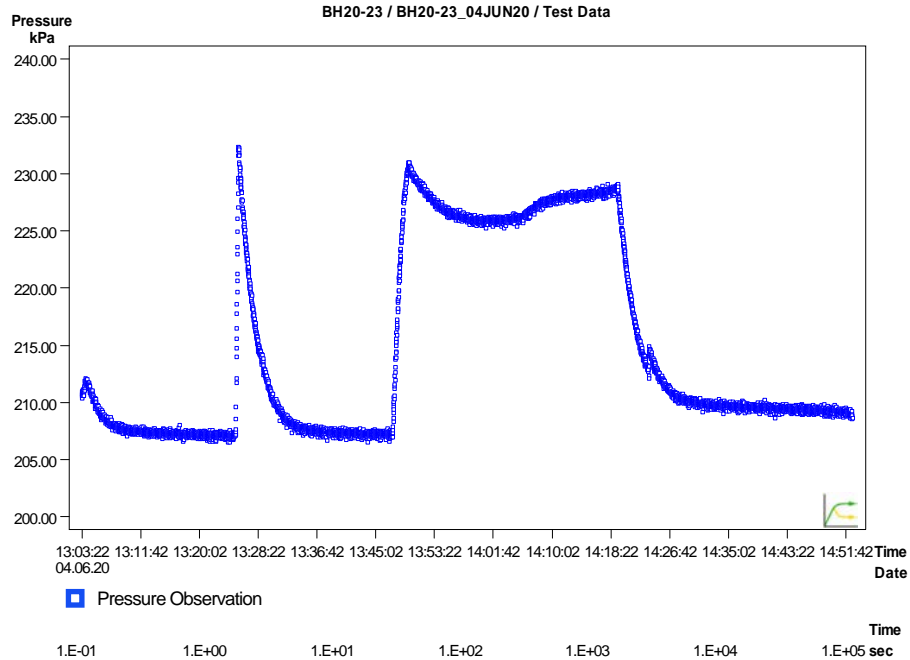
CONSULTANT  
**GOLDER**  
MEMBER OF WSP

YYYY-MM-DD     2022-02-15  
 PREPARED     PGM  
 DESIGN     ML  
 REVIEW     ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS BH20-22 LOWER INTERVAL (16.4 to 26.2 mbgs)**

PROJECT No.     19129150     PHASE     2300     Rev.     A     FIGURE     F-043

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

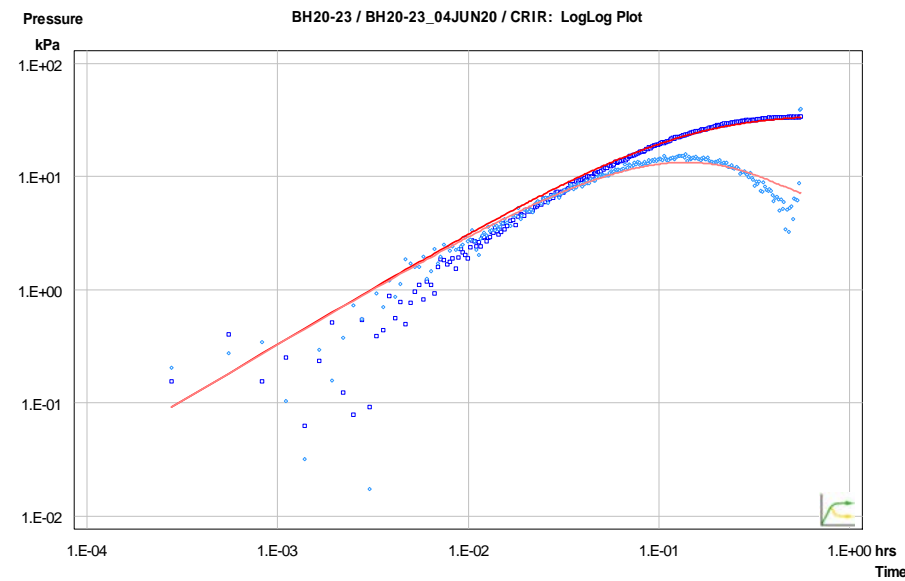
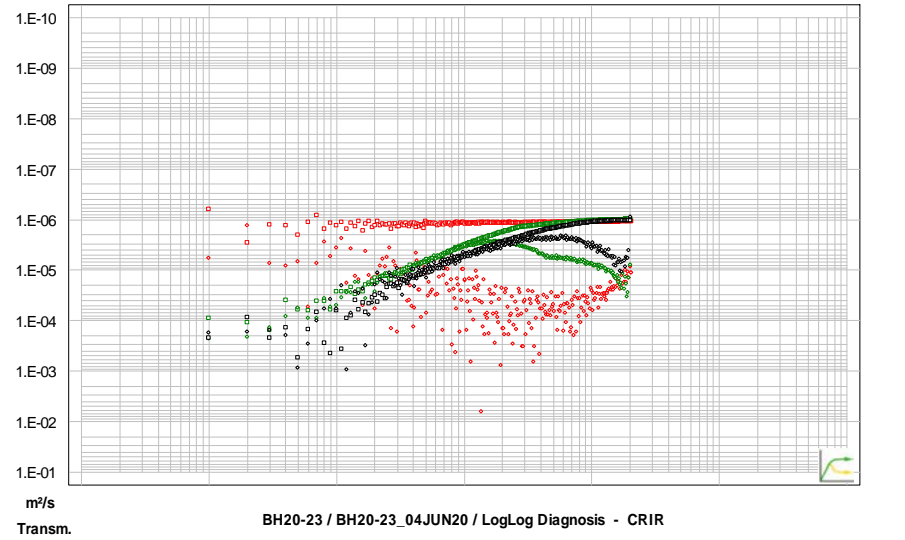
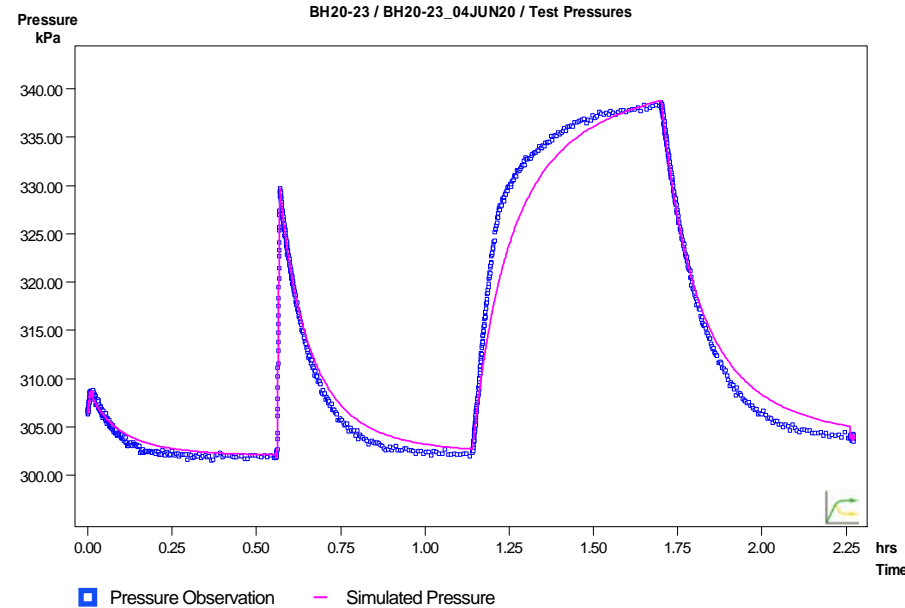
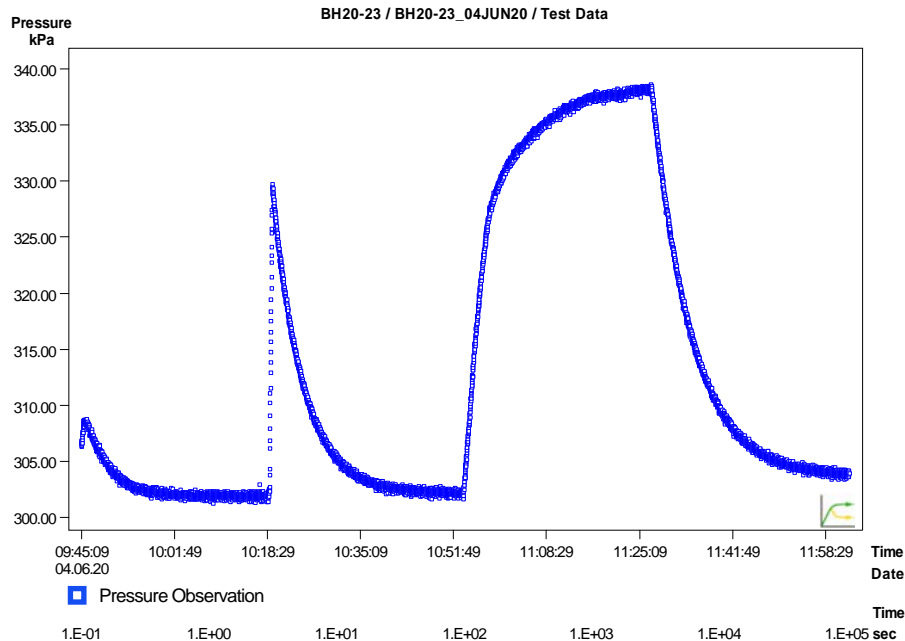
PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-15
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE	<b>PACKER TEST RESULTS BH20-23 UPPER INTERVAL (16.9 to 25.1 mbgs)</b>		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-044

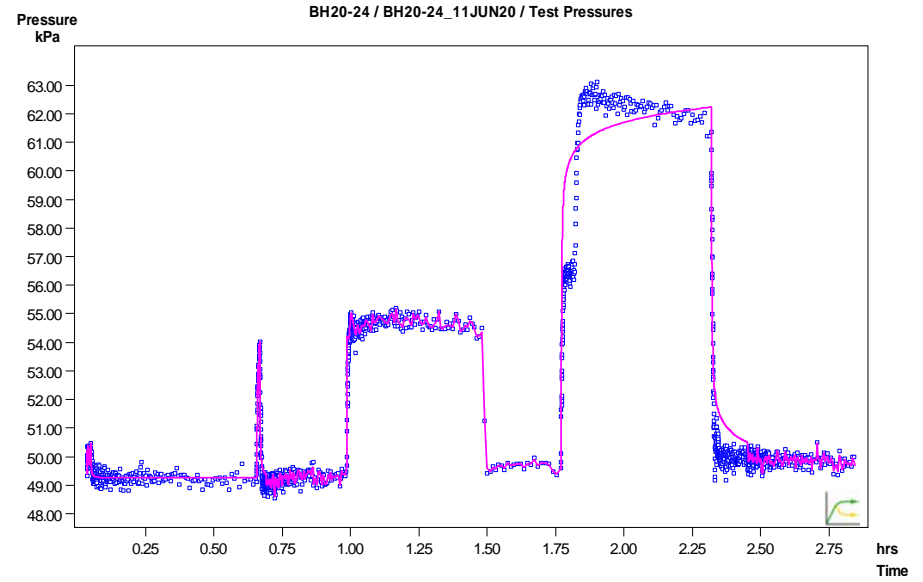
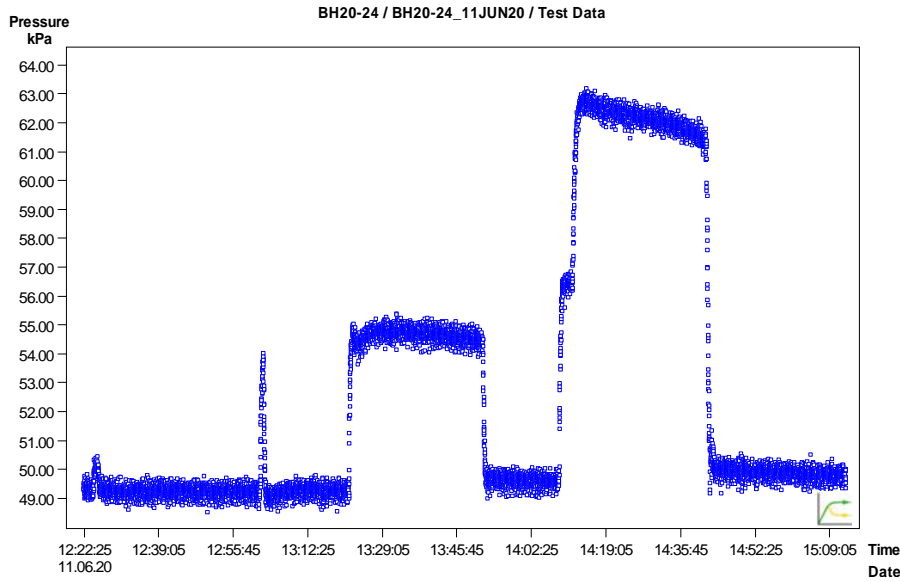
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI     ◆ Pressure Derivative CRI
- Pressure Observation CRIR     ◆ Pressure Derivative CRIR

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

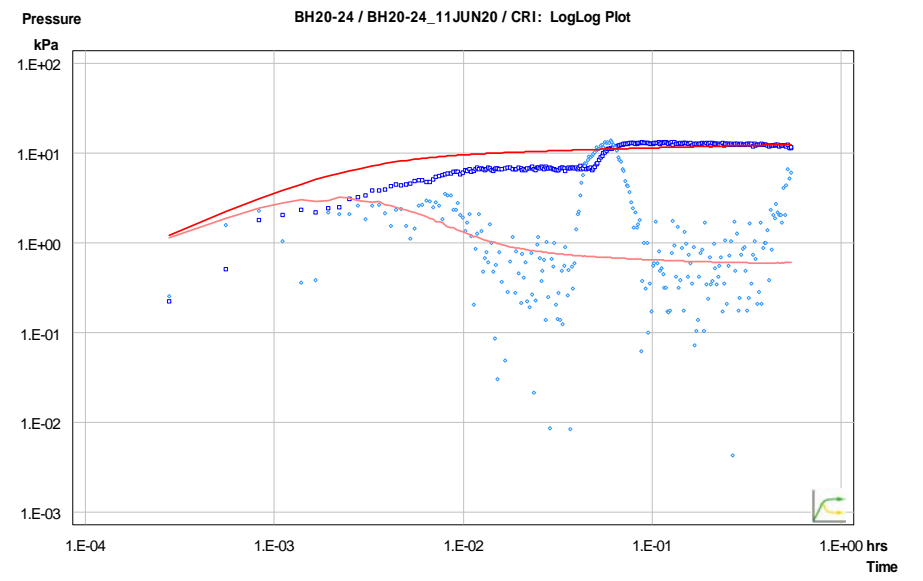
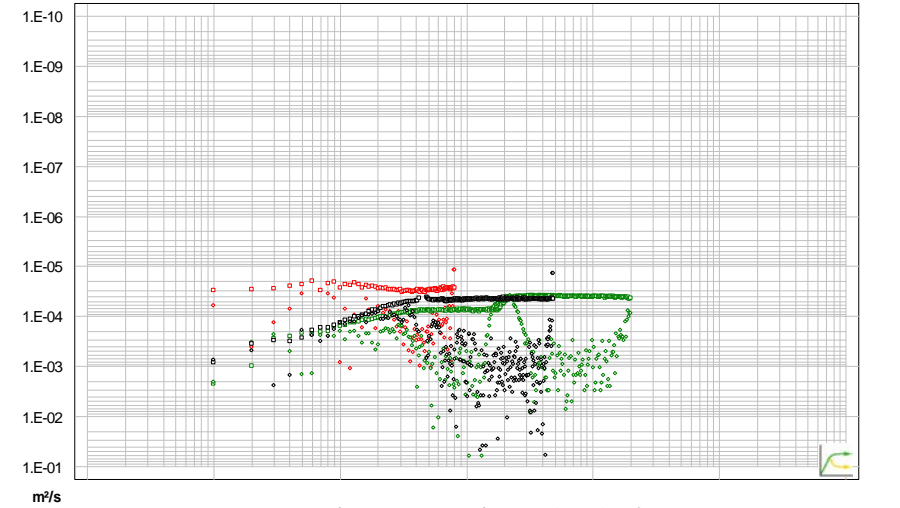


■ Pressure Observation

Time Date

■ Pressure Observation — Simulated Pressure

Time



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

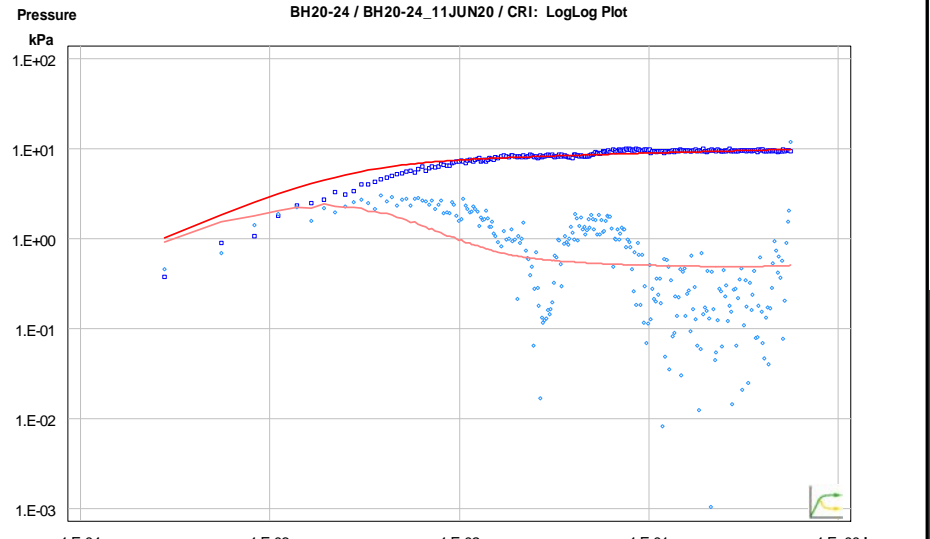
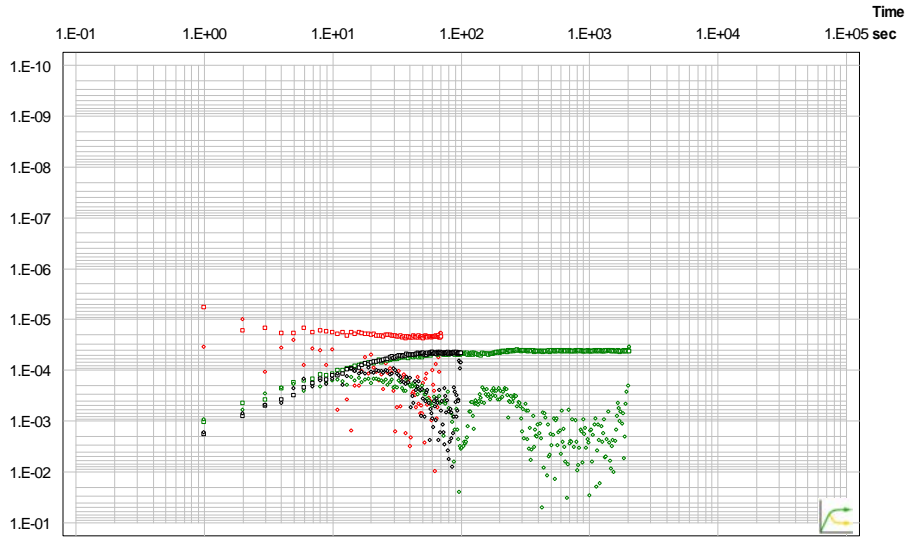
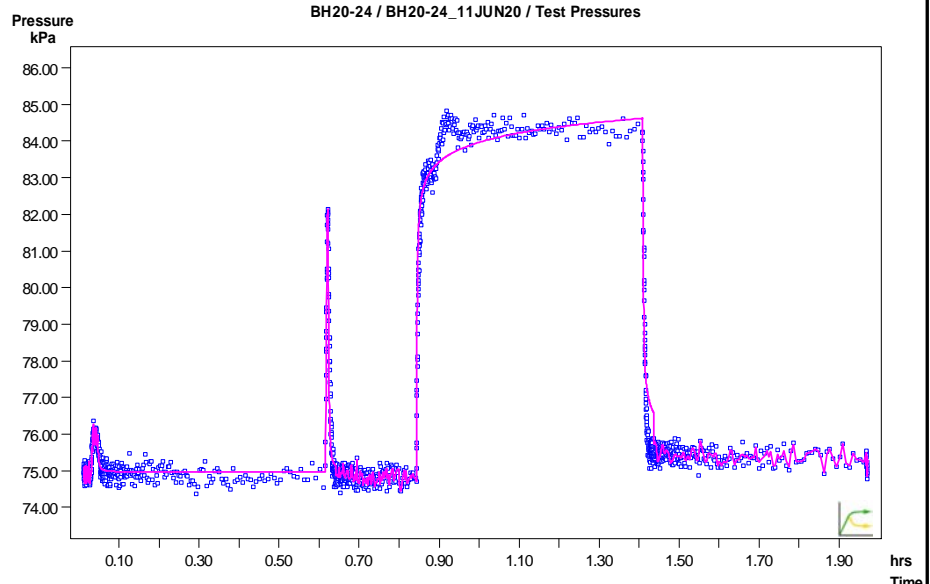
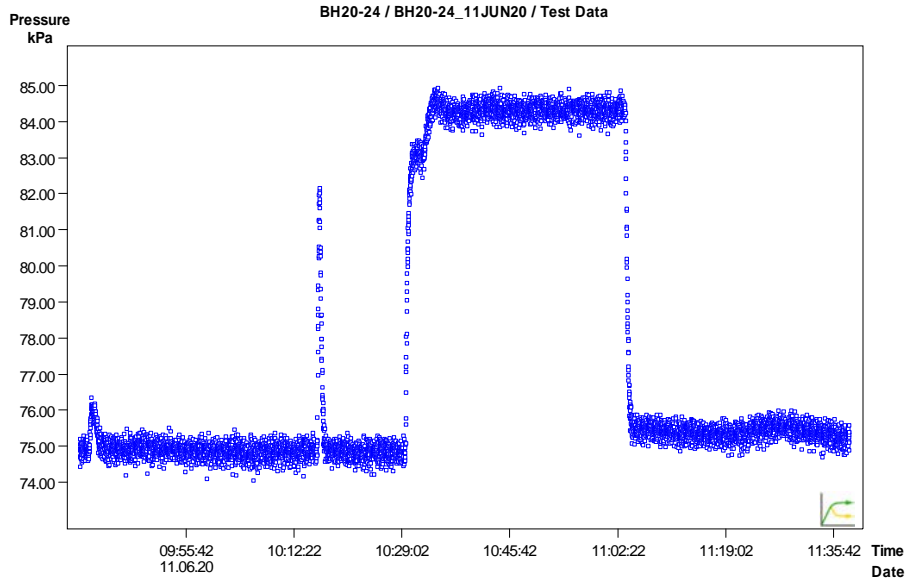
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS BH20-24 UPPER INTERVAL (14.0 to 17.7 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-046

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

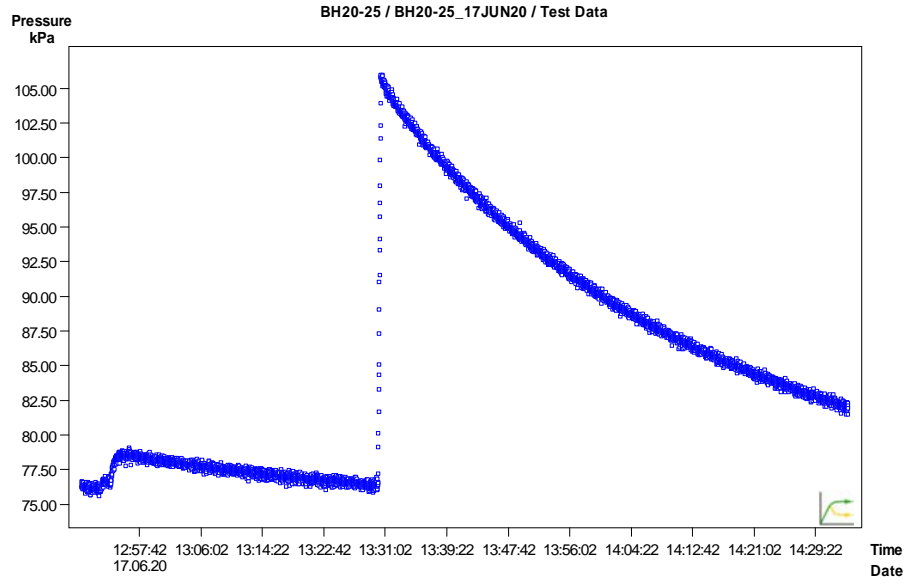
CONSULTANT

YYYY-MM-DD 2022-02-15  
 PREPARED PGM  
 DESIGN ML  
 REVIEW ###  
 APPROVED

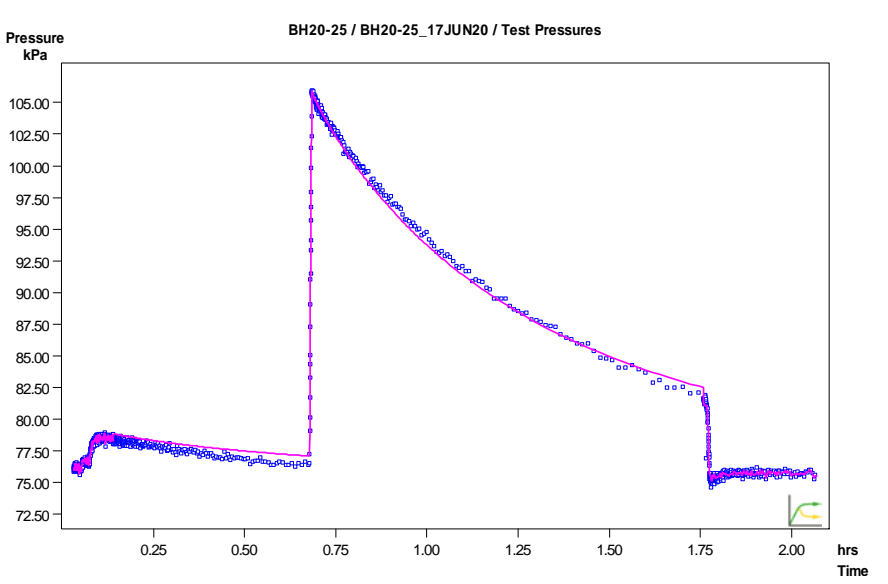
TITLE  
**PACKER TEST RESULTS BH20-24 LOWER INTERVAL (16.7 to 20.3 mbgs)**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE F-047

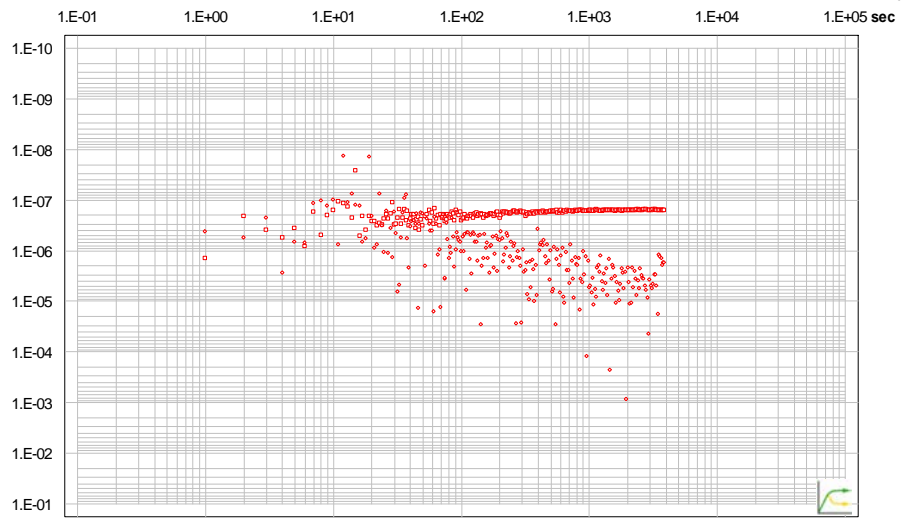
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

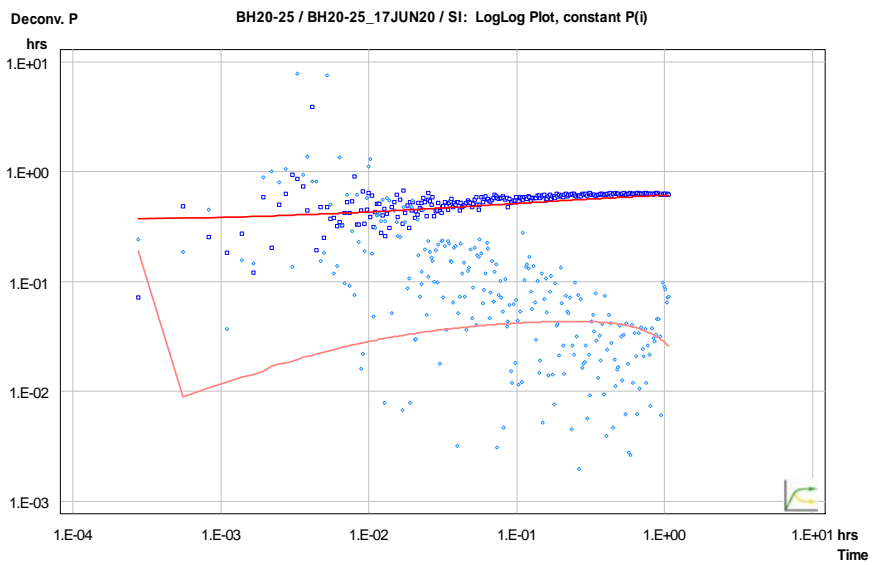


■ Pressure Observation — Simulated Pressure



BH20-25 / BH20-25\_17JUN20 / LogLog Diagnosis - SI

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR



- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

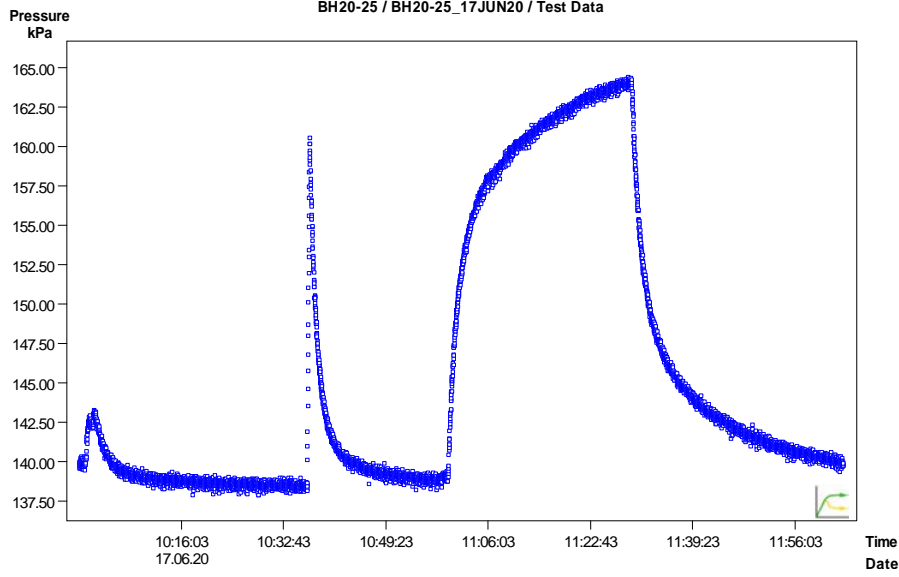
CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)** PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-15
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

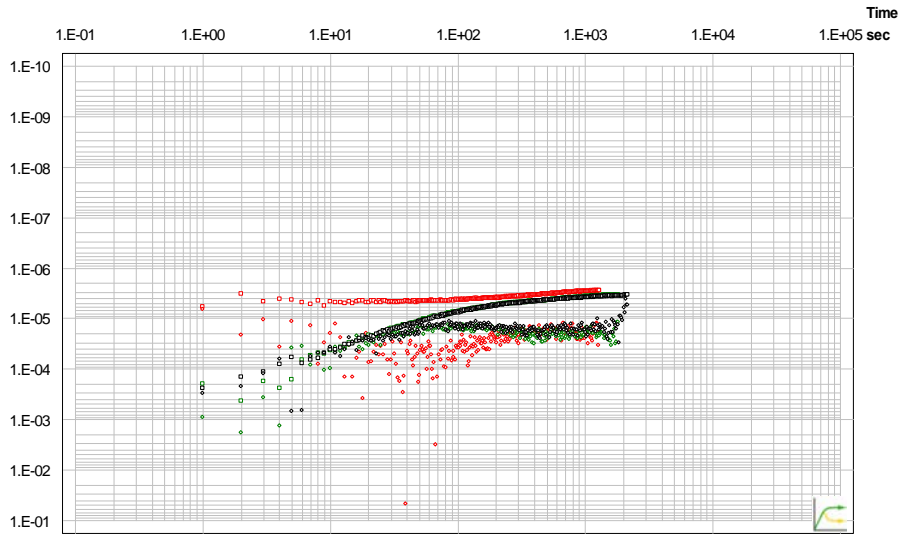
TITLE	PROJECT No.	PHASE	Rev.	FIGURE
<b>PACKER TEST RESULTS BH20-25 UPPER INTERVAL (7.9 to 13.1 mbgs)</b>	<b>19129150</b>	<b>2300</b>	<b>A</b>	<b>F-048</b>

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



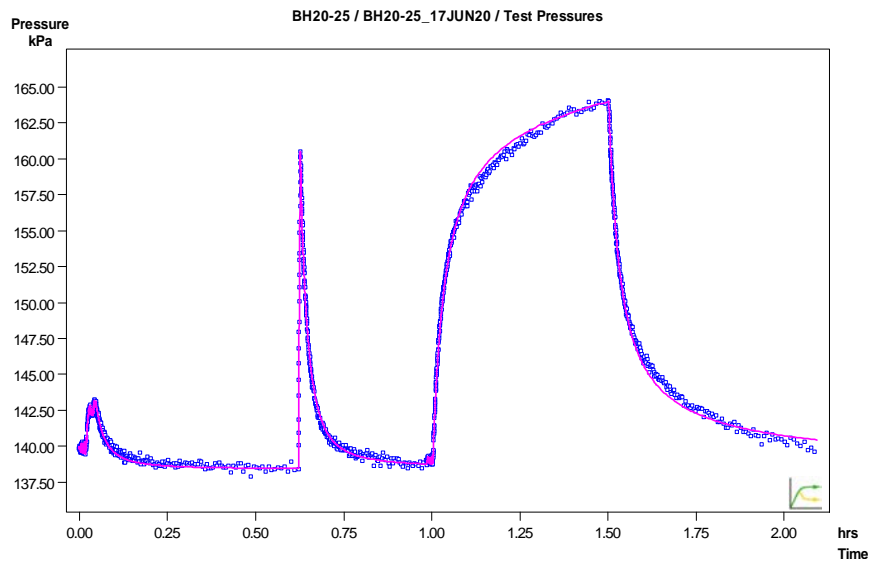


■ Pressure Observation

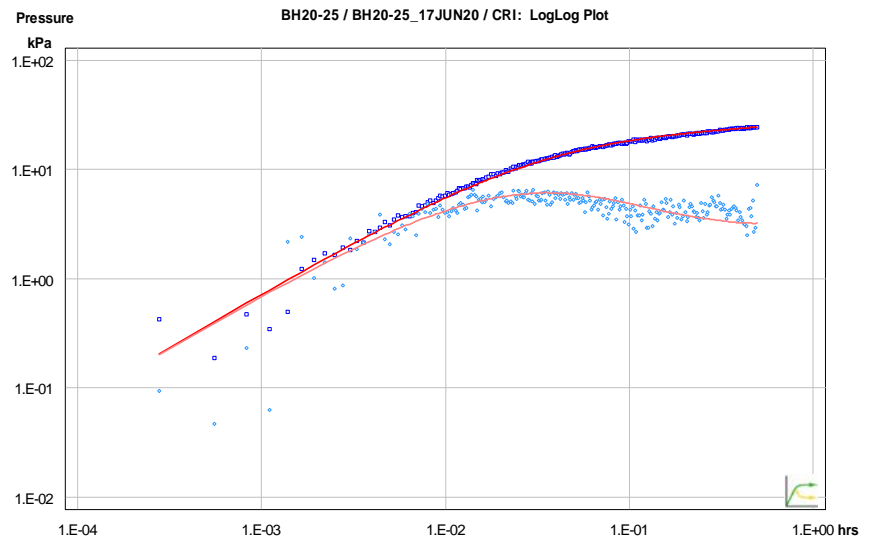


m<sup>2</sup>/s Transm. BH20-25 / BH20-25\_17JUN20 / LogLog Diagnosis - CRI

- Pressure Observation SI
- Pressure Observation CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative SI
- ◆ Pressure Derivative CRI
- ◆ Pressure Derivative CRIR



■ Pressure Observation — Simulated Pressure



- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

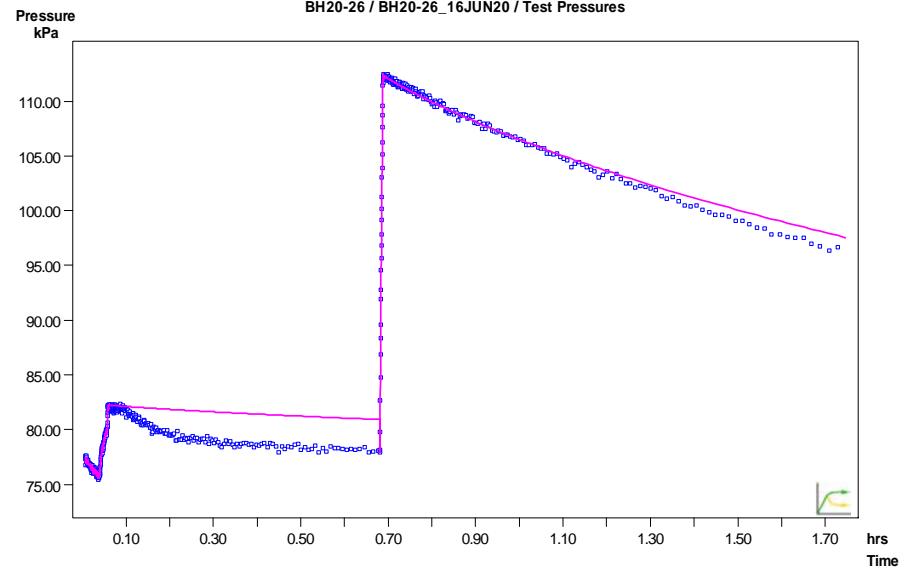
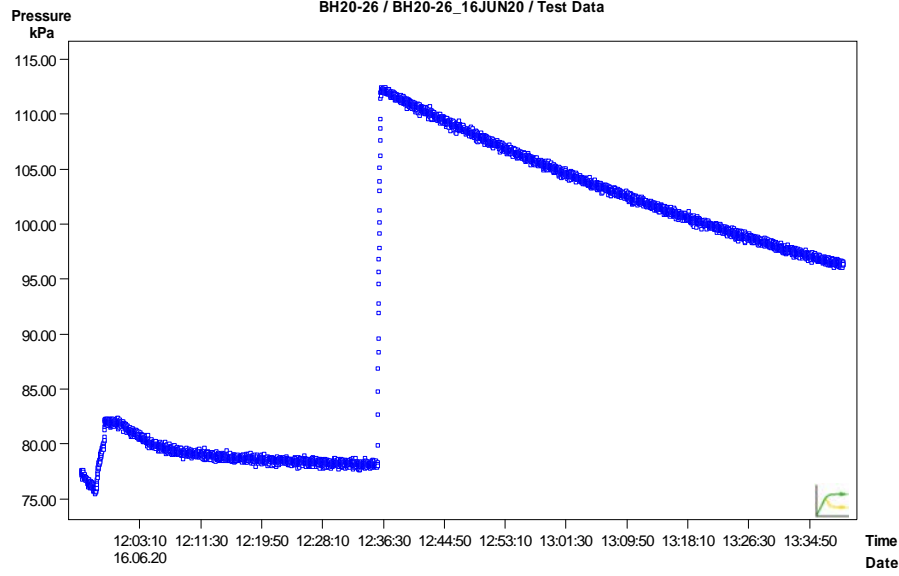
CLIENT  
CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT  
CALEDON PIT / QUARRY

CONSULTANT	YYYY-MM-DD	2022-02-15
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

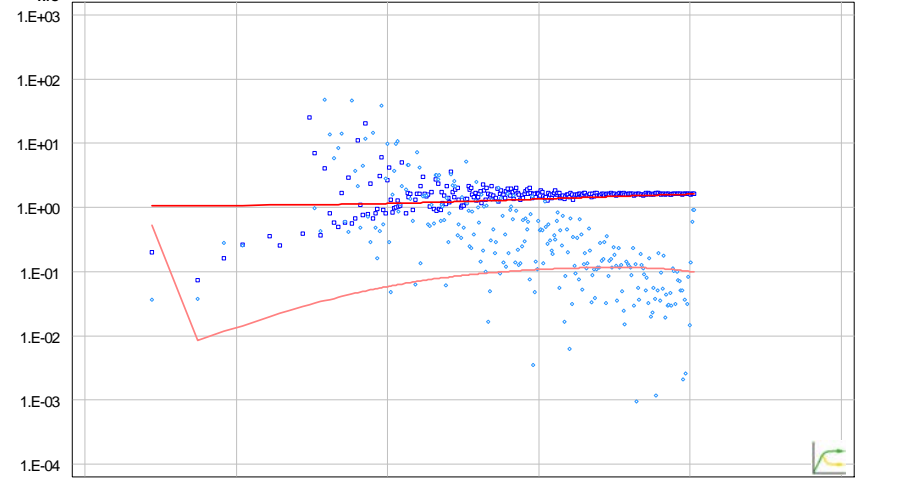
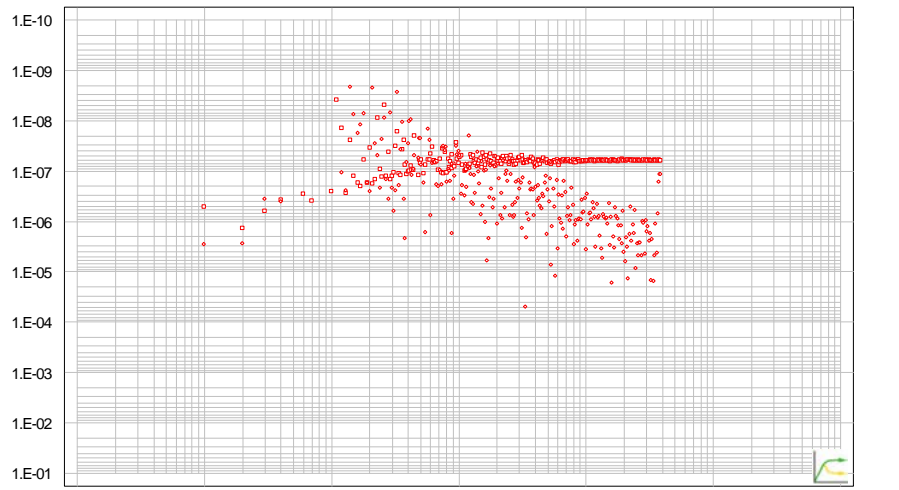
TITLE	PACKER TEST RESULTS BH20-25 LOWER INTERVAL (12.9 to 19.6 mbgs)		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-049

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI 11"



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



BH20-26 / BH20-26\_16JUN20 / LogLog Diagnosis - SI

BH20-26 / BH20-26\_16JUN20 / SI: LogLog Plot, constant P(i)

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

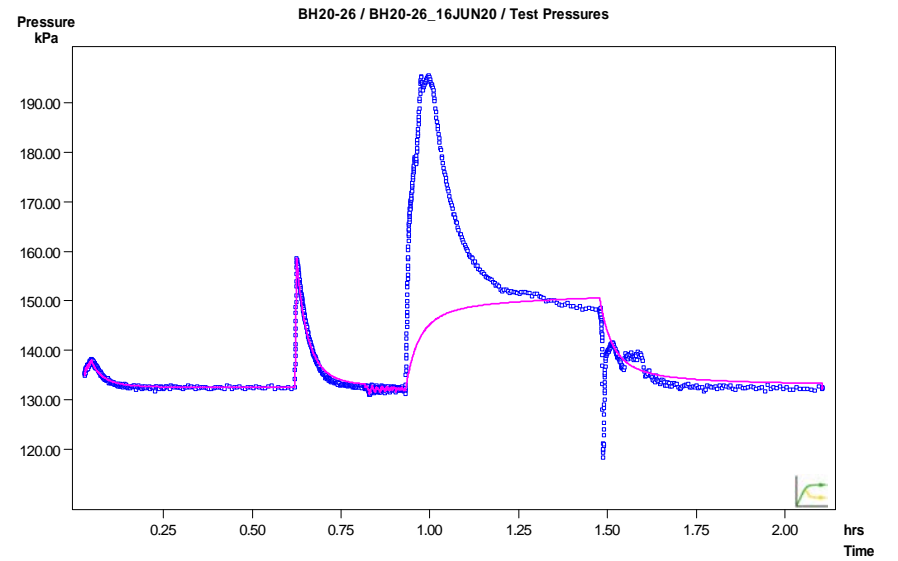
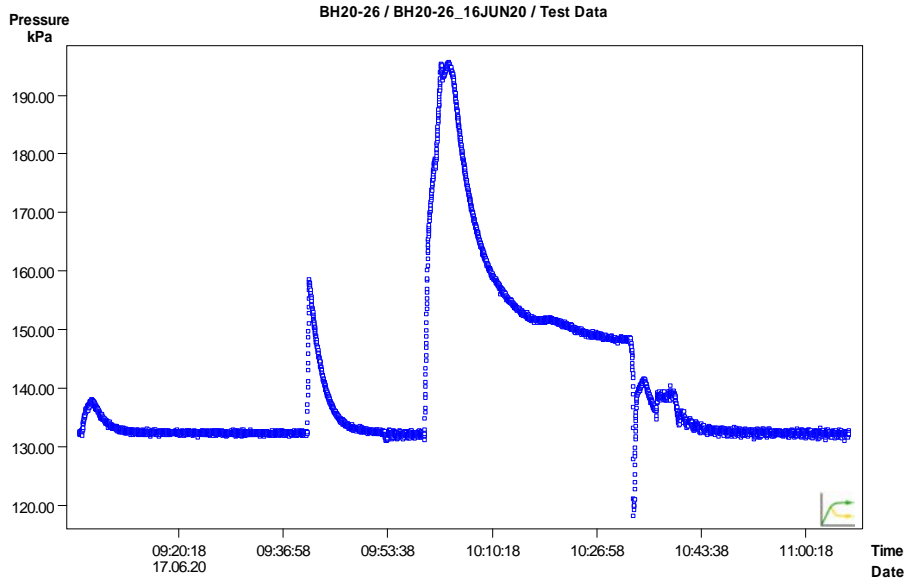
CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-15
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE	<b>PACKER TEST RESULTS BH20-26 UPPER INTERVAL (7.7 to 14.4 mbgs)</b>	
PROJECT No.	PHASE	Rev.
19129150	2300	A

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI

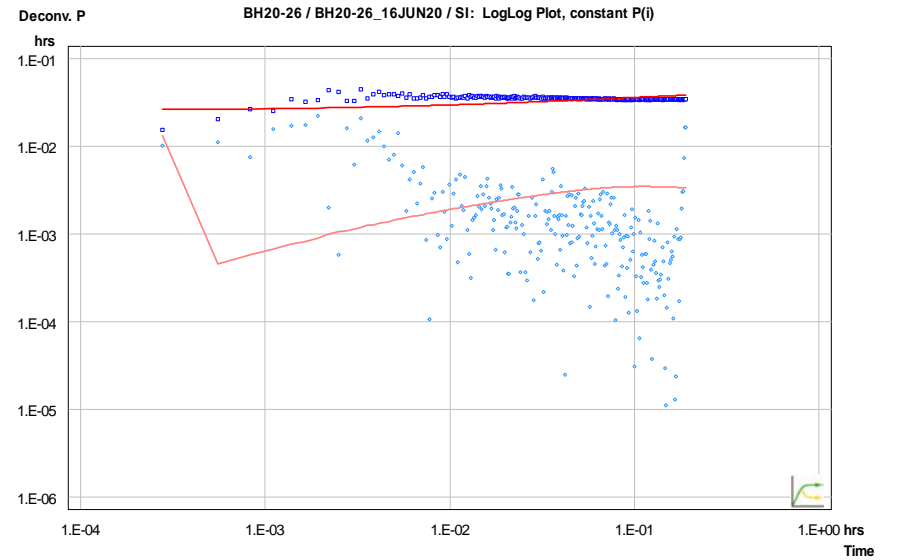
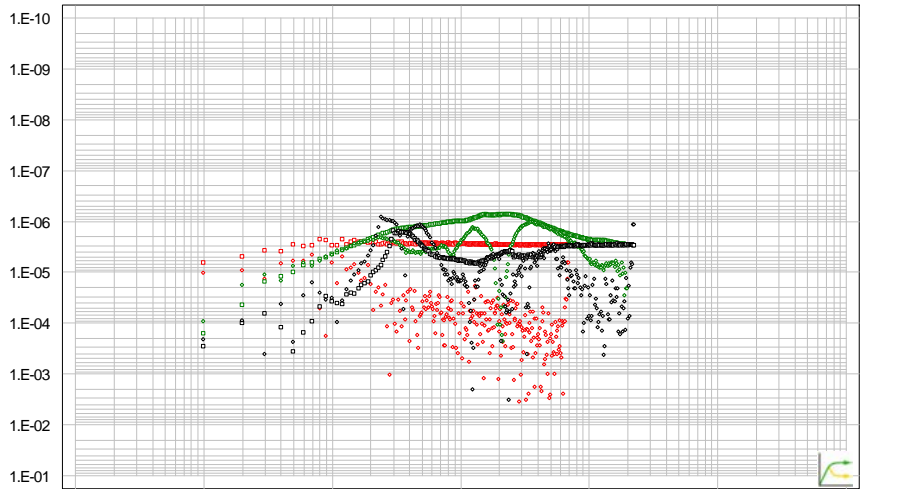


■ Pressure Observation

Time Date

■ Pressure Observation    — Simulated Pressure

Time



Transm.      BH20-26 / BH20-26\_16JUN20 / LogLog Diagnosis - SI

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response                      — Simulated Response Derivative

■ Pressure Observation SI      ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD      2022-02-15  
 PREPARED          PGM  
 DESIGN             ML  
 REVIEW             ###  
 APPROVED

TITLE

PACKER TEST RESULTS BH20-26 LOWER INTERVAL (13.6 to 20.3 mbgs)

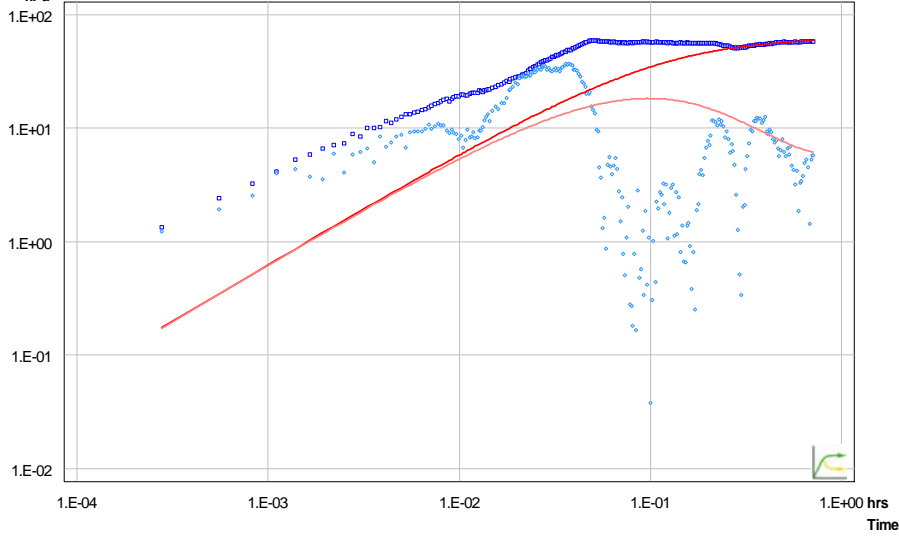
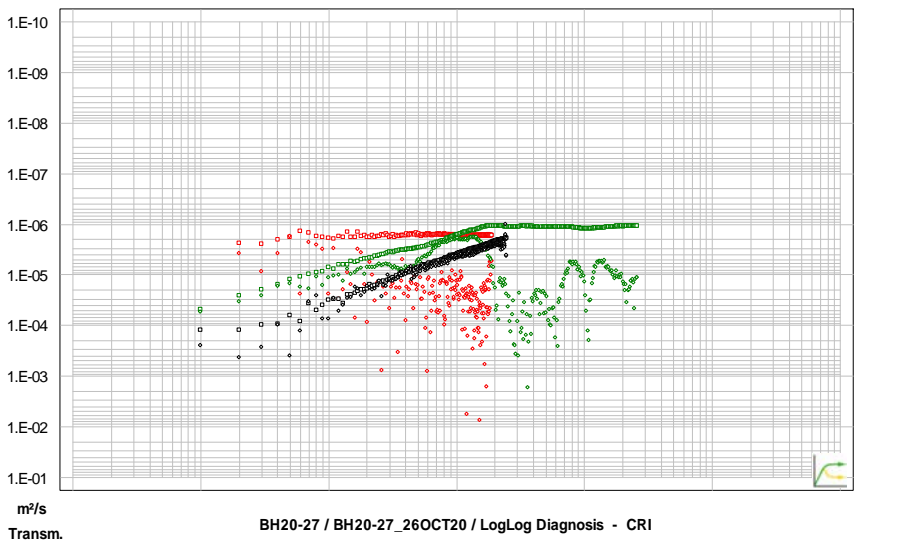
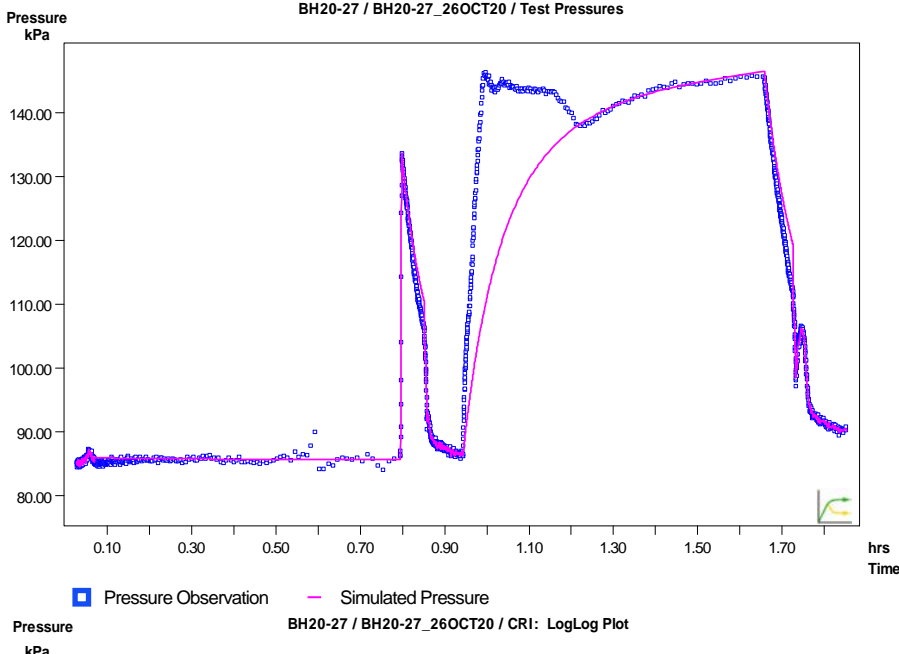
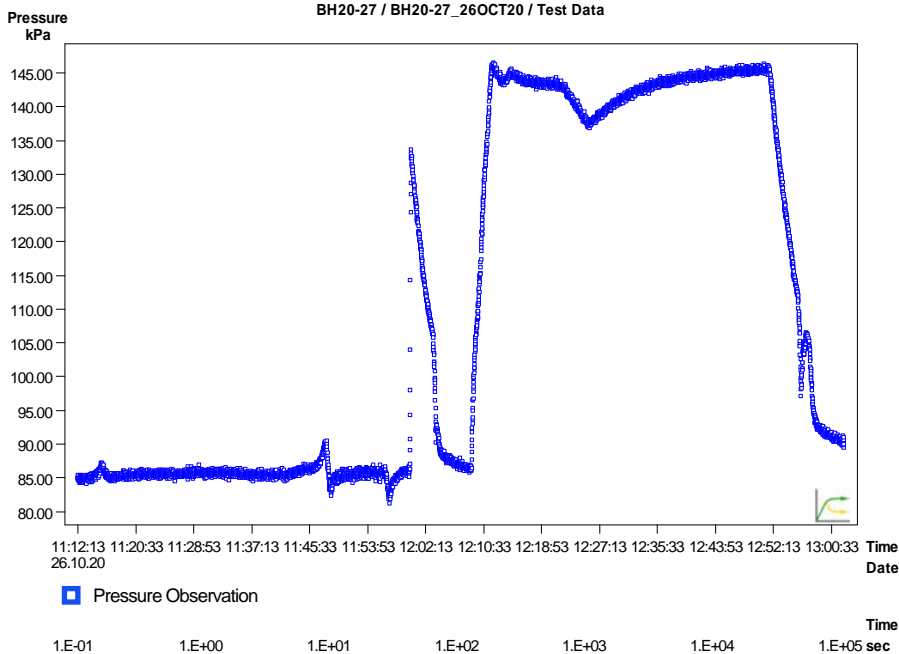
PROJECT No.  
19129150

PHASE  
2300

Rev.  
A

FIGURE  
F-051

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4



- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI     ◆ Pressure Derivative CRI
- Pressure Observation CRIR     ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase
- Simulated Response     — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER** MEMBER OF WSP

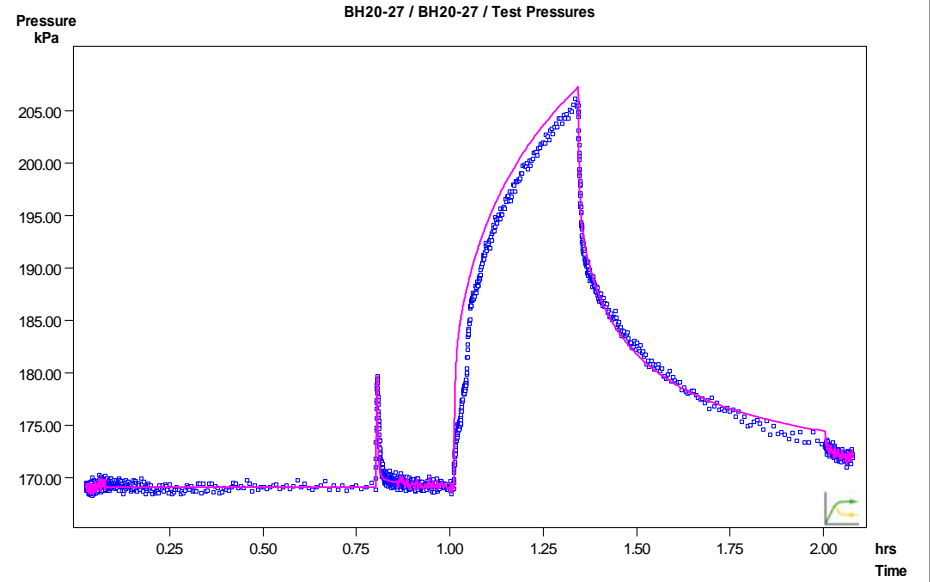
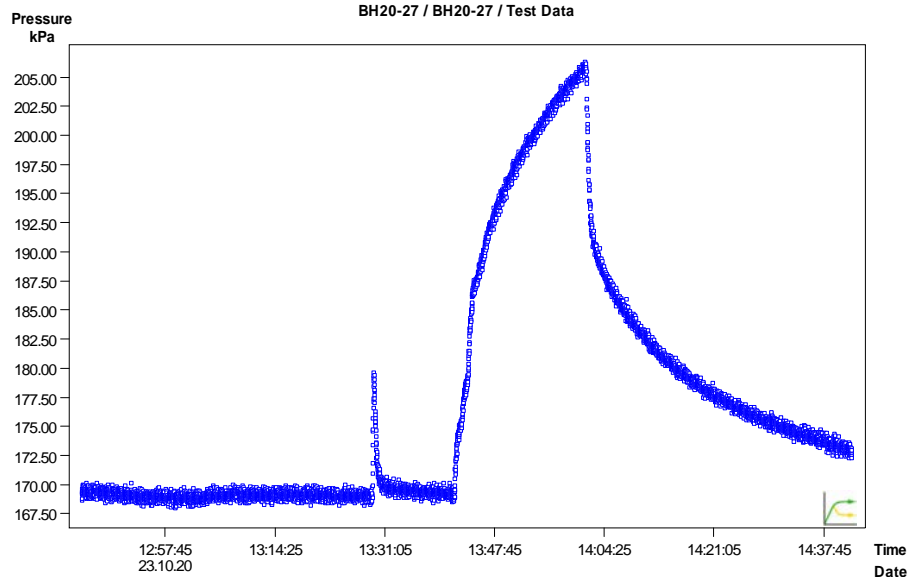
YYYY-MM-DD	2022-02-15
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

TITLE  
**PACKER TEST RESULTS BH20-27 UPPER INTERVAL (4.4 to 14.2 mbgs)**

PROJECT No.	19129150	PHASE	2300	Rev.	A	FIGURE	F-052
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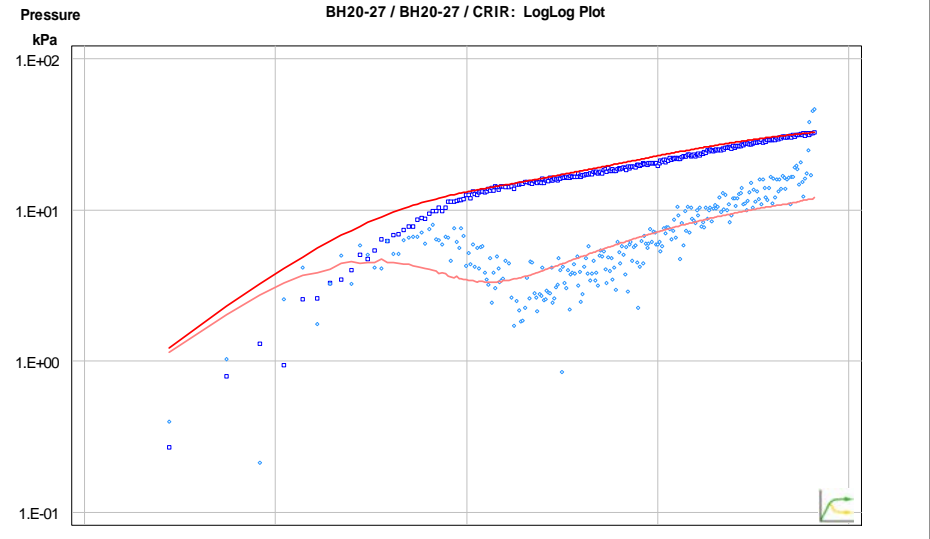
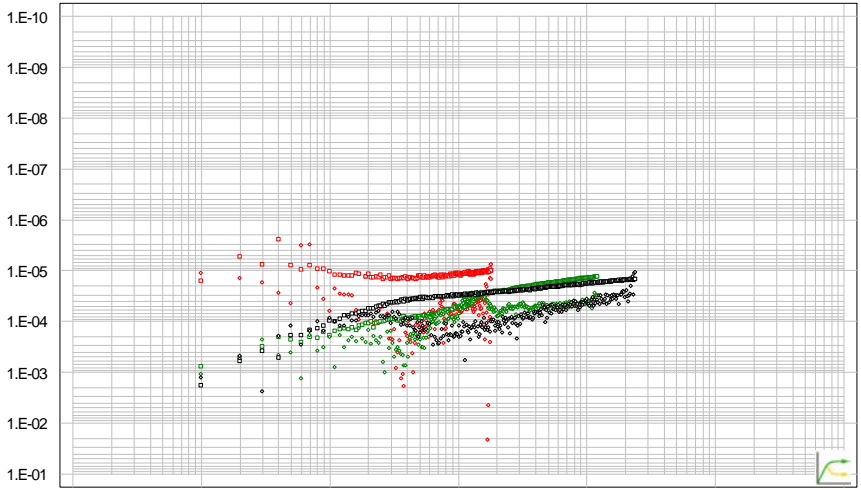
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A





■ Pressure Observation

■ Pressure Observation    — Simulated Pressure



m<sup>2</sup>/s  
Transm.

**BH20-27 / BH20-27 / LogLog Diagnosis - CRIR-2 shell**

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**      PROJECT: **CALEDON PIT / QUARRY**

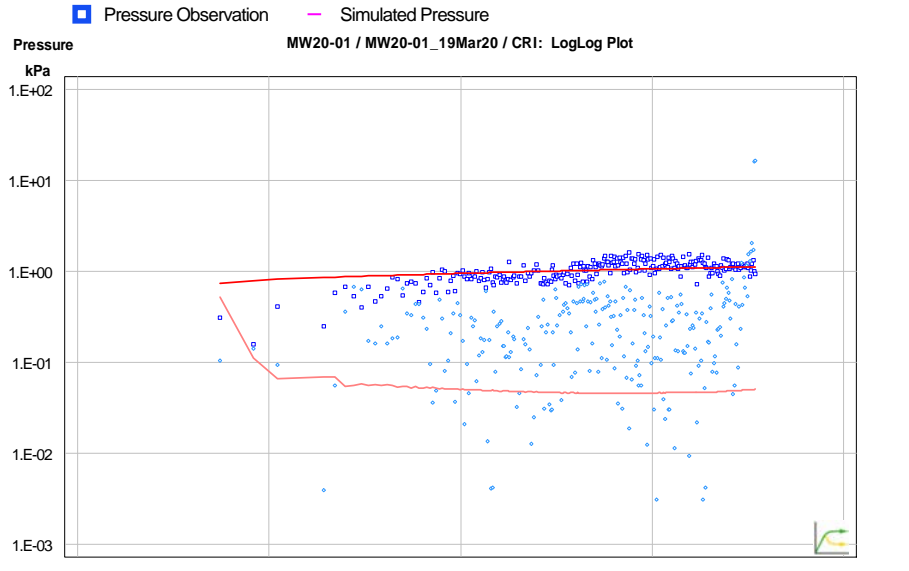
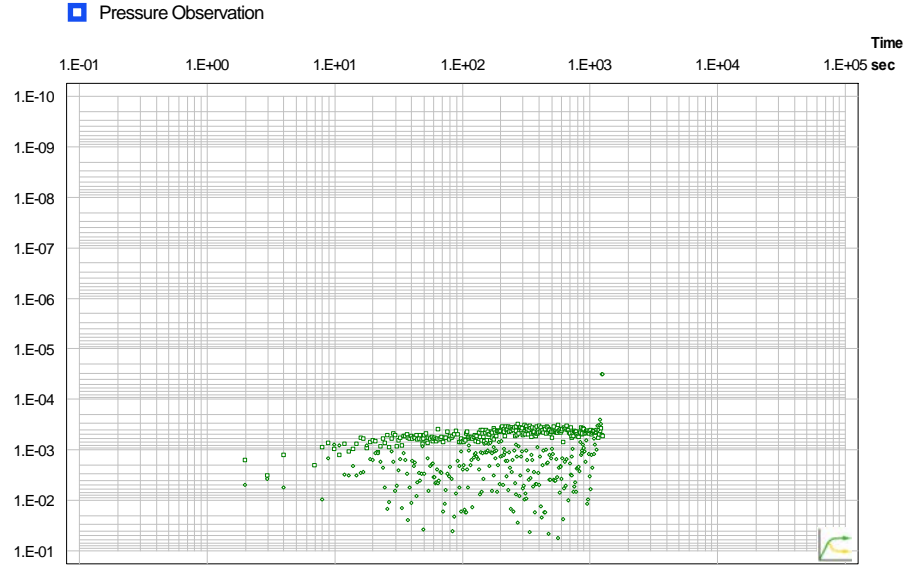
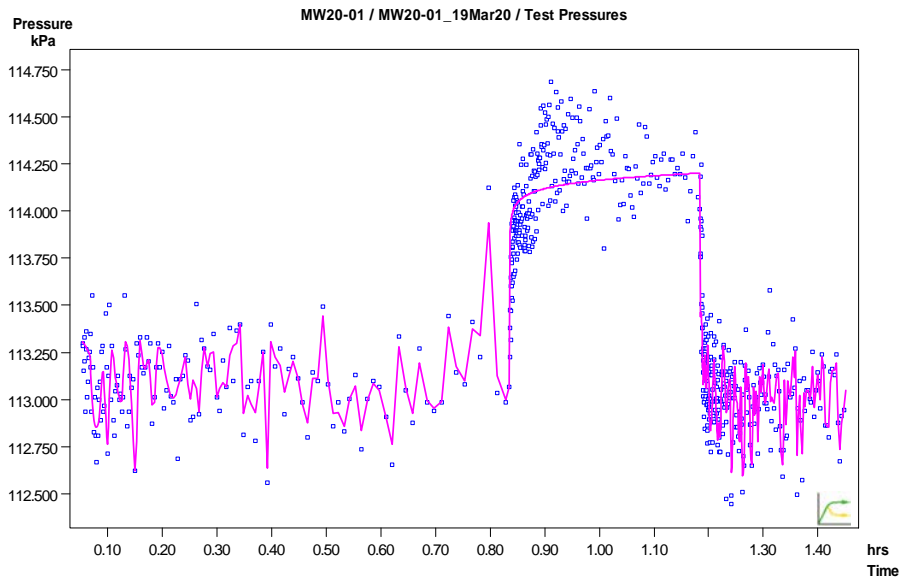
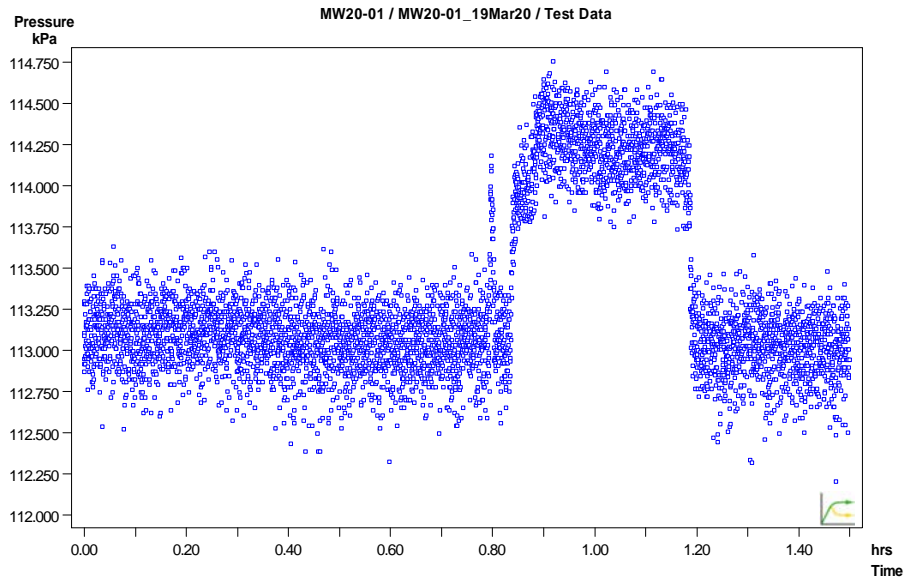
CONSULTANT: **GOLDER MEMBER OF WSP**

YYYY-MM-DD: 2022-03-14  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

TITLE: **PACKER TEST RESULTS BH20-27 LOWER INTERVAL (13.8 to 23.5 mbgs)**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE F-053

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- Pressure Observation CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative SI
- ◆ Pressure Derivative CRI
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- Simulated Response
- ◆ Pressure Derivative Selected Phase
- Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

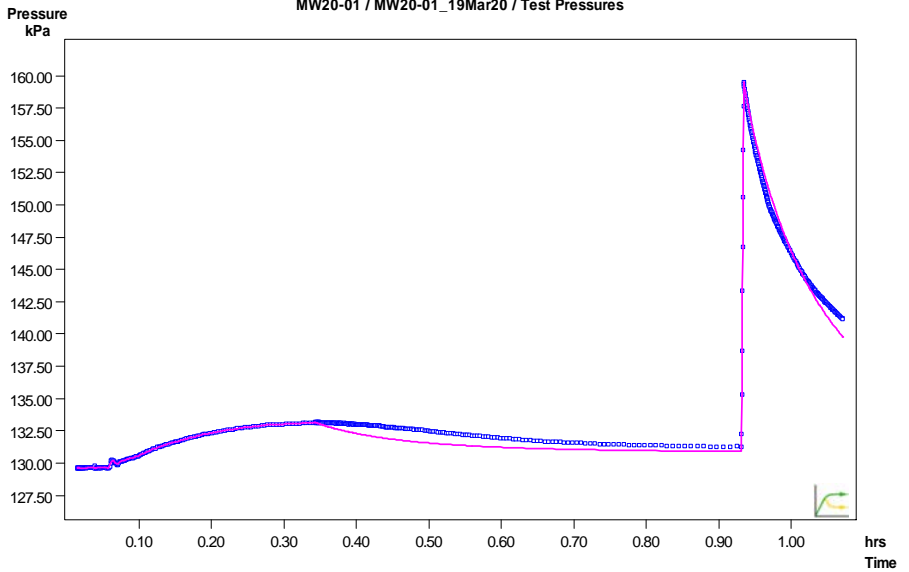
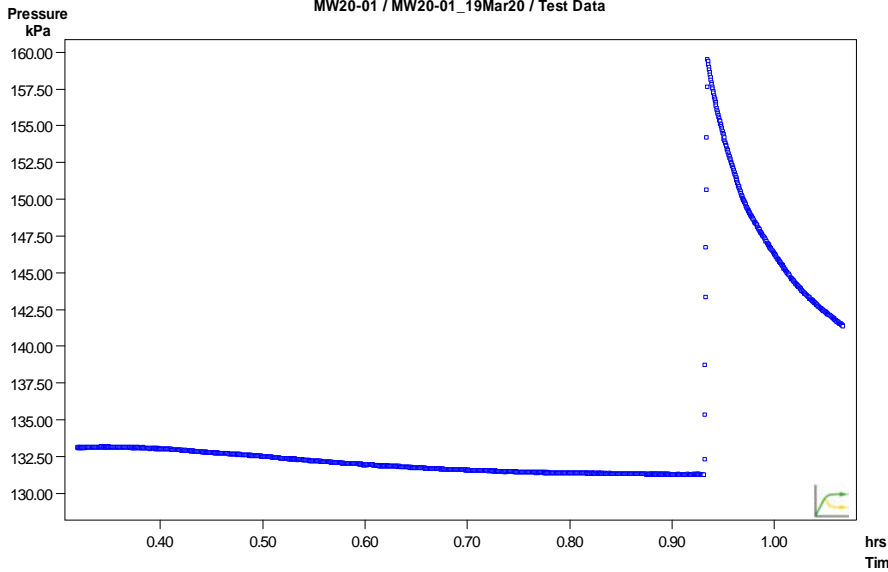
YYYY-MM-DD	2022-02-15
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS MW20-01 UPPER INTERVAL (10.9 to 14.5 mbgs)**

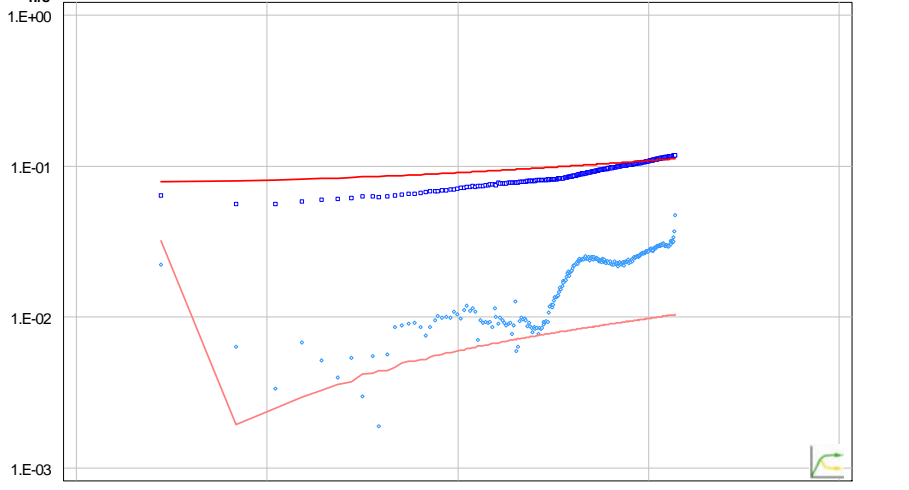
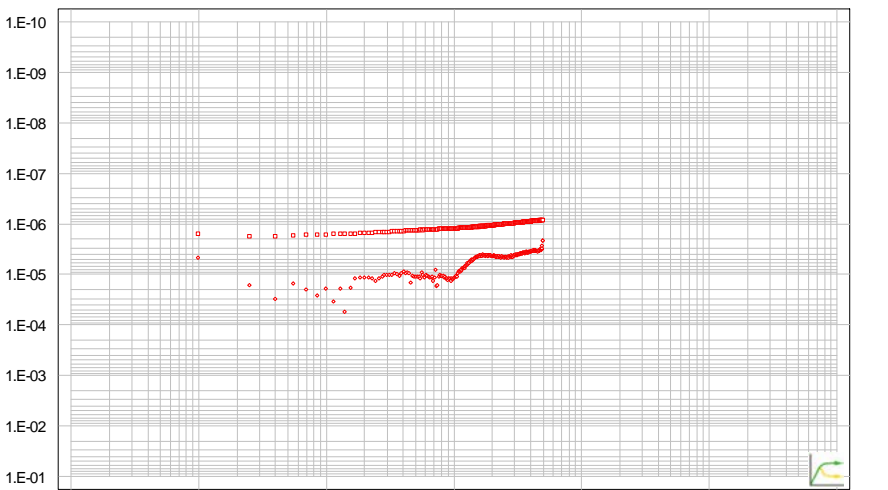
PROJECT No.	19129150	PHASE	2300	Rev.	A	FIGURE	F-054
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1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

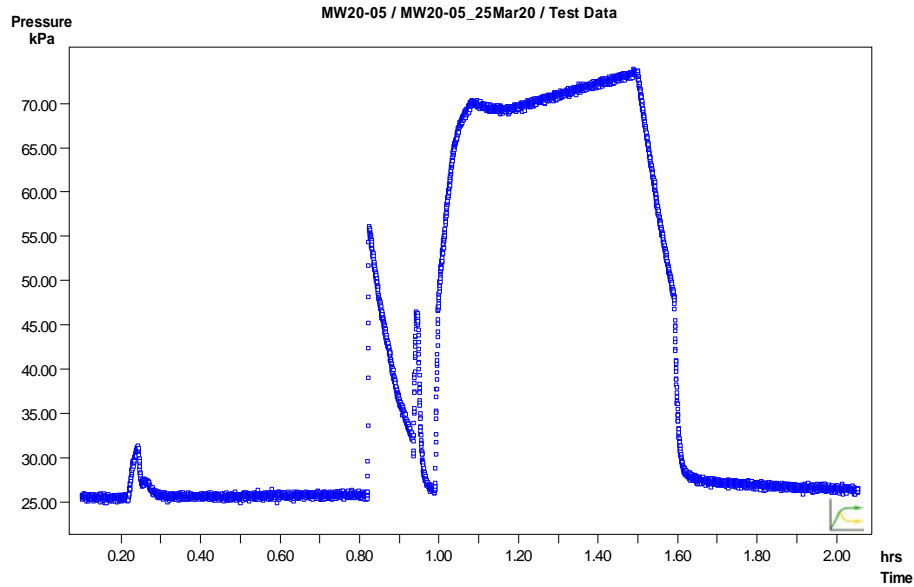


YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

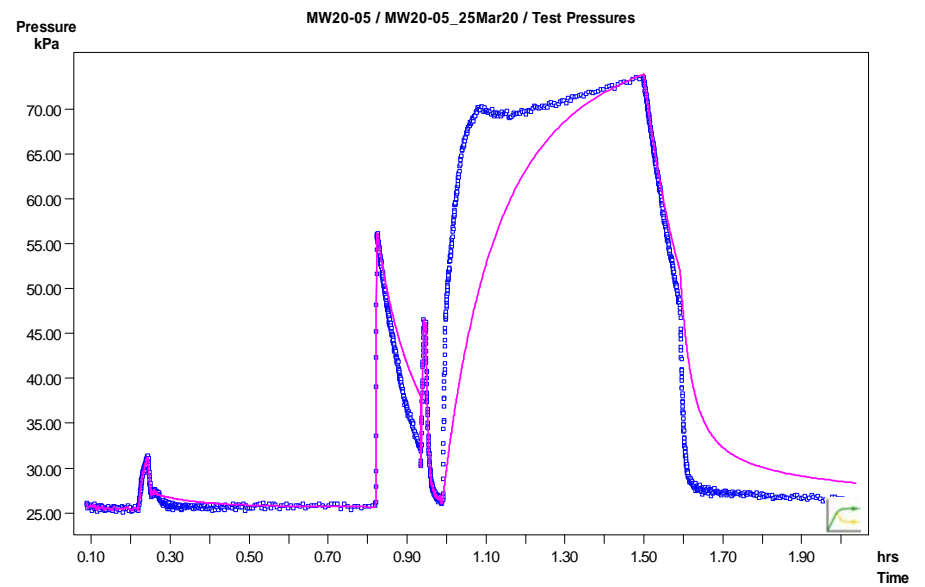
TITLE  
**PACKER TEST RESULTS MW20-01 LOWER INTERVAL (14.9 to 19.4 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-055

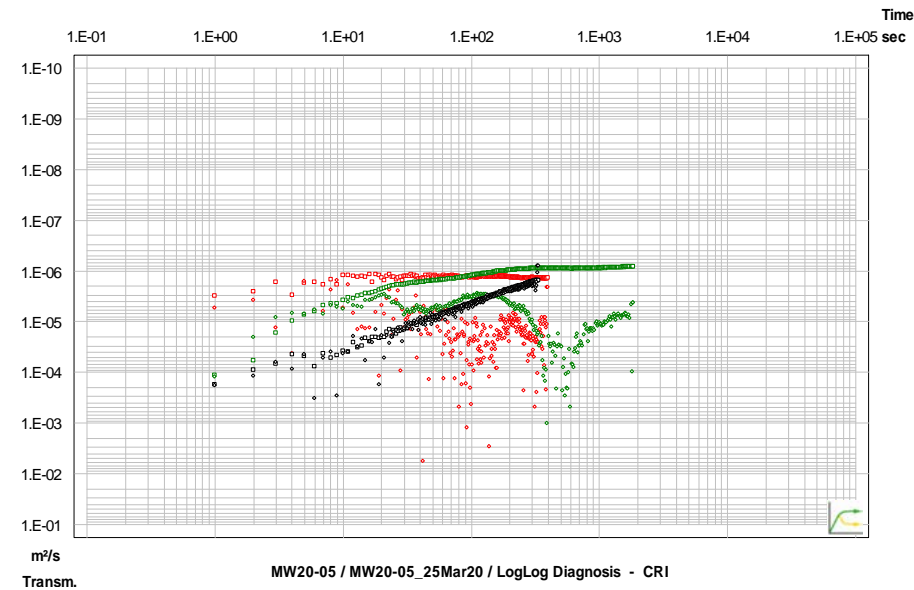
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



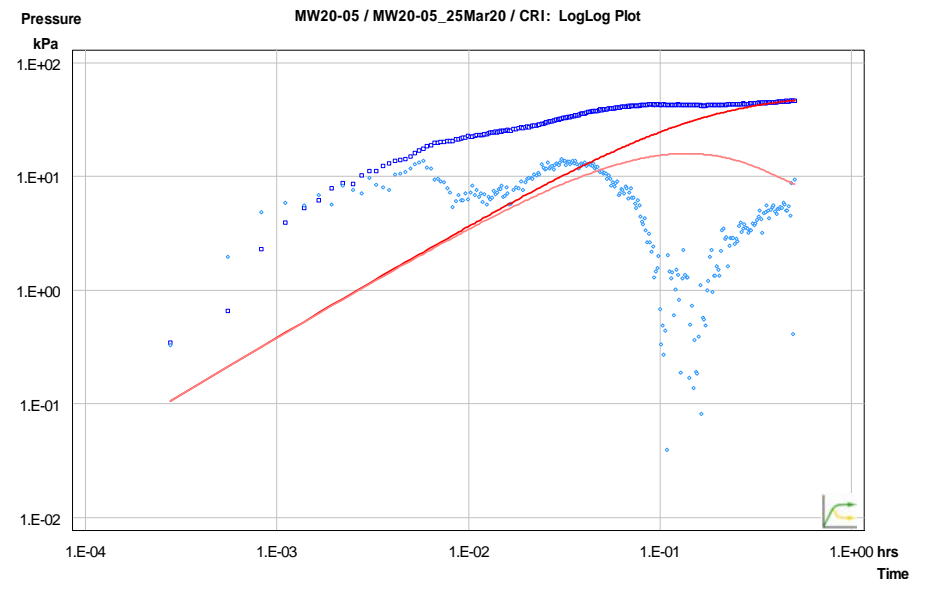
■ Pressure Observation



■ Pressure Observation    — Simulated Pressure



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR



■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE

PACKER TEST RESULTS MW20-05 UPPER INTERVAL (4.7 to 8.3 mbgs)

PROJECT No.  
19129150

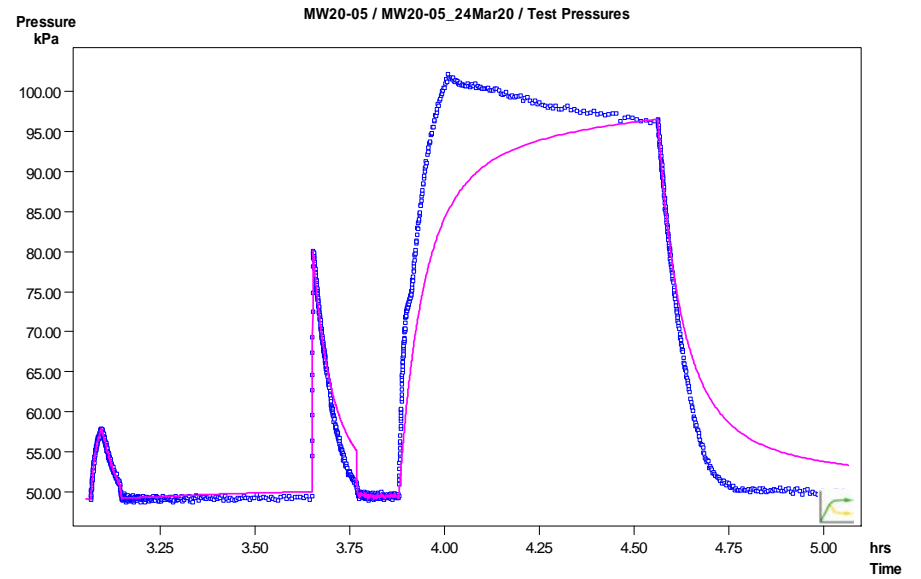
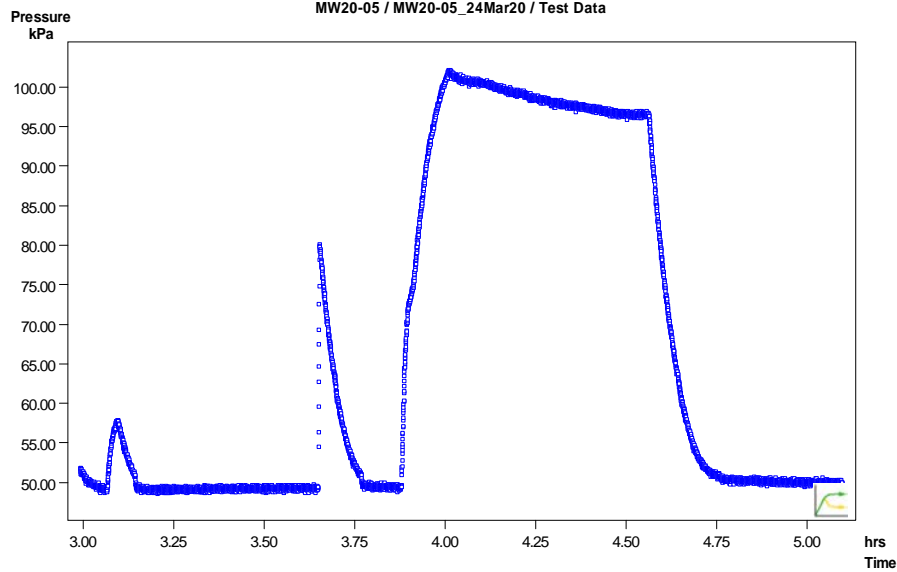
PHASE  
2300

Rev.  
A

FIGURE  
F-056

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



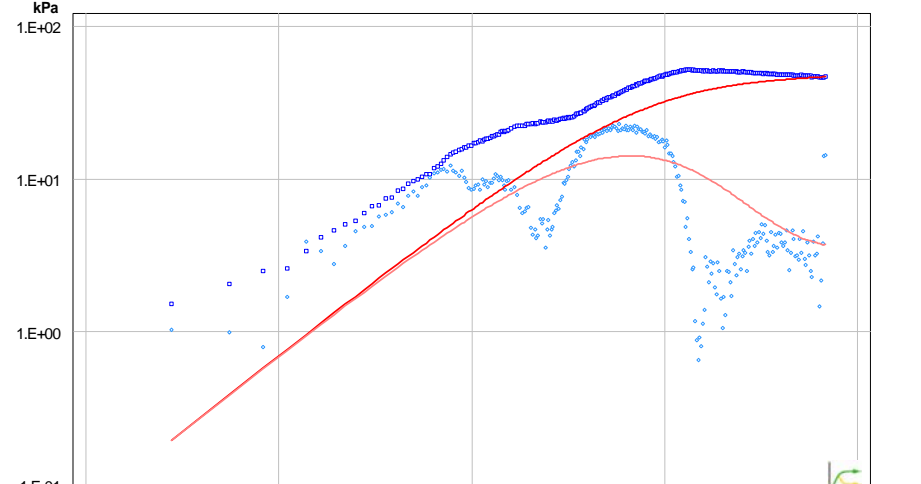
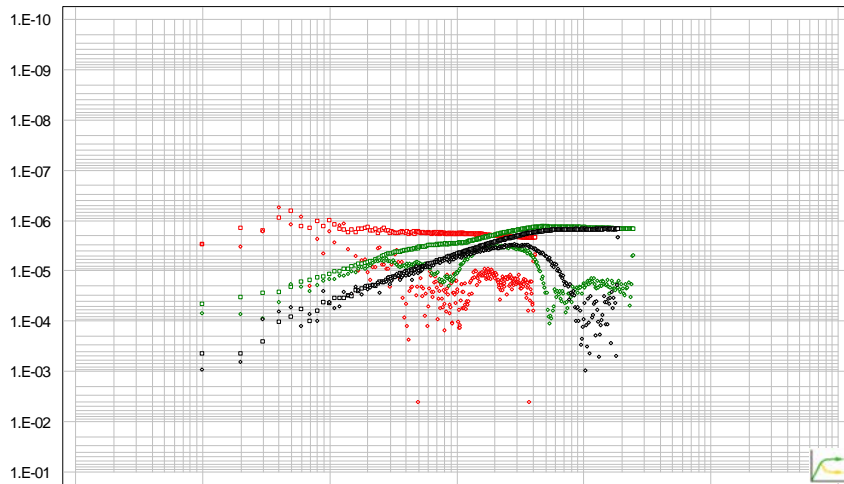


■ Pressure Observation

Time  
1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure

Pressure  
MW20-05 / MW20-05\_24Mar20 / CRI: LogLog Plot



m<sup>2</sup>/s  
Transm. MW20-05 / MW20-05\_24Mar20 / LogLog Diagnosis - CRI

1.E-04 1.E-03 1.E-02 1.E-01 1.E+00 hrs  
Time

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-15

PREPARED PGM

DESIGN ML

REVIEW ###

APPROVED

TITLE

PACKER TEST RESULTS MW20-05 MIDDLE INTERVAL (6.9 to 10.5 mbgs)

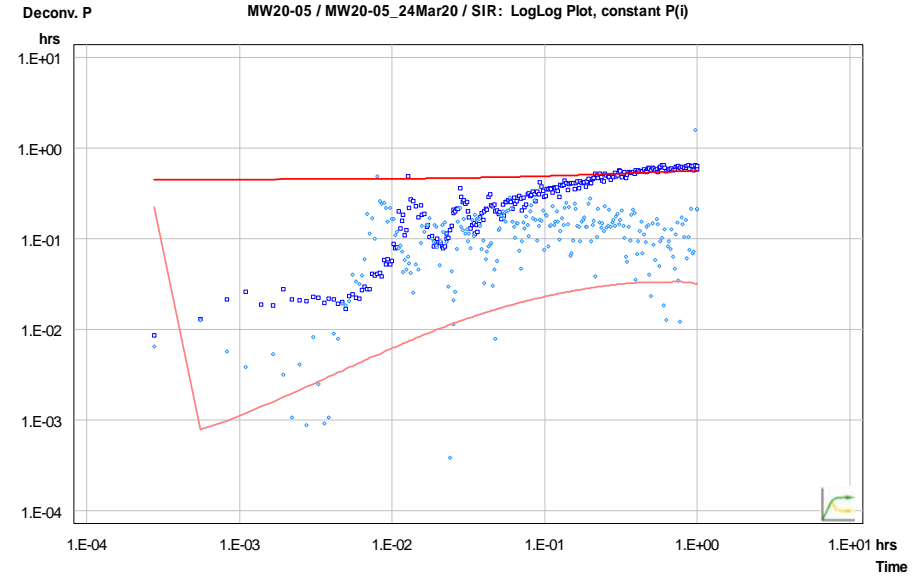
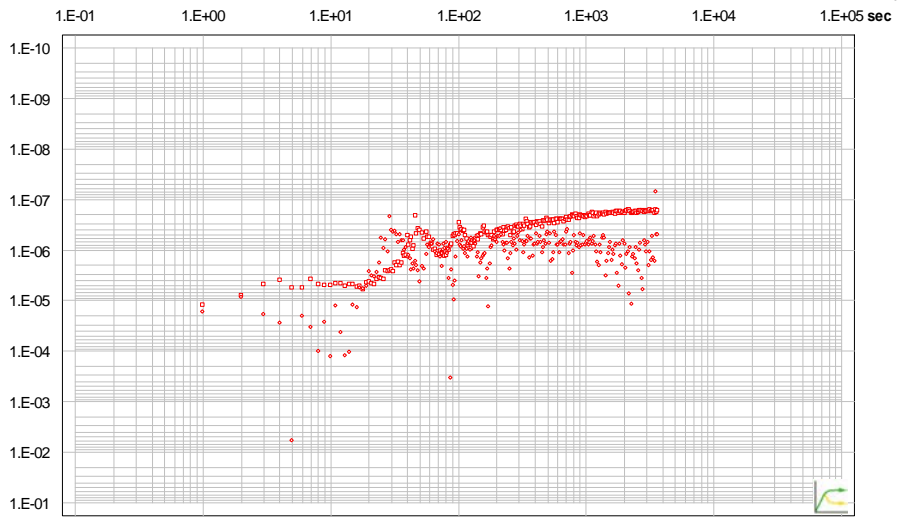
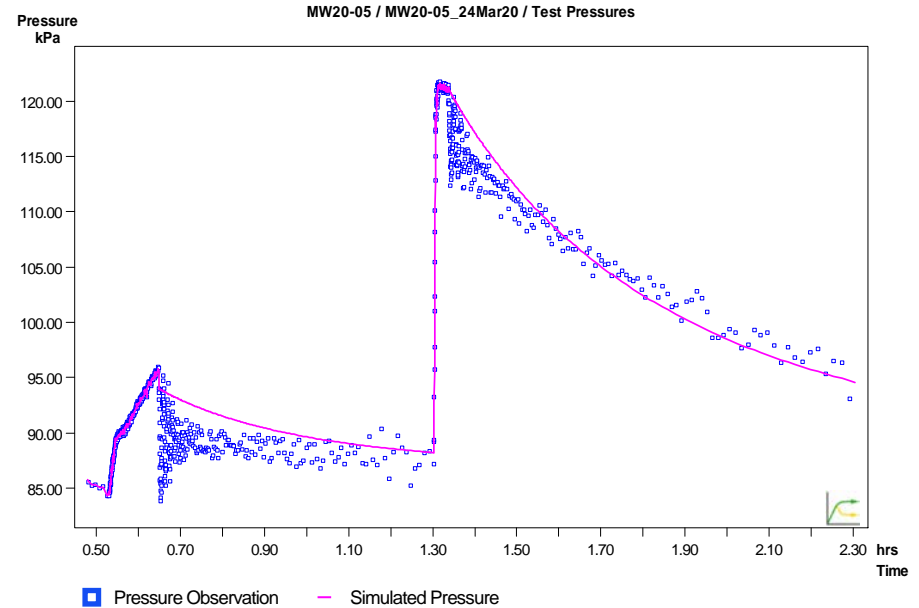
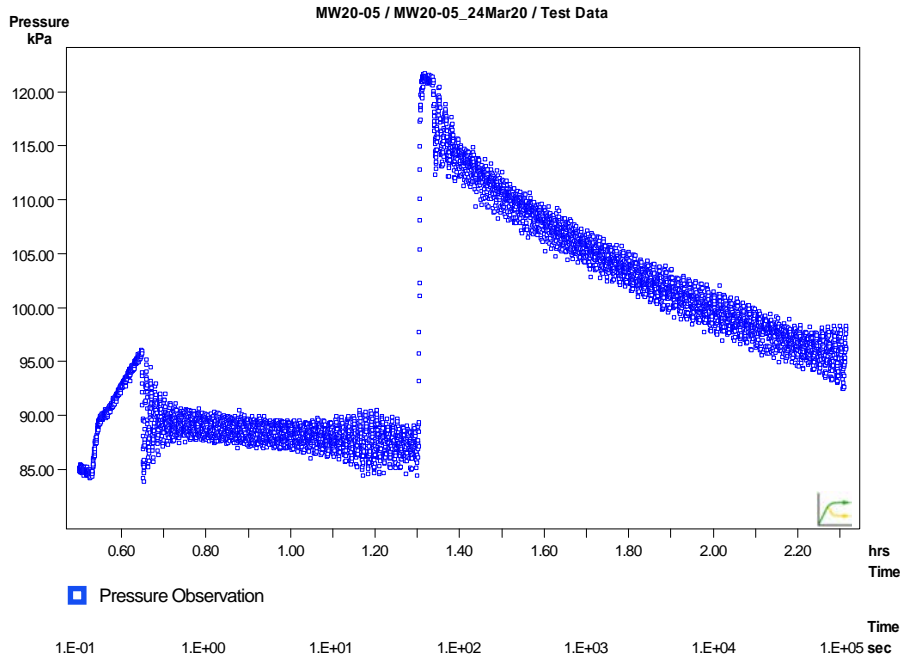
PROJECT No.  
19129150

PHASE  
2300

Rev.  
A

FIGURE  
F-057

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



MW20-05 / MW20-05\_24Mar20 / LogLog Diagnosis - SIR

- Pressure Observation SI      ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase      ◆ Pressure Derivative Selected Phase
- Simulated Response      — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**      PROJECT: **CALEDON PIT / QUARRY**

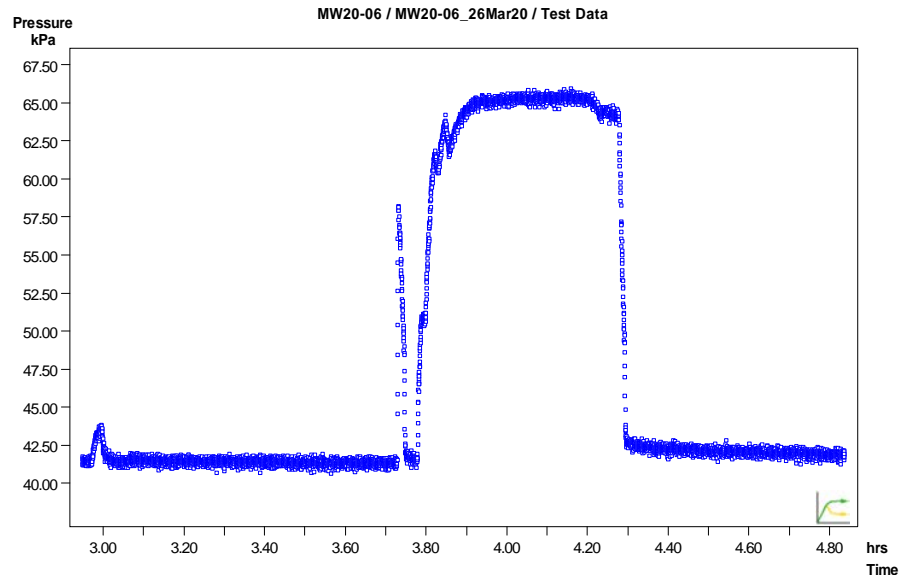
CONSULTANT: **GOLDER MEMBER OF WSP**

YYYY-MM-DD: 2022-02-15  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

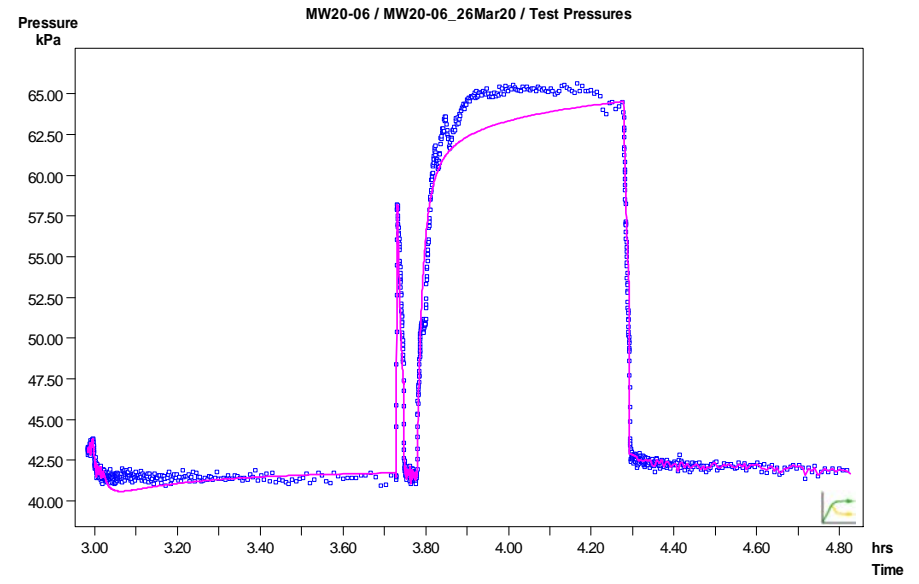
TITLE: **PACKER TEST RESULTS MW20-05 LOWER INTERVAL (10.6 to 14.8 mbgs)**

PROJECT No. **19129150**      PHASE **2300**      Rev. **A**      FIGURE **F-058**

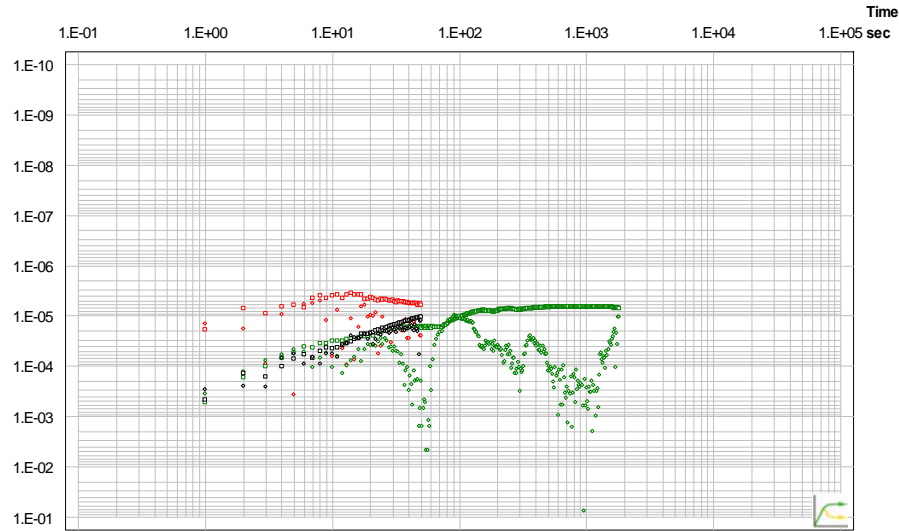
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI 11" x 17"



■ Pressure Observation

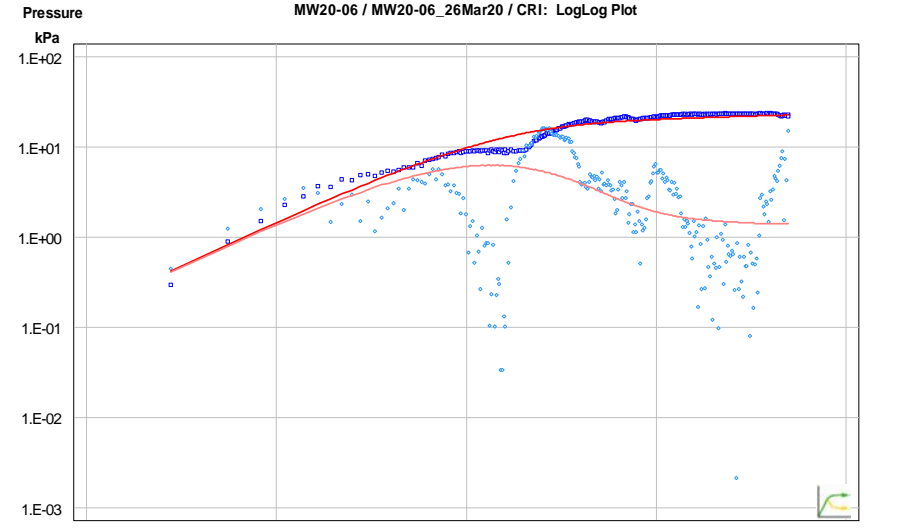


■ Pressure Observation    — Simulated Pressure



MW20-06 / MW20-06\_26Mar20 / LogLog Diagnosis - CRI

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR



■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

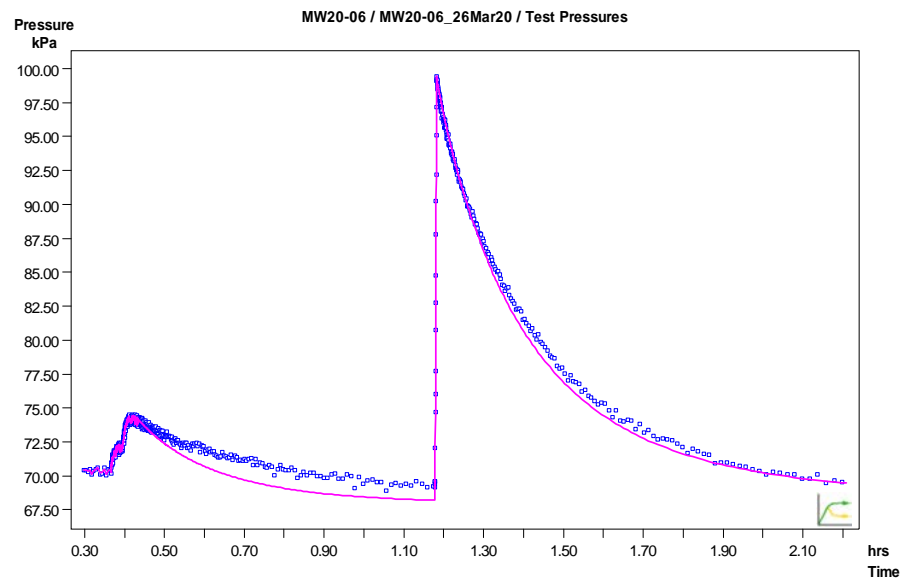
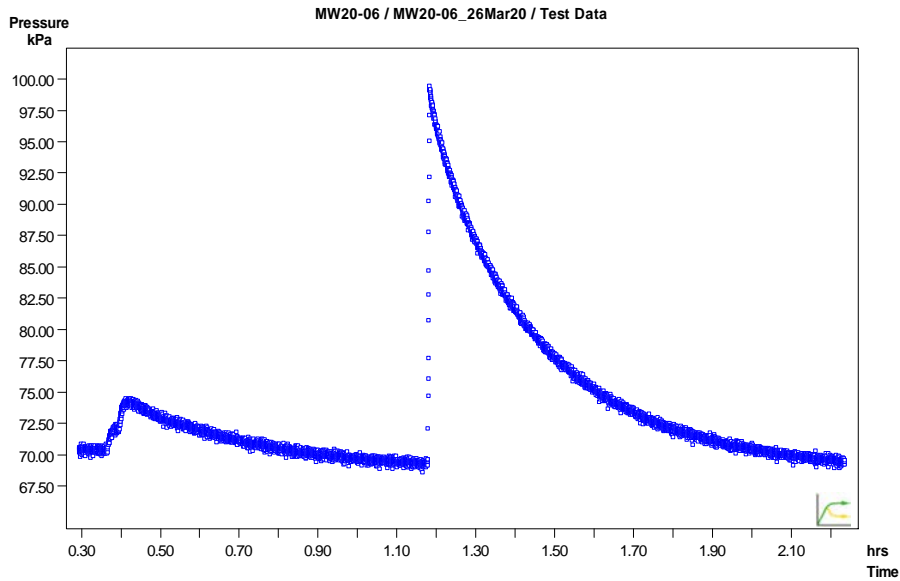
CONSULTANT

YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-06 UPPER INTERVAL (4.3 to 7.9 mbgs)**

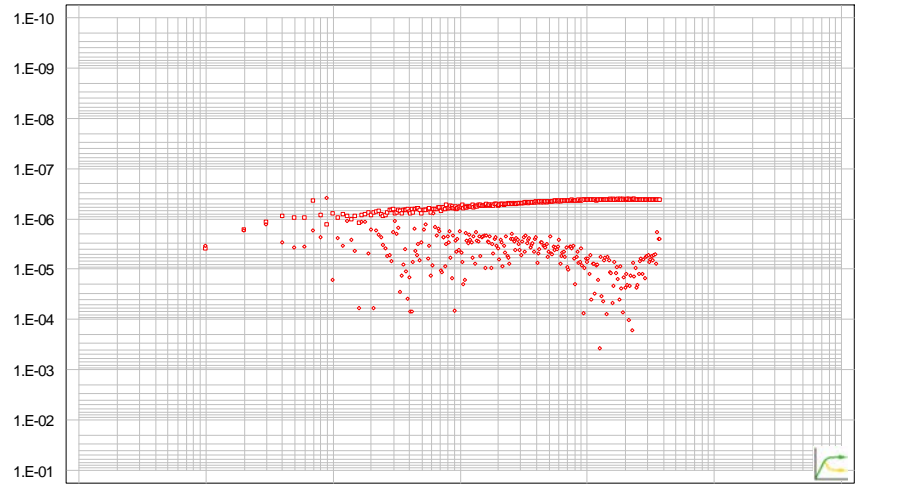
PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-059

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI

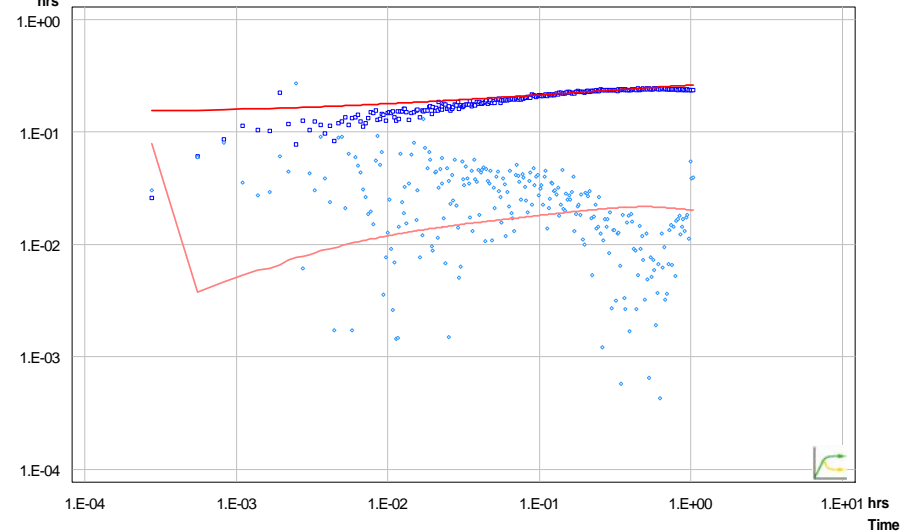


■ Pressure Observation

■ Pressure Observation    — Simulated Pressure



Deconv. P    MW20-06 / MW20-06\_26Mar20 / SIR: LogLog Plot, constant P(i)



Transm.    MW20-06 / MW20-06\_26Mar20 / LogLog Diagnosis - SIR

■ Pressure Observation SI    ◆ Pressure Derivative SI  
■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
— Simulated Response    — Simulated Response Derivative

CLIENT    CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

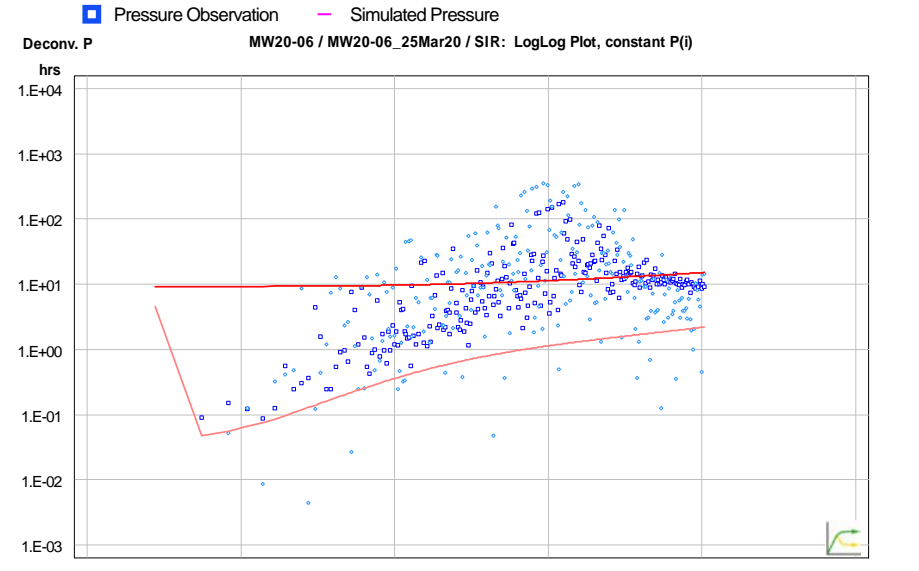
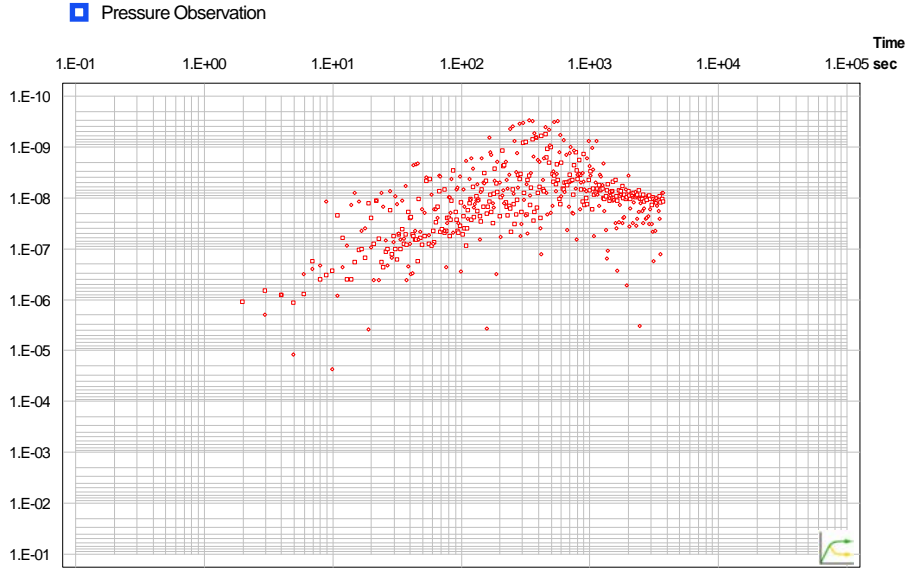
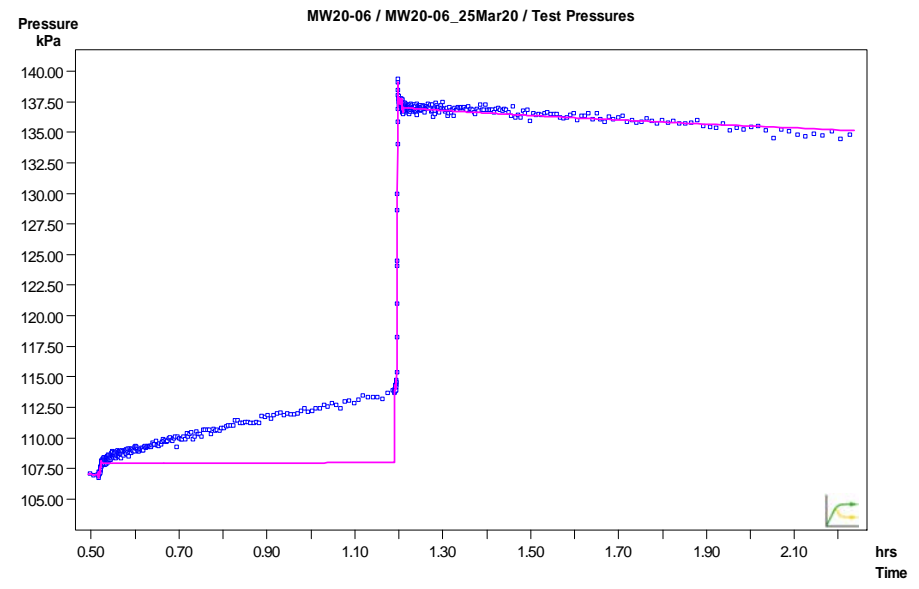
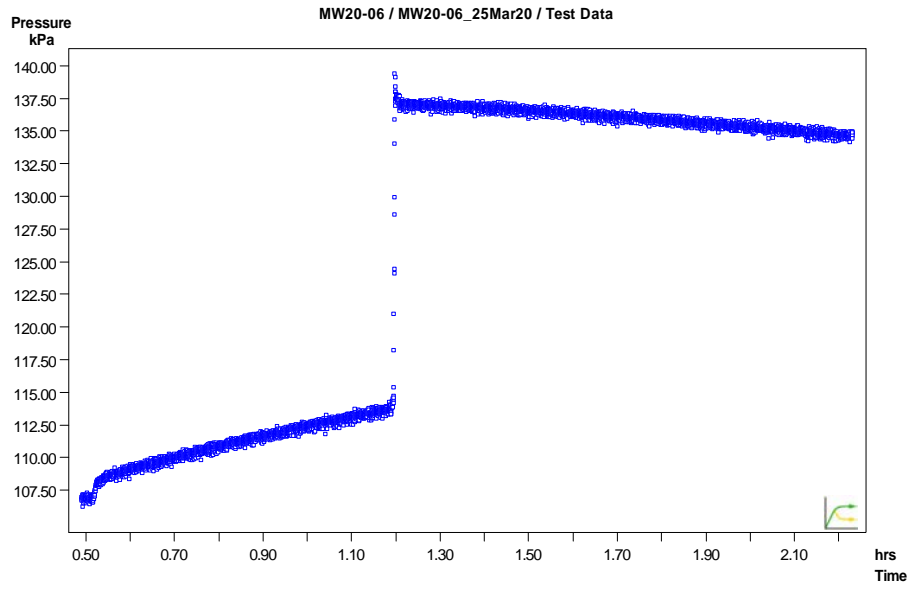
PROJECT    CALEDON PIT / QUARRY

CONSULTANT    **GOLDER** MEMBER OF WSP  
 YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE    **PACKER TEST RESULTS MW20-06 MIDDLE INTERVAL (7.2 to 10.8 mbgs)**  
 PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-060

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A5/A4





- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT

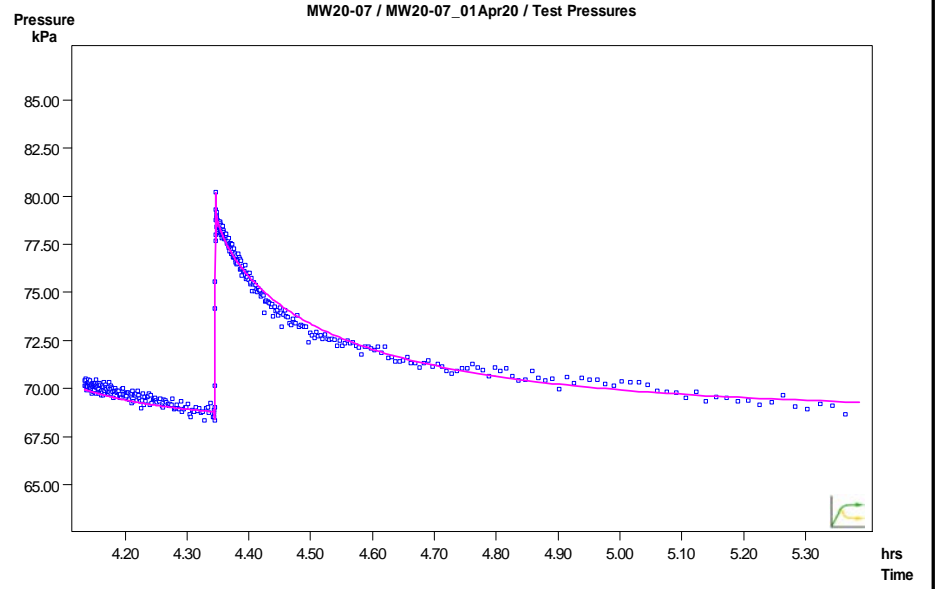
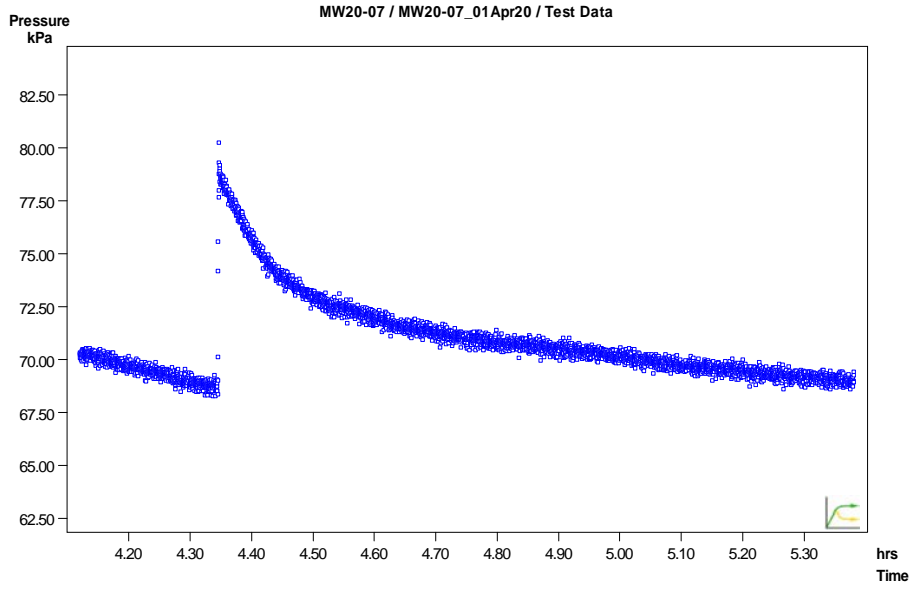
YYYY-MM-DD	2022-02-15
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS MW20-06 LOWER INTERVAL (10.9 to 16.0 mbgs)**

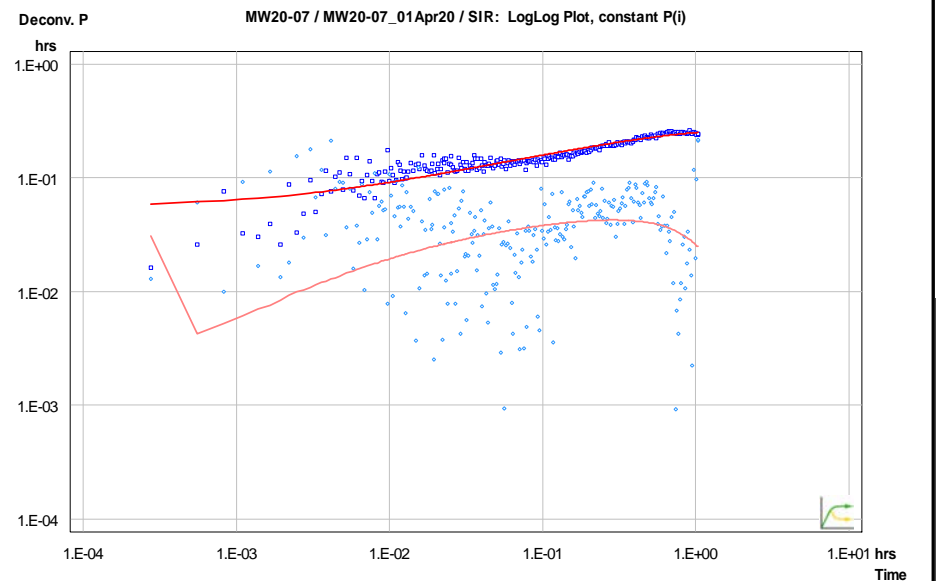
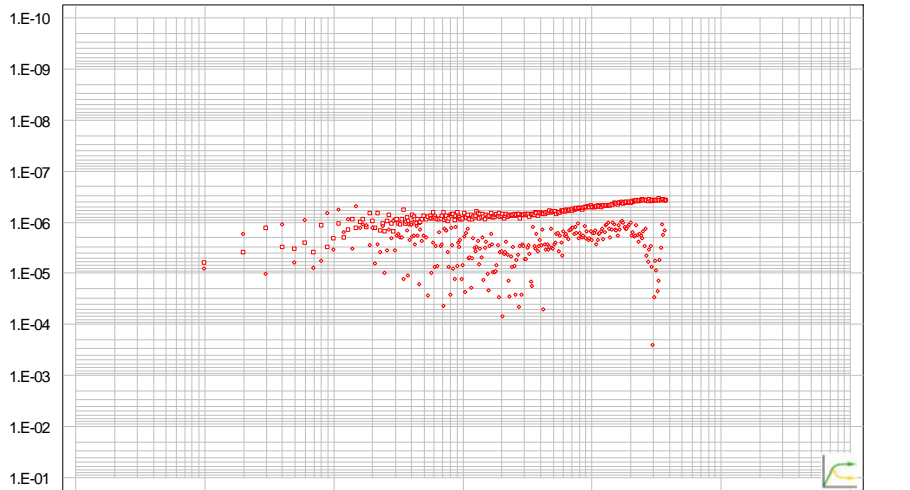
PROJECT No.	19129150	PHASE	2300	Rev.	A	FIGURE	F-061
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1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



m/s  
Transm.

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

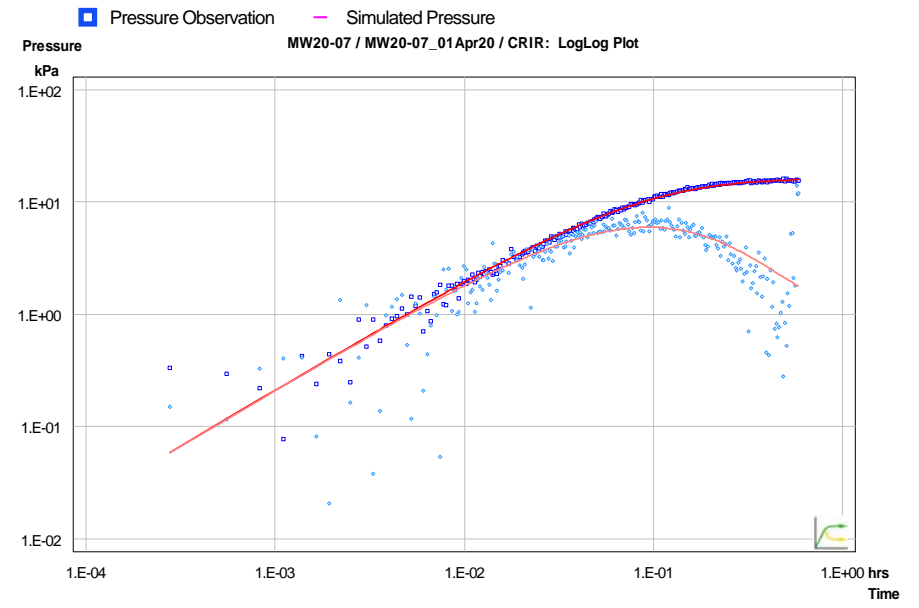
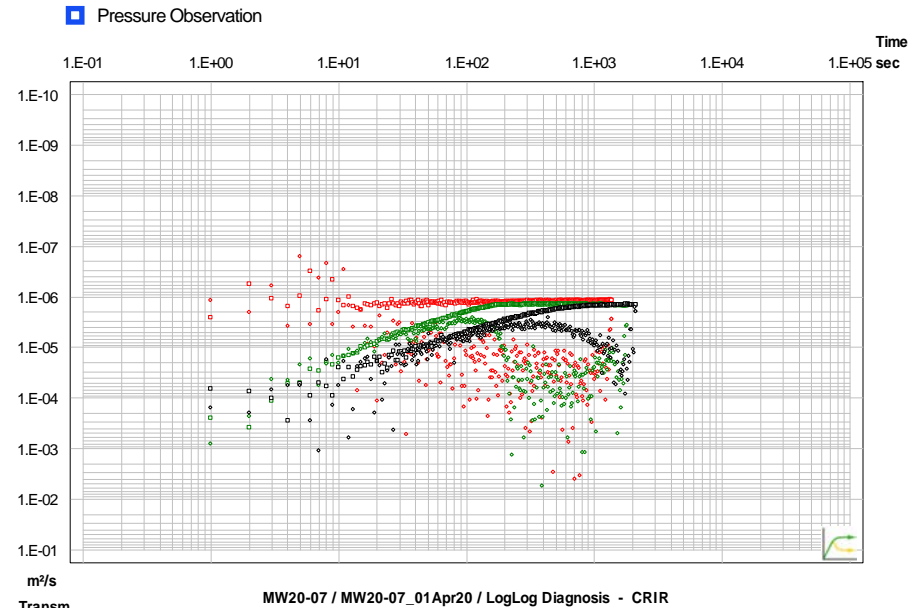
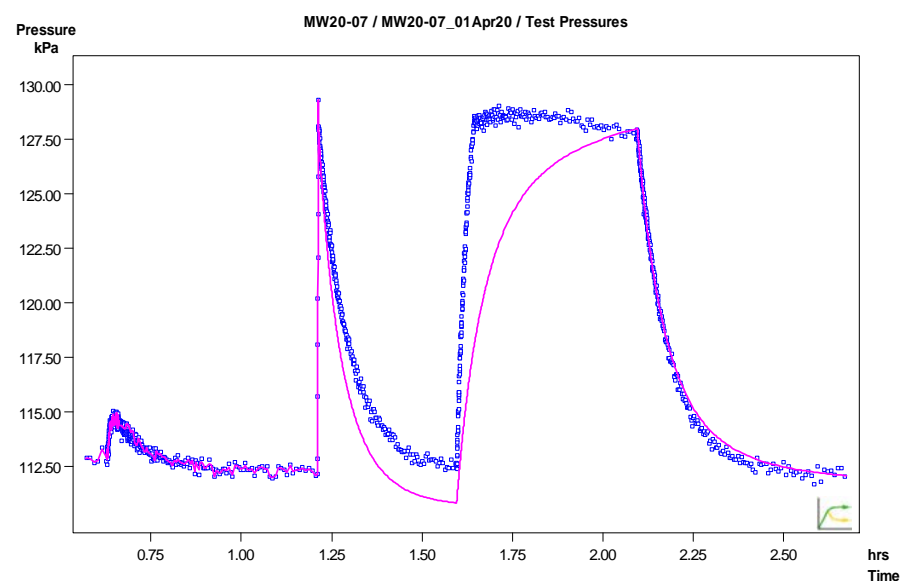
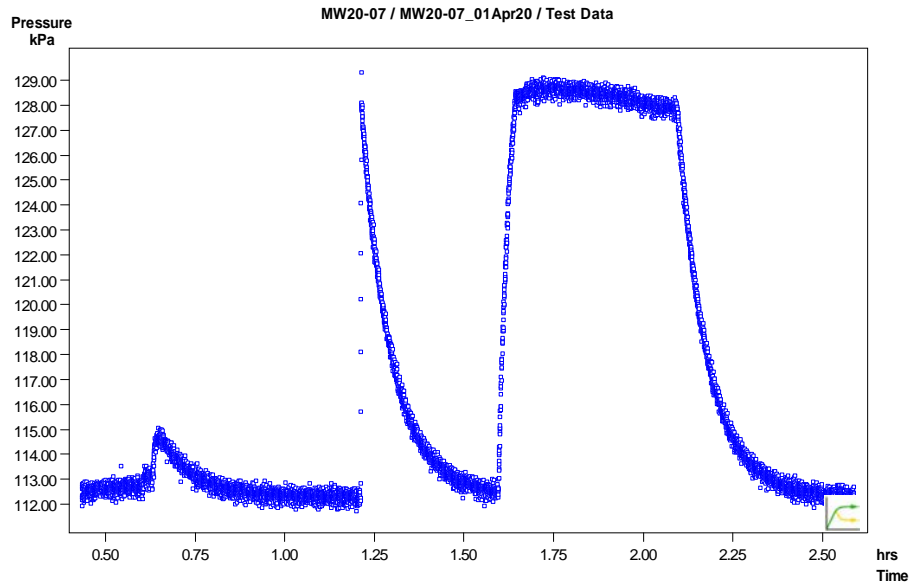
YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS MW20-07 UPPER INTERVAL (4.6 to 8.1 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-062

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR   ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase
- Simulated Response     — Simulated Response Derivative

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD     2022-02-15

PREPARED     PGM

DESIGN     ML

REVIEW     ###

APPROVED

TITLE

**PACKER TEST RESULTS MW20-07 MIDDLE INTERVAL (8.0 to 13.1 mbgs)**

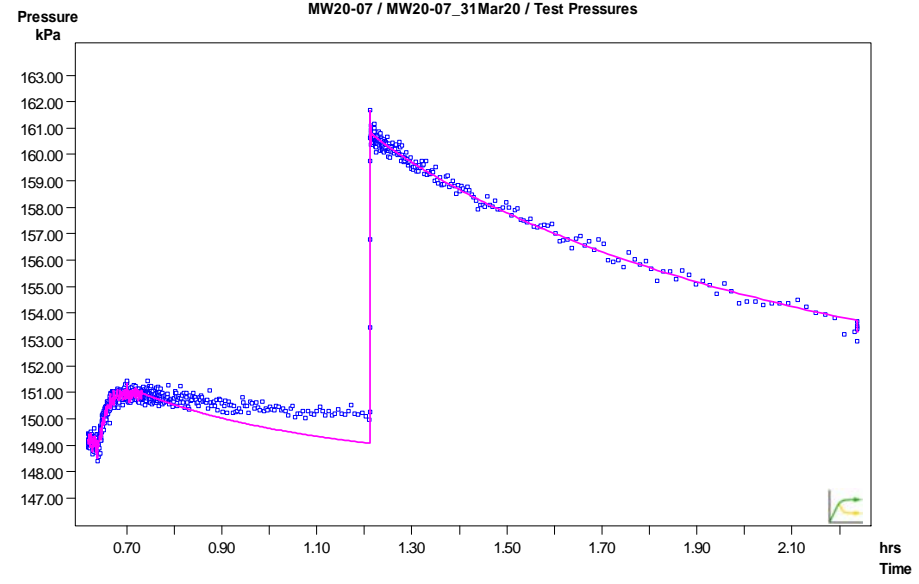
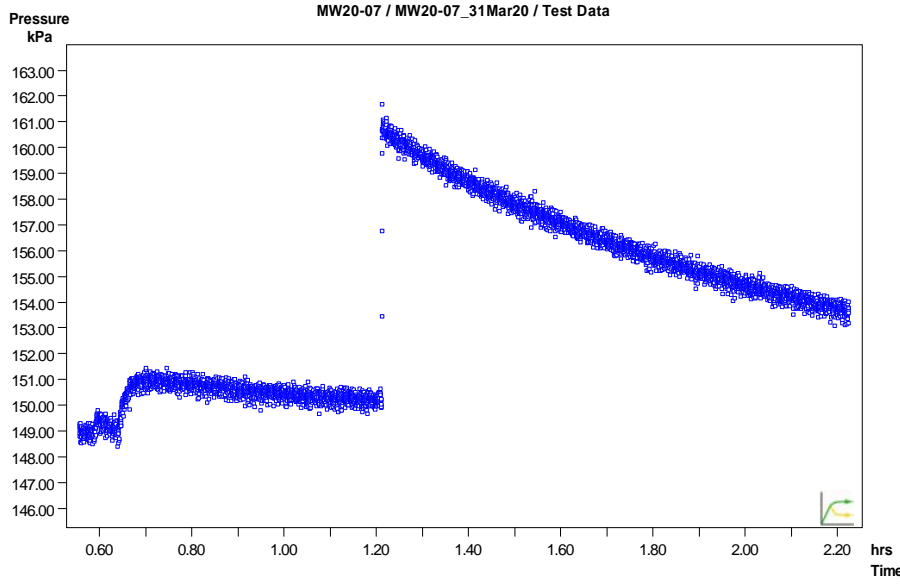
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

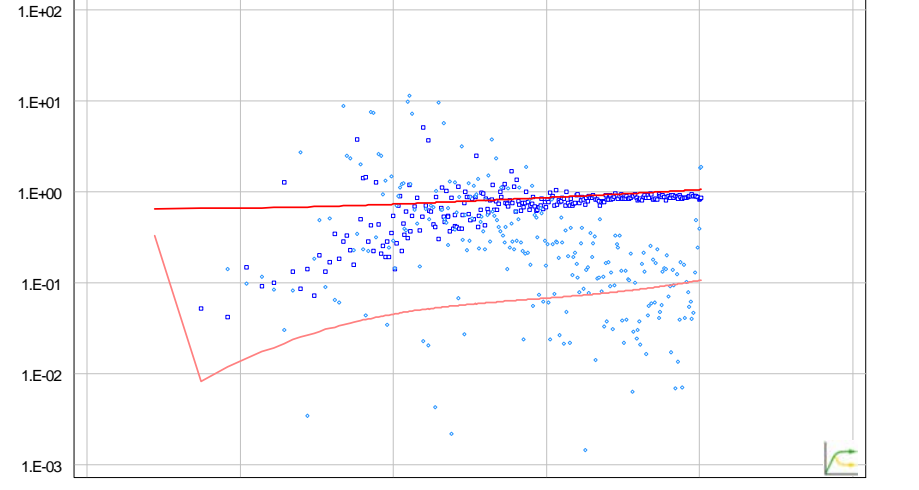
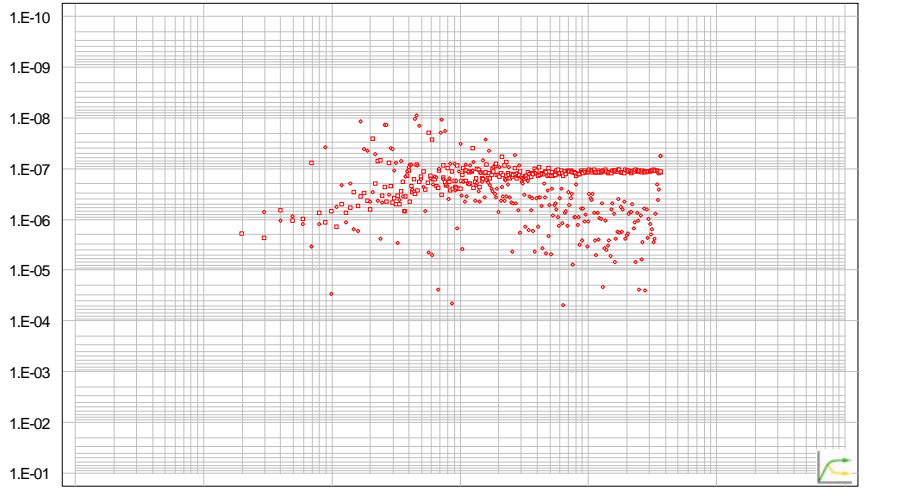
FIGURE  
**F-063**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation  
 Time  
 1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation    — Simulated Pressure  
 Deconv. P  
 MW20-07 / MW20-07\_31Mar20 / SIR: LogLog Plot, constant P(i)



m²/s  
 Transm.  
 MW20-07 / MW20-07\_31Mar20 / LogLog Diagnosis - SIR  
■ Pressure Observation SI    ◆ Pressure Derivative SI  
■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
— Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

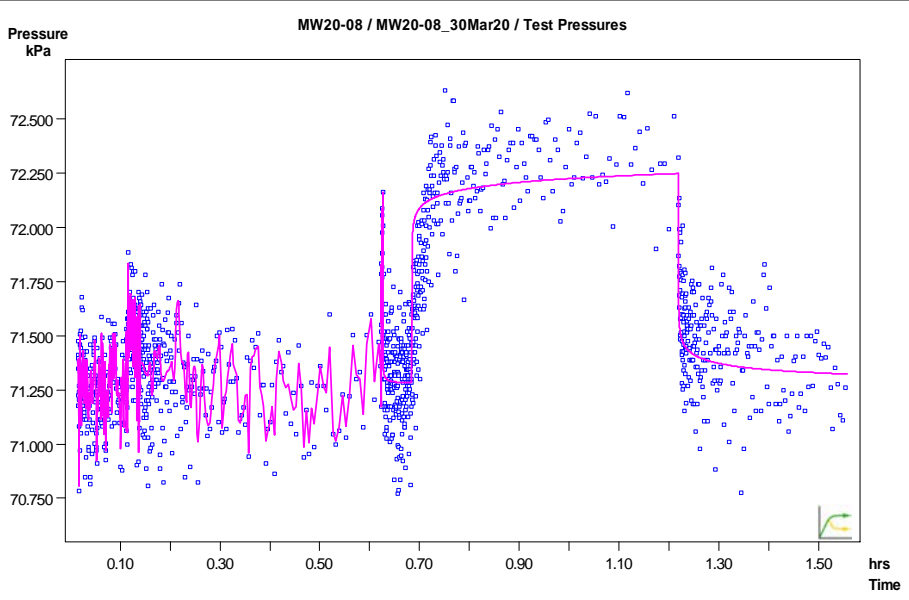
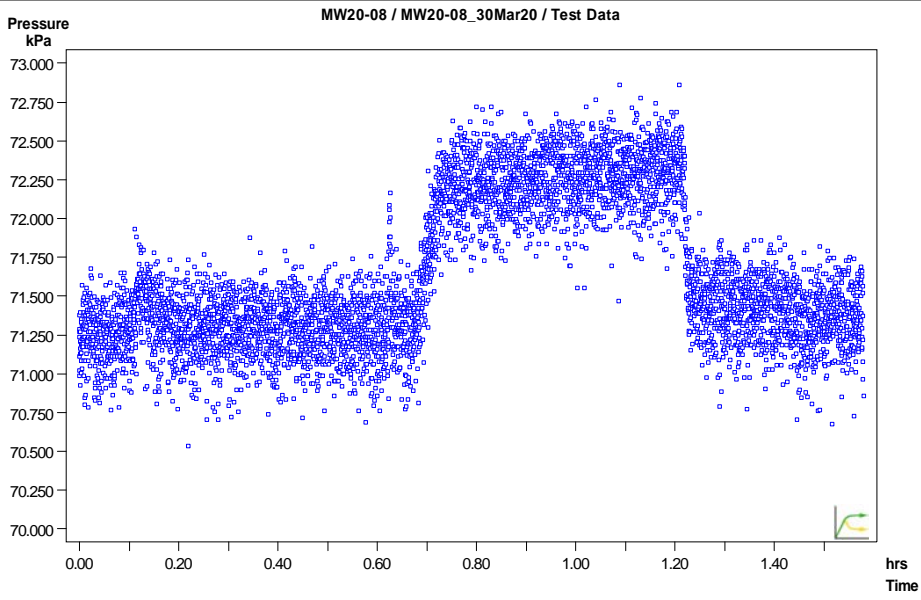
CONSULTANT  

 GOLDER  
 MEMBER OF WSP  
 YYYY-MM-DD    2022-02-15  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-07 LOWER INTERVAL (13.2 to 16.8 mbgs)**  
 PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-064

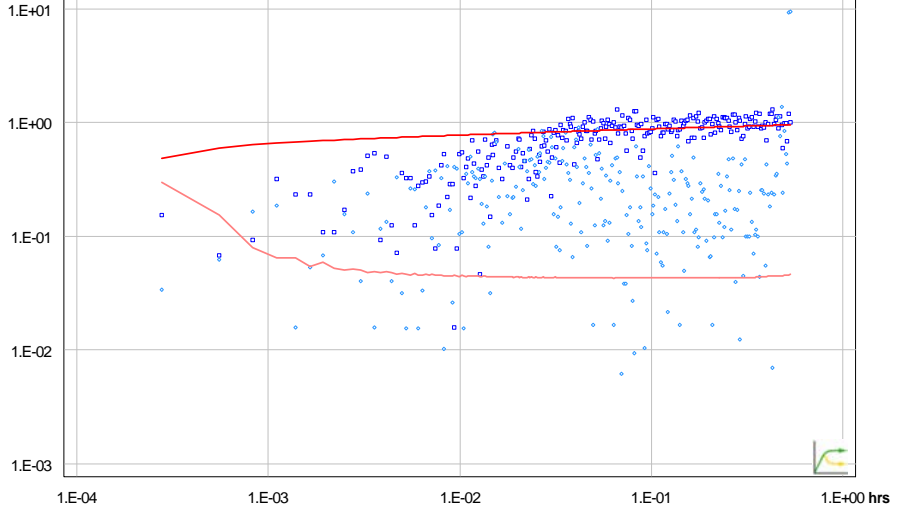
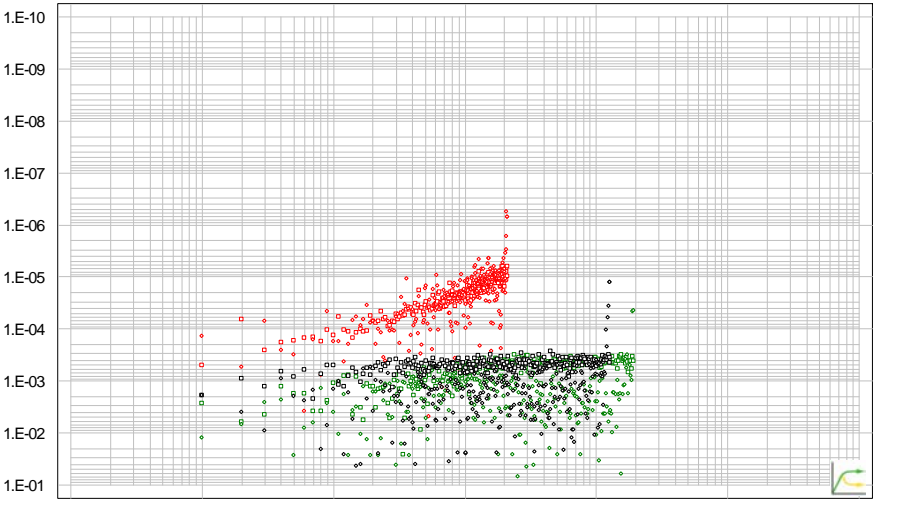
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Transm. **MW20-08 / MW20-08\_30Mar20 / LogLog Diagnosis - CRI**

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

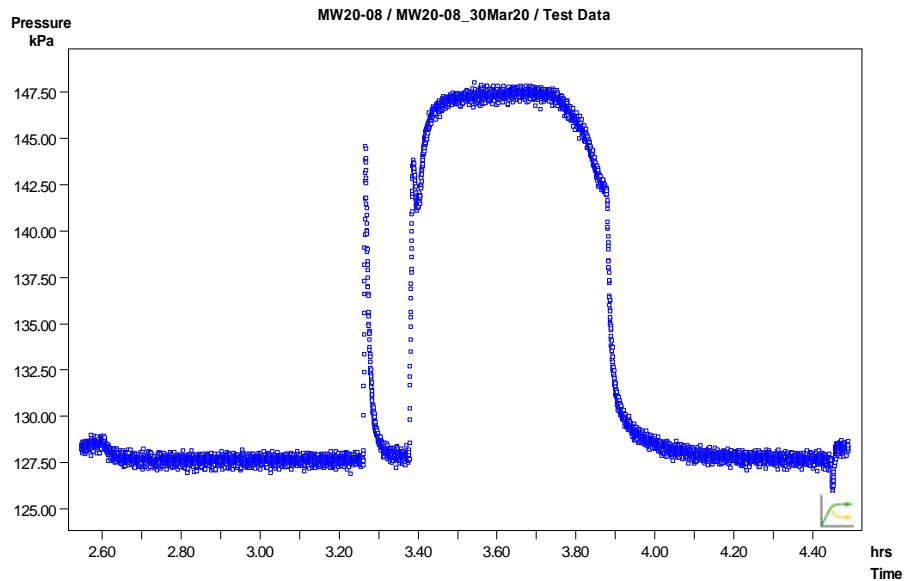
YYYY-MM-DD    2022-02-16  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

PROJECT  
**CALEDON PIT / QUARRY**

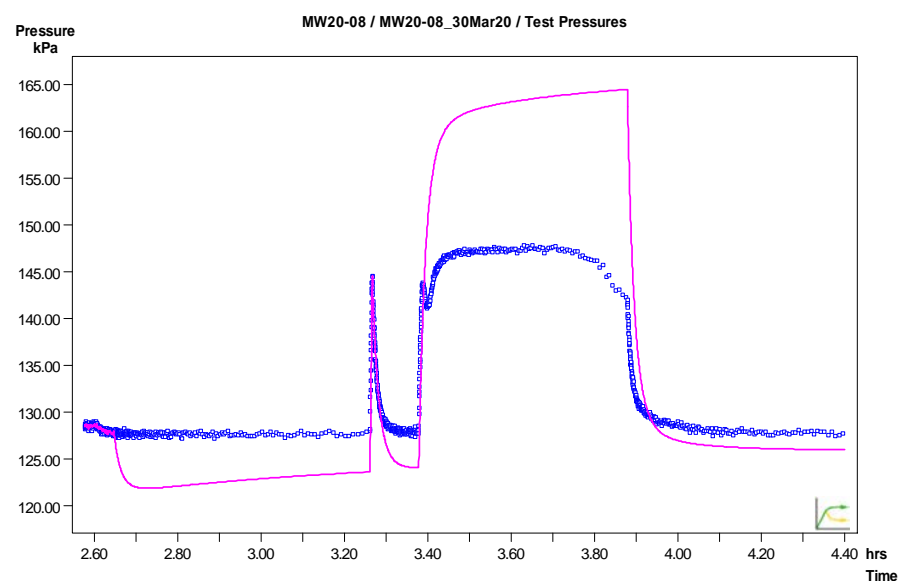
TITLE  
**PACKER TEST RESULTS MW20-08 UPPER INTERVAL (4.1 to 9.2 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-065

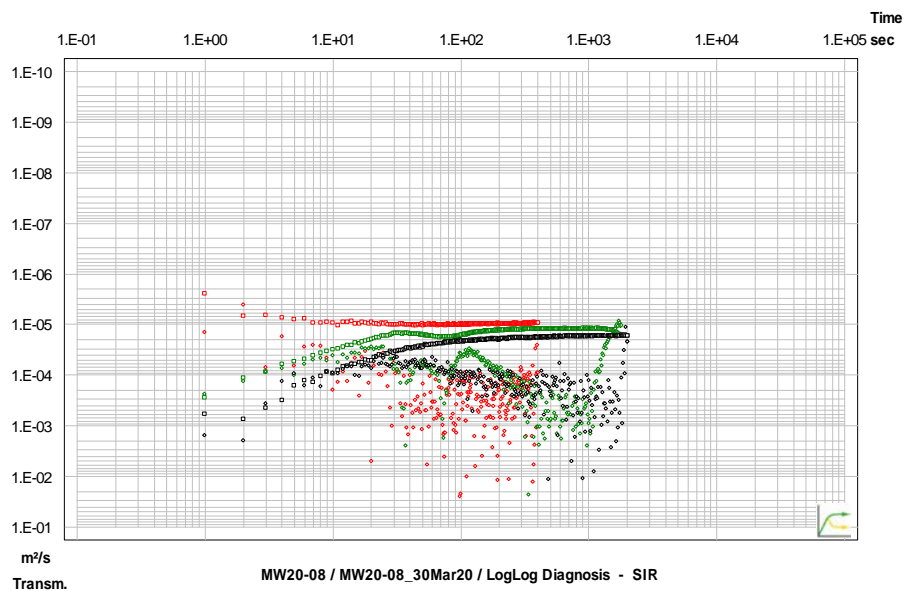
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANS I



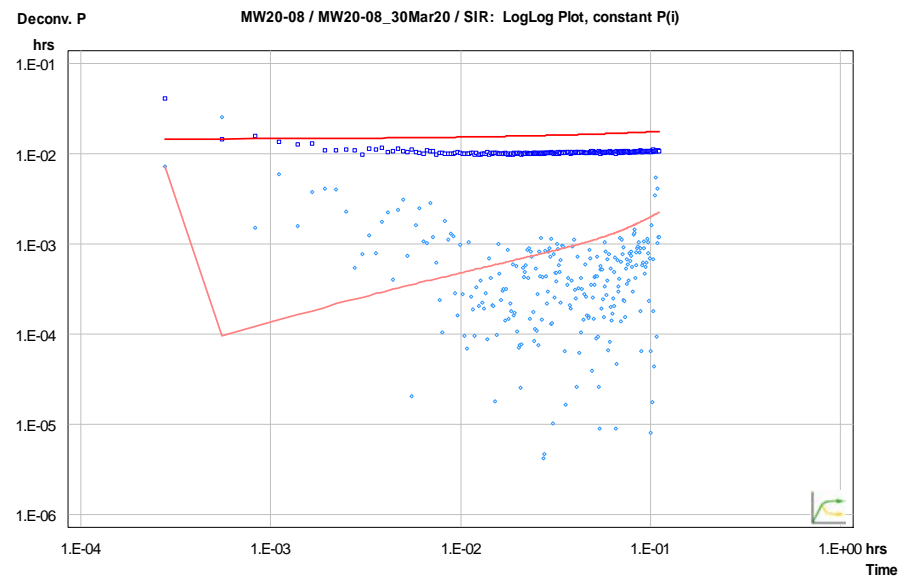
■ Pressure Observation



■ Pressure Observation    — Simulated Pressure



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR



■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD    2022-02-16

PREPARED    PGM

DESIGN    ML

REVIEW    ###

APPROVED

TITLE

PACKER TEST RESULTS MW20-08 MIDDLE INTERVAL (8.4 to 15.1 mbgs)

PROJECT No.  
19129150

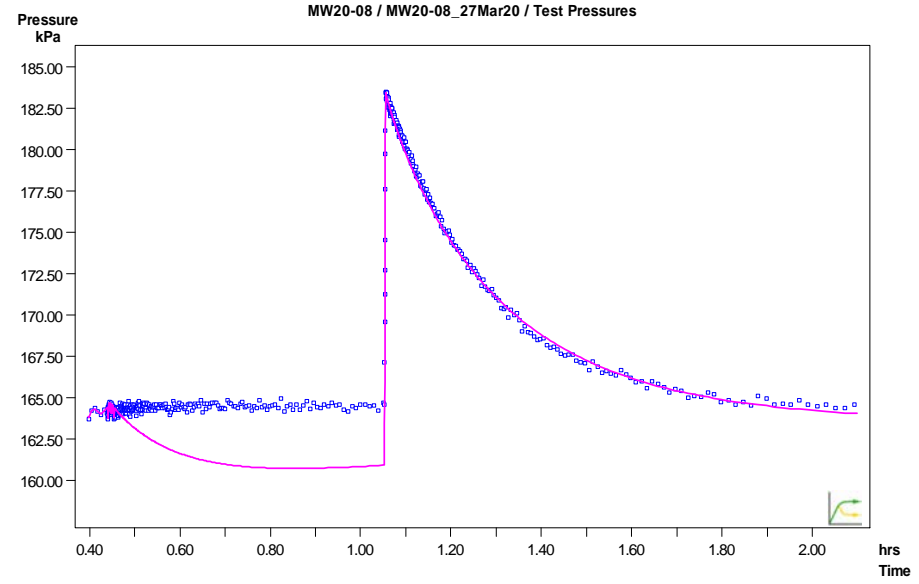
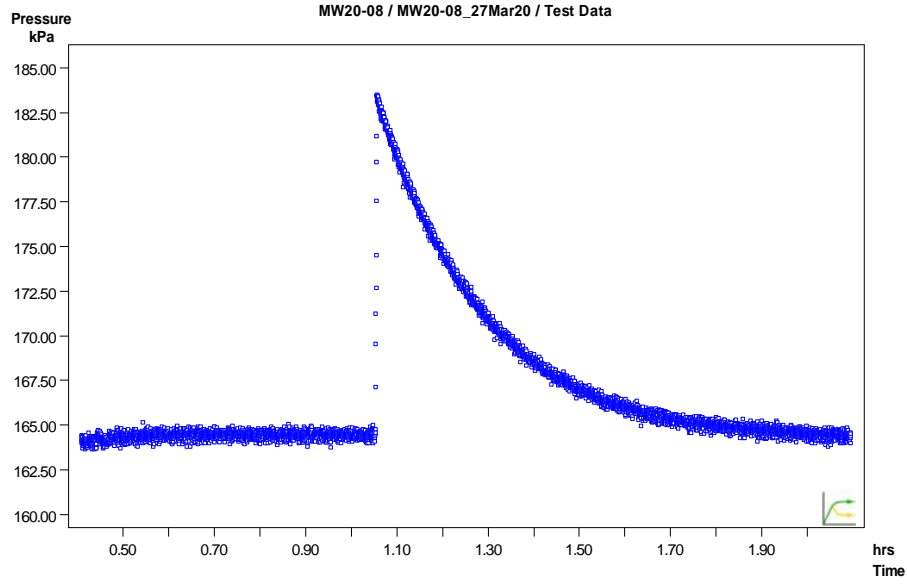
PHASE  
2300

Rev.  
A

FIGURE  
F-066

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A5/A4

1th

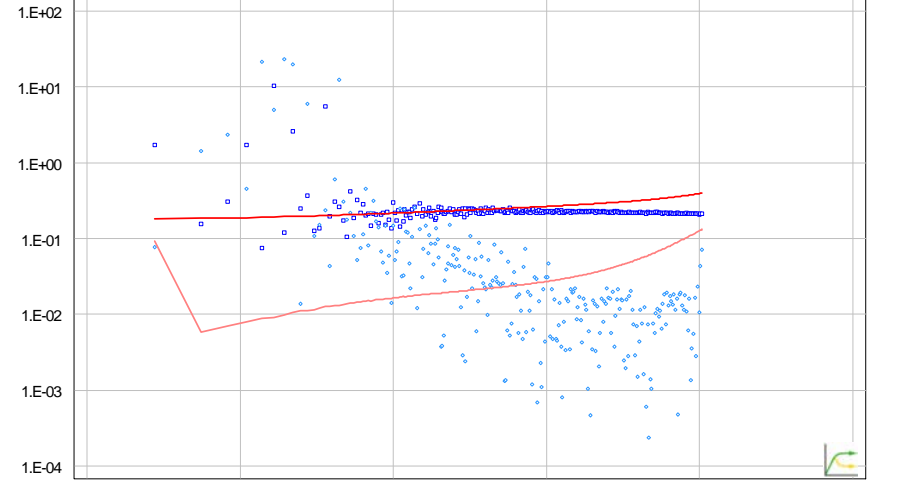
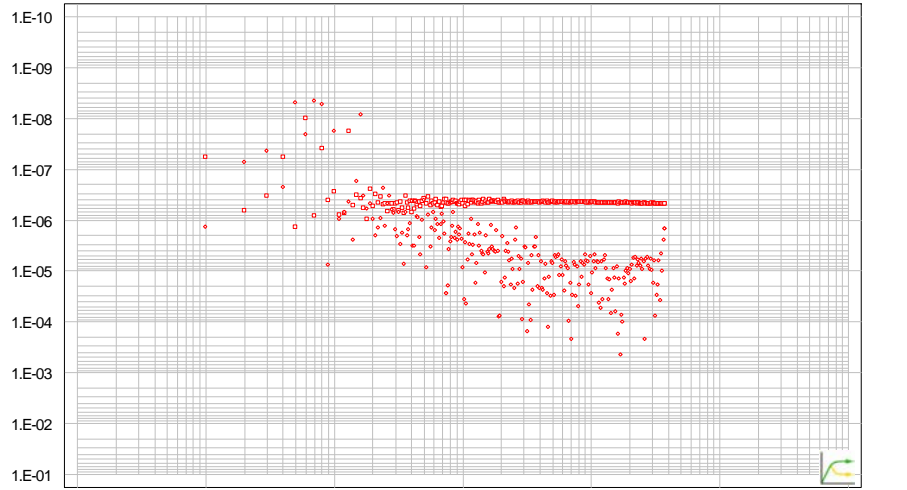


■ Pressure Observation

Time  
1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure

Deconv. P  
MW20-08 / MW20-08\_27Mar20 / SIR: LogLog Plot, constant P(i)



m²/s  
Transm.

MW20-08 / MW20-08\_27Mar20 / LogLog Diagnosis - SIR

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

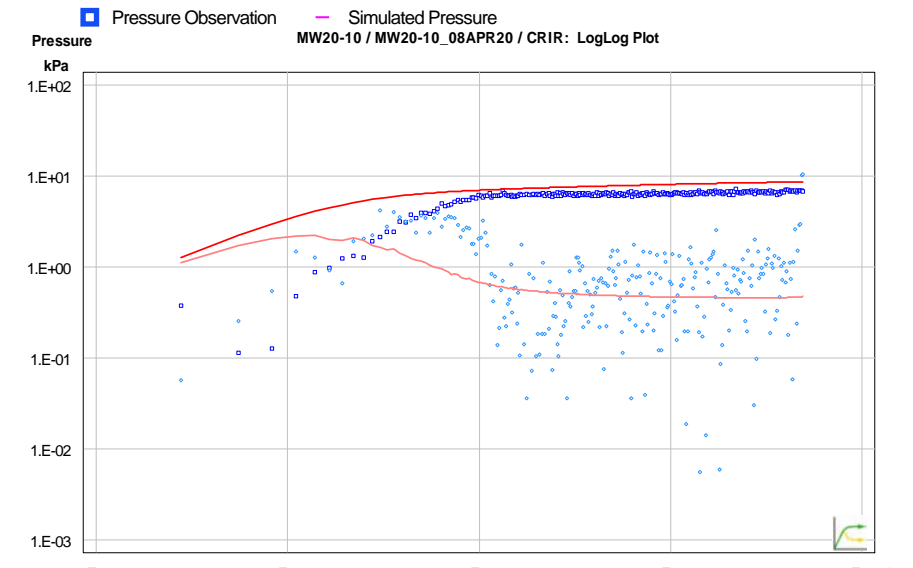
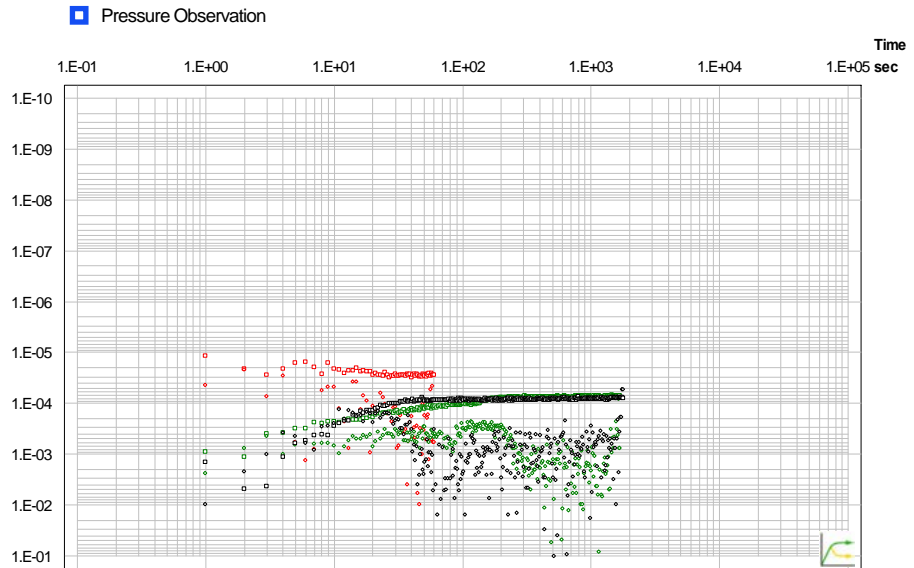
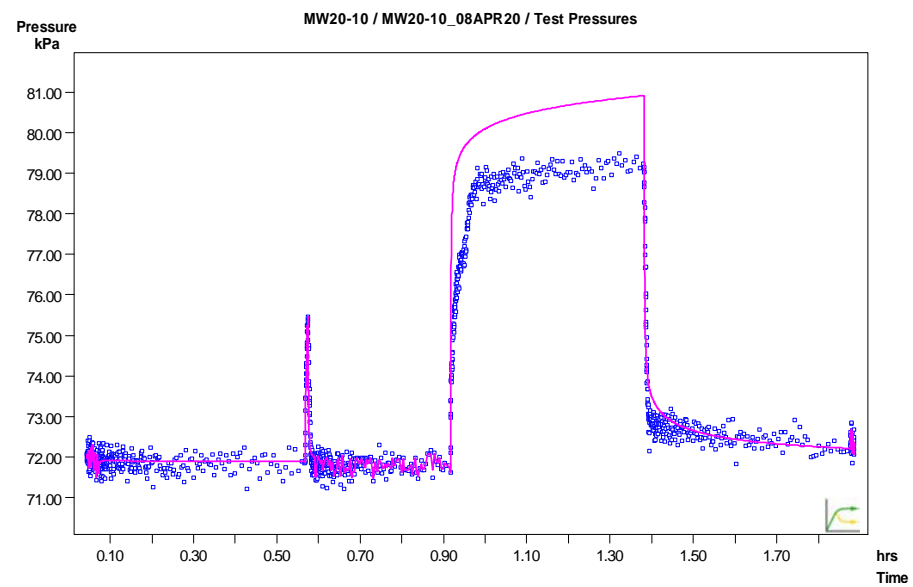
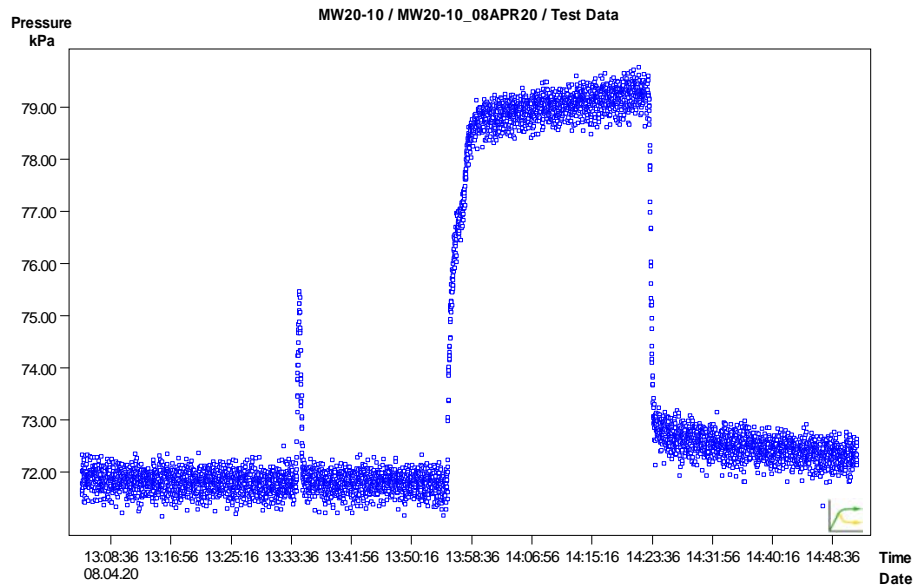
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD    2022-02-16  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-08 LOWER INTERVAL (15.2 to 18.6 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-067

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation SI    ◆ Pressure Derivative SI  
■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
— Simulated Response    — Simulated Response Derivative

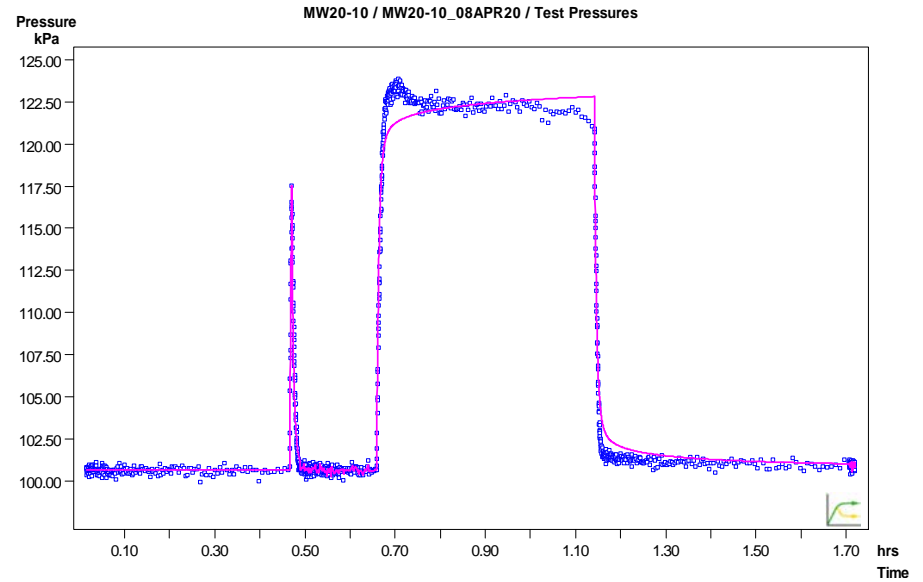
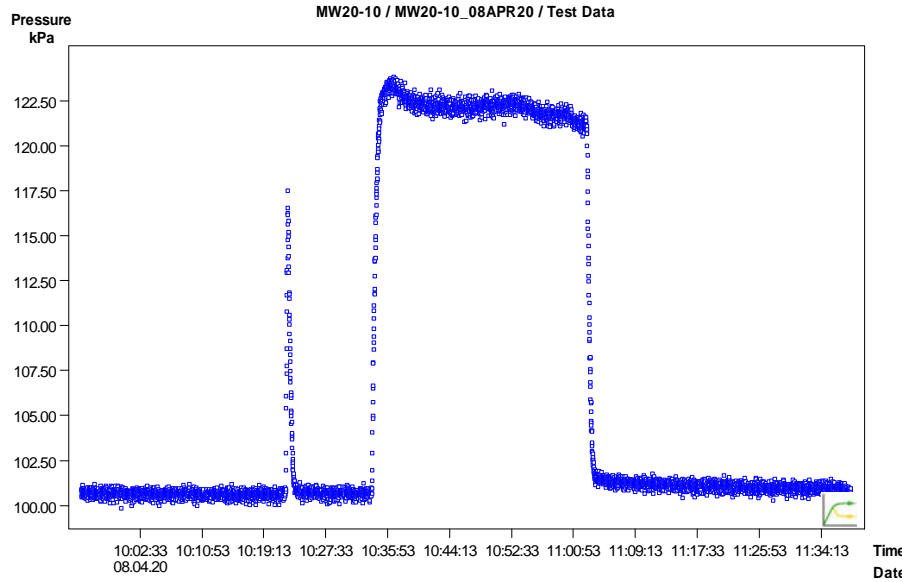
CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**      PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**  
 YYYY-MM-DD: 2022-02-16  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

TITLE: **PACKER TEST RESULTS MW20-10 UPPER INTERVAL (13.3 to 17.4 mbgs)**  
 PROJECT No.: 19129150      PHASE: 2300      Rev.: A      FIGURE: **F-068**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3



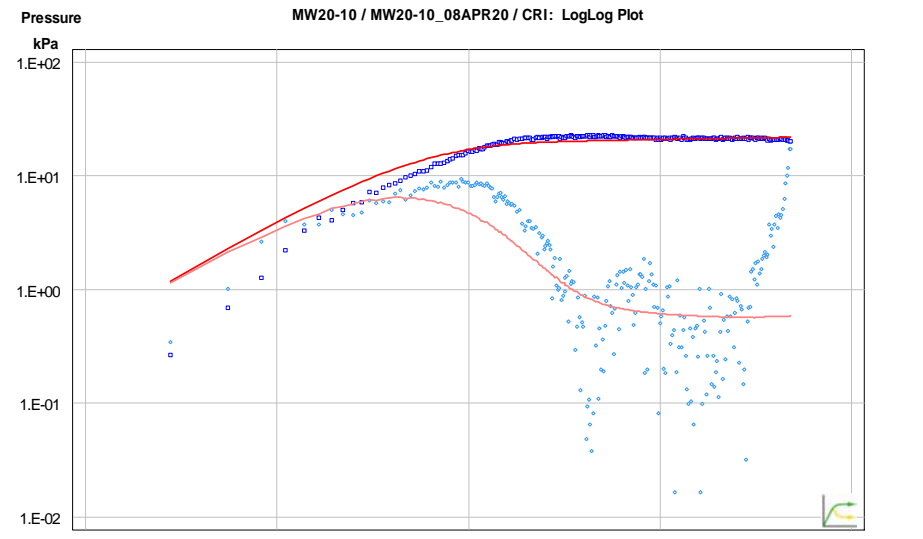
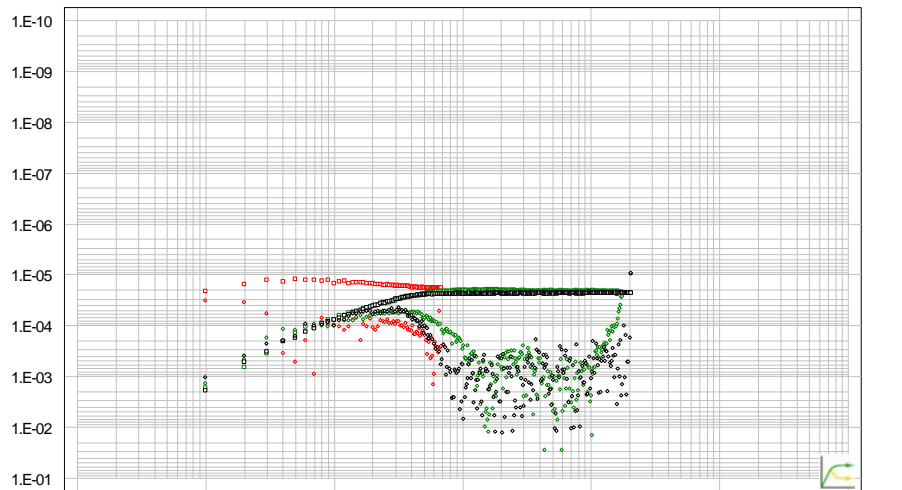


■ Pressure Observation

Time Date

■ Pressure Observation — Simulated Pressure

Time



m<sup>2</sup>/s

Transm.

MW20-10 / MW20-10\_08APR20 / LogLog Diagnosis - CRI

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**

YYYY-MM-DD: 2022-02-16

PREPARED: PGM

DESIGN: ML

REVIEW: ###

APPROVED:

TITLE: **PACKER TEST RESULTS MW20-10 LOWER INTERVAL (16.9 to 21.2 mbgs)**

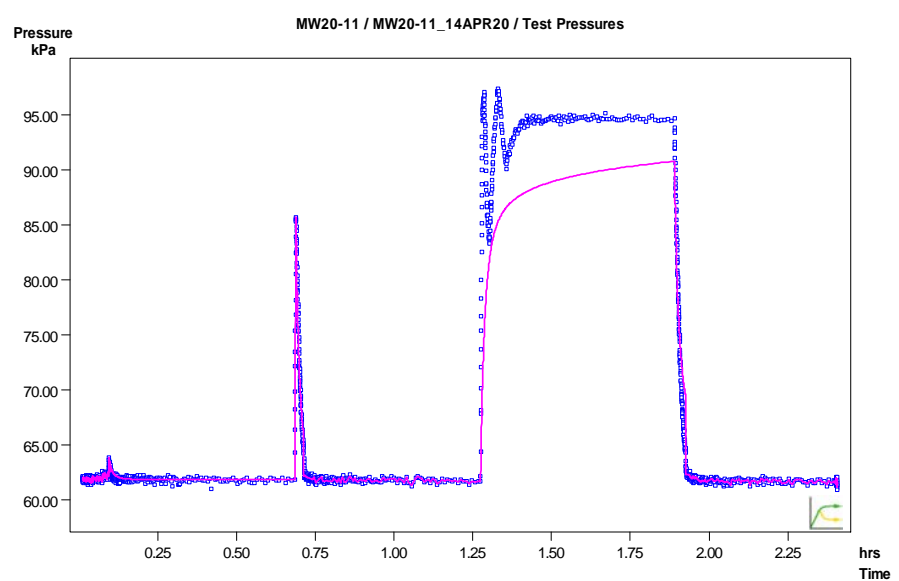
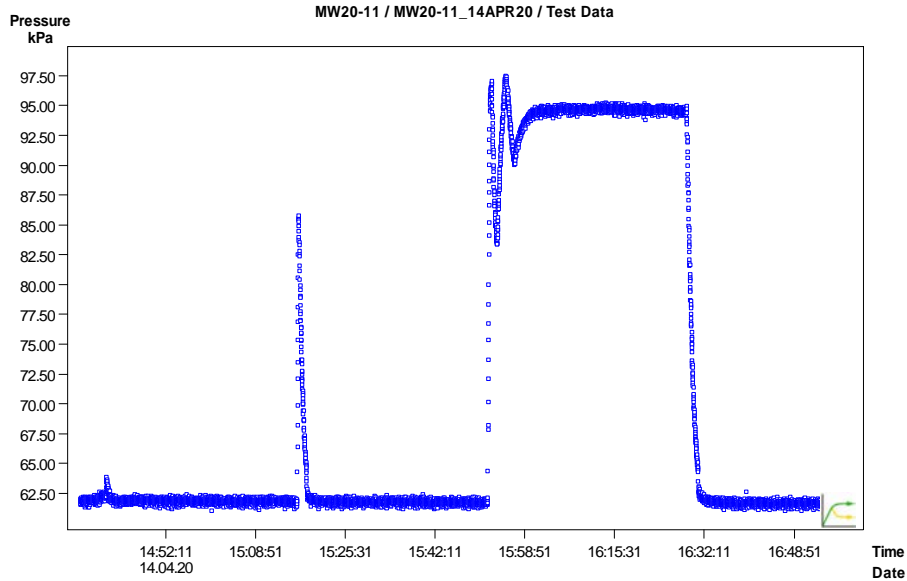
PROJECT No.: **19129150**

PHASE: **2300**

Rev.: **A**

FIGURE: **F-069**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

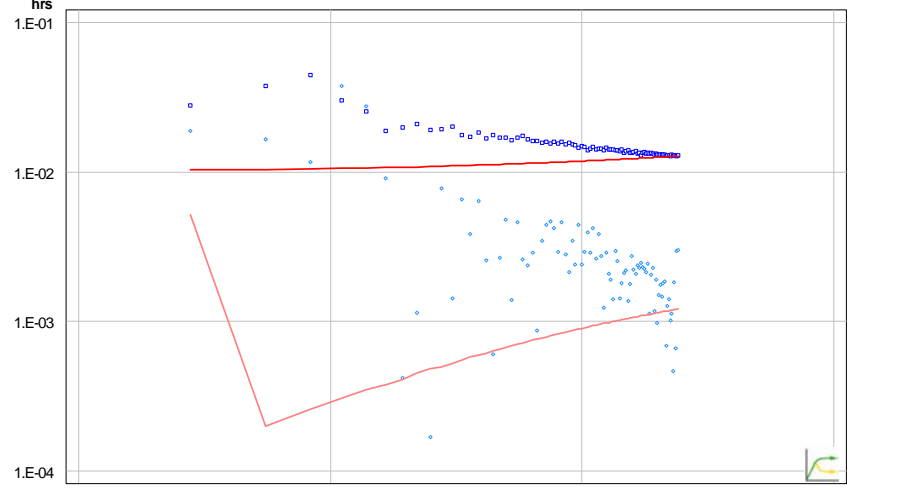
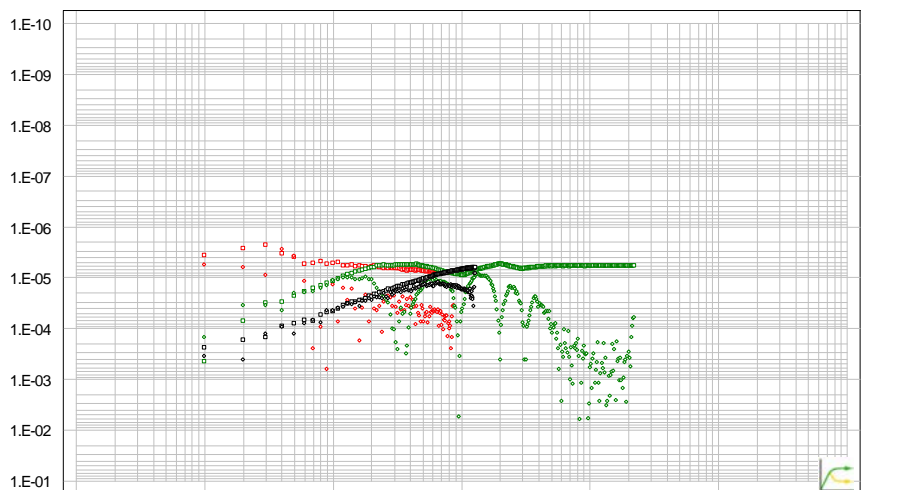


■ Pressure Observation

Time  
Date

■ Pressure Observation — Simulated Pressure

Deconv. P  
hrs



MW20-11 / MW20-11\_14APR20 / LogLog Diagnosis - SI

Transm.

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

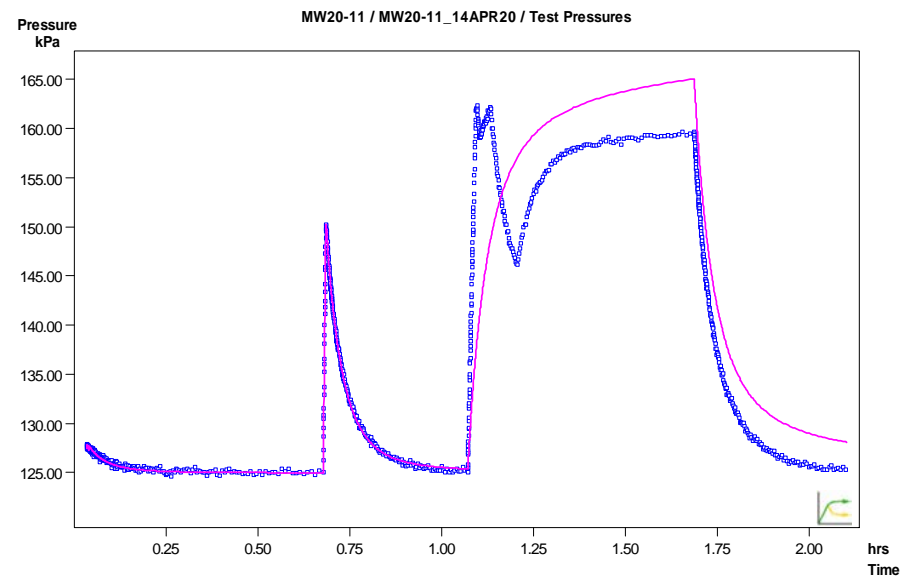
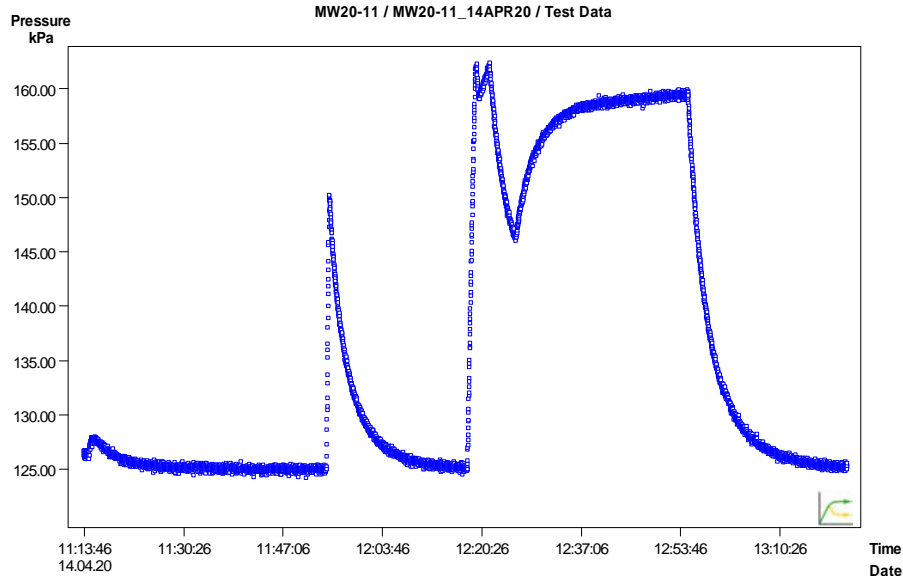
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD    2022-02-16  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-11 UPPER INTERVAL (4.8 to 10.0 mbgs)**

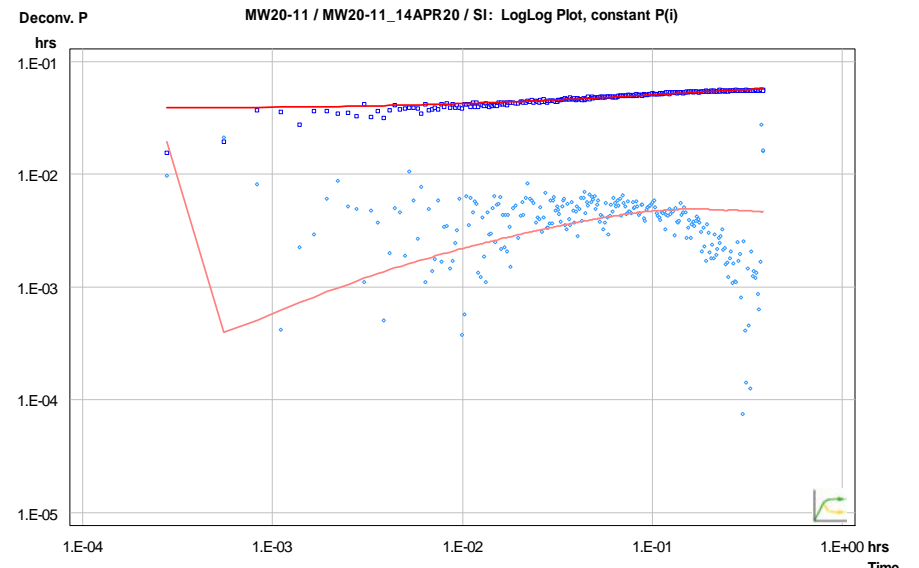
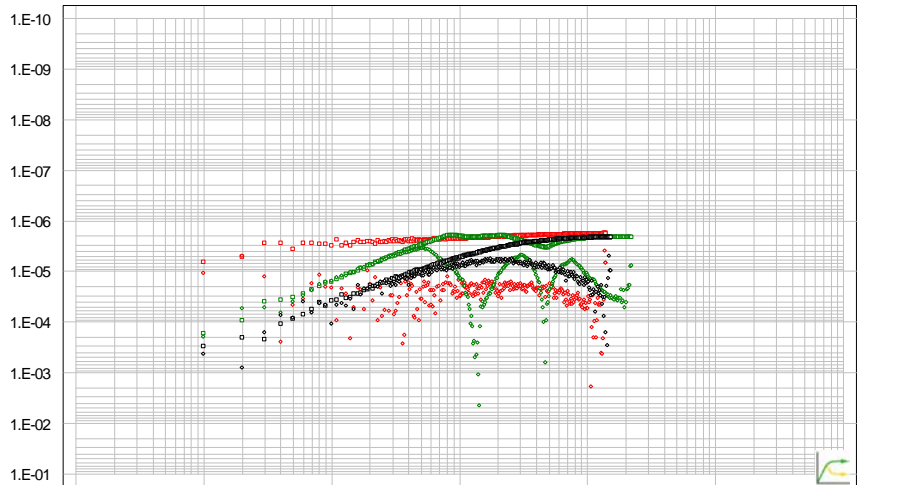
PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-070

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Transm. MW20-11 / MW20-11\_14APR20 / LogLog Diagnosis - SI

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)** PROJECT: **CALEDON PIT / QUARRY**

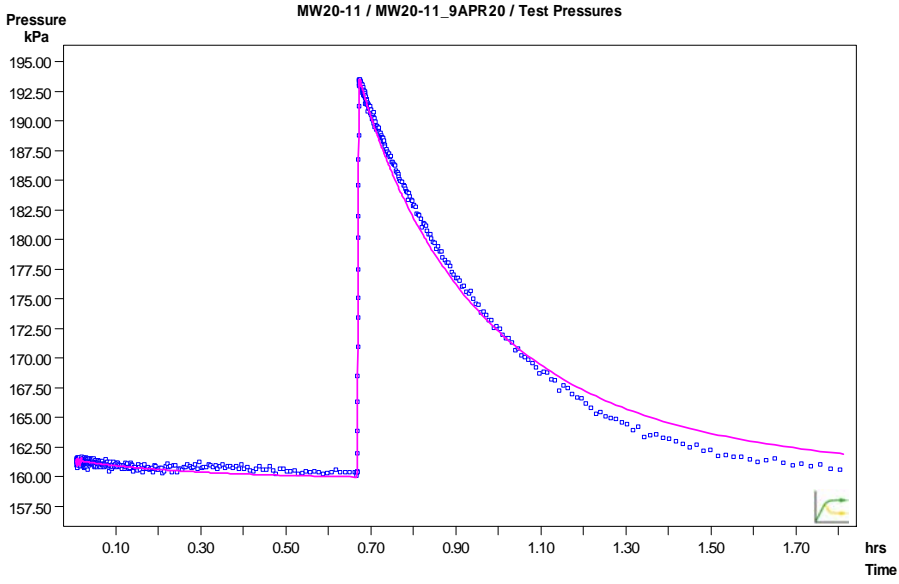
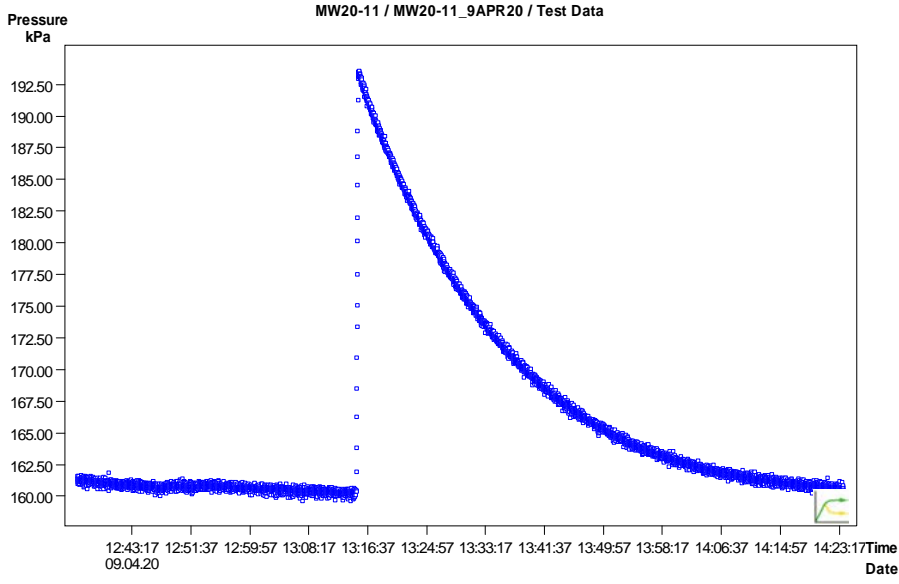
CONSULTANT: **GOLDER MEMBER OF WSP**

YYYY-MM-DD: 2022-02-16  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

TITLE: **PACKER TEST RESULTS MW20-11 MIDDLE INTERVAL (9.7 to 16.4 mbgs)**

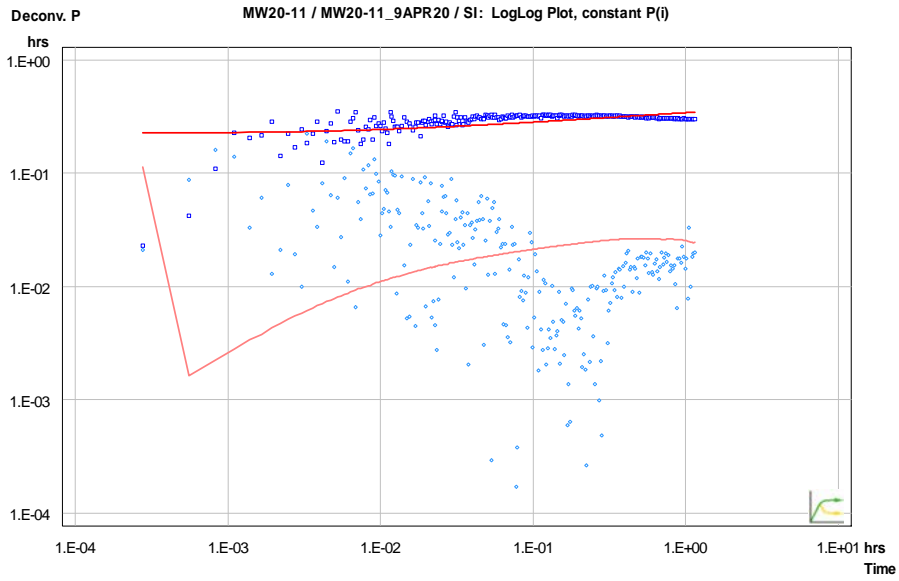
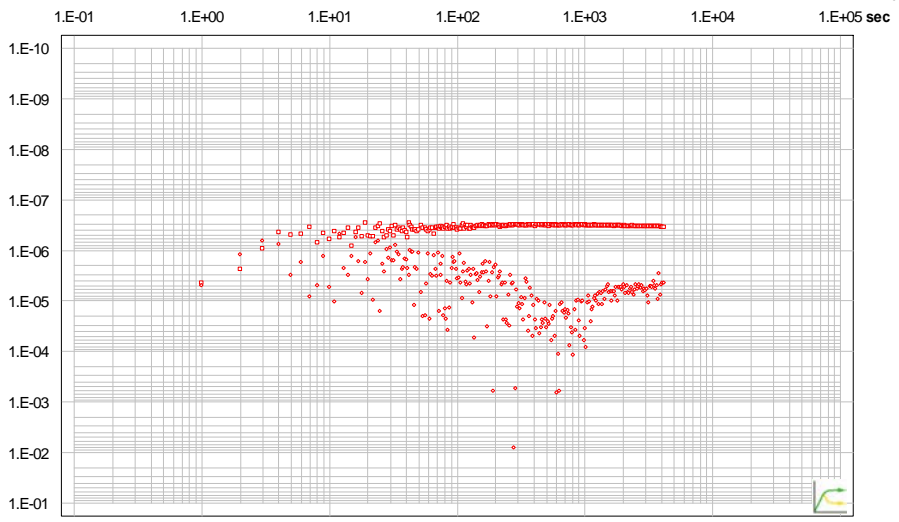
PROJECT No. 19129150    PHASE 2300    Rev. A    FIGURE F-071

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Transm. MW20-11 / MW20-11\_9APR20 / LogLog Diagnosis - SI

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

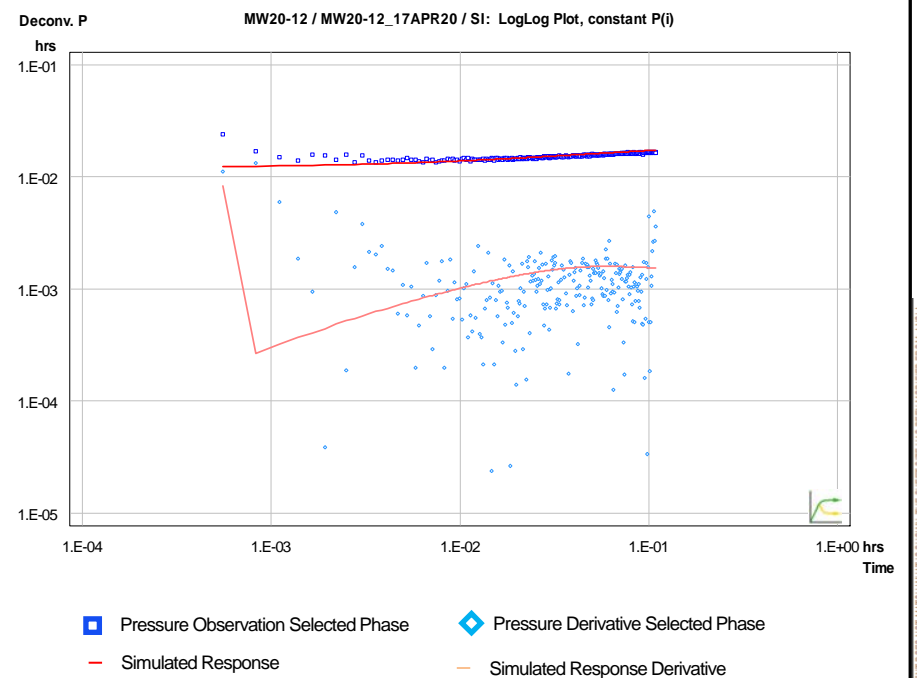
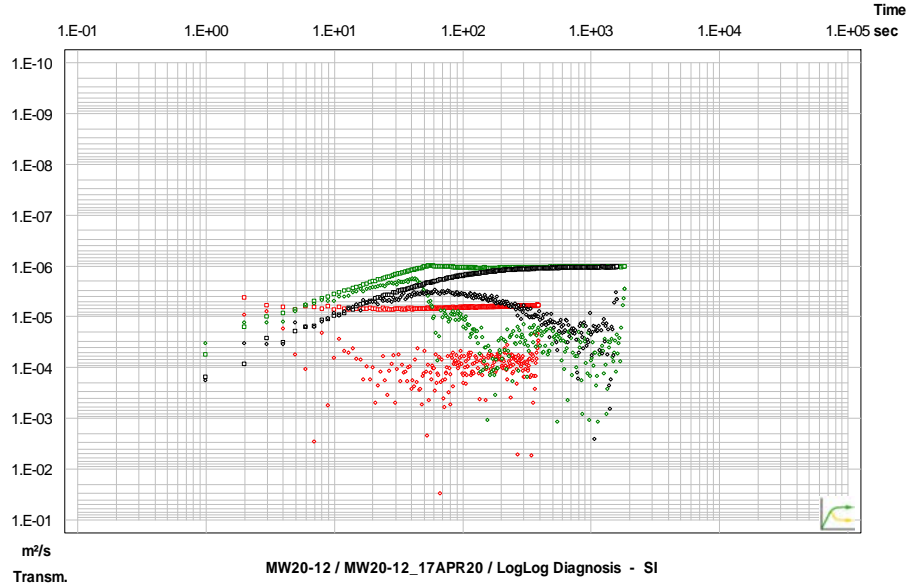
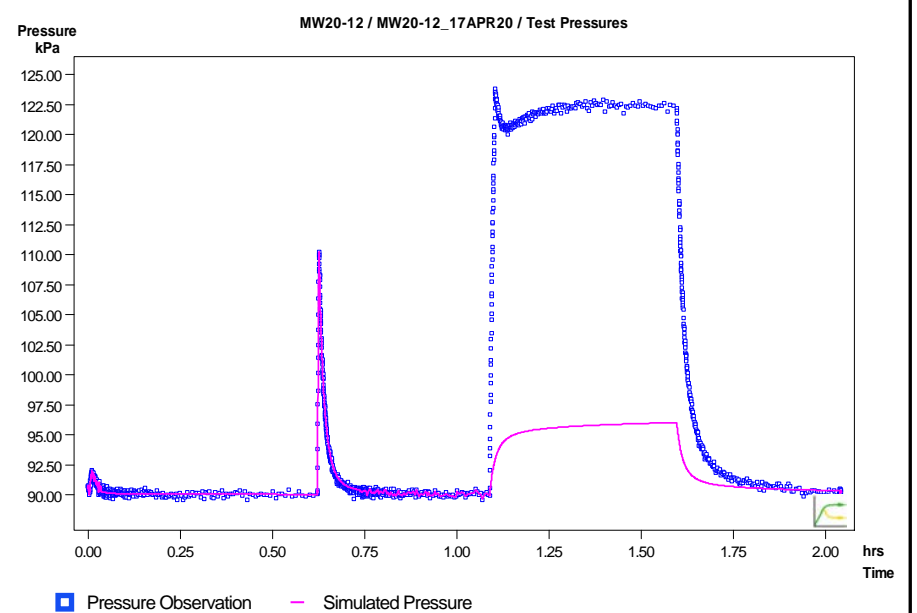
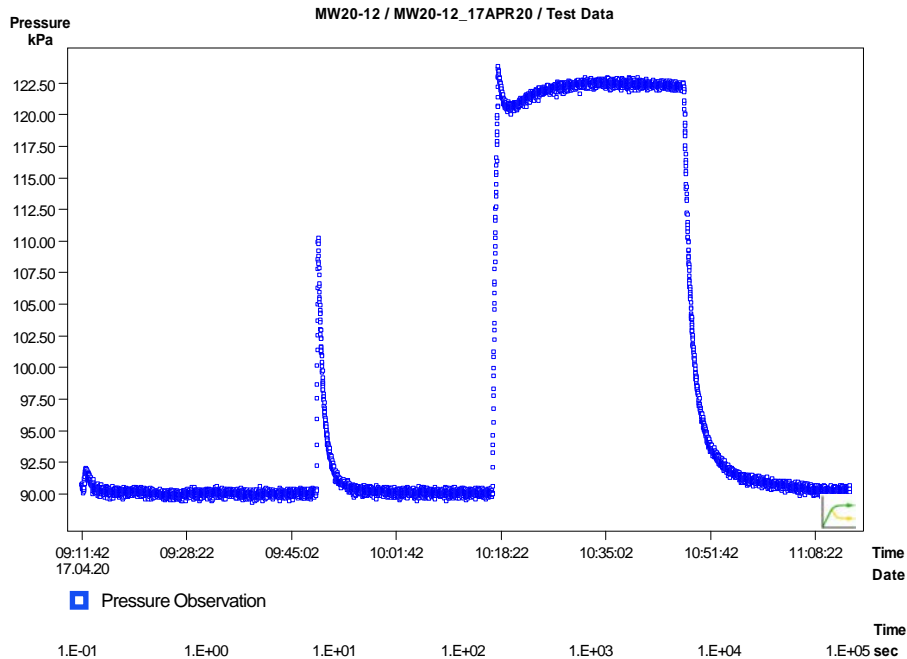
YYYY-MM-DD    2022-02-16  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-11 LOWER INTERVAL (16.4 to 19.4 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-072

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





- Pressure Observation SI     ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase
- Simulated Response     — Simulated Response Derivative

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD     2022-02-16

PREPARED     PGM

DESIGN     ML

REVIEW     ###

APPROVED

TITLE

**PACKER TEST RESULTS MW20-12 UPPER INTERVAL (7.5 to 14.2 mbgs)**

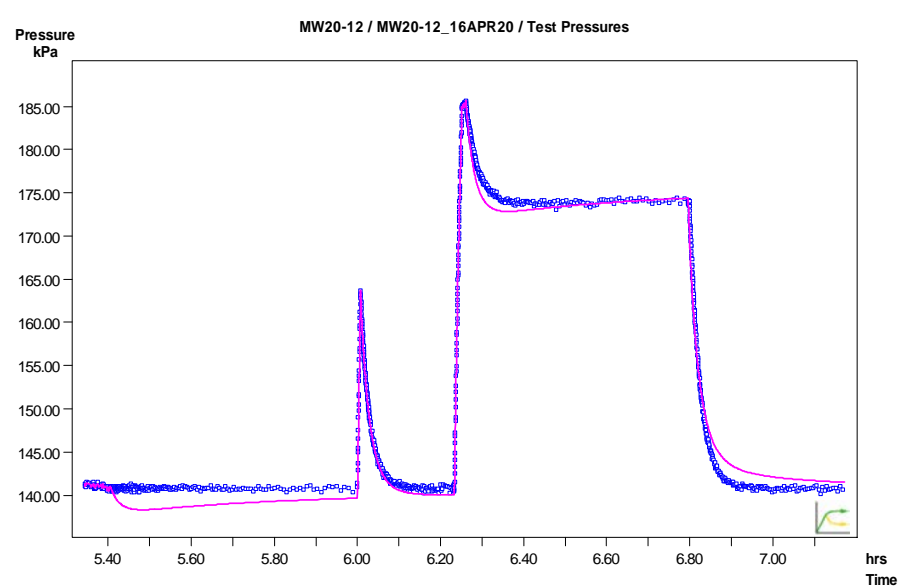
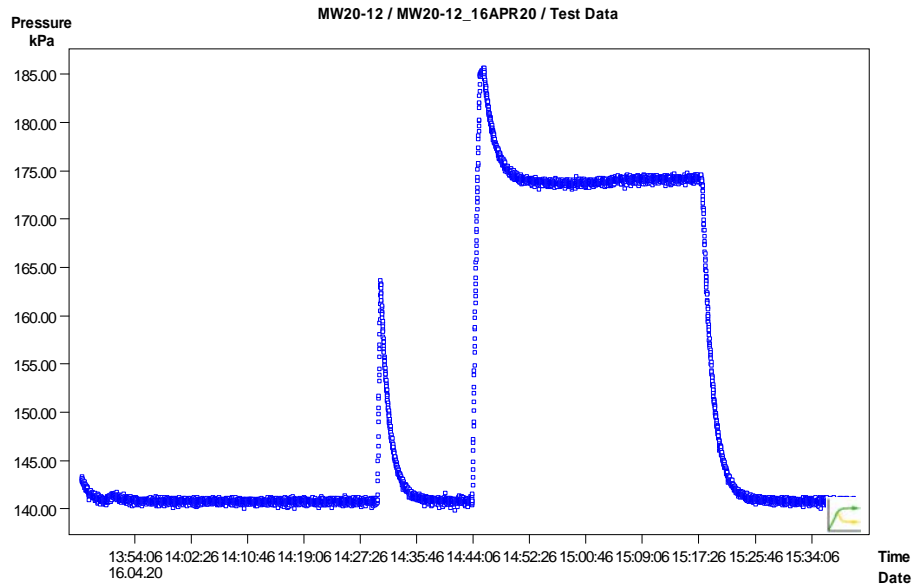
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

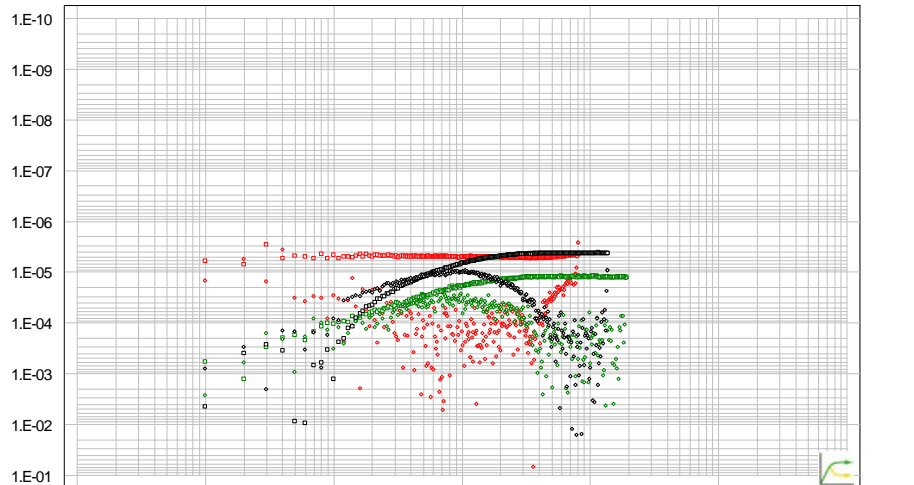
FIGURE  
**F-073**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4

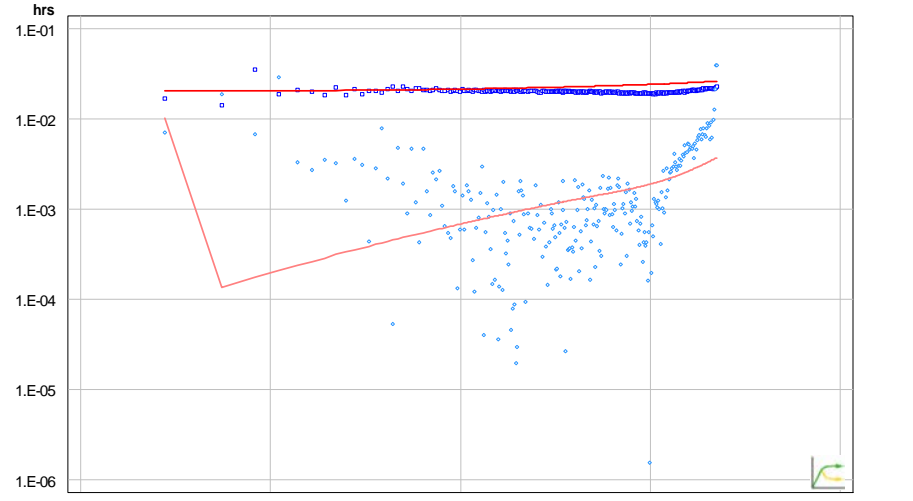


■ Pressure Observation

■ Pressure Observation    — Simulated Pressure



Deconv. P    MW20-12 / MW20-12\_16APR20 / SI: LogLog Plot, constant P(i)



■ Pressure Observation SI    ◆ Pressure Derivative SI  
■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

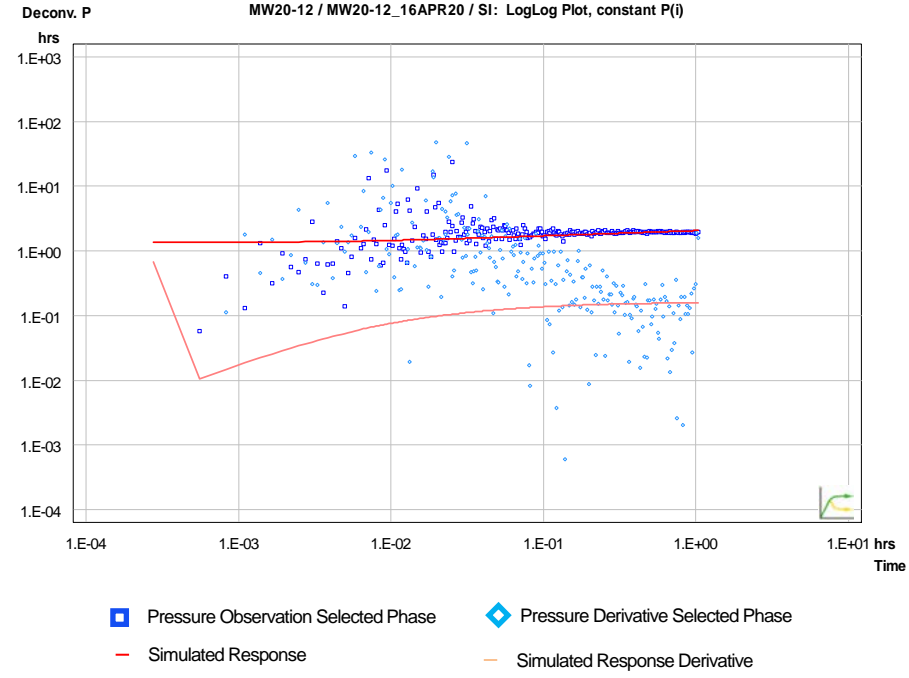
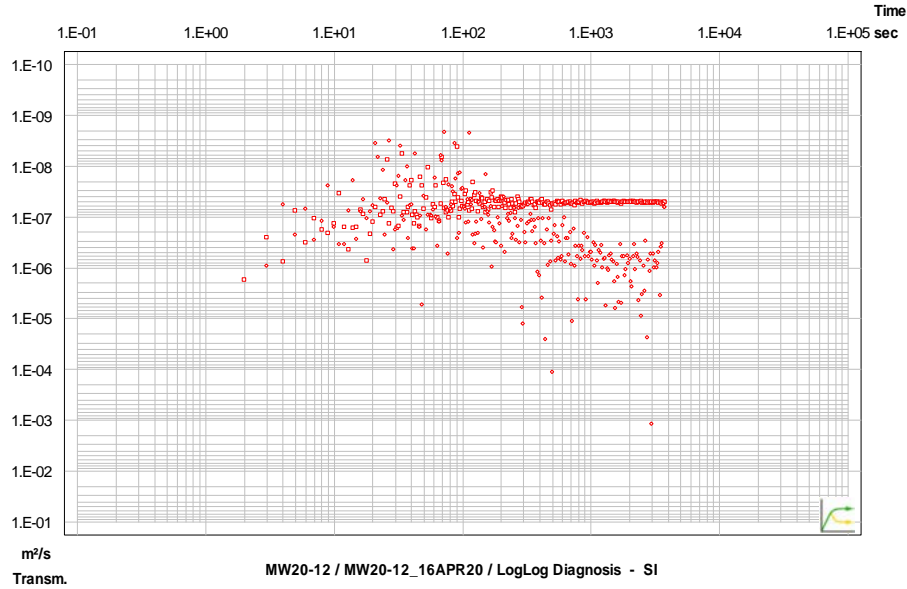
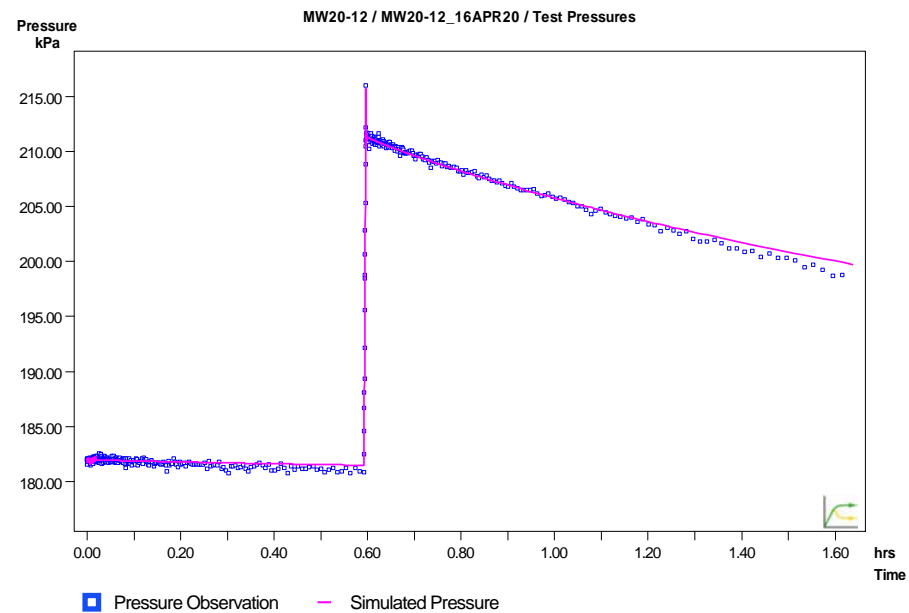
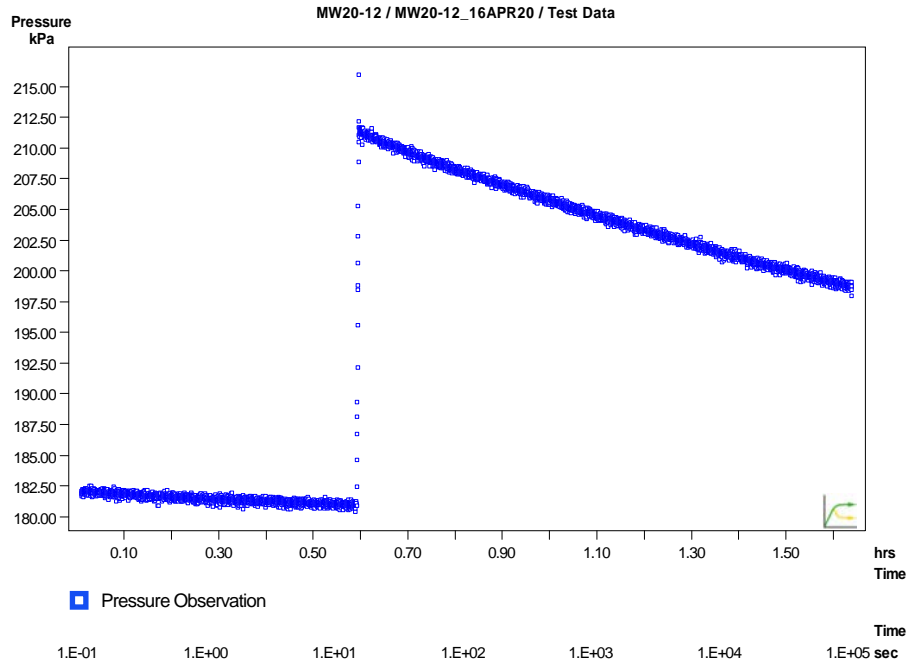
■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
— Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**    PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**  
 YYYY-MM-DD: 2022-02-16  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

TITLE: **PACKER TEST RESULTS MW20-12 MIDDLE INTERVAL (14.2 to 19.3 mbgs)**  
 PROJECT No.: 19129150    PHASE: 2300    Rev.: A    FIGURE: F-074

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

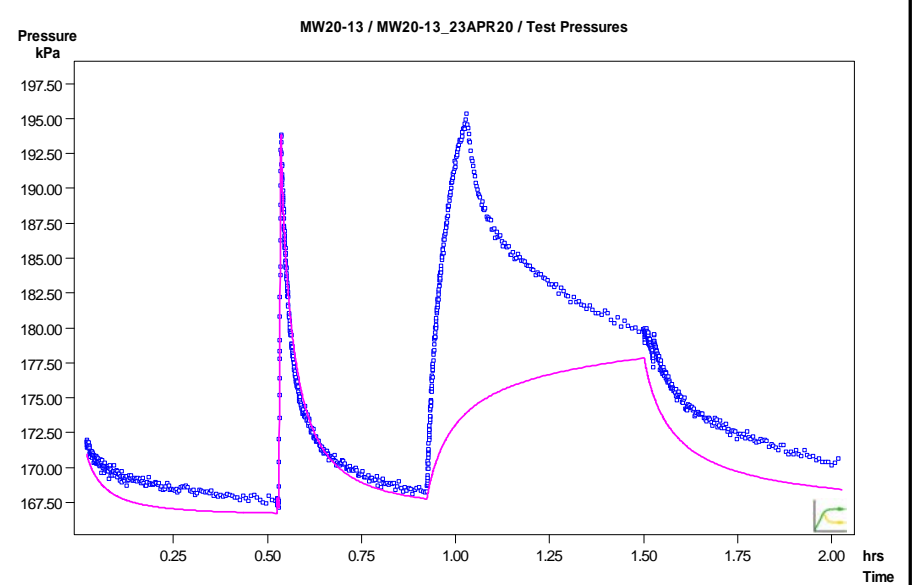
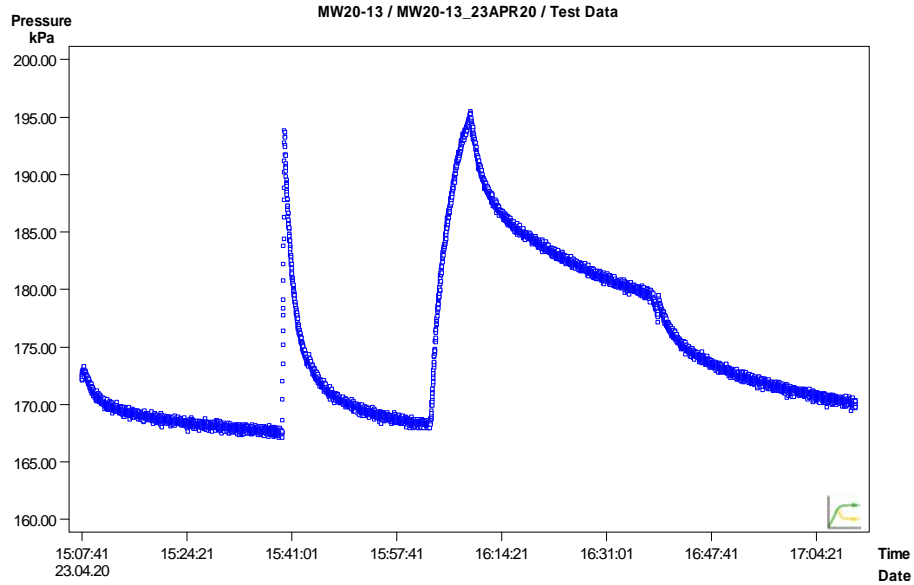
CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-16
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE	<b>PACKER TEST RESULTS MW20-12 LOWER INTERVAL (19.8 to 22.7 mbgs)</b>	
PROJECT No.	PHASE	Rev.
<b>19129150</b>	<b>2300</b>	<b>A</b>
		FIGURE
		<b>F-075</b>

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



■ Pressure Observation

Time Date

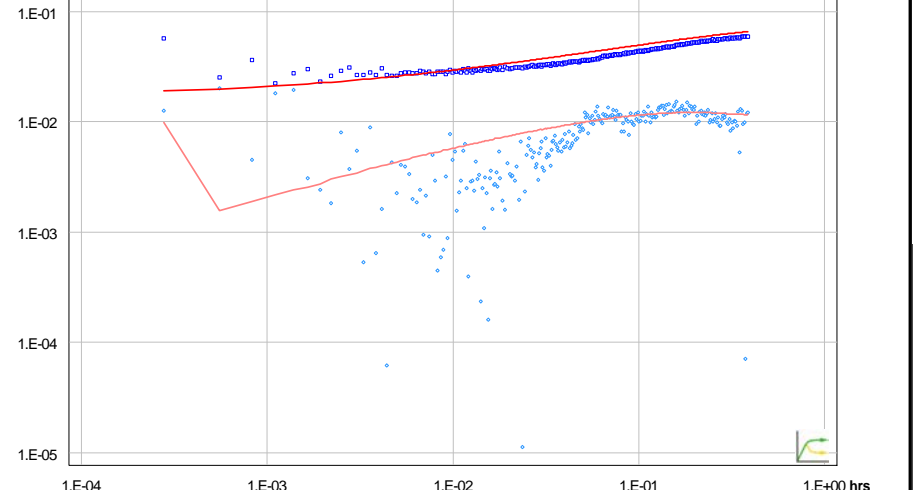
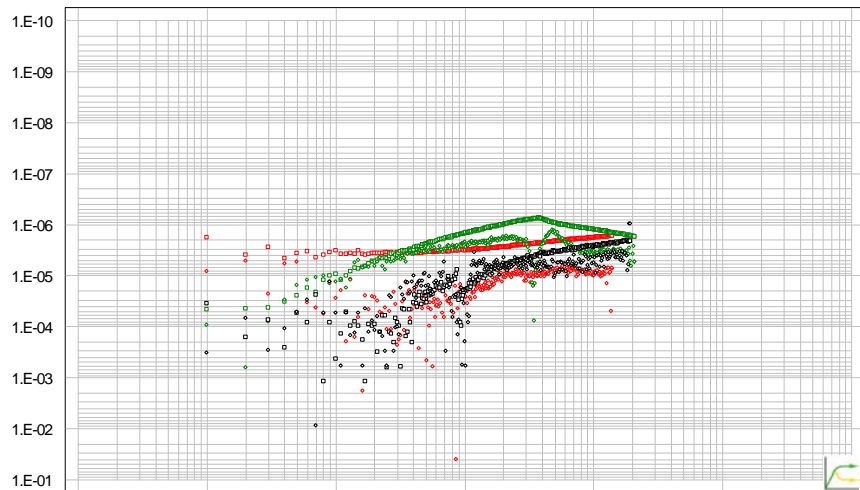
Time

1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure

Deconv. P

MW20-13 / MW20-13\_23APR20 / SI: LogLog Plot, constant P(i)



m/s

Transm.

MW20-13 / MW20-13\_23APR20 / LogLog Diagnosis - SI

■ Pressure Observation SI    ◆ Pressure Derivative SI

■ Pressure Observation CRI    ◆ Pressure Derivative CRI

■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase

— Simulated Response    — Simulated Response Derivative

CLIENT    PROJECT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**    **CALEDON PIT / QUARRY**

CONSULTANT

**GOLDER**  
MEMBER OF WSP

YYYY-MM-DD    2022-02-16

PREPARED    PGM

DESIGN    ML

REVIEW    ###

APPROVED

TITLE

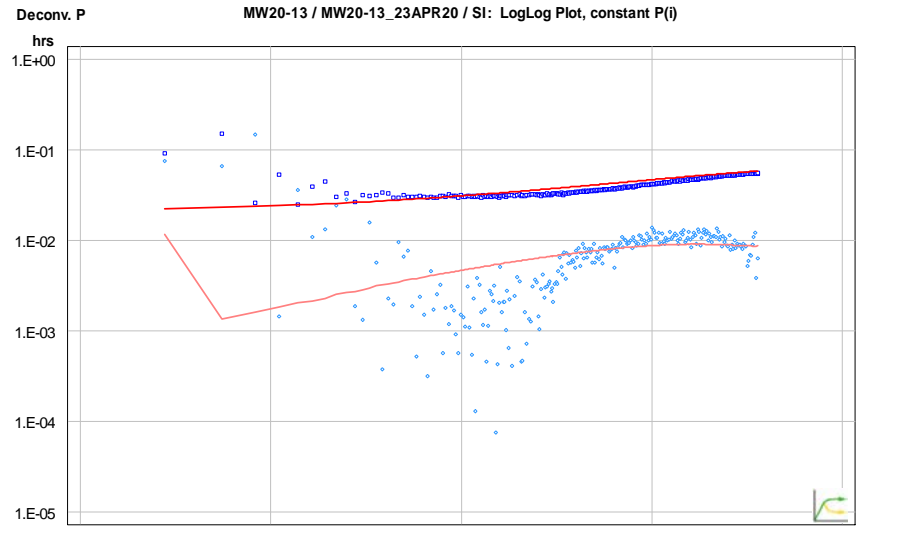
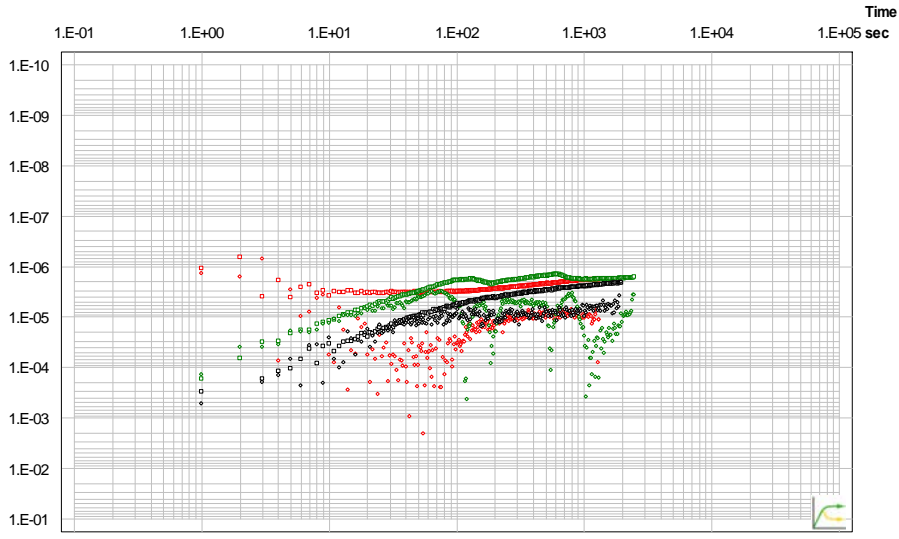
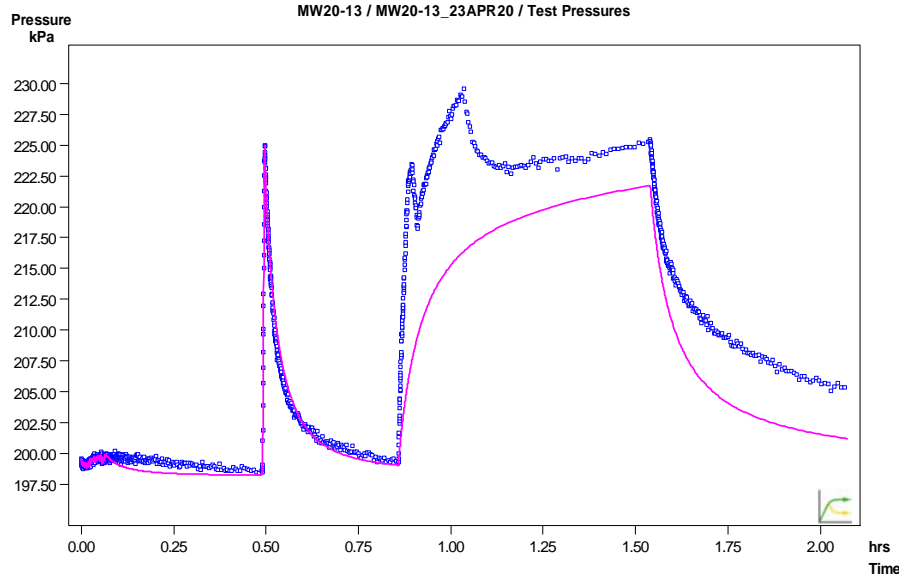
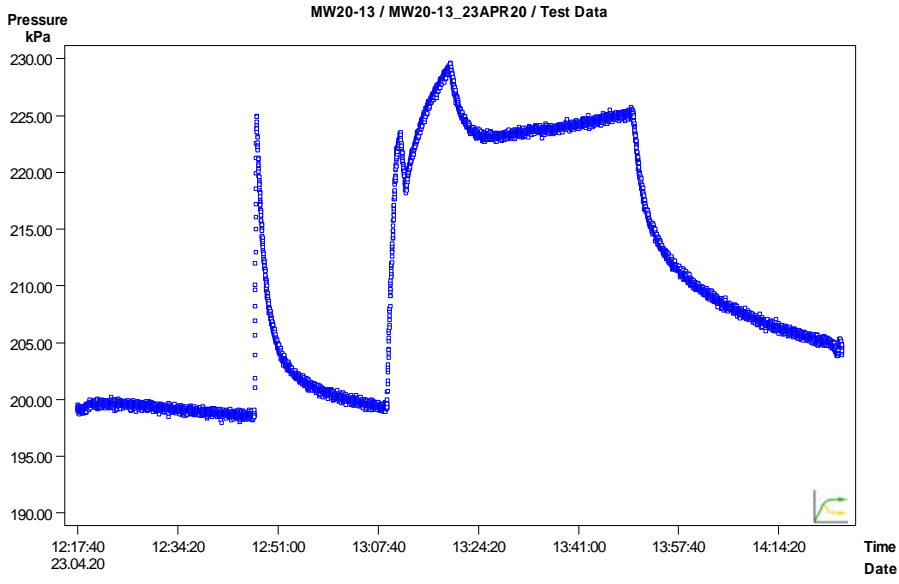
**PACKER TEST RESULTS MW20-13 UPPER INTERVAL (17.0 to 20.6 mbgs)**

PROJECT No.    PHASE    Rev.    FIGURE

**19129150    2300    A    F-076**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI





- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

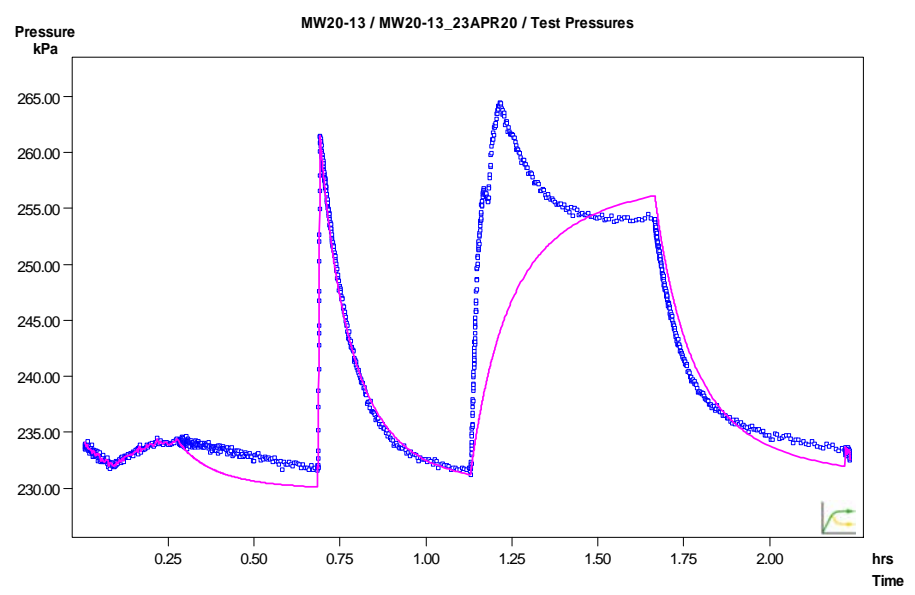
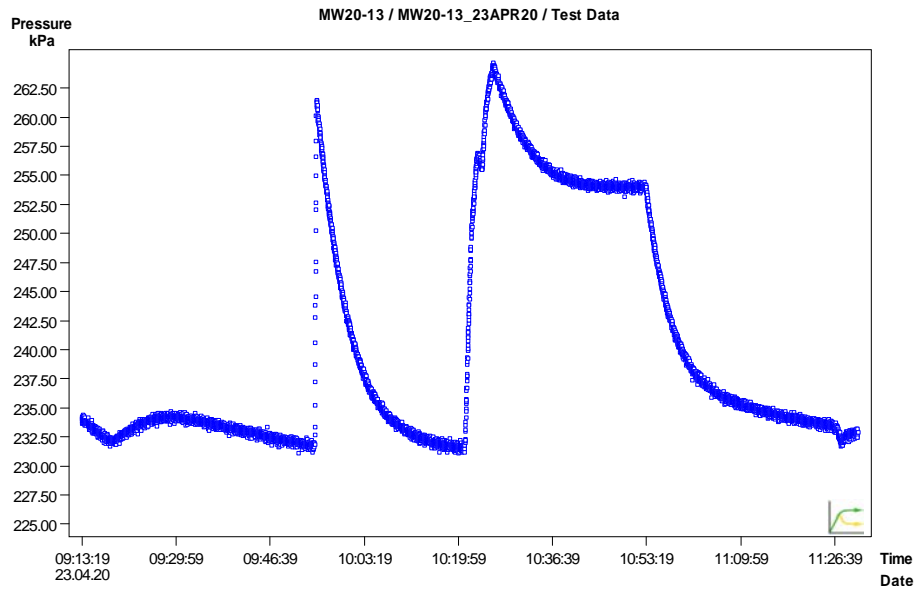
CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-16
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

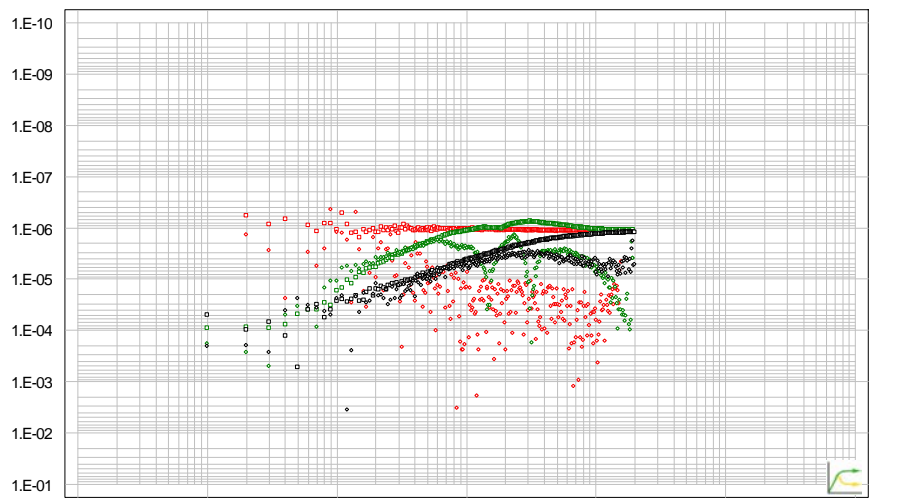
TITLE	<b>PACKER TEST RESULTS MW20-13 MIDDLE INTERVAL (20.2 to 23.9 mbgs)</b>	
PROJECT No.	PHASE	Rev.
<b>19129150</b>	<b>2300</b>	<b>A</b>

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI

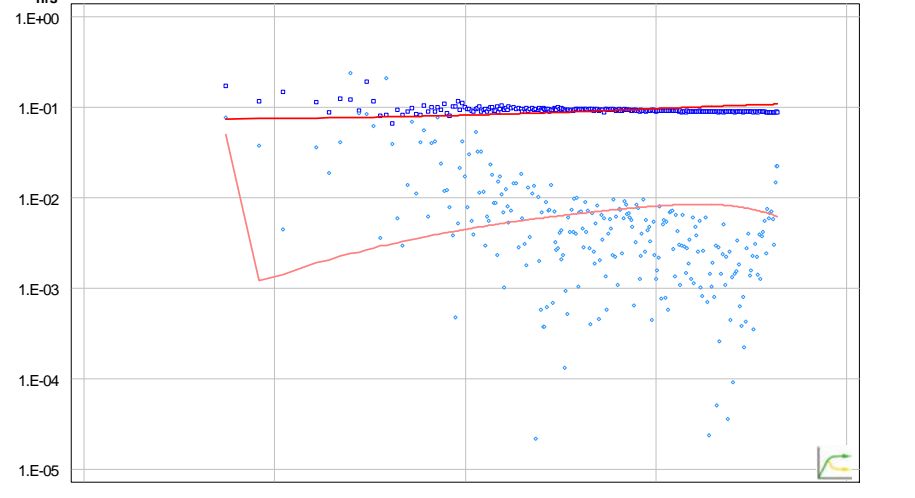


■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Deconv. P  
MW20-13 / MW20-13\_23APR20 / SIR: LogLog Plot, constant P(i)



Transm. m²/s

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

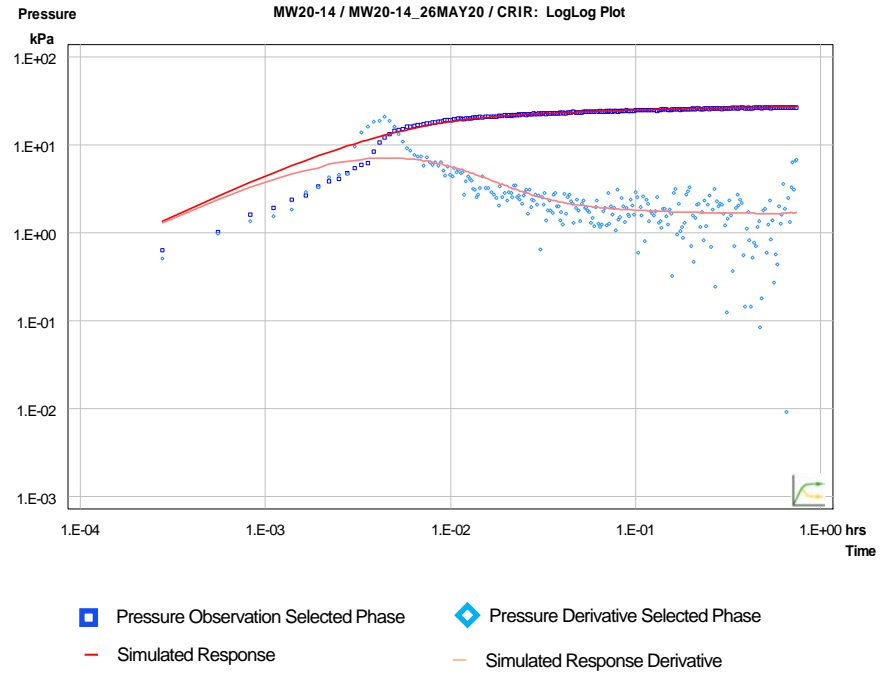
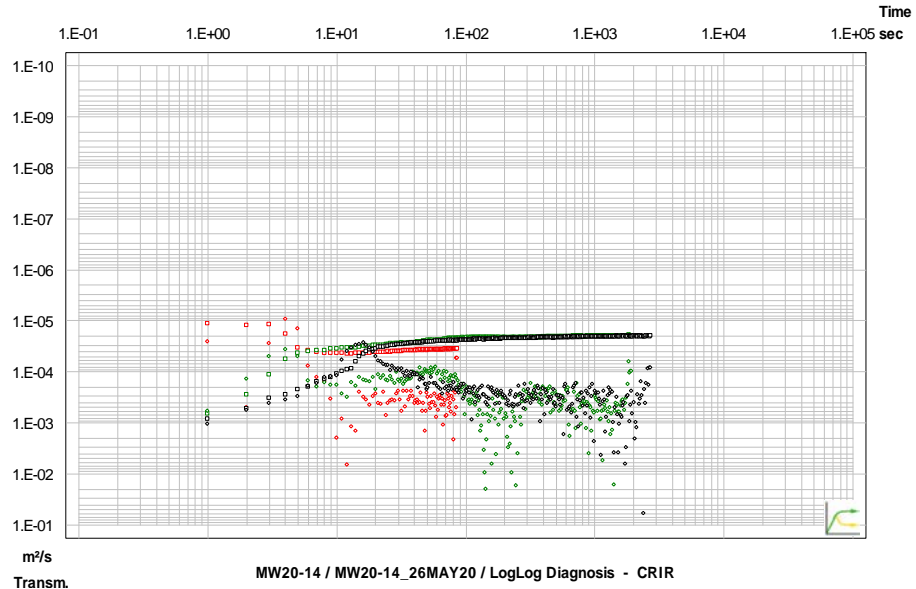
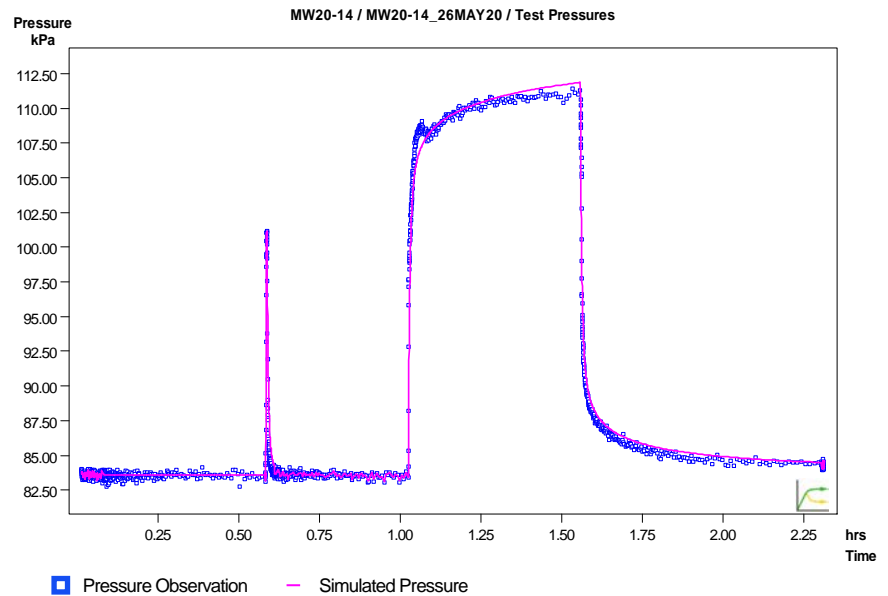
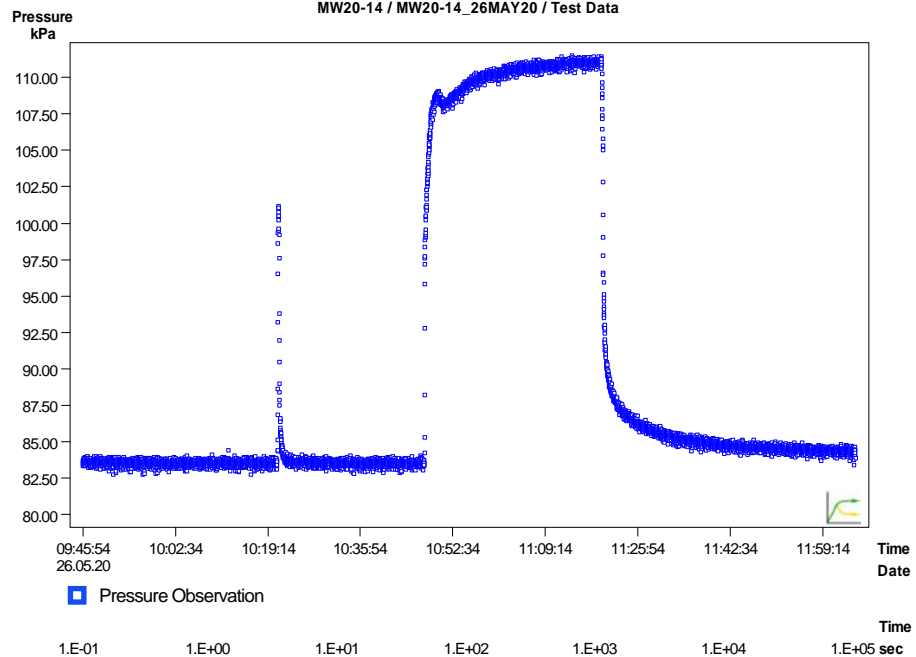
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD    2022-02-16  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-13 LOWER INTERVAL (23.9 to 28.2 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-078

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

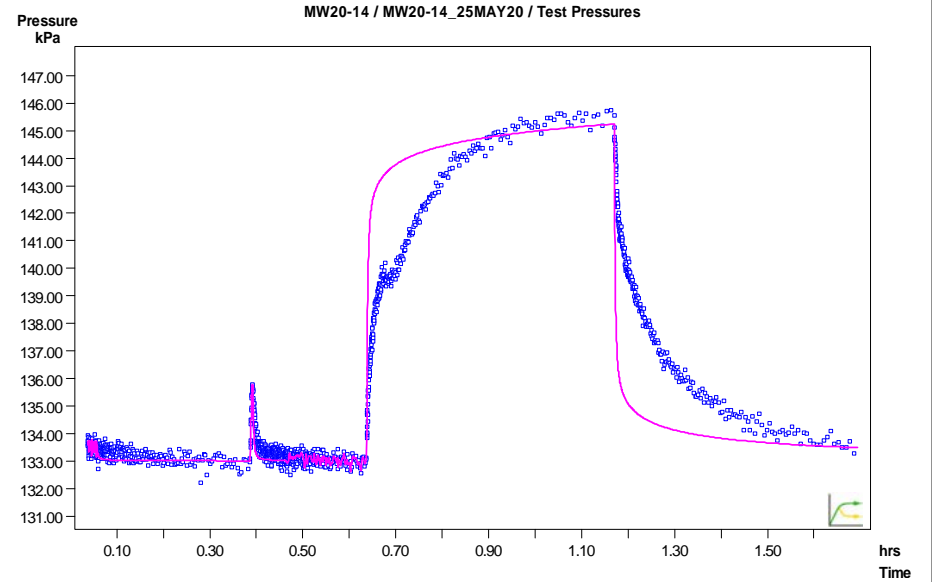
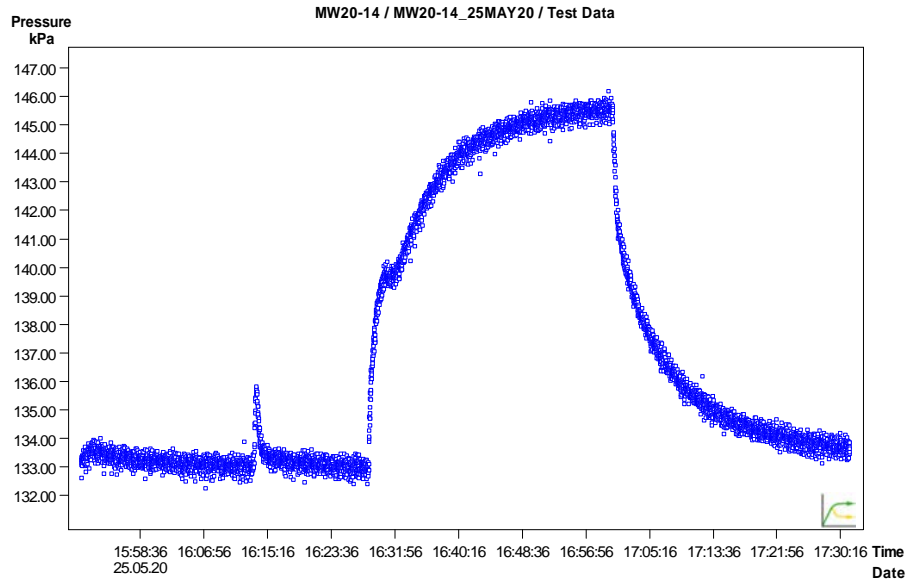
YYYY-MM-DD    2022-02-16  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS MW20-14 UPPER INTERVAL (4.6 to 14.4 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-079

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANS/A

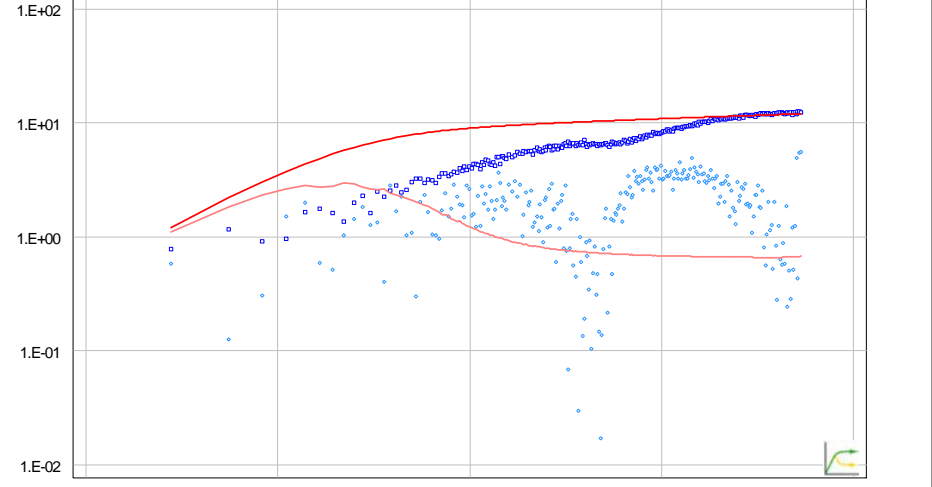
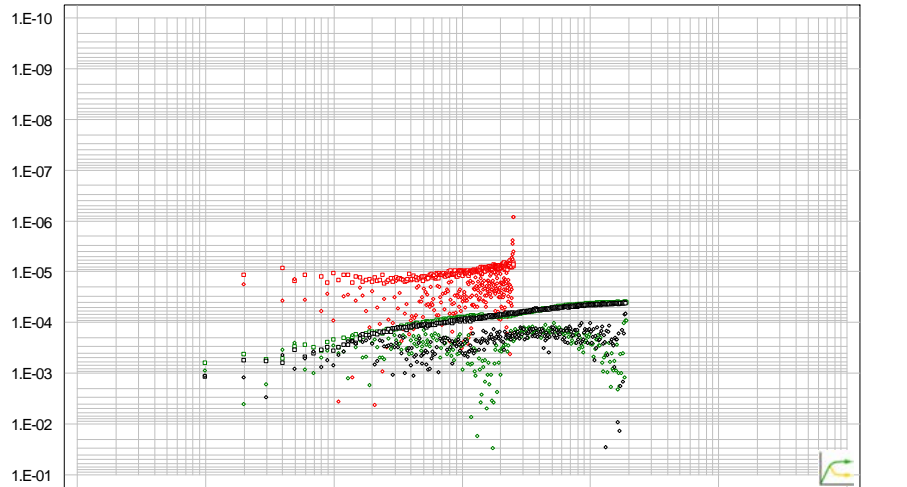


■ Pressure Observation

Time Date

■ Pressure Observation — Simulated Pressure

Time



m<sup>2</sup>/s

Transm.

MW20-14 / MW20-14\_25MAY20 / LogLog Diagnosis - CRI

Time

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED PGM

DESIGN ML

REVIEW ###

APPROVED

TITLE

PACKER TEST RESULTS MW20-14 MIDDLE INTERVAL (14.2 to 22.4 mbgs)

PROJECT No. 19129150

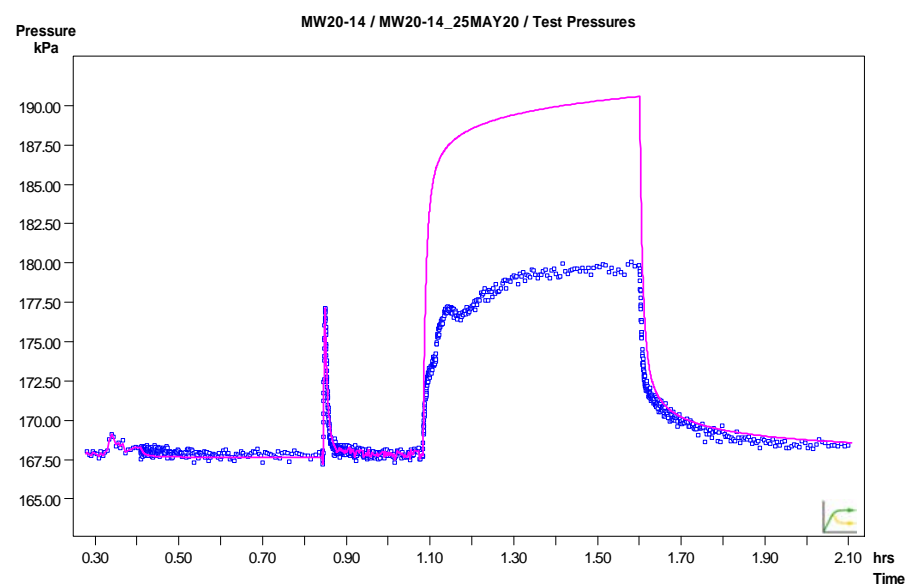
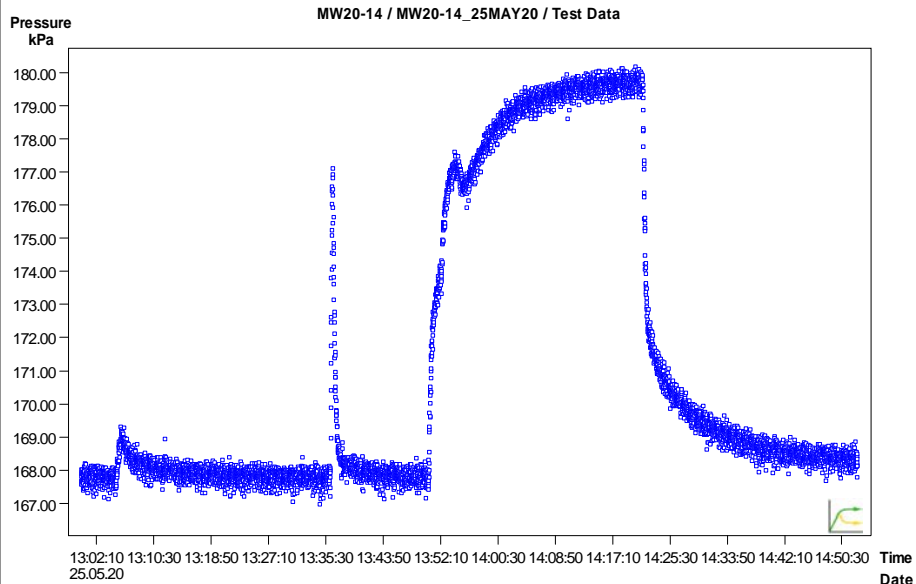
PHASE 2300

Rev. A

FIGURE F-080

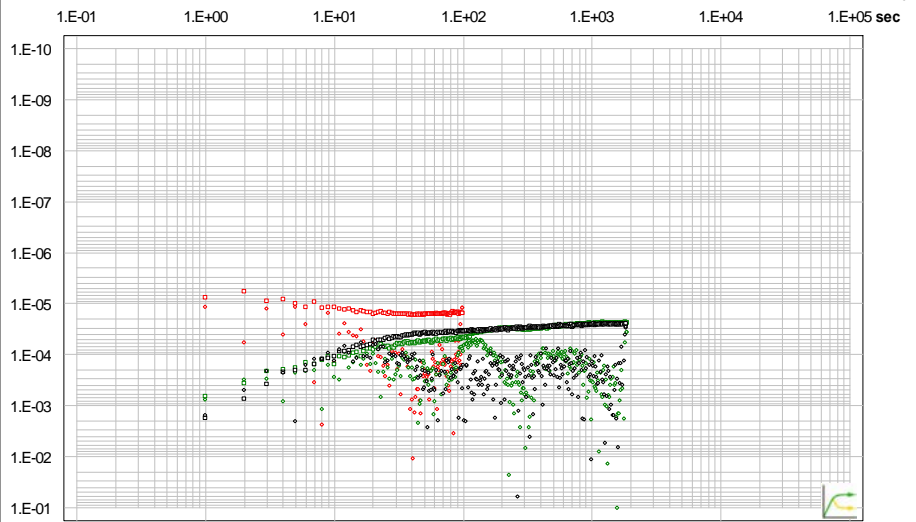
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



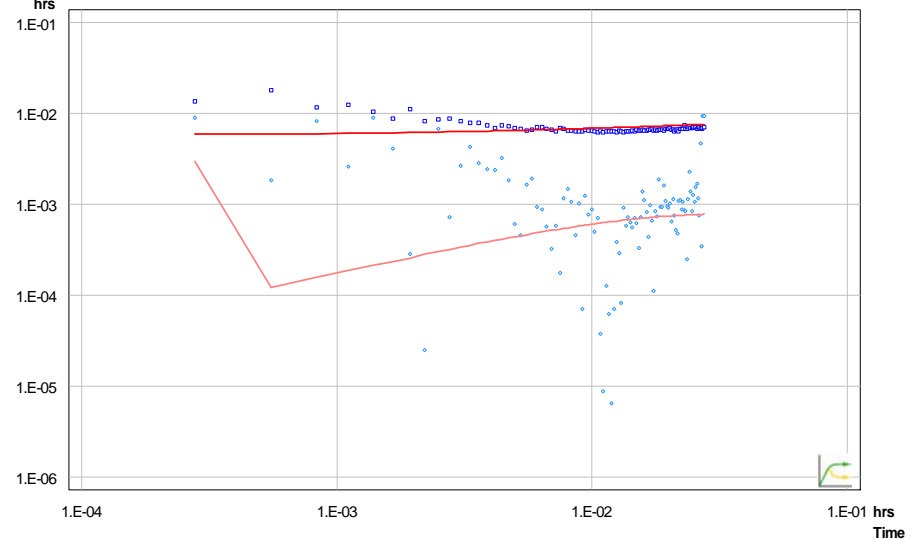


■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Deconv. P  
MW20-14 / MW20-14\_25MAY20 / SI: LogLog Plot, constant P(i)



■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

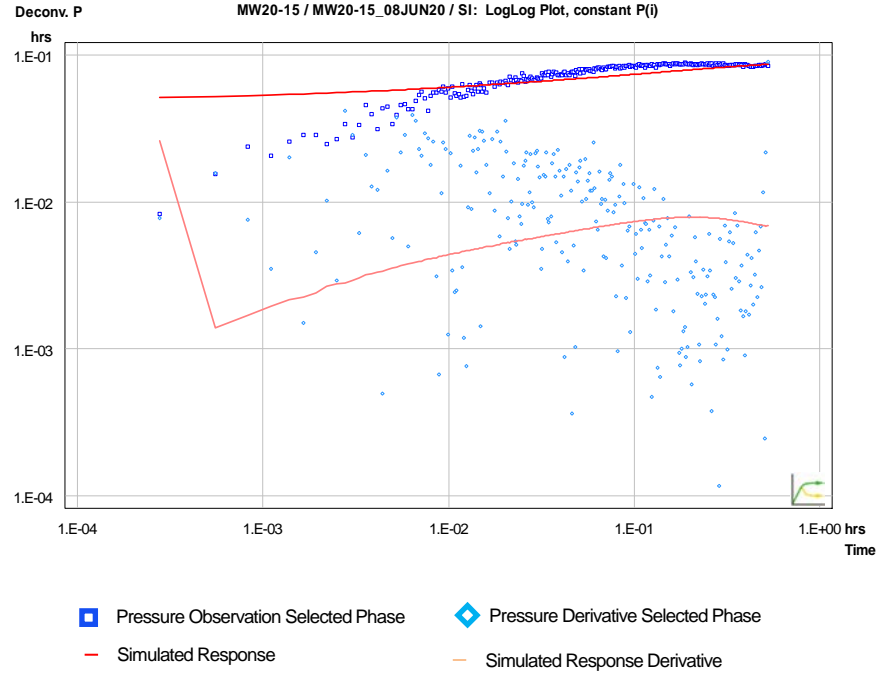
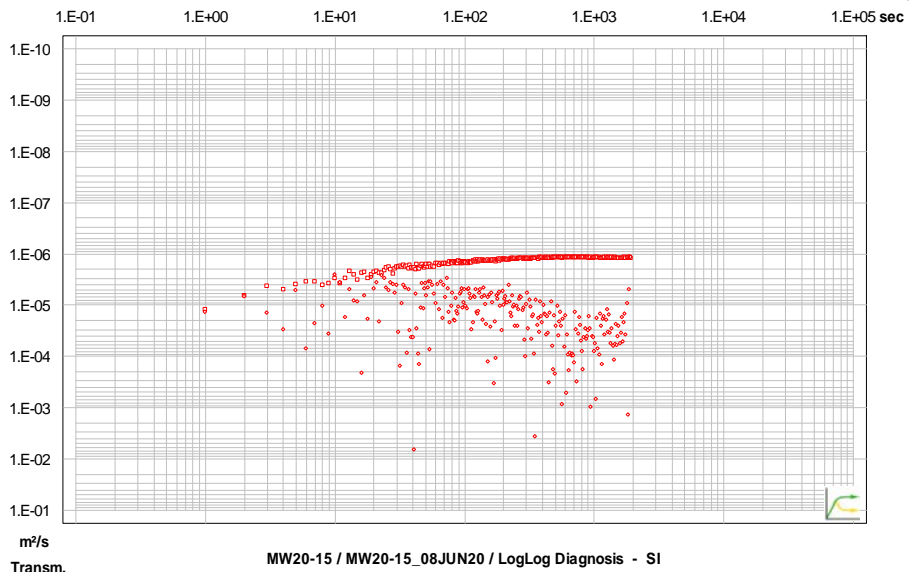
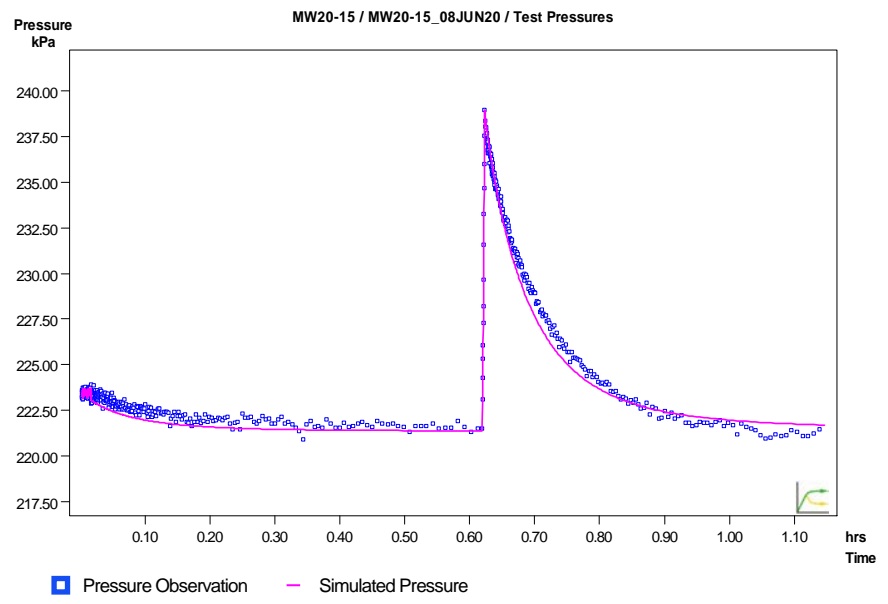
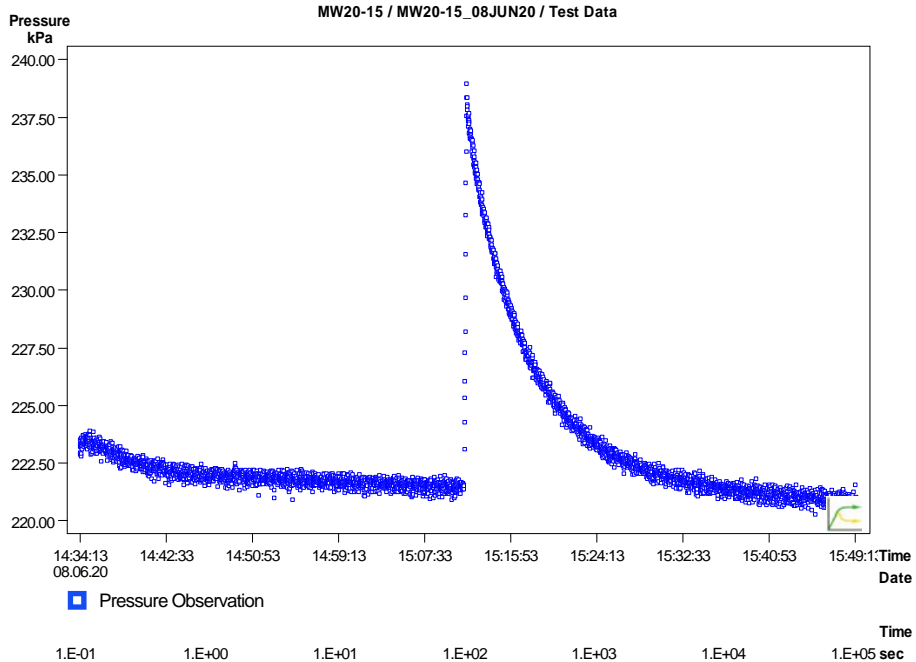
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD    2022-02-16  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-14 LOWER INTERVAL (22.4 to 26.4 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-081

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4 TO A



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

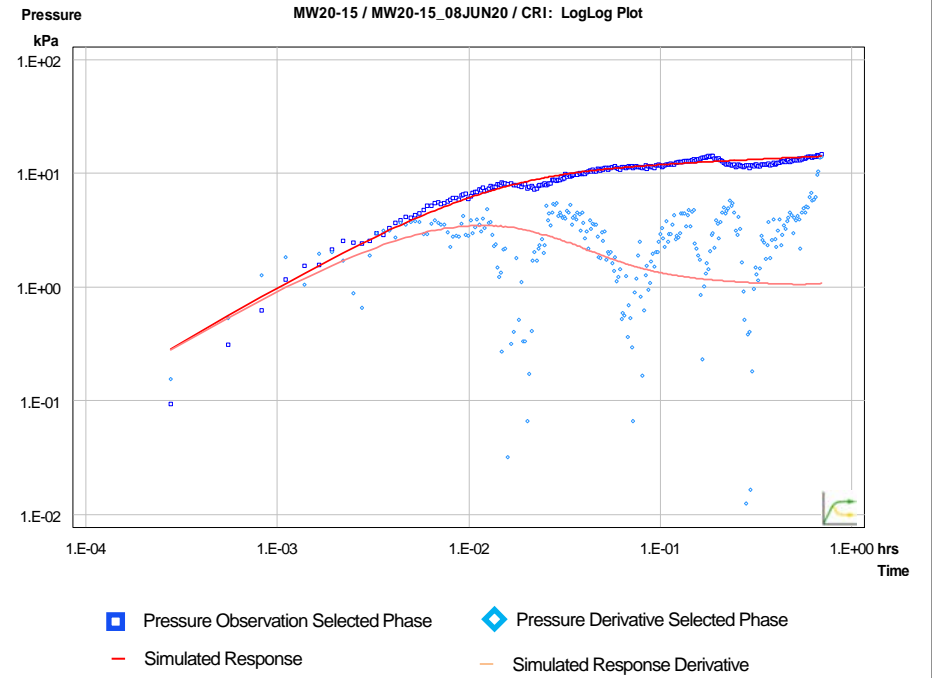
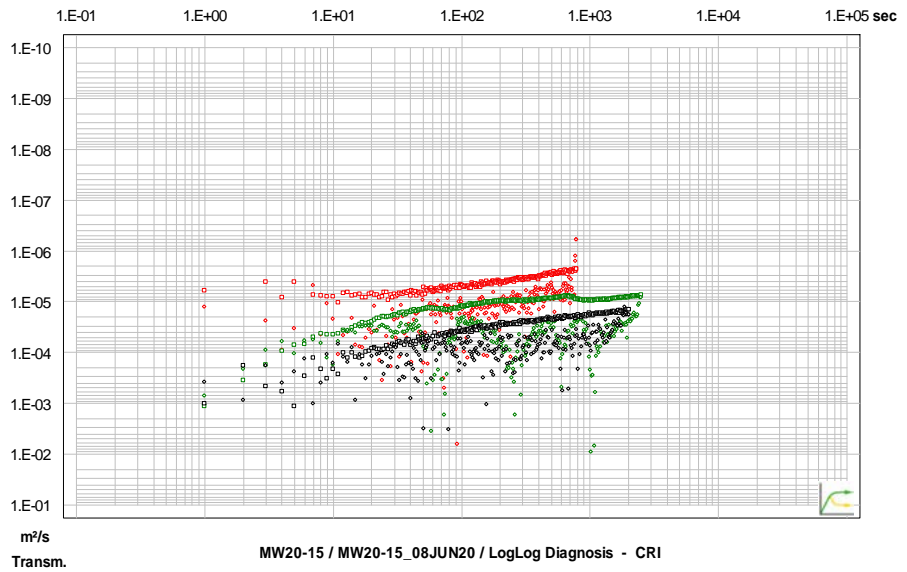
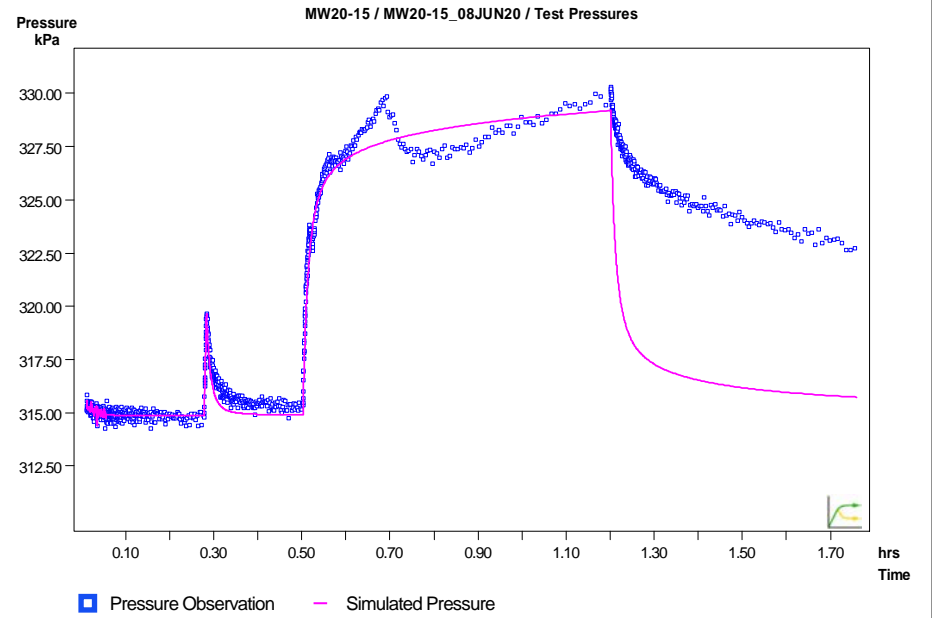
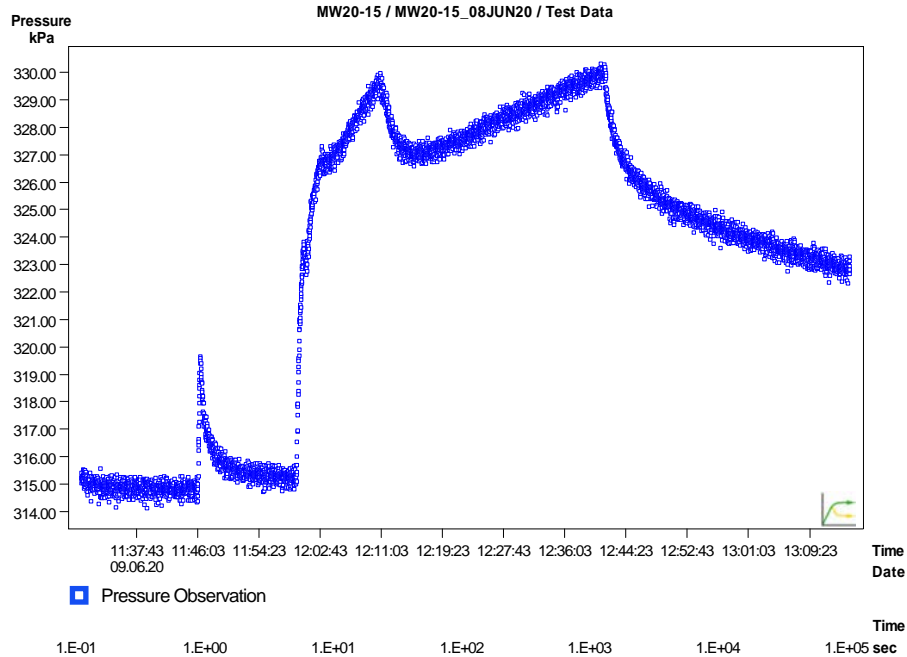
CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-16
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE	<b>PACKER TEST RESULTS MW20-15 UPPER INTERVAL (14.3 to 24.1 mbgs)</b>		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-082

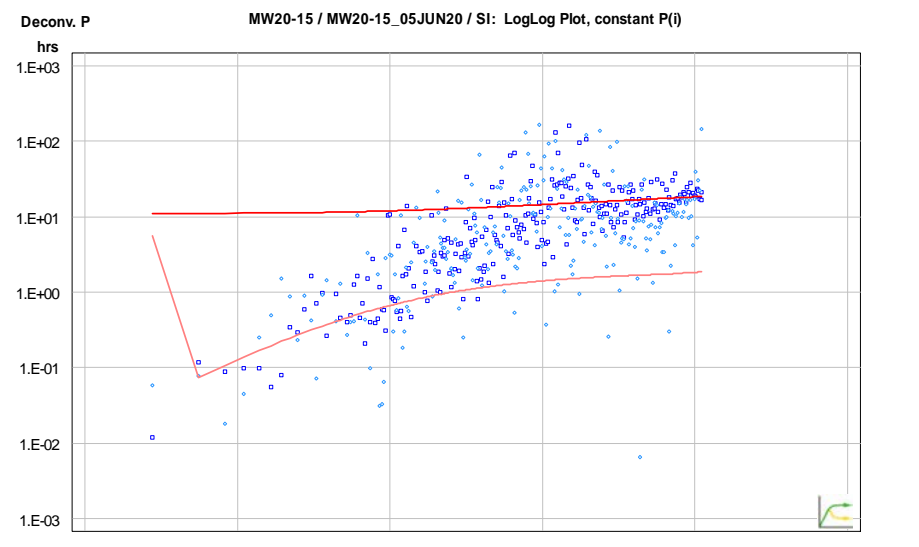
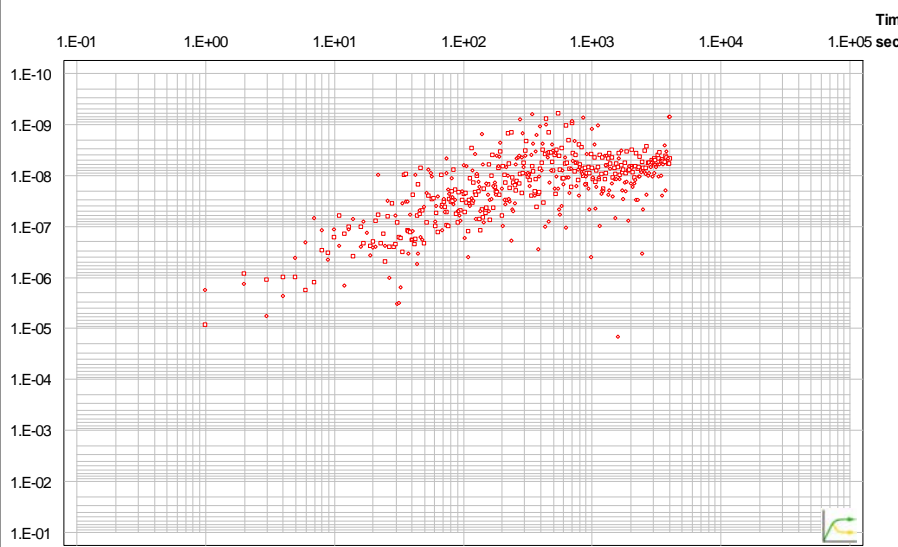
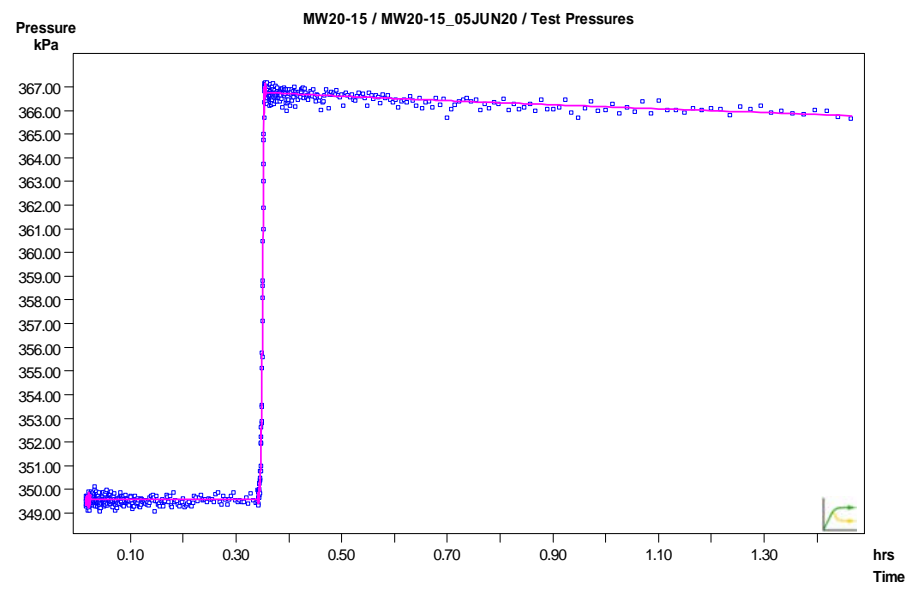
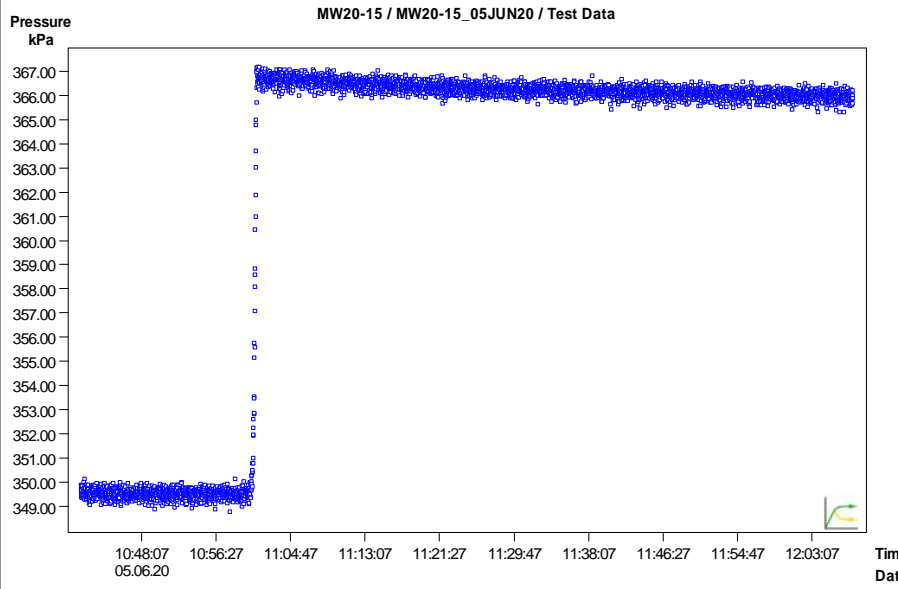
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

CLIENT	<b>CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)</b>	PROJECT	<b>CALEDON PIT / QUARRY</b>
CONSULTANT	<b>GOLDER</b> MEMBER OF WSP	TITLE	<b>PACKER TEST RESULTS MW20-15 MIDDLE INTERVAL (24.1 to 33.8 mbgs)</b>
YYYY-MM-DD	2022-02-16	PROJECT No.	19129150
PREPARED	PGM	PHASE	2300
DESIGN	ML	Rev.	A
REVIEW	###	FIGURE	F-083
APPROVED			

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

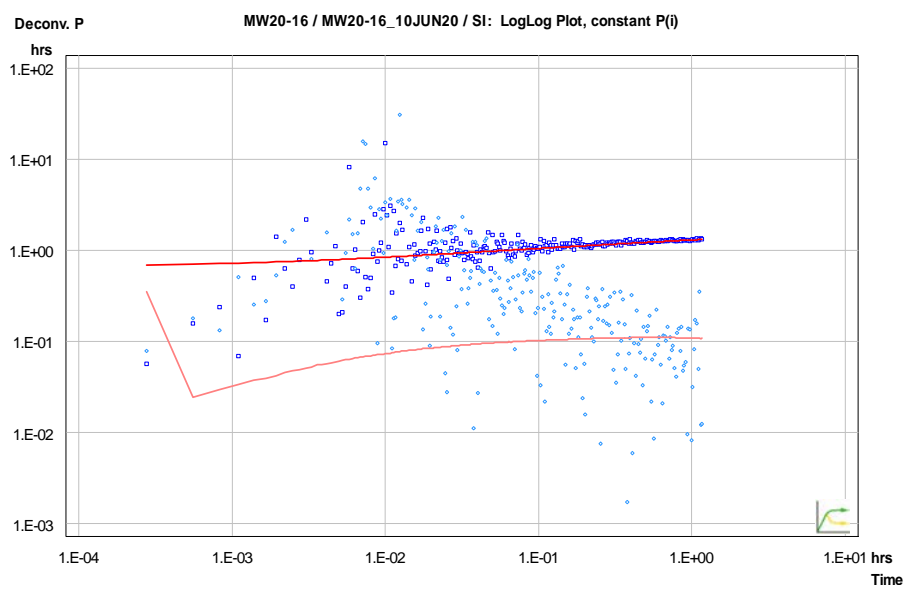
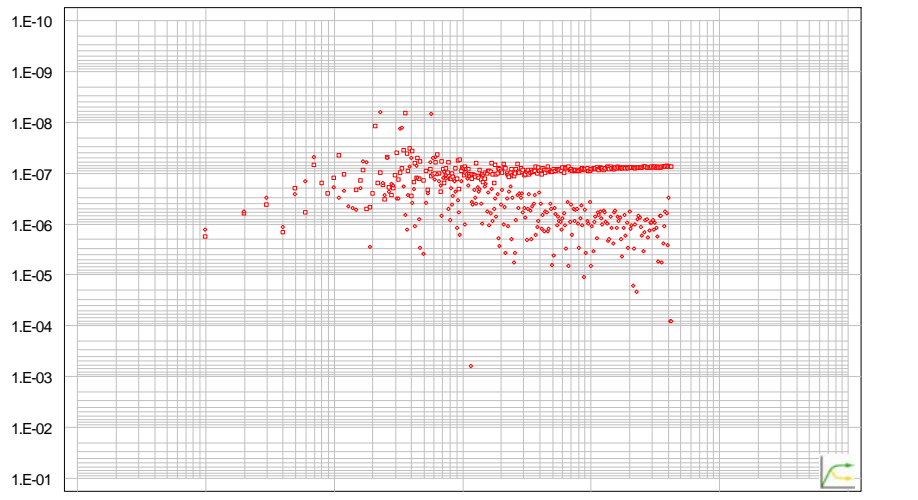
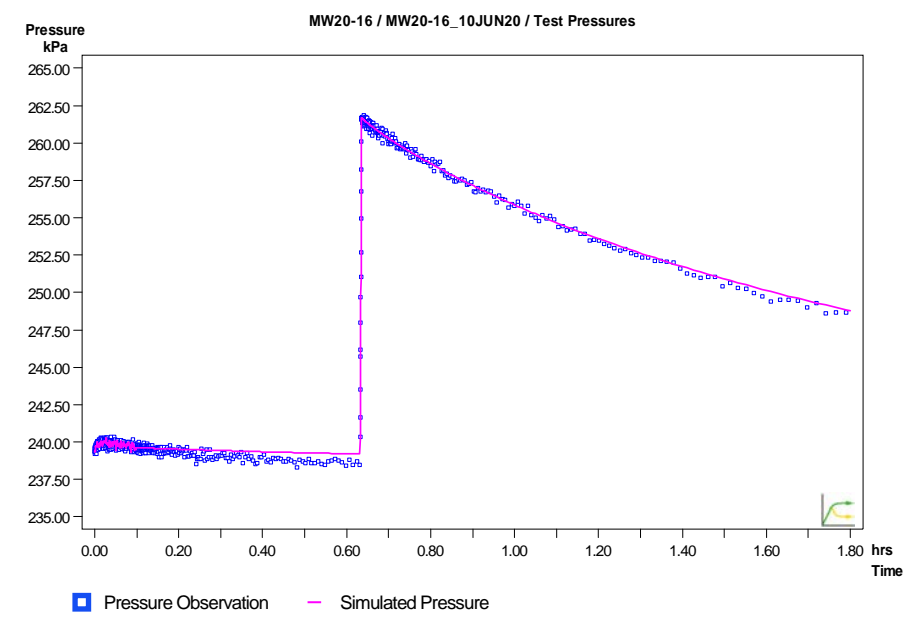
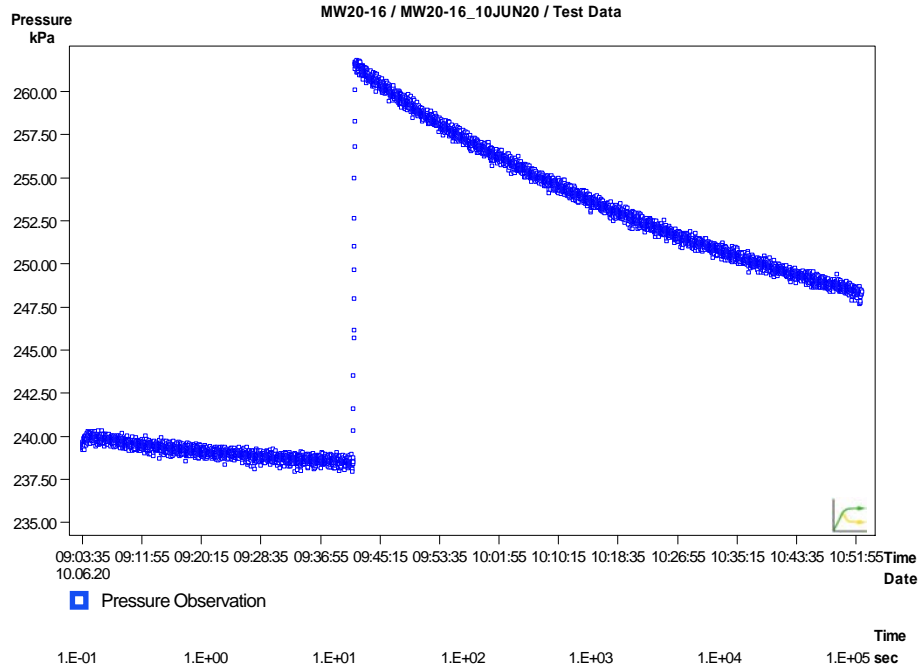


YYYY-MM-DD	2022-02-16
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

TITLE	<b>PACKER TEST RESULTS MW20-15 LOWER INTERVAL (33.8 to 37.2 mbgs)</b>		
PROJECT No.	19129150	PHASE	2300
Rev.	A	FIGURE	F-084

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/4





Legend for LogLog Diagnosis - SI:

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

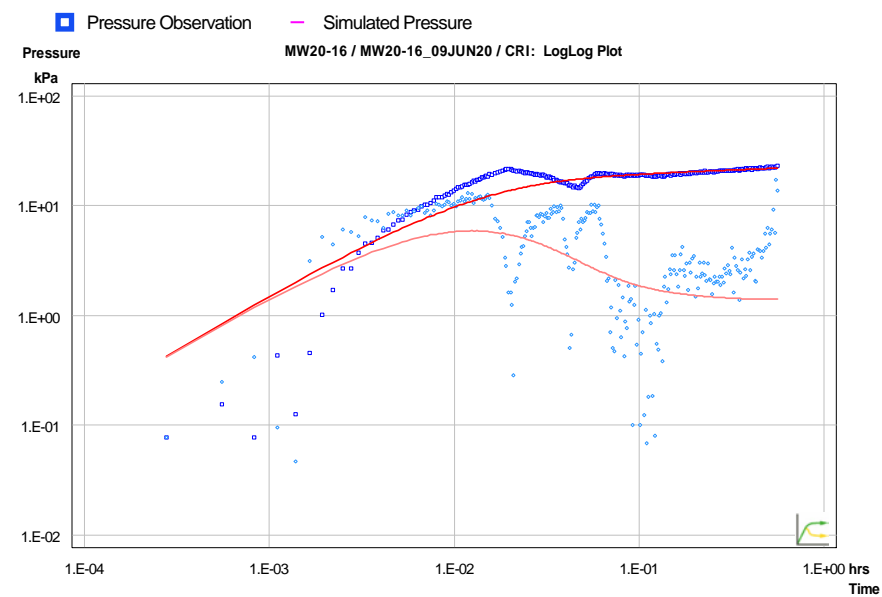
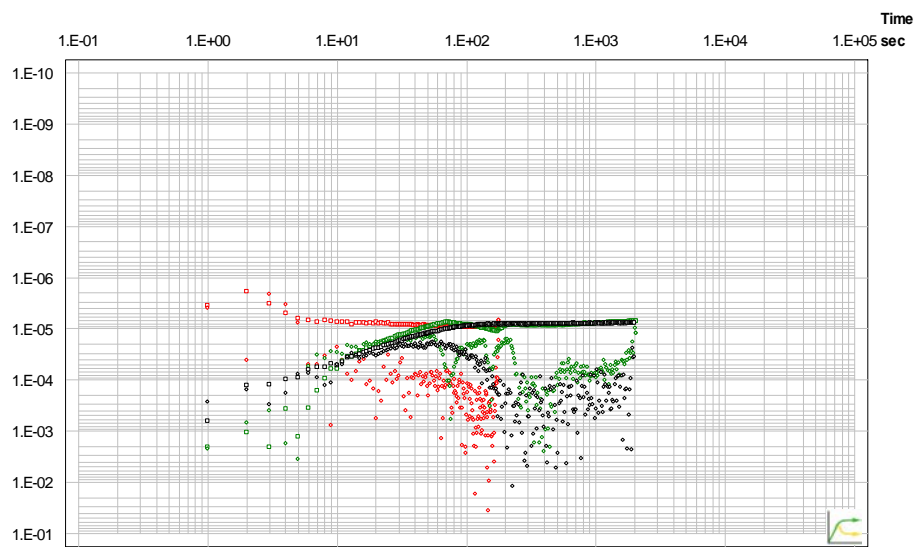
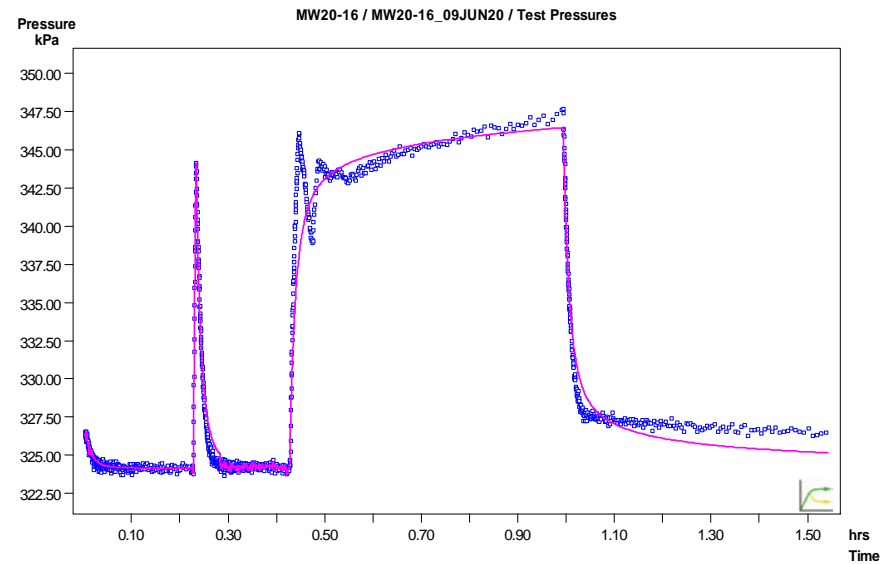
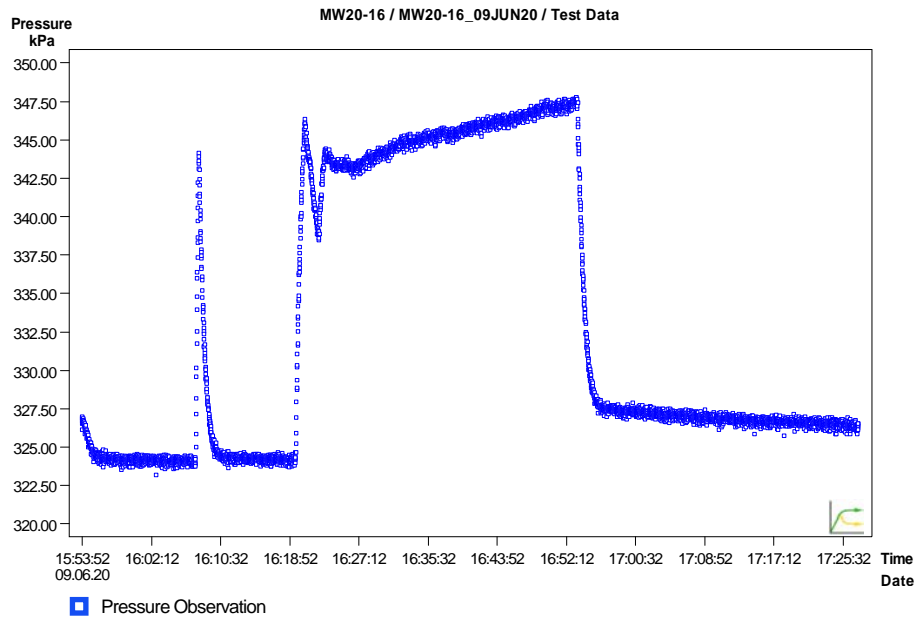
DATE: 2022-02-14  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS MW20-16 UPPER INTERVAL (16.9 to 26.5 mbgs)**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE F-085

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI      ◆ Pressure Derivative SI
- Pressure Observation CRI      ◆ Pressure Derivative CRI
- Pressure Observation CRIR      ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase      ◆ Pressure Derivative Selected Phase
- Simulated Response      — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT

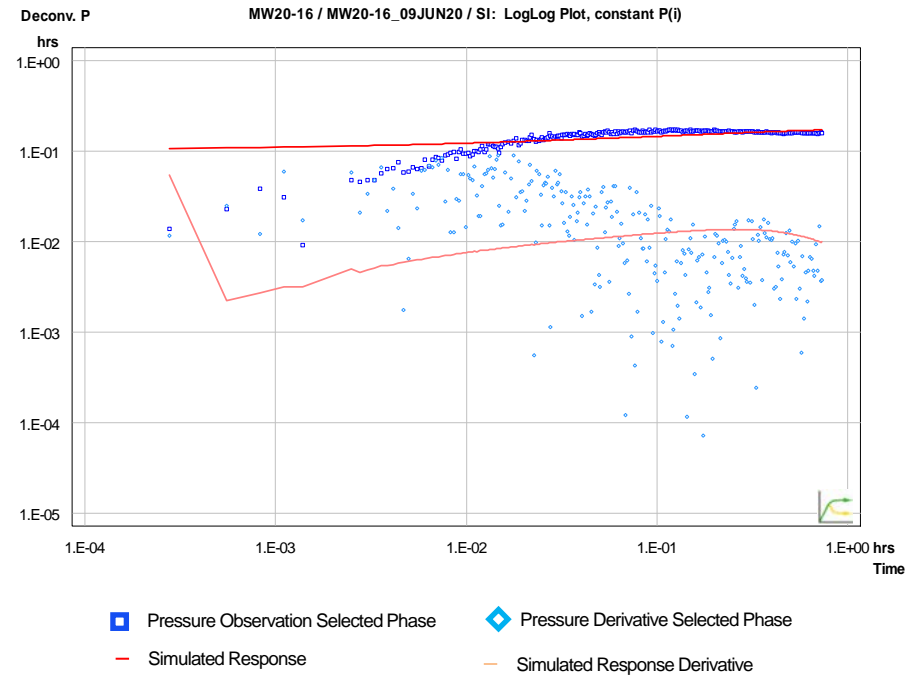
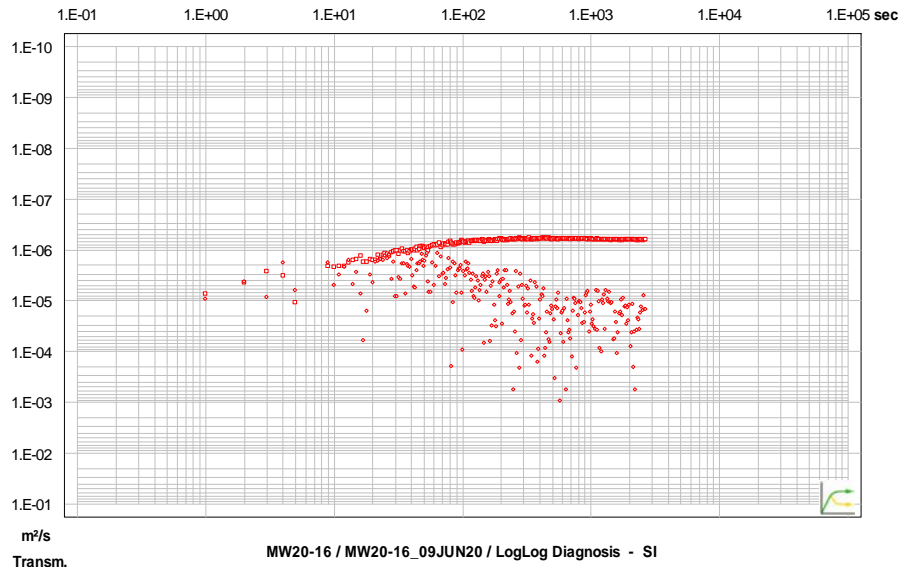
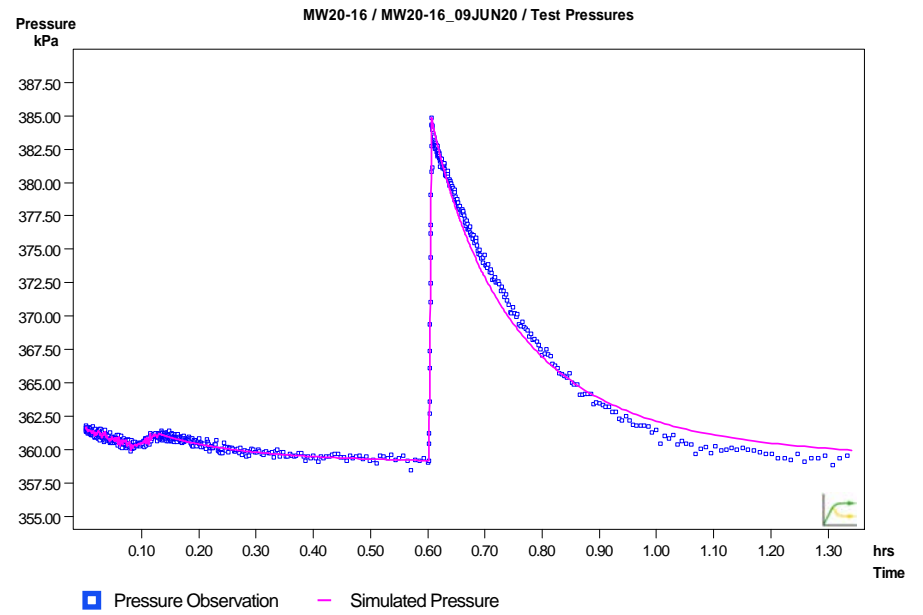
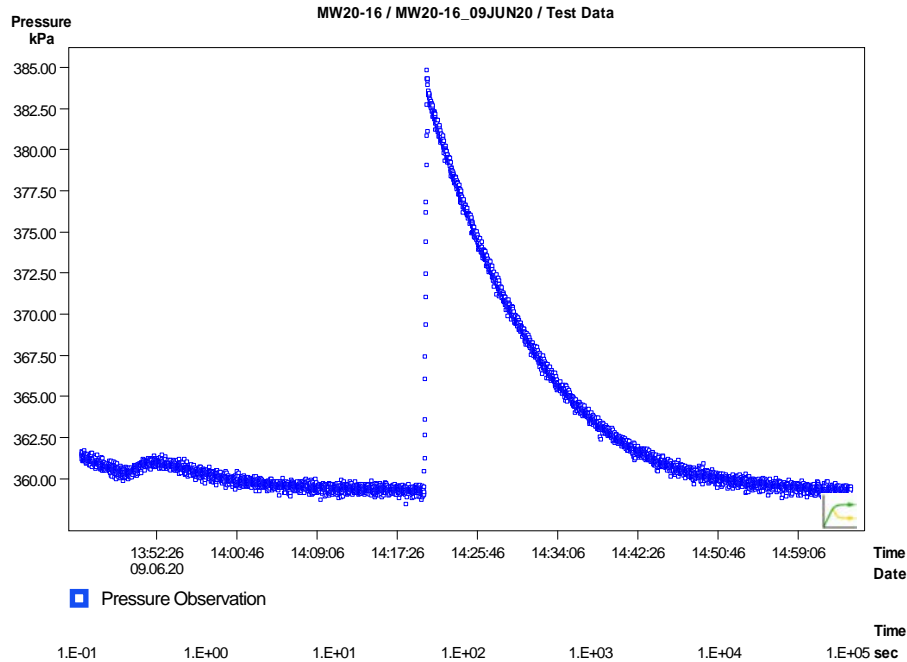
YYYY-MM-DD      2022-02-16  
 PREPARED      PGM  
 DESIGN      ML  
 REVIEW      ###  
 APPROVED

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS MW20-16 MIDDLE INTERVAL (25.8 to 35.4 mbgs)**

PROJECT No.      19129150      PHASE      2300      Rev.      A      FIGURE      F-086

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI ◆ Pressure Derivative SI
- Pressure Observation CRI ◆ Pressure Derivative CRI
- Pressure Observation CRIR ◆ Pressure Derivative CRIR

CLIENT

**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT

**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED PGM

DESIGN ML

REVIEW ###

APPROVED

TITLE

**PACKER TEST RESULTS MW20-16 LOWER INTERVAL (35.5 to 39.8 mbgs)**

PROJECT No.  
**19129150**

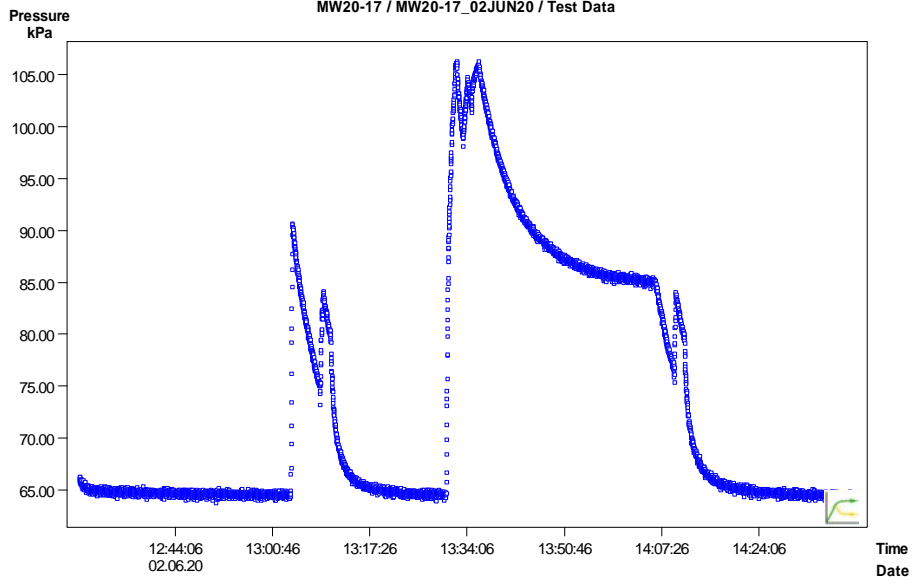
PHASE  
**2300**

Rev.  
**A**

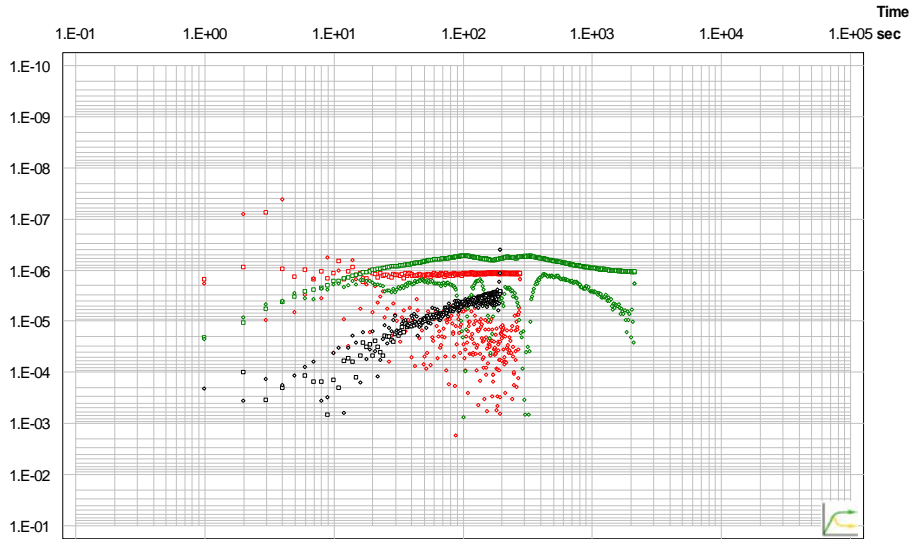
FIGURE  
**F-087**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4

1in

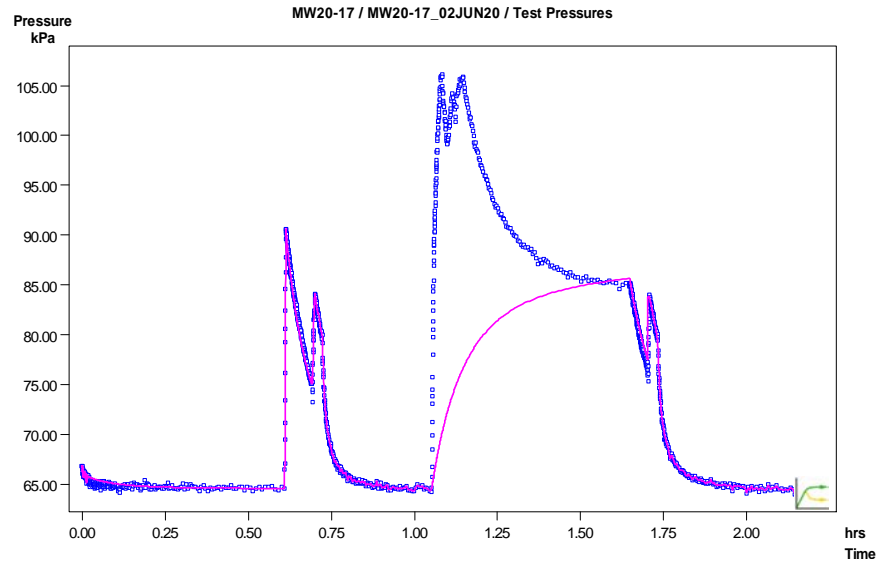


■ Pressure Observation

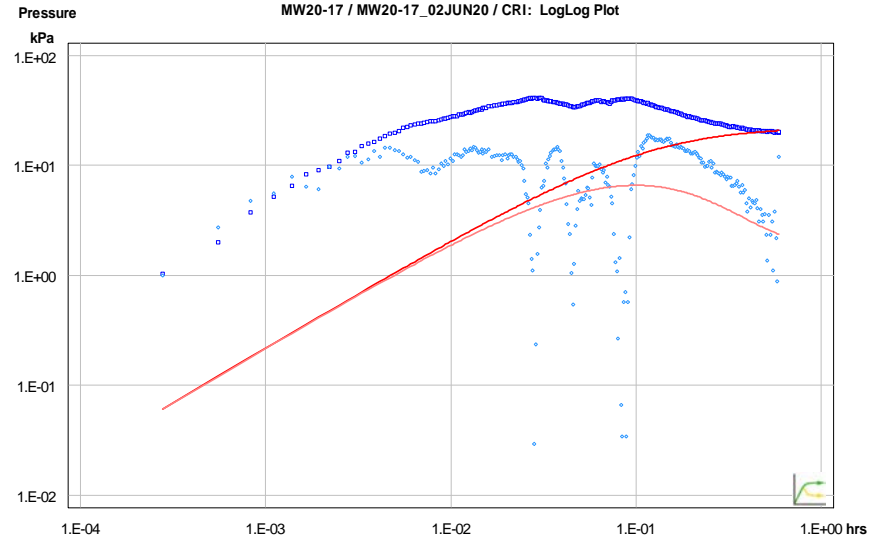


m<sup>2</sup>/s  
Transm. MW20-17 / MW20-17\_02JUN20 / LogLog Diagnosis - CRI

- Pressure Observation SI    ◆ Pressure Derivative SI
- Pressure Observation CRI    ◆ Pressure Derivative CRI
- Pressure Observation CRIR    ◆ Pressure Derivative CRIR



■ Pressure Observation    — Simulated Pressure



- Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase
- Simulated Response    — Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-16

PREPARED PGM

DESIGN ML

REVIEW ###

APPROVED

TITLE

PACKER TEST RESULTS MW20-17 UPPER INTERVAL (5.0 to 11.7 mbgs)

PROJECT No.  
19129150

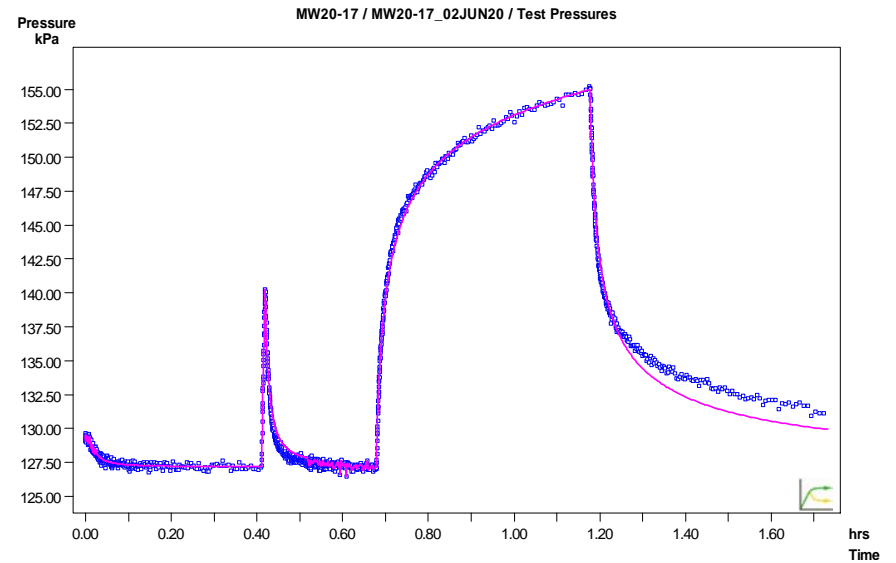
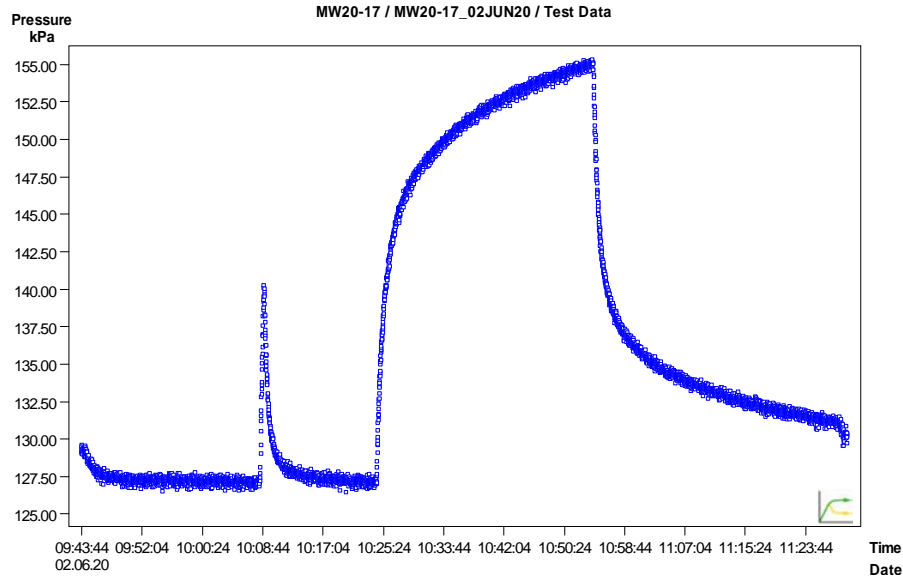
PHASE  
2300

Rev.  
A

FIGURE  
F-088

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4





■ Pressure Observation

Time Date

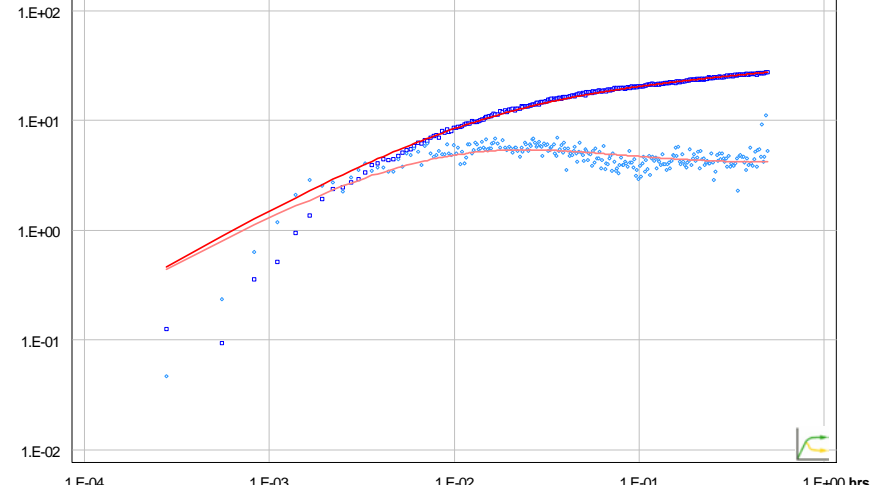
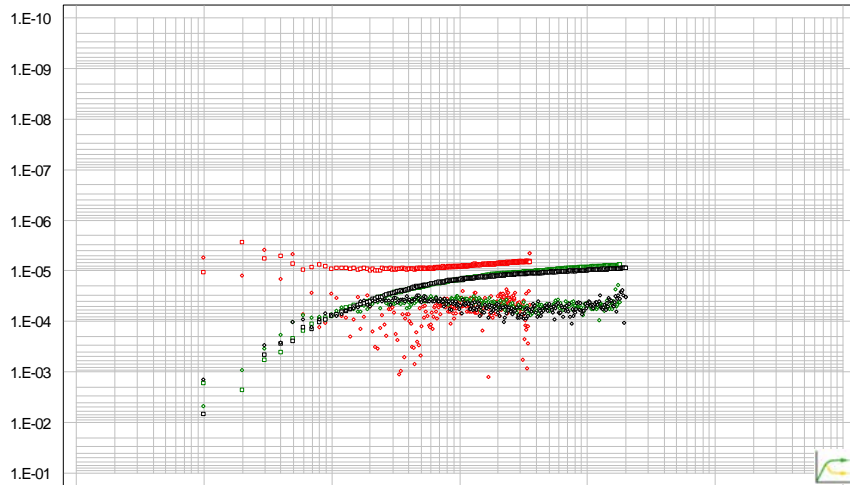
Time

1.E-01 1.E+00 1.E+01 1.E+02 1.E+03 1.E+04 1.E+05 sec

■ Pressure Observation — Simulated Pressure

Pressure

MW20-17 / MW20-17\_02JUN20 / CRI: LogLog Plot



Transm. MW20-17 / MW20-17\_02JUN20 / LogLog Diagnosis - CRI

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-16  
 PREPARED PGM  
 DESIGN ML  
 REVIEW ###  
 APPROVED

TITLE

PACKER TEST RESULTS MW20-17 MIDDLE INTERVAL (11.7 to 18.4 mbgs)

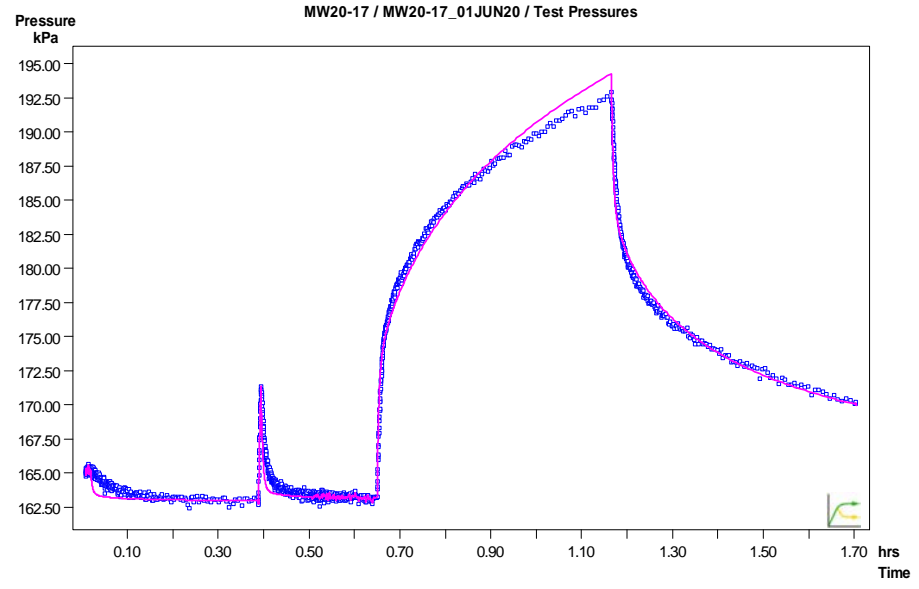
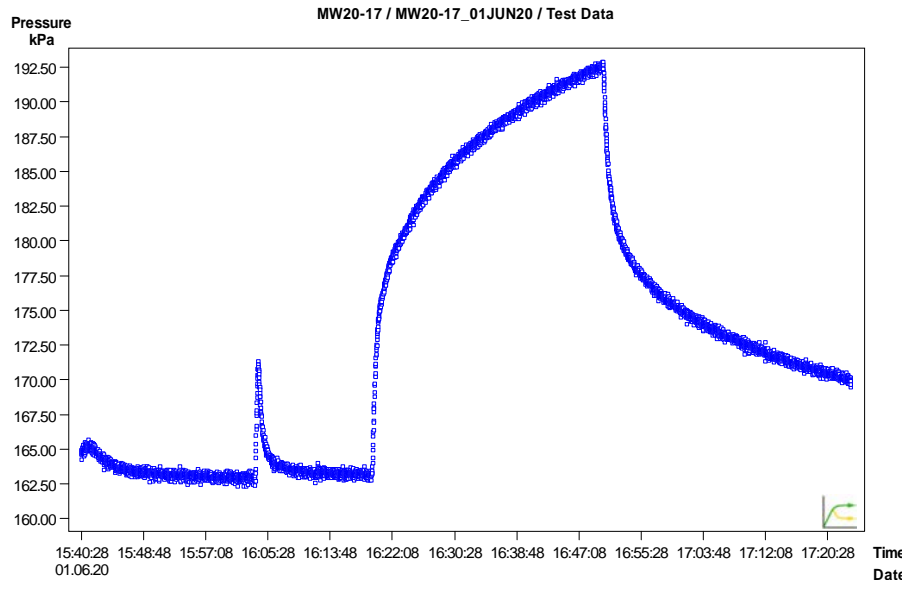
PROJECT No.  
19129150

PHASE  
2300

Rev.  
A

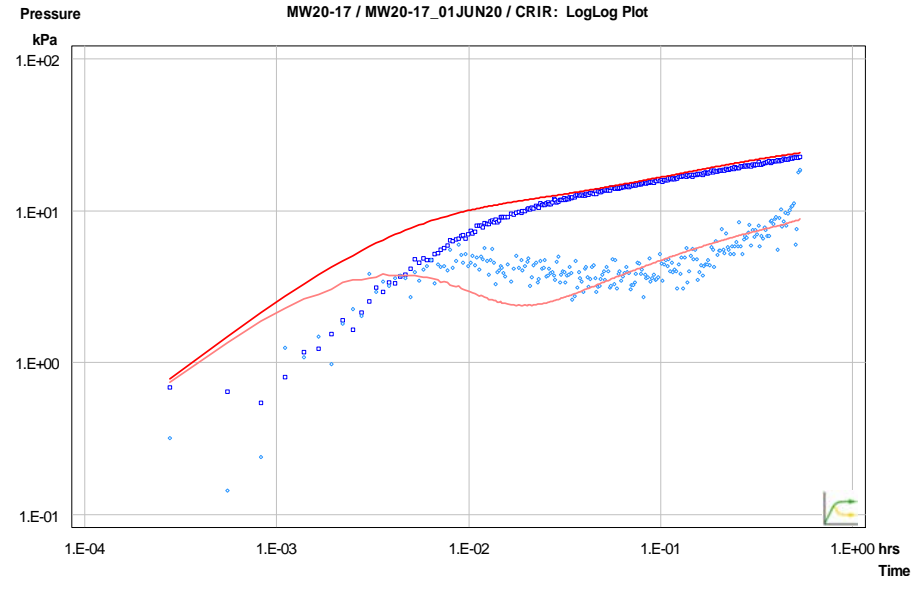
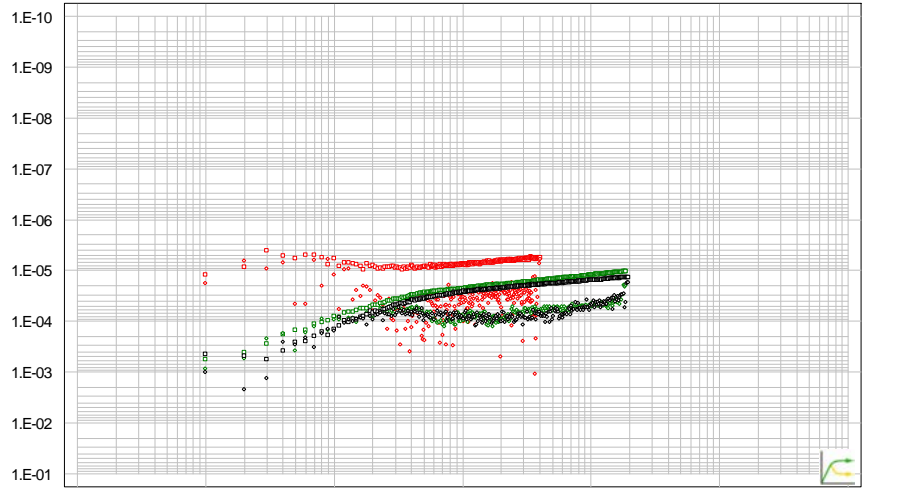
FIGURE  
F-089

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANS/A



■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Transm. **MW20-17 / MW20-17\_01JUN20 / LogLog Diagnosis - CRI/CRIR-2 shell**

■ Pressure Observation SI    ◆ Pressure Derivative SI  
 ■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
 ■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
 — Simulated Response    — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

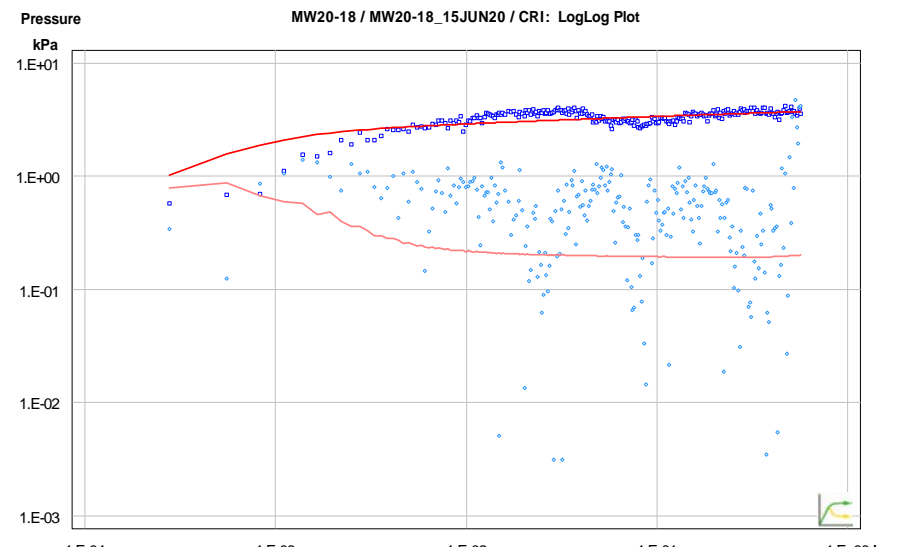
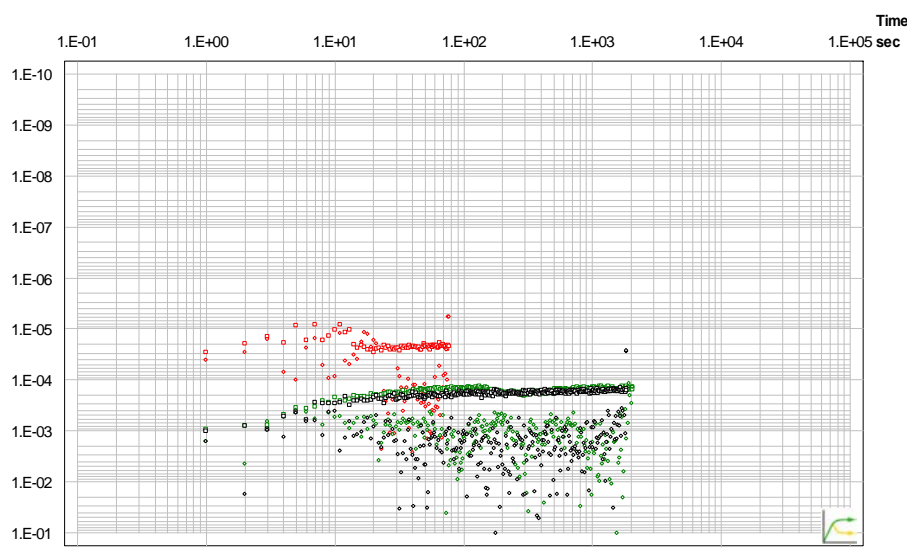
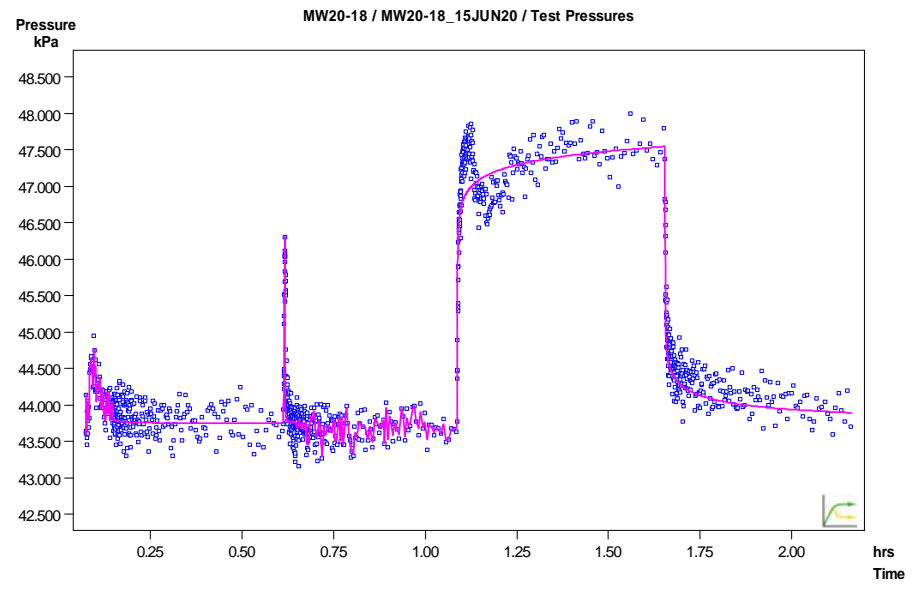
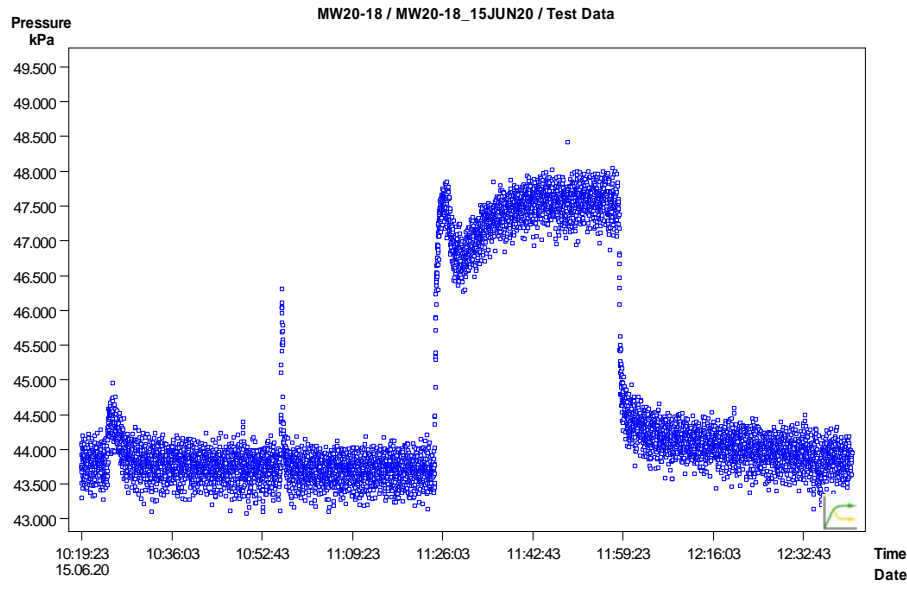
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD    2022-03-14  
 PREPARED    PGM  
 DESIGN    ML  
 REVIEW    ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-17 LOWER INTERVAL (18.4 to 27.5 mbgs)**

PROJECT No.    19129150    PHASE    2300    Rev.    A    FIGURE    F-090

1in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- Pressure Observation CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative SI
- ◆ Pressure Derivative CRI
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- Simulated Response
- Simulated Response Derivative
- ◆ Pressure Derivative Selected Phase

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

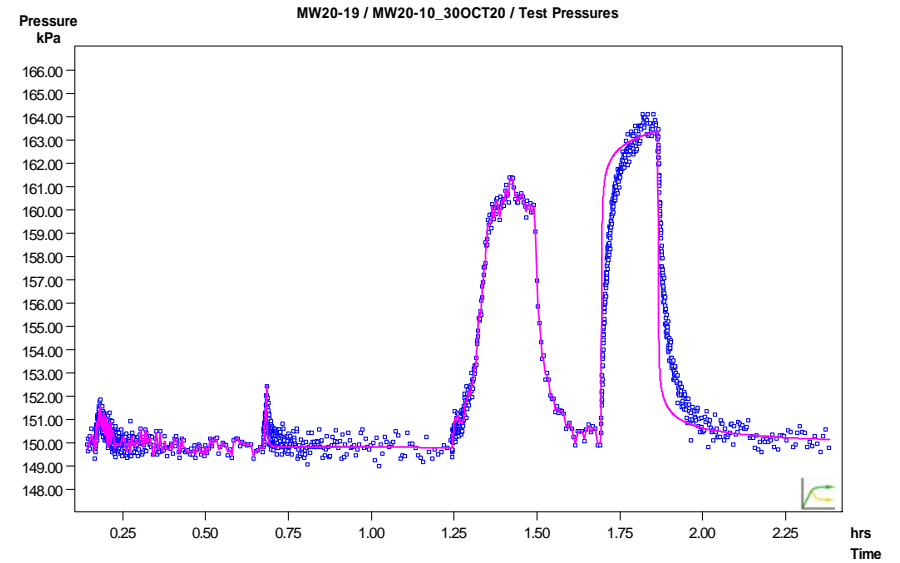
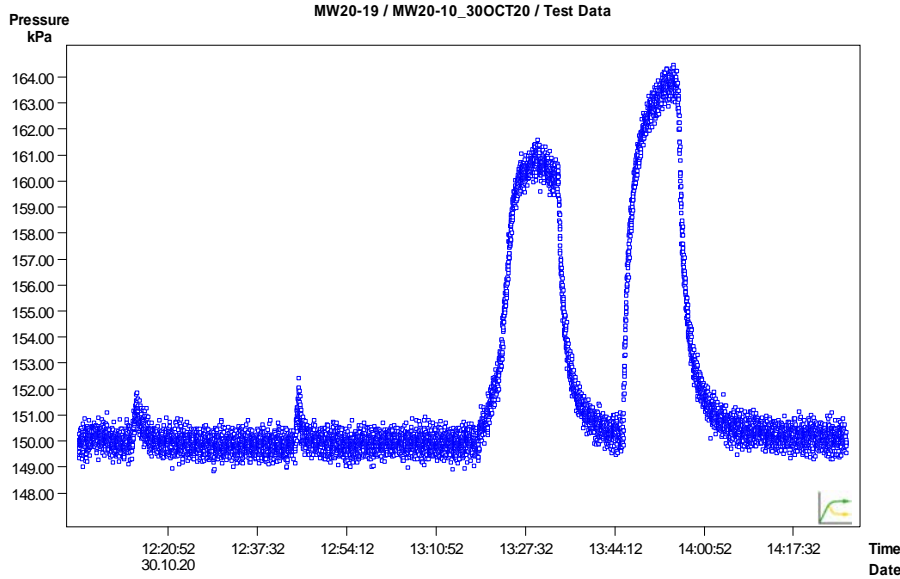
CONSULTANT	YYYY-MM-DD	2022-02-16
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE	<b>PACKER TEST RESULTS MW20-18 SINGLE INTERVAL (14.0 to 28.2 mbgs)</b>	
PROJECT No.	PHASE	Rev.
<b>19129150</b>	<b>2300</b>	<b>A</b>

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

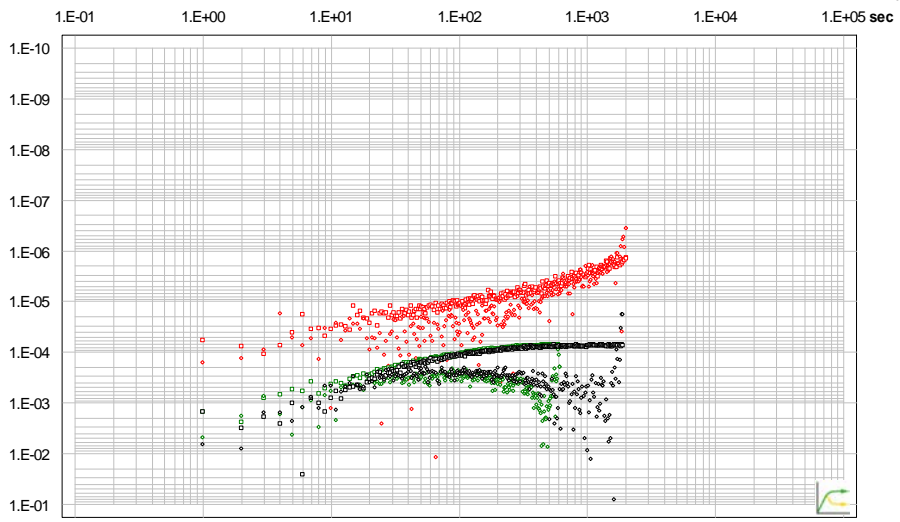




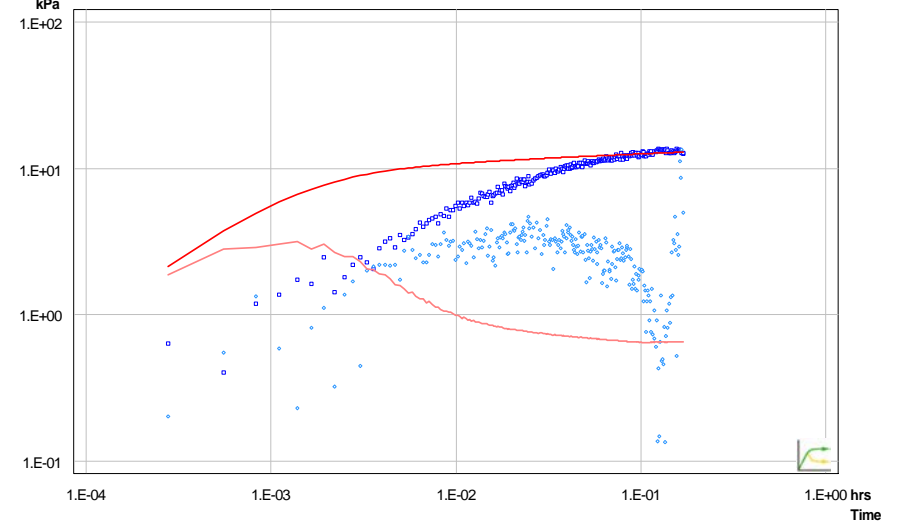


■ Pressure Observation

■ Pressure Observation    — Simulated Pressure



MW20-19 / MW20-10\_30OCT20 / CRI: LogLog Plot



■ Pressure Observation SI    ◆ Pressure Derivative SI  
■ Pressure Observation CRI    ◆ Pressure Derivative CRI  
■ Pressure Observation CRIR    ◆ Pressure Derivative CRIR

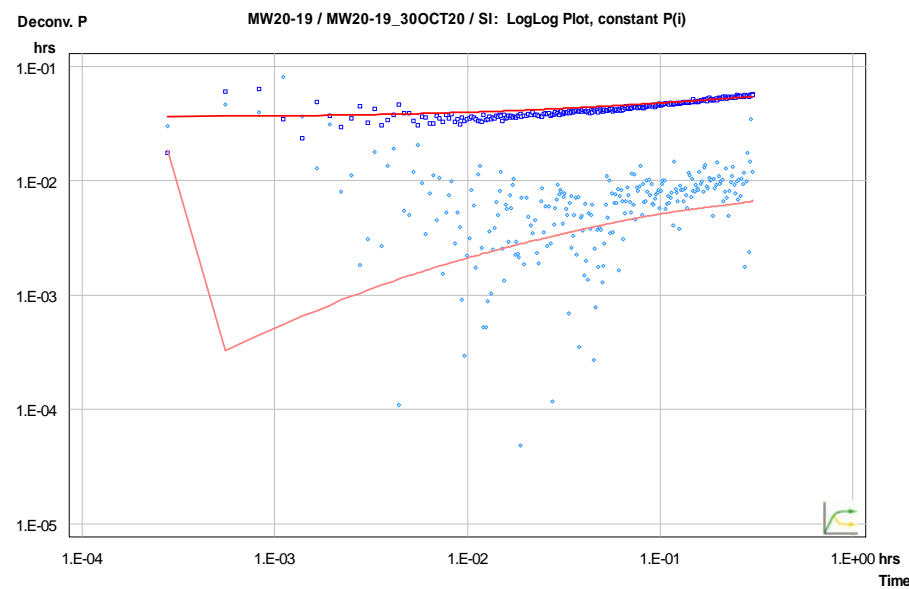
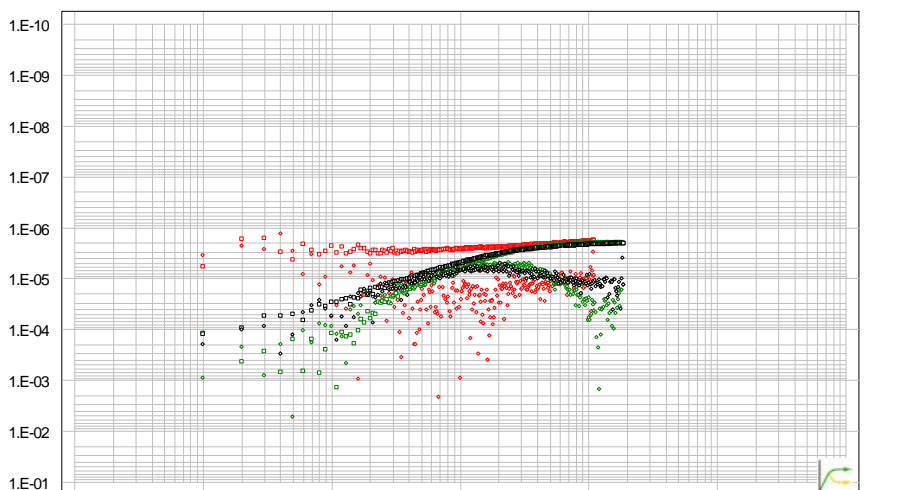
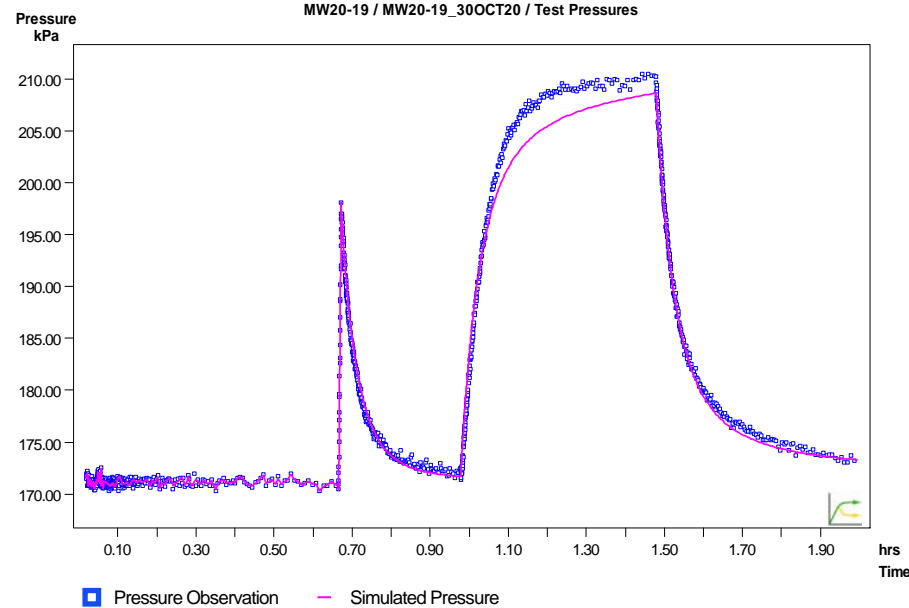
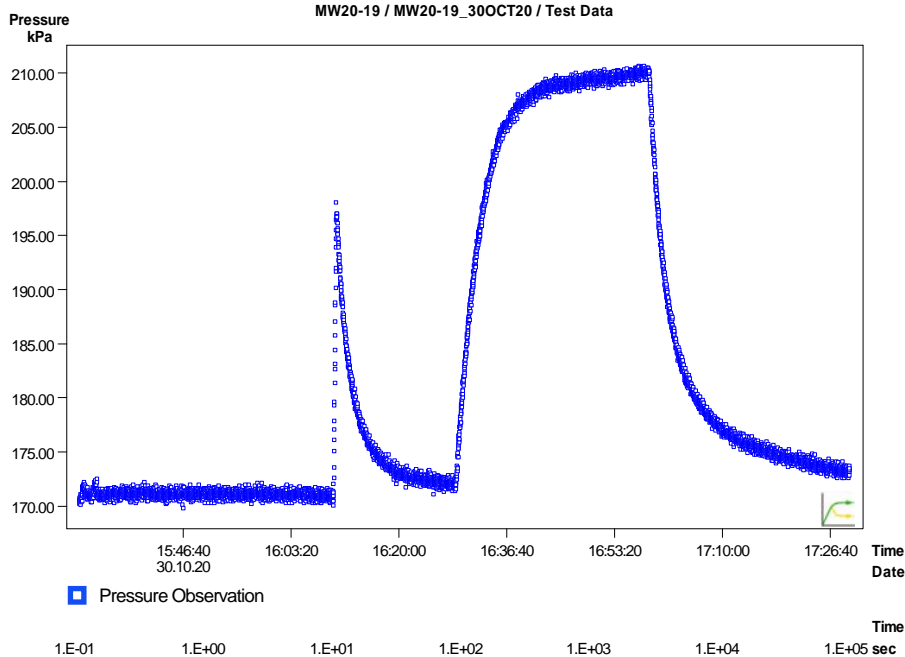
■ Pressure Observation Selected Phase    ◆ Pressure Derivative Selected Phase  
— Simulated Response    — Simulated Response Derivative

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**      PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**  
 YYYY-MM-DD: 2022-02-16  
 PREPARED: PGM  
 DESIGN: ML  
 REVIEW: ###  
 APPROVED:

TITLE: **PACKER TEST RESULTS MW20-19 MIDDLE INTERVAL (15.4 to 22.1 mbgs)**  
 PROJECT No.: 19129150      PHASE: 2300      Rev.: A      FIGURE: F-093

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

CONSULTANT

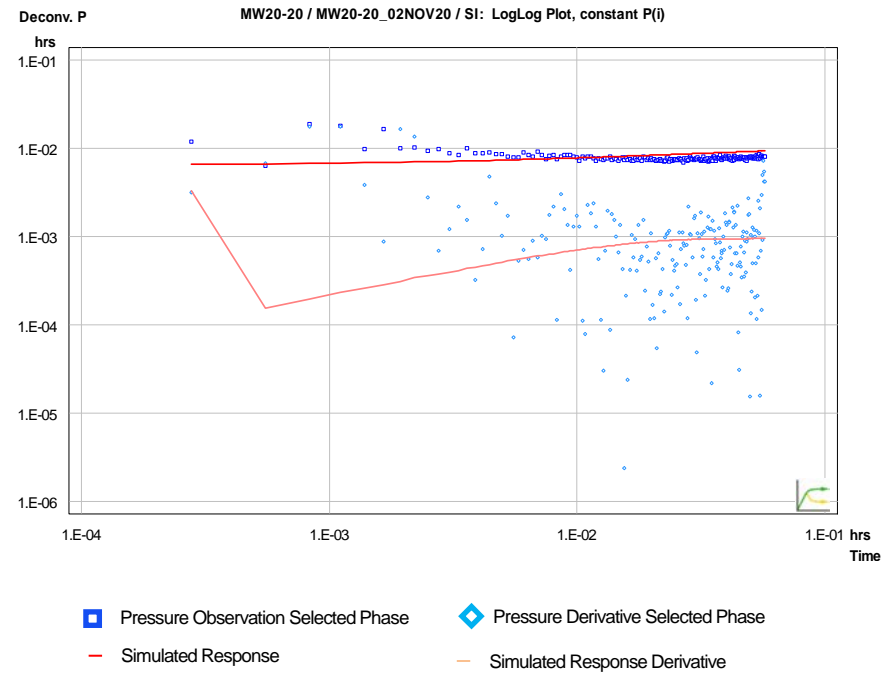
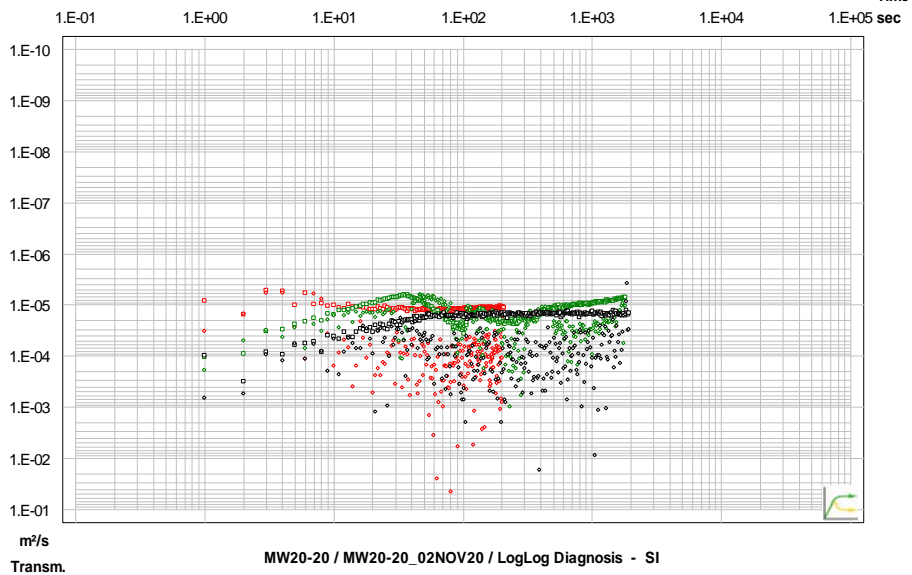
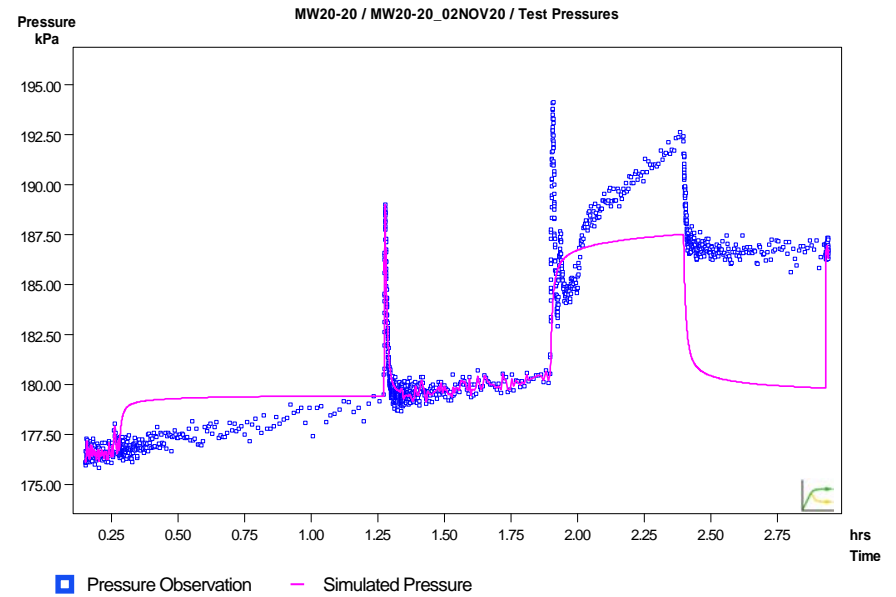
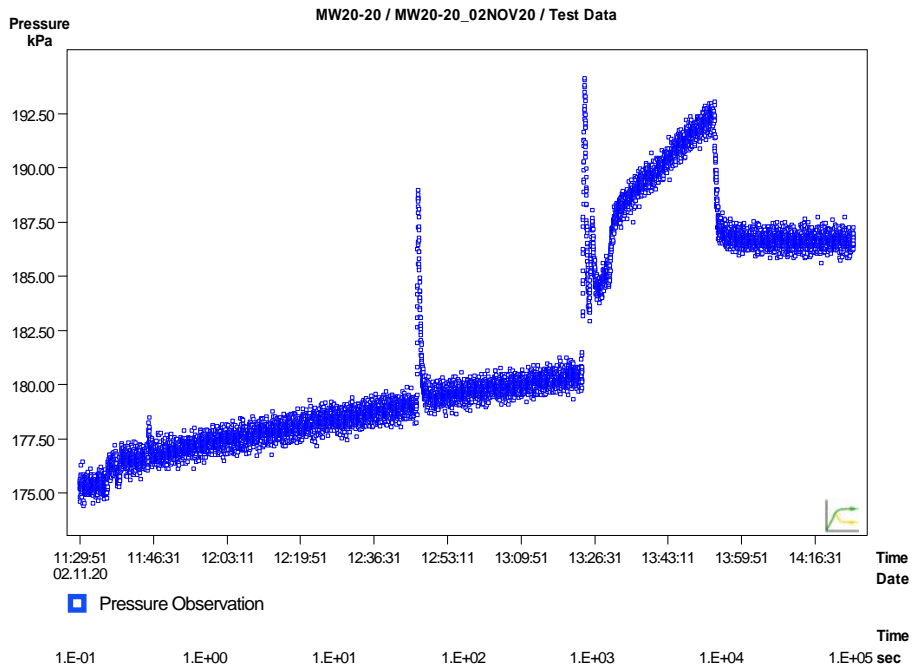
YYYY-MM-DD	2022-02-16
PREPARED	PGM
DESIGN	ML
REVIEW	###
APPROVED	

PROJECT  
**CALEDON PIT / QUARRY**

TITLE  
**PACKER TEST RESULTS MW20-19 LOWER INTERVAL (22.1 to 27.4 mbgs)**

PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-094

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



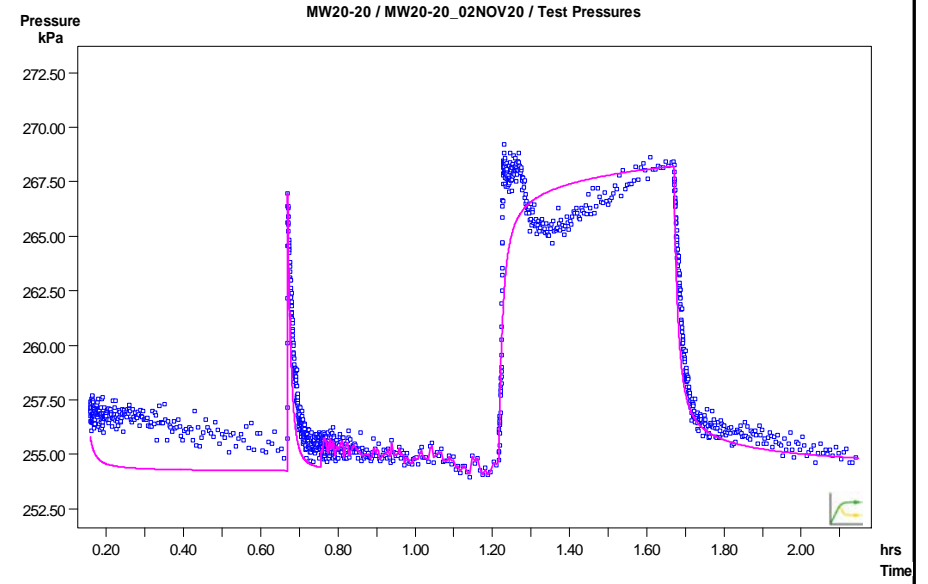
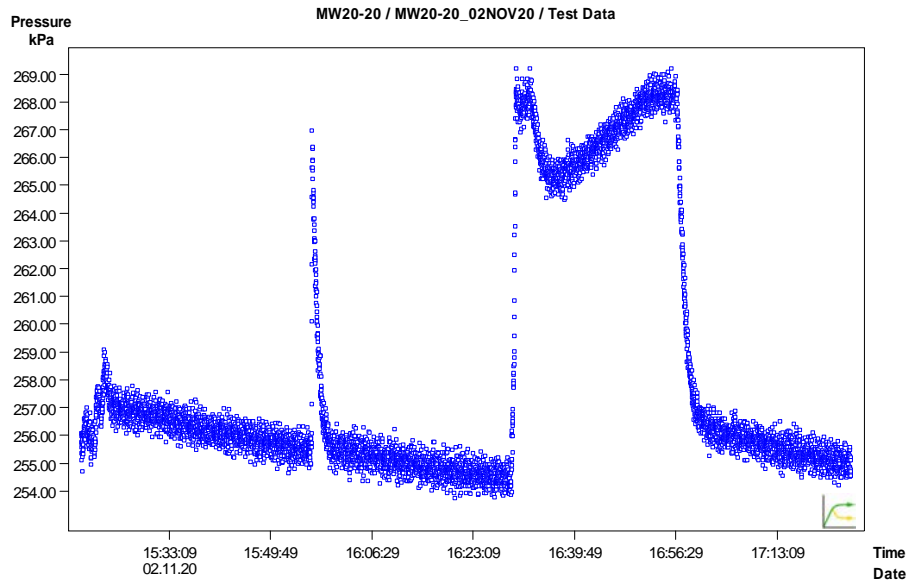
CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-02-16
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

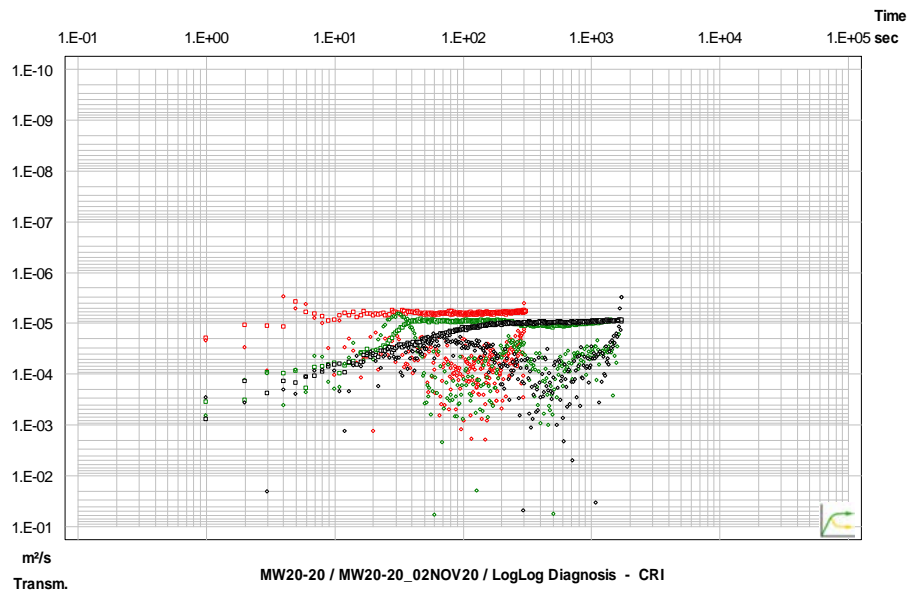
TITLE	<b>PACKER TEST RESULTS MW20-20 UPPER INTERVAL (7.8 to 17.5 mbgs)</b>		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-095

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



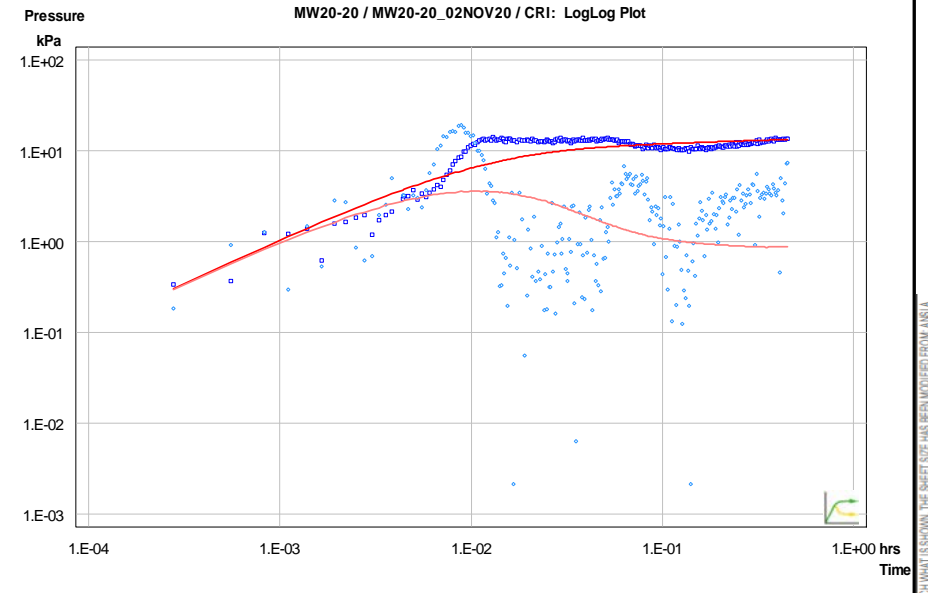
■ Pressure Observation

■ Pressure Observation — Simulated Pressure



MW20-20 / MW20-20\_02NOV20 / LogLog Diagnosis - CRI

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR



- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-16  
 PREPARED PGM  
 DESIGN ML  
 REVIEW ###  
 APPROVED

TITLE

PACKER TEST RESULTS MW20-20 MIDDLE INTERVAL (17.0 to 25.2 mbgs)

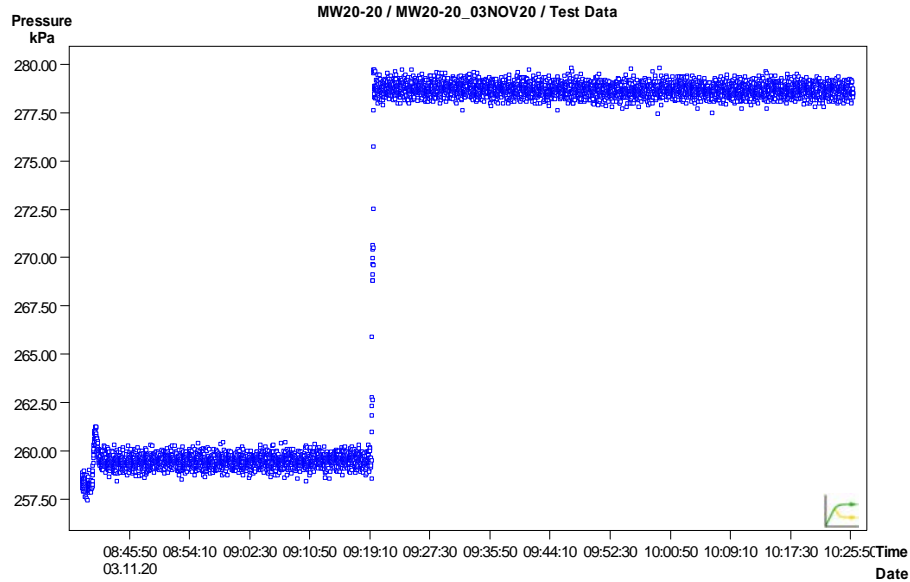
PROJECT No. 19129150

PHASE 2300

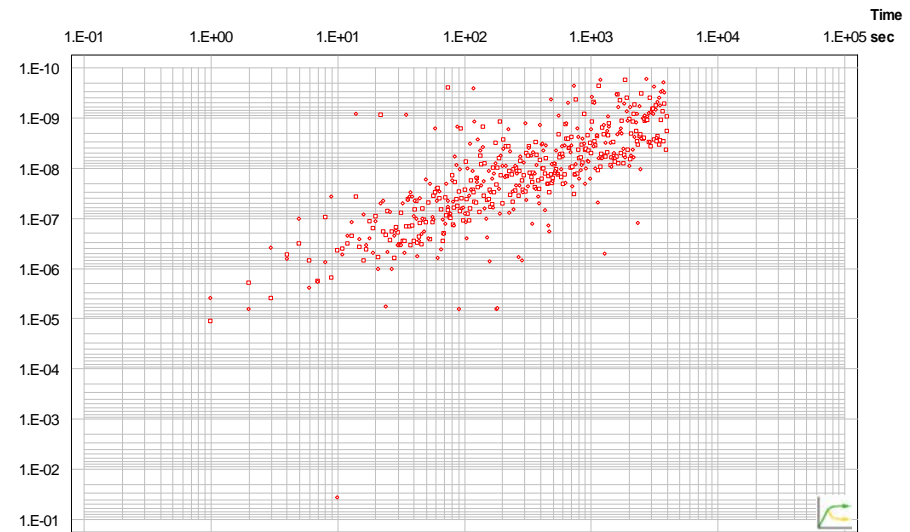
Rev. A

FIGURE F-096

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4

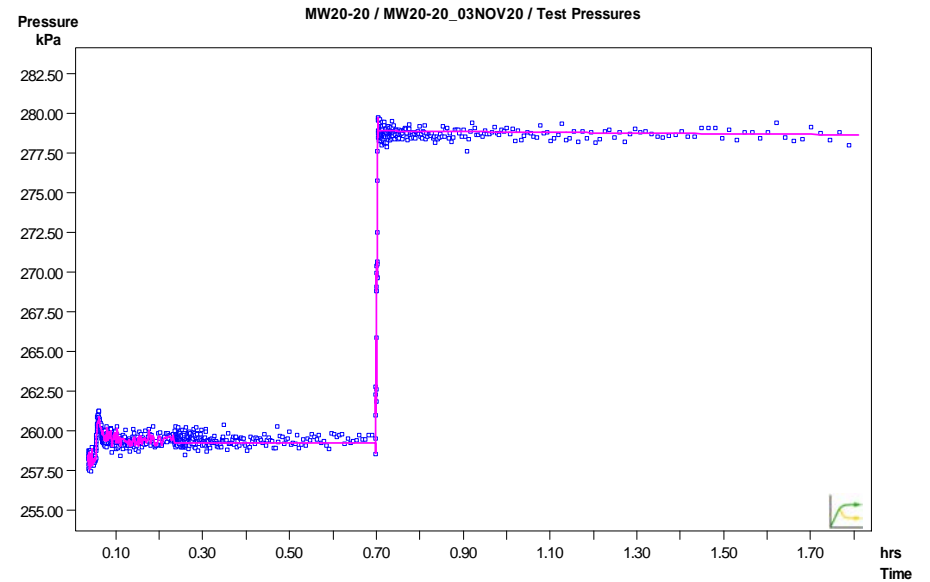


■ Pressure Observation

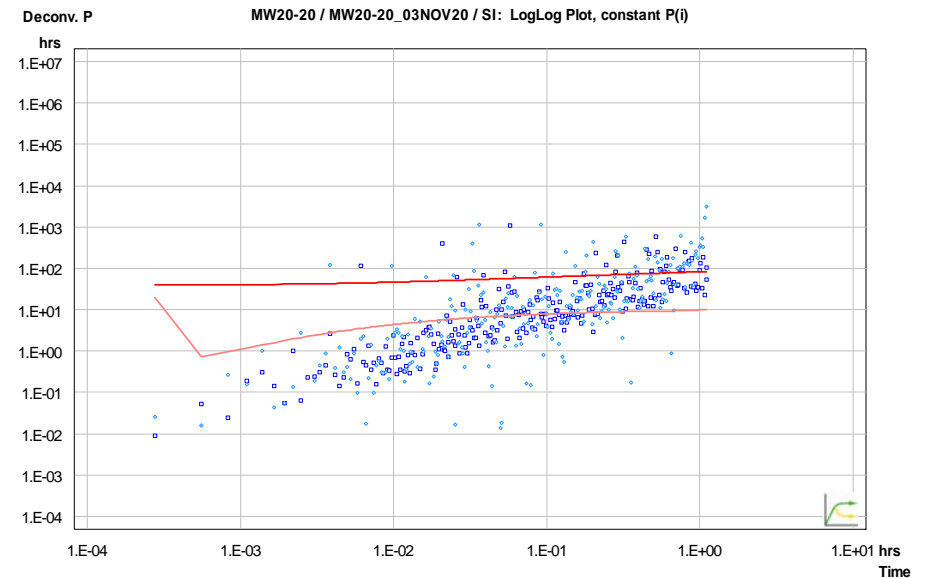


MW20-20 / MW20-20\_03NOV20 / LogLog Diagnosis - SI

- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR



■ Pressure Observation — Simulated Pressure



- Pressure Observation Selected Phase
- ◆ Pressure Derivative Selected Phase
- Simulated Response
- Simulated Response Derivative

CLIENT

CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT

CALEDON PIT / QUARRY

CONSULTANT



YYYY-MM-DD 2022-02-16  
 PREPARED PGM  
 DESIGN ML  
 REVIEW ###  
 APPROVED

TITLE

PACKER TEST RESULTS MW20-20 LOWER INTERVAL (25.2 to 28.0 mbgs)

PROJECT No. 19129150

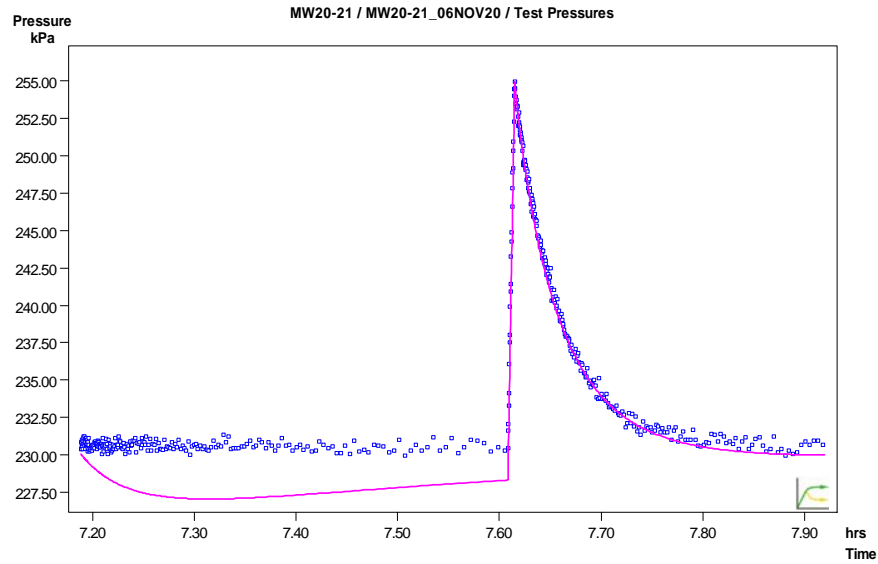
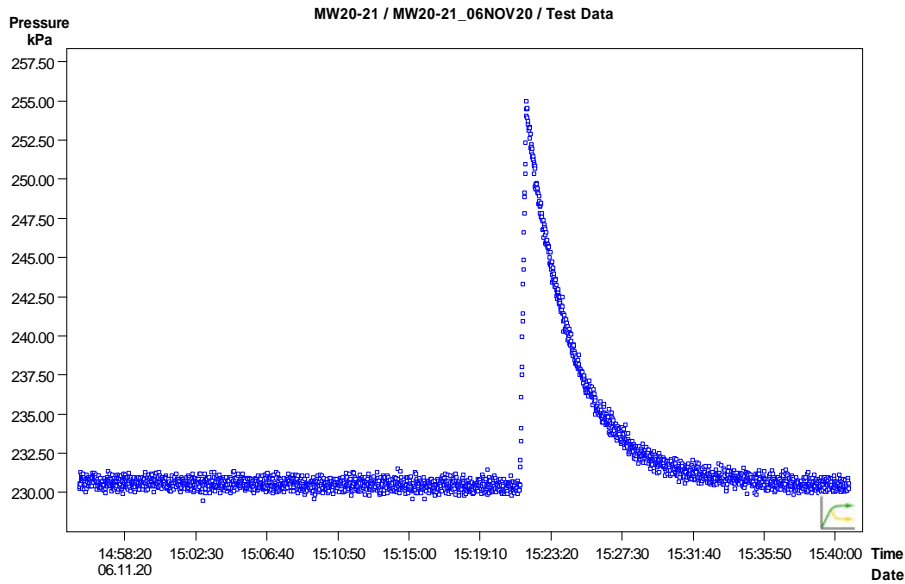
PHASE 2300

Rev. A

FIGURE F-097

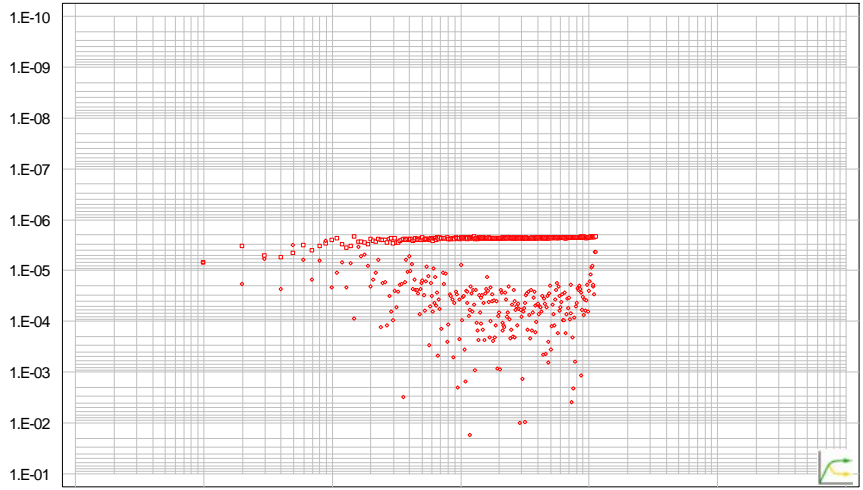
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



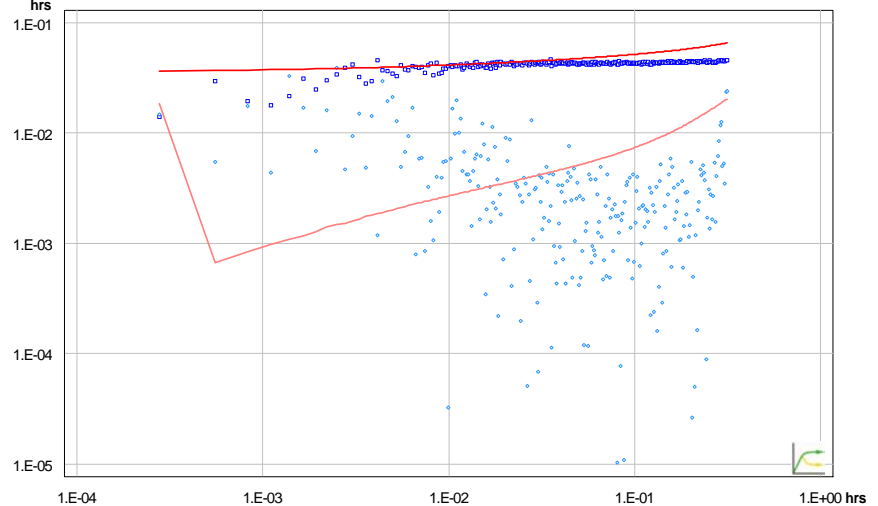


■ Pressure Observation

■ Pressure Observation — Simulated Pressure



Deconv. P MW20-21 / MW20-21\_06NOV20 / SI: LogLog Plot, constant P(i)



MW20-21 / MW20-21\_06NOV20 / LogLog Diagnosis - SI

- Pressure Observation SI
- Pressure Observation CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative SI
- ◆ Pressure Derivative CRI
- ◆ Pressure Derivative CRIR

- Pressure Observation Selected Phase
- Simulated Response
- ◆ Pressure Derivative Selected Phase
- Simulated Response Derivative

CLIENT  
CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)

PROJECT  
CALEDON PIT / QUARRY



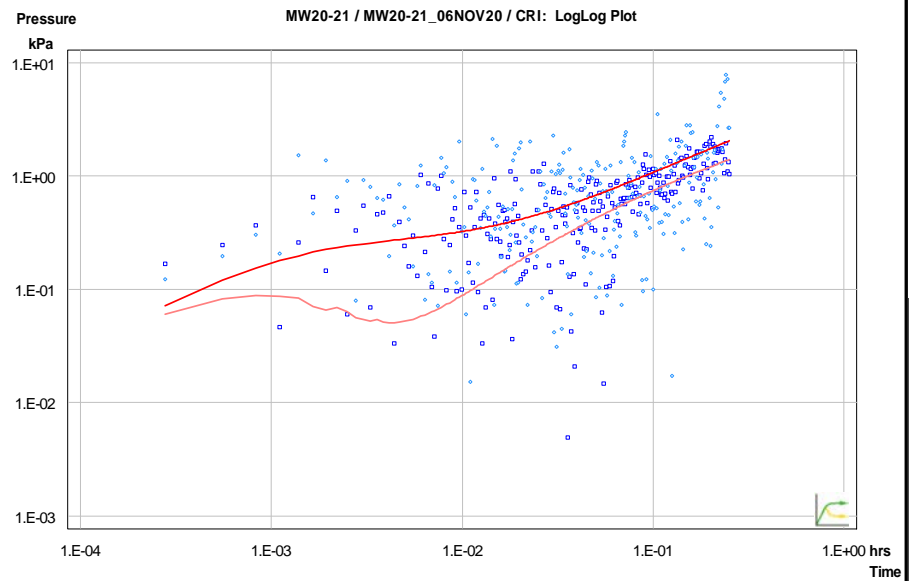
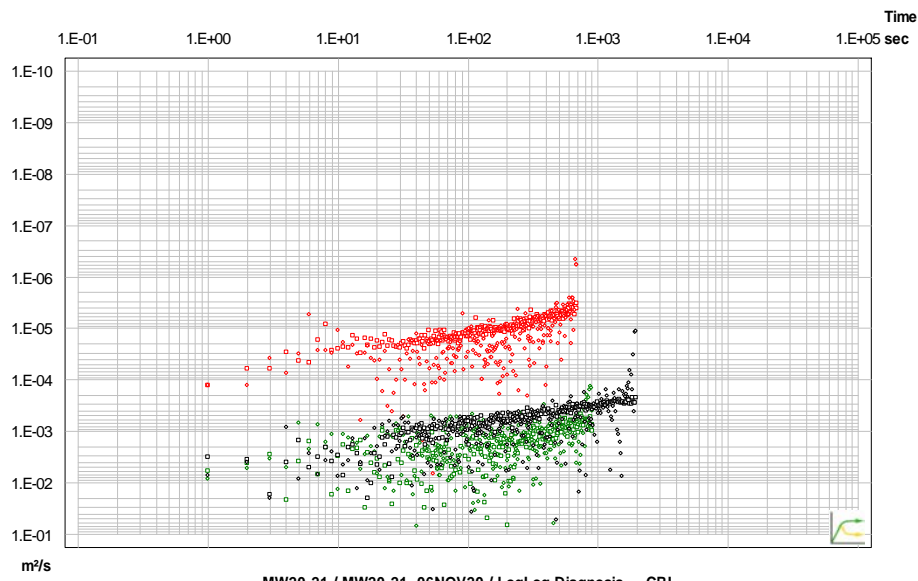
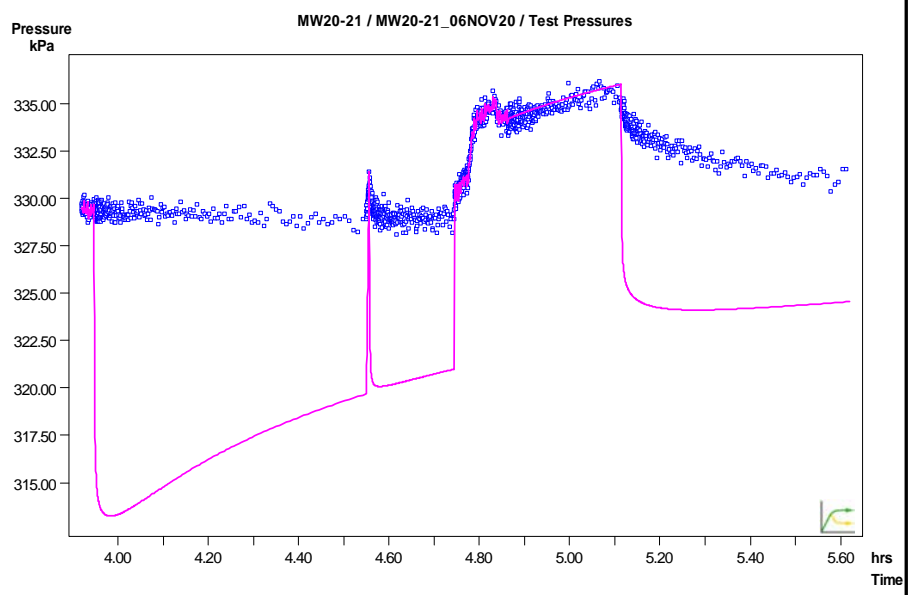
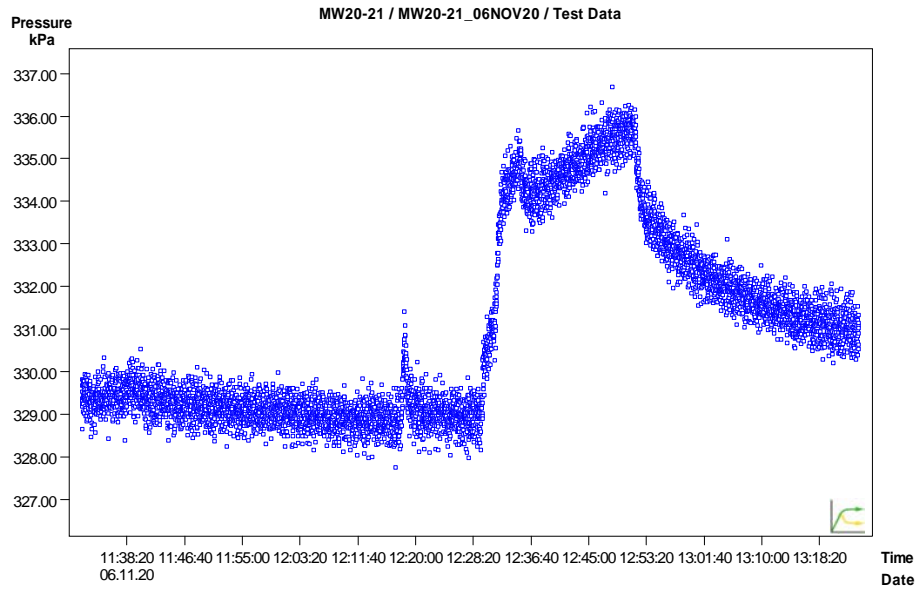
CONSULTANT	YYYY-MM-DD	2022-02-16
	PREPARED	PGM
	DESIGN	ML
	REVIEW	###
	APPROVED	

TITLE  
PACKER TEST RESULTS MW20-21 UPPER INTERVAL (16.9 to 26.6 mbgs)

PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	F-098

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4

1 in



■ Pressure Observation SI     ◆ Pressure Derivative SI  
■ Pressure Observation CRI     ◆ Pressure Derivative CRI  
■ Pressure Observation CRIR     ◆ Pressure Derivative CRIR

■ Pressure Observation Selected Phase     ◆ Pressure Derivative Selected Phase  
— Simulated Response     — Simulated Response Derivative

CLIENT  
**CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT  
**CALEDON PIT / QUARRY**

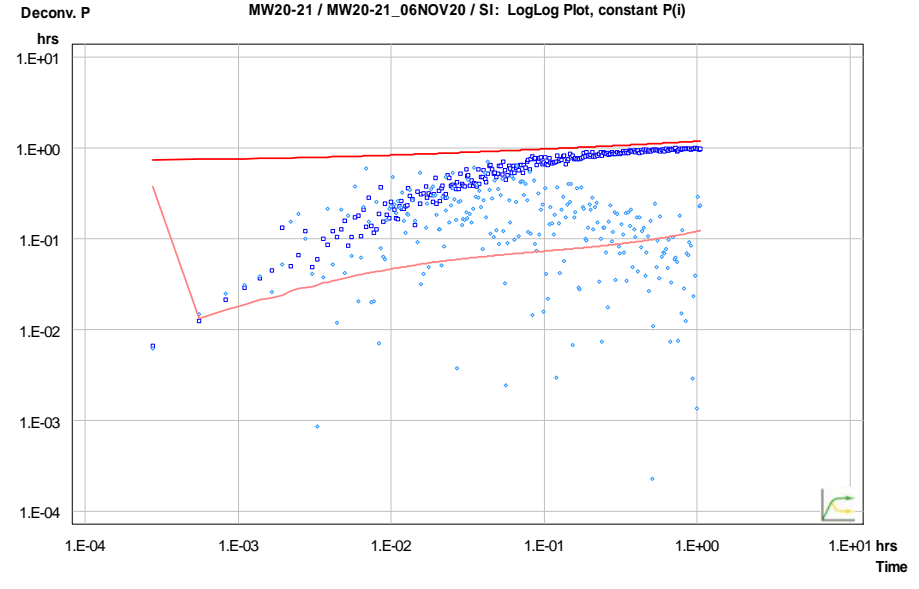
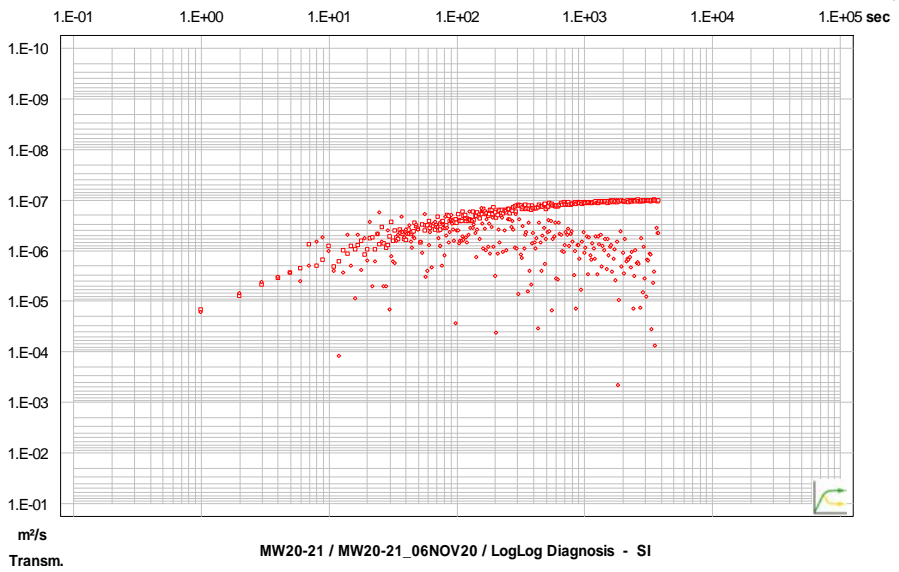
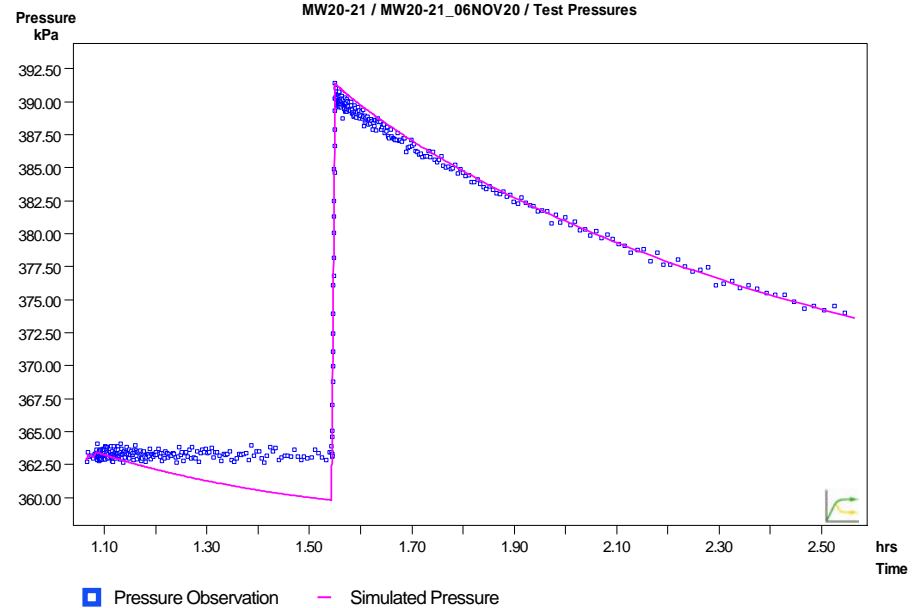
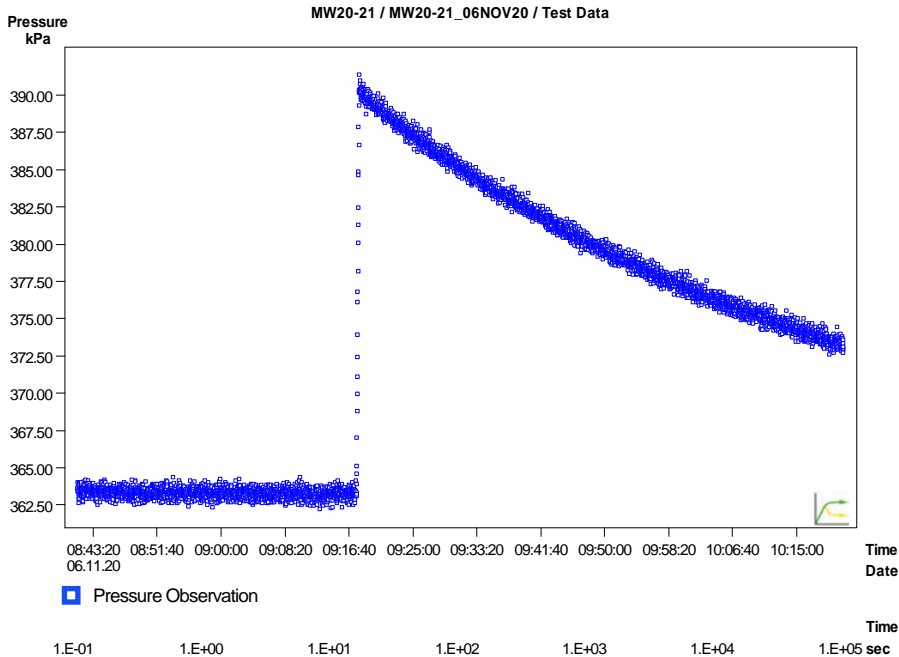
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD     2022-02-16  
 PREPARED     PGM  
 DESIGN     ML  
 REVIEW     ###  
 APPROVED

TITLE  
**PACKER TEST RESULTS MW20-21 MIDDLE INTERVAL (25.6 to 36.7 mbgs)**

PROJECT No.     19129150     PHASE     2300     Rev.     A     FIGURE     F-099

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI



- Pressure Observation SI
- ◆ Pressure Derivative SI
- Pressure Observation CRI
- ◆ Pressure Derivative CRI
- Pressure Observation CRIR
- ◆ Pressure Derivative CRIR

CLIENT: **CBM Aggregates (CBM), a Division of St. Marys Cement Inc. (Canada)**

PROJECT: **CALEDON PIT / QUARRY**

CONSULTANT: **GOLDER MEMBER OF WSP**

YYYY-MM-DD: 2022-02-16

PREPARED: PGM

DESIGN: ML

REVIEW: ###

APPROVED:

TITLE: **PACKER TEST RESULTS MW20-21 LOWER INTERVAL (36.7 to 39.7 mbgs)**

PROJECT No.: 19129150

PHASE: 2300

Rev.: A

FIGURE: **F-100**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

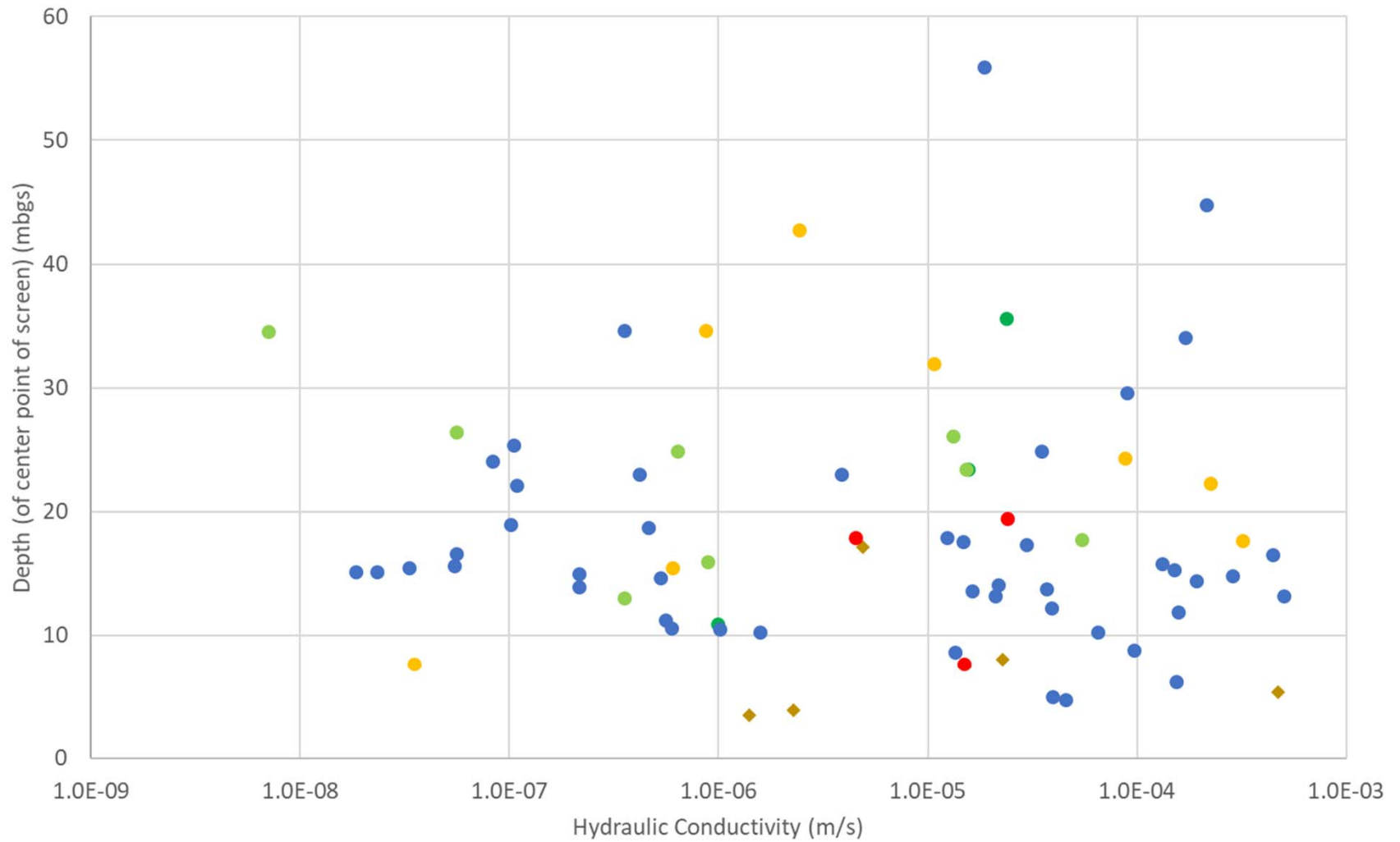
**APPENDIX G**

**Single Well Hydraulic Response  
Tests**

**Table G-1**  
**Caledon Quarry**  
**Single Well Response Test Summary**

MW ID	Figure Number	Top of test interval (mbgs)	Bottom of test interval (mbgs)	Depth of Test (center point mbgs)	Groundsurface Elevation (masl)	Depth of Test (center point masl)	Aquifer Model	Screened Formation	Final k (m/s)
MW20-01A	A01	17.1	18.63	17.86	395.10	377.24	Unconfined	Shaley Dolostone/Cabot Head Fm	4.5E-06
MW20-01B	A02	11.1	12.62	11.86	395.10	383.24	Unconfined	Gasport Fm	1.6E-04
MW20-02	A03	16.96	18.48	17.72	399.63	381.91	Unconfined	Shaley Dolostone	5.5E-05
MW20-03	A04	15.58	18.63	17.11	390.67	373.57	Unconfined	Overburden	4.9E-06
MW20-04	A05	16.11	17.63	16.87	399.46	382.59	Unconfined	Shaley Dolostone/Cabot Head Fm	1.7E-05
MW20-05A	A06	12.246	13.77	13.01	399.63	386.63	Unconfined	Shaley Dolostone	3.6E-07
MW20-05B		4.25	5.77	5.01	399.63	394.62	NA	Gasport Fm	NA
MW20-06A	A07	10.12	11.64	10.88	400.15	389.27	Unconfined	Gasport Fm/Shaley Dolostone	9.9E-07
MW20-06B	A08	4.2	5.72	4.96	400.15	395.19	Unconfined	Gasport Fm	4.0E-05
MW20-07A	A09	15.11	16.63	15.87	404.07	388.20	Unconfined	Shaley Dolostone	8.9E-07
MW20-07B	A10	9.736	11.26	10.50	404.07	393.57	Unconfined	Gasport Fm	1.0E-06
MW20-08A	A11	13.3	14.82	14.06	406.93	392.87	Unconfined	Gasport Fm	2.2E-05
MW20-08B	A12	5.38	6.90	6.14	406.93	400.79	Unconfined	Gasport Fm	1.5E-04
MW20-09	A13	6.85	8.37	7.61	399.95	392.34	Confined	Shaley Dolostone/Cabot Head Fm	1.5E-05
MW20-10A	A14	18.62	20.14	19.38	411.32	391.94	Unconfined	Shaley Dolostone/Cabot Head Fm	2.4E-05
MW20-10B	A15	14.49	16.01	15.25	411.32	396.07	Unconfined	Gasport Fm	1.5E-04
MW20-11A	A16	13.806	15.33	14.57	409.72	395.15	Unconfined	Gasport Fm	5.3E-07
MW20-11B	A17	3.96	5.48	4.72	409.72	405.00	Unconfined	Gasport Fm	4.6E-05
MW20-12A	A18	17.09	18.62	17.85	412.43	394.58	Unconfined	Gasport Fm	1.2E-05
MW20-12B	A19	7.825	9.35	8.59	412.43	403.85	Unconfined	Gasport Fm	1.4E-05
MW20-13A	A20	24.05	25.57	24.81	415.53	390.72	Confined	Shaley Dolostone	6.4E-07
MW20-13B	A21	18.14	19.66	18.90	415.53	396.63	Confined	Gasport Fm	1.0E-07
MW20-13C	A22	3.08	4.60	3.84	415.53	411.69	Unconfined	Overburden	2.3E-06
MW20-14A	A23	22.6	24.12	23.36	406.71	383.35	Unconfined	Shaley Dolostone	1.5E-05
MW20-14B	A24	14.98	16.50	15.74	406.71	390.97	Unconfined	Gasport Fm	1.3E-04
MW20-15A	A25	33.77	35.29	34.53	417.06	382.53	Confined	Shaley Dolostone	7.1E-09
MW20-15B	A26	28.81	30.33	29.57	417.06	387.49	Confined	Gasport Fm	9.0E-05
MW20-15C	A27	2.74	4.27	3.51	417.06	413.55	Unconfined	Overburden	1.4E-06
MW20-16A	A28	34.84	36.36	35.60	421.40	385.80	Confined	Gasport Fm/Shaley Dolostone	2.4E-05
MW20-16B	A29	16.8	18.33	17.57	421.40	403.83	Confined	Gasport Fm	1.5E-05
MW20-17A	A30	25.64	27.16	26.40	406.64	380.24	Unconfined	Shaley Dolostone	5.6E-08
MW20-17B	A31	12.75	14.27	13.51	406.64	393.13	Unconfined	Gasport Fm	1.6E-05
MW20-18	A32	12.42	13.94	13.18	404.29	391.11	Unconfined	Gasport Fm	2.1E-05
MW20-19A	A33	15.75	17.27	16.51	396.98	380.47	Unconfined	Gasport Fm	4.5E-04
MW20-19B	A34	8	9.52	8.76	396.98	388.22	Unconfined	Gasport Fm	9.7E-05
MW20-20A	A35	25.33	26.85	26.09	403.00	376.91	Confined	Shaley Dolostone	1.3E-05
MW20-20B	A36	12.97	14.49	13.73	403.00	389.27	Confined	Gasport Fm	3.7E-05
MW20-20C	A37	3.24	3.95	3.60	403.00	399.41	Unconfined	Gasport Fm	5.0E-05
MW20-21A	A38	33.27	34.79	34.03	415.23	381.20	Confined	Gasport Fm	1.7E-04
MW20-21B	A39	15.77	17.29	16.53	415.23	398.70	Confined	Gasport Fm	5.6E-08
MW20-22A	A40	23.48	25.00	24.24	399.27	375.03	Confined	Goat Island Fm	8.8E-05
MW20-22B	A41	6.89	8.41	7.65	399.27	391.62	Unconfined	Goat Island Fm	3.5E-08
MW20-23A	A42	22.59	24.11	23.35	395.05	371.70	Confined	Gasport Fm/Shaley Dolostone	1.6E-05
MW20-23B	A43	14.68	16.20	15.44	395.05	379.61	Confined	Goat Island Fm	6.1E-07
MW20-23C	A44	4.57	6.09	5.33	395.00	389.67	Unconfined	Overburden	4.8E-04
MW20-24A	A45	33.81	35.33	34.57	437.75	403.18	Confined	Gasport Fm	3.6E-07
MW20-24B	A46	21.49	23.02	22.25	437.75	415.50	Confined	Goat Island Fm	2.3E-04
MW20-25A	A47	44.03	45.55	44.79	419.02	374.23	Confined	Gasport Fm	2.2E-04
MW20-25B	A48	16.84	18.36	17.60	419.02	401.42	Confined	Goat Island Fm	3.2E-04
MW20-26A	A49	55.16	56.68	55.92	438.89	382.97	Confined	Gasport Fm	1.9E-05
MW20-26B	A50	31.12	32.64	31.88	438.89	407.01	Confined	Goat Island Fm	1.1E-05
MW20-26C	A51	7.26	8.78	8.02	438.88	430.86	Unconfined	Overburden	2.3E-05
MW20-27A	A52	41.99	43.51	42.75	431.15	388.40	Confined	Goat Island Fm	2.4E-06
MW20-27B	A53	33.85	35.37	34.61	431.15	396.54	Confined	Goat Island Fm	8.7E-07
MW20-28A	A54	24.07	25.59	24.83	419.31	394.48	Confined	Gasport Fm	3.5E-05
MW20-28B	A55	16.51	18.03	17.27	419.31	402.04	Confined	Gasport Fm	3.0E-05
PW21-1	A56	12.19	38.41	25.30	418.76	393.46	Confined	Gasport Fm	1.1E-07
MW21-1-1	A57	11.6	34.40	23.00	418.94	395.94	Confined	Gasport Fm	3.9E-06
MW21-1-2	A58	13.4	34.70	24.05	420.58	396.53	Confined	Gasport Fm	8.3E-08
MW21-1-3	A59	9.1	35.10	22.10	417.51	395.41	Confined	Gasport Fm	1.1E-07
MW21-1-4	A60	13.1	32.90	23.00	417.83	394.83	Confined	Gasport Fm	4.2E-07
PW21-2	A61	12.19	25.15	18.67	413.07	394.40	Unconfined	Gasport Fm	4.7E-07
MW21-2-1	A62	6.7	22.00	14.35	413.40	399.05	Unconfined	Gasport Fm	1.9E-04
MW21-2-2	A63	7	19.20	13.10	412.64	399.54	Confined	Gasport Fm	5.1E-04
MW21-2-3	A64	6.1	18.30	12.20	410.76	398.56	Unconfined	Gasport Fm	3.9E-05
MW21-2-4	A65	6.4	23.20	14.80	413.86	399.06	Unconfined	Gasport Fm	2.9E-04
PW21-3	A66	8.84	21.34	15.09	405.45	390.36	Unconfined	Gasport Fm	1.9E-08
MW21-3-1	A67	5.8	16.50	11.15	403.69	392.54	Unconfined	Gasport Fm	5.6E-07
MW21-3-2	A68	4.9	15.50	10.20	404.87	394.67	Unconfined	Gasport Fm	1.6E-06
MW21-3-3	A69	4.9	15.50	10.20	405.12	394.92	Unconfined	Gasport Fm	6.5E-05
MW21-3-4	A70	5.2	15.80	10.50	403.16	392.66	Unconfined	Gasport Fm	6.0E-07
PW21-4	A71	9.25	21.64	15.45	415.08	399.63	Unconfined	Gasport Fm	3.3E-08
PW21-4A	A72	8.6106	21.64	15.13	415.08	399.95	Unconfined	Gasport Fm	2.3E-08
MW21-4-1	A73	10.1	17.70	13.90	415.22	401.32	Unconfined	Gasport Fm	2.2E-07
MW21-4-2	A74	11	20.10	15.55	415.07	399.52	Unconfined	Gasport Fm	5.5E-08
MW21-4-3	A75	10.4	19.50	14.95	414.78	399.83	Unconfined	Gasport Fm	2.2E-07





- ◆ Overburden
- Goat Island
- Gasport
- Gasport/Shaley Dolostone
- Shaley Dolostone
- Shaley Dolostone/Cabot Head

ST.MARY'S CEMENT INC. (CANADA)

CALEDON PIT AND QUARRY

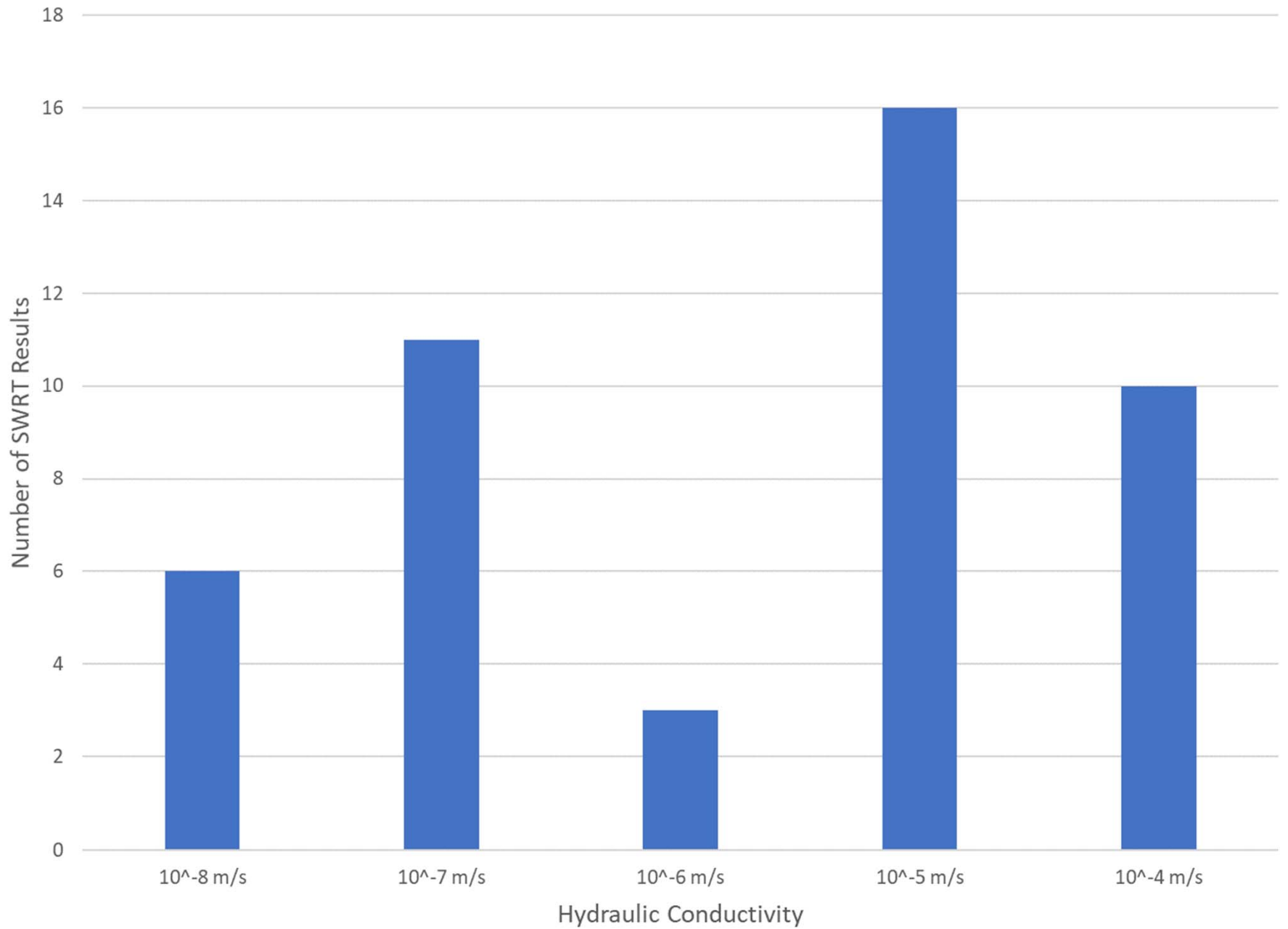


CLIENT	ST.MARY'S CEMENT INC. (CANADA)
PROJECT	CALEDON PIT AND QUARRY
CONTRACT	19129150
PHASE	2300
REV	A
FIGURE	G-1
DATE	2022-03-15
PREPARED	PGM
DESIGN	PGM
REVIEW	GWS
APPROVED	GWS

SINGLE WELL RESPONSE TEST HYDRAULIC CONDUCTIVITY VERSUS DEPTH

CLIENT	ST.MARY'S CEMENT INC. (CANADA)
PROJECT	CALEDON PIT AND QUARRY
CONTRACT	19129150
PHASE	2300
REV	A
FIGURE	G-1
DATE	2022-03-15
PREPARED	PGM
DESIGN	PGM
REVIEW	GWS
APPROVED	GWS

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANS/A 11th



ST.MARY'S CEMENT INC. (CANADA)

CALEDON PIT AND QUARRY



YYYY-MM-DD 2022-03-14  
 PREPARED PGM  
 DESIGN ML  
 REVIEW GWS  
 APPROVED GWS

SINGLE WELL RESPONSE TEST HYDRAULIC CONDUCTIVITY  
HISTOGRAM – GASPORT FORMATION

PROJECT: 19129150

PHASE: 2300

Rev: A

FIGURE: G-2

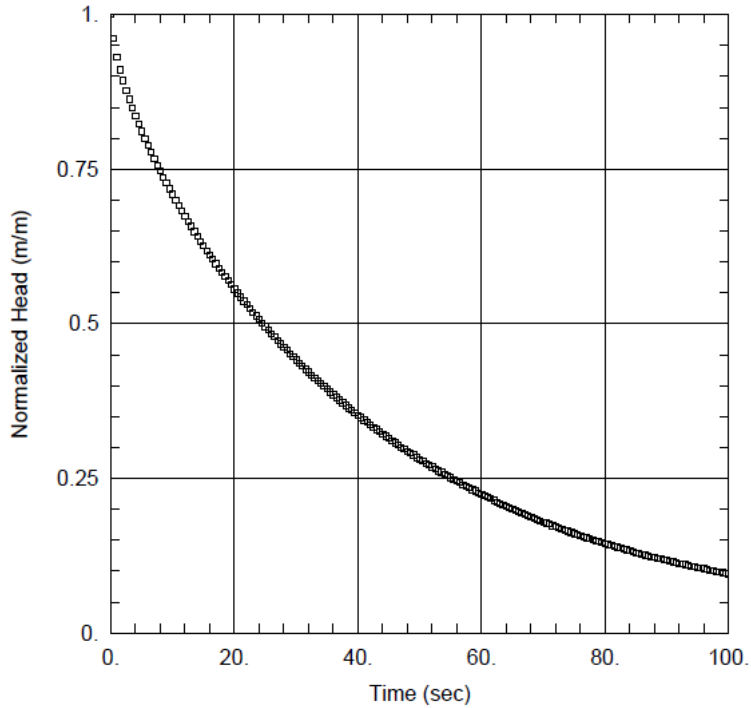
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/A4

**TEST INFORMATION:**

Test Well: MW20-01A  
 Date of Test: June 2, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

Static Water Level: 3.80 mbtoc  
 Initial Displacement: 3.37 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 17.10 to 18.63 m  
 Geology: Shaley Dolostone/Cabot Head Fm

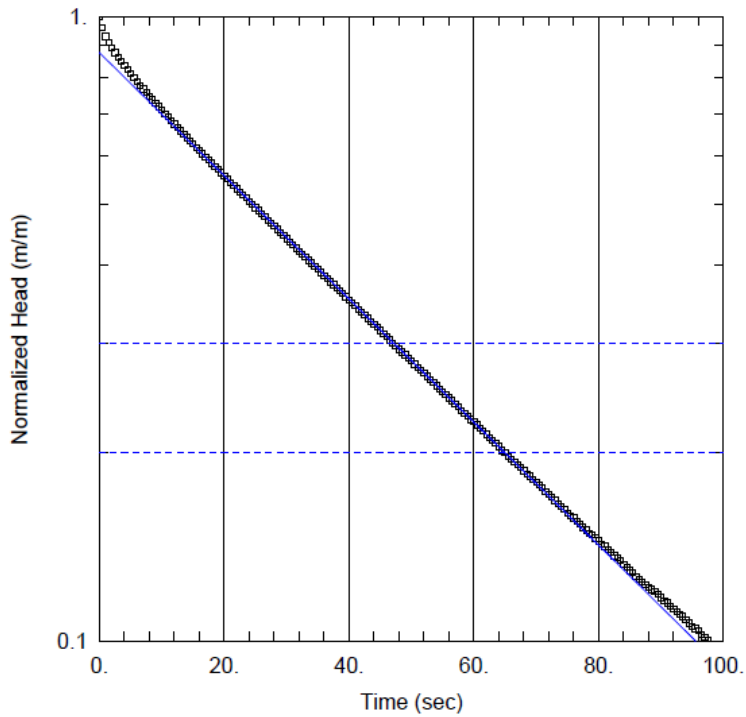


**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$5 \times 10^{-6} \text{ m/s}$**



□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2021-01-14

PREPARED AIM

DESIGN AIM

REVIEW PGM

APPROVED ###

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-01A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-03**

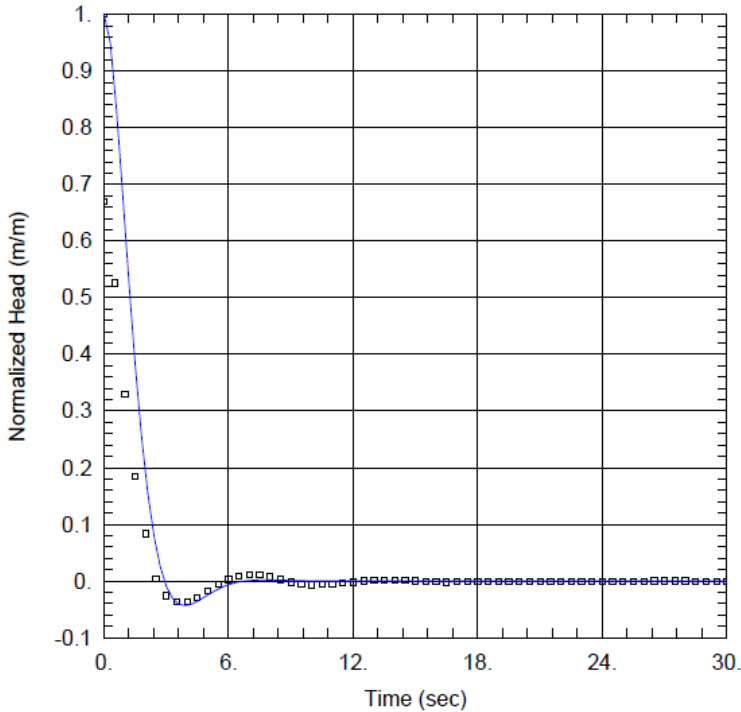
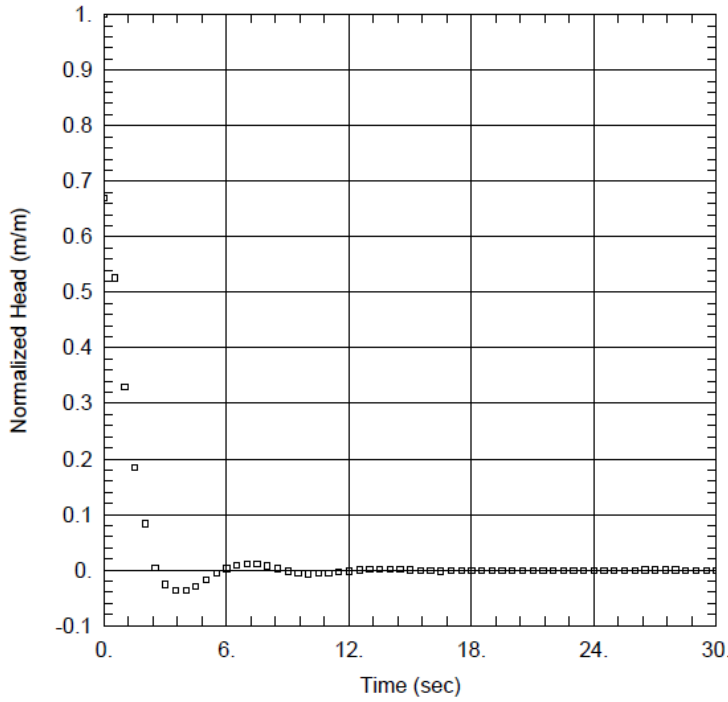
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-01B  
 Date of Test: June 2, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

Static Water Level: 2.83 mbgs  
 Initial Displacement: 1.93 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 11.10 to 12.62 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Springer-Gelhar  
 Solution Type: Inertial  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT

YYYY-MM-DD 2021-01-14

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-01B**



PREPARED AIM  
 DESIGN AIM  
 REVIEW PGM  
 APPROVED ###

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-04**

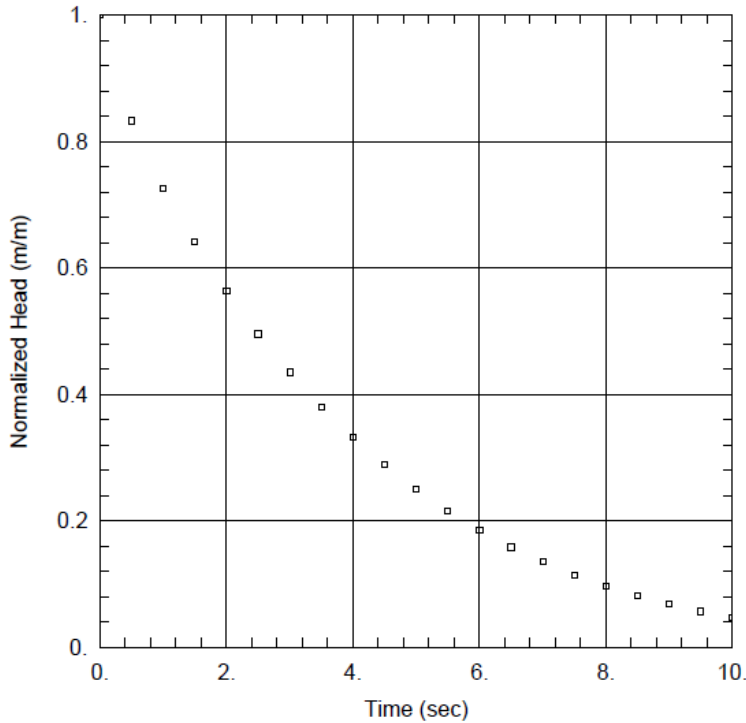
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-02  
 Date of Test: June 1, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

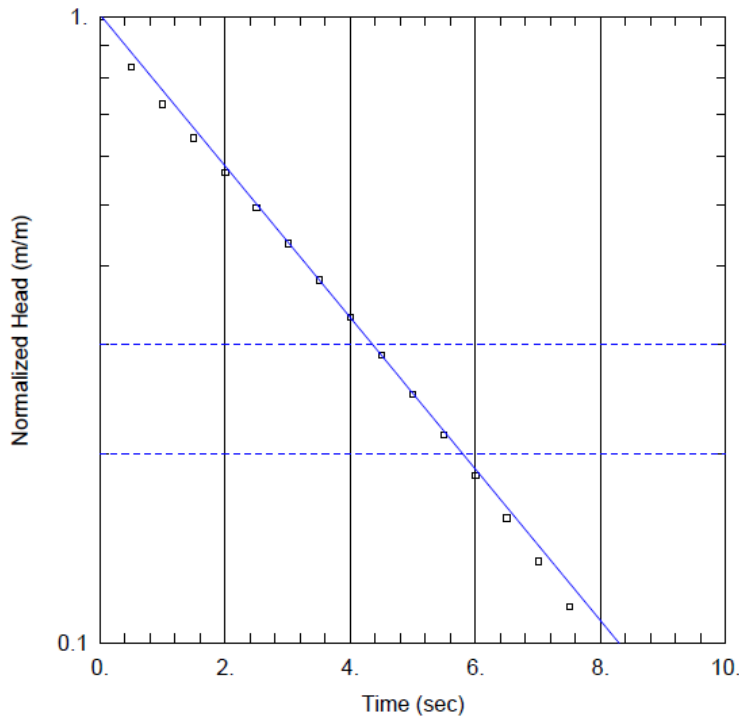
Static Water Level: 8.46 mbgs  
 Initial Displacement: 3.01 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 16.96 m to 18.48 m  
 Geology: Shaley Dolostone



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$5 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-02**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-05**

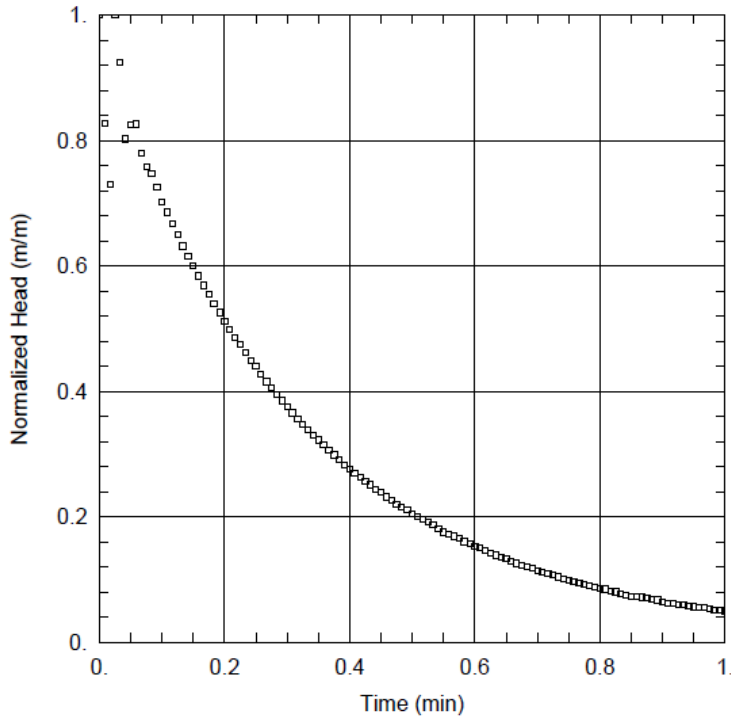


**TEST INFORMATION:**

Test Well: MW20-03  
 Date of Test: June 1, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

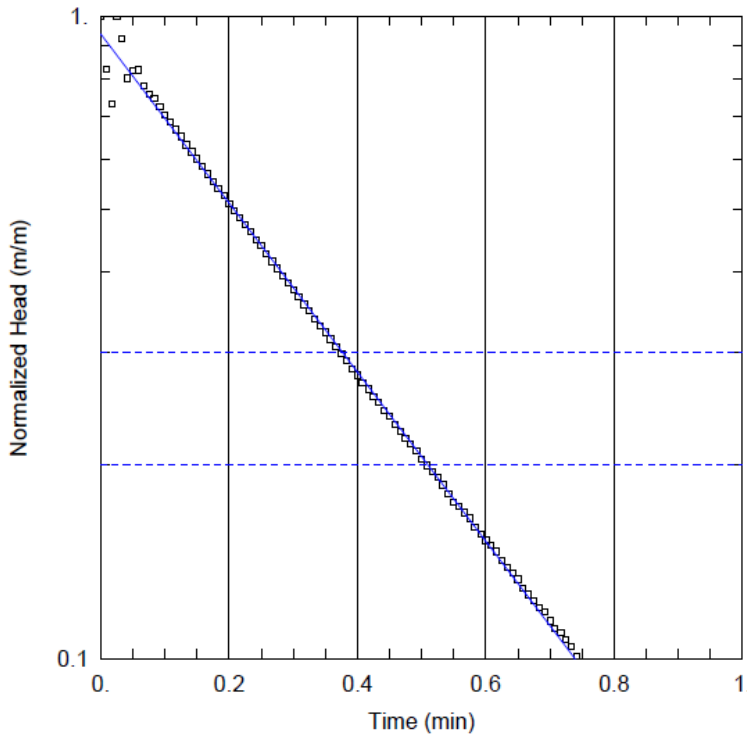
Static Water Level: 4.52 mbgs  
 Initial Displacement: 1.86 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.083 m  
 Well Screen Interval: 15.58 m to 18.63 m  
 Geology: Overburden, Sand, some silt



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



□ Water Level Measurement  
 — Solution Match Line

Hydraulic Conductivity (K) =

**$5 \times 10^{-6} \text{ m/s}$**

CLIENT

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CONSULTANT



YYYY-MM-DD 2022-01-19

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REVIEW PGM

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PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-03**

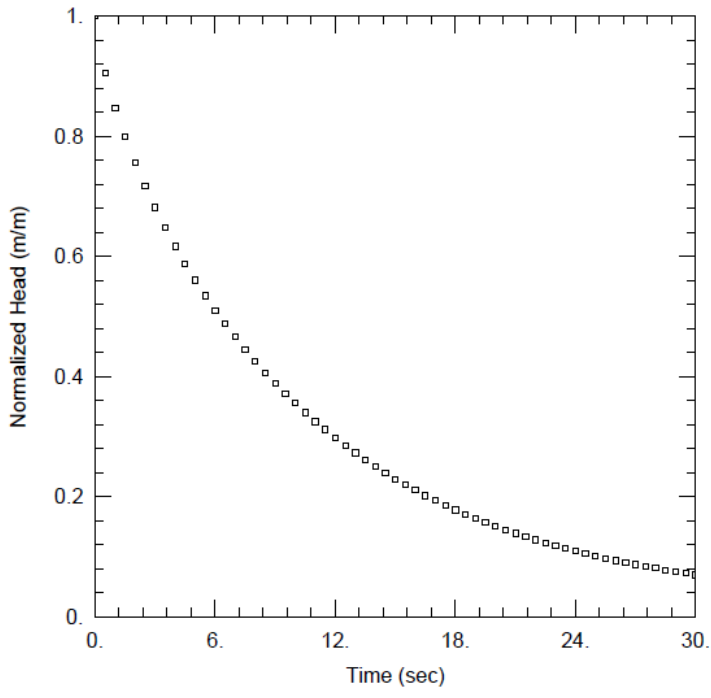
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-06**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

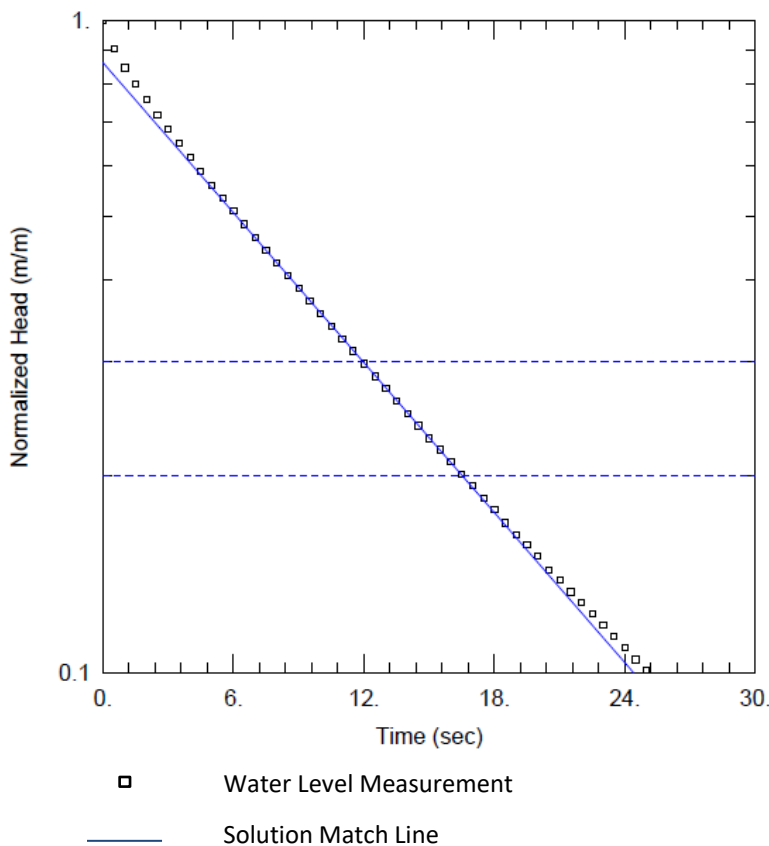


**TEST INFORMATION:**

Test Well: MW20-04  
 Date of Test: June 1, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

Static Water Level: 9.40 mbgs  
 Initial Displacement: 2.68 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 16.11 m to 17.63 m  
 Geology: Shaley Dolostone to Shale, Cabot Head Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**

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PROJECT  
**CALEDON PIT / QUARRY**

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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-04**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-07

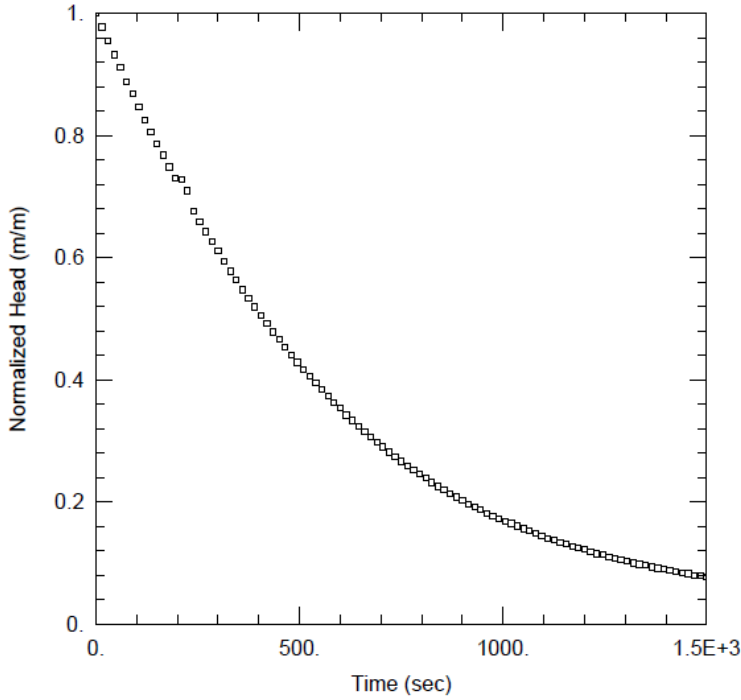
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-05A  
 Date of Test: June 2, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

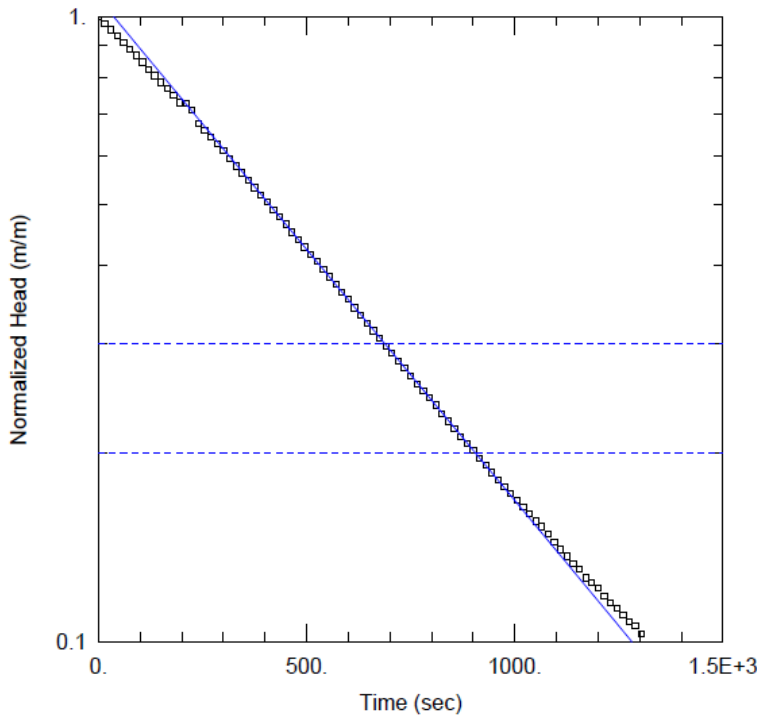
Static Water Level: 6.05 mbgs  
 Initial Displacement: 5.42 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 12.25 m to 13.77 m  
 Geology: Shaley Dolostone, Cabot Head Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$4 \times 10^{-7} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line

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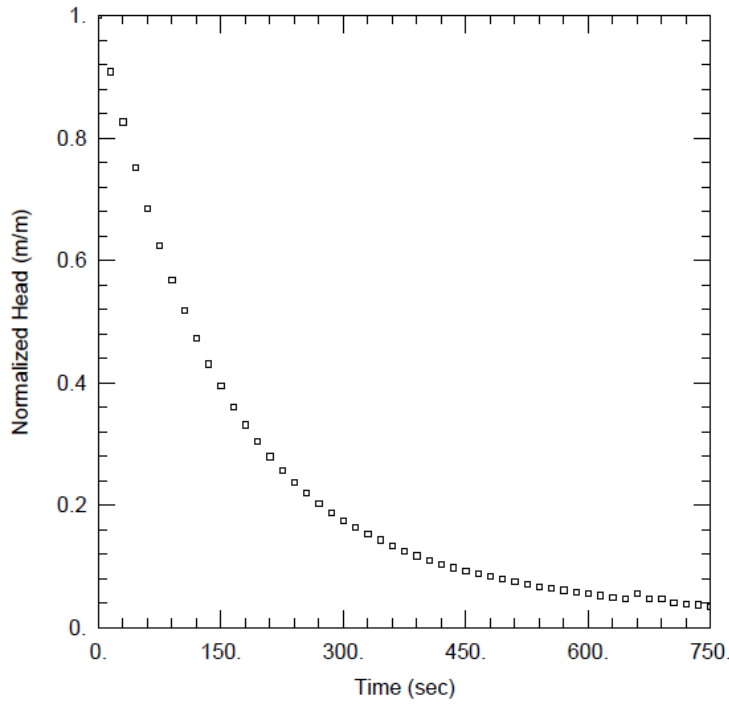
PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
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 DESIGN AIM  
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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-05A**

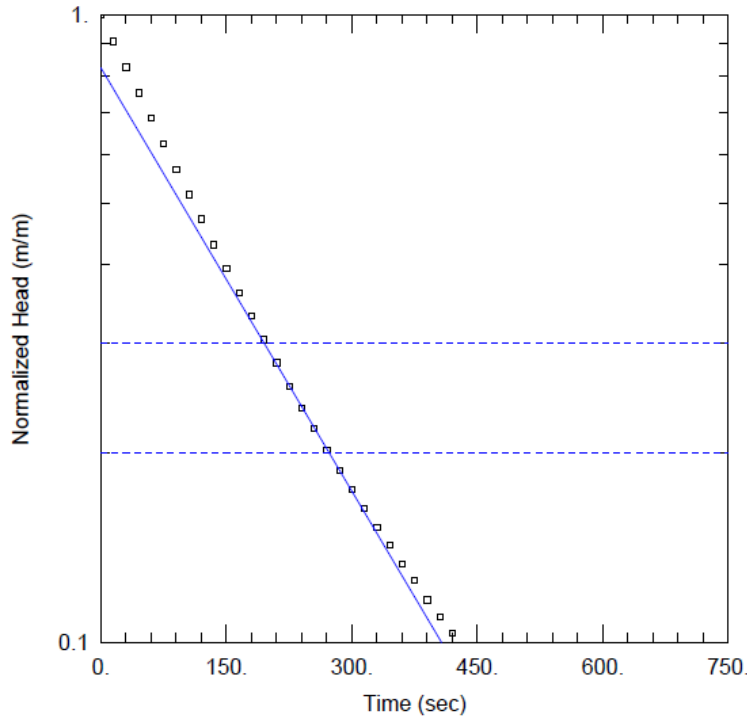
PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-08

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW20-06A  
 Date of Test: June 1, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
  
 Static Water Level: 3.18 mbgs  
 Initial Displacement: 3.96 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 10.12 m to 11.64 m  
 Geology: Shaley Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$1 \times 10^{-6} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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**CALEDON PIT / QUARRY**

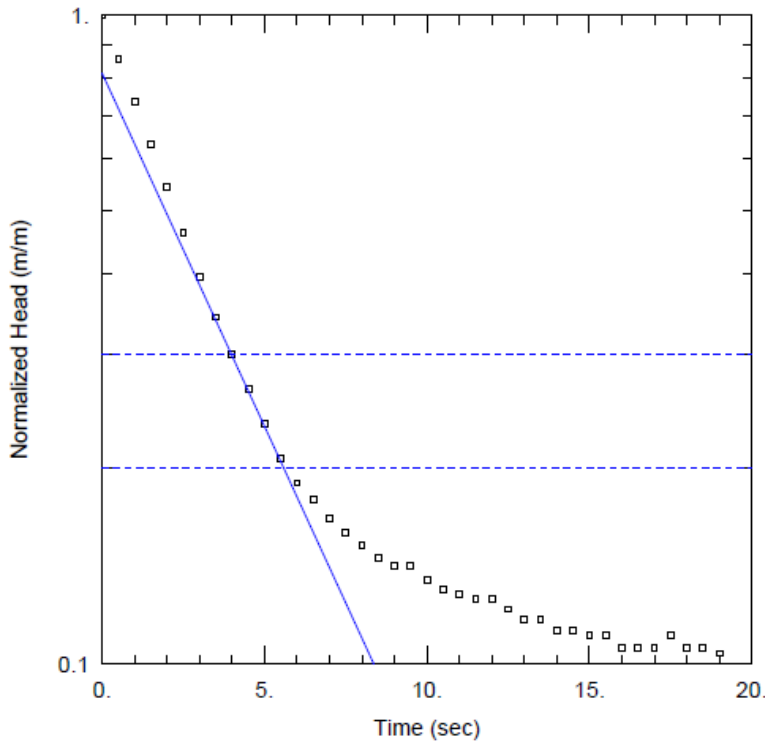


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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-06A**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-09

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

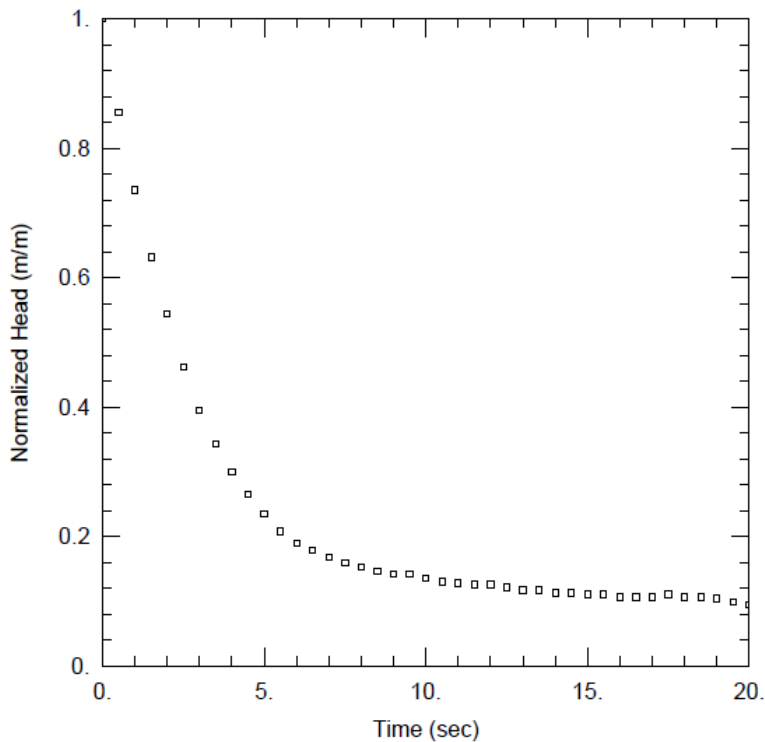


**TEST INFORMATION:**

Test Well: MW20-06B  
 Date of Test: June 1, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

Static Water Level: 2.98 mbgs  
 Initial Displacement: 0.45 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 4.20 m to 5.72 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

$4 \times 10^{-5} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-06B**

PROJECT No.  
**19129150**

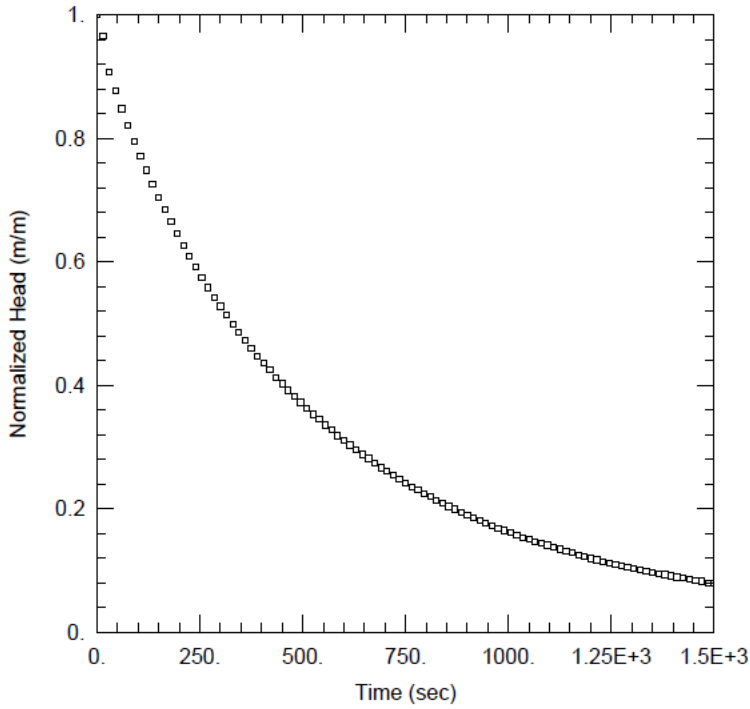
PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-10**

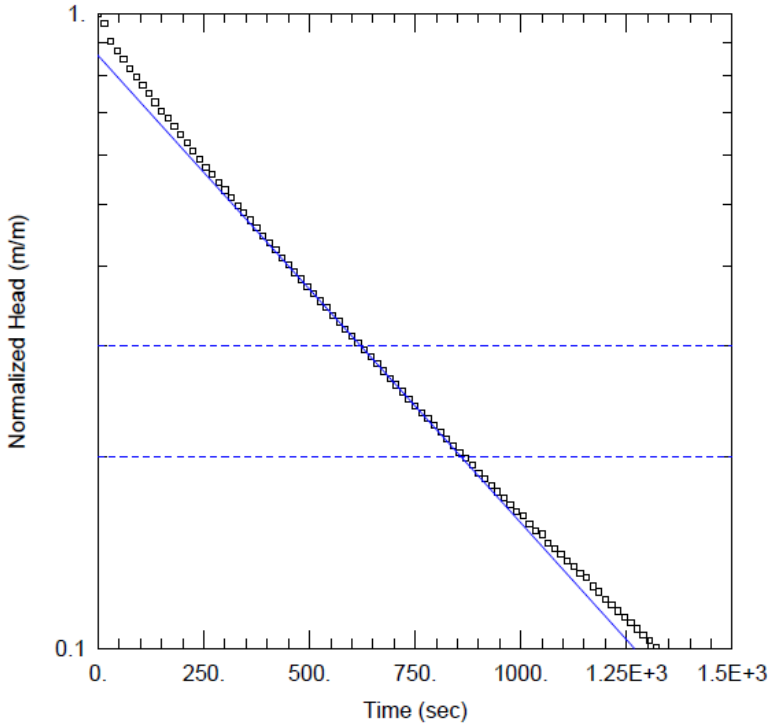
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A





**TEST INFORMATION:**

Test Well: MW20-07A  
 Date of Test: June 2, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
  
 Static Water Level: 1.18 mbgs  
 Initial Displacement: 3.69 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 15.11 m to 16.63 m  
 Geology: Shaley Dolostone, Cabot Head Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$9 \times 10^{-7} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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**CALEDON PIT / QUARRY**

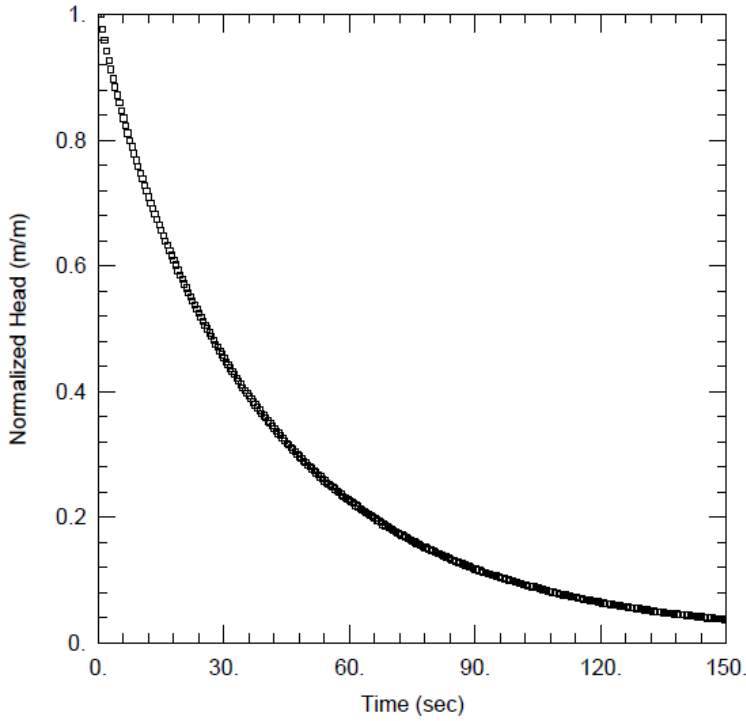
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-28
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DESIGN	AIM
REVIEW	PGM
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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-07A**

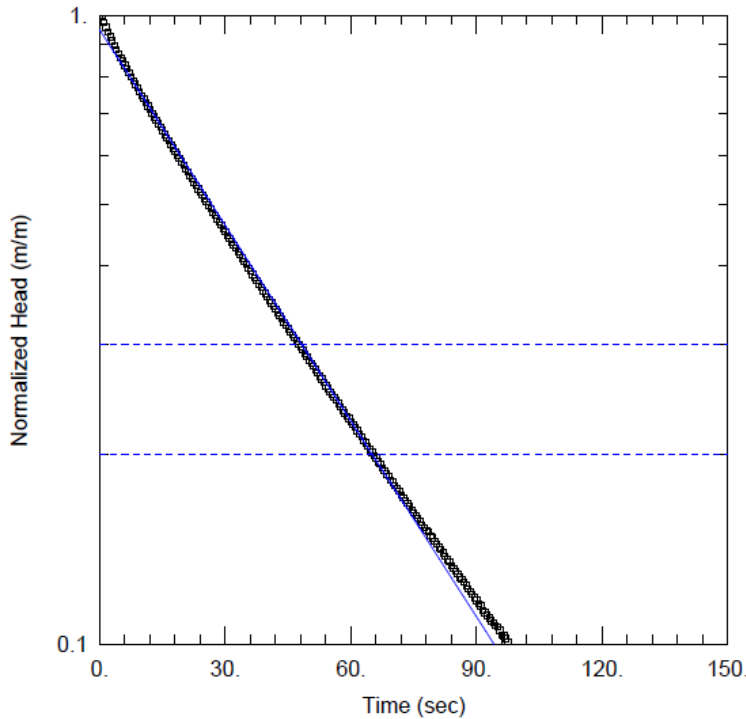
PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-11</b>
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW20-07B  
 Date of Test: June 2, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test  
  
 Static Water Level: 1.25 mbgs  
 Initial Displacement: 2.69 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 9.74 m to 11.26 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$1 \times 10^{-6} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
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PROJECT  
**CALEDON PIT / QUARRY**

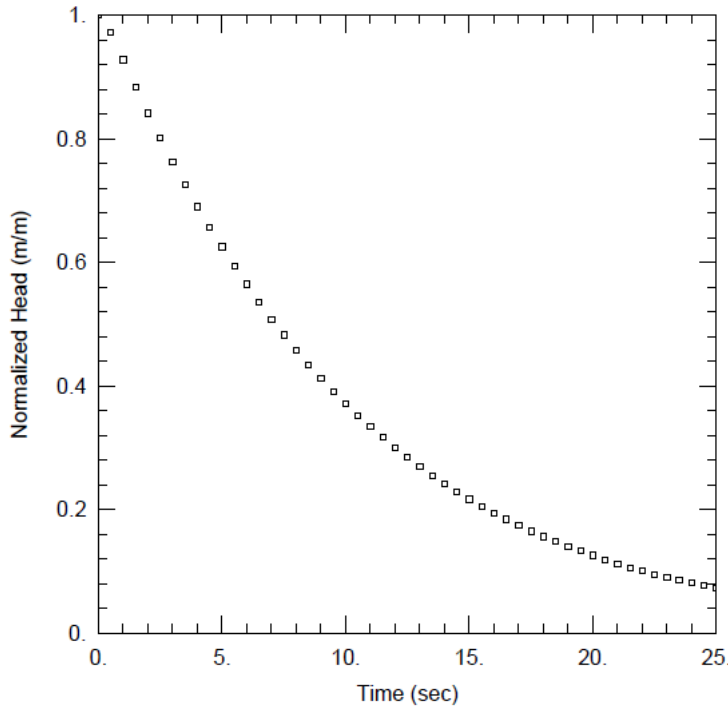
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-20
PREPARED	AIM
DESIGN	AIM
REVIEW	PGM
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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-07B**

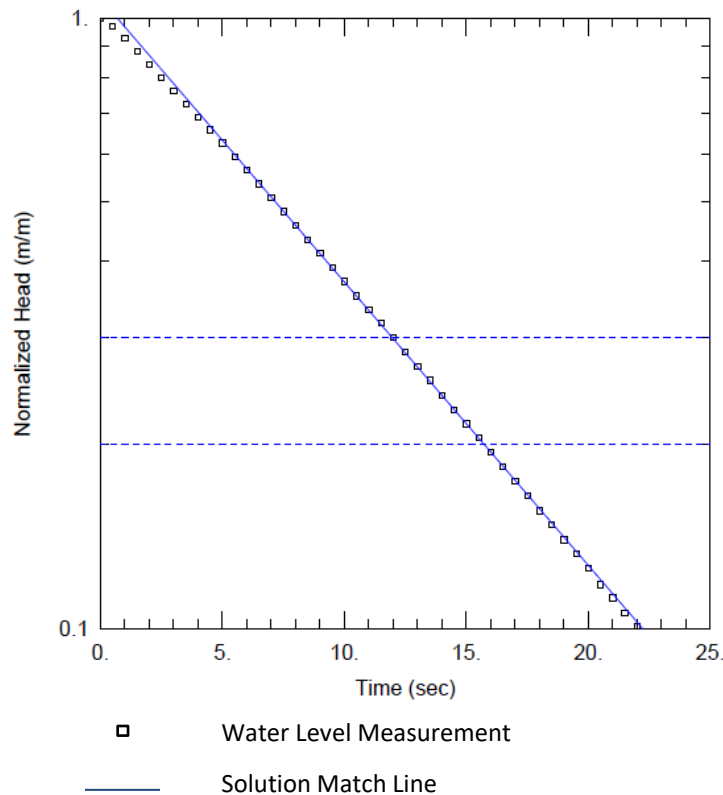
PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-12</b>
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW20-08A  
 Date of Test: May 28, 2022  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test  
  
 Static Water Level: 2.05 mbgs  
 Initial Displacement: 3.80 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 13.30 m to 14.82 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**

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**CALEDON PIT / QUARRY**

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**GOLDER**  
 MEMBER OF WSP

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DESIGN	AIM
REVIEW	PGM
APPROVED	###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-08A**

PROJECT No.	PHASE	Rev.	FIGURE
<b>19129150</b>	<b>2300</b>	<b>A</b>	<b>G-13</b>

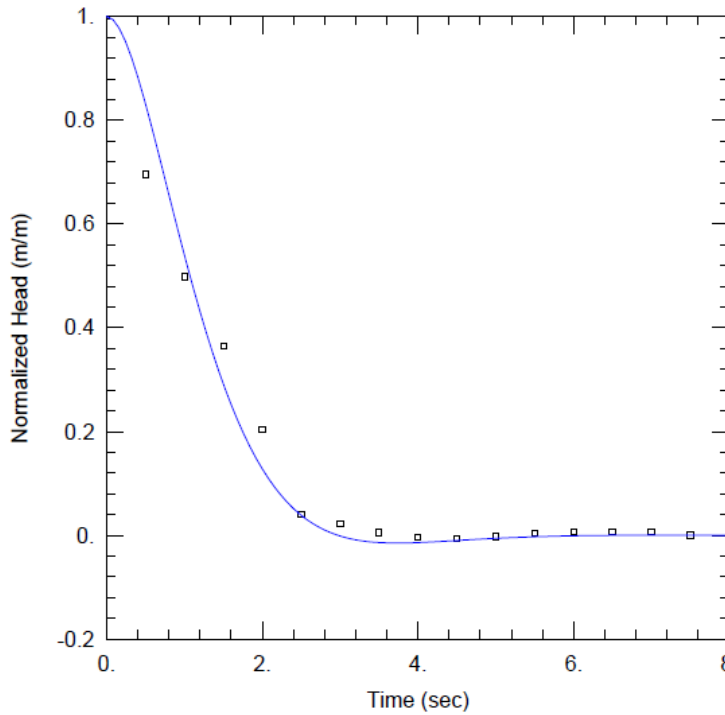
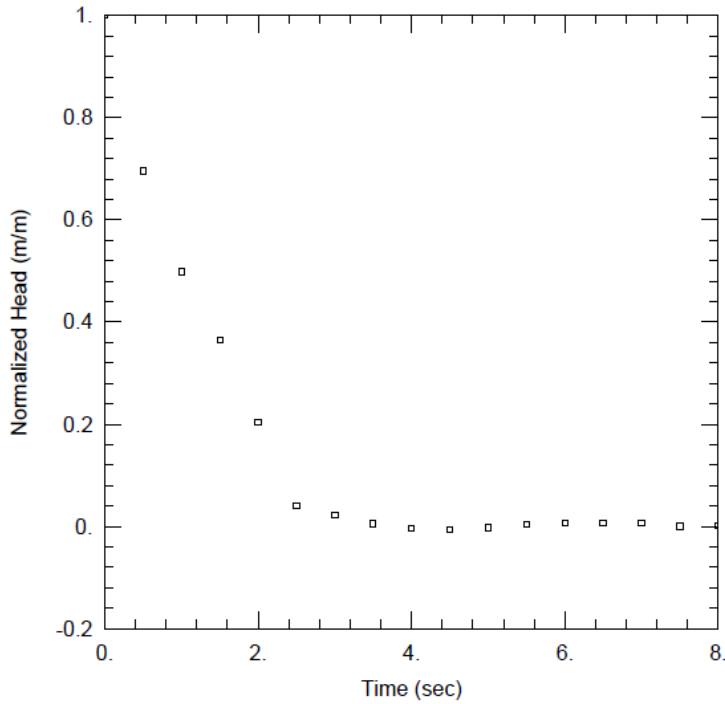
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-08B  
 Date of Test: May 28, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

Static Water Level: 1.99 mbgs  
 Initial Displacement: 1.21 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 5.38 m to 6.90 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Springer-Gelhar  
 Solution Type: Inertial  
 Aquifer Model: Unconfined

**Hydraulic Conductivity (K) =**

**$2 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-08B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-14**

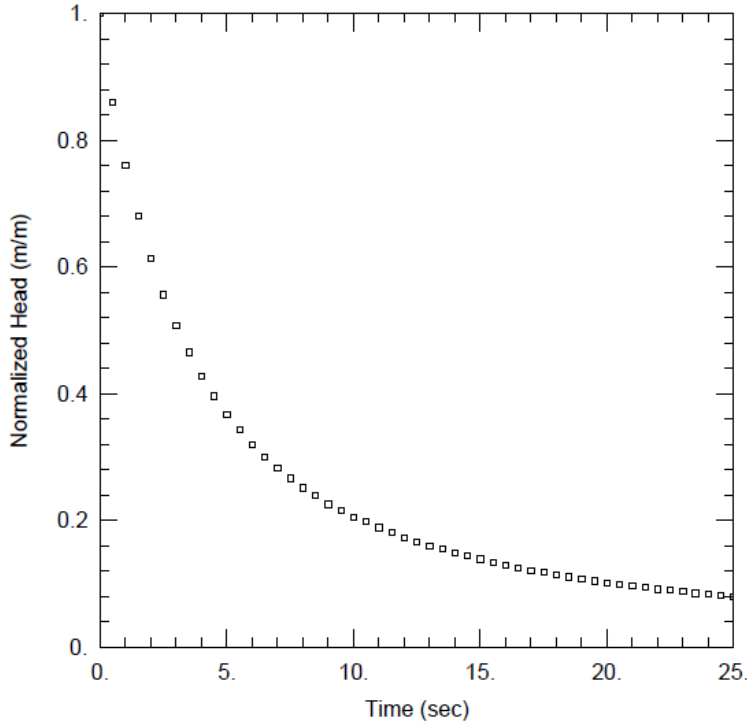
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-09  
 Date of Test: June 4, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

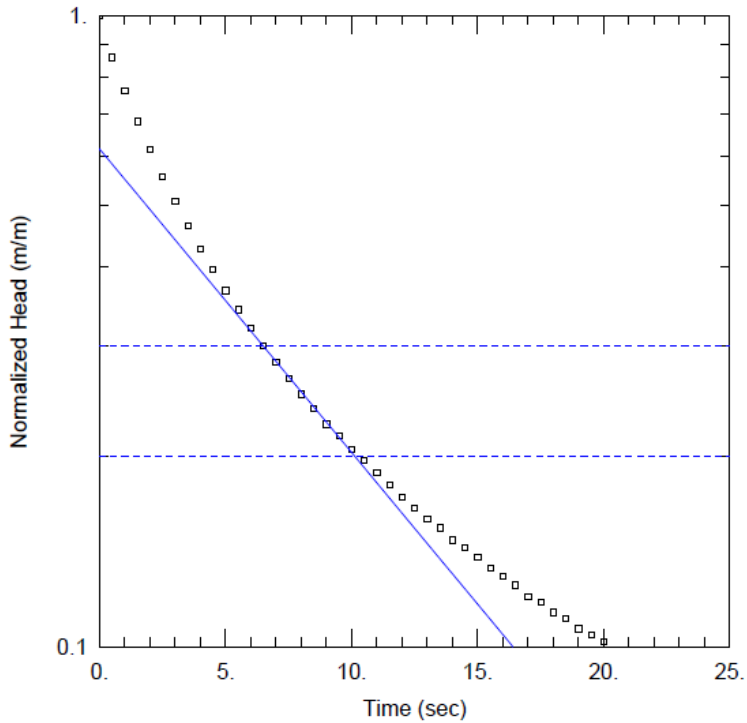
Static Water Level: 3.37 mbgs  
 Initial Displacement: 1.14 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 6.85 m to 8.37 m  
 Geology: Shaley Dolostone, Cabot Head Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined




Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-09**

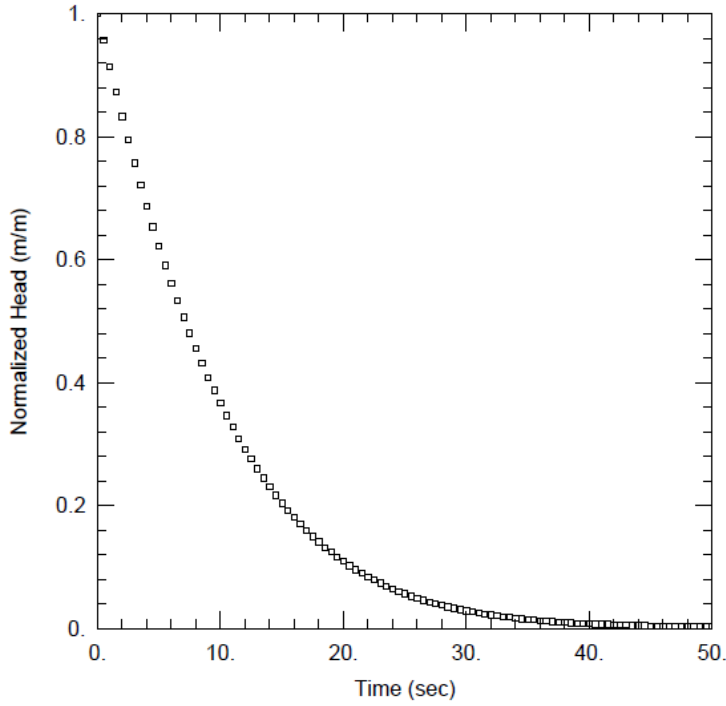
PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-15

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



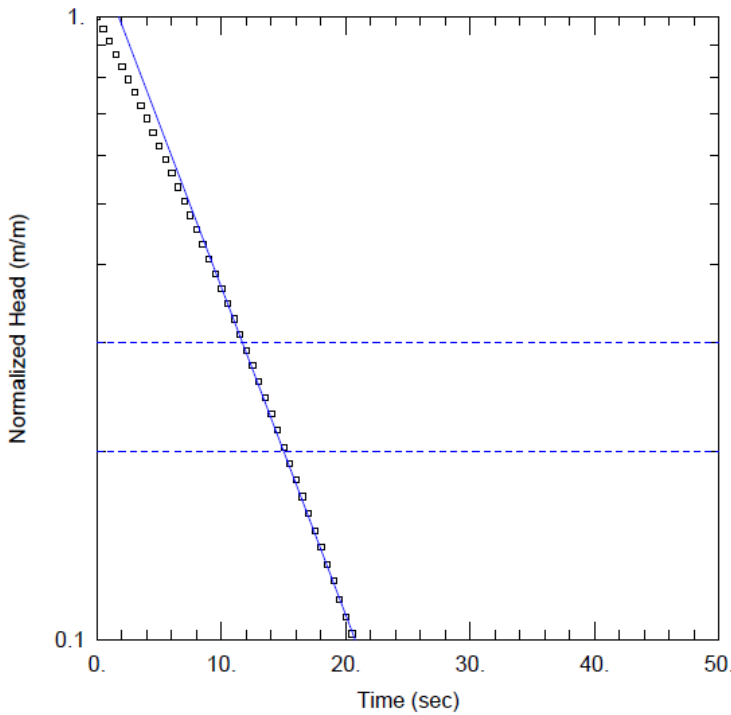
**TEST INFORMATION:**

Test Well: MW20-10A  
 Date of Test: June 3, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test  
  
 Static Water Level: 9.74 mbgs  
 Initial Displacement: 3.15 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 18.62 m to 20.14 m  
 Geology: Shaley Dolostone, Cabot Head Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



**Hydraulic Conductivity (K) =**

**$2 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

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DESIGN	DB
REVIEW	PGM
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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-10A**

PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-16</b>
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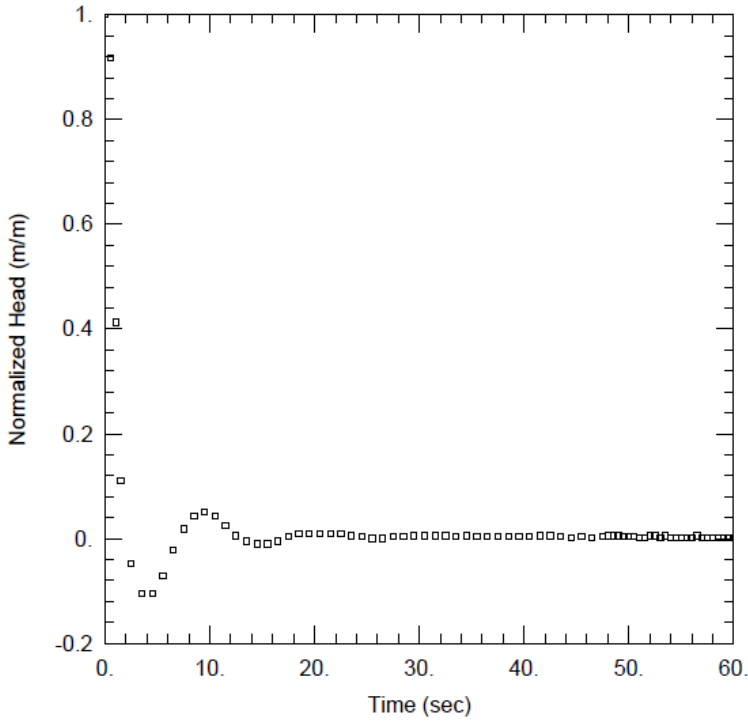
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-10B  
 Date of Test: June 3, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

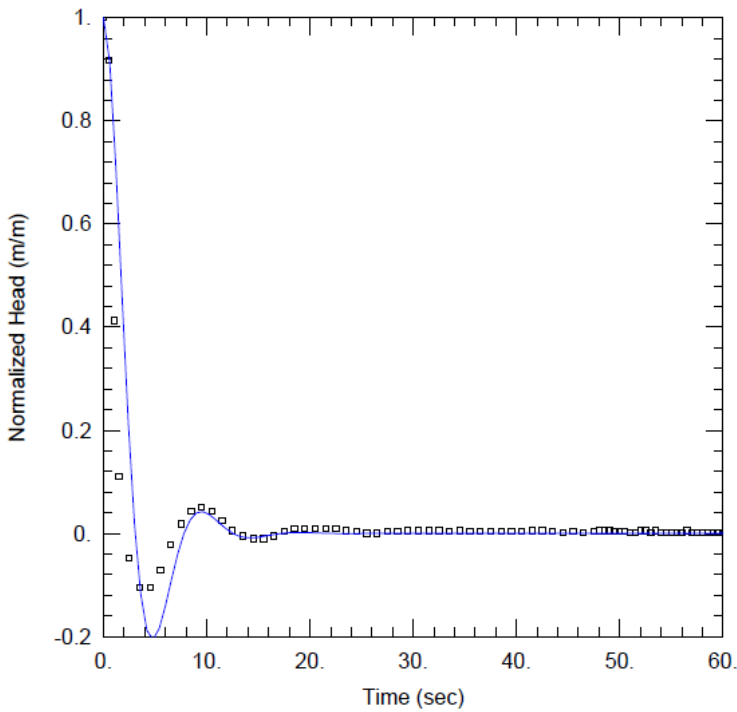
Static Water Level: 9.69 mbgs  
 Initial Displacement: 0.60 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 14.49 m to 16.01 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Springer-Gelhar  
 Solution Type: Inertial  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$2 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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DESIGN DB

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-10B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-17**

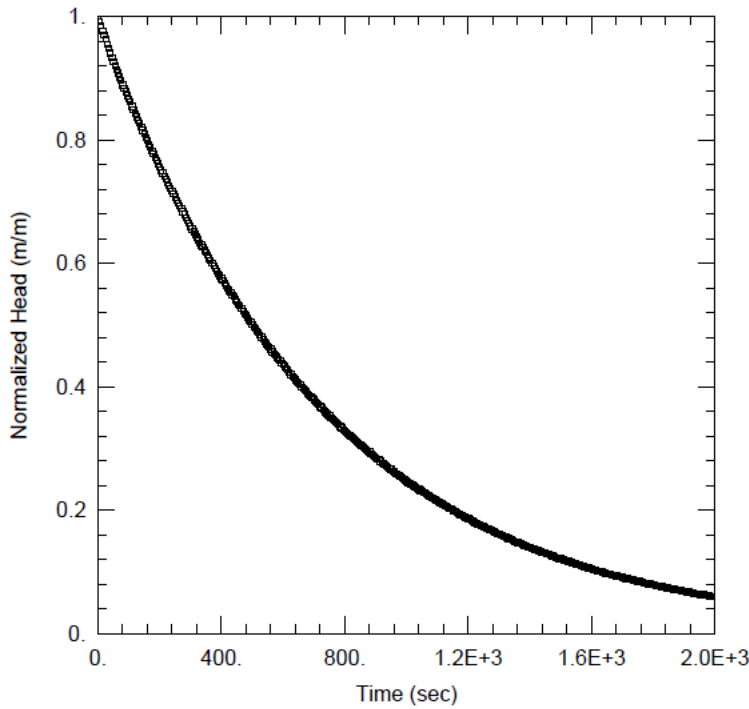
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-11A  
 Date of Test: June 4, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

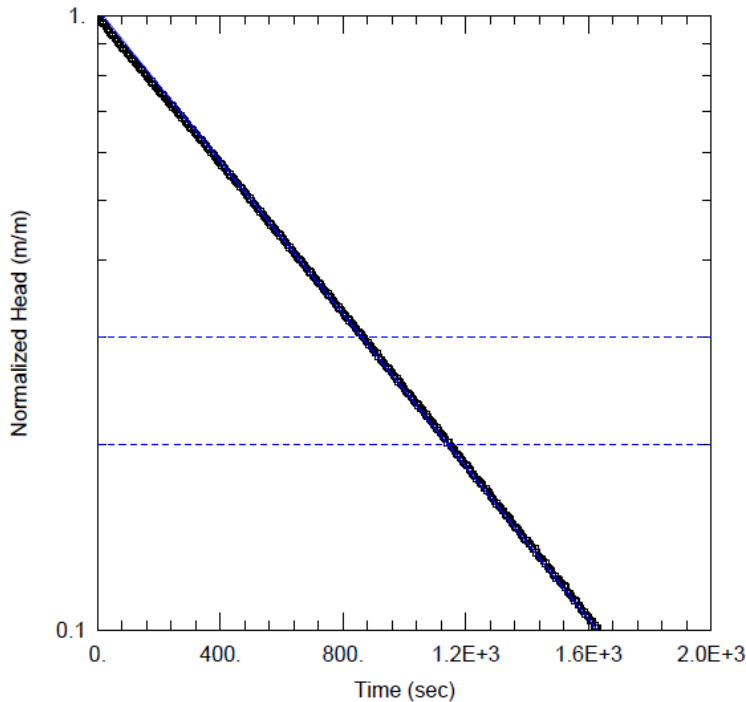
Static Water Level: 4.69 mbgs  
 Initial Displacement: 3.61 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 13.81 m to 15.33 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$5 \times 10^{-7} \text{ m/s}$**

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PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-11A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-18**

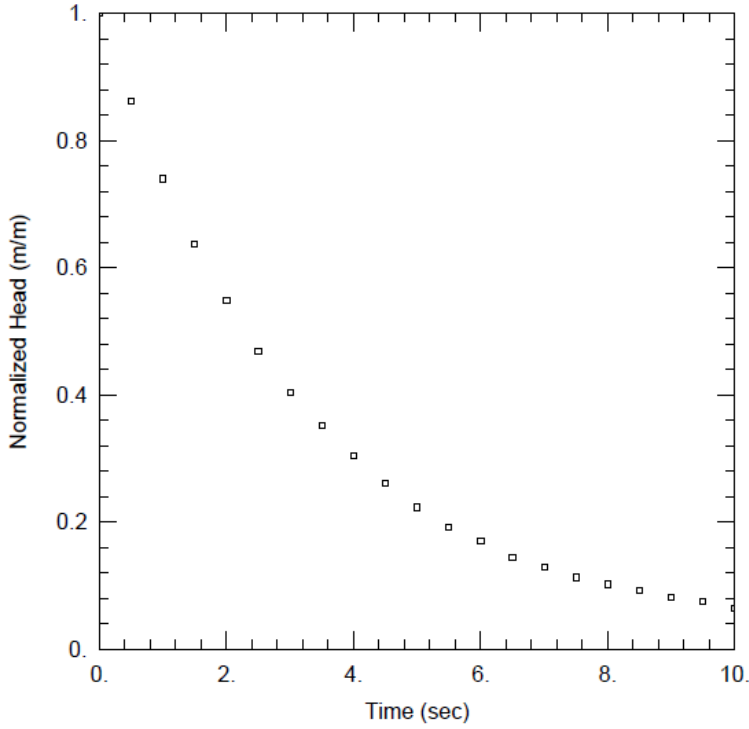
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-11B  
 Date of Test: June 4, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

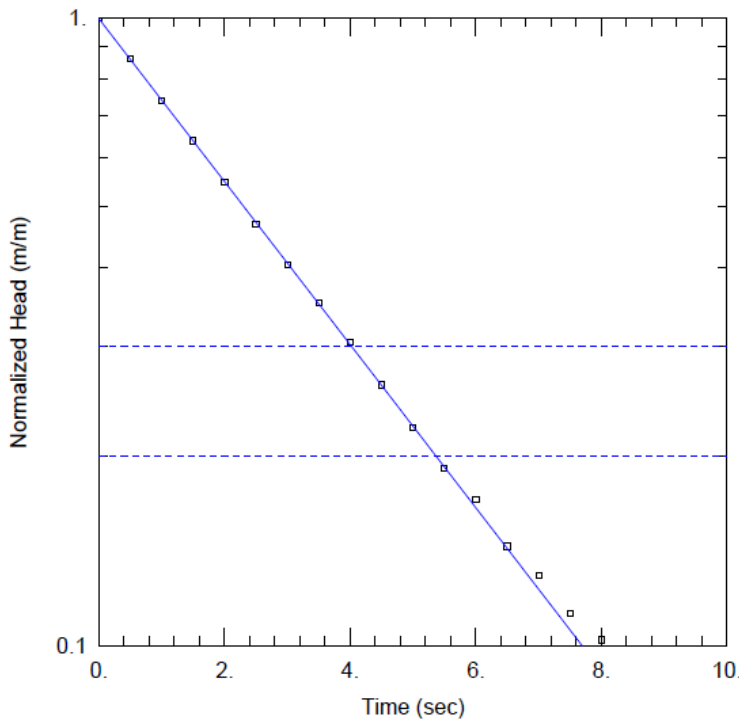
Static Water Level: 3.33 mbgs  
 Initial Displacement: 0.28 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 3.96 m to 5.48 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$5 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



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DESIGN AIM

REVIEW PGM

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-11B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-19**

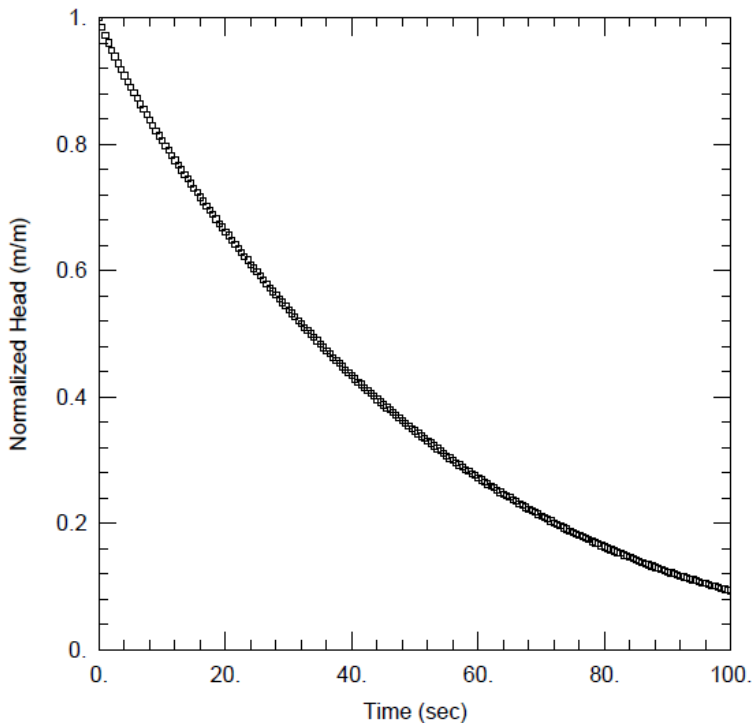
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-12A  
 Date of Test: June 3, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

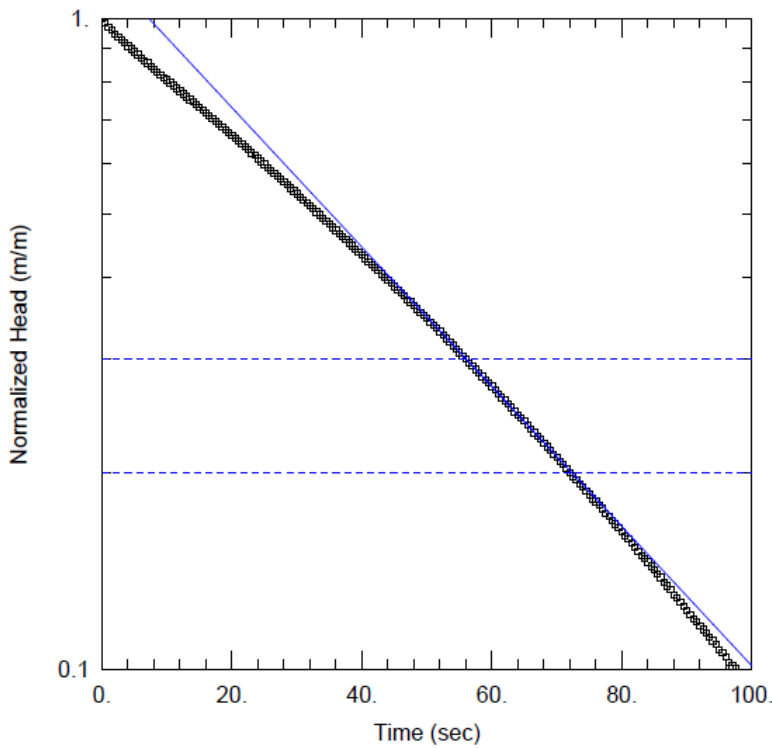
Static Water Level: 4.64 mbgs  
 Initial Displacement: 3.26 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 17.09 m to 18.62 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$1 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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PROJECT  
**CALEDON PIT / QUARRY**

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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-12A**



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PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-20

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

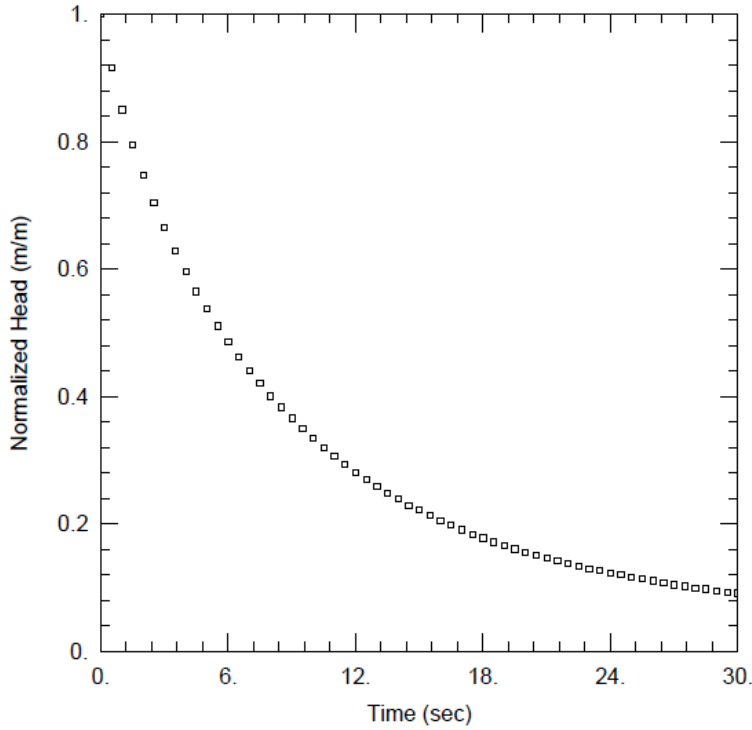


**TEST INFORMATION:**

Test Well: MW20-12B  
 Date of Test: June 3, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

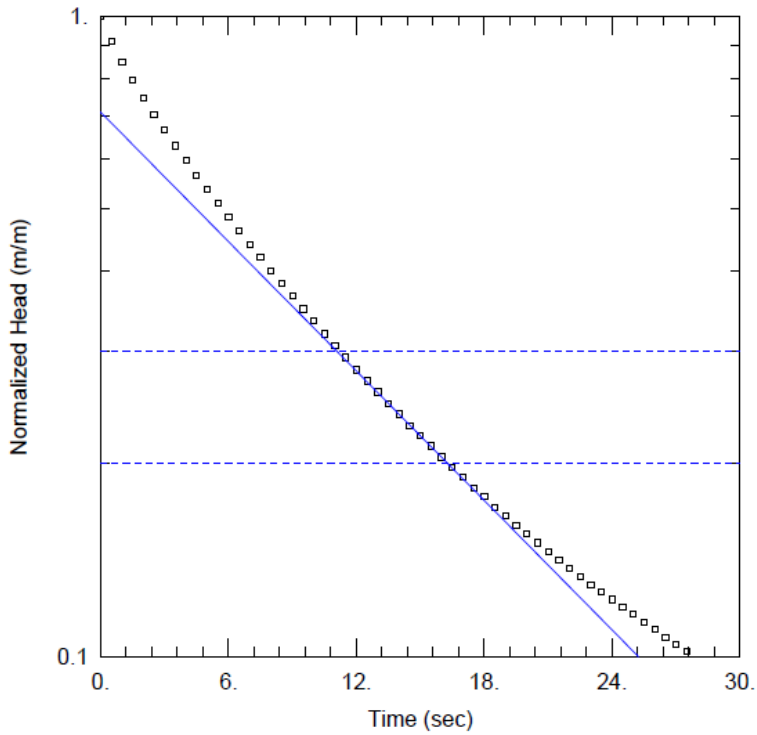
Static Water Level: 4.67 mbgs  
 Initial Displacement: 2.32 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 7.83 m to 9.35 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$1 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-12B**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-21

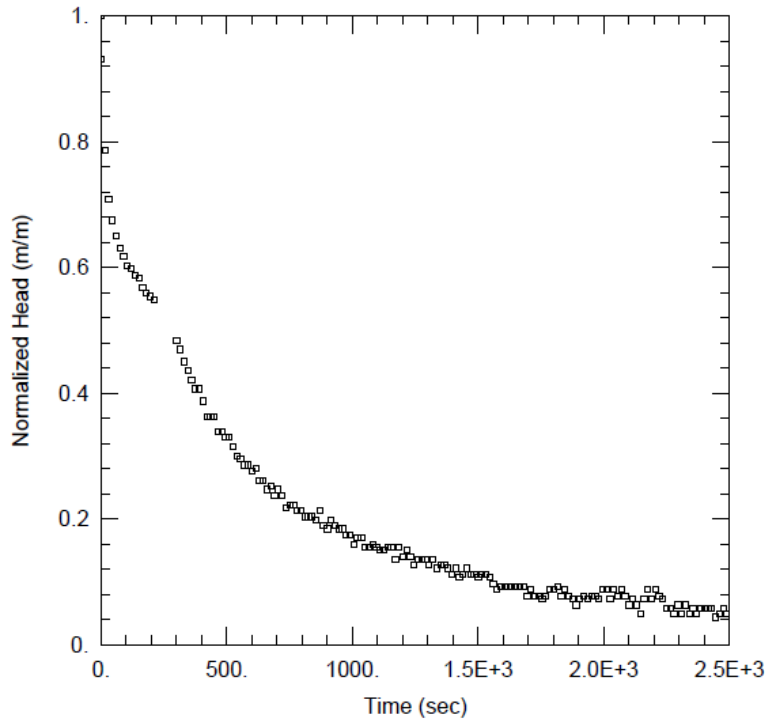
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-13A  
 Date of Test: June 12, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

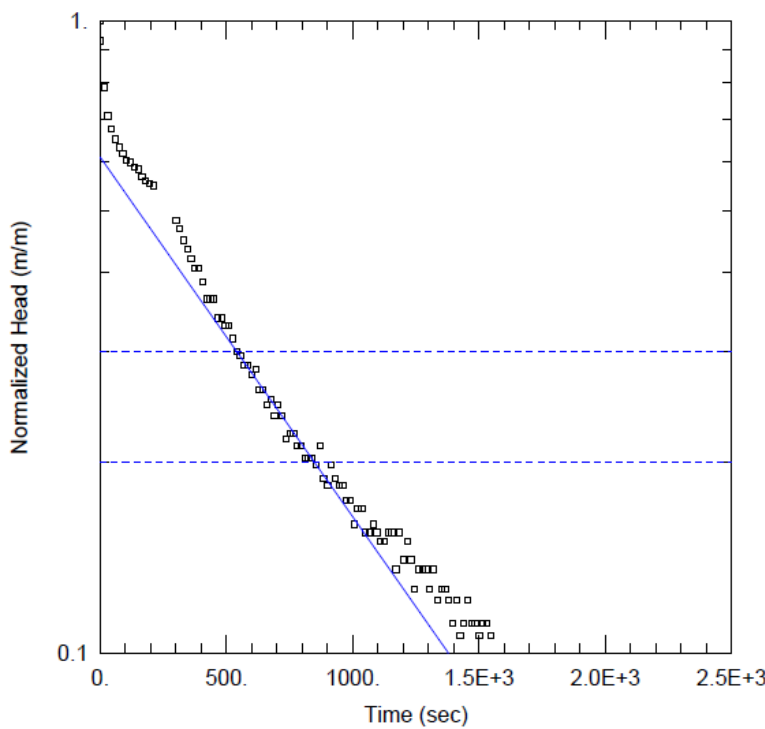
Static Water Level: 3.61 mbgs  
 Initial Displacement: 0.40 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 24.05 m to 25.57 m  
 Geology: Shaley Dolostone, Cabot Head Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$6 \times 10^{-7} \text{ m/s}$**

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**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-13A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

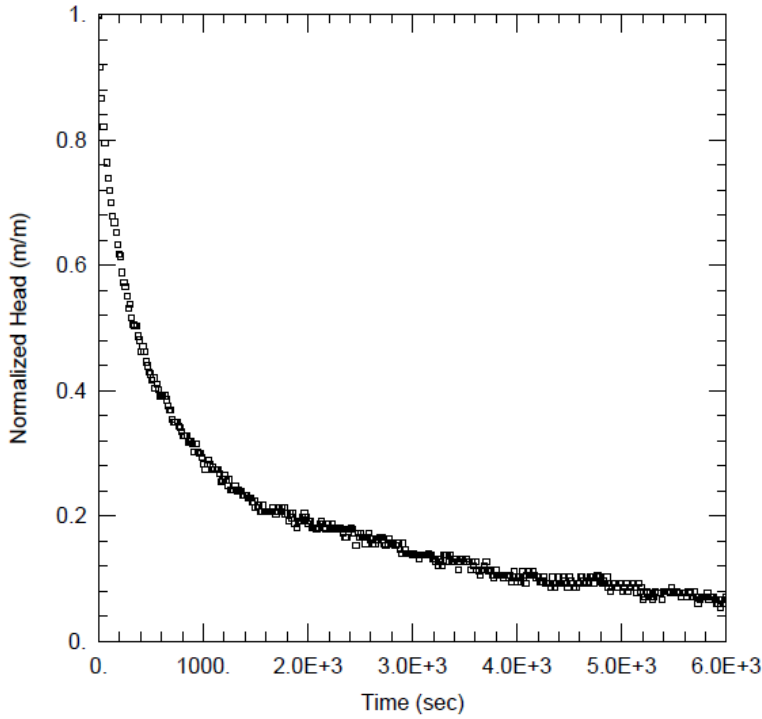
FIGURE  
**G-22**

**TEST INFORMATION:**

Test Well: MW20-13B  
 Date of Test: June 12, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

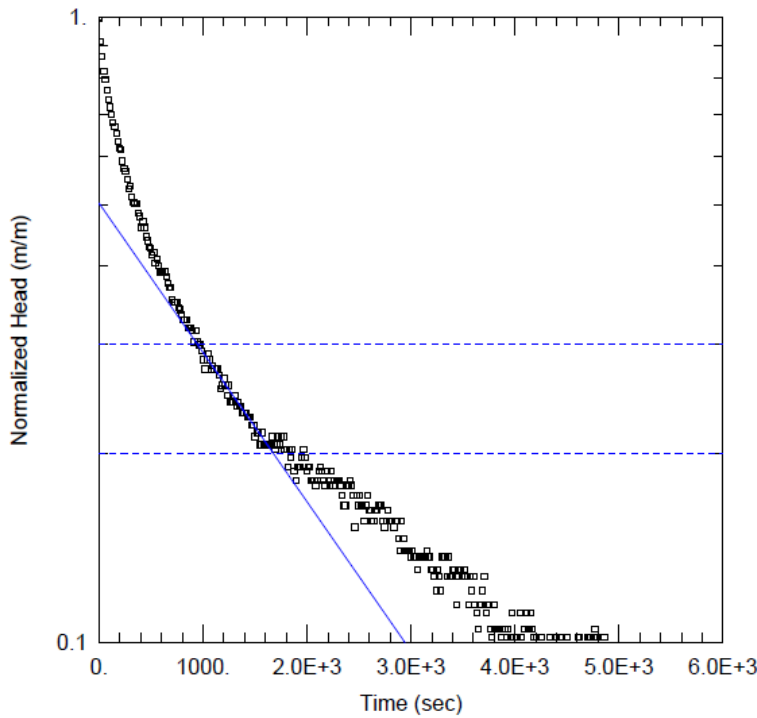
Static Water Level: 3.47 mbgs  
 Initial Displacement: 0.29 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 18.14 m to 19.66 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined




Hydraulic Conductivity (K) =

$1 \times 10^{-7} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

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CONSULTANT  
 **GOLDER**  
 MEMBER OF WSP

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APPROVED	###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-13B**

PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-23</b>
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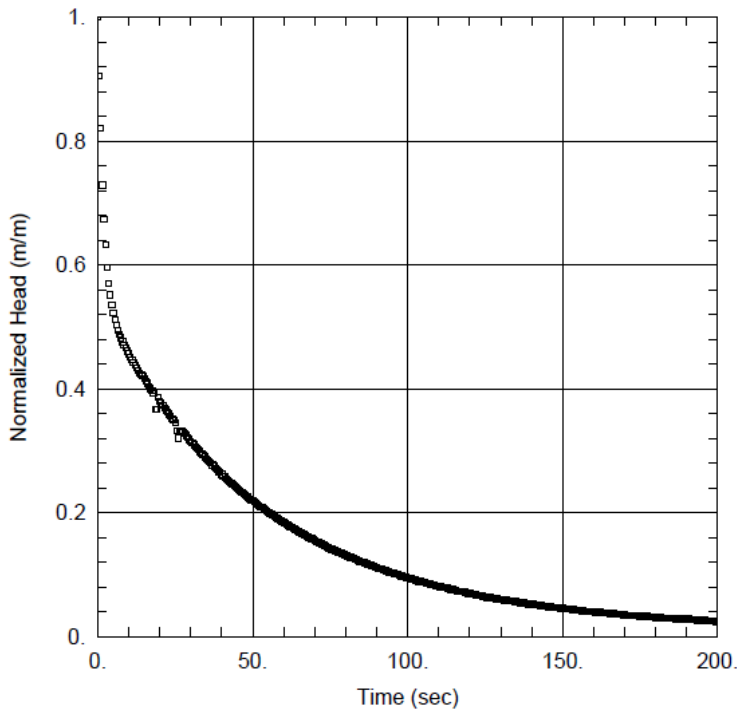
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-13C  
 Date of Test: June 8, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

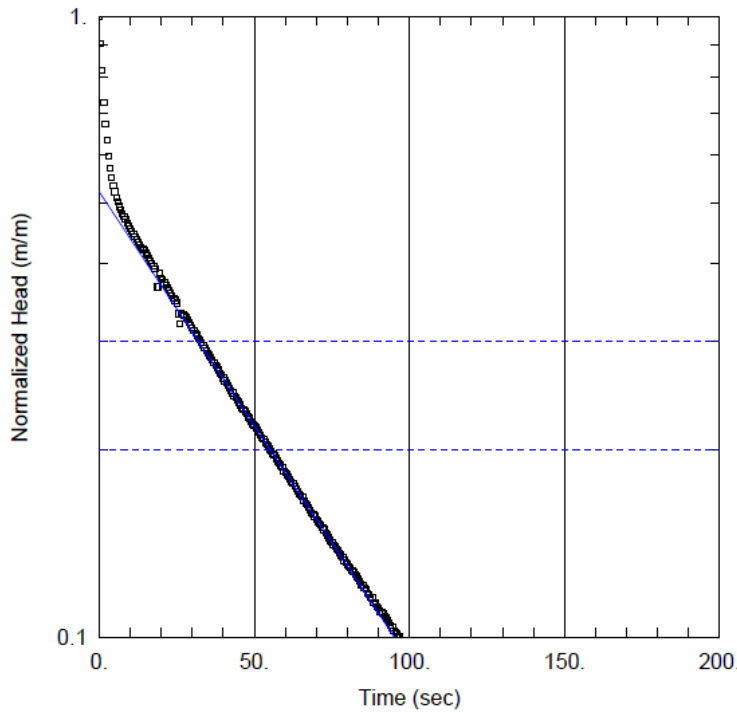
Static Water Level: 1.89 mbgs  
 Initial Displacement: 2.34 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.083 m  
 Well Screen Interval: 3.08 m to 4.60 m  
 Geology: Sand, some silt



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

$2 \times 10^{-6} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-13C**

PROJECT No.  
**19129150**

PHASE  
**2300**

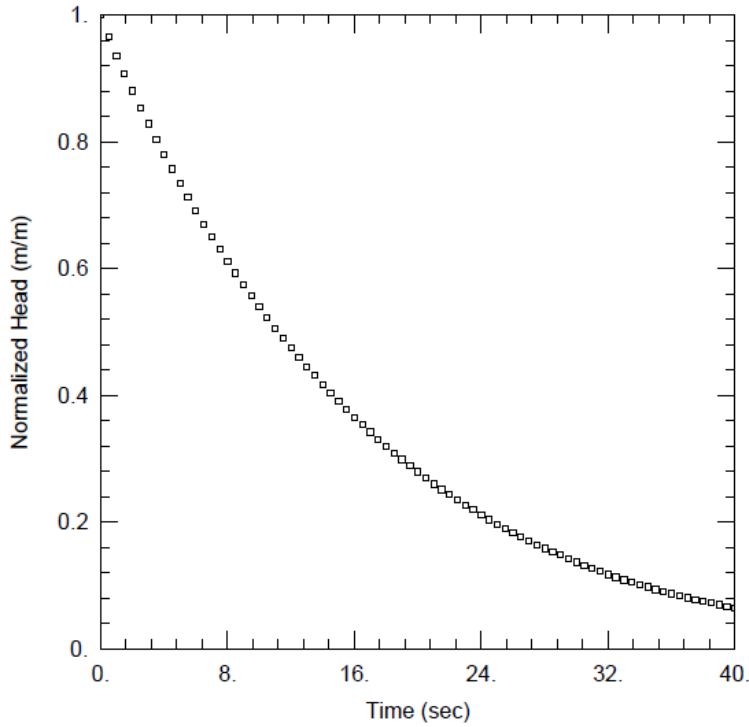
Rev.  
**A**

FIGURE  
**G-24**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-14A  
 Date of Test: June 5, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test  
  
 Static Water Level: 4.71 mbgs  
 Initial Displacement: 3.82 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 22.60 m to 24.12 m  
 Geology: Shaley Dolostone, Gasport Fm

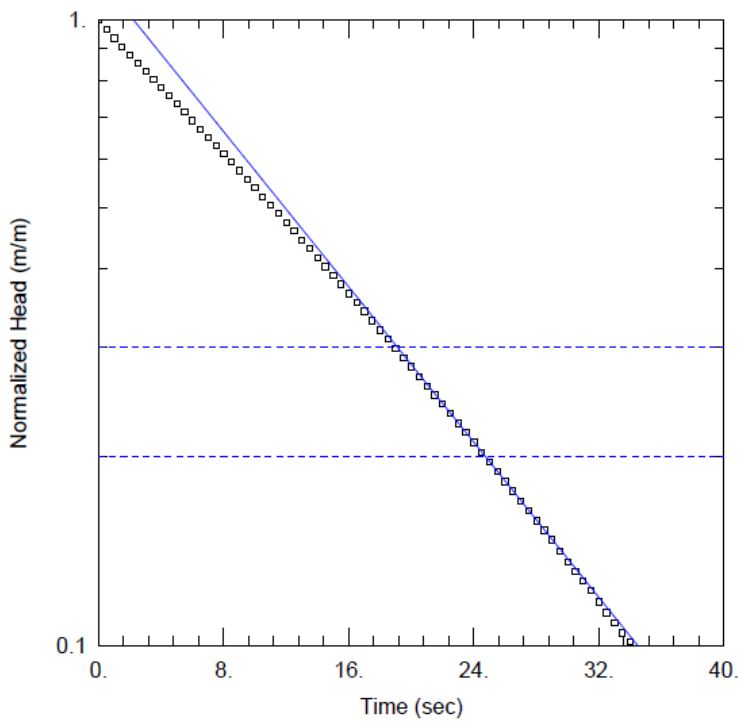


**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**



□ Water Level Measurement  
 — Solution Match Line

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-14A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-25**



IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

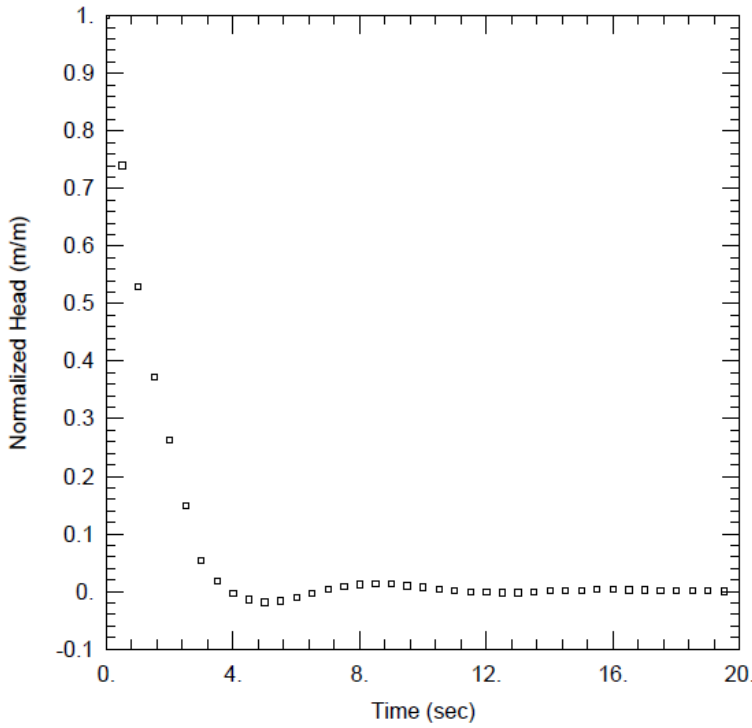


**TEST INFORMATION:**

Test Well: MW20-14B  
 Date of Test: June 5, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

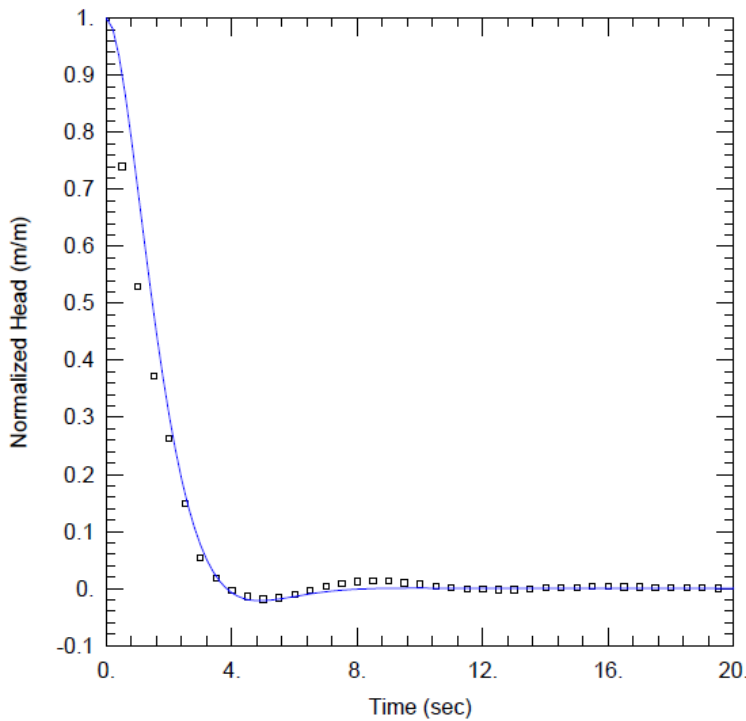
Static Water Level: 4.71 mbgs  
 Initial Displacement: 2.39 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 14.98 m to 16.50 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Springer-Gelhar  
 Solution Type: Inertial  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$1 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-14B**

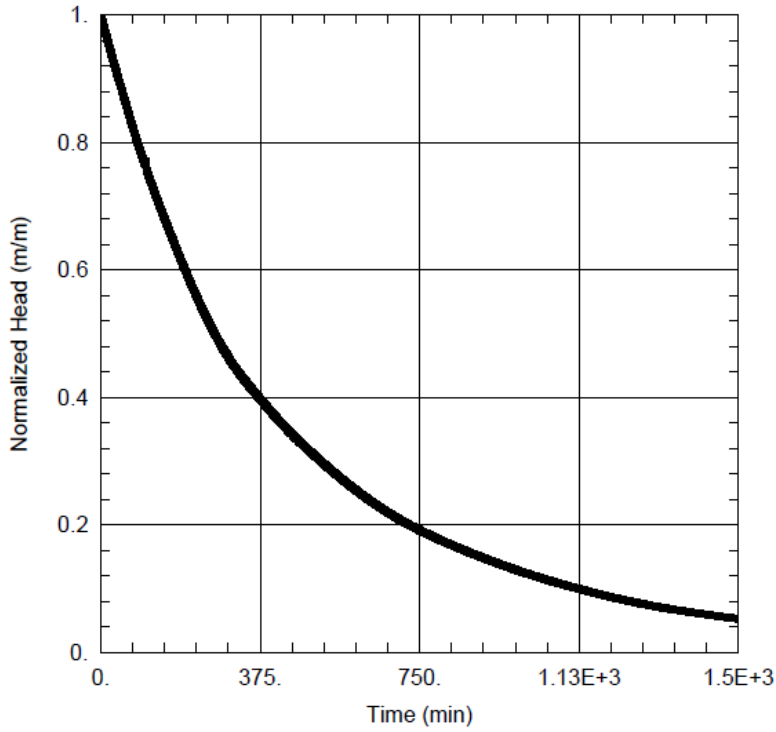
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

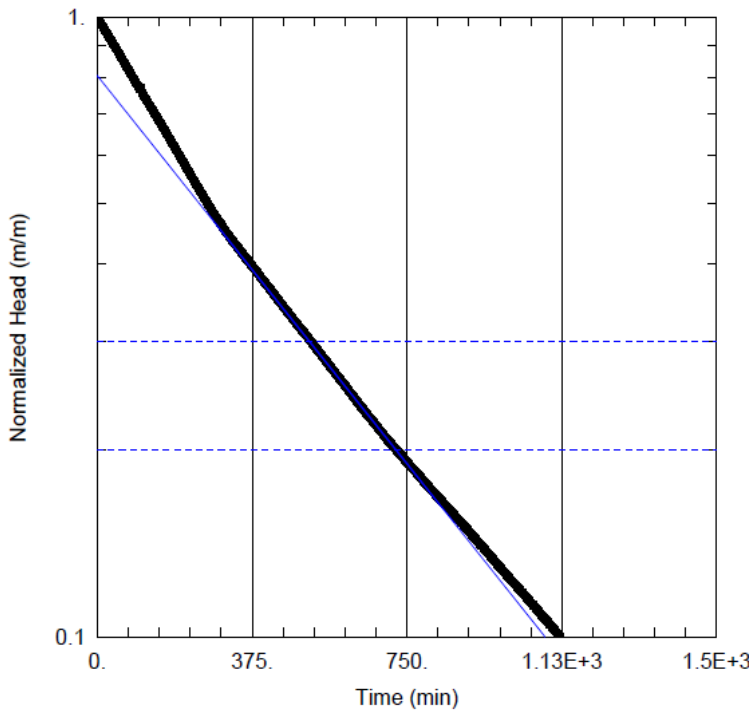
FIGURE  
**G-26**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW20-15A  
 Date of Test: June 15, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
  
 Static Water Level: 0.68 mbgs  
 Initial Displacement: 33.35 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 33.77 m to 35.29 m  
 Geology: Shaley Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$7 \times 10^{-9} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line

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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-15A**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-27

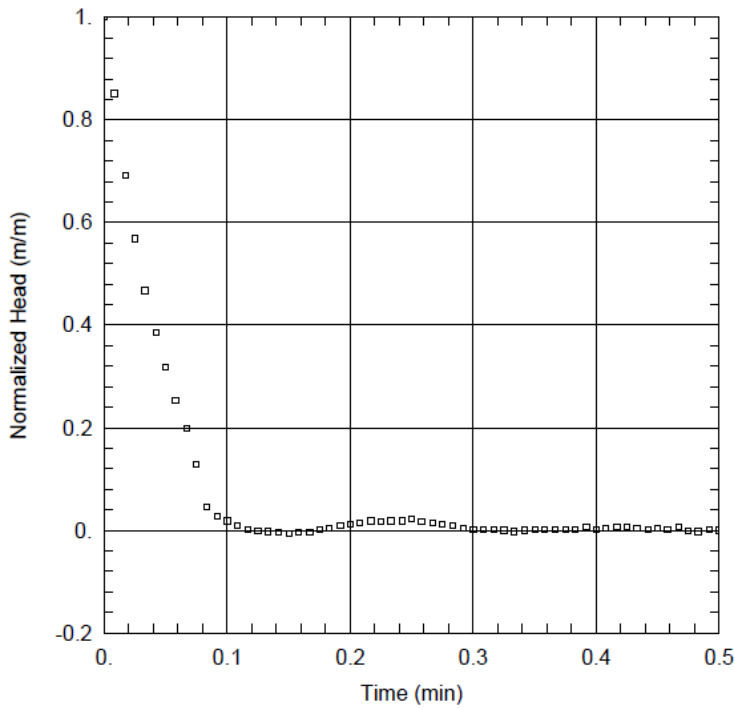
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-15B  
 Date of Test: June 19, 2022  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

Static Water Level: 0.58 mbgs  
 Initial Displacement: 1.68 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 28.81 m to 30.33 m  
 Geology: Dolostone, Gasport Fm

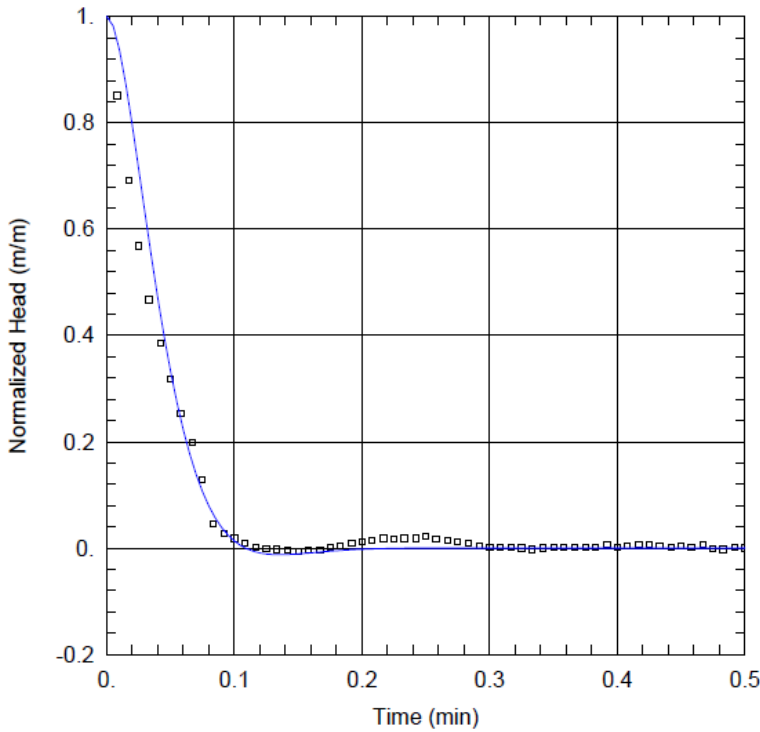


**SOLUTION:**

Solution Method: Butler  
 Solution Type: Inertial  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$9 \times 10^{-5} \text{ m/s}$**



□ Water Level Measurement  
 — Solution Match Line

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PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-15B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-28**

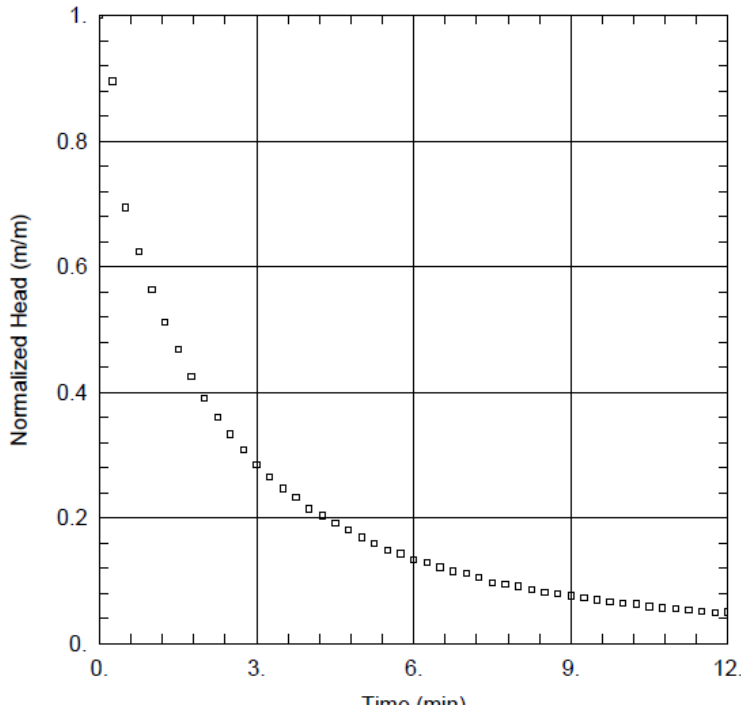
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-15C  
 Date of Test: June 15, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

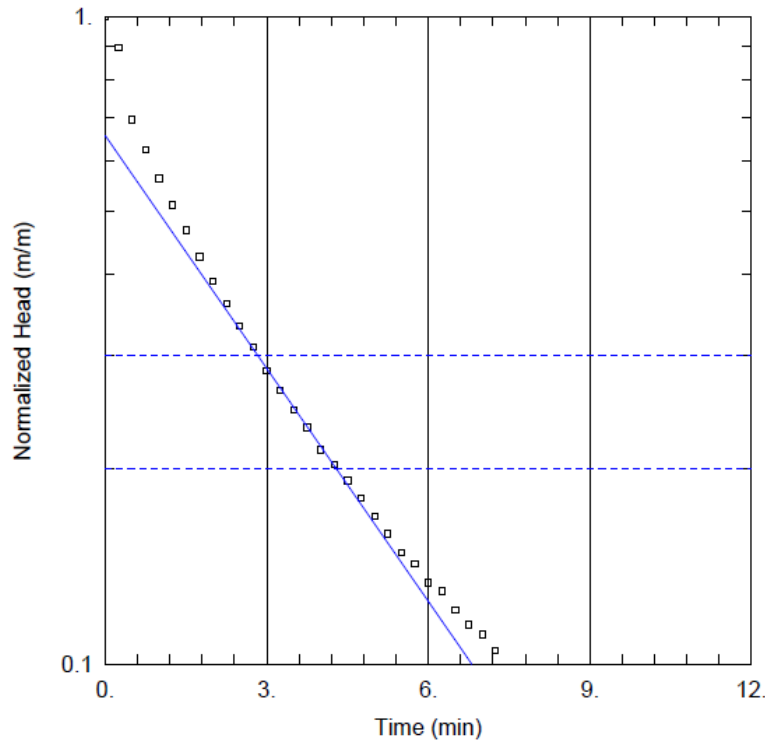
Static Water Level: 1.05 mbgs  
 Initial Displacement: 1.30 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.083 m  
 Well Screen Interval: 2.74 m to 4.27 m  
 Geology: Clayey Sand, Overburden



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$1 \times 10^{-6} \text{ m/s}$**

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

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PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-15C**

PROJECT No. 19129150

PHASE 2300

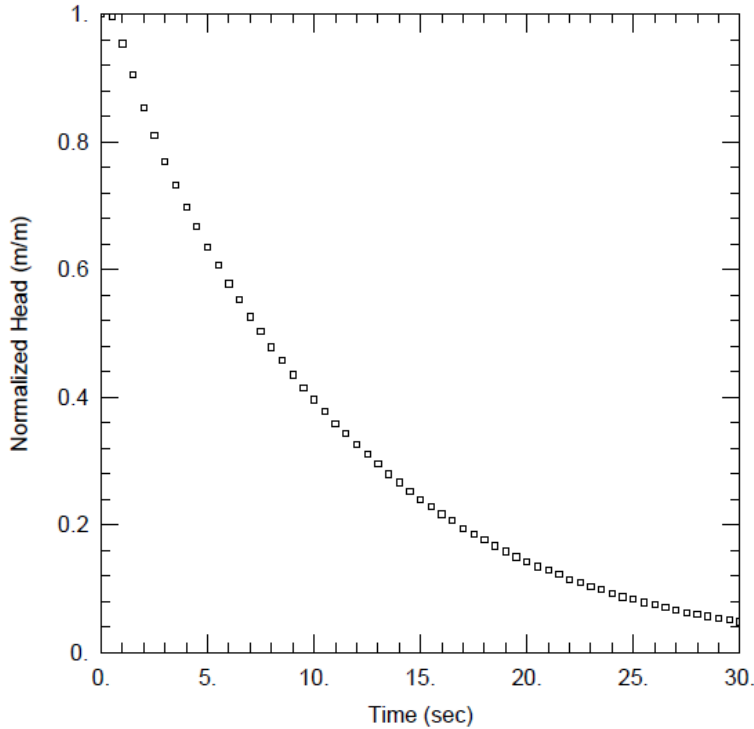
Rev. A

FIGURE G-29

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

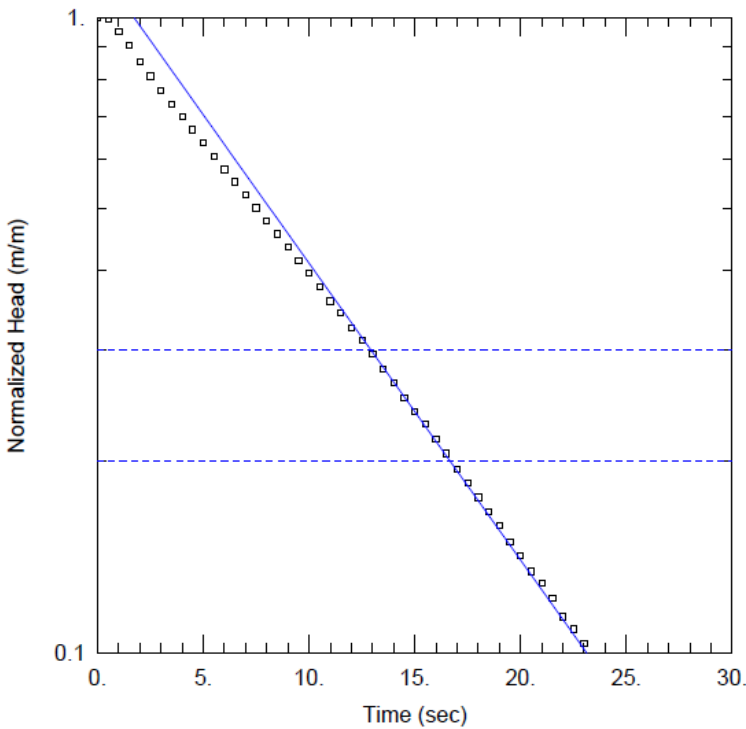
**TEST INFORMATION:**

Test Well: MW20-16A  
 Date of Test: June 19, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test  
  
 Static Water Level: 1.54 mbgs  
 Initial Displacement: 3.41 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 34.84 m to 36.36 m  
 Geology: Shaley Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

$2 \times 10^{-5} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-16A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-30**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

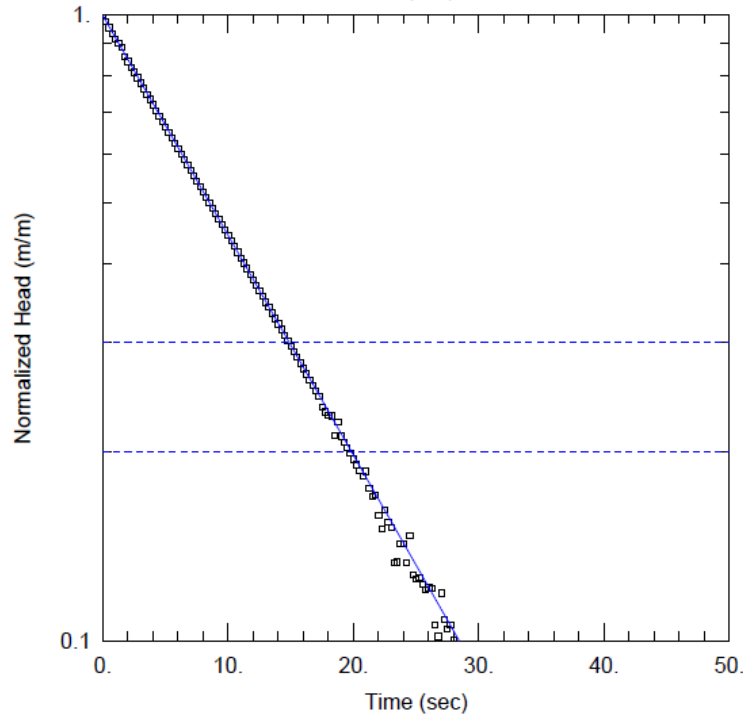
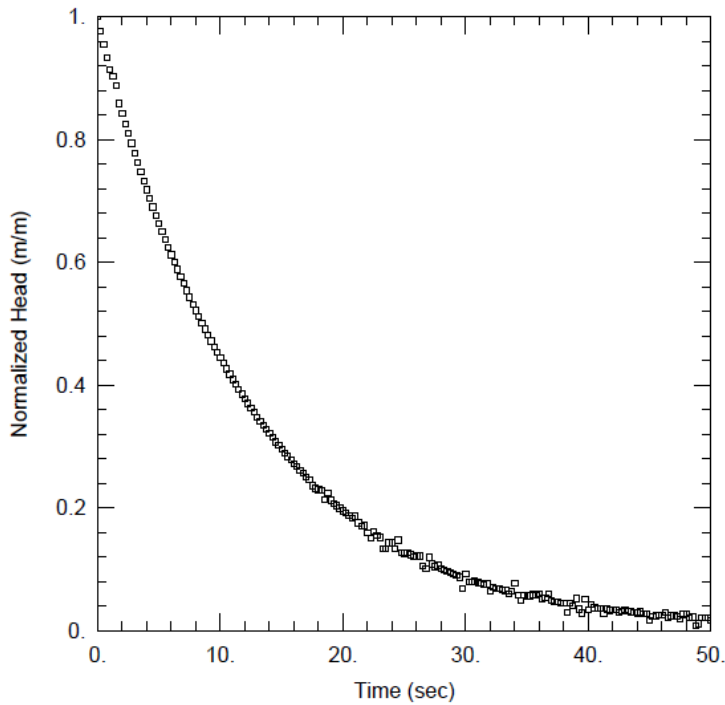


**TEST INFORMATION:**

Test Well: MW20-16B  
 Date of Test: June 19, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

Static Water Level: 1.42 mbgs  
 Initial Displacement: 11.30 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 16.80 m to 18.33 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$1 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

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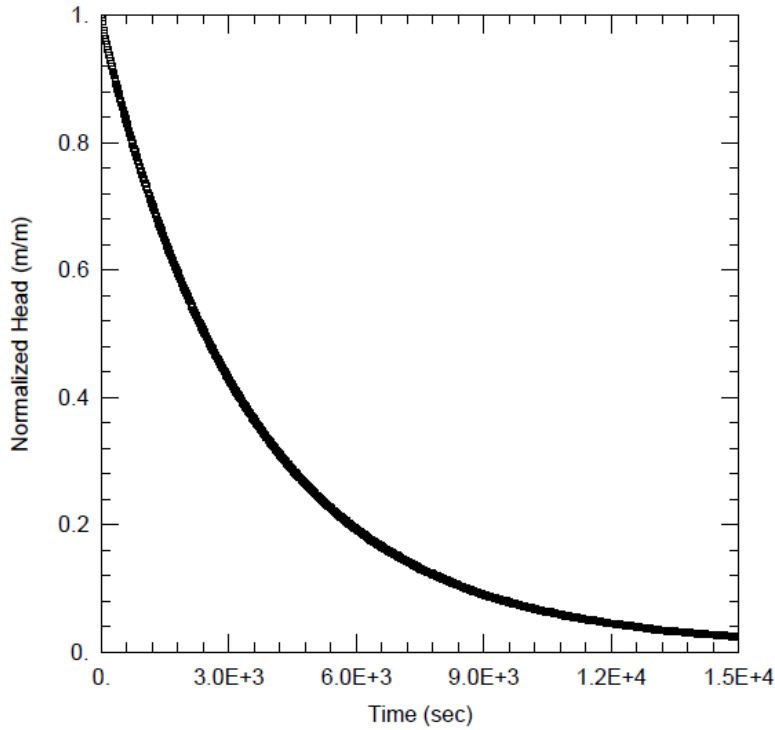
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-16B**



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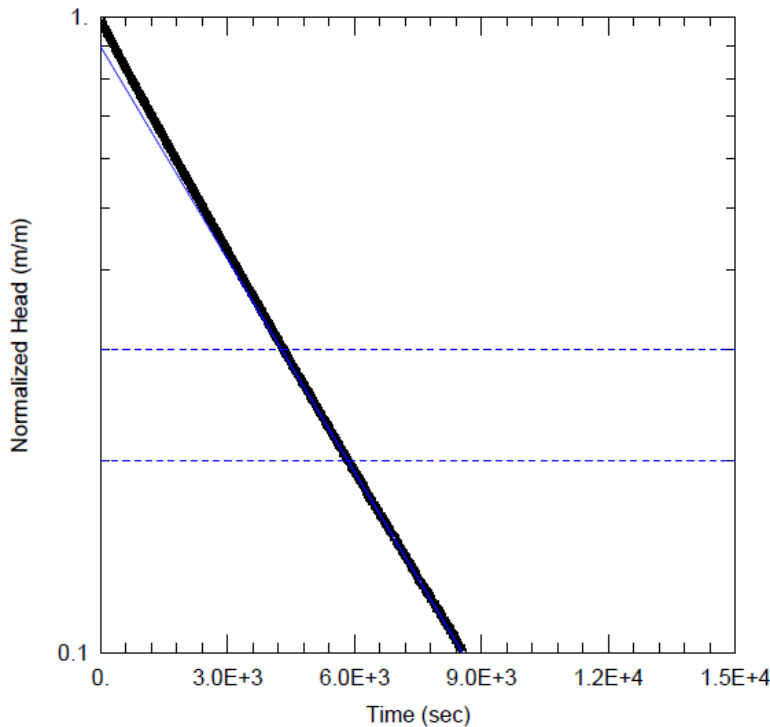
PROJECT No. 19129150 PHASE 2300 Rev. A FIGURE G-31

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW20-17A  
 Date of Test: June 8, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
  
 Static Water Level: 4.27 mbgs  
 Initial Displacement: 9.60 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 25.64 m to 27.16 m  
 Geology: Shaley Dolostone



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$6 \times 10^{-8} \text{ m/s}$**

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
MONITORING WELL MW20-17A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-32**

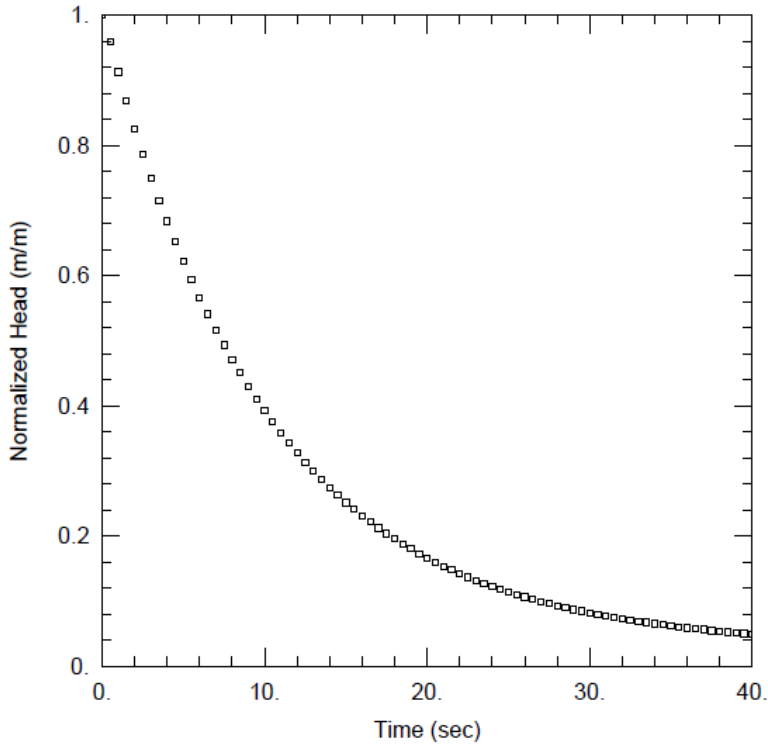
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-17B  
 Date of Test: June 5, 2020  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

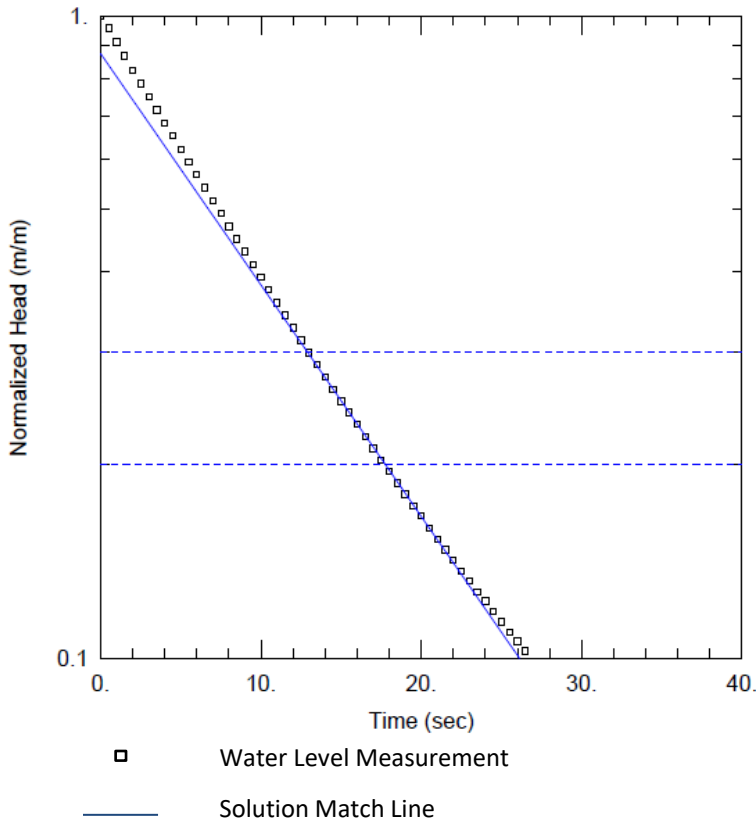
Static Water Level: 4.34 mbgs  
 Initial Displacement: 3.77 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 12.75 m to 14.27 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined




Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
 YYYY-MM-DD 2022-01-24  
 PREPARED AIM  
 DESIGN AIM  
 REVIEW PGM  
 APPROVED ###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-17B**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-33

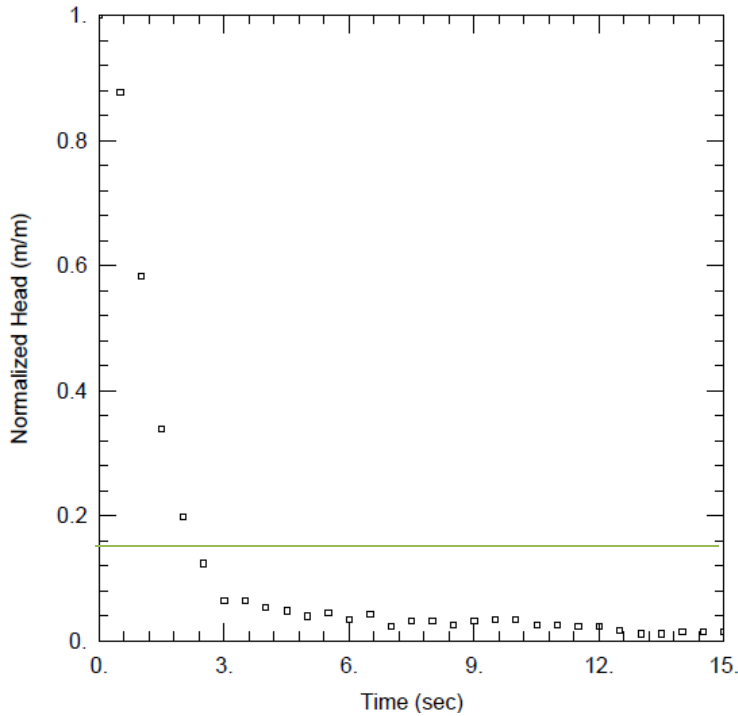
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-18  
 Date of Test: June 19, 2020  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

Static Water Level: 12.07 mbgs  
 Initial Displacement: 0.36 m

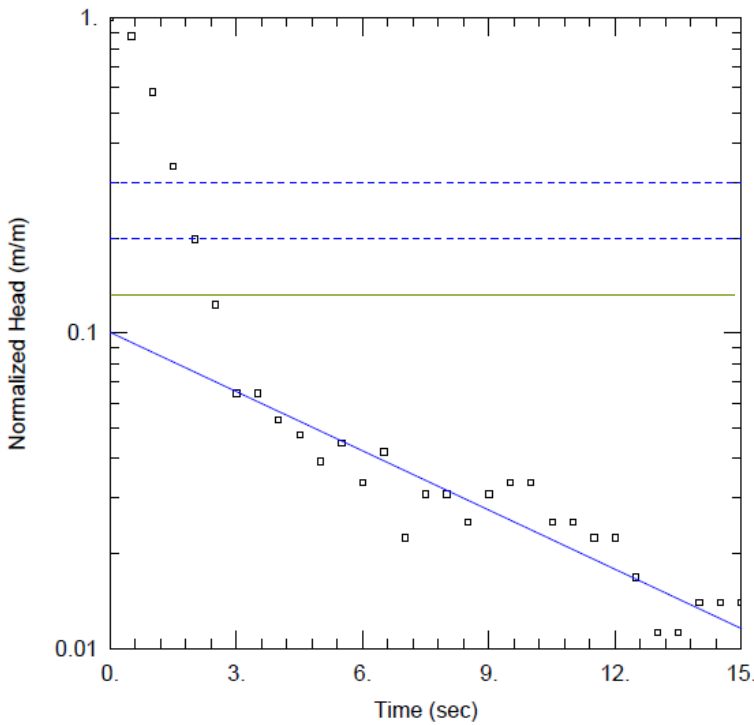
Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 12.42 m to 13.94 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Note: Fitted to later time data when water level was above the sand pack.



Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line
- Top of Sand Pack Annotation Line

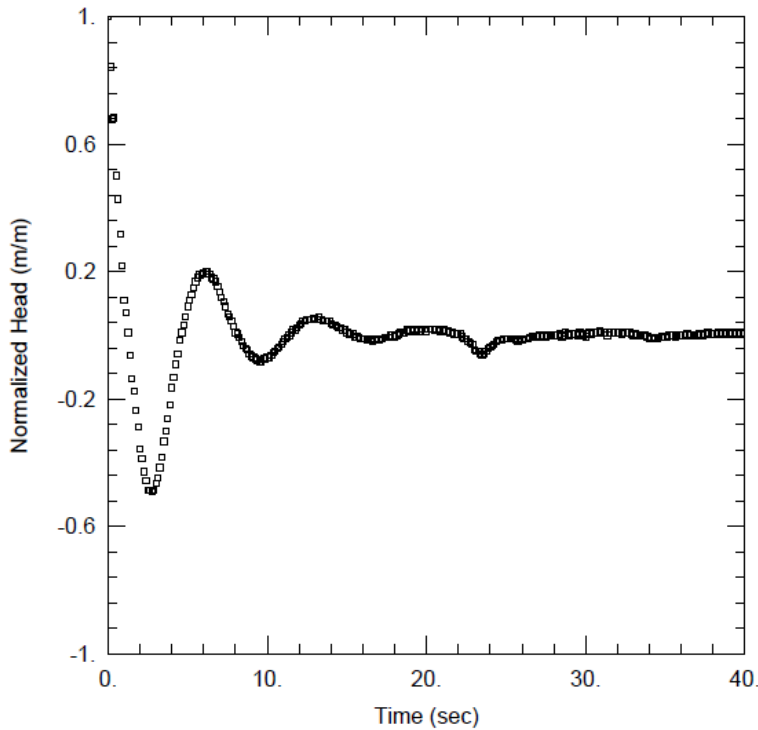
CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

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**CALEDON PIT / QUARRY**

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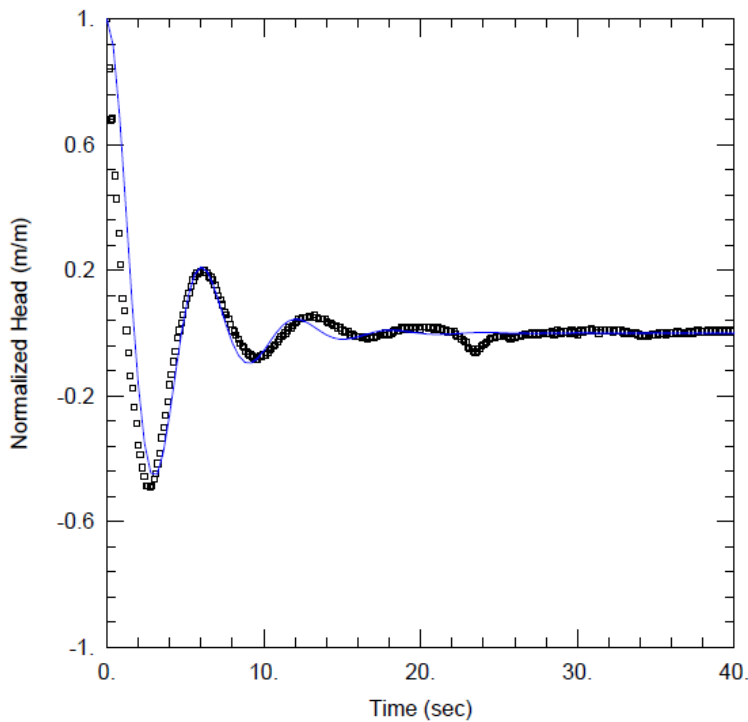
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-18**  
 PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-34

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW20-19A  
 Date of Test: June 24, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
 Static Water Level: 6.01 mbgs  
 Initial Displacement: 0.24 m  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 15.75 m to 17.27 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Springer-Gelhar  
 Solution Type: Inertial  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

$4 \times 10^{-4} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-19A**

PROJECT No.  
**19129150**

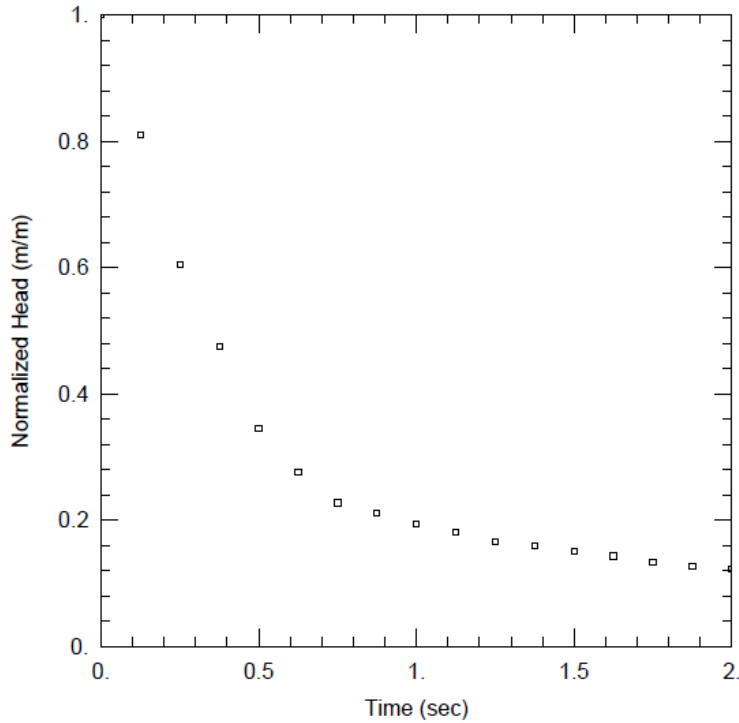
PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-35**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A



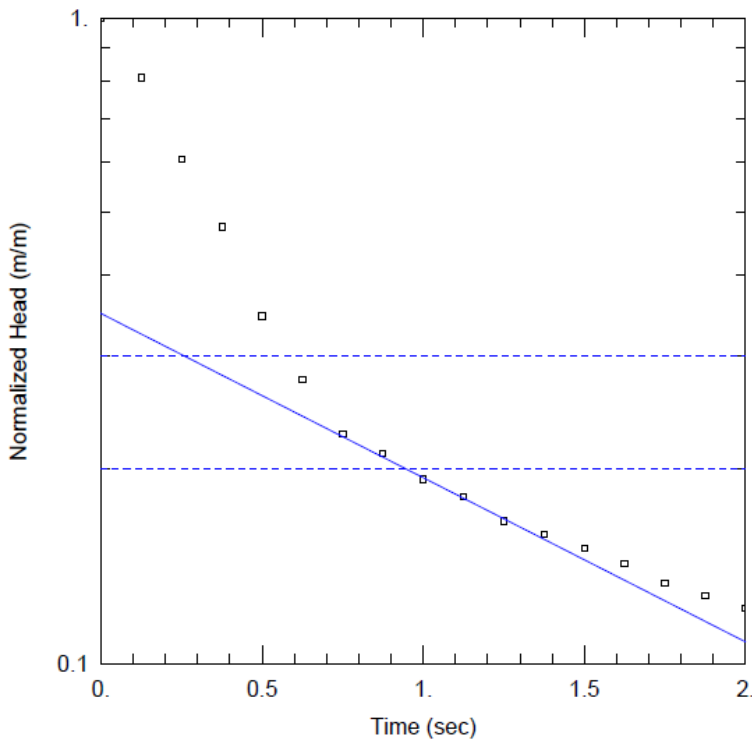


**TEST INFORMATION:**

Test Well: MW20-19B  
 Date of Test: June 24, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 6.01 mbgs  
 Initial Displacement: 1.04 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 8.00 m to 9.52 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$1 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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PROJECT  
**CALEDON PIT / QUARRY**

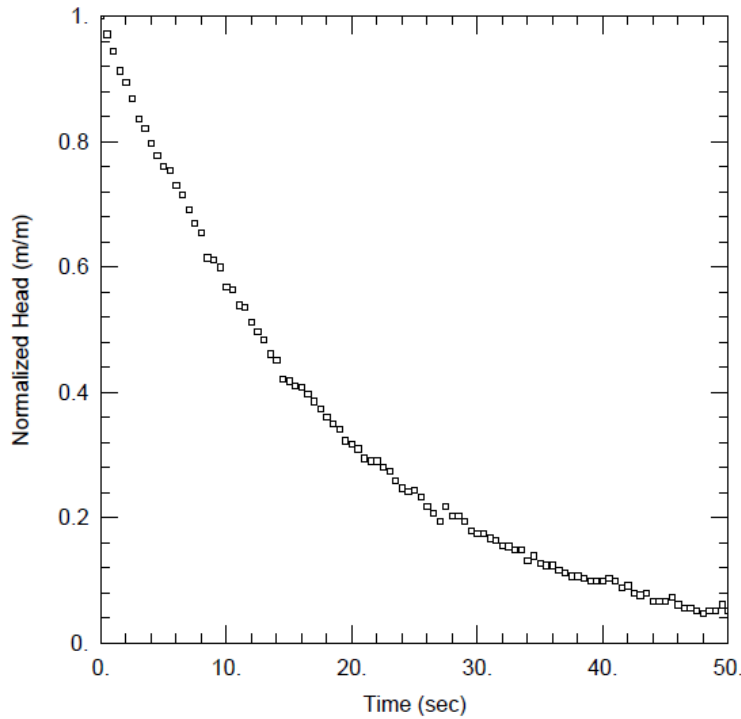
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-24
PREPARED	VRP
DESIGN	VRP
REVIEW	PGM
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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-19B**

PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-36</b>
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

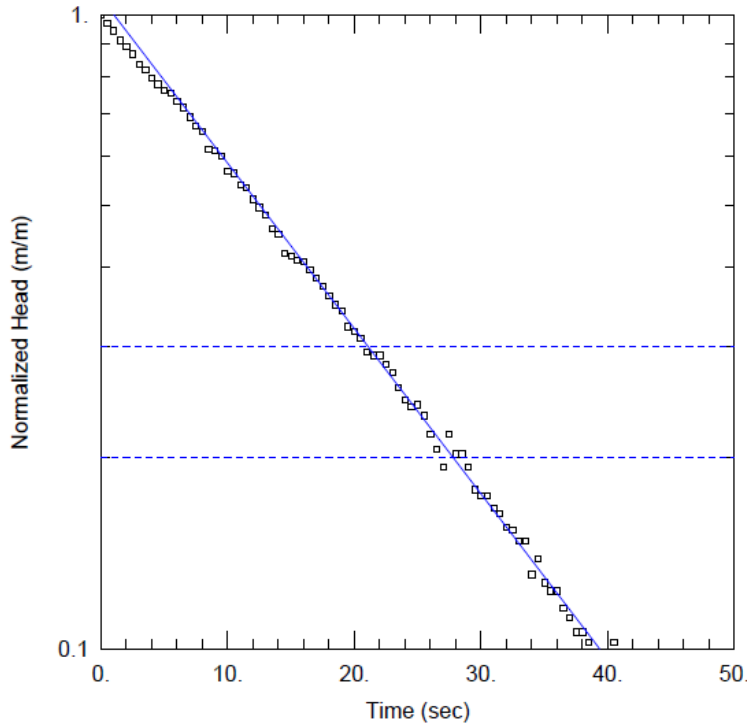


**TEST INFORMATION:**

Test Well: MW20-20A  
 Date of Test: June 24, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: -0.99 mbgs  
 Initial Displacement: 0.53 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 25.33 m to 26.85 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$1 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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PROJECT  
**CALEDON PIT / QUARRY**

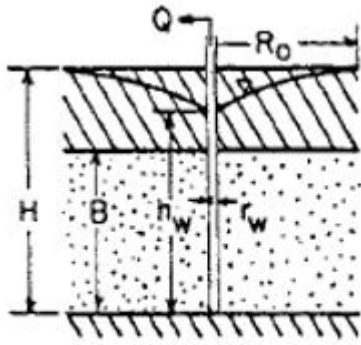
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

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DESIGN	AIM
REVIEW	PGM
APPROVED	###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-20A**

PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-37</b>
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



Radial flow, confined aquifer

$$Q_w = \frac{2\pi KB(H - h_w)}{\ln R_0/r_w}$$

$$R_0 = 3000(H - h)\sqrt{K}$$

Where:

- K = Hydraulic conductivity (m/s)
- Q = Flow rate ( 2.2 L/min;  $3.7 \times 10^{-5} \text{ m}^3/\text{s}$ )
- B = Aquifer thickness, from base of screen ( 12.35 m)
- H = Static groundwater level, from base of screen ( 16.37 m)
- h = Dewatering height, above the base of screen ( 15.62 m)
- $r_w$  = Well Radius (0.013 m)
- $R_0$  = radius of influence ( 4.3 m ).

**TEST INFORMATION:**

Test Well:	MW20-20B
Date of Test:	June 24, 2021
Test Type:	Rising Head Test
Test Method:	Constant Rate
Static Water Level:	-1.88 mbgs
Displacement:	0.75 m
Casing Radius:	0.013 m
Borehole Radius:	0.048 m
Well Screen Interval:	12.97 to 14.49 m
Geology:	Dolostone, Gasport Formation

**SOLUTION:**

Solution Method:	Radial Flow (Powers, 2007)
Aquifer Model:	Confined

**Hydraulic Conductivity (K) =**

**$4 \times 10^{-6} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line

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PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
MONITORING WELL MW20-20B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-38**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

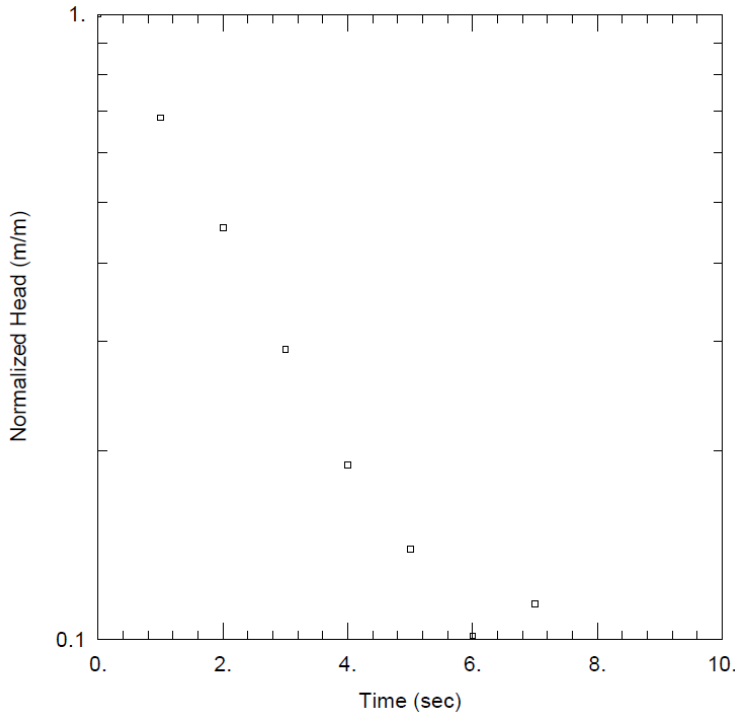
1 in

**TEST INFORMATION:**

Test Well: MW20-20C  
 Date of Test: March 16, 2022  
 Test Type: Rising Head Test  
 Test Method: Bailer Rising Head Test

Static Water Level: 2.74 mbtoc  
 Initial Displacement: 0.08 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.083 m  
 Well Screen Interval: 2.42 to 3.95 m  
 Geology: Gasport Fm

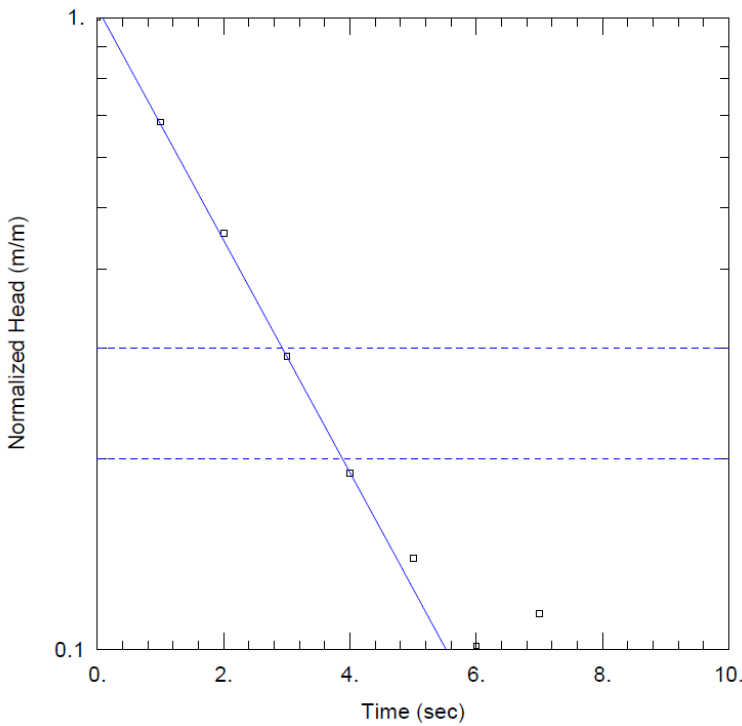


**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$5 \times 10^{-5} \text{ m/s}$**



□ Water Level Measurement  
 — Solution Match Line

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2022-05-02

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-20C**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-39**

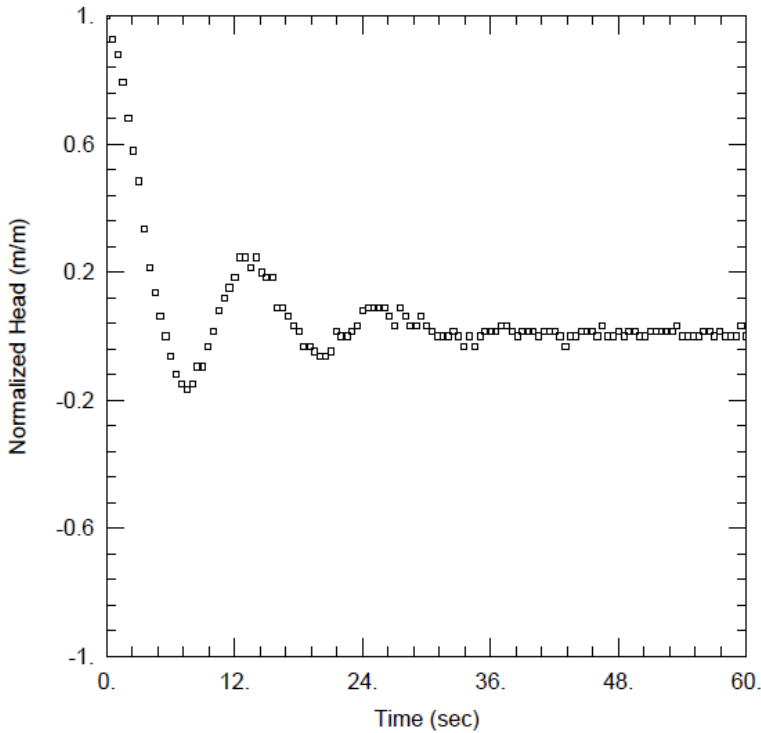
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-21A  
 Date of Test: December 17, 2021  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

Static Water Level: 0.88 mbgs  
 Initial Displacement: 0.13 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 33.27 to 18.63 m  
 Geology: Dolostone, Gasport Fm.

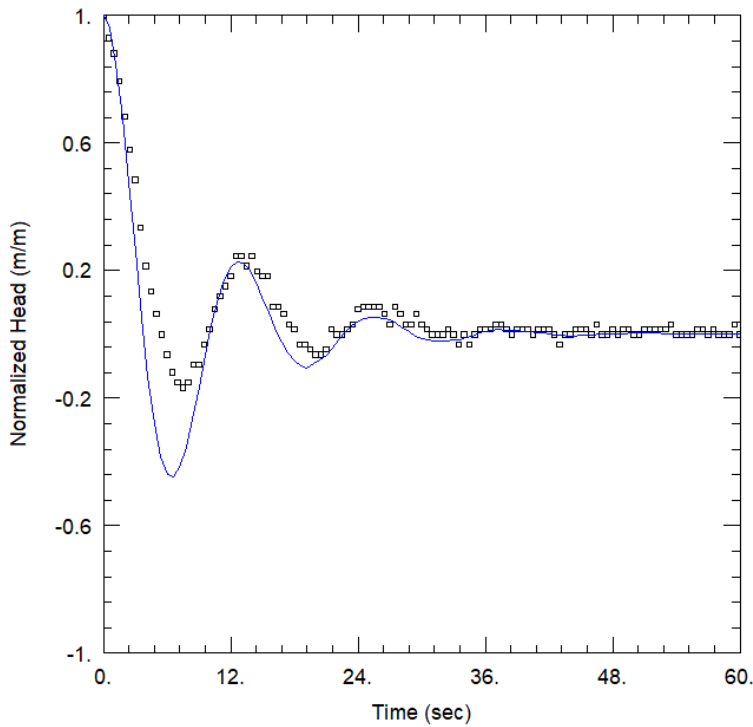


**SOLUTION:**

Solution Method: Butler-Zhan  
 Solution Type: Inertial  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$2 \times 10^{-4} \text{ m/s}$**



□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-01-17

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-21A**



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PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-40**

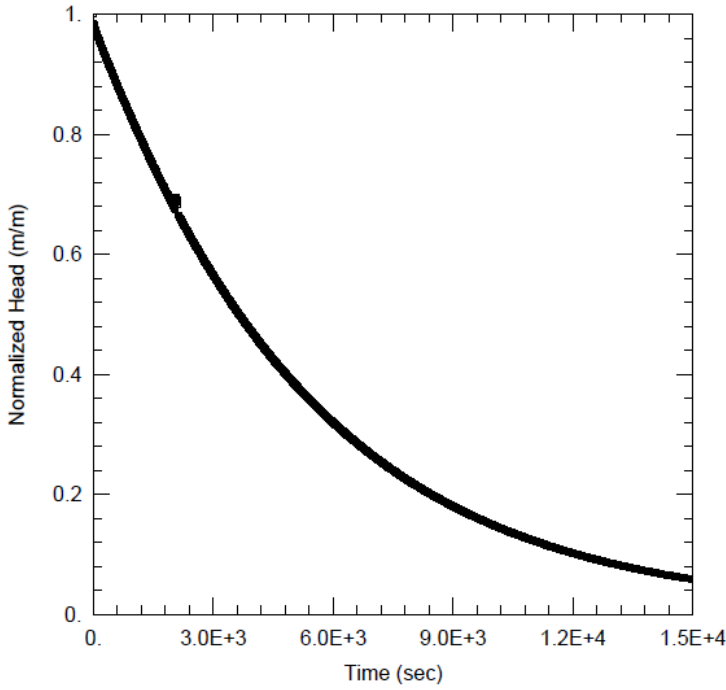


**TEST INFORMATION:**

Test Well: MW20-21B  
 Date of Test: June 28, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

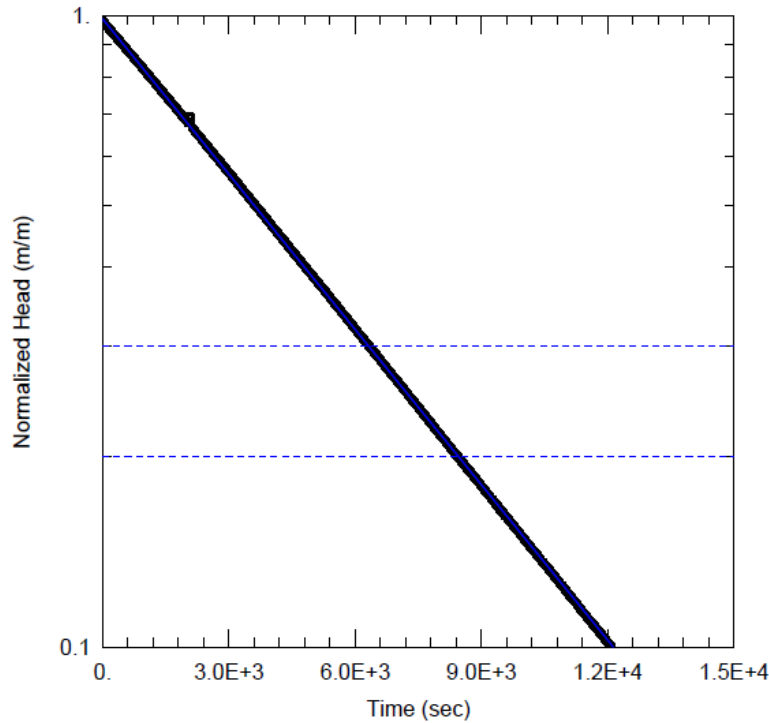
Static Water Level: 1.29 mbgs  
 Initial Displacement: 13.54 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 15.77 m to 17.29 m  
 Geology: Dolostone, Gasport Fm.



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined




Hydraulic Conductivity (K) =

$6 \times 10^{-8} \text{ m/s}$

- Water Level Measurement
- Solution Match Line

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

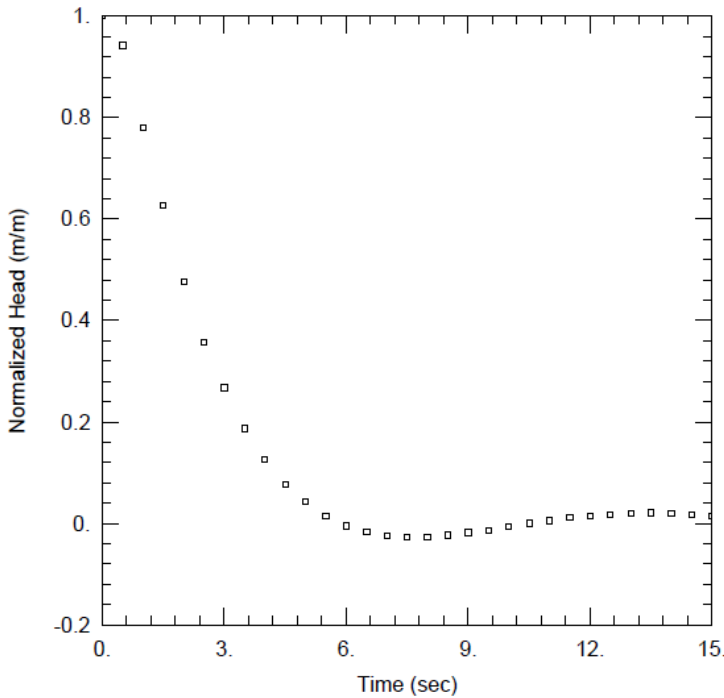
PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
 YYYY-MM-DD 2022-01-24  
 PREPARED AIM  
 DESIGN AIM  
 REVIEW PGM  
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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-21B**

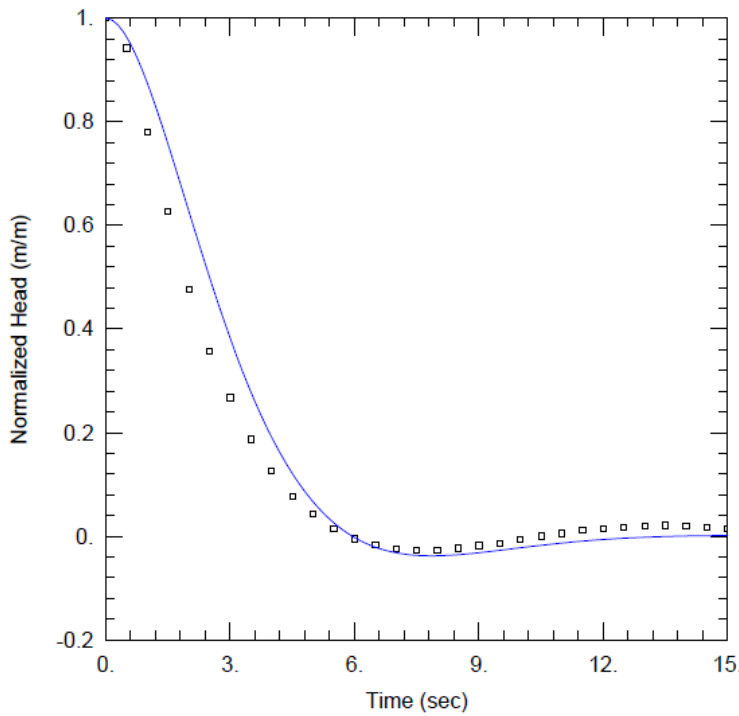
PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-41

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A



**TEST INFORMATION:**

Test Well: MW20-22A  
 Date of Test: December 17, 2021  
 Test Type: Rising Head Test  
 Test Method: Pneumatic  
  
 Static Water Level: -0.16 mbgs  
 Initial Displacement: 1.26 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 23.48 to 25.00 m  
 Geology: Dolostone, Goat Island Fm



**SOLUTION:**

Solution Method: Butler  
 Solution Type: Inertial  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$9 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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PROJECT  
**CALEDON PIT / QUARRY**

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-22A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-42**

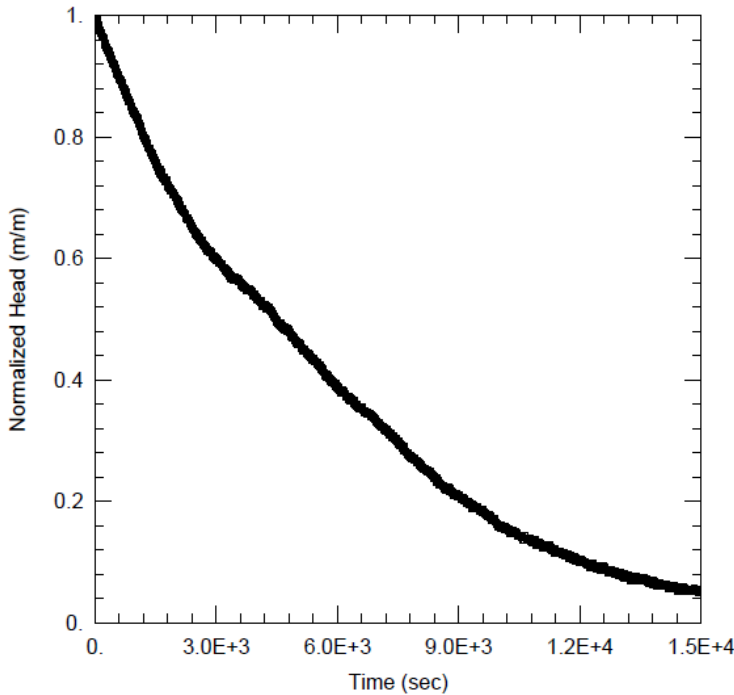
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-22B  
 Date of Test: June 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

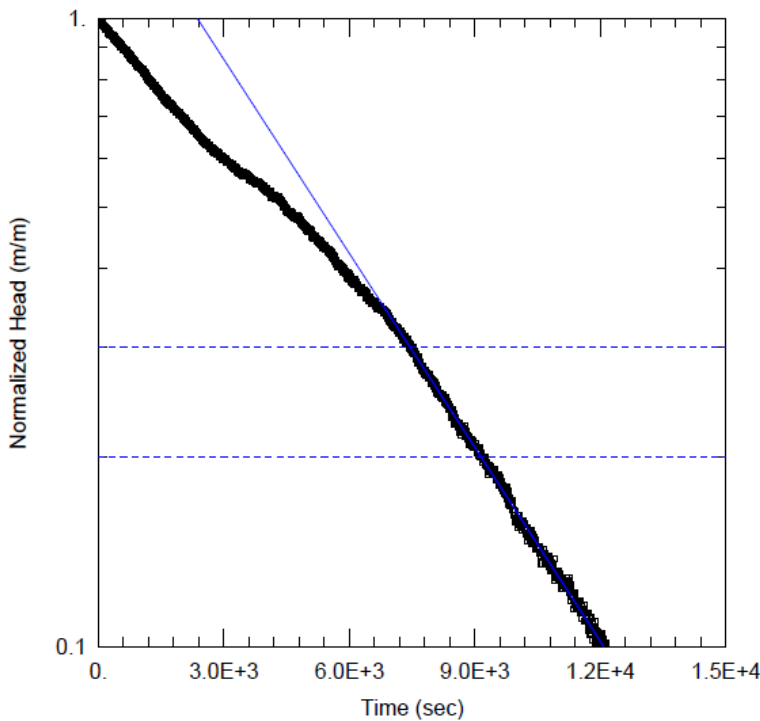
Static Water Level: 6.34 mbgs  
 Initial Displacement: 0.83 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 6.89 m to 8.41 m  
 Geology: Dolostone, Goat Island Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$4 \times 10^{-8} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

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DESIGN	AIM
REVIEW	PGM
APPROVED	###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-22B**

PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-43</b>
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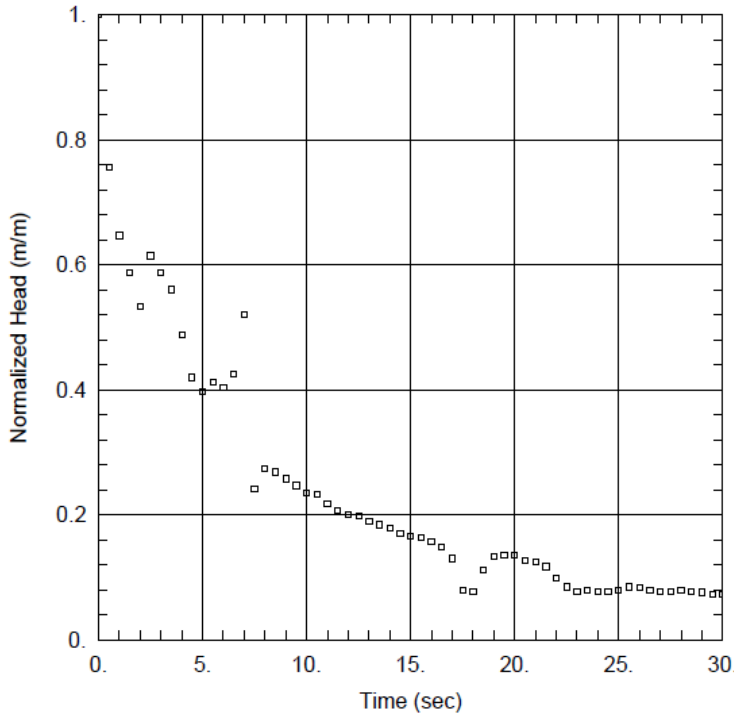
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-23A  
 Date of Test: June 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

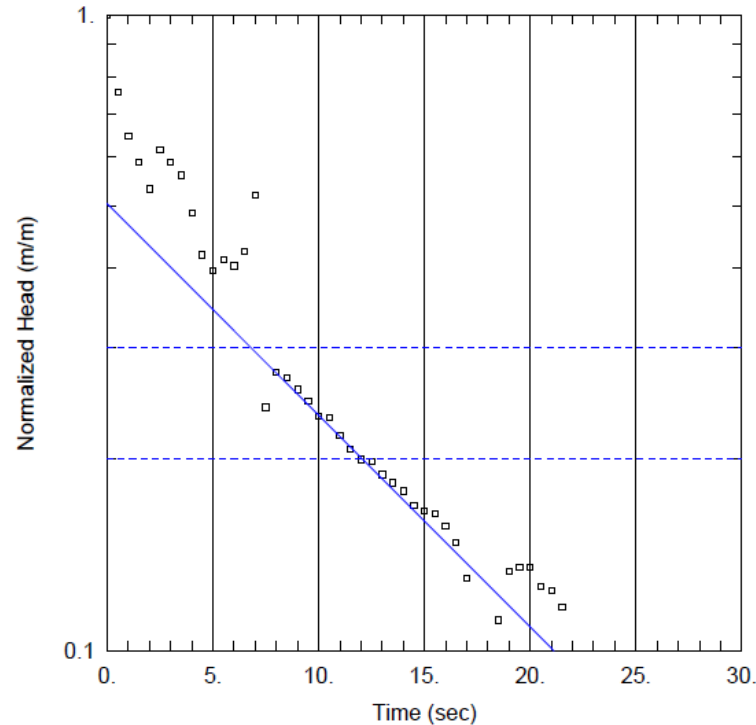
Static Water Level: 3.66 mbgs  
 Initial Displacement: 0.56 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 22.59 m to 24.11 m  
 Geology: Shaley Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
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 PREPARED AIM  
 DESIGN AIM  
 REVIEW PGM  
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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-23A**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-44

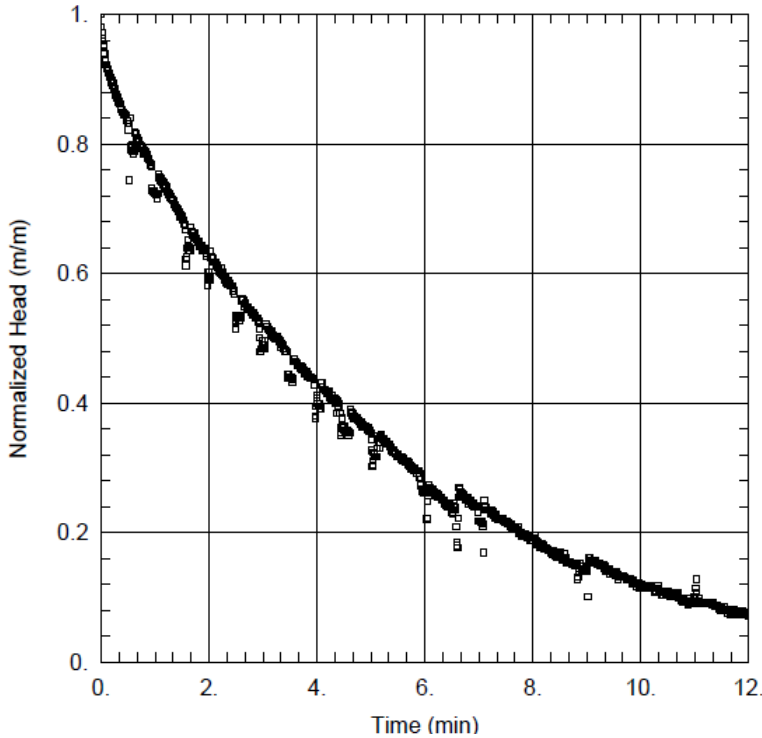
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-23B  
 Date of Test: June 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

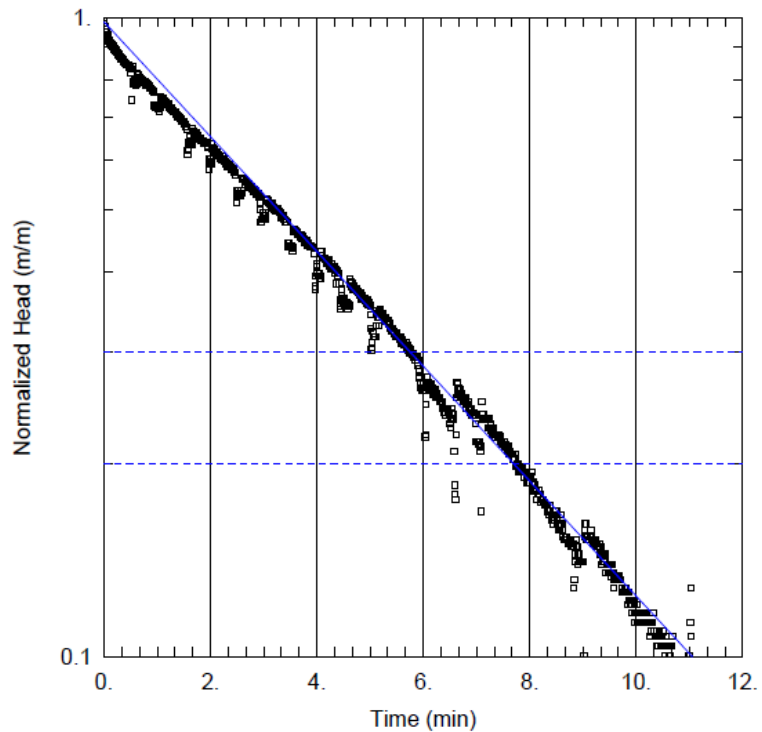
Static Water Level: 3.72 mbgs  
 Initial Displacement: 0.54 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 14.68 m to 16.20 m  
 Geology: Dolostone, Goat Island Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$6 \times 10^{-7} \text{ m/s}$**

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

CONSULTANT



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DESIGN AIM

REVIEW PGM

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PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-23B**

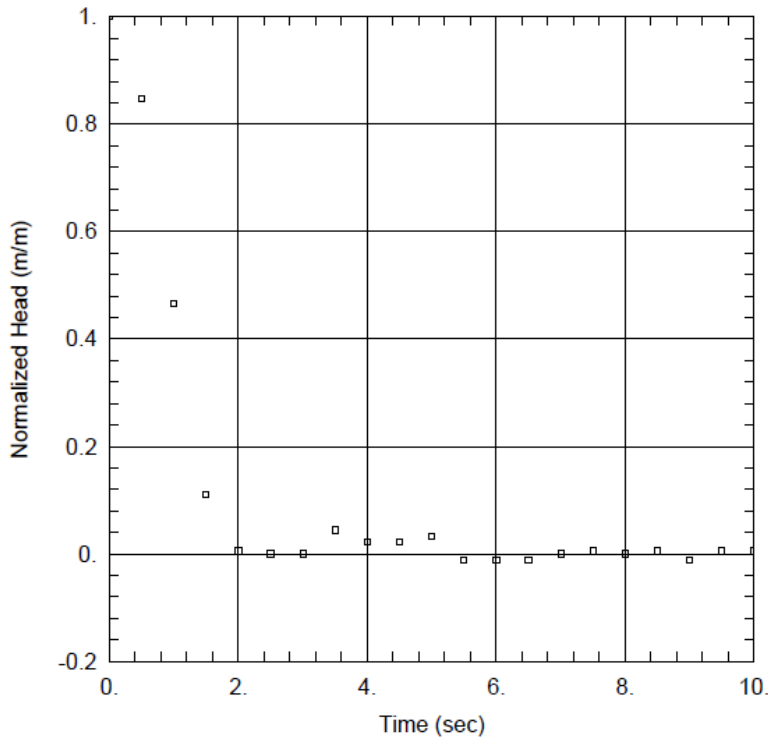
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

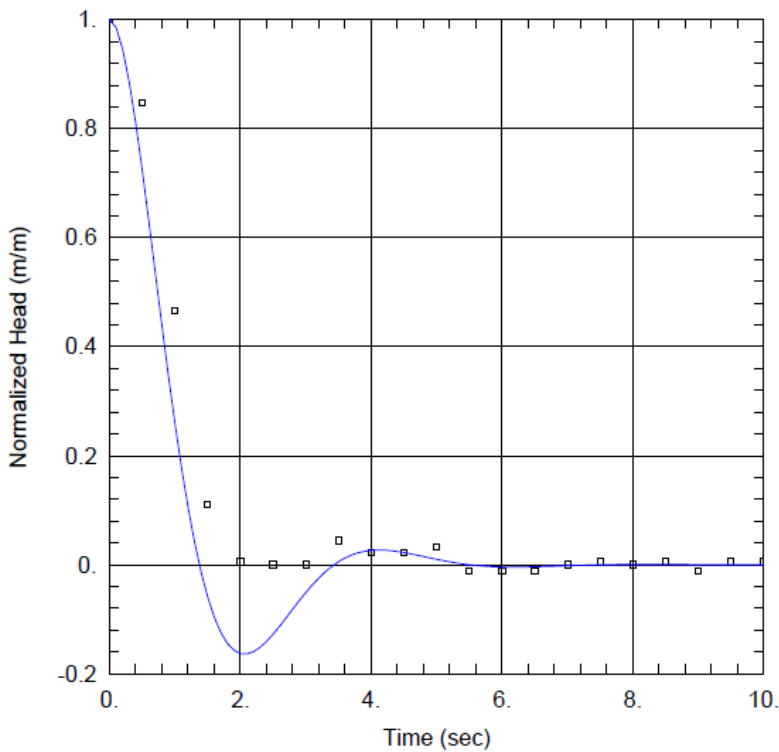
FIGURE  
**G-45**





**TEST INFORMATION:**

Test Well: MW20-23C  
 Date of Test: June 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
  
 Static Water Level: 3.62 mbgs  
 Initial Displacement: 0.18 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.083 m  
 Well Screen Interval: 4.57 m to 6.09 m  
 Geology: Silty Sand Till and Gravel, Overburden



**SOLUTION:**

Solution Method: Springer-Gelhar  
 Solution Type: Inertial  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$5 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2022-01-28  
 PREPARED NU  
 DESIGN AIM  
 REVIEW PGM  
 APPROVED ###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-23C**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-46**

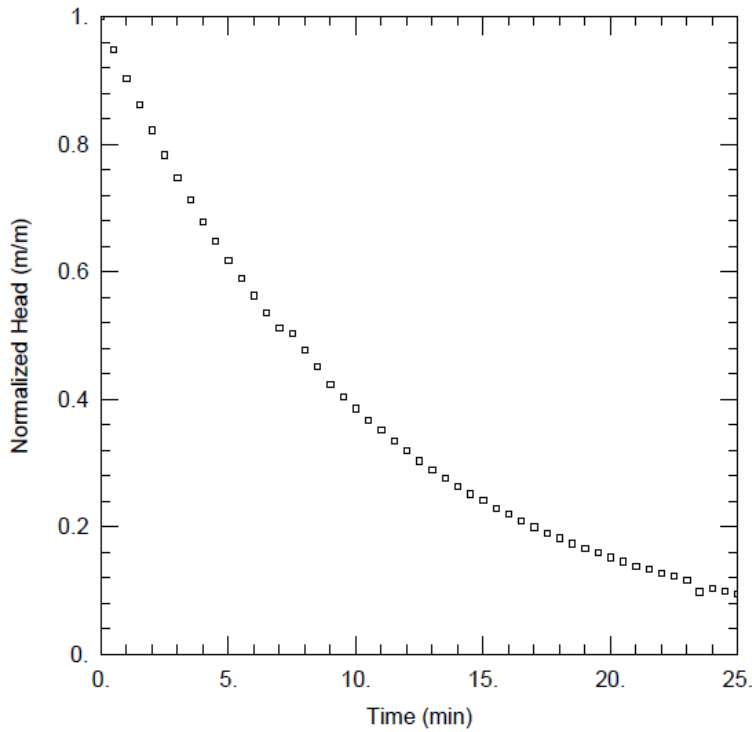
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-24A  
 Date of Test: December 17, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

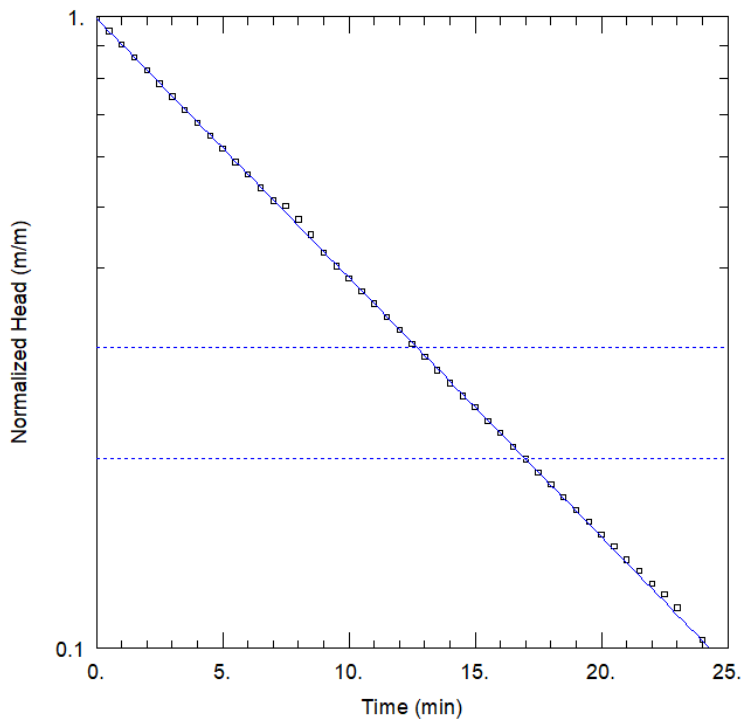
Static Water Level: 2.87 m  
 Initial Displacement: 5.09 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 33.81 to 35.33 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$4 \times 10^{-7} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-01-17

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-24A**



PREPARED PGM  
 DESIGN PGM  
 REVIEW JLH  
 APPROVED

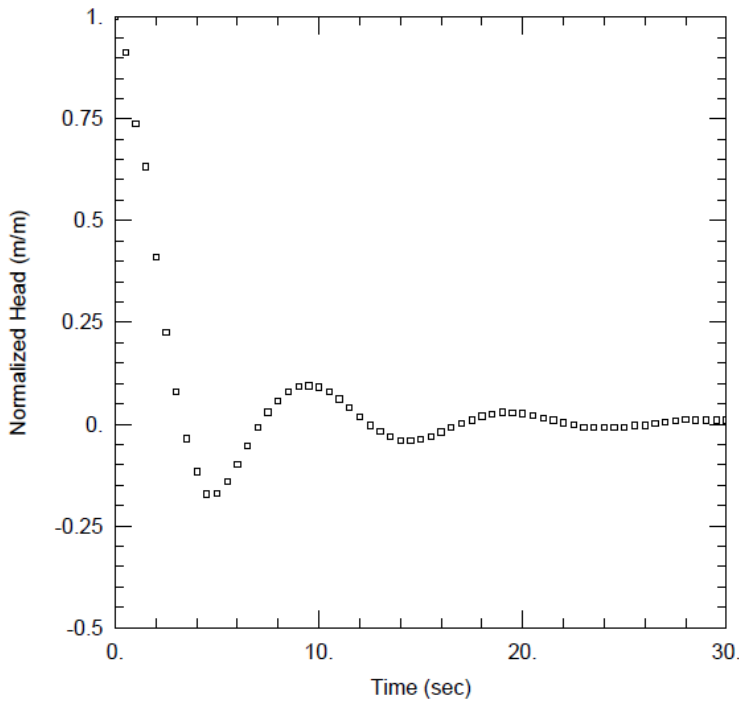
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

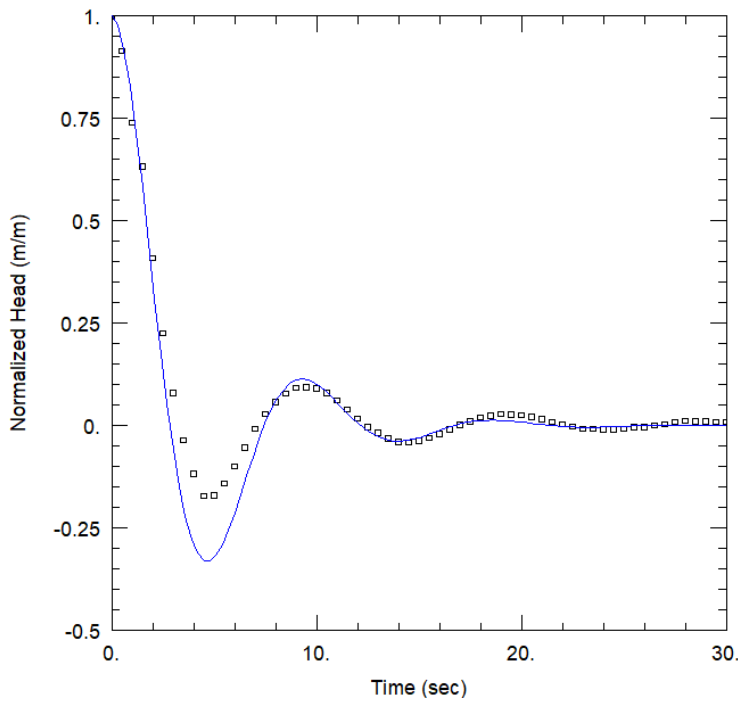
FIGURE  
**G-47**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW20-24B  
 Date of Test: December 17, 2021  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test  
  
 Static Water Level: 2.52 mbgs  
 Initial Displacement: 5.09 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 21.49 to 23.02 m  
 Geology: Dolostone, Goat Island Fm



**SOLUTION:**

Solution Method: Butler-Zhan  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

**Hydraulic Conductivity (K) =**

**$2 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT

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REVIEW JLH

APPROVED

PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
MONITORING WELL MW20-24B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-48**

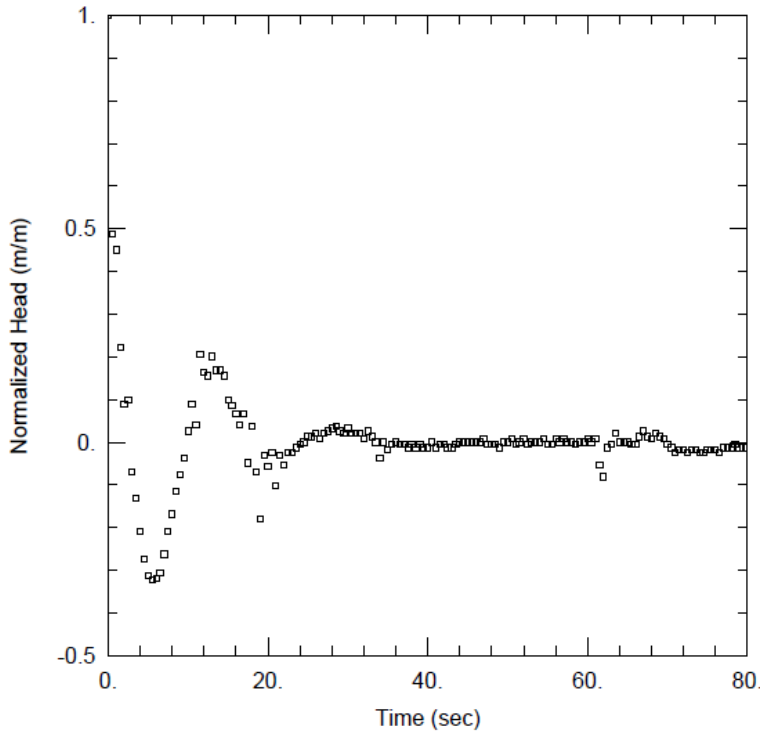
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-25A  
 Date of Test: June 29, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 0.17 mbgs  
 Initial Displacement: 0.47 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 44.03 m to 45.55 m  
 Geology: Dolostone, Gasport Fm

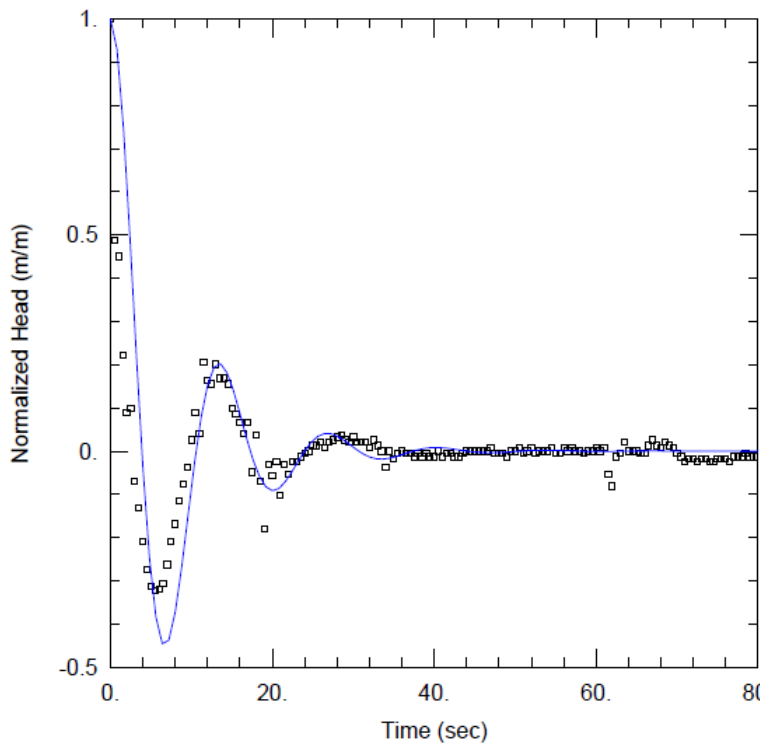


**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Inertial  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$2 \times 10^{-4} \text{ m/s}$**



□ Water Level Measurement  
 — Solution Match Line

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-01-25

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-25A**



PREPARED KB  
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PROJECT No. 19129150 PHASE 2300 Rev. A FIGURE G-49

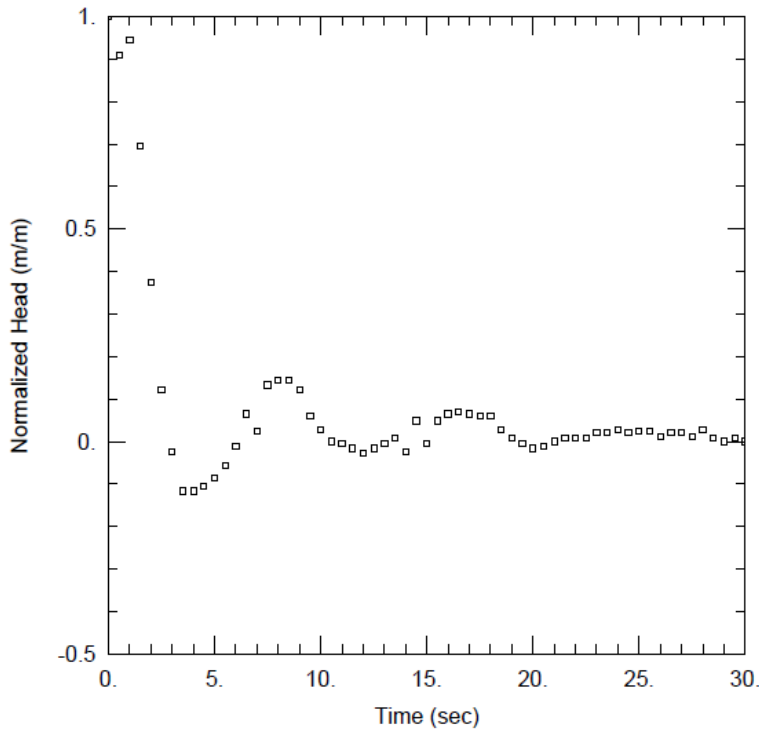
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW20-25B  
 Date of Test: June 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 0.89 mbgs  
 Initial Displacement: 0.25 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 16.84 m to 18.36 m  
 Geology: Dolostone, Goat Island Fm

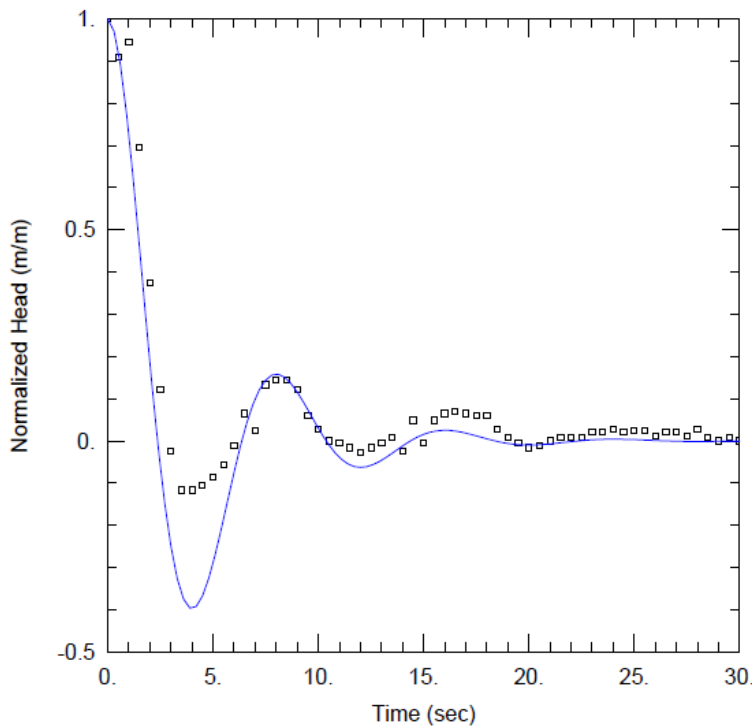


**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Inertial  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$3 \times 10^{-4} \text{ m/s}$**



□ Water Level Measurement  
 — Solution Match Line

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**CALEDON PIT / QUARRY**

CONSULTANT

YYYY-MM-DD 2022-01-25

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DESIGN KB

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APPROVED ###

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-25B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-50**



IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

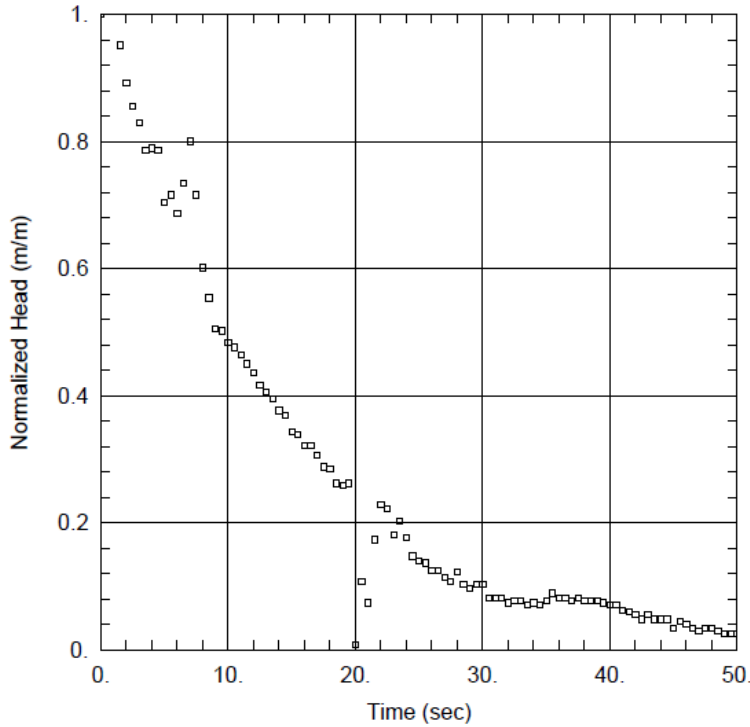


**TEST INFORMATION:**

Test Well: MW20-26A  
 Date of Test: June 28, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 5.28 mbgs  
 Initial Displacement: 0.52 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 55.16 m to 56.68 m  
 Geology: Dolostone, Gasport Fm

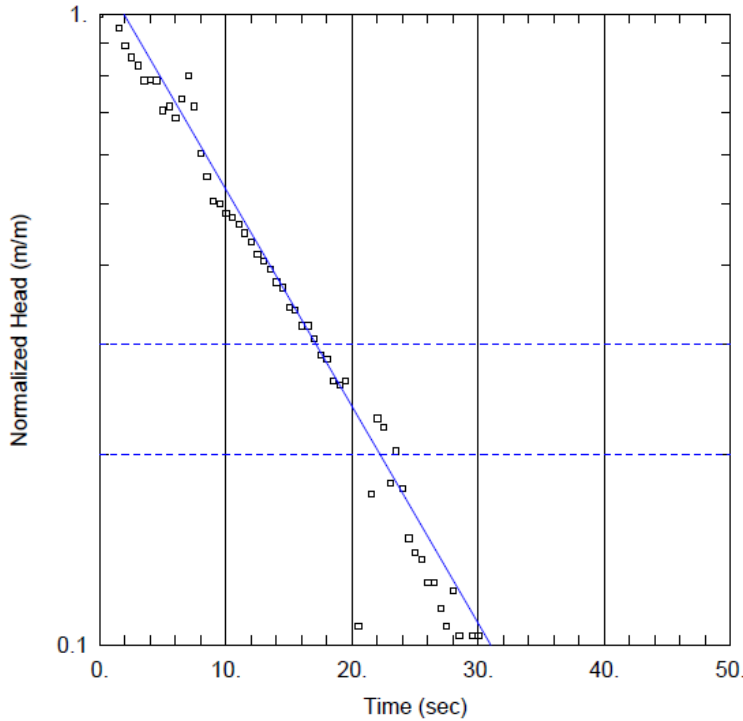


**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**



- Water Level Measurement
- Solution Match Line

CLIENT

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PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-26A**

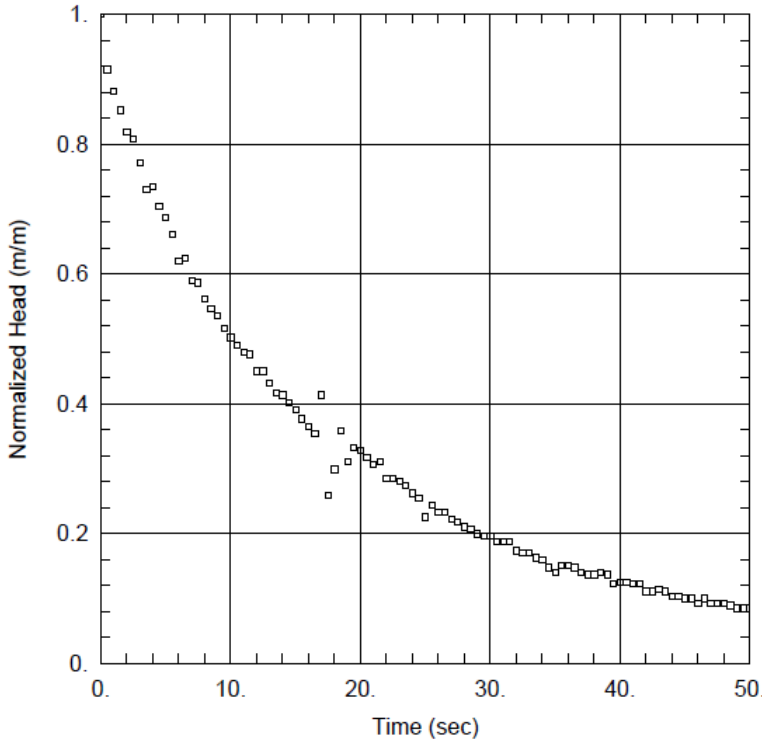
PROJECT No.  
**19129150**

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**2300**

Rev.  
**A**

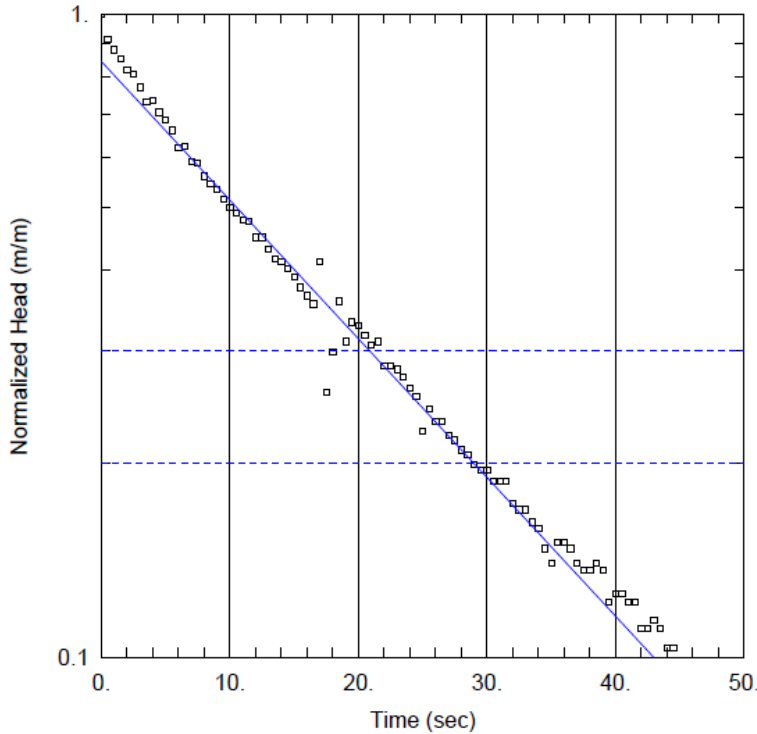
FIGURE  
**G-51**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A



**TEST INFORMATION:**

Test Well: MW20-26B  
 Date of Test: June 28, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
  
 Static Water Level: 5.20 mbgs  
 Initial Displacement: 0.52 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 31.12 m to 32.64 m  
 Geology: Dolostone, Goat Island Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

$1 \times 10^{-5} \text{ m/s}$

CLIENT  
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PROJECT  
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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
MONITORING WELL MW20-26B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-52**

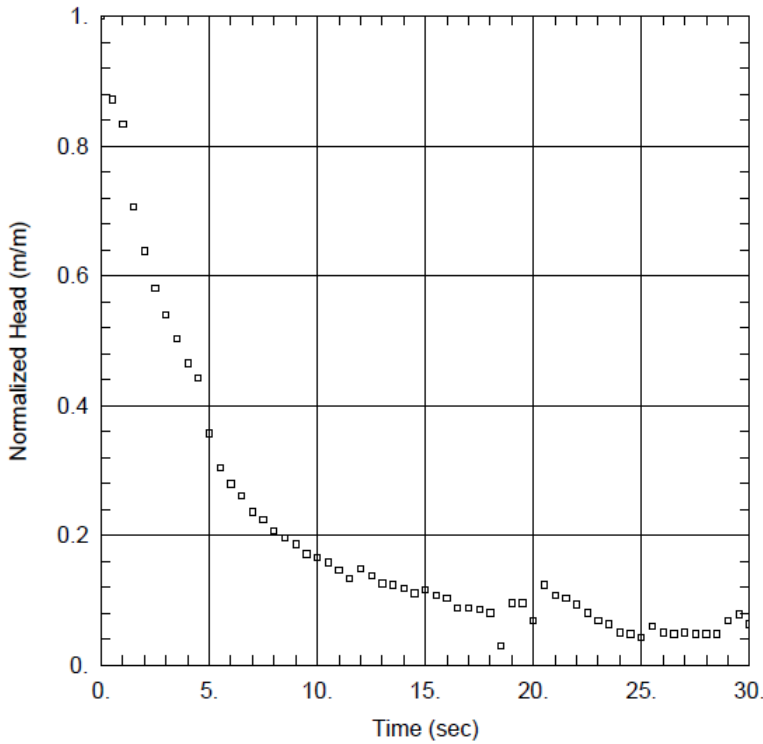
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-26C  
 Date of Test: June 28, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 3.48 mbgs  
 Initial Displacement: 0.40 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 7.26 m to 8.78 m  
 Geology: Silty Sand Till, Overburden

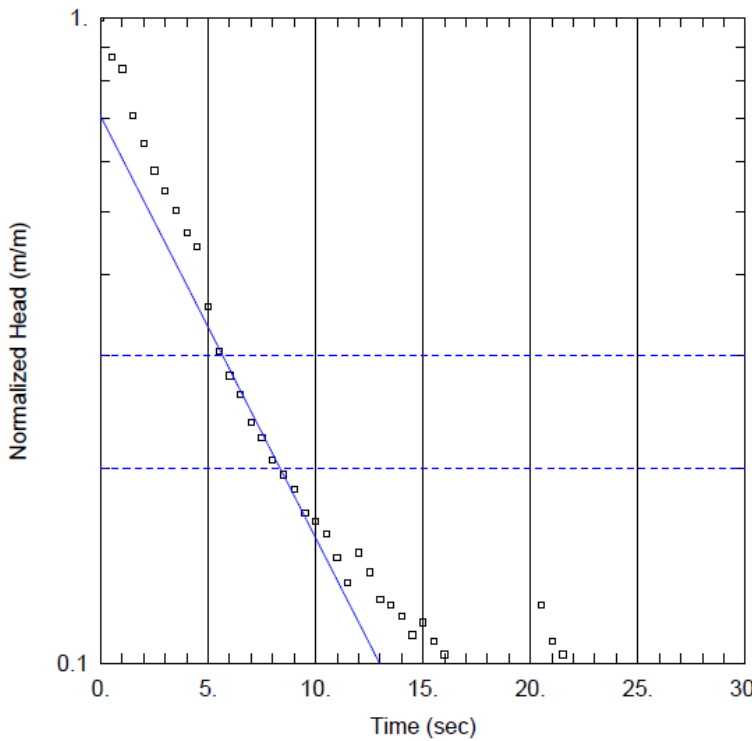


**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**



- Water Level Measurement
- Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD 2022-01-28

PREPARED AIM

DESIGN AIM

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TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-26C**

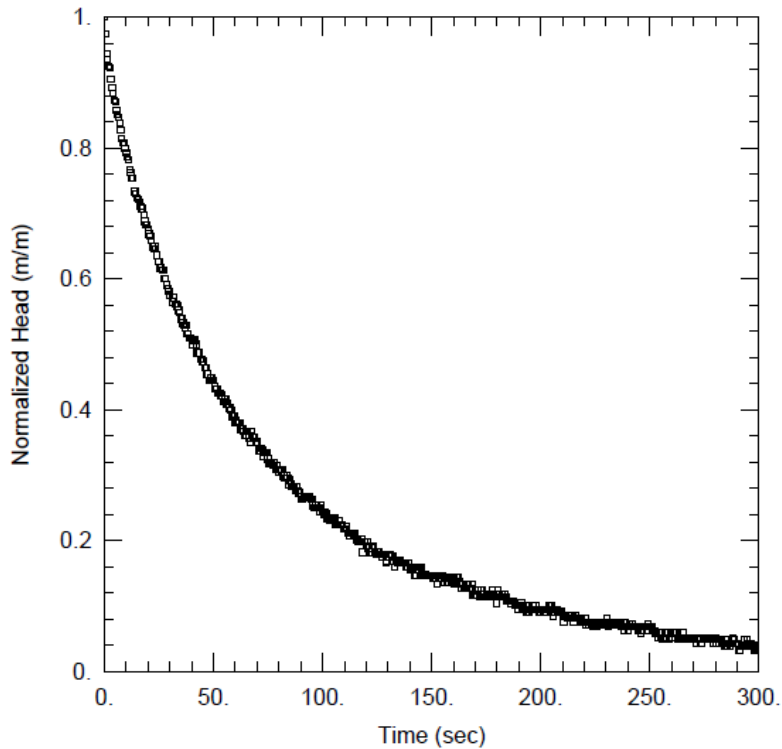
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

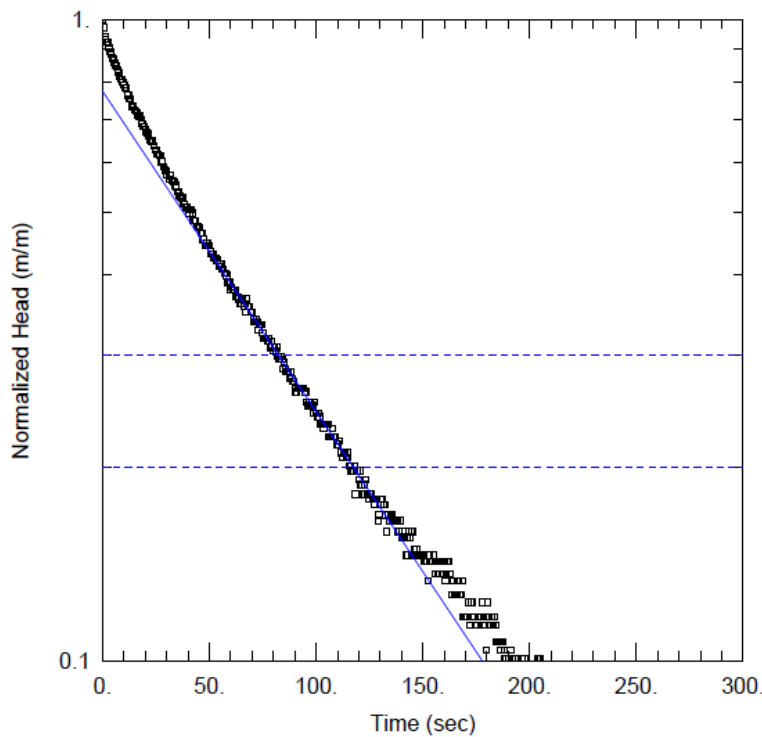
FIGURE  
**G-53**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A



**TEST INFORMATION:**

Test Well: MW20-27A  
 Date of Test: June 24, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
  
 Static Water Level: 7.79 mbgs  
 Initial Displacement: 0.59 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 41.99 m to 43.51 m  
 Geology: Dolostone, Goat Island Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

$2 \times 10^{-6} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-28
PREPARED	KB
DESIGN	KB
REVIEW	PGM
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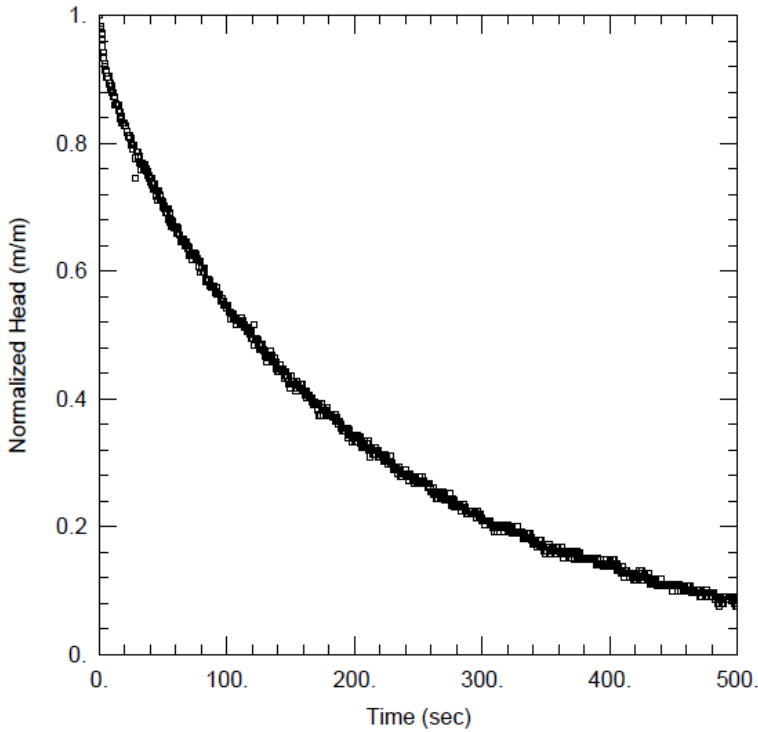
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-27A**

PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-54</b>
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1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

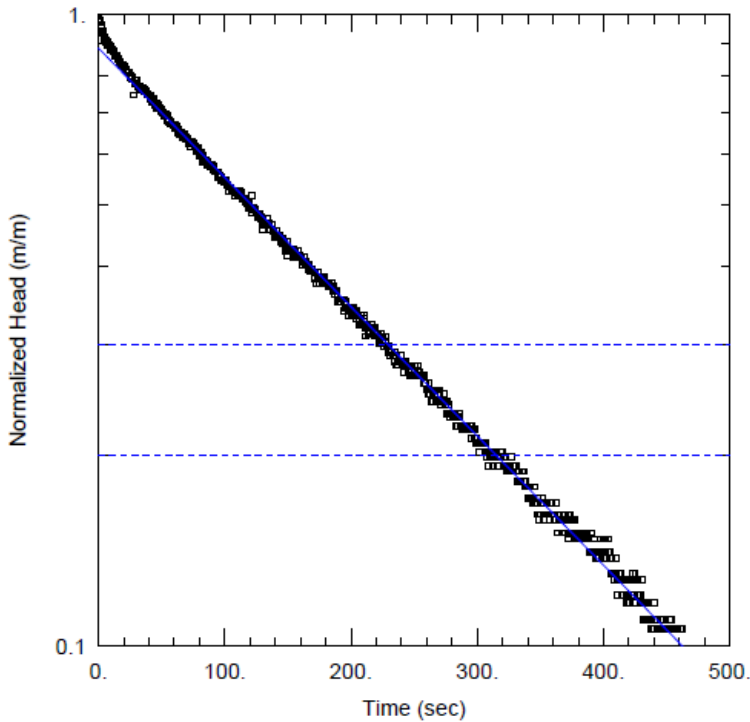
**TEST INFORMATION:**

Test Well: MW20-27B  
 Date of Test: June 24, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
  
 Static Water Level: 7.88 mbgs  
 Initial Displacement: 0.56 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 33.85 m to 35.37 m  
 Geology: Dolostone, Goat Island Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



□ Water Level Measurement  
 — Solution Match Line

Hydraulic Conductivity (K) =

**$9 \times 10^{-7} \text{ m/s}$**

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PROJECT  
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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
MONITORING WELL MW20-27B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-55**



IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

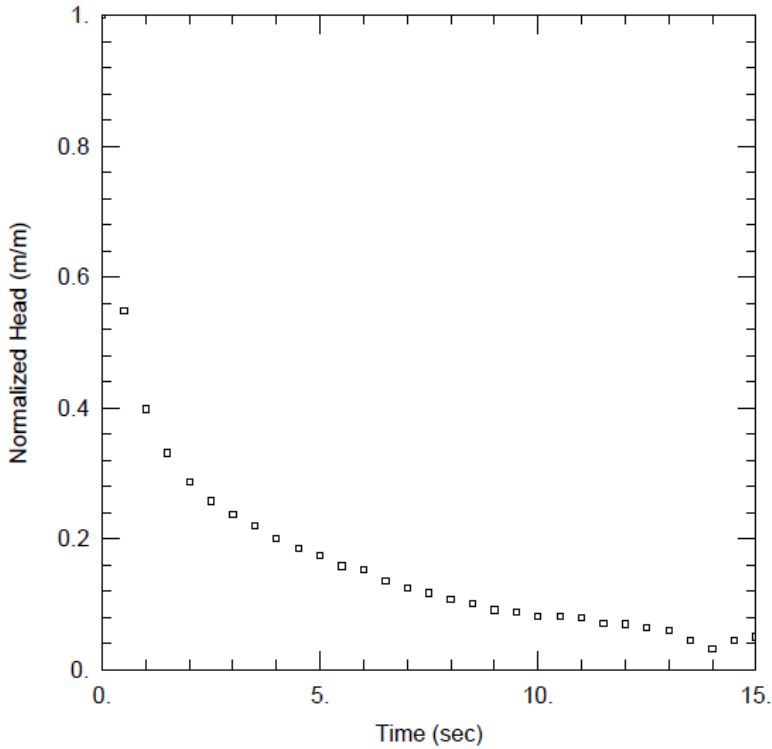


**TEST INFORMATION:**

Test Well: MW20-28A  
 Date of Test: June 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

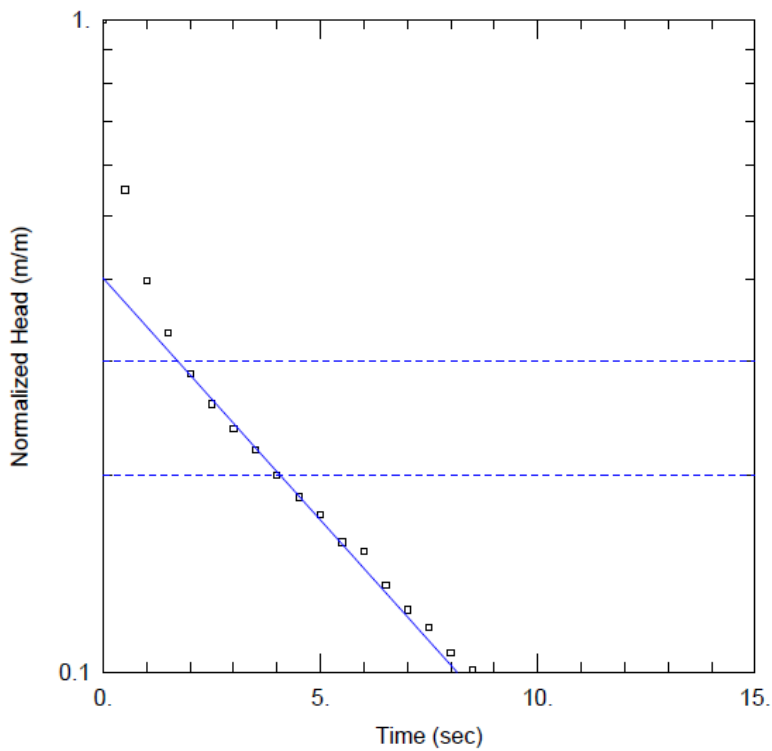
Static Water Level: 1.31 mbgs  
 Initial Displacement: 0.80 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 24.07 m to 25.59 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$3 \times 10^{-5} \text{ m/s}$**

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**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW20-28A**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-56**

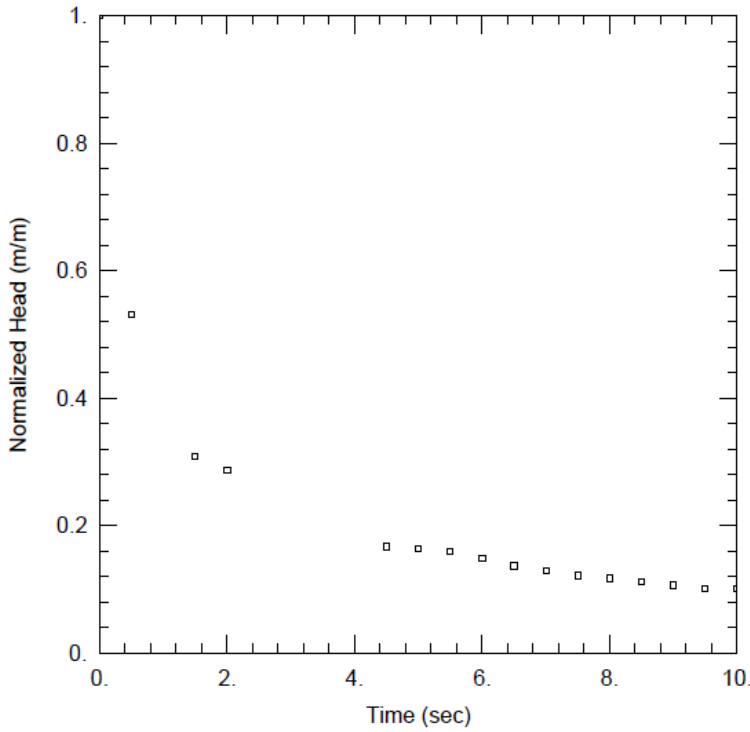
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MW20-28B  
 Date of Test: June 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

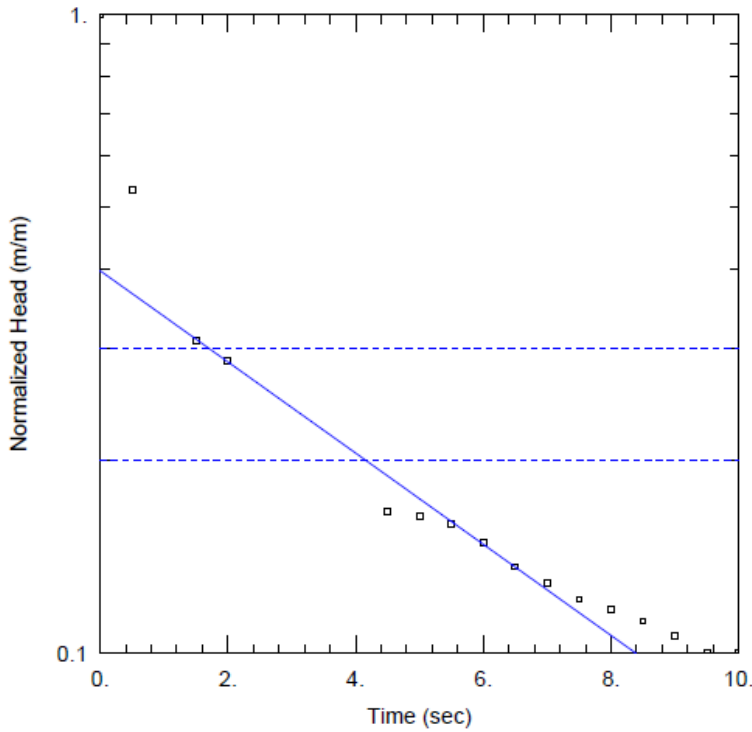
Static Water Level: 1.24 mbgs  
 Initial Displacement: 0.66 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.048 m  
 Well Screen Interval: 16.51 m to 18.03 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$3 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT	YYYY-MM-DD	2022-01-31
	PREPARED	KB
	DESIGN	KB
	REVIEW	PGM
	APPROVED	###

TITLE	<b>SINGLE WELL RESPONSE TEST ANALYSIS MONITORING WELL MW20-28B</b>		
PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	<b>G-57</b>

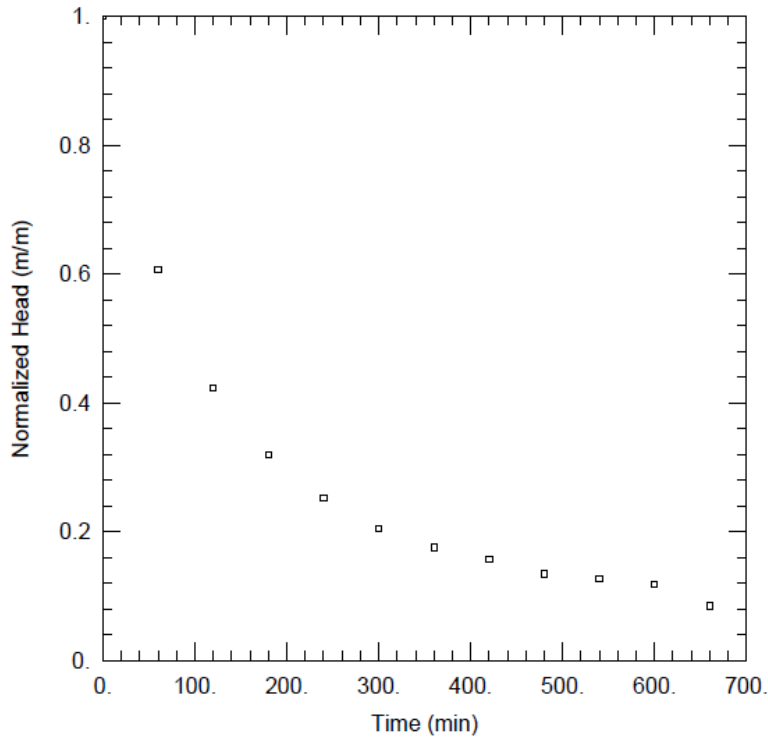
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: PW21-1  
 Date of Test: September 14, 2021  
 Test Type: Rising Head Test  
 Test Method: Recovery following short duration pumping

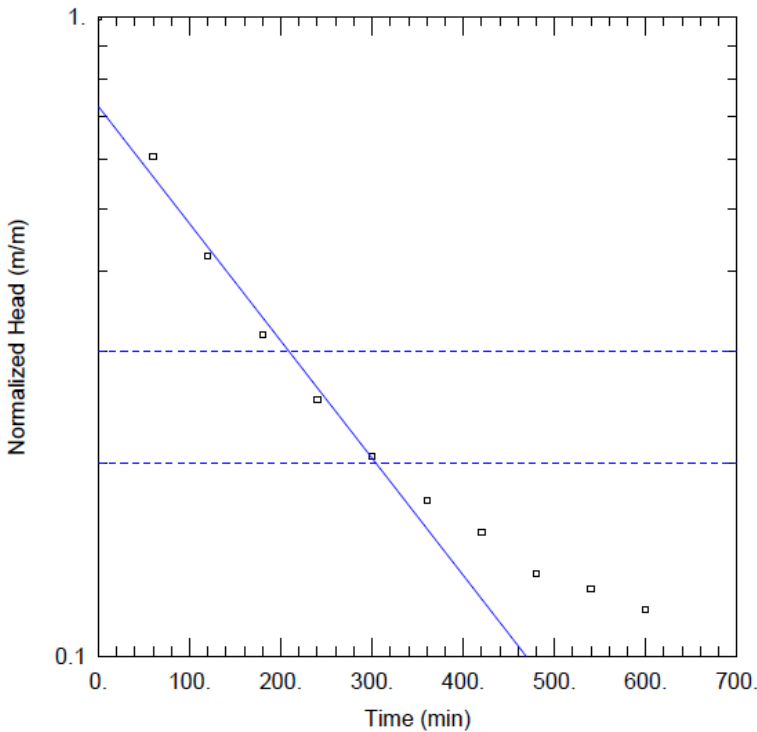
Static Water Level: 2.97 mbgs  
 Initial Displacement: 0.92 m

Casing Radius: 0.069 m  
 Borehole Radius: 0.062 m  
 Open BH Interval: 12.19 m to 38.41 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$1 \times 10^{-7} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

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TITLE

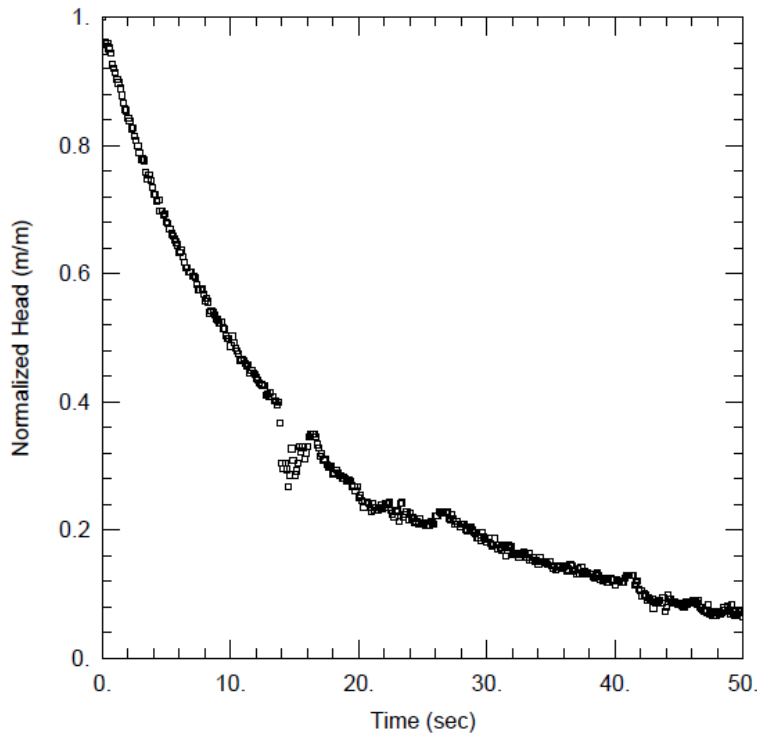
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL PW21-1**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-58**

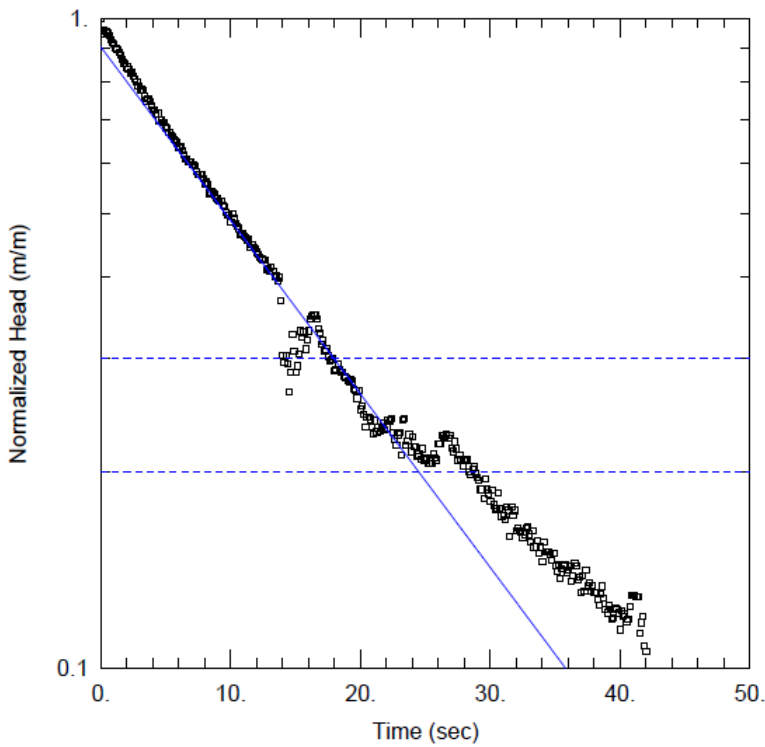


**TEST INFORMATION:**

Test Well: MW21-1-1  
 Date of Test: August 25, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 3.20 mbgs  
 Initial Displacement: 0.14 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 11.60 m to 34.40 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$4 \times 10^{-6} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-1-1**

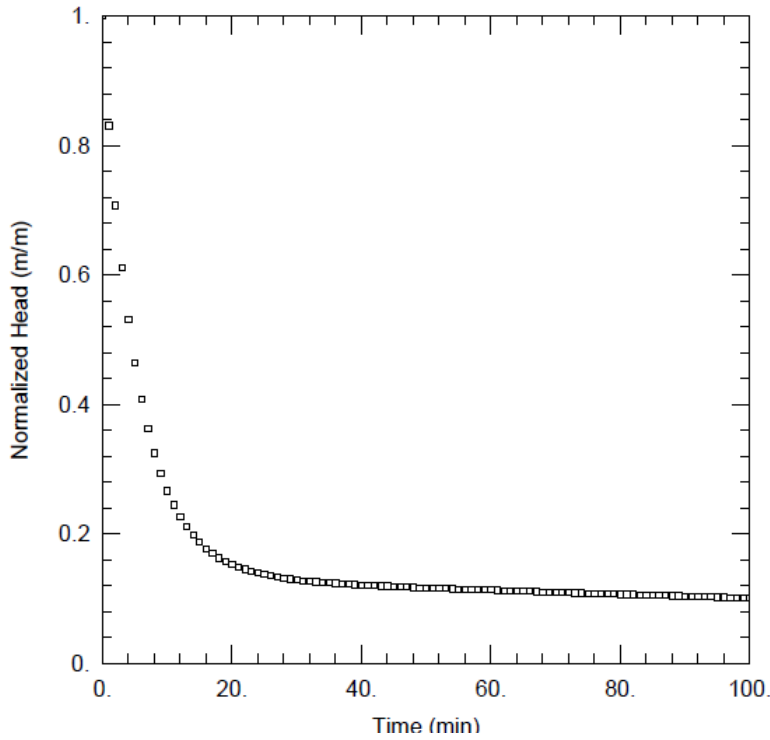
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-59**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

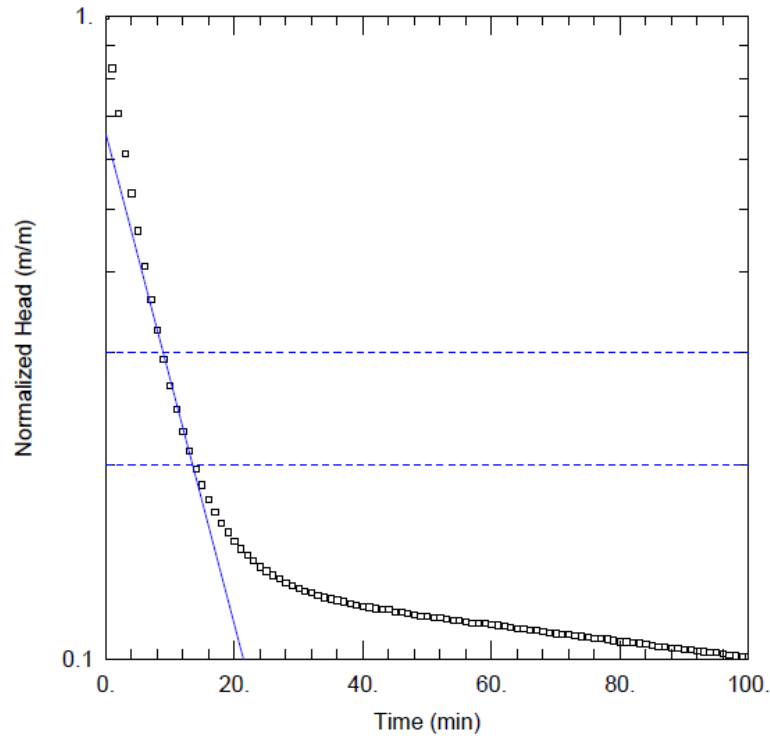


**TEST INFORMATION:**

Test Well: MW21-1-2  
 Date of Test: August 26, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

Static Water Level: 7.65 mbgs  
 Initial Displacement: 4.45 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 13.40 m to 34.70 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$8 \times 10^{-8} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT

YYYY-MM-DD 2022-01-29

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-1-2**



PREPARED AIM  
 DESIGN AIM  
 REVIEW PGM  
 APPROVED ###

PROJECT No.  
**19129150**

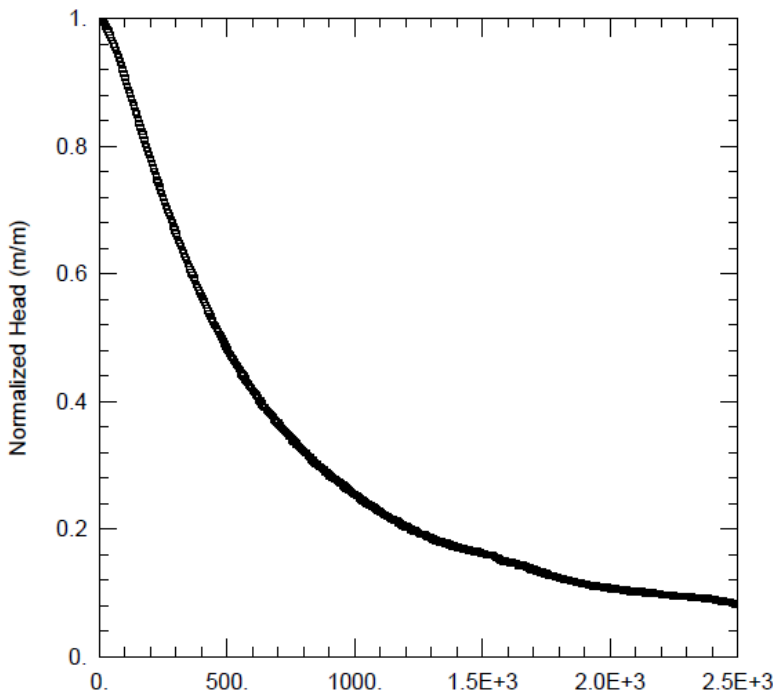
PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-60**

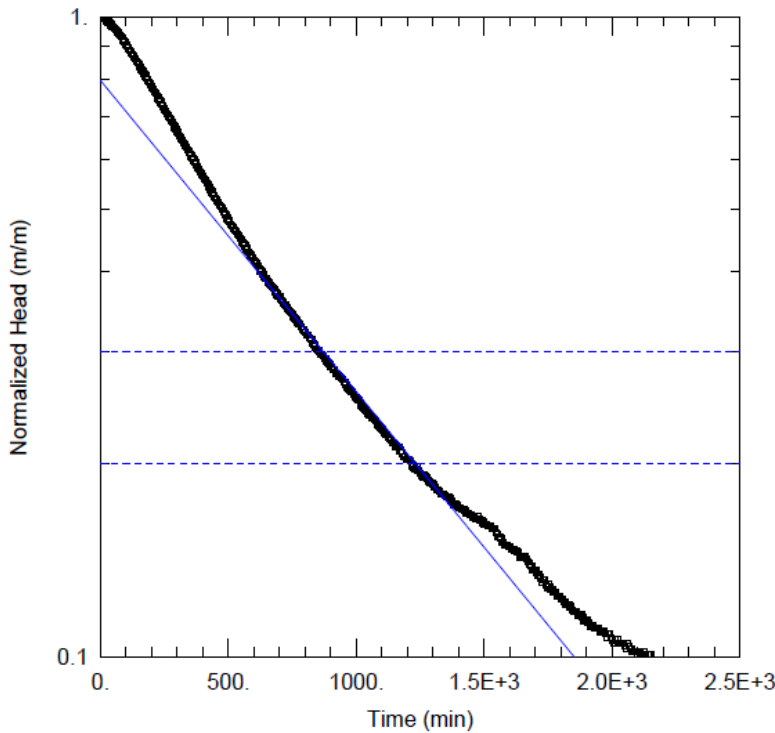
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A





**TEST INFORMATION:**

Test Well: MW21-1-3  
 Date of Test: September 24, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
  
 Static Water Level: 6.52 mbgs  
 Initial Displacement: 2.85 m  
  
 Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 9.10 m to 35.10 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

$1 \times 10^{-7} \text{ m/s}$

- Water Level Measurement
- Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

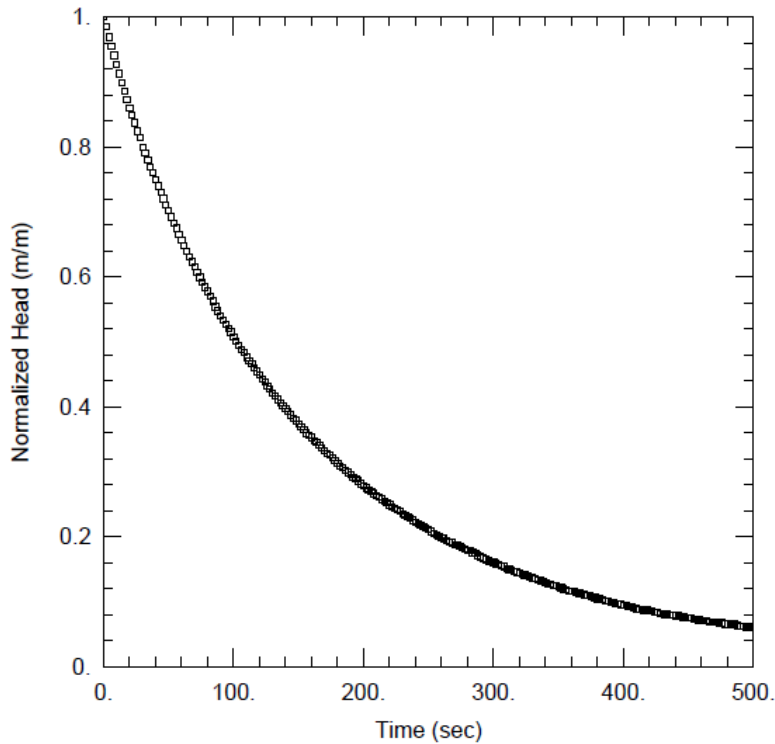
CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-29
PREPARED	AIM
DESIGN	AIM
REVIEW	PGM
APPROVED	###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-1-3**

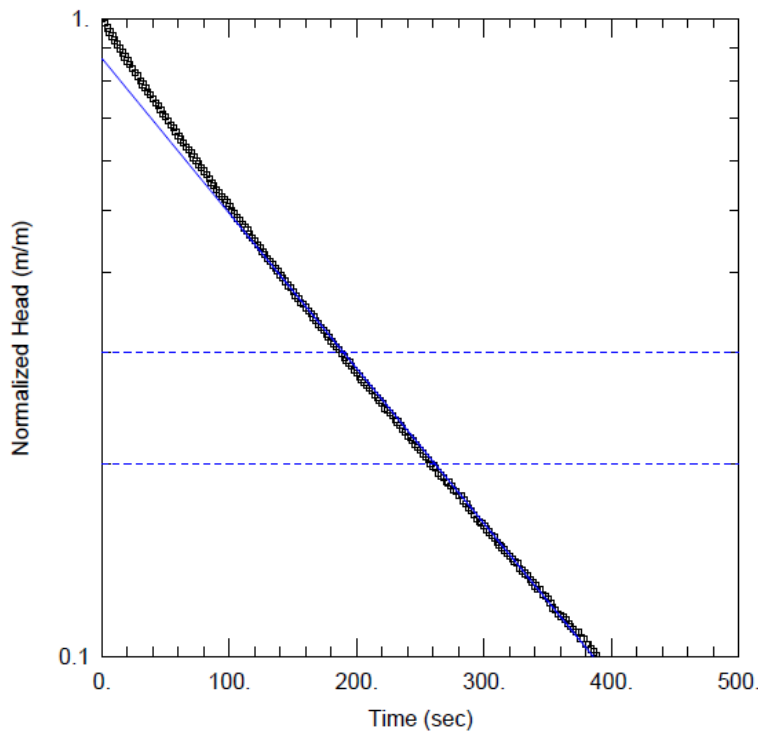
PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-61</b>
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A



**TEST INFORMATION:**

Test Well: MW21-1-4  
 Date of Test: September 29, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
  
 Static Water Level: 4.78 mbgs  
 Initial Displacement: 2.61 m  
  
 Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 13.10 m to 32.90 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

$4 \times 10^{-7} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT

YYYY-MM-DD 2022-01-29

PREPARED AIM

DESIGN AIM

REVIEW PGM

APPROVED ###

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-1-4**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-62**



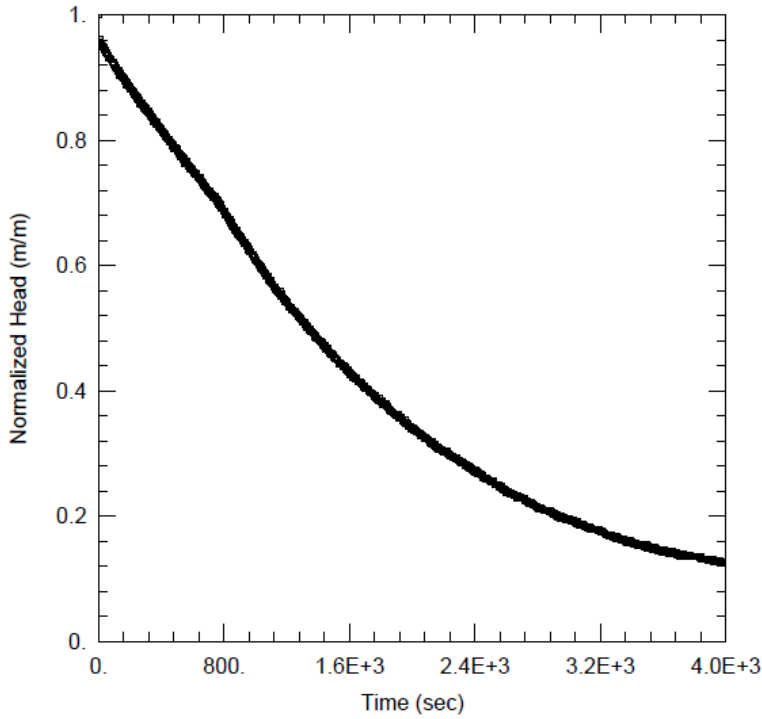
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: PW21-2  
 Date of Test: September 29, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

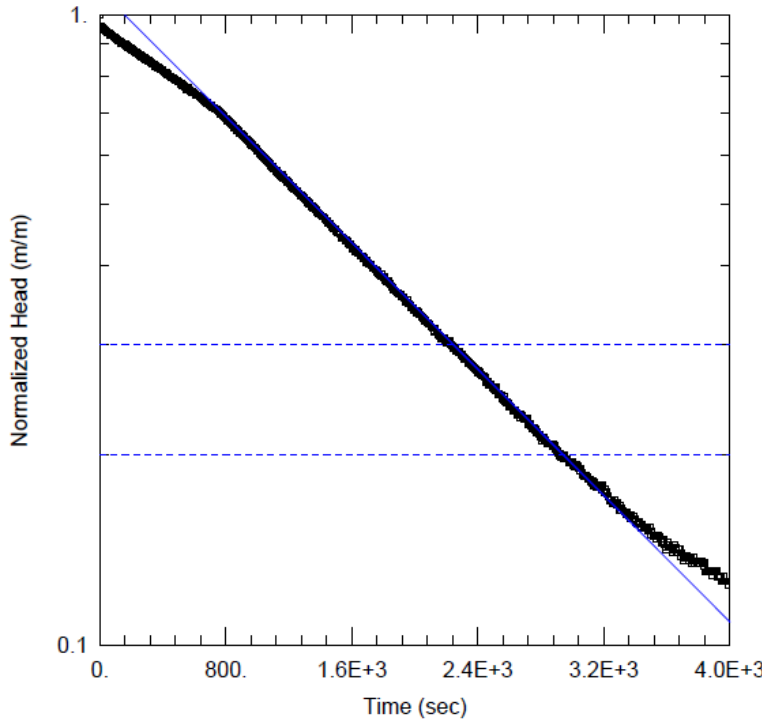
Static Water Level: 5.52 mbgs  
 Initial Displacement: 1.06 m

Casing Radius: 0.069 m  
 Borehole Radius: 0.062 m  
 Open BH Interval: 12.19 m to 25.15 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$5 \times 10^{-7} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

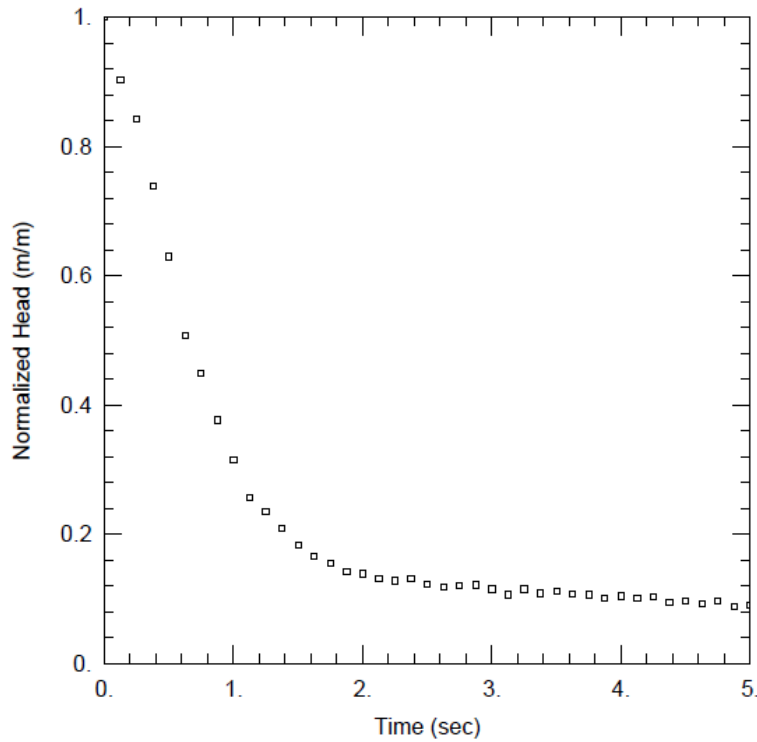
PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
 YYYY-MM-DD 2022-01-31  
 PREPARED AIM  
 DESIGN AIM  
 REVIEW PGM  
 APPROVED ###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL PW21-2**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-63

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

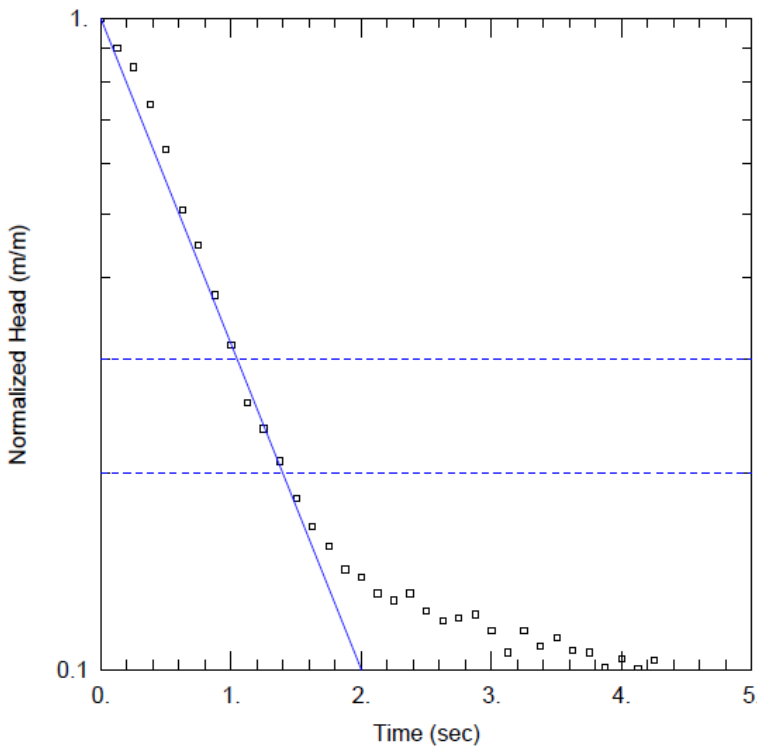


**TEST INFORMATION:**

Test Well: MW21-2-1  
 Date of Test: August 27, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 6.20 mbgs  
 Initial Displacement: 0.21 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 6.70 m to 22.00 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
 YYYY-MM-DD 2022-01-29  
 PREPARED KB  
 DESIGN KB  
 REVIEW PGM  
 APPROVED ###

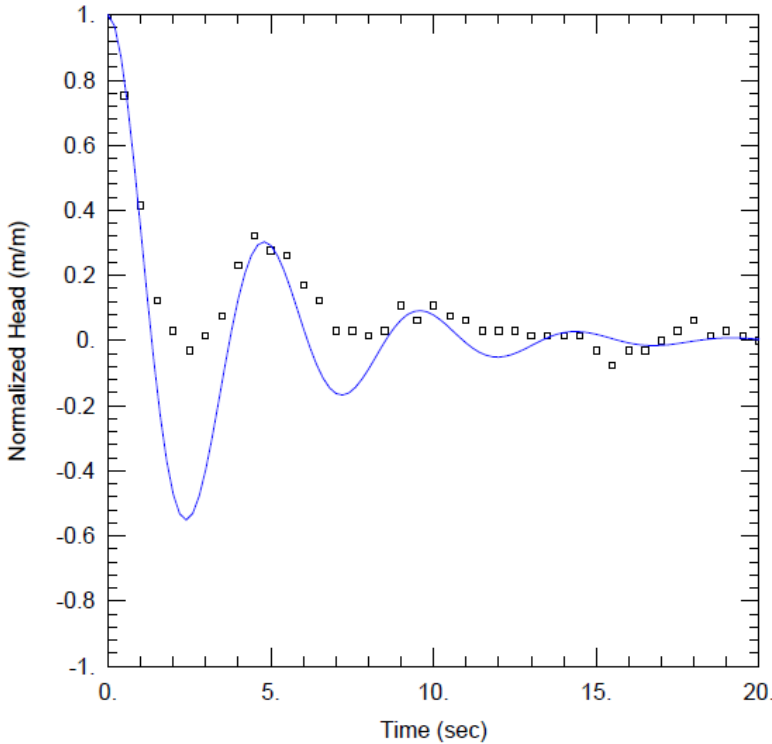
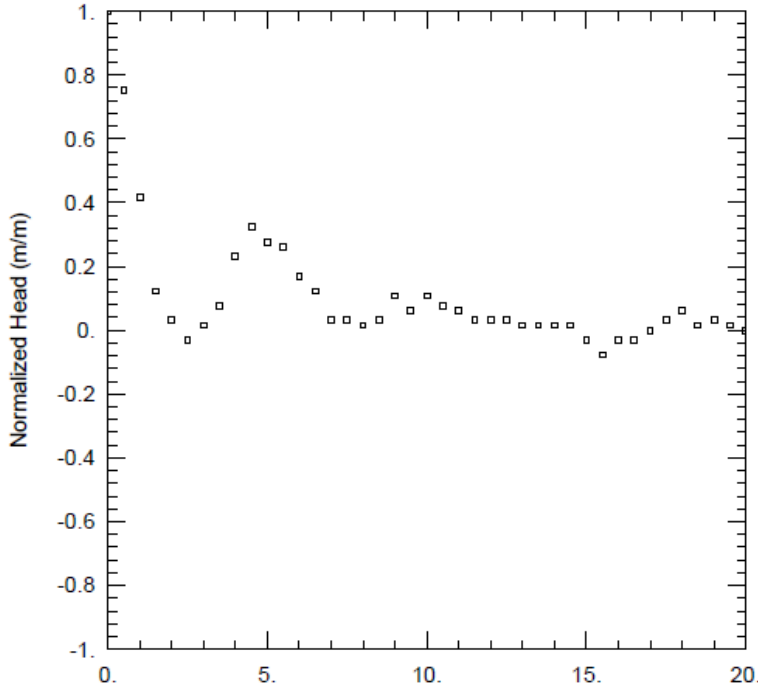
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-2-1**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-64

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW21-2-2  
 Date of Test: December 9, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
 Static Water Level: 5.12 mbgs  
 Initial Displacement: 0.07 m  
 Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 7.00 m to 19.20 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Butler  
 Solution Type: Inertial  
 Aquifer Model: Confined

**Hydraulic Conductivity (K) =**

**$5 \times 10^{-4} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-29
PREPARED	KB
DESIGN	AIM
REVIEW	PGM
APPROVED	###

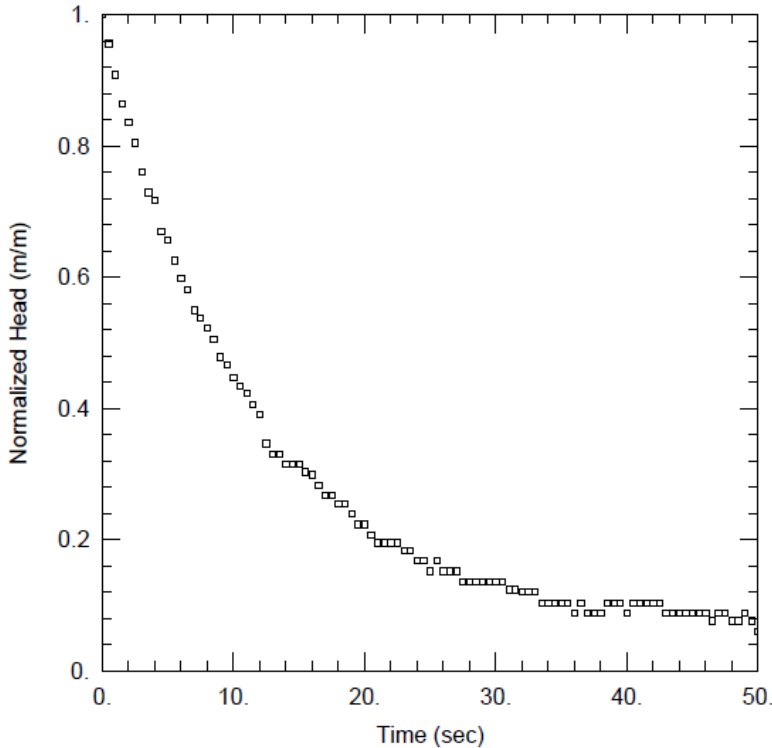
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-2-2**

PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	G-65

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

1 in



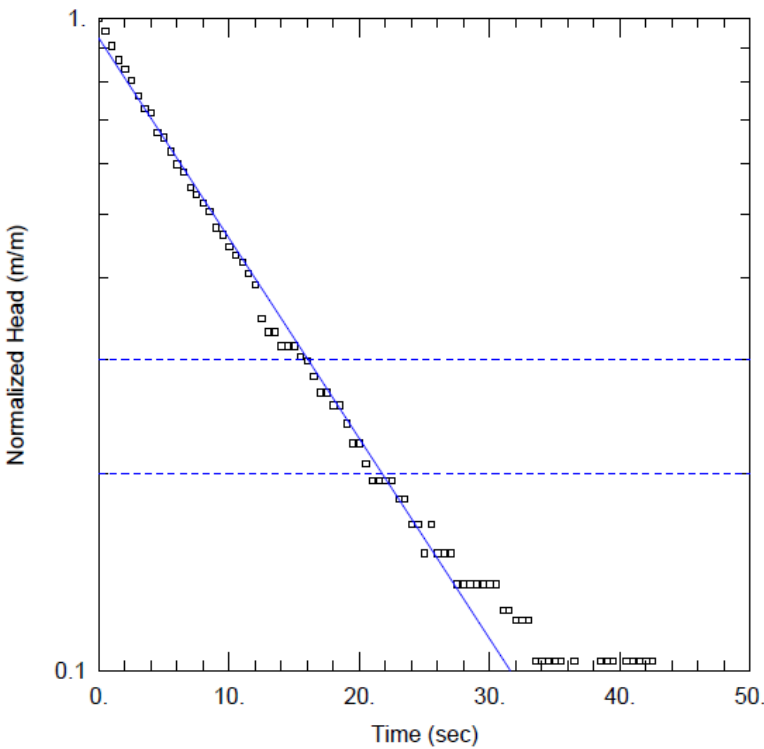


**TEST INFORMATION:**

Test Well: MW21-2-3  
 Date of Test: August 31, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 3.33 mbgs  
 Initial Displacement: 0.48 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 6.10 to 18.30 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$4 \times 10^{-5} \text{ m/s}$**

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

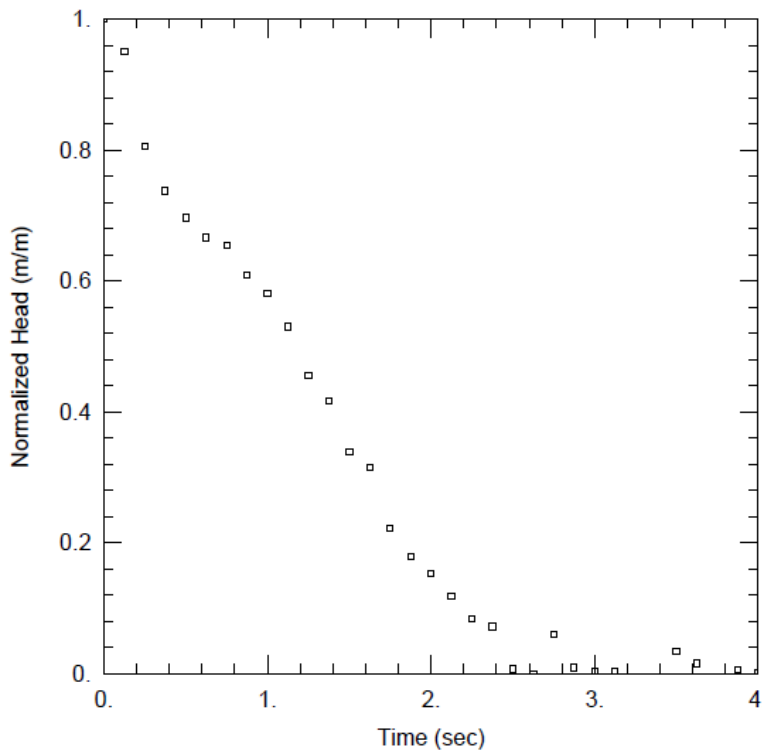
PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
 YYYY-MM-DD 2022-01-29  
 PREPARED KB  
 DESIGN KB  
 REVIEW PGM  
 APPROVED ###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-2-3**

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE G-66

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

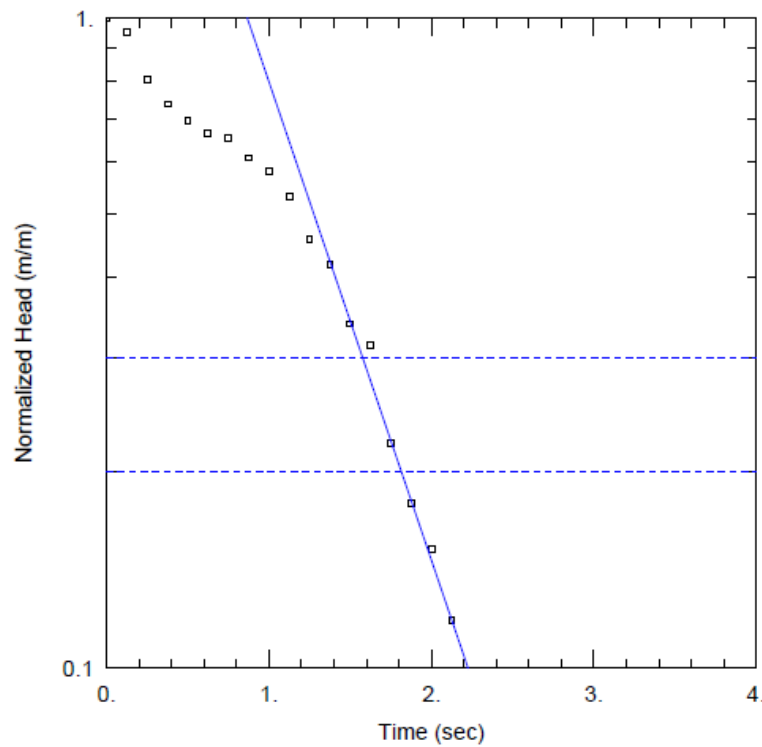


**TEST INFORMATION:**

Test Well: MW21-2-4  
 Date of Test: August 27, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 6.66 mbgs  
 Initial Displacement: 0.10 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 6.40 m to 23.20 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$3 \times 10^{-4} \text{ m/s}$**

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT

YYYY-MM-DD 2022-01-31

PREPARED KB

DESIGN KB

REVIEW PGM

APPROVED ###

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-2-4**

PROJECT No.  
**19129150**

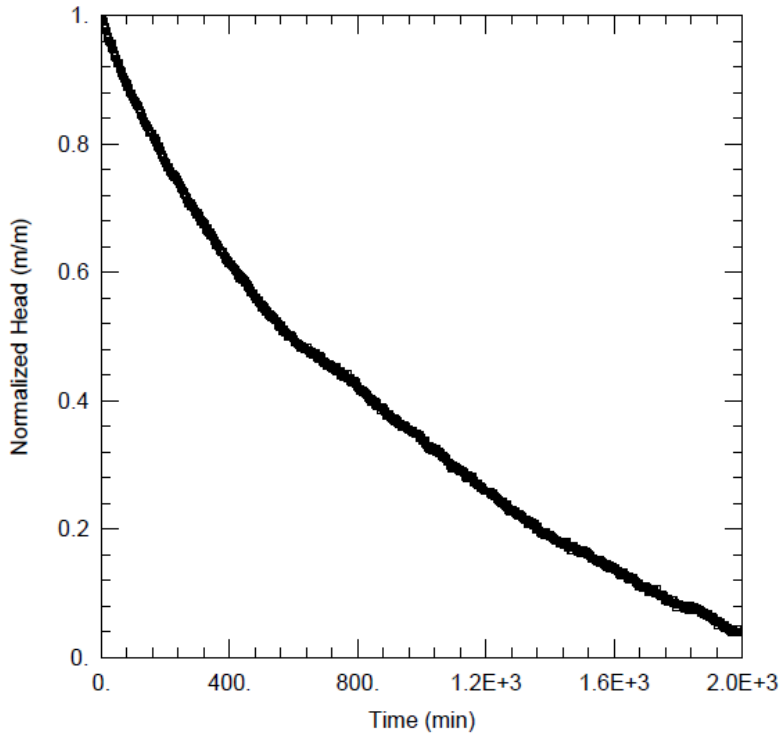
PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-67**



1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

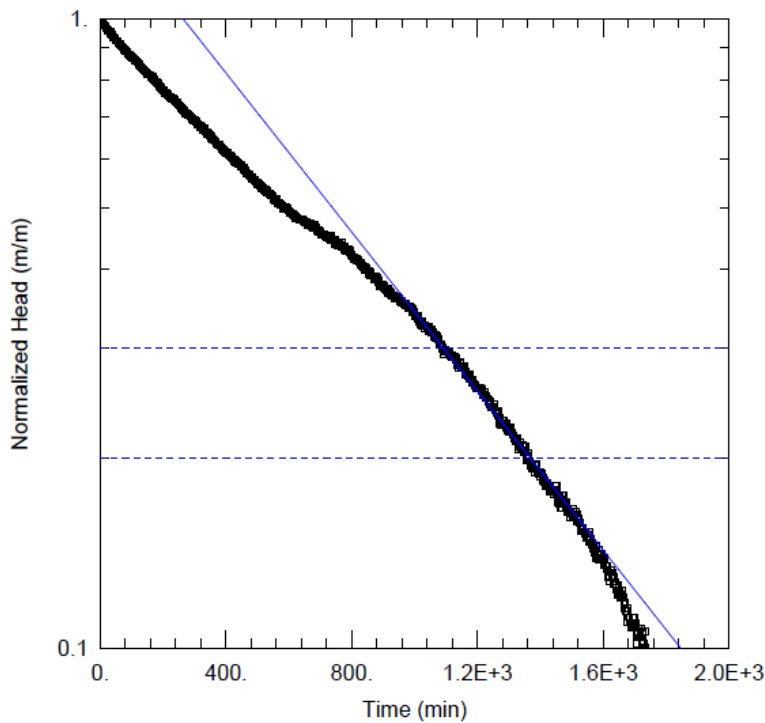


**TEST INFORMATION:**

Test Well: PW21-3  
 Date of Test: September 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Pump Down Recovery Rising Head Test

Static Water Level: 9.43 mbgs  
 Initial Displacement: 0.79 m

Casing Radius: 0.069 m  
 Borehole Radius: 0.062 m  
 Open BH Interval: 8.84 m to 21.34 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-8} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2022-01-31

PREPARED AIM

DESIGN AIM

REVIEW PGM

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TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL PW21-3**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-68**

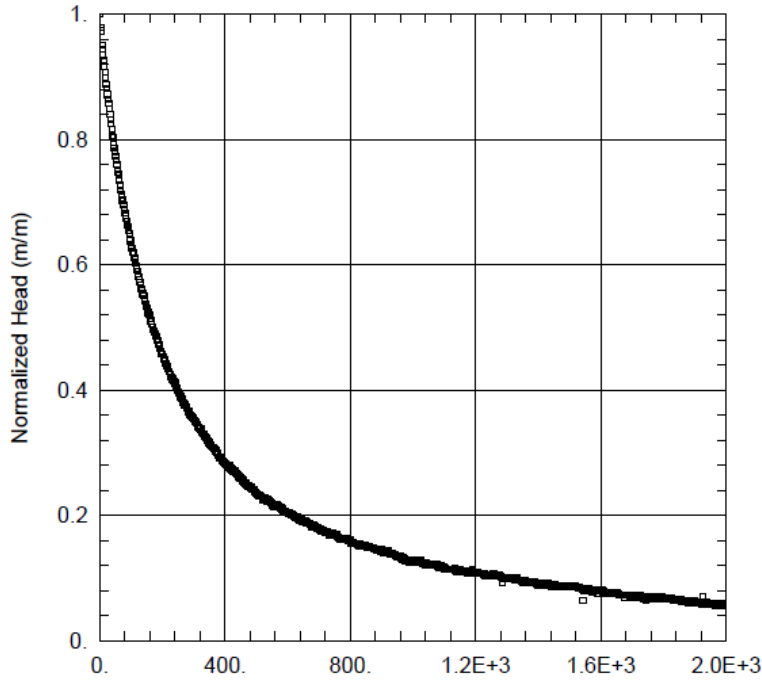
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW21-3-1  
 Date of Test: September 21, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

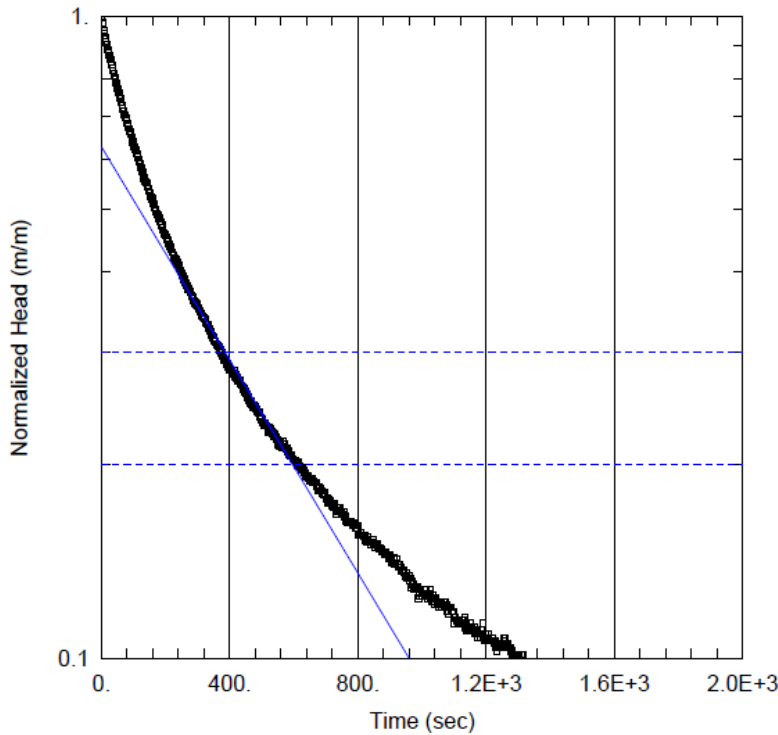
Static Water Level: 6.83 mbgs  
 Initial Displacement: 1.04 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 5.80 m to 16.50 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$6 \times 10^{-7} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2022-01-31

PREPARED KB

DESIGN AIM

REVIEW PGM

APPROVED ###

TITLE

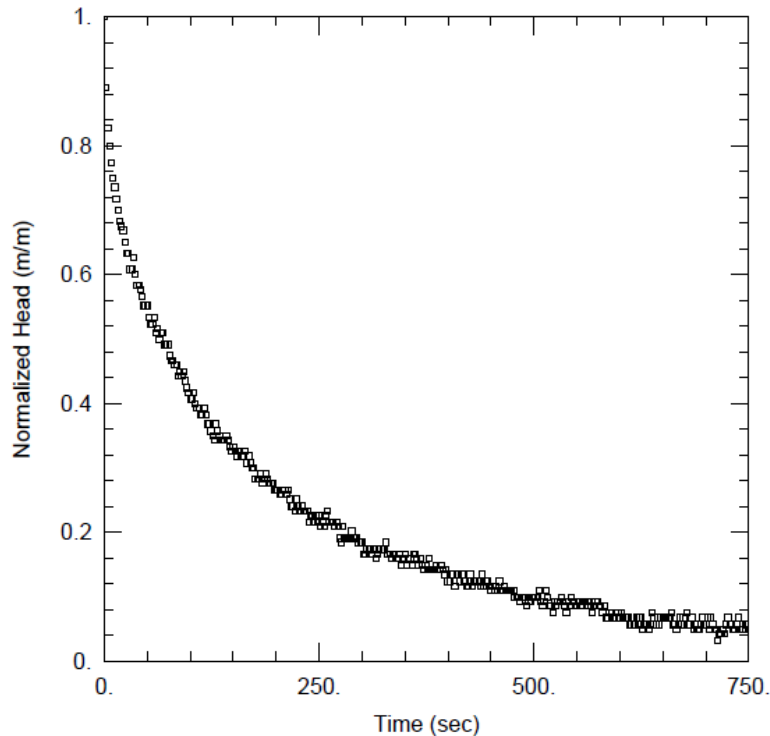
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-3-1**

PROJECT No.  
**19129150**

PHASE  
**2300**

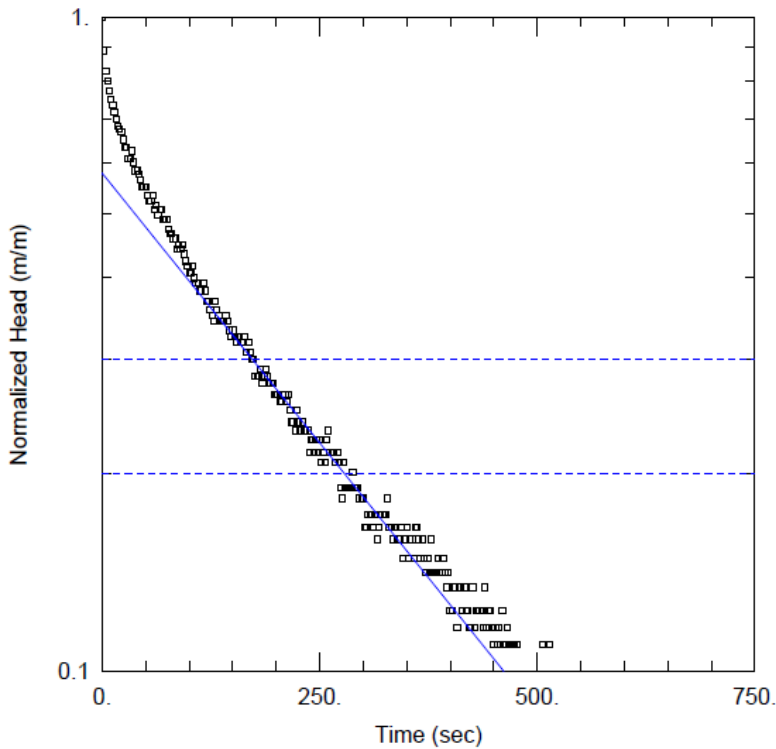
Rev.  
**A**

FIGURE  
**G-69**



**TEST INFORMATION:**

Test Well: MW21-3-2  
 Date of Test: September 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
  
 Static Water Level: 8.32 mbgs  
 Initial Displacement: 0.17 m  
  
 Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 4.90 m to 15.50 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-6} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-31
PREPARED	KB
DESIGN	KB
REVIEW	PGM
APPROVED	###

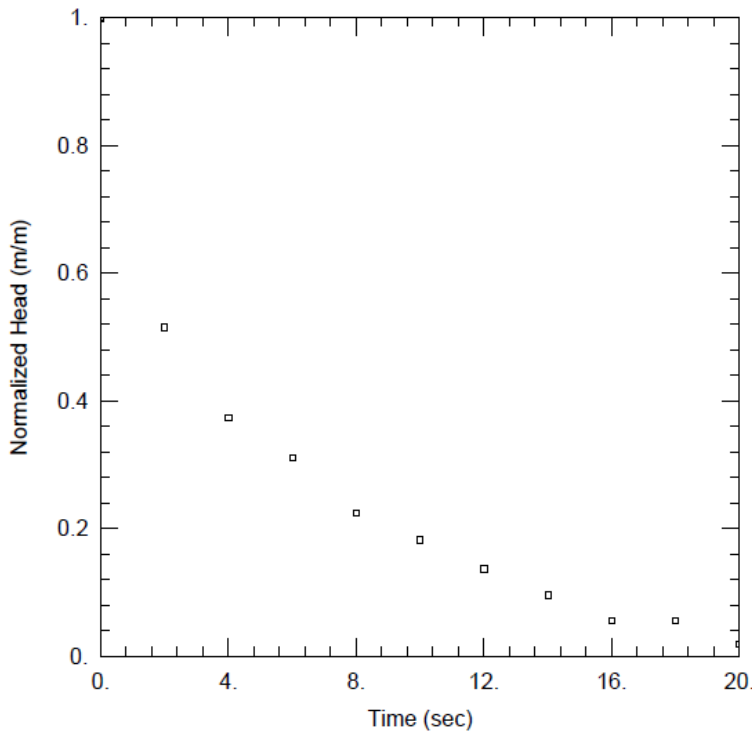
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-3-2**

PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-70</b>
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

1 in



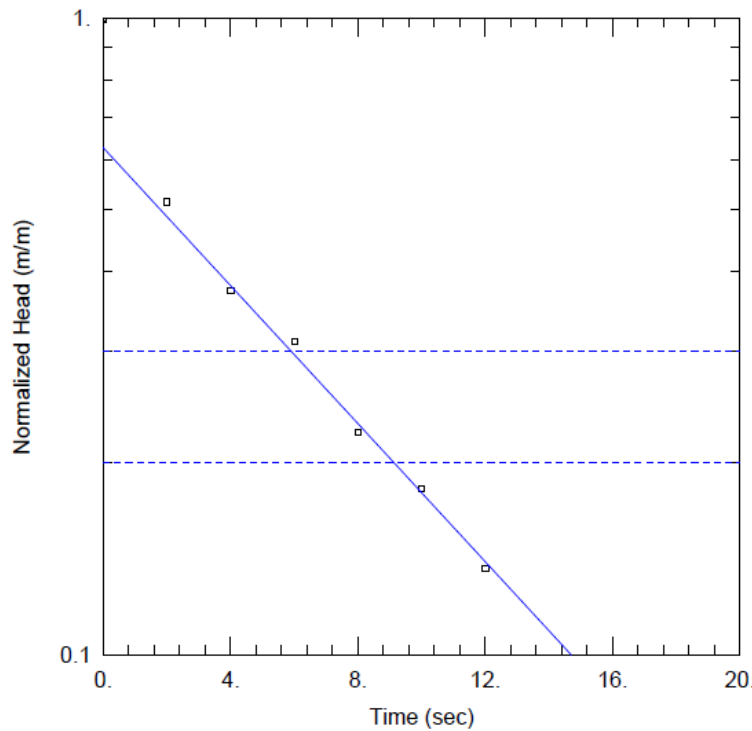


**TEST INFORMATION:**

Test Well: MW21-3-3  
 Date of Test: September 29, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 12.46 mbgs  
 Initial Displacement: 0.13 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 9.10 m to 18.30 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$7 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

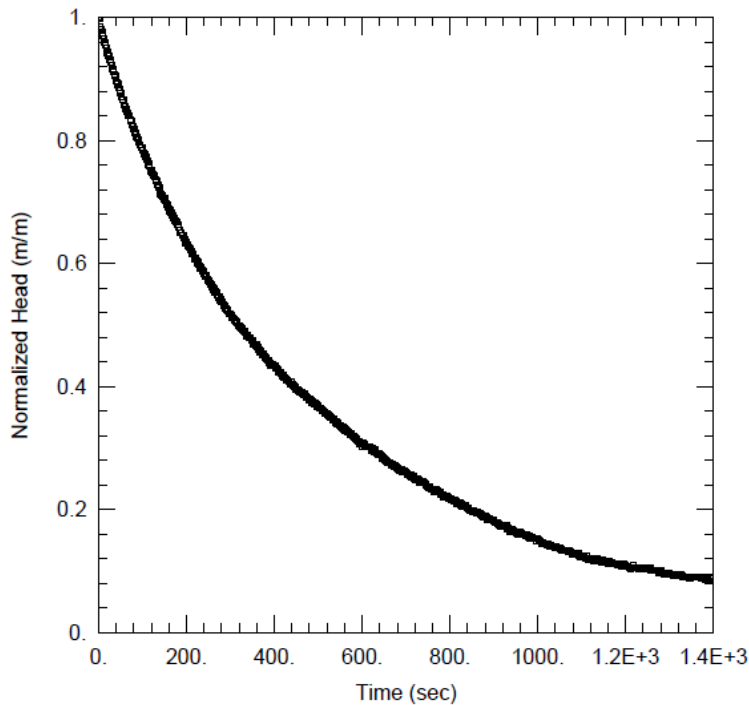
PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
  
 YYYY-MM-DD 2022-01-31  
 PREPARED KB  
 DESIGN KB  
 REVIEW PGM  
 APPROVED ###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-3-3**

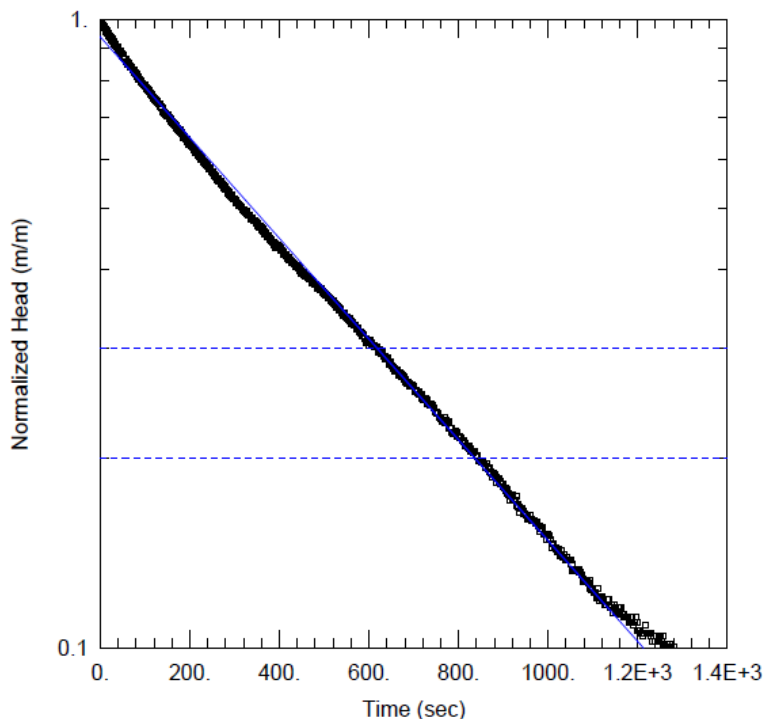
PROJECT No. 19129150 PHASE 2300 Rev. A FIGURE G-71

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A



**TEST INFORMATION:**

Test Well: MW21-3-4  
 Date of Test: September 23, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
 Static Water Level: 6.05 mbgs  
 Initial Displacement: 0.95 m  
 Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 5.20 m to 15.80 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$6 \times 10^{-7} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT

**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

CONSULTANT



YYYY-MM-DD 2022-01-31  
 PREPARED KB  
 DESIGN KB  
 REVIEW PGM  
 APPROVED ###

PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
MONITORING WELL MW21-3-4**

PROJECT No. 19129150

PHASE 2300

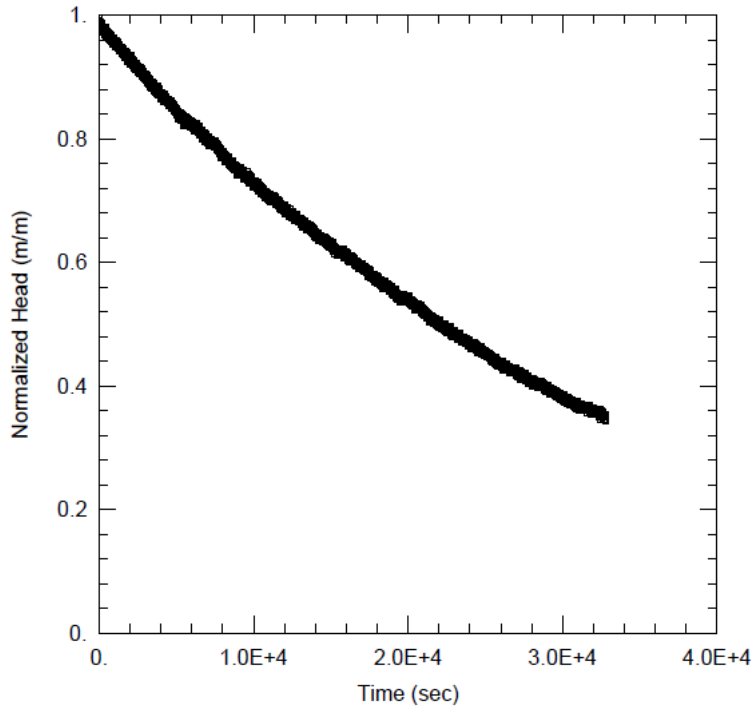
Rev. A

FIGURE G-72

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

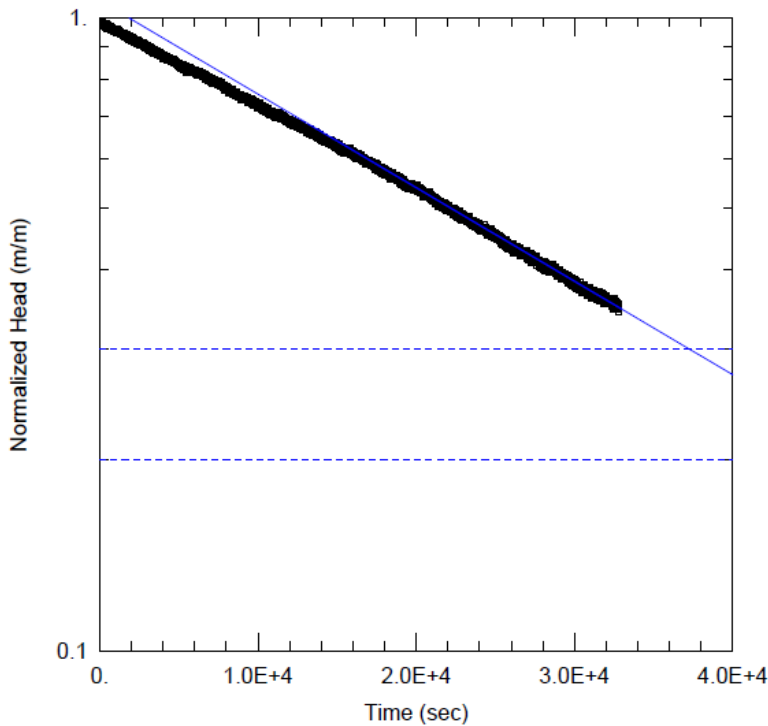
**TEST INFORMATION:**

Test Well: PW21-4  
 Date of Test: September 1, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
  
 Static Water Level: 12.82 mbgs  
 Initial Displacement: 0.70 m  
  
 Casing Radius: 0.069 m  
 Borehole Radius: 0.062 m  
 Open BH Interval: 9.25 m to 21.64 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$3 \times 10^{-8} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD	2022-01-31
PREPARED	AIM
DESIGN	AIM
REVIEW	PGM
APPROVED	###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL PW21-4**

PROJECT No.	PHASE	Rev.	FIGURE
19129150	2300	A	G-73

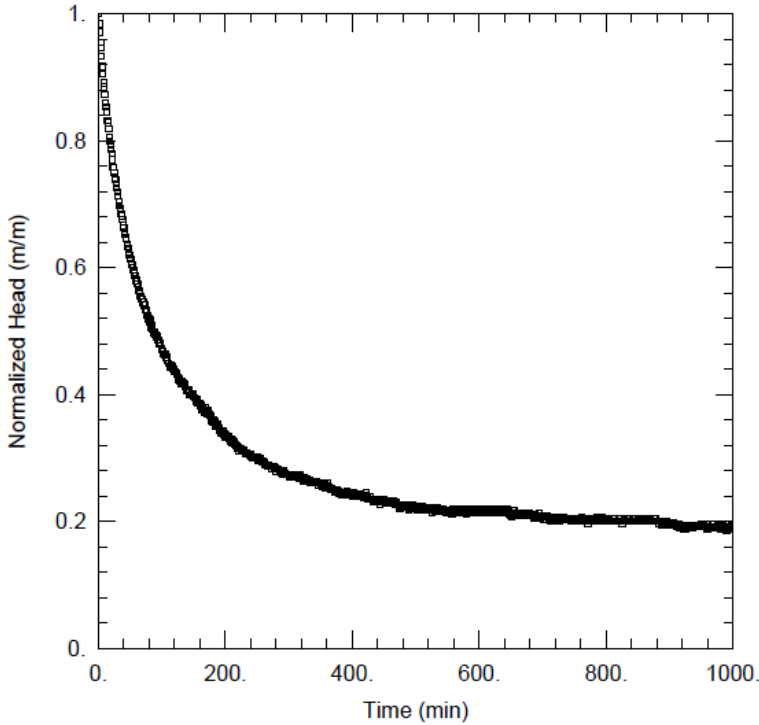
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: PW21-4A  
 Date of Test: October 15, 2021  
 Test Type: Rising Head Test  
 Test Method: Development Recovery Rising Head Test

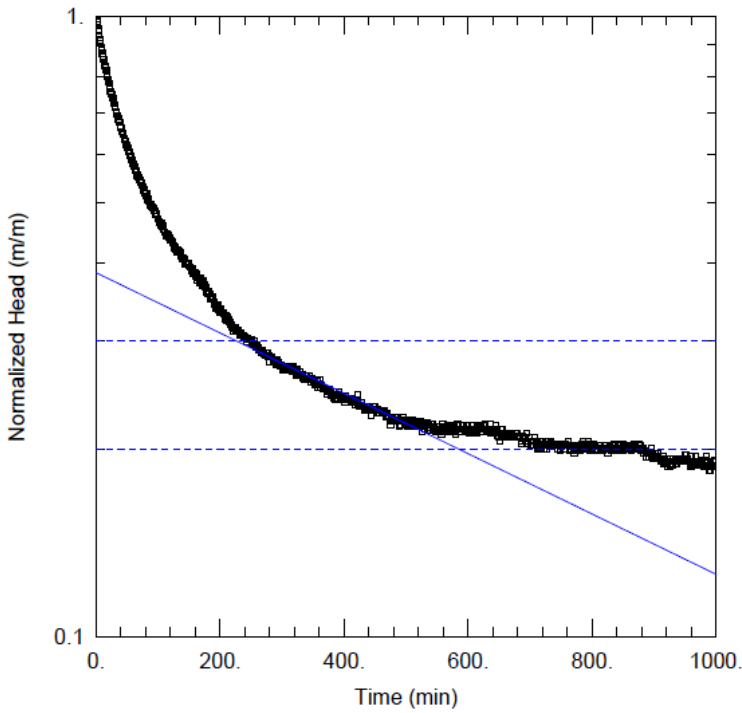
Static Water Level: 13.24 mbgs  
 Initial Displacement: 0.77 m

Casing Radius: 0.083 m  
 Borehole Radius: 0.076 m  
 Open BH Interval: 8.61 m to 21.64 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

$2 \times 10^{-8} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT

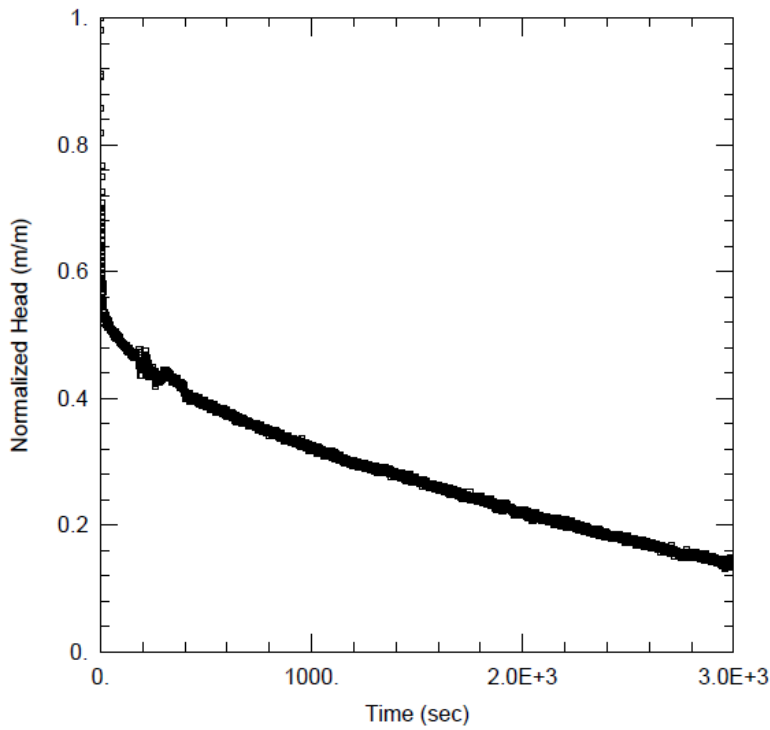


YYYY-MM-DD	2022-01-31
PREPARED	AIM
DESIGN	AIM
REVIEW	PGM
APPROVED	###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL PW21-4A**

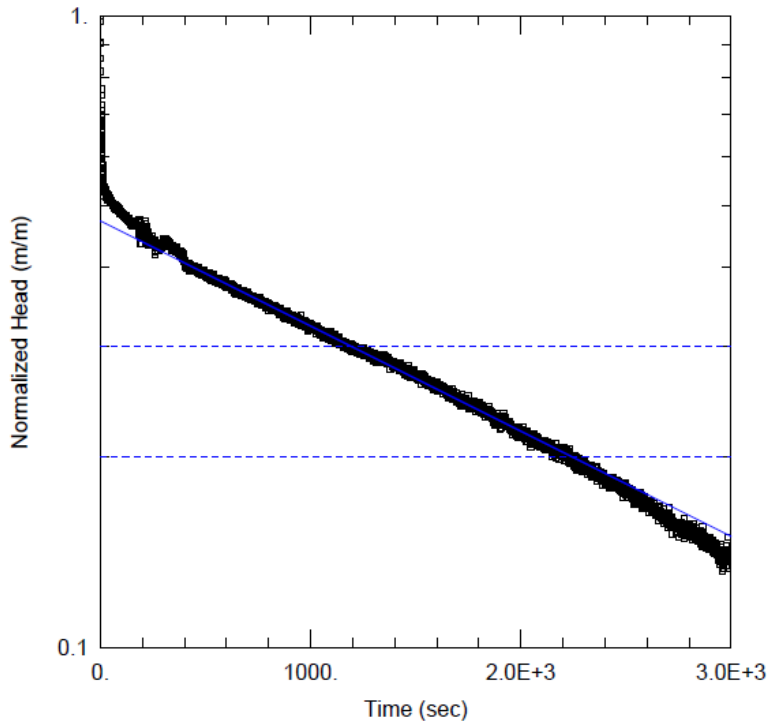
PROJECT No. <b>19129150</b>	PHASE <b>2300</b>	Rev. <b>A</b>	FIGURE <b>G-74</b>
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1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW21-4-1  
 Date of Test: September 1, 2021  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
  
 Static Water Level: 12.96 mbgs  
 Initial Displacement: 0.24 m  
  
 Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 10.10 m to 17.70 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-7} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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**CALEDON PIT / QUARRY**

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YYYY-MM-DD 2022-02-01

PREPARED KB

DESIGN KB

REVIEW PGM

APPROVED ###

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-4-1**

PROJECT No.  
**19129150**

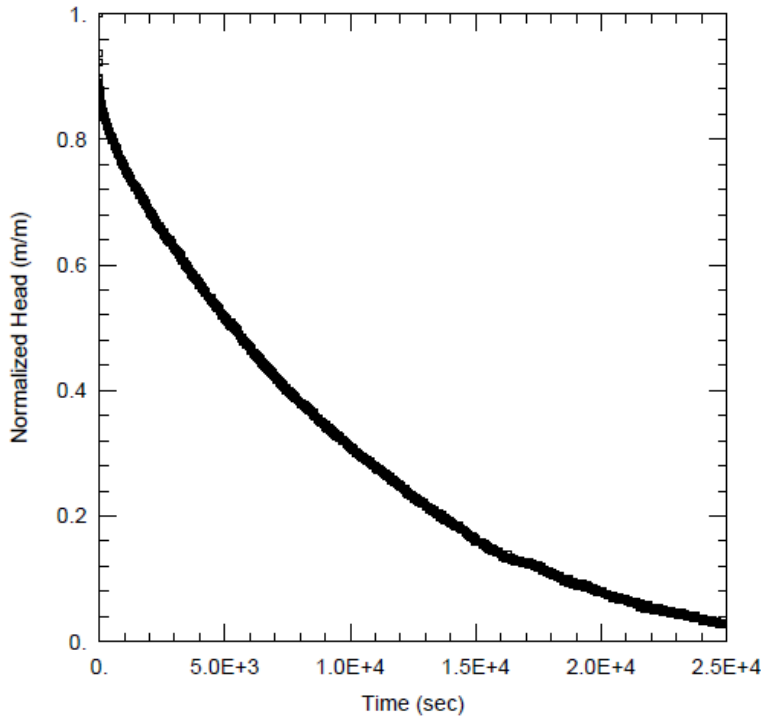
PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-75**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



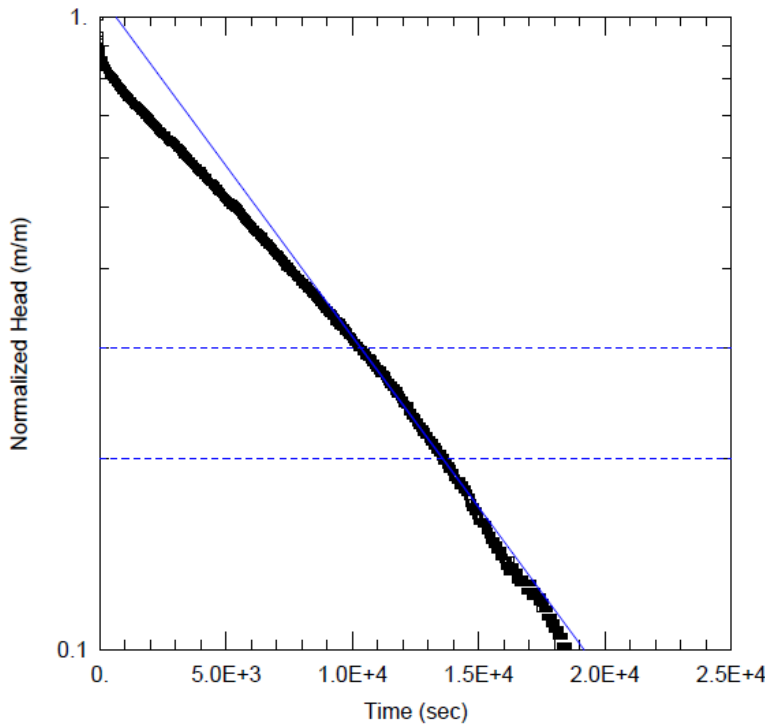


**TEST INFORMATION:**

Test Well: MW21-4-2  
 Date of Test: September 1, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 13.52 mbgs  
 Initial Displacement: 1.16 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 11.00 m to 20.10 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

$5 \times 10^{-8} \text{ m/s}$

- Water Level Measurement
- Solution Match Line

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**CALEDON PIT / QUARRY**

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YYYY-MM-DD 2022-02-01

PREPARED KB

DESIGN KB

REVIEW PGM

APPROVED ###

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-4-2**

PROJECT No.  
**19129150**

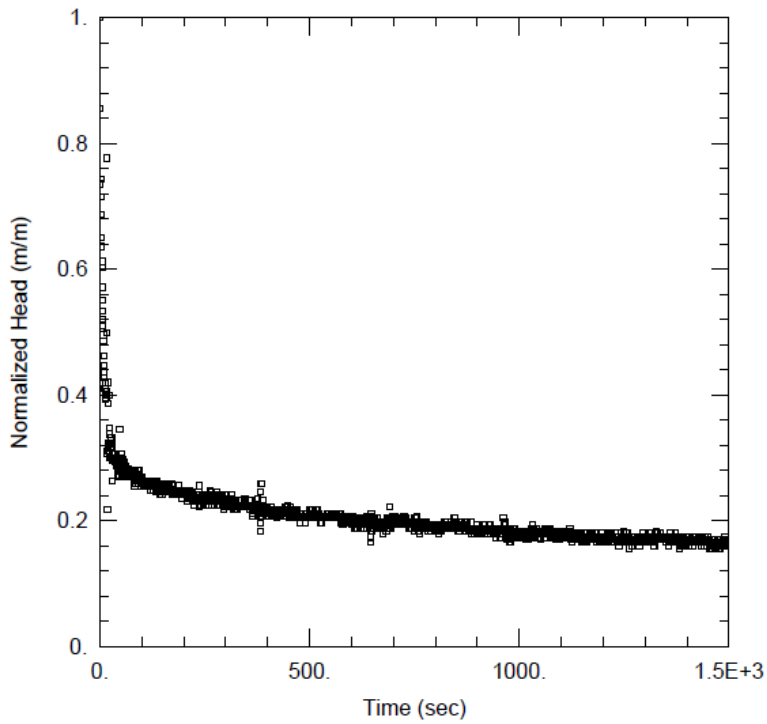
PHASE  
**2300**

Rev.  
**A**

FIGURE  
**G-76**



IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

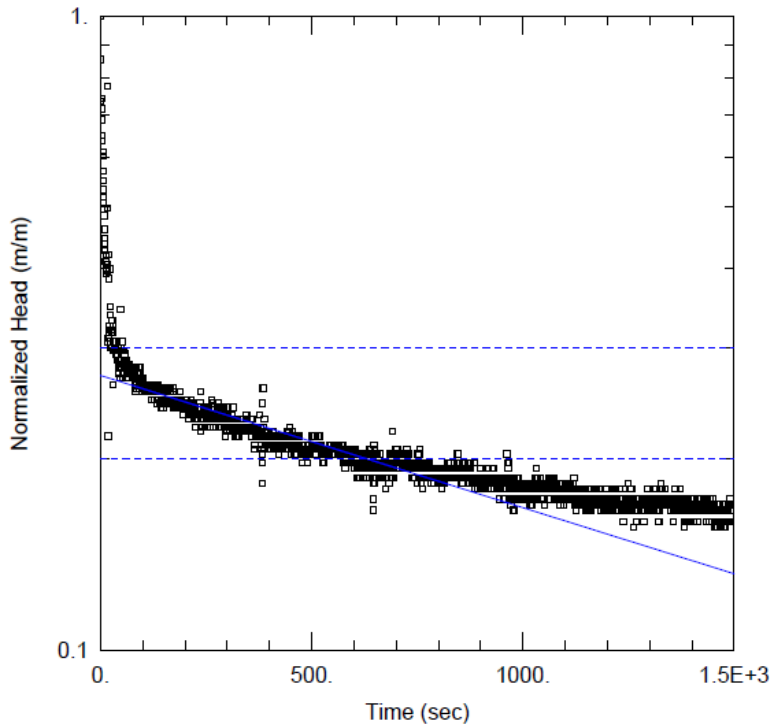


**TEST INFORMATION:**

Test Well: MW21-4-3  
 Date of Test: December 9, 2021  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test

Static Water Level: 11.61 mbgs  
 Initial Displacement: 0.27 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.062 m  
 Well Screen Interval: 10.40 m to 19.50 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

$2 \times 10^{-7} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

CLIENT

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YYYY-MM-DD 2022-01-31

PREPARED AIM

DESIGN AIM

REVIEW PGM

APPROVED ###

PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW21-4-3**

PROJECT No.  
**19129150**

PHASE  
**2300**

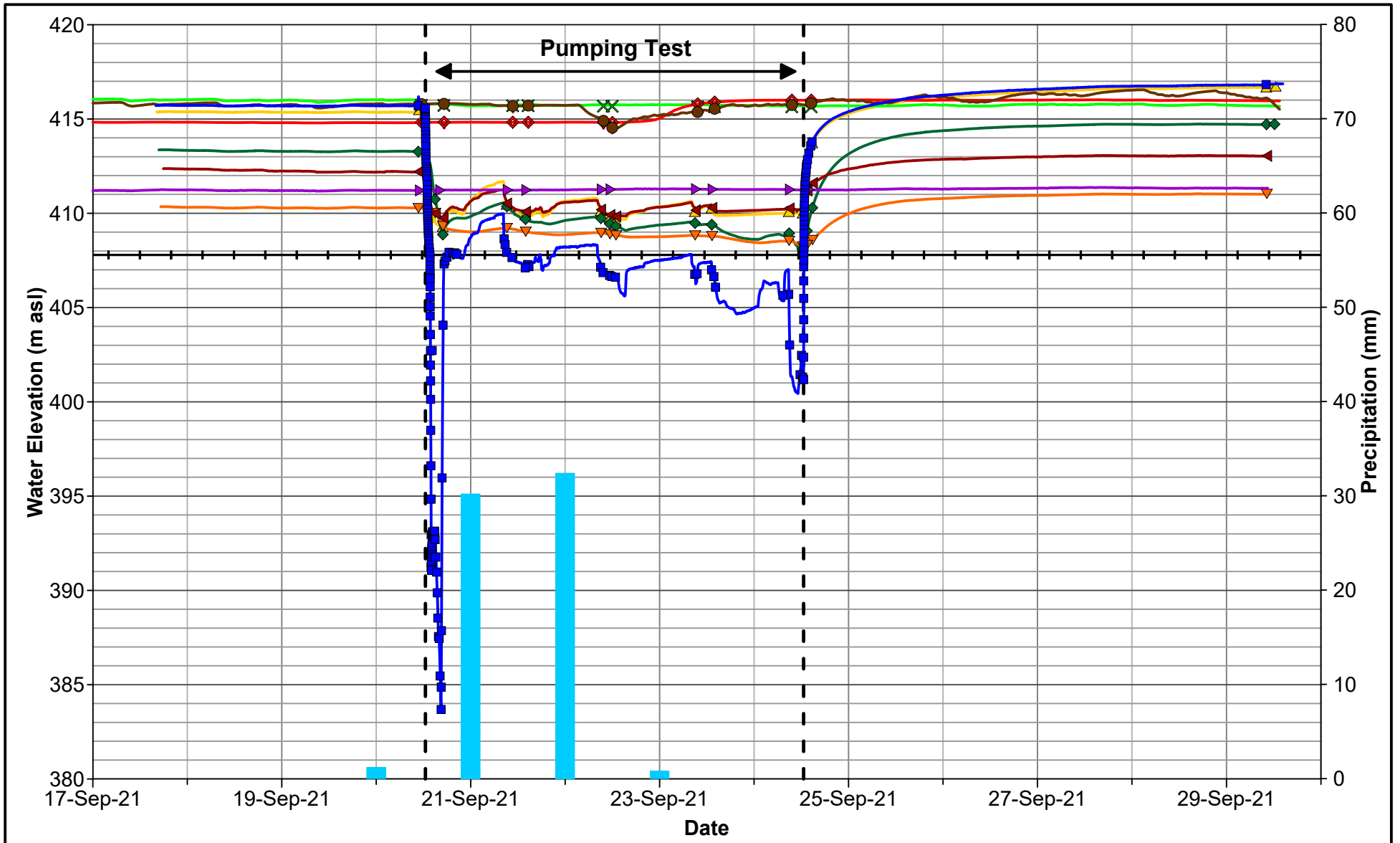
Rev.  
**A**

FIGURE  
**G-77**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**APPENDIX H**

**Pumping Tests**



- PW21-1
- ▲ MW21-1-1
- ◆ MW21-1-2
- ▼ MW21-1-3
- ◄ MW21-1-4
- ▶ BH2
- × MW20-15A
- MW20-15B
- ◊ MW20-15C
- Precipitation (mm)
- +— Bedrock Elevation

**NOTE** Average pumping rate = 21.7 L/min  
 Top of rock as observed at PW21-1  
 Precipitation observed at Georgetown WWTP meteorological station (ID:6152695)

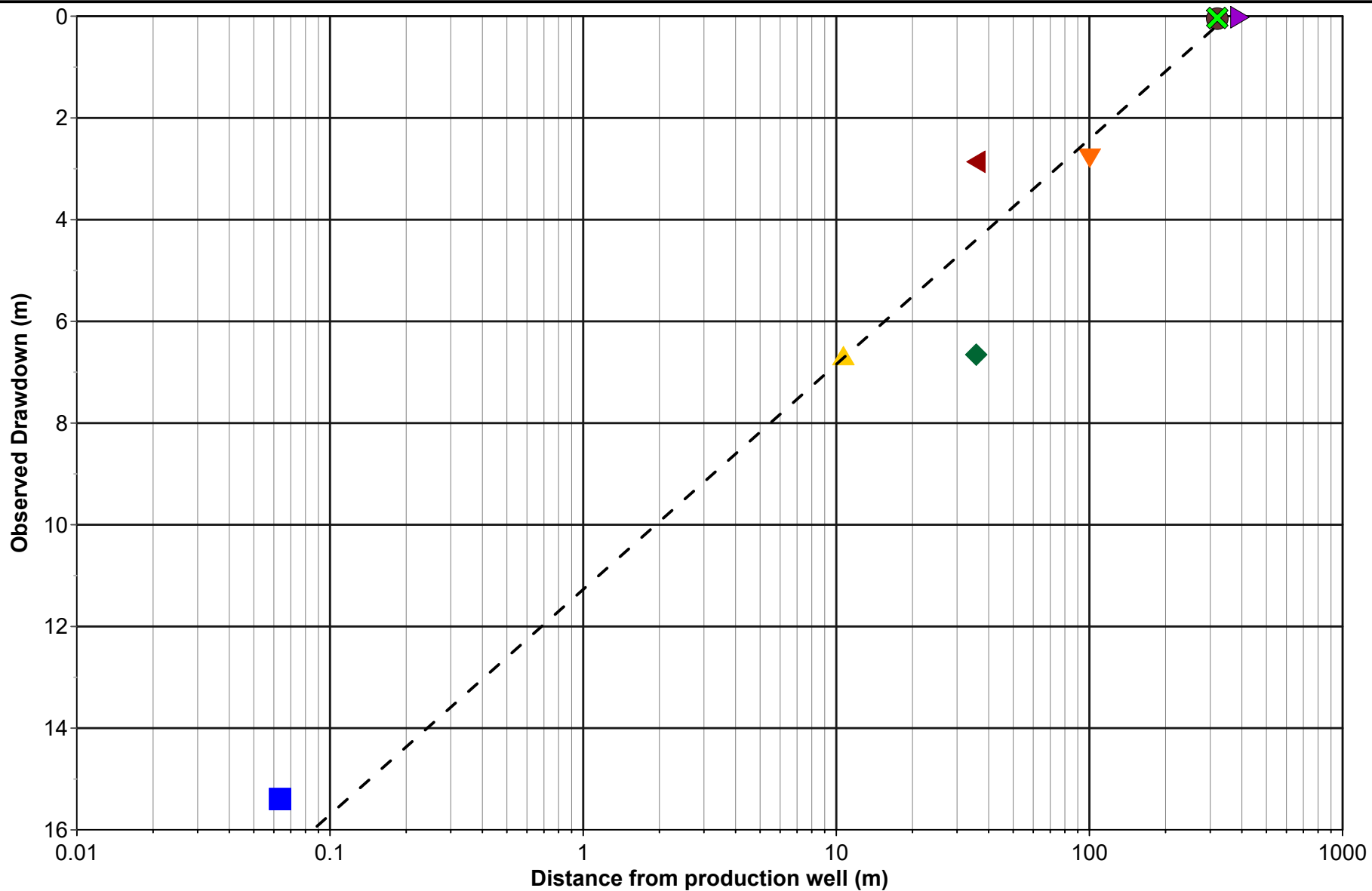


DATE March 2022  
 DESIGN VRP  
 REVIEW PGM/GRP  
 APPROVED --

**PROJECT CALEDON QUARRY**

**TITLE PW21-1 CONSTANT RATE TEST  
 GROUNDWATER ELEVATION MONITORING**

PROJECT NO. 19129150      REV A      FIGURE H-1



- PW21-1    
 ◆ MW21-1-2    
 ▲ MW21-1-4    
 ● MW20-15B    
 ▶ MW20-15B
- ▲ MW21-1-1    
 ▼ MW21-1-3    
 ✕ MW20-15A

PROJECT **CBM CALEDON QUARRY**

TITLE **PW21-1 PUMPING TEST  
DRAWDOWN VERSUS DISTANCE**



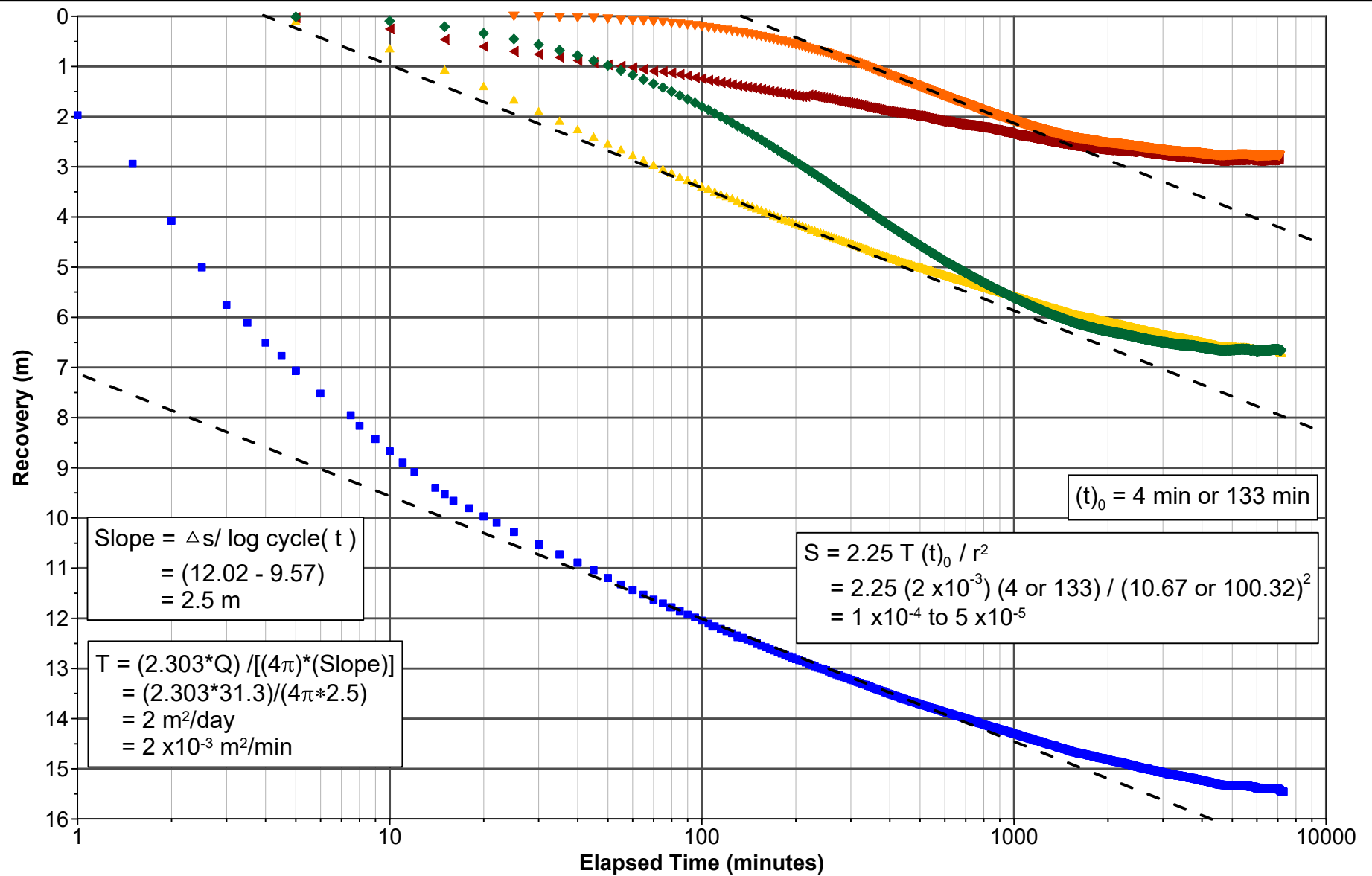
DATE	December 2022
DESIGN	VRP
REVIEW	PGM
APPROVED	..

PROJECT NO.  
19129150

REV  
A

FIGURE  
H-2





- PW21-1
- ▲ MW21-1-1
- ◆ MW21-1-2
- ▼ MW21-1-3
- ◄ MW21-1-4



DATE March 2022  
 DESIGN VRP  
 REVIEW PGM/GRP  
 APPROVED ..

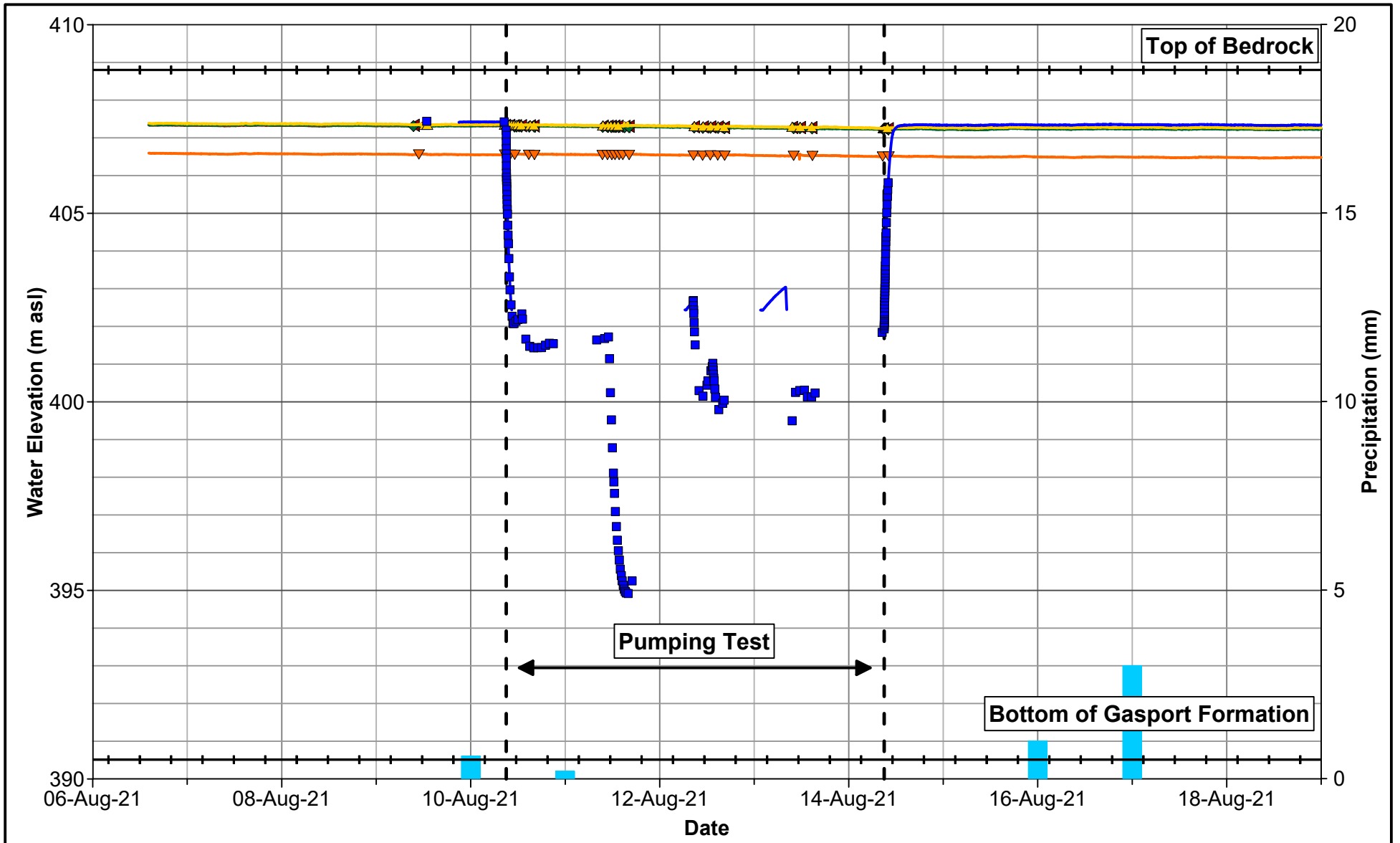
PROJECT CALEDON QUARRY

TITLE PW21-1 CONSTANT RATE TEST  
 RECOVERY VERSUS LOG TIME

PROJECT NO.  
 19129150

REV  
 A

FIGURE  
 H-3



- PW21-2
- ▲ MW21-2-1
- ◆ MW21-2-2
- ▼ MW21-2-3
- ▲ MW21-2-4
- Precipitation (mm)
- + Bedrock Annotation

**NOTE** Average pumping rate = 2.2 L/min  
 Top of rock as observed at PW21-2  
 Precipitation observed at Georgetown WWTP meteorological station (ID:6152695)  
 PW21-2 transducer data discontinuous when elevation <402.4 masl

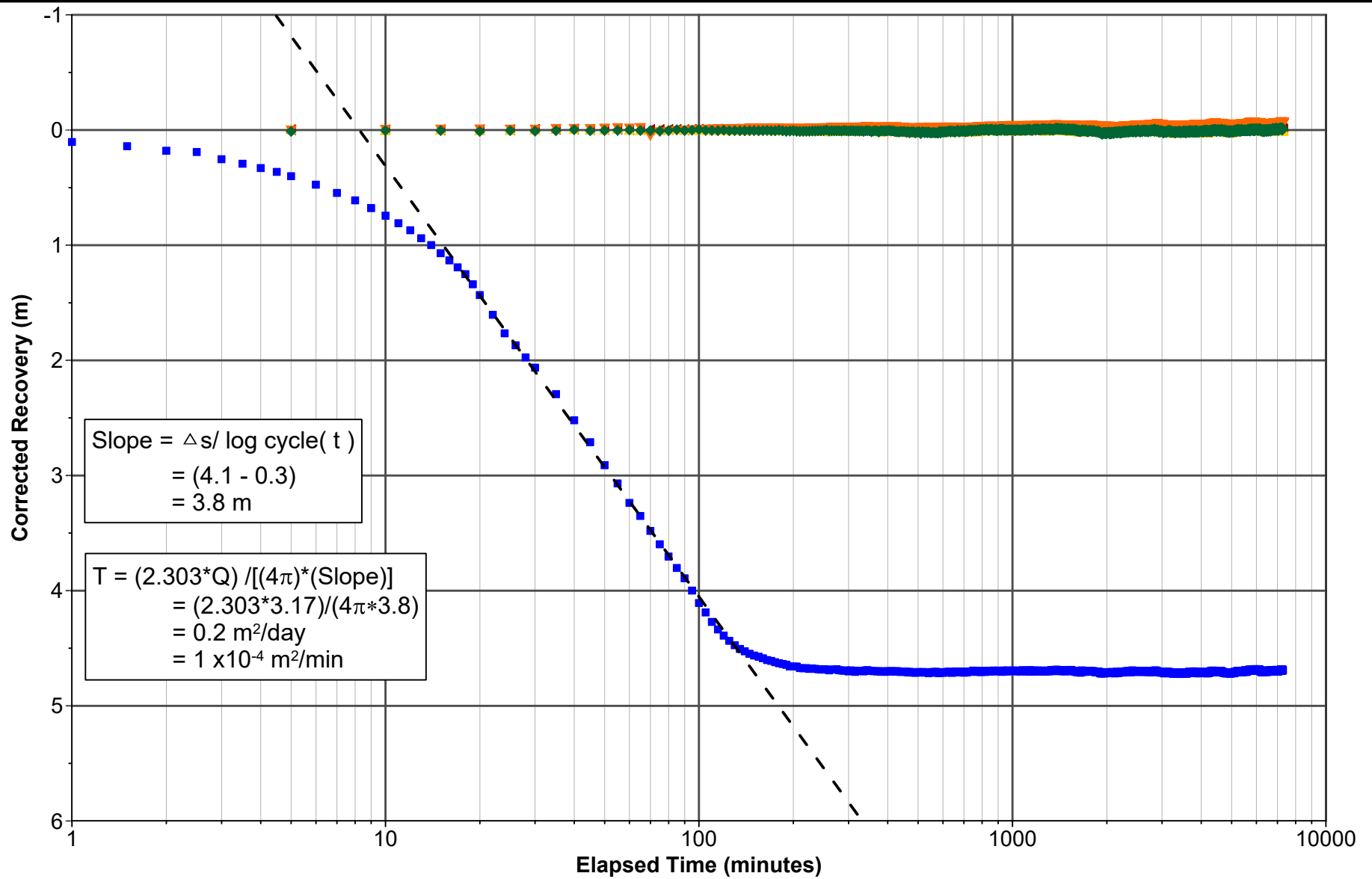


DATE November 2022  
 DESIGN VRP  
 REVIEW PGM/GRP  
 APPROVED ..

PROJECT **CALEDON QUARRY**

TITLE **PW21-2 CONSTANT RATE TEST  
 GROUNDWATER ELEVATION MONITORING**

PROJECT NO. 19129150      REV A      FIGURE H-4



- PW21-2
- ▲ MW21-2-1
- ◆ MW21-2-2
- ▼ MW21-2-3
- ▲ MW21-2-4

PROJECT CALEDON QUARRY

TITLE PW21-2 CONSTANT RATE TEST  
CORRECTED RECOVERY VERSUS LOG TIME

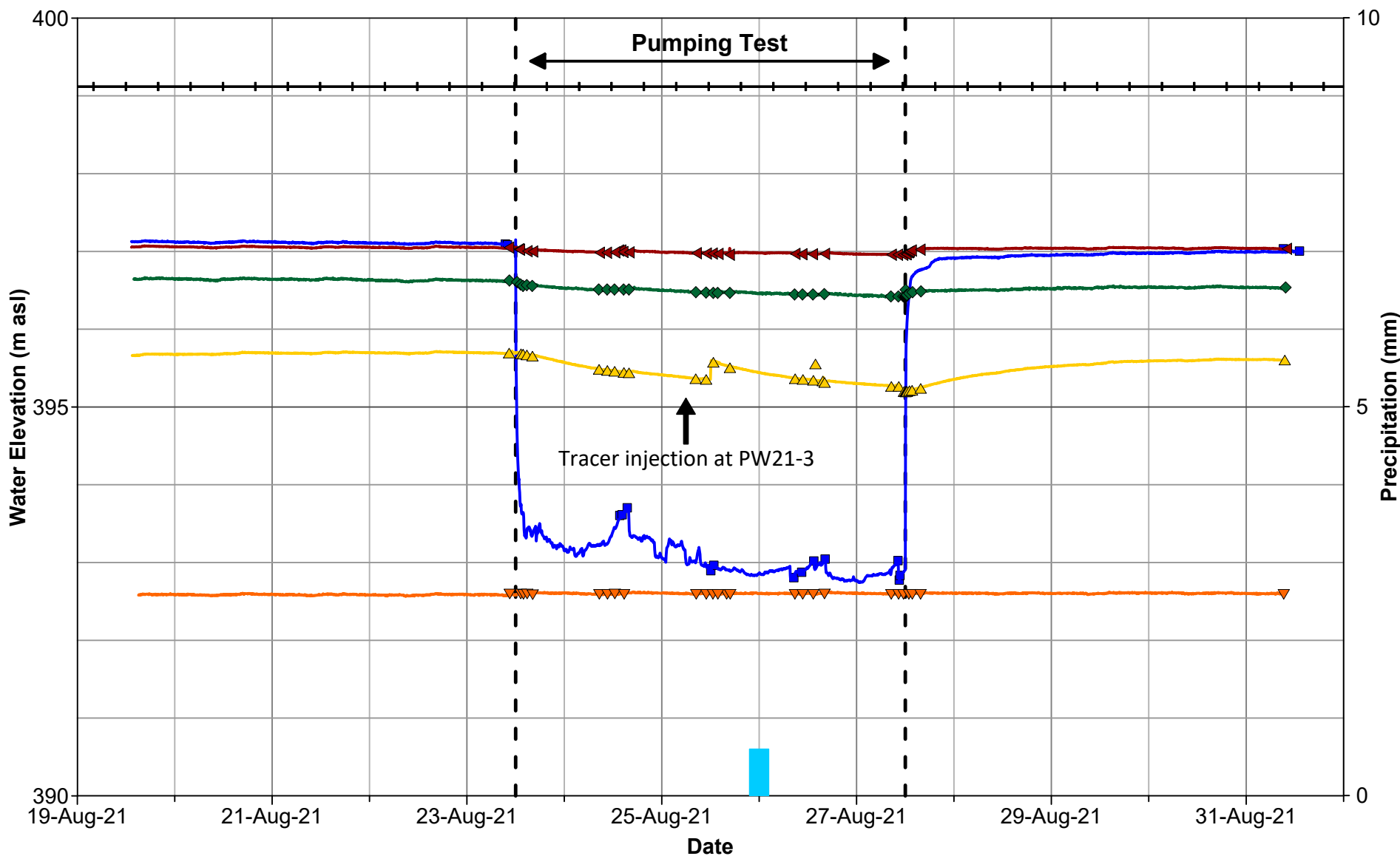


DATE November 2022  
 DESIGN VRP  
 REVIEW PGM/GRP  
 APPROVED ..

PROJECT NO.  
19129150

REV  
A

FIGURE  
H-5



- MW21-3-1 (Pumping well)
- ▲ PW21-3
- ◆ MW21-3-2
- ▼ MW21-3-3
- ▲ MW21-3-4
- Precipitation (mm)
- + Bedrock Elevation

**NOTE**  
 Average pumping rate = 1.7 L/min  
 Top of rock as observed at MW21-3-1  
 Precipitation observed at Georgetown WWTP meteorological station (ID:6152695)

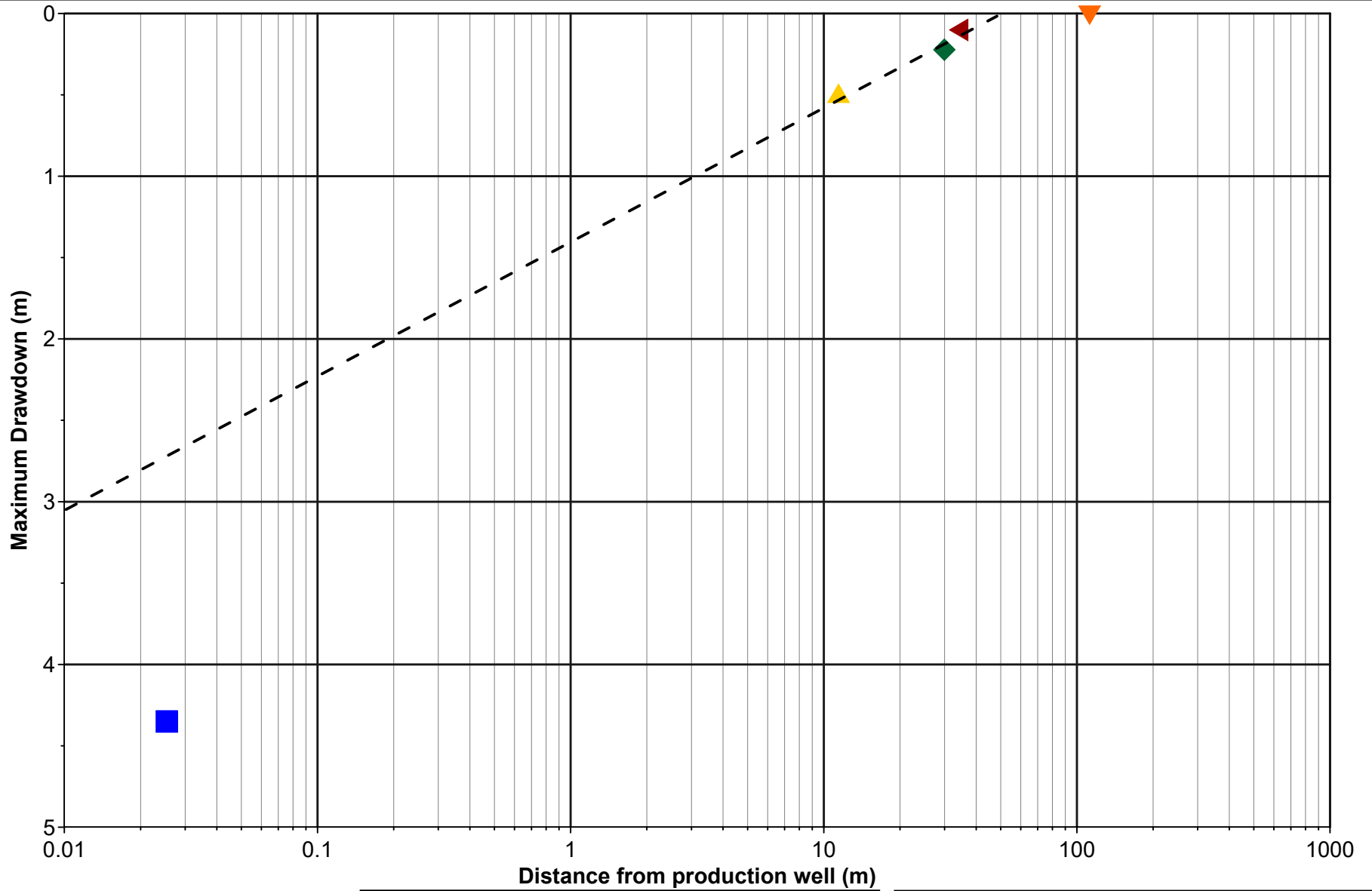


DATE	November 2022
DESIGN	VRP
REVIEW	PGM/GRP
APPROVED	--

**PROJECT** CALEDON QUARRY

**TITLE** MW21-3-1 CONSTANT RATE TEST  
GROUNDWATER ELEVATION MONITORING

<b>PROJECT NO.</b> 19129150	<b>REV</b> A	<b>FIGURE</b> H-6
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- MW21-3-1 (Pumping Well)
- ▲ PW21-3
- ◆ MW21-3-2
- ▲ MW21-3-3
- ▲ MW21-3-4

PROJECT **CALEDON QUARRY**

TITLE **MW21-3-1 CONSTANT RATE TEST  
DRAWDOWN VERSUS DISTANCE**



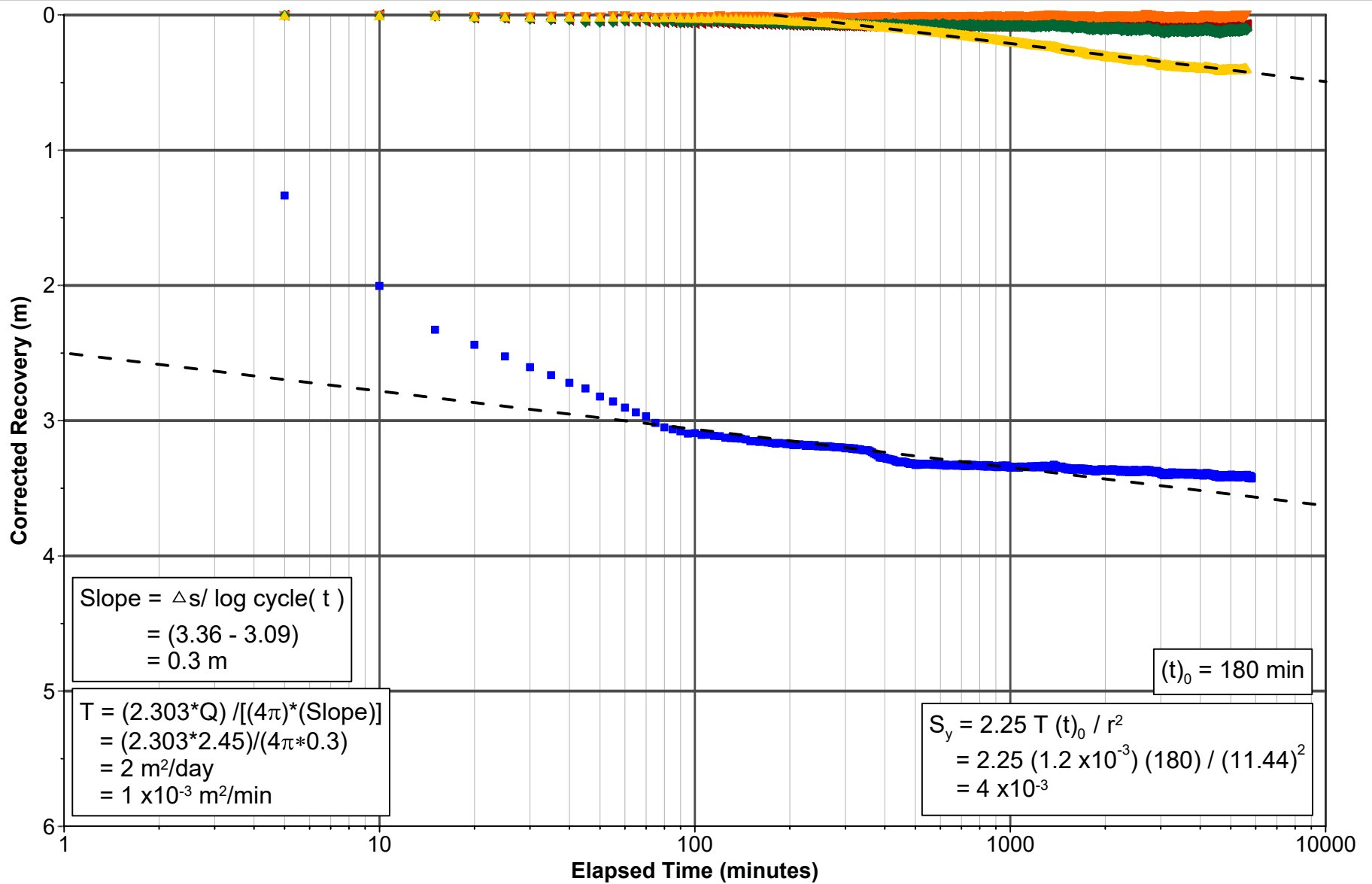
DATE November 2022  
 DESIGN VRP  
 REVIEW PGM/GRP  
 APPROVED --

PROJECT NO.  
19129150

REV  
A

FIGURE  
H-7





- MW21-3-1 (Pumping Well)
- ▲ PW21-3
- ◆ MW21-3-2
- ▼ MW21-3-3
- ◄ MW21-3-4



DATE November 2022  
 DESIGN VRP  
 REVIEW PGM/GRP  
 APPROVED ..

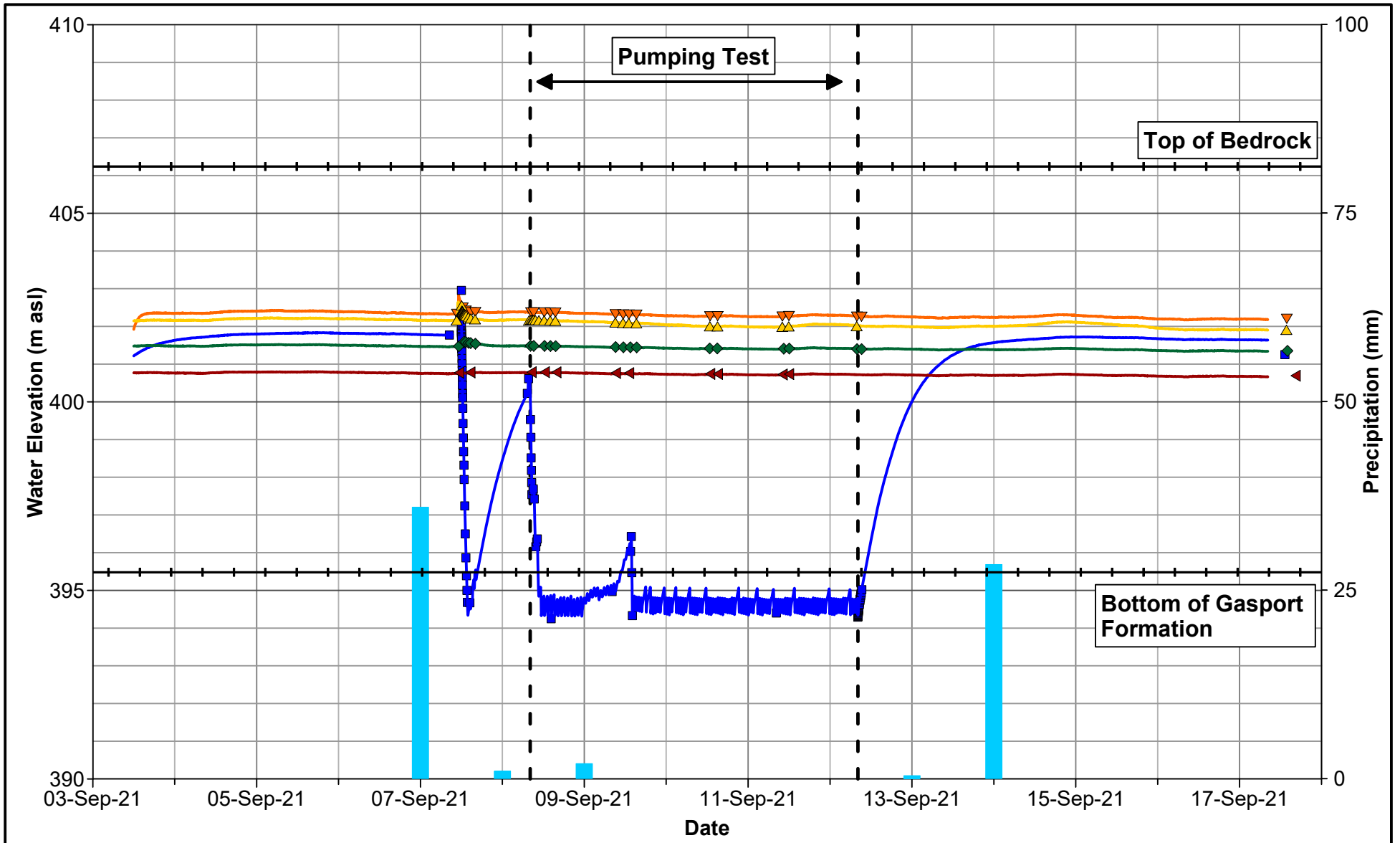
PROJECT CALEDON QUARRY

TITLE MW21-3-1 CONSTANT RATE TEST  
 CORRECTED RECOVERY VERSUS LOG TIME

PROJECT NO.  
 19129150

REV  
 A

FIGURE  
 H-8



- PW21-4
- ▲ MW21-4-1
- ◆ MW21-4-2
- ▼ MW21-4-3
- ▼ BH16
- Precipitation (mm)
- + Bedrock Annotation

**NOTE** Average pumping rate = 0.12 L/min  
 Top of rock as observed at PW21-4  
 Precipitation observed at Georgetown WWTP meteorological station (ID:6152695)

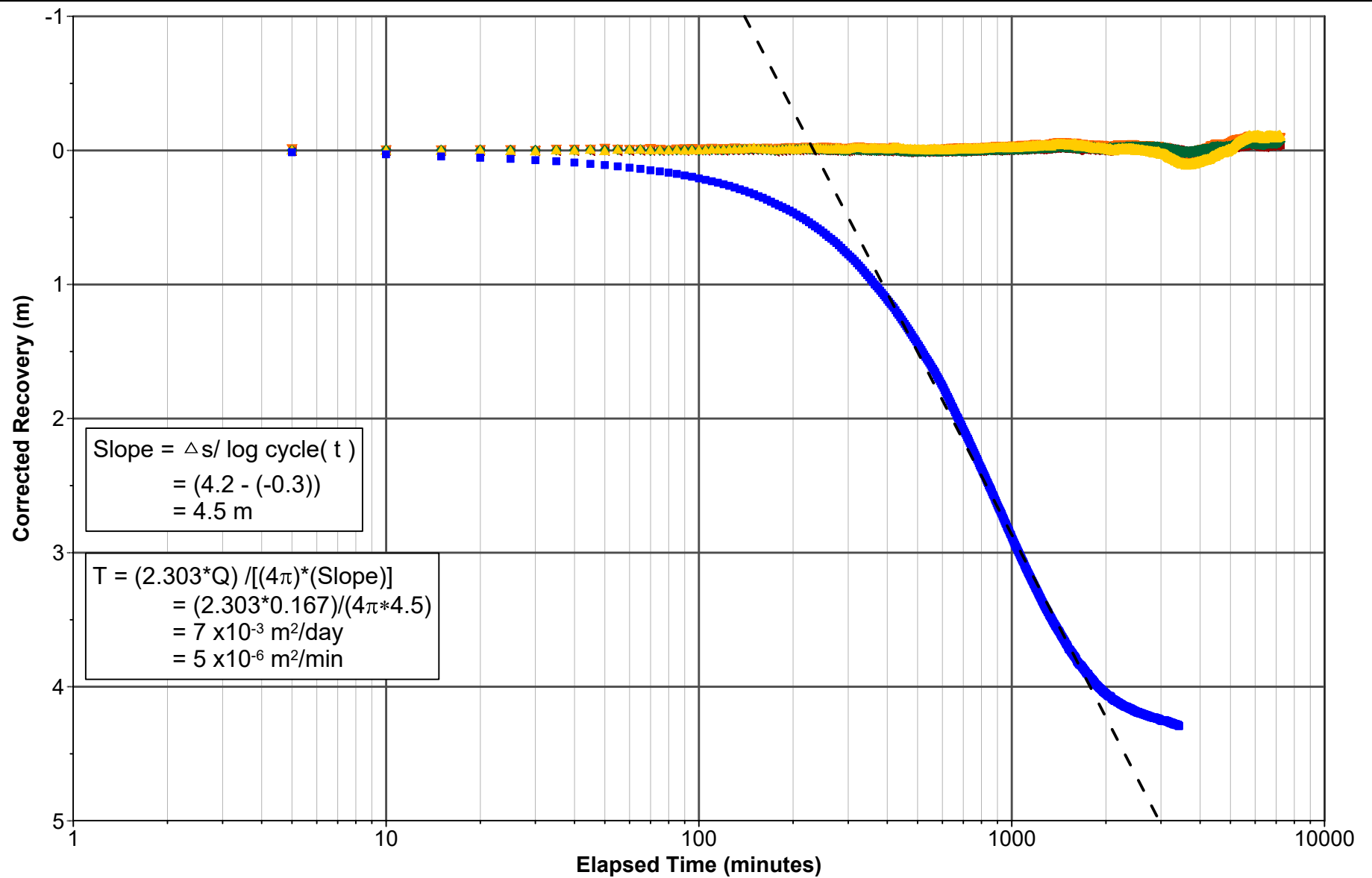


DATE	November 2022
DESIGN	VRP
REVIEW	PGM/GRP
APPROVED	--

**PROJECT CALEDON QUARRY**

**TITLE PW21-4 CONSTANT RATE TEST  
 GROUNDWATER ELEVATION MONITORING**

PROJECT NO. 19129150	REV A	FIGURE H-9
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- PW21-4
- ▲ MW21-2-1
- ◆ MW21-4-2
- ▼ MW21-4-3
- ▲ BH16

<b>PROJECT CALEDON QUARRY</b>		
<b>TITLE PW21-4 CONSTANT RATE TEST CORRECTED RECOVERY VERSUS LOG TIME</b>		
PROJECT NO. 19129150	REV A	FIGURE H-10

DATE	November 2022
DESIGN	VRP
REVIEW	PGM/GRP
APPROVED	..

**APPENDIX I**

**Groundwater Quality**

TABLE I-1  
SUMMARY OF GROUNDWATER QUALITY RESULTS  
CALEDON PIT / QUARRY

	Units	PWQO	ODWS				MECP Table 2	MW20-01 A	MW20-01B	MW20-02	MW20-03	MW20-04	MW20-05A	MW20-06A	MW20-06B	MW20-07A	MW20-07B	MW20-08A	MW20-08B	MW20-09	MW20-10A	MW20-10B
			MAC	IMAC	AO	OG		22-Jun-21	22-Jun-21	22-Jun-21	22-Jun-21	22-Jun-21	22-Jun-21	22-Jun-21	22-Jun-21	22-Jun-21	21-Jun-21	21-Jun-21	21-Jun-21	21-Jun-21	23-Jun-21	24-Jul-21
<b>Physical Tests (Water)</b>																						
Anion Sum	me/L						11.0	8.68	7.55	7.21	8.34	7.09	8.04	6.89	7.85	9.08	9.16	13.1	6.84	8.43	8.14	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L						200	250	240	270	230	230	260	230	250	260	270	280	270	290	280	
Calculated TDS	mg/L			500			690	460	410	380	460	380	440	370	410	500	490	720	360	460	450	
Carb. Alkalinity (calc. as CaCO3)	mg/L						1.3	1.7	1.7	2.3	2.0	2.0	2.3	1.9	2.7	3.1	2.9	2.8	2.0	3.0	2.7	
Cation Sum	me/L						11.7	8.24	7.40	7.18	8.38	6.94	8.20	6.82	7.75	9.08	9.23	13.2	6.73	8.45	8.41	
Hardness (CaCO3)	mg/L				80-100		470	300	300	300	310	310	340	300	330	270	330	320	320	370	370	
Ion Balance (% Difference)	%						2.81	2.62	1.00	0.190	0.210	1.11	1.02	0.520	0.610	0.00	0.400	0.690	0.850	0.0900	1.64	
Langelier Index (@ 20C)	N/A						0.825	0.753	0.762	0.888	0.819	0.837	0.903	0.820	0.928	0.901	0.947	0.925	0.833	1.05	0.994	
Langelier Index (@ 4C)	N/A						0.578	0.505	0.514	0.640	0.571	0.589	0.655	0.572	0.679	0.653	0.699	0.679	0.584	0.797	0.746	
Saturation pH (@ 20C)	N/A						7.02	7.11	7.13	7.06	7.14	7.13	7.07	7.12	7.13	7.19	7.12	7.10	7.06	7.01	7.02	
Saturation pH (@ 4C)	N/A						7.27	7.36	7.38	7.30	7.39	7.38	7.32	7.37	7.38	7.44	7.37	7.35	7.30	7.25	7.26	
<b>Inorganics</b>																						
Total Ammonia-N	mg/L						0.90	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.28	0.10	<0.050	<0.050	0.081	<0.050	
Unionized Ammonia	mg/L	20					<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Conductivity	umho/cm						1000	840	730	680	810	680	760	670	740	870	900	1400	610	720	670	
Dissolved Organic Carbon	mg/L			5			1.2	1.2	1.5	3.0	0.86	0.70	0.40	0.81	0.55	0.88	0.45	1.2	0.70	0.80	0.69	
Orthophosphate (P)	mg/L						<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
pH	pH	6.5-8.5			6.5-8.5		7.85	7.87	7.89	7.94	7.96	7.97	7.97	7.94	8.06	8.09	8.07	8.03	7.89	8.05	8.01	
Dissolved Sulphate (SO4)	mg/L			500			310	24	33	22	20	39	26	16	40	20	22	17	16	22	18	
Alkalinity (Total as CaCO3) <sup>2</sup>	mg/L				30-500		200	250	240	280	240	240	260	240	250	270	270	280	270	290	280	
Dissolved Chloride (Cl-)	mg/L			250		790000	23	100	64	40	97	39	66	45	68	100	110	240	18	43	44	
Nitrite (N)	mg/L		1.0				<0.010	<0.010	<0.010	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010	
Nitrate (N)	mg/L		10.0				<0.10	3.87	3.85	1.85	6.24	6.28	6.44	8.03	0.73	5.20	3.65	4.31	7.61	13.0	13.1	
Nitrate + Nitrite (N)	mg/L						<0.10	3.87	3.85	1.86	6.24	6.28	6.44	8.03	0.73	5.20	3.65	4.31	7.61	13.0	13.1	
<b>Metals</b>																						
Dissolved Aluminum (Al)	ug/L	75			100		300	17	<4.9	40	30	27	230	63	53	92	120	6.5	8.2	150	7.8	
Dissolved Antimony (Sb)	ug/L	20		6		6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Arsenic (As)	ug/L	100		10		25	9.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.9	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	
Dissolved Barium (Ba)	ug/L		1000			1000	15	42	55	75	41	110	30	19	56	34	41	31	19	46	25	
Dissolved Beryllium (Be)	ug/L	1100				4	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
Dissolved Boron (B)	ug/L	200		5000		5000	680	17	12	14	11	11	12	11	23	19	<10	<10	<10	11	10	
Dissolved Cadmium (Cd)	ug/L	0.2	5			2.7	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	
Dissolved Calcium (Ca)	ug/L						150000	88000	87000	88000	88000	86000	94000	88000	81000	71000	82000	92000	88000	98000	99000	
Dissolved Chromium (Cr)	ug/L	1 <sup>3</sup>	50			50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Dissolved Cobalt (Co)	ug/L	1				3.8	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Copper (Cu)	ug/L	5			1000	87	<0.90	1.0	<0.90	<0.90	1.6	2.1	1.0	1.2	<0.90	2.8	5.7	1.6	1.1	1.2	<0.90	
Dissolved Iron (Fe)	ug/L	300			300		940	<100	<100	<100	110	<100	400	<100	<100	<100	200	<100	<100	240	<100	
Dissolved Lead (Pb)	ug/L	5	10			10	0.92	<0.50	<0.50	<0.50	0.63	<0.50	2.3	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	1.2	<0.50	
Dissolved Magnesium (Mg)	ug/L						22000	19000	20000	19000	21000	22000	27000	19000	30000	22000	30000	22000	25000	30000	29000	
Dissolved Manganese (Mn)	ug/L			50			62	2.2	4.4	120	5.9	3.9	36	3.9	26	46	15	<2.0	<2.0	17	<2.0	
Dissolved Molybdenum (Mo)	ug/L	40				70	1.6	<0.50	0.87	7.3	<0.50	<0.50	<0.50	<0.50	1.5	5.5	0.56	<0.50	<0.50	0.64	<0.50	
Dissolved Nickel (Ni)	ug/L	25				100	2.2	<1.0	1.8	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	
Dissolved Phosphorus (P)	ug/L	30					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
Dissolved Potassium (K)	ug/L						11000	1300	1700	2100	1600	1500	2000	1200	2400	1500	880	920	1100	1200	1100	
Dissolved Selenium (Se)	ug/L	100	50			10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Dissolved Silicon (Si)	ug/L						4200	2700	3100	4100	2900	2600	3500	2300	3900	3700	3900	2700	4300	4800	4700	
Dissolved Silver (Ag)	ug/L	0.1				1.5	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	
Dissolved Sodium (Na)	ug/L				200000	490000	42000	52000	32000	26000	51000	17000	29000	20000	26000	83000	61000	160000	6400	25000	24000	
Dissolved Strontium (Sr)	ug/L						5800	160	220	190	180	1400	320	100	2600	220	230	160	140	960	150	
Dissolved Thallium (Tl)	ug/L	0.3				2	<0.050	<0.050	<0.050	<0.050	<0.050	0.065	<0.050	<0.050	0.056	0.079	<0.050	<0.050	<0.050	<0.050	<0.050	
Dissolved Titanium (Ti)	ug/L						7.7	<5.0	<5.0	7.3	<5.0	<5.0	11	<5.0	<5.0	<5.0	6.8	<5.0	<5.0	7.0	<5.0	
Dissolved Uranium (U)	ug/L	5	20			20	0.23	0.33	0.57	0.77	0.22	0.23	0.25	0.13	0.53	1.2	0.88	0.21	0.14	0.98	0.14	
Dissolved Vanadium (V)	ug/L	6				6.2	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Zinc (Zn)	ug/L	20			5000	1100	<5.0	<5.0	<5.0	<5.0	<5.0	5.5	10	<5.0	<5.0	9.5	9.3	<5.0	<5.0	<5.0	<5.0	
<b>BTEX &amp; F1 Hydrocarbons</b>																						
Benzene	ug/L	100	1			5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Toluene	ug/L	1	60		24	24	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Ethylbenzene	ug/L	8	140		1.6	2.4	<0.20	<0.20</														



TABLE I-1  
SUMMARY OF GROUNDWATER QUALITY RESULTS  
CALEDON PIT / QUARRY

	Units	PWQO	ODWS				MECP Table 2	MW20-11A	MW20-11B	MW20-12A	MW20-12B	MW20-13A	MW20-13B	MW20-13C	MW20-14A	MW20-14B	MW20-15A	MW20-15B	MW20-15C	MW20-16A	MW20-16B	MW20-17A
			MAC	IMAC	AO	OG		24-Jul-21	24-Jul-21	24-Jul-21	24-Jul-21	24-Jul-21	24-Jul-21	24-Jul-21	24-Jul-21	17-Feb-21	17-Feb-21	25-Jun-21	25-Jun-21	25-Jun-21	28-Jun-21	28-Jun-21
<b>Physical Tests (Water)</b>																						
Anion Sum	me/L						6.95	18.3	6.36	6.65	4.60	4.56	6.69	15.6	6.52	28.8	6.49	6.46	5.57	6.43	9.25	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L						250	380	260	260	190	190	280	200	240	190	210	290	200	240	210	
Calculated TDS	mg/L			500			370	1000	340	350	240	240	340	980	340	1900	370	360	290	350	560	
Carb. Alkalinity (calc. as CaCO3)	mg/L						4.7	3.6	2.9	2.9	2.7	3.6	5.0	2.3	3.2	1.2	2.0	2.7	3.2	5.2	2.4	
Cation Sum	me/L						6.91	19.2	6.36	6.78	4.45	4.54	6.72	15.3	6.35	30.6	6.63	8.40	5.04	6.56	9.80	
Hardness (CaCO3)	mg/L				80-100		230	430	300	300	200	200	320	630	300	1000	320	400	230	180	440	
Ion Balance (% Difference)	%						0.290	2.27	0.0300	0.920	1.66	0.250	0.160	1.11	1.28	3.06	1.11	13.0	4.96	1.02	2.89	
Langelier Index (@ 20C)	N/A						0.959	1.11	0.942	0.960	0.693	0.806	1.12	1.11	0.957	0.996	0.803	0.985	0.842	0.822	1.05	
Langelier Index (@ 4C)	N/A						0.710	0.868	0.693	0.712	0.444	0.556	0.874	0.864	0.708	0.753	0.555	0.736	0.593	0.573	0.797	
Saturation pH (@ 20C)	N/A						7.34	6.89	7.14	7.11	7.49	7.50	7.15	6.96	7.19	6.86	7.21	7.01	7.38	7.54	7.05	
Saturation pH (@ 4C)	N/A						7.59	7.14	7.39	7.36	7.74	7.75	7.40	7.20	7.44	7.10	7.45	7.26	7.63	7.78	7.30	
<b>Inorganics</b>																						
Total Ammonia-N	mg/L						0.081	<0.050	<0.050	<0.050	0.21	<0.050	0.11	1.2	<0.050	1.5	0.052	<0.050	0.063	0.23	0.19	
Unionized Ammonia	mg/L	20					<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	
Conductivity	umho/cm						670	1800	550	600	410	410	580	1300	600	2500	630	600	520	590	850	
Dissolved Organic Carbon	mg/L			5			0.61	1.0	<0.40	0.68	<0.40	<0.40	1.3	0.52	0.65	1.7	0.46	0.52	0.66	2.5	1.9	
Orthophosphate (P)	mg/L						<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
pH	pH	6.5-8.5			6.5-8.5		8.30	8.01	8.08	8.07	8.18	8.30	8.27	8.07	8.14	7.85	8.01	7.99	8.22	8.36	8.09	
Dissolved Sulphate (SO4)	mg/L			500			42	37	26	13	37	31	33	540	33	1200	110	25	58	29	230	
Alkalinity (Total as CaCO3) <sup>2</sup>	mg/L				30-500		250	380	260	260	190	190	290	210	240	190	210	290	210	250	210	
Dissolved Chloride (Cl-)	mg/L			250		790000	35	350	7.4	35	1.4	1.1	3.0	6.4	15	11	2.1	3.4	8.5	32	9.5	
Nitrite (N)	mg/L	1.0					0.013	<0.010	<0.010	<0.010	<0.010	<0.010	0.133	0.027	<0.010	0.039	<0.010	<0.010	<0.010	<0.010	<0.010	
Nitrate (N)	mg/L	10.0					0.18	2.73	4.91	2.45	<0.10	<0.10	1.76	0.21	7.35	0.31	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrate + Nitrite (N)	mg/L						0.19	2.73	4.91	2.45	<0.10	<0.10	1.89	0.23	7.35	0.35	<0.10	<0.10	<0.10	<0.10	<0.10	
<b>Metals<sup>1</sup></b>																						
Dissolved Aluminum (Al)	ug/L	75			100		28	520	<4.9	6.1	12	5.9	7.7	18	5.8	200	<4.9	600	5.8	6.6	80	
Dissolved Antimony (Sb)	ug/L	20		6		6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Arsenic (As)	ug/L	100		10		25	5.9	<1.0	<1.0	<1.0	2.7	2.6	<1.0	3.0	<1.0	23	2.0	7.3	8.2	5.8	33	
Dissolved Barium (Ba)	ug/L		1000			1000	96	61	52	30	43	57	37	30	38	24	19	170	42	73	31	
Dissolved Beryllium (Be)	ug/L	1100				4	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
Dissolved Boron (B)	ug/L	200		5000		5000	46	15	12	<10	67	56	27	640	<10	720	60	31	53	160		
Dissolved Cadmium (Cd)	ug/L	0.2	5			2.7	<0.090	0.25	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090		
Dissolved Calcium (Ca)	ug/L						49000	120000	74000	80000	43000	41000	66000	190000	72000	330000	81000	92000	53000	32000	130000	
Dissolved Chromium (Cr)	ug/L	1 <sup>3</sup>	50			50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Dissolved Cobalt (Co)	ug/L	1				3.8	0.63	1.2	<0.50	<0.50	<0.50	<0.50	0.89	<0.50	<0.50	0.60	<0.50	1.4	<0.50	<0.50	1.1	
Dissolved Copper (Cu)	ug/L	5			1000	87	<0.90	5.3	<0.90	<0.90	2.1	<0.90	<0.90	6.9	1.5	1.3	<0.90	4.7	<0.90	<0.90	3.4	
Dissolved Iron (Fe)	ug/L	300			300		<100	590	<100	<100	<100	110	<100	380	<100	210	<100	1200	110	<100	900	
Dissolved Lead (Pb)	ug/L	5	10			10	<0.50	5.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	3.2	<0.50	<0.50	<0.50	
Dissolved Magnesium (Mg)	ug/L						26000	33000	28000	23000	22000	25000	38000	39000	30000	51000	27000	42000	23000	24000	30000	
Dissolved Manganese (Mn)	ug/L			50			180	370	16	7.4	31	21	220	120	<2.0	54	16	130	11	21	61	
Dissolved Molybdenum (Mo)	ug/L	40				70	15	<0.50	0.77	<0.50	2.8	2.5	15	3.0	0.55	150	2.2	1.4	4.6	35	8.1	
Dissolved Nickel (Ni)	ug/L	25				100	4.3	4.2	<1.0	<1.0	<1.0	<1.0	1.6	2.9	<1.0	2.0	<1.0	2.1	<1.0	4.1	23	
Dissolved Phosphorus (P)	ug/L	30					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	130	<100	<100	<100	
Dissolved Potassium (K)	ug/L						1600	1300	3400	2100	1700	1700	1200	11000	740	12000	1600	1700	2100	1600	5300	
Dissolved Selenium (Se)	ug/L	100	50			10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.8	<2.0	<2.0	<2.0	<2.0	<2.0	
Dissolved Silicon (Si)	ug/L						4300	5200	4800	4000	6200	6400	3300	4200	3200	5500	6800	8500	5800	5200	4900	
Dissolved Silver (Ag)	ug/L	0.1				1.5	<0.090	0.19	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	
Dissolved Sodium (Na)	ug/L				200000	490000	51000	240000	6200	19000	10000	9700	6100	54000	6500	220000	6500	5100	11000	67000	17000	
Dissolved Strontium (Sr)	ug/L						1100	200	330	110	1700	960	250	5000	91	4700	1700	430	1000	210	3800	
Dissolved Thallium (Tl)	ug/L	0.3				2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.052	<0.050	<0.050	<0.050	<0.050	<0.050	
Dissolved Titanium (Ti)	ug/L						<5.0	16	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.7	<5.0	18	<5.0	<5.0	<5.0	
Dissolved Uranium (U)	ug/L	5	20			20	3.9	1.1	0.47	0.24	0.29	0.28	1.2	0.45	0.31	21	0.25	1.2	0.67	2.8	0.87	
Dissolved Vanadium (V)	ug/L	6				6.2	0.77	0.87	<0.50	<0.50	<0.50	<0.50	0.55	<0.50	<0.50	0.78	<0.50	1.7	<0.50	<0.50	<0.50	
Dissolved Zinc (Zn)	ug/L	20			5000	1100	<5.0	29	<5.0	<5.0	<5.0	<5.0	<5.0	5.9	<5.0	8.9	<5.0	13	<5.0	<5.0	8.6	
<b>BTEX &amp; F1 Hydrocarbons</b>																						
Benzene	ug/L	100	1			5		<0.20		<0.20		<0.20		<0.20	<0.20						<0.20	
Toluene	ug/L	1	60		24	24		<0.20		<0.20		0.29		<0.20	0.23						0.21	
Ethylbenzene	ug/L	8	140		1.6	2.4		<0.20		<0.20		<0.20		<0.20	<0.20						<0.20	
o-Xylene	ug/L	40						<0.20		<0.20		<0.20										



TABLE I-1  
SUMMARY OF GROUNDWATER QUALITY RESULTS  
CALEDON PIT / QUARRY

	Units	PWQO	ODWS				MECP Table 2	MW20-24B	MW20-25A	MW20-25B	MW20-26A	MW20-26B	MW20-26C	MW20-27A	MW20-27B	MW20-28A	MW20-28B	DUP1	DUP2	DUP3	DUP4	DUP5	DUP6
			MAC	IMAC	AO	OG		25-Jun-21	25-Jun-21	25-Jun-21	24-Jun-21	24-Jun-21	24-Jun-21	24-Jun-21	24-Jun-21	24-Jun-21	24-Jun-21	24-Jun-21	22-Jun-21	23-Jun-21	24-Jun-21	24-Jun-21	24-Jun-21
<b>Physical Tests (Water)</b>																							
Anion Sum	me/L						11.5	29.8	15.5	22.9	11.2	18.7	22.8	8.56	4.78	4.78	7.46	6.82	4.74	6.65	11.2	15.8	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L						290	180	180	180	200	230	190	210	200	200	250	270	200	260	200	180	
Calculated TDS	mg/L			500			620	2000	1000	1500	680	1000	1500	490	250	250	400	360	250	350	680	1000	
Carb. Alkalinity (calc. as CaCO3)	mg/L						1.9	<1.0	1.1	1.4	2.2	1.3	1.8	2.6	3.4	3.1	2.1	1.9	3.2	2.9	2.1	1.0	
Cation Sum	me/L						11.9	31.6	16.8	23.0	11.6	18.7	22.3	8.18	4.66	4.67	7.45	6.57	4.67	6.74	11.4	16.9	
Hardness (CaCO3)	mg/L				80-100		500	1500	810	1100	540	840	1100	370	220	220	320	310	220	290	530	820	
Ion Balance (% Difference)	%						1.67	3.01	3.97	0.160	1.84	0.110	1.09	2.27	1.31	1.20	0.0500	1.87	0.820	0.660	1.24	3.44	
Langelier Index (@ 20C)	N/A						0.916	1.06	0.909	1.10	1.04	0.936	1.24	0.956	0.853	0.824	0.847	0.807	0.833	0.954	1.02	0.871	
Langelier Index (@ 4C)	N/A						0.669	0.821	0.663	0.850	0.788	0.690	0.991	0.708	0.604	0.575	0.598	0.558	0.583	0.705	0.772	0.625	
Saturation pH (@ 20C)	N/A						6.93	6.70	6.91	6.84	7.03	6.86	6.77	7.17	7.39	7.39	7.11	7.07	7.39	7.13	7.04	6.91	
Saturation pH (@ 4C)	N/A						7.17	6.95	7.15	7.08	7.28	7.11	7.02	7.42	7.64	7.64	7.36	7.32	7.64	7.38	7.28	7.16	
<b>Inorganics</b>																							
Total Ammonia-N	mg/L						<0.050	0.11	0.064	0.090	<0.050	<0.050	0.081	0.10	<0.050	0.051	<0.050	<0.050	0.053	<0.050	0.071	0.078	
Unionized Ammonia	mg/L	20					<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Conductivity	umho/cm						1200	2400	1400	1900	1000	2000	1800	750	450	430	730	610	430	590	1000	1400	
Dissolved Organic Carbon	mg/L			5			0.63	1.1	0.67	1.7	1.4	<0.40	0.68	0.66	<0.40	<0.40	0.68	0.65	<0.40	0.63	1.4	0.66	
Orthophosphate (P)	mg/L						<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
pH	pH	6.5-8.5			6.5-8.5		7.84	7.77	7.82	7.93	8.07	7.80	8.01	8.13	8.25	8.21	7.96	7.88	8.22	8.08	8.05	7.78	
Dissolved Sulphate (SO4)	mg/L			500			36	1300	570	920	340	24	910	200	29	29	53	16	29	13	340	580	
Alkalinity (Total as CaCO3) <sup>2</sup>	mg/L				30-500		290	180	180	180	200	230	190	210	210	210	250	270	210	260	200	180	
Dissolved Chloride (Cl-)	mg/L			250		790000	170	3.9	2.0	8.0	5.0	490	2.1	6.2	1.0	1.0	47	20	<1.0	36	4.2	1.5	
Nitrite (N)	mg/L		1.0				<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Nitrate (N)	mg/L		10.0				0.98	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	0.74	7.76	<0.10	2.42	<0.10	<0.10	
Nitrate + Nitrite (N)	mg/L						0.98	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	0.74	7.76	<0.10	2.42	<0.10	<0.10	
<b>Metals</b>																							
Dissolved Aluminum (Al)	ug/L	75			100		<4.9	<4.9	<4.9	14	7.6	6.9	<4.9	<4.9	20	5.8	32	7.1	7.8	<4.9	<4.9	<4.9	
Dissolved Antimony (Sb)	ug/L	20		6		6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Arsenic (As)	ug/L	100		10		25	<1.0	9.6	<1.0	8.7	2.9	<1.0	5.4	1.9	<1.0	3.8	<1.0	<1.0	<1.0	<1.0	2.9	<1.0	
Dissolved Barium (Ba)	ug/L		1000			1000	120	10	6.6	12	20	110	18	26	12	11	52	19	10	29	21	6.9	
Dissolved Beryllium (Be)	ug/L	1100				4	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
Dissolved Boron (B)	ug/L	200		5000		5000	24	89	58	53	30	<10	42	24	23	22	25	<10	21	<10	32	47	
Dissolved Cadmium (Cd)	ug/L	0.2	5			2.7	0.29	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	
Dissolved Calcium (Ca)	ug/L						130000	490000	240000	330000	150000	210000	360000	93000	49000	50000	87000	86000	50000	78000	150000	240000	
Dissolved Chromium (Cr)	ug/L	1 <sup>3</sup>	50			50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Dissolved Cobalt (Co)	ug/L	1				3.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Copper (Cu)	ug/L	5			1000	87	2.1	<0.90	<0.90	<0.90	<0.90	1.0	<0.90	<0.90	<0.90	1.6	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	
Dissolved Iron (Fe)	ug/L	300			300		460	460	330	590	150	<100	690	430	<100	<100	<100	<100	<100	<100	150	330	
Dissolved Lead (Pb)	ug/L	5	10			10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Magnesium (Mg)	ug/L						45000	77000	53000	70000	42000	74000	49000	33000	23000	23000	24000	24000	23000	24000	40000	53000	
Dissolved Manganese (Mn)	ug/L			50			20	36	20	43	26	13	34	25	93	98	32	<2.0	100	7.2	26	21	
Dissolved Molybdenum (Mo)	ug/L	40				70	1.7	8.7	9.0	8.6	8.1	0.55	3.0	11	2.4	1.9	1.2	<0.50	1.9	<0.50	8.1	8.8	
Dissolved Nickel (Ni)	ug/L	25				100	2.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	
Dissolved Phosphorus (P)	ug/L	30					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
Dissolved Potassium (K)	ug/L						1300	2700	1800	2300	1600	1100	1700	820	1300	1200	1300	1100	1200	1700	1500	1800	
Dissolved Selenium (Se)	ug/L	100	50			10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Dissolved Silicon (Si)	ug/L						6600	5400	5400	5100	5600	6900	5500	5500	6300	6600	4900	4000	6700	3900	5500	5400	
Dissolved Silver (Ag)	ug/L	0.1				1.5	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	
Dissolved Sodium (Na)	ug/L			200000		490000	41000	18000	11000	18000	17000	45000	10000	18000	5700	6000	25000	6200	6000	19000	17000	11000	
Dissolved Strontium (Sr)	ug/L						170	8100	4400	5700	2400	320	9800	3000	460	420	740	140	420	110	2300	4600	
Dissolved Thallium (Tl)	ug/L	0.3				2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Dissolved Titanium (Ti)	ug/L						<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Dissolved Uranium (U)	ug/L	5	20			20	0.70	<0.10	<0.10	0.27	0.86	0.52	0.47	1.6	0.38	0.44	0.58	0.14	0.43	0.23	0.87	<0.10	
Dissolved Vanadium (V)	ug/L	6				6.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Zinc (Zn)	ug/L	20		5000		1100	180	<5.0	<5.0	14	<5.0	<5.0	<5.0	<5.0	5.4	11</							



Your Project #: 19129150  
 Your C.O.C. #: 813833-01-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
 210 Sheldon Drive  
 Cambridge, ON  
 CANADA N1T 1A8

**Report Date: 2021/02/24**  
 Report #: R6531316  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C145866**

**Received: 2021/02/19, 07:34**

Sample Matrix: Water  
 # Samples Received: 2

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	2	N/A	2021/02/22	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2021/02/23	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	1	N/A	2021/02/22	CAM SOP-00463	SM 23 4500-Cl E m
Chloride by Automated Colourimetry	1	N/A	2021/02/24	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	2	N/A	2021/02/22	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2021/02/22	CAM SOP-00446	SM 23 5310 B m
Petroleum Hydro. CCME F1 & BTEX in Water	2	N/A	2021/02/22	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	2	2021/02/22	2021/02/23	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	2	N/A	2021/02/23	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	1	N/A	2021/02/22	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2021/02/23	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2021/02/23		
Ion Balance (% Difference)	1	N/A	2021/02/24		
Anion and Cation Sum	2	N/A	2021/02/23		
Total Ammonia-N	2	N/A	2021/02/22	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	2	N/A	2021/02/22	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	2	2021/02/20	2021/02/22	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	1	N/A	2021/02/22	CAM SOP-00461	EPA 365.1 m
Orthophosphate	1	N/A	2021/02/23	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2021/02/23		Auto Calc
Sat. pH and Langelier Index (@ 20C)	1	N/A	2021/02/24		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2021/02/23		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2021/02/24		Auto Calc
Sulphate by Automated Colourimetry	1	N/A	2021/02/22	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	1	N/A	2021/02/24	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	1	N/A	2021/02/23		Auto Calc
Total Dissolved Solids (TDS calc)	1	N/A	2021/02/24		Auto Calc

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau



Your Project #: 19129150  
Your C.O.C. #: 813833-01-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/02/24**  
Report #: R6531316  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C145866**

**Received: 2021/02/19, 07:34**

Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: emese.gitej@bureauveritas.com

Phone# (905)817-5829

=====  
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU  
VERITASBV Labs Job #: C145866  
Report Date: 2021/02/24Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

## RCAP - COMPREHENSIVE (WATER)

BV Labs ID		OWT911			OWT912			OWT912		
Sampling Date		2021/02/17 11:00			2021/02/17 10:15			2021/02/17 10:15		
COC Number		813833-01-01			813833-01-01			813833-01-01		
	UNITS	MW20-14A	RDL	QC Batch	MW20-14B	RDL	QC Batch	MW20-14B Lab-Dup	RDL	QC Batch

## Calculated Parameters

Anion Sum	me/L	15.6	N/A	7209514	6.52	N/A	7209514			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	200	1.0	7208473	240	1.0	7208473			
Calculated TDS	mg/L	980	1.0	7209509	340	1.0	7209509			
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.3	1.0	7208473	3.2	1.0	7208473			
Cation Sum	me/L	15.3	N/A	7209514	6.35	N/A	7209514			
Hardness (CaCO3)	mg/L	630	1.0	7208484	300	1.0	7208484			
Ion Balance (% Difference)	%	1.11	N/A	7209339	1.28	N/A	7209339			
Langelier Index (@ 20C)	N/A	1.11		7209510	0.957		7209510			
Langelier Index (@ 4C)	N/A	0.864		7209511	0.708		7209511			
Saturation pH (@ 20C)	N/A	6.96		7209510	7.19		7209510			
Saturation pH (@ 4C)	N/A	7.20		7209511	7.44		7209511			

## Inorganics

Total Ammonia-N	mg/L	1.2	0.050	7210859	<0.050	0.050	7210859			
Conductivity	umho/cm	1300	1.0	7210025	600	1.0	7210025			
Dissolved Organic Carbon	mg/L	0.52	0.40	7211055	0.65	0.40	7211055	0.65	0.40	7211055
Orthophosphate (P)	mg/L	<0.010	0.010	7210038	<0.010	0.010	7211780	<0.010	0.010	7211780
pH	pH	8.07		7210026	8.14		7210026			
Dissolved Sulphate (SO4)	mg/L	540	5.0	7210034	33	1.0	7211777	33	1.0	7211777
Alkalinity (Total as CaCO3)	mg/L	210	1.0	7210029	240	1.0	7210029			
Dissolved Chloride (Cl-)	mg/L	6.4	1.0	7210032	15	1.0	7211766	15	1.0	7211766
Nitrite (N)	mg/L	0.027	0.010	7210069	<0.010	0.010	7210049			
Nitrate (N)	mg/L	0.21	0.10	7210069	7.35	0.10	7210049			
Nitrate + Nitrite (N)	mg/L	0.23	0.10	7210069	7.35	0.10	7210049			

## Metals

Dissolved Aluminum (Al)	ug/L	18	4.9	7210321	5.8	4.9	7210328			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7210321	<0.50	0.50	7210328			
Dissolved Arsenic (As)	ug/L	3.0	1.0	7210321	<1.0	1.0	7210328			
Dissolved Barium (Ba)	ug/L	30	2.0	7210321	38	2.0	7210328			
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7210321	<0.40	0.40	7210328			
Dissolved Boron (B)	ug/L	640	10	7210321	<10	10	7210328			

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



BUREAU  
VERITAS

BV Labs Job #: C145866  
Report Date: 2021/02/24

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		OWT911			OWT912			OWT912		
Sampling Date		2021/02/17 11:00			2021/02/17 10:15			2021/02/17 10:15		
COC Number		813833-01-01			813833-01-01			813833-01-01		
	UNITS	MW20-14A	RDL	QC Batch	MW20-14B	RDL	QC Batch	MW20-14B Lab-Dup	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7210321	<0.090	0.090	7210328			
Dissolved Calcium (Ca)	ug/L	190000	200	7210321	72000	200	7210328			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7210321	<5.0	5.0	7210328			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7210321	<0.50	0.50	7210328			
Dissolved Copper (Cu)	ug/L	6.9	0.90	7210321	1.5	0.90	7210328			
Dissolved Iron (Fe)	ug/L	380	100	7210321	<100	100	7210328			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7210321	<0.50	0.50	7210328			
Dissolved Magnesium (Mg)	ug/L	39000	50	7210321	30000	50	7210328			
Dissolved Manganese (Mn)	ug/L	120	2.0	7210321	<2.0	2.0	7210328			
Dissolved Molybdenum (Mo)	ug/L	3.0	0.50	7210321	0.55	0.50	7210328			
Dissolved Nickel (Ni)	ug/L	2.9	1.0	7210321	<1.0	1.0	7210328			
Dissolved Phosphorus (P)	ug/L	<100	100	7210321	<100	100	7210328			
Dissolved Potassium (K)	ug/L	11000	200	7210321	740	200	7210328			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7210321	<2.0	2.0	7210328			
Dissolved Silicon (Si)	ug/L	4200	50	7210321	3200	50	7210328			
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7210321	<0.090	0.090	7210328			
Dissolved Sodium (Na)	ug/L	54000	100	7210321	6500	100	7210328			
Dissolved Strontium (Sr)	ug/L	5000	1.0	7210321	91	1.0	7210328			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7210321	<0.050	0.050	7210328			
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7210321	<5.0	5.0	7210328			
Dissolved Uranium (U)	ug/L	0.45	0.10	7210321	0.31	0.10	7210328			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7210321	<0.50	0.50	7210328			
Dissolved Zinc (Zn)	ug/L	5.9	5.0	7210321	<5.0	5.0	7210328			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



BUREAU  
VERITAS

BV Labs Job #: C145866  
Report Date: 2021/02/24

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		OWT911	OWT912		
Sampling Date		2021/02/17 11:00	2021/02/17 10:15		
COC Number		813833-01-01	813833-01-01		
	UNITS	MW20-14A	MW20-14B	RDL	QC Batch
<b>BTEX &amp; F1 Hydrocarbons</b>					
Benzene	ug/L	<0.20	<0.20	0.20	7210596
Toluene	ug/L	<0.20	0.23	0.20	7210596
Ethylbenzene	ug/L	<0.20	<0.20	0.20	7210596
o-Xylene	ug/L	<0.20	<0.20	0.20	7210596
p+m-Xylene	ug/L	<0.40	<0.40	0.40	7210596
Total Xylenes	ug/L	<0.40	<0.40	0.40	7210596
F1 (C6-C10)	ug/L	<25	<25	25	7210596
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	7210596
<b>F2-F4 Hydrocarbons</b>					
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	100	7212293
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	200	7212293
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	200	7212293
Reached Baseline at C50	ug/L	Yes	Yes		7212293
<b>Surrogate Recovery (%)</b>					
1,4-Difluorobenzene	%	105	105		7210596
4-Bromofluorobenzene	%	90	93		7210596
D10-o-Xylene	%	98	103		7210596
D4-1,2-Dichloroethane	%	118	115		7210596
o-Terphenyl	%	97	99		7212293
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



BUREAU  
VERITAS

BV Labs Job #: C145866  
Report Date: 2021/02/24

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

### TEST SUMMARY

**BV Labs ID:** OWT911  
**Sample ID:** MW20-14A  
**Matrix:** Water

**Collected:** 2021/02/17  
**Shipped:**  
**Received:** 2021/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7210029	N/A	2021/02/22	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	7208473	N/A	2021/02/23	Automated Statchk
Chloride by Automated Colourimetry	KONE	7210032	N/A	2021/02/22	Deonarine Ramnarine
Conductivity	AT	7210025	N/A	2021/02/22	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7211055	N/A	2021/02/22	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7210596	N/A	2021/02/22	Joe Paino
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7212293	2021/02/22	2021/02/23	Prabhjot Gulati
Hardness (calculated as CaCO3)		7208484	N/A	2021/02/23	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7210321	N/A	2021/02/22	Arefa Dabhad
Ion Balance (% Difference)	CALC	7209339	N/A	2021/02/23	Automated Statchk
Anion and Cation Sum	CALC	7209514	N/A	2021/02/23	Automated Statchk
Total Ammonia-N	LACH/NH4	7210859	N/A	2021/02/22	Alina Dobreanu
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7210069	N/A	2021/02/22	Chandra Nandlal
pH	AT	7210026	2021/02/20	2021/02/22	Yogesh Patel
Orthophosphate	KONE	7210038	N/A	2021/02/22	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7209510	N/A	2021/02/23	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7209511	N/A	2021/02/23	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7210034	N/A	2021/02/22	Avneet Kour Sudan
Total Dissolved Solids (TDS calc)	CALC	7209509	N/A	2021/02/23	Automated Statchk

**BV Labs ID:** OWT912  
**Sample ID:** MW20-14B  
**Matrix:** Water

**Collected:** 2021/02/17  
**Shipped:**  
**Received:** 2021/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7210029	N/A	2021/02/22	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	7208473	N/A	2021/02/23	Automated Statchk
Chloride by Automated Colourimetry	KONE	7211766	N/A	2021/02/24	Deonarine Ramnarine
Conductivity	AT	7210025	N/A	2021/02/22	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7211055	N/A	2021/02/22	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7210596	N/A	2021/02/22	Joe Paino
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7212293	2021/02/22	2021/02/23	Prabhjot Gulati
Hardness (calculated as CaCO3)		7208484	N/A	2021/02/23	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7210328	N/A	2021/02/23	Arefa Dabhad
Ion Balance (% Difference)	CALC	7209339	N/A	2021/02/24	Automated Statchk
Anion and Cation Sum	CALC	7209514	N/A	2021/02/23	Automated Statchk
Total Ammonia-N	LACH/NH4	7210859	N/A	2021/02/22	Alina Dobreanu
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7210049	N/A	2021/02/22	Chandra Nandlal
pH	AT	7210026	2021/02/20	2021/02/22	Yogesh Patel
Orthophosphate	KONE	7211780	N/A	2021/02/23	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7209510	N/A	2021/02/24	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7209511	N/A	2021/02/24	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7211777	N/A	2021/02/24	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	7209509	N/A	2021/02/24	Automated Statchk



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BV Labs Job #: C145866  
Report Date: 2021/02/24

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

### TEST SUMMARY

**BV Labs ID:** OWT912 Dup  
**Sample ID:** MW20-14B  
**Matrix:** Water

**Collected:** 2021/02/17  
**Shipped:**  
**Received:** 2021/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	7211766	N/A	2021/02/24	Deonarine Ramnarine
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7211055	N/A	2021/02/22	Nimarta Singh
Orthophosphate	KONE	7211780	N/A	2021/02/23	Avneet Kour Sudan
Sulphate by Automated Colourimetry	KONE	7211777	N/A	2021/02/24	Deonarine Ramnarine





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BV Labs Job #: C145866  
Report Date: 2021/02/24

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.0°C
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**Results relate only to the items tested.**



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BV Labs Job #: C145866

Report Date: 2021/02/24

### QUALITY ASSURANCE REPORT

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: AL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7210596	1,4-Difluorobenzene	2021/02/22	98	70 - 130	101	70 - 130	104	%		
7210596	4-Bromofluorobenzene	2021/02/22	101	70 - 130	102	70 - 130	94	%		
7210596	D10-o-Xylene	2021/02/22	96	70 - 130	122	70 - 130	102	%		
7210596	D4-1,2-Dichloroethane	2021/02/22	108	70 - 130	97	70 - 130	110	%		
7212293	o-Terphenyl	2021/02/22	100	60 - 130	100	60 - 130	99	%		
7210025	Conductivity	2021/02/22			101	85 - 115	<1.0	umho/cm	0.25	25
7210026	pH	2021/02/22			102	98 - 103			0.47	N/A
7210029	Alkalinity (Total as CaCO3)	2021/02/22			96	85 - 115	<1.0	mg/L	0.15	20
7210032	Dissolved Chloride (Cl-)	2021/02/22	103	80 - 120	102	80 - 120	<1.0	mg/L	NC	20
7210034	Dissolved Sulphate (SO4)	2021/02/22	121 (1)	75 - 125	107	80 - 120	<1.0	mg/L	0.84	20
7210038	Orthophosphate (P)	2021/02/22	110	75 - 125	100	80 - 120	<0.010	mg/L	NC	25
7210049	Nitrate (N)	2021/02/22	NC	80 - 120	99	80 - 120	<0.10	mg/L	2.8	20
7210049	Nitrite (N)	2021/02/22	NC	80 - 120	108	80 - 120	<0.010	mg/L		
7210069	Nitrate (N)	2021/02/22	99	80 - 120	100	80 - 120	<0.10	mg/L	5.4	20
7210069	Nitrite (N)	2021/02/22	100	80 - 120	107	80 - 120	<0.010	mg/L		
7210321	Dissolved Aluminum (Al)	2021/02/22	111	80 - 120	104	80 - 120	<4.9	ug/L		
7210321	Dissolved Antimony (Sb)	2021/02/22	113	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
7210321	Dissolved Arsenic (As)	2021/02/22	107	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7210321	Dissolved Barium (Ba)	2021/02/22	107	80 - 120	103	80 - 120	<2.0	ug/L	0.44	20
7210321	Dissolved Beryllium (Be)	2021/02/22	102	80 - 120	97	80 - 120	<0.40	ug/L	NC	20
7210321	Dissolved Boron (B)	2021/02/22	100	80 - 120	97	80 - 120	<10	ug/L	1.9	20
7210321	Dissolved Cadmium (Cd)	2021/02/22	107	80 - 120	100	80 - 120	<0.090	ug/L	NC	20
7210321	Dissolved Calcium (Ca)	2021/02/22	NC	80 - 120	100	80 - 120	<200	ug/L		
7210321	Dissolved Chromium (Cr)	2021/02/22	100	80 - 120	95	80 - 120	<5.0	ug/L	NC	20
7210321	Dissolved Cobalt (Co)	2021/02/22	102	80 - 120	98	80 - 120	<0.50	ug/L	4.5	20
7210321	Dissolved Copper (Cu)	2021/02/22	102	80 - 120	96	80 - 120	<0.90	ug/L	3.0	20
7210321	Dissolved Iron (Fe)	2021/02/22	104	80 - 120	99	80 - 120	<100	ug/L		
7210321	Dissolved Lead (Pb)	2021/02/22	102	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
7210321	Dissolved Magnesium (Mg)	2021/02/22	NC	80 - 120	101	80 - 120	<50	ug/L		
7210321	Dissolved Manganese (Mn)	2021/02/22	104	80 - 120	98	80 - 120	<2.0	ug/L		
7210321	Dissolved Molybdenum (Mo)	2021/02/22	109	80 - 120	98	80 - 120	<0.50	ug/L	5.1	20



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VERITAS

BV Labs Job #: C145866

Report Date: 2021/02/24

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: AL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7210321	Dissolved Nickel (Ni)	2021/02/22	99	80 - 120	95	80 - 120	<1.0	ug/L	1.8	20
7210321	Dissolved Phosphorus (P)	2021/02/22	109	80 - 120	110	80 - 120	<100	ug/L		
7210321	Dissolved Potassium (K)	2021/02/22	109	80 - 120	102	80 - 120	<200	ug/L		
7210321	Dissolved Selenium (Se)	2021/02/22	107	80 - 120	103	80 - 120	<2.0	ug/L	NC	20
7210321	Dissolved Silicon (Si)	2021/02/22	106	80 - 120	100	80 - 120	<50	ug/L		
7210321	Dissolved Silver (Ag)	2021/02/22	102	80 - 120	94	80 - 120	<0.090	ug/L	NC	20
7210321	Dissolved Sodium (Na)	2021/02/22	NC	80 - 120	99	80 - 120	<100	ug/L	1.6	20
7210321	Dissolved Strontium (Sr)	2021/02/22	NC	80 - 120	98	80 - 120	<1.0	ug/L		
7210321	Dissolved Thallium (Tl)	2021/02/22	99	80 - 120	94	80 - 120	<0.050	ug/L	NC	20
7210321	Dissolved Titanium (Ti)	2021/02/22	107	80 - 120	98	80 - 120	<5.0	ug/L		
7210321	Dissolved Uranium (U)	2021/02/22	108	80 - 120	100	80 - 120	<0.10	ug/L	4.5	20
7210321	Dissolved Vanadium (V)	2021/02/22	105	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
7210321	Dissolved Zinc (Zn)	2021/02/22	102	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
7210328	Dissolved Aluminum (Al)	2021/02/23	108	80 - 120	101	80 - 120	<4.9	ug/L		
7210328	Dissolved Antimony (Sb)	2021/02/23	111	80 - 120	101	80 - 120	<0.50	ug/L	7.3	20
7210328	Dissolved Arsenic (As)	2021/02/23	106	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7210328	Dissolved Barium (Ba)	2021/02/23	107	80 - 120	102	80 - 120	<2.0	ug/L	0.50	20
7210328	Dissolved Beryllium (Be)	2021/02/23	106	80 - 120	98	80 - 120	<0.40	ug/L	NC	20
7210328	Dissolved Boron (B)	2021/02/23	102	80 - 120	95	80 - 120	<10	ug/L	0.35	20
7210328	Dissolved Cadmium (Cd)	2021/02/23	105	80 - 120	99	80 - 120	<0.090	ug/L	NC	20
7210328	Dissolved Calcium (Ca)	2021/02/23	NC	80 - 120	100	80 - 120	<200	ug/L		
7210328	Dissolved Chromium (Cr)	2021/02/23	101	80 - 120	95	80 - 120	<5.0	ug/L	NC	20
7210328	Dissolved Cobalt (Co)	2021/02/23	103	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
7210328	Dissolved Copper (Cu)	2021/02/23	102	80 - 120	98	80 - 120	<0.90	ug/L	0.88	20
7210328	Dissolved Iron (Fe)	2021/02/23	104	80 - 120	97	80 - 120	<100	ug/L		
7210328	Dissolved Lead (Pb)	2021/02/23	104	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
7210328	Dissolved Magnesium (Mg)	2021/02/23	NC	80 - 120	98	80 - 120	<50	ug/L		
7210328	Dissolved Manganese (Mn)	2021/02/23	103	80 - 120	96	80 - 120	<2.0	ug/L		
7210328	Dissolved Molybdenum (Mo)	2021/02/23	109	80 - 120	98	80 - 120	<0.50	ug/L	1.8	20
7210328	Dissolved Nickel (Ni)	2021/02/23	101	80 - 120	97	80 - 120	<1.0	ug/L	5.9	20
7210328	Dissolved Phosphorus (P)	2021/02/23	108	80 - 120	110	80 - 120	<100	ug/L		



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VERITAS

BV Labs Job #: C145866  
Report Date: 2021/02/24

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7210328	Dissolved Potassium (K)	2021/02/23	107	80 - 120	101	80 - 120	<200	ug/L		
7210328	Dissolved Selenium (Se)	2021/02/23	107	80 - 120	101	80 - 120	<2.0	ug/L	1.7	20
7210328	Dissolved Silicon (Si)	2021/02/23	108	80 - 120	101	80 - 120	<50	ug/L		
7210328	Dissolved Silver (Ag)	2021/02/23	84	80 - 120	97	80 - 120	<0.090	ug/L	NC	20
7210328	Dissolved Sodium (Na)	2021/02/23	NC	80 - 120	97	80 - 120	<100	ug/L		
7210328	Dissolved Strontium (Sr)	2021/02/23	NC	80 - 120	97	80 - 120	<1.0	ug/L		
7210328	Dissolved Thallium (Tl)	2021/02/23	100	80 - 120	97	80 - 120	<0.050	ug/L	NC	20
7210328	Dissolved Titanium (Ti)	2021/02/23	105	80 - 120	97	80 - 120	<5.0	ug/L		
7210328	Dissolved Uranium (U)	2021/02/23	110	80 - 120	101	80 - 120	<0.10	ug/L	2.0	20
7210328	Dissolved Vanadium (V)	2021/02/23	105	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
7210328	Dissolved Zinc (Zn)	2021/02/23	100	80 - 120	97	80 - 120	<5.0	ug/L	0.33	20
7210596	Benzene	2021/02/22	101	50 - 140	105	50 - 140	<0.20	ug/L	NC	30
7210596	Ethylbenzene	2021/02/22	110	50 - 140	116	50 - 140	<0.20	ug/L	NC	30
7210596	F1 (C6-C10) - BTEX	2021/02/22					<25	ug/L	NC	30
7210596	F1 (C6-C10)	2021/02/22	91	60 - 140	102	60 - 140	<25	ug/L	NC	30
7210596	o-Xylene	2021/02/22	110	50 - 140	111	50 - 140	<0.20	ug/L	NC	30
7210596	p+m-Xylene	2021/02/22	110	50 - 140	116	50 - 140	<0.40	ug/L	NC	30
7210596	Toluene	2021/02/22	101	50 - 140	105	50 - 140	<0.20	ug/L	NC	30
7210596	Total Xylenes	2021/02/22					<0.40	ug/L	NC	30
7210859	Total Ammonia-N	2021/02/22	89	75 - 125	99	80 - 120	<0.050	mg/L	12	20
7211055	Dissolved Organic Carbon	2021/02/22	92	80 - 120	95	80 - 120	<0.40	mg/L	0.11	20
7211766	Dissolved Chloride (Cl-)	2021/02/24	106	80 - 120	102	80 - 120	<1.0	mg/L	0.084	20
7211777	Dissolved Sulphate (SO4)	2021/02/24	NC	75 - 125	100	80 - 120	<1.0	mg/L	0.45	20
7211780	Orthophosphate (P)	2021/02/23	103	75 - 125	102	80 - 120	<0.010	mg/L	NC	25
7212293	F2 (C10-C16 Hydrocarbons)	2021/02/23	103	60 - 130	105	60 - 130	<100	ug/L	NC	30
7212293	F3 (C16-C34 Hydrocarbons)	2021/02/23	107	60 - 130	110	60 - 130	<200	ug/L	NC	30



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BV Labs Job #: C145866

Report Date: 2021/02/24

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: AL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7212293	F4 (C34-C50 Hydrocarbons)	2021/02/23	106	60 - 130	108	60 - 130	<200	ug/L	NC	30

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.





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BV Labs Job #: C145866  
Report Date: 2021/02/24

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AL

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

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Anastassia Hamanov, Scientific Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

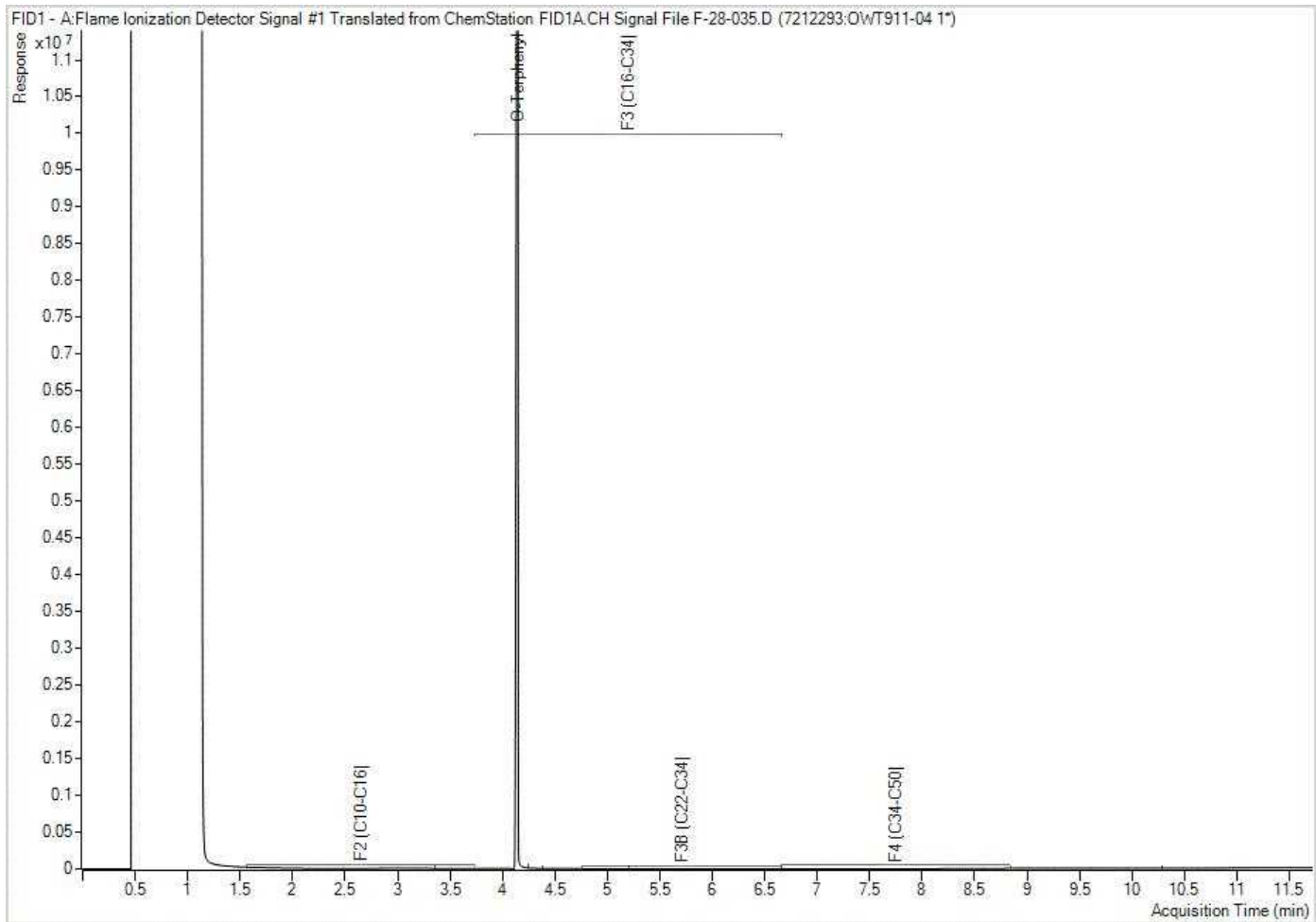


<b>INVOICE TO:</b>		<b>REPORT TO:</b>		<b>PROJECT INFORMATION:</b>		<b>Laboratory Use Only:</b>	
Company Name: #21375 Golder Associates Ltd	Company Name: Gregory Padusenko	Quotation #: B80683	BV Labs Job #:		Bottle Order #:		
Attention: Accounts Payable	Attention: Gregory Padusenko	P.O. #:	Project: 19129150		COC #:		813833
Address: 210 Sheldon Drive Cambridge ON N1T 1A8	Address:	Project Name:	Site #:		Project Manager:		Erna Gitej
Tel: (519) 620-8182 Fax:	Tel: (519) 620-8182 Ext: 6509 Fax: (519) 620-9878	Sampled By: AL	Barcode: C#813833-01-01				
Email: CanadaAccountsPayableInvoices@golder.com	Email: Gregory_Padusenko@golder.com						

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY						ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required: Please provide advance notice for rush projects		
Regulation 153 (2011)		Other Regulations		Special Instructions		Field Filtered (please circle): (Metals) / Hg / Cr VI RCAg - Comprehensive O.Reg 153 PHCs, BTEX/F1-F4										Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.		
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Medium/Fine	<input type="checkbox"/> CCME	<input type="checkbox"/> Sanitary Sewer Bylaw												Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ Rush Confirmation Number: _____ (call lab for #)		
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> Reg 558	<input type="checkbox"/> Storm Sewer Bylaw												# of Bottles: _____ Comments:		
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other	<input type="checkbox"/> For RSC	<input type="checkbox"/> MISA	Municipality: _____												19-Feb-21 07:34 Erna Gitej C145866 NP4 ENV-511		
<input type="checkbox"/> Table _____	<input type="checkbox"/> PWQO	<input type="checkbox"/> Reg 406 Table _____	<input type="checkbox"/> Other _____													REC'D IN WATERLOO		
Include Criteria on Certificate of Analysis (Y/N)? _____																REC'D IN WATERLOO		
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix														
1	MW20-14A	21/2/17	11-	GW	X	X	X											8
2	MW20-14B	21/2/17	10:15	GW	X	X	X											8
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

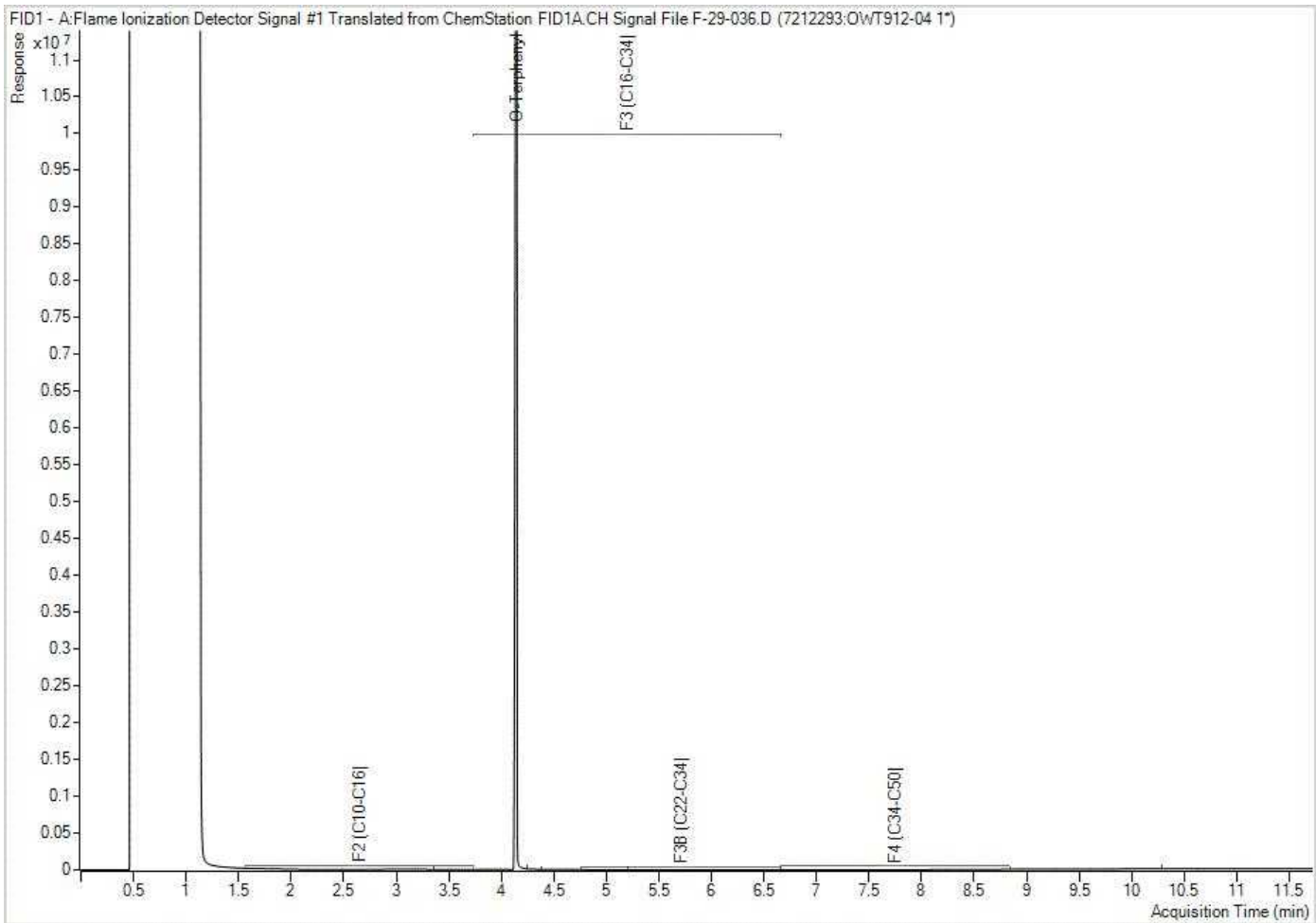
* RELINQUISHED BY: (Signature/Print) A. Linklater		Date: (YY/MM/DD) 21/02/17	Time 17:50	RECEIVED BY: (Signature/Print) Erna Gitej		Date: (YY/MM/DD) 2021/02/19	Time 07:34	# jars used and not submitted	Laboratory Use Only		Custody Seal Present		Yes	No
K. ESTON		21/02/18	18:15	Erna Gitej		21/02/19	15:11		Time Sensitive	Temperature (°C) on Receipt 1/1/1°C	Intact			
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.										White: BV Labs		Yellow: Client		
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.										010/0		SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS		
** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.														

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



**Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.**

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



**Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.**



Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-01-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/06/29**  
Report #: R6697111  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H0819**

**Received: 2021/06/21, 18:30**

Sample Matrix: Water  
# Samples Received: 4

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	3	N/A	2021/06/23	CAM SOP-00448	SM 23 2320 B m
Alkalinity	1	N/A	2021/06/24	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	4	N/A	2021/06/24	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	4	N/A	2021/06/23	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	3	N/A	2021/06/23	CAM SOP-00414	SM 23 2510 m
Conductivity	1	N/A	2021/06/24	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2021/06/24	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2021/06/25	CAM SOP-00446	SM 23 5310 B m
Petroleum Hydro. CCME F1 & BTEX in Water	2	N/A	2021/06/25	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	2	2021/06/25	2021/06/27	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	4	N/A	2021/06/24	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	4	N/A	2021/06/24	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	4	N/A	2021/06/24		
Anion and Cation Sum	4	N/A	2021/06/24		
Total Ammonia-N	4	N/A	2021/06/28	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	4	N/A	2021/06/24	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	3	2021/06/22	2021/06/23	CAM SOP-00413	SM 4500H+ B m
pH	1	2021/06/22	2021/06/24	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	4	N/A	2021/06/23	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	4	N/A	2021/06/24		Auto Calc
Sat. pH and Langelier Index (@ 4C)	4	N/A	2021/06/24		Auto Calc
Sulphate by Automated Colourimetry	4	N/A	2021/06/24	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	4	N/A	2021/06/24		Auto Calc

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are





Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-01-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/06/29**  
Report #: R6697111  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H0819**

**Received: 2021/06/21, 18:30**

reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager  
Email: emese.gitej@bureauveritas.com  
Phone# (905)817-5829

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BUREAU  
VERITASBV Labs Job #: C1H0819  
Report Date: 2021/06/29Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

## RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PWX685			PWX685			PWX686		
Sampling Date		2021/06/21 15:30			2021/06/21 15:30			2021/06/21 15:30		
COC Number		831949-01-01			831949-01-01			831949-01-01		
	UNITS	MW20-08 A	RDL	QC Batch	MW20-08 A Lab-Dup	RDL	QC Batch	MW20-08 B	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	9.16	N/A	7421638				13.1	N/A	7421638
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	270	1.0	7421635				280	1.0	7421635
Calculated TDS	mg/L	490	1.0	7421642				720	1.0	7421642
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.9	1.0	7421635				2.8	1.0	7421635
Cation Sum	me/L	9.23	N/A	7421638				13.2	N/A	7421638
Hardness (CaCO3)	mg/L	330	1.0	7421636				320	1.0	7421636
Ion Balance (% Difference)	%	0.400	N/A	7421637				0.690	N/A	7421637
Langelier Index (@ 20C)	N/A	0.947		7421639				0.925		7421639
Langelier Index (@ 4C)	N/A	0.699		7421640				0.679		7421640
Saturation pH (@ 20C)	N/A	7.12		7421639				7.10		7421639
Saturation pH (@ 4C)	N/A	7.37		7421640				7.35		7421640

Inorganics										
Total Ammonia-N	mg/L	0.10	0.050	7430355				<0.050	0.050	7430355
Conductivity	umho/cm	900	1.0	7422524				1400	1.0	7422524
Dissolved Organic Carbon	mg/L	0.45	0.40	7427516				1.2	0.40	7428766
Orthophosphate (P)	mg/L	<0.010	0.010	7422545	<0.010	0.010	7422545	<0.010	0.010	7422545
pH	pH	8.07		7422527				8.03		7422527
Dissolved Sulphate (SO4)	mg/L	22	1.0	7422560	21	1.0	7422560	17	1.0	7422560
Alkalinity (Total as CaCO3)	mg/L	270	1.0	7422513				280	1.0	7422513
Dissolved Chloride (Cl-)	mg/L	110	1.0	7422556	110	1.0	7422556	240	3.0	7422556
Nitrite (N)	mg/L	<0.010	0.010	7423349				<0.010	0.010	7423349
Nitrate (N)	mg/L	3.65	0.10	7423349				4.31	0.10	7423349
Nitrate + Nitrite (N)	mg/L	3.65	0.10	7423349				4.31	0.10	7423349

Metals										
Dissolved Aluminum (Al)	ug/L	120	4.9	7423183				6.5	4.9	7423183
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7423183				<0.50	0.50	7423183
Dissolved Arsenic (As)	ug/L	<1.0	1.0	7423183				<1.0	1.0	7423183
Dissolved Barium (Ba)	ug/L	41	2.0	7423183				31	2.0	7423183
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7423183				<0.40	0.40	7423183

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 N/A = Not Applicable



BUREAU  
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BV Labs Job #: C1H0819  
Report Date: 2021/06/29

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PWX685			PWX685			PWX686		
Sampling Date		2021/06/21 15:30			2021/06/21 15:30			2021/06/21 15:30		
COC Number		831949-01-01			831949-01-01			831949-01-01		
	UNITS	MW20-08 A	RDL	QC Batch	MW20-08 A Lab-Dup	RDL	QC Batch	MW20-08 B	RDL	QC Batch
Dissolved Boron (B)	ug/L	<10	10	7423183				<10	10	7423183
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7423183				<0.090	0.090	7423183
Dissolved Calcium (Ca)	ug/L	82000	200	7423183				92000	200	7423183
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7423183				<5.0	5.0	7423183
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7423183				<0.50	0.50	7423183
Dissolved Copper (Cu)	ug/L	5.7	0.90	7423183				1.6	0.90	7423183
Dissolved Iron (Fe)	ug/L	200	100	7423183				<100	100	7423183
Dissolved Lead (Pb)	ug/L	1.1	0.50	7423183				<0.50	0.50	7423183
Dissolved Magnesium (Mg)	ug/L	30000	50	7423183				22000	50	7423183
Dissolved Manganese (Mn)	ug/L	15	2.0	7423183				<2.0	2.0	7423183
Dissolved Molybdenum (Mo)	ug/L	0.56	0.50	7423183				<0.50	0.50	7423183
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7423183				<1.0	1.0	7423183
Dissolved Phosphorus (P)	ug/L	<100	100	7423183				<100	100	7423183
Dissolved Potassium (K)	ug/L	880	200	7423183				920	200	7423183
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7423183				<2.0	2.0	7423183
Dissolved Silicon (Si)	ug/L	3900	50	7423183				2700	50	7423183
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7423183				<0.090	0.090	7423183
Dissolved Sodium (Na)	ug/L	61000	100	7423183				160000	100	7423183
Dissolved Strontium (Sr)	ug/L	230	1.0	7423183				160	1.0	7423183
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7423183				<0.050	0.050	7423183
Dissolved Titanium (Ti)	ug/L	6.8	5.0	7423183				<5.0	5.0	7423183
Dissolved Uranium (U)	ug/L	0.88	0.10	7423183				0.21	0.10	7423183
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7423183				<0.50	0.50	7423183
Dissolved Zinc (Zn)	ug/L	9.3	5.0	7423183				<5.0	5.0	7423183

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch  
Lab-Dup = Laboratory Initiated Duplicate

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VERITASBV Labs Job #: C1H0819  
Report Date: 2021/06/29Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

## RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PWX686			PWX687	PWX688		
Sampling Date		2021/06/21 15:30			2021/06/21 16:45	2021/06/21 16:45		
COC Number		831949-01-01			831949-01-01	831949-01-01		
	UNITS	MW20-08 B Lab-Dup	RDL	QC Batch	MW20-07 A	MW20-07 B	RDL	QC Batch
<b>Calculated Parameters</b>								
Anion Sum	me/L				7.85	9.08	N/A	7421638
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				250	260	1.0	7421635
Calculated TDS	mg/L				410	500	1.0	7421642
Carb. Alkalinity (calc. as CaCO3)	mg/L				2.7	3.1	1.0	7421635
Cation Sum	me/L				7.75	9.08	N/A	7421638
Hardness (CaCO3)	mg/L				330	270	1.0	7421636
Ion Balance (% Difference)	%				0.610	0.00	N/A	7421637
Langelier Index (@ 20C)	N/A				0.928	0.901		7421639
Langelier Index (@ 4C)	N/A				0.679	0.653		7421640
Saturation pH (@ 20C)	N/A				7.13	7.19		7421639
Saturation pH (@ 4C)	N/A				7.38	7.44		7421640
<b>Inorganics</b>								
Total Ammonia-N	mg/L				<0.050	0.28	0.050	7430355
Conductivity	umho/cm				740	870	1.0	7422524
Dissolved Organic Carbon	mg/L	1.2	0.40	7428766	0.55	0.88	0.40	7427516
Orthophosphate (P)	mg/L				<0.010	<0.010	0.010	7422545
pH	pH				8.06	8.09		7422527
Dissolved Sulphate (SO4)	mg/L				40	20	1.0	7422560
Alkalinity (Total as CaCO3)	mg/L				250	270	1.0	7422513
Dissolved Chloride (Cl-)	mg/L				68	100	1.0	7422556
Nitrite (N)	mg/L				<0.010	<0.010	0.010	7423349
Nitrate (N)	mg/L				0.73	5.20	0.10	7423349
Nitrate + Nitrite (N)	mg/L				0.73	5.20	0.10	7423349
<b>Metals</b>								
Dissolved Aluminum (Al)	ug/L				53	92	4.9	7423183
Dissolved Antimony (Sb)	ug/L				<0.50	<0.50	0.50	7423183
Dissolved Arsenic (As)	ug/L				7.9	<1.0	1.0	7423183
Dissolved Barium (Ba)	ug/L				56	34	2.0	7423183
Dissolved Beryllium (Be)	ug/L				<0.40	<0.40	0.40	7423183
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable								



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BV Labs Job #: C1H0819  
Report Date: 2021/06/29

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PWX686			PWX687	PWX688		
Sampling Date		2021/06/21 15:30			2021/06/21 16:45	2021/06/21 16:45		
COC Number		831949-01-01			831949-01-01	831949-01-01		
	UNITS	MW20-08 B Lab-Dup	RDL	QC Batch	MW20-07 A	MW20-07 B	RDL	QC Batch
Dissolved Boron (B)	ug/L				23	19	10	7423183
Dissolved Cadmium (Cd)	ug/L				<0.090	<0.090	0.090	7423183
Dissolved Calcium (Ca)	ug/L				81000	71000	200	7423183
Dissolved Chromium (Cr)	ug/L				<5.0	<5.0	5.0	7423183
Dissolved Cobalt (Co)	ug/L				<0.50	<0.50	0.50	7423183
Dissolved Copper (Cu)	ug/L				<0.90	2.8	0.90	7423183
Dissolved Iron (Fe)	ug/L				<100	<100	100	7423183
Dissolved Lead (Pb)	ug/L				<0.50	<0.50	0.50	7423183
Dissolved Magnesium (Mg)	ug/L				30000	22000	50	7423183
Dissolved Manganese (Mn)	ug/L				26	46	2.0	7423183
Dissolved Molybdenum (Mo)	ug/L				1.5	5.5	0.50	7423183
Dissolved Nickel (Ni)	ug/L				<1.0	2.8	1.0	7423183
Dissolved Phosphorus (P)	ug/L				<100	<100	100	7423183
Dissolved Potassium (K)	ug/L				2400	1500	200	7423183
Dissolved Selenium (Se)	ug/L				<2.0	<2.0	2.0	7423183
Dissolved Silicon (Si)	ug/L				3900	3700	50	7423183
Dissolved Silver (Ag)	ug/L				<0.090	<0.090	0.090	7423183
Dissolved Sodium (Na)	ug/L				26000	83000	100	7423183
Dissolved Strontium (Sr)	ug/L				2600	220	1.0	7423183
Dissolved Thallium (Tl)	ug/L				0.056	0.079	0.050	7423183
Dissolved Titanium (Ti)	ug/L				<5.0	<5.0	5.0	7423183
Dissolved Uranium (U)	ug/L				0.53	1.2	0.10	7423183
Dissolved Vanadium (V)	ug/L				<0.50	<0.50	0.50	7423183
Dissolved Zinc (Zn)	ug/L				<5.0	9.5	5.0	7423183

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch  
Lab-Dup = Laboratory Initiated Duplicate





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BV Labs Job #: C1H0819  
Report Date: 2021/06/29

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		PWX686	PWX688		
Sampling Date		2021/06/21 15:30	2021/06/21 16:45		
COC Number		831949-01-01	831949-01-01		
	UNITS	MW20-08 B	MW20-07 B	RDL	QC Batch
<b>BTEX &amp; F1 Hydrocarbons</b>					
Benzene	ug/L	<0.20	<0.20	0.20	7430651
Toluene	ug/L	<0.20	<0.20	0.20	7430651
Ethylbenzene	ug/L	<0.20	<0.20	0.20	7430651
o-Xylene	ug/L	<0.20	<0.20	0.20	7430651
p+m-Xylene	ug/L	<0.40	<0.40	0.40	7430651
Total Xylenes	ug/L	<0.40	<0.40	0.40	7430651
F1 (C6-C10)	ug/L	<25	<25	25	7430651
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	7430651
<b>F2-F4 Hydrocarbons</b>					
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	100	7430615
F3 (C16-C34 Hydrocarbons)	ug/L	<200	360	200	7430615
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	200	7430615
Reached Baseline at C50	ug/L	Yes	Yes		7430615
<b>Surrogate Recovery (%)</b>					
1,4-Difluorobenzene	%	99	100		7430651
4-Bromofluorobenzene	%	99	97		7430651
D10-o-Xylene	%	116	114		7430651
D4-1,2-Dichloroethane	%	112	111		7430651
o-Terphenyl	%	99	99		7430615
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



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BV Labs Job #: C1H0819  
Report Date: 2021/06/29

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PWX685  
**Sample ID:** MW20-08 A  
**Matrix:** Water

**Collected:** 2021/06/21  
**Shipped:**  
**Received:** 2021/06/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7422513	N/A	2021/06/23	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7421635	N/A	2021/06/24	Automated Statchk
Chloride by Automated Colourimetry	KONE	7422556	N/A	2021/06/23	Alina Dobreanu
Conductivity	AT	7422524	N/A	2021/06/23	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7427516	N/A	2021/06/24	Nimarta Singh
Hardness (calculated as CaCO3)		7421636	N/A	2021/06/24	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7423183	N/A	2021/06/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	7421637	N/A	2021/06/24	Automated Statchk
Anion and Cation Sum	CALC	7421638	N/A	2021/06/24	Automated Statchk
Total Ammonia-N	LACH/NH4	7430355	N/A	2021/06/28	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7423349	N/A	2021/06/24	Chandra Nandlal
pH	AT	7422527	2021/06/22	2021/06/23	Surinder Rai
Orthophosphate	KONE	7422545	N/A	2021/06/23	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7421639	N/A	2021/06/24	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7421640	N/A	2021/06/24	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7422560	N/A	2021/06/24	Avneet Kour Sudan
Total Dissolved Solids (TDS calc)	CALC	7421642	N/A	2021/06/24	Automated Statchk

**BV Labs ID:** PWX685 Dup  
**Sample ID:** MW20-08 A  
**Matrix:** Water

**Collected:** 2021/06/21  
**Shipped:**  
**Received:** 2021/06/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	7422556	N/A	2021/06/23	Alina Dobreanu
Orthophosphate	KONE	7422545	N/A	2021/06/23	Avneet Kour Sudan
Sulphate by Automated Colourimetry	KONE	7422560	N/A	2021/06/24	Avneet Kour Sudan

**BV Labs ID:** PWX686  
**Sample ID:** MW20-08 B  
**Matrix:** Water

**Collected:** 2021/06/21  
**Shipped:**  
**Received:** 2021/06/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7422513	N/A	2021/06/24	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7421635	N/A	2021/06/24	Automated Statchk
Chloride by Automated Colourimetry	KONE	7422556	N/A	2021/06/23	Alina Dobreanu
Conductivity	AT	7422524	N/A	2021/06/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7428766	N/A	2021/06/25	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7430651	N/A	2021/06/25	Lincoln Ramdahin
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7430615	2021/06/25	2021/06/27	Jeevaraj Jeevaratnam
Hardness (calculated as CaCO3)		7421636	N/A	2021/06/24	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7423183	N/A	2021/06/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	7421637	N/A	2021/06/24	Automated Statchk
Anion and Cation Sum	CALC	7421638	N/A	2021/06/24	Automated Statchk
Total Ammonia-N	LACH/NH4	7430355	N/A	2021/06/28	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7423349	N/A	2021/06/24	Chandra Nandlal



Your Project #: 19129150 (2300)  
 Your C.O.C. #: 831949-01-01, C#831949-02-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
 210 Sheldon Drive  
 Cambridge, ON  
 CANADA N1T 1A8

**Report Date: 2021/07/02**  
 Report #: R6702818  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H4635**

**Received: 2021/06/24, 08:00**

Sample Matrix: Water  
 # Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	9	N/A	2021/06/30	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	9	N/A	2021/06/30	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	9	N/A	2021/06/30	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	9	N/A	2021/06/30	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	9	N/A	2021/06/29	CAM SOP-00446	SM 23 5310 B m
Petroleum Hydro. CCME F1 & BTEX in Water	5	N/A	2021/06/29	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	4	2021/06/29	2021/06/30	CAM SOP-00316	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	1	2021/06/30	2021/06/30	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	9	N/A	2021/07/02	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	6	N/A	2021/06/30	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	3	N/A	2021/07/02	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	9	N/A	2021/07/02		
Anion and Cation Sum	9	N/A	2021/07/02		
Total Ammonia-N	9	N/A	2021/06/30	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	9	N/A	2021/06/30	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	1	2021/06/29	2021/06/30	CAM SOP-00413	SM 4500H+ B m
pH	8	2021/06/30	2021/06/30	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	9	N/A	2021/06/30	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	9	N/A	2021/07/02		Auto Calc
Sat. pH and Langelier Index (@ 4C)	9	N/A	2021/07/02		Auto Calc
Sulphate by Automated Colourimetry	9	N/A	2021/06/30	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	9	N/A	2021/07/02		Auto Calc

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement



Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-01-01, C#831949-02-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/07/02**  
Report #: R6702818  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H4635**

**Received: 2021/06/24, 08:00**

Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager  
Email: emese.gitej@bureauveritas.com  
Phone# (905)817-5829

=====  
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU  
VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

**RCAP - COMPREHENSIVE (WATER)**

<b>BV Labs ID</b>		PXS026			PXS026			PXS027		
<b>Sampling Date</b>		2021/06/23 15:30			2021/06/23 15:30			2021/06/23 15:45		
<b>COC Number</b>		C#831949-02-01			C#831949-02-01			C#831949-02-01		
	<b>UNITS</b>	<b>MW20-19A</b>	<b>RDL</b>	<b>QC Batch</b>	<b>MW20-19A Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>	<b>MW20-19B</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>										
Anion Sum	me/L	9.06	N/A	7427593				7.25	N/A	7427593
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	240	1.0	7427591				260	1.0	7427591
Calculated TDS	mg/L	490	1.0	7426927				370	1.0	7426927
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.1	1.0	7427591				2.4	1.0	7427591
Cation Sum	me/L	8.56	N/A	7427593				6.66	N/A	7427593
Hardness (CaCO3)	mg/L	420	1.0	7429889				310	1.0	7429889
Ion Balance (% Difference)	%	2.85	N/A	7427592				4.22	N/A	7427592
Langelier Index (@ 20C)	N/A	0.806		7427594				0.859		7427594
Langelier Index (@ 4C)	N/A	0.558		7427596				0.611		7427596
Saturation pH (@ 20C)	N/A	7.16		7427594				7.14		7427594
Saturation pH (@ 4C)	N/A	7.40		7427596				7.39		7427596

<b>Inorganics</b>										
Total Ammonia-N	mg/L	<0.050	0.050	7436397				<0.050	0.050	7436397
Conductivity	umho/cm	780	1.0	7438035	770	1.0	7438035	640	1.0	7438035
Dissolved Organic Carbon	mg/L	1.1	0.40	7436754				0.62	0.40	7436754
Orthophosphate (P)	mg/L	<0.010	0.010	7437783	<0.010	0.010	7437783	<0.010	0.010	7437783
pH	pH	7.96		7438036	7.99		7438036	8.00		7438036
Dissolved Sulphate (SO4)	mg/L	190	1.0	7437782	190	1.0	7437782	76	1.0	7437782
Alkalinity (Total as CaCO3)	mg/L	250	1.0	7438032	240	1.0	7438032	260	1.0	7438032
Dissolved Chloride (Cl-)	mg/L	7.1	1.0	7437775	8.9	1.0	7437775	18	1.0	7437775
Nitrite (N)	mg/L	<0.010	0.010	7437964	<0.010	0.010	7437964	<0.010	0.010	7437964
Nitrate (N)	mg/L	<0.10	0.10	7437964	<0.10	0.10	7437964	<0.10	0.10	7437964
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7437964	<0.10	0.10	7437964	<0.10	0.10	7437964

<b>Metals</b>										
Dissolved Aluminum (Al)	ug/L	46	4.9	7435801				6.5	4.9	7435801
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7435801				<0.50	0.50	7435801
Dissolved Arsenic (As)	ug/L	1.3	1.0	7435801				4.3	1.0	7435801
Dissolved Barium (Ba)	ug/L	22	2.0	7435801				35	2.0	7435801
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7435801				<0.40	0.40	7435801
Dissolved Boron (B)	ug/L	35	10	7435801				12	10	7435801

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 N/A = Not Applicable





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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PXS026			PXS026			PXS027		
Sampling Date		2021/06/23 15:30			2021/06/23 15:30			2021/06/23 15:45		
COC Number		C#831949-02-01			C#831949-02-01			C#831949-02-01		
	UNITS	MW20-19A	RDL	QC Batch	MW20-19A Lab-Dup	RDL	QC Batch	MW20-19B	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7435801				<0.090	0.090	7435801
Dissolved Calcium (Ca)	ug/L	83000	200	7435801				77000	200	7435801
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7435801				<5.0	5.0	7435801
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7435801				<0.50	0.50	7435801
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7435801				<0.90	0.90	7435801
Dissolved Iron (Fe)	ug/L	310	100	7435801				380	100	7435801
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7435801				<0.50	0.50	7435801
Dissolved Magnesium (Mg)	ug/L	50000	50	7435801				29000	50	7435801
Dissolved Manganese (Mn)	ug/L	7.0	2.0	7435801				48	2.0	7435801
Dissolved Molybdenum (Mo)	ug/L	1.6	0.50	7435801				3.4	0.50	7435801
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7435801				2.2	1.0	7435801
Dissolved Phosphorus (P)	ug/L	<100	100	7435801				<100	100	7435801
Dissolved Potassium (K)	ug/L	1700	200	7435801				730	200	7435801
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7435801				<2.0	2.0	7435801
Dissolved Silicon (Si)	ug/L	3900	50	7435801				2900	50	7435801
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7435801				<0.090	0.090	7435801
Dissolved Sodium (Na)	ug/L	4400	100	7435801				8800	100	7435801
Dissolved Strontium (Sr)	ug/L	1500	1.0	7435801				610	1.0	7435801
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7435801				<0.050	0.050	7435801
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7435801				<5.0	5.0	7435801
Dissolved Uranium (U)	ug/L	0.12	0.10	7435801				0.13	0.10	7435801
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7435801				<0.50	0.50	7435801
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7435801				<5.0	5.0	7435801

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch  
Lab-Dup = Laboratory Initiated Duplicate

BUREAU  
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BV Labs Job #: C1H4635

Report Date: 2021/07/02

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PXS028		PXS029		PXS030		
Sampling Date		2021/06/23		2021/06/23 16:10		2021/06/23 16:40		
COC Number		C#831949-02-01		C#831949-02-01		C#831949-02-01		
	UNITS	DUP2	RDL	MW20-20A	RDL	MW20-20B	RDL	QC Batch
<b>Calculated Parameters</b>								
Anion Sum	me/L	6.82	N/A	26.3	N/A	8.64	N/A	7427593
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	270	1.0	180	1.0	200	1.0	7427591
Calculated TDS	mg/L	360	1.0	1700	1.0	500	1.0	7426927
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.9	1.0	<1.0	1.0	1.3	1.0	7427591
Cation Sum	me/L	6.57	N/A	26.3	N/A	8.13	N/A	7427593
Hardness (CaCO3)	mg/L	310	1.0	1300	1.0	400	1.0	7429889
Ion Balance (% Difference)	%	1.87	N/A	0.00	N/A	3.03	N/A	7427592
Langelier Index (@ 20C)	N/A	0.807		0.952		0.715		7427594
Langelier Index (@ 4C)	N/A	0.558		0.708		0.467		7427596
Saturation pH (@ 20C)	N/A	7.07		6.74		7.13		7427594
Saturation pH (@ 4C)	N/A	7.32		6.98		7.38		7427596
<b>Inorganics</b>								
Total Ammonia-N	mg/L	<0.050	0.050	0.22	0.050	<0.050	0.050	7436397
Conductivity	umho/cm	610	1.0	2000	1.0	740	1.0	7438035
Dissolved Organic Carbon	mg/L	0.65	0.40	<0.40	0.40	<0.40	0.40	7436754
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010	7437783
pH	pH	7.88		7.69		7.85		7438036
Dissolved Sulphate (SO4)	mg/L	16	1.0	1100	5.0	220	1.0	7437782
Alkalinity (Total as CaCO3)	mg/L	270	1.0	180	1.0	200	1.0	7438032
Dissolved Chloride (Cl-)	mg/L	20	1.0	4.2	1.0	4.5	1.0	7437775
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010	7437964
Nitrate (N)	mg/L	7.76	0.10	<0.10	0.10	<0.10	0.10	7437964
Nitrate + Nitrite (N)	mg/L	7.76	0.10	<0.10	0.10	<0.10	0.10	7437964
<b>Metals</b>								
Dissolved Aluminum (Al)	ug/L	7.1	4.9	26	4.9	<4.9	4.9	7435801
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	7435801
Dissolved Arsenic (As)	ug/L	<1.0	1.0	4.8	1.0	5.5	1.0	7435801
Dissolved Barium (Ba)	ug/L	19	2.0	8.1	2.0	14	2.0	7435801
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	<0.40	0.40	<0.40	0.40	7435801
Dissolved Boron (B)	ug/L	<10	10	54	10	13	10	7435801
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	<0.090	0.090	<0.090	0.090	7435801
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PXS028		PXS029		PXS030		
Sampling Date		2021/06/23		2021/06/23 16:10		2021/06/23 16:40		
COC Number		C#831949-02-01		C#831949-02-01		C#831949-02-01		
	UNITS	DUP2	RDL	MW20-20A	RDL	MW20-20B	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	86000	200	430000	400	110000	200	7435801
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	<5.0	5.0	7435801
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	7435801
Dissolved Copper (Cu)	ug/L	<0.90	0.90	<0.90	0.90	<0.90	0.90	7435801
Dissolved Iron (Fe)	ug/L	<100	100	620	100	180	100	7435801
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	7435801
Dissolved Magnesium (Mg)	ug/L	24000	50	54000	50	30000	50	7435801
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	41	2.0	6.7	2.0	7435801
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	2.0	0.50	2.1	0.50	7435801
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	<1.0	1.0	<1.0	1.0	7435801
Dissolved Phosphorus (P)	ug/L	<100	100	<100	100	<100	100	7435801
Dissolved Potassium (K)	ug/L	1100	200	1600	200	820	200	7435801
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	2.0	<2.0	2.0	7435801
Dissolved Silicon (Si)	ug/L	4000	50	6700	50	7300	50	7435801
Dissolved Silver (Ag)	ug/L	<0.090	0.090	<0.090	0.090	<0.090	0.090	7435801
Dissolved Sodium (Na)	ug/L	6200	100	7100	100	3300	100	7435801
Dissolved Strontium (Sr)	ug/L	140	1.0	8600	1.0	2700	1.0	7435801
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	0.050	<0.050	0.050	7435801
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	<5.0	5.0	<5.0	5.0	7435801
Dissolved Uranium (U)	ug/L	0.14	0.10	0.17	0.10	<0.10	0.10	7435801
Dissolved Vanadium (V)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	7435801
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	5.0	<5.0	5.0	7435801
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU  
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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

<b>BV Labs ID</b>		PXS031		PXS032			PXS033		
<b>Sampling Date</b>		2021/06/23 17:10		2021/06/23 09:30			2021/06/23 16:30		
<b>COC Number</b>		C#831949-02-01		C#831949-02-01			C#831949-02-01		
	<b>UNITS</b>	<b>MW20-20C</b>	<b>QC Batch</b>	<b>MW20-09</b>	<b>RDL</b>	<b>QC Batch</b>	<b>MW20-22A</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>									
Anion Sum	me/L	7.54	7427593	6.84	N/A	7427593	27.0	N/A	7427593
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	310	7434506	270	1.0	7434506	200	1.0	7434506
Calculated TDS	mg/L	380	7426927	360	1.0	7426927	1700	1.0	7426927
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.2	7434506	2.0	1.0	7434506	<1.0	1.0	7434506
Cation Sum	me/L	7.34	7427593	6.73	N/A	7427593	25.7	N/A	7427593
Hardness (CaCO3)	mg/L	340	7429889	320	1.0	7429889	1300	1.0	7429889
Ion Balance (% Difference)	%	1.38	7427592	0.850	N/A	7427592	2.53	N/A	7427592
Langelier Index (@ 20C)	N/A	0.904	7427594	0.833		7427594	0.961		7427594
Langelier Index (@ 4C)	N/A	0.655	7427596	0.584		7427596	0.717		7427596
Saturation pH (@ 20C)	N/A	6.97	7427594	7.06		7427594	6.73		7427594
Saturation pH (@ 4C)	N/A	7.22	7427596	7.30		7427596	6.98		7427596

<b>Inorganics</b>									
Total Ammonia-N	mg/L	<0.050	7436397	<0.050	0.050	7436397	0.070	0.050	7436397
Conductivity	umho/cm	660	7438035	610	1.0	7438035	2000	1.0	7438035
Dissolved Organic Carbon	mg/L	4.6	7436754	0.70	0.40	7436754	1.2	0.40	7436754
Orthophosphate (P)	mg/L	<0.010	7437783	<0.010	0.010	7436693	<0.010	0.010	7437783
pH	pH	7.88	7438036	7.89		7438036	7.69		7438036
Dissolved Sulphate (SO4)	mg/L	15	7437782	16	1.0	7436692	1100	5.0	7437782
Alkalinity (Total as CaCO3)	mg/L	310	7438032	270	1.0	7438032	200	1.0	7438032
Dissolved Chloride (Cl-)	mg/L	35	7437775	18	1.0	7436686	7.2	1.0	7437775
Nitrite (N)	mg/L	<0.010	7437964	<0.010	0.010	7437964	<0.010	0.010	7437964
Nitrate (N)	mg/L	0.13	7437964	7.61	0.10	7437964	<0.10	0.10	7437964
Nitrate + Nitrite (N)	mg/L	0.13	7437964	7.61	0.10	7437964	<0.10	0.10	7437964

<b>Metals</b>									
Dissolved Aluminum (Al)	ug/L	80	7437678	8.2	4.9	7435801	9.4	4.9	7435801
Dissolved Antimony (Sb)	ug/L	<0.50	7437678	<0.50	0.50	7435801	<0.50	0.50	7435801
Dissolved Arsenic (As)	ug/L	<1.0	7437678	<1.0	1.0	7435801	2.8	1.0	7435801
Dissolved Barium (Ba)	ug/L	33	7437678	19	2.0	7435801	7.7	2.0	7435801
Dissolved Beryllium (Be)	ug/L	<0.40	7437678	<0.40	0.40	7435801	<0.40	0.40	7435801
Dissolved Boron (B)	ug/L	16	7437678	<10	10	7435801	71	10	7435801
Dissolved Cadmium (Cd)	ug/L	<0.090	7437678	<0.090	0.090	7435801	<0.090	0.090	7435801

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 N/A = Not Applicable



BUREAU  
VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXS031		PXS032			PXS033		
Sampling Date		2021/06/23 17:10		2021/06/23 09:30			2021/06/23 16:30		
COC Number		C#831949-02-01		C#831949-02-01			C#831949-02-01		
	UNITS	MW20-20C	QC Batch	MW20-09	RDL	QC Batch	MW20-22A	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	95000	7437678	88000	200	7435801	400000	1000	7435801
Dissolved Chromium (Cr)	ug/L	<5.0	7437678	<5.0	5.0	7435801	<5.0	5.0	7435801
Dissolved Cobalt (Co)	ug/L	<0.50	7437678	<0.50	0.50	7435801	<0.50	0.50	7435801
Dissolved Copper (Cu)	ug/L	2.0	7437678	1.1	0.90	7435801	<0.90	0.90	7435801
Dissolved Iron (Fe)	ug/L	110	7437678	<100	100	7435801	350	100	7435801
Dissolved Lead (Pb)	ug/L	<0.50	7437678	<0.50	0.50	7435801	<0.50	0.50	7435801
Dissolved Magnesium (Mg)	ug/L	26000	7437678	25000	50	7435801	62000	50	7435801
Dissolved Manganese (Mn)	ug/L	6.0	7437678	<2.0	2.0	7435801	39	2.0	7435801
Dissolved Molybdenum (Mo)	ug/L	<0.50	7437678	<0.50	0.50	7435801	2.9	0.50	7435801
Dissolved Nickel (Ni)	ug/L	<1.0	7437678	<1.0	1.0	7435801	3.9	1.0	7435801
Dissolved Phosphorus (P)	ug/L	<100	7437678	<100	100	7435801	<100	100	7435801
Dissolved Potassium (K)	ug/L	1100	7437678	1100	200	7435801	2200	200	7435801
Dissolved Selenium (Se)	ug/L	<2.0	7437678	<2.0	2.0	7435801	<2.0	2.0	7435801
Dissolved Silicon (Si)	ug/L	4700	7437678	4300	50	7435801	5600	50	7435801
Dissolved Silver (Ag)	ug/L	<0.090	7437678	<0.090	0.090	7435801	<0.090	0.090	7435801
Dissolved Sodium (Na)	ug/L	11000	7437678	6400	100	7435801	14000	100	7435801
Dissolved Strontium (Sr)	ug/L	150	7437678	140	1.0	7435801	7200	1.0	7435801
Dissolved Thallium (Tl)	ug/L	<0.050	7437678	<0.050	0.050	7435801	<0.050	0.050	7435801
Dissolved Titanium (Ti)	ug/L	<5.0	7437678	<5.0	5.0	7435801	<5.0	5.0	7435801
Dissolved Uranium (U)	ug/L	0.80	7437678	0.14	0.10	7435801	0.22	0.10	7435801
Dissolved Vanadium (V)	ug/L	<0.50	7437678	<0.50	0.50	7435801	<0.50	0.50	7435801
Dissolved Zinc (Zn)	ug/L	<5.0	7437678	<5.0	5.0	7435801	<5.0	5.0	7435801
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									





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VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXS034		
Sampling Date		2021/06/23 18:30		
COC Number		C#831949-02-01		
	UNITS	MW20-22B	RDL	QC Batch
<b>Calculated Parameters</b>				
Anion Sum	me/L	18.7	N/A	7427593
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	220	1.0	7434506
Calculated TDS	mg/L	1200	1.0	7426927
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.9	1.0	7434506
Cation Sum	me/L	18.9	N/A	7427593
Hardness (CaCO3)	mg/L	870	1.0	7429889
Ion Balance (% Difference)	%	0.680	N/A	7427592
Langelier Index (@ 20C)	N/A	1.15		7427594
Langelier Index (@ 4C)	N/A	0.902		7427596
Saturation pH (@ 20C)	N/A	6.81		7427594
Saturation pH (@ 4C)	N/A	7.05		7427596
<b>Inorganics</b>				
Total Ammonia-N	mg/L	0.15	0.050	7436397
Conductivity	umho/cm	1500	1.0	7438035
Dissolved Organic Carbon	mg/L	0.85	0.40	7436754
Orthophosphate (P)	mg/L	<0.010	0.010	7437783
pH	pH	7.95		7438036
Dissolved Sulphate (SO4)	mg/L	650	5.0	7437782
Alkalinity (Total as CaCO3)	mg/L	230	1.0	7438032
Dissolved Chloride (Cl-)	mg/L	24	1.0	7437775
Nitrite (N)	mg/L	0.010	0.010	7437964
Nitrate (N)	mg/L	0.25	0.10	7437964
Nitrate + Nitrite (N)	mg/L	0.26	0.10	7437964
<b>Metals</b>				
Dissolved Aluminum (Al)	ug/L	9.7	4.9	7435801
Dissolved Antimony (Sb)	ug/L	1.8	0.50	7435801
Dissolved Arsenic (As)	ug/L	11	1.0	7435801
Dissolved Barium (Ba)	ug/L	13	2.0	7435801
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7435801
Dissolved Boron (B)	ug/L	54	10	7435801
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7435801
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				



BUREAU  
VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXS034		
Sampling Date		2021/06/23 18:30		
COC Number		C#831949-02-01		
	UNITS	MW20-22B	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	260000	200	7435801
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7435801
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7435801
Dissolved Copper (Cu)	ug/L	1.0	0.90	7435801
Dissolved Iron (Fe)	ug/L	<100	100	7435801
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7435801
Dissolved Magnesium (Mg)	ug/L	57000	50	7435801
Dissolved Manganese (Mn)	ug/L	34	2.0	7435801
Dissolved Molybdenum (Mo)	ug/L	24	0.50	7435801
Dissolved Nickel (Ni)	ug/L	5.9	1.0	7435801
Dissolved Phosphorus (P)	ug/L	<100	100	7435801
Dissolved Potassium (K)	ug/L	2000	200	7435801
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7435801
Dissolved Silicon (Si)	ug/L	4700	50	7435801
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7435801
Dissolved Sodium (Na)	ug/L	32000	100	7435801
Dissolved Strontium (Sr)	ug/L	4700	1.0	7435801
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7435801
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7435801
Dissolved Uranium (U)	ug/L	1.4	0.10	7435801
Dissolved Vanadium (V)	ug/L	1.2	0.50	7435801
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7435801
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		PXS027	PXS028			PXS028		
Sampling Date		2021/06/23 15:45	2021/06/23			2021/06/23		
COC Number		C#831949-02-01	C#831949-02-01			C#831949-02-01		
	UNITS	MW20-19B	DUP2	RDL	QC Batch	DUP2 Lab-Dup	RDL	QC Batch
<b>BTEX &amp; F1 Hydrocarbons</b>								
Benzene	ug/L	<0.20	<0.20	0.20	7435755			
Toluene	ug/L	<0.20	<0.20	0.20	7435755			
Ethylbenzene	ug/L	<0.20	<0.20	0.20	7435755			
o-Xylene	ug/L	<0.20	<0.20	0.20	7435755			
p+m-Xylene	ug/L	<0.40	<0.40	0.40	7435755			
Total Xylenes	ug/L	<0.40	<0.40	0.40	7435755			
F1 (C6-C10)	ug/L	<25	<25	25	7435755			
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	7435755			
<b>F2-F4 Hydrocarbons</b>								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	100	7436245	<100	100	7436245
F3 (C16-C34 Hydrocarbons)	ug/L	1100	<200	200	7436245	<200	200	7436245
F4 (C34-C50 Hydrocarbons)	ug/L	810	<200	200	7436245	<200	200	7436245
Reached Baseline at C50	ug/L	Yes	Yes		7436245	Yes		7436245
<b>Surrogate Recovery (%)</b>								
1,4-Difluorobenzene	%	100	100		7435755			
4-Bromofluorobenzene	%	96	96		7435755			
D10-o-Xylene	%	98	97		7435755			
D4-1,2-Dichloroethane	%	107	107		7435755			
o-Terphenyl	%	93	97		7436245	97		7436245
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate								



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VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		PXS030				PXS030				PXS032			
Sampling Date		2021/06/23 16:40				2021/06/23 16:40				2021/06/23 09:30			
COC Number		C#831949-02-01				C#831949-02-01				C#831949-02-01			
	UNITS	MW20-20B	RDL	QC Batch	MW20-20B Lab-Dup	RDL	QC Batch	MW20-09	RDL	QC Batch			
<b>BTEX &amp; F1 Hydrocarbons</b>													
Benzene	ug/L	<0.20	0.20	7435755	<0.20	0.20	7435755	<0.20	0.20	7435755			
Toluene	ug/L	<0.20	0.20	7435755	<0.20	0.20	7435755	<0.20	0.20	7435755			
Ethylbenzene	ug/L	<0.20	0.20	7435755	<0.20	0.20	7435755	<0.20	0.20	7435755			
o-Xylene	ug/L	<0.20	0.20	7435755	<0.20	0.20	7435755	<0.20	0.20	7435755			
p+m-Xylene	ug/L	<0.40	0.40	7435755	<0.40	0.40	7435755	<0.40	0.40	7435755			
Total Xylenes	ug/L	<0.40	0.40	7435755	<0.40	0.40	7435755	<0.40	0.40	7435755			
F1 (C6-C10)	ug/L	<25	25	7435755	<25	25	7435755	<25	25	7435755			
F1 (C6-C10) - BTEX	ug/L	<25	25	7435755	<25	25	7435755	<25	25	7435755			
<b>F2-F4 Hydrocarbons</b>													
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	7436245				<100	100	7436245			
F3 (C16-C34 Hydrocarbons)	ug/L	330	200	7436245				<200	200	7436245			
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	7436245				<200	200	7436245			
Reached Baseline at C50	ug/L	Yes		7436245				Yes		7436245			
<b>Surrogate Recovery (%)</b>													
1,4-Difluorobenzene	%	99		7435755	101		7435755	99		7435755			
4-Bromofluorobenzene	%	99		7435755	92		7435755	99		7435755			
D10-o-Xylene	%	98		7435755	99		7435755	97		7435755			
D4-1,2-Dichloroethane	%	106		7435755	108		7435755	103		7435755			
o-Terphenyl	%	98		7436245				96		7436245			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate													



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VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

<b>BV Labs ID</b>		PXS034		
<b>Sampling Date</b>		2021/06/23 18:30		
<b>COC Number</b>		C#831949-02-01		
	<b>UNITS</b>	<b>MW20-22B</b>	<b>RDL</b>	<b>QC Batch</b>
<b>BTEX &amp; F1 Hydrocarbons</b>				
Benzene	ug/L	<0.20	0.20	7435755
Toluene	ug/L	0.27	0.20	7435755
Ethylbenzene	ug/L	<0.20	0.20	7435755
o-Xylene	ug/L	<0.20	0.20	7435755
p+m-Xylene	ug/L	<0.40	0.40	7435755
Total Xylenes	ug/L	<0.40	0.40	7435755
F1 (C6-C10)	ug/L	<25	25	7435755
F1 (C6-C10) - BTEX	ug/L	<25	25	7435755
<b>F2-F4 Hydrocarbons</b>				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	7437559
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	7437559
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	7437559
Reached Baseline at C50	ug/L	Yes		7437559
<b>Surrogate Recovery (%)</b>				
1,4-Difluorobenzene	%	100		7435755
4-Bromofluorobenzene	%	91		7435755
D10-o-Xylene	%	98		7435755
D4-1,2-Dichloroethane	%	104		7435755
o-Terphenyl	%	99		7437559
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				





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VERITAS

BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PXS026  
**Sample ID:** MW20-19A  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7427591	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/06/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXS026 Dup  
**Sample ID:** MW20-19A  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu

**BV Labs ID:** PXS027  
**Sample ID:** MW20-19B  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7427591	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7435755	N/A	2021/06/29	Anca Ganea
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/06/30	Arefa Dabhad



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PXS027  
**Sample ID:** MW20-19B  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXS028  
**Sample ID:** DUP2  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7427591	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7435755	N/A	2021/06/29	Anca Ganea
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/06/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXS028 Dup  
**Sample ID:** DUP2  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PXS029  
**Sample ID:** MW20-20A  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7427591	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/07/02	Arefa Dabhad
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXS030  
**Sample ID:** MW20-20B  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7427591	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7435755	N/A	2021/06/29	Anca Ganea
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/06/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk



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BV Labs Job #: C1H4635

Report Date: 2021/07/02

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PXS030 Dup  
**Sample ID:** MW20-20B  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7435755	N/A	2021/06/29	Anca Ganea

**BV Labs ID:** PXS031  
**Sample ID:** MW20-20C  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7434506	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/07/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXS032  
**Sample ID:** MW20-09  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7434506	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7436686	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7435755	N/A	2021/06/29	Anca Ganea
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/06/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/29	2021/06/30	Surinder Rai
Orthophosphate	KONE	7436693	N/A	2021/06/30	Avneet Kour Sudan



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PXS032  
**Sample ID:** MW20-09  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7436692	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXS033  
**Sample ID:** MW20-22A  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7434506	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/07/02	Arefa Dabhad
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXS034  
**Sample ID:** MW20-22B  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438032	N/A	2021/06/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7434506	N/A	2021/06/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437775	N/A	2021/06/30	Alina Dobreanu
Conductivity	AT	7438035	N/A	2021/06/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7436754	N/A	2021/06/29	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7435755	N/A	2021/06/29	Anca Ganea
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7437559	2021/06/30	2021/06/30	(Kent) Maolin Li
Hardness (calculated as CaCO3)		7429889	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7435801	N/A	2021/06/30	Arefa Dabhad
Ion Balance (% Difference)	CALC	7427592	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7427593	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal





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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PXS034  
**Sample ID:** MW20-22B  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437964	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438036	2021/06/30	2021/06/30	Surinder Rai
Orthophosphate	KONE	7437783	N/A	2021/06/30	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7427594	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7427596	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437782	N/A	2021/06/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7426927	N/A	2021/07/02	Automated Statchk



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.0°C
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**Results relate only to the items tested.**



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

### QUALITY ASSURANCE REPORT

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7435755	1,4-Difluorobenzene	2021/06/30	98	70 - 130	99	70 - 130	100	%		
7435755	4-Bromofluorobenzene	2021/06/30	102	70 - 130	100	70 - 130	95	%		
7435755	D10-o-Xylene	2021/06/30	83	70 - 130	97	70 - 130	96	%		
7435755	D4-1,2-Dichloroethane	2021/06/30	101	70 - 130	99	70 - 130	101	%		
7436245	o-Terphenyl	2021/06/29	98	60 - 130	98	60 - 130	98	%		
7437559	o-Terphenyl	2021/06/30	97	60 - 130	99	60 - 130	96	%		
7435755	Benzene	2021/06/29	92	50 - 140	106	50 - 140	<0.20	ug/L	NC	30
7435755	Ethylbenzene	2021/06/29	100	50 - 140	115	50 - 140	<0.20	ug/L	NC	30
7435755	F1 (C6-C10) - BTEX	2021/06/29					<25	ug/L	NC	30
7435755	F1 (C6-C10)	2021/06/29	82	60 - 140	95	60 - 140	<25	ug/L	NC	30
7435755	o-Xylene	2021/06/29	98	50 - 140	112	50 - 140	<0.20	ug/L	NC	30
7435755	p+m-Xylene	2021/06/29	97	50 - 140	110	50 - 140	<0.40	ug/L	NC	30
7435755	Toluene	2021/06/29	88	50 - 140	101	50 - 140	<0.20	ug/L	NC	30
7435755	Total Xylenes	2021/06/29					<0.40	ug/L	NC	30
7435801	Dissolved Aluminum (Al)	2021/06/30	104	80 - 120	99	80 - 120	<4.9	ug/L	1.8	20
7435801	Dissolved Antimony (Sb)	2021/06/30	104	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
7435801	Dissolved Arsenic (As)	2021/06/30	100	80 - 120	98	80 - 120	<1.0	ug/L	13	20
7435801	Dissolved Barium (Ba)	2021/06/30	104	80 - 120	99	80 - 120	<2.0	ug/L	3.9	20
7435801	Dissolved Beryllium (Be)	2021/06/30	103	80 - 120	97	80 - 120	<0.40	ug/L	NC	20
7435801	Dissolved Boron (B)	2021/06/30	95	80 - 120	93	80 - 120	<10	ug/L	2.6	20
7435801	Dissolved Cadmium (Cd)	2021/06/30	99	80 - 120	97	80 - 120	<0.090	ug/L	NC	20
7435801	Dissolved Calcium (Ca)	2021/06/30	NC	80 - 120	100	80 - 120	<200	ug/L	1.0	20
7435801	Dissolved Chromium (Cr)	2021/06/30	95	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7435801	Dissolved Cobalt (Co)	2021/06/30	97	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7435801	Dissolved Copper (Cu)	2021/06/30	99	80 - 120	95	80 - 120	<0.90	ug/L	4.4	20
7435801	Dissolved Iron (Fe)	2021/06/30	94	80 - 120	95	80 - 120	<100	ug/L	2.5	20
7435801	Dissolved Lead (Pb)	2021/06/30	95	80 - 120	94	80 - 120	<0.50	ug/L	NC	20
7435801	Dissolved Magnesium (Mg)	2021/06/30	97	80 - 120	97	80 - 120	<50	ug/L	1.3	20
7435801	Dissolved Manganese (Mn)	2021/06/30	97	80 - 120	96	80 - 120	<2.0	ug/L	0.82	20
7435801	Dissolved Molybdenum (Mo)	2021/06/30	101	80 - 120	94	80 - 120	<0.50	ug/L	0.23	20
7435801	Dissolved Nickel (Ni)	2021/06/30	93	80 - 120	95	80 - 120	<1.0	ug/L	0.95	20



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7435801	Dissolved Phosphorus (P)	2021/06/30	97	80 - 120	95	80 - 120	<100	ug/L	NC	20
7435801	Dissolved Potassium (K)	2021/06/30	104	80 - 120	98	80 - 120	<200	ug/L	1.3	20
7435801	Dissolved Selenium (Se)	2021/06/30	99	80 - 120	101	80 - 120	<2.0	ug/L	NC	20
7435801	Dissolved Silicon (Si)	2021/06/30	102	80 - 120	97	80 - 120	<50	ug/L	2.6	20
7435801	Dissolved Silver (Ag)	2021/06/30	94	80 - 120	94	80 - 120	<0.090	ug/L	NC	20
7435801	Dissolved Sodium (Na)	2021/06/30	NC	80 - 120	95	80 - 120	<100	ug/L	0.65	20
7435801	Dissolved Strontium (Sr)	2021/06/30	NC	80 - 120	94	80 - 120	<1.0	ug/L	0.72	20
7435801	Dissolved Thallium (Tl)	2021/06/30	98	80 - 120	98	80 - 120	<0.050	ug/L	NC	20
7435801	Dissolved Titanium (Ti)	2021/06/30	100	80 - 120	95	80 - 120	<5.0	ug/L	NC	20
7435801	Dissolved Uranium (U)	2021/06/30	98	80 - 120	95	80 - 120	<0.10	ug/L	4.0	20
7435801	Dissolved Vanadium (V)	2021/06/30	98	80 - 120	95	80 - 120	<0.50	ug/L	15	20
7435801	Dissolved Zinc (Zn)	2021/06/30	93	80 - 120	94	80 - 120	<5.0	ug/L	NC	20
7436245	F2 (C10-C16 Hydrocarbons)	2021/06/30	90	60 - 130	99	60 - 130	<100	ug/L	NC	30
7436245	F3 (C16-C34 Hydrocarbons)	2021/06/30	88	60 - 130	103	60 - 130	<200	ug/L	NC	30
7436245	F4 (C34-C50 Hydrocarbons)	2021/06/30	93	60 - 130	106	60 - 130	<200	ug/L	NC	30
7436397	Total Ammonia-N	2021/06/30	100	75 - 125	104	80 - 120	<0.050	mg/L	20	20
7436686	Dissolved Chloride (Cl-)	2021/06/30	116	80 - 120	104	80 - 120	<1.0	mg/L	18	20
7436692	Dissolved Sulphate (SO4)	2021/06/30	174 (1)	75 - 125	105	80 - 120	<1.0	mg/L	NC	20
7436693	Orthophosphate (P)	2021/06/30	97	75 - 125	99	80 - 120	<0.010	mg/L	NC	25
7436754	Dissolved Organic Carbon	2021/06/29	93	80 - 120	98	80 - 120	<0.40	mg/L	1.0	20
7437559	F2 (C10-C16 Hydrocarbons)	2021/06/30	104	60 - 130	111	60 - 130	<100	ug/L	NC	30
7437559	F3 (C16-C34 Hydrocarbons)	2021/06/30	114	60 - 130	115	60 - 130	<200	ug/L	NC	30
7437559	F4 (C34-C50 Hydrocarbons)	2021/06/30	112	60 - 130	118	60 - 130	<200	ug/L	NC	30
7437678	Dissolved Aluminum (Al)	2021/06/30	101	80 - 120	99	80 - 120	<4.9	ug/L	NC	20
7437678	Dissolved Antimony (Sb)	2021/06/30	105	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7437678	Dissolved Arsenic (As)	2021/06/30	103	80 - 120	100	80 - 120	<1.0	ug/L	0.65	20
7437678	Dissolved Barium (Ba)	2021/06/30	102	80 - 120	100	80 - 120	<2.0	ug/L	3.8	20
7437678	Dissolved Beryllium (Be)	2021/06/30	103	80 - 120	96	80 - 120	<0.40	ug/L	NC	20
7437678	Dissolved Boron (B)	2021/06/30	97	80 - 120	88	80 - 120	<10	ug/L	4.1	20
7437678	Dissolved Cadmium (Cd)	2021/06/30	102	80 - 120	99	80 - 120	<0.090	ug/L	NC	20
7437678	Dissolved Calcium (Ca)	2021/06/30	NC	80 - 120	98	80 - 120	<200	ug/L	1.6	20



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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7437678	Dissolved Chromium (Cr)	2021/06/30	100	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7437678	Dissolved Cobalt (Co)	2021/06/30	105	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
7437678	Dissolved Copper (Cu)	2021/06/30	101	80 - 120	105	80 - 120	<0.90	ug/L	NC	20
7437678	Dissolved Iron (Fe)	2021/06/30	102	80 - 120	99	80 - 120	<100	ug/L	0.31	20
7437678	Dissolved Lead (Pb)	2021/06/30	100	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
7437678	Dissolved Magnesium (Mg)	2021/06/30	NC	80 - 120	102	80 - 120	<50	ug/L	1.2	20
7437678	Dissolved Manganese (Mn)	2021/06/30	100	80 - 120	98	80 - 120	<2.0	ug/L	1.4	20
7437678	Dissolved Molybdenum (Mo)	2021/06/30	105	80 - 120	98	80 - 120	<0.50	ug/L	1.5	20
7437678	Dissolved Nickel (Ni)	2021/06/30	100	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7437678	Dissolved Phosphorus (P)	2021/06/30	102	80 - 120	103	80 - 120	<100	ug/L	NC	20
7437678	Dissolved Potassium (K)	2021/06/30	104	80 - 120	103	80 - 120	<200	ug/L	0.33	20
7437678	Dissolved Selenium (Se)	2021/06/30	106	80 - 120	102	80 - 120	<2.0	ug/L	NC	20
7437678	Dissolved Silicon (Si)	2021/06/30	98	80 - 120	97	80 - 120	<50	ug/L	1.0	20
7437678	Dissolved Silver (Ag)	2021/06/30	101	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7437678	Dissolved Sodium (Na)	2021/06/30	102	80 - 120	101	80 - 120	<100	ug/L	1.5	20
7437678	Dissolved Strontium (Sr)	2021/06/30	NC	80 - 120	97	80 - 120	<1.0	ug/L	2.9	20
7437678	Dissolved Thallium (Tl)	2021/06/30	106	80 - 120	102	80 - 120	<0.050	ug/L	NC	20
7437678	Dissolved Titanium (Ti)	2021/06/30	100	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7437678	Dissolved Uranium (U)	2021/06/30	105	80 - 120	99	80 - 120	<0.10	ug/L	0.64	20
7437678	Dissolved Vanadium (V)	2021/06/30	100	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
7437678	Dissolved Zinc (Zn)	2021/06/30	99	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
7437775	Dissolved Chloride (Cl-)	2021/06/30	100	80 - 120	106	80 - 120	<1.0	mg/L	NC	20
7437782	Dissolved Sulphate (SO4)	2021/06/30	NC	75 - 125	104	80 - 120	<1.0	mg/L	0.82	20
7437783	Orthophosphate (P)	2021/06/30	97	75 - 125	102	80 - 120	<0.010	mg/L	NC	25
7437964	Nitrate (N)	2021/06/30	99	80 - 120	99	80 - 120	<0.10	mg/L	NC	20
7437964	Nitrite (N)	2021/06/30	106	80 - 120	105	80 - 120	<0.010	mg/L	NC	20
7438032	Alkalinity (Total as CaCO3)	2021/06/30			94	85 - 115	<1.0	mg/L	0.58	20
7438035	Conductivity	2021/06/30			102	85 - 115	<1.0	umho/cm	1.2	25





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BV Labs Job #: C1H4635  
Report Date: 2021/07/02

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7438036	pH	2021/06/30			102	98 - 103			0.38	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



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BV Labs Job #: C1H4635

Report Date: 2021/07/02

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

\_\_\_\_\_  
Anastassia Hamanov, Scientific Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



<b>INVOICE TO:</b> Company Name: #21375 Golder Associates Ltd Attention: Accounts Payable Address: 210 Sheldon Drive Cambridge ON N1T 1A8 Tel: (519) 620-8182 Fax: _____ Email: CanadaAccountsPayableInvoices@golder.com		<b>REPORT TO:</b> Company Name: _____ Attention: Gregory Padusenko Address: _____ Tel: (519) 620-8182 Ext: 6509 Fax: (519) 620-9878 Email: Gregory_Padusenko@golder.com		<b>PROJECT INFORMATION:</b> Quotation #: B80683 P.O. #: _____ Project: 19129150 (2300) Project Name: _____ Site #: _____ Sampled By: _____		<b>Laboratory Use Only:</b> BV Labs Job #: _____ Bottle Order #: _____ COC #: _____ Project Manager: _____ Barcode: 831949 Barcode: C#831949-02-01 Ema Gitej	
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**MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY**

Regulation 153 (2011)		Other Regulations		Special Instructions	Field Filtered (please circle): (Metals) Hg / Cr / V	RCap - Comprehensive	O Reg 153 PHCs, BTEX/F1-F4	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)												T turnaround Time (TAT) Required Please provide advance notice for rush projects
Table 1	Res/Park	Medium/Fine	CCME					Sanitary Sewer Bylaw	Table 2	Ind/Comm	Coarse	Reg 558	Storm Sewer Bylaw	Table 3	Agri/Other	For RSC	MISA	Municipality	PWQO	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>												Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ Rush Confirmation Number: _____ (call lab for #)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>												# of Bottles: _____ Comments: _____	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>												24-Jun-21 08:00 Ema Gitej C1H4635 SYK ENV-796	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>													
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RELINQUISHED BY: (Signature/Print) <i>Oliver Steckle / C Steckle</i>	Date: (YY/MM/DD) 21/06/23	Time	RECEIVED BY: (Signature/Print) <i>[Signature]</i>	Date: (YY/MM/DD) 24/06/24	Time 08:00	# jars used and not submitted	Laboratory Use Only
Time Sensitive		Temperature (°C) on Recl 11/11	Custody Seal	Yes	No	White: BV Labs Yellow: Client	

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.  
 \*\* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.  
 \*\*\* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.  
 SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS



Bureau Veritas Laboratories  
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-5700 Toll-free 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CHAIN OF CUSTODY RECORD

<b>INVOICE TO:</b> Company Name: #21375 Golder Associates Ltd Attention: Accounts Payable Address: 210 Sheldon Drive Cambridge ON N1T 1A8 Tel: (519) 620-8182 Fax: _____ Email: CanadaAccountsPayableInvoices@golder.com		<b>REPORT TO:</b> Company Name: _____ Attention: Gregory Padusenko Address: _____ Tel: (519) 620-8182 Ext: 6509 Fax: (519) 620-9878 Email: Gregory_Padusenko@golder.com		<b>PROJECT INFORMATION:</b> Quotation #: B80683 P.O. #: _____ Project: 19129150 (2300) Project Name: _____ Site #: _____ Sampled By: _____		<b>Laboratory Use Only:</b> BV Labs Job #: _____ Bottle Order #:  831949 COC #: _____ Project Manager: _____  C#B31949-05-01 Erna Gitej	
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MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY						ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required: Please provide advance notice for rush projects								
Regulation 153 (2011)			Other Regulations			Special Instructions			Field Filtered (please circle): Metals / Hg / Cr VI	RCap - Comprehensive	O Reg 153 PHCs, BTEX/F1-F4												Regular (Standard) TAT: <small>(will be applied if Rush TAT is not specified)</small> Standard TAT = 5-7 Working days for most tests. <small>Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are &gt; 5 days - contact your Project Manager for details.</small>	
Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ Rush Confirmation Number: _____ (call lab for #)																								
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix																			# of Bottles	Comments
1	MW20-22A	06/23/21	16:30	GW	X	X																	4	
2	MW20-22B	06/23/21	18:30	GW	X	X	X																8	
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								

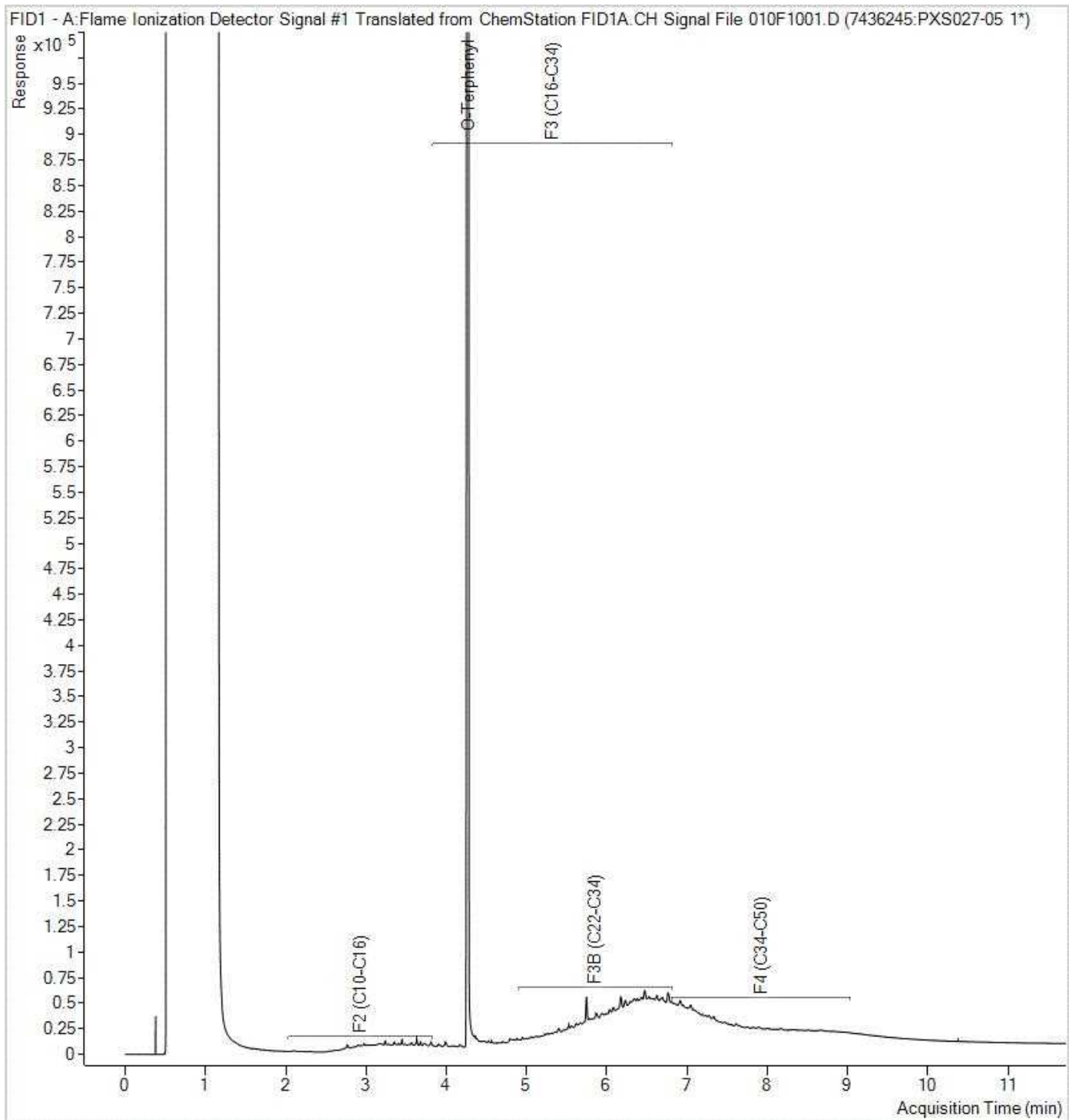
* RELINQUISHED BY: (Signature/Print) <i>Walter Strohle / C Strohle</i>	Date: (YY/MM/DD) 21/06/23	Time	RECEIVED BY: (Signature/Print) <i>see page 1</i>	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
							Time Sensitive	Temperature (°C) on Receipt	Custody Seal Present	Yes	No

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.  
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SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

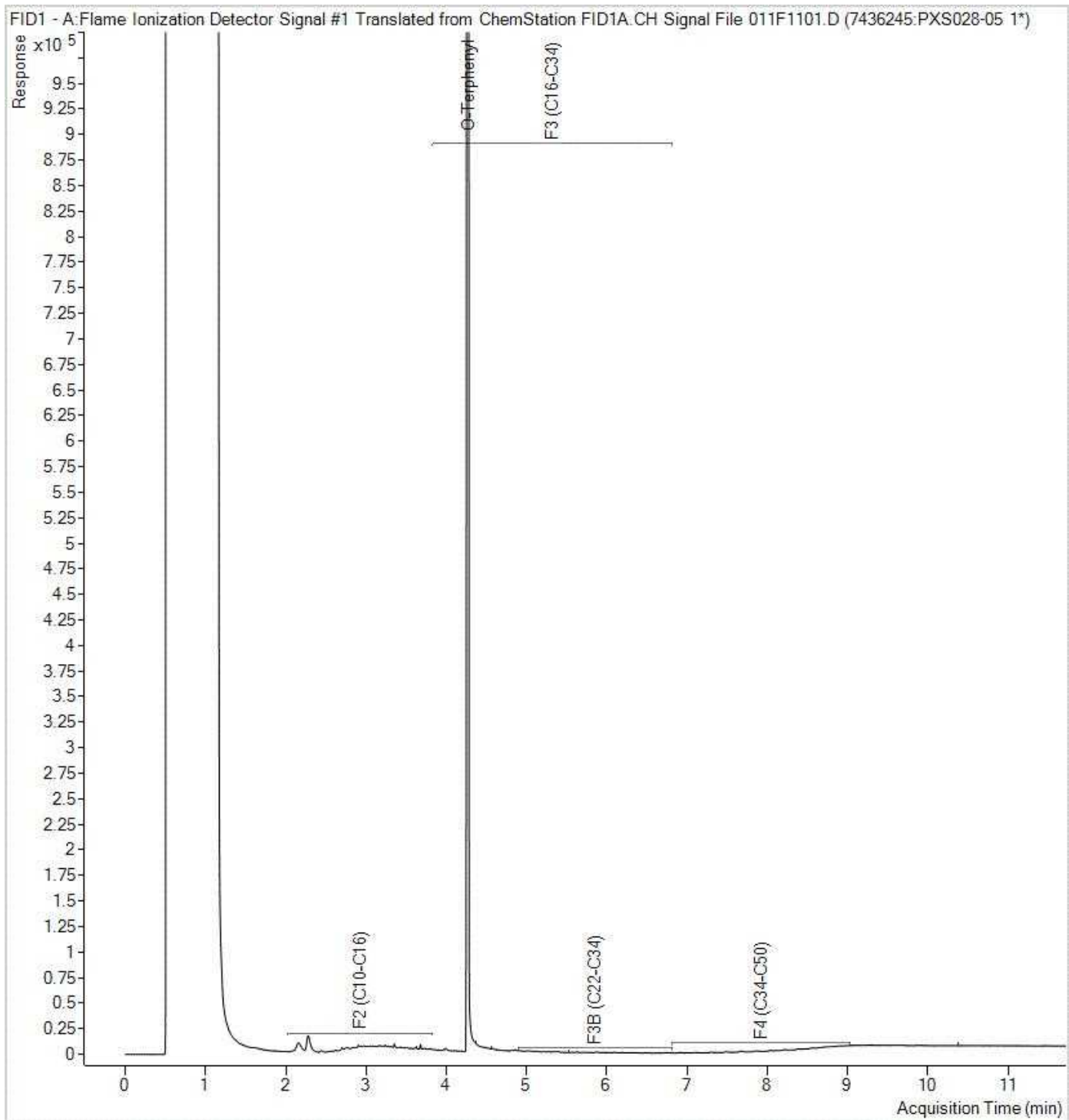
Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

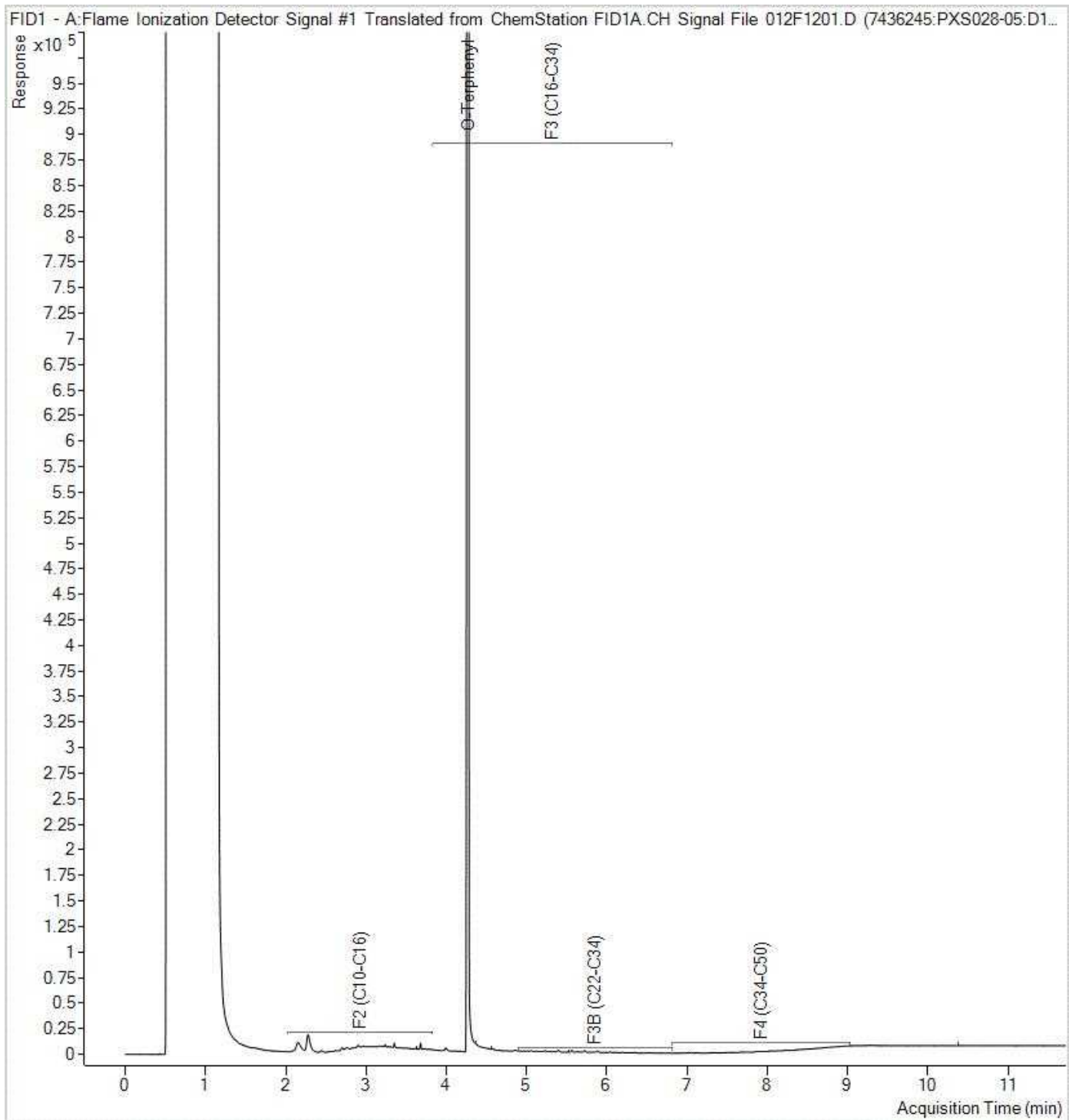


Petroleum Hydrocarbons F2-F4 in Water Chromatogram



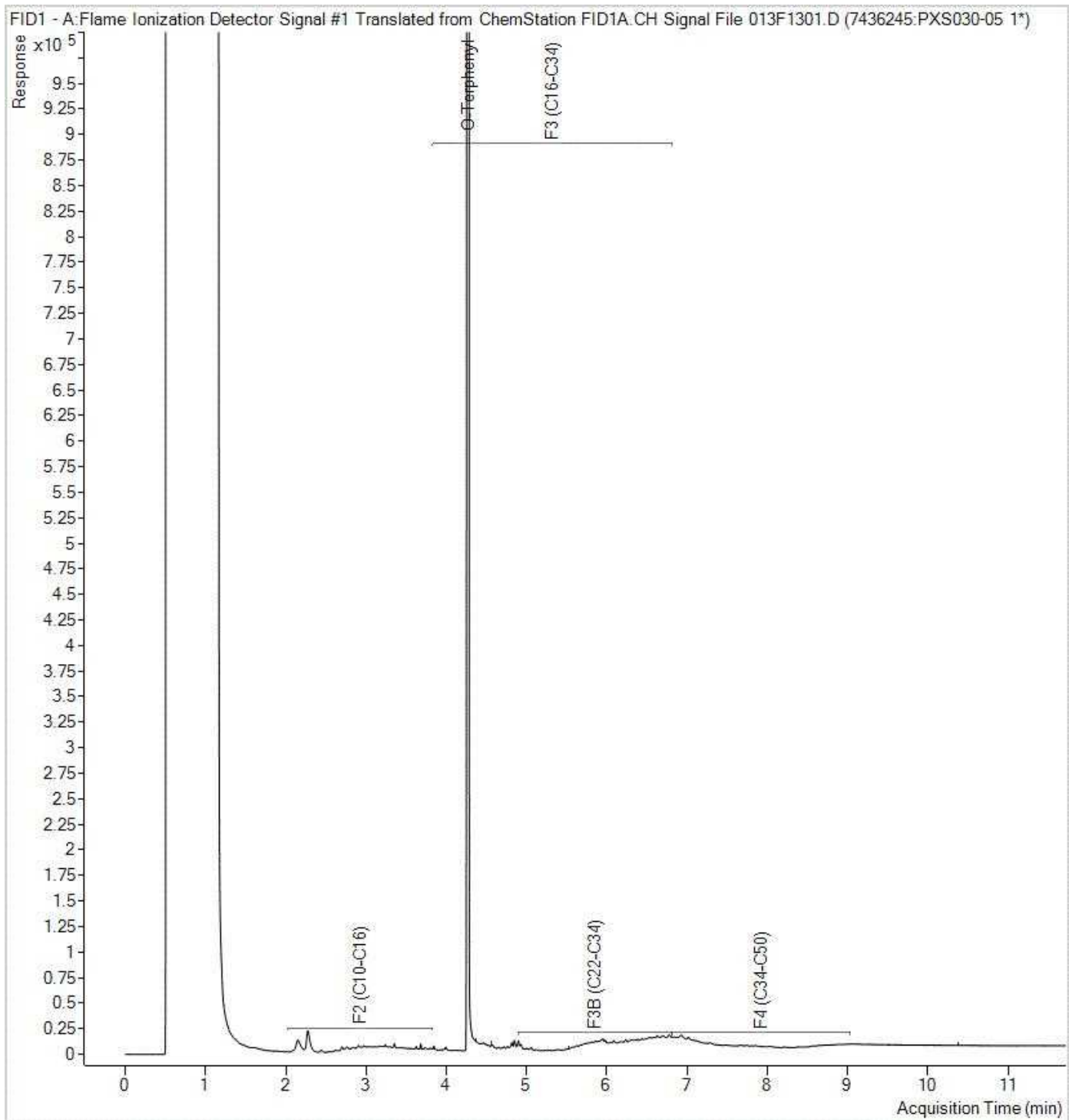
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



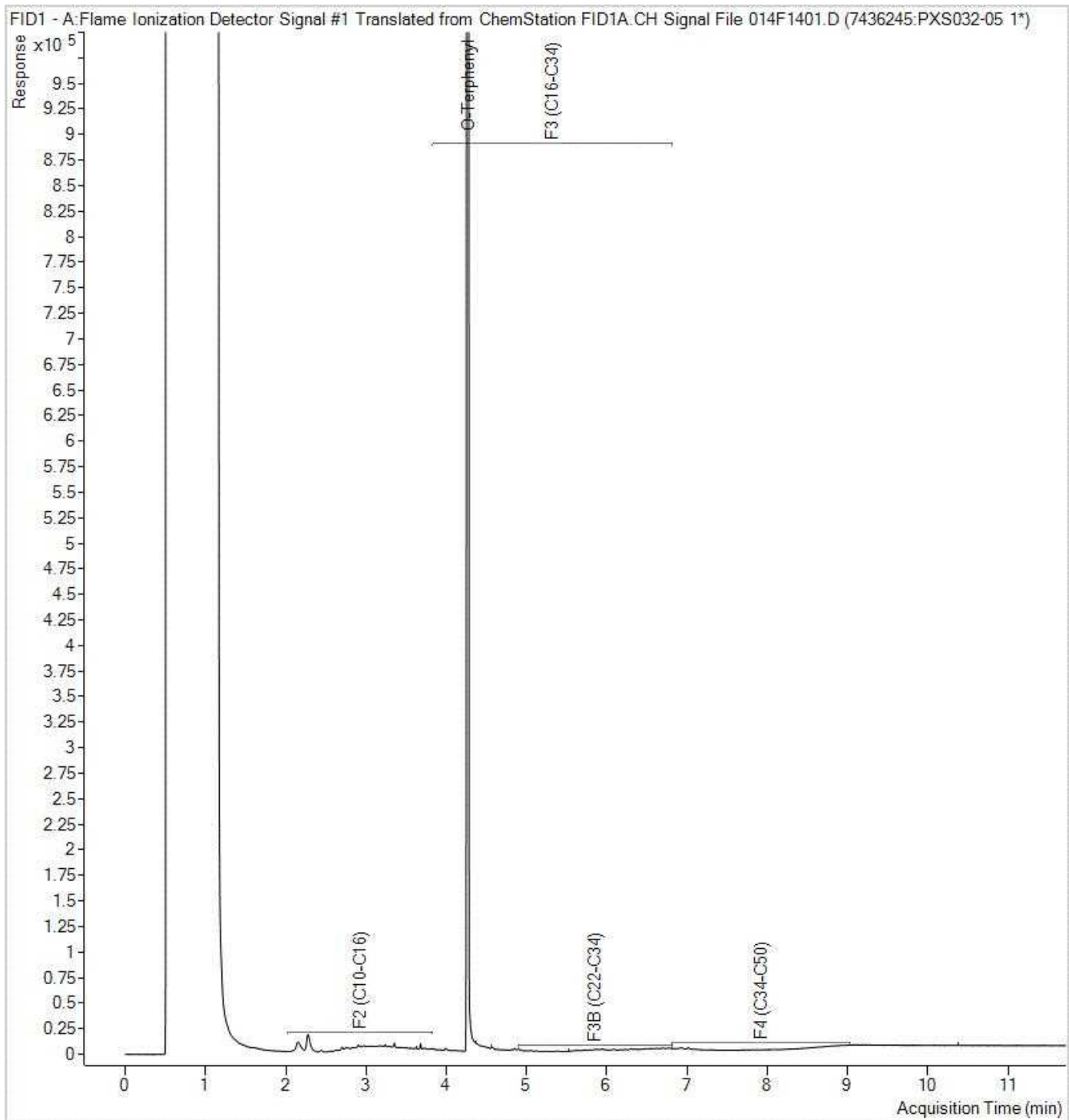
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



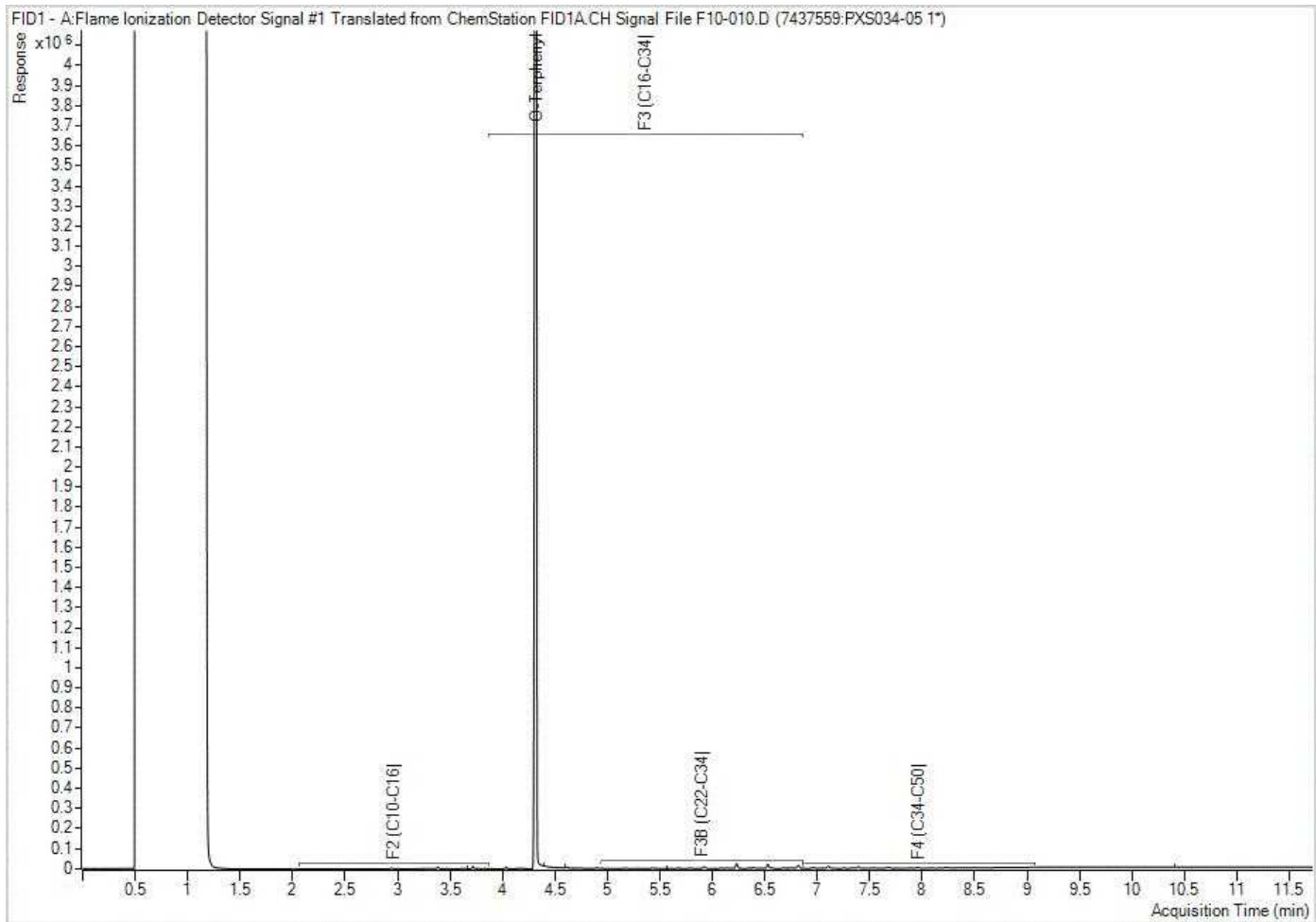
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.





Your Project #: 19129150 (2300)  
 Your C.O.C. #: 831949-06-01, 831949-07-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
 210 Sheldon Drive  
 Cambridge, ON  
 CANADA N1T 1A8

**Report Date: 2021/07/12**  
 Report #: R6715096  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H5980**

**Received: 2021/06/25, 12:50**

Sample Matrix: Water  
 # Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	19	N/A	2021/07/01	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	19	N/A	2021/07/02	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	19	N/A	2021/07/02	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	19	N/A	2021/07/02	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	10	N/A	2021/06/30	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	9	N/A	2021/07/01	CAM SOP-00446	SM 23 5310 B m
Petroleum Hydro. CCME F1 & BTEX in Water	10	N/A	2021/06/30	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	10	2021/06/29	2021/06/30	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	19	N/A	2021/07/02	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	1	2021/07/09	2021/07/12	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	18	N/A	2021/06/30	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	19	N/A	2021/07/02		
Anion and Cation Sum	19	N/A	2021/07/02		
Total Ammonia-N	7	N/A	2021/06/30	CAM SOP-00441	USGS I-2522-90 m
Total Ammonia-N	12	N/A	2021/07/02	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	17	N/A	2021/06/30	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (3)	2	N/A	2021/07/02	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	19	2021/06/30	2021/07/01	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	19	N/A	2021/07/05	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	19	N/A	2021/07/02		Auto Calc
Sat. pH and Langelier Index (@ 4C)	19	N/A	2021/07/02		Auto Calc
Sulphate by Automated Colourimetry	19	N/A	2021/07/02	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	19	N/A	2021/07/02		Auto Calc

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are



Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-06-01, 831949-07-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/07/12**  
Report #: R6715096  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H5980**

**Received: 2021/06/25, 12:50**

reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager  
Email: emese.gitej@bureauveritas.com  
Phone# (905)817-5829

=====  
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BUREAU  
VERITAS

BV Labs Job #: C1H5980

Report Date: 2021/07/12

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: VP

## RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY679		PXY680			PXY680		
Sampling Date		2021/06/24 15:45		2021/06/24 16:30			2021/06/24 16:30		
COG Number		831949-06-01		831949-06-01			831949-06-01		
	UNITS	MW20-13A	QC Batch	MW20-13B	RDL	QC Batch	MW20-13B Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>									
Anion Sum	me/L	4.60	7433941	4.56	N/A	7433941			
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	190	7433456	190	1.0	7433456			
Calculated TDS	mg/L	240	7433944	240	1.0	7433944			
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	2.7	7433456	3.6	1.0	7433456			
Cation Sum	me/L	4.45	7433941	4.54	N/A	7433941			
Hardness (CaCO <sub>3</sub> )	mg/L	200	7433195	200	1.0	7433195			
Ion Balance (% Difference)	%	1.66	7433940	0.250	N/A	7433940			
Langelier Index (@ 20C)	N/A	0.693	7433942	0.806		7433942			
Langelier Index (@ 4C)	N/A	0.444	7433943	0.556		7433943			
Saturation pH (@ 20C)	N/A	7.49	7433942	7.50		7433942			
Saturation pH (@ 4C)	N/A	7.74	7433943	7.75		7433943			
<b>Inorganics</b>									
Total Ammonia-N	mg/L	0.21	7436363	<0.050	0.050	7436363			
Conductivity	umho/cm	410	7438013	410	1.0	7438013			
Dissolved Organic Carbon	mg/L	<0.40	7438054	<0.40	0.40	7437920			
Orthophosphate (P)	mg/L	<0.010	7437991	<0.010	0.010	7437991			
pH	pH	8.18	7438016	8.30		7438016			
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	37	7437990	31	1.0	7437990			
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	190	7438011	190	1.0	7438011			
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	1.4	7437986	1.1	1.0	7437986			
Nitrite (N)	mg/L	<0.010	7437970	<0.010	0.010	7437970	<0.010	0.010	7437970
Nitrate (N)	mg/L	<0.10	7437970	<0.10	0.10	7437970	<0.10	0.10	7437970
Nitrate + Nitrite (N)	mg/L	<0.10	7437970	<0.10	0.10	7437970	<0.10	0.10	7437970
<b>Metals</b>									
Dissolved Aluminum (Al)	ug/L	12	7437678	5.9	4.9	7437678			
Dissolved Antimony (Sb)	ug/L	<0.50	7437678	<0.50	0.50	7437678			
Dissolved Arsenic (As)	ug/L	2.7	7437678	2.6	1.0	7437678			
Dissolved Barium (Ba)	ug/L	43	7437678	57	2.0	7437678			
Dissolved Beryllium (Be)	ug/L	<0.40	7437678	<0.40	0.40	7437678			
Dissolved Boron (B)	ug/L	67	7437678	56	10	7437678			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PXY679		PXY680			PXY680		
Sampling Date		2021/06/24 15:45		2021/06/24 16:30			2021/06/24 16:30		
COC Number		831949-06-01		831949-06-01			831949-06-01		
	UNITS	MW20-13A	QC Batch	MW20-13B	RDL	QC Batch	MW20-13B Lab-Dup	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	7437678	<0.090	0.090	7437678			
Dissolved Calcium (Ca)	ug/L	43000	7437678	41000	200	7437678			
Dissolved Chromium (Cr)	ug/L	<5.0	7437678	<5.0	5.0	7437678			
Dissolved Cobalt (Co)	ug/L	<0.50	7437678	<0.50	0.50	7437678			
Dissolved Copper (Cu)	ug/L	2.1	7437678	<0.90	0.90	7437678			
Dissolved Iron (Fe)	ug/L	<100	7437678	110	100	7437678			
Dissolved Lead (Pb)	ug/L	<0.50	7437678	<0.50	0.50	7437678			
Dissolved Magnesium (Mg)	ug/L	22000	7437678	25000	50	7437678			
Dissolved Manganese (Mn)	ug/L	31	7437678	21	2.0	7437678			
Dissolved Molybdenum (Mo)	ug/L	2.8	7437678	2.5	0.50	7437678			
Dissolved Nickel (Ni)	ug/L	<1.0	7437678	<1.0	1.0	7437678			
Dissolved Phosphorus (P)	ug/L	<100	7437678	<100	100	7437678			
Dissolved Potassium (K)	ug/L	2100	7437678	1700	200	7437678			
Dissolved Selenium (Se)	ug/L	<2.0	7437678	<2.0	2.0	7437678			
Dissolved Silicon (Si)	ug/L	6200	7437678	6400	50	7437678			
Dissolved Silver (Ag)	ug/L	<0.090	7437678	<0.090	0.090	7437678			
Dissolved Sodium (Na)	ug/L	10000	7437678	9700	100	7437678			
Dissolved Strontium (Sr)	ug/L	1700	7437678	960	1.0	7437678			
Dissolved Thallium (Tl)	ug/L	<0.050	7437678	<0.050	0.050	7437678			
Dissolved Titanium (Ti)	ug/L	<5.0	7437678	<5.0	5.0	7437678			
Dissolved Uranium (U)	ug/L	0.29	7437678	0.28	0.10	7437678			
Dissolved Vanadium (V)	ug/L	<0.50	7437678	<0.50	0.50	7437678			
Dissolved Zinc (Zn)	ug/L	<5.0	7437678	<5.0	5.0	7437678			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY681			PXY682		PXY683		
Sampling Date		2021/06/24 16:00			2021/06/24		2021/06/24 10:00		
COC Number		831949-06-01			831949-06-01		831949-06-01		
	UNITS	MW20-13C	RDL	QC Batch	DUP-4	QC Batch	MW20-10A	RDL	QC Batch

Calculated Parameters									
Anion Sum	me/L	6.69	N/A	7433941	6.65	7433941	8.43	N/A	7433941
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	280	1.0	7433456	260	7433456	290	1.0	7433456
Calculated TDS	mg/L	340	1.0	7433944	350	7433944	460	1.0	7433944
Carb. Alkalinity (calc. as CaCO3)	mg/L	5.0	1.0	7433456	2.9	7433456	3.0	1.0	7433456
Cation Sum	me/L	6.72	N/A	7433941	6.74	7433941	8.45	N/A	7433941
Hardness (CaCO3)	mg/L	320	1.0	7433195	290	7433195	370	1.0	7433195
Ion Balance (% Difference)	%	0.160	N/A	7433940	0.660	7433940	0.0900	N/A	7433940
Langelier Index (@ 20C)	N/A	1.12		7433942	0.954	7433942	1.05		7433942
Langelier Index (@ 4C)	N/A	0.874		7433943	0.705	7433943	0.797		7433943
Saturation pH (@ 20C)	N/A	7.15		7433942	7.13	7433942	7.01		7433942
Saturation pH (@ 4C)	N/A	7.40		7433943	7.38	7433943	7.25		7433943

Inorganics									
Total Ammonia-N	mg/L	0.11	0.050	7436397	<0.050	7436397	0.081	0.050	7436397
Conductivity	umho/cm	580	1.0	7438013	590	7438013	720	1.0	7438013
Dissolved Organic Carbon	mg/L	1.3	0.40	7437920	0.63	7438054	0.80	0.40	7437920
Orthophosphate (P)	mg/L	<0.010	0.010	7437991	<0.010	7437991	<0.010	0.010	7437991
pH	pH	8.27		7438016	8.08	7438016	8.05		7438016
Dissolved Sulphate (SO4)	mg/L	33	1.0	7437990	13	7437990	22	1.0	7437990
Alkalinity (Total as CaCO3)	mg/L	290	1.0	7438011	260	7438011	290	1.0	7438011
Dissolved Chloride (Cl-)	mg/L	3.0	1.0	7437986	36	7437986	43	1.0	7437986
Nitrite (N)	mg/L	0.133	0.010	7437970	<0.010	7437970	0.013	0.010	7437970
Nitrate (N)	mg/L	1.76	0.10	7437970	2.42	7437970	13.0	0.10	7437970
Nitrate + Nitrite (N)	mg/L	1.89	0.10	7437970	2.42	7437970	13.0	0.10	7437970

Metals									
Dissolved Aluminum (Al)	ug/L				<4.9	7437678	150	4.9	7437678
Dissolved Antimony (Sb)	ug/L				<0.50	7437678	<0.50	0.50	7437678
Dissolved Arsenic (As)	ug/L				<1.0	7437678	1.4	1.0	7437678
Dissolved Barium (Ba)	ug/L				29	7437678	46	2.0	7437678
Dissolved Beryllium (Be)	ug/L				<0.40	7437678	<0.40	0.40	7437678
Dissolved Boron (B)	ug/L				<10	7437678	11	10	7437678
Dissolved Cadmium (Cd)	ug/L				<0.090	7437678	<0.090	0.090	7437678

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 N/A = Not Applicable





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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY681			PXY682		PXY683		
Sampling Date		2021/06/24 16:00			2021/06/24		2021/06/24 10:00		
COC Number		831949-06-01			831949-06-01		831949-06-01		
	UNITS	MW20-13C	RDL	QC Batch	DUP-4	QC Batch	MW20-10A	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L				78000	7437678	98000	200	7437678
Dissolved Chromium (Cr)	ug/L				<5.0	7437678	<5.0	5.0	7437678
Dissolved Cobalt (Co)	ug/L				<0.50	7437678	<0.50	0.50	7437678
Dissolved Copper (Cu)	ug/L				<0.90	7437678	1.2	0.90	7437678
Dissolved Iron (Fe)	ug/L				<100	7437678	240	100	7437678
Dissolved Lead (Pb)	ug/L				<0.50	7437678	1.2	0.50	7437678
Dissolved Magnesium (Mg)	ug/L				24000	7437678	30000	50	7437678
Dissolved Manganese (Mn)	ug/L				7.2	7437678	17	2.0	7437678
Dissolved Molybdenum (Mo)	ug/L				<0.50	7437678	0.64	0.50	7437678
Dissolved Nickel (Ni)	ug/L				<1.0	7437678	<1.0	1.0	7437678
Dissolved Phosphorus (P)	ug/L				<100	7437678	<100	100	7437678
Dissolved Potassium (K)	ug/L				1700	7437678	1200	200	7437678
Dissolved Selenium (Se)	ug/L				<2.0	7437678	<2.0	2.0	7437678
Dissolved Silicon (Si)	ug/L				3900	7437678	4800	50	7437678
Dissolved Silver (Ag)	ug/L				<0.090	7437678	<0.090	0.090	7437678
Dissolved Sodium (Na)	ug/L				19000	7437678	25000	100	7437678
Dissolved Strontium (Sr)	ug/L				110	7437678	960	1.0	7437678
Dissolved Thallium (Tl)	ug/L				<0.050	7437678	<0.050	0.050	7437678
Dissolved Titanium (Ti)	ug/L				<5.0	7437678	7.0	5.0	7437678
Dissolved Uranium (U)	ug/L				0.23	7437678	0.98	0.10	7437678
Dissolved Vanadium (V)	ug/L				<0.50	7437678	<0.50	0.50	7437678
Dissolved Zinc (Zn)	ug/L				<5.0	7437678	<5.0	5.0	7437678
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY684			PXY684			PXY685		
Sampling Date		2021/06/24 10:30			2021/06/24 10:30			2021/06/24 12:45		
COC Number		831949-06-01			831949-06-01			831949-06-01		
	UNITS	MW20-10B	RDL	QC Batch	MW20-10B Lab-Dup	RDL	QC Batch	MW20-11A	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	8.14	N/A	7433941				6.95	N/A	7433941
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	280	1.0	7433456				250	1.0	7433456
Calculated TDS	mg/L	450	1.0	7433944				370	1.0	7433944
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.7	1.0	7433456				4.7	1.0	7433456
Cation Sum	me/L	8.41	N/A	7433941				6.91	N/A	7433941
Hardness (CaCO3)	mg/L	370	1.0	7433195				230	1.0	7433195
Ion Balance (% Difference)	%	1.64	N/A	7433940				0.290	N/A	7433940
Langelier Index (@ 20C)	N/A	0.994		7433942				0.959		7433942
Langelier Index (@ 4C)	N/A	0.746		7433943				0.710		7433943
Saturation pH (@ 20C)	N/A	7.02		7433942				7.34		7433942
Saturation pH (@ 4C)	N/A	7.26		7433943				7.59		7433943

Inorganics										
Total Ammonia-N	mg/L	<0.050	0.050	7436363				0.081	0.050	7436363
Conductivity	umho/cm	670	1.0	7438013	670	1.0	7438013	670	1.0	7438013
Dissolved Organic Carbon	mg/L	0.69	0.40	7437920				0.61	0.40	7438054
Orthophosphate (P)	mg/L	<0.010	0.010	7437991				<0.010	0.010	7437991
pH	pH	8.01		7438016	8.04		7438016	8.30		7438016
Dissolved Sulphate (SO4)	mg/L	18	1.0	7437990				42	1.0	7437990
Alkalinity (Total as CaCO3)	mg/L	280	1.0	7438011	290	1.0	7438011	250	1.0	7438011
Dissolved Chloride (Cl-)	mg/L	44	1.0	7437986				35	1.0	7437986
Nitrite (N)	mg/L	<0.010	0.010	7437970				0.013	0.010	7437970
Nitrate (N)	mg/L	13.1	0.10	7437970				0.18	0.10	7437970
Nitrate + Nitrite (N)	mg/L	13.1	0.10	7437970				0.19	0.10	7437970

Metals										
Dissolved Aluminum (Al)	ug/L	7.8	4.9	7437678				28	4.9	7437678
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7437678				<0.50	0.50	7437678
Dissolved Arsenic (As)	ug/L	<1.0	1.0	7437678				5.9	1.0	7437678
Dissolved Barium (Ba)	ug/L	25	2.0	7437678				96	2.0	7437678
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7437678				<0.40	0.40	7437678
Dissolved Boron (B)	ug/L	10	10	7437678				46	10	7437678

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 N/A = Not Applicable



BUREAU  
VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PXY684			PXY684			PXY685		
Sampling Date		2021/06/24 10:30			2021/06/24 10:30			2021/06/24 12:45		
COC Number		831949-06-01			831949-06-01			831949-06-01		
	UNITS	MW20-10B	RDL	QC Batch	MW20-10B Lab-Dup	RDL	QC Batch	MW20-11A	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7437678				<0.090	0.090	7437678
Dissolved Calcium (Ca)	ug/L	99000	200	7437678				49000	200	7437678
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7437678				<5.0	5.0	7437678
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7437678				0.63	0.50	7437678
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7437678				<0.90	0.90	7437678
Dissolved Iron (Fe)	ug/L	<100	100	7437678				<100	100	7437678
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7437678				<0.50	0.50	7437678
Dissolved Magnesium (Mg)	ug/L	29000	50	7437678				26000	50	7437678
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	7437678				180	2.0	7437678
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	7437678				15	0.50	7437678
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7437678				4.3	1.0	7437678
Dissolved Phosphorus (P)	ug/L	<100	100	7437678				<100	100	7437678
Dissolved Potassium (K)	ug/L	1100	200	7437678				1600	200	7437678
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7437678				<2.0	2.0	7437678
Dissolved Silicon (Si)	ug/L	4700	50	7437678				4300	50	7437678
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7437678				<0.090	0.090	7437678
Dissolved Sodium (Na)	ug/L	24000	100	7437678				51000	100	7437678
Dissolved Strontium (Sr)	ug/L	150	1.0	7437678				1100	1.0	7437678
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7437678				<0.050	0.050	7437678
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7437678				<5.0	5.0	7437678
Dissolved Uranium (U)	ug/L	0.14	0.10	7437678				3.9	0.10	7437678
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7437678				0.77	0.50	7437678
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7437678				<5.0	5.0	7437678
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



BUREAU  
VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY686			PXY687	PXY688	PXY888		
Sampling Date		2021/06/24 13:15			2021/06/24 15:45	2021/06/24 16:15	2021/06/23 12:00		
COC Number		831949-06-01			831949-06-01	831949-06-01	831949-07-01		
	UNITS	MW20-11B	RDL	QC Batch	MW20-12A	MW20-12B	MW20-28A	RDL	QC Batch

Calculated Parameters									
Anion Sum	me/L	18.3	N/A	7433941	6.36	6.65	4.78	N/A	7433941
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	380	1.0	7433456	260	260	200	1.0	7433456
Calculated TDS	mg/L	1000	1.0	7433944	340	350	250	1.0	7433944
Carb. Alkalinity (calc. as CaCO3)	mg/L	3.6	1.0	7433456	2.9	2.9	3.4	1.0	7433456
Cation Sum	me/L	19.2	N/A	7433941	6.36	6.78	4.66	N/A	7433941
Hardness (CaCO3)	mg/L	430	1.0	7433195	300	300	220	1.0	7433195
Ion Balance (% Difference)	%	2.27	N/A	7433940	0.0300	0.920	1.31	N/A	7433940
Langelier Index (@ 20C)	N/A	1.11		7433942	0.942	0.960	0.853		7433942
Langelier Index (@ 4C)	N/A	0.868		7433943	0.693	0.712	0.604		7433943
Saturation pH (@ 20C)	N/A	6.89		7433942	7.14	7.11	7.39		7433942
Saturation pH (@ 4C)	N/A	7.14		7433943	7.39	7.36	7.64		7433943

Inorganics									
Total Ammonia-N	mg/L	<0.050	0.050	7436397	<0.050	<0.050	<0.050	0.050	7436363
Conductivity	umho/cm	1800	1.0	7438013	550	600	450	1.0	7438013
Dissolved Organic Carbon	mg/L	1.0	0.40	7438054	<0.40	0.68	<0.40	0.40	7437920
Orthophosphate (P)	mg/L	<0.010	0.010	7437991	<0.010	<0.010	<0.010	0.010	7437991
pH	pH	8.01		7438016	8.08	8.07	8.25		7438016
Dissolved Sulphate (SO4)	mg/L	37	1.0	7437990	26	13	29	1.0	7437990
Alkalinity (Total as CaCO3)	mg/L	380	1.0	7438011	260	260	210	1.0	7438011
Dissolved Chloride (Cl-)	mg/L	350	5.0	7437986	7.4	35	1.0	1.0	7437986
Nitrite (N)	mg/L	<0.010	0.010	7437970	<0.010	<0.010	<0.010	0.010	7437970
Nitrate (N)	mg/L	2.73	0.10	7437970	4.91	2.45	<0.10	0.10	7437970
Nitrate + Nitrite (N)	mg/L	2.73	0.10	7437970	4.91	2.45	<0.10	0.10	7437970

Metals									
Dissolved Aluminum (Al)	ug/L	520	4.9	7437678	<4.9	6.1	20	4.9	7437678
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7437678	<0.50	<0.50	<0.50	0.50	7437678
Dissolved Arsenic (As)	ug/L	<1.0	1.0	7437678	<1.0	<1.0	<1.0	1.0	7437678
Dissolved Barium (Ba)	ug/L	61	2.0	7437678	52	30	12	2.0	7437678
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7437678	<0.40	<0.40	<0.40	0.40	7437678
Dissolved Boron (B)	ug/L	15	10	7437678	12	<10	23	10	7437678
Dissolved Cadmium (Cd)	ug/L	0.25	0.090	7437678	<0.090	<0.090	<0.090	0.090	7437678

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 N/A = Not Applicable



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY686			PXY687	PXY688	PXY888		
Sampling Date		2021/06/24 13:15			2021/06/24 15:45	2021/06/24 16:15	2021/06/23 12:00		
COC Number		831949-06-01			831949-06-01	831949-06-01	831949-07-01		
	UNITS	MW20-11B	RDL	QC Batch	MW20-12A	MW20-12B	MW20-28A	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	120000	200	7437678	74000	80000	49000	200	7437678
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7437678	<5.0	<5.0	<5.0	5.0	7437678
Dissolved Cobalt (Co)	ug/L	1.2	0.50	7437678	<0.50	<0.50	<0.50	0.50	7437678
Dissolved Copper (Cu)	ug/L	5.3	0.90	7437678	<0.90	<0.90	<0.90	0.90	7437678
Dissolved Iron (Fe)	ug/L	590	100	7437678	<100	<100	<100	100	7437678
Dissolved Lead (Pb)	ug/L	5.2	0.50	7437678	<0.50	<0.50	<0.50	0.50	7437678
Dissolved Magnesium (Mg)	ug/L	33000	50	7437678	28000	23000	23000	50	7437678
Dissolved Manganese (Mn)	ug/L	370	2.0	7437678	16	7.4	93	2.0	7437678
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	7437678	0.77	<0.50	2.4	0.50	7437678
Dissolved Nickel (Ni)	ug/L	4.2	1.0	7437678	<1.0	<1.0	<1.0	1.0	7437678
Dissolved Phosphorus (P)	ug/L	<100	100	7437678	<100	<100	<100	100	7437678
Dissolved Potassium (K)	ug/L	1300	200	7437678	3400	1600	1300	200	7437678
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7437678	<2.0	<2.0	<2.0	2.0	7437678
Dissolved Silicon (Si)	ug/L	5200	50	7437678	4800	4000	6300	50	7437678
Dissolved Silver (Ag)	ug/L	0.19	0.090	7437678	<0.090	<0.090	<0.090	0.090	7437678
Dissolved Sodium (Na)	ug/L	240000	100	7437678	6200	19000	5700	100	7437678
Dissolved Strontium (Sr)	ug/L	200	1.0	7437678	330	110	460	1.0	7437678
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7437678	<0.050	<0.050	<0.050	0.050	7437678
Dissolved Titanium (Ti)	ug/L	16	5.0	7437678	<5.0	<5.0	<5.0	5.0	7437678
Dissolved Uranium (U)	ug/L	1.1	0.10	7437678	0.47	0.24	0.38	0.10	7437678
Dissolved Vanadium (V)	ug/L	0.87	0.50	7437678	<0.50	<0.50	<0.50	0.50	7437678
Dissolved Zinc (Zn)	ug/L	29	5.0	7437678	<5.0	<5.0	5.4	5.0	7437678
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									





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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY888			PXY889			PXY890		
Sampling Date		2021/06/23 12:00			2021/06/23 12:30			2021/06/24 10:30		
COC Number		831949-07-01			831949-07-01			831949-07-01		
	UNITS	MW20-28A Lab-Dup	RDL	QC Batch	MW20-28B	RDL	QC Batch	MW20-27A	RDL	QC Batch
<b>Calculated Parameters</b>										
Anion Sum	me/L				4.78	N/A	7433941	22.8	N/A	7433941
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				200	1.0	7433456	190	1.0	7433456
Calculated TDS	mg/L				250	1.0	7433944	1500	1.0	7433944
Carb. Alkalinity (calc. as CaCO3)	mg/L				3.1	1.0	7433456	1.8	1.0	7433456
Cation Sum	me/L				4.67	N/A	7433941	22.3	N/A	7433941
Hardness (CaCO3)	mg/L				220	1.0	7433195	1100	1.0	7433195
Ion Balance (% Difference)	%				1.20	N/A	7433940	1.09	N/A	7433940
Langelier Index (@ 20C)	N/A				0.824		7433942	1.24		7433942
Langelier Index (@ 4C)	N/A				0.575		7433943	0.991		7433943
Saturation pH (@ 20C)	N/A				7.39		7433942	6.77		7433942
Saturation pH (@ 4C)	N/A				7.64		7433943	7.02		7433943
<b>Inorganics</b>										
Total Ammonia-N	mg/L				0.051	0.050	7436363	0.081	0.050	7436397
Conductivity	umho/cm				430	1.0	7438013	1800	1.0	7438013
Dissolved Organic Carbon	mg/L	<0.40	0.40	7437920	<0.40	0.40	7438054	0.68	0.40	7438054
Orthophosphate (P)	mg/L				<0.010	0.010	7437991	<0.010	0.010	7437991
pH	pH				8.21		7438016	8.01		7438016
Dissolved Sulphate (SO4)	mg/L				29	1.0	7437990	910	5.0	7437990
Alkalinity (Total as CaCO3)	mg/L				210	1.0	7438011	190	1.0	7438011
Dissolved Chloride (Cl-)	mg/L				1.0	1.0	7437986	2.1	1.0	7437986
Nitrite (N)	mg/L				<0.010	0.010	7437970	<0.010	0.010	7437970
Nitrate (N)	mg/L				<0.10	0.10	7437970	<0.10	0.10	7437970
Nitrate + Nitrite (N)	mg/L				<0.10	0.10	7437970	<0.10	0.10	7437970
<b>Metals</b>										
Dissolved Aluminum (Al)	ug/L				5.8	4.9	7437678	<4.9	4.9	7437678
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Arsenic (As)	ug/L				<1.0	1.0	7437678	5.4	1.0	7437678
Dissolved Barium (Ba)	ug/L				11	2.0	7437678	18	2.0	7437678
Dissolved Beryllium (Be)	ug/L				<0.40	0.40	7437678	<0.40	0.40	7437678
Dissolved Boron (B)	ug/L				22	10	7437678	42	10	7437678
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY888			PXY889			PXY890		
Sampling Date		2021/06/23 12:00			2021/06/23 12:30			2021/06/24 10:30		
COC Number		831949-07-01			831949-07-01			831949-07-01		
	UNITS	MW20-28A Lab-Dup	RDL	QC Batch	MW20-28B	RDL	QC Batch	MW20-27A	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L				<0.090	0.090	7437678	<0.090	0.090	7437678
Dissolved Calcium (Ca)	ug/L				50000	200	7437678	360000	400	7437678
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	7437678	<5.0	5.0	7437678
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Copper (Cu)	ug/L				1.6	0.90	7437678	<0.90	0.90	7437678
Dissolved Iron (Fe)	ug/L				<100	100	7437678	690	100	7437678
Dissolved Lead (Pb)	ug/L				<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Magnesium (Mg)	ug/L				23000	50	7437678	49000	50	7437678
Dissolved Manganese (Mn)	ug/L				98	2.0	7437678	34	2.0	7437678
Dissolved Molybdenum (Mo)	ug/L				1.9	0.50	7437678	3.0	0.50	7437678
Dissolved Nickel (Ni)	ug/L				<1.0	1.0	7437678	<1.0	1.0	7437678
Dissolved Phosphorus (P)	ug/L				<100	100	7437678	<100	100	7437678
Dissolved Potassium (K)	ug/L				1200	200	7437678	1700	200	7437678
Dissolved Selenium (Se)	ug/L				<2.0	2.0	7437678	<2.0	2.0	7437678
Dissolved Silicon (Si)	ug/L				6600	50	7437678	5500	50	7437678
Dissolved Silver (Ag)	ug/L				<0.090	0.090	7437678	<0.090	0.090	7437678
Dissolved Sodium (Na)	ug/L				6000	100	7437678	10000	100	7437678
Dissolved Strontium (Sr)	ug/L				420	1.0	7437678	9800	1.0	7437678
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	7437678	<0.050	0.050	7437678
Dissolved Titanium (Ti)	ug/L				<5.0	5.0	7437678	<5.0	5.0	7437678
Dissolved Uranium (U)	ug/L				0.44	0.10	7437678	0.47	0.10	7437678
Dissolved Vanadium (V)	ug/L				<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Zinc (Zn)	ug/L				11	5.0	7437678	<5.0	5.0	7437678
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

<b>BV Labs ID</b>		PXY890			PXY891			PXY892		
<b>Sampling Date</b>		2021/06/24 10:30			2021/06/24 14:30			2021/06/24 17:00		
<b>COC Number</b>		831949-07-01			831949-07-01			831949-07-01		
	<b>UNITS</b>	<b>MW20-27A Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>	<b>MW20-27B</b>	<b>RDL</b>	<b>QC Batch</b>	<b>MW20-26A</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>										
Anion Sum	me/L				8.56	N/A	7433941	22.9	N/A	7433941
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				210	1.0	7433456	180	1.0	7433456
Calculated TDS	mg/L				490	1.0	7433944	1500	1.0	7433944
Carb. Alkalinity (calc. as CaCO3)	mg/L				2.6	1.0	7433456	1.4	1.0	7433456
Cation Sum	me/L				8.18	N/A	7433941	23.0	N/A	7433941
Hardness (CaCO3)	mg/L				370	1.0	7433195	1100	1.0	7433195
Ion Balance (% Difference)	%				2.27	N/A	7433940	0.160	N/A	7433940
Langelier Index (@ 20C)	N/A				0.956		7433942	1.10		7433942
Langelier Index (@ 4C)	N/A				0.708		7433943	0.850		7433943
Saturation pH (@ 20C)	N/A				7.17		7433942	6.84		7433942
Saturation pH (@ 4C)	N/A				7.42		7433943	7.08		7433943

<b>Inorganics</b>										
Total Ammonia-N	mg/L	0.066	0.050	7436397	0.10	0.050	7436363	0.090	0.050	7436363
Conductivity	umho/cm				750	1.0	7438013	1900	1.0	7438013
Dissolved Organic Carbon	mg/L				0.66	0.40	7437920	1.7	0.40	7438054
Orthophosphate (P)	mg/L	<0.010	0.010	7437991	<0.010	0.010	7437991	<0.010	0.010	7437991
pH	pH				8.13		7438016	7.93		7438016
Dissolved Sulphate (SO4)	mg/L	940	5.0	7437990	200	1.0	7437990	920	5.0	7437990
Alkalinity (Total as CaCO3)	mg/L				210	1.0	7438011	180	1.0	7438011
Dissolved Chloride (Cl-)	mg/L	1.9	1.0	7437986	6.2	1.0	7437986	8.0	1.0	7437986
Nitrite (N)	mg/L				<0.010	0.010	7437970	<0.010	0.010	7437970
Nitrate (N)	mg/L				<0.10	0.10	7437970	<0.10	0.10	7437970
Nitrate + Nitrite (N)	mg/L				<0.10	0.10	7437970	<0.10	0.10	7437970

<b>Metals</b>										
Dissolved Aluminum (Al)	ug/L	<4.9	4.9	7437678	<4.9	4.9	7437678	14	4.9	7437678
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Arsenic (As)	ug/L	5.4	1.0	7437678	1.9	1.0	7437678	8.7	1.0	7437678
Dissolved Barium (Ba)	ug/L	18	2.0	7437678	26	2.0	7437678	12	2.0	7437678
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7437678	<0.40	0.40	7437678	<0.40	0.40	7437678
Dissolved Boron (B)	ug/L	44	10	7437678	24	10	7437678	53	10	7437678

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 N/A = Not Applicable



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY890			PXY891			PXY892		
Sampling Date		2021/06/24 10:30			2021/06/24 14:30			2021/06/24 17:00		
COC Number		831949-07-01			831949-07-01			831949-07-01		
	UNITS	MW20-27A Lab-Dup	RDL	QC Batch	MW20-27B	RDL	QC Batch	MW20-26A	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7437678	<0.090	0.090	7437678	<0.090	0.090	7437678
Dissolved Calcium (Ca)	ug/L	360000	1000	7437678	93000	200	7437678	330000	400	7437678
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7437678	<5.0	5.0	7437678	<5.0	5.0	7437678
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7437678	<0.90	0.90	7437678	<0.90	0.90	7437678
Dissolved Iron (Fe)	ug/L	690	100	7437678	430	100	7437678	590	100	7437678
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Magnesium (Mg)	ug/L	50000	50	7437678	33000	50	7437678	70000	50	7437678
Dissolved Manganese (Mn)	ug/L	34	2.0	7437678	25	2.0	7437678	43	2.0	7437678
Dissolved Molybdenum (Mo)	ug/L	3.0	0.50	7437678	11	0.50	7437678	8.6	0.50	7437678
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7437678	<1.0	1.0	7437678	<1.0	1.0	7437678
Dissolved Phosphorus (P)	ug/L	<100	100	7437678	<100	100	7437678	<100	100	7437678
Dissolved Potassium (K)	ug/L	1700	200	7437678	820	200	7437678	2300	200	7437678
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7437678	<2.0	2.0	7437678	<2.0	2.0	7437678
Dissolved Silicon (Si)	ug/L	5500	50	7437678	5500	50	7437678	5100	50	7437678
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7437678	<0.090	0.090	7437678	<0.090	0.090	7437678
Dissolved Sodium (Na)	ug/L	10000	100	7437678	18000	100	7437678	18000	100	7437678
Dissolved Strontium (Sr)	ug/L	10000	1.0	7437678	3000	1.0	7437678	5700	1.0	7437678
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7437678	<0.050	0.050	7437678	<0.050	0.050	7437678
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7437678	<5.0	5.0	7437678	<5.0	5.0	7437678
Dissolved Uranium (U)	ug/L	0.47	0.10	7437678	1.6	0.10	7437678	0.27	0.10	7437678
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7437678	<5.0	5.0	7437678	14	5.0	7437678
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY893			PXY894			PXY895		
Sampling Date		2021/06/24 18:30			2021/06/24 17:15			2021/06/23		
COC Number		831949-07-01			831949-07-01			831949-07-01		
	UNITS	MW20-26B	RDL	QC Batch	MW20-26C	RDL	QC Batch	DUP-3	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	11.2	N/A	7433941	18.7	N/A	7433941	4.74	N/A	7433941
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	200	1.0	7433456	230	1.0	7433456	200	1.0	7433456
Calculated TDS	mg/L	680	1.0	7433944	1000	1.0	7433944	250	1.0	7433944
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.2	1.0	7433456	1.3	1.0	7433456	3.2	1.0	7433456
Cation Sum	me/L	11.6	N/A	7433941	18.7	N/A	7433941	4.67	N/A	7433941
Hardness (CaCO3)	mg/L	540	1.0	7433195	840	1.0	7433195	220	1.0	7433195
Ion Balance (% Difference)	%	1.84	N/A	7433940	0.110	N/A	7433940	0.820	N/A	7433940
Langelier Index (@ 20C)	N/A	1.04		7433942	0.936		7433942	0.833		7433942
Langelier Index (@ 4C)	N/A	0.788		7433943	0.690		7433943	0.583		7433943
Saturation pH (@ 20C)	N/A	7.03		7433942	6.86		7433942	7.39		7433942
Saturation pH (@ 4C)	N/A	7.28		7433943	7.11		7433943	7.64		7433943

Inorganics										
Total Ammonia-N	mg/L	<0.050	0.050	7436363	<0.050	0.050	7436363	0.053	0.050	7436397
Conductivity	umho/cm	1000	1.0	7438013	2000	1.0	7438013	430	1.0	7438013
Dissolved Organic Carbon	mg/L	1.4	0.40	7437920	<0.40	0.40	7438054	<0.40	0.40	7437920
Orthophosphate (P)	mg/L	<0.010	0.010	7437991	<0.010	0.010	7437991	<0.010	0.010	7437991
pH	pH	8.07		7438016	7.80		7438016	8.22		7438016
Dissolved Sulphate (SO4)	mg/L	340	2.0	7437990	24	1.0	7437990	29	1.0	7437990
Alkalinity (Total as CaCO3)	mg/L	200	1.0	7438011	230	1.0	7438011	210	1.0	7438011
Dissolved Chloride (Cl-)	mg/L	5.0	1.0	7437986	490	6.0	7437986	<1.0	1.0	7437986
Nitrite (N)	mg/L	<0.010	0.010	7437970	<0.010	0.010	7437970	<0.010	0.010	7437970
Nitrate (N)	mg/L	<0.10	0.10	7437970	0.12	0.10	7437970	<0.10	0.10	7437970
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7437970	0.12	0.10	7437970	<0.10	0.10	7437970

Metals										
Dissolved Aluminum (Al)	ug/L	7.6	4.9	7437678	6.9	4.9	7437678	7.8	4.9	7437678
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Arsenic (As)	ug/L	2.9	1.0	7437678	<1.0	1.0	7437678	<1.0	1.0	7437678
Dissolved Barium (Ba)	ug/L	20	2.0	7437678	110	2.0	7437678	10	2.0	7437678
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7437678	<0.40	0.40	7437678	<0.40	0.40	7437678
Dissolved Boron (B)	ug/L	30	10	7437678	<10	10	7437678	21	10	7437678
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7437678	<0.090	0.090	7437678	<0.090	0.090	7437678

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 N/A = Not Applicable





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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY893			PXY894			PXY895		
Sampling Date		2021/06/24 18:30			2021/06/24 17:15			2021/06/23		
COC Number		831949-07-01			831949-07-01			831949-07-01		
	UNITS	MW20-26B	RDL	QC Batch	MW20-26C	RDL	QC Batch	DUP-3	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	150000	200	7437678	210000	200	7437678	50000	200	7437678
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7437678	<5.0	5.0	7437678	<5.0	5.0	7437678
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7437678	1.0	0.90	7437678	<0.90	0.90	7437678
Dissolved Iron (Fe)	ug/L	150	100	7437678	<100	100	7437678	<100	100	7437678
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Magnesium (Mg)	ug/L	42000	50	7437678	74000	50	7437678	23000	50	7437678
Dissolved Manganese (Mn)	ug/L	26	2.0	7437678	13	2.0	7437678	100	2.0	7437678
Dissolved Molybdenum (Mo)	ug/L	8.1	0.50	7437678	0.55	0.50	7437678	1.9	0.50	7437678
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7437678	<1.0	1.0	7437678	<1.0	1.0	7437678
Dissolved Phosphorus (P)	ug/L	<100	100	7437678	<100	100	7437678	<100	100	7437678
Dissolved Potassium (K)	ug/L	1600	200	7437678	1100	200	7437678	1200	200	7437678
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7437678	<2.0	2.0	7437678	<2.0	2.0	7437678
Dissolved Silicon (Si)	ug/L	5600	50	7437678	6900	50	7437678	6700	50	7437678
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7437678	<0.090	0.090	7437678	<0.090	0.090	7437678
Dissolved Sodium (Na)	ug/L	17000	100	7437678	45000	100	7437678	6000	100	7437678
Dissolved Strontium (Sr)	ug/L	2400	1.0	7437678	320	1.0	7437678	420	1.0	7437678
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7437678	<0.050	0.050	7437678	<0.050	0.050	7437678
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7437678	<5.0	5.0	7437678	<5.0	5.0	7437678
Dissolved Uranium (U)	ug/L	0.86	0.10	7437678	0.52	0.10	7437678	0.43	0.10	7437678
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7437678	<0.50	0.50	7437678	<0.50	0.50	7437678
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7437678	<5.0	5.0	7437678	8.1	5.0	7437678
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

**RCAP - COMPREHENSIVE (WATER)**

<b>BV Labs ID</b>		PXY896		
<b>Sampling Date</b>		2021/06/24		
<b>COC Number</b>		831949-07-01		
	<b>UNITS</b>	<b>DUP-5</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Anion Sum	me/L	11.2	N/A	7433941
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	200	1.0	7433456
Calculated TDS	mg/L	680	1.0	7433944
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.1	1.0	7433456
Cation Sum	me/L	11.4	N/A	7433941
Hardness (CaCO3)	mg/L	530	1.0	7433195
Ion Balance (% Difference)	%	1.24	N/A	7433940
Langelier Index (@ 20C)	N/A	1.02		7433942
Langelier Index (@ 4C)	N/A	0.772		7433943
Saturation pH (@ 20C)	N/A	7.04		7433942
Saturation pH (@ 4C)	N/A	7.28		7433943
<b>Inorganics</b>				
Total Ammonia-N	mg/L	0.071	0.050	7436397
Conductivity	umho/cm	1000	1.0	7438013
Dissolved Organic Carbon	mg/L	1.4	0.40	7438054
Orthophosphate (P)	mg/L	<0.010	0.010	7437991
pH	pH	8.05		7438016
Dissolved Sulphate (SO4)	mg/L	340	2.0	7437990
Alkalinity (Total as CaCO3)	mg/L	200	1.0	7438011
Dissolved Chloride (Cl-)	mg/L	4.2	1.0	7437986
Nitrite (N)	mg/L	<0.010	0.010	7437970
Nitrate (N)	mg/L	<0.10	0.10	7437970
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7437970
<b>Metals</b>				
Dissolved Aluminum (Al)	ug/L	<4.9	4.9	7437678
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7437678
Dissolved Arsenic (As)	ug/L	2.9	1.0	7437678
Dissolved Barium (Ba)	ug/L	21	2.0	7437678
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7437678
Dissolved Boron (B)	ug/L	32	10	7437678
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7437678
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
N/A = Not Applicable				



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PXY896		
Sampling Date		2021/06/24		
COC Number		831949-07-01		
	UNITS	DUP-5	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	150000	200	7437678
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7437678
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7437678
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7437678
Dissolved Iron (Fe)	ug/L	150	100	7437678
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7437678
Dissolved Magnesium (Mg)	ug/L	40000	50	7437678
Dissolved Manganese (Mn)	ug/L	26	2.0	7437678
Dissolved Molybdenum (Mo)	ug/L	8.1	0.50	7437678
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7437678
Dissolved Phosphorus (P)	ug/L	<100	100	7437678
Dissolved Potassium (K)	ug/L	1500	200	7437678
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7437678
Dissolved Silicon (Si)	ug/L	5500	50	7437678
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7437678
Dissolved Sodium (Na)	ug/L	17000	100	7437678
Dissolved Strontium (Sr)	ug/L	2300	1.0	7437678
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7437678
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7437678
Dissolved Uranium (U)	ug/L	0.87	0.10	7437678
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7437678
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7437678
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

<b>BV Labs ID</b>		PXY681		
<b>Sampling Date</b>		2021/06/24 16:00		
<b>COC Number</b>		831949-06-01		
	<b>UNITS</b>	<b>MW20-13C</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Metals</b>				
Dissolved Aluminum (Al)	ug/L	7.7	4.9	7455024
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7455024
Dissolved Arsenic (As)	ug/L	<1.0	1.0	7455024
Dissolved Barium (Ba)	ug/L	37	2.0	7455024
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7455024
Dissolved Boron (B)	ug/L	27	10	7455024
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7455024
Dissolved Calcium (Ca)	ug/L	66000	200	7455024
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7455024
Dissolved Cobalt (Co)	ug/L	0.89	0.50	7455024
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7455024
Dissolved Iron (Fe)	ug/L	<100	100	7455024
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7455024
Dissolved Magnesium (Mg)	ug/L	38000	50	7455024
Dissolved Manganese (Mn)	ug/L	220	2.0	7455024
Dissolved Molybdenum (Mo)	ug/L	15	0.50	7455024
Dissolved Nickel (Ni)	ug/L	1.6	1.0	7455024
Dissolved Phosphorus (P)	ug/L	<100	100	7455024
Dissolved Potassium (K)	ug/L	1200	200	7455024
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7455024
Dissolved Silicon (Si)	ug/L	3300	50	7455024
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7455024
Dissolved Sodium (Na)	ug/L	6100	100	7455024
Dissolved Strontium (Sr)	ug/L	250	1.0	7455024
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7455024
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7455024
Dissolved Uranium (U)	ug/L	1.2	0.10	7455024
Dissolved Vanadium (V)	ug/L	0.55	0.50	7455024
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7455024
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		PXY680	PXY682	PXY684	PXY686	PXY688	PXY889		
Sampling Date		2021/06/24 16:30	2021/06/24	2021/06/24 10:30	2021/06/24 13:15	2021/06/24 16:15	2021/06/23 12:30		
COC Number		831949-06-01	831949-06-01	831949-06-01	831949-06-01	831949-06-01	831949-07-01		
	UNITS	MW20-13B	DUP-4	MW20-10B	MW20-11B	MW20-12B	MW20-28B	RDL	QC Batch
<b>BTEX &amp; F1 Hydrocarbons</b>									
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7437379
Toluene	ug/L	0.29	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7437379
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7437379
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7437379
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7437379
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7437379
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	<25	25	7437379
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	<25	25	7437379
<b>F2-F4 Hydrocarbons</b>									
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	<100	100	7436245
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	200	7436245
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	200	7436245
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes	Yes		7436245
<b>Surrogate Recovery (%)</b>									
1,4-Difluorobenzene	%	101	101	99	101	103	100		7437379
4-Bromofluorobenzene	%	86	93	90	88	86	97		7437379
D10-o-Xylene	%	111	114	112	111	112	110		7437379
D4-1,2-Dichloroethane	%	106	109	110	108	108	110		7437379
o-Terphenyl	%	96	97	96	96	97	95		7436245
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									





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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		PXY891	PXY893	PXY895	PXY896		
Sampling Date		2021/06/24 14:30	2021/06/24 18:30	2021/06/23	2021/06/24		
COC Number		831949-07-01	831949-07-01	831949-07-01	831949-07-01		
	UNITS	MW20-27B	MW20-26B	DUP-3	DUP-5	RDL	QC Batch
<b>BTEX &amp; F1 Hydrocarbons</b>							
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7437379
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7437379
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7437379
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7437379
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7437379
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7437379
F1 (C6-C10)	ug/L	<25	<25	<25	<25	25	7437379
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	25	7437379
<b>F2-F4 Hydrocarbons</b>							
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	100	7436245
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	200	7436245
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	200	7436245
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes		7436245
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene	%	100	101	100	101		7437379
4-Bromofluorobenzene	%	86	86	94	90		7437379
D10-o-Xylene	%	106	115	107	111		7437379
D4-1,2-Dichloroethane	%	111	107	106	108		7437379
o-Terphenyl	%	96	95	96	95		7436245
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY679  
**Sample ID:** MW20-13A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY680  
**Sample ID:** MW20-13B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY680 Dup  
**Sample ID:** MW20-13B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal

**BV Labs ID:** PXY681  
**Sample ID:** MW20-13C  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	7455024	2021/07/09	2021/07/12	Nan Raykha
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY682  
**Sample ID:** DUP-4  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan



BUREAU  
VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY682  
**Sample ID:** DUP-4  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY683  
**Sample ID:** MW20-10A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY684  
**Sample ID:** MW20-10B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY684  
**Sample ID:** MW20-10B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY684 Dup  
**Sample ID:** MW20-10B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai

**BV Labs ID:** PXY685  
**Sample ID:** MW20-11A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk





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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY686  
**Sample ID:** MW20-11B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY687  
**Sample ID:** MW20-12A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY688  
**Sample ID:** MW20-12B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY888  
**Sample ID:** MW20-28A  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY888 Dup  
**Sample ID:** MW20-28A  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh

**BV Labs ID:** PXY889  
**Sample ID:** MW20-28B  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/07/02	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY890  
**Sample ID:** MW20-27A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan



BUREAU  
VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY890  
**Sample ID:** MW20-27A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY890 Dup  
**Sample ID:** MW20-27A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu

**BV Labs ID:** PXY891  
**Sample ID:** MW20-27B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY892  
**Sample ID:** MW20-26A  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY893  
**Sample ID:** MW20-26B  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk





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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY894  
**Sample ID:** MW20-26C  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436363	N/A	2021/07/02	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk

**BV Labs ID:** PXY895  
**Sample ID:** DUP-3  
**Matrix:** Water

**Collected:** 2021/06/23  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7437920	N/A	2021/06/30	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/06/30	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### TEST SUMMARY

**BV Labs ID:** PXY896  
**Sample ID:** DUP-5  
**Matrix:** Water

**Collected:** 2021/06/24  
**Shipped:**  
**Received:** 2021/06/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7438011	N/A	2021/07/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7433456	N/A	2021/07/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	7437986	N/A	2021/07/02	Alina Dobreanu
Conductivity	AT	7438013	N/A	2021/07/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7438054	N/A	2021/07/01	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7437379	N/A	2021/06/30	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7436245	2021/06/29	2021/06/30	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7433195	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7437678	N/A	2021/06/30	Prempal Bhatti
Ion Balance (% Difference)	CALC	7433940	N/A	2021/07/02	Automated Statchk
Anion and Cation Sum	CALC	7433941	N/A	2021/07/02	Automated Statchk
Total Ammonia-N	LACH/NH4	7436397	N/A	2021/06/30	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7437970	N/A	2021/07/02	Chandra Nandlal
pH	AT	7438016	2021/06/30	2021/07/01	Surinder Rai
Orthophosphate	KONE	7437991	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7433942	N/A	2021/07/02	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7433943	N/A	2021/07/02	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7437990	N/A	2021/07/02	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7433944	N/A	2021/07/02	Automated Statchk



### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.0°C
Package 2	9.7°C

**Results relate only to the items tested.**



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

### QUALITY ASSURANCE REPORT

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7436245	o-Terphenyl	2021/06/29	98	60 - 130	98	60 - 130	98	%		
7437379	1,4-Difluorobenzene	2021/06/30	94	70 - 130	96	70 - 130	100	%		
7437379	4-Bromofluorobenzene	2021/06/30	112	70 - 130	113	70 - 130	102	%		
7437379	D10-o-Xylene	2021/06/30	101	70 - 130	96	70 - 130	112	%		
7437379	D4-1,2-Dichloroethane	2021/06/30	99	70 - 130	95	70 - 130	104	%		
7436245	F2 (C10-C16 Hydrocarbons)	2021/06/30	90	60 - 130	99	60 - 130	<100	ug/L	NC	30
7436245	F3 (C16-C34 Hydrocarbons)	2021/06/30	88	60 - 130	103	60 - 130	<200	ug/L	NC	30
7436245	F4 (C34-C50 Hydrocarbons)	2021/06/30	93	60 - 130	106	60 - 130	<200	ug/L	NC	30
7436363	Total Ammonia-N	2021/07/02	97	75 - 125	101	80 - 120	<0.050	mg/L	3.4	20
7436397	Total Ammonia-N	2021/06/30	100	75 - 125	104	80 - 120	<0.050	mg/L	20	20
7437379	Benzene	2021/06/30	95	50 - 140	92	50 - 140	<0.20	ug/L	NC	30
7437379	Ethylbenzene	2021/06/30	100	50 - 140	98	50 - 140	<0.20	ug/L	NC	30
7437379	F1 (C6-C10) - BTEX	2021/06/30					<25	ug/L	NC	30
7437379	F1 (C6-C10)	2021/06/30	87	60 - 140	85	60 - 140	<25	ug/L	NC	30
7437379	o-Xylene	2021/06/30	99	50 - 140	97	50 - 140	<0.20	ug/L	NC	30
7437379	p+m-Xylene	2021/06/30	94	50 - 140	93	50 - 140	<0.40	ug/L	NC	30
7437379	Toluene	2021/06/30	90	50 - 140	88	50 - 140	<0.20	ug/L	NC	30
7437379	Total Xylenes	2021/06/30					<0.40	ug/L	NC	30
7437678	Dissolved Aluminum (Al)	2021/06/30	101	80 - 120	99	80 - 120	<4.9	ug/L	NC	20
7437678	Dissolved Antimony (Sb)	2021/06/30	105	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7437678	Dissolved Arsenic (As)	2021/06/30	103	80 - 120	100	80 - 120	<1.0	ug/L	0.65	20
7437678	Dissolved Barium (Ba)	2021/06/30	102	80 - 120	100	80 - 120	<2.0	ug/L	3.8	20
7437678	Dissolved Beryllium (Be)	2021/06/30	103	80 - 120	96	80 - 120	<0.40	ug/L	NC	20
7437678	Dissolved Boron (B)	2021/06/30	97	80 - 120	88	80 - 120	<10	ug/L	4.1	20
7437678	Dissolved Cadmium (Cd)	2021/06/30	102	80 - 120	99	80 - 120	<0.090	ug/L	NC	20
7437678	Dissolved Calcium (Ca)	2021/06/30	NC	80 - 120	98	80 - 120	<200	ug/L	1.6	20
7437678	Dissolved Chromium (Cr)	2021/06/30	100	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7437678	Dissolved Cobalt (Co)	2021/06/30	105	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
7437678	Dissolved Copper (Cu)	2021/06/30	101	80 - 120	105	80 - 120	<0.90	ug/L	NC	20
7437678	Dissolved Iron (Fe)	2021/06/30	102	80 - 120	99	80 - 120	<100	ug/L	0.31	20
7437678	Dissolved Lead (Pb)	2021/06/30	100	80 - 120	98	80 - 120	<0.50	ug/L	NC	20



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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7437678	Dissolved Magnesium (Mg)	2021/06/30	NC	80 - 120	102	80 - 120	<50	ug/L	1.2	20
7437678	Dissolved Manganese (Mn)	2021/06/30	100	80 - 120	98	80 - 120	<2.0	ug/L	1.4	20
7437678	Dissolved Molybdenum (Mo)	2021/06/30	105	80 - 120	98	80 - 120	<0.50	ug/L	1.5	20
7437678	Dissolved Nickel (Ni)	2021/06/30	100	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7437678	Dissolved Phosphorus (P)	2021/06/30	102	80 - 120	103	80 - 120	<100	ug/L	NC	20
7437678	Dissolved Potassium (K)	2021/06/30	104	80 - 120	103	80 - 120	<200	ug/L	0.33	20
7437678	Dissolved Selenium (Se)	2021/06/30	106	80 - 120	102	80 - 120	<2.0	ug/L	NC	20
7437678	Dissolved Silicon (Si)	2021/06/30	98	80 - 120	97	80 - 120	<50	ug/L	1.0	20
7437678	Dissolved Silver (Ag)	2021/06/30	101	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7437678	Dissolved Sodium (Na)	2021/06/30	102	80 - 120	101	80 - 120	<100	ug/L	1.5	20
7437678	Dissolved Strontium (Sr)	2021/06/30	NC	80 - 120	97	80 - 120	<1.0	ug/L	2.9	20
7437678	Dissolved Thallium (Tl)	2021/06/30	106	80 - 120	102	80 - 120	<0.050	ug/L	NC	20
7437678	Dissolved Titanium (Ti)	2021/06/30	100	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7437678	Dissolved Uranium (U)	2021/06/30	105	80 - 120	99	80 - 120	<0.10	ug/L	0.64	20
7437678	Dissolved Vanadium (V)	2021/06/30	100	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
7437678	Dissolved Zinc (Zn)	2021/06/30	99	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
7437920	Dissolved Organic Carbon	2021/06/30	93	80 - 120	94	80 - 120	<0.40	mg/L	NC	20
7437970	Nitrate (N)	2021/06/30	94	80 - 120	97	80 - 120	<0.10	mg/L	NC	20
7437970	Nitrite (N)	2021/06/30	104	80 - 120	105	80 - 120	<0.010	mg/L	NC	20
7437986	Dissolved Chloride (Cl-)	2021/07/02	113	80 - 120	102	80 - 120	<1.0	mg/L	7.0	20
7437990	Dissolved Sulphate (SO4)	2021/07/02	NC	75 - 125	103	80 - 120	<1.0	mg/L	2.5	20
7437991	Orthophosphate (P)	2021/07/05	119	75 - 125	99	80 - 120	<0.010	mg/L	NC	25
7438011	Alkalinity (Total as CaCO3)	2021/07/01			96	85 - 115	<1.0	mg/L	3.0	20
7438013	Conductivity	2021/07/02			99	85 - 115	<1.0	umho/cm	0	25
7438016	pH	2021/07/01			102	98 - 103			0.36	N/A
7438054	Dissolved Organic Carbon	2021/07/01	93	80 - 120	94	80 - 120	<0.40	mg/L	2.7	20
7455024	Dissolved Aluminum (Al)	2021/07/12	101	80 - 120	97	80 - 120	<4.9	ug/L	NC	20
7455024	Dissolved Antimony (Sb)	2021/07/12	109	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7455024	Dissolved Arsenic (As)	2021/07/12	106	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7455024	Dissolved Barium (Ba)	2021/07/12	105	80 - 120	98	80 - 120	<2.0	ug/L	2.0	20
7455024	Dissolved Beryllium (Be)	2021/07/12	112	80 - 120	100	80 - 120	<0.40	ug/L	NC	20





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BV Labs Job #: C1H5980  
Report Date: 2021/07/12

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7455024	Dissolved Boron (B)	2021/07/12	105	80 - 120	93	80 - 120	<10	ug/L	2.8	20
7455024	Dissolved Cadmium (Cd)	2021/07/12	105	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7455024	Dissolved Calcium (Ca)	2021/07/12	NC	80 - 120	97	80 - 120	<200	ug/L	0.91	20
7455024	Dissolved Chromium (Cr)	2021/07/12	105	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
7455024	Dissolved Cobalt (Co)	2021/07/12	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7455024	Dissolved Copper (Cu)	2021/07/12	105	80 - 120	101	80 - 120	1.2, RDL=0.90 (1)	ug/L	NC	20
7455024	Dissolved Iron (Fe)	2021/07/12	104	80 - 120	96	80 - 120	<100	ug/L	NC	20
7455024	Dissolved Lead (Pb)	2021/07/12	101	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
7455024	Dissolved Magnesium (Mg)	2021/07/12	98	80 - 120	99	80 - 120	<50	ug/L	1.5	20
7455024	Dissolved Manganese (Mn)	2021/07/12	104	80 - 120	97	80 - 120	<2.0	ug/L	NC	20
7455024	Dissolved Molybdenum (Mo)	2021/07/12	112	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
7455024	Dissolved Nickel (Ni)	2021/07/12	101	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
7455024	Dissolved Phosphorus (P)	2021/07/12	110	80 - 120	106	80 - 120	<100	ug/L	NC	20
7455024	Dissolved Potassium (K)	2021/07/12	103	80 - 120	98	80 - 120	<200	ug/L	4.8	20
7455024	Dissolved Selenium (Se)	2021/07/12	104	80 - 120	99	80 - 120	<2.0	ug/L	NC	20
7455024	Dissolved Silicon (Si)	2021/07/12	101	80 - 120	97	80 - 120	<50	ug/L	0.68	20
7455024	Dissolved Silver (Ag)	2021/07/12	106	80 - 120	100	80 - 120	<0.090	ug/L	NC	20
7455024	Dissolved Sodium (Na)	2021/07/12	102	80 - 120	98	80 - 120	<100	ug/L	0.96	20
7455024	Dissolved Strontium (Sr)	2021/07/12	106	80 - 120	96	80 - 120	<1.0	ug/L	2.9	20
7455024	Dissolved Thallium (Tl)	2021/07/12	103	80 - 120	99	80 - 120	<0.050	ug/L	NC	20
7455024	Dissolved Titanium (Ti)	2021/07/12	96	80 - 120	94	80 - 120	<5.0	ug/L	NC	20
7455024	Dissolved Uranium (U)	2021/07/12	98	80 - 120	94	80 - 120	<0.10	ug/L	5.1	20
7455024	Dissolved Vanadium (V)	2021/07/12	105	80 - 120	98	80 - 120	<0.50	ug/L	NC	20



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VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7455024	Dissolved Zinc (Zn)	2021/07/12	104	80 - 120	97	80 - 120	<5.0	ug/L	14	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Analyte was detected in the method blank at a level marginally above the detection limit. Sample results have not been blank corrected. Those results at or near the detection limit may be biased high..



BUREAU  
VERITAS

BV Labs Job #: C1H5980  
Report Date: 2021/07/12

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: VP

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

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Anastassia Hamanov, Scientific Specialist

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Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.





2 coolers

<b>INVOICE TO:</b>		<b>REPORT TO:</b>		<b>PROJECT INFORMATION:</b>		<b>Laboratory Use Only:</b>	
Company Name: #21375 Golder Associates Ltd	Company Name: Gregory Padusenko	Quotation #: B80683	BV Labs Job #:		Bottle Order #:		
Attention: Accounts Payable	Attention: Gregory Padusenko	P.O. #:	831949		COC #:		Project Manager:
Address: 210 Sheldon Drive Cambridge ON N1T 1A8	Address:	Project: 19129150 (2300)	Barcode		Barcode		Erna Gitej
Tel: (519) 620-8182 Fax:	Tel: (519) 620-8182 Ext: 6509 Fax: (519) 620-9878	Project Name:	C#831949-07-01				
Email: CanadaAccountsPayableInvoices@golder.com	Email: Gregory_Padusenko@golder.com	Site #:					
		Sampled By:					

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY						ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required					
Regulation 153 (2011)			Other Regulations			Special Instructions	Field Filtered (please circle):	RCap - Comprehensive	O Reg 153 PHCs, BTEX/F1-F4											Please provide advance notice for rush projects	
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Medium/Fine	<input type="checkbox"/> CCME	<input type="checkbox"/> Sanitary Sewer Bylaw															<b>Regular (Standard) TAT:</b>		
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> Reg 558	<input type="checkbox"/> Storm Sewer Bylaw															(will be applied if Rush TAT is not specified)		
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other	<input type="checkbox"/> For RSC	<input type="checkbox"/> MISA	Municipality _____															Standard TAT = 5-7 Working days for most tests.		
<input type="checkbox"/> Table _____			<input type="checkbox"/> PWQO	Reg 406 Table _____															Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.		
			<input type="checkbox"/> Other _____																<b>Job Specific Rush TAT (if applies to entire submission)</b>		
Include Criteria on Certificate of Analysis (Y/N)?																			Date Required: _____ Time Required: _____		
																			Rush Confirmation Number: _____ (call lab for #)		
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix														# of Bottles	Comments		
1	MW20-28A	21/06/23	1200	GW	Y	X												4			
2	MW20-28B	21/06/23	1230			X	X											8			
3	MW20-27A	21/06/24	1030			X												4			
4	MW20-27B	21/06/24	1430			X	X											8			
5	MW20-26A	21/06/24	1700			X												4			
6	MW20-26B	21/06/24	1830			X	X											8			
7	MW20-26C	21/06/24	1715	↓	↓	X												4			
8	DUP-3	21/06/23	-	GW	↓	X	X											8			
9	DUP-5	21/06/24	-	GW	Y	X	X											8			
10																					

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
V Propp		21/06/24	20:40	fer pset					Time Sensitive	Temperature (°C) on Receipt	Custody Seal Present	Yes	No
											Intact		

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

\* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

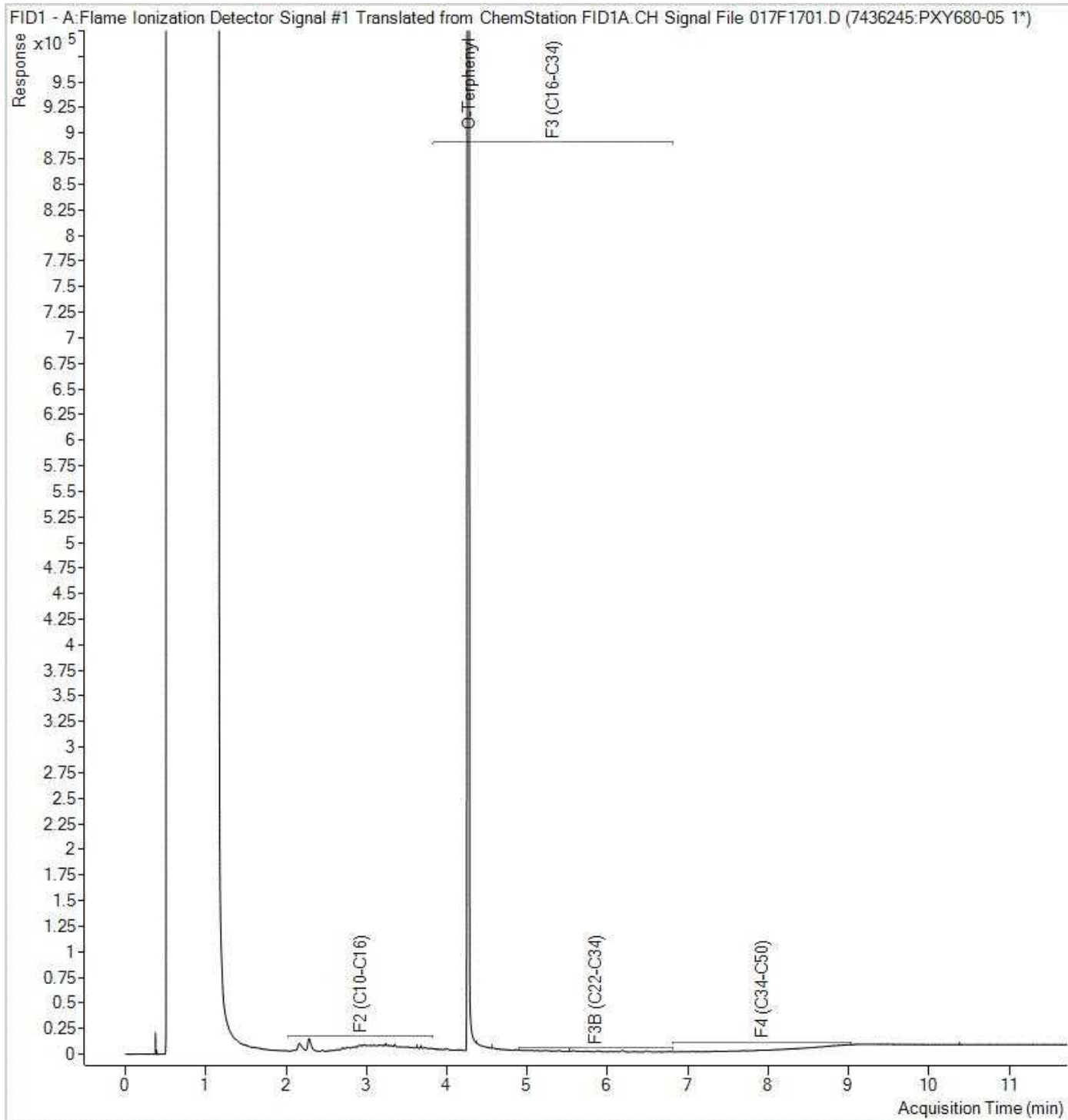
\*\* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

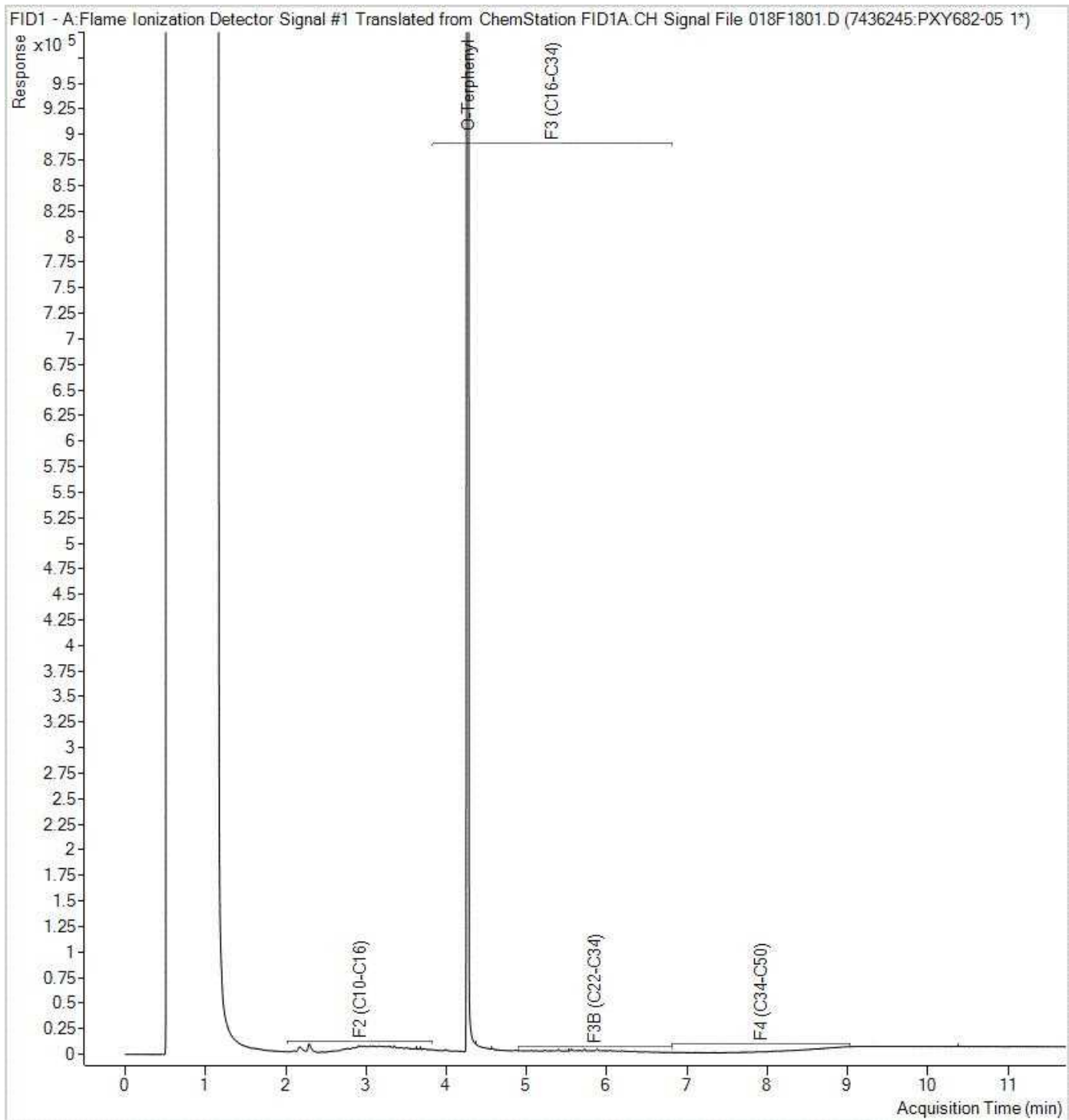


Petroleum Hydrocarbons F2-F4 in Water Chromatogram



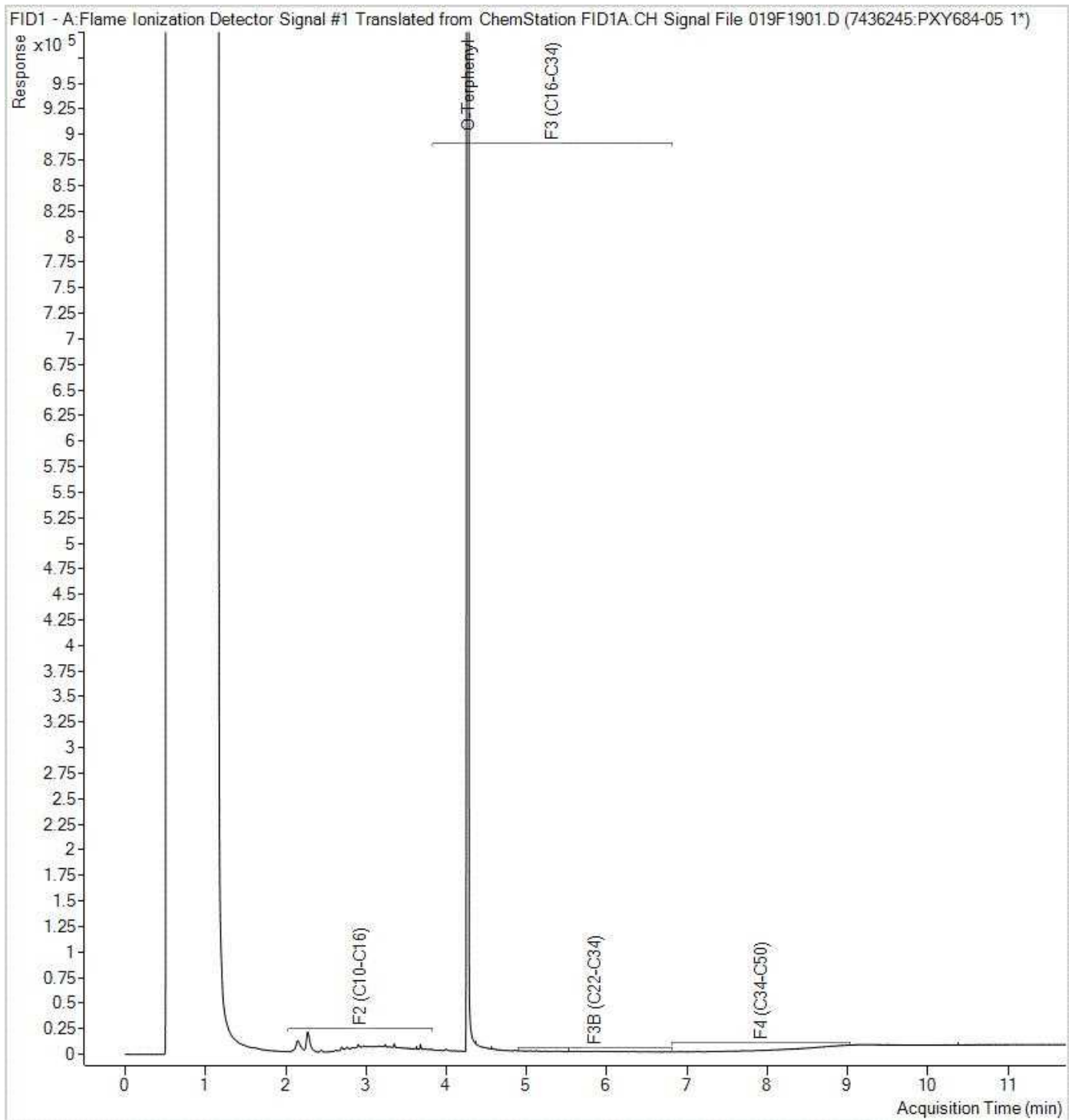
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



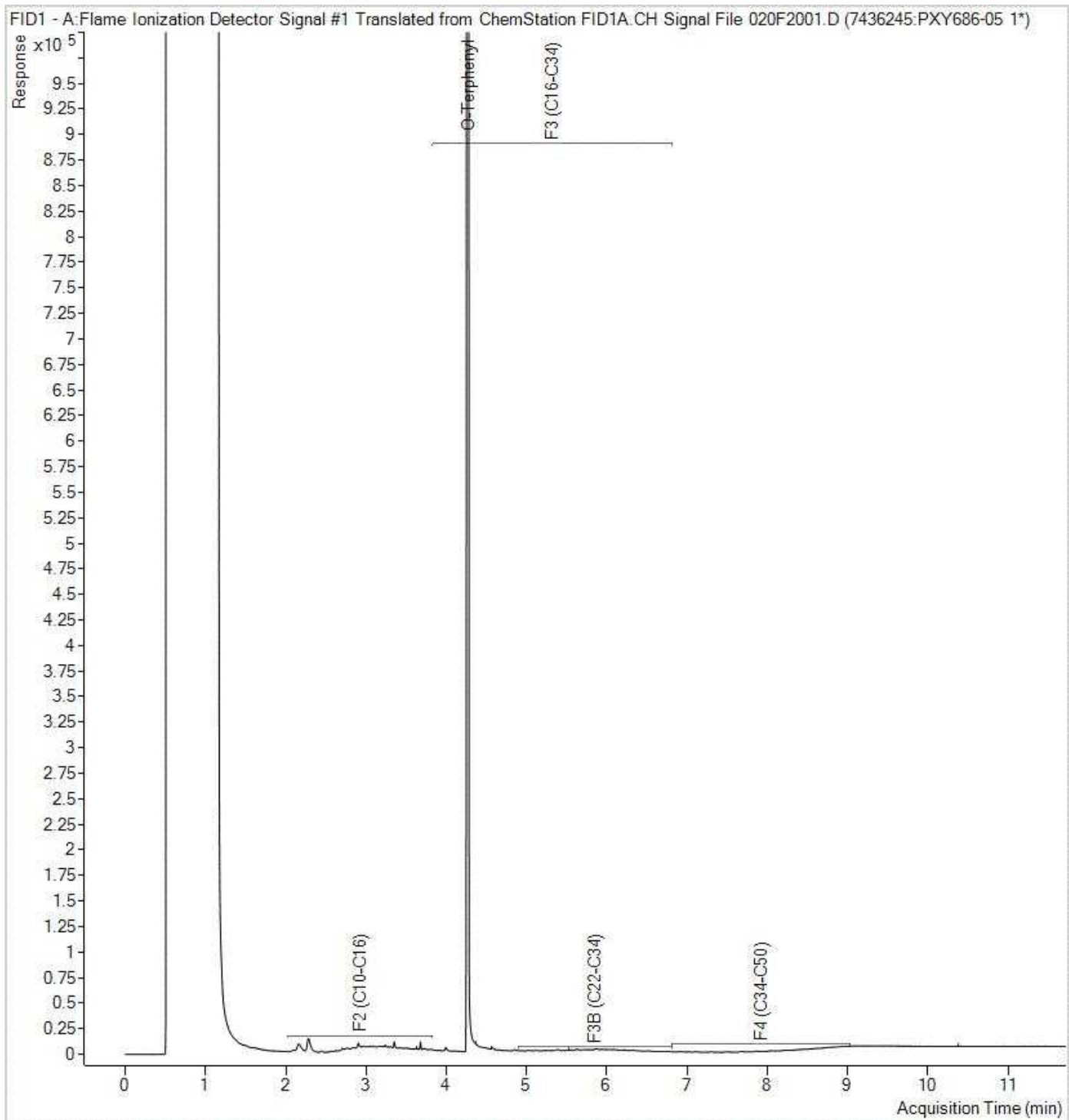
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Petroleum Hydrocarbons F2-F4 in Water Chromatogram



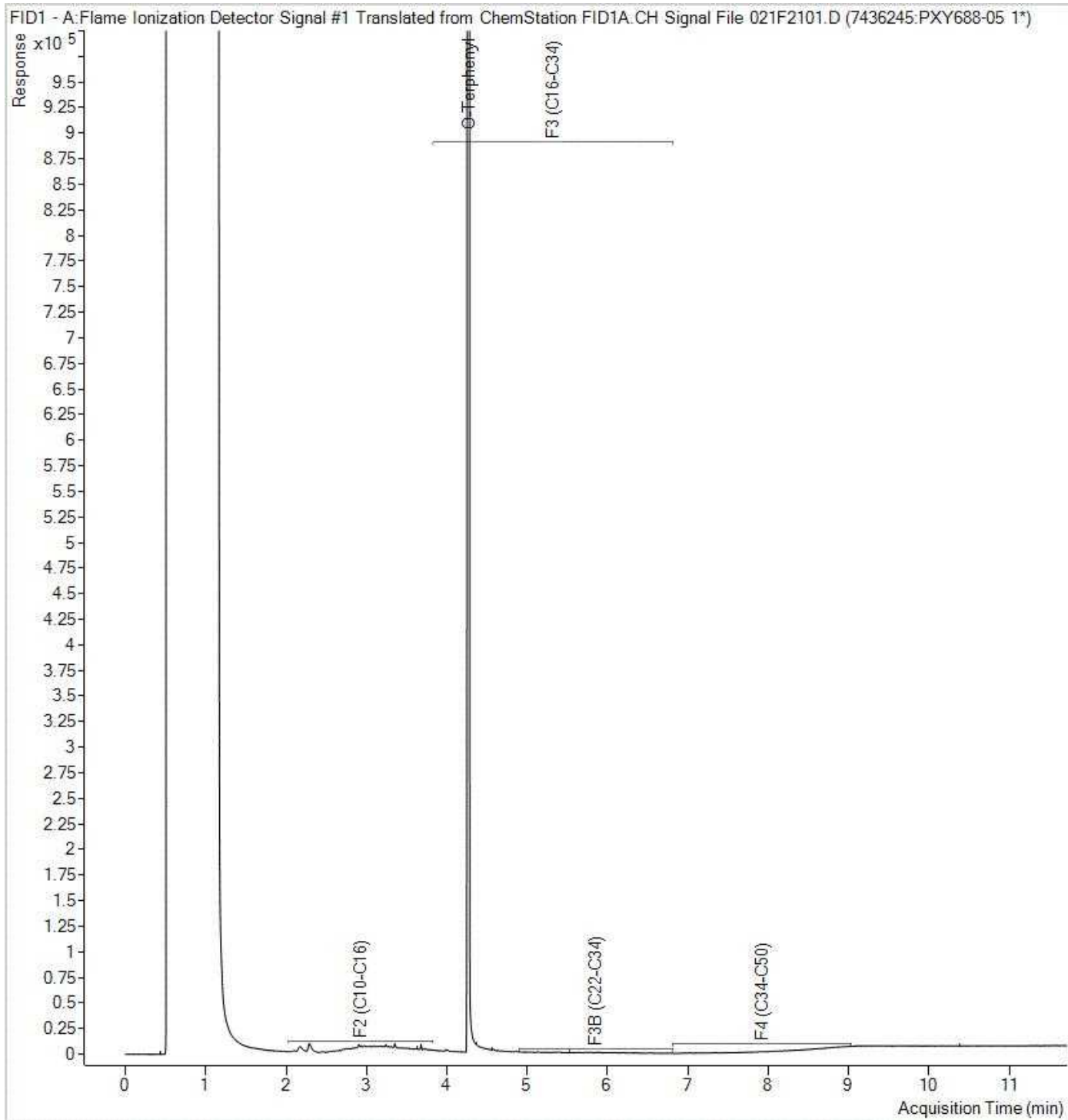
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

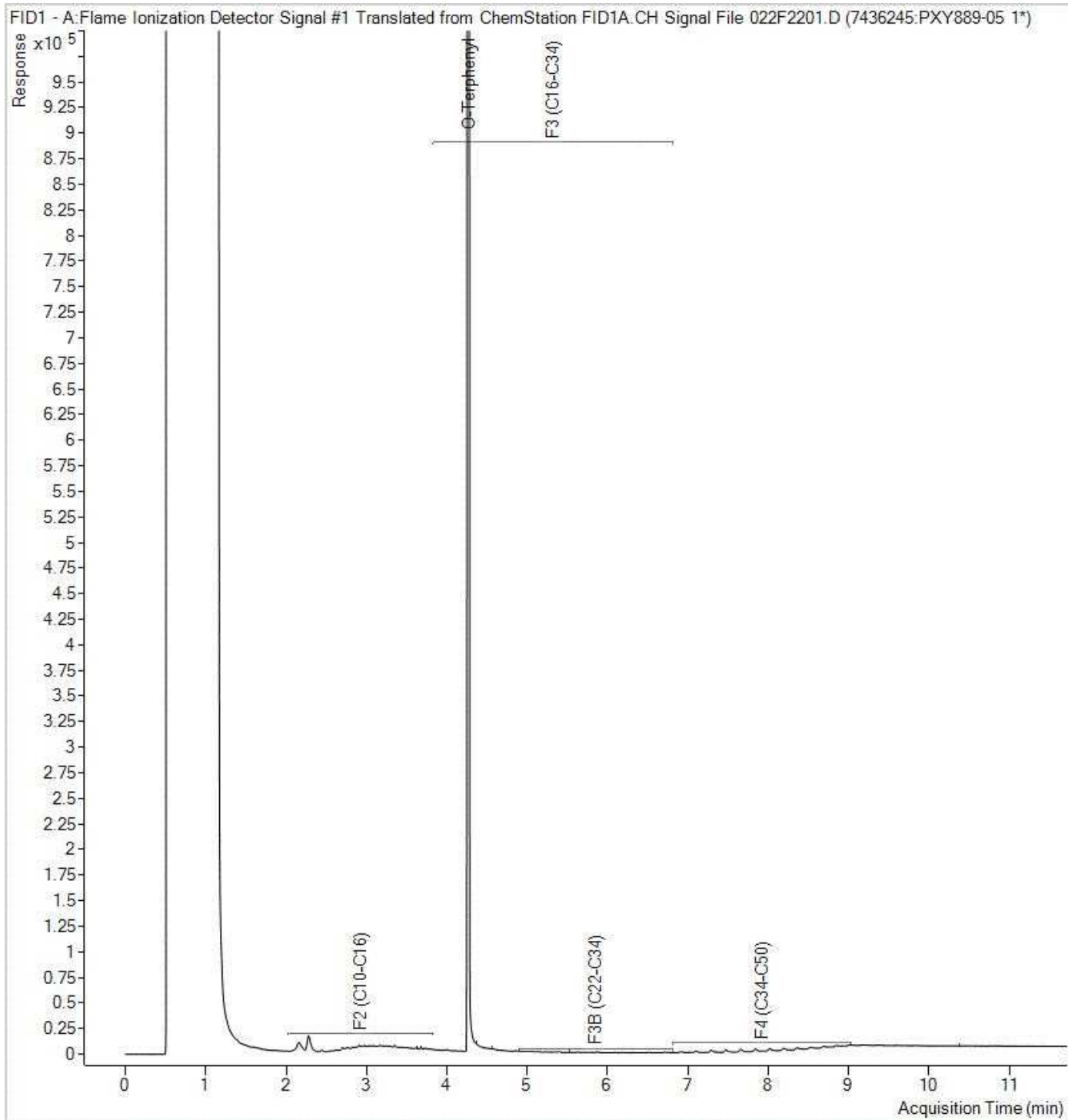
Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

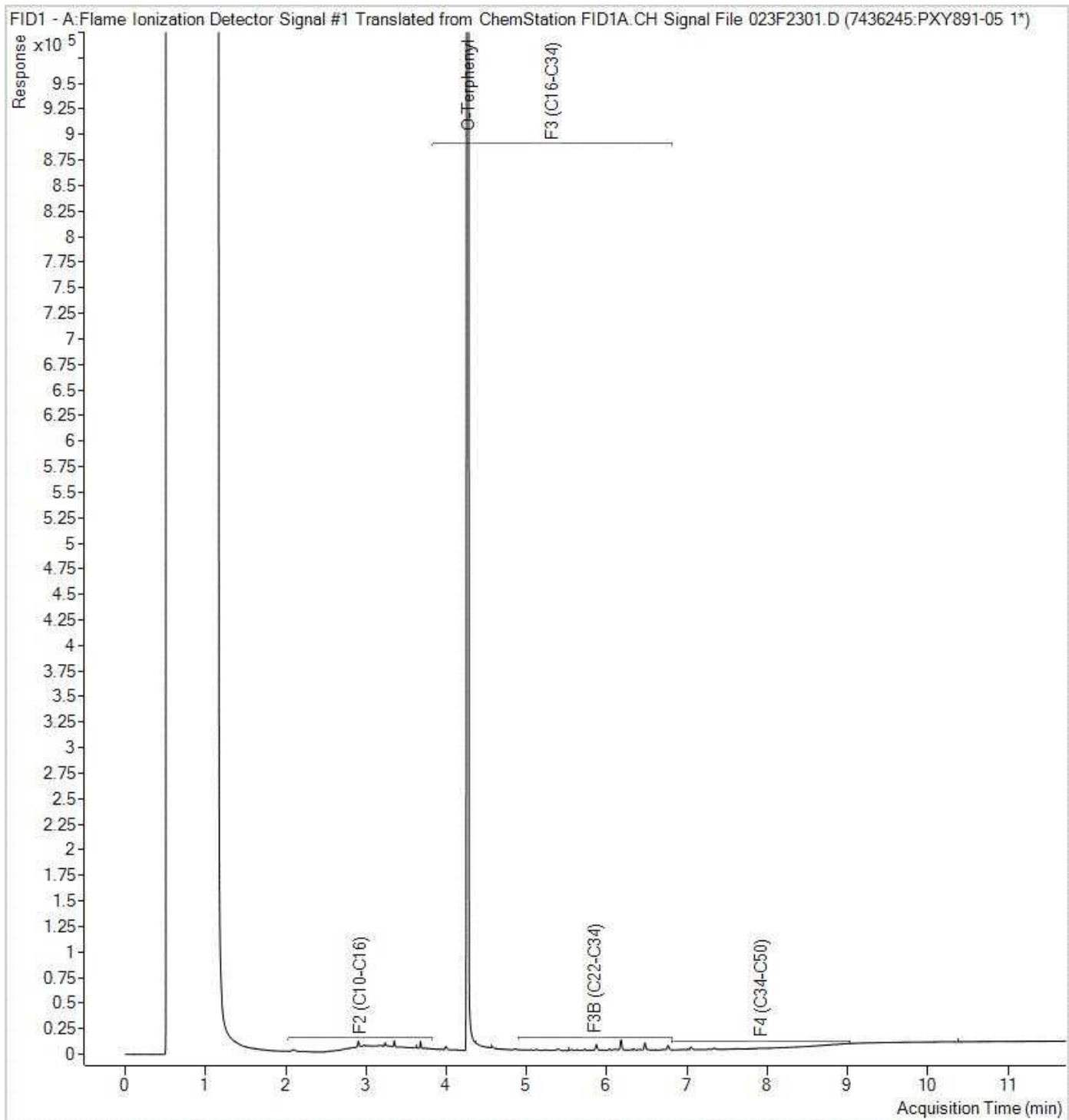


Petroleum Hydrocarbons F2-F4 in Water Chromatogram



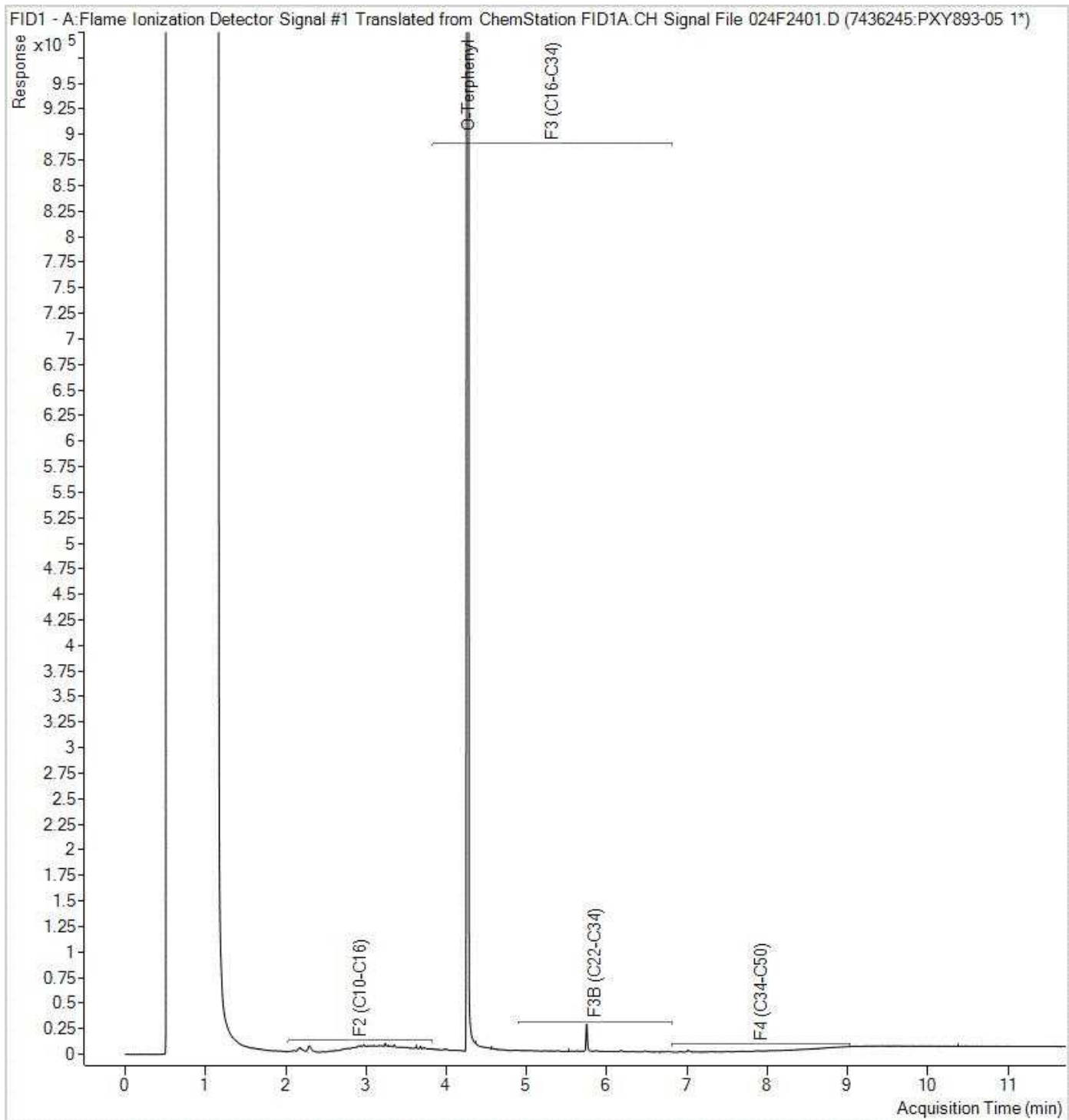
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



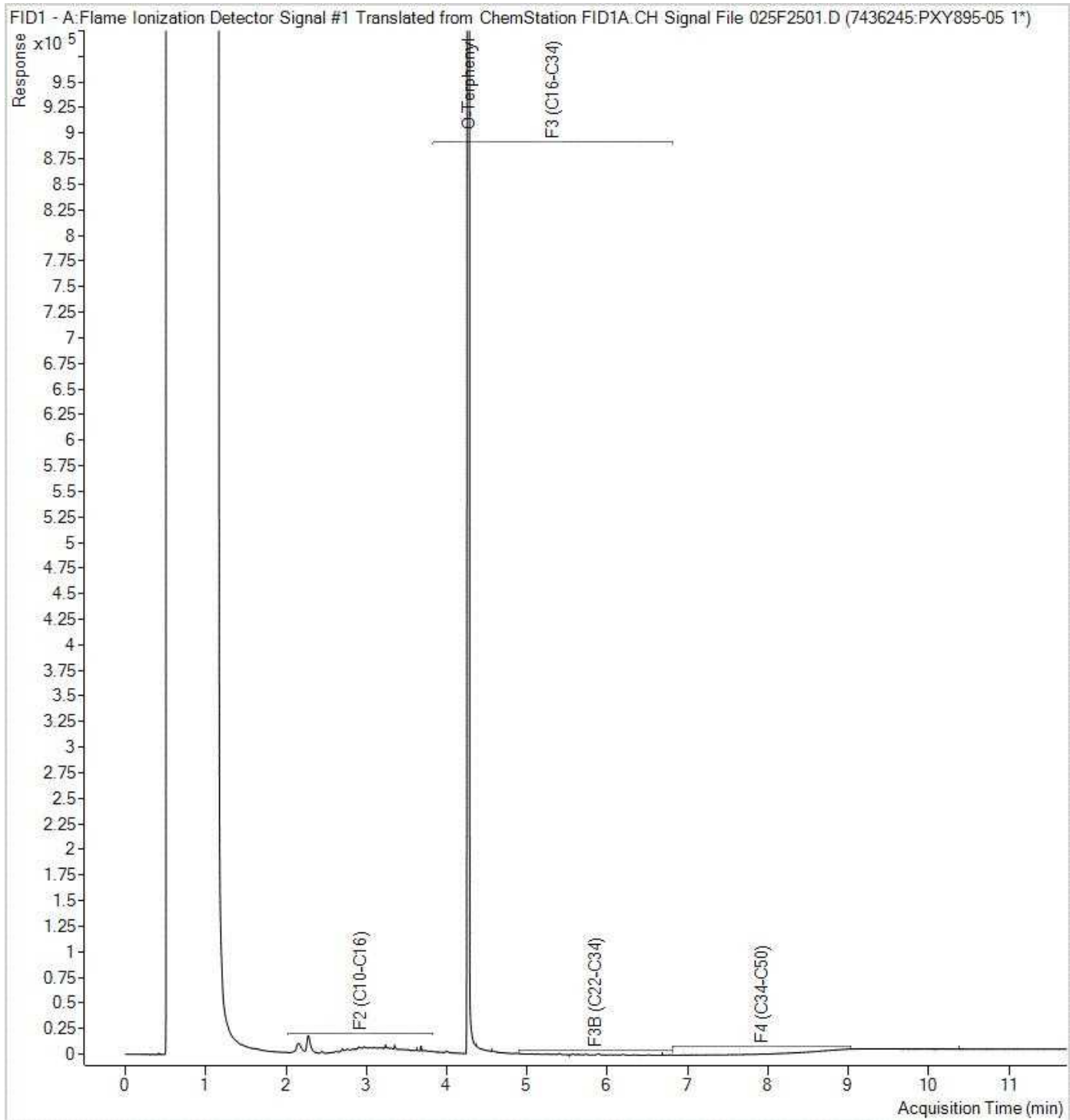
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Petroleum Hydrocarbons F2-F4 in Water Chromatogram



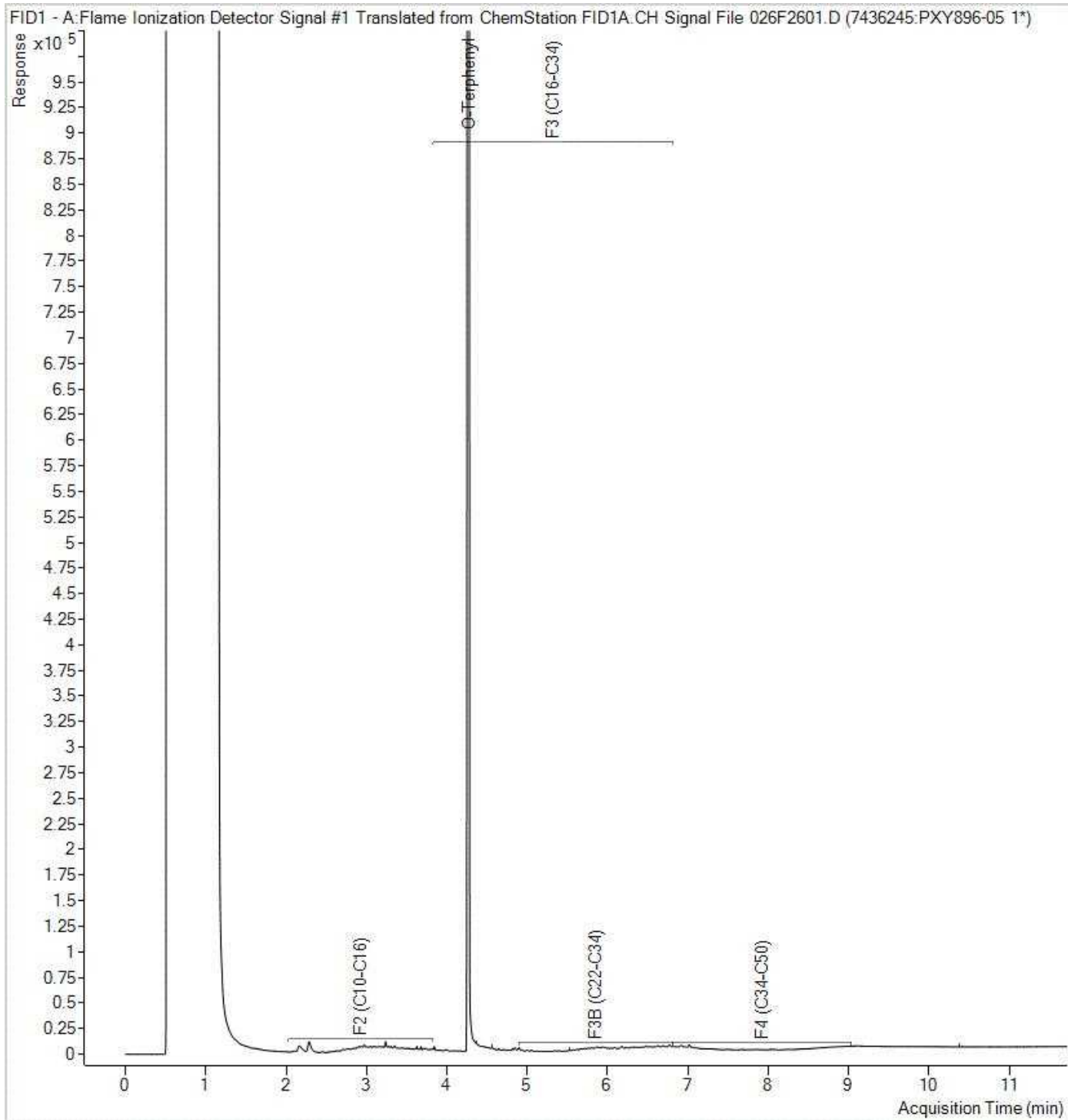
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.





Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-08-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/07/08**  
Report #: R6709360  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H7092**

**Received: 2021/06/26, 10:13**

Sample Matrix: Water  
# Samples Received: 8

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	8	N/A	2021/07/05	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	8	N/A	2021/07/06	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	8	N/A	2021/07/05	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	8	N/A	2021/07/05	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2021/06/30	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	7	N/A	2021/07/02	CAM SOP-00446	SM 23 5310 B m
Petroleum Hydro. CCME F1 & BTEX in Water	4	N/A	2021/07/05	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	4	2021/07/02	2021/07/03	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	8	N/A	2021/07/02	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	8	N/A	2021/07/02	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	8	N/A	2021/07/06		
Anion and Cation Sum	8	N/A	2021/07/06		
Total Ammonia-N	8	N/A	2021/07/05	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	1	N/A	2021/07/02	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (3)	7	N/A	2021/07/05	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	8	2021/07/02	2021/07/05	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	8	N/A	2021/07/05	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	8	N/A	2021/07/06		Auto Calc
Sat. pH and Langelier Index (@ 4C)	8	N/A	2021/07/06		Auto Calc
Sulphate by Automated Colourimetry	8	N/A	2021/07/05	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	8	N/A	2021/07/06		Auto Calc

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.



Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-08-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/07/08**  
Report #: R6709360  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1H7092**  
**Received: 2021/06/26, 10:13**

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

- (1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
- (2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
- (3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager  
Email: emese.gitej@bureauveritas.com  
Phone# (905)817-5829

=====  
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BUREAU  
VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYF176			PYF177		PYF178		
Sampling Date		2021/06/25 13:30			2021/06/25 12:15		2021/06/25 13:15		
COC Number		831949-08-01			831949-08-01		831949-08-01		
	UNITS	MW20-15A	RDL	QC Batch	MW20-15B	QC Batch	MW20-15C	RDL	QC Batch

Calculated Parameters									
Anion Sum	me/L	28.8	N/A	7437804	6.49	7437804	6.46	N/A	7437804
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	190	1.0	7437805	210	7437805	290	1.0	7437805
Calculated TDS	mg/L	1900	1.0	7437809	370	7437809	360	1.0	7437809
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.2	1.0	7437805	2.0	7437805	2.7	1.0	7437805
Cation Sum	me/L	30.6	N/A	7437804	6.63	7437804	8.40	N/A	7437804
Hardness (CaCO3)	mg/L	1000	1.0	7437803	320	7437803	400	1.0	7437803
Ion Balance (% Difference)	%	3.06	N/A	7437802	1.11	7437802	13.0	N/A	7437802
Langelier Index (@ 20C)	N/A	0.996		7437806	0.803	7437806	0.985		7437806
Langelier Index (@ 4C)	N/A	0.753		7437807	0.555	7437807	0.736		7437807
Saturation pH (@ 20C)	N/A	6.86		7437806	7.21	7437806	7.01		7437806
Saturation pH (@ 4C)	N/A	7.10		7437807	7.45	7437807	7.26		7437807

Inorganics									
Total Ammonia-N	mg/L	1.5	0.050	7441345	0.052	7441336	<0.050	0.050	7441345
Conductivity	umho/cm	2500	1.0	7442510	630	7442510	600	1.0	7442510
Dissolved Organic Carbon	mg/L	1.7	0.40	7441338	0.46	7441338	0.52	0.40	7439424
Orthophosphate (P)	mg/L	<0.010	0.010	7442183	<0.010	7442183	<0.010	0.010	7442183
pH	pH	7.85		7442511	8.01	7442511	7.99		7442511
Dissolved Sulphate (SO4)	mg/L	1200	10	7442181	110	7442181	25	1.0	7442181
Alkalinity (Total as CaCO3)	mg/L	190	1.0	7442502	210	7442502	290	1.0	7442502
Dissolved Chloride (Cl-)	mg/L	11	1.0	7442173	2.1	7442173	3.4	1.0	7442173
Nitrite (N)	mg/L	0.039	0.010	7442687	<0.010	7442216	<0.010	0.010	7442218
Nitrate (N)	mg/L	0.31	0.10	7442687	<0.10	7442216	<0.10	0.10	7442218
Nitrate + Nitrite (N)	mg/L	0.35	0.10	7442687	<0.10	7442216	<0.10	0.10	7442218

Metals									
Dissolved Aluminum (Al)	ug/L	200	4.9	7439514	<4.9	7439514	600	4.9	7439514
Dissolved Antimony (Sb)	ug/L	2.2	0.50	7439514	<0.50	7439514	<0.50	0.50	7439514
Dissolved Arsenic (As)	ug/L	23	1.0	7439514	2.0	7439514	7.3	1.0	7439514
Dissolved Barium (Ba)	ug/L	24	2.0	7439514	19	7439514	170	2.0	7439514
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7439514	<0.40	7439514	<0.40	0.40	7439514
Dissolved Boron (B)	ug/L	720	10	7439514	60	7439514	31	10	7439514
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7439514	<0.090	7439514	<0.090	0.090	7439514

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 N/A = Not Applicable



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BV Labs Job #: C1H7092

Report Date: 2021/07/08

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYF176			PYF177		PYF178		
Sampling Date		2021/06/25 13:30			2021/06/25 12:15		2021/06/25 13:15		
COC Number		831949-08-01			831949-08-01		831949-08-01		
	UNITS	MW20-15A	RDL	QC Batch	MW20-15B	QC Batch	MW20-15C	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	330000	200	7439514	81000	7439514	92000	200	7439514
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7439514	<5.0	7439514	<5.0	5.0	7439514
Dissolved Cobalt (Co)	ug/L	0.60	0.50	7439514	<0.50	7439514	1.4	0.50	7439514
Dissolved Copper (Cu)	ug/L	1.3	0.90	7439514	<0.90	7439514	4.7	0.90	7439514
Dissolved Iron (Fe)	ug/L	210	100	7439514	<100	7439514	1200	100	7439514
Dissolved Lead (Pb)	ug/L	1.1	0.50	7439514	<0.50	7439514	3.2	0.50	7439514
Dissolved Magnesium (Mg)	ug/L	51000	50	7439514	27000	7439514	42000	50	7439514
Dissolved Manganese (Mn)	ug/L	54	2.0	7439514	16	7439514	130	2.0	7439514
Dissolved Molybdenum (Mo)	ug/L	150	0.50	7439514	2.2	7439514	1.4	0.50	7439514
Dissolved Nickel (Ni)	ug/L	2.0	1.0	7439514	<1.0	7439514	2.1	1.0	7439514
Dissolved Phosphorus (P)	ug/L	<100	100	7439514	<100	7439514	130	100	7439514
Dissolved Potassium (K)	ug/L	12000	200	7439514	1600	7439514	1700	200	7439514
Dissolved Selenium (Se)	ug/L	2.8	2.0	7439514	<2.0	7439514	<2.0	2.0	7439514
Dissolved Silicon (Si)	ug/L	5500	50	7439514	6800	7439514	8500	50	7439514
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7439514	<0.090	7439514	<0.090	0.090	7439514
Dissolved Sodium (Na)	ug/L	220000	100	7439514	6500	7439514	5100	100	7439514
Dissolved Strontium (Sr)	ug/L	4700	1.0	7439514	1700	7439514	430	1.0	7439514
Dissolved Thallium (Tl)	ug/L	0.052	0.050	7439514	<0.050	7439514	<0.050	0.050	7439514
Dissolved Titanium (Ti)	ug/L	7.7	5.0	7439514	<5.0	7439514	18	5.0	7439514
Dissolved Uranium (U)	ug/L	21	0.10	7439514	0.25	7439514	1.2	0.10	7439514
Dissolved Vanadium (V)	ug/L	0.78	0.50	7439514	<0.50	7439514	1.7	0.50	7439514
Dissolved Zinc (Zn)	ug/L	8.9	5.0	7439514	<5.0	7439514	13	5.0	7439514
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

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VERITAS

BV Labs Job #: C1H7092

Report Date: 2021/07/08

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

## RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYF179			PYF179			PYF180		
Sampling Date		2021/06/25 11:00			2021/06/25 11:00			2021/06/25 11:45		
COC Number		831949-08-01			831949-08-01			831949-08-01		
	UNITS	MW20-25A	RDL	QC Batch	MW20-25A Lab-Dup	RDL	QC Batch	MW20-25B	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	29.8	N/A	7437804				15.5	N/A	7437804
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	180	1.0	7437805				180	1.0	7437805
Calculated TDS	mg/L	2000	1.0	7437809				1000	1.0	7437809
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	7437805				1.1	1.0	7437805
Cation Sum	me/L	31.6	N/A	7437804				16.8	N/A	7437804
Hardness (CaCO3)	mg/L	1500	1.0	7437803				810	1.0	7437803
Ion Balance (% Difference)	%	3.01	N/A	7437802				3.97	N/A	7437802
Langelier Index (@ 20C)	N/A	1.06		7437806				0.909		7437806
Langelier Index (@ 4C)	N/A	0.821		7437807				0.663		7437807
Saturation pH (@ 20C)	N/A	6.70		7437806				6.91		7437806
Saturation pH (@ 4C)	N/A	6.95		7437807				7.15		7437807

Inorganics										
Total Ammonia-N	mg/L	0.11	0.050	7441336	0.10	0.050	7441336	0.064	0.050	7441345
Conductivity	umho/cm	2400	1.0	7442510				1400	1.0	7442510
Dissolved Organic Carbon	mg/L	1.1	0.40	7441338				0.67	0.40	7441338
Orthophosphate (P)	mg/L	<0.010	0.010	7442183				<0.010	0.010	7442183
pH	pH	7.77		7442511				7.82		7442511
Dissolved Sulphate (SO4)	mg/L	1300	10	7442181				570	5.0	7442181
Alkalinity (Total as CaCO3)	mg/L	180	1.0	7442502				180	1.0	7442502
Dissolved Chloride (Cl-)	mg/L	3.9	1.0	7442173				2.0	1.0	7442173
Nitrite (N)	mg/L	<0.010	0.010	7442218				<0.010	0.010	7442218
Nitrate (N)	mg/L	<0.10	0.10	7442218				<0.10	0.10	7442218
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7442218				<0.10	0.10	7442218

Metals										
Dissolved Aluminum (Al)	ug/L	<4.9	4.9	7439514				<4.9	4.9	7439514
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7439514				<0.50	0.50	7439514
Dissolved Arsenic (As)	ug/L	9.6	1.0	7439514				<1.0	1.0	7439514
Dissolved Barium (Ba)	ug/L	10	2.0	7439514				6.6	2.0	7439514
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7439514				<0.40	0.40	7439514
Dissolved Boron (B)	ug/L	89	10	7439514				58	10	7439514

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable





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VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYF179			PYF179			PYF180		
Sampling Date		2021/06/25 11:00			2021/06/25 11:00			2021/06/25 11:45		
COC Number		831949-08-01			831949-08-01			831949-08-01		
	UNITS	MW20-25A	RDL	QC Batch	MW20-25A Lab-Dup	RDL	QC Batch	MW20-25B	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7439514				<0.090	0.090	7439514
Dissolved Calcium (Ca)	ug/L	490000	400	7439514				240000	200	7439514
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7439514				<5.0	5.0	7439514
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7439514				<0.50	0.50	7439514
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7439514				<0.90	0.90	7439514
Dissolved Iron (Fe)	ug/L	460	100	7439514				330	100	7439514
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7439514				<0.50	0.50	7439514
Dissolved Magnesium (Mg)	ug/L	77000	50	7439514				53000	50	7439514
Dissolved Manganese (Mn)	ug/L	36	2.0	7439514				20	2.0	7439514
Dissolved Molybdenum (Mo)	ug/L	8.7	0.50	7439514				9.0	0.50	7439514
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7439514				<1.0	1.0	7439514
Dissolved Phosphorus (P)	ug/L	<100	100	7439514				<100	100	7439514
Dissolved Potassium (K)	ug/L	2700	200	7439514				1800	200	7439514
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7439514				<2.0	2.0	7439514
Dissolved Silicon (Si)	ug/L	5400	50	7439514				5400	50	7439514
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7439514				<0.090	0.090	7439514
Dissolved Sodium (Na)	ug/L	18000	100	7439514				11000	100	7439514
Dissolved Strontium (Sr)	ug/L	8100	1.0	7439514				4400	1.0	7439514
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7439514				<0.050	0.050	7439514
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7439514				<5.0	5.0	7439514
Dissolved Uranium (U)	ug/L	<0.10	0.10	7439514				<0.10	0.10	7439514
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7439514				<0.50	0.50	7439514
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7439514				<5.0	5.0	7439514
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



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VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYF180			PYF181			PYF182		
Sampling Date		2021/06/25 11:45			2021/06/25 13:45			2021/06/25 14:00		
COC Number		831949-08-01			831949-08-01			831949-08-01		
	UNITS	MW20-25B Lab-Dup	RDL	QC Batch	MW20-24A	RDL	MW20-24B	RDL	QC Batch	
<b>Calculated Parameters</b>										
Anion Sum	me/L				7.93	N/A	11.5	N/A	7437804	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				270	1.0	290	1.0	7437805	
Calculated TDS	mg/L				430	1.0	620	1.0	7437809	
Carb. Alkalinity (calc. as CaCO3)	mg/L				2.0	1.0	1.9	1.0	7437805	
Cation Sum	me/L				8.48	N/A	11.9	N/A	7437804	
Hardness (CaCO3)	mg/L				350	1.0	500	1.0	7437803	
Ion Balance (% Difference)	%				3.36	N/A	1.67	N/A	7437802	
Langelier Index (@ 20C)	N/A				0.780		0.916		7437806	
Langelier Index (@ 4C)	N/A				0.532		0.669		7437807	
Saturation pH (@ 20C)	N/A				7.12		6.93		7437806	
Saturation pH (@ 4C)	N/A				7.37		7.17		7437807	
<b>Inorganics</b>										
Total Ammonia-N	mg/L				0.094	0.050	<0.050	0.050	7441336	
Conductivity	umho/cm				770	1.0	1200	1.0	7442510	
Dissolved Organic Carbon	mg/L	0.71	0.40	7441338	2.4	0.40	0.63	0.40	7441338	
Orthophosphate (P)	mg/L				<0.010	0.010	<0.010	0.010	7442183	
pH	pH				7.90		7.84		7442511	
Dissolved Sulphate (SO4)	mg/L				79	1.0	36	1.0	7442181	
Alkalinity (Total as CaCO3)	mg/L				270	1.0	290	1.0	7442502	
Dissolved Chloride (Cl-)	mg/L				31	1.0	170	2.0	7442173	
Nitrite (N)	mg/L				<0.010	0.010	<0.010	0.010	7442218	
Nitrate (N)	mg/L				<0.10	0.10	0.98	0.10	7442218	
Nitrate + Nitrite (N)	mg/L				<0.10	0.10	0.98	0.10	7442218	
<b>Metals</b>										
Dissolved Aluminum (Al)	ug/L				79	4.9	<4.9	4.9	7439514	
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	<0.50	0.50	7439514	
Dissolved Arsenic (As)	ug/L				<1.0	1.0	<1.0	1.0	7439514	
Dissolved Barium (Ba)	ug/L				56	2.0	120	2.0	7439514	
Dissolved Beryllium (Be)	ug/L				<0.40	0.40	<0.40	0.40	7439514	
Dissolved Boron (B)	ug/L				31	10	24	10	7439514	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



BUREAU  
VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYF180			PYF181		PYF182		
Sampling Date		2021/06/25 11:45			2021/06/25 13:45		2021/06/25 14:00		
COC Number		831949-08-01			831949-08-01		831949-08-01		
	UNITS	MW20-25B Lab-Dup	RDL	QC Batch	MW20-24A	RDL	MW20-24B	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L				<0.090	0.090	0.29	0.090	7439514
Dissolved Calcium (Ca)	ug/L				79000	200	130000	200	7439514
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	<5.0	5.0	7439514
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	<0.50	0.50	7439514
Dissolved Copper (Cu)	ug/L				5.4	0.90	2.1	0.90	7439514
Dissolved Iron (Fe)	ug/L				640	100	460	100	7439514
Dissolved Lead (Pb)	ug/L				0.72	0.50	<0.50	0.50	7439514
Dissolved Magnesium (Mg)	ug/L				38000	50	45000	50	7439514
Dissolved Manganese (Mn)	ug/L				27	2.0	20	2.0	7439514
Dissolved Molybdenum (Mo)	ug/L				20	0.50	1.7	0.50	7439514
Dissolved Nickel (Ni)	ug/L				1.7	1.0	2.1	1.0	7439514
Dissolved Phosphorus (P)	ug/L				<100	100	<100	100	7439514
Dissolved Potassium (K)	ug/L				1700	200	1300	200	7439514
Dissolved Selenium (Se)	ug/L				<2.0	2.0	<2.0	2.0	7439514
Dissolved Silicon (Si)	ug/L				5200	50	6600	50	7439514
Dissolved Silver (Ag)	ug/L				<0.090	0.090	<0.090	0.090	7439514
Dissolved Sodium (Na)	ug/L				31000	100	41000	100	7439514
Dissolved Strontium (Sr)	ug/L				130	1.0	170	1.0	7439514
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	<0.050	0.050	7439514
Dissolved Titanium (Ti)	ug/L				<5.0	5.0	<5.0	5.0	7439514
Dissolved Uranium (U)	ug/L				0.20	0.10	0.70	0.10	7439514
Dissolved Vanadium (V)	ug/L				<0.50	0.50	<0.50	0.50	7439514
Dissolved Zinc (Zn)	ug/L				7.6	5.0	180	5.0	7439514
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									

BUREAU  
VERITAS

BV Labs Job #: C1H7092

Report Date: 2021/07/08

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

**RCAP - COMPREHENSIVE (WATER)**

<b>BV Labs ID</b>		PYF183			PYF183		
<b>Sampling Date</b>		2021/06/25			2021/06/25		
<b>COC Number</b>		831949-08-01			831949-08-01		
	<b>UNITS</b>	<b>DUP-6</b>	<b>RDL</b>	<b>QC Batch</b>	<b>DUP-6 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>							
Anion Sum	me/L	15.8	N/A	7437804			
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	180	1.0	7437805			
Calculated TDS	mg/L	1000	1.0	7437809			
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1.0	1.0	7437805			
Cation Sum	me/L	16.9	N/A	7437804			
Hardness (CaCO <sub>3</sub> )	mg/L	820	1.0	7437803			
Ion Balance (% Difference)	%	3.44	N/A	7437802			
Langelier Index (@ 20C)	N/A	0.871		7437806			
Langelier Index (@ 4C)	N/A	0.625		7437807			
Saturation pH (@ 20C)	N/A	6.91		7437806			
Saturation pH (@ 4C)	N/A	7.16		7437807			
<b>Inorganics</b>							
Total Ammonia-N	mg/L	0.078	0.050	7441345			
Conductivity	umho/cm	1400	1.0	7442510			
Dissolved Organic Carbon	mg/L	0.66	0.40	7441338			
Orthophosphate (P)	mg/L	<0.010	0.010	7442183	<0.010	0.010	7442183
pH	pH	7.78		7442511			
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	580	5.0	7442181	590	5.0	7442181
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	180	1.0	7442502			
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	1.5	1.0	7442173	2.1	1.0	7442173
Nitrite (N)	mg/L	<0.010	0.010	7442218			
Nitrate (N)	mg/L	<0.10	0.10	7442218			
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7442218			
<b>Metals</b>							
Dissolved Aluminum (Al)	ug/L	<4.9	4.9	7439514	<4.9	4.9	7439514
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7439514	<0.50	0.50	7439514
Dissolved Arsenic (As)	ug/L	<1.0	1.0	7439514	<1.0	1.0	7439514
Dissolved Barium (Ba)	ug/L	6.9	2.0	7439514	6.6	2.0	7439514
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7439514	<0.40	0.40	7439514
Dissolved Boron (B)	ug/L	47	10	7439514	48	10	7439514
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Lab-Dup = Laboratory Initiated Duplicate							
N/A = Not Applicable							



**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PYF183			PYF183		
Sampling Date		2021/06/25			2021/06/25		
COC Number		831949-08-01			831949-08-01		
	UNITS	DUP-6	RDL	QC Batch	DUP-6 Lab-Dup	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7439514	<0.090	0.090	7439514
Dissolved Calcium (Ca)	ug/L	240000	200	7439514	240000	200	7439514
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7439514	<5.0	5.0	7439514
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7439514	<0.50	0.50	7439514
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7439514	<0.90	0.90	7439514
Dissolved Iron (Fe)	ug/L	330	100	7439514	330	100	7439514
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7439514	<0.50	0.50	7439514
Dissolved Magnesium (Mg)	ug/L	53000	50	7439514	52000	50	7439514
Dissolved Manganese (Mn)	ug/L	21	2.0	7439514	20	2.0	7439514
Dissolved Molybdenum (Mo)	ug/L	8.8	0.50	7439514	8.8	0.50	7439514
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7439514	<1.0	1.0	7439514
Dissolved Phosphorus (P)	ug/L	<100	100	7439514	<100	100	7439514
Dissolved Potassium (K)	ug/L	1800	200	7439514	1800	200	7439514
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7439514	<2.0	2.0	7439514
Dissolved Silicon (Si)	ug/L	5400	50	7439514	5400	50	7439514
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7439514	<0.090	0.090	7439514
Dissolved Sodium (Na)	ug/L	11000	100	7439514	11000	100	7439514
Dissolved Strontium (Sr)	ug/L	4600	1.0	7439514	4500	1.0	7439514
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7439514	<0.050	0.050	7439514
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7439514	<5.0	5.0	7439514
Dissolved Uranium (U)	ug/L	<0.10	0.10	7439514	<0.10	0.10	7439514
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7439514	<0.50	0.50	7439514
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7439514	<5.0	5.0	7439514
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Lab-Dup = Laboratory Initiated Duplicate							





BUREAU  
VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		PYF177	PYF180	PYF182	PYF183			PYF183		
Sampling Date		2021/06/25 12:15	2021/06/25 11:45	2021/06/25 14:00	2021/06/25			2021/06/25		
COC Number		831949-08-01	831949-08-01	831949-08-01	831949-08-01			831949-08-01		
	UNITS	MW20-15B	MW20-25B	MW20-24B	DUP-6	RDL	QC Batch	DUP-6 Lab-Dup	RDL	QC Batch
<b>BTEX &amp; F1 Hydrocarbons</b>										
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7443249			
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7443249			
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7443249			
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	7443249			
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7443249			
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7443249			
F1 (C6-C10)	ug/L	<25	<25	<25	<25	25	7443249			
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	25	7443249			
<b>F2-F4 Hydrocarbons</b>										
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	100	7441556	<100	100	7441556
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	200	7441556	<200	200	7441556
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	200	7441556	<200	200	7441556
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes		7441556	Yes		7441556
<b>Surrogate Recovery (%)</b>										
1,4-Difluorobenzene	%	99	98	99	97		7443249			
4-Bromofluorobenzene	%	89	90	90	89		7443249			
D10-o-Xylene	%	100	99	99	97		7443249			
D4-1,2-Dichloroethane	%	97	93	95	97		7443249			
o-Terphenyl	%	95	94	94	93		7441556	94		7441556
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



BUREAU  
VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PYF176  
**Sample ID:** MW20-15A  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441345	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442687	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYF177  
**Sample ID:** MW20-15B  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7443249	N/A	2021/07/05	Domnica Andronesco
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7441556	2021/07/02	2021/07/03	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441336	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442216	N/A	2021/07/02	Chandra Nandlal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk



BUREAU  
VERITAS

BV Labs Job #: C1H7092

Report Date: 2021/07/08

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PYF178  
**Sample ID:** MW20-15C  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7439424	N/A	2021/06/30	Nimarta Singh
Hardness (calculated as CaCO <sub>3</sub> )		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH <sub>4</sub>	7441345	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO <sub>3</sub> ) and Nitrite (NO <sub>2</sub> ) in Water	LACH	7442218	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYF179  
**Sample ID:** MW20-25A  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Hardness (calculated as CaCO <sub>3</sub> )		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH <sub>4</sub>	7441336	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO <sub>3</sub> ) and Nitrite (NO <sub>2</sub> ) in Water	LACH	7442218	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk



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VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PYF179 Dup  
**Sample ID:** MW20-25A  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	7441336	N/A	2021/07/05	Amanpreet Sappal

**BV Labs ID:** PYF180  
**Sample ID:** MW20-25B  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7443249	N/A	2021/07/05	Domnica Andronesco
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7441556	2021/07/02	2021/07/03	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441345	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442218	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYF180 Dup  
**Sample ID:** MW20-25B  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh

**BV Labs ID:** PYF181  
**Sample ID:** MW20-24A  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk



BUREAU  
VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PYF181  
**Sample ID:** MW20-24A  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441336	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442218	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYF182  
**Sample ID:** MW20-24B  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7443249	N/A	2021/07/05	Domnica Andronesco
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7441556	2021/07/02	2021/07/03	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441336	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442218	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYF183  
**Sample ID:** DUP-6  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7442502	N/A	2021/07/05	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu





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VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

### TEST SUMMARY

**BV Labs ID:** PYF183  
**Sample ID:** DUP-6  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	7442510	N/A	2021/07/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7443249	N/A	2021/07/05	Domnica Andronesco
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7441556	2021/07/02	2021/07/03	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441345	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442218	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7442511	2021/07/02	2021/07/05	Surinder Rai
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYF183 Dup  
**Sample ID:** DUP-6  
**Matrix:** Water

**Collected:** 2021/06/25  
**Shipped:**  
**Received:** 2021/06/26

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	7442173	N/A	2021/07/05	Alina Dobreanu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7441556	2021/07/02	2021/07/03	Ravinder Gaidhu
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Orthophosphate	KONE	7442183	N/A	2021/07/05	Avneet Kour Sudan
Sulphate by Automated Colourimetry	KONE	7442181	N/A	2021/07/05	Alina Dobreanu



BUREAU  
VERITAS

BV Labs Job #: C1H7092

Report Date: 2021/07/08

Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	13.7°C
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**Results relate only to the items tested.**



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VERITAS

BV Labs Job #: C1H7092  
Report Date: 2021/07/08

### QUALITY ASSURANCE REPORT

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7441556	o-Terphenyl	2021/07/03	95	60 - 130	96	60 - 130	94	%		
7443249	1,4-Difluorobenzene	2021/07/05	95	70 - 130	98	70 - 130	98	%		
7443249	4-Bromofluorobenzene	2021/07/05	91	70 - 130	93	70 - 130	89	%		
7443249	D10-o-Xylene	2021/07/05	88	70 - 130	95	70 - 130	100	%		
7443249	D4-1,2-Dichloroethane	2021/07/05	93	70 - 130	90	70 - 130	95	%		
7439424	Dissolved Organic Carbon	2021/06/30	95	80 - 120	98	80 - 120	<0.40	mg/L	0.99	20
7439514	Dissolved Aluminum (Al)	2021/07/02	101	80 - 120	101	80 - 120	<4.9	ug/L	NC	20
7439514	Dissolved Antimony (Sb)	2021/07/02	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Arsenic (As)	2021/07/02	103	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7439514	Dissolved Barium (Ba)	2021/07/02	102	80 - 120	98	80 - 120	<2.0	ug/L	3.5	20
7439514	Dissolved Beryllium (Be)	2021/07/02	103	80 - 120	100	80 - 120	<0.40	ug/L	NC	20
7439514	Dissolved Boron (B)	2021/07/02	98	80 - 120	96	80 - 120	<10	ug/L	2.1	20
7439514	Dissolved Cadmium (Cd)	2021/07/02	101	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7439514	Dissolved Calcium (Ca)	2021/07/02	NC	80 - 120	100	80 - 120	<200	ug/L	0.63	20
7439514	Dissolved Chromium (Cr)	2021/07/02	98	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7439514	Dissolved Cobalt (Co)	2021/07/02	103	80 - 120	105	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Copper (Cu)	2021/07/02	106	80 - 120	103	80 - 120	<0.90	ug/L	NC	20
7439514	Dissolved Iron (Fe)	2021/07/02	101	80 - 120	100	80 - 120	<100	ug/L	2.1	20
7439514	Dissolved Lead (Pb)	2021/07/02	102	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Magnesium (Mg)	2021/07/02	NC	80 - 120	102	80 - 120	<50	ug/L	2.1	20
7439514	Dissolved Manganese (Mn)	2021/07/02	97	80 - 120	96	80 - 120	<2.0	ug/L	2.6	20
7439514	Dissolved Molybdenum (Mo)	2021/07/02	106	80 - 120	99	80 - 120	<0.50	ug/L	0.43	20
7439514	Dissolved Nickel (Ni)	2021/07/02	98	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7439514	Dissolved Phosphorus (P)	2021/07/02	102	80 - 120	101	80 - 120	<100	ug/L	NC	20
7439514	Dissolved Potassium (K)	2021/07/02	102	80 - 120	100	80 - 120	<200	ug/L	0.43	20
7439514	Dissolved Selenium (Se)	2021/07/02	103	80 - 120	102	80 - 120	<2.0	ug/L	NC	20
7439514	Dissolved Silicon (Si)	2021/07/02	100	80 - 120	97	80 - 120	<50	ug/L	0.98	20
7439514	Dissolved Silver (Ag)	2021/07/02	100	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7439514	Dissolved Sodium (Na)	2021/07/02	104	80 - 120	102	80 - 120	<100	ug/L	1.7	20
7439514	Dissolved Strontium (Sr)	2021/07/02	NC	80 - 120	90	80 - 120	<1.0	ug/L	2.2	20
7439514	Dissolved Thallium (Tl)	2021/07/02	107	80 - 120	102	80 - 120	<0.050	ug/L	NC	20



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BV Labs Job #: C1H7092  
Report Date: 2021/07/08

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7439514	Dissolved Titanium (Ti)	2021/07/02	96	80 - 120	94	80 - 120	<5.0	ug/L	NC	20
7439514	Dissolved Uranium (U)	2021/07/02	101	80 - 120	97	80 - 120	<0.10	ug/L	NC	20
7439514	Dissolved Vanadium (V)	2021/07/02	101	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Zinc (Zn)	2021/07/02	98	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7441336	Total Ammonia-N	2021/07/05	96	75 - 125	101	80 - 120	<0.050	mg/L	6.3	20
7441338	Dissolved Organic Carbon	2021/07/02	94	80 - 120	92	80 - 120	<0.40	mg/L	5.9	20
7441345	Total Ammonia-N	2021/07/05	96	75 - 125	99	80 - 120	<0.050	mg/L	NC	20
7441556	F2 (C10-C16 Hydrocarbons)	2021/07/03	107	60 - 130	108	60 - 130	<100	ug/L	NC	30
7441556	F3 (C16-C34 Hydrocarbons)	2021/07/03	108	60 - 130	110	60 - 130	<200	ug/L	NC	30
7441556	F4 (C34-C50 Hydrocarbons)	2021/07/03	110	60 - 130	110	60 - 130	<200	ug/L	NC	30
7442173	Dissolved Chloride (Cl-)	2021/07/05	116	80 - 120	104	80 - 120	<1.0	mg/L	NC	20
7442181	Dissolved Sulphate (SO4)	2021/07/05	NC	75 - 125	102	80 - 120	<1.0	mg/L	1.2	20
7442183	Orthophosphate (P)	2021/07/05	105	75 - 125	99	80 - 120	<0.010	mg/L	NC	25
7442216	Nitrate (N)	2021/07/02	94	80 - 120	99	80 - 120	<0.10	mg/L	2.8	20
7442216	Nitrite (N)	2021/07/02	103	80 - 120	108	80 - 120	<0.010	mg/L	NC	20
7442218	Nitrate (N)	2021/07/05	87	80 - 120	99	80 - 120	<0.10	mg/L	0.50	20
7442218	Nitrite (N)	2021/07/05	100	80 - 120	103	80 - 120	<0.010	mg/L	11	20
7442502	Alkalinity (Total as CaCO3)	2021/07/06			97	85 - 115	<1.0	mg/L	0.34	20
7442510	Conductivity	2021/07/05			103	85 - 115	<1.0	umho/cm	0.14	25
7442511	pH	2021/07/05			102	98 - 103			0.21	N/A
7442687	Nitrate (N)	2021/07/05	96	80 - 120	98	80 - 120	<0.10	mg/L	0.38	20
7442687	Nitrite (N)	2021/07/05	103	80 - 120	104	80 - 120	<0.010	mg/L	5.3	20
7443249	Benzene	2021/07/05	94	50 - 140	99	50 - 140	<0.20	ug/L	NC	30
7443249	Ethylbenzene	2021/07/05	103	50 - 140	110	50 - 140	<0.20	ug/L	NC	30
7443249	F1 (C6-C10) - BTEX	2021/07/05					<25	ug/L	NC	30
7443249	F1 (C6-C10)	2021/07/05	84	60 - 140	89	60 - 140	<25	ug/L	NC	30
7443249	o-Xylene	2021/07/05	100	50 - 140	107	50 - 140	<0.20	ug/L	NC	30
7443249	p+m-Xylene	2021/07/05	111	50 - 140	122	50 - 140	<0.40	ug/L	NC	30
7443249	Toluene	2021/07/05	98	50 - 140	105	50 - 140	<0.20	ug/L	NC	30



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BV Labs Job #: C1H7092  
Report Date: 2021/07/08

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: CS

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7443249	Total Xylenes	2021/07/05					<0.40	ug/L	NC	30

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).





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BV Labs Job #: C1H7092

Report Date: 2021/07/08


Golder Associates Ltd

Client Project #: 19129150 (2300)

Sampler Initials: CS

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

*Eva Pranjic*  


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Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Bureau Veritas Laboratories  
6740 Campbell Road, Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-5700 Toll-free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

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26-Jun-21 10:13

Ema Gitej



C1H7092

Project Manager: Ema Gitej

<b>INVOICE TO:</b> Company Name: #21375 Golder Associates Ltd Attention: Accounts Payable Address: 210 Sheldon Drive, Cambridge ON N1T 1A8 Tel: (519) 620-8182 Fax: _____ Email: CanadaAccountsPayableInvoices@golder.com		<b>REPORT TO:</b> Company Name: _____ Attention: Gregory Padusenko Address: _____ Tel: (519) 620-8182 Ext: 6509 Fax: (519) 620-9878 Email: Gregory_Padusenko@golder.com		<b>PROJECT INFORMATION:</b> Quotation #: B80683 P.O. #: _____ Project: 19129150 (2300) I D E ENV 1250 Project Name: _____ Site #: _____ Sampled By: CS + VP		Barcode: 831949 Bottle Order #: _____ Project Manager: Ema Gitej	
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**MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY**

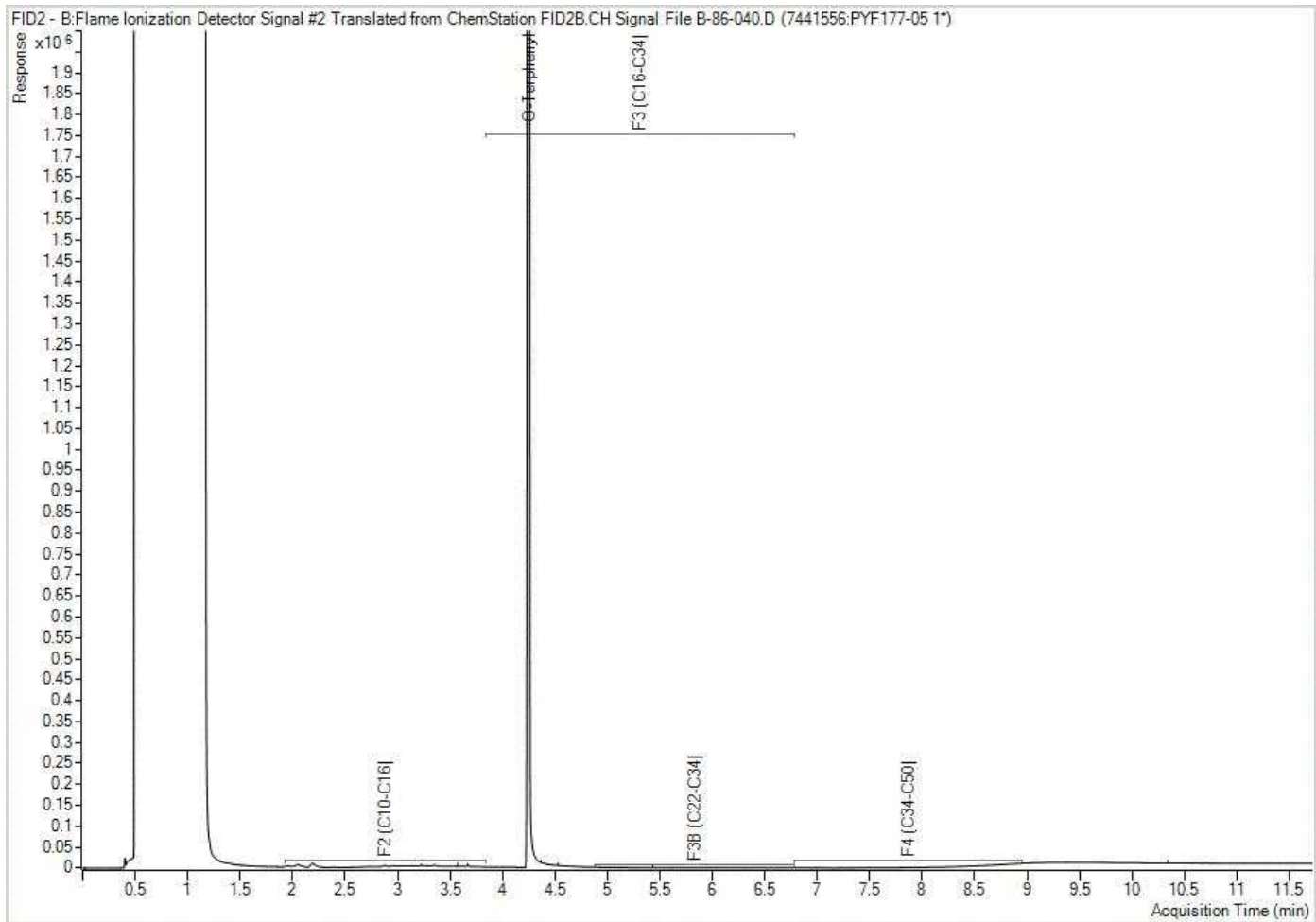
<b>Regulation 153 (2011)</b> <input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Medium/Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> For RSC <input type="checkbox"/> Table _____	<b>Other Regulations</b> <input type="checkbox"/> CCME <input type="checkbox"/> Sanitary Sewer Bylaw <input type="checkbox"/> Reg 558 <input type="checkbox"/> Storm Sewer Bylaw <input type="checkbox"/> MISA Municipality: _____ <input type="checkbox"/> PWQG <input type="checkbox"/> Reg 406 Table <input type="checkbox"/> Other: _____	<b>Special Instructions</b> _____
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Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr / V	RCAP - Comprehensive	O Reg 153 PHCs, BTEX/F1-F4	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)	Turnaround Time (TAT) Required: Please provide advance notice for rush projects	
1	MW20-15A	June 25 2021	13:30	GW	Y	✓	✓		Regular (Standard) TAT: (will be applied if Rush TAT is not specified) Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details. Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ Rush Confirmation Number: _____ (call lab for #)	
2	MW20-15B	↓	12:15	↑	Y	✓	✓		# of Bottles: 4 Comments:	
3	MW20-15C		13:15	↑	Y	✓				
4	MW20-25A		1100	↑	Y	✓				
5	MW20-25B		1145	↑	Y	✓	✓			
6	MW20-24A*		1345	↑	Y	✓		*field filtered, not preserved, lab to preserve		
7	MW20-24B		1400	↑	Y	✓	✓			
8	DUP-6		↓	↓	↓	Y	✓	✓		
9										
10										

* RELINQUISHED BY: (Signature/Print) <i>Clara Steckle / C Steckle</i>	Date: (YY/MM/DD) 21/06/25	Time: 1630	RECEIVED BY: (Signature/Print) <i>[Signature]</i>	Date: (YY/MM/DD) 21/06/25	Time: 1659	# jars used and not submitted	Laboratory Use Only Time Sensitive: _____ Temperature (°C) on Receipt: 14.1/11.6 Custody Seal: Present / Intact Yes / No
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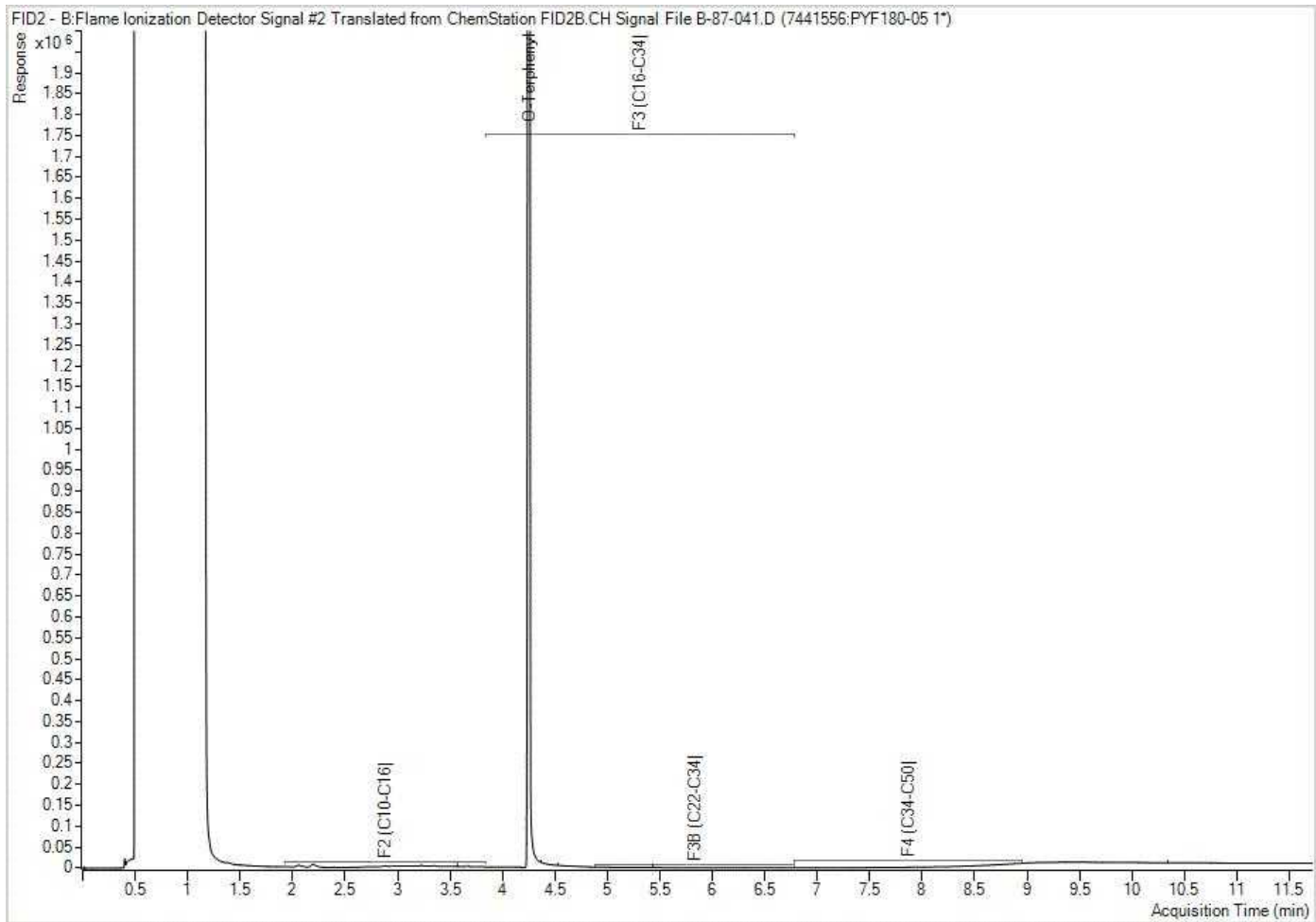
\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.  
 \*\* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



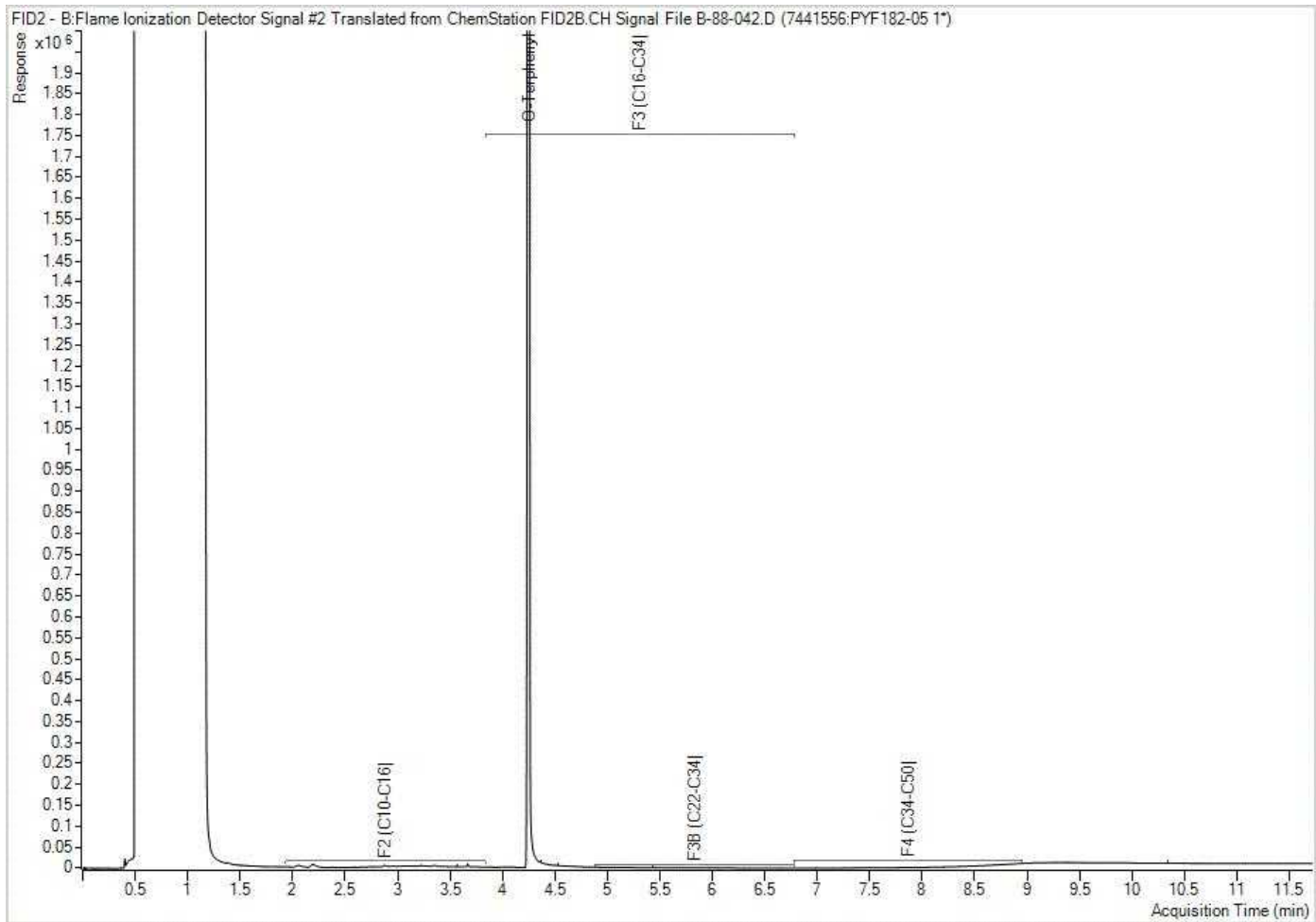
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

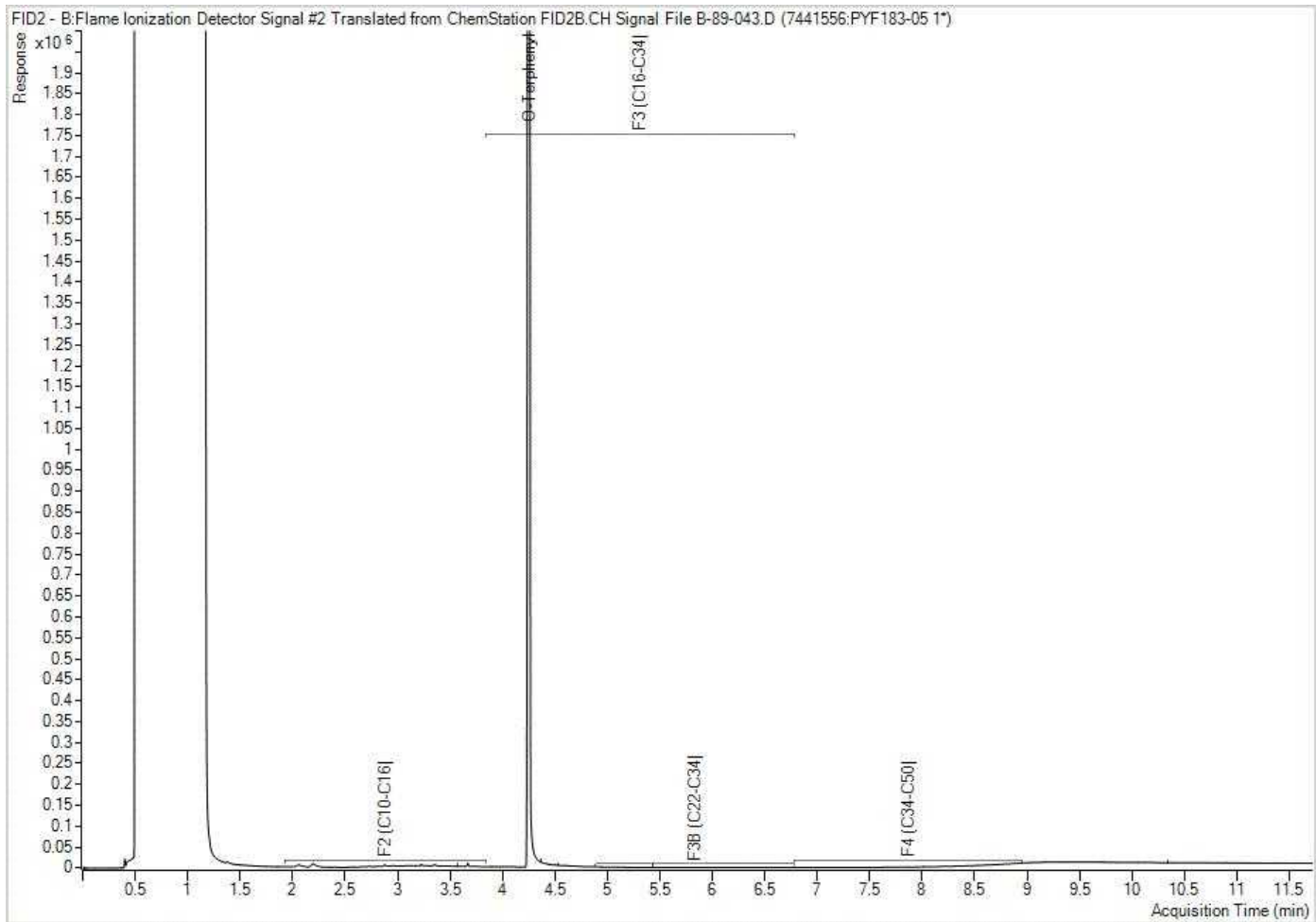
Petroleum Hydrocarbons F2-F4 in Water Chromatogram



**Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.**

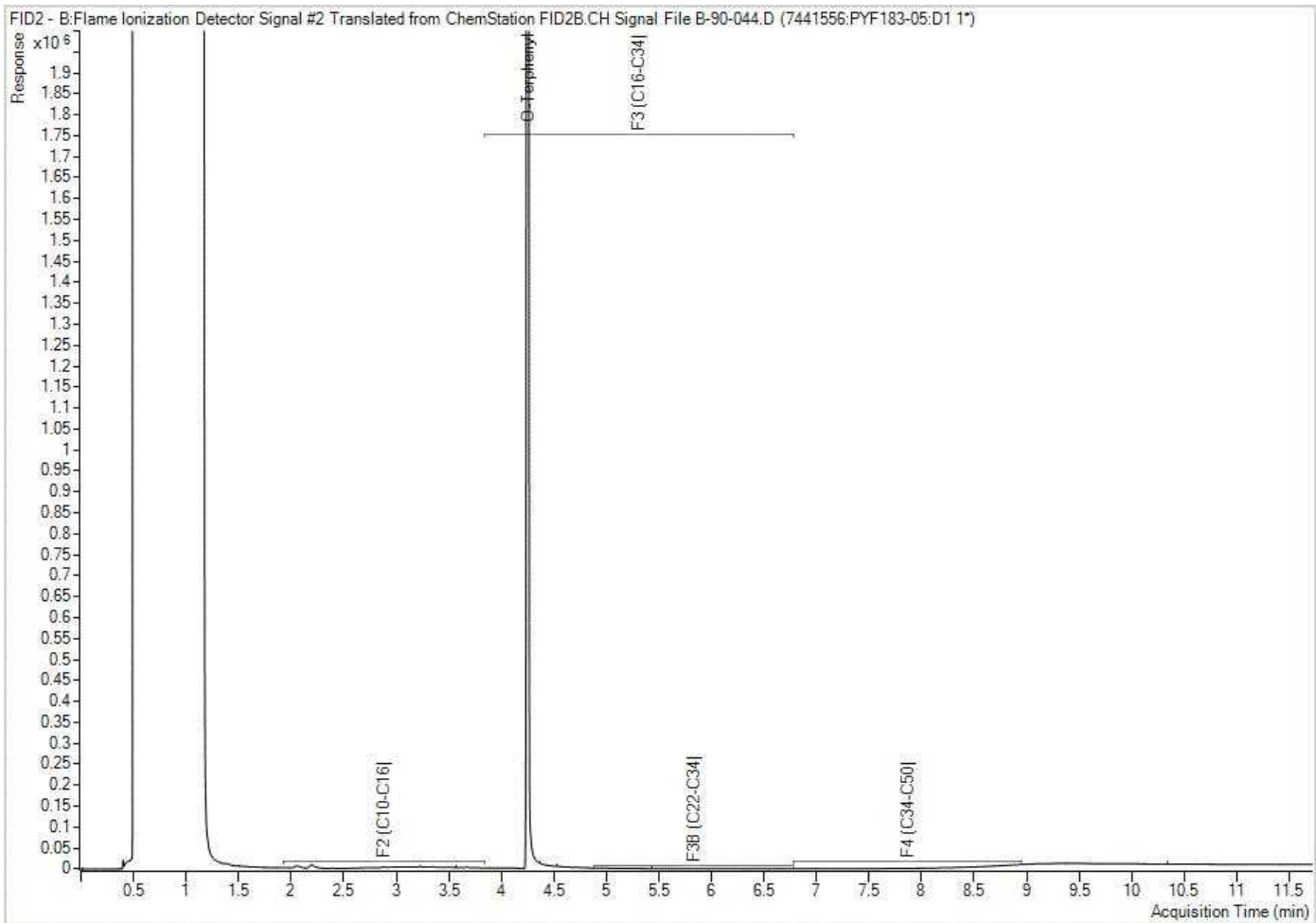


Petroleum Hydrocarbons F2-F4 in Water Chromatogram



**Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.**

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.



Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-09-01

**Attention: Gregory Padusenko**

Golder Associates Ltd  
210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/07/08**  
Report #: R6709541  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1I0177**

**Received: 2021/06/28, 16:35**

Sample Matrix: Water  
# Samples Received: 4

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	4	N/A	2021/07/06	CAM SOP-00448	SM 23 2320 B m
Carbonate, Bicarbonate and Hydroxide	4	N/A	2021/07/06	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	4	N/A	2021/07/05	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	4	N/A	2021/07/06	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2021/06/30	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2021/07/02	CAM SOP-00446	SM 23 5310 B m
Petroleum Hydro. CCME F1 & BTEX in Water	2	N/A	2021/07/05	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	2	2021/07/02	2021/07/03	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	3	N/A	2021/07/02	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	1	N/A	2021/07/05	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	4	N/A	2021/07/02	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	4	N/A	2021/07/06		
Anion and Cation Sum	4	N/A	2021/07/06		
Total Ammonia-N	4	N/A	2021/07/05	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (3)	4	N/A	2021/07/05	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	4	2021/07/02	2021/07/06	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	4	N/A	2021/07/05	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	4	N/A	2021/07/06		Auto Calc
Sat. pH and Langelier Index (@ 4C)	4	N/A	2021/07/06		Auto Calc
Sulphate by Automated Colourimetry	4	N/A	2021/07/05	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	4	N/A	2021/07/06		Auto Calc

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement



Your Project #: 19129150 (2300)  
Your C.O.C. #: 831949-09-01

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210 Sheldon Drive  
Cambridge, ON  
CANADA N1T 1A8

**Report Date: 2021/07/08**  
Report #: R6709541  
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**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1I0177**

**Received: 2021/06/28, 16:35**

Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager  
Email: emese.gitej@bureauveritas.com  
Phone# (905)817-5829

=====

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BV Labs Job #: C1I0177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYW902			PYW902			PYW903		
Sampling Date		2021/06/28			2021/06/28			2021/06/28		
COC Number		831949-09-01			831949-09-01			831949-09-01		
	UNITS	MW20-16A	RDL	QC Batch	MW20-16A Lab-Dup	RDL	QC Batch	MW20-16B	RDL	QC Batch

#### Calculated Parameters

Anion Sum	me/L	5.57	N/A	7437804				6.43	N/A	7437804
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	200	1.0	7437805				240	1.0	7437805
Calculated TDS	mg/L	290	1.0	7437809				350	1.0	7437809
Carb. Alkalinity (calc. as CaCO3)	mg/L	3.2	1.0	7437805				5.2	1.0	7437805
Cation Sum	me/L	5.04	N/A	7437804				6.56	N/A	7437804
Hardness (CaCO3)	mg/L	230	1.0	7437803				180	1.0	7437803
Ion Balance (% Difference)	%	4.96	N/A	7437802				1.02	N/A	7437802
Langelier Index (@ 20C)	N/A	0.842		7437806				0.822		7437806
Langelier Index (@ 4C)	N/A	0.593		7437807				0.573		7437807
Saturation pH (@ 20C)	N/A	7.38		7437806				7.54		7437806
Saturation pH (@ 4C)	N/A	7.63		7437807				7.78		7437807

#### Inorganics

Total Ammonia-N	mg/L	0.063	0.050	7441345				0.23	0.050	7441345
Conductivity	umho/cm	520	1.0	7441777				590	1.0	7441777
Dissolved Organic Carbon	mg/L	0.66	0.40	7441338				2.5	0.40	7439424
Orthophosphate (P)	mg/L	<0.010	0.010	7441833				<0.010	0.010	7441833
pH	pH	8.22		7441778				8.36		7441778
Dissolved Sulphate (SO4)	mg/L	58	1.0	7441832				29	1.0	7441832
Alkalinity (Total as CaCO3)	mg/L	210	1.0	7441747				250	1.0	7441747
Dissolved Chloride (Cl-)	mg/L	8.5	1.0	7441814				32	1.0	7441814
Nitrite (N)	mg/L	<0.010	0.010	7442218				<0.010	0.010	7442481
Nitrate (N)	mg/L	<0.10	0.10	7442218				<0.10	0.10	7442481
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7442218				<0.10	0.10	7442481

#### Metals

Dissolved Aluminum (Al)	ug/L	5.8	4.9	7439414	5.6	4.9	7439414	6.6	4.9	7439514
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	7439414	<0.50	0.50	7439414	<0.50	0.50	7439514
Dissolved Arsenic (As)	ug/L	8.2	1.0	7439414	8.1	1.0	7439414	5.8	1.0	7439514
Dissolved Barium (Ba)	ug/L	42	2.0	7439414	42	2.0	7439414	73	2.0	7439514
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	7439414	<0.40	0.40	7439414	<0.40	0.40	7439514
Dissolved Boron (B)	ug/L	53	10	7439414	53	10	7439414	53	10	7439514
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	7439414	<0.090	0.090	7439414	<0.090	0.090	7439514

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable





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BV Labs Job #: C1I0177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PYW902			PYW902			PYW903		
Sampling Date		2021/06/28			2021/06/28			2021/06/28		
COC Number		831949-09-01			831949-09-01			831949-09-01		
	UNITS	MW20-16A	RDL	QC Batch	MW20-16A Lab-Dup	RDL	QC Batch	MW20-16B	RDL	QC Batch
Dissolved Calcium (Ca)	ug/L	53000	200	7439414	53000	200	7439414	32000	200	7439514
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	7439414	<5.0	5.0	7439414	<5.0	5.0	7439514
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	7439414	<0.50	0.50	7439414	<0.50	0.50	7439514
Dissolved Copper (Cu)	ug/L	<0.90	0.90	7439414	<0.90	0.90	7439414	<0.90	0.90	7439514
Dissolved Iron (Fe)	ug/L	110	100	7439414	110	100	7439414	<100	100	7439514
Dissolved Lead (Pb)	ug/L	<0.50	0.50	7439414	<0.50	0.50	7439414	<0.50	0.50	7439514
Dissolved Magnesium (Mg)	ug/L	23000	50	7439414	23000	50	7439414	24000	50	7439514
Dissolved Manganese (Mn)	ug/L	11	2.0	7439414	10	2.0	7439414	21	2.0	7439514
Dissolved Molybdenum (Mo)	ug/L	4.6	0.50	7439414	4.5	0.50	7439414	35	0.50	7439514
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	7439414	<1.0	1.0	7439414	4.1	1.0	7439514
Dissolved Phosphorus (P)	ug/L	<100	100	7439414	<100	100	7439414	<100	100	7439514
Dissolved Potassium (K)	ug/L	2100	200	7439414	2100	200	7439414	1600	200	7439514
Dissolved Selenium (Se)	ug/L	<2.0	2.0	7439414	<2.0	2.0	7439414	<2.0	2.0	7439514
Dissolved Silicon (Si)	ug/L	5800	50	7439414	5800	50	7439414	5200	50	7439514
Dissolved Silver (Ag)	ug/L	<0.090	0.090	7439414	<0.090	0.090	7439414	<0.090	0.090	7439514
Dissolved Sodium (Na)	ug/L	11000	100	7439414	11000	100	7439414	67000	100	7439514
Dissolved Strontium (Sr)	ug/L	1000	1.0	7439414	1000	1.0	7439414	210	1.0	7439514
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	7439414	<0.050	0.050	7439414	<0.050	0.050	7439514
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	7439414	<5.0	5.0	7439414	<5.0	5.0	7439514
Dissolved Uranium (U)	ug/L	0.67	0.10	7439414	0.66	0.10	7439414	2.8	0.10	7439514
Dissolved Vanadium (V)	ug/L	<0.50	0.50	7439414	<0.50	0.50	7439414	<0.50	0.50	7439514
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	7439414	<5.0	5.0	7439414	<5.0	5.0	7439514

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch  
Lab-Dup = Laboratory Initiated Duplicate



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BV Labs Job #: C110177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

### RCAP - COMPREHENSIVE (WATER)

BV Labs ID		PYW904		PYW905		
Sampling Date		2021/06/28		2021/06/28		
COC Number		831949-09-01		831949-09-01		
	UNITS	MW20-21A	RDL	MW20-21B	RDL	QC Batch
<b>Calculated Parameters</b>						
Anion Sum	me/L	27.5	N/A	7.21	N/A	7437804
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	200	1.0	290	1.0	7437805
Calculated TDS	mg/L	1800	1.0	410	1.0	7437809
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.9	1.0	4.7	1.0	7437805
Cation Sum	me/L	28.6	N/A	8.22	N/A	7437804
Hardness (CaCO3)	mg/L	1400	1.0	350	1.0	7437803
Ion Balance (% Difference)	%	2.00	N/A	6.59	N/A	7437802
Langelier Index (@ 20C)	N/A	1.27		1.22		7437806
Langelier Index (@ 4C)	N/A	1.02		0.970		7437807
Saturation pH (@ 20C)	N/A	6.73		7.01		7437806
Saturation pH (@ 4C)	N/A	6.98		7.26		7437807
<b>Inorganics</b>						
Total Ammonia-N	mg/L	0.085	0.050	0.61	0.050	7441345
Conductivity	umho/cm	2100	1.0	640	1.0	7441777
Dissolved Organic Carbon	mg/L	0.92	0.40	5.5	0.40	7441338
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	7441833
pH	pH	8.00		8.23		7441778
Dissolved Sulphate (SO4)	mg/L	1100	10	56	1.0	7441832
Alkalinity (Total as CaCO3)	mg/L	200	1.0	300	1.0	7441747
Dissolved Chloride (Cl-)	mg/L	15	1.0	3.1	1.0	7441814
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	7442481
Nitrate (N)	mg/L	<0.10	0.10	<0.10	0.10	7442481
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	<0.10	0.10	7442481
<b>Metals</b>						
Dissolved Aluminum (Al)	ug/L	7.4	4.9	500	4.9	7439514
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.50	7439514
Dissolved Arsenic (As)	ug/L	14	1.0	9.3	1.0	7439514
Dissolved Barium (Ba)	ug/L	17	2.0	130	2.0	7439514
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	<0.40	0.40	7439514
Dissolved Boron (B)	ug/L	110	10	47	10	7439514
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	<0.090	0.090	7439514
Dissolved Calcium (Ca)	ug/L	390000	400	91000	200	7439514
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
N/A = Not Applicable						



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BV Labs Job #: C1I0177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

**RCAP - COMPREHENSIVE (WATER)**

BV Labs ID		PYW904		PYW905		
Sampling Date		2021/06/28		2021/06/28		
COC Number		831949-09-01		831949-09-01		
	UNITS	MW20-21A	RDL	MW20-21B	RDL	QC Batch
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	7439514
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	<0.50	0.50	7439514
Dissolved Copper (Cu)	ug/L	<0.90	0.90	3.1	0.90	7439514
Dissolved Iron (Fe)	ug/L	810	100	1100	100	7439514
Dissolved Lead (Pb)	ug/L	<0.50	0.50	2.1	0.50	7439514
Dissolved Magnesium (Mg)	ug/L	94000	50	30000	50	7439514
Dissolved Manganese (Mn)	ug/L	21	2.0	41	2.0	7439514
Dissolved Molybdenum (Mo)	ug/L	4.0	0.50	5.1	0.50	7439514
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5.2	1.0	7439514
Dissolved Phosphorus (P)	ug/L	<100	100	<100	100	7439514
Dissolved Potassium (K)	ug/L	3200	200	1100	200	7439514
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	2.0	7439514
Dissolved Silicon (Si)	ug/L	6600	50	10000	50	7439514
Dissolved Silver (Ag)	ug/L	<0.090	0.090	<0.090	0.090	7439514
Dissolved Sodium (Na)	ug/L	33000	100	25000	100	7439514
Dissolved Strontium (Sr)	ug/L	7100	1.0	1200	1.0	7439514
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	0.050	7439514
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	23	5.0	7439514
Dissolved Uranium (U)	ug/L	0.20	0.10	1.8	0.10	7439514
Dissolved Vanadium (V)	ug/L	<0.50	0.50	1.2	0.50	7439514
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	9.8	5.0	7439514
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						



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BV Labs Job #: C110177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

**O.REG 153 PHCS, BTEX/F1-F4 (WATER)**

BV Labs ID		PYW903	PYW905		
Sampling Date		2021/06/28	2021/06/28		
COC Number		831949-09-01	831949-09-01		
	UNITS	MW20-16B	MW20-21B	RDL	QC Batch
<b>BTEX &amp; F1 Hydrocarbons</b>					
Benzene	ug/L	<0.20	<0.20	0.20	7443249
Toluene	ug/L	0.21	<0.20	0.20	7443249
Ethylbenzene	ug/L	<0.20	<0.20	0.20	7443249
o-Xylene	ug/L	<0.20	<0.20	0.20	7443249
p+m-Xylene	ug/L	<0.40	<0.40	0.40	7443249
Total Xylenes	ug/L	<0.40	<0.40	0.40	7443249
F1 (C6-C10)	ug/L	86	<25	25	7443249
F1 (C6-C10) - BTEX	ug/L	86	<25	25	7443249
<b>F2-F4 Hydrocarbons</b>					
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	100	7441624
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	200	7441624
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	200	7441624
Reached Baseline at C50	ug/L	Yes	Yes		7441624
<b>Surrogate Recovery (%)</b>					
1,4-Difluorobenzene	%	97	98		7443249
4-Bromofluorobenzene	%	92	89		7443249
D10-o-Xylene	%	97	98		7443249
D4-1,2-Dichloroethane	%	98	97		7443249
o-Terphenyl	%	93	94		7441624
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					



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BV Labs Job #: C110177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

### TEST SUMMARY

**BV Labs ID:** PYW902  
**Sample ID:** MW20-16A  
**Matrix:** Water

**Collected:** 2021/06/28  
**Shipped:**  
**Received:** 2021/06/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7441747	N/A	2021/07/06	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7441814	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7441777	N/A	2021/07/06	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439414	N/A	2021/07/02	Nan Raykha
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441345	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442218	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7441778	2021/07/02	2021/07/06	Surinder Rai
Orthophosphate	KONE	7441833	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7441832	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYW902 Dup  
**Sample ID:** MW20-16A  
**Matrix:** Water

**Collected:** 2021/06/28  
**Shipped:**  
**Received:** 2021/06/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	7439414	N/A	2021/07/02	Nan Raykha

**BV Labs ID:** PYW903  
**Sample ID:** MW20-16B  
**Matrix:** Water

**Collected:** 2021/06/28  
**Shipped:**  
**Received:** 2021/06/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7441747	N/A	2021/07/06	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7441814	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7441777	N/A	2021/07/06	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7439424	N/A	2021/06/30	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7443249	N/A	2021/07/05	Domnica Andronesco
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7441624	2021/07/02	2021/07/03	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441345	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442481	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7441778	2021/07/02	2021/07/06	Surinder Rai
Orthophosphate	KONE	7441833	N/A	2021/07/05	Avneet Kour Sudan





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BV Labs Job #: C1I0177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

### TEST SUMMARY

**BV Labs ID:** PYW903  
**Sample ID:** MW20-16B  
**Matrix:** Water

**Collected:** 2021/06/28  
**Shipped:**  
**Received:** 2021/06/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7441832	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYW904  
**Sample ID:** MW20-21A  
**Matrix:** Water

**Collected:** 2021/06/28  
**Shipped:**  
**Received:** 2021/06/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7441747	N/A	2021/07/06	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7441814	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7441777	N/A	2021/07/06	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441345	N/A	2021/07/05	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442481	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7441778	2021/07/02	2021/07/06	Surinder Rai
Orthophosphate	KONE	7441833	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7441832	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk

**BV Labs ID:** PYW905  
**Sample ID:** MW20-21B  
**Matrix:** Water

**Collected:** 2021/06/28  
**Shipped:**  
**Received:** 2021/06/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7441747	N/A	2021/07/06	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	7437805	N/A	2021/07/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	7441814	N/A	2021/07/05	Alina Dobreanu
Conductivity	AT	7441777	N/A	2021/07/06	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7441338	N/A	2021/07/02	Nimarta Singh
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	7443249	N/A	2021/07/05	Domnica Andronesco
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7441624	2021/07/02	2021/07/03	Ravinder Gaidhu
Hardness (calculated as CaCO3)		7437803	N/A	2021/07/02	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	7439514	N/A	2021/07/02	Daniel Teclu
Ion Balance (% Difference)	CALC	7437802	N/A	2021/07/06	Automated Statchk
Anion and Cation Sum	CALC	7437804	N/A	2021/07/06	Automated Statchk
Total Ammonia-N	LACH/NH4	7441345	N/A	2021/07/05	Amanpreet Sappal



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BV Labs Job #: C110177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

### TEST SUMMARY

**BV Labs ID:** PYW905  
**Sample ID:** MW20-21B  
**Matrix:** Water

**Collected:** 2021/06/28  
**Shipped:**  
**Received:** 2021/06/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7442481	N/A	2021/07/05	Amanpreet Sappal
pH	AT	7441778	2021/07/02	2021/07/06	Surinder Rai
Orthophosphate	KONE	7441833	N/A	2021/07/05	Avneet Kour Sudan
Sat. pH and Langelier Index (@ 20C)	CALC	7437806	N/A	2021/07/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	7437807	N/A	2021/07/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	7441832	N/A	2021/07/05	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	7437809	N/A	2021/07/06	Automated Statchk



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Sampler Initials: AK

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.0°C
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Sample PYW903 [MW20-16B] : F1 BTEX analysis: The contamination in the F1 range is mainly due to a single peak , not a typical petroleum product.

**Results relate only to the items tested.**



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BV Labs Job #: C110177  
Report Date: 2021/07/08

### QUALITY ASSURANCE REPORT

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7441624	o-Terphenyl	2021/07/02	99	60 - 130	98	60 - 130	95	%		
7443249	1,4-Difluorobenzene	2021/07/05	95	70 - 130	98	70 - 130	98	%		
7443249	4-Bromofluorobenzene	2021/07/05	91	70 - 130	93	70 - 130	89	%		
7443249	D10-o-Xylene	2021/07/05	88	70 - 130	95	70 - 130	100	%		
7443249	D4-1,2-Dichloroethane	2021/07/05	93	70 - 130	90	70 - 130	95	%		
7439414	Dissolved Aluminum (Al)	2021/07/02	93	80 - 120	101	80 - 120	<4.9	ug/L	3.5	20
7439414	Dissolved Antimony (Sb)	2021/07/02	108	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7439414	Dissolved Arsenic (As)	2021/07/02	103	80 - 120	98	80 - 120	<1.0	ug/L	0.20	20
7439414	Dissolved Barium (Ba)	2021/07/02	102	80 - 120	101	80 - 120	<2.0	ug/L	0.49	20
7439414	Dissolved Beryllium (Be)	2021/07/02	110	80 - 120	102	80 - 120	<0.40	ug/L	NC	20
7439414	Dissolved Boron (B)	2021/07/02	108	80 - 120	100	80 - 120	<10	ug/L	0.65	20
7439414	Dissolved Cadmium (Cd)	2021/07/02	103	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7439414	Dissolved Calcium (Ca)	2021/07/02	NC	80 - 120	91	80 - 120	<200	ug/L	0.39	20
7439414	Dissolved Chromium (Cr)	2021/07/02	100	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7439414	Dissolved Cobalt (Co)	2021/07/02	98	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
7439414	Dissolved Copper (Cu)	2021/07/02	102	80 - 120	97	80 - 120	<0.90	ug/L	NC	20
7439414	Dissolved Iron (Fe)	2021/07/02	98	80 - 120	95	80 - 120	<100	ug/L	0.35	20
7439414	Dissolved Lead (Pb)	2021/07/02	103	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7439414	Dissolved Magnesium (Mg)	2021/07/02	93	80 - 120	92	80 - 120	<50	ug/L	0.98	20
7439414	Dissolved Manganese (Mn)	2021/07/02	99	80 - 120	96	80 - 120	<2.0	ug/L	2.6	20
7439414	Dissolved Molybdenum (Mo)	2021/07/02	107	80 - 120	101	80 - 120	<0.50	ug/L	1.4	20
7439414	Dissolved Nickel (Ni)	2021/07/02	96	80 - 120	94	80 - 120	<1.0	ug/L	NC	20
7439414	Dissolved Phosphorus (P)	2021/07/02	102	80 - 120	110	80 - 120	<100	ug/L	NC	20
7439414	Dissolved Potassium (K)	2021/07/02	99	80 - 120	97	80 - 120	<200	ug/L	1.0	20
7439414	Dissolved Selenium (Se)	2021/07/02	98	80 - 120	94	80 - 120	<2.0	ug/L	NC	20
7439414	Dissolved Silicon (Si)	2021/07/02	91	80 - 120	91	80 - 120	<50	ug/L	0.20	20
7439414	Dissolved Silver (Ag)	2021/07/02	98	80 - 120	96	80 - 120	<0.090	ug/L	NC	20
7439414	Dissolved Sodium (Na)	2021/07/02	96	80 - 120	92	80 - 120	<100	ug/L	2.3	20
7439414	Dissolved Strontium (Sr)	2021/07/02	NC	80 - 120	98	80 - 120	<1.0	ug/L	0.37	20
7439414	Dissolved Thallium (Tl)	2021/07/02	104	80 - 120	98	80 - 120	<0.050	ug/L	NC	20
7439414	Dissolved Titanium (Ti)	2021/07/02	91	80 - 120	90	80 - 120	<5.0	ug/L	NC	20



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BV Labs Job #: C110177  
Report Date: 2021/07/08

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7439414	Dissolved Uranium (U)	2021/07/02	104	80 - 120	96	80 - 120	<0.10	ug/L	0.30	20
7439414	Dissolved Vanadium (V)	2021/07/02	99	80 - 120	95	80 - 120	<0.50	ug/L	NC	20
7439414	Dissolved Zinc (Zn)	2021/07/02	99	80 - 120	95	80 - 120	<5.0	ug/L	NC	20
7439424	Dissolved Organic Carbon	2021/06/30	95	80 - 120	98	80 - 120	<0.40	mg/L	0.99	20
7439514	Dissolved Aluminum (Al)	2021/07/02	101	80 - 120	101	80 - 120	<4.9	ug/L	NC	20
7439514	Dissolved Antimony (Sb)	2021/07/02	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Arsenic (As)	2021/07/02	103	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7439514	Dissolved Barium (Ba)	2021/07/02	102	80 - 120	98	80 - 120	<2.0	ug/L	3.5	20
7439514	Dissolved Beryllium (Be)	2021/07/02	103	80 - 120	100	80 - 120	<0.40	ug/L	NC	20
7439514	Dissolved Boron (B)	2021/07/02	98	80 - 120	96	80 - 120	<10	ug/L	2.1	20
7439514	Dissolved Cadmium (Cd)	2021/07/02	101	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7439514	Dissolved Calcium (Ca)	2021/07/02	NC	80 - 120	100	80 - 120	<200	ug/L	0.63	20
7439514	Dissolved Chromium (Cr)	2021/07/02	98	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7439514	Dissolved Cobalt (Co)	2021/07/02	103	80 - 120	105	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Copper (Cu)	2021/07/02	106	80 - 120	103	80 - 120	<0.90	ug/L	NC	20
7439514	Dissolved Iron (Fe)	2021/07/02	101	80 - 120	100	80 - 120	<100	ug/L	2.1	20
7439514	Dissolved Lead (Pb)	2021/07/02	102	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Magnesium (Mg)	2021/07/02	NC	80 - 120	102	80 - 120	<50	ug/L	2.1	20
7439514	Dissolved Manganese (Mn)	2021/07/02	97	80 - 120	96	80 - 120	<2.0	ug/L	2.6	20
7439514	Dissolved Molybdenum (Mo)	2021/07/02	106	80 - 120	99	80 - 120	<0.50	ug/L	0.43	20
7439514	Dissolved Nickel (Ni)	2021/07/02	98	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7439514	Dissolved Phosphorus (P)	2021/07/02	102	80 - 120	101	80 - 120	<100	ug/L	NC	20
7439514	Dissolved Potassium (K)	2021/07/02	102	80 - 120	100	80 - 120	<200	ug/L	0.43	20
7439514	Dissolved Selenium (Se)	2021/07/02	103	80 - 120	102	80 - 120	<2.0	ug/L	NC	20
7439514	Dissolved Silicon (Si)	2021/07/02	100	80 - 120	97	80 - 120	<50	ug/L	0.98	20
7439514	Dissolved Silver (Ag)	2021/07/02	100	80 - 120	98	80 - 120	<0.090	ug/L	NC	20
7439514	Dissolved Sodium (Na)	2021/07/02	104	80 - 120	102	80 - 120	<100	ug/L	1.7	20
7439514	Dissolved Strontium (Sr)	2021/07/02	NC	80 - 120	90	80 - 120	<1.0	ug/L	2.2	20
7439514	Dissolved Thallium (Tl)	2021/07/02	107	80 - 120	102	80 - 120	<0.050	ug/L	NC	20
7439514	Dissolved Titanium (Ti)	2021/07/02	96	80 - 120	94	80 - 120	<5.0	ug/L	NC	20
7439514	Dissolved Uranium (U)	2021/07/02	101	80 - 120	97	80 - 120	<0.10	ug/L	NC	20





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BV Labs Job #: C110177  
Report Date: 2021/07/08

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7439514	Dissolved Vanadium (V)	2021/07/02	101	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
7439514	Dissolved Zinc (Zn)	2021/07/02	98	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7441338	Dissolved Organic Carbon	2021/07/02	94	80 - 120	92	80 - 120	<0.40	mg/L	5.9	20
7441345	Total Ammonia-N	2021/07/05	96	75 - 125	99	80 - 120	<0.050	mg/L	NC	20
7441624	F2 (C10-C16 Hydrocarbons)	2021/07/03	NC	60 - 130	111	60 - 130	<100	ug/L	12	30
7441624	F3 (C16-C34 Hydrocarbons)	2021/07/03	100	60 - 130	113	60 - 130	<200	ug/L	NC	30
7441624	F4 (C34-C50 Hydrocarbons)	2021/07/03	104	60 - 130	112	60 - 130	<200	ug/L	NC	30
7441747	Alkalinity (Total as CaCO3)	2021/07/06			95	85 - 115	<1.0	mg/L	1.2	20
7441777	Conductivity	2021/07/06			99	85 - 115	<1.0	umho/cm	0.38	25
7441778	pH	2021/07/06			101	98 - 103			0.42	N/A
7441814	Dissolved Chloride (Cl-)	2021/07/05	112	80 - 120	104	80 - 120	<1.0	mg/L	1.9	20
7441832	Dissolved Sulphate (SO4)	2021/07/05	NC	75 - 125	102	80 - 120	<1.0	mg/L	0.30	20
7441833	Orthophosphate (P)	2021/07/05	113	75 - 125	99	80 - 120	<0.010	mg/L	NC	25
7442218	Nitrate (N)	2021/07/05	87	80 - 120	99	80 - 120	<0.10	mg/L	0.50	20
7442218	Nitrite (N)	2021/07/05	100	80 - 120	103	80 - 120	<0.010	mg/L	11	20
7442481	Nitrate (N)	2021/07/05	97	80 - 120	100	80 - 120	<0.10	mg/L	NC	20
7442481	Nitrite (N)	2021/07/05	102	80 - 120	103	80 - 120	<0.010	mg/L	NC	20
7443249	Benzene	2021/07/05	94	50 - 140	99	50 - 140	<0.20	ug/L	NC	30
7443249	Ethylbenzene	2021/07/05	103	50 - 140	110	50 - 140	<0.20	ug/L	NC	30
7443249	F1 (C6-C10) - BTEX	2021/07/05					<25	ug/L	NC	30
7443249	F1 (C6-C10)	2021/07/05	84	60 - 140	89	60 - 140	<25	ug/L	NC	30
7443249	o-Xylene	2021/07/05	100	50 - 140	107	50 - 140	<0.20	ug/L	NC	30
7443249	p+m-Xylene	2021/07/05	111	50 - 140	122	50 - 140	<0.40	ug/L	NC	30
7443249	Toluene	2021/07/05	98	50 - 140	105	50 - 140	<0.20	ug/L	NC	30



BUREAU  
VERITAS

BV Labs Job #: C110177  
Report Date: 2021/07/08

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7443249	Total Xylenes	2021/07/05					<0.40	ug/L	NC	30

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).




BUREAU  
VERITAS

BV Labs Job #: C1I0177  
Report Date: 2021/07/08

Golder Associates Ltd  
Client Project #: 19129150 (2300)  
Sampler Initials: AK

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

*Eva Pranjic*  


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Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Bureau Veritas Laboratories  
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-5700 Toll-free 800-563-6264 Fax: (905) 817-5777 www.bvlabs.com

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28-Jun-21 16:35

Ema Gitej



C110177

VSD ENV 1200

INVOICE TO:  
Company Name: #21375 Golder Associates Ltd  
Attention: Accounts Payable  
Address: 210 Sheldon Drive  
Cambridge ON N1T 1A8  
Tel: (519) 620-8182 Fax:  
Email: CanadaAccountsPayableInvoices@golder.com

REPORT TO:  
Company Name:  
Attention: Gregory Padusenko  
Address:  
Tel: (519) 620-8182 Ext: 6509 Fax: (519) 620-9878  
Email: Gregory\_Padusenko@golder.com

PROJECT INFORMATION:  
Quotation #: B80683  
P.O. #:  
Project: 19129150 (2300)  
Project Name:  
Site #:  
Sampled By:

Only:  
Bottle Order #:  
831949  
Project Manager:  
Ema Gitej

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)  
 Table 1  Res/Park  Medium/Fine  
 Table 2  Ind/Comm  Coarse  
 Table 3  Agri/Other  For RSC  
 Table

Other Regulations  
 CCME  Sanitary Sewer Bylaw  
 Reg 558  Storm Sewer Bylaw  
 MISA Municipality  
 PWDO  Reg 406 Table  
 Other

Special Instructions

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)  
Field Filtered (please circle):  
Metals Hg / Cr VI  
RCAs - Comprehensive  
Reg 153 PHCs BTEX/FH4

Turnaround Time (TAT) Required:  
Please provide advance notice for rush projects  
Regular (Standard) TAT:  
(will be applied if Rush TAT is not specified)  
Standard TAT = 5-7 Working days for most tests  
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.  
Job Specific Rush TAT (if applies to entire submission)  
Date Required: Time Required:  
Rush Confirmation Number: (call lab for #)

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle)	Metals Hg / Cr VI	RCAs - Comprehensive	Reg 153 PHCs BTEX/FH4	# of Bottles	Comments
1	MW20-16A	06/28/21	GW	12-	X	X			4	
2	MW20-16B	↓	↓	12:30	X	X	X		8	
3	MW20-21A	↓	↓	9-	X	X			4	
4	MW20-21B	↓	↓	9:30	X	X	X		8	
5										
6										
7										
8										
9										
10										

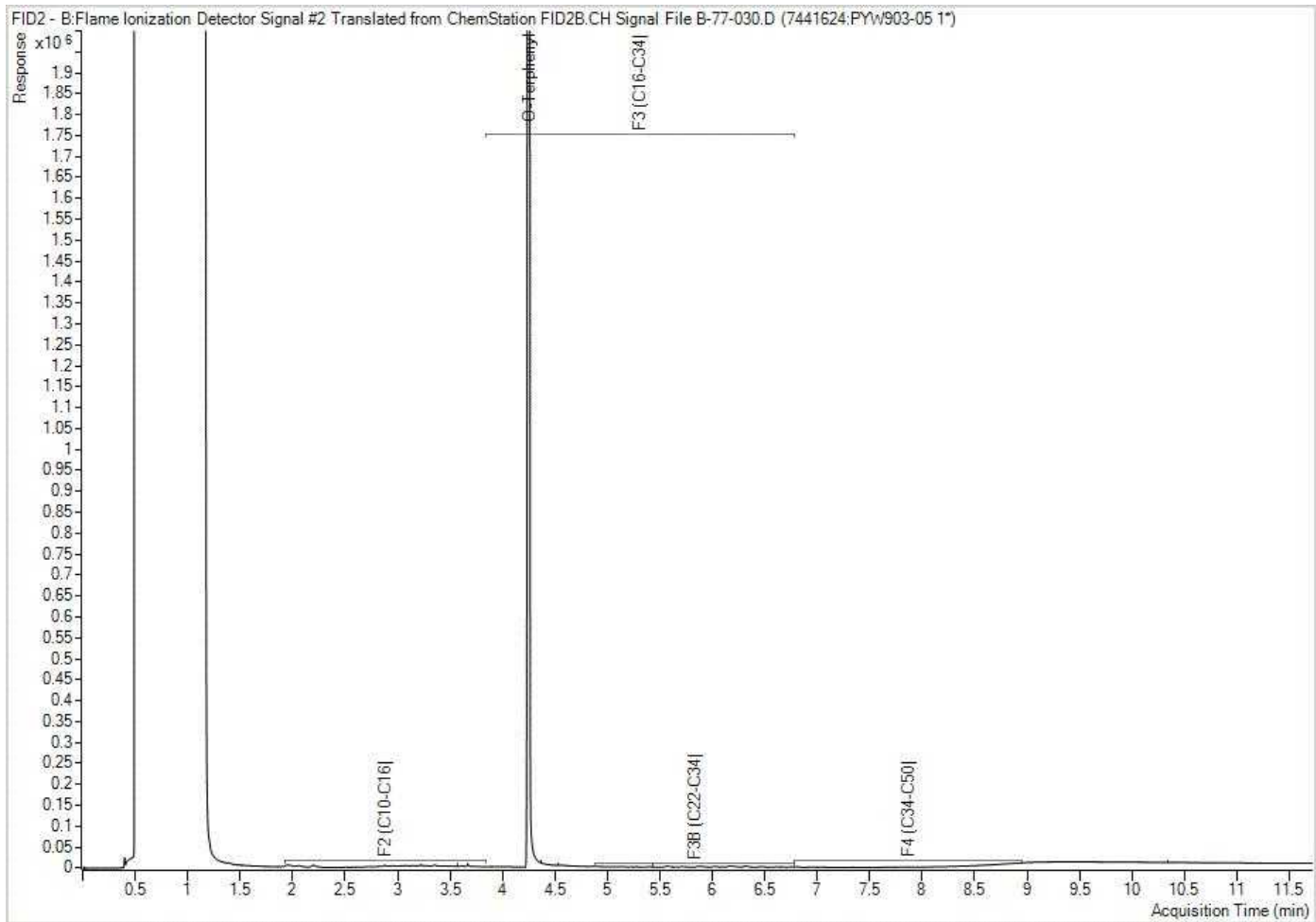
REC'D IN WATERLOO

RELINQUISHED BY: (Signature/Print) Date: (YY/MM/DD) Time RECEIVED BY: (Signature/Print) Date: (YY/MM/DD) Time # jars used and not submitted Laboratory Use Only  
Time Sensitive Temperature (°C) on Receipt Custody Seal Present Intact Yes No  
21/06/28 16:35 21/06/28 12:30 16/12/14

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.  
\* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.  
\*\* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.  
SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

6/27/21 ON ICE

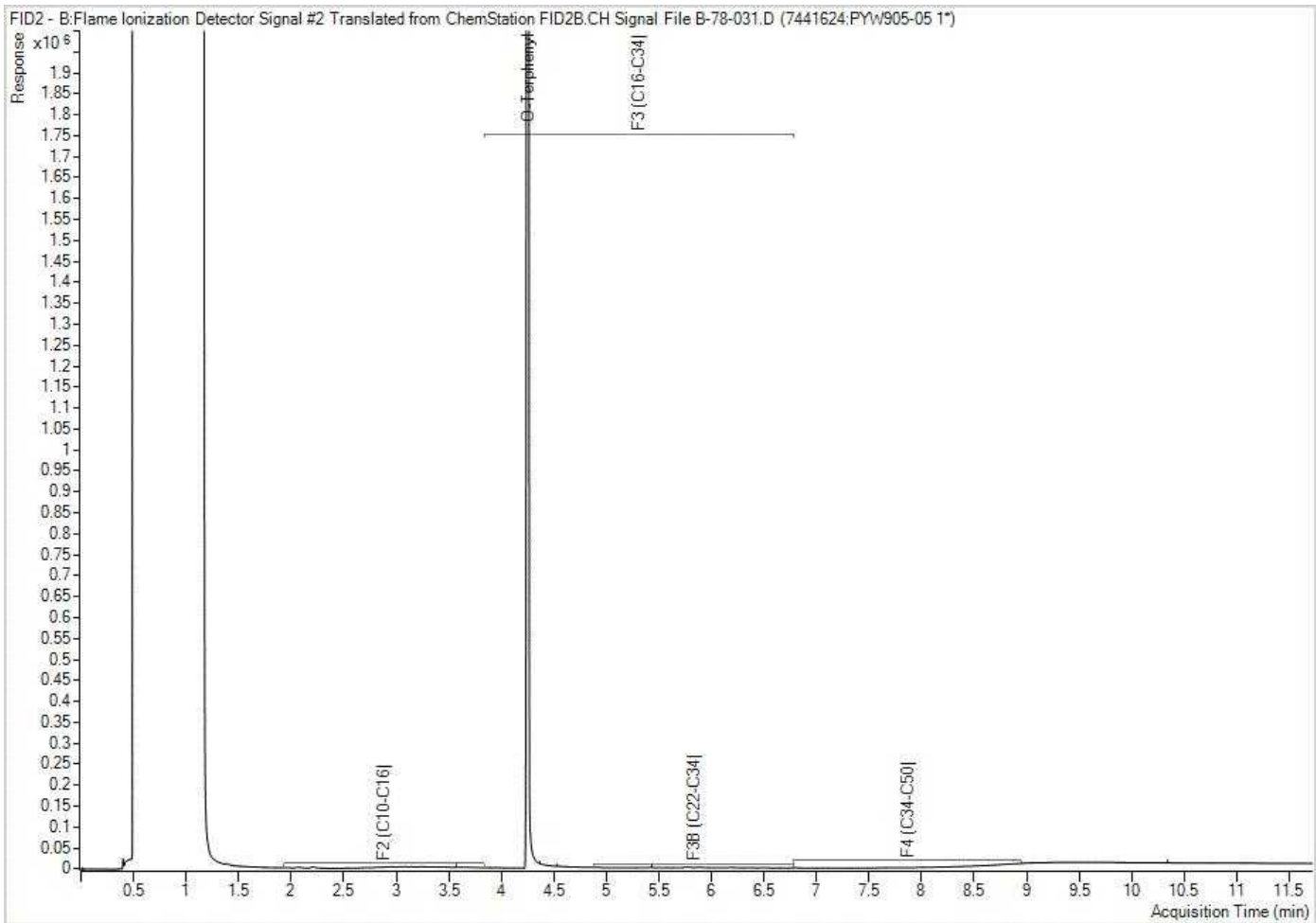
Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.



Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

**APPENDIX J**

# Northwest Area Investigations

**APPENDIX J**

# Northwest Investigation Borehole Logs

PROJECT: 19129150

# RECORD OF DRILLHOLE: MW22-01 (CAL)

SHEET 1 OF 1

LOCATION: N 4853808.0 ; E 576781.7

DRILLING DATE: August 9, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Sonic

DRILLING CONTRACTOR: Choice Sonic Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR	% RETURN	JN - Joint		BD - Bedding		PL - Planar		PO - Polished		BR - Broken Rock	NOTES: For additional abbreviations refer to list of abbreviations & symbols.	WATER LEVELS INSTRUMENTATION
										FLT - Fault		FO - Foliation		CU - Curved		K - Slickensided				
										SHR - Shear		CO - Contact		UN - Undulating		SM - Smooth				
VN - Vein		OR - Orthogonal		ST - Stepped		Ro - Rough		MB - Mechanical Break		IR - Irregular										
RECOVERY		R.Q.D. %		FRACT. INDEX PER 0.25 m		DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, cm/sec		Diametral Point Load Index (MPa)		RMC - Q' AVG.								
TOTAL CORE %	SOLID CORE %					TYPE AND SURFACE DESCRIPTION		Jr	Ja	Ja	Ja	10	10	10	10					
0		GROUND SURFACE		421.40																
		(SM) SILTY SAND LOAM; dark brown, no odors, no straining, non-cohesive, moist (TOPSOIL)		0.00 420.79 0.61																
2		(SM) SILTY SAND, with trace clay; brown, no odors, no staining, non-cohesive, moist		419.57 1.83																Bentonite
		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, cohesive, w<PL																		August 26, 2022
4																				Sand
		(SM) SILTY SAND; brown, no odors, no staining, non-cohesive, moist		415.92 5.49																
6		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, cohesive, w<PL		415.00 6.40																Screen
8		BOTTOM OF HOLE		413.33 8.08																Sand
10																				
12																				
14																				
16																				
18																				
20																				
22																				
24																				
26																				
28																				
30																				

GTA-RCK 004 S:\CLIENTS\VOTORANTIM\_CIMENTOS\LONG\_PAR\_5\_CALEDON\02\_DATA\GINT\LONG\_PAR\_5\_CALEDON.GPJ\_GAL-MISS.GDT\_11/1/22

DEPTH SCALE

1 : 150



LOGGED: VP

CHECKED: GRP

PROJECT: 19129150

# RECORD OF DRILLHOLE: MW22-02 (CAL) - OFFSET

SHEET 1 OF 1

LOCATION: N 4853793.8 ; E 576478.0

DRILLING DATE: August 8, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Sonic

DRILLING CONTRACTOR: Choice Sonic Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR	% RETURN	RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA				HYDRAULIC CONDUCTIVITY			Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION	
										TOTAL CORE %	SOLID CORE %			B Angle	DIP w.r.t. CORE AXIS	K, cm/sec	T	σ						
										JN - Joint	BD - Bedding			PL - Planar	PO - Polished	BR - Broken Rock								
0		GROUND SURFACE		420.00																				
0.30		(ML/SP) SILT and SAND LOAM; brown, no odors, no staining, cohesive, w<PL (TOPSOIL)																						
2		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, cohesive, w<PL																						
4		(SM/GP) SILTY SAND and GRAVEL TILL; brown, no odors, no staining, non-cohesive, moist		416.64																				
6		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, cohesive, w<PL		414.51																				
8																								
8.69		BOTTOM OF HOLE		411.31																				
10																								
12																								
14																								
16																								
18																								
20																								
22																								
24																								
26																								
28																								
30																								

GTA-RCK 004 S:\CLIENTS\VOTORANTIM\_CIMENTOS\LONG\_PAR\_5\_CALEDON\02\_DATA\GINT\LONG\_PAR\_5\_CALEDON.GPJ\_GAL-MISS.GDT\_11/1/22

DEPTH SCALE

1 : 150



LOGGED: VP

CHECKED: GRP



PROJECT: 19129150

# RECORD OF DRILLHOLE: MW22-02 (CAL)

SHEET 1 OF 2

LOCATION: N 4853794.9 ; E 576481.0

DRILLING DATE: August 2-3, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Sonic

DRILLING CONTRACTOR: Choice Sonic Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR % RETURN	RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA				HYDRAULIC CONDUCTIVITY		Diameter Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION				
									TOTAL CORE %	SOLID CORE %			B Angle	DIP w.r.t. CORE AXIS	Type and Surface Description	Jr	Ja	Js				K, cm/sec	10 <sup>0</sup>	10 <sup>1</sup>	10 <sup>2</sup>
									80	80			0	0											
0		GROUND SURFACE		419.81																					
0.46		(ML/SP) SILT and SAND LOAM; brown, no odors, no staining, cohesive, w<PL (TOPSOIL)																							
2		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, cohesive, w<PL																							
4		(SM/GP) SILTY SAND and GRAVEL TILL; brown, no odors, no staining, non-cohesive, moist		416.45																					
6		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, cohesive, w<PL		414.32																					
8		(CH) SILTY CLAY TILL, some sand and gravel; brown, no odors, no staining, cohesive, W < PL		411.27																					
10		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, non-cohesive, wet		409.14																					
12		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, non-cohesive, wet		407.31																					
14		DOLOSTONE, highly weathered to fresh, bedded dolostone, grey (GASPORT FORMATION)		12.50																					
16																									
18																									
20																									
22																									
24																									
26																									
28																									
30																									
		CONTINUED NEXT PAGE																							

August 26, 2022 (B)  
 August 28, 2022 (A)

Bentonite

Sand

Screen

Sand

Bentonite

GTA-RCK 004 S:\CLIENTS\VOTORANTIM\_CIMENTOS\LONG\_PAR\_5\_CALEDON02\_DATA\GINT\LONG\_PAR\_5\_CALEDON.GPJ\_GAL-MISS.GDT\_11/1/22

DEPTH SCALE

1 : 150



LOGGED: VP

CHECKED: GRP

PROJECT: 19129150

# RECORD OF DRILLHOLE: MW22-02 (CAL)

SHEET 2 OF 2

LOCATION: N 4853794.9 ;E 576481.0

DRILLING DATE: August 2-3, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Sonic

DRILLING CONTRACTOR: Choice Sonic Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR % RETURN	RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA			HYDRAULIC CONDUCTIVITY		Diameter Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
									TOTAL CORE %	SOLID CORE %			B Angle	DIP W.Z.L. CORE AXIS	K <sub>1</sub> cm/sec	K <sub>2</sub> cm/sec				
									80	80			0	0	0	0				
30		--- CONTINUED FROM PREVIOUS PAGE ---																		
32		DOLOSTONE, highly weathered to fresh, bedded dolostone, grey (GASPORT FORMATION)																		Bentonite
34																				
36																				Sand
37.19				37.19																Screen
38.10		SHALEY DOLOSTONE, bedded, shaley dolostone, slate grey/brown		38.10																Sand
38.10		SHALE; bedded shale, blue green (CABOT HEAD FORMATION)		38.10																Bentonite
38.62				38.62																
39.62		BOTTOM OF HOLE		39.62																
40																				
42																				
44																				
46																				
48																				
50																				
52																				
54																				
56																				
58																				
60																				

GTA-RCK 004 S:\CLIENTS\VOTORANTIM\_CIMENTOS\LONG\_PAR\_5\_CALEDON\02\_DATA\GINT\LONG\_PAR\_5\_CALEDON.GPJ\_GAL-MISS.GDT\_11/1/22

DEPTH SCALE

1 : 150



LOGGED: VP

CHECKED: GRP



PROJECT: 19129150

# RECORD OF DRILLHOLE: PW22-01 (CAL)

SHEET 1 OF 2

LOCATION: N 4853535.3 ; E 576573.8

DRILLING DATE: August 9-10, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Sonic

DRILLING CONTRACTOR: Choice Sonic Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR	% RETURN	JN - Joint		BD - Bedding		PL - Planar		PO - Polished		BR - Broken Rock	NOTES: For additional abbreviations refer to list of abbreviations & symbols.	WATER LEVELS INSTRUMENTATION	
										FLT - Fault	FO - Foliation	CJ - Curved	K - Slickensided	UN - Undulating	SM - Smooth	Ro - Rough	MB - Mechanical Break				
										SHR - Shear	CO - Contact	UN - Undulating	SM - Smooth	Ro - Rough	MB - Mechanical Break						
0		GROUND SURFACE		416.75																	
0		(SM) SILTY SAND LOAM; dark brown, no odors, no straining, non-cohesive, moist (TOPSOIL)		0.00																	
0.46				0.46																	
1.22		(SM) SILTY SAND TILL, with some gravel; brown, no odors, no staining, non-cohesive, moist		415.53																	
2		(CH) SILTY CLAY TILL, some sand and gravel; brown, no odors, no staining, cohesive, W < PL		1.22																	
4																					
6																					
8																					
10																					
10.36		DOLOSTONE, highly weathered to fresh, bedded dolostone, grey (GASPORT FORMATION)		406.38																	
12				10.36																	
14																					
16																					
18																					
20																					
22																					
24																					
26																					
28																					
30																					
		CONTINUED NEXT PAGE																			

August 26, 2022

Bentonite

Sand

Screen

GTA-RCK 004 S:\CLIENTS\VOTORANTIM\_CIMENTOS\LONG\_PAR\_5\_CALEDON\02\_DATA\GINT\LONG\_PAR\_5\_CALEDON.GPJ\_GAL-MISS.GDT\_11/1/22

DEPTH SCALE

1 : 150



LOGGED: VP

CHECKED: GRP

PROJECT: 19129150

# RECORD OF DRILLHOLE: PW22-01 (CAL)

SHEET 2 OF 2

LOCATION: N 4853535.3 ; E 576573.8

DRILLING DATE: August 9-10, 2022

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Sonic

DRILLING CONTRACTOR: Choice Sonic Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR	% RETURN	RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA			HYDRAULIC CONDUCTIVITY			Diameter Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
										TOTAL CORE %	SOLID CORE %			B Angle	DIP W/L AXIS	K, cm/sec	φ	ψ	σ			
										80	80			0	0	10	10	10				
30		--- CONTINUED FROM PREVIOUS PAGE ---																				
32		DOLOSTONE, highly weathered to fresh, bedded dolostone, grey (GASPORT FORMATION)		383.83																		Screen
34		SHALEY DOLOSTONE, bedded, shaley dolostone, slate grey/brown		382.61																		
36		SHALE; bedded shale, blue green (CABOT HEAD FORMATION)		377.12																		Sand
40		BOTTOM OF HOLE		39.62																		
42																						
44																						
46																						
48																						
50																						
52																						
54																						
56																						
58																						
60																						

GTA-RCK 004 S:\CLIENTS\VOTORANTIM\_CIMENTOS\LONG\_PAR\_5\_CALEDON\02\_DATA\GINT\LONG\_PAR\_5\_CALEDON.GPJ\_GAL-MISS.GDT\_11/1/22

DEPTH SCALE

1 : 150



LOGGED: VP

CHECKED: GRP



**APPENDIX J**

## Northwest Investigation - Geophysical Borehole Logs

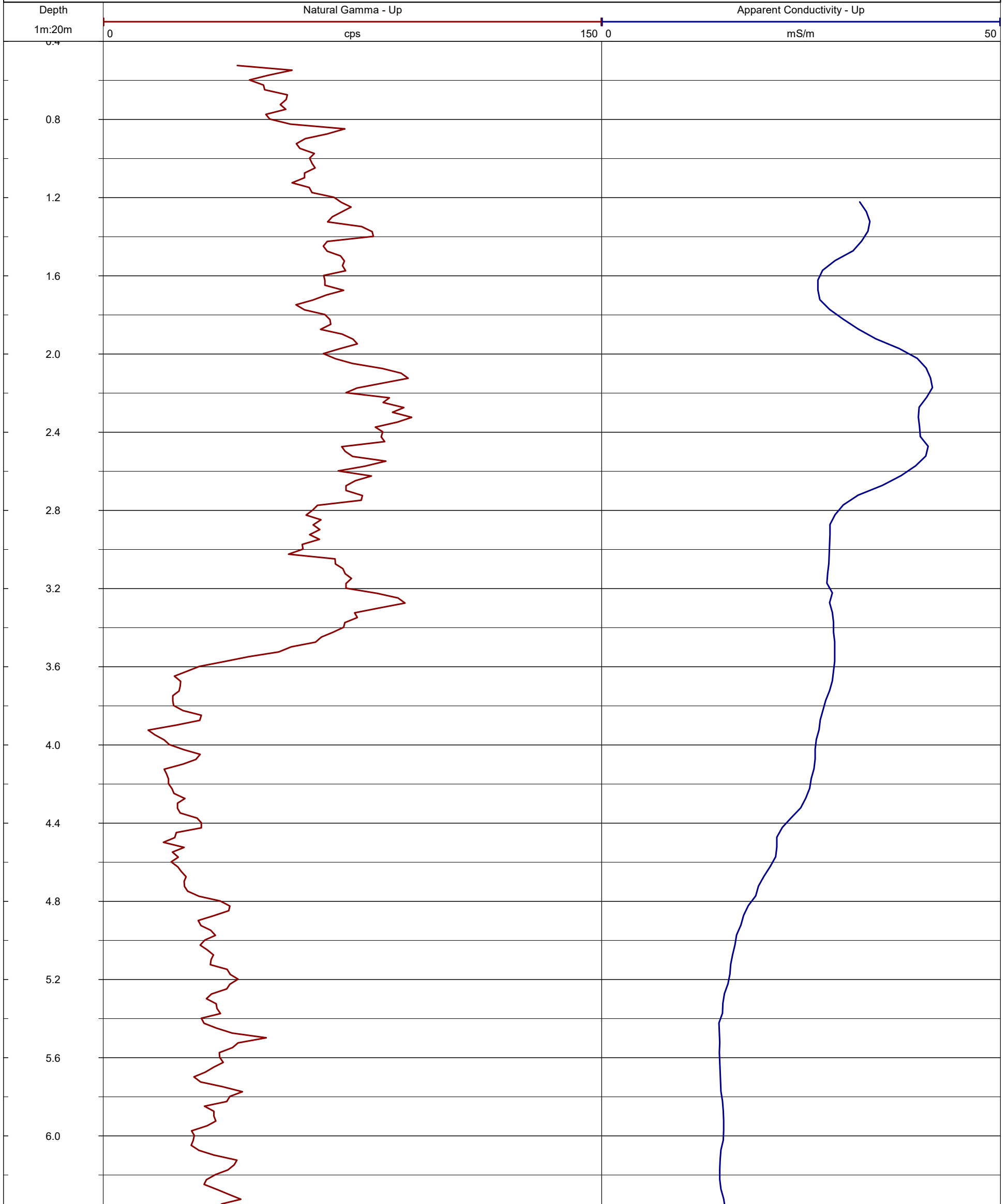


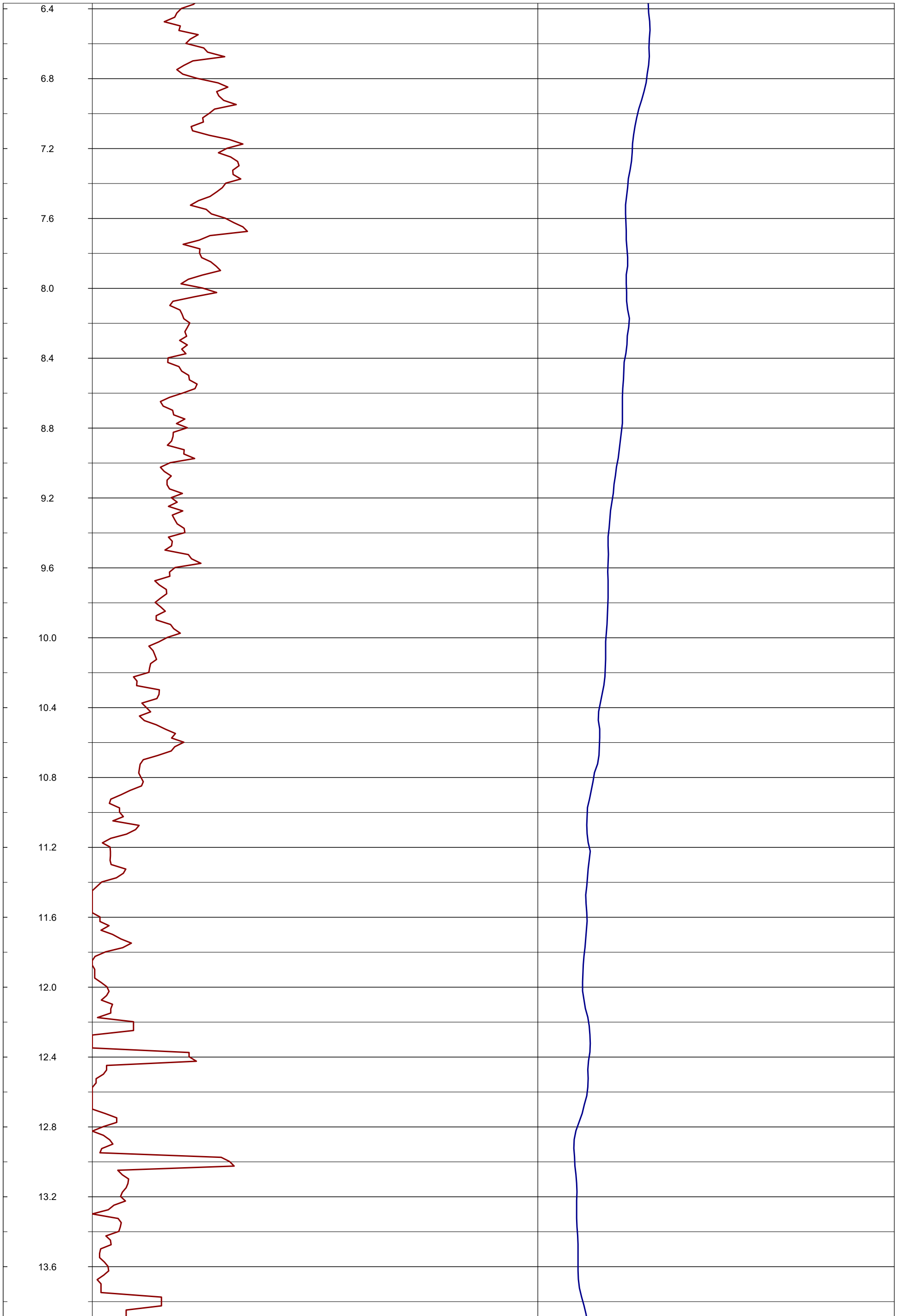
**GOLDER**  
MEMBER OF WSP

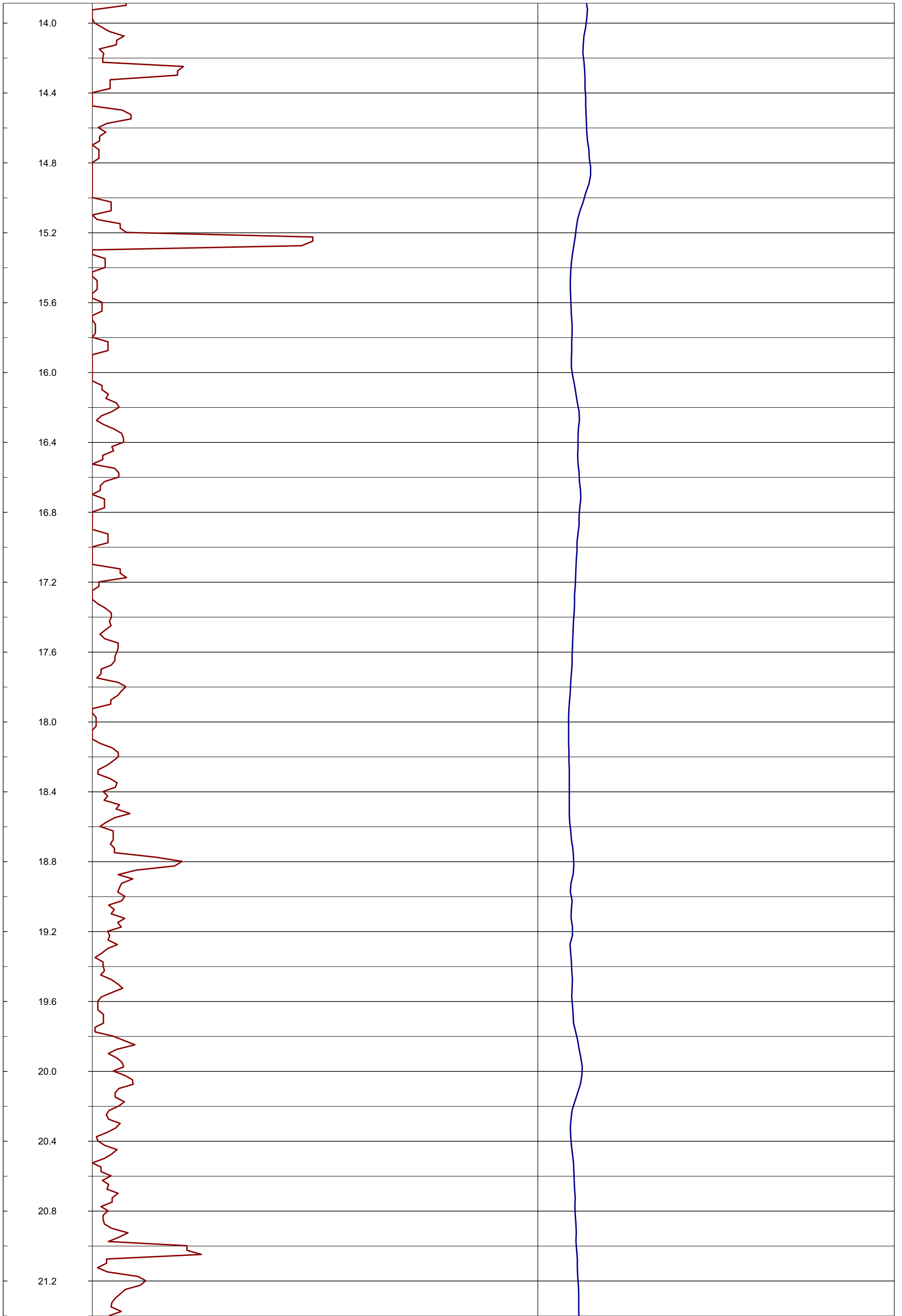
**Geophysical Record of Borehole: PW22-01 (CAL)**

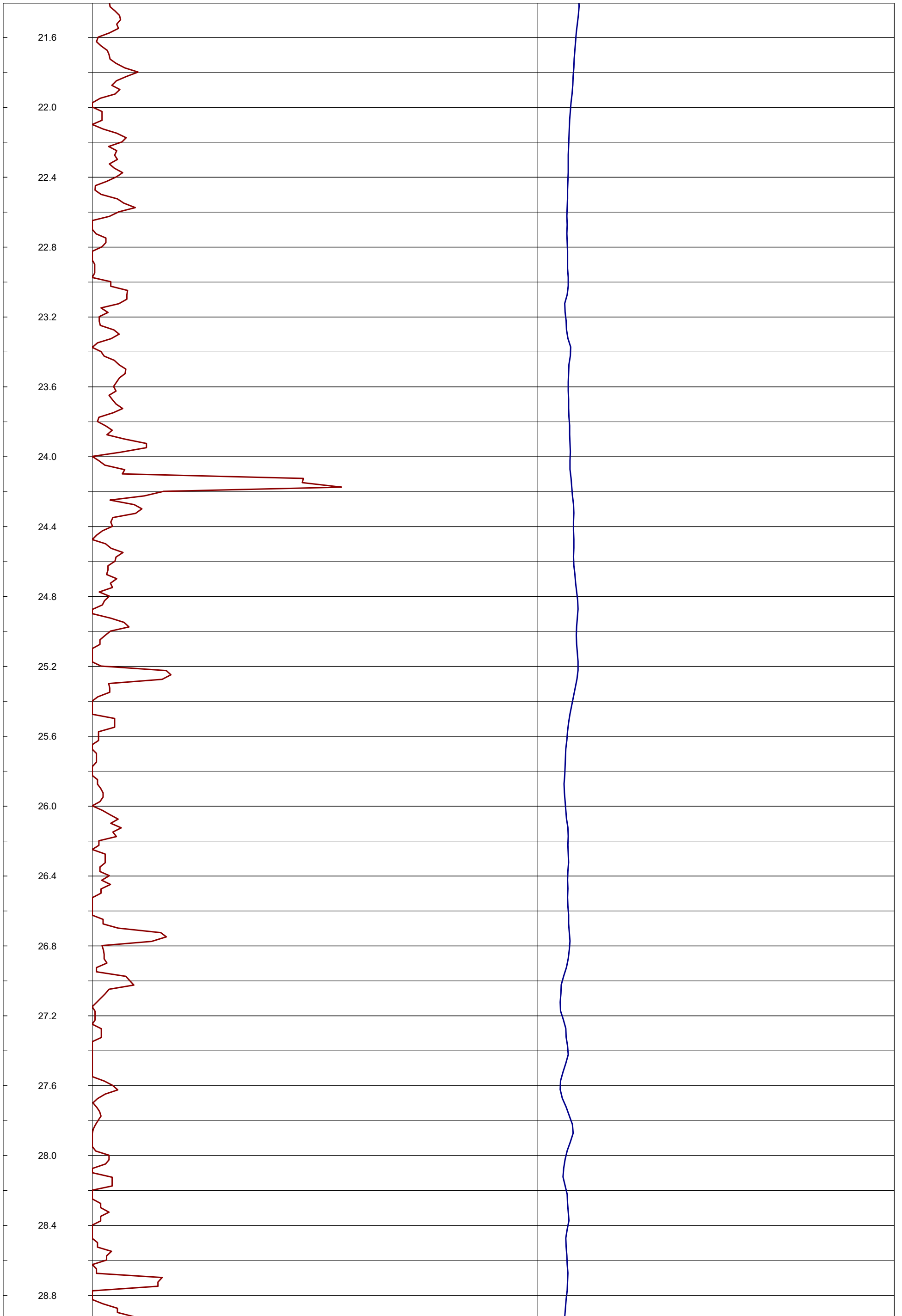
**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** September 2022

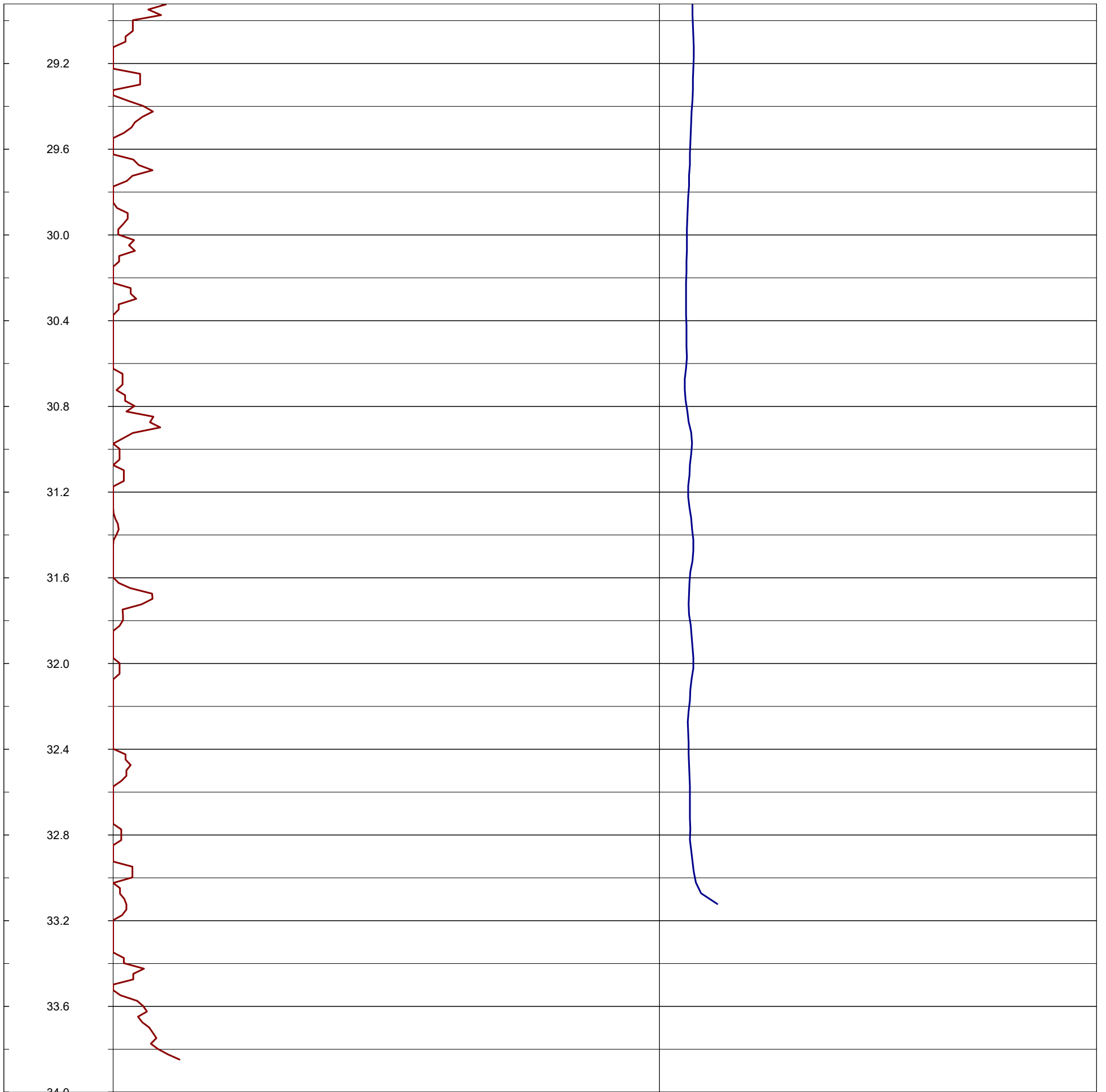
<b>Datum:</b> NAD83, UTM Zone 17N	<b>Depth Reference:</b> "0" at Ground	<b>Casing Depth:</b> 1.22 m bgs	<b>Location:</b> Caledon, Ontario
<b>Easting:</b>	<b>Drilled Depth:</b> 34.14 m bgs	<b>Water Level:</b> 1.54 m bgs	<b>Log Date:</b> Sept-9-2022
<b>Northing:</b>	<b>Borehole Diameter:</b> 124 mm	<b>Borehole Inclination:</b> 0 degs	<b>Logged By:</b> EP
<b>Elevation:</b>	<b>Casing Diameter:</b> 152 mm	<b>Casing Stickup:</b> 0.97 m ags	













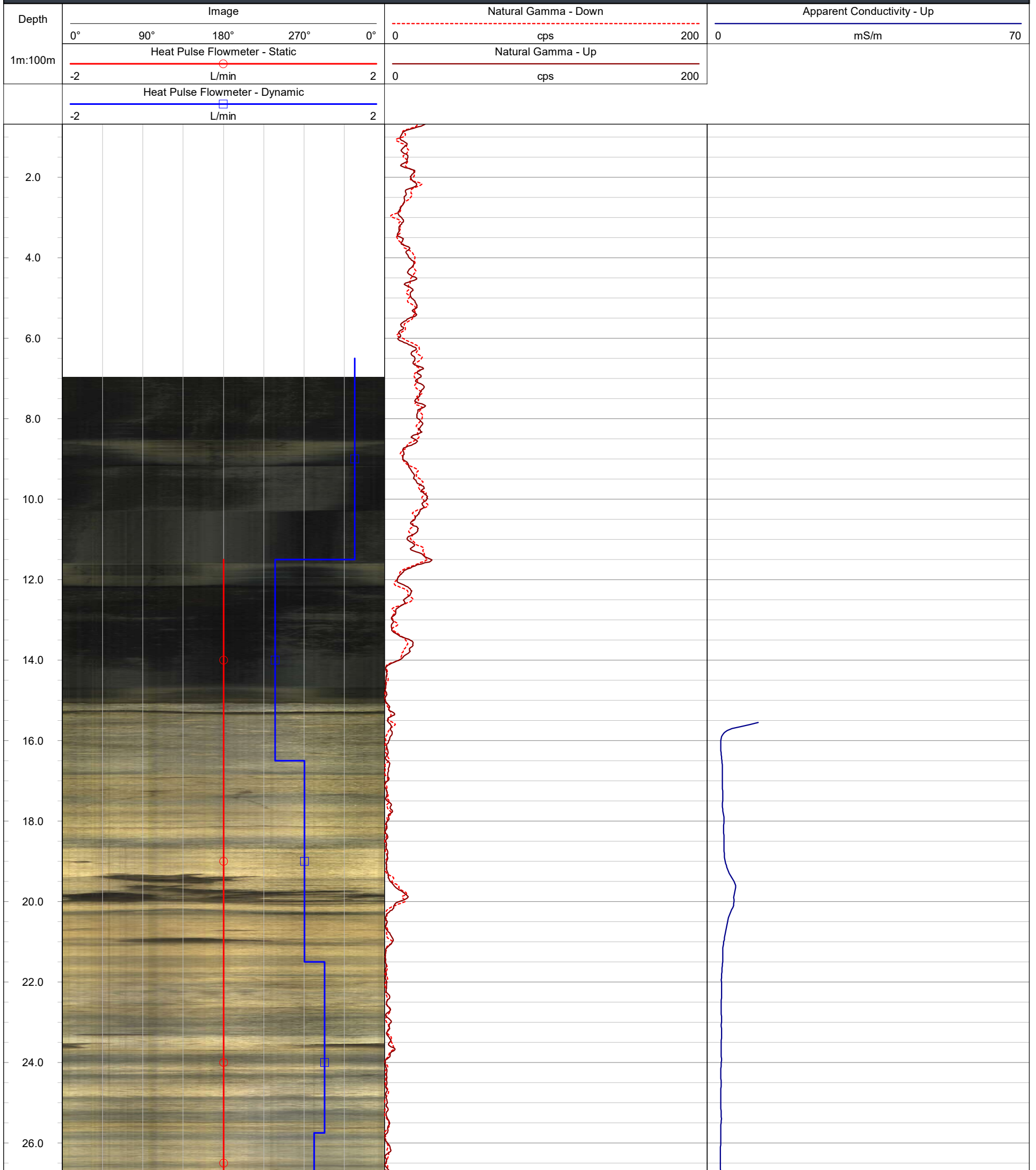


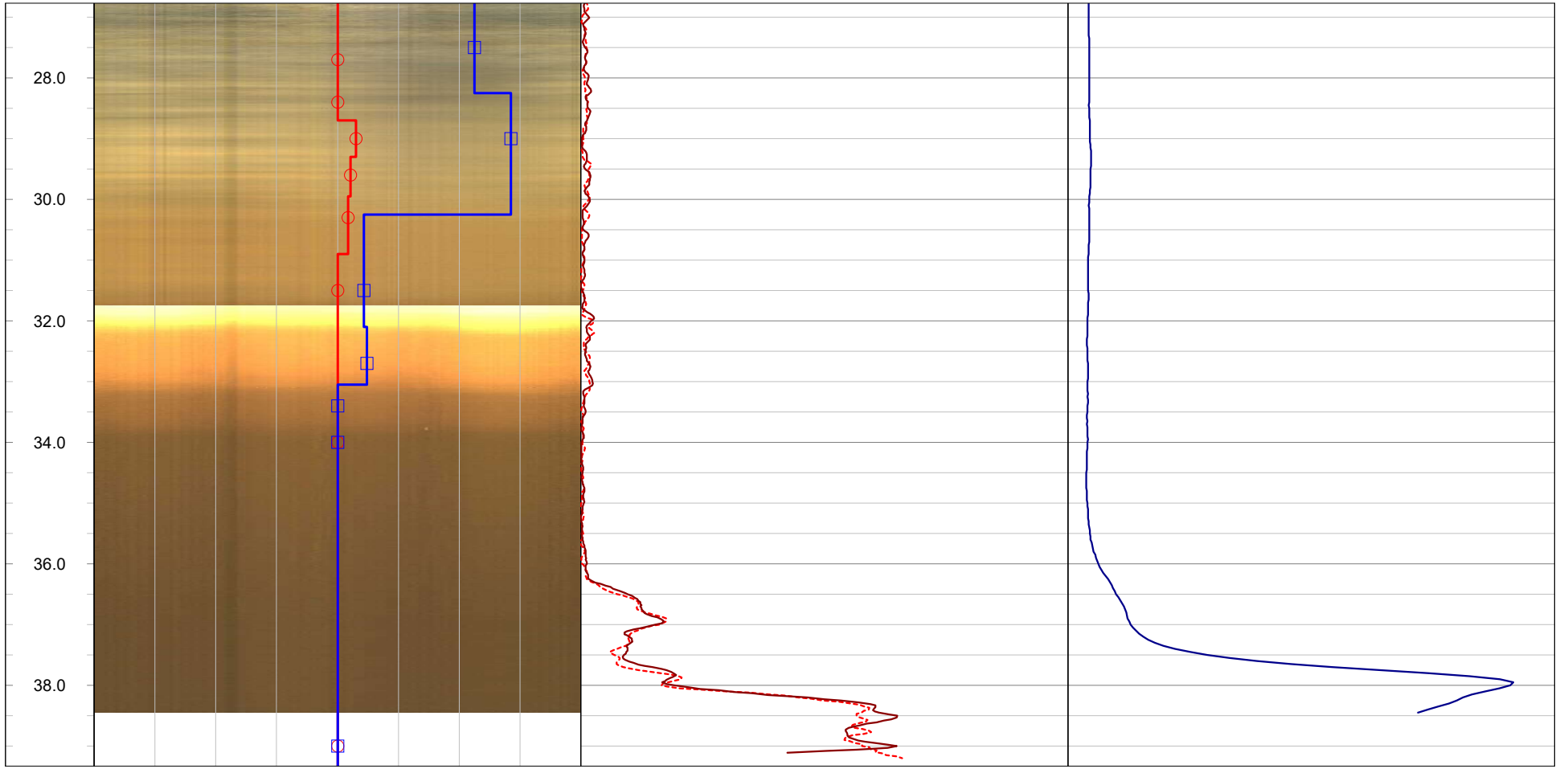
**Geophysical Record of Borehole: MW22-02 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** August 2022

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 14.85 m bgs    **Location:** Caledon, Ontario  
**Easting:**    **Drilled Depth:** 39.27 m bgs    **Water Level:** 0.67 m bgs    **Log Date:** Aug-05-2022  
**Northing:**    **Borehole Diameter:** 124 mm    **Borehole Inclination:** 0 degs  
**Elevation:**    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.33 m ags    **Logged By:** PL

**Notes:** OBI Image opaque >39 m bgs





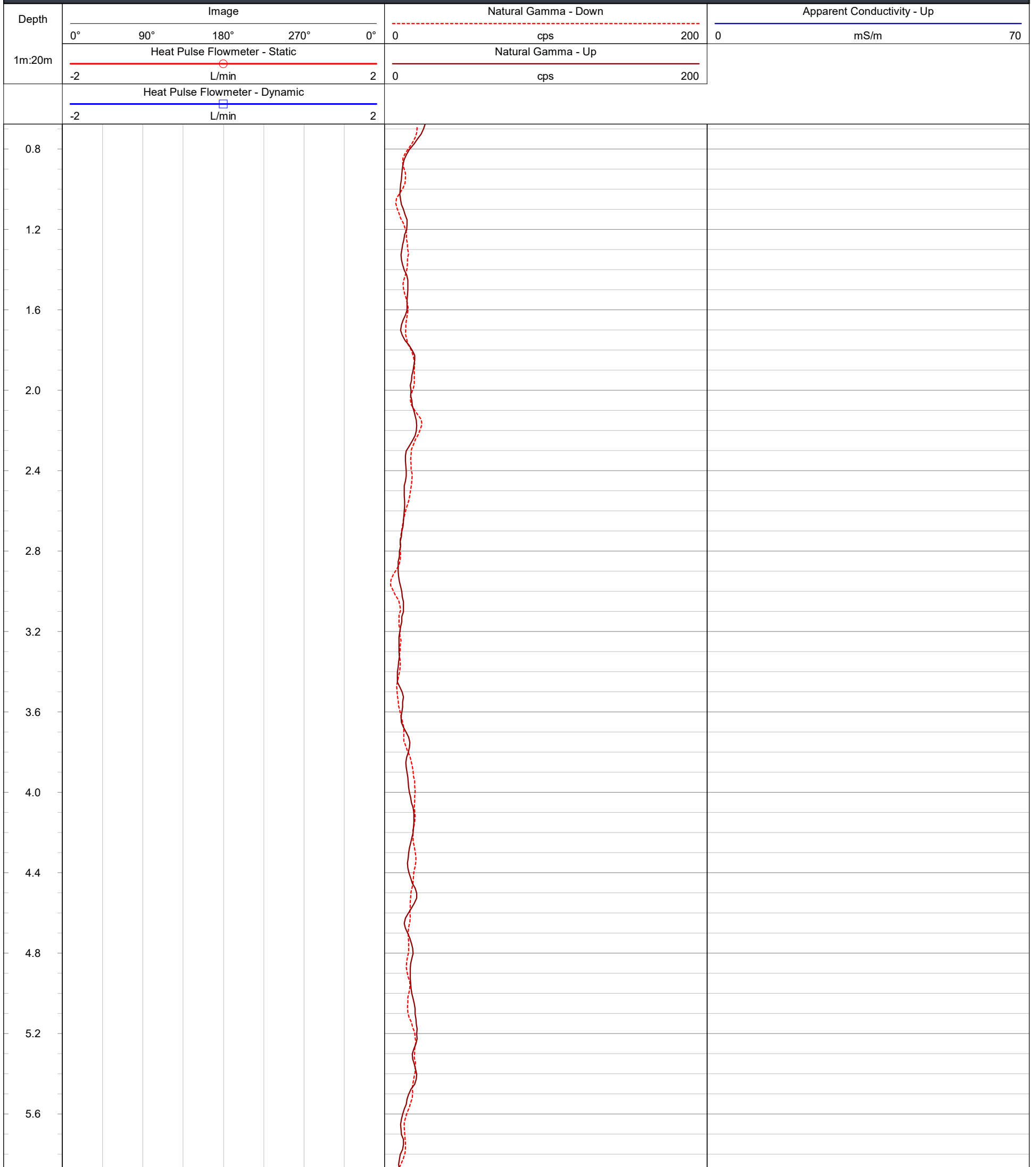


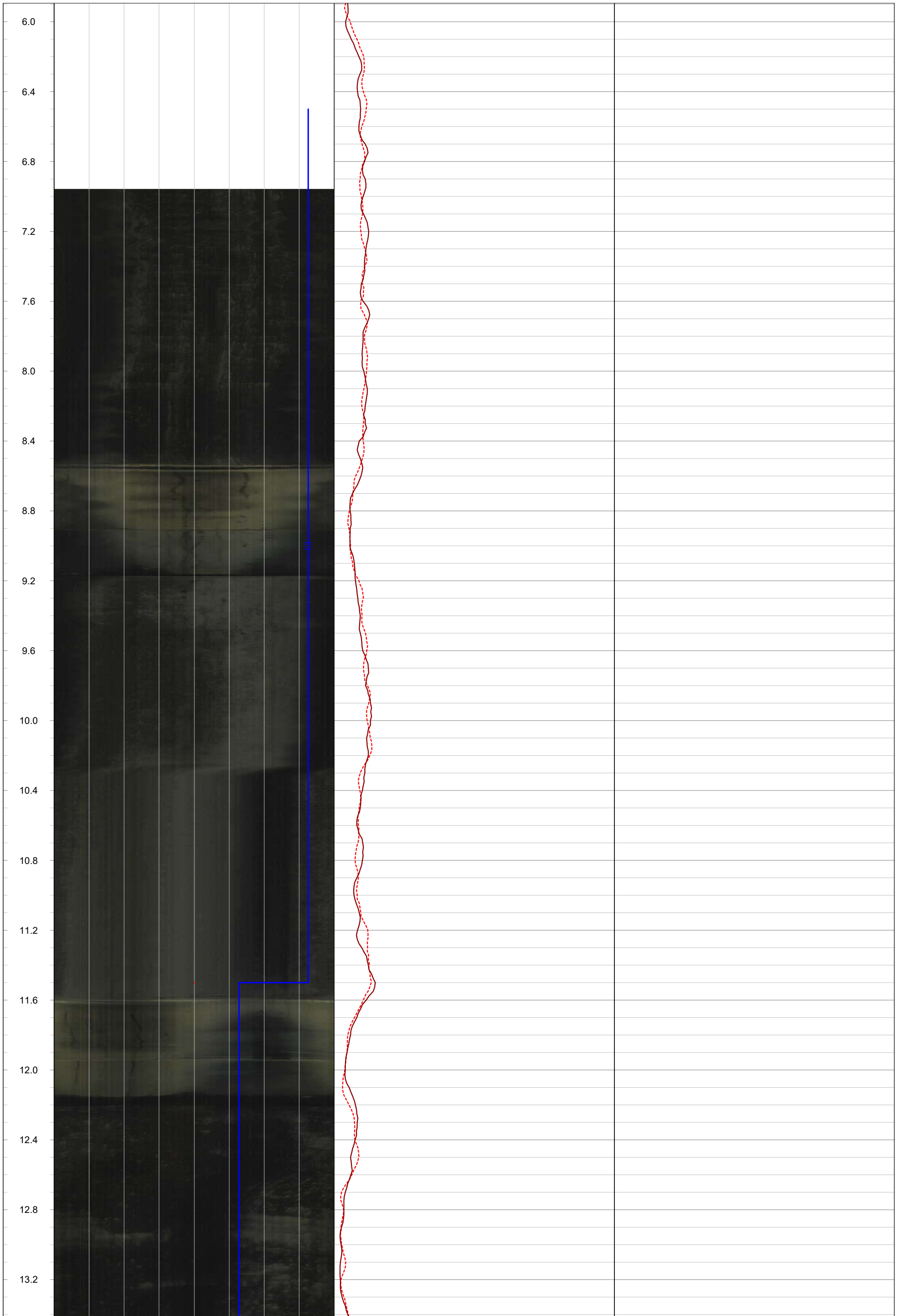
**Geophysical Record of Borehole: MW22-02 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** August 2022

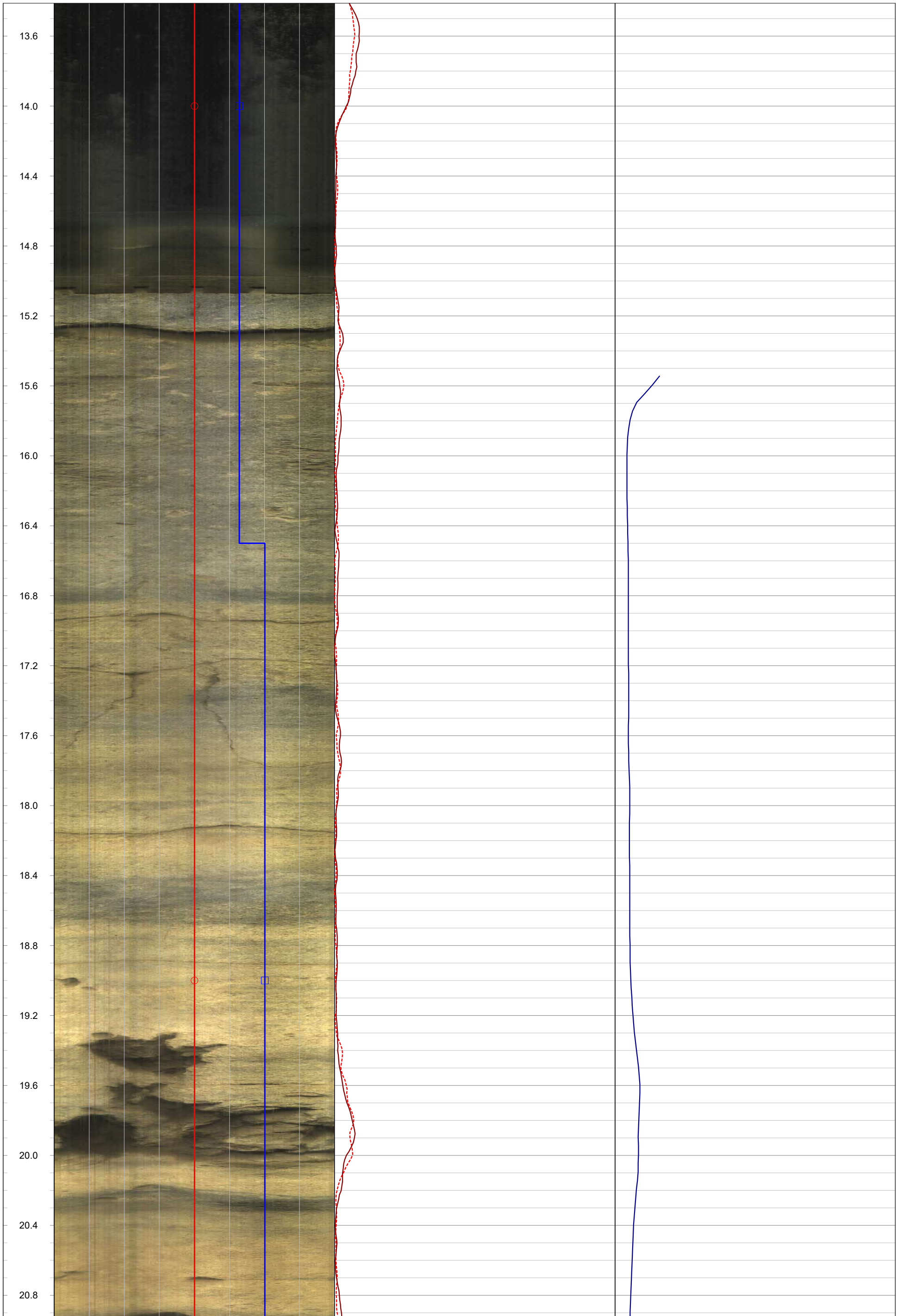
**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 14.85 m bgs    **Location:** Caledon, Ontario  
**Easting:**    **Drilled Depth:** 39.27 m bgs    **Water Level:** 0.67 m bgs    **Log Date:** Aug-05-2022  
**Northing:**    **Borehole Diameter:** 124 mm    **Borehole Inclination:** 0 degs  
**Elevation:**    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.33 m ags    **Logged By:** PL

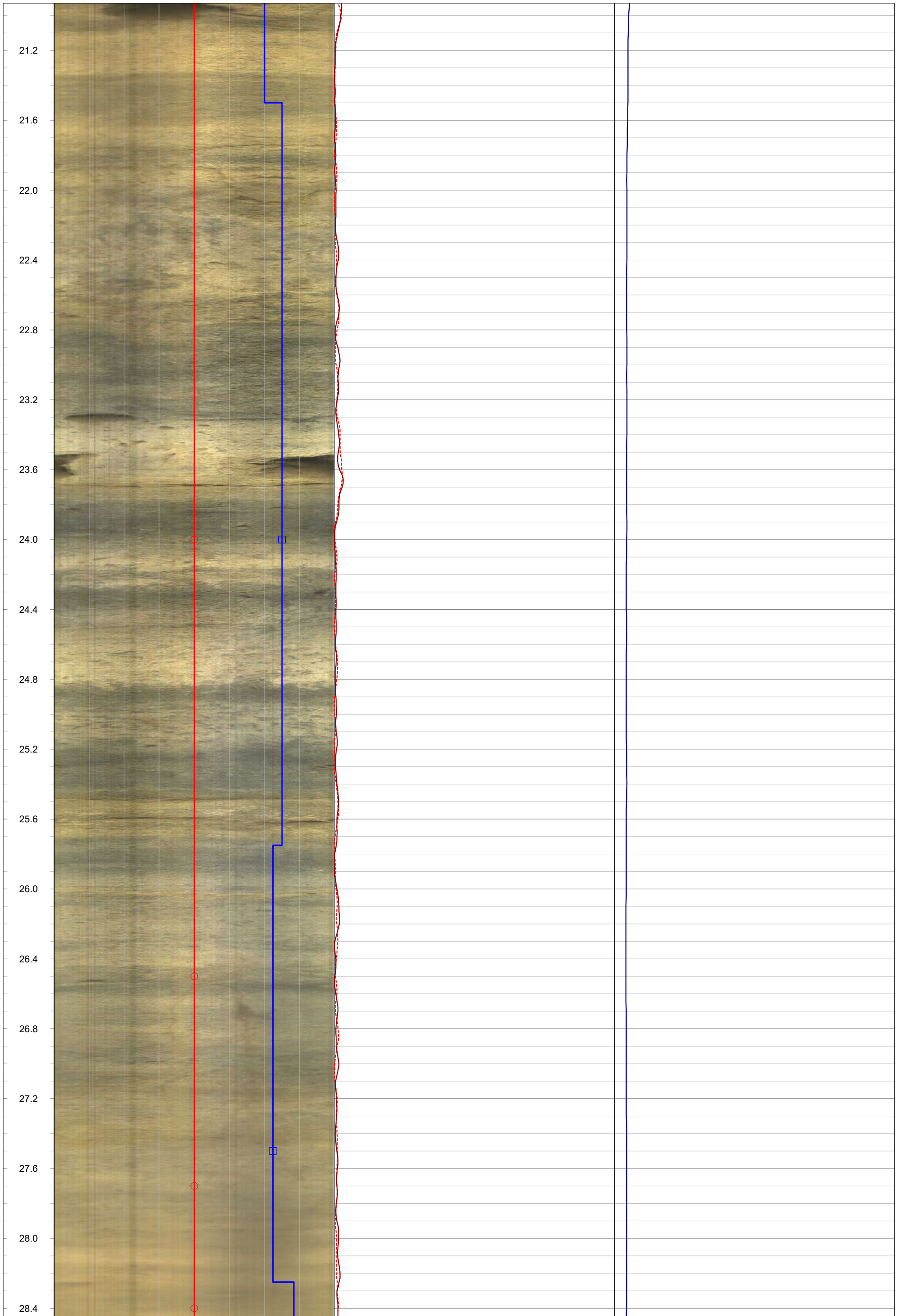
**Notes:** OBI Image opaque >39 m bgs



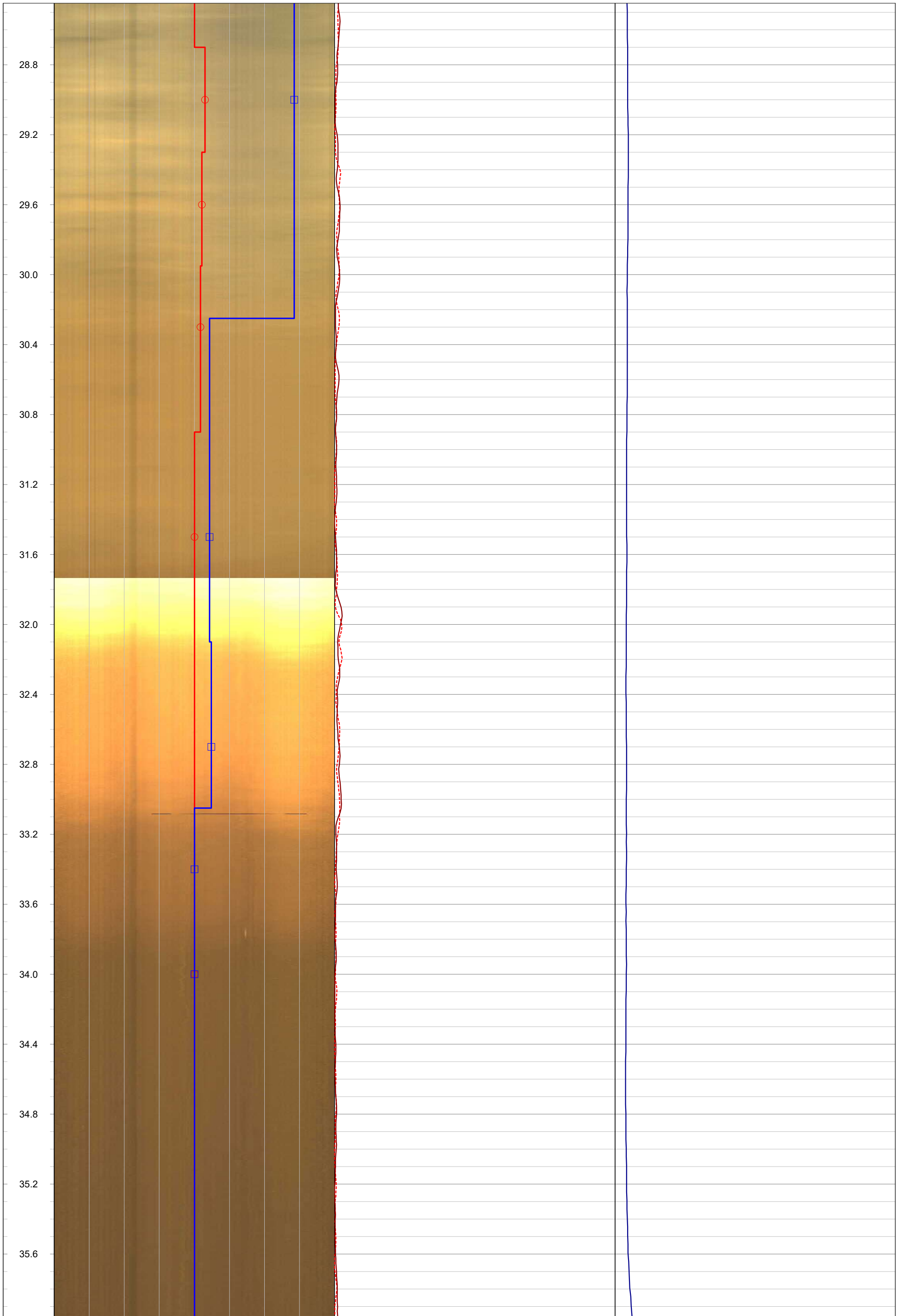














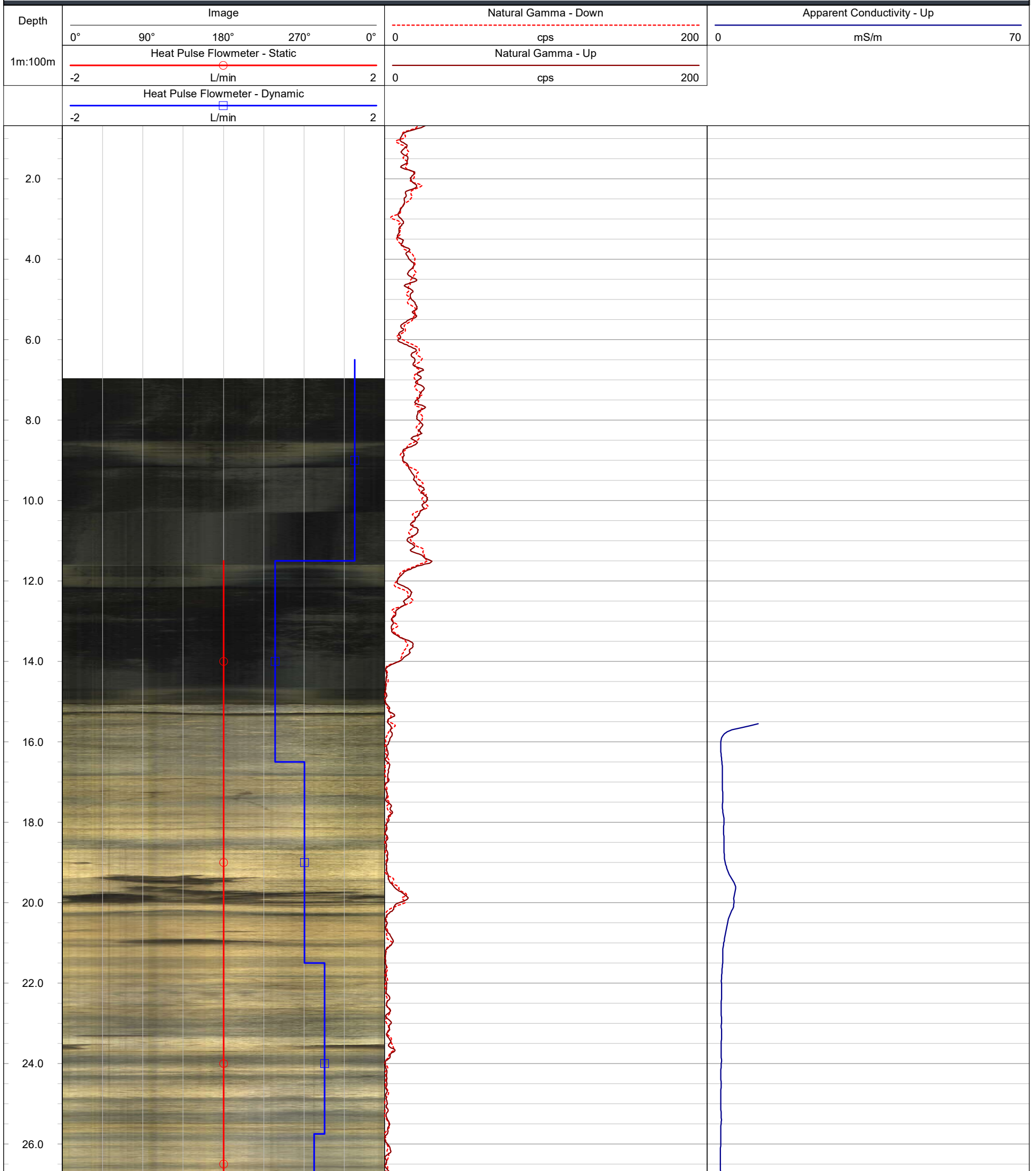


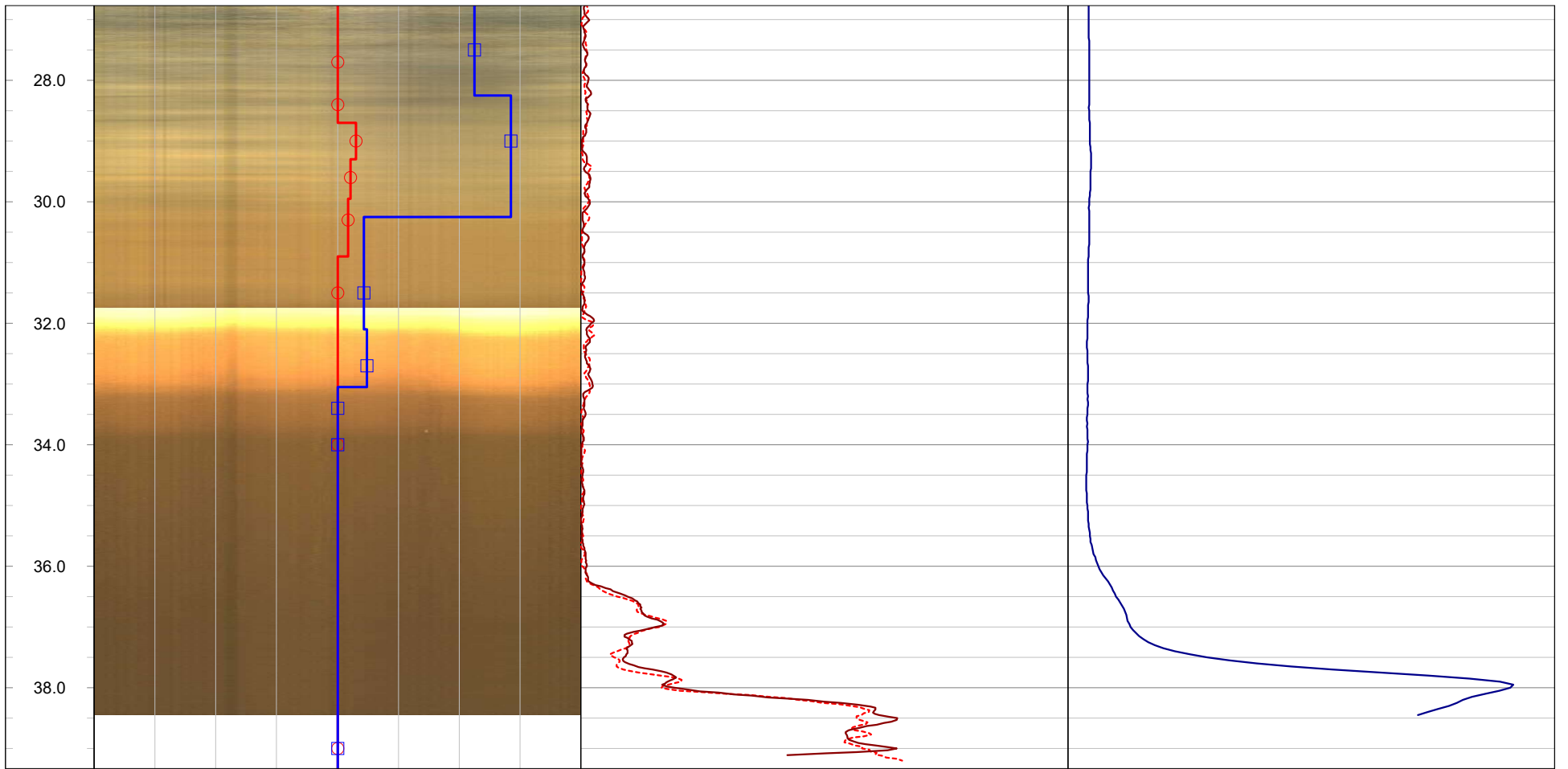
**Geophysical Record of Borehole: MW22-02 (CAL)**

**Log Title:** Geophysical Log  
**Project Number:** 19129150  
**Client:** St. Marys Cement Inc. (Canada)  
**Date:** August 2022

**Datum:** NAD83, UTM Zone 17N    **Depth Reference:** "0" at Ground    **Casing Depth:** 14.85 m bgs    **Location:** Caledon, Ontario  
**Easting:**    **Drilled Depth:** 39.27 m bgs    **Water Level:** 0.67 m bgs    **Log Date:** Aug-05-2022  
**Northing:**    **Borehole Diameter:** 124 mm    **Borehole Inclination:** 0 degs  
**Elevation:**    **Casing Diameter:** 152 mm    **Casing Stickup:** 0.33 m ags    **Logged By:** PL

**Notes:** OBI Image opaque >39 m bgs





**APPENDIX J**

## Northwest Investigation - Soil Core Soil Sample Results

**SUMMARY OF WATER CONTENT DETERMINATIONS**

**ASTM D 2216-10**

PROJECT NUMBER		19129150 (7900)	
PROJECT NAME			
DATE TESTED		September 20, 2022	
Borehole No.	Sample No.	Water Content (%)	Atterberg Limits LL, PL, PI
SC 22-01	1	35.5%	
SC 22-01	2	15.5%	
SC 22-01	3	5.8%	
SC 22-02	1	24.6%	
SC 22-02	2	16.5%	
SC 22-03	1	43.3%	
SC 22-03	2	15.1%	
SC 22-04	1	56.4%	
SC 22-04	2	22.4%	
SC 22-05	1	19.0%	
SC 22-05	2	10.6%	
SC 22-06	2	20.7%	
SC 22-07	2	32.3%	
SC 22-07	3	30.5%	
SC 22-07	4	14.1%	
SC 22-08	1	23.5%	
SC 22-08	2	15.8%	
SC 22-09	1	21.6%	
SC 22-09	2	10.3%	

Checked By: 

**Golder Associates**

Page 1

**SUMMARY OF WATER CONTENT DETERMINATIONS**

**ASTM D 2216-10**

PROJECT NUMBER		19129150 (7900)	
PROJECT NAME			
DATE TESTED		September 20, 2022	
Borehole No.	Sample No.	Water Content (%)	Atterberg Limits LL, PL, PI
SC 22-10	1	29.1%	
SC 22-10	2	11.9%	

Checked By: 

**Golder Associates**

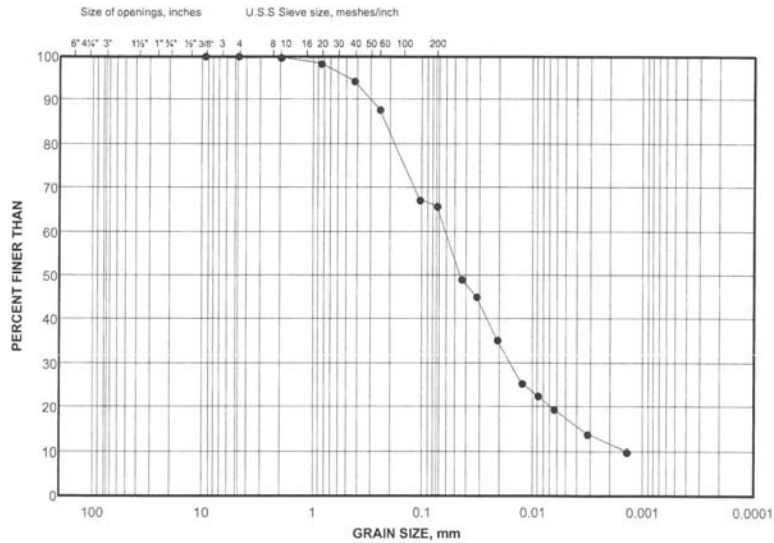
Page 2



### GRAIN SIZE DISTRIBUTION

MTO LS-702

FIGURE



COBBLE SIZE	GRAVEL SIZE	SAND SIZE	FINE GRAINED
COARSE	FINE	COARSE	MEDIUM FINE
		SILT AND CLAY SIZES	

#### LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-01	1	

Project Number: 19129150 (7900)

Checked By:

Golder Associates

Date: 23-Sep-22

### SOIL SIEVE AND HYDROMETER ANALYSIS

Initial weight of dry sample = 286.74(g)  
 Weight measured for back sieving = 50.26(g)  
 Weight of Sample for Hydrometer = 50.26(g)

#### COARSE SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	0.38	0.13	4.75	99.9
2.00mm	1.07	0.24	2.00	99.6
PAN	284.88	99.63	0.00	0.0

#### HYDROMETER BACK SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.69	1.37	0.85	98.3
425µm	2.62	3.83	0.43	94.4
250µm	5.99	6.68	0.25	87.8
106µm	16.38	20.60	0.11	67.2
75µm	17.11	1.45	0.08	65.7

#### HYDROMETER

DATE (MM/DD/YYYY) TIME (HH:MM:SS)  
 Started : 2022-09-21 10:11:00 AM  
 Finished : 2022-09-22 8:30:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	30.00	5.0	23.7	25.00	0.0450	49.1	True
2.00	28.00	5.0	23.7	23.00	0.0323	45.1	True
5.00	23.00	5.0	23.7	18.00	0.0211	35.3	True
15.00	18.00	5.0	23.5	13.00	0.0126	25.5	True
30.00	16.50	5.0	23.5	11.50	0.0090	22.6	True
60.00	15.00	5.0	23.6	10.00	0.0064	19.6	True
250.00	12.00	5.0	23.6	7.00	0.0032	13.7	True
1339.00	10.00	5.0	21.9	5.00	0.0014	9.8	True

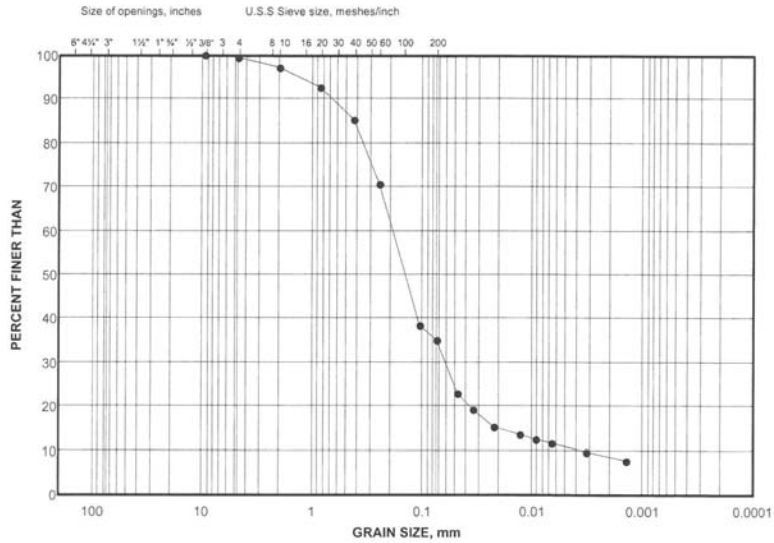
Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-01  
 Sample Number 1  
 Checked By

Depth Units Metric  
 Testing Date 2022-09-22 12:16:12 PM  
 Tested By Sieve - SI, Hydrometer - KM  
 LabID 22-2006

Golder Associates

**GRAIN SIZE DISTRIBUTION**  
MTO LS-702

FIGURE



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE		FINE GRAINED	

**LEGEND**

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-01	2	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

**SOIL SIEVE AND HYDROMETER ANALYSIS**

Initial weight of dry sample = 360.01(g)  
Weight measured for back sieving = 50.26(g)  
Weight of Sample for Hydrometer = 50.26(g)

**COARSE SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	2.32	0.64	4.75	99.4
2.00mm	9.77	2.07	2.00	97.3
PAN	349.07	97.29	0.00	0.0

**HYDROMETER BACK SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	2.44	4.72	0.85	92.6
425µm	6.16	7.20	0.43	85.4
250µm	13.72	14.63	0.25	70.7
106µm	30.48	32.44	0.11	38.3
75µm	32.19	3.31	0.08	35.0

**HYDROMETER**

DATE (MM/DD/YYYY) TIME (HH:MM:SS)  
Started : 2022-09-20 11:23:00 AM  
Finished : 2022-09-21 9:33:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	17.00	5.0	24.2	12.00	0.0486	23.0	True
2.00	15.00	5.0	24.2	10.00	0.0348	19.2	True
5.00	13.00	5.0	24.2	8.00	0.0222	15.3	True
15.00	12.00	5.0	24.0	7.00	0.0129	13.4	True
30.00	11.50	5.0	23.9	6.50	0.0092	12.5	True
60.00	11.00	5.0	23.5	6.00	0.0066	11.5	True
250.00	10.00	5.0	23.2	5.00	0.0032	9.6	True
1330.00	9.00	5.0	22.3	4.00	0.0014	7.7	True

Project Number 19129150 (7900)  
Project Task 1000  
Borehole Number SC 22-01  
Sample Number 2  
Checked By \_\_\_\_\_

Depth Units Metric  
Testing Date 2022-09-22 8:47:23 AM  
Tested By Sieve - KM, Hydrometer - KM  
LabID 22-2007

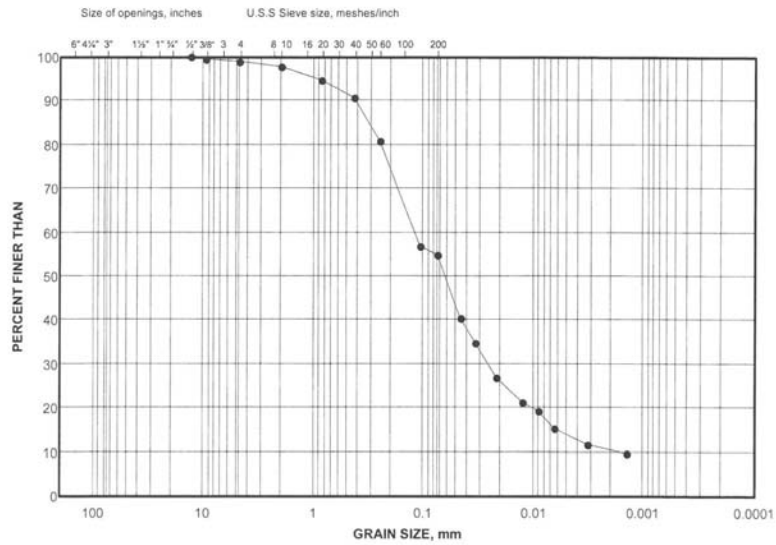
**Golder Associates**





**GRAIN SIZE DISTRIBUTION**  
MTO LS-702

FIGURE



COBBLE SIZE	COARSE GRAVEL SIZE	FINE GRAVEL SIZE	COARSE SAND SIZE	MEDIUM SAND SIZE	FINE SAND SIZE	SILT AND CLAY SIZES

**LEGEND**

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-02	2	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

**SOIL SIEVE AND HYDROMETER ANALYSIS**

Initial weight of dry sample = 346.23(g)  
 Weight measured for back sieving = 50.27(g)  
 Weight of Sample for Hydrometer = 50.27(g)

**COARSE SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	2.12	0.61	9.50	99.4
4.75mm	3.72	0.46	4.75	98.9
2.00mm	7.86	1.20	2.00	97.7
PAN	337.81	97.73	0.00	0.0

**HYDROMETER BACK SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	1.55	3.01	0.85	94.7
425µm	3.63	4.04	0.43	90.7
250µm	8.68	9.82	0.25	80.9
106µm	21.12	24.18	0.11	56.7
75µm	22.06	1.83	0.08	54.9

**HYDROMETER**

DATE (MM/DD/YYYY)      TIME (HH:MM:SS)  
 Started : 2022-09-20      10:09:00 AM  
 Finished : 2022-09-21      9:05:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	26.00	5.0	24.2	21.00	0.0460	40.4	True
2.00	23.00	5.0	24.2	18.00	0.0331	34.6	True
5.00	19.00	5.0	24.2	14.00	0.0215	26.9	True
15.00	16.00	5.0	24.0	11.00	0.0127	21.2	True
30.00	15.00	5.0	23.8	10.00	0.0090	19.2	True
60.00	13.00	5.0	23.7	8.00	0.0065	15.4	True
250.00	11.00	5.0	23.2	6.00	0.0032	11.5	True
1440.00	10.00	5.0	22.3	5.00	0.0014	9.6	True

Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-02  
 Sample Number 2  
 Checked By \_\_\_\_\_

Depth Units  
 Testing Date 2022-09-22 8:50:41 AM  
 Tested By Sieve - KM, Hydrometer - KM  
 LabID 22-2010

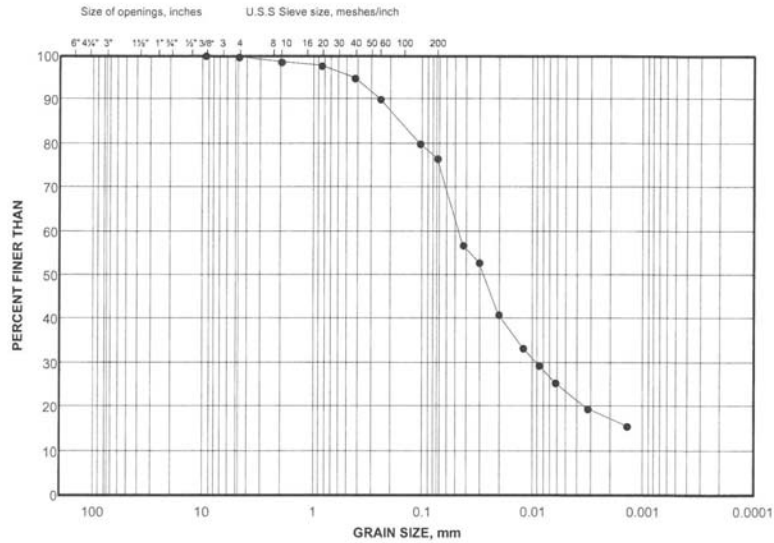
**Golder Associates**



### GRAIN SIZE DISTRIBUTION

MTO LS-702

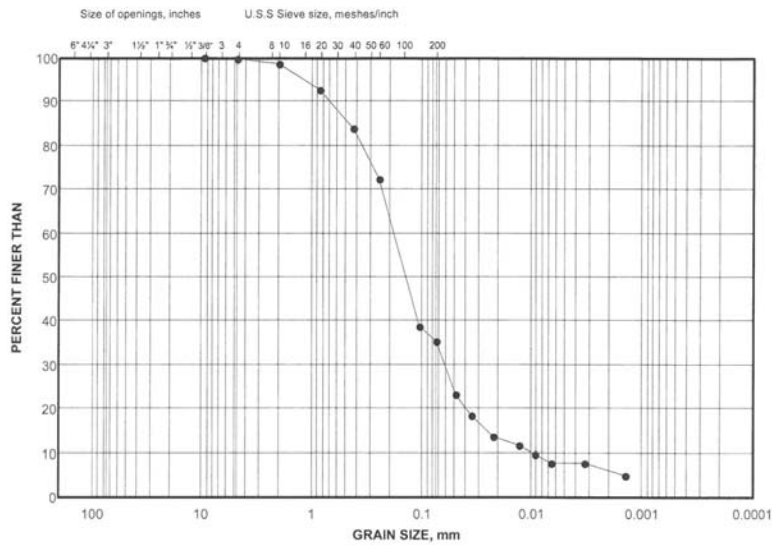
FIGURE





**GRAIN SIZE DISTRIBUTION**  
MTO LS-702

FIGURE



COBBLE SIZE	COARSE GRAVEL SIZE	FINE GRAVEL SIZE	COARSE SAND SIZE	MEDIUM SAND SIZE	FINE SAND SIZE	SILT AND CLAY SIZES

**LEGEND**

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-03	2	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

**SOIL SIEVE AND HYDROMETER ANALYSIS**

Initial weight of dry sample = 402.83(g)  
 Weight measured for back sieving = 50.66(g)  
 Weight of Sample for Hydrometer = 50.66(g)

**COARSE SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	1.62	0.40	4.75	99.6
2.00mm	5.82	1.04	2.00	98.6
PAN	396.27	98.56	0.00	0.0

**HYDROMETER BACK SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	3.09	6.01	0.85	92.6
425µm	7.57	8.72	0.43	83.8
250µm	13.56	11.65	0.25	72.2
106µm	30.75	33.44	0.11	38.7
75µm	32.52	3.44	0.08	35.3

**HYDROMETER**

DATE (MM/DD/YYYY)      TIME (HH:MM:SS)  
 Started : 2022-09-20      10:37:00 AM  
 Finished : 2022-09-21      9:19:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	17.00	5.0	24.1	12.00	0.0487	23.1	True
2.00	14.50	5.0	24.1	9.50	0.0349	18.3	True
5.00	12.00	5.0	24.1	7.00	0.0224	13.5	True
15.00	11.00	5.0	24.0	6.00	0.0130	11.6	True
30.00	10.00	5.0	23.9	5.00	0.0093	9.6	True
60.00	9.00	5.0	23.7	4.00	0.0066	7.7	True
250.00	9.00	5.0	23.2	4.00	0.0033	7.7	True
1362.00	7.50	5.0	22.2	2.50	0.0014	4.8	True

Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-03  
 Sample Number 2  
 Checked By \_\_\_\_\_

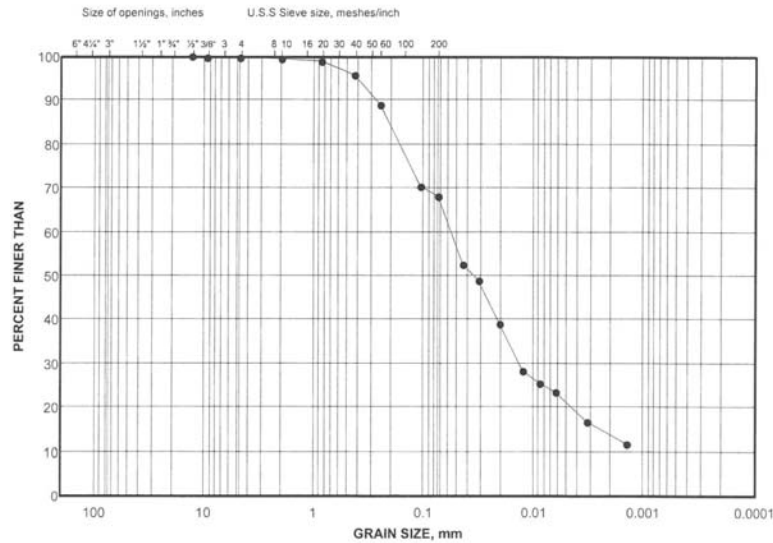
Depth 1000  
 Units  
 Testing Date 2022-09-22 8:55:01 AM  
 Tested By Sieve - KM, Hydrometer - KM  
 LabID 22-2012

**Golder Associates**

### GRAIN SIZE DISTRIBUTION

MTO LS-702

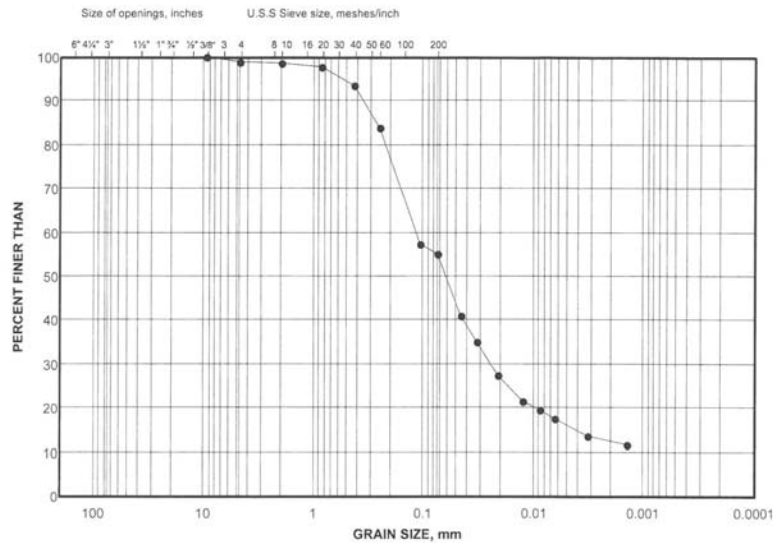
FIGURE



### GRAIN SIZE DISTRIBUTION

MTO LS-702

FIGURE



COBBLE SIZE	COARSE GRAVEL SIZE	FINE GRAVEL SIZE	COARSE SAND SIZE	MEDIUM SAND SIZE	FINE SAND SIZE	SILT AND CLAY SIZES

#### LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-04	2	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

Golder Associates

Date: 23-Sep-22

### SOIL SIEVE AND HYDROMETER ANALYSIS

Initial weight of dry sample = 369.77(g)  
 Weight measured for back sieving = 50.1(g)  
 Weight of Sample for Hydrometer = 50.1(g)

#### COARSE SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	4.04	1.09	4.75	98.9
2.00mm	5.07	0.28	2.00	98.6
PAN	363.92	98.63	0.00	0.0

#### HYDROMETER BACK SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.54	1.06	0.85	97.6
425µm	2.55	3.96	0.43	93.6
250µm	7.54	9.82	0.25	83.8
106µm	21.01	26.52	0.11	57.3
75µm	22.10	2.15	0.08	55.1

#### HYDROMETER

DATE (MM/DD/YYYY)      TIME (HH:MM:SS)  
 Started : 2022-09-20      10:50:00 AM  
 Finished : 2022-09-21      9:20:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	26.00	5.0	25.1	21.00	0.0454	40.9	True
2.00	23.00	5.0	25.1	18.00	0.0327	35.1	True
5.00	19.00	5.0	25.1	14.00	0.0212	27.3	True
15.00	16.00	5.0	24.7	11.00	0.0125	21.4	True
30.00	15.00	5.0	24.5	10.00	0.0089	19.5	True
60.00	14.00	5.0	24.1	9.00	0.0064	17.5	True
250.00	12.00	5.0	23.3	7.00	0.0032	13.6	True
1350.00	11.00	5.0	22.3	6.00	0.0014	11.7	True

Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-04  
 Sample Number 2  
 Checked By \_\_\_\_\_

Depth Units Metric  
 Testing Date 2022-09-22 9:02:24 AM  
 Tested By Sieve - KM, Hydrometer - KM  
 LabID 22-2014

Golder Associates







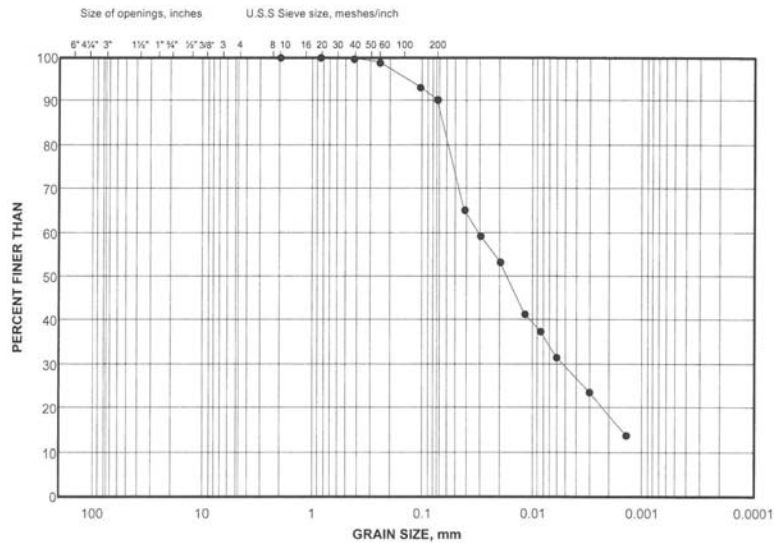




# GRAIN SIZE DISTRIBUTION

MTO LS-702

FIGURE



COBBLE SIZE	COARSE GRAVEL SIZE	FINE GRAVEL SIZE	COARSE SAND SIZE	MEDIUM SAND SIZE	FINE SAND SIZE	SLT AND CLAY SIZES
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## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-07	2	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

# SOIL SIEVE AND HYDROMETER ANALYSIS

Initial weight of dry sample = 361.84(g)  
 Weight measured for back sieving = 50.18(g)  
 Weight of Sample for Hydrometer = 50.16(g)

## COARSE SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	0.00	0.00	4.75	100.0
2.00mm	0.14	0.04	2.00	100.0
PAN	361.06	99.96	0.00	0.0

## HYDROMETER BACK SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.05	0.10	0.85	99.9
425µm	0.17	0.24	0.43	99.6
250µm	0.50	0.66	0.25	99.0
106µm	3.37	5.72	0.11	93.2
75µm	4.79	2.83	0.08	90.4

## HYDROMETER

DATE (MM/DD/YYYY)      TIME (HH:MM:SS)  
 Started : 2022-09-15      10:38:00 AM  
 Finished : 2022-09-16      7:27:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	38.00	5.0	24.1	33.00	0.0422	65.1	True
2.00	35.00	5.0	24.1	30.00	0.0306	59.2	True
5.00	32.00	5.0	24.1	27.00	0.0198	53.3	True
15.00	26.00	5.0	23.9	21.00	0.0119	41.5	True
30.00	24.00	5.0	23.8	19.00	0.0085	37.5	True
60.00	21.00	5.0	23.3	16.00	0.0062	31.6	True
250.00	17.00	5.0	22.6	12.00	0.0031	23.7	True
1249.00	12.00	5.0	22.5	7.00	0.0014	13.8	True

Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-07  
 Sample Number 2  
 Checked By \_\_\_\_\_

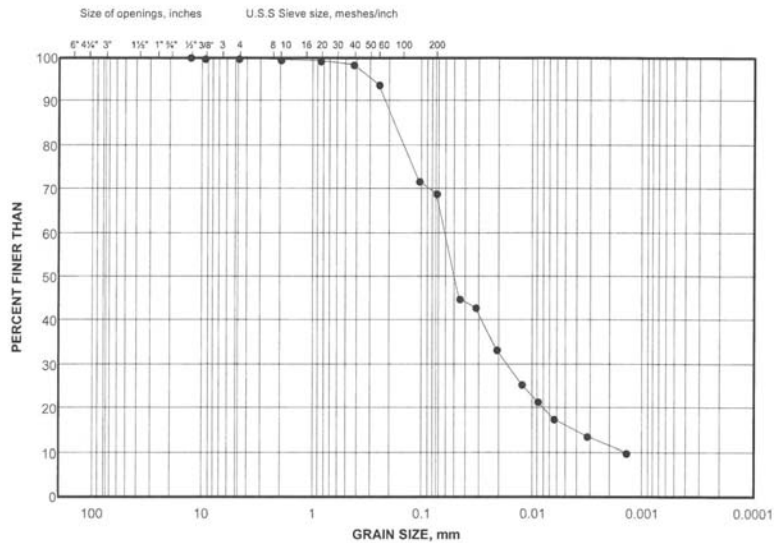
Depth Units 2022-09-21 8:52:01 AM  
 Testing Date Sieve - ES, Hydrometer - KM  
 Tested By 22-2018  
 LabID

**Golder Associates**

### GRAIN SIZE DISTRIBUTION

MTO LS-702

FIGURE



COBBLE SIZE	COARSE GRAVEL SIZE	FINE GRAVEL SIZE	COARSE SAND SIZE	MEDIUM SAND SIZE	FINE SAND SIZE	SILT AND CLAY SIZES

#### LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-07	3	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

### SOIL SIEVE AND HYDROMETER ANALYSIS

Initial weight of dry sample = 455.69(g)  
 Weight measured for back sieving = 50.32(g)  
 Weight of Sample for Hydrometer = 50.32(g)

#### COARSE SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	1.25	0.27	9.50	99.7
4.75mm	1.51	0.06	4.75	99.7
2.00mm	2.11	0.13	2.00	99.5
PAN	451.48	99.54	0.00	0.0

#### HYDROMETER BACK SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.15	0.30	0.85	99.2
425µm	0.60	0.89	0.43	98.4
250µm	2.91	4.57	0.25	93.8
106µm	14.00	21.94	0.11	71.8
75µm	15.53	3.03	0.08	68.8

#### HYDROMETER

DATE (MM/DD/YYYY) TIME (HH:MM:SS)  
 Started : 2022-09-20 11:13:00 AM  
 Finished : 2022-09-21 9:30:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	28.00	5.0	23.9	23.00	0.0455	45.0	True
2.00	27.00	5.0	23.9	22.00	0.0324	43.1	True
5.00	22.00	5.0	23.9	17.00	0.0212	33.3	True
15.00	18.00	5.0	23.7	13.00	0.0126	25.5	True
30.00	16.00	5.0	23.6	11.00	0.0090	21.5	True
60.00	14.00	5.0	23.4	9.00	0.0065	17.6	True
250.00	12.00	5.0	23.2	7.00	0.0032	13.7	True
1337.00	10.00	5.0	22.4	5.00	0.0014	9.8	True

Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-07  
 Sample Number 3  
 Checked By \_\_\_\_\_

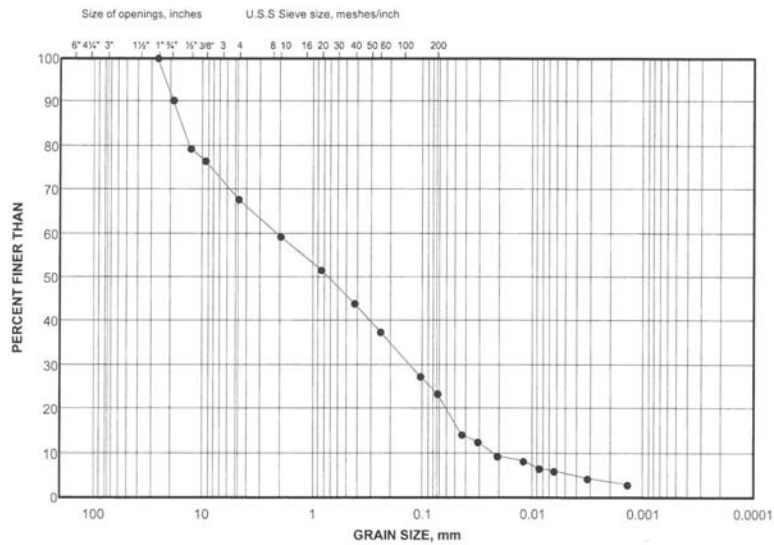
Depth  
 Units  
 Metric  
 Testing Date 2022-09-22 9:12:44 AM  
 Tested By Sieve - KM, Hydrometer - KM  
 LabID 22-2019

**Golder Associates**

### GRAIN SIZE DISTRIBUTION

MTO LS-702

FIGURE



COBBLE	COARSE GRAVEL	FINE GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND	SILT AND CLAY
SIZE	GRAVEL SIZE		SAND SIZE		FINE GRAINED	

#### LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-07	4	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

### SOIL SIEVE AND HYDROMETER ANALYSIS

Initial weight of dry sample = 414.49(g)  
 Weight measured for back sieving = 99.89(g)  
 Weight of Sample for Hydrometer = 99.89(g)

#### COARSE SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	39.34	9.49	19.00	90.5
13.2mm	85.98	11.25	13.20	79.3
9.5mm	97.21	2.71	9.50	76.6
4.75mm	133.16	8.67	4.75	67.9
2.00mm	168.37	8.49	2.00	59.4
PAN	246.10	59.39	0.00	0.0

#### HYDROMETER BACK SIEVING

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	12.79	7.60	0.85	51.8
425µm	25.50	7.56	0.43	44.2
250µm	36.53	6.56	0.25	37.7
106µm	53.74	10.23	0.11	27.4
75µm	60.43	3.98	0.08	23.5

#### HYDROMETER

DATE (MM/DD/YYYY) TIME (HH:MM:SS)  
 Started : 2022-09-15 9:52:00 AM  
 Finished : 2022-09-16 7:24:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	29.00	5.0	25.0	24.00	0.0446	14.1	True
2.00	26.00	5.0	25.0	21.00	0.0322	12.4	True
5.00	21.00	5.0	25.0	16.00	0.0210	9.4	True
15.00	19.00	5.0	24.6	14.00	0.0123	8.2	True
30.00	16.00	5.0	24.2	11.00	0.0089	6.5	True
60.00	15.00	5.0	23.9	10.00	0.0064	5.9	True
250.00	12.00	5.0	22.8	7.00	0.0032	4.1	True
1292.00	10.00	5.0	22.5	5.00	0.0014	2.9	True

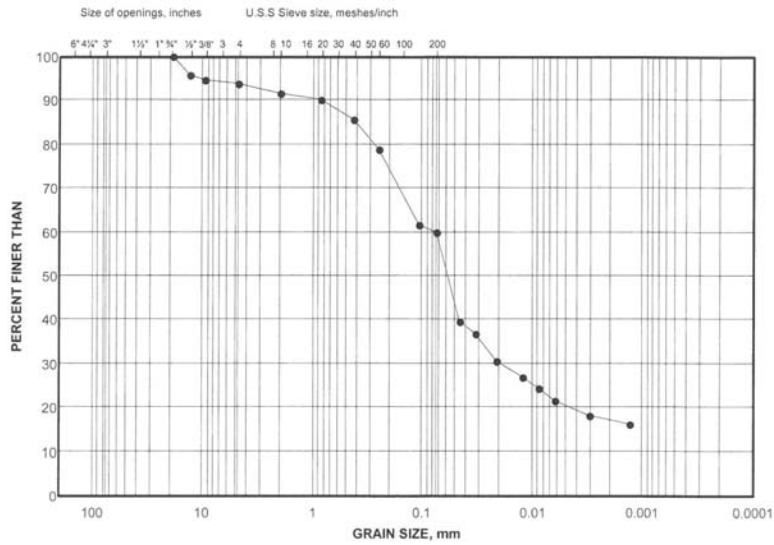
Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-07  
 Sample Number 4  
 Checked By \_\_\_\_\_

Depth 1000  
 Units Metric  
 Testing Date 2022-09-21 8:55:18 AM  
 Tested By Sieve - ES, Hydrometer - KM  
 LabID 22-2020

**Golder Associates**

**GRAIN SIZE DISTRIBUTION**  
MTO LS-702

FIGURE



COBBLE SIZE	GRAVEL SIZE	SAND SIZE	FINE GRAINED
COARSE	FINE	COARSE	MEDIUM FINE
SILT AND CLAY SIZES			

**LEGEND**

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-08	1	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

**SOIL SIEVE AND HYDROMETER ANALYSIS**

Initial weight of dry sample = 320.45(g)  
Weight measured for back sieving = 50.38(g)  
Weight of Sample for Hydrometer = 50.38(g)

**COARSE SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	13.64	4.26	13.20	95.7
9.5mm	16.89	5.27	9.50	94.7
4.75mm	19.79	6.18	4.75	93.8
2.00mm	27.37	8.54	2.00	91.5
PAN	292.77	91.46	0.00	0.0

**HYDROMETER BACK SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.68	1.23	0.85	90.2
425µm	3.25	5.94	0.43	85.6
250µm	6.98	12.54	0.25	78.8
106µm	16.39	29.33	0.11	61.7
75µm	17.39	31.12	0.08	59.9

**HYDROMETER**

DATE (MM/DD/YYYY) 2022-09-21  
TIME (HH:MM:SS) 10:56:00 AM  
Finished : 2022-09-22 8:36:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	27.00	5.0	24.4	22.00	0.0455	39.6	True
2.00	25.50	5.0	24.4	20.50	0.0325	36.9	True
5.00	22.00	5.0	24.4	17.00	0.0210	30.6	True
15.00	20.00	5.0	24.2	15.00	0.0123	27.0	True
30.00	18.50	5.0	24.2	13.50	0.0088	24.3	True
60.00	17.00	5.0	23.9	12.00	0.0063	21.6	True
250.00	15.00	5.0	23.8	10.00	0.0031	18.0	True
1440.00	14.00	5.0	21.8	9.00	0.0013	16.2	True

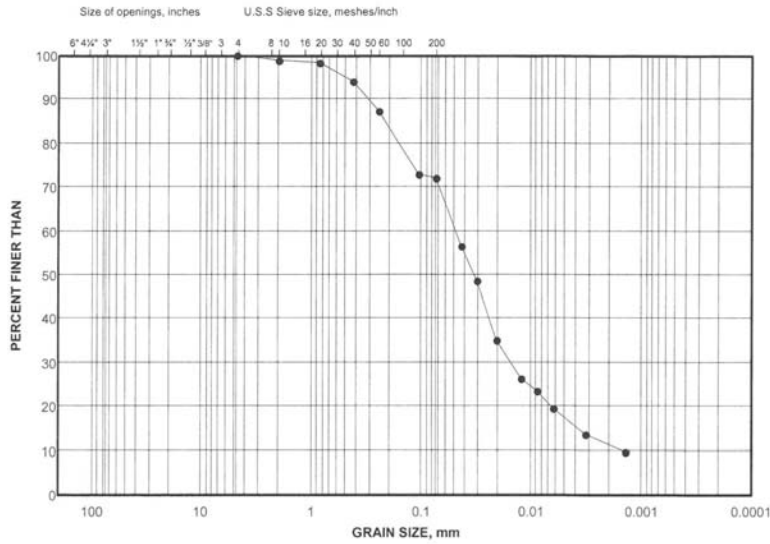
Project Number 19129150 (7900)  
Project Task 1000  
Borehole Number SC 22-08  
Sample Number 1  
Checked By \_\_\_\_\_

Depth 1000  
Units Metric  
Testing Date 2022-09-22 12:22:49 PM  
Tested By Sieve - SI, Hydrometer - KM  
LabID 22-2021

**Golder Associates**

**GRAIN SIZE DISTRIBUTION**  
MTO LS-702

FIGURE



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE		FINE GRAINED	

**LEGEND**

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-08	2	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

**SOIL SIEVE AND HYDROMETER ANALYSIS**

Initial weight of dry sample = 281.35(g)  
 Weight measured for back sieving = 50.22(g)  
 Weight of Sample for Hydrometer = 50.22(g)

**COARSE SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	0.00	0.00	4.75	100.0
2.00mm	3.26	1.16	2.00	98.8
PAN	276.89	98.84	0.00	0.0

**HYDROMETER BACK SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.32	0.63	0.85	98.2
425µm	2.36	4.02	0.43	94.2
250µm	5.80	6.77	0.25	87.4
106µm	13.11	14.39	0.11	73.0
75µm	13.67	1.10	0.08	71.9

**HYDROMETER**

DATE (MMDD/YYYY)      TIME (HH:MM:SS)  
 Started : 2022-09-21      10:45:00 AM  
 Finished : 2022-09-22      8:35:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	34.00	5.0	24.7	29.00	0.0432	56.5	True
2.00	30.00	5.0	24.7	25.00	0.0314	48.7	True
5.00	23.00	5.0	24.7	18.00	0.0208	35.1	True
15.00	18.50	5.0	24.7	13.50	0.0124	26.3	True
30.00	17.00	5.0	24.6	12.00	0.0088	23.4	True
60.00	15.00	5.0	24.3	10.00	0.0063	19.5	True
250.00	12.00	5.0	23.8	7.00	0.0032	13.6	True
1310.00	10.00	5.0	21.9	5.00	0.0014	9.7	True

Project Number 19129150 (7900)  
 Project Task 1000  
 Borehole Number SC 22-08  
 Sample Number 2  
 Checked By \_\_\_\_\_

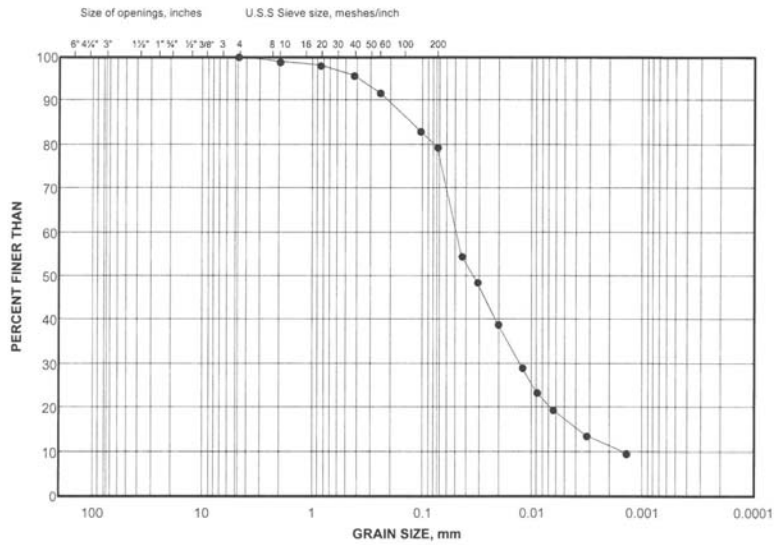
Depth Units  
 Testing Date 2022-09-22 12:28:38 PM  
 Tested By Sieve - SI, Hydrometer - KM  
 LabID 22-2022

**Golder Associates**



**GRAIN SIZE DISTRIBUTION**  
MTO LS-702

FIGURE



COBBLE	GRAVEL SIZE	SAND SIZE	SILT AND CLAY SIZES

**LEGEND**

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-09	1	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

**SOIL SIEVE AND HYDROMETER ANALYSIS**

Initial weight of dry sample = 280.77(g)  
Weight measured for back sieving = 50.33(g)  
Weight of Sample for Hydrometer = 50.33(g)

**COARSE SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	0.00	0.00	4.75	100.0
2.00mm	3.01	1.07	2.00	98.9
PAN	277.43	98.93	0.00	0.0

**HYDROMETER BACK SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.50	0.98	0.85	98.0
425µm	1.66	2.28	0.43	95.7
250µm	3.68	3.97	0.25	91.7
106µm	8.05	8.59	0.11	83.1
75µm	9.95	3.73	0.08	79.4

**HYDROMETER**

DATE (MMDD/YYYY)      TIME (HH-MM-SS)  
Started : 2022-09-15      10:04:00 AM  
Finished : 2022-09-16      7:25:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	33.00	5.0	23.8	28.00	0.0440	54.5	True
2.00	30.00	5.0	23.8	25.00	0.0318	48.6	True
5.00	25.00	5.0	23.8	20.00	0.0208	38.9	True
15.00	20.00	5.0	23.6	15.00	0.0124	29.2	True
30.00	17.00	5.0	23.4	12.00	0.0090	23.3	True
60.00	15.00	5.0	23.3	10.00	0.0064	19.5	True
250.00	12.00	5.0	22.6	7.00	0.0032	13.6	True
1440.00	10.00	5.0	22.5	5.00	0.0014	9.7	True

Project Number 19129150 (7900)  
Project Task 1000  
Borehole Number SC 22-09  
Sample Number 1  
Checked By \_\_\_\_\_

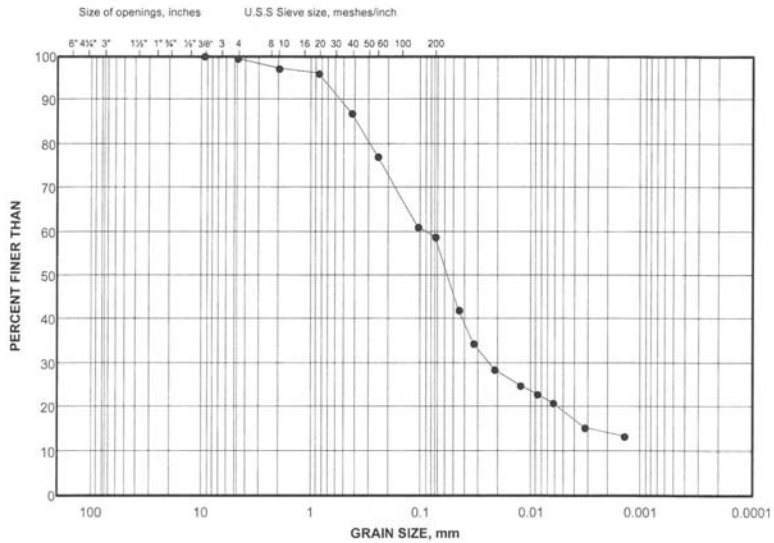
Depth Units Metric  
Testing Date 2022-09-21 8:58:59 AM  
Tested By Sieve - ES, Hydrometer - KM  
LabID 22-2023

**Golder Associates**



**GRAIN SIZE DISTRIBUTION**  
MTO LS-702

FIGURE



COBBLE SIZE	GRAVEL SIZE	FINE SAND SIZE	MEDIUM SAND SIZE	FINE SAND SIZE	SILT AND CLAY SIZES

**LEGEND**

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	SC 22-09	2	

Project Number: 19129150 (7900)

Checked By: \_\_\_\_\_

**Golder Associates**

Date: 23-Sep-22

**SOIL SIEVE AND HYDROMETER ANALYSIS**

Initial weight of dry sample = 405.06(g)  
Weight measured for back sieving = 50.4(g)  
Weight of Sample for Hydrometer = 50.4(g)

**COARSE SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
150mm	0.00	0.00	150.00	100.0
125mm	0.00	0.00	125.00	100.0
75mm	0.00	0.00	75.00	100.0
63mm	0.00	0.00	63.00	100.0
53mm	0.00	0.00	53.00	100.0
37.5mm	0.00	0.00	37.50	100.0
26.5mm	0.00	0.00	26.50	100.0
19.0mm	0.00	0.00	19.00	100.0
13.2mm	0.00	0.00	13.20	100.0
9.5mm	0.00	0.00	9.50	100.0
4.75mm	2.94	0.73	4.75	99.3
2.00mm	11.61	2.14	2.00	97.1
PAN	392.87	97.13	0.00	0.0

**HYDROMETER BACK SIEVING**

SIEVE	CUM. MASS RETAINED (g)	% RETAINED	PARTICLE SIZE(mm)	% PASSING
850µm	0.54	1.04	0.85	96.1
425µm	5.23	9.04	0.43	87.1
250µm	10.44	10.04	0.25	77.0
106µm	18.74	16.00	0.11	61.0
75µm	19.91	2.25	0.08	58.8

**HYDROMETER**

DATE (MMDD/YYYY) 2022-09-21  
TIME (HH:MM:SS) 10:33:00 AM  
Finished : 2022-09-22 8:34:00 AM

Elapsed Time (min)	HYDROMETER READING	DEFLOCCULANT CORRECTION	WATER TEMP (°C)	CORRECTED HYDROMETER READING	PARTICLE SIZE (mm)	% PASSING	PLOT
1.00	27.00	5.0	24.1	22.00	0.0457	42.0	True
2.00	23.00	5.0	24.1	18.00	0.0332	34.3	True
5.00	20.00	5.0	24.1	15.00	0.0214	28.6	True
15.00	18.00	5.0	24.0	13.00	0.0125	24.8	True
30.00	17.00	5.0	24.0	12.00	0.0089	22.9	True
60.00	16.00	5.0	24.0	11.00	0.0063	21.0	True
250.00	13.00	5.0	23.7	8.00	0.0032	15.3	True
1321.00	12.00	5.0	21.9	7.00	0.0014	13.4	True

Project Number 19129150 (7900)  
Project Task 1000  
Borehole Number SC 22-09  
Sample Number 2  
Checked By \_\_\_\_\_

Depth Units Metric  
Testing Date 2022-09-22 12:32:52 PM  
Tested By Sieve - SI, Hydrometer - KM  
LabID 22-2024

**Golder Associates**





**APPENDIX J**

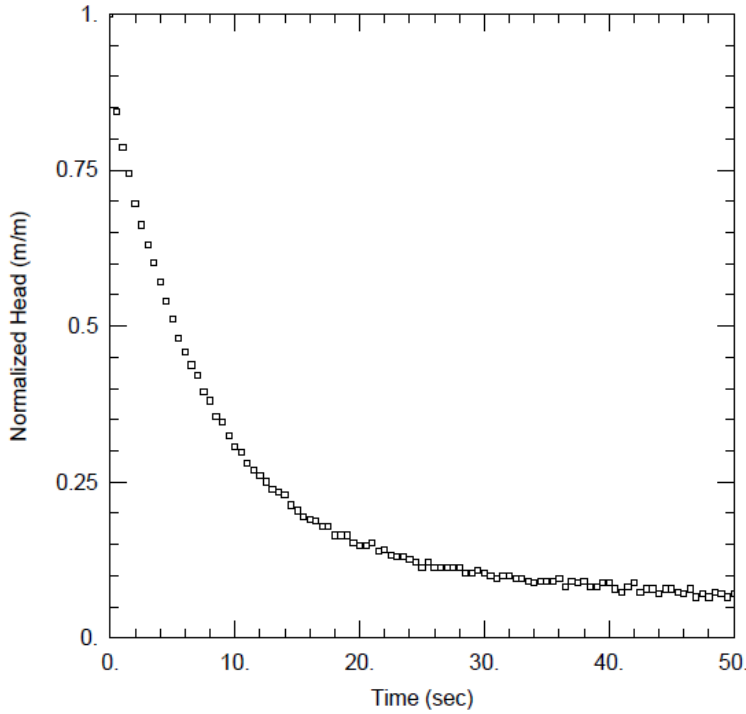
## Northwest Investigation - Single Well Response Test Results

**TEST INFORMATION:**

Test Well: PW22-01  
 Date of Test: September 14, 2022  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test

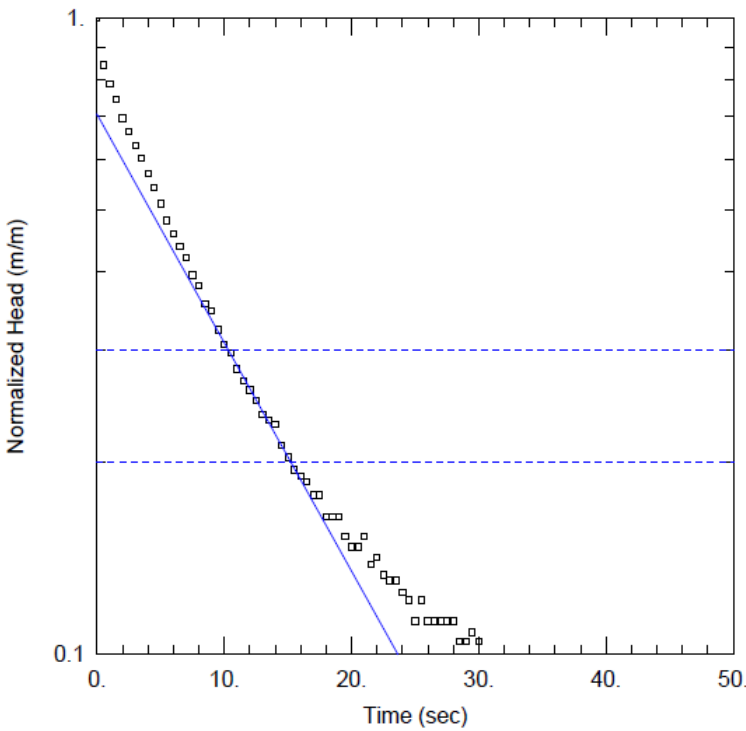
Static Water Level: 0.62 mbgs  
 Initial Displacement: 1.12 m

Casing Radius: 0.051 m  
 Borehole Radius: 0.084 m  
 Well Screen Interval: 10.36 m to 39.62 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

$2 \times 10^{-5} \text{ m/s}$

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
**GOLDER**  
 MEMBER OF WSP

YYYY-MM-DD 2022-10-12

PREPARED PGM

DESIGN PGM

REVIEW GWS

APPROVED ###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL PW22-01**

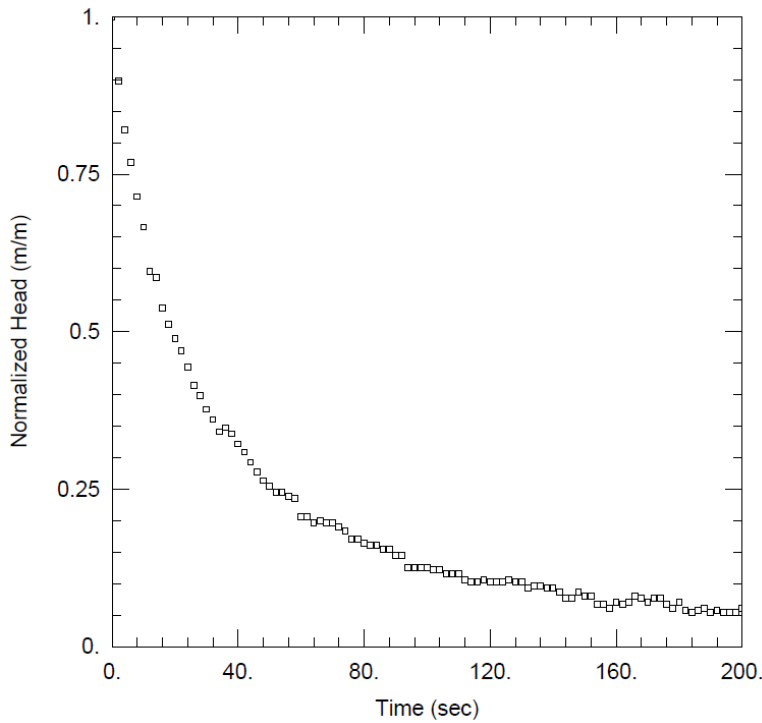
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

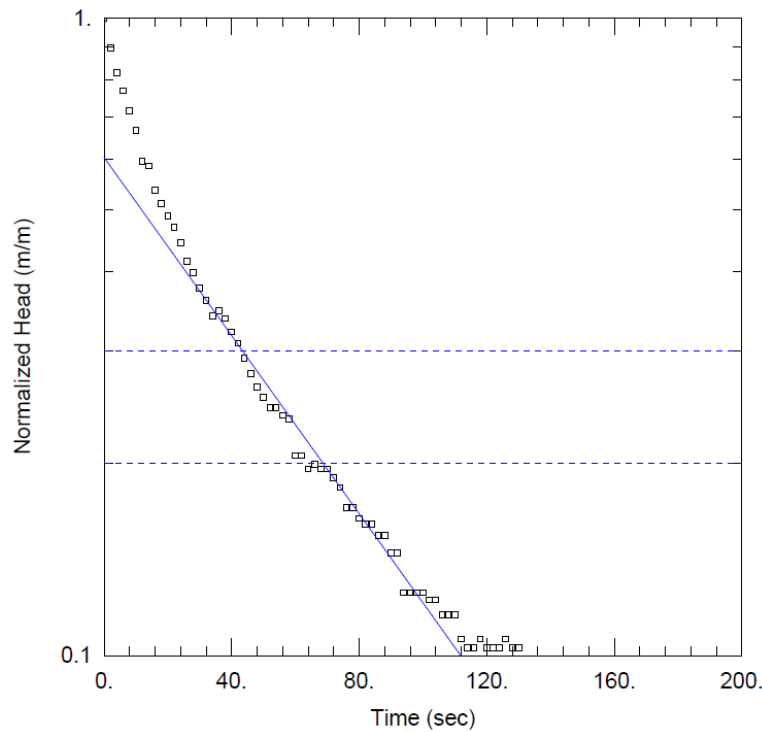
FIGURE  
**J-01**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A



**TEST INFORMATION:**

Test Well: MW22-01  
 Date of Test: August 15, 2022  
 Test Type: Rising Head Test  
 Test Method: Physical Slug Rising Head Test  
  
 Static Water Level: 2.35 mbgs  
 Initial Displacement: 0.31 m  
  
 Casing Radius: 0.025 m  
 Borehole Radius: 0.079 m  
 Well Screen Interval: 4.11 m to 7.16 m  
 Geology: Silty Sand



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$5 \times 10^{-6} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-10-12

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW22-01**



PREPARED PGM  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED ###

PROJECT No.  
**19129150**

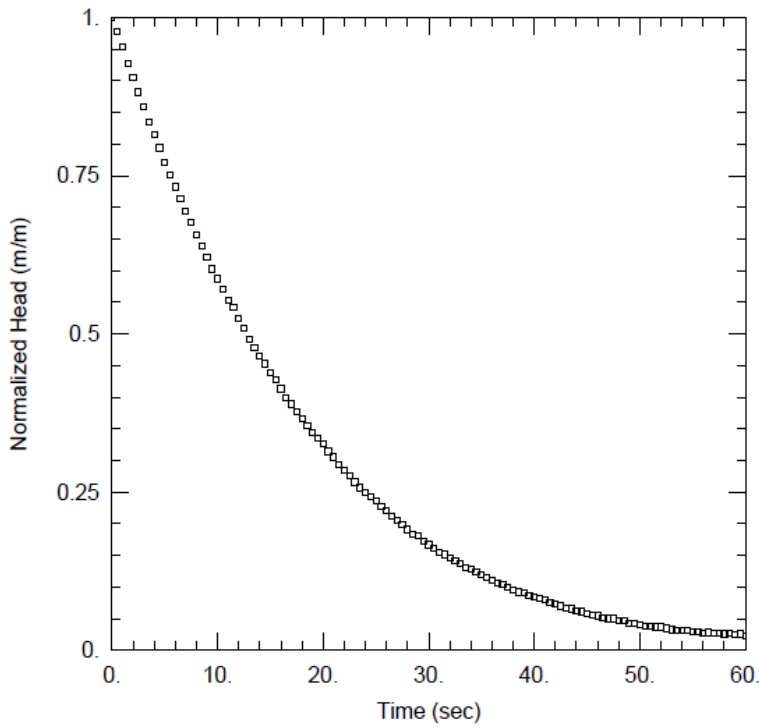
PHASE  
**2300**

Rev.  
**A**

FIGURE  
**J-02**

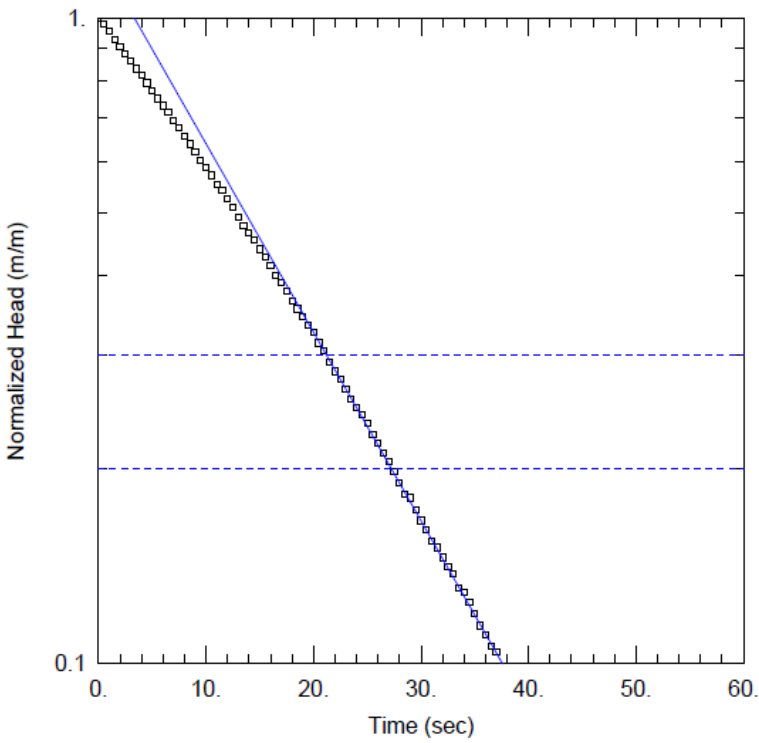
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A





**TEST INFORMATION:**

Test Well: MW22-02A  
 Date of Test: September 14, 2022  
 Test Type: Rising Head Test  
 Test Method: Pneumatic Rising Head Test  
  
 Static Water Level: 1.56 mbgs  
 Initial Displacement: 3.65 m  
  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.054 m  
 Well Screen Interval: 34.75 m to 36.27 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$2 \times 10^{-5} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-10-12

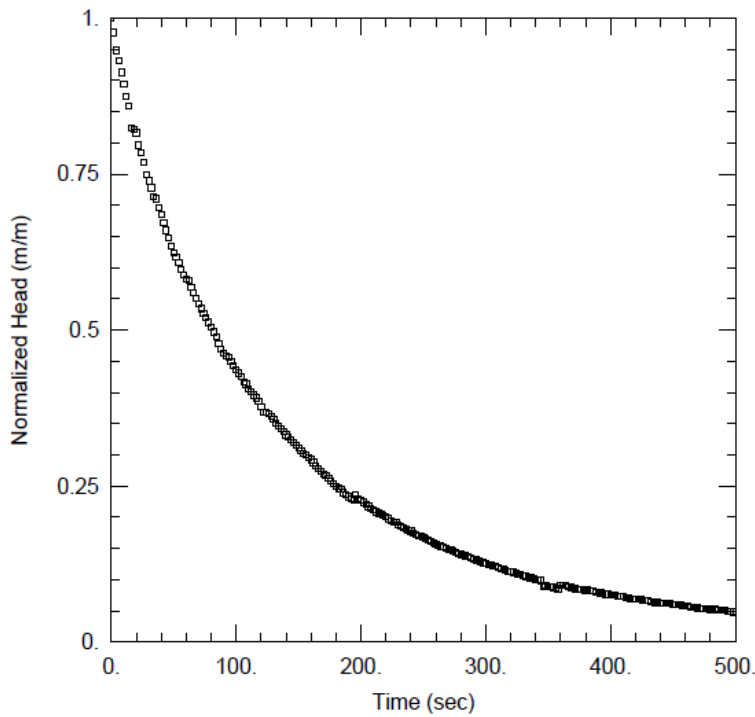
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW22-02A**



PREPARED PGM  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED ###

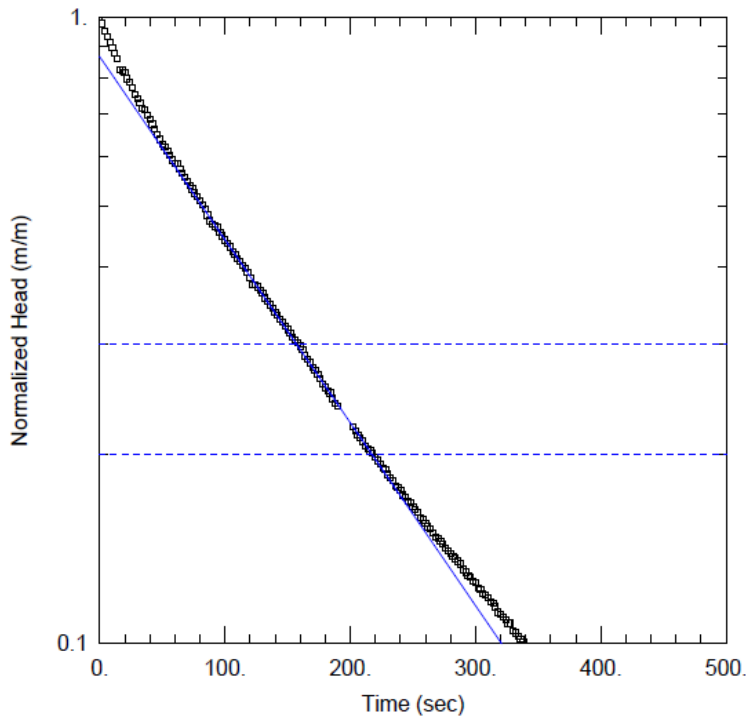
PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE J-03

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



**TEST INFORMATION:**

Test Well: MW22-02B  
 Date of Test: September 6, 2022  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test  
 Static Water Level: 1.29 mbgs  
 Initial Displacement: 2.20 m  
 Casing Radius: 0.013 m  
 Borehole Radius: 0.054 m  
 Well Screen Interval: 12.80 m to 15.85 m  
 Geology: Dolostone, Gasport Fm



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined

Hydraulic Conductivity (K) =

**$8 \times 10^{-6} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-10-12

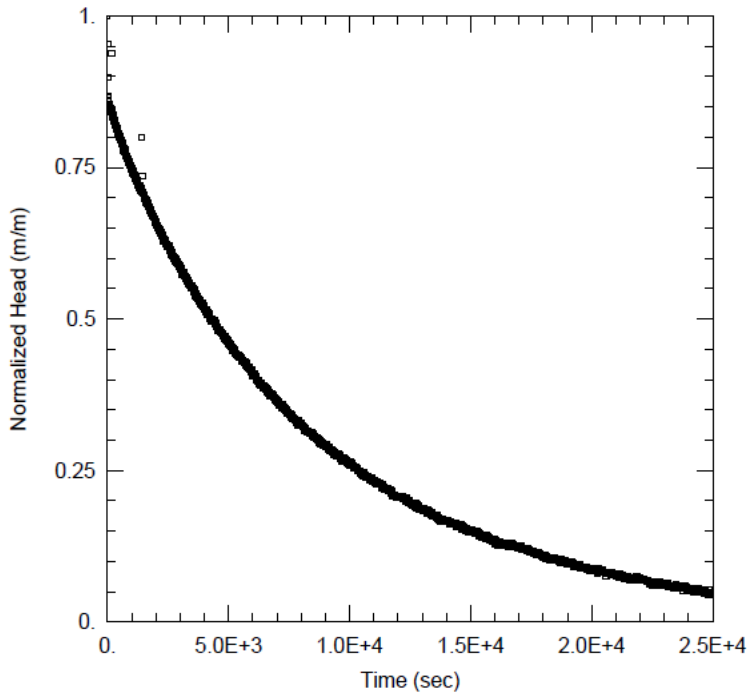
TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW22-02B**



PREPARED PGM  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED ###

PROJECT No. 19129150      PHASE 2300      Rev. A      FIGURE J-04

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

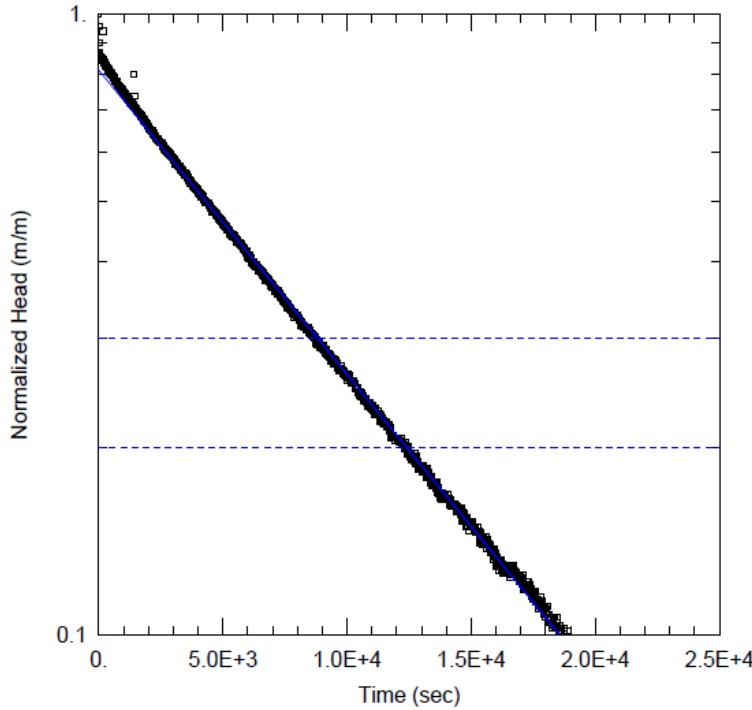


**TEST INFORMATION:**

Test Well: MW22-02C  
 Date of Test: September 6, 2022  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

Static Water Level: 1.64 mbgs  
 Initial Displacement: 0.94 m

Casing Radius: 0.025 m  
 Borehole Radius: 0.079 m  
 Well Screen Interval: 3.96 m to 5.49 m  
 Geology: Silty Sand and Gravel Till



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-8} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

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PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-10-12

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW22-02C**



PREPARED PGM  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED ###

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

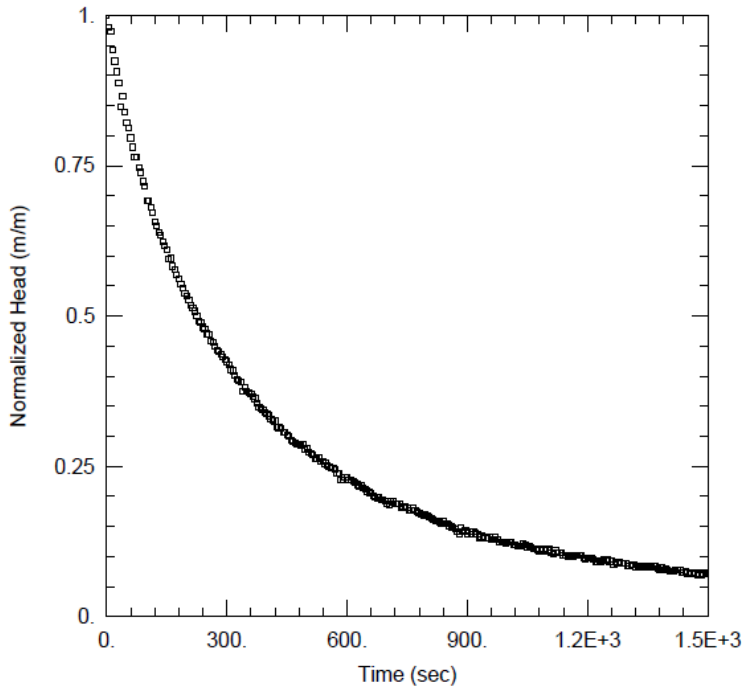
FIGURE  
**J-05**

**TEST INFORMATION:**

Test Well: MW22-03A  
 Date of Test: September 6, 2022  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

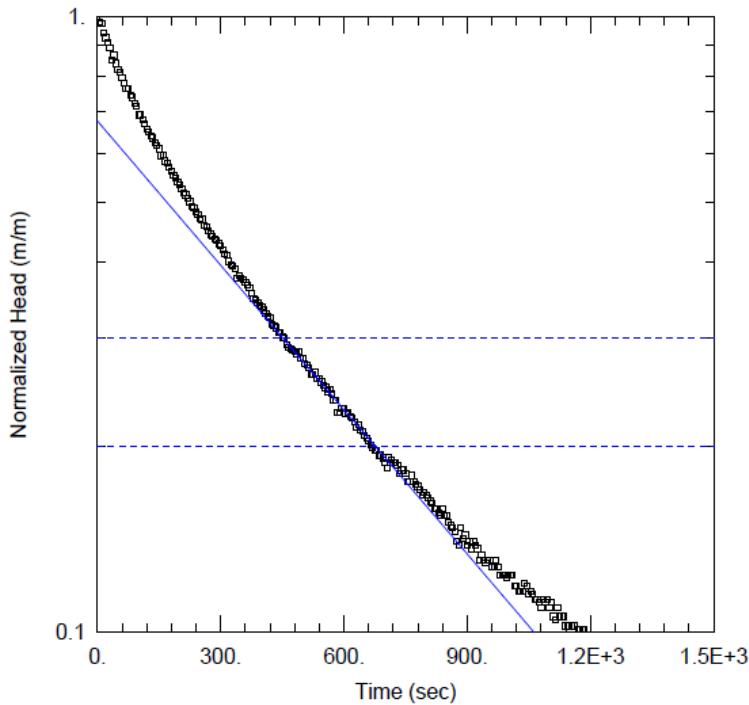
Static Water Level: 0.92 mbgs  
 Initial Displacement: 2.68 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.079 m  
 Well Screen Interval: 12.80 m to 15.85 m  
 Geology: Silty Sand Till



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$2 \times 10^{-7} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-10-12

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW22-03A**



PREPARED PGM  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED ###

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**J-06**

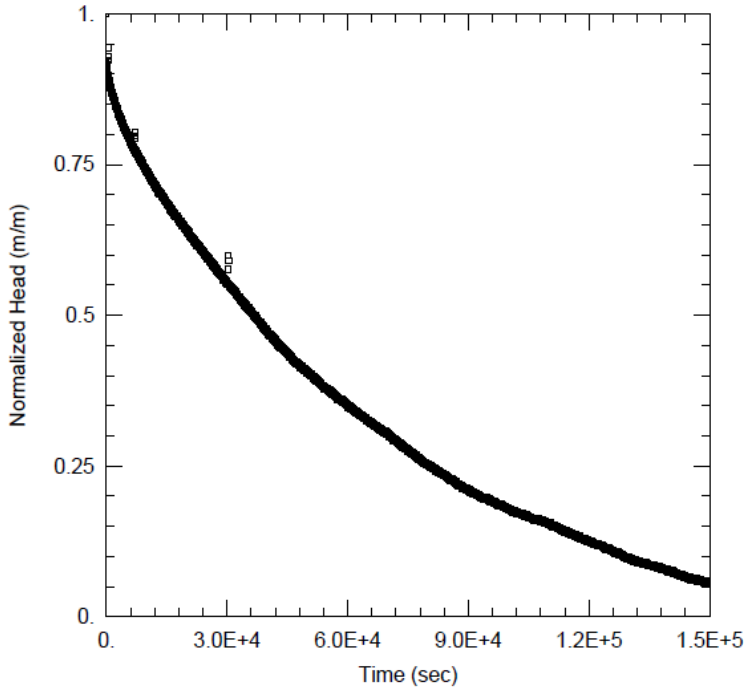
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

**TEST INFORMATION:**

Test Well: MW22-03B  
 Date of Test: September 6 to 8, 2022  
 Test Type: Rising Head Test  
 Test Method: Waterra Purge Rising Head Test

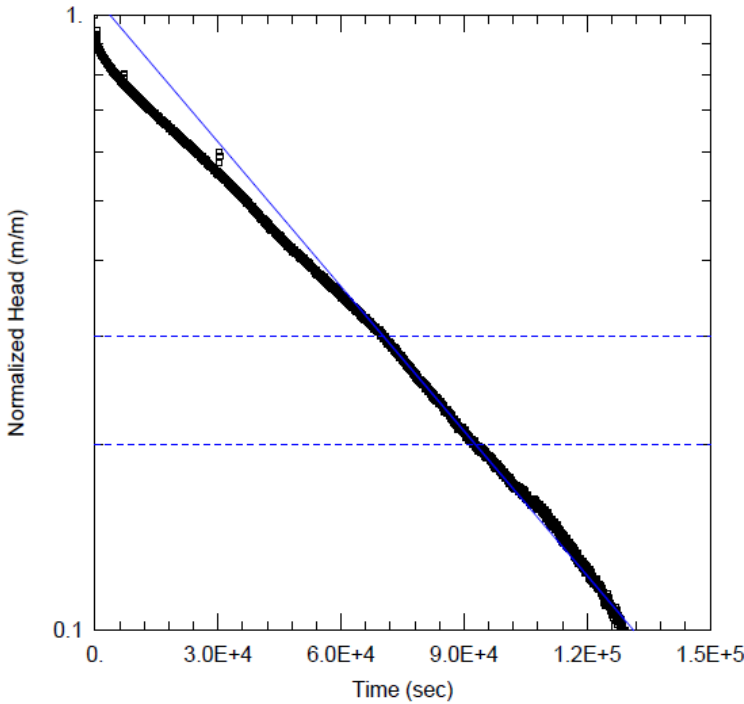
Static Water Level: 1.73 mbgs  
 Initial Displacement: 1.59 m

Casing Radius: 0.013 m  
 Borehole Radius: 0.079 m  
 Well Screen Interval: 4.57 m to 6.10 m  
 Geology: Silty Sand and Gravel Till



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Confined



Hydraulic Conductivity (K) =

**$3 \times 10^{-9} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT



YYYY-MM-DD 2022-10-12

PREPARED PGM

DESIGN PGM

REVIEW GWS

APPROVED ###

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MW22-03B**

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**J-07**

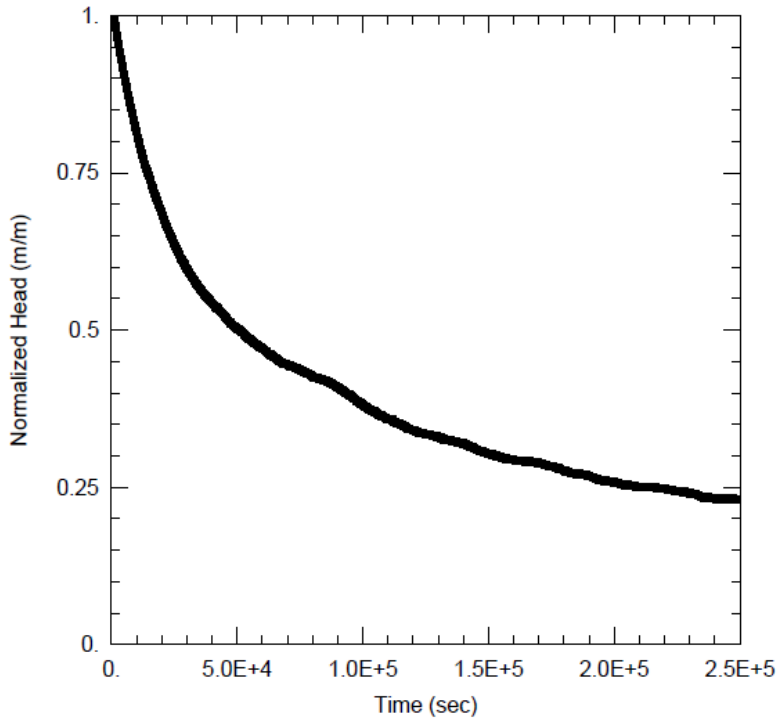
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

**TEST INFORMATION:**

Test Well: MP17  
 Date of Test: August 12 to 15, 2022  
 Test Type: Falling Head Test  
 Test Method: Pour In Falling Head Test

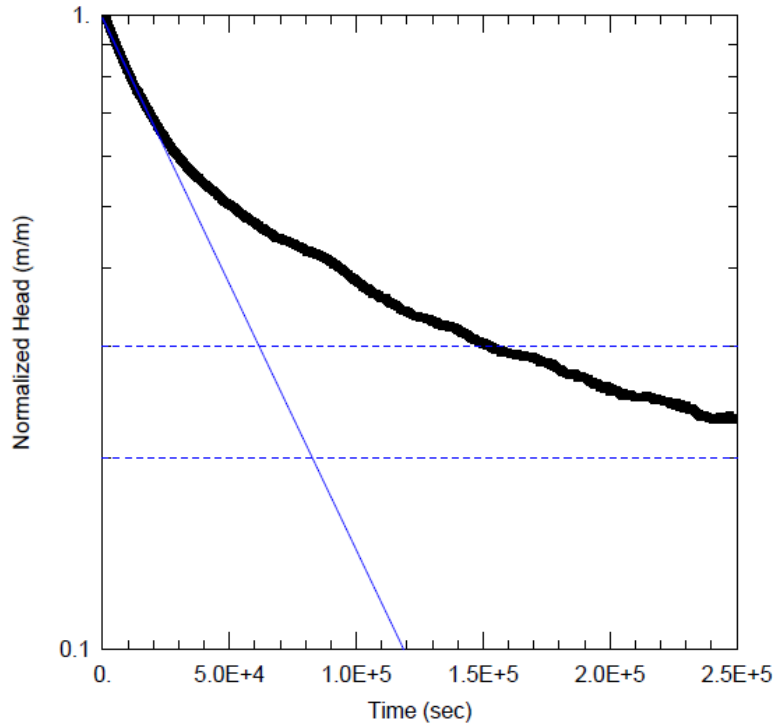
Static Water Level: 0.80 mbgs  
 Initial Displacement: 1.74 m

Casing Radius: 0.010 m  
 Borehole Radius: 0.013 m  
 Well Screen Interval: 0.90 m to 1.10 m  
 Geology: Silty Sand Till



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined



Hydraulic Conductivity (K) =

**$1 \times 10^{-8} \text{ m/s}$**

CLIENT

**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

CONSULTANT



YYYY-MM-DD 2022-10-12

PREPARED PGM

DESIGN PGM

REVIEW GWS

APPROVED ###

PROJECT

**CALEDON PIT / QUARRY**

TITLE

**SINGLE WELL RESPONSE TEST ANALYSIS MONITORING WELL MP17**

PROJECT No. 19129150

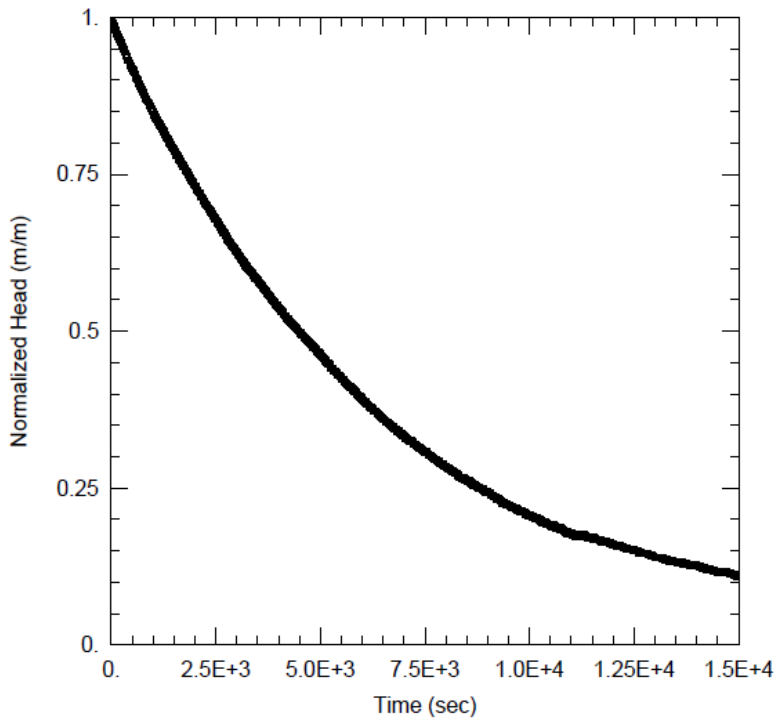
PHASE 2300

Rev. A

FIGURE J-08

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



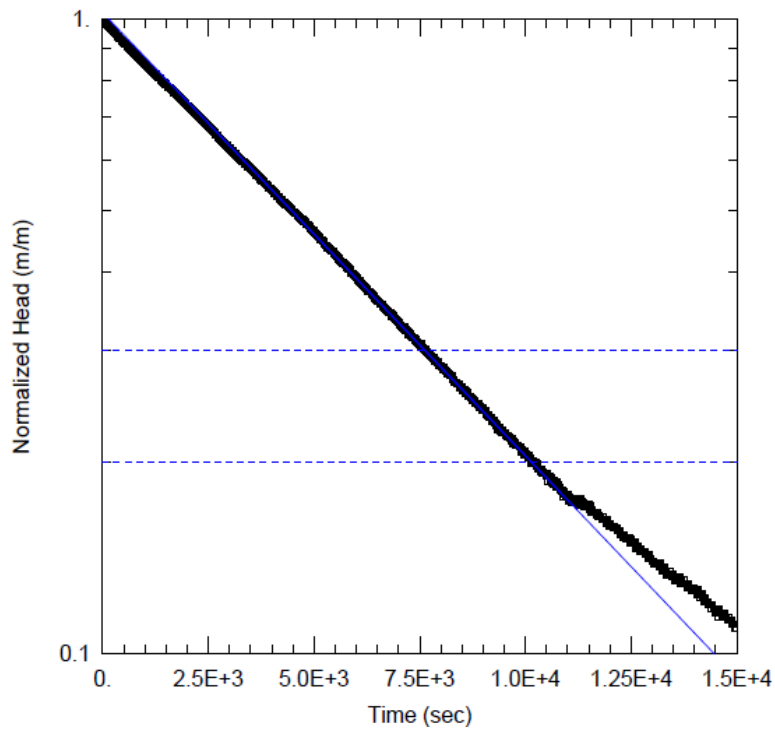


**TEST INFORMATION:**

Test Well: MP18  
 Date of Test: August 12, 2022  
 Test Type: Falling Head Test  
 Test Method: Pour In Falling Head Test

Static Water Level: 0.55 mbgs  
 Initial Displacement: 1.10 m

Casing Radius: 0.010 m  
 Borehole Radius: 0.013 m  
 Well Screen Interval: 1.35 m to 1.55 m  
 Geology: -



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$1 \times 10^{-7} \text{ m/s}$**

- Water Level Measurement
- Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-10-12

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MP18**



PREPARED PGM  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED ###

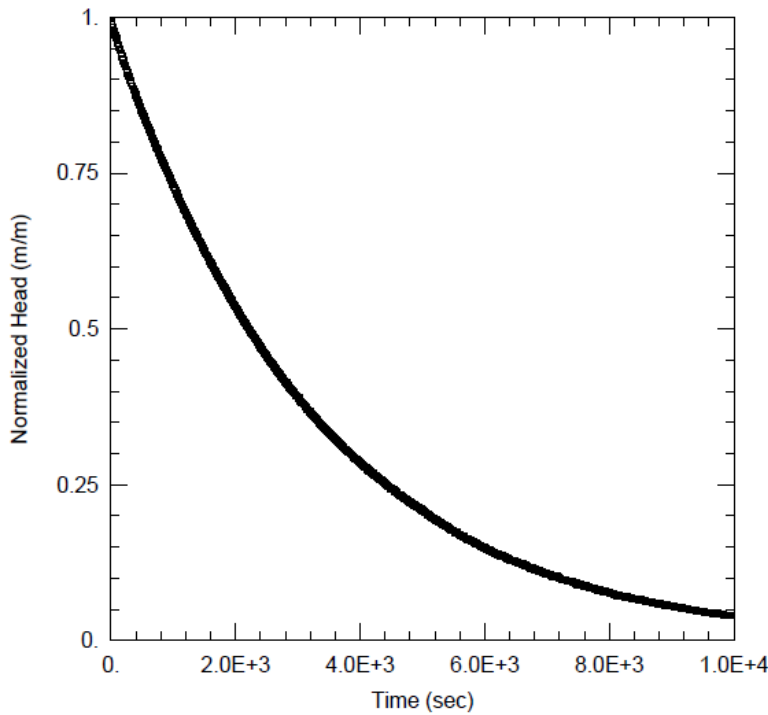
PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**J-09**

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI/A

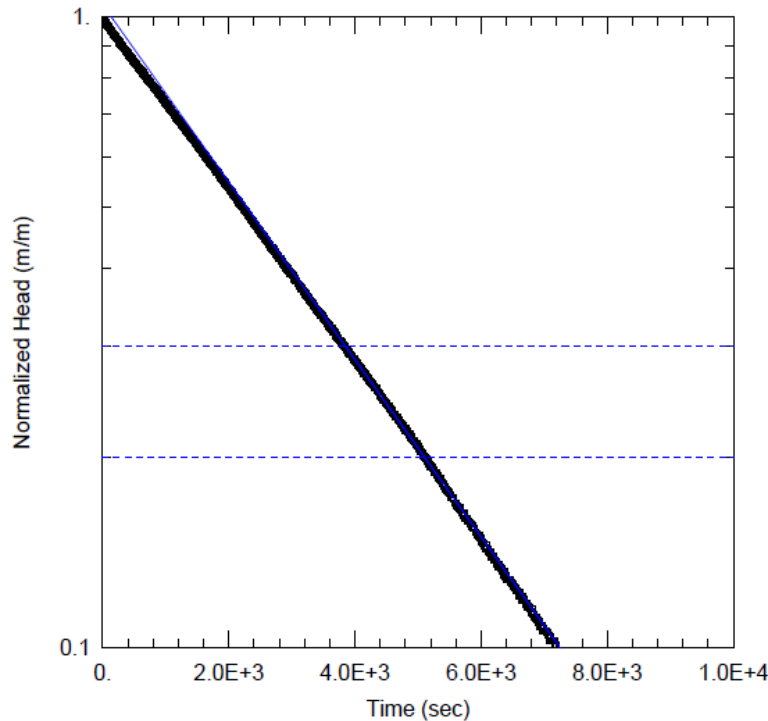


**TEST INFORMATION:**

Test Well: MP19  
 Date of Test: August 12, 2022  
 Test Type: Falling Head Test  
 Test Method: Pour In Falling Head Test

Static Water Level: 0.62 mbgs  
 Initial Displacement: 1.50 m

Casing Radius: 0.010 m  
 Borehole Radius: 0.013 m  
 Well Screen Interval: 1.01 m to 1.21 m  
 Geology: -



**SOLUTION:**

Solution Method: Bouwer-Rice  
 Solution Type: Zero Storage  
 Aquifer Model: Unconfined

Hydraulic Conductivity (K) =

**$2 \times 10^{-7} \text{ m/s}$**

□ Water Level Measurement  
 — Solution Match Line

CLIENT  
**CBM AGGREGATES (CBM), A DIVISION OF ST. MARYS CEMENT INC. (CANADA)**

PROJECT  
**CALEDON PIT / QUARRY**

CONSULTANT  
 YYYY-MM-DD 2022-10-12

TITLE  
**SINGLE WELL RESPONSE TEST ANALYSIS  
 MONITORING WELL MP19**



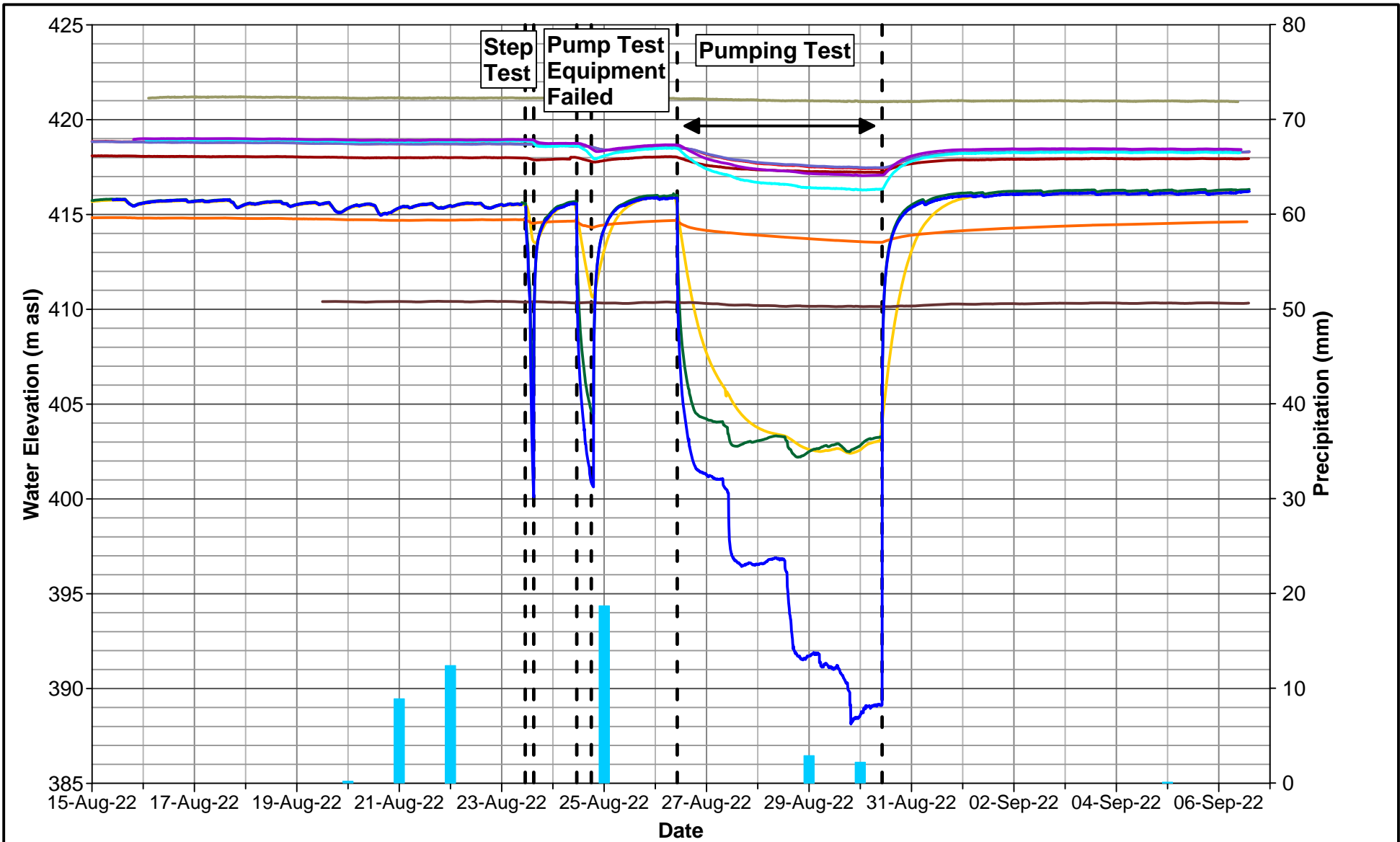
PREPARED PGM  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED ###

PROJECT No.  
**19129150**

PHASE  
**2300**

Rev.  
**A**

FIGURE  
**J-10**



- PW22-01    MW20-15A    MW20-16A    MW22-02A    MW22-03A
- PW21-1    MW20-15B    MW20-16B    MW22-02B    Precipitation (mm)
- MW21-1-3    MW20-15C

Notes:  
 1) Average pumping rate = 80.4 L/min  
 2) Precipitation data from Met Station ID 6157000

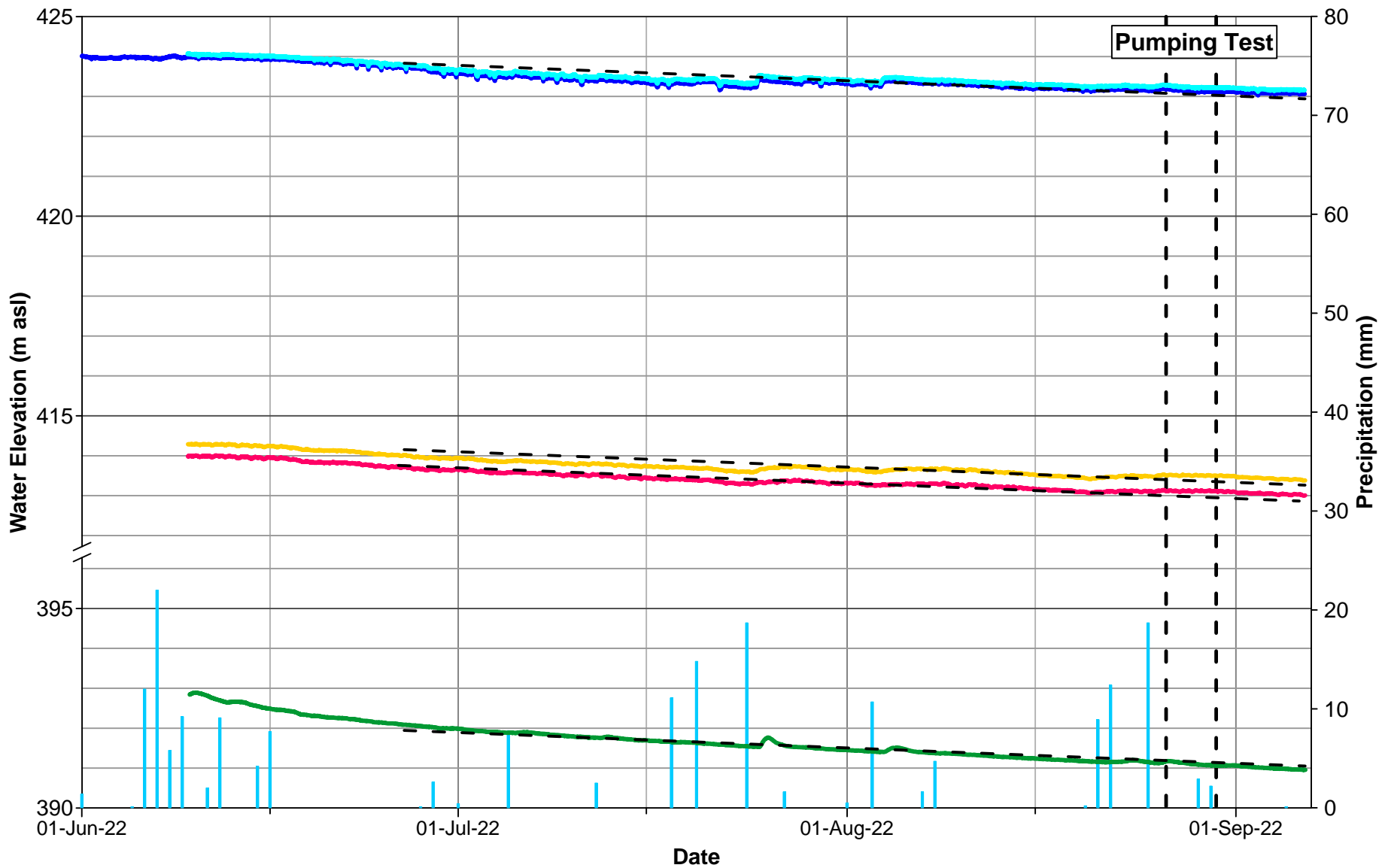


DATE	October 2022
DESIGN	PGM
REVIEW	GWS
APPROVED	GWS

PROJECT **CBM CALEDON QUARRY**

TITLE **PW22-01 PUMPING TEST GROUNDWATER ELEVATION**

PROJECT NO. 19129150	REV A	FIGURE J-11
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- Precipitation (mm)
- MW20-12A
- MW20-12B
- MW20-21A
- - Water Level Trend Line
- MW20-21B
- MW22-27A
- MW20-27B
- MW20-18

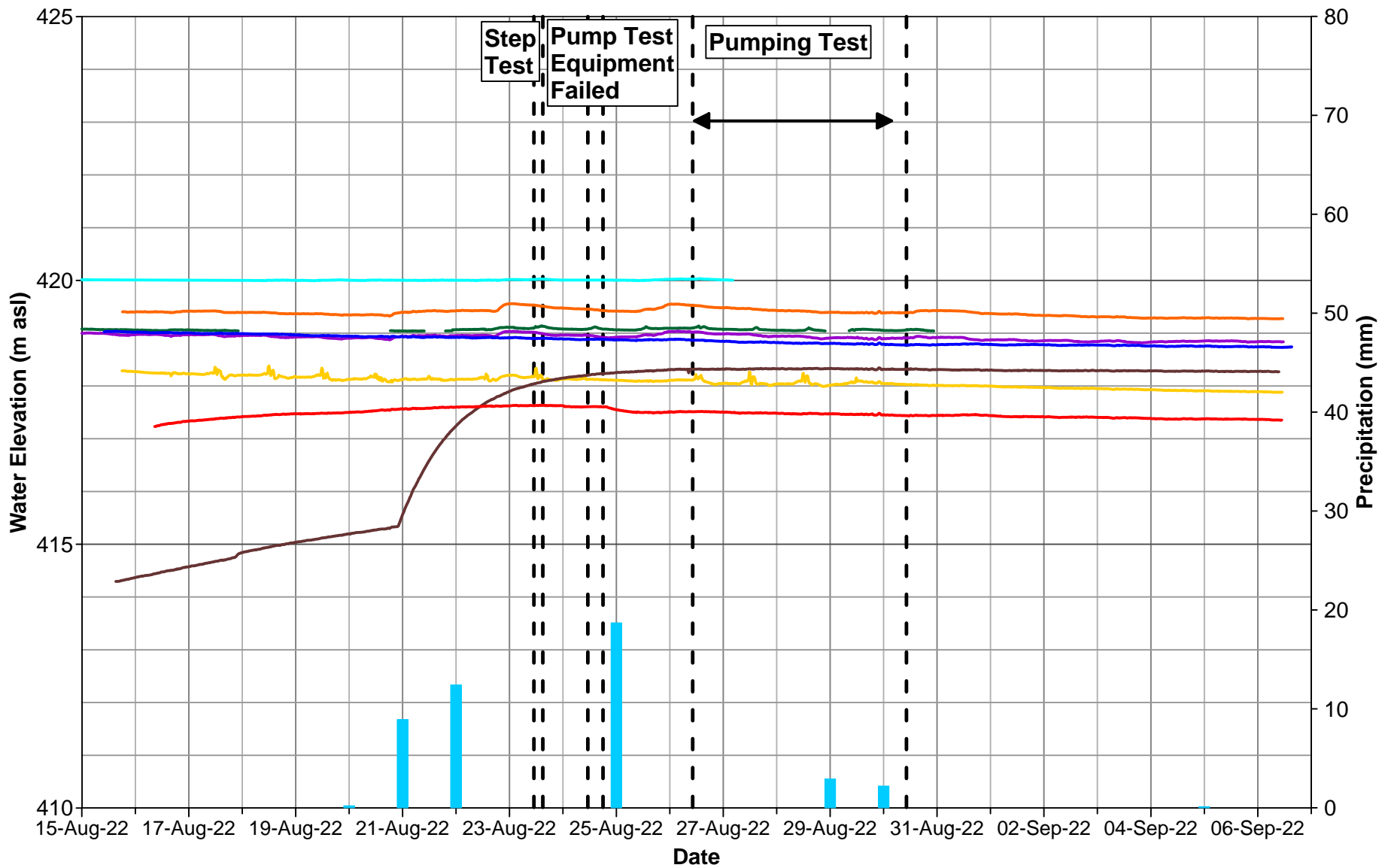


DATE	October 2022
DESIGN	PGM/ VRP
REVIEW	GWS
APPROVED	GWS

PROJECT **CBM CALEDON QUARRY**

TITLE **PW22-01 PUMPING TEST  
BEDROCK AQUIFER BACKGROUND  
GROUNDWATER ELEVATION**

PROJECT NO. 19129150	REV A	FIGURE J-12
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— MP17    — MP18    — SG19    — MW22-02C    ■ Precipitation (mm)  
— SG17    — MP19    — MW22-03B    — MW22-01

PROJECT **CBM CALEDON QUARRY**

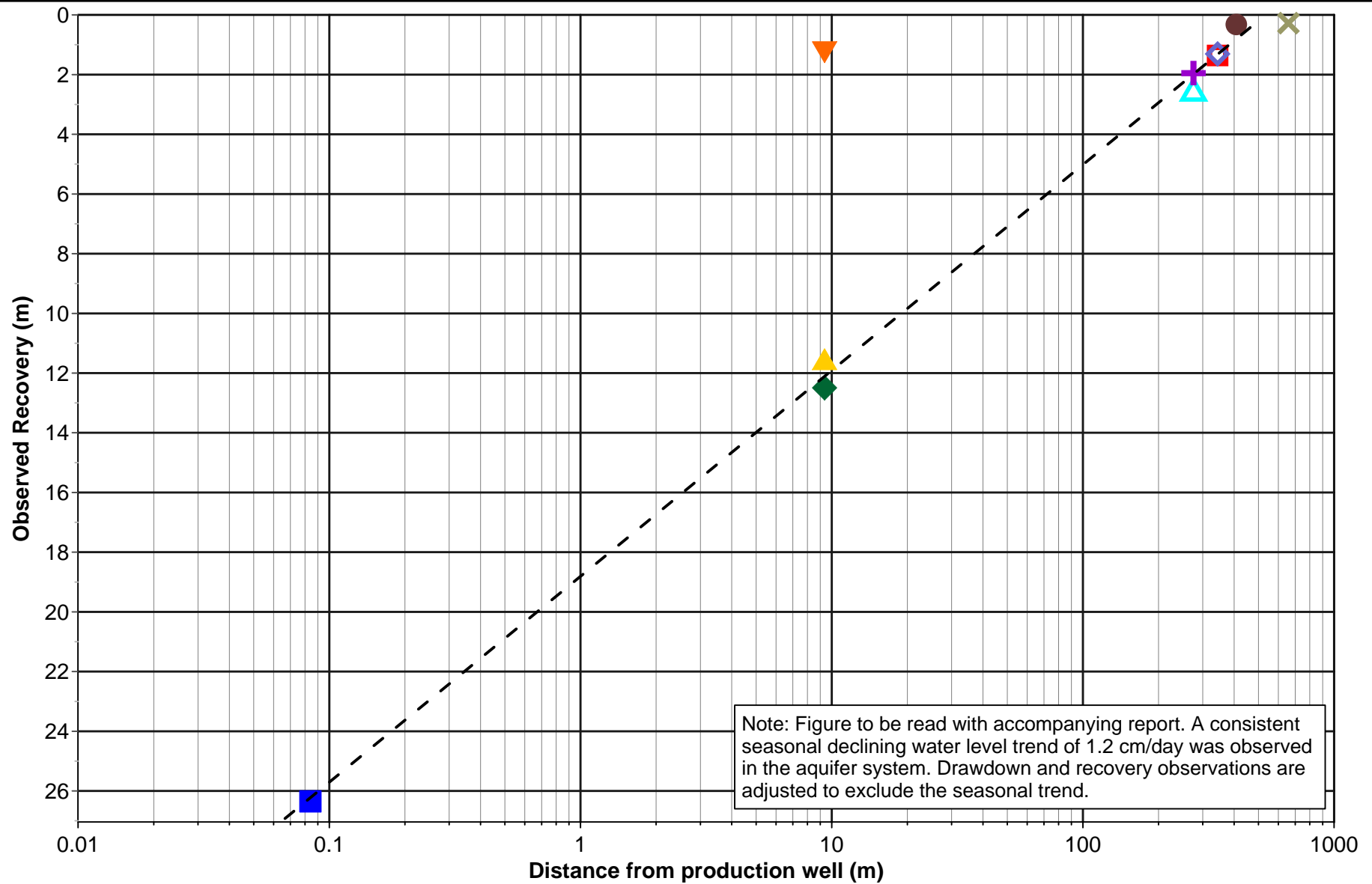
TITLE **PW22-01 PUMPING TEST  
OVERBURDEN GROUNDWATER  
AND SURFACE WATER ELEVATION**

Notes:  
 1) Average pumping rate = 80.4 L/min  
 2) Precipitation data from  
 Met Station ID 6157000



DATE October 2022  
 DESIGN PGM/ VRP  
 REVIEW GWS  
 APPROVED GWS

PROJECT NO. 19129150    REV A    FIGURE J-13



- ▲ MW20-15A    ◀ PW21-1    ◻ MW20-16A    ▲ MW22-02A    ✕ MW22-03A
- ◆ MW20-15B    ● MW21-1-3    ◇ MW20-16B    + MW22-02B    ■ PW22-01
- ▼ MW20-15C

PROJECT **CBM CALEDON QUARRY**

TITLE **PW22-01 PUMPING TEST  
DISTANCE VERSUS RECOVERY**



DATE October 2022  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED GWS

PROJECT NO.  
19129150

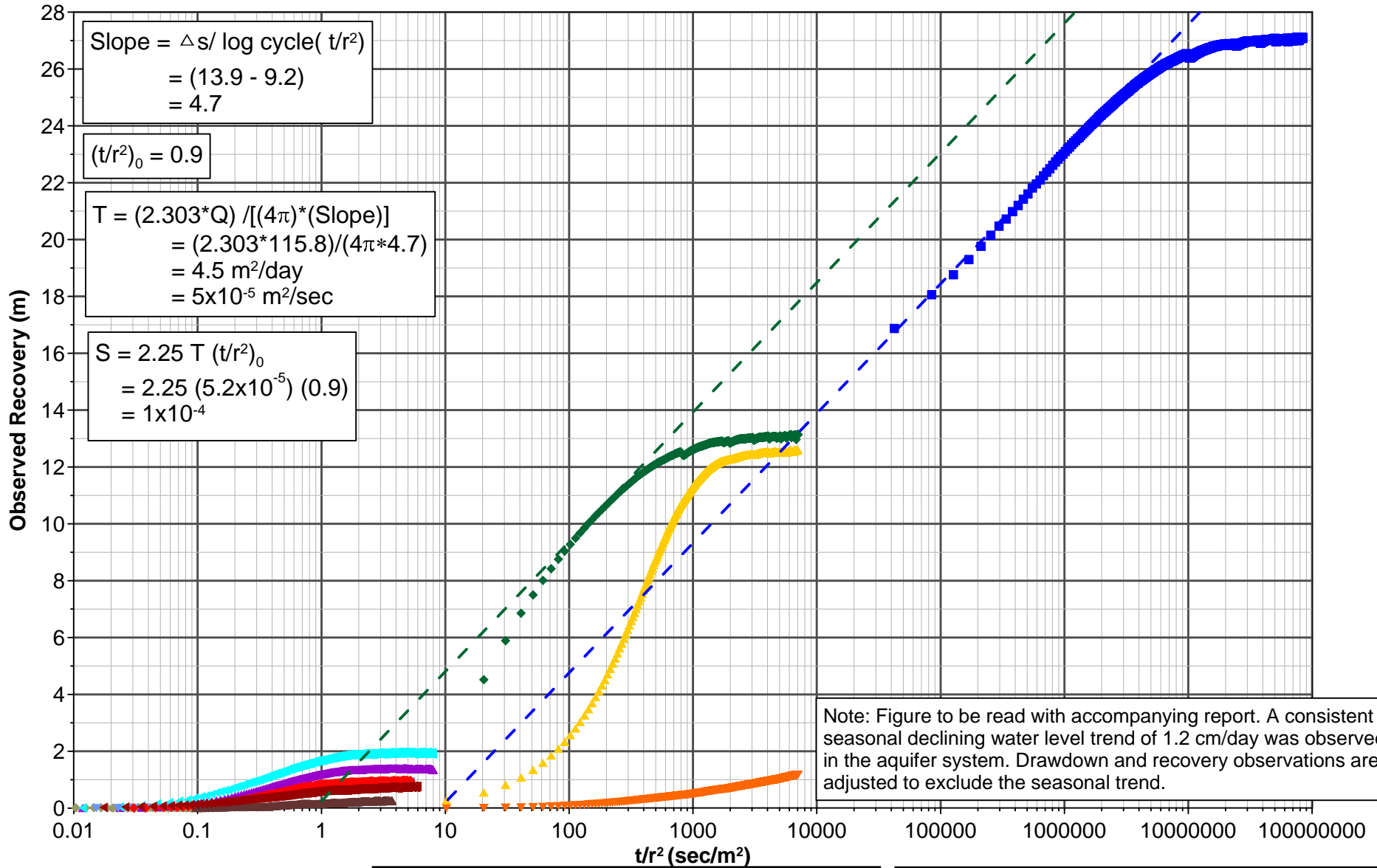
REV  
A

FIGURE  
J-14









- ▲ MW20-15A    ▲ PW21-01    ◆ MW20-16A    ▲ MW22-02A    ◆ MW22-03A
- ◆ MW20-15B    ▲ MW21-1-3    ▼ MW20-16B    ▲ MW22-02B    ■ PW22-01
- ▼ MW20-15C

PROJECT **CBM CALEDON QUARRY**

TITLE **PW22-01 PUMPING TEST  
t/r² VERSUS RECOVERY**



DATE October 2022  
 DESIGN PGM  
 REVIEW GWS  
 APPROVED GWS

PROJECT NO.  
19129150

REV  
A

FIGURE  
J-16

**APPENDIX K**

**Karst Assessment**

## Report on potential karst issues at the proposed Caledon Quarry Stephen R.H. Worthington, Ph.D., P.Geo.

### 1. Introduction

Karst is a geomorphological term that refers to a landscape that exhibits solutional erosion of outcropping bedrock and associated hydrological features such as sinking streams and springs. It is common on limestone and dolostone, which are moderately soluble, as well as on the more highly-soluble halite and gypsum rocks. All four rocks occur in Ontario, with limestone and dolostone often forming prominent escarpments such as the Niagara Escarpment, and halite and gypsum being so soluble that they have been completely dissolved away at the surface. Limestone and dolostone are collectively referred to as carbonate rocks. Dissolution of the bedrock enhances the hydraulic conductivity of carbonate rocks so that in some areas the hydraulic conductivity is high enough that carbonate aquifers are able to transmit the entire water surplus (i.e. precipitation minus evapotranspiration). In these situations there is an absence of surface streams. Where lower-hydraulic conductivity rocks or sediments are adjacent to limestone or dolostone, then streams that flow off the lower-hydraulic conductivity rock and onto the higher-hydraulic conductivity carbonate rocks may lose all their flow into the bedrock. Such streams are referred to as sinking streams. These streams often have low solute concentrations and substantial dissolution occurs when they flow onto carbonate bedrock, enlarging fractures to form conduits and sometimes caves. Many hundreds of sinking streams are known in southern Ontario, of which some dozens have known caves associated with them.

The solution of limestone and dolostone varies with the carbon dioxide concentration. In areas of bare rock, dissolved carbon dioxide in recharge water equilibrates with the 415 ppm concentration in the atmosphere, and the solubility limit is <50 mg/L. Where there are thick soils and a vegetation cover then plants and microorganisms can raise the soil water carbon dioxide to >1%, resulting in greater dissolution and solute concentrations are often >300 mg/L. Caves are more likely to be formed in limestone than in dolostone because the dissolution rate is about twenty times higher.

There are a range of definitions of the term "karst aquifer". There are five common ones (Worthington et al., 2017). The defining characteristic of the five definitions are that a karst aquifer is characterized by:

- a) the presence of caves
- b) a karstic landscape, or "karst terrain" on the surface
- c) the presence of turbulent flow in conduits
- d) the presence of hydraulic conductivities  $>10^{-6}$  m/s
- e) the presence of solutionally-enlarged fractures.

The use of different definitions can result on conflicting views on whether specific areas have karst aquifers. If any of the first three definitions is used than a majority of southern Ontario carbonate aquifers would not be classified as karstic. If the either of the last two definitions is used than a majority of southern Ontario carbonate aquifers would be classified as karstic. However, it is not the definition

that is important in evaluating an aquifer but rather how karst processes may have affected the functioning of the aquifer.

There are two major karst considerations associated with development on karst areas. The first is the extent of preferential flow paths, especially those associated with recharge at sinking streams. These result in faster groundwater velocities and less predictable flow directions than in lithologies that are less soluble, such as shale or sand. This is particularly the case where there are substantial (e.g. >10 L/s) sinking streams or springs.

A second karst consideration is that dissolution of the bedrock may result in an uneven bedrock surface and the possibility of collapse of voids created by dissolution. This creates a potential hazard for building structures in karst areas. However, this risk applies to built structures and so is not relevant to this quarry application.

## **2. Investigation of closed depressions and surface flow**

A site visit was carried out on April 23, 2020 to assess possible karst features. The timing was chosen because it was before the onset of seasonal growth of surface vegetation that might obscure karst features and because high water levels in both the groundwater and surface water features in April enable seasonally active flows to be assessed. The main focus of the investigation was to visit closed depressions, 15 of which had been identified within the project area from topographic mapping with a 1 m contour interval (Figure 1). Overburden thickness varies from <5 m over much of the centre of the project area to >10 m in the northern part of the site and to >20 m in the southern part of the site. Sediments vary from gravel and sand in the southern part of the site to sandy silt till to the north.

One closed depression (Figure 2 and location 2 on Figure 1) had standing water when visited on April 23, 2020. Several more depressions are also shallow, have gentle slopes, and lie within arable fields (e.g. Figures 3, 4, 5, and 7). The small depression shown in Figure 6 has somewhat steeper sides. The origin of all of the depressions appears to have been from the uneven deposition of the glacial and fluvio-glacial sediments. No evidence of concentrated surface flow into any of the depressions was found. This is not surprising, given the coarse-grained nature and thus high hydraulic conductivity of the overburden sediments. One depression (Figure 5) has field stones in the center of the depression. However, the lack of vegetation in this area does suggest that the depression does flood at times. This inference was supported by checking the 17 historical images available in Google Earth. Consequently, it is concluded that none of the depressions in the project area deliver concentrated recharge into the subsurface and thus do not perform a karstic function.

An important consideration in a karst assessment is whether there are substantial sinking (or losing) streams. In the Caledon investigation, there is a wetland (the Northwest Wetland) at an elevation of 420-421 m, which is >30 m higher than the Credit River some 2 km to the east. Accordingly, it was thought likely that groundwater flow would predominantly be to the east in the northern part of the site, and it was possible that there might be a sinking stream at the eastern end of the wetland. This part

of the wetland was visited on April 23, 2020, and it was found that flow in the wetland was towards the creek to the west, and no evidence of any sinking stream was found. Subsequent investigations showed that the water-table contours are smooth and that the hydraulic conductivity in this area is fairly low (Gasport zone GP6:  $K_h = 1E-7$  m/s). These are both indications that there is an absence of the preferential flow that would be expected if there were a sinking stream in the wetland.

### **3. Investigations during pumping tests**

#### **3.1 Tracer tests**

Four four-day pumping tests were carried out in the project area in August and September 2021. It was planned to carry out tracer tests from nearby monitoring wells to each pumping well if drawdowns in the wells indicated that the tracer test would probably succeed. In the event, tracer injections were made during three of the four pumping tests. It was decided to not perform a tracer test at the PW21-4 cluster due to the small response at the monitoring wells during the first day of the pumping test. Sodium fluorescein (uranine) was chosen as the tracer due to its high detectability and low toxicity. The mass injected was calculated from equations developed by Worthington and Smart (2016).

##### **3.1.1. Pumping test at PW21-1 cluster**

A four-day pumping test took place at PW-21-1, starting on September 20, 2021 at 12:00. A mass of 0.76 g of sodium fluorescein was injected into MW21-1-1 at 14:27, following which 80 litres of water was siphoned into the well over the following 20 minutes to ensure that the tracer was flushed out of the well and into the aquifer. Initial manual sampling at the pumping well took place at one minute intervals, reducing to 5 minute intervals after 30 minutes, and ten minutes intervals after two hours. Manual sampling was discontinued at 17:50, when an Isco model 3700 24-bottle water sampler started to collect samples at 40 minute intervals was installed at the pumping well. The following day the Isco was reprogrammed to collect samples every three hours for the last three days of the pumping test.

Dye concentrations were measured on site with a Turner Designs Picofluor filter fluorometer, and following the end of the test all samples were measured under lab conditions. Tracer test results are shown in Figure 8a. The dye arrived at the pumping well after 1.25 hours, reached a peak after 8.7 hours, and thereafter followed an approximately exponential recession.

##### **3.1.2. Pumping test at PW21-2 cluster**

A four-day pumping test at PW-21-2 started on August 10, 2021, but small drawdowns at monitoring wells resulted in a delay in dye injection until 14:22 on August 11. A mass of 0.26 g of sodium fluorescein was injected in MW21-2-1, following which 60 litres of water was injected over the following 85 minutes to flush the dye into the aquifer. Initial sampling took place at about 5 minute intervals, with the Isco collecting samples at 40 minute intervals over the first night and then at 2 hour intervals over the last two days of the test.

The main dye breakthrough curve started after 4.1 hours, reaching a peak after 15.8 hours, followed by an exponential decline in dye concentration (Figure 8b). There were also two sharp and short-lived



earlier peaks, with the first starting 0.88 hours after tracer injection. It is thought that these are associated with the flushing of the dye into the aquifer. The flushing consisted of three slugs, each of 20 litres, which would have raised the water table in PW-21-2 and may have activated a preferential flow path for a short period that could have carried a small fraction of the dye to the pumping well.

### **3.1.3. Pumping test at PW21-3 cluster**

A tracer test was also carried out at the PW3 well cluster, where MW21-3-1 served as the as the pumping well. Injection of 0.922 g of sodium fluorescein into PW21-3 took place at 12:00 on August 25. Sampling protocols were similar to the other tracer tests, with 98 samples being collected, but no dye was detected in the pumping well. At the end of the test, a sampling at the injection well gave a dye concentration of 6925 ppb, giving a mass of 0.794 g of sodium fluorescein still in the well. Thus some 86% of the dye injected had not moved out of the injection well, indicating the very low hydraulic conductivity of this well.

## **3.2 Electrical conductivity profiling**

A series of electrical conductivity (EC) profiles were measured at the PW21-1, PW21-2, and PW21-3 clusters, using a Heron Instruments conductivity meter. Profiles were measured at the monitoring wells before the pumping tests started and thereafter during the tracer tests. A total of 41 profiles were measured at 11 wells (Figure 9, 10, and 11). Measurements were usually made at 1 m intervals, with closer-spaced measurements being made where there were substantial changes in EC values.

Results show a number of distinctive characteristics which are typical of bedrock aquifers dominated by fracture flow. Notable characteristics include:

- a) the combination of minimal changes over most of the profiles due to vertical flow with the well between horizontal bedding plane fractures with different heads.
- b) substantial changes over narrow intervals due to substantial fracture flow and varying fractures flow EC.
- c) a substantial decrease in the EC in the top 2 m of MW21-1-1 on September 21, 2021. This followed heavy overnight rain.
- d) contrasts at the bottom of MW21-1-2, MW21-1-3, MW21-2-1, MW21-2-2, MW21-2-4, PW21-3

## **4. Correlation with other site investigations**

### **4.1 Proportions of surface flow and groundwater flow in the study area**

Long-term measurements of flow in the Credit River are made to the east of the site. The average flow for the period 1915 to 2020 was 1.79 m<sup>3</sup>/s. The average discharge per unit area is known as the specific discharge. For the 209 km<sup>2</sup> catchment area of the Credit River, the specific discharge is 8.6 L/s/km<sup>2</sup>. This is shown in Figure 12, along with specific discharges for 16 much smaller catchments gauged by Golder Associates. Most of these have values <8.6 L/s/km<sup>2</sup>, and are shown with a pink background. Low values represent recharge from the surface to groundwater, and this reflects the high hydraulic conductivity of both the sediments and the bedrock in the area. Higher values than the specific discharge in the Credit River are shown with a blue background, and represent groundwater discharge areas. Two are to the

east of the site and represent low-elevation groundwater discharge. The third site is two kilometres to the west of the site, and also represents an area where the groundwater catchment is larger than the surface water catchment.

#### 4.2 Preferential flow in the bedrock aquifer

Carbonate aquifers sometimes have large conduits in which flow is turbulent rather than laminar. The high hydraulic conductivity in such conduits often results in there being troughs in the water table, with convergent flow to the troughs. Turbulent flow in a conduit results in much larger seasonal changes in water levels than if flow were laminar. This is because the water level change is proportional to the square root of the hydraulic gradient if flow is turbulent, but is proportional to the gradient if flow is laminar (Worthington and Soley, 2017).

There is a trough in the water table on the western site of the site, and it defined by five well along or close to Mississauga Road, MW 20-01, MW20-15, MW20-17, MW20-18, and MW20-27. Groundwater levels in the bedrock at times of high levels in April 2021 and low levels in September 2021 are shown in Figure 13. The difference in water levels at these two times at the five wells are 1.52 m, 0.90 m, 0.65 m, 2.21 m, and 0.80 m, respectively. These values are not consistently much greater than elsewhere on the site, and so it is concluded that there is no conduit with turbulent flow in this area.

#### 4.3 Fracture apertures from tracer tests and packer tests

The results from the tracer tests and packer tests can be correlated by calculating fracture apertures. The first method is to use the cubic law (Domenico and Schwartz, 1998, p. 50):

$$Q = \rho g b^3 w i / 12 \mu \quad (1)$$

where  $Q$  is discharge,  $\Delta$  is the density of water,  $g$  is gravitational acceleration,  $b$  is fracture aperture,  $w$  is fracture width, and  $\mu$  is dynamic viscosity. This equation can be combined with the continuity equation  $Q = vA$ , where  $v$  is groundwater velocity in the fracture and  $A$  is fracture cross-sectional area ( $= wb$ ), to give

$$b = (12 \nu \mu / \rho g i)^{1/2} \quad (2)$$

Calculated fracture apertures from the two tracer tests are shown in Table 1.

**Table 1 Calculated fracture apertures from tracer tests**

Injection well	Recovery well	Traced distance (m)	Elapsed time to tracer peak (hours)	Groundwater velocity (m/d)	Hydraulic gradient	Fracture aperture (mm)
MW21-1-1	PW21-1	10.7	8.7	29.5	0.54	0.032
MW21-2-1	PW21-2	11.3	15.8	17.2	0.62	0.023

The second method is to use transmissivity ( $T$ ) measurements from the packer tests (Novakowski et al., 2016), using the cubic law

$$T = \rho g b^3 / 12: \tag{3}$$

Equation 3 was applied to the 81 packer tests in 44 wells carried out at the site in the Gasport Formation. Results are shown in Figure 14. In both cases, most calculated fracture apertures are between 0.1 mm and 1 mm, with a minority up to several millimetres in diameter.

#### 4.4 Groundwater modelling

Groundwater models provide a useful tool for understanding aquifer behaviour because they synthesize available data to provide a coherent explanation of groundwater flow and transport. This is particularly the case in carbonate aquifers due to dissolution preferentially enlarging some fractures. If wells encounter solutionally-enlarged fractures then they can have high hydraulic conductivities. Conversely, if a well does not encounter any solutionally-enlarged fractures then it can have very low hydraulic conductivity. Regional groundwater models are calibrated principally on the water levels in wells and the flow through the aquifers, and give estimates of hydraulic conductivity over much broader areas than individual well tests. However, measurements at a local scale using pumping tests, packer tests, and single well response (slug) tests are a useful complement for understanding the detailed local permeability variation in the aquifer.

Hydraulic conductivity in carbonates is highest where there is the most dissolution. The most obvious place where dissolution takes place is in the uppermost bedrock, where infiltration from rainwater has low solute concentrations and consequently there is substantial dissolution. Consequently a high-hydraulic conductivity zone develops here, which is referred to as the weathered zone or epikarst. This is present in the Caledon model, where its horizontal hydraulic conductivity ( $K_h$ ) varies from  $5E-6$  to  $1E-3$  m/s.

Deeper in the bedrock, the major factor determining hydraulic conductivity is the specific discharge (i.e. the flow per unit of cross-sectional area). In an aquifer such as at Caledon there is an increase in flow in

a downgradient direction as a result of there being more recharge to the aquifer than discharge from the aquifer to creeks, except at the downgradient termination of the Gasport where it discharges to the Credit River. Such a flow pattern in a sand would result in increasing hydraulic gradients, giving a convex water table. However, in limestone and dolostone the increase in flow results in an increase in hydraulic conductivity, so the convexity of the water table is less than in a sand and may be flat or concave, especially for long flow paths (>10 km). This is well established and widespread (Worthington, 2009; Worthington and Foley, 2021). In the Caledon model this is seen in higher hydraulic conductivity (1E-5 m/s) in the downgradient GP4 and GP5 than further upgradient (e.g. 1E-7 m/s in GP2). However this is not ubiquitous; the downgradient GP6 has low K (1E-7 m/s).

The third dissolution effect seen at the site is a groundwater trough identified in particular at three wells along Mississauga Road - MW20-01, MW20-17, and MW20-18. Flowlines converge on groundwater troughs and this increases the specific discharge and hence there is more dissolution and the hydraulic conductivity increases. This trough has the highest Kh values at the site in both the Gasport (GP4: 1E-5 m/s) and in the overlying weathered zone (WB4: 1E-3 m/s).

The above explanation broadly accounts for the variation in hydraulic conductivity across the site. It shows that the calibration of the groundwater model on flow and water level data provides an excellent way to determine regional hydraulic conductivity.

## **5. Conclusions**

The karst investigation found that dolostone aquifer on the study area is a typical of such aquifers where there is fairly thin overburden, which allows substantial recharge to enter the bedrock. Such distributed recharge results in pervasive dissolution of fractures, with most enlarged fractures having apertures of 0.1 mm - 3 mm. This results in the aquifer having a predictable to response to large-scale stresses such as quarry development.

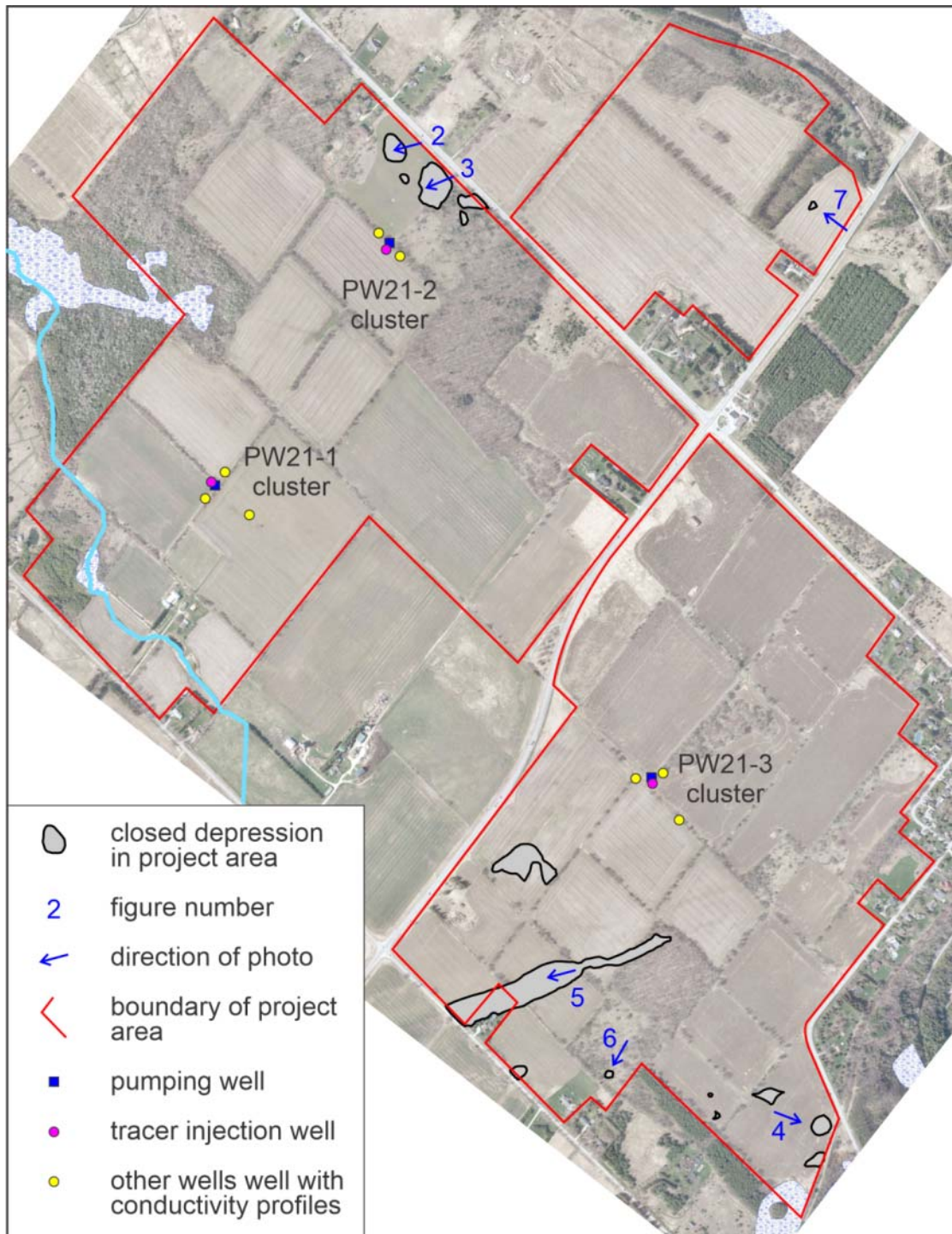
## **References**

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Worthington, S.R.H., and Foley, A.E., 2021. Development of spatial permeability variations in English chalk aquifers. Geological Society, London, Special Publications, 517.

Worthington, S.R.H., and R.W.N. Soley. 2017. Identifying turbulent flow in carbonate aquifers. Journal of Hydrology 552: 70-80.

Worthington, S.R.H, P-Y. Jeannin, E.C. Alexander, Jr., G. J. Davies, and G.M. Schindel, 2017, Contrasting definitions for the term 'karst aquifer'. Hydrogeology Journal, 25(5), 1237-1240.  
10.1007/s10040-017-1628-7.



**Figure 1. Orthophotography of the project area, showing locations of tracer tests, electrical conductivity profiles, and closed depressions identified from 1 m contour interval mapping. Numbers 2 to 7 refer to the photos shown in Figures 2 to 7, respectively.**





**Figure 2. Looking west from Main Street (Regional Road 136) across a closed depression with ponded surface water on April 23, 2020 (location 2 on Figure 1).**



**Figure 3. Looking west from Main Street (Regional Road 136) across a closed depression (with darker vegetation) on April 23, 2020 (location 3 on Figure 1).**



**Figure 4. Looking southeast towards a closed depression on April 23, 2020. (location 4 on Figure 1).**



**Figure 5. Looking west to a closed depression filled with field stones(location 5 on Figure 1).**

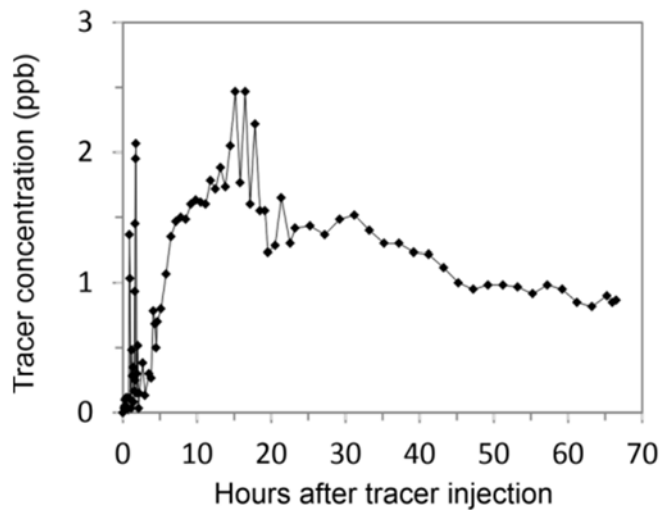
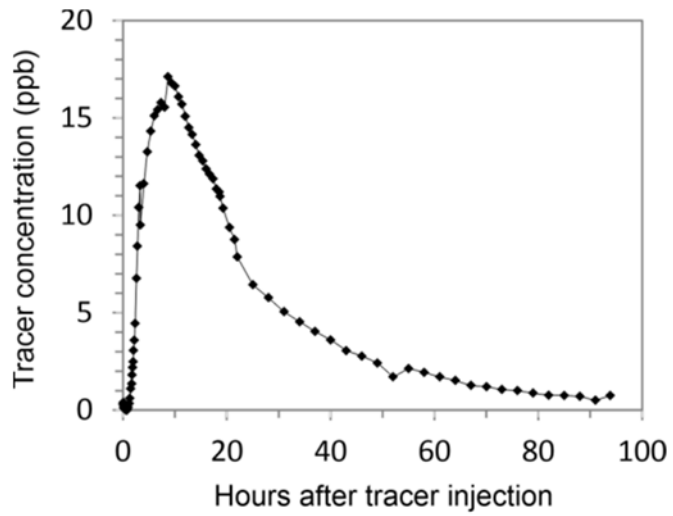




**Figure 6. Looking southwest to a closed depression with willow saplings, just behind the pine tree (location 6 on Figure 1).**



**Figure 7. Looking northwest from Charleston Sideroad (Regional Road 24) (location 7 on Figure 1).**



**Figure 8. Tracer test results:**

**(top) From MW1-1 to PW21-1, starting on September 20, 2021.**

**(bottom) From MW2-1 to PW21-2, starting on August 11, 2021.**

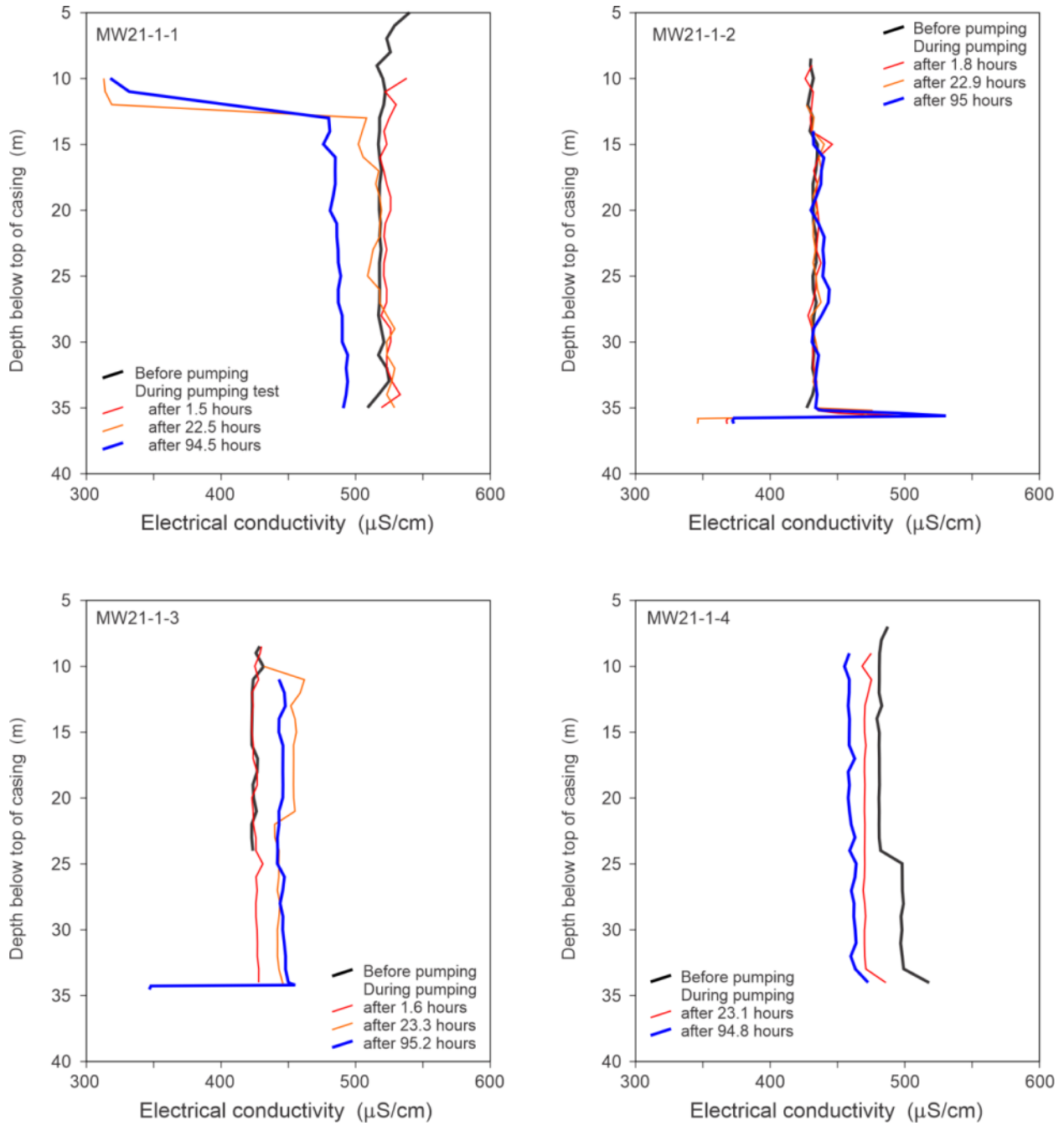
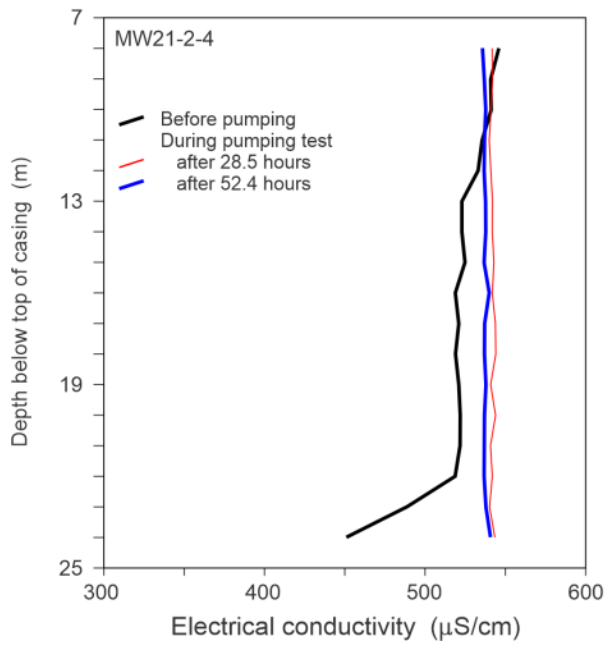
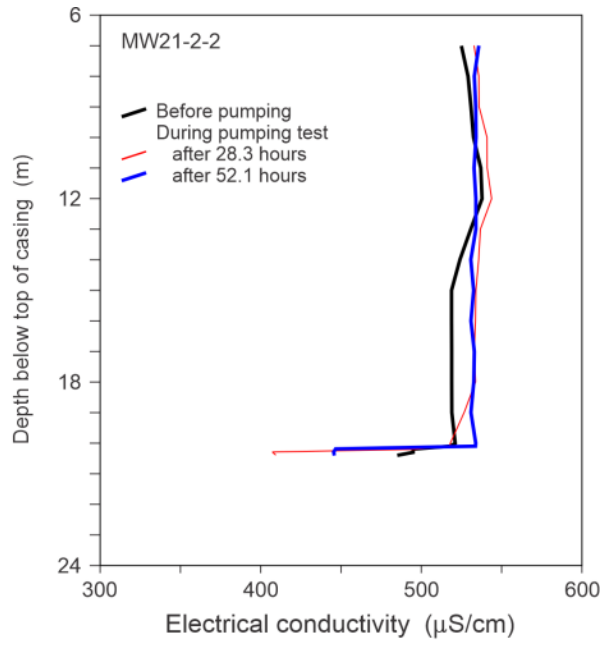
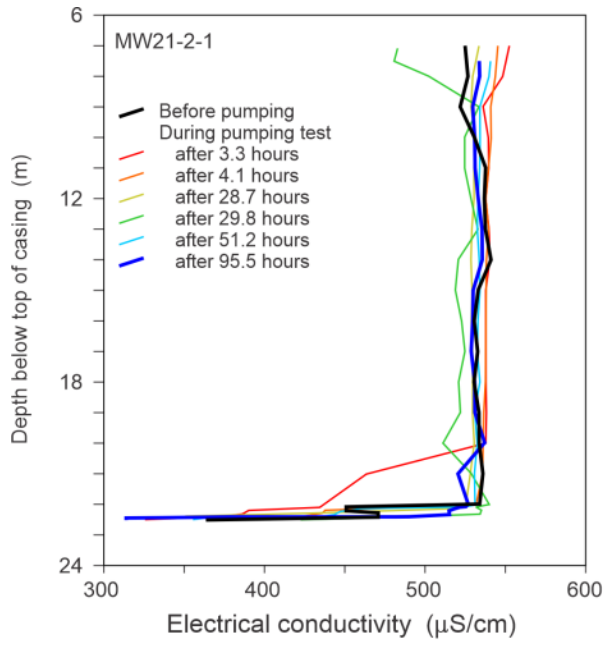
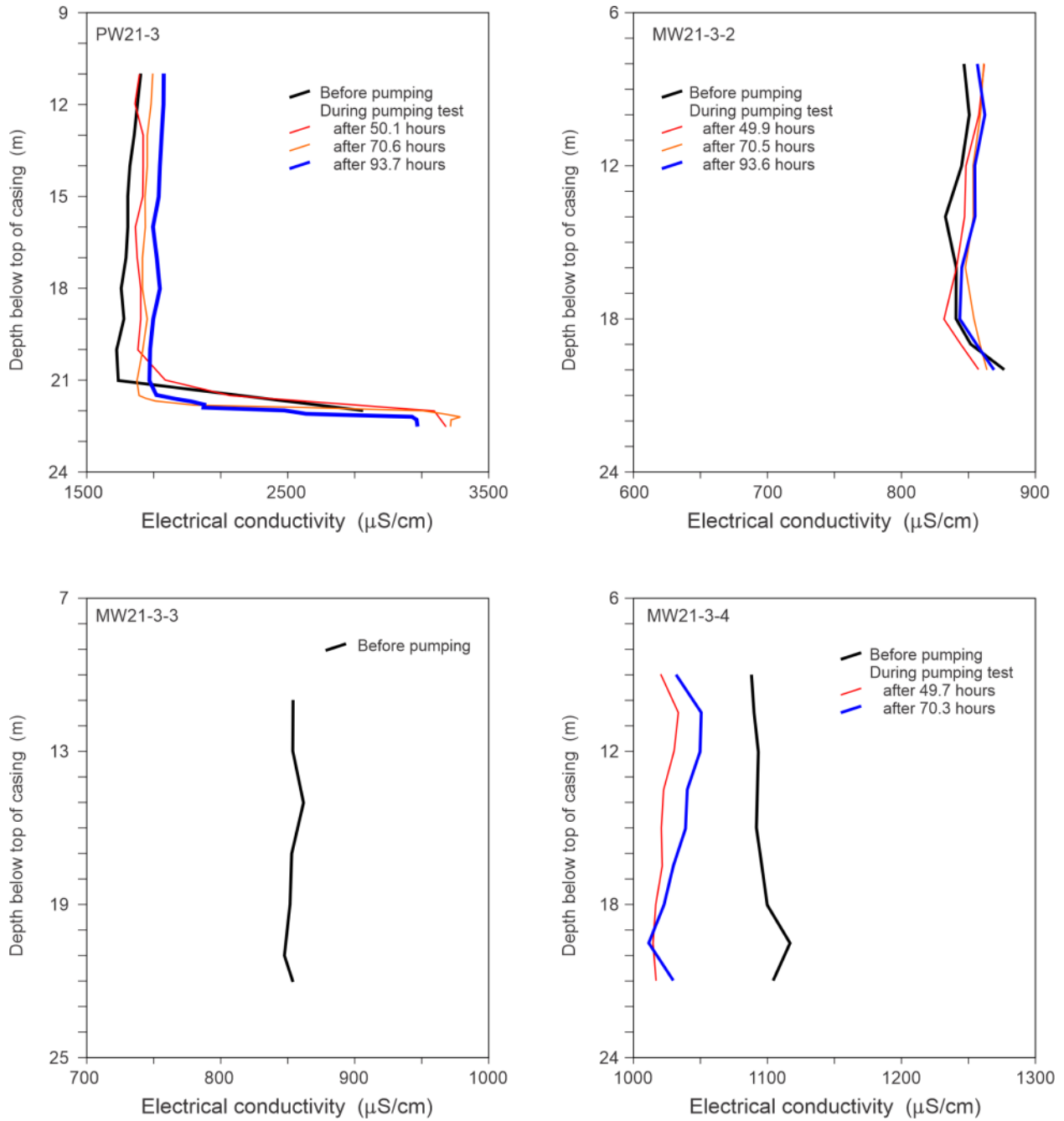


Figure 9. Electrical conductivity profiles at the PW21-1 cluster during the pumping test

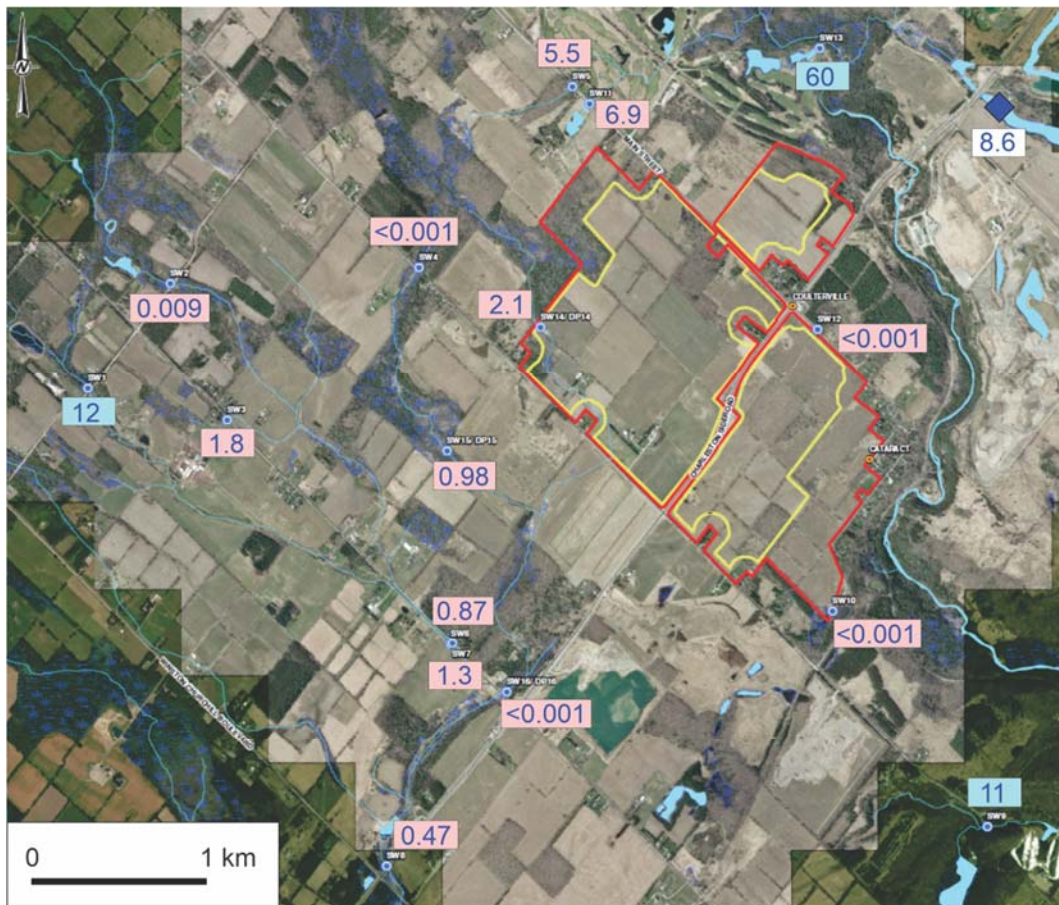


**Figure 10. Electrical conductivity profiles at the PW21-2 cluster during the pumping test**





**Figure 11. Electrical conductivity profiles at the PW21-3 cluster during the pumping test**



- ◆ Water Survey of Canada gauging station on Credit River
- 8.6 Specific discharge for catchment of gauging station ( $L/s/km^2$ )
- 1.8 Specific discharge at station with substantial flow loss to groundwater flow
- 12 Specific discharge at station with substantial gain from groundwater flow

**Figure 12. Specific discharge at stream gauging stations in the study area, showing values calculated for the 16 stations monitored by Golder Associates plus the Water Survey of Canada station on the Credit River.**

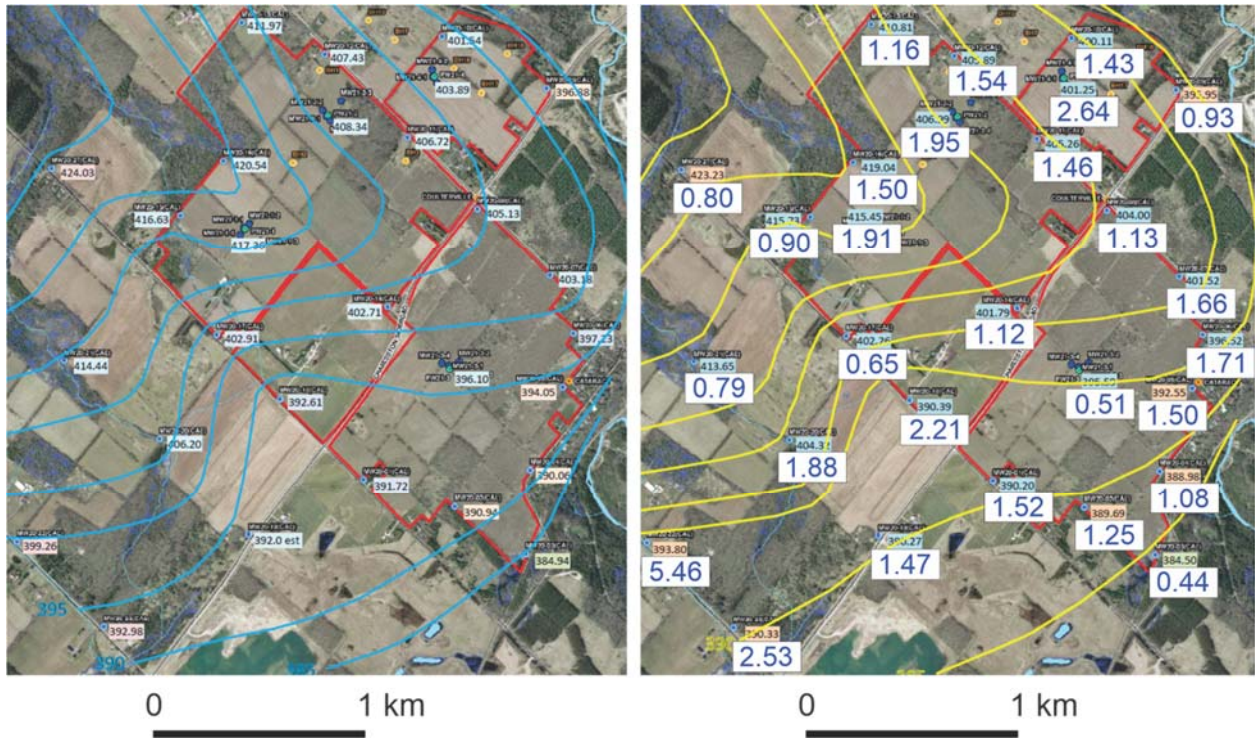


Figure 13. Inferred bedrock groundwater levels in April 2021 (left) and September 2021 (right). The differences in water levels between the two values are shown in blue on the right-hand figure.

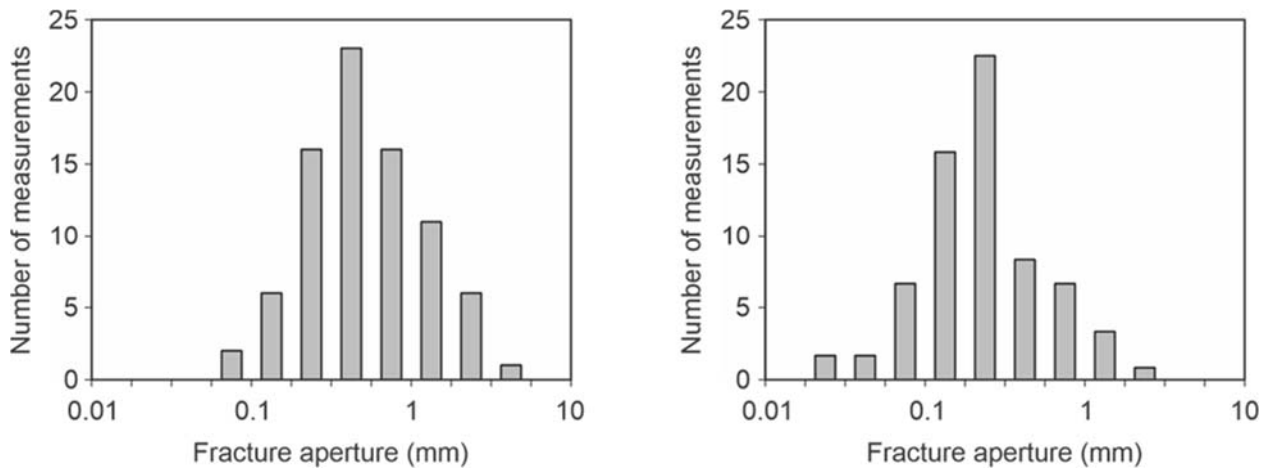
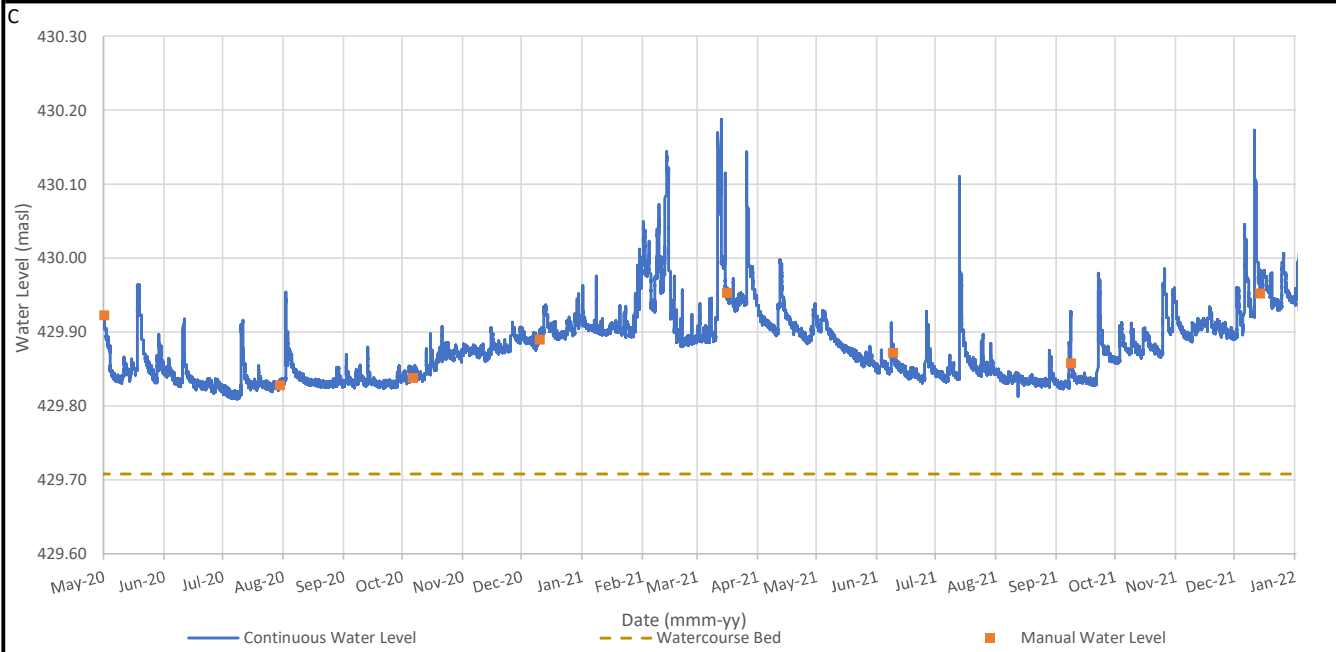
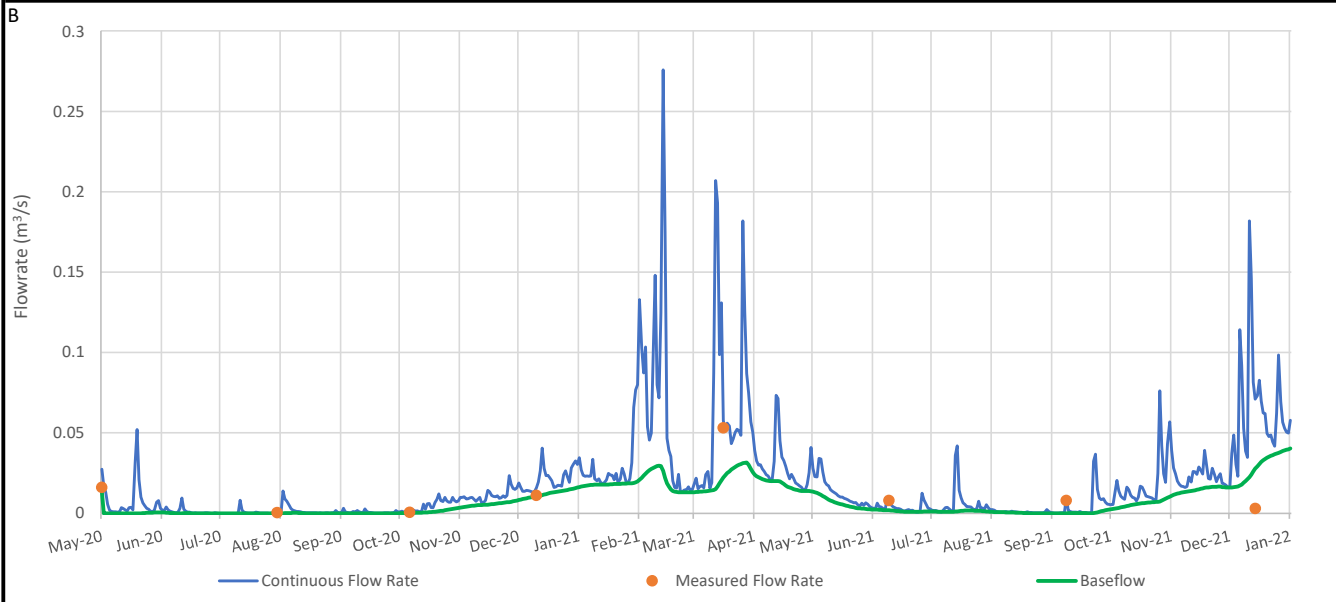
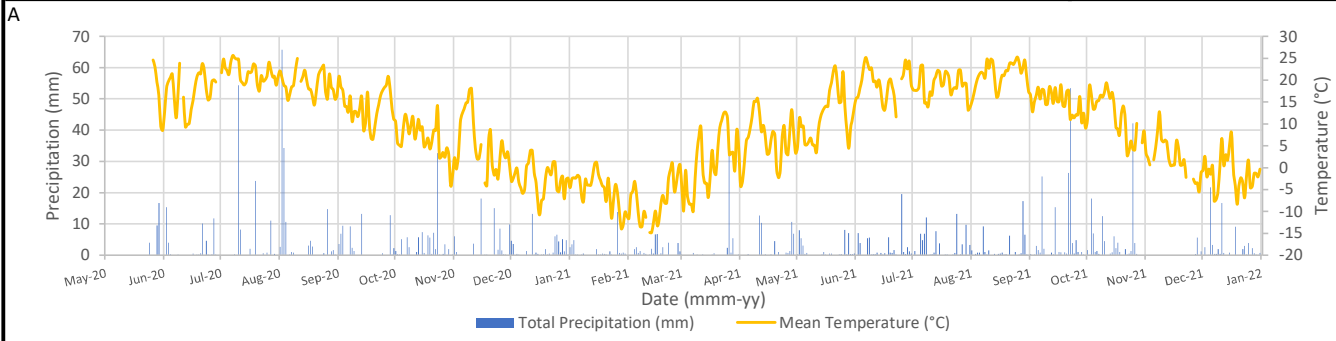


Figure 14. Calculated fracture apertures derived from packer testing using the cubic law, based on the assumption that all flow is through a single constant-aperture fracture per packer test intervals (left), and through ten fractures with identical apertures (right).

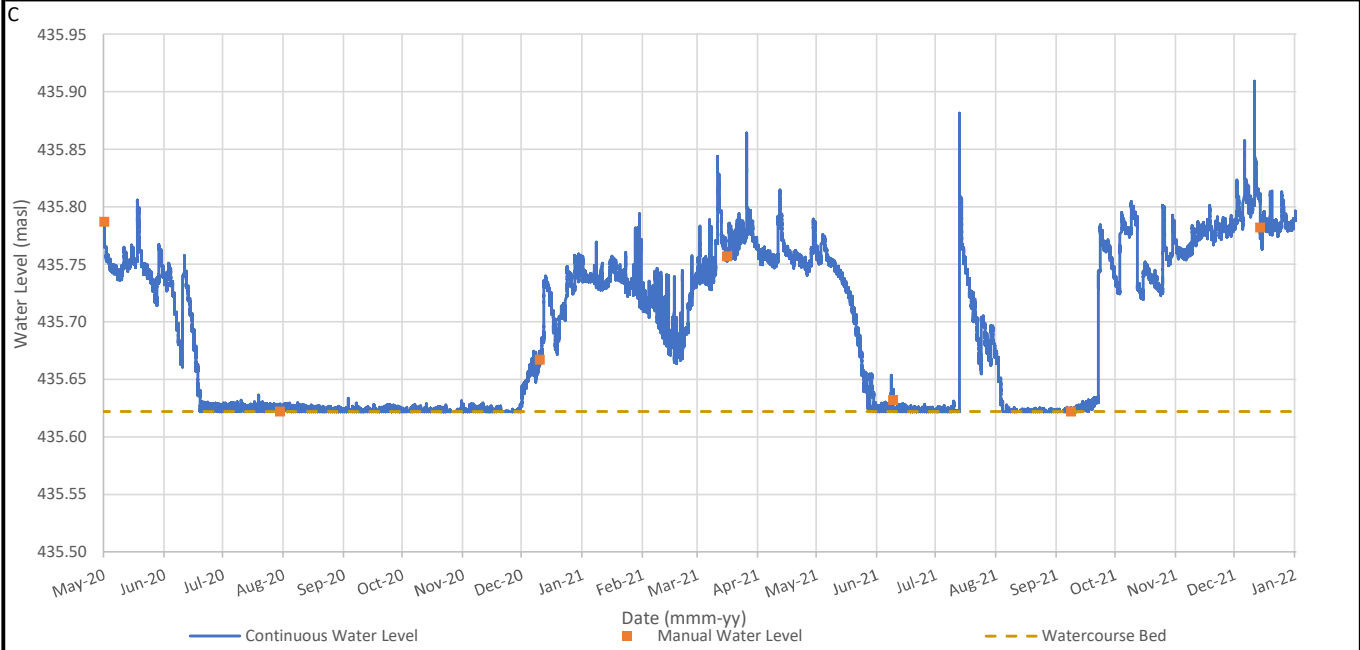
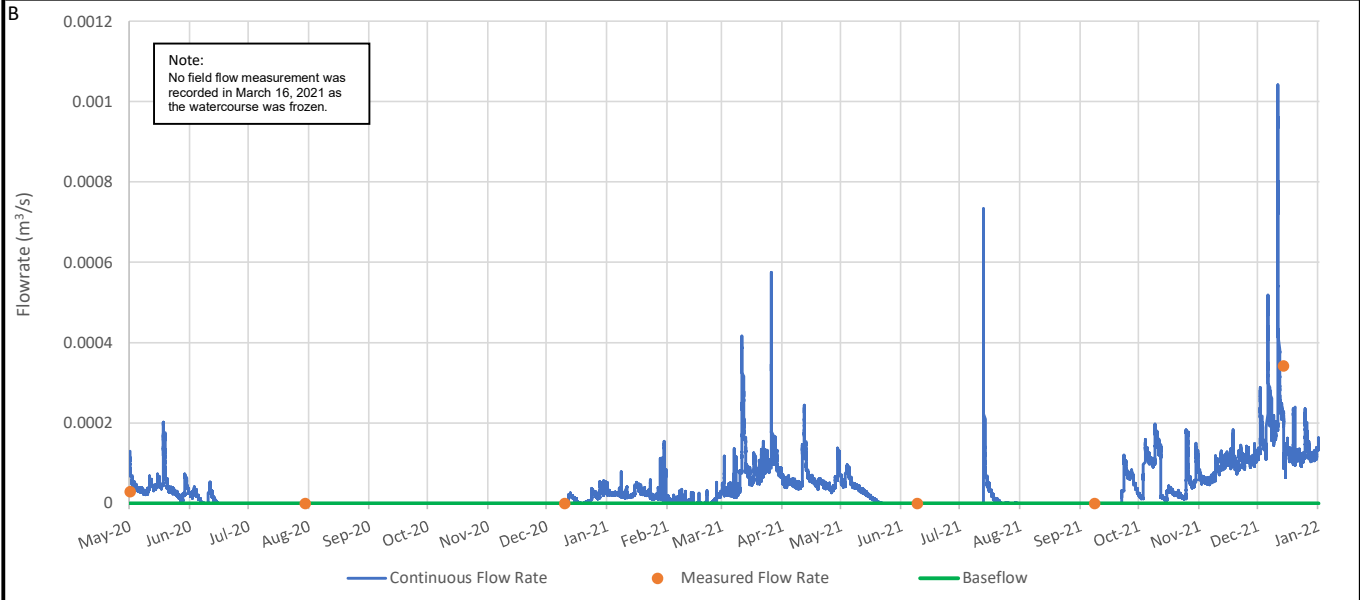
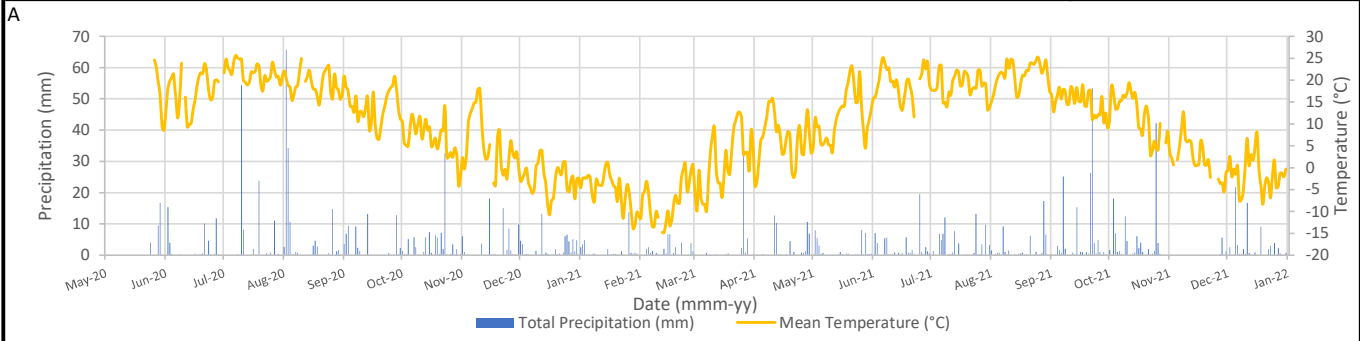
**APPENDIX L**

# Surface Water Levels and Flows



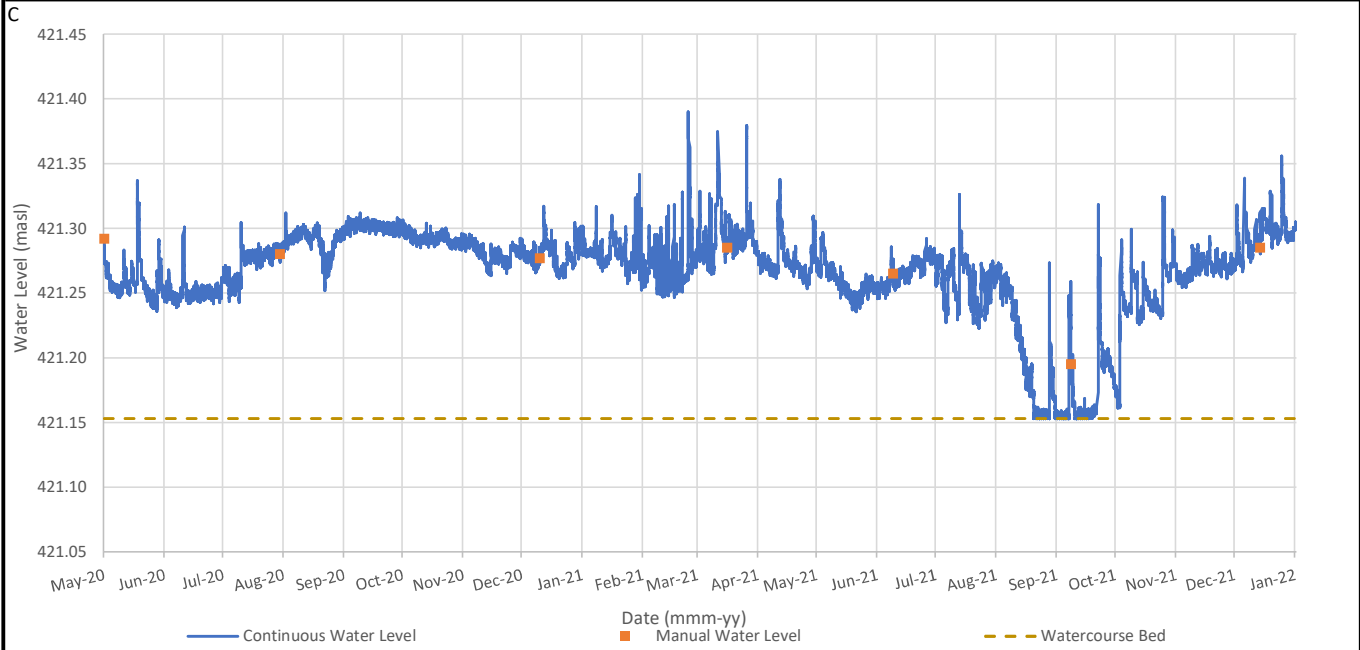
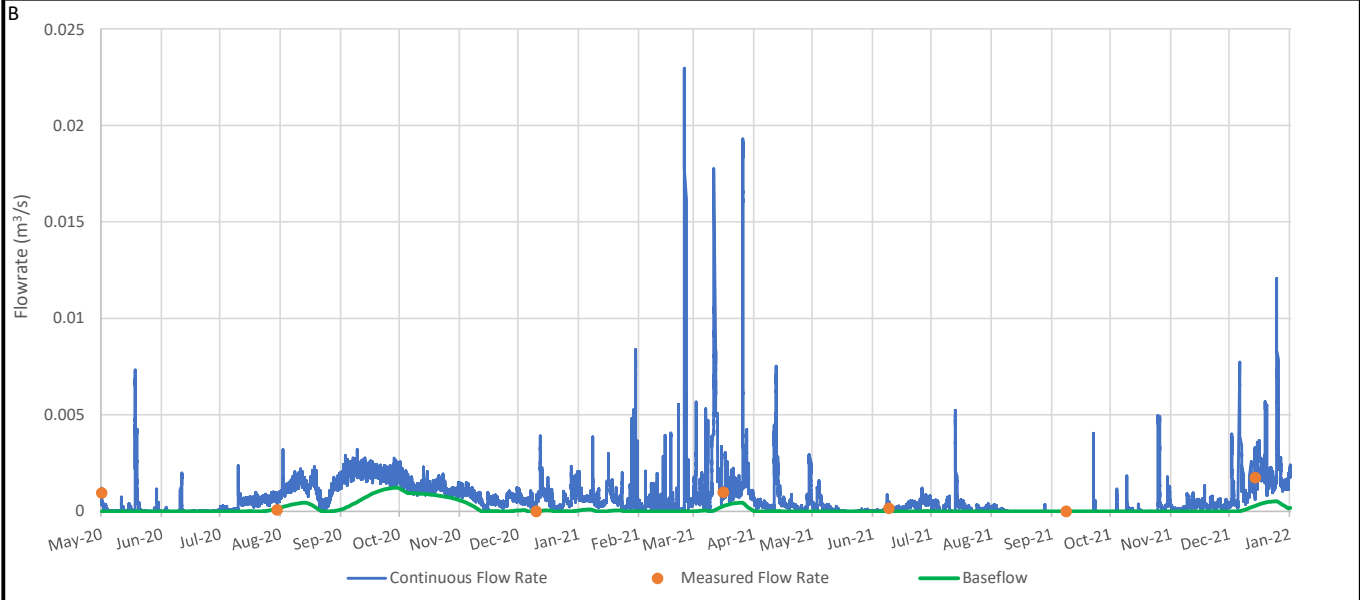
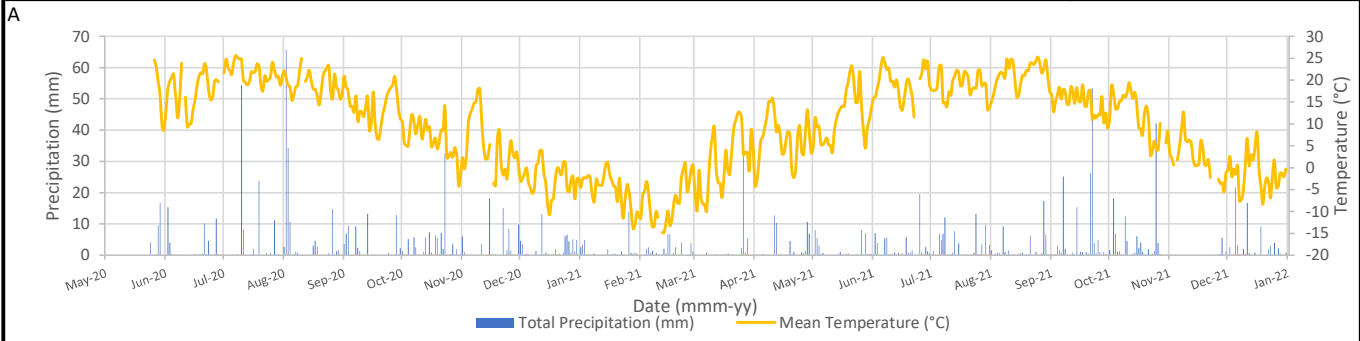
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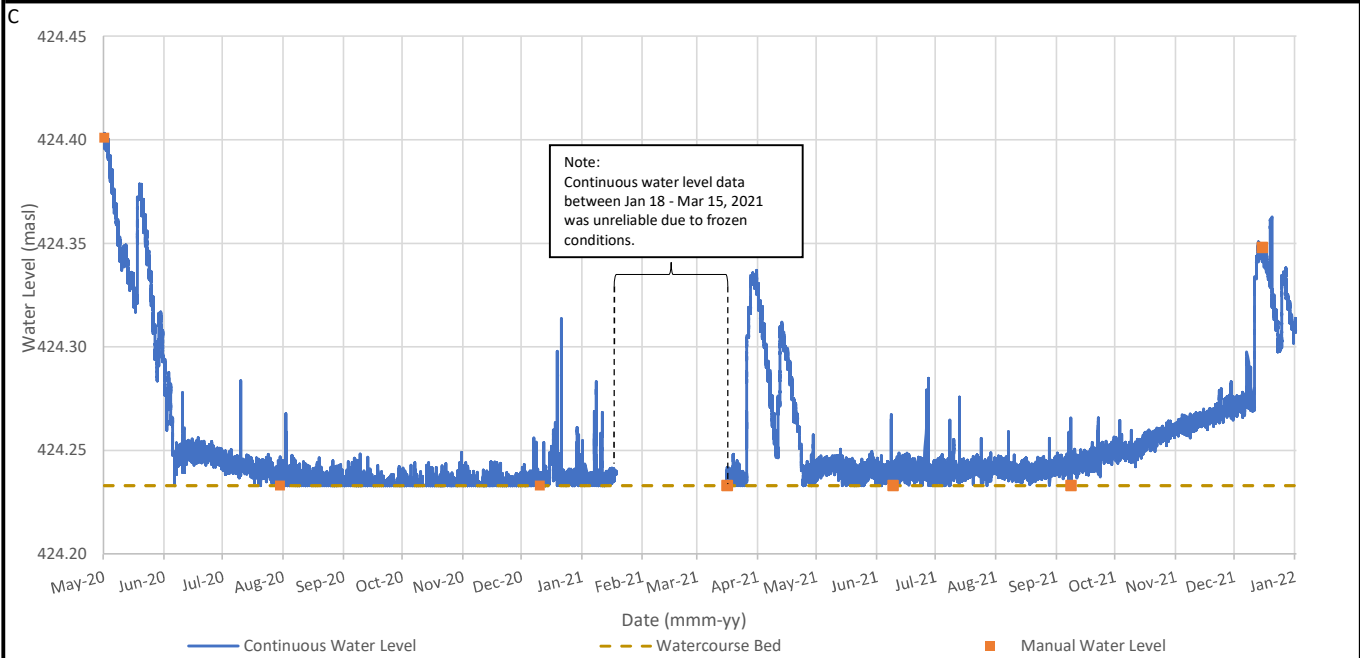
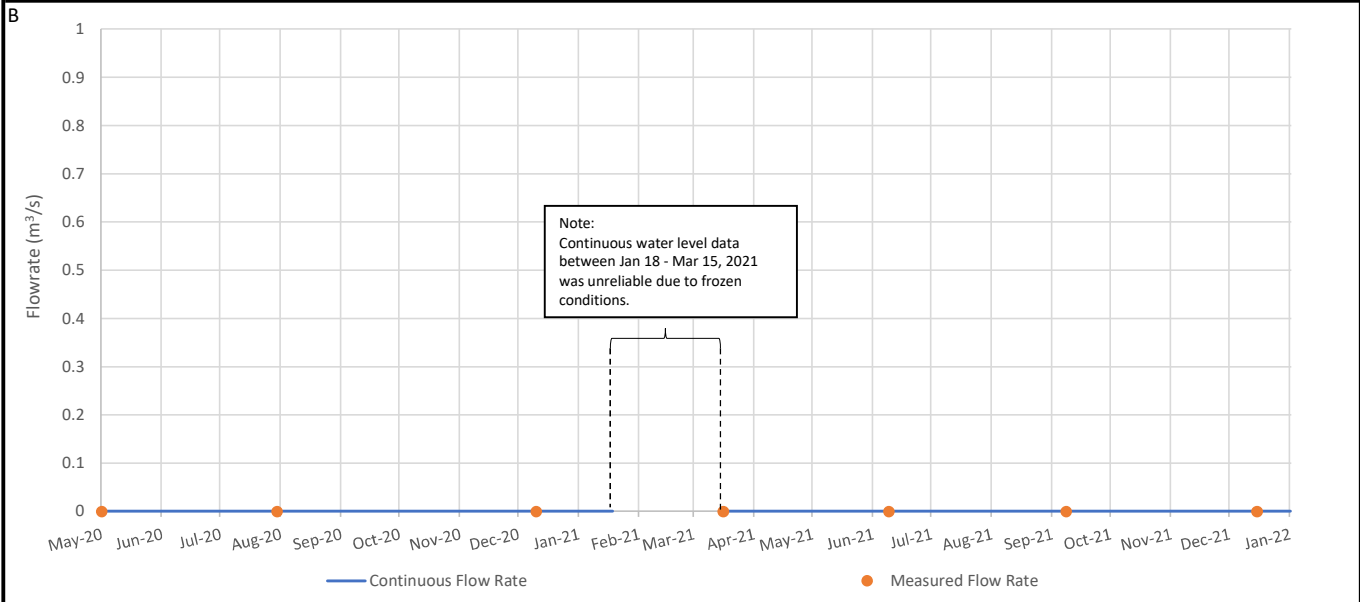
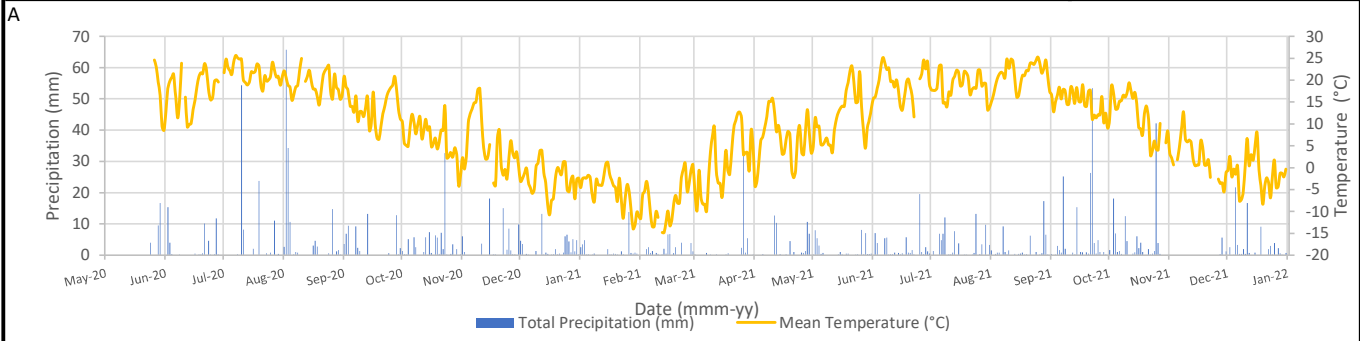


**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow rate    C. Water Level**

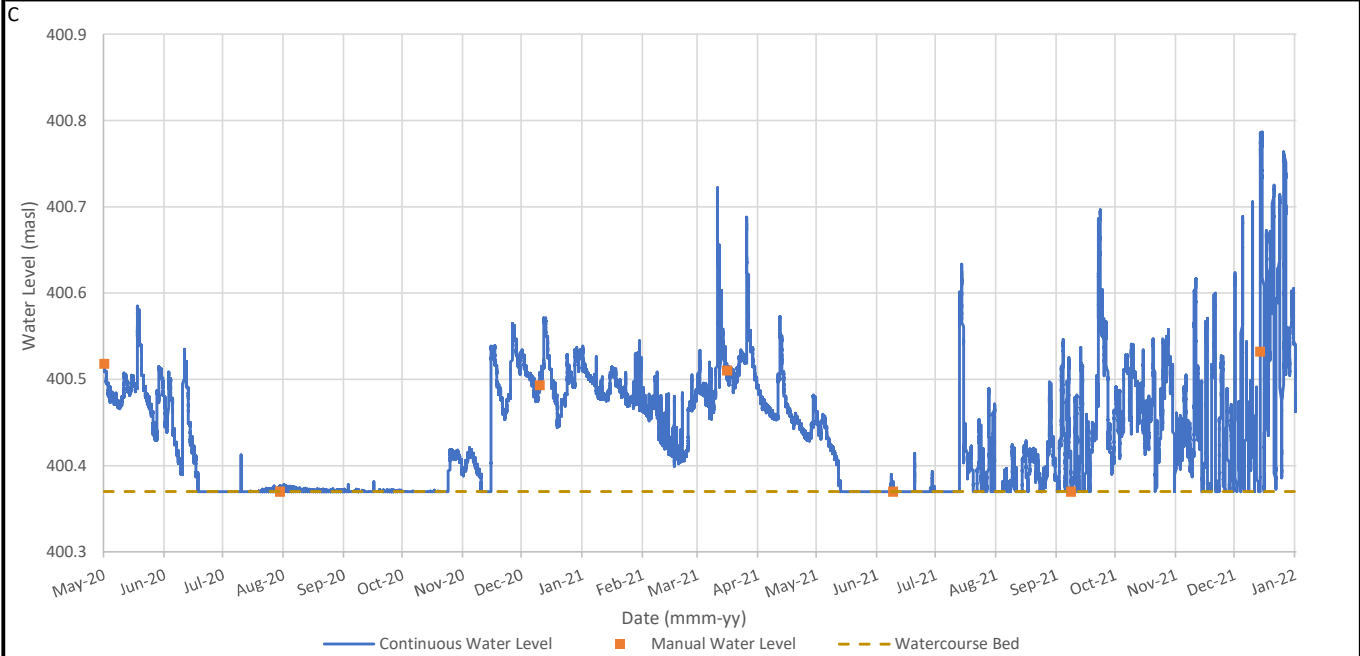
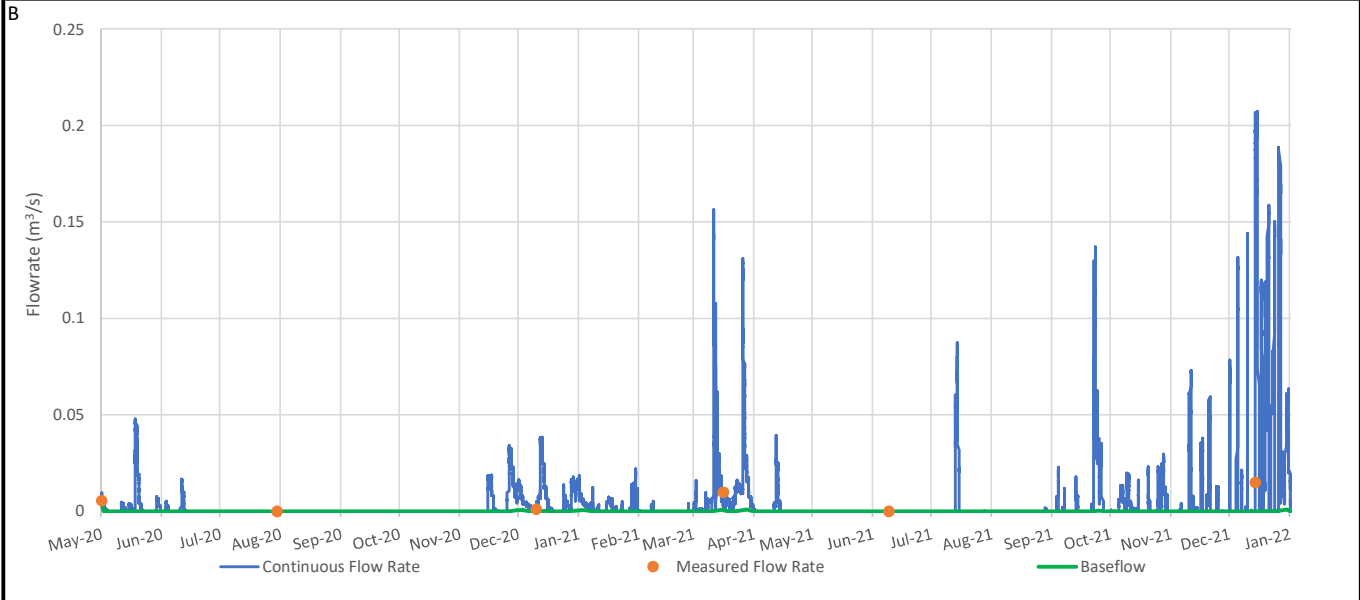
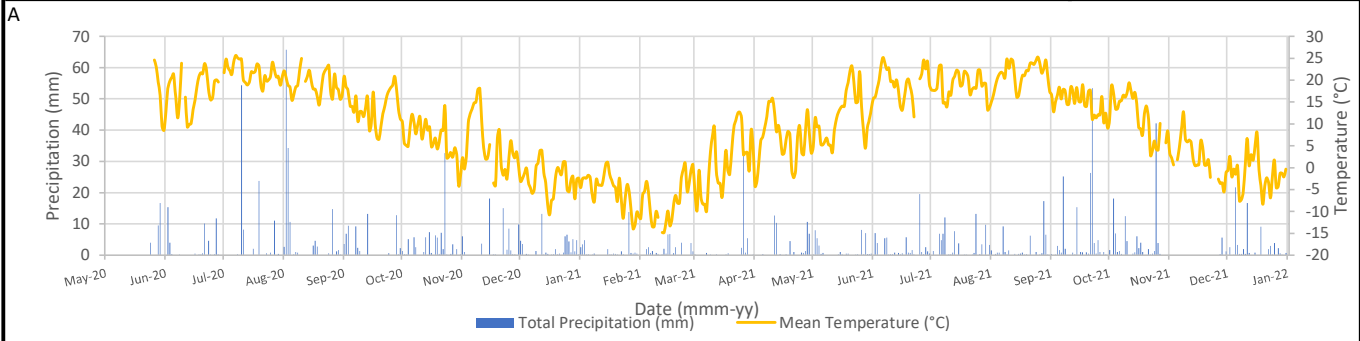




**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow Rate    C. Water Level**



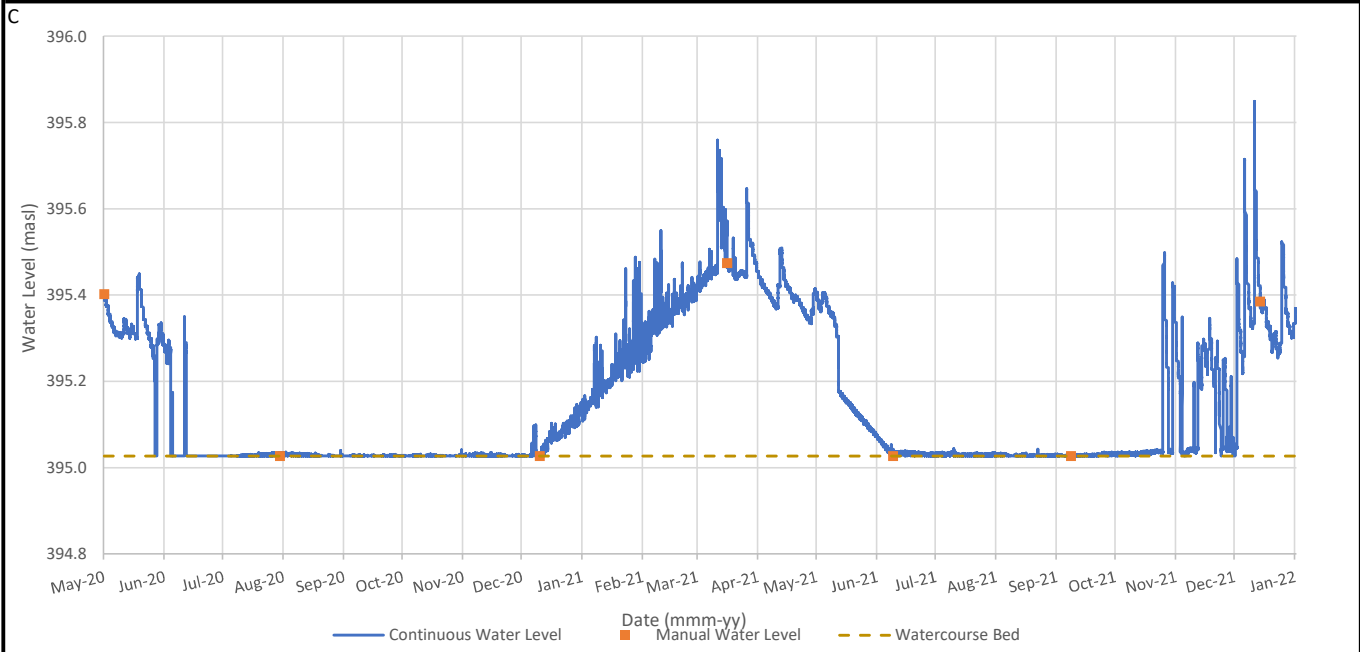
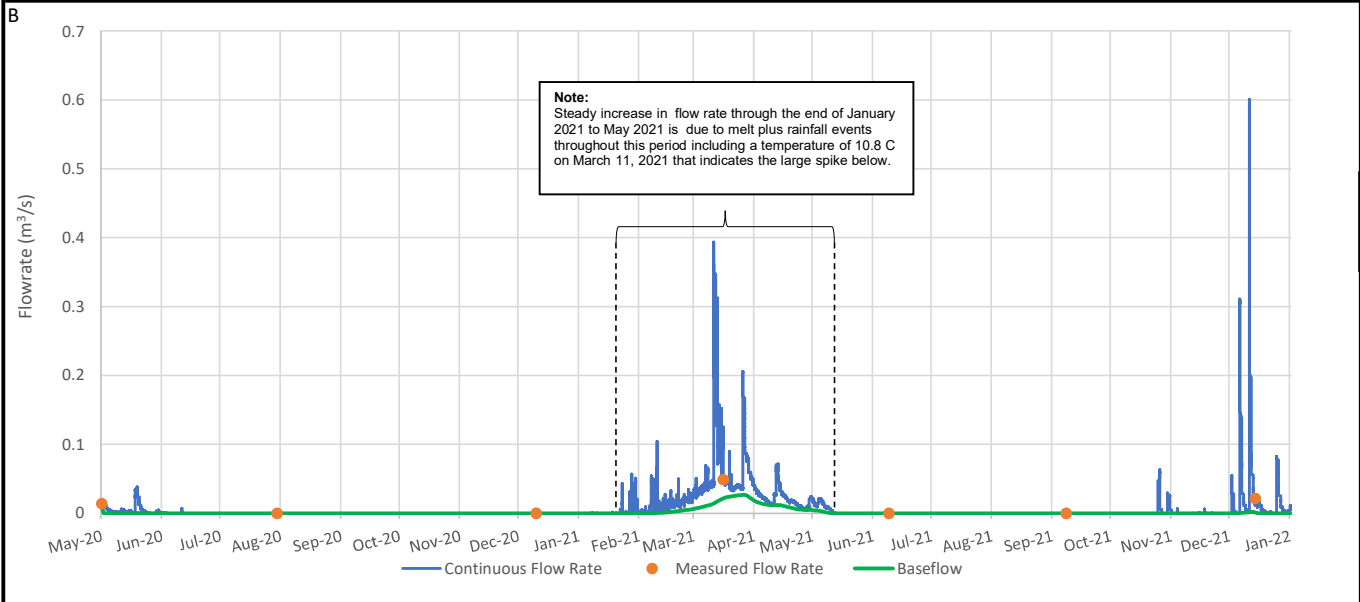
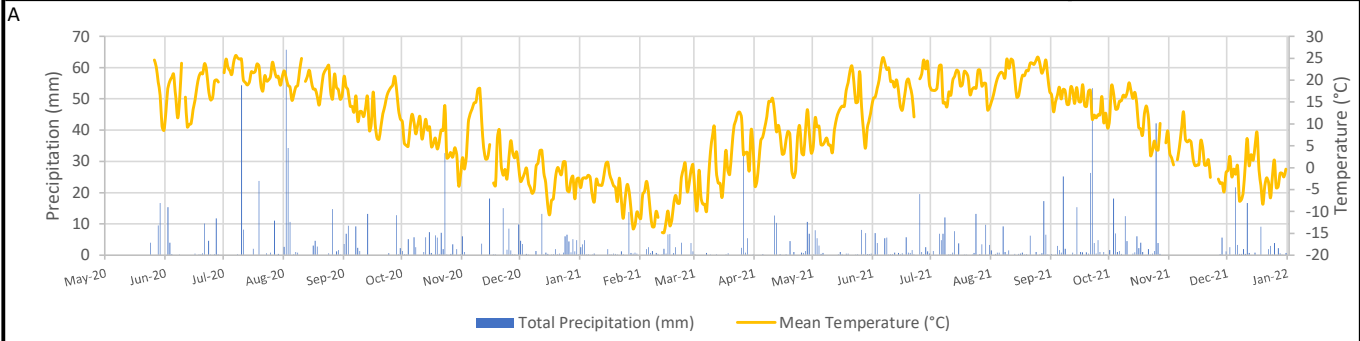
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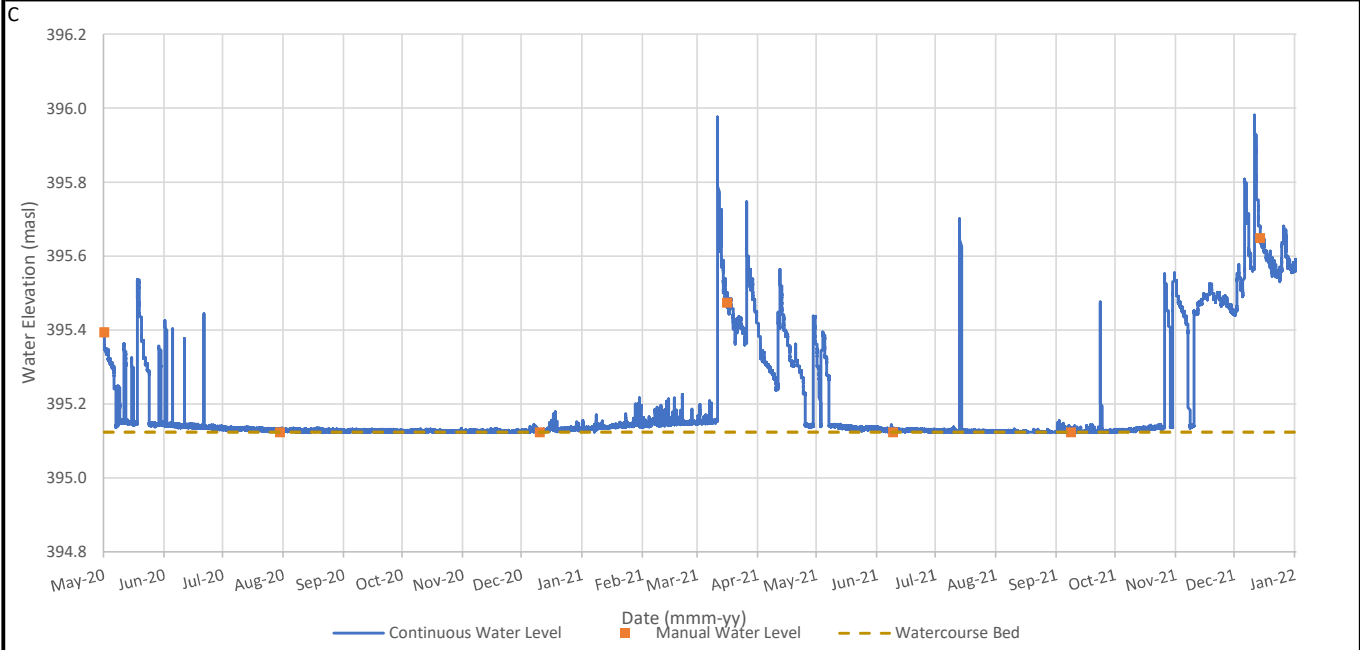
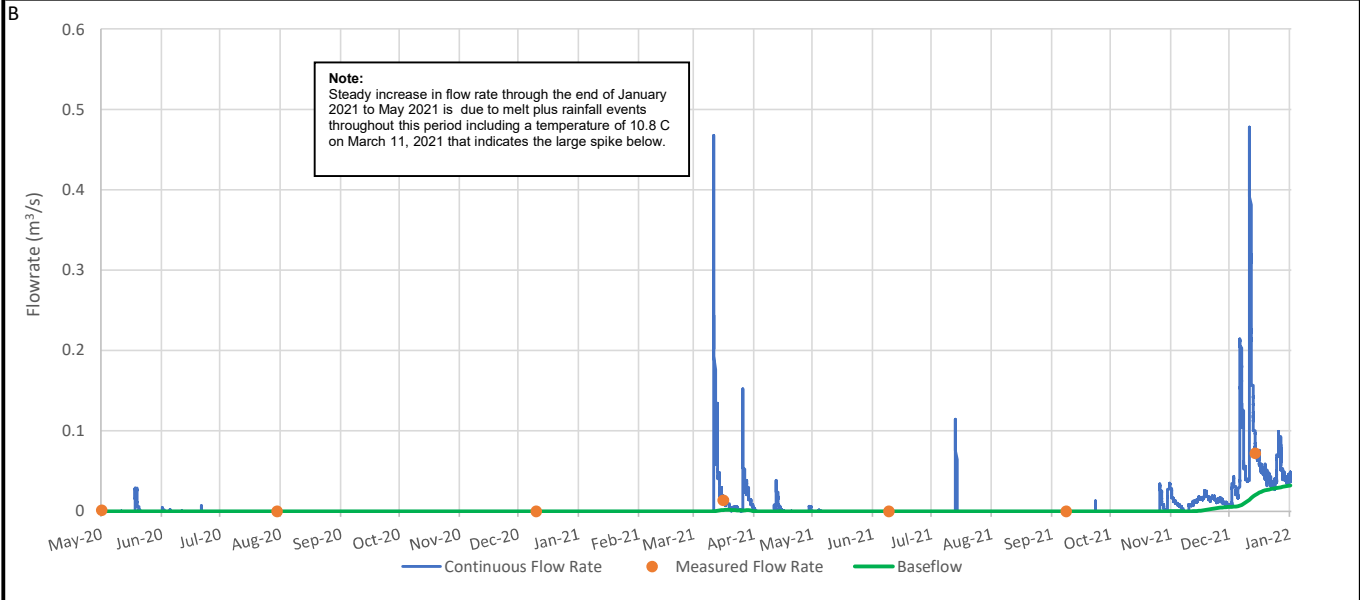
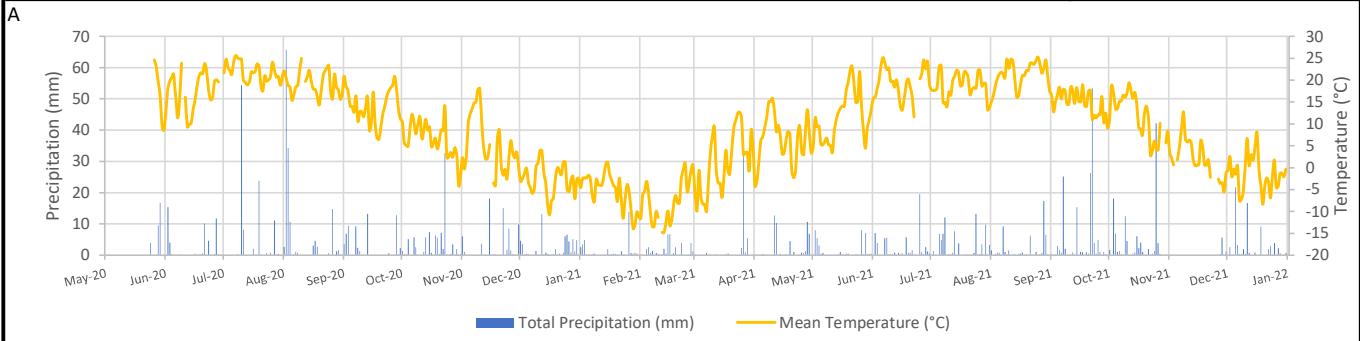
**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Flow Rate C. Water Level**

Water Levels & Flow at SW6 Adjacent to VCNA Caledon Quarry (2020 - 2021)

FIGURE L6



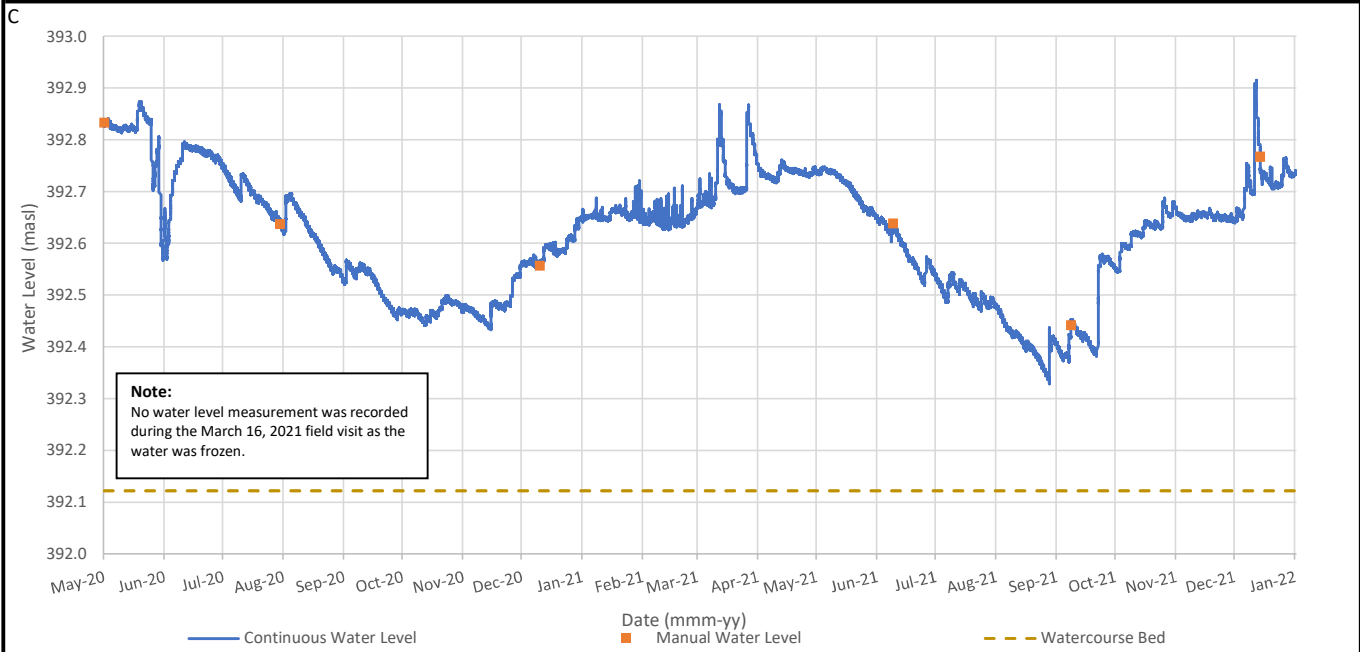
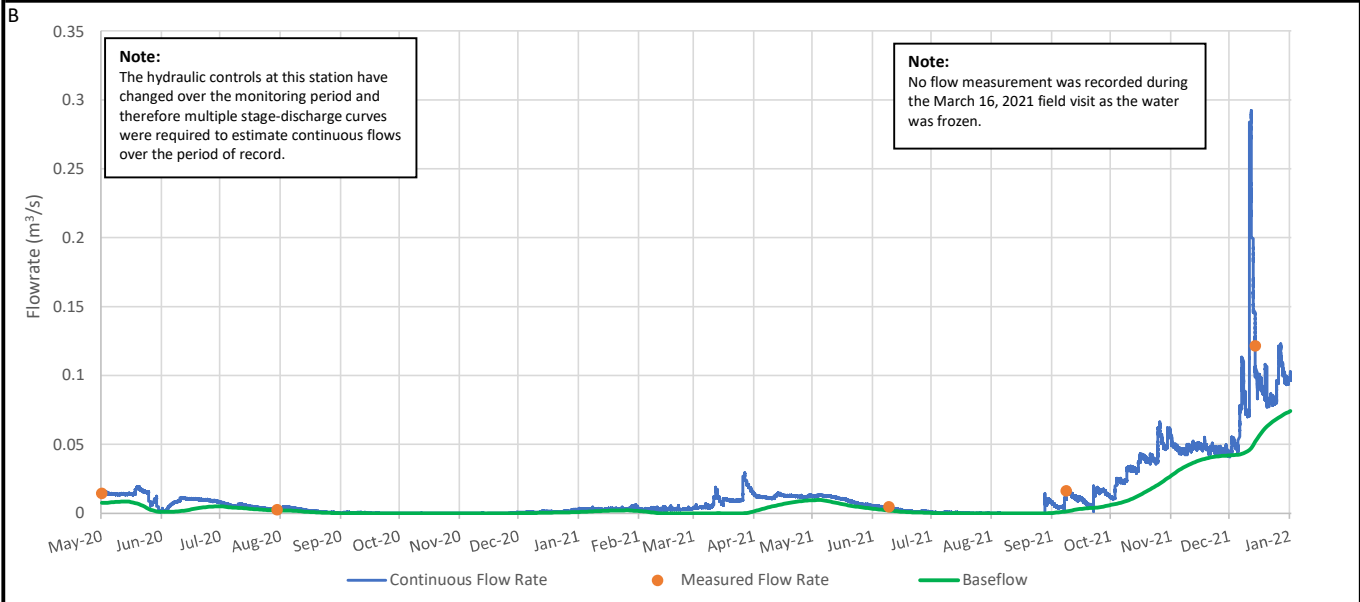
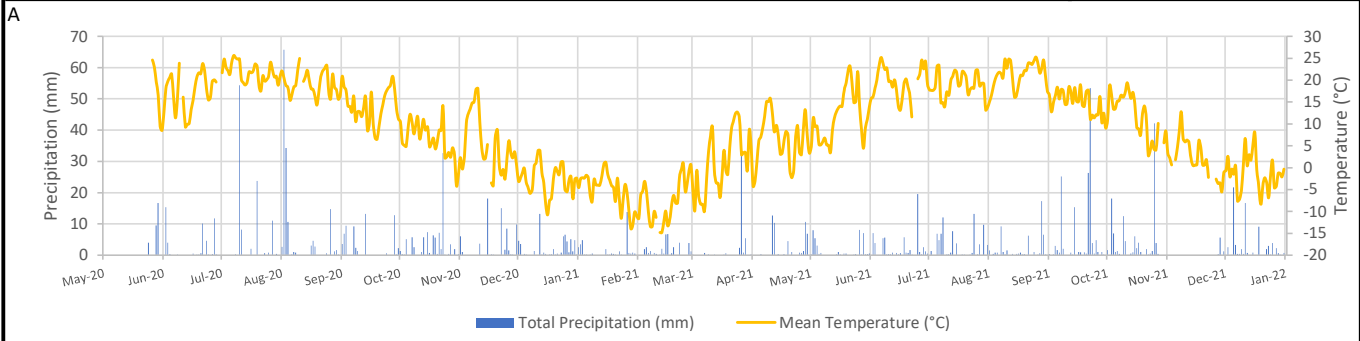
**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow Rate    C. Water Level**



**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Flow Rate C. Water Level**

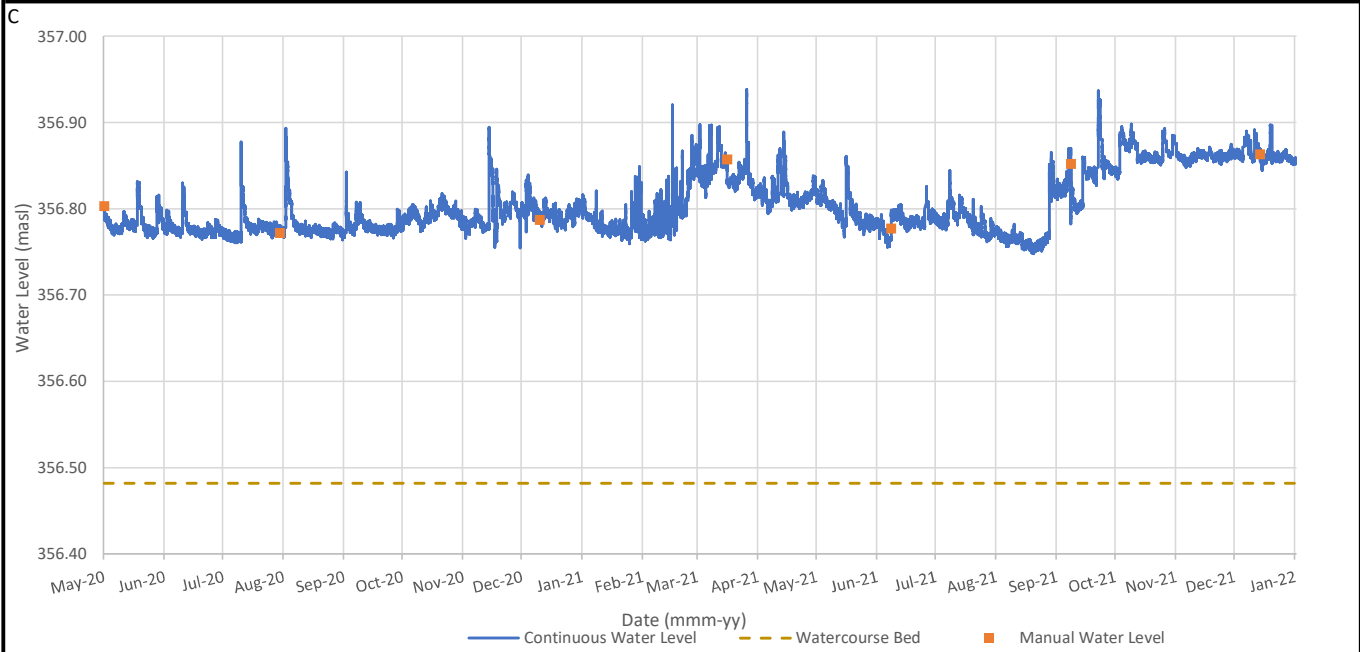
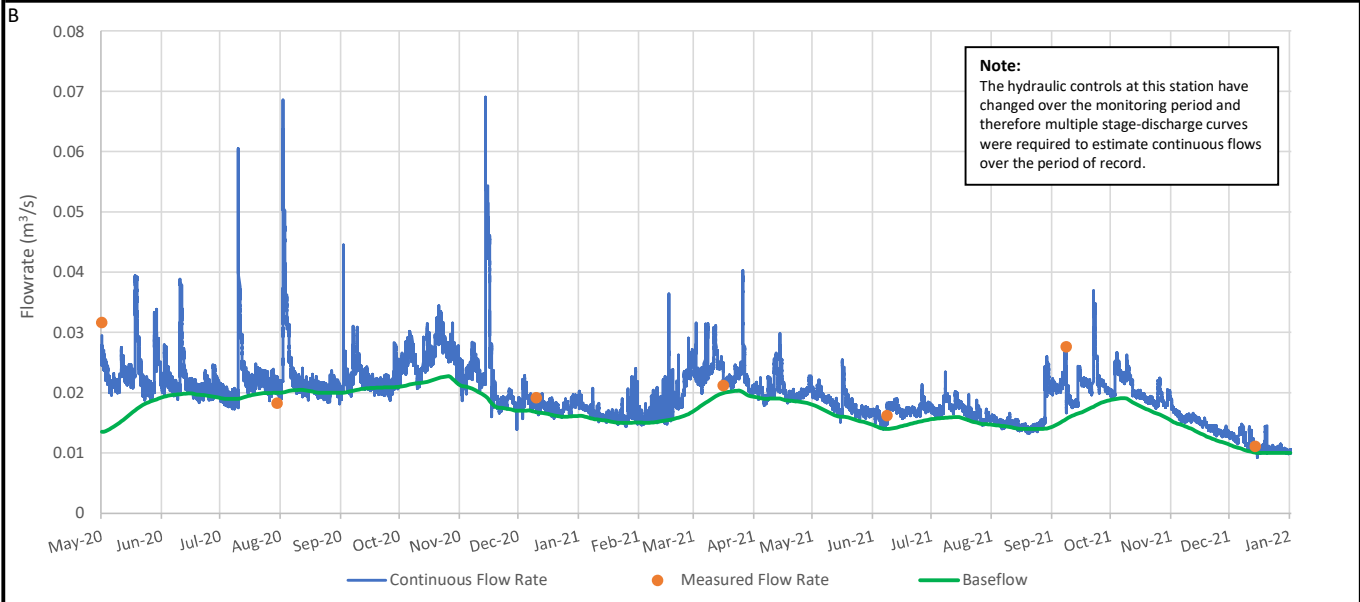
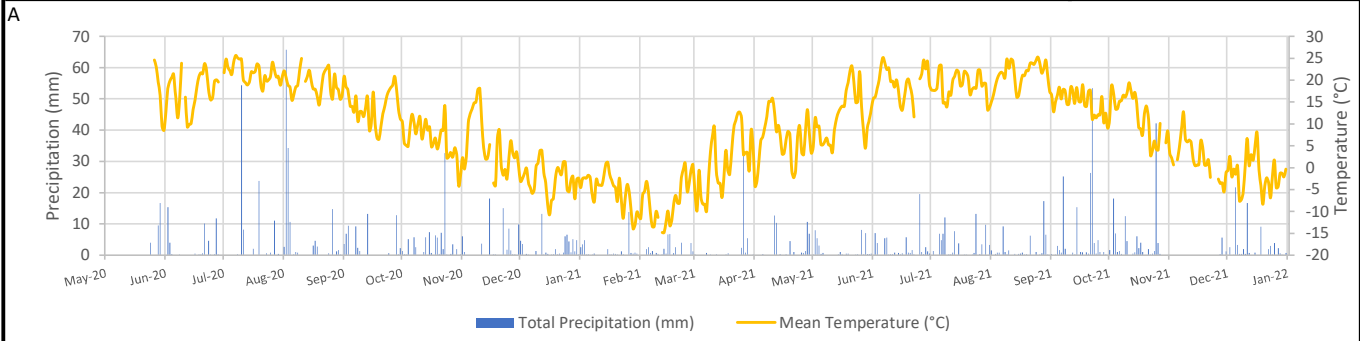
Water Levels & Flow at SW8 Adjacent to VCNA Caledon Quarry (2020 - 2021)

FIGURE L8

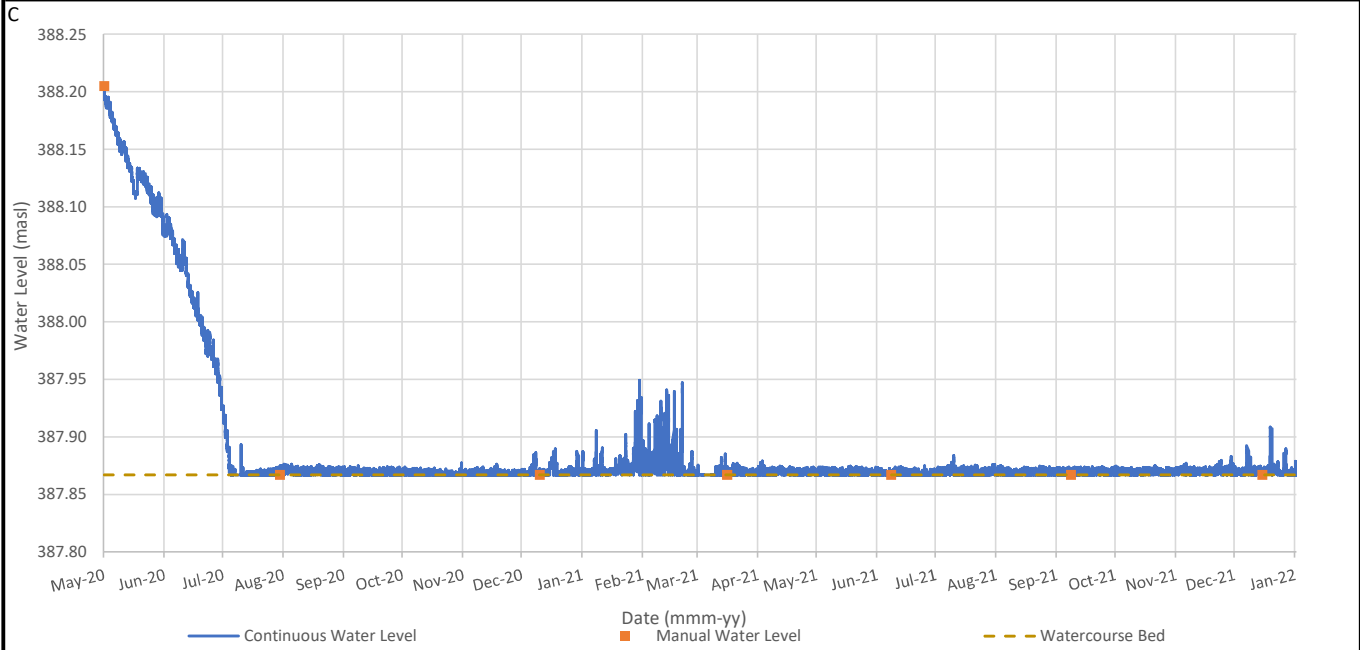
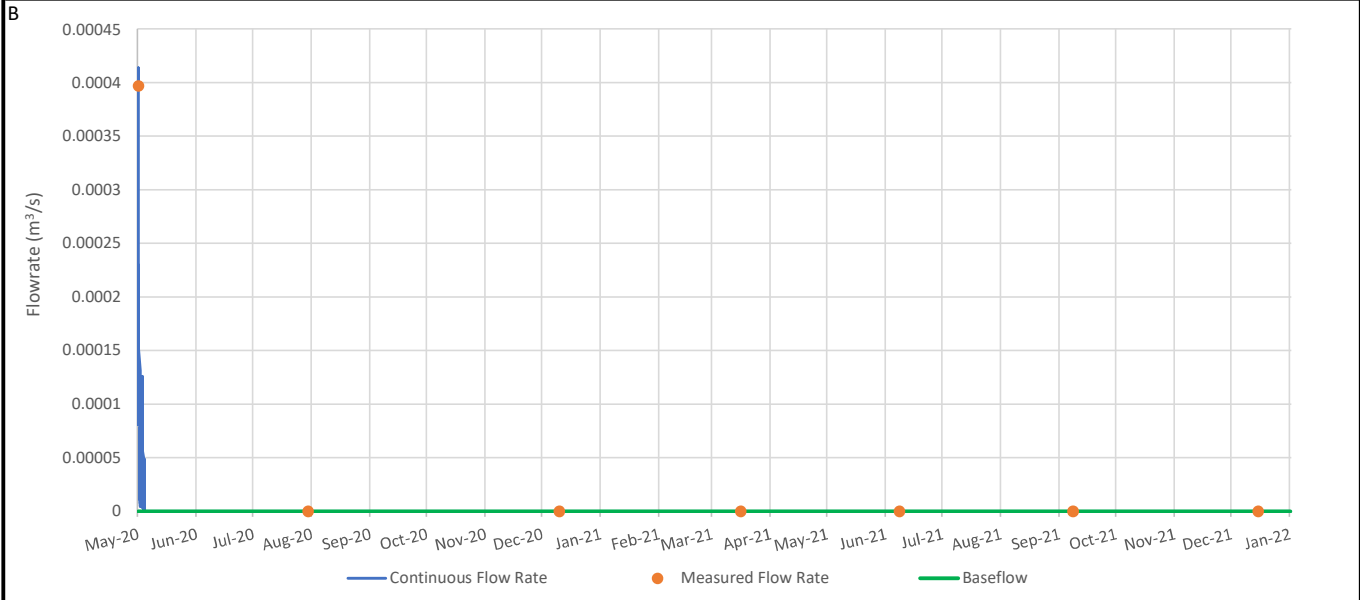
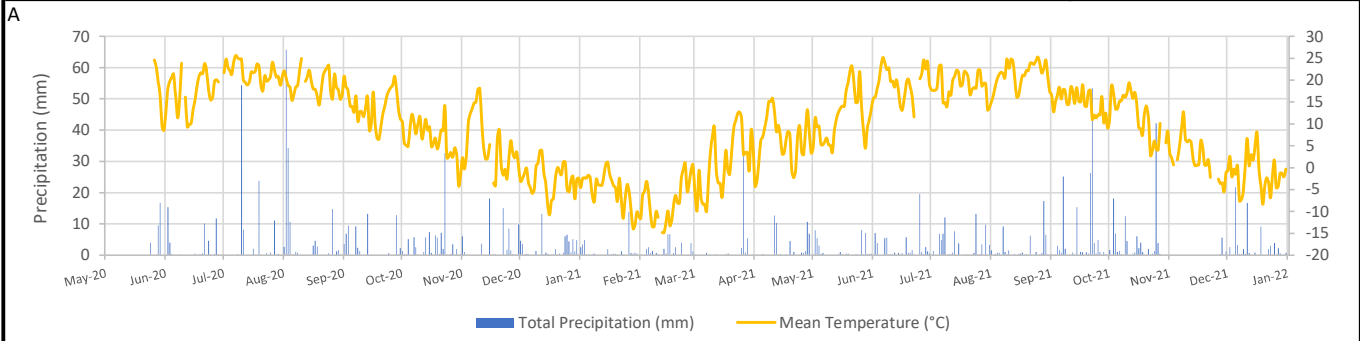


**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Flow Rate C. Water Level**

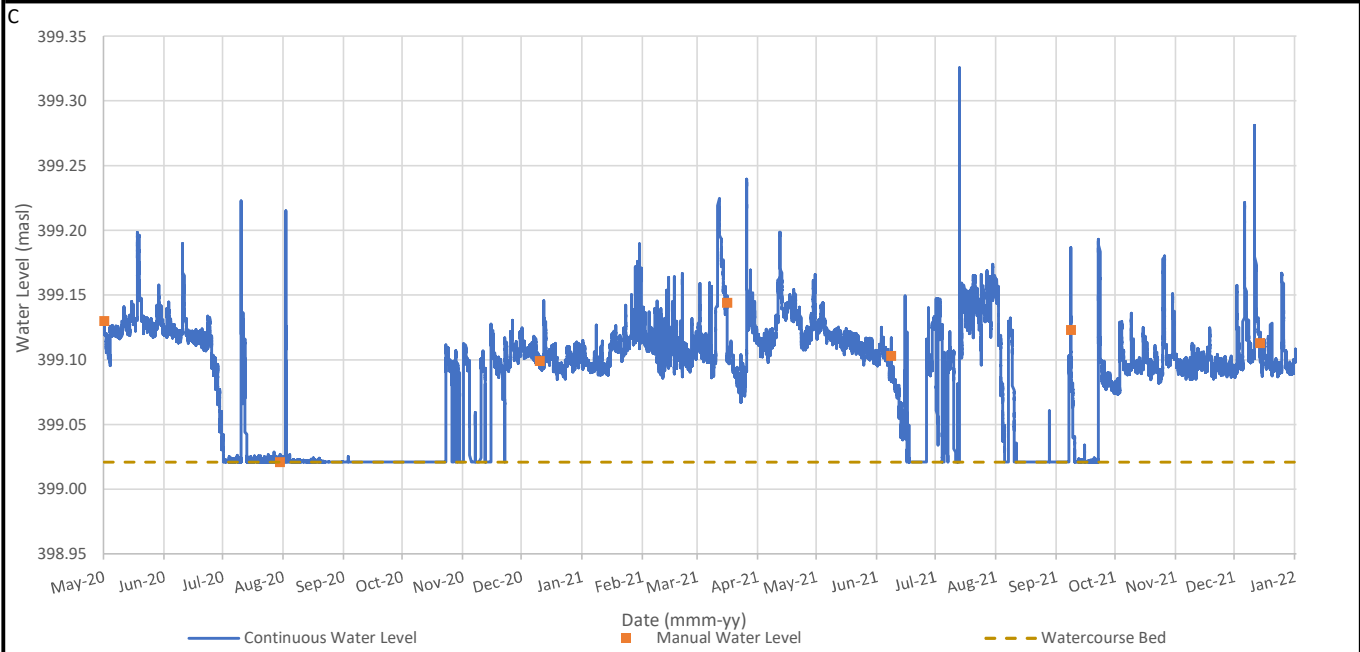
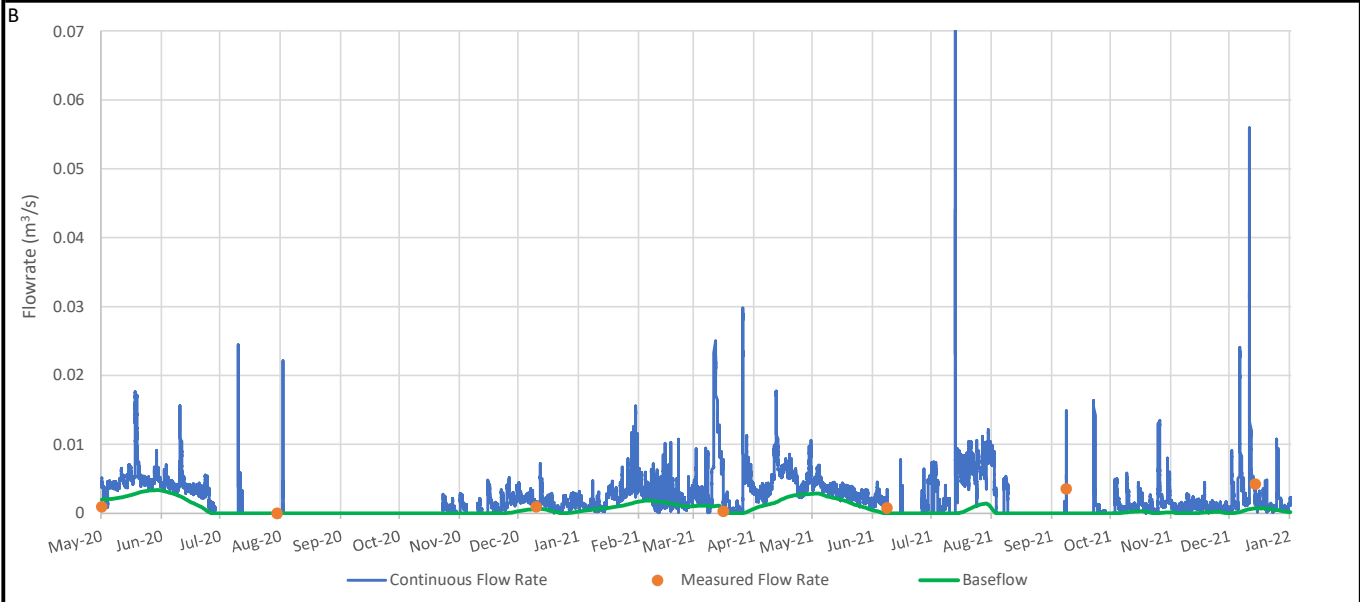
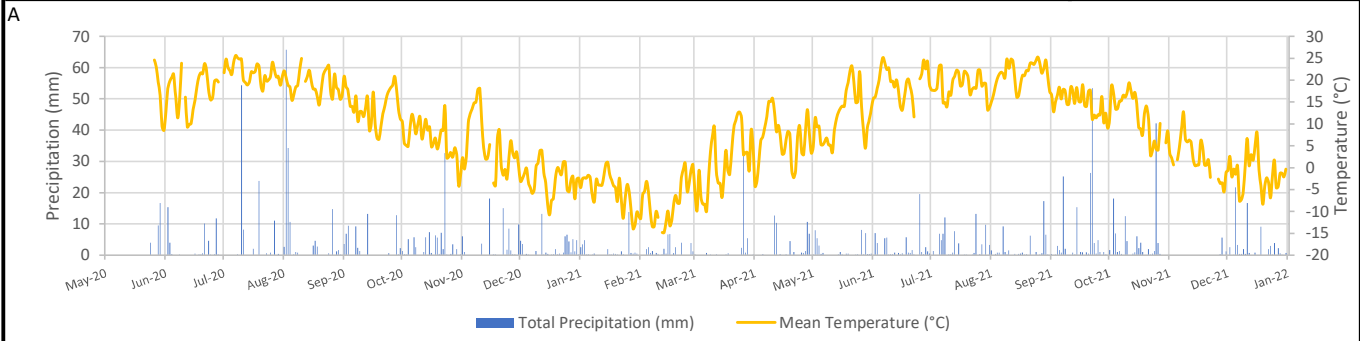




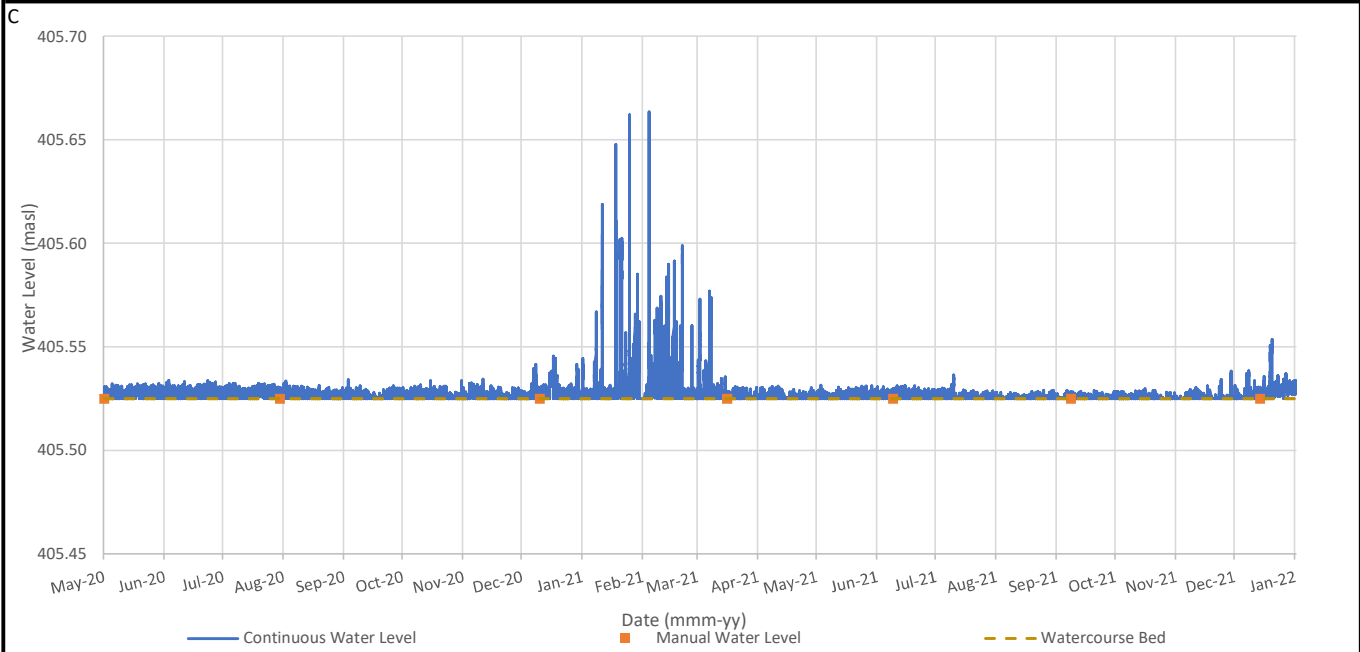
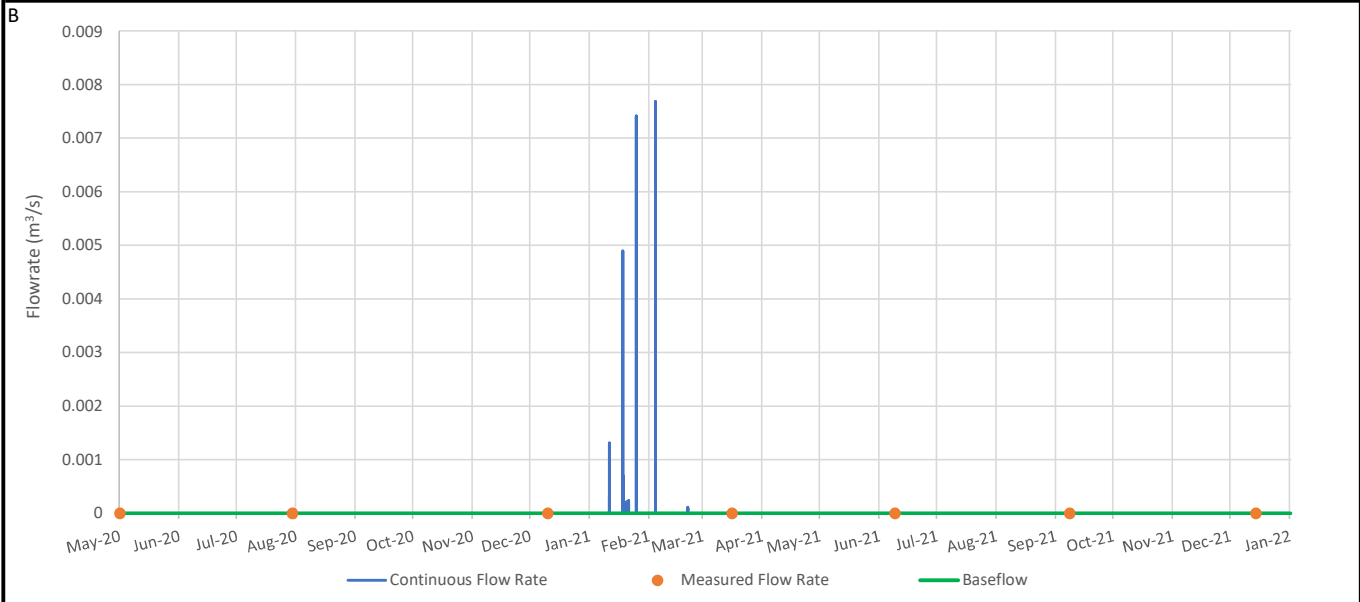
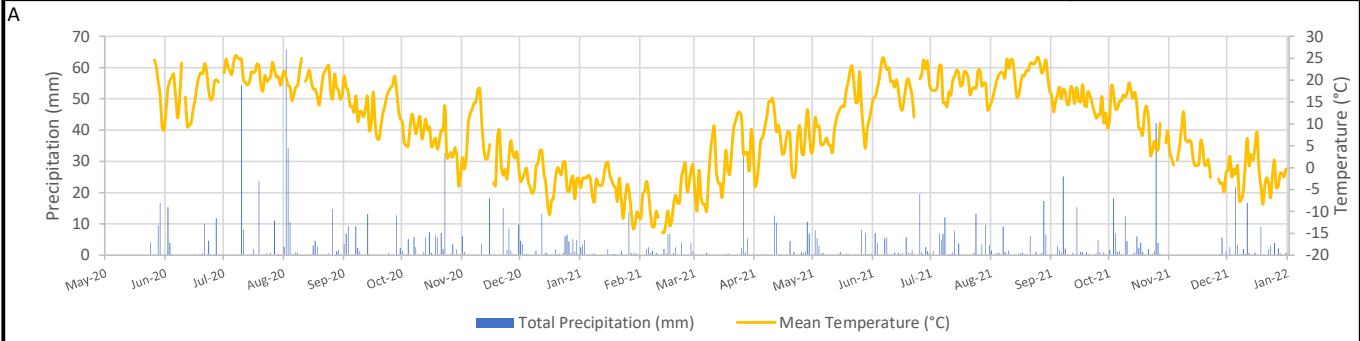
**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow rate    C. Water Level**



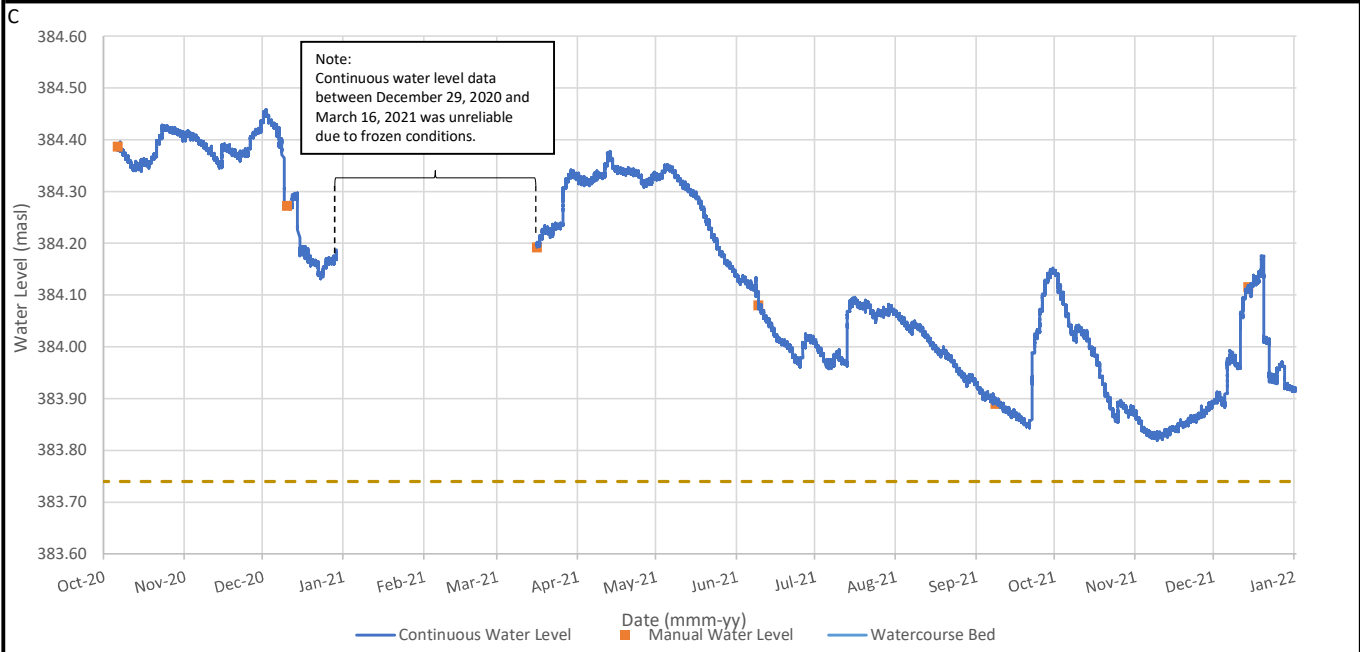
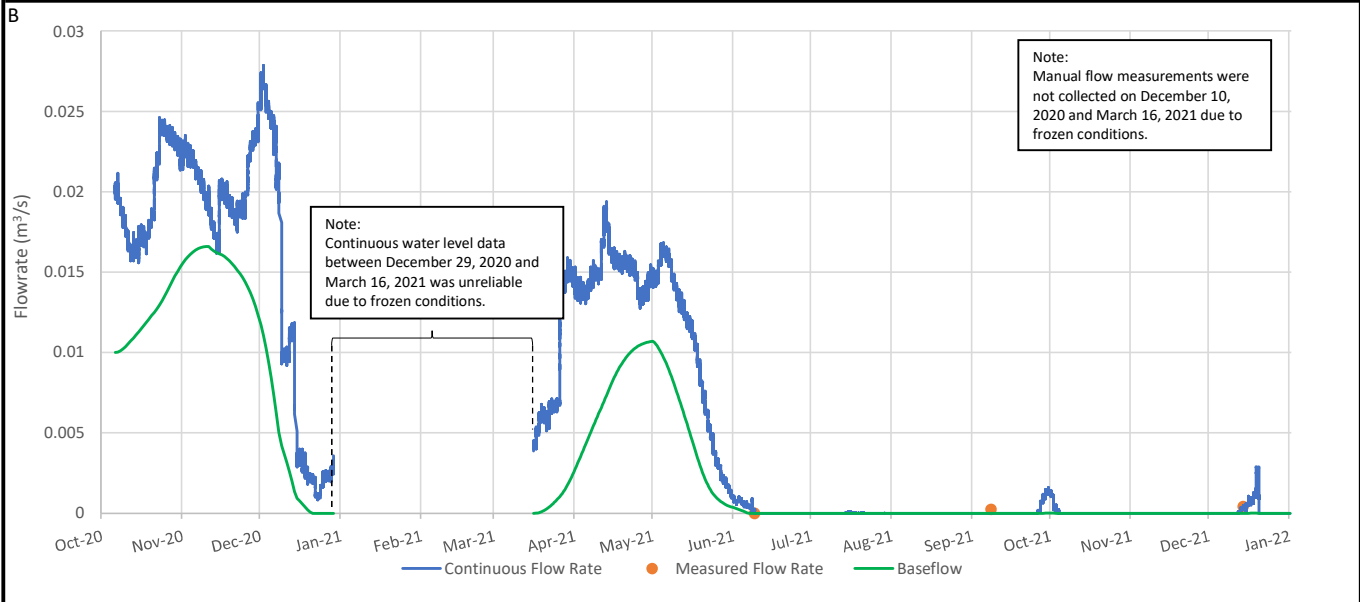
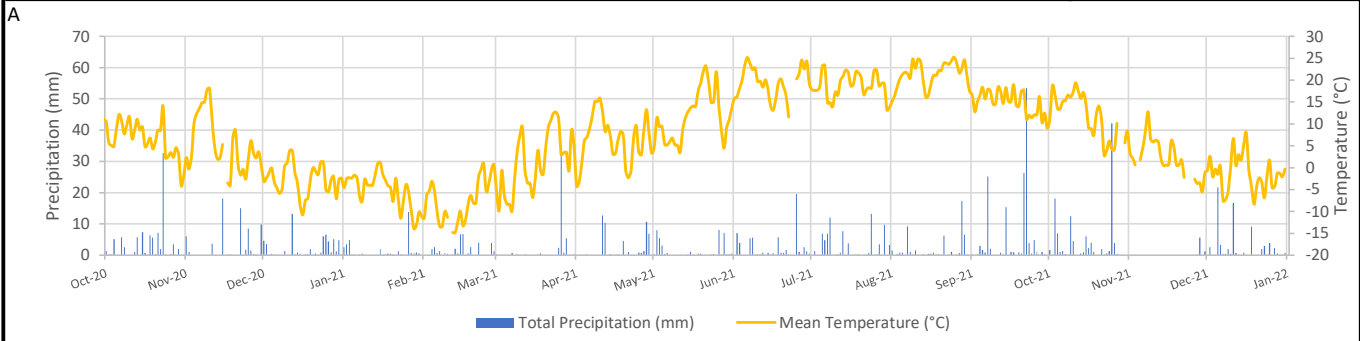
**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow rate    C. Water Level**



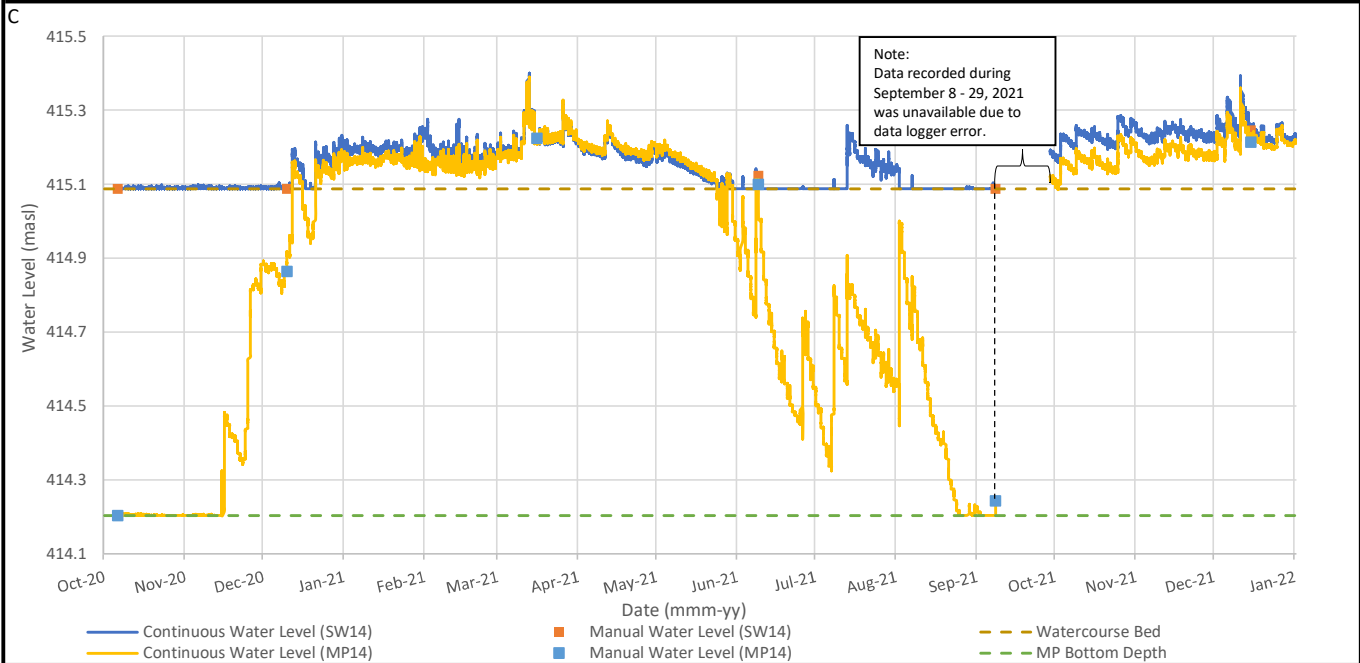
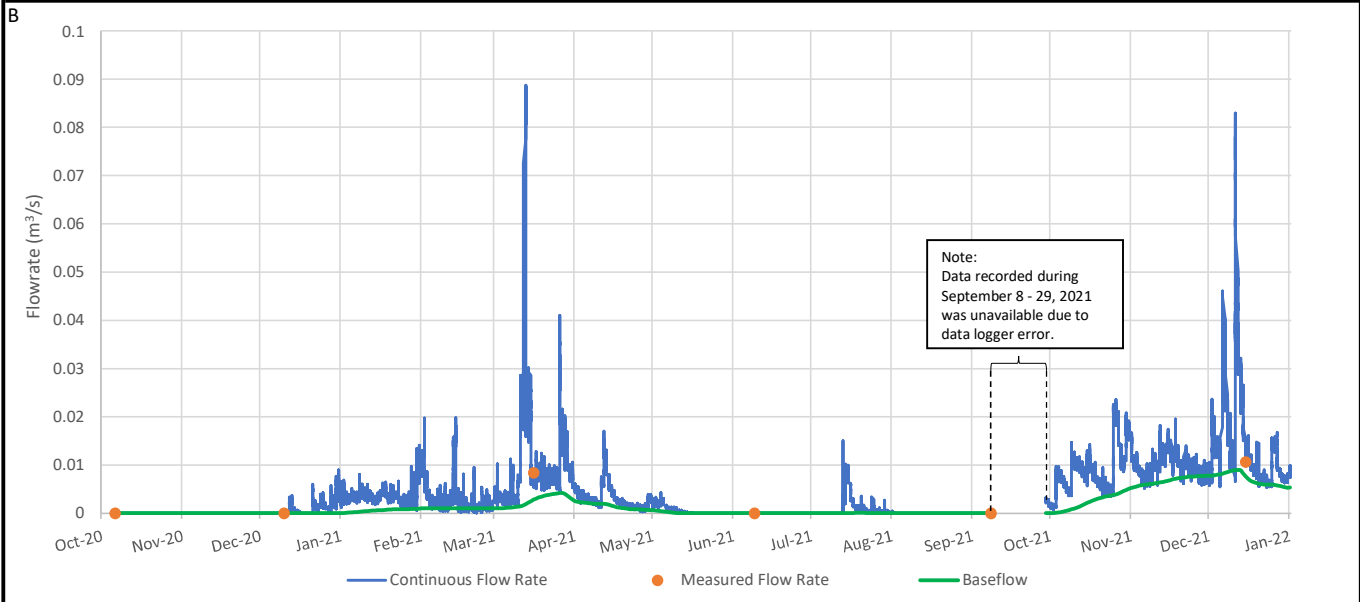
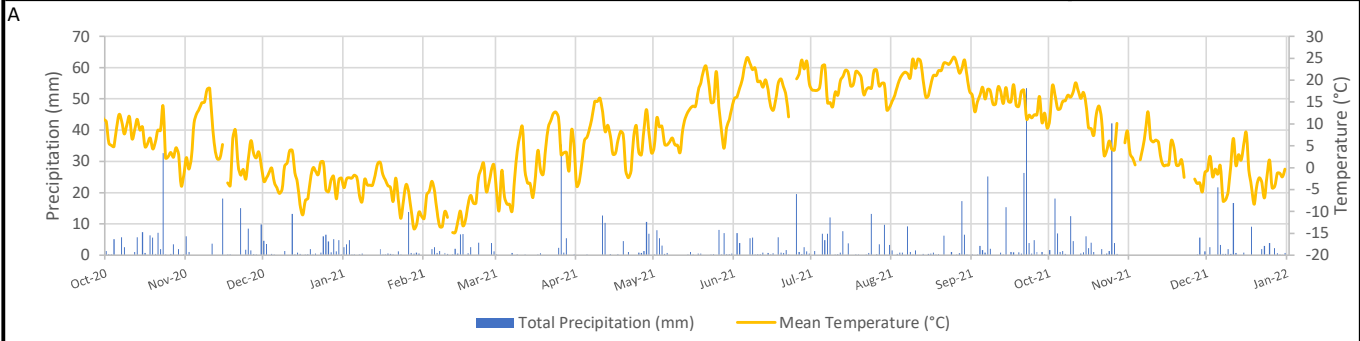
**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow rate    C. Water Level**



**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Flow Rate C. Water Level**

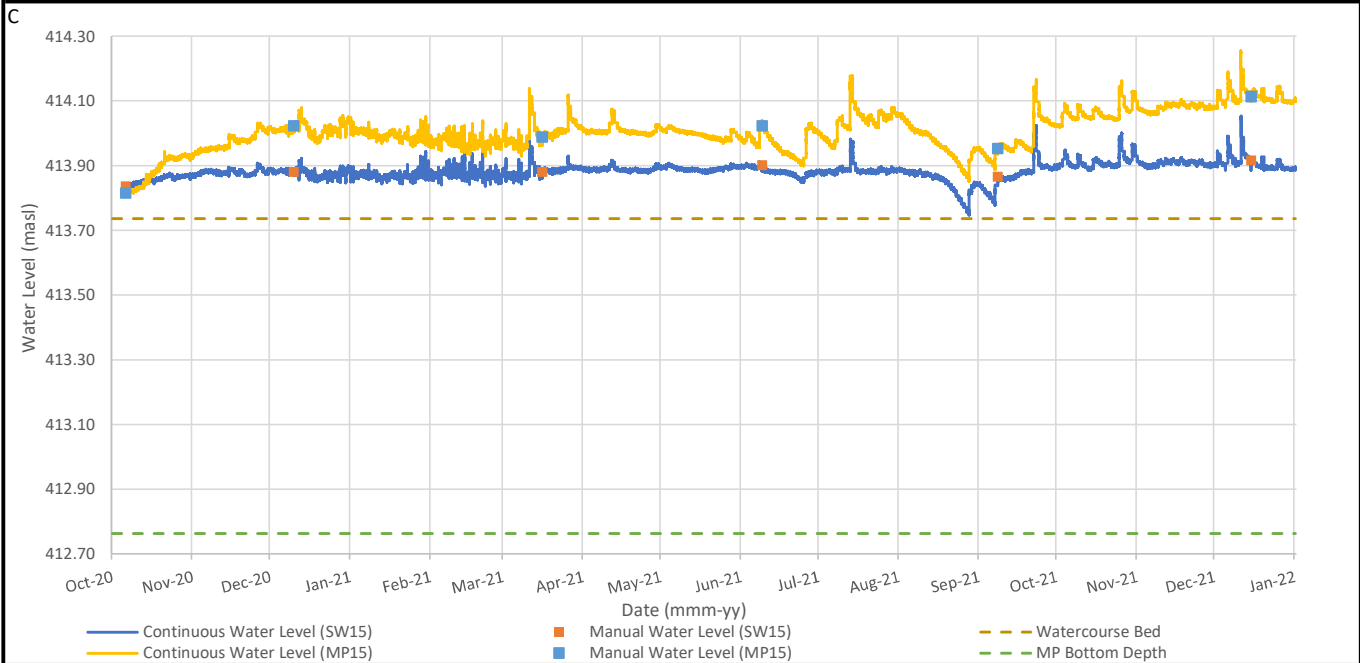
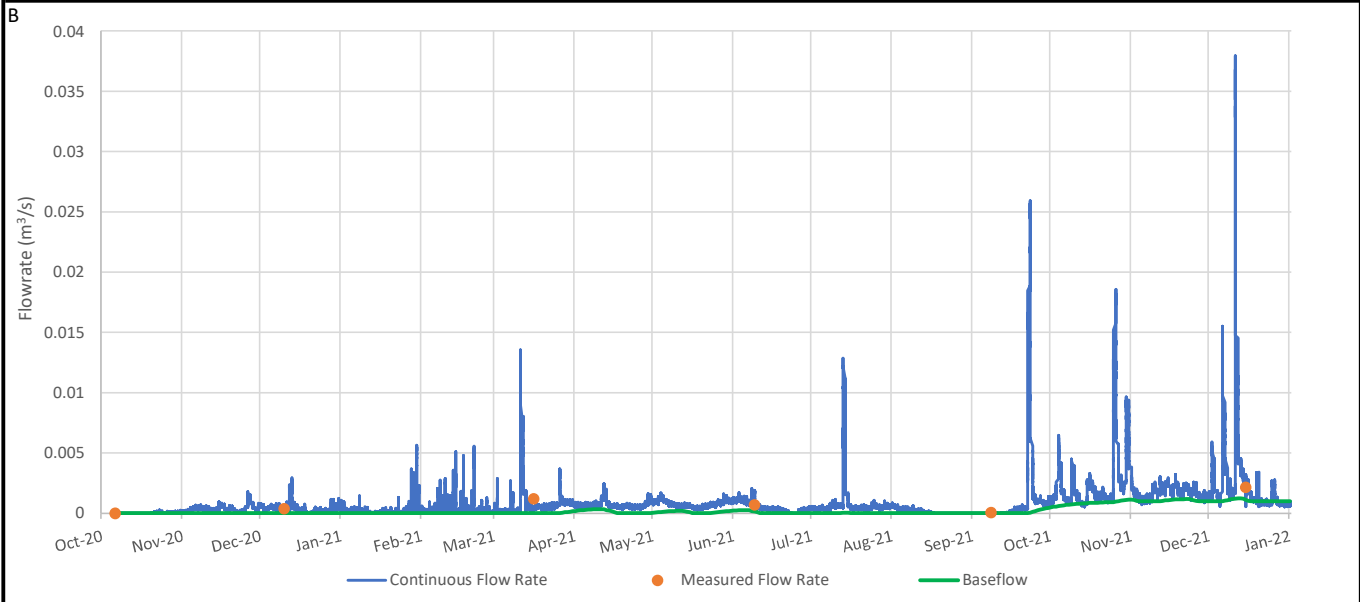
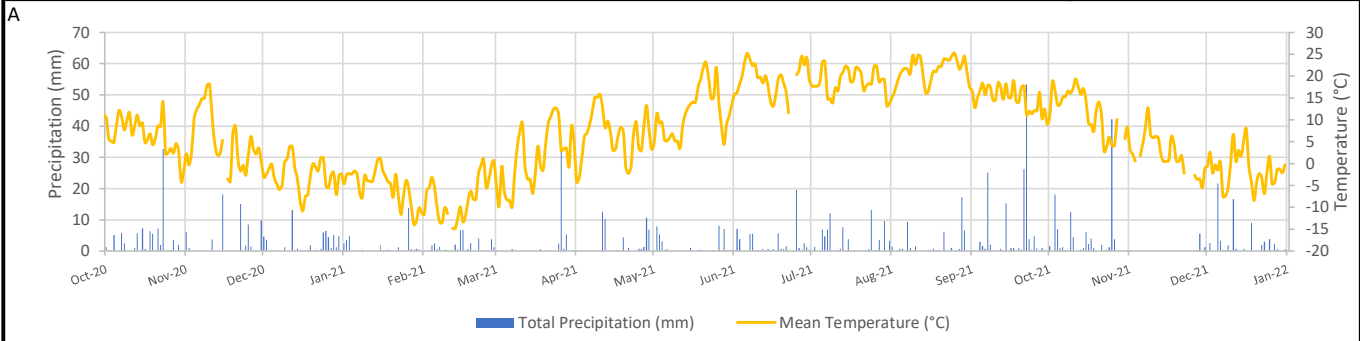


**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Flow Rate C. Water Level**

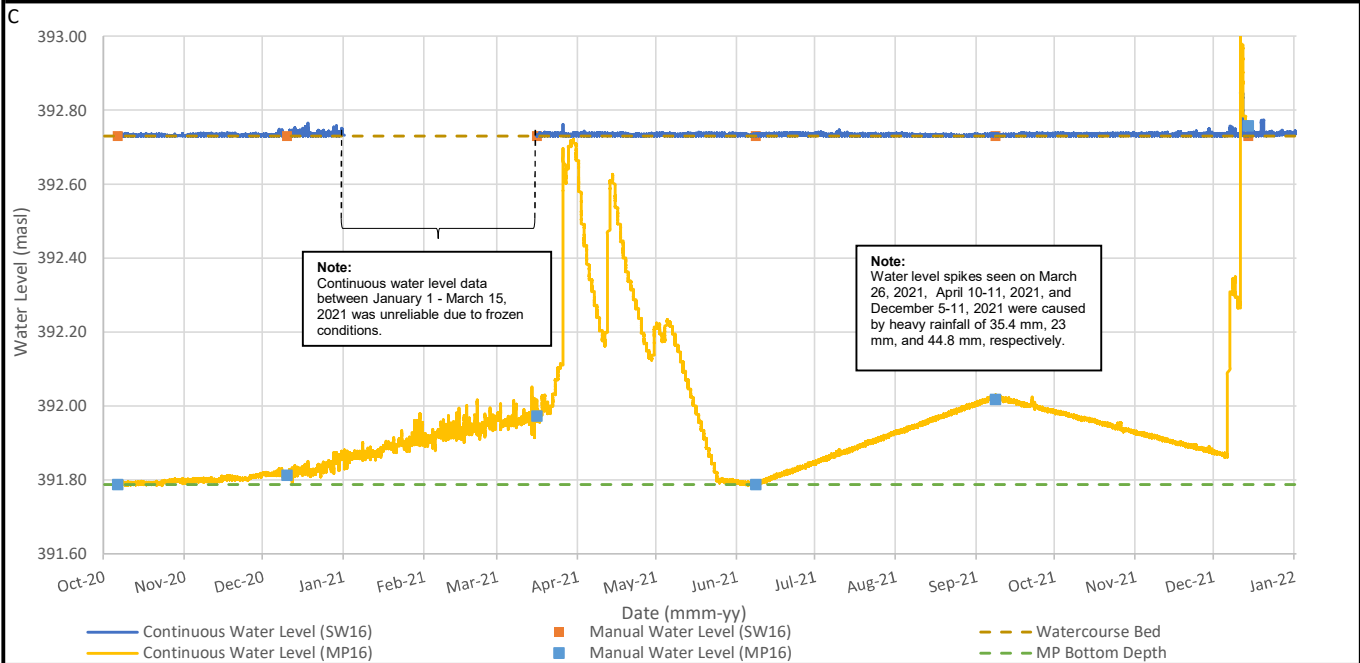
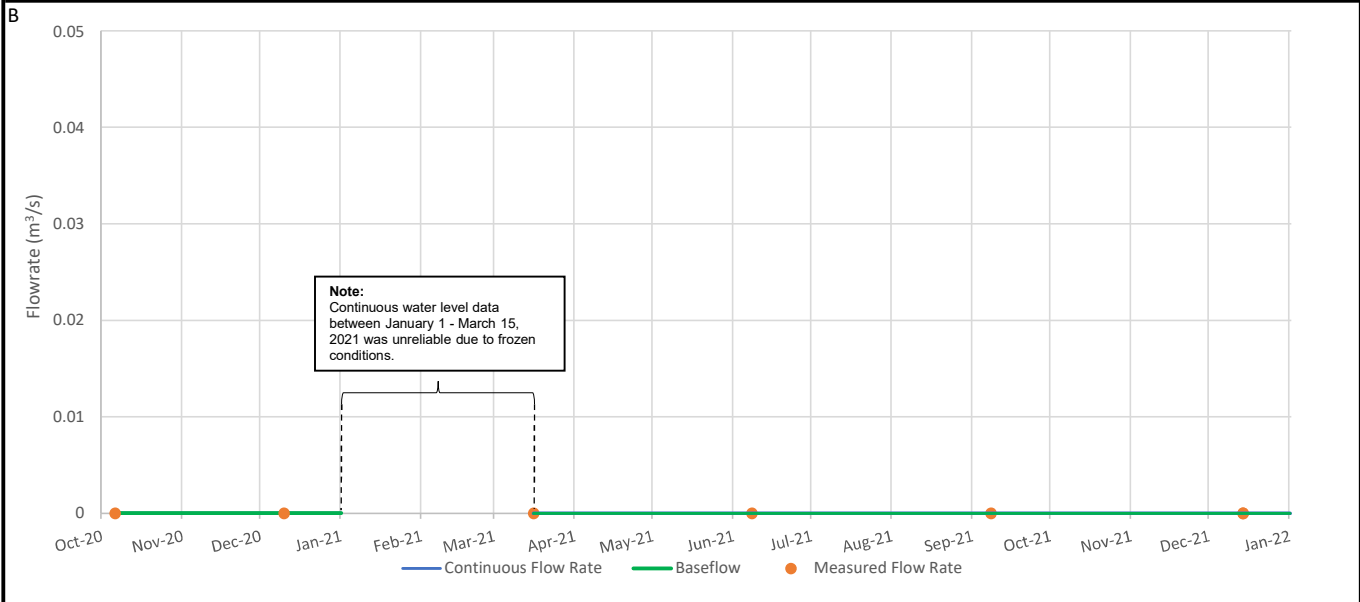
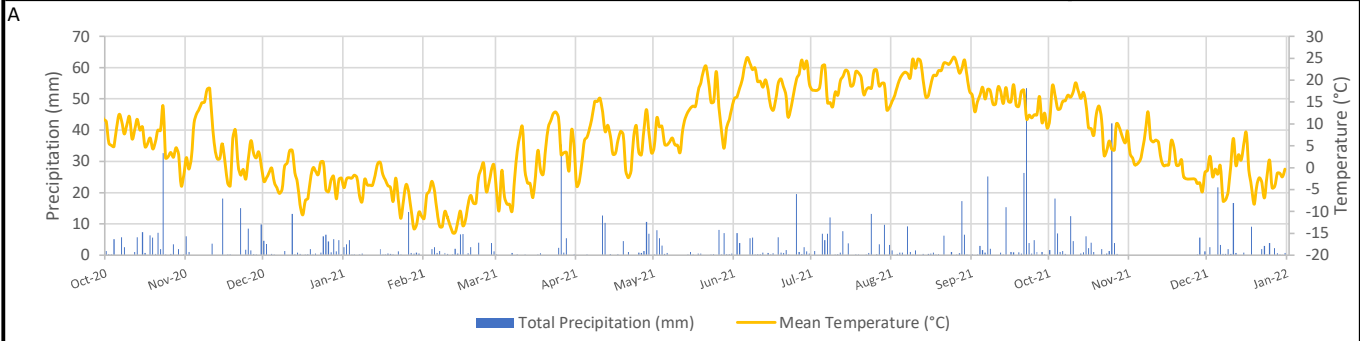


**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow Rate    C. Water Level**





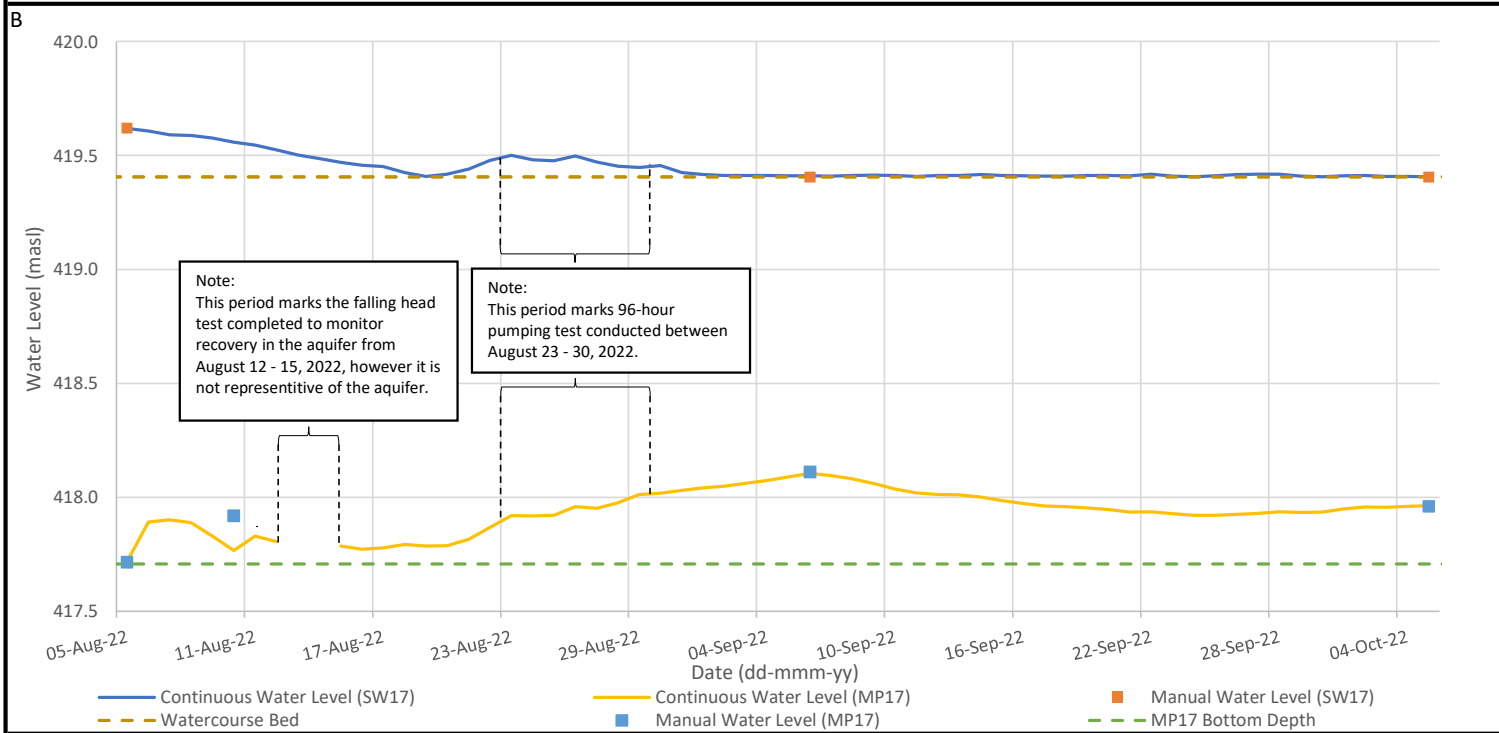
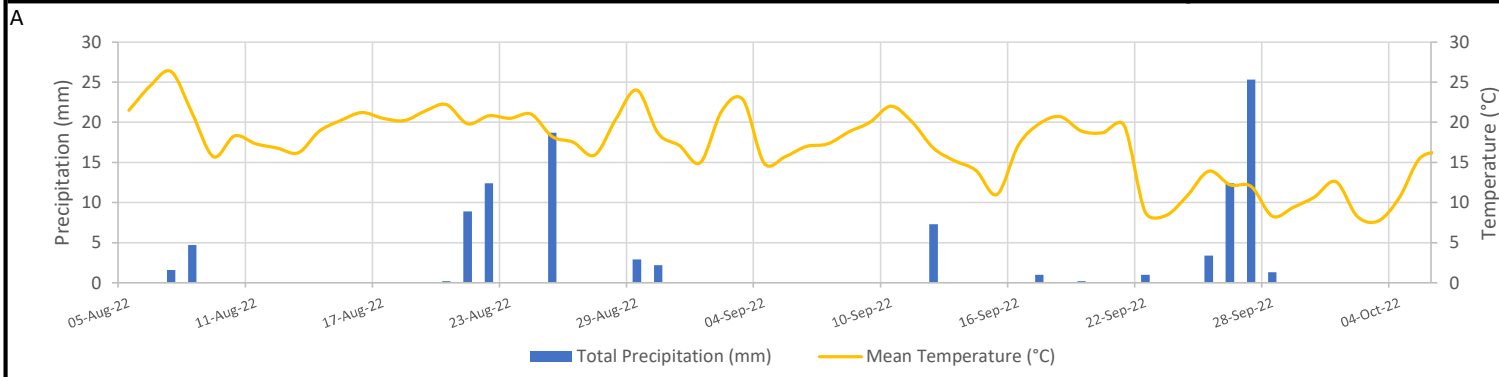
**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow Rate    C. Water Level**



**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Flow Rate    C. Water Level**

Water Levels at SW17/MP17 Adjacent to VCNA Caledon Quarry in the Northwest Wetland (2022)

FIGURE L17



A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Water Level

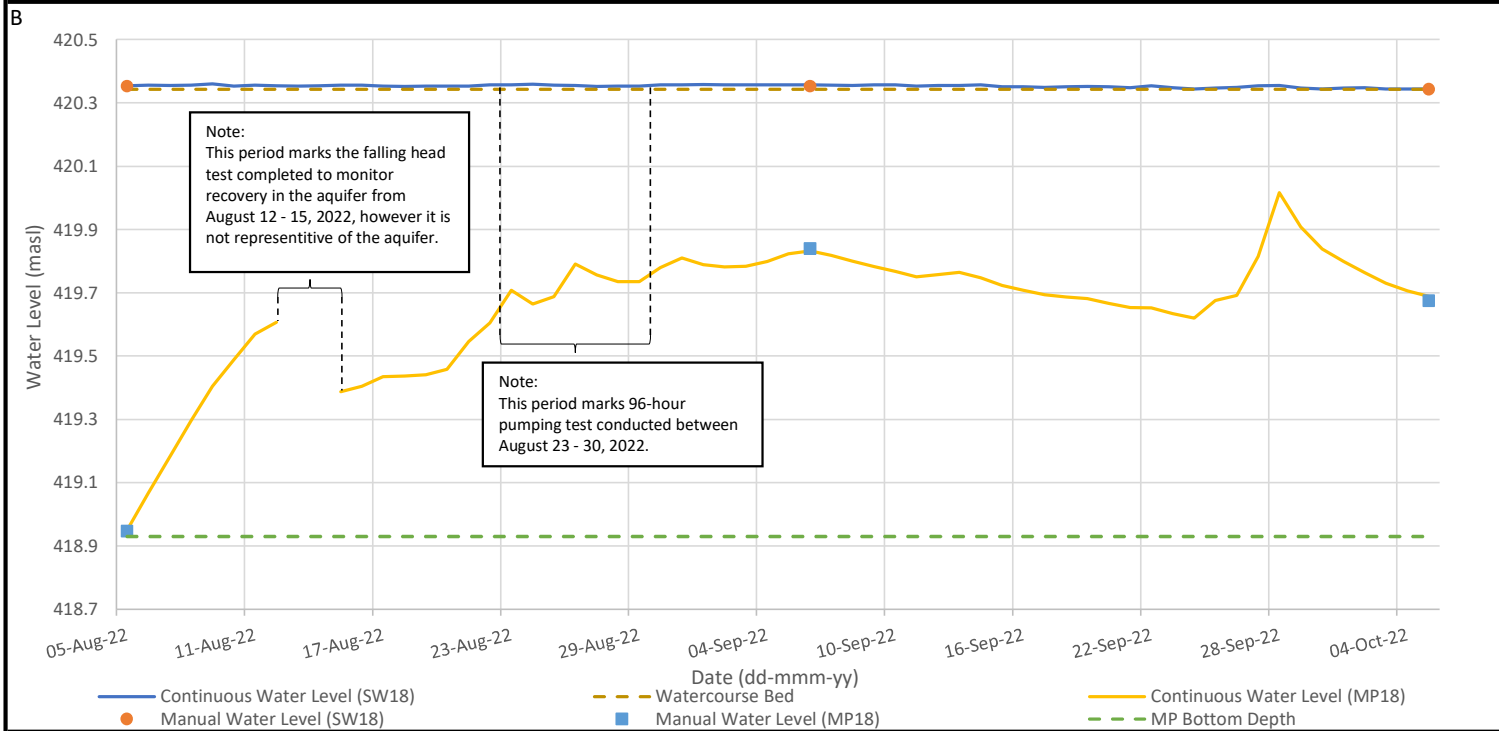
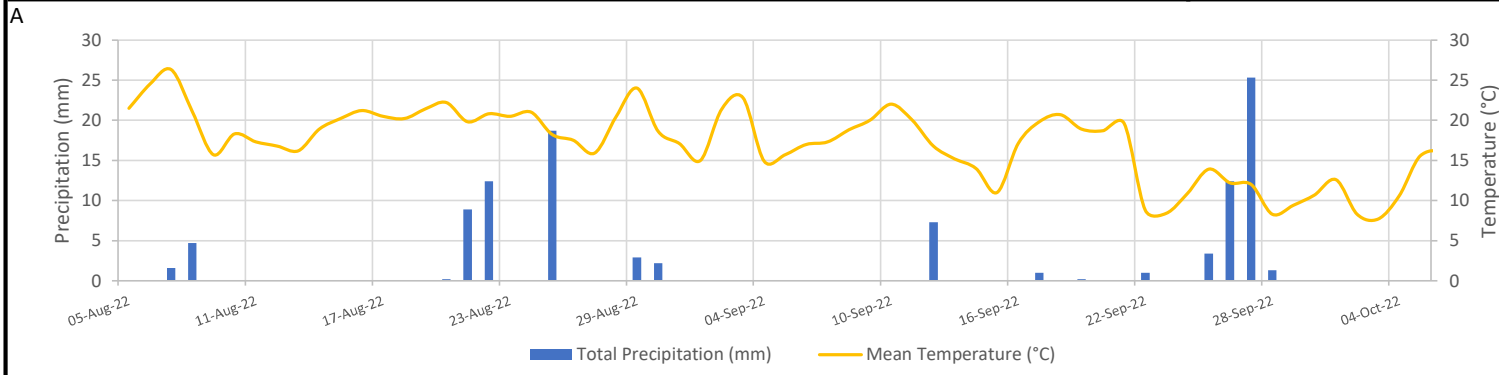
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DATE: December 2022



DRAWN: MR  
CHECK: CDV

Water Levels at SW18/MP18 Adjacent to VCNA Caledon Quarry in the Northwest Wetland (2022)

FIGURE L18



A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Water Level

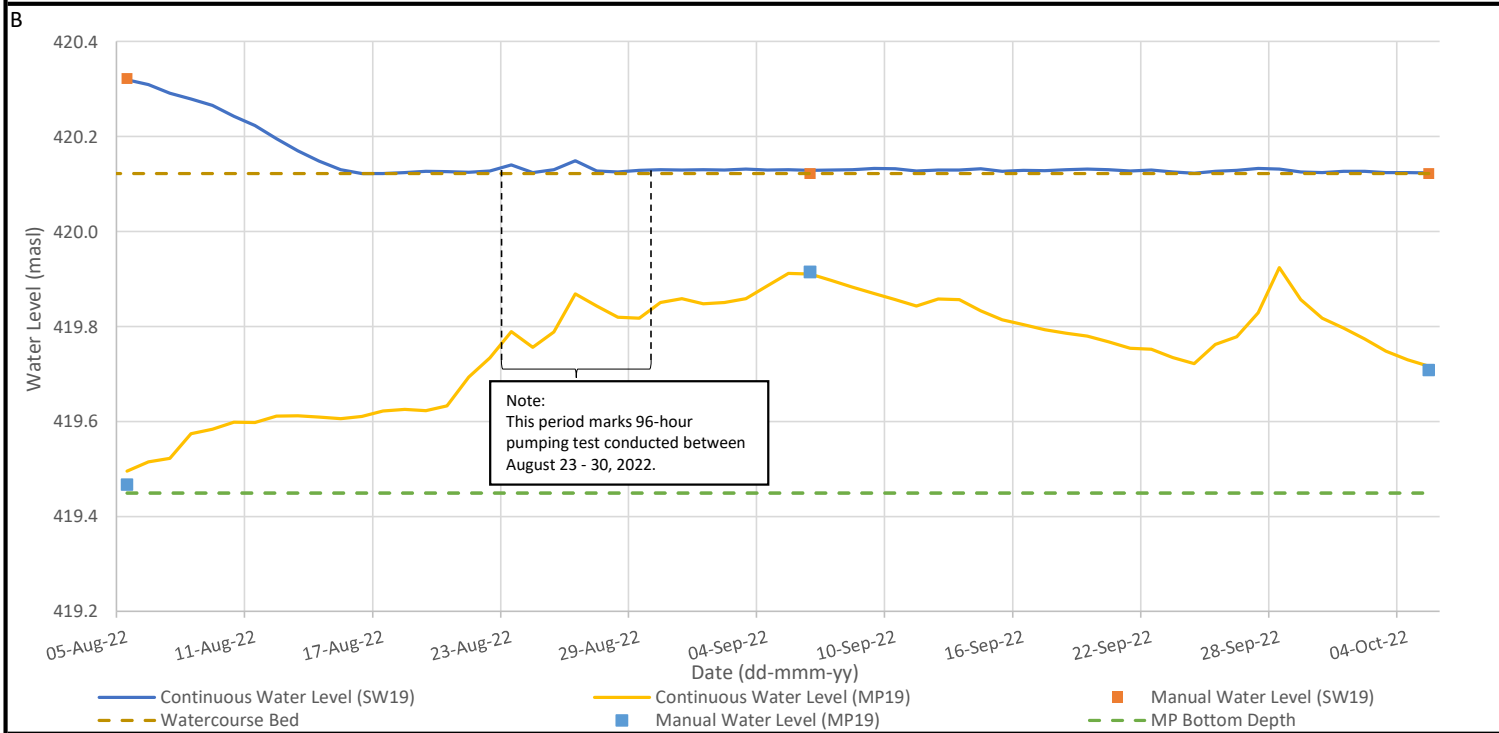
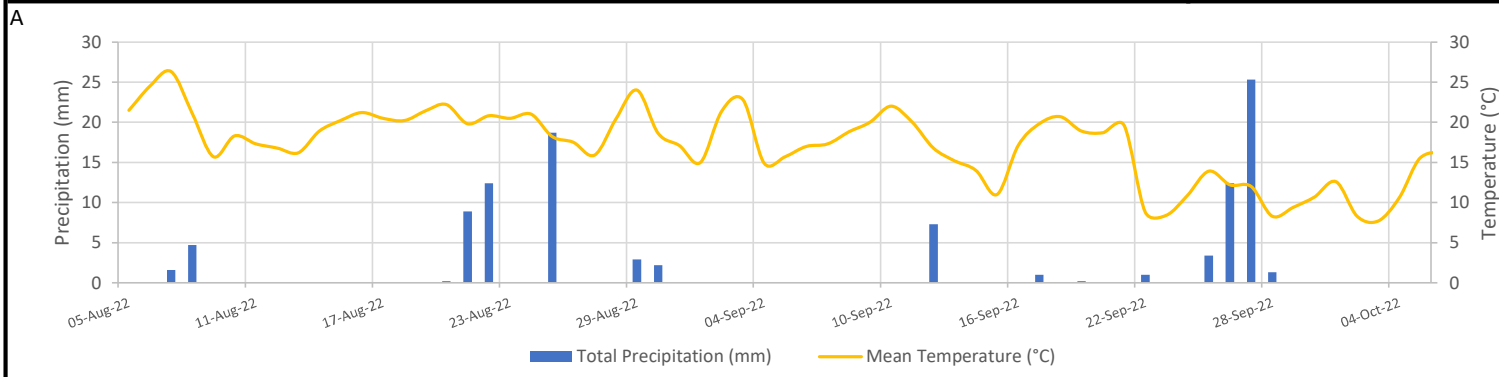
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DATE: December 2022



DRAWN: MR  
CHECK: CDV

Water Levels at SW19/MP19 Adjacent to VCNA Caledon Quarry in the Northwest Wetland (2022)

FIGURE L19



**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Water Level**

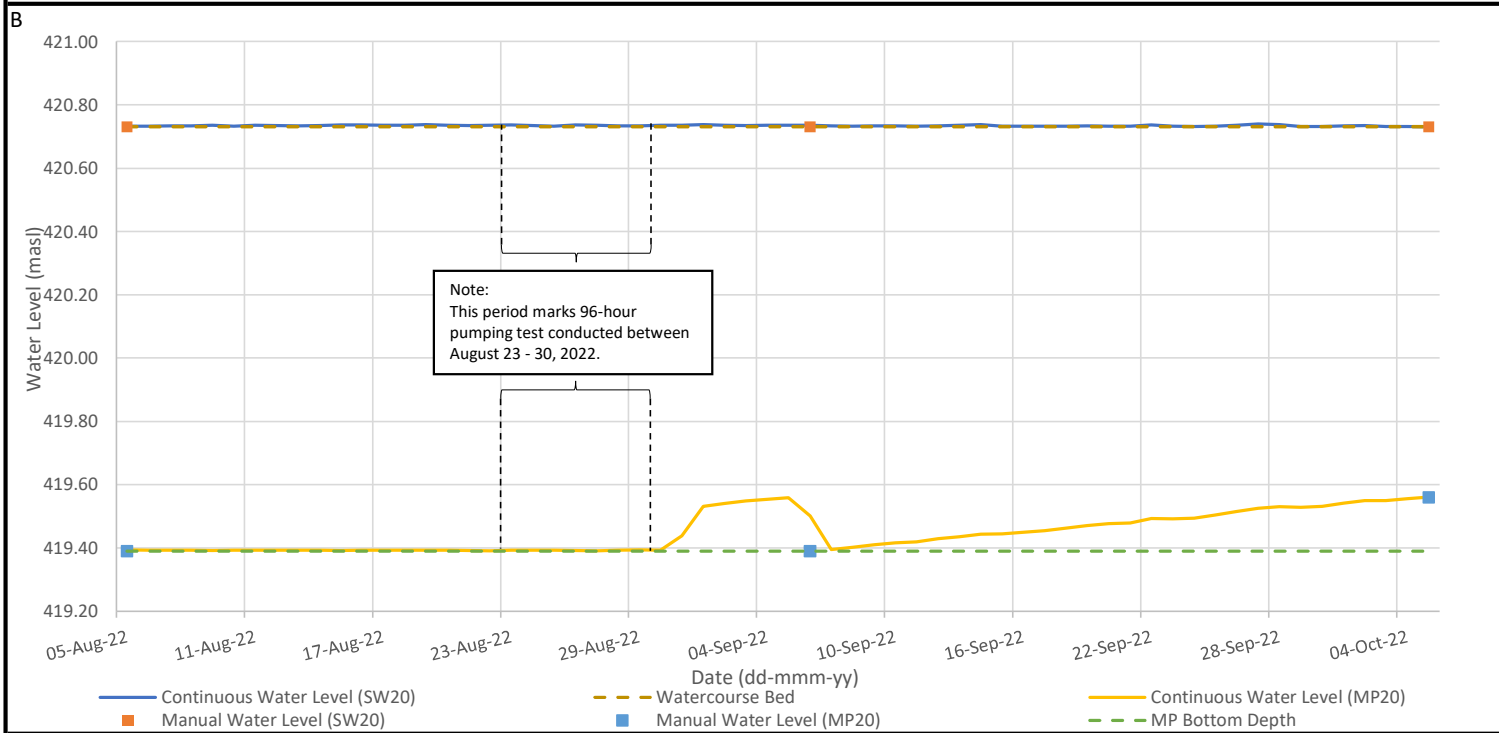
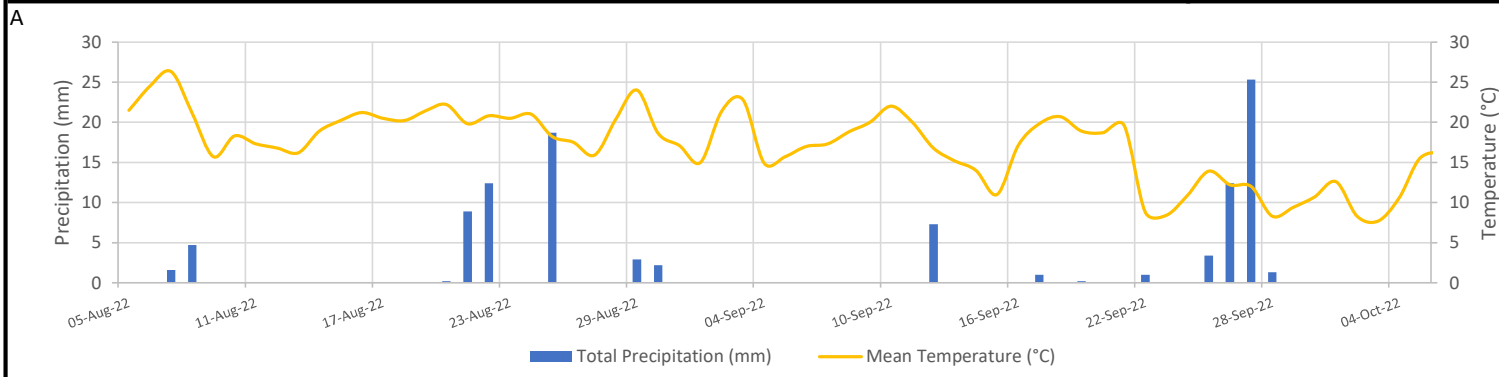
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DATE: December 2022



DRAWN: MR  
CHECK: CDV

Water Levels at SW20/MP20 Adjacent to VCNA Caledon Quarry in the Northwest Wetland (2022)

FIGURE L20

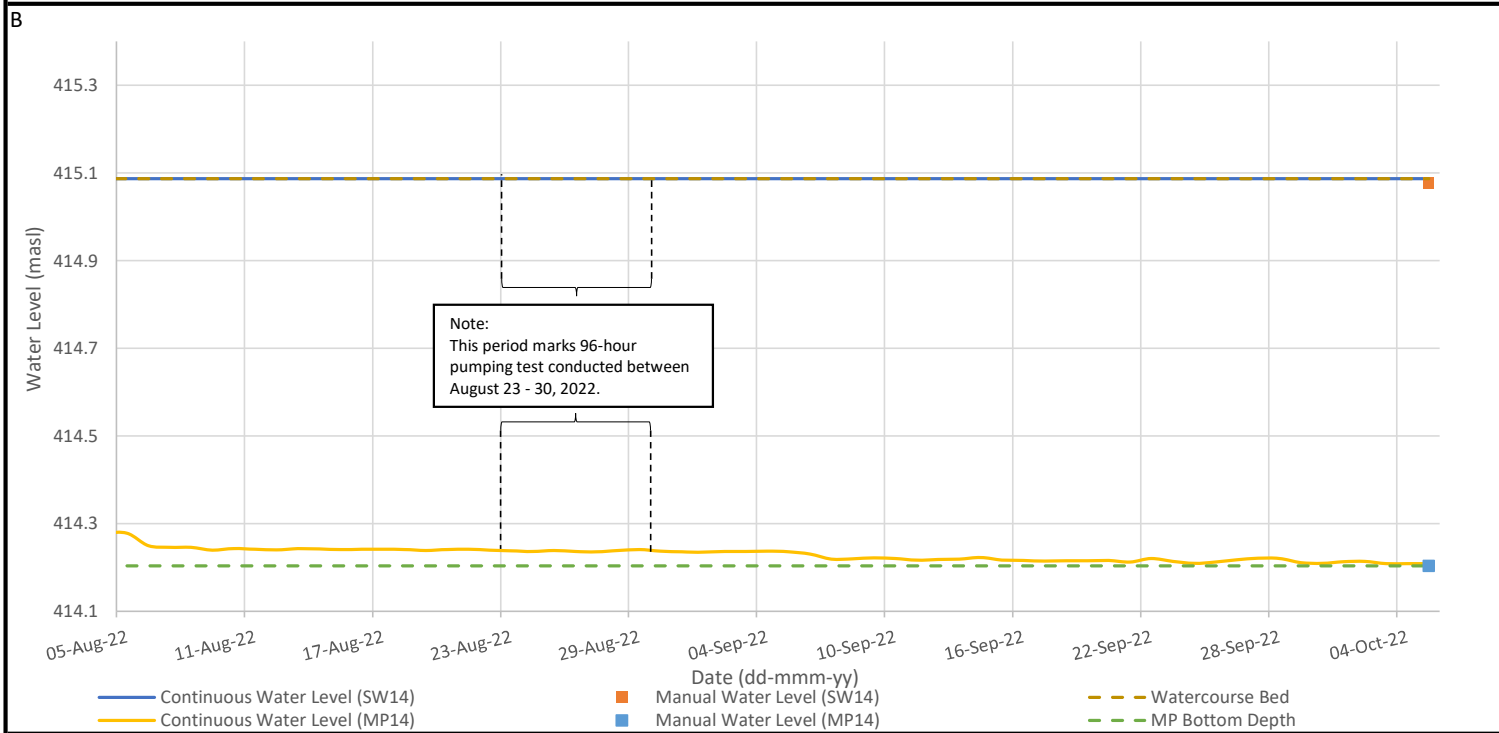
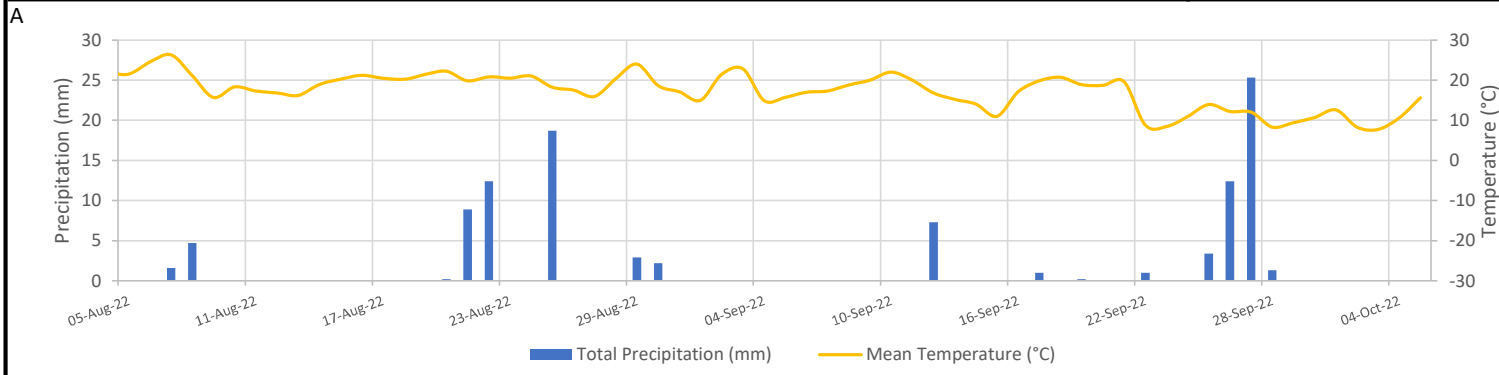


A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000) B. Water Level



Water Levels at SW14/MP14 Adjacent to VCNA Caledon Quarry in the Northwest Wetland (2022)

FIGURE L21



**A. Total Daily Precipitation and Mean Daily Temperature (Mono Centre, ON, EC Climate ID#6157000)    B. Water Level**

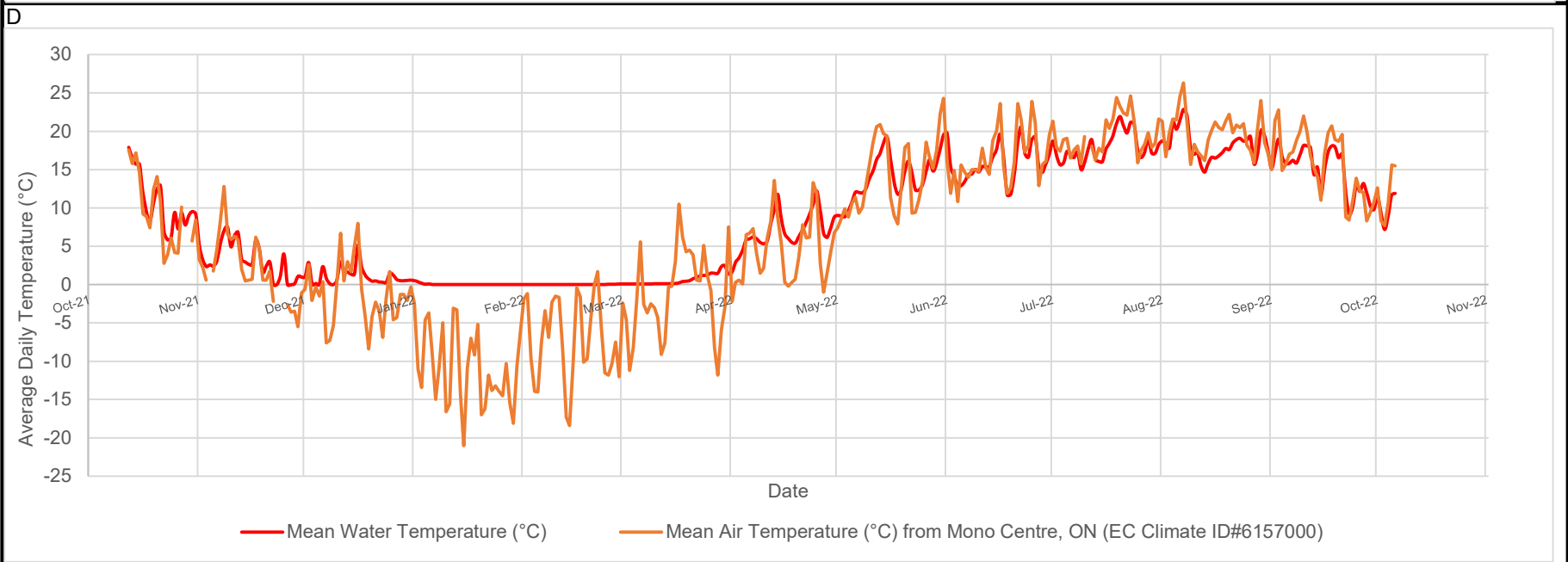
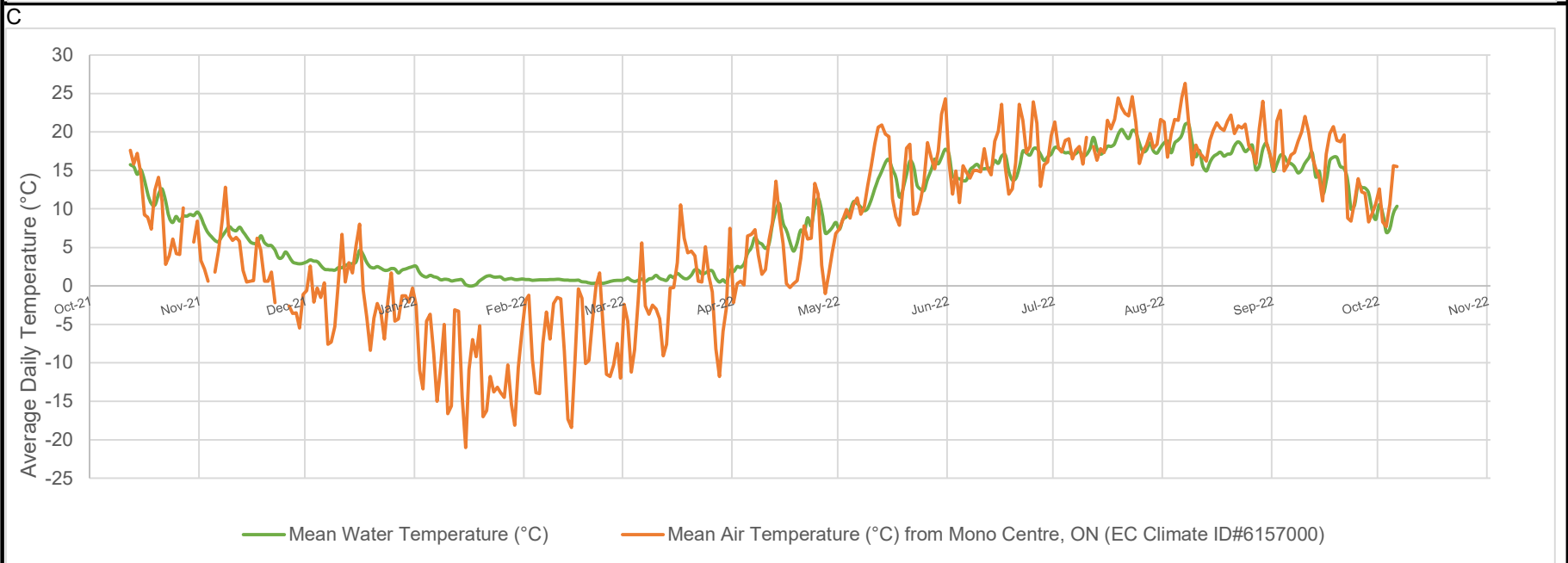
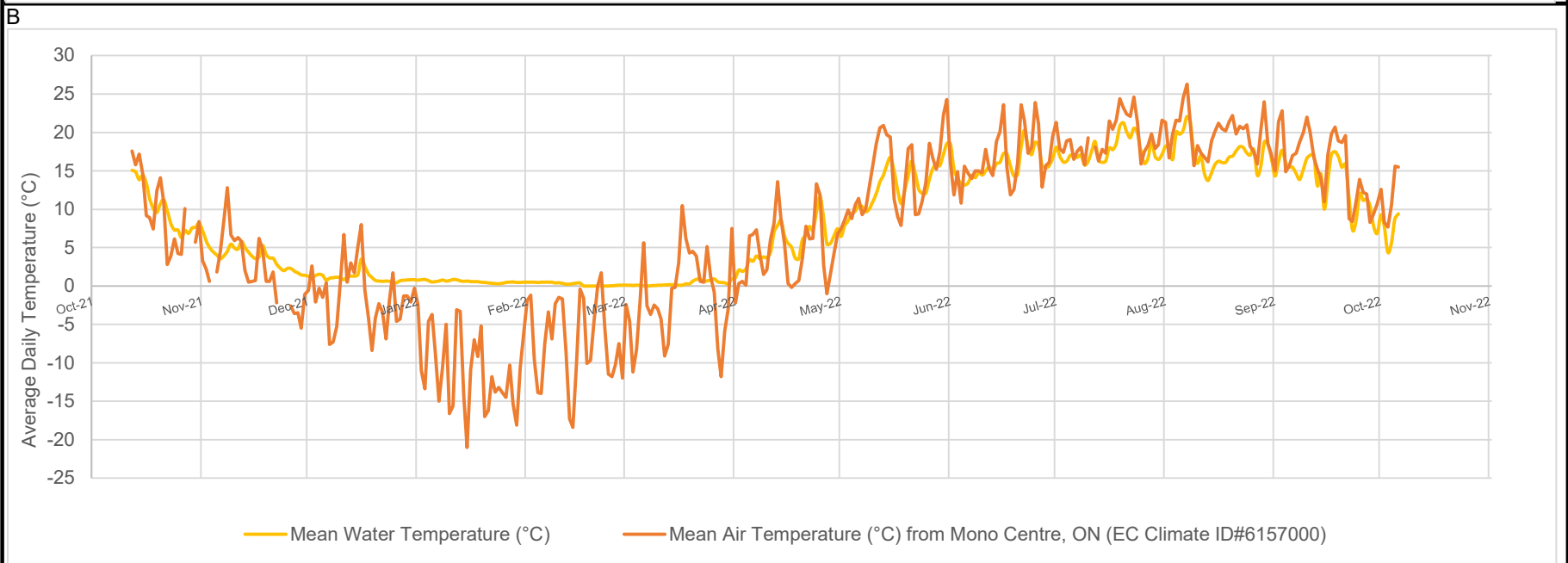
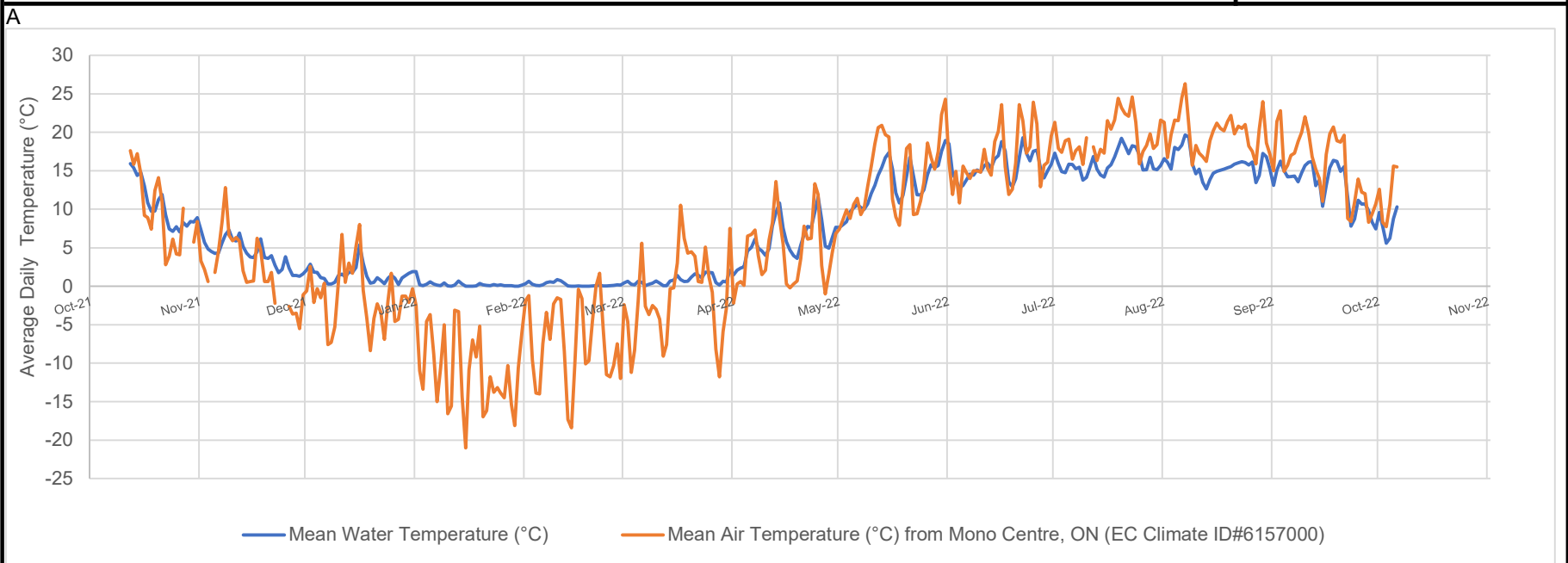
PROJECT: 19129150  
DATE: December 2022



DRAWN: MR  
CHECK: CDV

**APPENDIX M**

# Surface Water Temperature

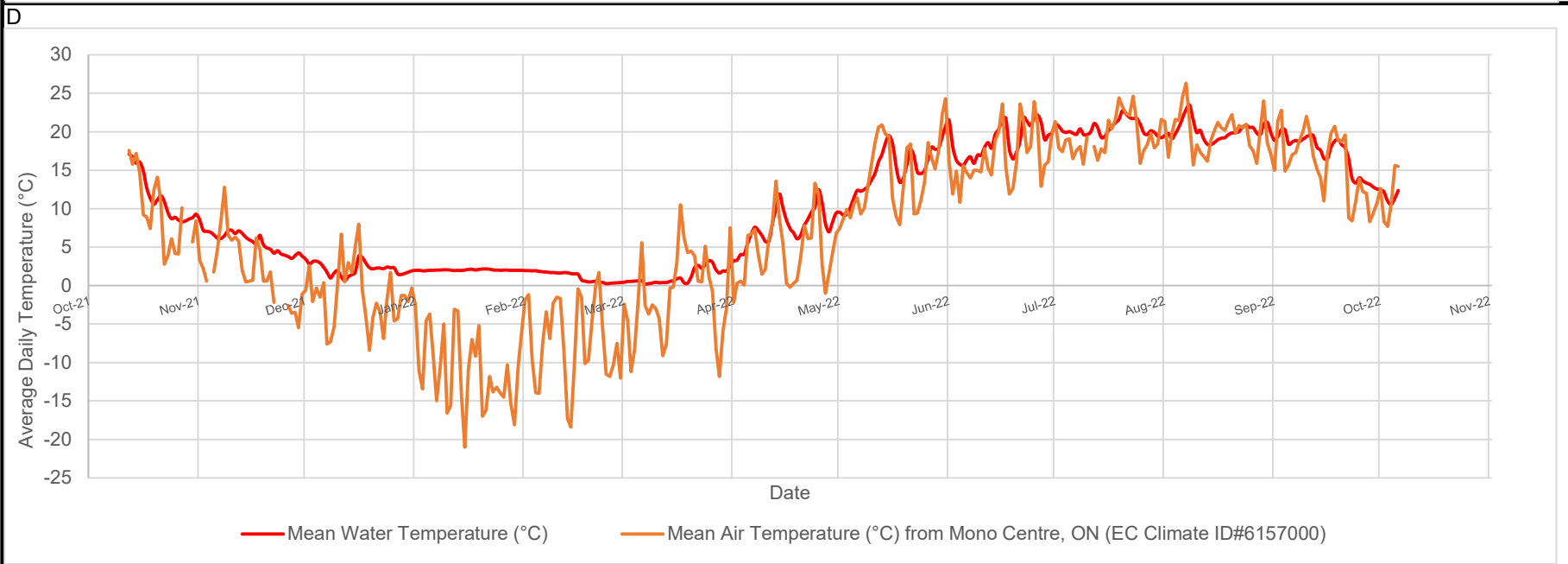
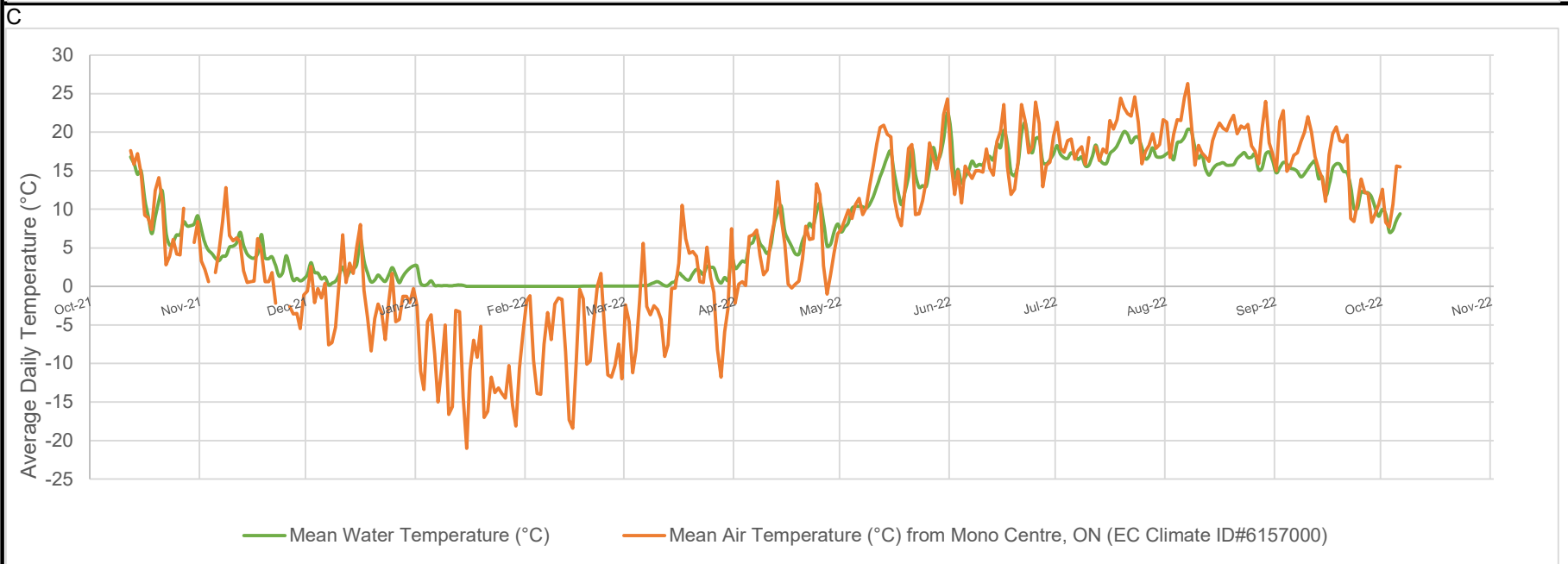
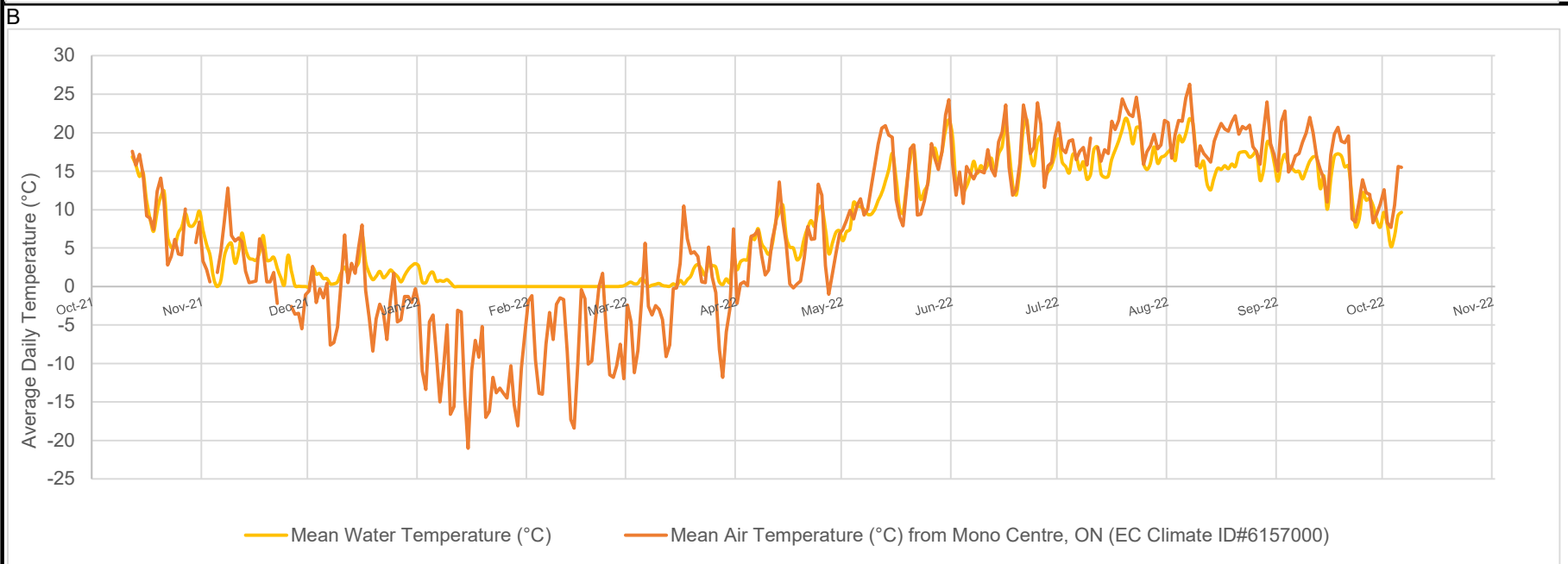
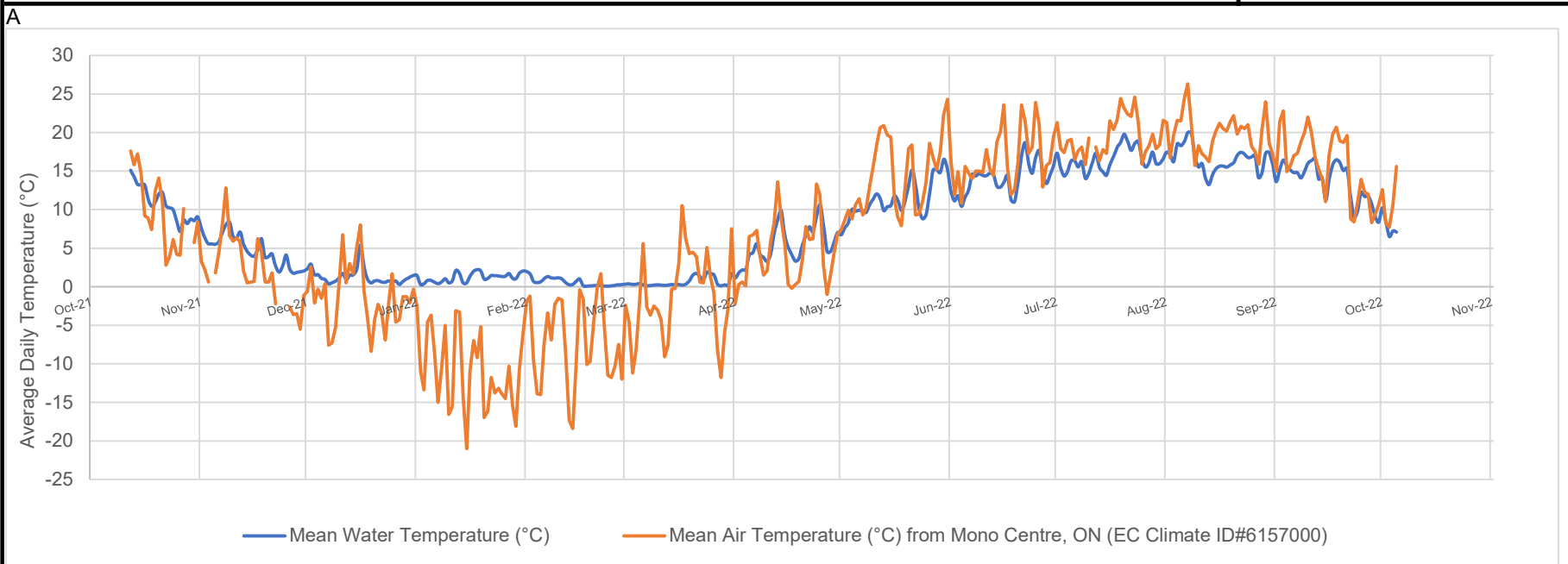


A. SW1 Water Temperature

B. SW2 Water Temperature

C. SW3 Water Temperature

D. SW4 Water Temperature

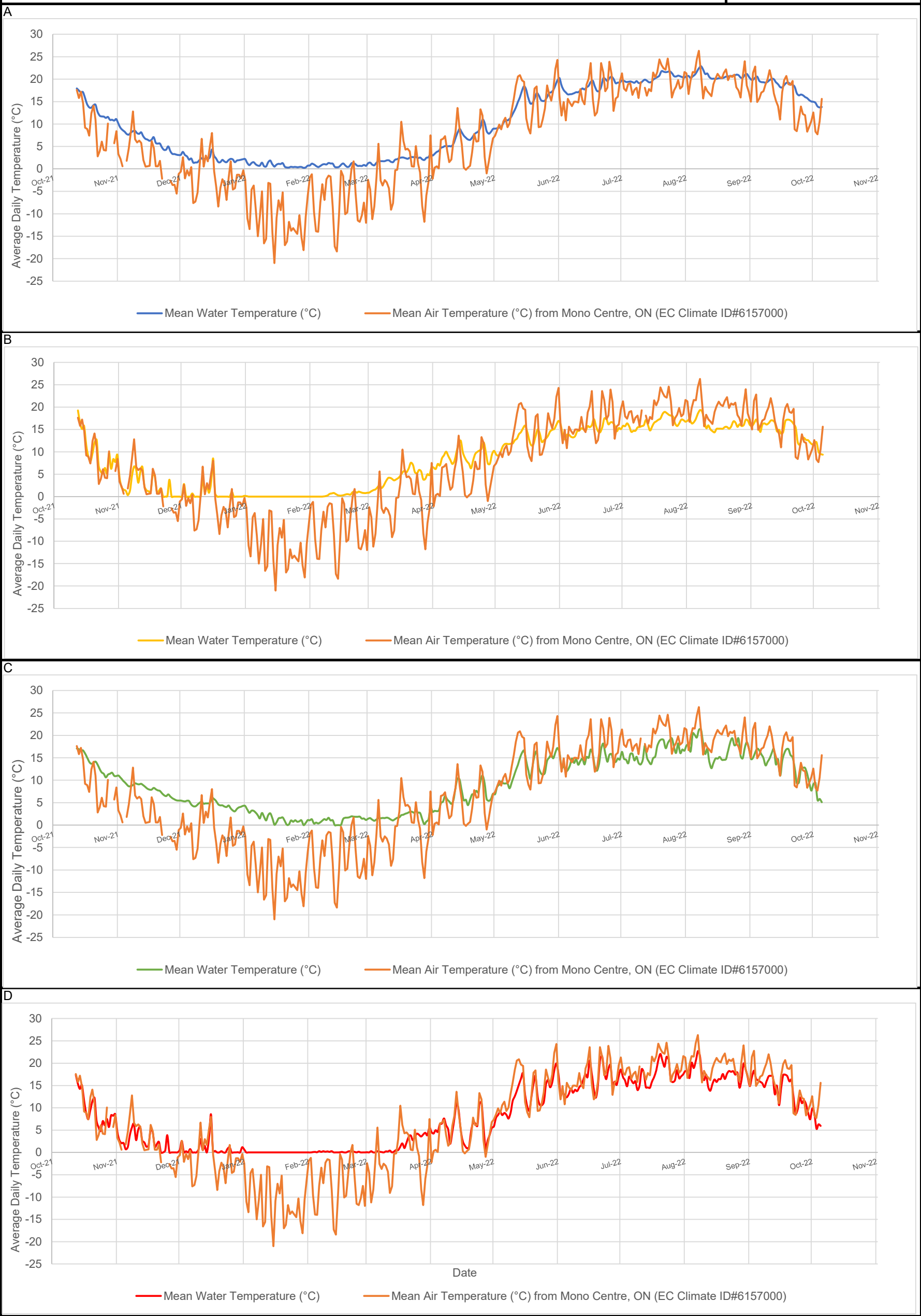


A. SW5 Water Temperature

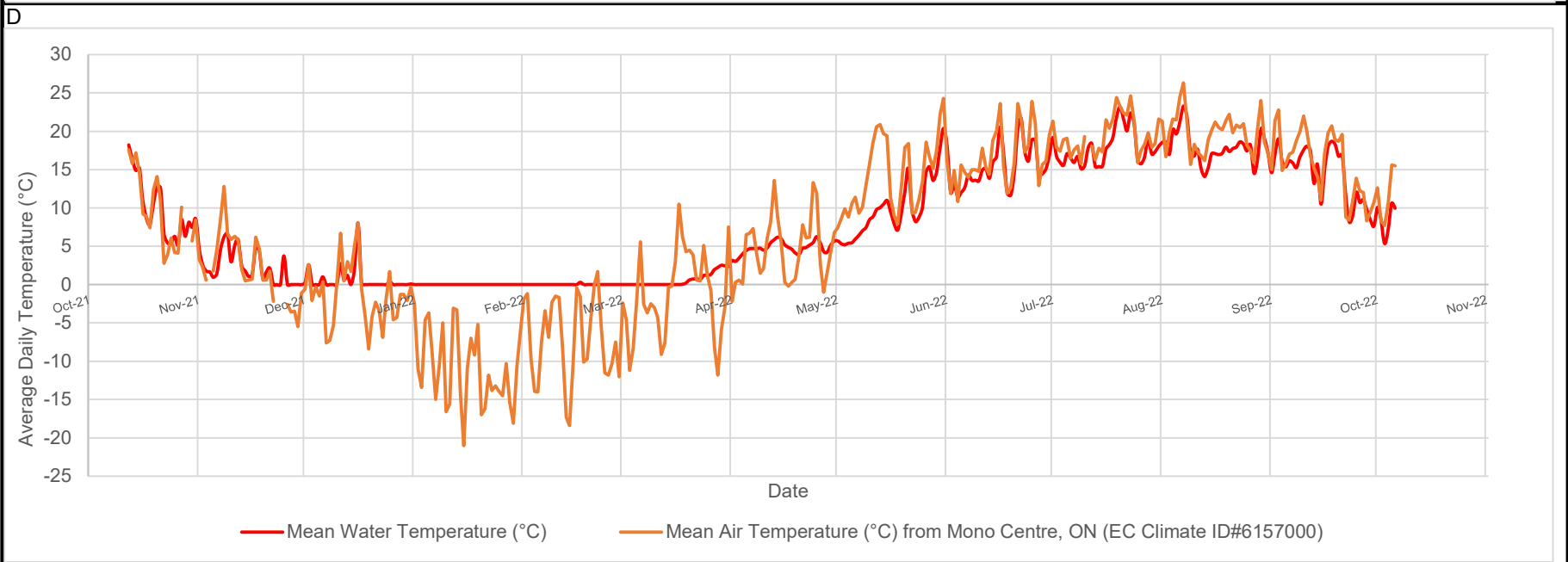
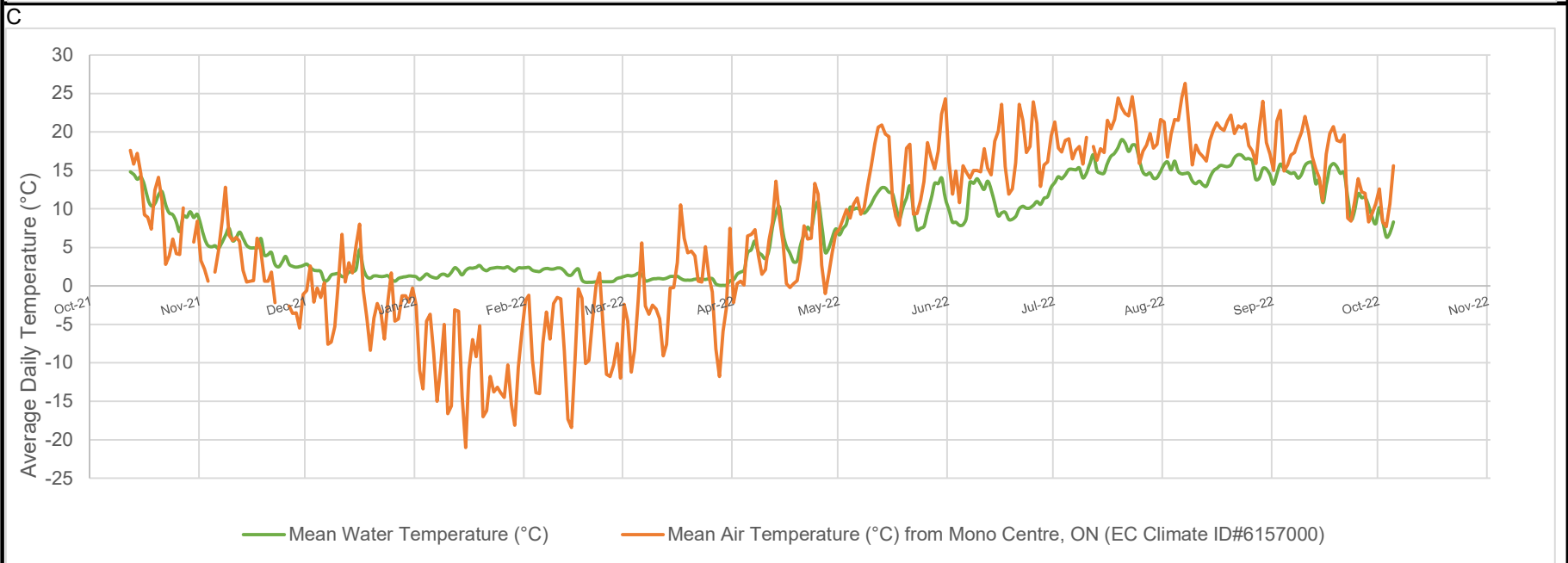
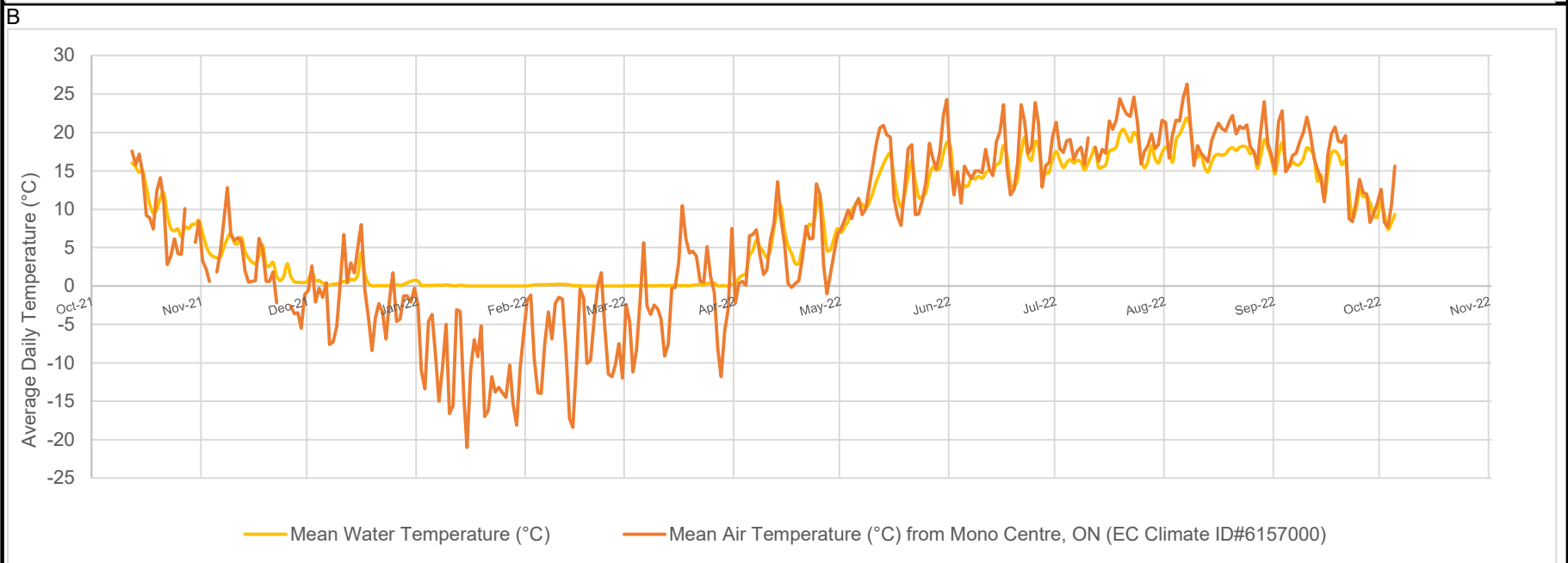
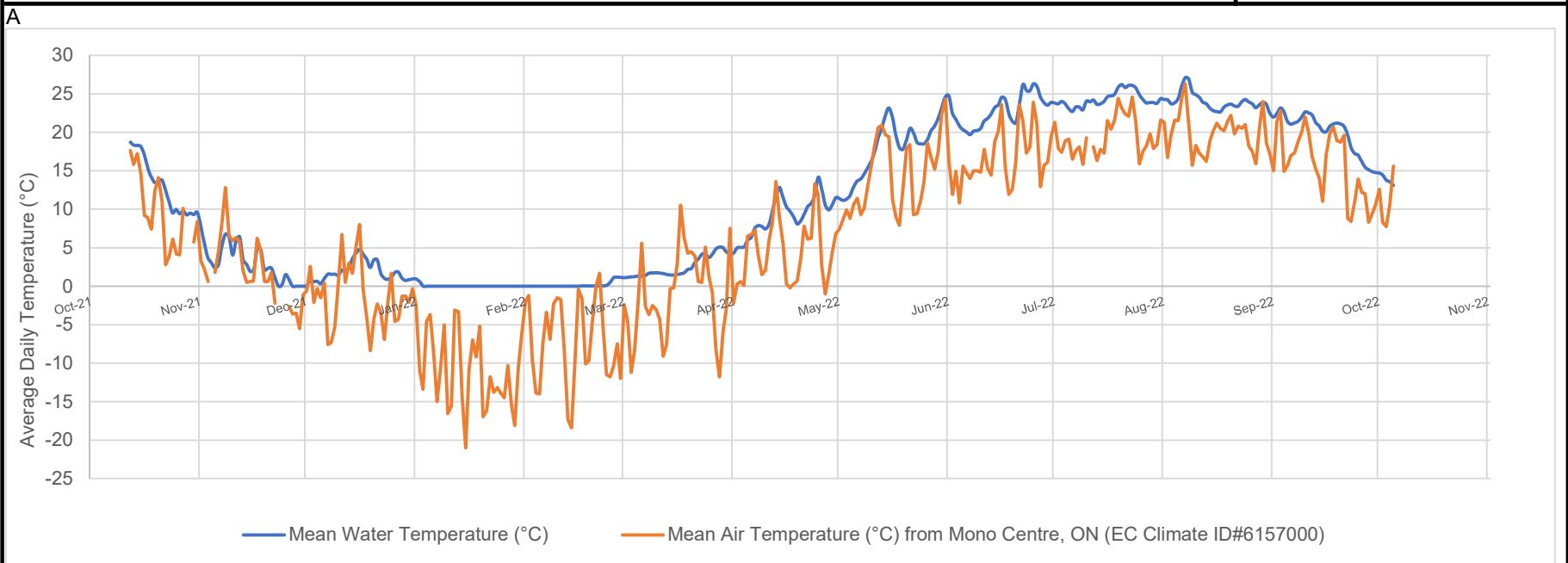
B. SW6 Water Temperature

C. SW7 Water Temperature

D. SW8 Water Temperature



A. SW9 Water Temperature    B. SW10 Water Temperature    C. SW11 Water Temperature    D. SW12 Water Temperature



A. SW13 Water Temperature

B. SW14 Water Temperature

C. SW15 Water Temperature

D. SW16 Water Temperature



**APPENDIX N**

# Surface Water Quality

Table N-1  
CBM Caledon Quarry Water Quality Results

Sampling Date	June 8, 2021										September 8, 2021				December 14, 2021				March 24, 2022				
	Calculated Parameters	UNITS	PWQO	SW8	SW9	SW10	SW11	SW13	SW8	SW9	SW11	SW13	SW8	SW9	SW11	SW13	SW8	SW9	SW10	SW11	SW13		
Hardness (CaCO3)	mg/L	-	250.00	260.00	250.00	170.00	150.00	190.00	250.00	130.00	220.00	240	270	230	170	220	230	280	230	210			
<b>Field Measurements</b>																							
Field Temperature	Celsius	-	25.2	23.6	26.9	22.6	25.1	18.6	21.8	20.5	15.1	1.2	1.9	2.4	1.5	4.3	2.6	5.2	3.0	3.0			
Field Measured pH	-	6.5 - 8.5	7.8	8.4	8.1	7.5	8.3	8.1	8.7	8.3	8.3	7.9	8.7	8.4	8.7	8.0	7.8	7.9	7.9	7.8			
Field Measured Conductivity	uS/cm	-	812	615	595	407	411	1817	606	305	759	547	615	494	424	627	507	626	465	450			
Field Measured Dissolved Oxygen	mg/L	-	7.31	8.33	9.85	4.21	9.62	8.00	8.52	6.25	6.95	10.63	12.30	11.81	14.41	10.12	9.47	10.80	11.06	11.58			
Field Measured Turbidity	NTU	-	2.3	6.0	1.2	1.5	1.2	11.1	25.5	7.6	17.3	1.2	3.7	3.4	4.5	0.0	0.8	0.0	5.5	0.3			
<b>Inorganics</b>																							
Total Ammonia-N	mg/L	-	<0.050	0.06	<0.050	0.21	<0.050	0.07	<0.050	<0.050	<0.050	<0.050	0.39	0.35	0.13	<0.050	0.099	<0.050	1.2	0.087			
Total Phosphorus	mg/L	0.03	0.081	0.028	0.027	0.180	0.027	0.064	0.020	0.120	0.025	0.024	0.016	0.220	0.007	0.014	0.020	0.008	0.37	0.009			
Alkalinity (Total as CaCO3)	mg/L	-	240.00	230.00	180.00	160.00	140.00	170.00	210.00	120.00	180.00	200	230	220	150	200	200	240	210	190			
Dissolved Chloride (Cl-)	mg/L	-	130.00	44.00	45.00	23.00	39.00	420.00	44.00	21.00	110.00	29	40	19	34	36	30	42	37	31			
Nitrite (N)	mg/L	-	<0.010	0.01	<0.010	0.02	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.022	0.021	<0.010	<0.010	<0.010	<0.010	0.059	<0.010			
Nitrate (N)	mg/L	-	<0.10	0.72	<0.10	<0.10	<0.10	<0.10	0.50	<0.10	0.63	1.7	0.63	0.36	0.10	1.26	1.00	1.08	1.14	0.26			
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.74	<0.10	<0.10	<0.10	<0.10	0.50	<0.10	0.63	1.71	0.66	0.38	0.10	1.26	1.00	1.08	1.20	0.26			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.54	0.17	0.46	0.88	0.43	0.50	0.27	0.55	0.24	0.37	0.58	1	0.48	0.20	0.30	0.12	1.6	0.27			
Total Suspended Solids	mg/L	-	4.00	13.00	2.00	7.00	4.00	13.00	9.00	14.00	11.00	1	7	8	4	<1	18	<1	5	2			
<b>Petroleum Hydrocarbons</b>																							
Total Oil & Grease	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.60	0.80	0.70	0.70			
<b>Total Metals</b>																							
Aluminum (Al)	ug/L	-	12	21	7	31	7	180	20	32	30	17	24	30	4.9	23	13	7.0	27	18			
Antimony (Sb)	ug/L	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Arsenic (As)	ug/L	100	<1.0	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Barium (Ba)	ug/L	-	16	140	76	19	27	46	130	12	47	16	130	19	28	16	97	63	19	28			
Beryllium (Be)	ug/L	11	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40			
Bismuth (Bi)	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Boron (B)	ug/L	200	12	27	24	25	10	12	29	22	32	<10	24	16	<10	<10	16	<10	10	<10			
Cadmium (Cd)	ug/L	0.2	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090			
Calcium (Ca)	ug/L	-	68000	72000	74000	42000	37000	56000	63000	25000	62000	60000	69000	66000	43000	62000	59000	77000	66000	58000			
Chromium (Cr)	ug/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0			
Cobalt (Co)	ug/L	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Copper (Cu)	ug/L	5	<0.90	<0.90	<0.90	<0.90	2	3	<0.90	<0.90	1	<0.90	<0.90	1.1	<0.90	<0.90	<0.90	<0.90	1.8	<0.90			
Iron (Fe)	ug/L	300	1200	<100	<100	730	210	610	<100	170	<100	<100	<100	280	110	<100	<100	<100	290	130			
Lead (Pb)	ug/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Lithium (Li)	ug/L	-	<5.0	8	<5.0	<5.0	<5.0	<5.0	9	<5.0	<5.0	<5.0	6.6	<5.0	<5.0	<5.0	5.3	<5.0	<5.0	<5.0			
Magnesium (Mg)	ug/L	-	22000	24000	17000	17000	17000	13000	24000	16000	17000	16000	22000	15000	12000	16000	16000	16000	13000	12000			
Manganese (Mn)	ug/L	-	110	13	20	420	31	130	8	23	58	3.4	13	65	11	4.6	13	3.9	130	41			
Molybdenum (Mo)	ug/L	40	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	<0.50	<0.50	<0.50			
Nickel (Ni)	ug/L	25	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Potassium (K)	ug/L	-	690	1500	770	9000	1400	1200	1600	9000	2700	2600	1400	12000	1400	1800	1100	1200	6400	1200			
Selenium (Se)	ug/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
Silicon (Si)	ug/L	-	2100	3400	7700	890	680	2500	3500	640	2900	3700	5500	1800	2800	2000	3800	3300	2500	2100			
Silver (Ag)	ug/L	0.1	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090			
Sodium (Na)	ug/L	-	73000	24000	22000	7800	23000	280000	25000	6100	60000	12000	20000	4700	18000	18000	16000	24000	17000	16000			
Strontium (Sr)	ug/L	-	180	240	140	94	120	180	240	81	140	110	230	120	110	110	180	130	100	100			
Tellurium (Te)	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Thallium (Tl)	ug/L	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050			
Tin (Sn)	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Titanium (Ti)	ug/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	7	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0			
Tungsten (W)	ug/L	30	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Uranium (U)	ug/L	5	0	1	0	0	0	0.2	0	<0.10	0	0.65	0.38	0.28	0.2	0.54	0.59	0.19	0.26	0.18			
Vanadium (V)	ug/L	6	<0.50	<0.50	1	1	<0.50	1	<0.50	1	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Zinc (Zn)	ug/L	30	<5.0	<5.0	<5.0	<5.0	<5.0	8	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	6.6	<5.0			
Zirconium (Zr)	ug/L	4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			

Note(s):  
(1) Shaded (grey) results indicate an exceedance of Ontario Provincial Water Quality Objectives (PWQO).

**APPENDIX O**

# Surface Water Lab Certificates



Your Project #: 19129150  
 Your C.O.C. #: 830687-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
 6925 Century Ave  
 Suite 100  
 Mississauga, ON  
 CANADA L5N 7K2

**Report Date: 2021/06/15**  
 Report #: R6676766  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1F8070**

**Received: 2021/06/09, 07:59**

Sample Matrix: Water  
 # Samples Received: 5

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	5	N/A	2021/06/11	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	5	N/A	2021/06/11	CAM SOP-00463	SM 23 4500-Cl E m
Hardness (calculated as CaCO3)	5	N/A	2021/06/14	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	5	N/A	2021/06/14	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2021/06/11	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	3	N/A	2021/06/11	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2021/06/14	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	5	2021/06/13	2021/06/13	CAM SOP-00326	EPA1664B m,SM5520B m
Total Kjeldahl Nitrogen in Water	5	2021/06/10	2021/06/11	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2021/06/10	2021/06/11	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	2	2021/06/10	2021/06/14	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	2	2021/06/11	2021/06/14	CAM SOP-00428	SM 23 2540D m
Low Level Total Suspended Solids	3	2021/06/12	2021/06/14	CAM SOP-00428	SM 23 2540D m

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope



Your Project #: 19129150  
Your C.O.C. #: 830687-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
6925 Century Ave  
Suite 100  
Mississauga, ON  
CANADA L5N 7K2

**Report Date: 2021/06/15**  
Report #: R6676766  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1F8070**

**Received: 2021/06/09, 07:59**

dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: emese.gitej@bureauveritas.com

Phone# (905)817-5829

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This report has been generated and distributed using a secure automated process.

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU  
VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

**RESULTS OF ANALYSES OF WATER**

BV Labs ID		PUG858		PUG859			PUG859		
Sampling Date		2021/06/08 14:00		2021/06/08 15:00			2021/06/08 15:00		
COC Number		830687-01-01		830687-01-01			830687-01-01		
	UNITS	SW8	QC Batch	SW9	RDL	QC Batch	SW9 Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>									
Hardness (CaCO <sub>3</sub> )	mg/L	250	7398104	260	1.0	7398104			
<b>Inorganics</b>									
Total Ammonia-N	mg/L	<0.050	7400379	0.055	0.050	7401360	<0.050	0.050	7401360
Total Kjeldahl Nitrogen (TKN)	mg/L	0.54	7401057	0.17	0.10	7401057			
Total Phosphorus	mg/L	0.081	7400351	0.028	0.004	7400351			
Total Suspended Solids	mg/L	4	7404824	13	1	7400752			
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	240	7401873	230	1.0	7401873			
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	130	7401927	44	1.0	7401927			
Nitrite (N)	mg/L	<0.010	7401889	0.014	0.010	7401903			
Nitrate (N)	mg/L	<0.10	7401889	0.72	0.10	7401903			
Nitrate + Nitrite (N)	mg/L	<0.10	7401889	0.74	0.10	7401903			
<b>Petroleum Hydrocarbons</b>									
Total Oil & Grease	mg/L	<0.50	7405212	<0.50	0.50	7405212			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									





BUREAU  
VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

**RESULTS OF ANALYSES OF WATER**

BV Labs ID		PUG860			PUG861			PUG862		
Sampling Date		2021/06/08 15:45			2021/06/08 12:15			2021/06/08 11:00		
COC Number		830687-01-01			830687-01-01			830687-01-01		
	UNITS	SW10	RDL	QC Batch	SW11	RDL	QC Batch	SW13	RDL	QC Batch
<b>Calculated Parameters</b>										
Hardness (CaCO3)	mg/L	250	1.0	7398104	170	1.0	7398104	150	1.0	7398104
<b>Inorganics</b>										
Total Ammonia-N	mg/L	<0.050	0.050	7400379	0.21	0.050	7400379	<0.050	0.050	7400379
Total Kjeldahl Nitrogen (TKN)	mg/L	0.46	0.10	7401057	0.88	0.10	7401057	0.43	0.10	7401057
Total Phosphorus	mg/L	0.027	0.004	7400351	0.18	0.02	7400351	0.027	0.004	7400351
Total Suspended Solids	mg/L	2	1	7400752	7	1	7404824	4	1	7404824
Alkalinity (Total as CaCO3)	mg/L	180	1.0	7401873	160	1.0	7401873	140	1.0	7401873
Dissolved Chloride (Cl-)	mg/L	45	1.0	7401927	23	1.0	7401927	39	1.0	7401927
Nitrite (N)	mg/L	<0.010	0.010	7401889	0.022	0.010	7401889	<0.010	0.010	7401903
Nitrate (N)	mg/L	<0.10	0.10	7401889	<0.10	0.10	7401889	<0.10	0.10	7401903
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7401889	<0.10	0.10	7401889	<0.10	0.10	7401903
<b>Petroleum Hydrocarbons</b>										
Total Oil & Grease	mg/L	<0.50	0.50	7405212	<0.50	0.50	7405212	<0.50	0.50	7405212
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		PUG862		
Sampling Date		2021/06/08 11:00		
COC Number		830687-01-01		
	UNITS	SW13 Lab-Dup	RDL	QC Batch
<b>Inorganics</b>				
Total Phosphorus	mg/L	0.026	0.004	7400351
Dissolved Chloride (Cl-)	mg/L	40	1.0	7401927
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate				



BUREAU  
VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		PUG858	PUG859	PUG860	PUG861	PUG862		
Sampling Date		2021/06/08 14:00	2021/06/08 15:00	2021/06/08 15:45	2021/06/08 12:15	2021/06/08 11:00		
COC Number		830687-01-01	830687-01-01	830687-01-01	830687-01-01	830687-01-01		
	UNITS	SW8	SW9	SW10	SW11	SW13	RDL	QC Batch

Metals								
Total Aluminum (Al)	ug/L	12	21	6.7	31	6.5	4.9	7405528
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7405528
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.4	<1.0	1.0	7405528
Total Barium (Ba)	ug/L	16	140	76	19	27	2.0	7405528
Total Beryllium (Be)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7405528
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7405528
Total Boron (B)	ug/L	12	27	24	25	10	10	7405528
Total Cadmium (Cd)	ug/L	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7405528
Total Calcium (Ca)	ug/L	68000	72000	74000	42000	37000	200	7405528
Total Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7405528
Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7405528
Total Copper (Cu)	ug/L	<0.90	<0.90	<0.90	<0.90	1.5	0.90	7405528
Total Iron (Fe)	ug/L	1200	<100	<100	730	210	100	7405528
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7405528
Total Lithium (Li)	ug/L	<5.0	7.8	<5.0	<5.0	<5.0	5.0	7405528
Total Magnesium (Mg)	ug/L	22000	24000	17000	17000	17000	50	7405528
Total Manganese (Mn)	ug/L	110	13	20	420	31	2.0	7405528
Total Molybdenum (Mo)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7405528
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7405528
Total Potassium (K)	ug/L	690	1500	770	9000	1400	200	7405528
Total Selenium (Se)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7405528
Total Silicon (Si)	ug/L	2100	3400	7700	890	680	50	7405528
Total Silver (Ag)	ug/L	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7405528
Total Sodium (Na)	ug/L	73000	24000	22000	7800	23000	100	7405528
Total Strontium (Sr)	ug/L	180	240	140	94	120	1.0	7405528
Total Tellurium (Te)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7405528
Total Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7405528
Total Tin (Sn)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7405528
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7405528
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7405528
Total Uranium (U)	ug/L	0.12	0.50	0.22	0.20	0.21	0.10	7405528

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

BV Labs ID		PUG858	PUG859	PUG860	PUG861	PUG862		
Sampling Date		2021/06/08 14:00	2021/06/08 15:00	2021/06/08 15:45	2021/06/08 12:15	2021/06/08 11:00		
COC Number		830687-01-01	830687-01-01	830687-01-01	830687-01-01	830687-01-01		
	<b>UNITS</b>	<b>SW8</b>	<b>SW9</b>	<b>SW10</b>	<b>SW11</b>	<b>SW13</b>	<b>RDL</b>	<b>QC Batch</b>
Total Vanadium (V)	ug/L	<0.50	<0.50	0.54	0.57	<0.50	0.50	7405528
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7405528
Total Zirconium (Zr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7405528
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



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VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### TEST SUMMARY

**BV Labs ID:** PUG858  
**Sample ID:** SW8  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7401873	N/A	2021/06/11	Surinder Rai
Chloride by Automated Colourimetry	KONE	7401927	N/A	2021/06/11	Alina Dobreanu
Hardness (calculated as CaCO3)		7398104	N/A	2021/06/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7405528	N/A	2021/06/14	Prempal Bhatti
Total Ammonia-N	LACH/NH4	7400379	N/A	2021/06/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7401889	N/A	2021/06/11	Chandra Nandlal
Total Oil and Grease	BAL	7405212	2021/06/13	2021/06/13	Mitul Patel
Total Kjeldahl Nitrogen in Water	SKAL	7401057	2021/06/10	2021/06/11	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7400351	2021/06/10	2021/06/14	Shivani Shivani
Low Level Total Suspended Solids	BAL	7404824	2021/06/12	2021/06/14	Sandeep Kaur

**BV Labs ID:** PUG859  
**Sample ID:** SW9  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7401873	N/A	2021/06/11	Surinder Rai
Chloride by Automated Colourimetry	KONE	7401927	N/A	2021/06/11	Alina Dobreanu
Hardness (calculated as CaCO3)		7398104	N/A	2021/06/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7405528	N/A	2021/06/14	Prempal Bhatti
Total Ammonia-N	LACH/NH4	7401360	N/A	2021/06/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7401903	N/A	2021/06/14	Chandra Nandlal
Total Oil and Grease	BAL	7405212	2021/06/13	2021/06/13	Mitul Patel
Total Kjeldahl Nitrogen in Water	SKAL	7401057	2021/06/10	2021/06/11	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7400351	2021/06/10	2021/06/11	Shivani Shivani
Low Level Total Suspended Solids	BAL	7400752	2021/06/11	2021/06/14	Sandeep Kaur

**BV Labs ID:** PUG859 Dup  
**Sample ID:** SW9  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	7401360	N/A	2021/06/11	Amanpreet Sappal

**BV Labs ID:** PUG860  
**Sample ID:** SW10  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7401873	N/A	2021/06/11	Surinder Rai
Chloride by Automated Colourimetry	KONE	7401927	N/A	2021/06/11	Alina Dobreanu
Hardness (calculated as CaCO3)		7398104	N/A	2021/06/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7405528	N/A	2021/06/14	Prempal Bhatti
Total Ammonia-N	LACH/NH4	7400379	N/A	2021/06/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7401889	N/A	2021/06/11	Chandra Nandlal



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VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### TEST SUMMARY

**BV Labs ID:** PUG860  
**Sample ID:** SW10  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Oil and Grease	BAL	7405212	2021/06/13	2021/06/13	Mitul Patel
Total Kjeldahl Nitrogen in Water	SKAL	7401057	2021/06/10	2021/06/11	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7400351	2021/06/10	2021/06/11	Shivani Shivani
Low Level Total Suspended Solids	BAL	7400752	2021/06/11	2021/06/14	Sandeep Kaur

**BV Labs ID:** PUG861  
**Sample ID:** SW11  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7401873	N/A	2021/06/11	Surinder Rai
Chloride by Automated Colourimetry	KONE	7401927	N/A	2021/06/11	Alina Dobreanu
Hardness (calculated as CaCO3)		7398104	N/A	2021/06/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7405528	N/A	2021/06/14	Prempal Bhatti
Total Ammonia-N	LACH/NH4	7400379	N/A	2021/06/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7401889	N/A	2021/06/11	Chandra Nandlal
Total Oil and Grease	BAL	7405212	2021/06/13	2021/06/13	Mitul Patel
Total Kjeldahl Nitrogen in Water	SKAL	7401057	2021/06/10	2021/06/11	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7400351	2021/06/10	2021/06/14	Shivani Shivani
Low Level Total Suspended Solids	BAL	7404824	2021/06/12	2021/06/14	Sandeep Kaur

**BV Labs ID:** PUG862  
**Sample ID:** SW13  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7401873	N/A	2021/06/11	Surinder Rai
Chloride by Automated Colourimetry	KONE	7401927	N/A	2021/06/11	Alina Dobreanu
Hardness (calculated as CaCO3)		7398104	N/A	2021/06/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7405528	N/A	2021/06/14	Prempal Bhatti
Total Ammonia-N	LACH/NH4	7400379	N/A	2021/06/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7401903	N/A	2021/06/14	Chandra Nandlal
Total Oil and Grease	BAL	7405212	2021/06/13	2021/06/13	Mitul Patel
Total Kjeldahl Nitrogen in Water	SKAL	7401057	2021/06/10	2021/06/11	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7400351	2021/06/10	2021/06/11	Shivani Shivani
Low Level Total Suspended Solids	BAL	7404824	2021/06/12	2021/06/14	Sandeep Kaur

**BV Labs ID:** PUG862 Dup  
**Sample ID:** SW13  
**Matrix:** Water

**Collected:** 2021/06/08  
**Shipped:**  
**Received:** 2021/06/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	7401927	N/A	2021/06/11	Alina Dobreanu
Total Phosphorus (Colourimetric)	LACH/P	7400351	2021/06/10	2021/06/11	Shivani Shivani



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VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-0.3°C
Package 2	0.7°C

**Results relate only to the items tested.**





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VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

### QUALITY ASSURANCE REPORT

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7400351	Total Phosphorus	2021/06/11	102	80 - 120	101	80 - 120	<0.004	mg/L	0.38	20	96	80 - 120
7400379	Total Ammonia-N	2021/06/11	86	75 - 125	103	80 - 120	<0.050	mg/L	0.48	20		
7400752	Total Suspended Solids	2021/06/14					<1	mg/L	3.6	25	98	85 - 115
7401057	Total Kjeldahl Nitrogen (TKN)	2021/06/11	NC	80 - 120	95	80 - 120	<0.10	mg/L	1.1	20	94	80 - 120
7401360	Total Ammonia-N	2021/06/11	97	75 - 125	100	80 - 120	<0.050	mg/L	10	20		
7401873	Alkalinity (Total as CaCO3)	2021/06/11			96	85 - 115	<1.0	mg/L	1.0	20		
7401889	Nitrate (N)	2021/06/11	97	80 - 120	97	80 - 120	<0.10	mg/L	0.76	20		
7401889	Nitrite (N)	2021/06/11	100	80 - 120	101	80 - 120	<0.010	mg/L	NC	20		
7401903	Nitrate (N)	2021/06/14	99	80 - 120	100	80 - 120	<0.10	mg/L	NC	20		
7401903	Nitrite (N)	2021/06/14	105	80 - 120	106	80 - 120	<0.010	mg/L	NC	20		
7401927	Dissolved Chloride (Cl-)	2021/06/11	NC	80 - 120	105	80 - 120	<1.0	mg/L	1.2	20		
7404824	Total Suspended Solids	2021/06/14					<1	mg/L	6.1	25	96	85 - 115
7405212	Total Oil & Grease	2021/06/13			98	85 - 115	<0.50	mg/L	1.0	25		
7405528	Total Aluminum (Al)	2021/06/14	NC	80 - 120	95	80 - 120	<4.9	ug/L	3.5	20		
7405528	Total Antimony (Sb)	2021/06/14	101	80 - 120	99	80 - 120	<0.50	ug/L				
7405528	Total Arsenic (As)	2021/06/14	98	80 - 120	98	80 - 120	<1.0	ug/L				
7405528	Total Barium (Ba)	2021/06/14	95	80 - 120	96	80 - 120	<2.0	ug/L				
7405528	Total Beryllium (Be)	2021/06/14	99	80 - 120	95	80 - 120	<0.40	ug/L				
7405528	Total Bismuth (Bi)	2021/06/14	103	80 - 120	99	80 - 120	<1.0	ug/L				
7405528	Total Boron (B)	2021/06/14	95	80 - 120	92	80 - 120	<10	ug/L				
7405528	Total Cadmium (Cd)	2021/06/14	99	80 - 120	99	80 - 120	<0.090	ug/L	7.2	20		
7405528	Total Calcium (Ca)	2021/06/14	NC	80 - 120	98	80 - 120	<200	ug/L				
7405528	Total Chromium (Cr)	2021/06/14	93	80 - 120	92	80 - 120	<5.0	ug/L	2.6	20		
7405528	Total Cobalt (Co)	2021/06/14	101	80 - 120	98	80 - 120	<0.50	ug/L				
7405528	Total Copper (Cu)	2021/06/14	100	80 - 120	99	80 - 120	<0.90	ug/L	3.2	20		
7405528	Total Iron (Fe)	2021/06/14	96	80 - 120	96	80 - 120	<100	ug/L	0.68	20		
7405528	Total Lead (Pb)	2021/06/14	102	80 - 120	99	80 - 120	<0.50	ug/L	9.6	20		
7405528	Total Lithium (Li)	2021/06/14	102	80 - 120	96	80 - 120	<5.0	ug/L				
7405528	Total Magnesium (Mg)	2021/06/14	95	80 - 120	98	80 - 120	<50	ug/L				
7405528	Total Manganese (Mn)	2021/06/14	95	80 - 120	95	80 - 120	<2.0	ug/L				
7405528	Total Molybdenum (Mo)	2021/06/14	98	80 - 120	96	80 - 120	<0.50	ug/L				



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BV Labs Job #: C1F8070

Report Date: 2021/06/15

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: BL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7405528	Total Nickel (Ni)	2021/06/14	96	80 - 120	96	80 - 120	<1.0	ug/L	8.2	20		
7405528	Total Potassium (K)	2021/06/14	92	80 - 120	96	80 - 120	<200	ug/L				
7405528	Total Selenium (Se)	2021/06/14	90	80 - 120	102	80 - 120	<2.0	ug/L				
7405528	Total Silicon (Si)	2021/06/14	97	80 - 120	96	80 - 120	<50	ug/L				
7405528	Total Silver (Ag)	2021/06/14	98	80 - 120	99	80 - 120	<0.090	ug/L				
7405528	Total Sodium (Na)	2021/06/14	NC	80 - 120	97	80 - 120	<100	ug/L				
7405528	Total Strontium (Sr)	2021/06/14	93	80 - 120	94	80 - 120	<1.0	ug/L				
7405528	Total Tellurium (Te)	2021/06/14	95	80 - 120	99	80 - 120	<1.0	ug/L				
7405528	Total Thallium (Tl)	2021/06/14	102	80 - 120	101	80 - 120	<0.050	ug/L				
7405528	Total Tin (Sn)	2021/06/14	98	80 - 120	98	80 - 120	<1.0	ug/L				
7405528	Total Titanium (Ti)	2021/06/14	93	80 - 120	96	80 - 120	<5.0	ug/L				
7405528	Total Tungsten (W)	2021/06/14	104	80 - 120	101	80 - 120	<1.0	ug/L				
7405528	Total Uranium (U)	2021/06/14	104	80 - 120	99	80 - 120	<0.10	ug/L				
7405528	Total Vanadium (V)	2021/06/14	95	80 - 120	93	80 - 120	<0.50	ug/L				
7405528	Total Zinc (Zn)	2021/06/14	100	80 - 120	102	80 - 120	<5.0	ug/L	0.83	20		
7405528	Total Zirconium (Zr)	2021/06/14	65 (1)	80 - 120	96	80 - 120	<1.0	ug/L				

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Matrix spike exceeds acceptance limits, probable matrix interference



BUREAU  
VERITAS

BV Labs Job #: C1F8070  
Report Date: 2021/06/15

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in black ink, appearing to read 'Anastassia Hamanov', written over a horizontal line.

Anastassia Hamanov, Scientific Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



<b>INVOICE TO:</b>		<b>REPORT TO:</b>		<b>PROJECT INFORMATION:</b>		<b>Laboratory Use Only:</b>	
Company Name: #1326 Golder Associates Ltd		Company Name: <u>Craig De Vito</u>		Quotation #: B80683		BV Labs Job #:	
Attention: Accounts Payable		Attention: <u>Craig De Vito</u>		P.O. #:		Bottle Order #:	
Address: 6925 Century Ave Suite 100		Address:		Project: 19129150		COC #:	
Mississauga ON L5N 7K2				Project Name:		Project Manager:	
Tel: (905) 567-4444 Fax: (905) 567-6561		Tel: (905) 567-6100 Ext: 1507 Fax:		Site #:		Erma Gitej	
Email: CanadaAccountsPayableInvoices@golder.com		Email: Craig_DeVito@golder.com		Sampled By: <u>B. LINGELBACH</u>		C#830687-01-01	

**MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY**

<b>Regulation 153 (2011)</b> <input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Medium/Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> For RSC <input type="checkbox"/> Table _____		<b>Other Regulations</b> <input type="checkbox"/> CCME <input type="checkbox"/> Sanitary Sewer Bylaw <input type="checkbox"/> Reg 558 <input type="checkbox"/> Storm Sewer Bylaw <input type="checkbox"/> MISA <input type="checkbox"/> Municipality _____ <input type="checkbox"/> PWQO <input type="checkbox"/> Reg 406 Table _____ <input type="checkbox"/> Other _____		<b>Special Instructions</b>  	
<b>Include Criteria on Certificate of Analysis (Y/N)?</b> <u>N</u>				<b>ANALYSIS REQUESTED (PLEASE BE SPECIFIC)</b>	

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr / V	Total Metals Analysis by CPMS	Chloride Nitrate & Nitrite	Total Ammonia-N, TRN, Total P	Alkalinity, Hardness	Low Level Total Suspended Solids	Total Oil and Grease	# of Bottles	Comments
1	SW 8	2021/06/08	14:00	SW	Y	Y	Y	Y	Y	Y	Y	6	
2	SW 9	"	15:00	SW	Y	Y	Y	Y	Y	Y	Y	6	
3	SW 10	"	15:45	SW	Y	Y	Y	Y	Y	Y	Y	6	
4	SW 11	"	12:15	SW	Y	Y	Y	Y	Y	Y	Y	6	
5	SW 13	"	11:00	SW	Y	Y	Y	Y	Y	Y	Y	6	
6													
7													
8													
9													
10													

09-Jun-21 07:59  
Erma Gitej  
C1F8070

REC'D IN WATERLOC

Ice Melted

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)		Time		RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)		Time		# jars used and not submitted		Laboratory Use Only	
<u>K. EASTON</u>		21/06/08		17:20		<u>JASPREET KAUR</u>		2021/06/09		7:59				Time Sensitive Temperature (°C) on Receipt: <u>-1.0</u> Custody Seal Present: <u>Intact</u> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.  
 \* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.  
 \*\* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.  
 White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.  
KAVITHASELVAN 2021/06/09 16:02 BV # 82/3 1/1/2



Your Project #: 19129150  
 Your C.O.C. #: 845006-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
 6925 Century Ave  
 Suite 100  
 Mississauga, ON  
 CANADA L5N 7K2

**Report Date: 2021/09/14**  
 Report #: R6810615  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1P7686**

**Received: 2021/09/08, 16:40**

Sample Matrix: Water  
 # Samples Received: 4

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	2	N/A	2021/09/11	CAM SOP-00448	SM 23 2320 B m
Alkalinity	2	N/A	2021/09/14	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	4	N/A	2021/09/13	CAM SOP-00463	SM 23 4500-Cl E m
Hardness (calculated as CaCO3)	4	N/A	2021/09/14	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	4	N/A	2021/09/10	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	4	N/A	2021/09/11	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	4	N/A	2021/09/10	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	4	2021/09/11	2021/09/11	CAM SOP-00326	EPA1664B m,SM5520B m
Total Kjeldahl Nitrogen in Water	1	2021/09/10	2021/09/13	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	3	2021/09/09	2021/09/13	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2021/09/10	2021/09/10	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	1	2021/09/10	2021/09/13	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	2	2021/09/10	2021/09/14	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	4	2021/09/10	2021/09/13	CAM SOP-00428	SM 23 2540D m

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.



Your Project #: 19129150  
Your C.O.C. #: 845006-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
6925 Century Ave  
Suite 100  
Mississauga, ON  
CANADA L5N 7K2

**Report Date: 2021/09/14**  
Report #: R6810615  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1P7686**

**Received: 2021/09/08, 16:40**

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: emese.gitej@bureauveritas.com

Phone# (905)817-5829

=====

This report has been generated and distributed using a secure automated process.

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.





**RESULTS OF ANALYSES OF WATER**

BV Labs ID		QPC693			QPC693			QPC694		
Sampling Date		2021/09/08 08:45			2021/09/08 08:45			2021/09/08 10:00		
COC Number		845006-01-01			845006-01-01			845006-01-01		
	UNITS	SW 13	RDL	QC Batch	SW 13 Lab-Dup	RDL	QC Batch	SW 11	RDL	QC Batch
<b>Calculated Parameters</b>										
Hardness (CaCO <sub>3</sub> )	mg/L	220	1.0	7564190				130	1.0	7564190
<b>Inorganics</b>										
Total Ammonia-N	mg/L	<0.050	0.050	7571013				<0.050	0.050	7571013
Total Kjeldahl Nitrogen (TKN)	mg/L	0.24	0.10	7567963				0.55	0.10	7567963
Total Phosphorus	mg/L	0.025	0.004	7570124	0.027	0.004	7570124	0.12	0.02	7570124
Total Suspended Solids	mg/L	11	1	7568700				14	1	7568700
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	180	1.0	7569431				120	1.0	7569431
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	110	1.0	7569572	100	1.0	7569572	21	1.0	7569572
Nitrite (N)	mg/L	<0.010	0.010	7569473				<0.010	0.010	7569473
Nitrate (N)	mg/L	0.63	0.10	7569473				<0.10	0.10	7569473
Nitrate + Nitrite (N)	mg/L	0.63	0.10	7569473				<0.10	0.10	7569473
<b>Petroleum Hydrocarbons</b>										
Total Oil & Grease	mg/L	<0.50	0.50	7572204				<0.50	0.50	7572204
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



BUREAU  
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BV Labs Job #: C1P7686  
Report Date: 2021/09/14

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AK

### RESULTS OF ANALYSES OF WATER

BV Labs ID		QPC695			QPC696			QPC696		
Sampling Date		2021/09/08 13:45			2021/09/08 15:00			2021/09/08 15:00		
COC Number		845006-01-01			845006-01-01			845006-01-01		
	UNITS	SW 8	RDL	QC Batch	SW 9	RDL	QC Batch	SW 9 Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>										
Hardness (CaCO <sub>3</sub> )	mg/L	190	1.0	7564190	250	1.0	7564190			
<b>Inorganics</b>										
Total Ammonia-N	mg/L	0.066	0.050	7571013	<0.050	0.050	7571013			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.50	0.10	7570411	0.27	0.10	7567963			
Total Phosphorus	mg/L	0.064	0.004	7570124	0.020	0.004	7569427	0.019	0.004	7569427
Total Suspended Solids	mg/L	13	1	7568700	9	1	7568700			
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	170	1.0	7571045	210	1.0	7571045			
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	420	5.0	7569572	44	1.0	7569572			
Nitrite (N)	mg/L	<0.010	0.010	7569473	<0.010	0.010	7569473	<0.010	0.010	7569473
Nitrate (N)	mg/L	<0.10	0.10	7569473	0.50	0.10	7569473	0.50	0.10	7569473
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	7569473	0.50	0.10	7569473	0.50	0.10	7569473
<b>Petroleum Hydrocarbons</b>										
Total Oil & Grease	mg/L	<0.50	0.50	7572204	<0.50	0.50	7572204			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



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BV Labs Job #: C1P7686  
Report Date: 2021/09/14

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AK

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		QPC693	QPC694	QPC695	QPC696		
Sampling Date		2021/09/08 08:45	2021/09/08 10:00	2021/09/08 13:45	2021/09/08 15:00		
COC Number		845006-01-01	845006-01-01	845006-01-01	845006-01-01		
	UNITS	SW 13	SW 11	SW 8	SW 9	RDL	QC Batch
<b>Metals</b>							
Total Aluminum (Al)	ug/L	30	32	180	20	4.9	7569728
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7569728
Total Arsenic (As)	ug/L	<1.0	1.2	<1.0	<1.0	1.0	7569728
Total Barium (Ba)	ug/L	47	12	46	130	2.0	7569728
Total Beryllium (Be)	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7569728
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7569728
Total Boron (B)	ug/L	32	22	12	29	10	7569728
Total Cadmium (Cd)	ug/L	<0.090	<0.090	<0.090	<0.090	0.090	7569728
Total Calcium (Ca)	ug/L	62000	25000	56000	63000	200	7569728
Total Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	7569728
Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7569728
Total Copper (Cu)	ug/L	1.3	<0.90	3.1	<0.90	0.90	7569728
Total Iron (Fe)	ug/L	<100	170	610	<100	100	7569728
Total Lead (Pb)	ug/L	<0.50	<0.50	0.61	<0.50	0.50	7569728
Total Lithium (Li)	ug/L	<5.0	<5.0	<5.0	8.9	5.0	7569728
Total Magnesium (Mg)	ug/L	17000	16000	13000	24000	50	7569728
Total Manganese (Mn)	ug/L	58	23	130	7.6	2.0	7569728
Total Molybdenum (Mo)	ug/L	<0.50	<0.50	0.90	<0.50	0.50	7569728
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7569728
Total Potassium (K)	ug/L	2700	9000	1200	1600	200	7569728
Total Selenium (Se)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7569728
Total Silicon (Si)	ug/L	2900	640	2500	3500	50	7569728
Total Silver (Ag)	ug/L	<0.090	<0.090	<0.090	<0.090	0.090	7569728
Total Sodium (Na)	ug/L	60000	6100	280000	25000	100	7569728
Total Strontium (Sr)	ug/L	140	81	180	240	1.0	7569728
Total Tellurium (Te)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7569728
Total Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7569728
Total Tin (Sn)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7569728
Total Titanium (Ti)	ug/L	<5.0	<5.0	7.2	<5.0	5.0	7569728
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7569728
Total Uranium (U)	ug/L	0.27	<0.10	0.17	0.41	0.10	7569728
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

BV Labs ID		QPC693	QPC694	QPC695	QPC696		
Sampling Date		2021/09/08 08:45	2021/09/08 10:00	2021/09/08 13:45	2021/09/08 15:00		
COC Number		845006-01-01	845006-01-01	845006-01-01	845006-01-01		
	UNITS	SW 13	SW 11	SW 8	SW 9	RDL	QC Batch
Total Vanadium (V)	ug/L	0.51	0.61	0.89	<0.50	0.50	7569728
Total Zinc (Zn)	ug/L	<5.0	<5.0	7.6	<5.0	5.0	7569728
Total Zirconium (Zr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7569728
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



BUREAU  
VERITAS

BV Labs Job #: C1P7686  
Report Date: 2021/09/14

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AK

### TEST SUMMARY

**BV Labs ID:** QPC693  
**Sample ID:** SW 13  
**Matrix:** Water

**Collected:** 2021/09/08  
**Shipped:**  
**Received:** 2021/09/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7569431	N/A	2021/09/11	Surinder Rai
Chloride by Automated Colourimetry	KONE	7569572	N/A	2021/09/13	Alina Dobreanu
Hardness (calculated as CaCO3)		7564190	N/A	2021/09/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7569728	N/A	2021/09/10	Nan Raykha
Total Ammonia-N	LACH/NH4	7571013	N/A	2021/09/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7569473	N/A	2021/09/10	Chandra Nandlal
Total Oil and Grease	BAL	7572204	2021/09/11	2021/09/11	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7567963	2021/09/09	2021/09/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7570124	2021/09/10	2021/09/13	Shivani Shivani
Low Level Total Suspended Solids	BAL	7568700	2021/09/10	2021/09/13	Shaneil Hall

**BV Labs ID:** QPC693 Dup  
**Sample ID:** SW 13  
**Matrix:** Water

**Collected:** 2021/09/08  
**Shipped:**  
**Received:** 2021/09/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	7569572	N/A	2021/09/13	Alina Dobreanu
Total Phosphorus (Colourimetric)	LACH/P	7570124	2021/09/10	2021/09/13	Shivani Shivani

**BV Labs ID:** QPC694  
**Sample ID:** SW 11  
**Matrix:** Water

**Collected:** 2021/09/08  
**Shipped:**  
**Received:** 2021/09/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7569431	N/A	2021/09/11	Surinder Rai
Chloride by Automated Colourimetry	KONE	7569572	N/A	2021/09/13	Alina Dobreanu
Hardness (calculated as CaCO3)		7564190	N/A	2021/09/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7569728	N/A	2021/09/10	Nan Raykha
Total Ammonia-N	LACH/NH4	7571013	N/A	2021/09/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7569473	N/A	2021/09/10	Chandra Nandlal
Total Oil and Grease	BAL	7572204	2021/09/11	2021/09/11	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7567963	2021/09/09	2021/09/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7570124	2021/09/10	2021/09/14	Shivani Shivani
Low Level Total Suspended Solids	BAL	7568700	2021/09/10	2021/09/13	Shaneil Hall

**BV Labs ID:** QPC695  
**Sample ID:** SW 8  
**Matrix:** Water

**Collected:** 2021/09/08  
**Shipped:**  
**Received:** 2021/09/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7571045	N/A	2021/09/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	7569572	N/A	2021/09/13	Alina Dobreanu
Hardness (calculated as CaCO3)		7564190	N/A	2021/09/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7569728	N/A	2021/09/10	Nan Raykha
Total Ammonia-N	LACH/NH4	7571013	N/A	2021/09/11	Amanpreet Sappal



BUREAU  
VERITAS

BV Labs Job #: C1P7686  
Report Date: 2021/09/14

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AK

### TEST SUMMARY

**BV Labs ID:** QPC695  
**Sample ID:** SW 8  
**Matrix:** Water

**Collected:** 2021/09/08  
**Shipped:**  
**Received:** 2021/09/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7569473	N/A	2021/09/10	Chandra Nandlal
Total Oil and Grease	BAL	7572204	2021/09/11	2021/09/11	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7570411	2021/09/10	2021/09/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7570124	2021/09/10	2021/09/14	Shivani Shivani
Low Level Total Suspended Solids	BAL	7568700	2021/09/10	2021/09/13	Shaneil Hall

**BV Labs ID:** QPC696  
**Sample ID:** SW 9  
**Matrix:** Water

**Collected:** 2021/09/08  
**Shipped:**  
**Received:** 2021/09/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7571045	N/A	2021/09/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	7569572	N/A	2021/09/13	Alina Dobreanu
Hardness (calculated as CaCO3)		7564190	N/A	2021/09/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7569728	N/A	2021/09/10	Nan Raykha
Total Ammonia-N	LACH/NH4	7571013	N/A	2021/09/11	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7569473	N/A	2021/09/10	Chandra Nandlal
Total Oil and Grease	BAL	7572204	2021/09/11	2021/09/11	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7567963	2021/09/09	2021/09/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7569427	2021/09/10	2021/09/10	Shivani Shivani
Low Level Total Suspended Solids	BAL	7568700	2021/09/10	2021/09/13	Shaneil Hall

**BV Labs ID:** QPC696 Dup  
**Sample ID:** SW 9  
**Matrix:** Water

**Collected:** 2021/09/08  
**Shipped:**  
**Received:** 2021/09/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7569473	N/A	2021/09/10	Chandra Nandlal
Total Phosphorus (Colourimetric)	LACH/P	7569427	2021/09/10	2021/09/10	Shivani Shivani





BUREAU  
VERITAS

BV Labs Job #: C1P7686  
Report Date: 2021/09/14

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AK

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	14.0°C
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**Results relate only to the items tested.**



BUREAU  
VERITAS

BV Labs Job #: C1P7686

Report Date: 2021/09/14

### QUALITY ASSURANCE REPORT

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: AK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7567963	Total Kjeldahl Nitrogen (TKN)	2021/09/13	102	80 - 120	105	80 - 120	<0.10	mg/L	NC (1)	20	102	80 - 120
7568700	Total Suspended Solids	2021/09/13					<1	mg/L	8.3	25	95	85 - 115
7569427	Total Phosphorus	2021/09/10	110	80 - 120	99	80 - 120	<0.004	mg/L	1.0	20	104	80 - 120
7569431	Alkalinity (Total as CaCO3)	2021/09/11			96	85 - 115	<1.0	mg/L	0.49	20		
7569473	Nitrate (N)	2021/09/10	99	80 - 120	100	80 - 120	<0.10	mg/L	0.30	20		
7569473	Nitrite (N)	2021/09/10	104	80 - 120	104	80 - 120	<0.010	mg/L	NC	20		
7569572	Dissolved Chloride (Cl-)	2021/09/13	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.2	20		
7569728	Total Aluminum (Al)	2021/09/10	95	80 - 120	95	80 - 120	<4.9	ug/L	NC	20		
7569728	Total Antimony (Sb)	2021/09/10	105	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
7569728	Total Arsenic (As)	2021/09/10	96	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
7569728	Total Barium (Ba)	2021/09/10	92	80 - 120	93	80 - 120	<2.0	ug/L	3.4	20		
7569728	Total Beryllium (Be)	2021/09/10	94	80 - 120	92	80 - 120	<0.40	ug/L	NC	20		
7569728	Total Bismuth (Bi)	2021/09/10	95	80 - 120	91	80 - 120	<1.0	ug/L				
7569728	Total Boron (B)	2021/09/10	91	80 - 120	89	80 - 120	<10	ug/L	NC	20		
7569728	Total Cadmium (Cd)	2021/09/10	97	80 - 120	98	80 - 120	<0.090	ug/L	NC	20		
7569728	Total Calcium (Ca)	2021/09/10	NC	80 - 120	94	80 - 120	<200	ug/L	0.44	20		
7569728	Total Chromium (Cr)	2021/09/10	90	80 - 120	90	80 - 120	<5.0	ug/L	NC	20		
7569728	Total Cobalt (Co)	2021/09/10	97	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
7569728	Total Copper (Cu)	2021/09/10	90	80 - 120	91	80 - 120	<0.90	ug/L	NC	20		
7569728	Total Iron (Fe)	2021/09/10	94	80 - 120	94	80 - 120	<100	ug/L	NC	20		
7569728	Total Lead (Pb)	2021/09/10	91	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
7569728	Total Lithium (Li)	2021/09/10	105	80 - 120	97	80 - 120	<5.0	ug/L				
7569728	Total Magnesium (Mg)	2021/09/10	NC	80 - 120	92	80 - 120	<50	ug/L	1.8	20		
7569728	Total Manganese (Mn)	2021/09/10	92	80 - 120	93	80 - 120	<2.0	ug/L	NC	20		
7569728	Total Molybdenum (Mo)	2021/09/10	94	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
7569728	Total Nickel (Ni)	2021/09/10	92	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
7569728	Total Potassium (K)	2021/09/10	95	80 - 120	92	80 - 120	<200	ug/L	1.1	20		
7569728	Total Selenium (Se)	2021/09/10	99	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
7569728	Total Silicon (Si)	2021/09/10	92	80 - 120	92	80 - 120	<50	ug/L	1.1	20		
7569728	Total Silver (Ag)	2021/09/10	95	80 - 120	95	80 - 120	<0.090	ug/L	NC	20		
7569728	Total Sodium (Na)	2021/09/10	92	80 - 120	95	80 - 120	<100	ug/L	2.7	20		



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BV Labs Job #: C1P7686

Report Date: 2021/09/14

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: AK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7569728	Total Strontium (Sr)	2021/09/10	91	80 - 120	93	80 - 120	<1.0	ug/L	0.22	20		
7569728	Total Tellurium (Te)	2021/09/10	94	80 - 120	93	80 - 120	<1.0	ug/L				
7569728	Total Thallium (Tl)	2021/09/10	91	80 - 120	94	80 - 120	<0.050	ug/L	NC	20		
7569728	Total Tin (Sn)	2021/09/10	97	80 - 120	97	80 - 120	<1.0	ug/L				
7569728	Total Titanium (Ti)	2021/09/10	91	80 - 120	91	80 - 120	<5.0	ug/L	NC	20		
7569728	Total Tungsten (W)	2021/09/10	98	80 - 120	97	80 - 120	<1.0	ug/L				
7569728	Total Uranium (U)	2021/09/10	91	80 - 120	94	80 - 120	<0.10	ug/L				
7569728	Total Vanadium (V)	2021/09/10	90	80 - 120	90	80 - 120	<0.50	ug/L	NC	20		
7569728	Total Zinc (Zn)	2021/09/10	95	80 - 120	97	80 - 120	<5.0	ug/L	3.8	20		
7569728	Total Zirconium (Zr)	2021/09/10	98	80 - 120	99	80 - 120	<1.0	ug/L				
7570124	Total Phosphorus	2021/09/13	112	80 - 120	100	80 - 120	<0.004	mg/L	8.8	20	99	80 - 120
7570411	Total Kjeldahl Nitrogen (TKN)	2021/09/13	104	80 - 120	105	80 - 120	<0.10	mg/L	5.9	20	101	80 - 120
7571013	Total Ammonia-N	2021/09/11	98	75 - 125	102	80 - 120	<0.050	mg/L	9.5	20		
7571045	Alkalinity (Total as CaCO3)	2021/09/14			97	85 - 115	<1.0	mg/L	1.5	20		
7572204	Total Oil & Grease	2021/09/11			98	85 - 115	<0.50	mg/L	1.5	25		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.



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BV Labs Job #: C1P7686  
Report Date: 2021/09/14

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: AK

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

*Eva Pranjic*

\_\_\_\_\_  
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Bureau Veritas Laboratories  
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-5700 Toll-free 800-563-6266 Fax: (905) 817-5777 www.bvlab.com

08-Sep-21 16:40

Page 1 of 1

Emma Gitej

C1P7686

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Bottle Order #:	
Company Name: #1326 Golder Associates Ltd	Company Name:	Quotation #: B80683	P.O. #:		Barcode		845006
Attention: Accounts Payable	Attention: Craig De Vito	Project: 19129150 RIM FNV-907	Project Name:		COC #:		Project Manager:
Address: 6925 Century Ave Suite 100	Address:	Site #:	Sampled By: AK/MH		Barcode		Emma Gitej
Tel: (905) 567-4444 Fax: (905) 567-6561	Tel: (905) 567-6100 Ext: 1507 Fax:						
Email: CanadaAccountsPayableInvoices@golder.com	Email: Craig_DeVito@golder.com						

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY						ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:					
Regulation 153 (2011)		Other Regulations		Special Instructions		Field Filtered (please circle): Metals / Hg / Cr / VI	Total Metals Analysis by ICPMS	Chloride, Nitrate & Nitrite	Total Ammonia-N, TKN, Total P	Alkalinity, Hardness	Low Level Total Suspended Solids	Total Oil and Grease						Please provide advance notice for rush projects			
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Medium/Fine	<input type="checkbox"/> CCME	<input type="checkbox"/> Sanitary Sewer Bylaw														<input type="checkbox"/> Reg 558	<input type="checkbox"/> Storm Sewer Bylaw		<input type="checkbox"/> MISA
Include Criteria on Certificate of Analysis (Y/N)?																Job Specific Rush TAT (if applies to entire submission)					
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix														# of Bottles	PH	Comments	Temp °C
1	SW 13	21/09/08	8:45	SW	No	✓	✓	✓	✓	✓	✓							6	8.27		15.05
2	SW 11	↓	10:00	↓	↓	✓	✓	✓	✓	✓	✓							6	8.34		20.46
3	SW 8	↓	13:45	↓	↓	✓	✓	✓	✓	✓	✓							6	8.12		18.63
4	SW 9	↓	15:00	↓	↓	✓	✓	✓	✓	✓	✓							6	8.65		21.75
5																					
6																					
7																					
8																					
9																					
10																					

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
<i>Adam Kennedy</i>	21/09/08	16:40	<i>[Signature]</i>	20/09/08	16:40		Time Sensitive	Temperature (°C) on Receipt	Custody Seal Present	Yes	No
								19/10/10	Intact	✓	

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

\* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

\*\* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client  
ONITE



Your Project #: 19129150  
 Your C.O.C. #: 844029-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
 6925 Century Ave  
 Suite 100  
 Mississauga, ON  
 CANADA L5N 7K2

**Report Date: 2021/12/23**  
 Report #: R6936963  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1Z1795**

**Received: 2021/12/15, 09:16**

Sample Matrix: Water  
 # Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	5	N/A	2021/12/17	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	5	N/A	2021/12/17	CAM SOP-00463	SM 23 4500-Cl E m
Hardness (calculated as CaCO3)	5	N/A	2021/12/22	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	5	N/A	2021/12/21	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	4	N/A	2021/12/20	CAM SOP-00441	USGS I-2522-90 m
Total Ammonia-N	1	N/A	2021/12/21	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	5	N/A	2021/12/20	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	5	2021/12/17	2021/12/17	CAM SOP-00326	EPA1664B m,SM5520B m
Total Kjeldahl Nitrogen in Water	5	2021/12/17	2021/12/20	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	5	2021/12/17	2021/12/19	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	5	2021/12/18	2021/12/20	CAM SOP-00428	SM 23 2540D m

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.





Your Project #: 19129150  
Your C.O.C. #: 844029-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
6925 Century Ave  
Suite 100  
Mississauga, ON  
CANADA L5N 7K2

**Report Date: 2021/12/23**  
Report #: R6936963  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1Z1795**

**Received: 2021/12/15, 09:16**

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: emese.gitej@bureauveritas.com

Phone# (905)817-5829

=====  
This report has been generated and distributed using a secure automated process.

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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VERITAS

Bureau Veritas Job #: C1Z1795  
Report Date: 2021/12/23

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

**RESULTS OF ANALYSES OF WATER**

Bureau Veritas ID		RJF526			RJF526			RJF527		
Sampling Date		2021/12/14 15:45			2021/12/14 15:45			2021/12/14		
COC Number		844029-01-01			844029-01-01			844029-01-01		
	UNITS	SW8	RDL	QC Batch	SW8 Lab-Dup	RDL	QC Batch	DUP	RDL	QC Batch
<b>Calculated Parameters</b>										
Hardness (CaCO3)	mg/L	240	1.0	7727723				240	1.0	7727723
<b>Inorganics</b>										
Total Ammonia-N	mg/L	<0.050	0.050	7736126				<0.050	0.050	7736126
Total Kjeldahl Nitrogen (TKN)	mg/L	0.37	0.10	7735168				0.40	0.10	7735168
Total Phosphorus	mg/L	0.024	0.004	7735497				0.025	0.004	7735497
Total Suspended Solids	mg/L	1	1	7736524				2	1	7736524
Alkalinity (Total as CaCO3)	mg/L	200	1.0	7732729	200	1.0	7732729	210	1.0	7732729
Dissolved Chloride (Cl-)	mg/L	29	1.0	7733859				29	1.0	7733859
Nitrite (N)	mg/L	0.012	0.010	7732590				0.012	0.010	7733819
Nitrate (N)	mg/L	1.70	0.10	7732590				1.69	0.10	7733819
Nitrate + Nitrite (N)	mg/L	1.71	0.10	7732590				1.71	0.10	7733819
<b>Petroleum Hydrocarbons</b>										
Total Oil & Grease	mg/L	<0.50	0.50	7736936				<0.50	0.50	7736936
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



BUREAU  
VERITAS

Bureau Veritas Job #: C1Z1795  
Report Date: 2021/12/23

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		RJF528			RJF528			RJF529		
Sampling Date		2021/12/14 11:30			2021/12/14 11:30			2021/12/14 10:40		
COC Number		844029-01-01			844029-01-01			844029-01-01		
	UNITS	SW9	RDL	QC Batch	SW9 Lab-Dup	RDL	QC Batch	SW11	RDL	QC Batch
<b>Calculated Parameters</b>										
Hardness (CaCO <sub>3</sub> )	mg/L	270	1.0	7727723				230	1.0	7727723
<b>Inorganics</b>										
Total Ammonia-N	mg/L	0.39	0.050	7736146	0.37	0.050	7736146	0.35	0.050	7736126
Total Kjeldahl Nitrogen (TKN)	mg/L	0.58	0.10	7735168	0.59	0.10	7735168	1.0	0.10	7735168
Total Phosphorus	mg/L	0.016	0.004	7735497				0.22	0.02	7735497
Total Suspended Solids	mg/L	7	1	7736524				8	1	7736524
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	230	1.0	7732729				220	1.0	7732729
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	40	1.0	7733859	40	1.0	7733859	19	1.0	7733859
Nitrite (N)	mg/L	0.022	0.010	7732590				0.021	0.010	7732590
Nitrate (N)	mg/L	0.63	0.10	7732590				0.36	0.10	7732590
Nitrate + Nitrite (N)	mg/L	0.66	0.10	7732590				0.38	0.10	7732590
<b>Petroleum Hydrocarbons</b>										
Total Oil & Grease	mg/L	<0.50	0.50	7736936				<0.50	0.50	7736936
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										



**RESULTS OF ANALYSES OF WATER**

<b>Bureau Veritas ID</b>		RJF530		
<b>Sampling Date</b>		2021/12/14 09:20		
<b>COC Number</b>		844029-01-01		
	<b>UNITS</b>	<b>SW13</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Hardness (CaCO3)	mg/L	170	1.0	7727723
<b>Inorganics</b>				
Total Ammonia-N	mg/L	0.13	0.050	7736126
Total Kjeldahl Nitrogen (TKN)	mg/L	0.48	0.10	7735168
Total Phosphorus	mg/L	0.007	0.004	7735497
Total Suspended Solids	mg/L	4	1	7736524
Alkalinity (Total as CaCO3)	mg/L	150	1.0	7732729
Dissolved Chloride (Cl-)	mg/L	34	1.0	7733859
Nitrite (N)	mg/L	<0.010	0.010	7732590
Nitrate (N)	mg/L	0.10	0.10	7732590
Nitrate + Nitrite (N)	mg/L	0.10	0.10	7732590
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<0.50	0.50	7736936
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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VERITAS

Bureau Veritas Job #: C1Z1795  
Report Date: 2021/12/23

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		RJF526	RJF527	RJF528	RJF529	RJF530	RJF530		
Sampling Date		2021/12/14 15:45	2021/12/14	2021/12/14 11:30	2021/12/14 10:40	2021/12/14 09:20	2021/12/14 09:20		
COC Number		844029-01-01	844029-01-01	844029-01-01	844029-01-01	844029-01-01	844029-01-01		
	UNITS	SW8	DUP	SW9	SW11	SW13	SW13 Lab-Dup	RDL	QC Batch

Metals									
Total Aluminum (Al)	ug/L	17	14	24	30	7.8	7.1	4.9	7742166
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7742166
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7742166
Total Barium (Ba)	ug/L	16	16	130	19	28	29	2.0	7742166
Total Beryllium (Be)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7742166
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7742166
Total Boron (B)	ug/L	<10	<10	24	16	<10	<10	10	7742166
Total Cadmium (Cd)	ug/L	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7742166
Total Calcium (Ca)	ug/L	60000	61000	69000	66000	43000	43000	200	7742166
Total Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7742166
Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7742166
Total Copper (Cu)	ug/L	<0.90	<0.90	<0.90	1.1	<0.90	<0.90	0.90	7742166
Total Iron (Fe)	ug/L	<100	<100	<100	280	110	110	100	7742166
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7742166
Total Lithium (Li)	ug/L	<5.0	<5.0	6.6	<5.0	<5.0	<5.0	5.0	7742166
Total Magnesium (Mg)	ug/L	16000	16000	22000	15000	12000	12000	50	7742166
Total Manganese (Mn)	ug/L	3.4	3.3	13	65	11	11	2.0	7742166
Total Molybdenum (Mo)	ug/L	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	0.50	7742166
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7742166
Total Potassium (K)	ug/L	2600	2600	1400	12000	1400	1400	200	7742166
Total Selenium (Se)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7742166
Total Silicon (Si)	ug/L	3700	3700	5500	1800	2800	2800	50	7742166
Total Silver (Ag)	ug/L	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7742166
Total Sodium (Na)	ug/L	12000	12000	20000	4700	18000	18000	100	7742166
Total Strontium (Sr)	ug/L	110	110	230	120	110	110	1.0	7742166
Total Tellurium (Te)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7742166
Total Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7742166
Total Tin (Sn)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7742166
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7742166
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7742166
Total Uranium (U)	ug/L	0.65	0.70	0.38	0.28	0.20	0.20	0.10	7742166

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate



**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Bureau Veritas ID		RJF526	RJF527	RJF528	RJF529	RJF530	RJF530		
Sampling Date		2021/12/14 15:45	2021/12/14	2021/12/14 11:30	2021/12/14 10:40	2021/12/14 09:20	2021/12/14 09:20		
COC Number		844029-01-01	844029-01-01	844029-01-01	844029-01-01	844029-01-01	844029-01-01		
	UNITS	SW8	DUP	SW9	SW11	SW13	SW13 Lab-Dup	RDL	QC Batch
Total Vanadium (V)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7742166
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7742166
Total Zirconium (Zr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7742166
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									





BUREAU  
VERITAS

Bureau Veritas Job #: C1Z1795  
Report Date: 2021/12/23

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### TEST SUMMARY

**Bureau Veritas ID:** RJF526  
**Sample ID:** SW8  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7732729	N/A	2021/12/17	Surinder Rai
Chloride by Automated Colourimetry	KONE	7733859	N/A	2021/12/17	Alina Dobreanu
Hardness (calculated as CaCO3)		7727723	N/A	2021/12/22	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7742166	N/A	2021/12/21	Daniel Teclu
Total Ammonia-N	LACH/NH4	7736126	N/A	2021/12/20	Amanpreet Sappal
Nitrate & Nitrite as Nitrogen in Water	LACH	7732590	N/A	2021/12/20	Chandra Nandlal
Total Oil and Grease	BAL	7736936	2021/12/17	2021/12/17	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7735168	2021/12/17	2021/12/20	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7735497	2021/12/17	2021/12/19	Shivani Shivani
Low Level Total Suspended Solids	BAL	7736524	2021/12/18	2021/12/20	Shivani Desai

**Bureau Veritas ID:** RJF526 Dup  
**Sample ID:** SW8  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7732729	N/A	2021/12/17	Surinder Rai

**Bureau Veritas ID:** RJF527  
**Sample ID:** DUP  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7732729	N/A	2021/12/17	Surinder Rai
Chloride by Automated Colourimetry	KONE	7733859	N/A	2021/12/17	Alina Dobreanu
Hardness (calculated as CaCO3)		7727723	N/A	2021/12/22	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7742166	N/A	2021/12/21	Daniel Teclu
Total Ammonia-N	LACH/NH4	7736126	N/A	2021/12/20	Amanpreet Sappal
Nitrate & Nitrite as Nitrogen in Water	LACH	7733819	N/A	2021/12/20	Chandra Nandlal
Total Oil and Grease	BAL	7736936	2021/12/17	2021/12/17	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7735168	2021/12/17	2021/12/20	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7735497	2021/12/17	2021/12/19	Shivani Shivani
Low Level Total Suspended Solids	BAL	7736524	2021/12/18	2021/12/20	Shivani Desai

**Bureau Veritas ID:** RJF528  
**Sample ID:** SW9  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7732729	N/A	2021/12/17	Surinder Rai
Chloride by Automated Colourimetry	KONE	7733859	N/A	2021/12/17	Alina Dobreanu
Hardness (calculated as CaCO3)		7727723	N/A	2021/12/22	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7742166	N/A	2021/12/21	Daniel Teclu
Total Ammonia-N	LACH/NH4	7736146	N/A	2021/12/21	Amanpreet Sappal
Nitrate & Nitrite as Nitrogen in Water	LACH	7732590	N/A	2021/12/20	Chandra Nandlal



BUREAU  
VERITAS

Bureau Veritas Job #: C1Z1795  
Report Date: 2021/12/23

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### TEST SUMMARY

**Bureau Veritas ID:** RJF528  
**Sample ID:** SW9  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Oil and Grease	BAL	7736936	2021/12/17	2021/12/17	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7735168	2021/12/17	2021/12/20	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7735497	2021/12/17	2021/12/19	Shivani Shivani
Low Level Total Suspended Solids	BAL	7736524	2021/12/18	2021/12/20	Shivani Desai

**Bureau Veritas ID:** RJF528 Dup  
**Sample ID:** SW9  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	7733859	N/A	2021/12/17	Alina Dobreanu
Total Ammonia-N	LACH/NH4	7736146	N/A	2021/12/21	Amanpreet Sappal
Total Kjeldahl Nitrogen in Water	SKAL	7735168	2021/12/17	2021/12/20	Rajni Tyagi

**Bureau Veritas ID:** RJF529  
**Sample ID:** SW11  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7732729	N/A	2021/12/17	Surinder Rai
Chloride by Automated Colourimetry	KONE	7733859	N/A	2021/12/17	Alina Dobreanu
Hardness (calculated as CaCO3)		7727723	N/A	2021/12/22	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7742166	N/A	2021/12/21	Daniel Teclu
Total Ammonia-N	LACH/NH4	7736126	N/A	2021/12/20	Amanpreet Sappal
Nitrate & Nitrite as Nitrogen in Water	LACH	7732590	N/A	2021/12/20	Chandra Nandlal
Total Oil and Grease	BAL	7736936	2021/12/17	2021/12/17	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7735168	2021/12/17	2021/12/20	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7735497	2021/12/17	2021/12/19	Shivani Shivani
Low Level Total Suspended Solids	BAL	7736524	2021/12/18	2021/12/20	Shivani Desai

**Bureau Veritas ID:** RJF530  
**Sample ID:** SW13  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7732729	N/A	2021/12/17	Surinder Rai
Chloride by Automated Colourimetry	KONE	7733859	N/A	2021/12/17	Alina Dobreanu
Hardness (calculated as CaCO3)		7727723	N/A	2021/12/22	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7742166	N/A	2021/12/21	Daniel Teclu
Total Ammonia-N	LACH/NH4	7736126	N/A	2021/12/20	Amanpreet Sappal
Nitrate & Nitrite as Nitrogen in Water	LACH	7732590	N/A	2021/12/20	Chandra Nandlal
Total Oil and Grease	BAL	7736936	2021/12/17	2021/12/17	Saumya Modh
Total Kjeldahl Nitrogen in Water	SKAL	7735168	2021/12/17	2021/12/20	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	7735497	2021/12/17	2021/12/19	Shivani Shivani
Low Level Total Suspended Solids	BAL	7736524	2021/12/18	2021/12/20	Shivani Desai



BUREAU  
VERITAS

Bureau Veritas Job #: C1Z1795  
Report Date: 2021/12/23

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### TEST SUMMARY

**Bureau Veritas ID:** RJF530 Dup  
**Sample ID:** SW13  
**Matrix:** Water

**Collected:** 2021/12/14  
**Shipped:**  
**Received:** 2021/12/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	7742166	N/A	2021/12/21	Daniel Teclu



### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.7°C
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**Results relate only to the items tested.**



BUREAU  
VERITAS

Bureau Veritas Job #: C1Z1795

Report Date: 2021/12/23

### QUALITY ASSURANCE REPORT

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: BL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7732590	Nitrate (N)	2021/12/20	NC	80 - 120	104	80 - 120	<0.10	mg/L	0.25	20		
7732590	Nitrite (N)	2021/12/20	105	80 - 120	106	80 - 120	<0.010	mg/L	9.6	20		
7732729	Alkalinity (Total as CaCO3)	2021/12/17			97	85 - 115	<1.0	mg/L	0.10	20		
7733819	Nitrate (N)	2021/12/20	106	80 - 120	104	80 - 120	<0.10	mg/L	1.8	20		
7733819	Nitrite (N)	2021/12/20	106	80 - 120	107	80 - 120	<0.010	mg/L				
7733859	Dissolved Chloride (Cl-)	2021/12/17	NC	80 - 120	104	80 - 120	<1.0	mg/L	0.091	20		
7735168	Total Kjeldahl Nitrogen (TKN)	2021/12/20	102	80 - 120	105	80 - 120	<0.10	mg/L	1.7	20	101	80 - 120
7735497	Total Phosphorus	2021/12/19	104	80 - 120	103	80 - 120	<0.004	mg/L	3.9	20	102	80 - 120
7736126	Total Ammonia-N	2021/12/20	98	75 - 125	103	80 - 120	<0.050	mg/L	NC	20		
7736146	Total Ammonia-N	2021/12/21	98	75 - 125	101	80 - 120	<0.050	mg/L	4.0	20		
7736524	Total Suspended Solids	2021/12/20					<1	mg/L	19	25	95	85 - 115
7736936	Total Oil & Grease	2021/12/17			99	85 - 115	<0.50	mg/L	1.0	25		
7742166	Total Aluminum (Al)	2021/12/21	98	80 - 120	99	80 - 120	<4.9	ug/L	8.7	20		
7742166	Total Antimony (Sb)	2021/12/21	101	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
7742166	Total Arsenic (As)	2021/12/21	97	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
7742166	Total Barium (Ba)	2021/12/21	94	80 - 120	97	80 - 120	<2.0	ug/L	4.6	20		
7742166	Total Beryllium (Be)	2021/12/21	96	80 - 120	96	80 - 120	<0.40	ug/L	NC	20		
7742166	Total Bismuth (Bi)	2021/12/21	88	80 - 120	92	80 - 120	<1.0	ug/L	NC	20		
7742166	Total Boron (B)	2021/12/21	100	80 - 120	99	80 - 120	<10	ug/L	NC	20		
7742166	Total Cadmium (Cd)	2021/12/21	98	80 - 120	94	80 - 120	<0.090	ug/L	NC	20		
7742166	Total Calcium (Ca)	2021/12/21	NC	80 - 120	96	80 - 120	<200	ug/L	0.085	20		
7742166	Total Chromium (Cr)	2021/12/21	94	80 - 120	94	80 - 120	<5.0	ug/L	NC	20		
7742166	Total Cobalt (Co)	2021/12/21	94	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
7742166	Total Copper (Cu)	2021/12/21	97	80 - 120	95	80 - 120	<0.90	ug/L	NC	20		
7742166	Total Iron (Fe)	2021/12/21	92	80 - 120	94	80 - 120	<100	ug/L	2.2	20		
7742166	Total Lead (Pb)	2021/12/21	89	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
7742166	Total Lithium (Li)	2021/12/21	94	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
7742166	Total Magnesium (Mg)	2021/12/21	92	80 - 120	96	80 - 120	<50	ug/L	0.38	20		
7742166	Total Manganese (Mn)	2021/12/21	96	80 - 120	97	80 - 120	<2.0	ug/L	2.9	20		
7742166	Total Molybdenum (Mo)	2021/12/21	99	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
7742166	Total Nickel (Ni)	2021/12/21	95	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		



BUREAU  
VERITAS

Bureau Veritas Job #: C1Z1795

Report Date: 2021/12/23

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: BL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7742166	Total Potassium (K)	2021/12/21	97	80 - 120	97	80 - 120	<200	ug/L	1.2	20		
7742166	Total Selenium (Se)	2021/12/21	100	80 - 120	99	80 - 120	<2.0	ug/L	NC	20		
7742166	Total Silicon (Si)	2021/12/21	99	80 - 120	99	80 - 120	<50	ug/L	0.52	20		
7742166	Total Silver (Ag)	2021/12/21	98	80 - 120	96	80 - 120	<0.090	ug/L	NC	20		
7742166	Total Sodium (Na)	2021/12/21	93	80 - 120	96	80 - 120	<100	ug/L	0.093	20		
7742166	Total Strontium (Sr)	2021/12/21	94	80 - 120	95	80 - 120	<1.0	ug/L	0.45	20		
7742166	Total Tellurium (Te)	2021/12/21	102	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
7742166	Total Thallium (Tl)	2021/12/21	90	80 - 120	94	80 - 120	<0.050	ug/L	NC	20		
7742166	Total Tin (Sn)	2021/12/21	99	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
7742166	Total Titanium (Ti)	2021/12/21	93	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
7742166	Total Tungsten (W)	2021/12/21	94	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
7742166	Total Uranium (U)	2021/12/21	92	80 - 120	93	80 - 120	<0.10	ug/L	1.5	20		
7742166	Total Vanadium (V)	2021/12/21	96	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
7742166	Total Zinc (Zn)	2021/12/21	95	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
7742166	Total Zirconium (Zr)	2021/12/21	99	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).





BUREAU  
VERITAS

Bureau Veritas Job #: C1Z1795  
Report Date: 2021/12/23

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BL

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in black ink, appearing to read 'Brad Newman', written over a horizontal line.

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Your Project #: 19129150  
 Your C.O.C. #: 868520-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
 6925 Century Ave  
 Suite 100  
 Mississauga, ON  
 CANADA L5N 7K2

**Report Date: 2022/03/31**  
 Report #: R7067378  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C279893**

**Received: 2022/03/25, 08:35**

Sample Matrix: Water  
 # Samples Received: 5

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	5	N/A	2022/03/28	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	5	N/A	2022/03/28	CAM SOP-00463	SM 23 4500-Cl E m
Hardness (calculated as CaCO3)	3	N/A	2022/03/29	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	2	N/A	2022/03/30	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	5	N/A	2022/03/30	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2022/03/30	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	2	N/A	2022/03/27	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (1)	3	N/A	2022/03/29	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	5	2022/03/29	2022/03/29	CAM SOP-00326	EPA1664B m,SM5520B m
Total Kjeldahl Nitrogen in Water	5	2022/03/29	2022/03/30	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	5	2022/03/29	2022/03/29	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	5	2022/03/28	2022/03/29	CAM SOP-00428	SM 23 2540D m

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope



Your Project #: 19129150  
Your C.O.C. #: 868520-01-01

**Attention: Craig De Vito**

Golder Associates Ltd  
6925 Century Ave  
Suite 100  
Mississauga, ON  
CANADA L5N 7K2

**Report Date: 2022/03/31**  
Report #: R7067378  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C279893**

**Received: 2022/03/25, 08:35**

dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ankita Bhalla, Project Manager

Email: Ankita.Bhalla@bureauveritas.com

Phone# (905) 817-5700

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For Service Group specific validation please refer to the Validation Signature Page.



**RESULTS OF ANALYSES OF WATER**

Bureau Veritas ID		SES283		SES284			SES284		
Sampling Date		2022/03/24 17:30		2022/03/24 11:30			2022/03/24 11:30		
COC Number		868520-01-01		868520-01-01			868520-01-01		
	UNITS	SW8	QC Batch	SW10	RDL	QC Batch	SW10 Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>									
Hardness (CaCO3)	mg/L	220	7903799	280	1.0	7903799			
<b>Inorganics</b>									
Total Ammonia-N	mg/L	<0.050	7909691	<0.050	0.050	7910207			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.20	7909303	0.12	0.10	7909303	<0.10	0.10	7909303
Total Phosphorus	mg/L	0.014	7909659	0.008	0.004	7909659			
Total Suspended Solids	mg/L	<1	7905830	<1	1	7905830	1	1	7905830
Alkalinity (Total as CaCO3)	mg/L	200	7905833	240	1.0	7905833			
Dissolved Chloride (Cl-)	mg/L	36	7905356	42	1.0	7905356			
Nitrite (N)	mg/L	<0.010	7905642	<0.010	0.010	7905733			
Nitrate (N)	mg/L	1.26	7905642	1.08	0.10	7905733			
Nitrate + Nitrite (N)	mg/L	1.26	7905642	1.08	0.10	7905733			
<b>Petroleum Hydrocarbons</b>									
Total Oil & Grease	mg/L	<0.50	7908938	0.80	0.50	7908938			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									



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Bureau Veritas Job #: C279893  
Report Date: 2022/03/31

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BC

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		SES285			SES286	SES287		
Sampling Date		2022/03/24 09:30			2022/03/24 12:00	2022/03/24 09:00		
COC Number		868520-01-01			868520-01-01	868520-01-01		
	UNITS	SW11	RDL	QC Batch	SW9	SW13	RDL	QC Batch
<b>Calculated Parameters</b>								
Hardness (CaCO3)	mg/L	230	1.0	7903799	230	210	1.0	7903799
<b>Inorganics</b>								
Total Ammonia-N	mg/L	1.2	0.050	7910207	0.099	0.087	0.050	7910207
Total Kjeldahl Nitrogen (TKN)	mg/L	1.6	0.10	7909303	0.30	0.27	0.10	7909303
Total Phosphorus	mg/L	0.37	0.02	7909659	0.020	0.009	0.004	7909659
Total Suspended Solids	mg/L	5	1	7905830	18	2	1	7905830
Alkalinity (Total as CaCO3)	mg/L	210	1.0	7905833	200	190	1.0	7905833
Dissolved Chloride (Cl-)	mg/L	37	1.0	7905356	30	31	1.0	7905356
Nitrite (N)	mg/L	0.059	0.010	7905733	<0.010	<0.010	0.010	7905642
Nitrate (N)	mg/L	1.14	0.10	7905733	1.00	0.26	0.10	7905642
Nitrate + Nitrite (N)	mg/L	1.20	0.10	7905733	1.00	0.26	0.10	7905642
<b>Petroleum Hydrocarbons</b>								
Total Oil & Grease	mg/L	0.70	0.50	7908938	0.60	0.70	0.50	7908938
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



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Bureau Veritas Job #: C279893  
Report Date: 2022/03/31

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BC

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		SES283	SES284	SES285	SES286	SES287		
Sampling Date		2022/03/24 17:30	2022/03/24 11:30	2022/03/24 09:30	2022/03/24 12:00	2022/03/24 09:00		
COC Number		868520-01-01	868520-01-01	868520-01-01	868520-01-01	868520-01-01		
	UNITS	SW8	SW10	SW11	SW9	SW13	RDL	QC Batch

Metals								
Total Aluminum (Al)	ug/L	23	7.0	27	13	18	4.9	7911690
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7911690
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7911690
Total Barium (Ba)	ug/L	16	63	19	97	28	2.0	7911690
Total Beryllium (Be)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7911690
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7911690
Total Boron (B)	ug/L	<10	<10	10	16	<10	10	7911690
Total Cadmium (Cd)	ug/L	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7911690
Total Calcium (Ca)	ug/L	62000	77000	66000	59000	58000	200	7911690
Total Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7911690
Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7911690
Total Copper (Cu)	ug/L	<0.90	1.8	1.4	<0.90	<0.90	0.90	7911690
Total Iron (Fe)	ug/L	<100	<100	290	<100	130	100	7911690
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7911690
Total Lithium (Li)	ug/L	<5.0	<5.0	<5.0	5.3	<5.0	5.0	7911690
Total Magnesium (Mg)	ug/L	16000	16000	13000	16000	12000	50	7911690
Total Manganese (Mn)	ug/L	4.6	3.9	130	13	41	2.0	7911690
Total Molybdenum (Mo)	ug/L	<0.50	<0.50	<0.50	0.59	<0.50	0.50	7911690
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7911690
Total Potassium (K)	ug/L	1800	1200	6400	1100	1200	200	7911690
Total Selenium (Se)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7911690
Total Silicon (Si)	ug/L	2000	3300	2500	3800	2100	50	7911690
Total Silver (Ag)	ug/L	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7911690
Total Sodium (Na)	ug/L	18000	24000	17000	16000	16000	100	7911690
Total Strontium (Sr)	ug/L	110	130	100	180	100	1.0	7911690
Total Tellurium (Te)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7911690
Total Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7911690
Total Tin (Sn)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7911690
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7911690
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7911690
Total Uranium (U)	ug/L	0.54	0.19	0.26	0.59	0.18	0.10	7911690

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch





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Bureau Veritas Job #: C279893  
Report Date: 2022/03/31

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BC

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		SES283	SES284	SES285	SES286	SES287		
Sampling Date		2022/03/24 17:30	2022/03/24 11:30	2022/03/24 09:30	2022/03/24 12:00	2022/03/24 09:00		
COC Number		868520-01-01	868520-01-01	868520-01-01	868520-01-01	868520-01-01		
	UNITS	SW8	SW10	SW11	SW9	SW13	RDL	QC Batch
Total Vanadium (V)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7911690
Total Zinc (Zn)	ug/L	<5.0	<5.0	6.6	<5.0	<5.0	5.0	7911690
Total Zirconium (Zr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7911690
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



BUREAU  
VERITAS

Bureau Veritas Job #: C279893  
Report Date: 2022/03/31

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BC

### TEST SUMMARY

**Bureau Veritas ID:** SES283  
**Sample ID:** SW8  
**Matrix:** Water

**Collected:** 2022/03/24  
**Shipped:**  
**Received:** 2022/03/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7905833	N/A	2022/03/28	Surinder Rai
Chloride by Automated Colourimetry	KONE	7905356	N/A	2022/03/28	Alina Dobreanu
Hardness (calculated as CaCO3)		7903799	N/A	2022/03/29	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7911690	N/A	2022/03/30	Azita Fazaeli
Total Ammonia-N	LACH/NH4	7909691	N/A	2022/03/30	Raiq Kashif
Nitrate & Nitrite as Nitrogen in Water	LACH	7905642	N/A	2022/03/29	Samuel Law
Total Oil and Grease	BAL	7908938	2022/03/29	2022/03/29	Jay Bhadresh Doshi
Total Kjeldahl Nitrogen in Water	SKAL	7909303	2022/03/29	2022/03/30	Massarat Jan
Total Phosphorus (Colourimetric)	LACH/P	7909659	2022/03/29	2022/03/29	Nimarta Singh
Low Level Total Suspended Solids	BAL	7905830	2022/03/28	2022/03/29	Shaneil Hall

**Bureau Veritas ID:** SES284  
**Sample ID:** SW10  
**Matrix:** Water

**Collected:** 2022/03/24  
**Shipped:**  
**Received:** 2022/03/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7905833	N/A	2022/03/28	Surinder Rai
Chloride by Automated Colourimetry	KONE	7905356	N/A	2022/03/28	Alina Dobreanu
Hardness (calculated as CaCO3)		7903799	N/A	2022/03/29	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7911690	N/A	2022/03/30	Azita Fazaeli
Total Ammonia-N	LACH/NH4	7910207	N/A	2022/03/30	Raiq Kashif
Nitrate & Nitrite as Nitrogen in Water	LACH	7905733	N/A	2022/03/27	Raiq Kashif
Total Oil and Grease	BAL	7908938	2022/03/29	2022/03/29	Jay Bhadresh Doshi
Total Kjeldahl Nitrogen in Water	SKAL	7909303	2022/03/29	2022/03/30	Massarat Jan
Total Phosphorus (Colourimetric)	LACH/P	7909659	2022/03/29	2022/03/29	Nimarta Singh
Low Level Total Suspended Solids	BAL	7905830	2022/03/28	2022/03/29	Shaneil Hall

**Bureau Veritas ID:** SES284 Dup  
**Sample ID:** SW10  
**Matrix:** Water

**Collected:** 2022/03/24  
**Shipped:**  
**Received:** 2022/03/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	7909303	2022/03/29	2022/03/30	Massarat Jan
Low Level Total Suspended Solids	BAL	7905830	2022/03/28	2022/03/29	Shaneil Hall

**Bureau Veritas ID:** SES285  
**Sample ID:** SW11  
**Matrix:** Water

**Collected:** 2022/03/24  
**Shipped:**  
**Received:** 2022/03/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7905833	N/A	2022/03/28	Surinder Rai
Chloride by Automated Colourimetry	KONE	7905356	N/A	2022/03/28	Alina Dobreanu
Hardness (calculated as CaCO3)		7903799	N/A	2022/03/30	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7911690	N/A	2022/03/30	Azita Fazaeli
Total Ammonia-N	LACH/NH4	7910207	N/A	2022/03/30	Raiq Kashif



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Bureau Veritas Job #: C279893  
Report Date: 2022/03/31

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BC

### TEST SUMMARY

**Bureau Veritas ID:** SES285  
**Sample ID:** SW11  
**Matrix:** Water

**Collected:** 2022/03/24  
**Shipped:**  
**Received:** 2022/03/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate & Nitrite as Nitrogen in Water	LACH	7905733	N/A	2022/03/27	Raiq Kashif
Total Oil and Grease	BAL	7908938	2022/03/29	2022/03/29	Jay Bhadresh Doshi
Total Kjeldahl Nitrogen in Water	SKAL	7909303	2022/03/29	2022/03/30	Massarat Jan
Total Phosphorus (Colourimetric)	LACH/P	7909659	2022/03/29	2022/03/29	Nimarta Singh
Low Level Total Suspended Solids	BAL	7905830	2022/03/28	2022/03/29	Shaneil Hall

**Bureau Veritas ID:** SES286  
**Sample ID:** SW9  
**Matrix:** Water

**Collected:** 2022/03/24  
**Shipped:**  
**Received:** 2022/03/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7905833	N/A	2022/03/28	Surinder Rai
Chloride by Automated Colourimetry	KONE	7905356	N/A	2022/03/28	Alina Dobreanu
Hardness (calculated as CaCO3)		7903799	N/A	2022/03/30	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7911690	N/A	2022/03/30	Azita Fazaeli
Total Ammonia-N	LACH/NH4	7910207	N/A	2022/03/30	Raiq Kashif
Nitrate & Nitrite as Nitrogen in Water	LACH	7905642	N/A	2022/03/29	Samuel Law
Total Oil and Grease	BAL	7908938	2022/03/29	2022/03/29	Jay Bhadresh Doshi
Total Kjeldahl Nitrogen in Water	SKAL	7909303	2022/03/29	2022/03/30	Massarat Jan
Total Phosphorus (Colourimetric)	LACH/P	7909659	2022/03/29	2022/03/29	Nimarta Singh
Low Level Total Suspended Solids	BAL	7905830	2022/03/28	2022/03/29	Shaneil Hall

**Bureau Veritas ID:** SES287  
**Sample ID:** SW13  
**Matrix:** Water

**Collected:** 2022/03/24  
**Shipped:**  
**Received:** 2022/03/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7905833	N/A	2022/03/28	Surinder Rai
Chloride by Automated Colourimetry	KONE	7905356	N/A	2022/03/28	Alina Dobreanu
Hardness (calculated as CaCO3)		7903799	N/A	2022/03/29	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	7911690	N/A	2022/03/30	Azita Fazaeli
Total Ammonia-N	LACH/NH4	7910207	N/A	2022/03/30	Raiq Kashif
Nitrate & Nitrite as Nitrogen in Water	LACH	7905642	N/A	2022/03/29	Samuel Law
Total Oil and Grease	BAL	7908938	2022/03/29	2022/03/29	Jay Bhadresh Doshi
Total Kjeldahl Nitrogen in Water	SKAL	7909303	2022/03/29	2022/03/30	Massarat Jan
Total Phosphorus (Colourimetric)	LACH/P	7909659	2022/03/29	2022/03/29	Nimarta Singh
Low Level Total Suspended Solids	BAL	7905830	2022/03/28	2022/03/29	Shaneil Hall



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Bureau Veritas Job #: C279893  
Report Date: 2022/03/31

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BC

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.3°C
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**Results relate only to the items tested.**



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Bureau Veritas Job #: C279893

Report Date: 2022/03/31

### QUALITY ASSURANCE REPORT

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: BC

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7905356	Dissolved Chloride (Cl <sup>-</sup> )	2022/03/28	NC	80 - 120	106	80 - 120	<1.0	mg/L	0.17	20		
7905642	Nitrate (N)	2022/03/29	100	80 - 120	102	80 - 120	<0.10	mg/L	0.043	20		
7905642	Nitrite (N)	2022/03/29	107	80 - 120	107	80 - 120	<0.010	mg/L	NC	20		
7905733	Nitrate (N)	2022/03/27	103	80 - 120	104	80 - 120	<0.10	mg/L	NC	20		
7905733	Nitrite (N)	2022/03/27	105	80 - 120	105	80 - 120	<0.010	mg/L	NC	20		
7905830	Total Suspended Solids	2022/03/29					<1	mg/L	0	25	97	85 - 115
7905833	Alkalinity (Total as CaCO <sub>3</sub> )	2022/03/28			96	85 - 115	<1.0	mg/L	1.4	20		
7908938	Total Oil & Grease	2022/03/29			98	85 - 115	<0.50	mg/L	0.26	25		
7909303	Total Kjeldahl Nitrogen (TKN)	2022/03/30	105	80 - 120	102	80 - 120	<0.10	mg/L	19	20	94	80 - 120
7909659	Total Phosphorus	2022/03/29	105	80 - 120	108	80 - 120	<0.004	mg/L	NC	20	110	80 - 120
7909691	Total Ammonia-N	2022/03/30	50 (1)	75 - 125	99	80 - 120	<0.050	mg/L	NC	20		
7910207	Total Ammonia-N	2022/03/30	47 (1)	75 - 125	100	80 - 120	<0.050	mg/L	1.7	20		
7911690	Total Aluminum (Al)	2022/03/30	99	80 - 120	98	80 - 120	<4.9	ug/L				
7911690	Total Antimony (Sb)	2022/03/30	102	80 - 120	98	80 - 120	<0.50	ug/L				
7911690	Total Arsenic (As)	2022/03/30	99	80 - 120	96	80 - 120	<1.0	ug/L				
7911690	Total Barium (Ba)	2022/03/30	98	80 - 120	95	80 - 120	<2.0	ug/L				
7911690	Total Beryllium (Be)	2022/03/30	96	80 - 120	95	80 - 120	<0.40	ug/L				
7911690	Total Bismuth (Bi)	2022/03/30	94	80 - 120	94	80 - 120	<1.0	ug/L				
7911690	Total Boron (B)	2022/03/30	94	80 - 120	91	80 - 120	<10	ug/L	NC	20		
7911690	Total Cadmium (Cd)	2022/03/30	99	80 - 120	97	80 - 120	<0.090	ug/L				
7911690	Total Calcium (Ca)	2022/03/30	NC	80 - 120	95	80 - 120	<200	ug/L	0.82	20		
7911690	Total Chromium (Cr)	2022/03/30	97	80 - 120	94	80 - 120	<5.0	ug/L				
7911690	Total Cobalt (Co)	2022/03/30	102	80 - 120	97	80 - 120	<0.50	ug/L				
7911690	Total Copper (Cu)	2022/03/30	96	80 - 120	92	80 - 120	<0.90	ug/L				
7911690	Total Iron (Fe)	2022/03/30	99	80 - 120	95	80 - 120	<100	ug/L	NC	20		
7911690	Total Lead (Pb)	2022/03/30	97	80 - 120	95	80 - 120	<0.50	ug/L				
7911690	Total Lithium (Li)	2022/03/30	96	80 - 120	94	80 - 120	<5.0	ug/L				
7911690	Total Magnesium (Mg)	2022/03/30	98	80 - 120	97	80 - 120	<50	ug/L	1.3	20		
7911690	Total Manganese (Mn)	2022/03/30	99	80 - 120	96	80 - 120	<2.0	ug/L				
7911690	Total Molybdenum (Mo)	2022/03/30	99	80 - 120	94	80 - 120	<0.50	ug/L				
7911690	Total Nickel (Ni)	2022/03/30	98	80 - 120	96	80 - 120	<1.0	ug/L				



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Bureau Veritas Job #: C279893

Report Date: 2022/03/31

### QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd

Client Project #: 19129150

Sampler Initials: BC

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7911690	Total Potassium (K)	2022/03/30	99	80 - 120	97	80 - 120	<200	ug/L	1.4	20		
7911690	Total Selenium (Se)	2022/03/30	102	80 - 120	101	80 - 120	<2.0	ug/L				
7911690	Total Silicon (Si)	2022/03/30	98	80 - 120	96	80 - 120	<50	ug/L				
7911690	Total Silver (Ag)	2022/03/30	95	80 - 120	93	80 - 120	<0.090	ug/L				
7911690	Total Sodium (Na)	2022/03/30	NC	80 - 120	95	80 - 120	<100	ug/L	1.5	20		
7911690	Total Strontium (Sr)	2022/03/30	96	80 - 120	93	80 - 120	<1.0	ug/L				
7911690	Total Tellurium (Te)	2022/03/30	99	80 - 120	96	80 - 120	<1.0	ug/L				
7911690	Total Thallium (Tl)	2022/03/30	103	80 - 120	98	80 - 120	<0.050	ug/L				
7911690	Total Tin (Sn)	2022/03/30	101	80 - 120	96	80 - 120	<1.0	ug/L				
7911690	Total Titanium (Ti)	2022/03/30	94	80 - 120	93	80 - 120	<5.0	ug/L				
7911690	Total Tungsten (W)	2022/03/30	102	80 - 120	98	80 - 120	<1.0	ug/L				
7911690	Total Uranium (U)	2022/03/30	95	80 - 120	92	80 - 120	<0.10	ug/L				
7911690	Total Vanadium (V)	2022/03/30	97	80 - 120	94	80 - 120	<0.50	ug/L				
7911690	Total Zinc (Zn)	2022/03/30	101	80 - 120	100	80 - 120	<5.0	ug/L	0.42	20		
7911690	Total Zirconium (Zr)	2022/03/30	103	80 - 120	97	80 - 120	<1.0	ug/L				

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.





BUREAU  
VERITAS

Bureau Veritas Job #: C279893  
Report Date: 2022/03/31

Golder Associates Ltd  
Client Project #: 19129150  
Sampler Initials: BC

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

*Eva Pranjic*

\_\_\_\_\_  
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Bureau Veritas  
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25-Mar-22 08:35

Ankita Bhalla



C279893

Bottle Order #:



868520

Project Manager:

Ankita Bhalla

**INVOICE TO:**  
Company Name: #1326 Golder Associates Ltd  
Attention: Accounts Payable  
Address: 6925 Century Ave Suite 100  
Mississauga ON L5N 7K2  
Tel: (905) 567-4444 Fax: (905) 567-6561  
Email: CanadaAccountsPayableInvoices@golder.com

**REPORT TO:**  
Company Name:  
Attention: Craig De Vito  
Address:  
Tel: (905) 567-6100 Ext: 1507 Fax:  
Email: Craig\_DeVito@golder.com

**PROJECT INFORMATION:**  
Quotation #: C20239  
P.O. #:  
Project: 19129150  
Project Name:  
Site #:  
Sampled By:

KTN

FNV-1171



C#988520-01-01

**MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY**

Regulation 153 (2011)	Other Regulations	Special Instructions
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Medium/Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> For RSC <input type="checkbox"/> Table	<input type="checkbox"/> CCME <input type="checkbox"/> Sanitary Sewer Bylaw <input type="checkbox"/> Reg 558 <input type="checkbox"/> Storm Sewer Bylaw <input type="checkbox"/> MISA <input type="checkbox"/> Municipality <input type="checkbox"/> PW00 <input type="checkbox"/> Reg 406 Table <input type="checkbox"/> Other	

**ANALYSIS REQUESTED (PLEASE BE SPECIFIC)**

Field Filtered (please circle): Metals / Hg / Cr VI	Total Metals Analysis by ICPMS	Chloride, Nitrate & Nitrite	Total Ammonia-N, TKN, Total P	Alkalinity, Hardness	Low Level Total Suspended Solids	Total Oil and Grease
X	X	X	X	X	X	X

**Turnaround Time (TAT) Required:**  
Please provide advance notice for rush projects

**Regular (Standard) TAT:**  
(will be applied if Rush TAT is not specified):  
Standard TAT = 5-7 Working days for most tests.  
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

**Job Specific Rush TAT (if applies to entire submission)**  
Date Required: \_\_\_\_\_ Time Required: \_\_\_\_\_  
Rush Confirmation Number: \_\_\_\_\_ (call lab for #)

**Include Criteria on Certificate of Analysis (Y/N)?**

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix
1	SW 8	Mar 24 2022	1730	SW
2	SW 10		1130	
3	SW 11		930	
4	SW 9		1200	
5	SW 13		900	
6				
7				
8				
9				
10				

REC'D IN WATERLOO

**\* RELINQUISHED BY: (Signature/Print)** Brian Linghart 2022/03/24 20:20  
**RECEIVED BY: (Signature/Print)** Sarah Wenzel 2022/03/25 0835  
Ray Moseley 2022/03/25 1546

**# Jars used and not submitted**  
**Laboratory Use Only**  
Time Sensitive:   
Temperature (°C) on Receipt: 1/4/2  
Custody Seal: Present  Intact   
Yes  No

\* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS.

\* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS  
White: Bureau Veritas Yellow: Client  
on ice.

\*\* SAMPLE OF THE CHAIN OF CUSTODY RECORD, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

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