



## **2019 ANNUAL QUARTZ MINING LICENCE REPORT**

**Submitted to Yukon Government, Energy Mines and Resources  
Yukon Quartz Mining Licence QML-0007**

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**March 2020**

## 2019 ANNUAL QUARTZ MINING LICENCE REPORT

Submitted to Yukon Government Energy Mines and Resources  
Yukon Quartz Mining License QML-0007

**Carmacks Copper Project, Yukon Territory**

**Submitted by:**

Copper North Mining Corp.  
1120 -1095 West Pender Street  
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## Executive Summary

Activities at the mine site during the period 1 January 2019 to 31 December 2019 consisted of:

- the Annual Engineer's Inspection;

No exploration activities were conducted.

Copies of the 2019 Annual Engineer's Inspection Report and the 2019 Report of Activities for the property are appended to this report. No development activities were undertaken in 2019.

Closure and reclamation security in the amount of \$80,300 has been posted with Yukon against the liability incurred as a result of exploration activities.

This report has been formatted to respond to the specific requirements in the QML even though there may be no corresponding project undertakings.

## Table of Contents

1.0	INTRODUCTION .....	1
2.0	SITE ACTIVITIES .....	3
2.1	Exploration .....	3
2.2	Construction and Development.....	3
2.2.1	Overview of Activities by Quarter .....	3
2.2.2	As-built Drawings .....	3
2.3	Mining Activities .....	3
2.3.1	Overview of Activities by Quarter .....	3
2.3.2	Production Schedule – Ore and Waste Removal.....	3
2.3.3	Average Head Grades .....	3
2.3.4	Open Pit Stability.....	3
2.3.5	Heap Leach Cells – Status of Leaching (including layout drawing) .....	3
2.3.6	Copper Production .....	3
2.3.7	Spills.....	3
2.3.8	On-going Reclamation .....	3
2.3.9	Actions Undertaken in Response to Annual Engineer's Inspection .....	4
2.3.10	Access Road .....	4
2.4	Resources and Reserves.....	4
2.5	Care and Maintenance.....	4
2.6	Proposed Development and Production for Upcoming Year .....	4
3.0	MONITORING PROGRAMS AND STUDIES .....	5
3.1	On-going Metallurgical Studies .....	5
3.1.1	Field Tests.....	5
3.1.2	Laboratory Tests .....	5
3.2	Heap Leach Pad Liner Performance Monitoring.....	5
3.3	Water Quality Surveillance Program .....	5
3.3.1	Surface Water Quality .....	8
3.3.2	Groundwater Quality .....	8
3.4	Hydrogeology Studies.....	8
3.5	Water Treatment and Management .....	8
3.6	Climate Data and Snow Survey Monitoring Program .....	8
3.7	Geochemical Studies and Acid-Base Accounting.....	8
3.8	Physical Monitoring Program .....	8
3.9	Engineer's Annual Physical Inspection Reports .....	8

3.10	Reclamation and Revegetation Studies .....	9
3.11	Submission and Approval of Plans .....	9
4.0	OUTSTANDING FINANCIAL LIABILITY .....	10
4.1	Heap Leach.....	10
4.2	Waste Rock Storage .....	10
4.3	Overall Liability.....	10
4.4	Engineering Contingencies .....	11

## List of Figures

Figure 1. Preliminary Mine Layout (not yet constructed). .....	2
Figure 2. Water Quality Monitoring Station Locations. ....	7

## List of Tables

Table 1. Carmacks Project Mineral Resource Statement, October 12, 2016. ....	4
Table 2. Water Quality Surveillance Program Site Descriptions and Locations. ....	6
Table 3. Estimated closure liability for the planned heap leach project. ....	10

## List of Appendices

Appendix A	Annual Engineer's Inspection Report, October 29, 2019
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## 1.0 INTRODUCTION

This Annual Report has been prepared by Copper North Mining Corp. and covers the period from January 1, 2019 to December 31, 2019 as required by Clauses 16.5 and 16.6 of Quartz Mining License (QML) QML-0007. As of January 19, 2012, the assignment of QML-007 was authorized from Carmacks Copper Limited to Carmacks Mining Corp., a wholly-owned subsidiary of Copper North Mining Corp.

This report provides a summary of activities at the Carmacks Copper Property for the reporting year, including, but not limited to, physical stability inspection and exploration.

Few site activities occurred that would normally form a part of this report in future years, once major project permitting is completed. Additional sections and information will be added to the annual reports as necessary to accommodate expanded reporting requirements from future mine development and related plans. The preliminary mine layout (not yet constructed) for the copper heap leach project is illustrated in Figure 1.

The reader should note that, since QML-0007 was issued, Copper North has been working to re-engineer the metallurgical process for the project to recover gold and silver in addition to copper. The results of the re-engineering work to date are detailed in a Preliminary Economic Assessment (PEA) completed in October 2016 (JDS 2016), a copy of which was provided with the 2016 Annual Report and represents the general plan for future development of the deposit, subject to regulatory approvals and financing. Nevertheless, QML-0007 applies to the project as planned at the time of issue and therefore dictates the context for this annual report.

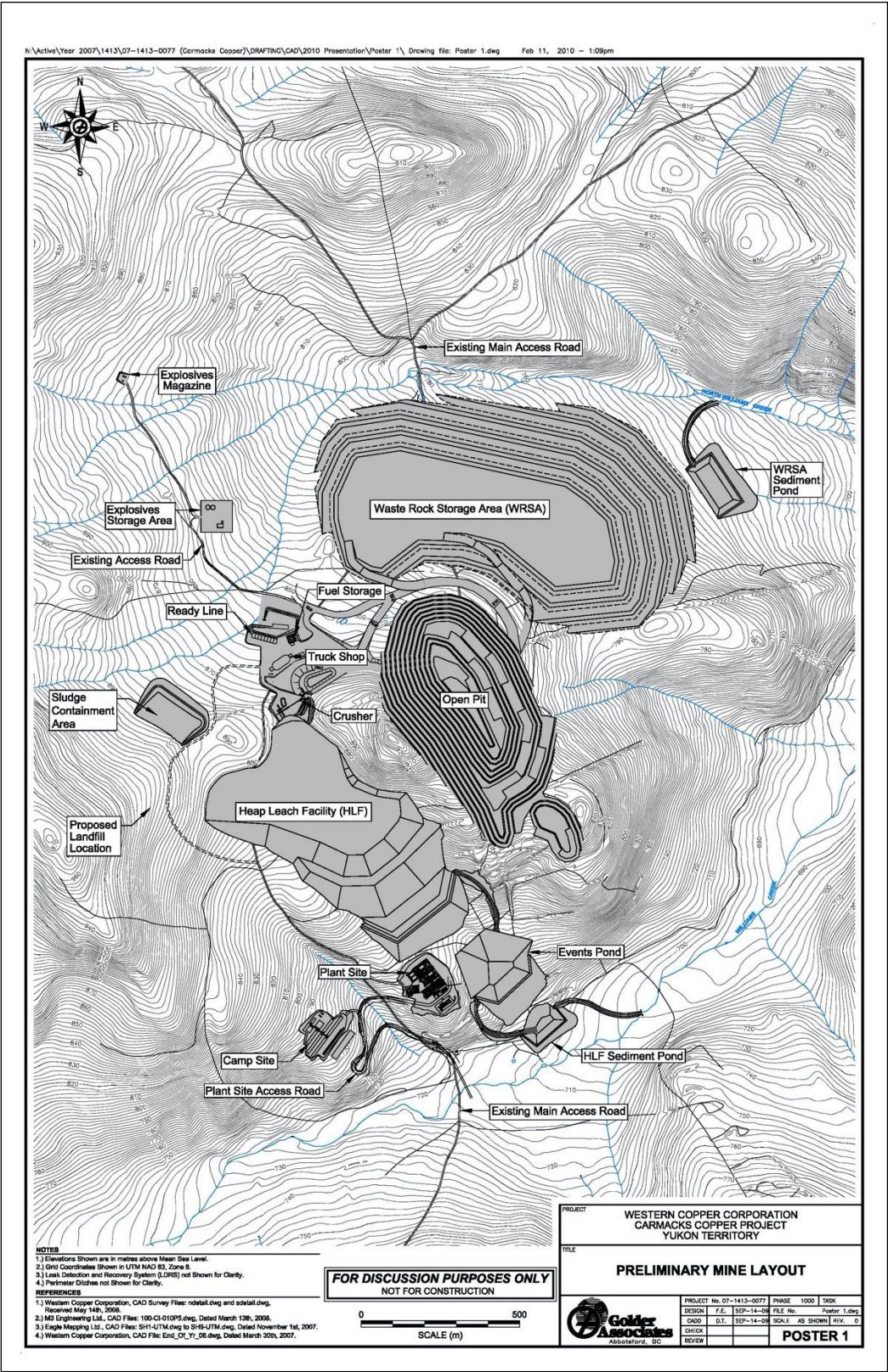


Figure 1. Preliminary Mine Layout (not yet constructed).



## **2.0 SITE ACTIVITIES**

### **2.1 EXPLORATION**

No exploration was conducted in 2019.

### **2.2 CONSTRUCTION AND DEVELOPMENT**

#### **2.2.1 Overview of Activities by Quarter**

No construction or development activities occurred on the property in 2019.

#### **2.2.2 As-built Drawings**

No as-built drawings were produced in 2019.

### **2.3 MINING ACTIVITIES**

#### **2.3.1 Overview of Activities by Quarter**

No mining activities took place in 2019.

#### **2.3.2 Production Schedule – Ore and Waste Removal**

Not applicable for this reporting period; no mining activities took place in 2019.

#### **2.3.3 Average Head Grades**

Not applicable for this reporting period; no mining activities took place in 2019.

#### **2.3.4 Open Pit Stability**

Not applicable for this reporting period; no mining activities took place in 2019.

#### **2.3.5 Heap Leach Cells – Status of Leaching (including layout drawing)**

Not applicable for this reporting period; no mining activities took place in 2019.

#### **2.3.6 Copper Production**

Not applicable for this reporting period; no mining activities took place in 2019.

#### **2.3.7 Spills**

No spills occurred during the reporting period.

#### **2.3.8 On-going Reclamation**

No reclamation was done in 2019

.

### 2.3.9 Actions Undertaken in Response to Annual Engineer's Inspection

No response was necessary to the 2017 inspection report.

### 2.3.10 Access Road

The access road to the site has not been constructed.

## 2.4 RESOURCES AND RESERVES

The current resource estimate for the property (Table 1) is as stated in the October 2016 Preliminary Economic Assessment (PEA) (JDS 2016). This PEA supersedes the January 2016 Independent Technical Report (ACS 2016). No reserve is currently stated for the property.

**Table 1. Carmacks Project Mineral Resource Statement, October 12, 2016.**

Mineralised Zone	Resource Class	Tonnes (000)	Total Cu (%)	Soluble Cu (%)	Au (g/t)	Ag (g/t)	Sulphide Cu (%)
<b>Oxide and Transition mineralisation</b>	Measured	6,484	0.86	0.69	0.41	4.24	0.17
	Indicated	9,206	0.97	0.77	0.36	3.80	0.20
	Measured + Indicated	15,690	0.94	0.74	0.38	3.97	0.20
	Inferred	913	0.45	0.30	0.12	1.90	0.15
<b>Sulphide mineralisation</b>	Measured	1,381	0.64	0.05	0.19	2.17	0.59
	Indicated	6,687	0.69	0.04	0.17	2.34	0.65
	Measured + Indicated	8,068	0.68	0.05	0.18	2.33	0.65
	Inferred	8,407	0.63	0.03	0.15	1.99	0.61

## 2.5 CARE AND MAINTENANCE

No activities to report.

## 2.6 PROPOSED DEVELOPMENT AND PRODUCTION FOR UPCOMING YEAR

There are presently no development or production plans for the 2020 year.

### **3.0 MONITORING PROGRAMS AND STUDIES**

The QML contains several requirements for studies and monitoring programs. The following sections outline work done with respect to these studies and programs.

#### **3.1 ON-GOING METALLURGICAL STUDIES**

##### **3.1.1 Field Tests**

No metallurgical field tests were in progress as of 2019.

##### **3.1.2 Laboratory Tests**

No metallurgical laboratory tests were conducted in 2019.

#### **3.2 HEAP LEACH PAD LINER PERFORMANCE MONITORING**

No liner has been placed and no performance monitoring is in progress.

#### **3.3 WATER QUALITY SURVEILLANCE PROGRAM**

No water quality surveillance was conducted in 2019.

The locations established to date for the monitoring of surface water quality are in Table 2 and Figure 2. Additional locations will be added as the mine is brought into production.

**Table 2. Water Quality Surveillance Program Site Descriptions and Locations.**

Station	Description	Northing	Easting
W2	Williams Creek Upstream of North Williams Creek Confluence	6914145	413499
W3	Lower North Williams Creek Upstream of Confluence with Williams Creek	6914379	413640
W4	Williams Creek Downstream of Confluence with North Williams Creek	6914653	413888
W5	South East Tributary to Williams Creek	6912947	412978
W6	Williams Creek Downstream of South East Tributary	6913373	413042
W7	Upper North Williams Creek Tributary Upstream of Road Crossing	6914810	411778
W9	Williams Creek Upstream of Access Road Crossing	6912511	411907
W10	Williams Creek Upstream of Yukon River	6919033	416606
W11	Nancy Lee Creek (Tributary of Williams Creek)	6918096	415803
W12	Williams Creek Downstream of Confluence with Nancy Lee Creek	6918000	416102
W13	Williams Creek Upstream of Confluence with Nancy Lee Creek	6917984	415912
Y1	Yukon River Upstream of Williams Creek	6918974	416752
Y2	Yukon River Downstream of Williams Creek	6919308	416249

Notes: Coordinates are UTM Zone 8 NAD83

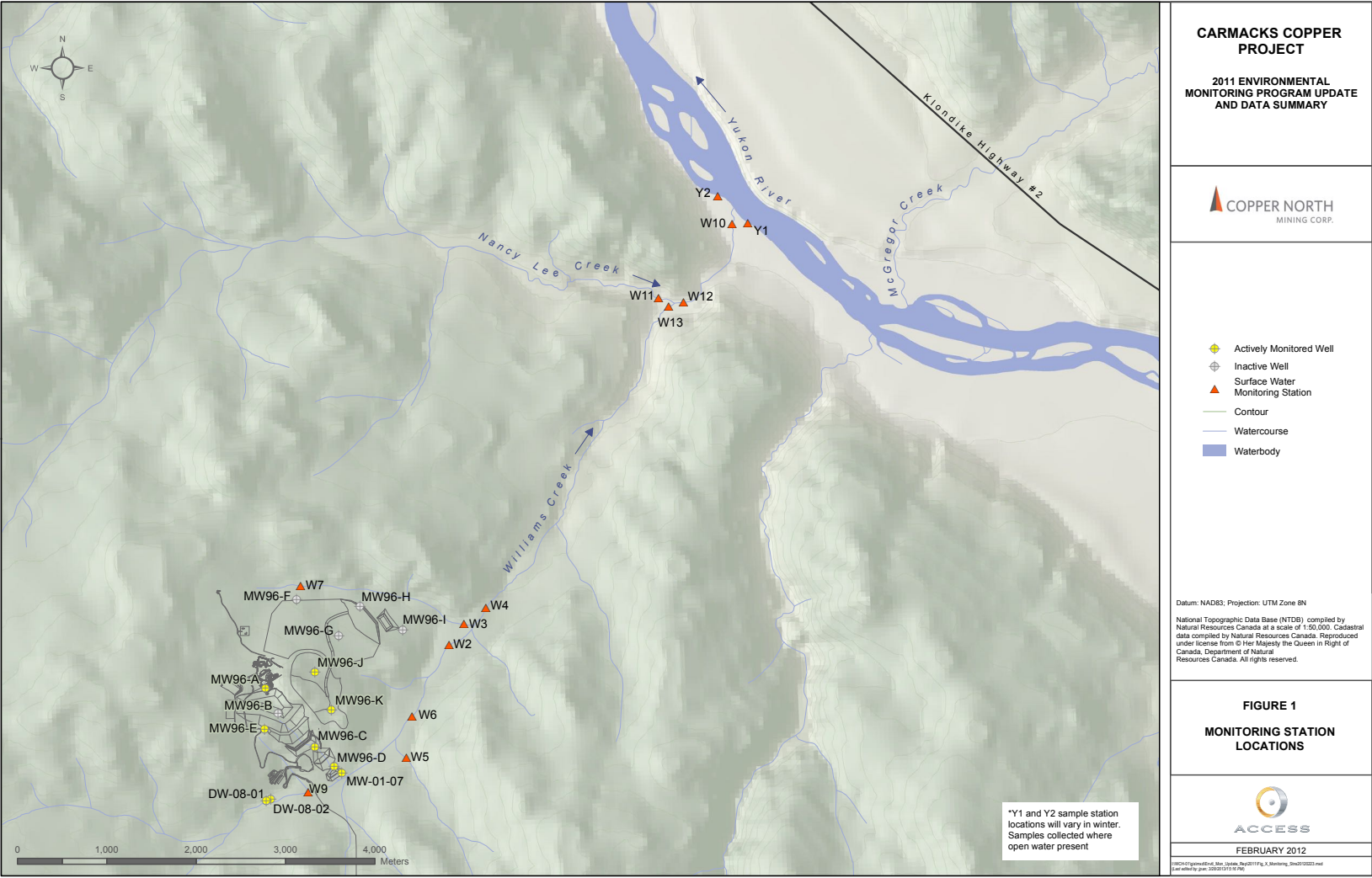


Figure 2. Water Quality Monitoring Station Locations.

**3.3.1 Surface Water Quality**

No surface water quality sampling was required or conducted in 2019.

**3.3.2 Groundwater Quality**

No groundwater quality monitoring was required in 2019.

**3.4 HYDROGEOLOGY STUDIES**

Six (6) groundwater wells were installed by Golder Associates Ltd. in 2017 in the area of the planned dry stack tailings management area (described in JDS 2016) to enable pumping tests and monitoring of piezometric elevation. Further details regarding the well installations and findings are pending completion of the field report.

**3.5 WATER TREATMENT AND MANAGEMENT**

No water treatment studies, or water management studies were required or conducted in 2019.

**3.6 CLIMATE DATA AND SNOW SURVEY MONITORING PROGRAM**

Copper North did not conduct any meteorological monitoring on site in 2019.

**3.7 GEOCHEMICAL STUDIES AND ACID-BASE ACCOUNTING**

Tailings residue from locked cycle metallurgical tests conducted in 2015 have been submitted for geochemical analysis and humidity cell testing. The lab work has been completed and the geochemical test report is pending.

**3.8 PHYSICAL MONITORING PROGRAM**

Physical monitoring of structures and facilities in 2019 was limited to the Annual Engineer's Inspection (Appendix A).

**3.9 ENGINEER'S ANNUAL PHYSICAL INSPECTION REPORTS**

Copper North Mining Corp. engaged Golder Associates Ltd. to perform the Annual Physical Inspection of the site required under Sections 16.1 and 16.2 of the QML. The inspection was carried out on October 15, 2019. The complete report is contained in Appendix A and a copy of this report was previously submitted to Government of Yukon, Department of Energy, Mines and Resources, Mineral Resources Branch.

The report focused on inspection of existing site conditions and of the limited infrastructure on site, since no development has yet taken place on site. No areas were identified as requiring immediate attention. Items requiring repair were limited to the geomembrane liner of the fuel storage berm, which had been damaged by a bear. This item will be addressed prior to a need for fuel storage on site. Recommendations were limited to identifying areas of minor maintenance to be addressed, as required, in relation to road maintenance to prevent erosion and washouts and ongoing minor maintenance of silt fences and sediment traps. Also, the

beaver dam located downstream of the Merrice Creek Bridge was indicated for removal in order to prevent erosion of the bank supporting the bridge.

### **3.10 RECLAMATION AND REVEGETATION STUDIES**

In 2007, a test patch of seeding was completed on an approximately 500 m x 12 m area located adjacent to the west side the access road and south of the Williams Creek crossing and the helicopter pad area. The seeding, and resulting vegetation, was intended to help stabilize sediments in this area and has been observed in the past six years to be performing well.

### **3.11 SUBMISSION AND APPROVAL OF PLANS**

No development plans were submitted during 2019.

## 4.0 OUTSTANDING FINANCIAL LIABILITY

### 4.1 HEAP LEACH

There has been no update to the assessment of the liability associated with the Heap Leach Facility, which was presented in the May 2009 revision of the Preliminary Detailed Closure and Reclamation Plan.

### 4.2 WASTE ROCK STORAGE

There has also been no update to the assessment of the liability associated with the Waste Rock Storage Facility, which was presented in the May 2009 revision of the Preliminary Detailed Closure and Reclamation Plan.

### 4.3 OVERALL LIABILITY

The estimated maximum overall liability associated with the development and operation of the mine remains as set out in the May 2009 revision of the Preliminary Detailed Closure and Reclamation Plan is detailed in Table 3.

**Table 3. Estimated closure liability for the planned heap leach project.**

Facility or Area Description	Cost
Open Pit	\$ 23,000
Heap Leach Facility	\$ 17,295,000
HLF Events and Sediment Ponds	\$ 296,000
Waste Rock Storage Area	\$ 740,000
Plant and Ancillary Facilities	\$ 467,000
Camp	\$ 103,000
Truck Shop Service Complex	\$ 70,000
Miscellaneous Facilities	\$ 95,000
Access and Haul Roads	\$ 248,000
Site Management	\$ 1,103,000
<b>Total</b>	<b>\$ 20,440,000</b>

An additional \$2.675 million in addition to the above total has been estimated to cover costs associated with rinsing and neutralization of the heap leach facility, should the rinsing period extend to 9 years instead of the initially estimated 4.5-year period.

To date, security in the amount of \$80,300 has been posted with Yukon Government. This represents the accrued liability due to exploration activities on the site.

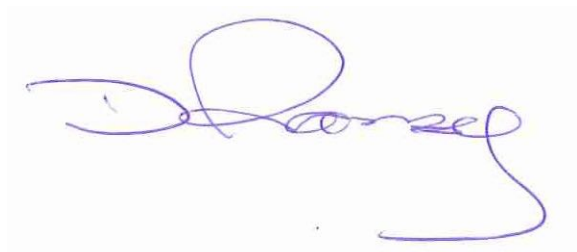


#### **4.4 ENGINEERING CONTINGENCIES**

In accordance with Section 11.0 of the QML, Copper North Mining Corp. prepared a Contingency Plan based on a workshop held in October 2009. The plan was submitted to the Chief of Mining Land Use in January 2010. The main purpose of the Contingency Plan was to identify possible alternative approaches to decommissioning the Heap Leach Facility, however, other facilities were also examined. The plan identified several possible failure modes and contingency measures for each of the facilities and recommended further work that should be undertaken. The report was issued in draft format pending comments from government. No comment from government has been received to date. No further work has been undertaken to develop any of the contingency plans identified.

**COPPER NORTH MINING CORP.**

**(On behalf of CARMACKS MINING CORP.)**

A handwritten signature in blue ink, appearing to read "Doug Ramsey", is centered on a light gray rectangular background.

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**Doug Ramsey**

President and CEO

## Appendix A. Annual Engineer's Inspection Report

29 October 2019

Reference No. 18110616-004-L-Rev0-2019

**Doug Ramsey, VP Sustainability and Environmental Affairs**

Carmacks Mining Corporation  
1120-1095 West Pender Street  
Vancouver, BC V6E 2M6

**2019 ANNUAL INSPECTION OF THE CARMACKS COPPER PROJECT, CARMACKS, YUKON**

Dear Mr. Ramsey,

**1.0 INTRODUCTION**

This letter summarises the observations made during the 2019 annual inspection of the Carmacks Copper Project site. The inspection was carried out by Golder Associates Ltd. (Golder) for Carmacks Mining Corp. (Carmacks Mining) to fulfil the requirements of Section 16.1 of the Quartz Mining License (QML-0007) for the site. The work was carried out in accordance with Golder's proposal 18110616-003-Rev0-2000, dated 30 September 2019, and approved by Carmacks Mining in an email dated 2 October 2019.

The purpose of the inspection was to evaluate the condition and stability of the existing facilities in the area of the proposed mine. The existing facilities at the site comprise a mine exploration camp, which was vacant at the time of the inspection, access roads, and minor drainage structures. Golder also inspected the area of proposed mine development. The proposed mine infrastructure, as described in the approved QML, dated 15 April 2009, includes a heap leach facility, water management ponds, an open pit, a waste rock storage area, a processing plant and related facilities, ore preparation facilities, ore stockpiles, and water diversion structures.

**2.0 OBSERVATIONS**

**2.1 Overview**

The inspection was carried out by Mr. Dale Heffernan of Golder, in the company of Mr. Doug Ramsey of Carmacks Mining on 15 October 2019. The inspection focused on the existing site infrastructure and a review of the general site conditions. There was a small amount of snow cover due to snowfall throughout the day of the inspection, however the ground surface was generally visible. Photographs of the site at the time of the inspection are presented in Attachment 2. Data collected from thermistors, between 2007 and 2019, are presented in Attachment 3.

The project is in the advanced exploration stage. The only infrastructure on site at the time of inspection was the exploration camp and access roads to the proposed open pit mine area and other areas of the property. The access roads were developed to provide access for exploration and investigation activities.

The site development required to support operations has not started yet. Therefore, there is no stability concern associated with the undeveloped facilities and no maintenance is required. No permanent water diversion structures are in place. There are, however, temporary water management structures (i.e., ditches and sediment catch basins) in place that are appropriate for the exploration stage of the property. We recommend that these diversion structures continue to be inspected annually and that ongoing maintenance be conducted, as deemed necessary.

## **2.2 Exploration Camp Area**

In previous years, inspections of the camp area have noted the presence of cracking, most likely resulting from thaw induced settlement beneath and adjacent to core storage racks. During the current inspection, only one crack was observed in the vicinity of the core storage racks. In general, the appearance of cracks in the core storage rack area was consistent with the 2018 inspection. There appears to have been some infilling of cracks observed during previous inspections. The area is also characterised by the regrowth of vegetation around the core racks and a general decrease in the magnitude of settlements occurring with time. As in previous years, settlement in this area does not represent a safety concern and the inspection did not indicate erosion of sediments from the pad area into the surrounding natural area.

There are two heated buildings, the core shack and geology office, located adjacent to the core storage racks (Photograph 1). The tanks, valves and hosing were in a satisfactory condition, at the time of inspection. Liners have been placed beneath each tank to act as secondary containment for potential leaks and were also in a satisfactory condition.

The slope behind the camp (Photographs 3 and 4) is stable and does not pose a safety concern for the camp structures or current operations. There is minor ravelling of small sections of the slope, but these are not impacting camp safety nor would they represent a risk for workers on the project. Some regrowth of vegetation was observed in the camp area.

## **2.3 Proposed Heap Leach Facility Area**

The inspection included the area of the 2009 proposed heap leach facility and associated water management pond. Site preparation in these areas has been limited to clearing of trees and topsoil. This portion of the site also includes several access roads and drilling platforms previously used for exploration and investigation activities.

Since the initial clearing in 1997 and 1998, regrowth of vegetation has been occurring in the area. Small coniferous trees are established throughout this area. Erosion and sediment control measures in this area were initially installed in September 2008 and further maintained in September 2009 and August 2010. The sediment control measures include ditches and berms to divert water into sediment catch basins, silt fences, and vegetated areas to break up flow and reduce the potential for erosion. There continues to be some minor erosion of sediments along the access roads, however, this appears to be attenuating as vegetation growth on the access roads increases (Photograph 5).

Clearing and drilling activities were carried out in 2015 and 2017 at a location down slope of the proposed heap leach facility, near the proposed water management pond (Photograph 6). Regrowth of vegetation, primarily volunteer species of grass, has mitigated loss of sediment from the former drill pads and is suitably rehabilitating.

Further downstream, within the floodplain of Williams Creek, silt fences have been installed and the area seeded where sediment from previous site erosion accumulated (Photographs 7 and 8). Grass seed was applied in 2009 to promote the re-establishment of vegetation and to further stabilize sediment. The approach was noted to be generally effective in 2011 and 2012, but with limited regrowth attributed to periodic pooling of water. The area was also re-vegetated with woody plants (willow cuttings), and these plants are now well established. Volunteer species of grass and woody plants are performing very well. There was no evidence of sediment movement, indicating that re-vegetation has been effective in minimizing erosion. Silt fencing surrounding these areas is now overgrown and there is no evidence of sediment movement through the area. Silt fences are typically a temporary measure and could be removed if no further disturbance is expected upgradient.

## **2.4 Proposed Open Pit Area**

The area proposed for the open pit mine was inspected. The slopes of the trenches excavated as part of the effort to obtain bulk samples during exploration activities were observed to be in satisfactory condition (Photograph 9). There was no observed slumping or failures of the trenches and the slopes facilitate egress for wildlife. Several of the closed drill pads were inspected and there did not appear to be any erosion noted from these areas that would require attention.

## **2.5 Proposed Waste Rock Storage Facility Area**

The 2009 proposed waste rock storage area was inspected. The waste rock storage area is tree covered and the drill pads and access roads in the area are re-vegetating by volunteer species to the extent that access on foot is now difficult.

## **2.6 Fuel Storage Area**

The existing fuel storage area was inspected. It comprises a bunded and lined basin constructed to contain any spilled fuel and currently a few dozen drums of diesel fuel. Approximately 0.2 m of water has accumulated in the basin (Photograph 10). The bund is less than 3 m in height and the basin capacity is less than 10,000 m<sup>3</sup>; therefore, the fuel storage area is appropriately permitted under the QML without need for a water license (Yukon Environment Dam Guide).

In the 2017 inspection, it was noted that an animal damaged the liner in a few locations (Photograph 11). The damage is still visible and repairs have yet to be completed. The fuel drums have since been organized in a manner to allow wildlife egress from the basin. There is some vegetation growth along the top of the containment berms and within the lined basin. There is one small shrub that is growing on the soil within the bermed area. There is the potential that the roots of the shrub penetrate through the liner. At the time when repairs to the liner are made, the shrub should be removed, the area inspected and repaired, if required.

## 2.7 Site Access Roads

The main access road to the north of the proposed waste rock storage area was observed to be in good condition with only minor erosion observed. Damage to the road near North Williams Creek noted in the 2017 inspection report have since been repaired. The North Williams Creek culvert has undergone some crushing and has accumulated some sediment (Photographs 13 and 14). However, the culvert remains adequate to accommodate the relatively minor flows observed at the time of the inspection. There is no visual evidence to indicate that erosion is occurring near the culvert. The access road should be inspected annually and periodic maintenance of drainage features and erosion management should be anticipated.

The ford road crossing installed at Williams Creek in 2013 continues to function as intended (Photograph 15). The rockfill in the ford is well-graded and there is no indication of movement of finer materials. Ponded water was observed on the upstream side of the road, with flow across the road. It is possible that a large rainfall event could result in erosion. We therefore recommended that the ford continue to be inspected annually and maintenance be carried out, if required. The ford is appropriate for the current status of the project. However, prior to site development, it is recommended that the crossing is upgraded.

The access road crossing at Merrice Creek includes a single-span bridge (Photographs 16 and 17). Following recommendations in the July 2014 inspection memorandum, the bridge was extended by approximately 3 m and seated 1 to 2 m on the abutments. Approximately 3 m of steel was welded to the existing span, bridge decking was replaced and extended, and the approaches were re-graded to the bridge deck elevation.

At the time of the inspection there was a large beaver dam downstream of the bridge which had caused higher than normal water levels in Merrice Creek, for the time of year (Photograph 18). The bridge was observed to be in a satisfactory condition and is securely anchored at each of the abutments. The right (or southern) abutment is steep sided and there is evidence that erosion may be continuing to occur at this location under high-flow conditions. The bridge should be monitored annually and following large rainfall events. In the event that erosion begins to compromise the stability of the abutment, consideration should be given to the installation of erosion protection at this location.

## 3.0 THERMISTOR DATA

Thermistor monitoring data, through 2019 demonstrate that clearing of the Heap Leach Facility area in 1997, promoted thawing of the discontinuous permafrost. However, in recent years that progress has been lost due to vegetation regrowth. Based on thermistor monitoring from 2007 to 2019, shown in Attachment 3, the Heap Leach Facility area would need to be re-cleared to facilitate thawing. Further monitoring would be initiated prior to any planned clearing of the heap pad area.

In general, thermistors BH-01-07, BH-03-07, BH-06-07, BH-17-07, located at the heap leach site, have continued to show a gradual year-on-year decrease in temperatures at depths greater than 5 to 7 m, depending on location. Similar trends are also apparent in BH-12-07, BH-18-07 and BH-29-07, located within the proposed waste rock storage area. The remaining thermistors indicate little or no permafrost, over the depth monitored, and in general show a warming trend. Note the monitoring depth varies by location.

The project is located in an area of discontinuous permafrost, which is relatively warm. Based on site data, where permafrost exists, the mean annual temperature ranges from about -0.4 to -2°C, below a depth of 10 m. This is evident from the thermistor plots, which can be interpreted to estimate the active thaw layer and permafrost, where present. The thermistor plots indicate the presence of permafrost at the following locations:

- BH-01-07, BH-03-07 and BH-06-07 to the south and west of the proposed heap leach facility area, where the active thaw layer is approximately 5 to 7 m thick with permafrost below.
- BH-12-07, BH-18-07 and BH-29-07 within the proposed waste rock storage area, where the active thaw layer varies from approximately 5 to 8 m thick with permafrost below.
- BH-13-07, within the proposed events pond area, indicates that permafrost has thawed to at least 18.3 m. However, permafrost likely exists below.

No permafrost has been observed at thermistors BH-23-07 and BH-26-07 over the monitored depths of 15.0 m and 12.0 m, respectively. These instruments are within the proposed Heap Leach Facility area. Permafrost likely exist below the depth monitored. Both of these instruments show a warming trend, possibly indicating an increase in the mean annual air temperature above 10 m. Below 10 m depth, a decreasing temperature trend approaching 0C is evident. Note that during the 2019 inspection BH-06-07 could not be located.

## 4.0 RECOMMENDATIONS

The inspection of the Carmacks Copper Project site was completed on 15 October 2019. Based on the inspection the following recommendations are provided:

- The beaver dam located downstream of the Merrice Creek crossing should be dismantled.
- Water crossings, including the bridge abutments at Merrice Creek, should continue to be inspected annually and following major rainfall events. Maintenance should be carried out, as required to maintain the functionality and safety of these crossings.
- The damage to the liner at the fuel storage area should be repaired.

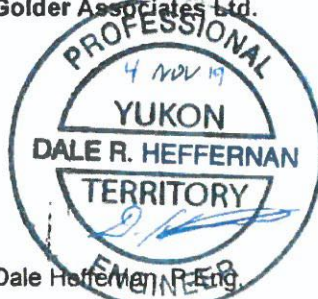


## 5.0 CLOSURE

We draw your attention to the "Important Information and Limitations of this Report" included as Attachment 1, which form an integral part of this document. We trust that this letter satisfies your requirements. However, please do not hesitate to contact us should you have any queries or require any further information.

Yours very truly,

Golder Associates Ltd.



Dale Heffernan, P.Eng.  
Geotechnical Engineer

A handwritten signature in blue ink, appearing to read "Fiona Esford".

Fiona Esford, M.A.Sc., P.Eng.  
Principal, Senior Geotechnical Engineer

DH/FCE/cmm/no

Attachments: Attachment 1: Important Information and Limitations of this Report  
Attachment 2: Photographs  
Attachment 3: Thermistor Plots

[https://golderassociates.sharepoint.com/sites/34115g/deliverables/3.0 issued/18110616-004-L-Rev0-2019/18110616-004-L-Rev0-2019-annual\\_inspection\\_2019\\_29oct\\_19.docx](https://golderassociates.sharepoint.com/sites/34115g/deliverables/3.0%20issued/18110616-004-L-Rev0-2019/18110616-004-L-Rev0-2019-annual_inspection_2019_29oct_19.docx)

PERMIT TO PRACTICE GOLDER ASSOCIATES LTD.	
SIGNATURE	
Date	04 Nov. 2019
PERMIT NUMBER PP024 Association of Professional Engineers of Yukon	

**ATTACHMENT 1**

**Important Information and  
Limitations of this Report**

**Standard of Care:** Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

**Basis and Use of the Report:** This report has been prepared for the specific site, design objective, development and purpose described to Golder by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. Any change of site conditions, purpose, development plans or if the project is not initiated within eighteen months of the date of the report may alter the validity of the report. Golder can not be responsible for use of this report, or portions thereof, unless Golder is requested to review and, if necessary, revise the report.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client cannot rely upon the electronic media versions of Golder's report or other work products.

The report is of a summary nature and is not intended to stand alone without reference to the instructions given to Golder by the Client, communications between Golder and the Client, and to any other reports prepared by Golder for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. Golder can not be responsible for use of portions of the report without reference to the entire report.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

**Soil, Rock and Groundwater Conditions:** Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Golder does not warrant or guarantee the exactness of the descriptions.

Special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions. The environmental, geologic, geotechnical, geochemical and hydrogeologic conditions that Golder interprets to exist between and beyond sampling points may differ from those that actually exist. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. **The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report.** The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

**Sample Disposal:** Golder will dispose of all uncontaminated soil and/or rock samples 90 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

**Follow-Up and Construction Services:** All details of the design were not known at the time of submission of Golder's report. Golder should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of Golder's report.

During construction, Golder should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Golder's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Golder's report. Adequate field review, observation and testing during construction are necessary for Golder to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Golder's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

**Changed Conditions and Drainage:** Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Golder be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Golder be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Golder takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

**ATTACHMENT 2**

## Photographs





**Photograph 1: Core Storage Racks**



**Photograph 2: Core Storage Racks**





**Photograph 3: Cut-slope behind Camp Geology Office and Core Shack**



**Photograph 4: Cut-slope behind the Camp Geology Office and Core Logging Shack**





**Photograph 5: Vegetation Regrowth on Access Roads**



**Photograph 6: Vegetation Regrowth in 2015 Drilling Area and Proposed Water Management Pond Area**





**Photograph 7: 2017 Drilling Area and Vegetation Regrowth in Williams Creek Floodplain**



**Photograph 8: Vegetation Growth around Sediment Fencing**





**Photograph 9: Exploration Trench at the Discovery Outcrop**



**Photograph 10: Lined Basin at Fuel Storage Area**



**Photograph 11: Liner Damage at Fuel Storage Area**



**Photograph 12: Road Near North Williams Creek**





**Photograph 13: Culvert Inlet beneath road at North Williams Creek**



**Photograph 14: Culvert Outlet beneath Road at North Williams Creek**



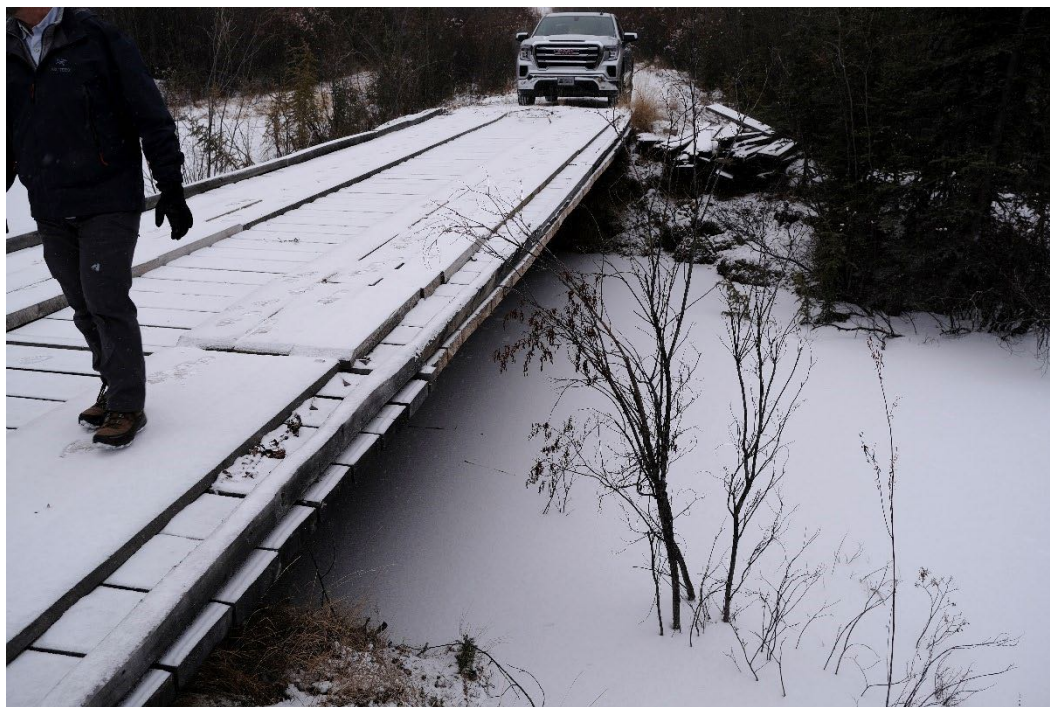


**Photograph 15: Williams Creek Ford Crossing**



**Photograph 16: Bridge Crossing at Merrice Creek – Downstream Side**





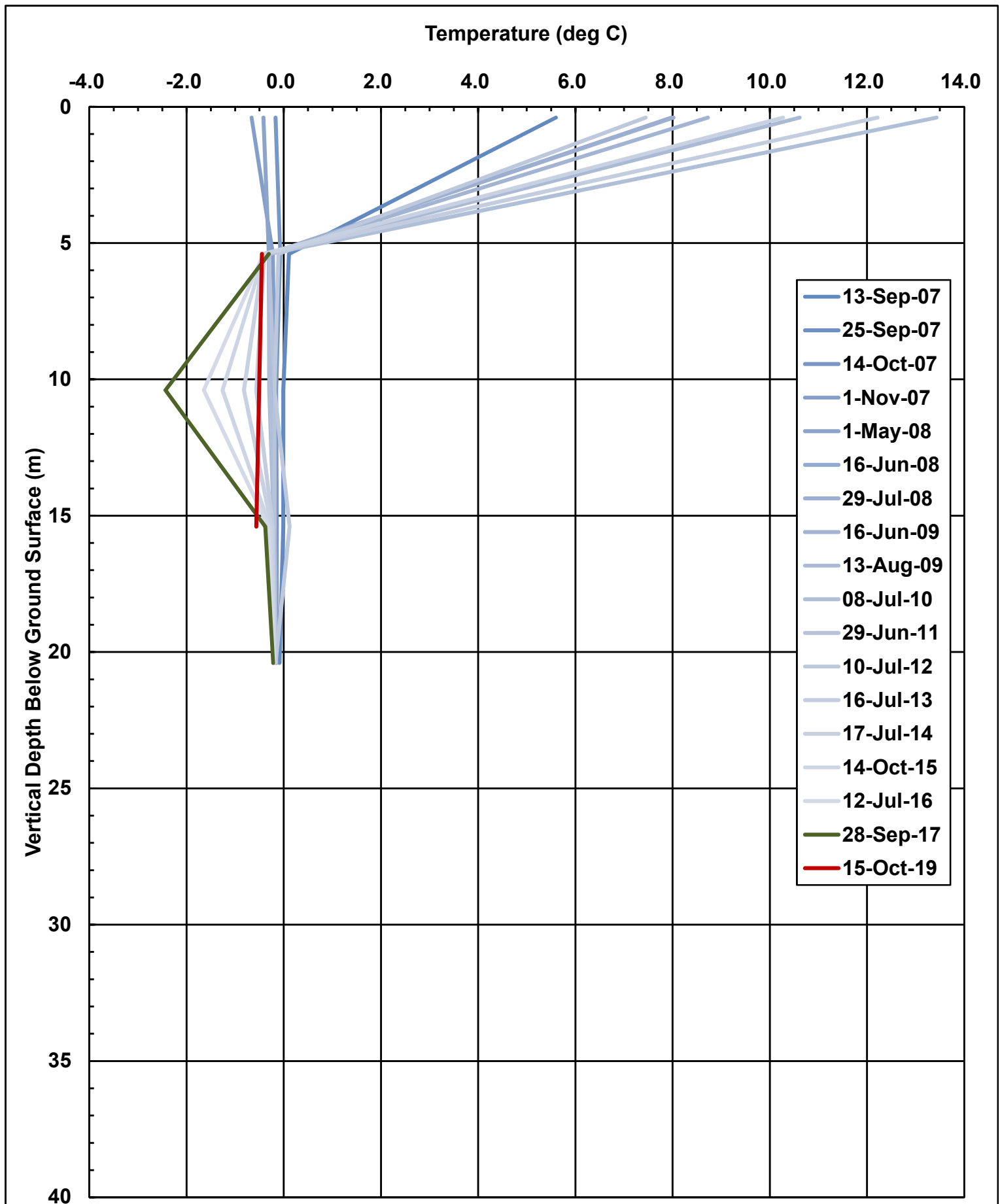
**Photograph 17: Bridge Crossing at Merrice Creek – Upstream Side**



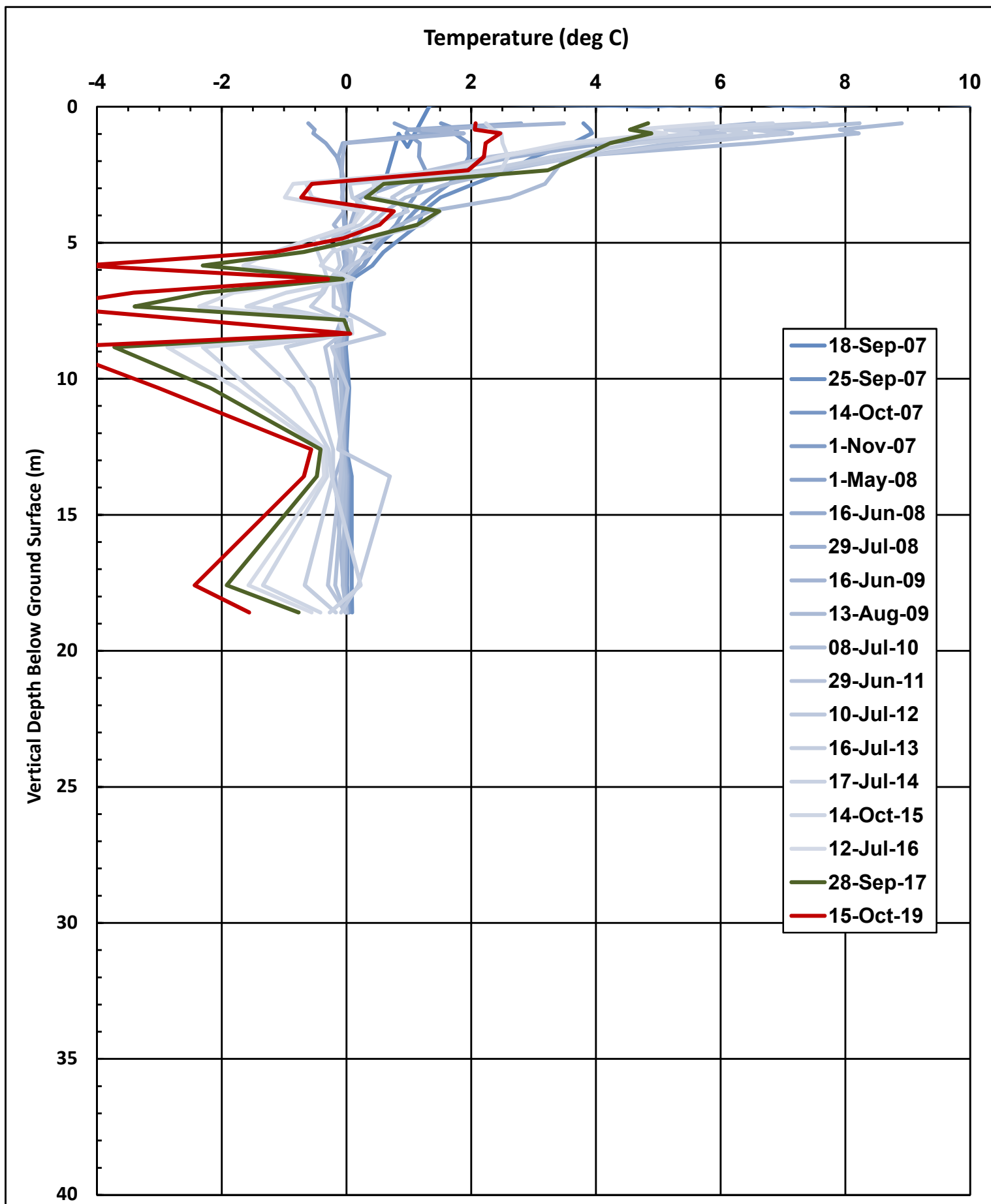
**Photograph 18: Bridge Crossing at Merrice Creek – Downstream Beaver Dam**

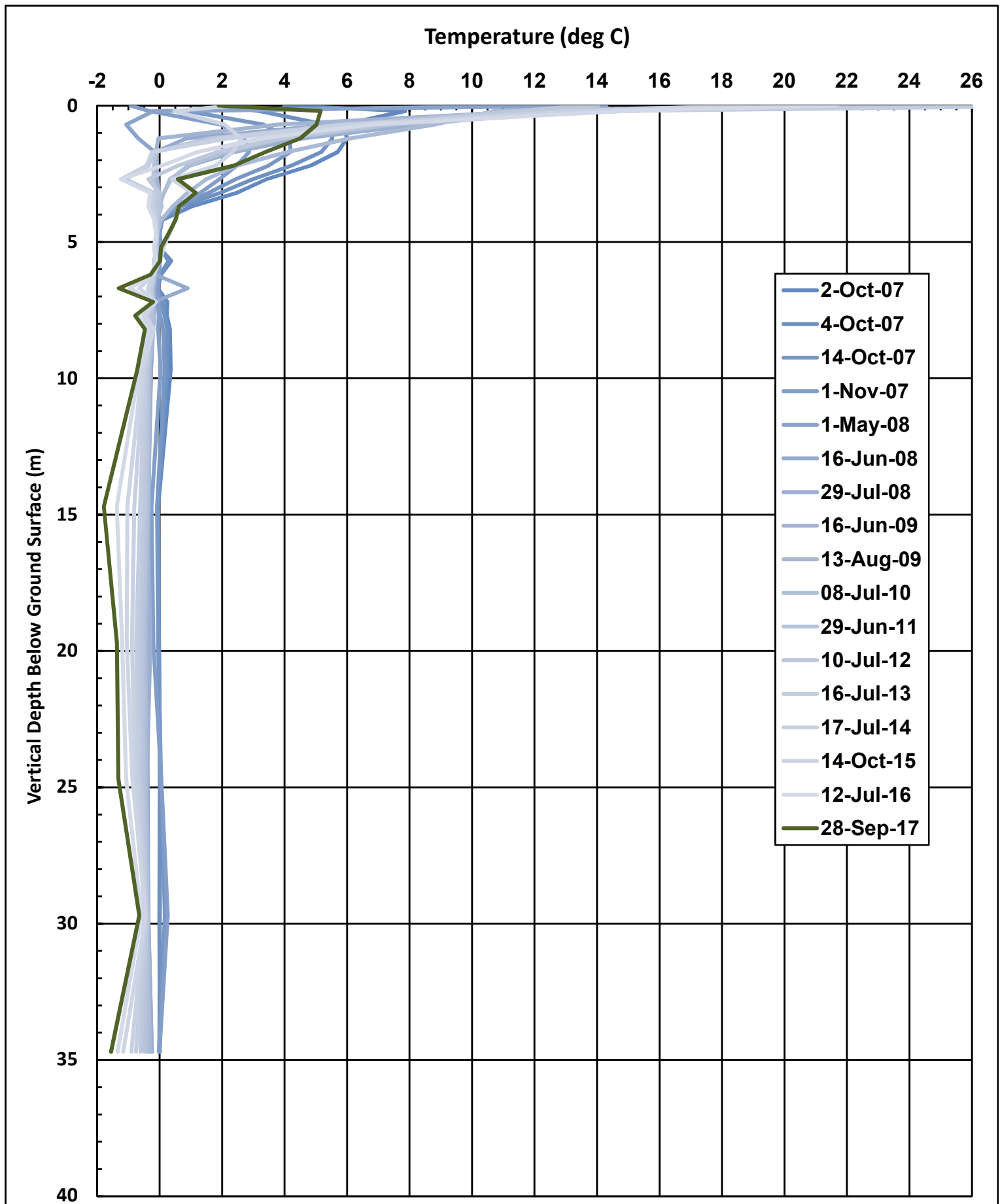
**ATTACHMENT 3**

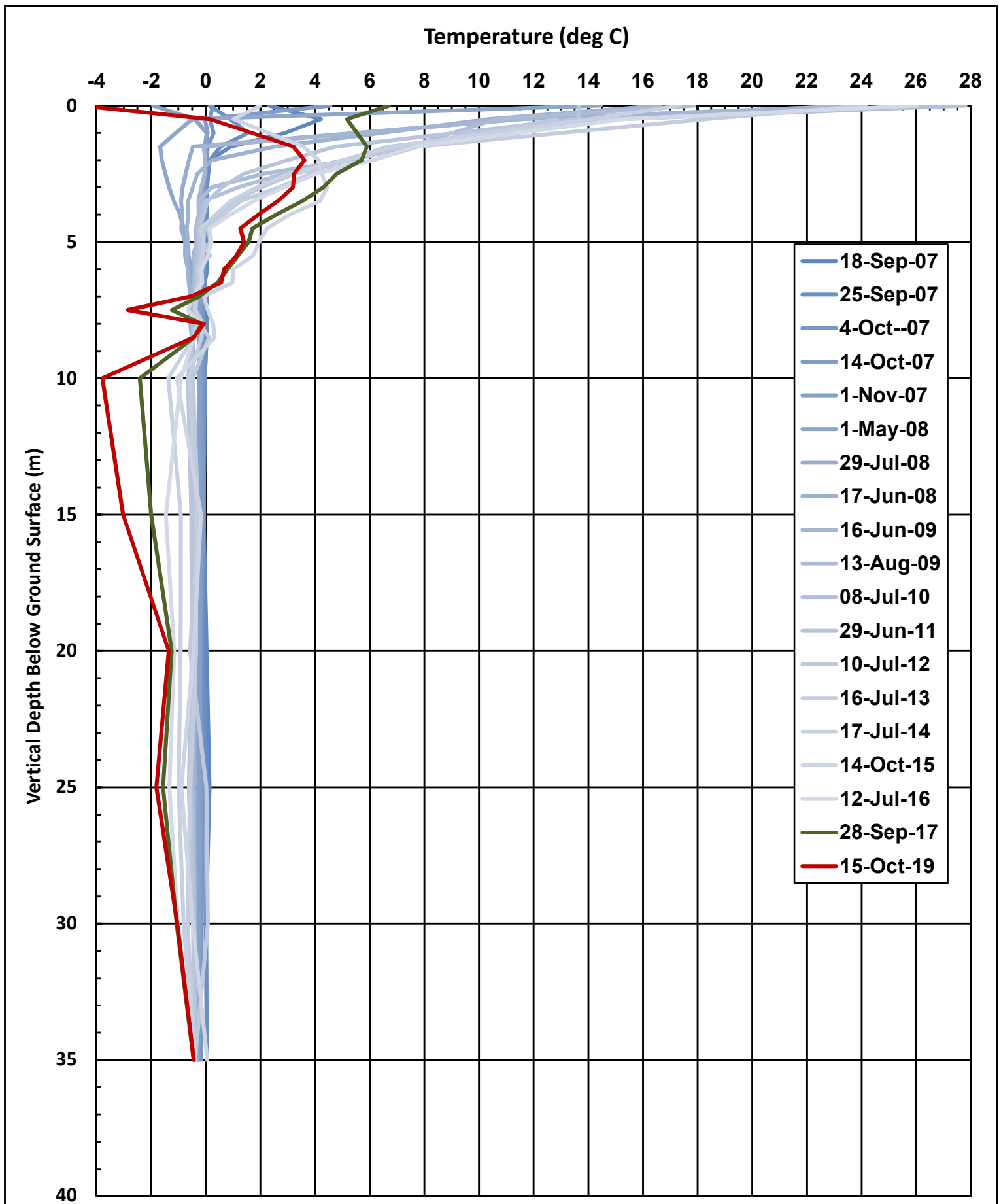
## Thermistor Plots

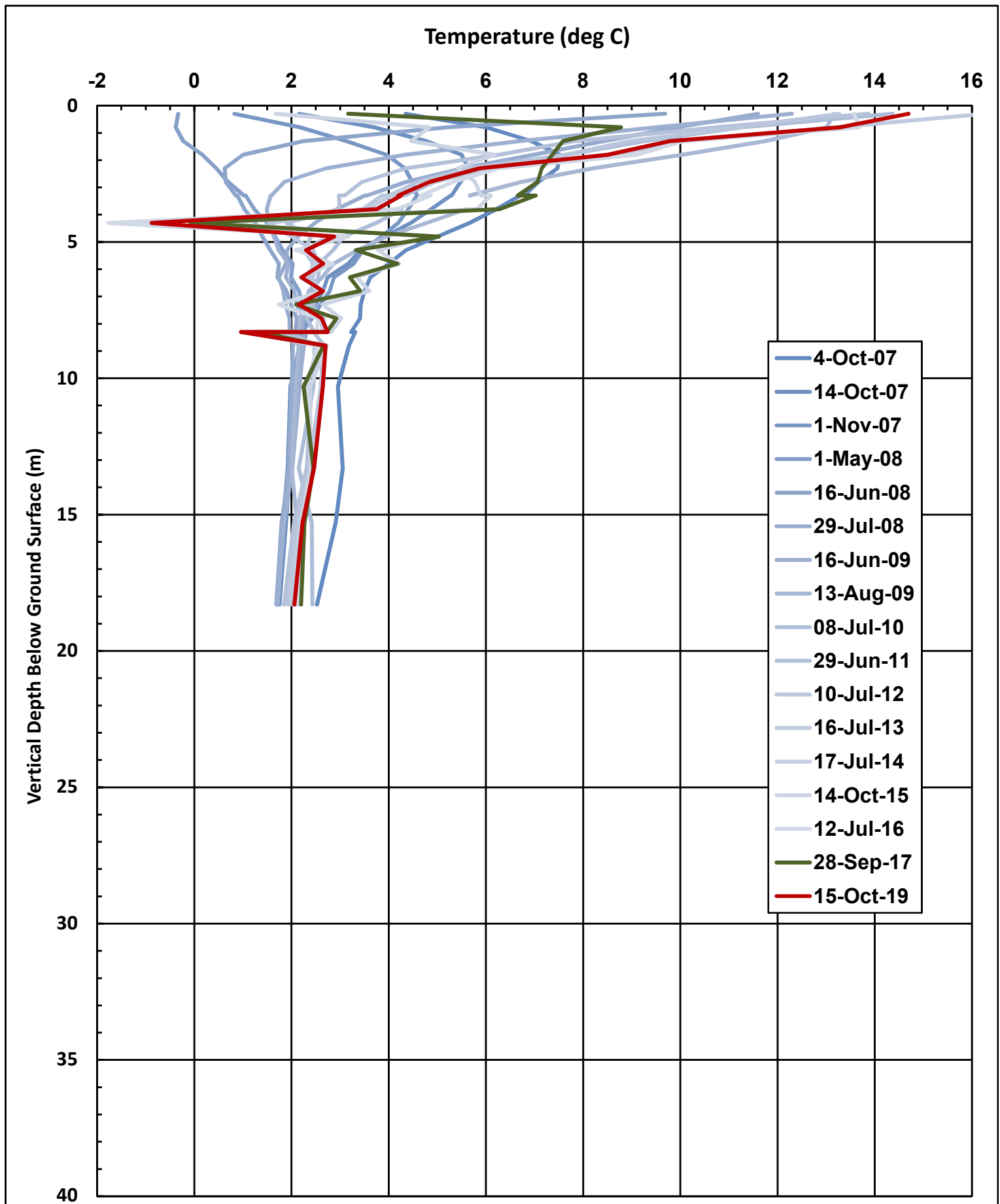


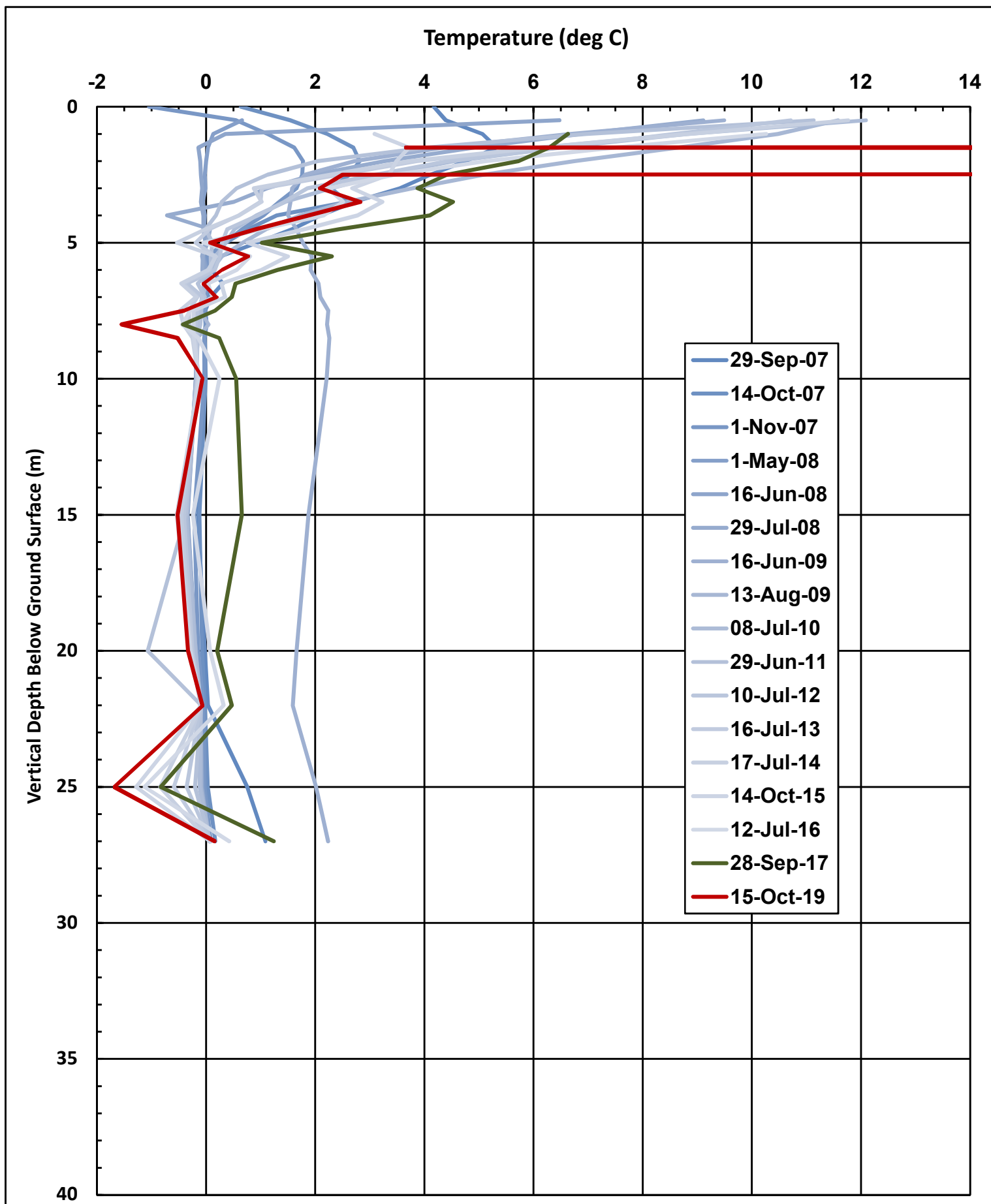


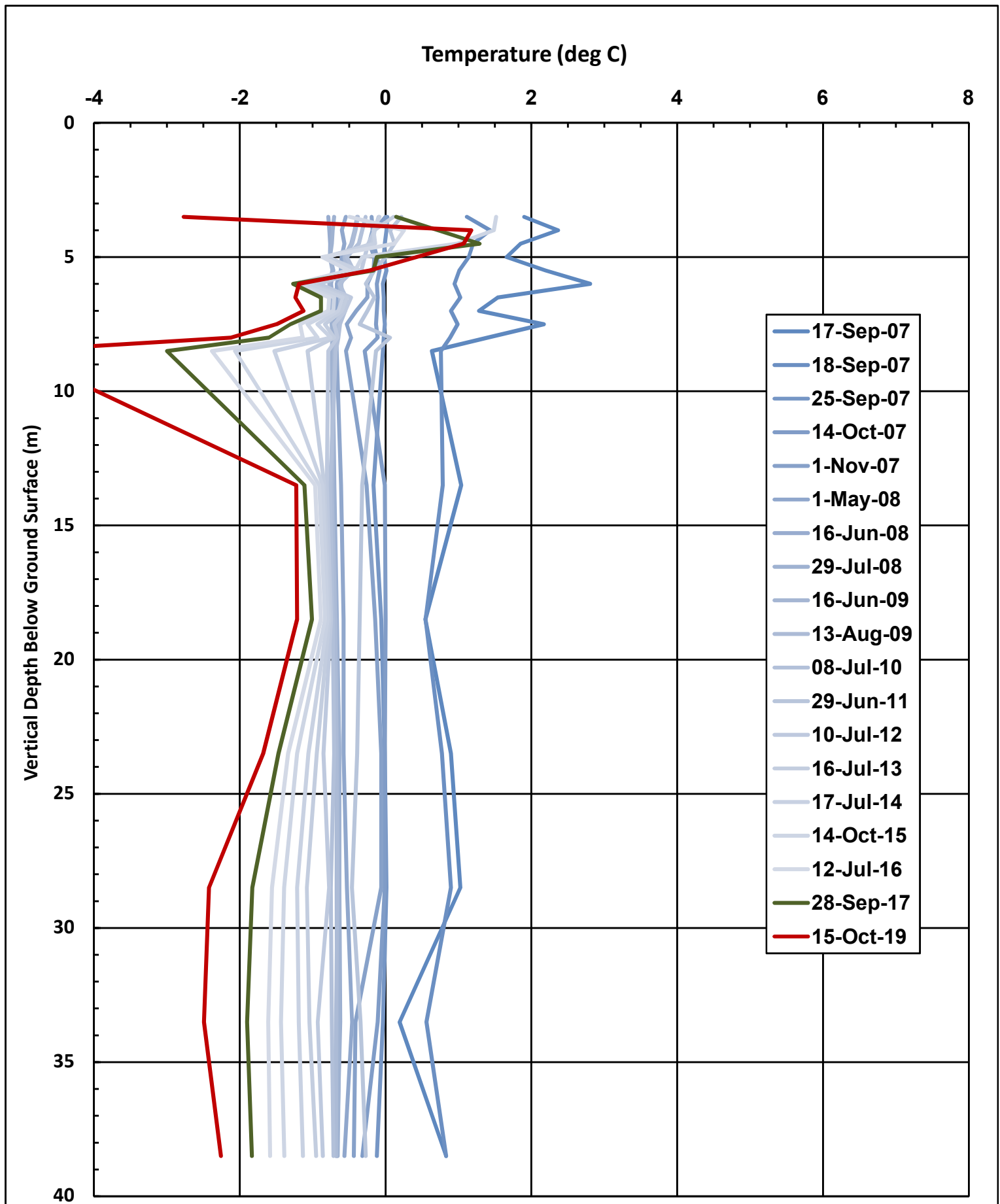


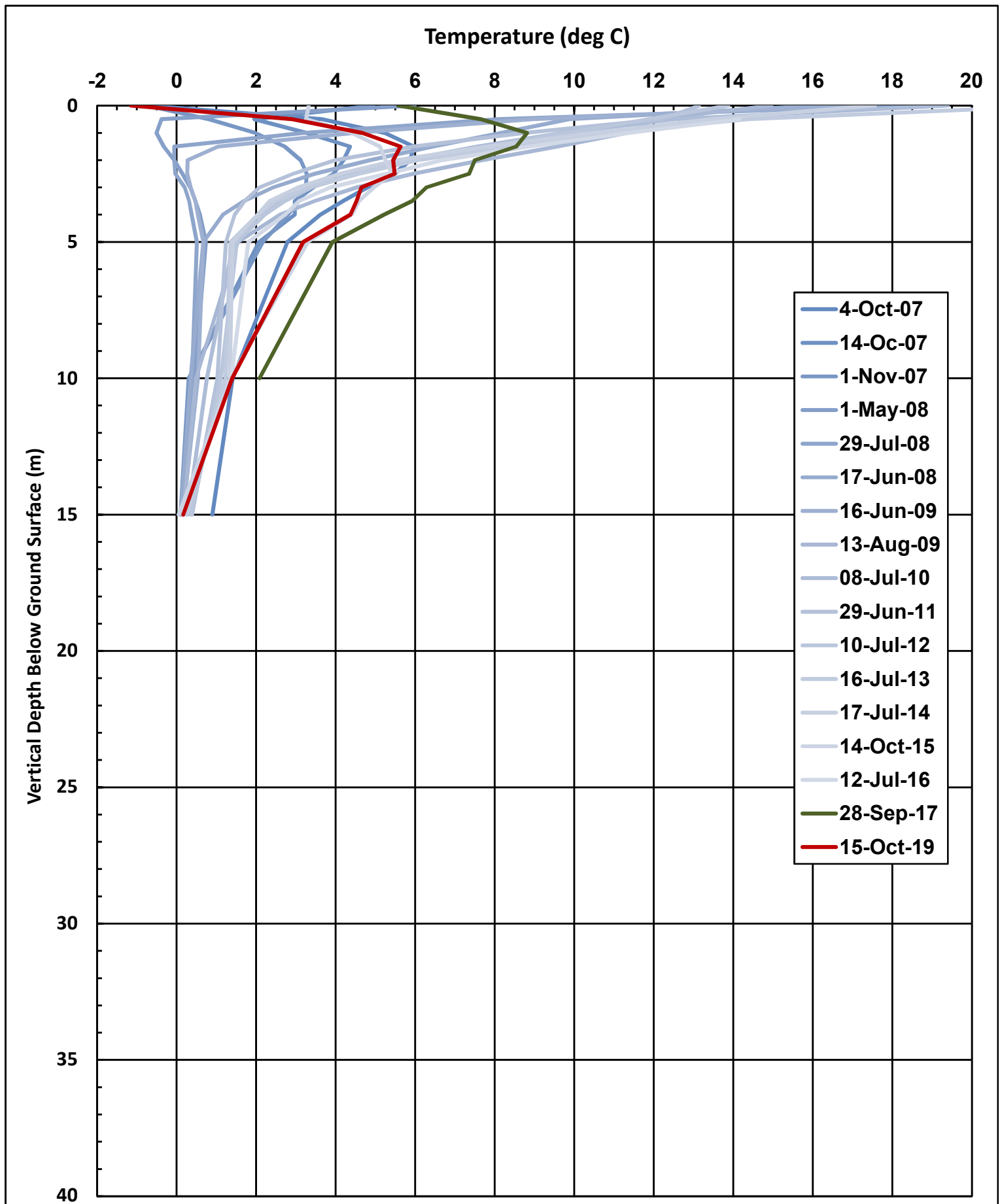


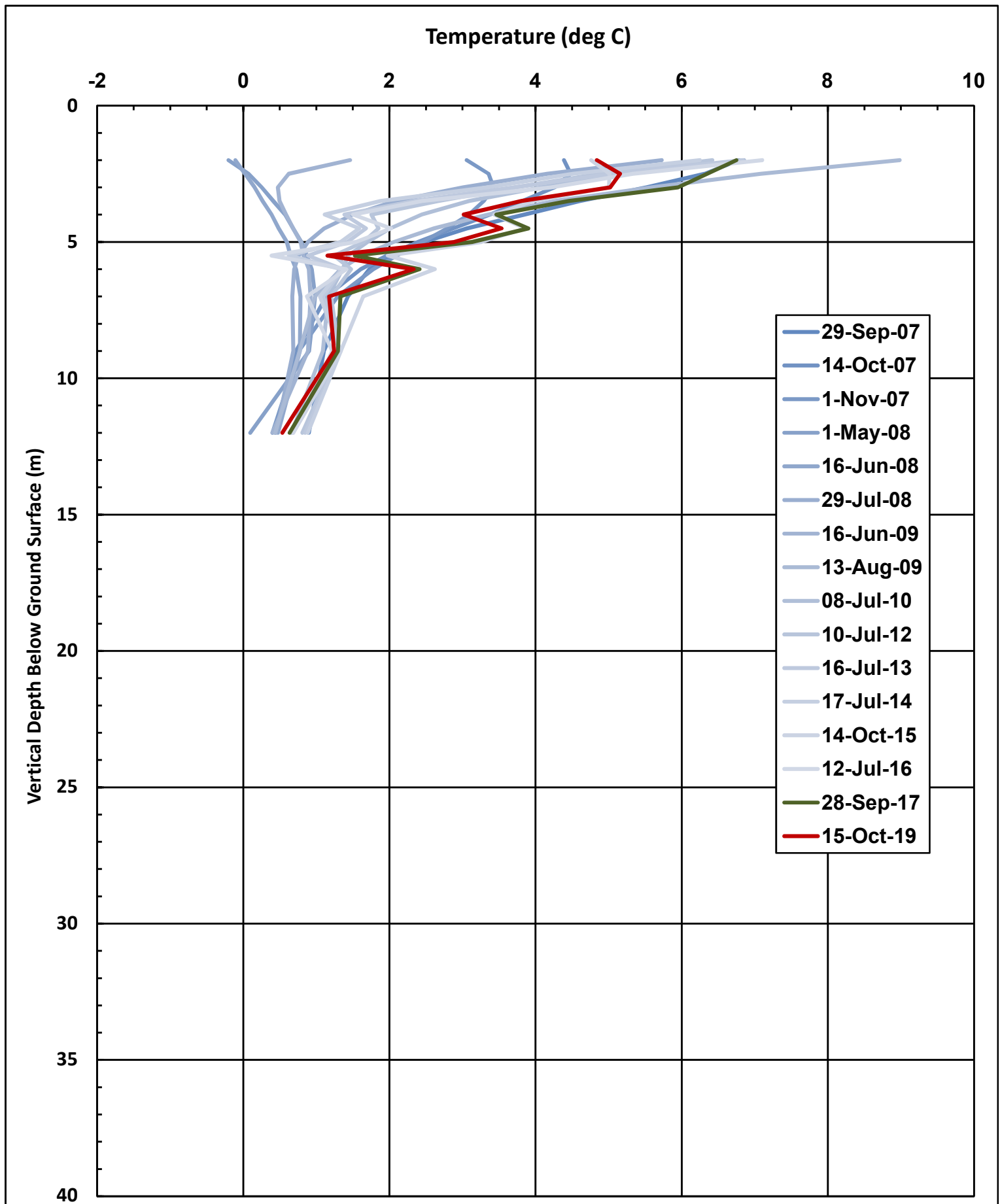




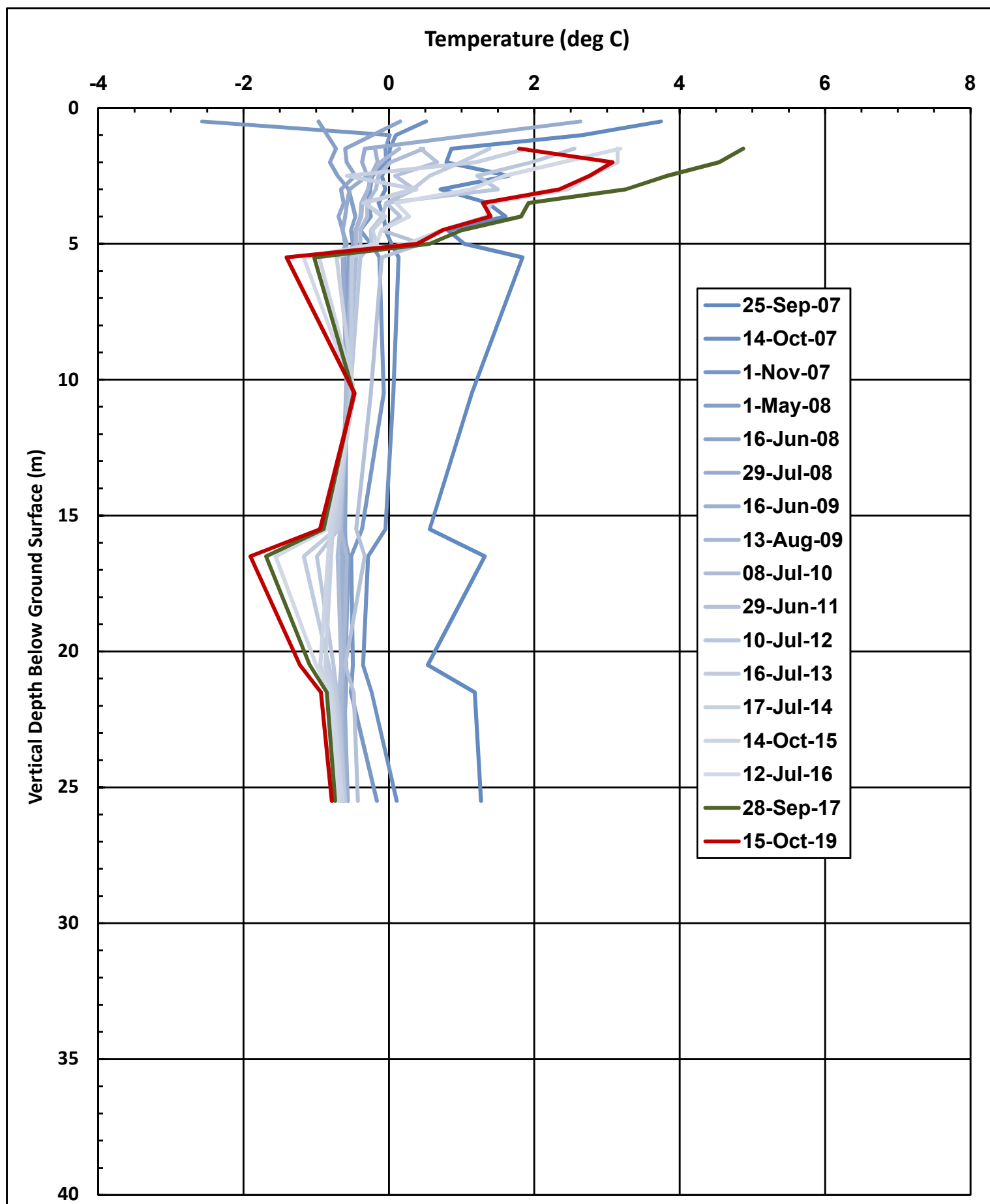














## **REPORT OF ACTIVITIES RELATING TO THE 2019 FIELD SEASON, CARMACKS COPPER-GOLD-SILVER PROJECT**

Quartz LUP LQ00427

Whitehorse Mining District, Yukon Territory

NTS 115I07 62° 20' N 136° 41' W

Grant numbers: Y 51118; Y 51149-Y 51152; Y 51181; Y 59373; Y 59382; YB26708-YB26750; YB36240-YB36252; YB36254; YB36256; YB36446-YB36451; YB36765-YB36777; YB36898; YB36899; YB36929-YB36931; YB36933; YB36962-YB36964; YB96620; YB96622; YB96626-YB96630; YB96632; YB96634; YB96636-YB96647; YB96986-YB96998; YB97068; YB97251; YC39221-YC39254; YC60381-YC60420; YC65320-YC65324; YC65554- YC65580; YC66844-YC66873.

Owner and operator of claims: Carmacks Mining Corp., a wholly owned subsidiary of Copper North Mining Corp.

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## Table of Contents

1.0	INTRODUCTION .....	1
1.1	Location and Access .....	1
2.0	PHYSIOGRAPHY AND CLIMATE.....	4
3.0	2019 EXPLORATION PROGRAM – SUMMARY OF ACTIVITIES .....	4
3.1	Total Length and Width of Corridors .....	4
3.2	Total Volume of Trenching per Claim.....	4
3.3	Number of New Clearings per Claim and Purpose .....	6
3.4	Total Length and Width of New Access Roads.....	6
3.5	Total Length of Road Upgrades .....	6
3.6	Total Length and Width of New Trails .....	6
3.8	Total Amount of Explosives.....	6
3.9	Total Disturbed Area .....	6
3.10	Underground Material Moved to Surface .....	6
3.11	Reclamation Activity Description.....	6
3.12	Status of Camp .....	6
3.13	Status of Fuel Storage .....	7
3.14	Bulk Sampling Update.....	7
4.0	WILDLIFE LOGS .....	7
5.0	MAPS .....	7
6.0	CAMP LAYOUT.....	8

## List of Figures

Figure 1. Location of the Carmacks Copper Project, Yukon Territory, Canada. ....	2
Figure 2. Location of the Carmacks Copper Project, Yukon Territory, Canada. ....	3
Figure 3. Mineralization Zones – Carmacks Copper Project, Yukon Territory, Canada.....	5
Figure 4. Carmacks Camp Layout.....	8

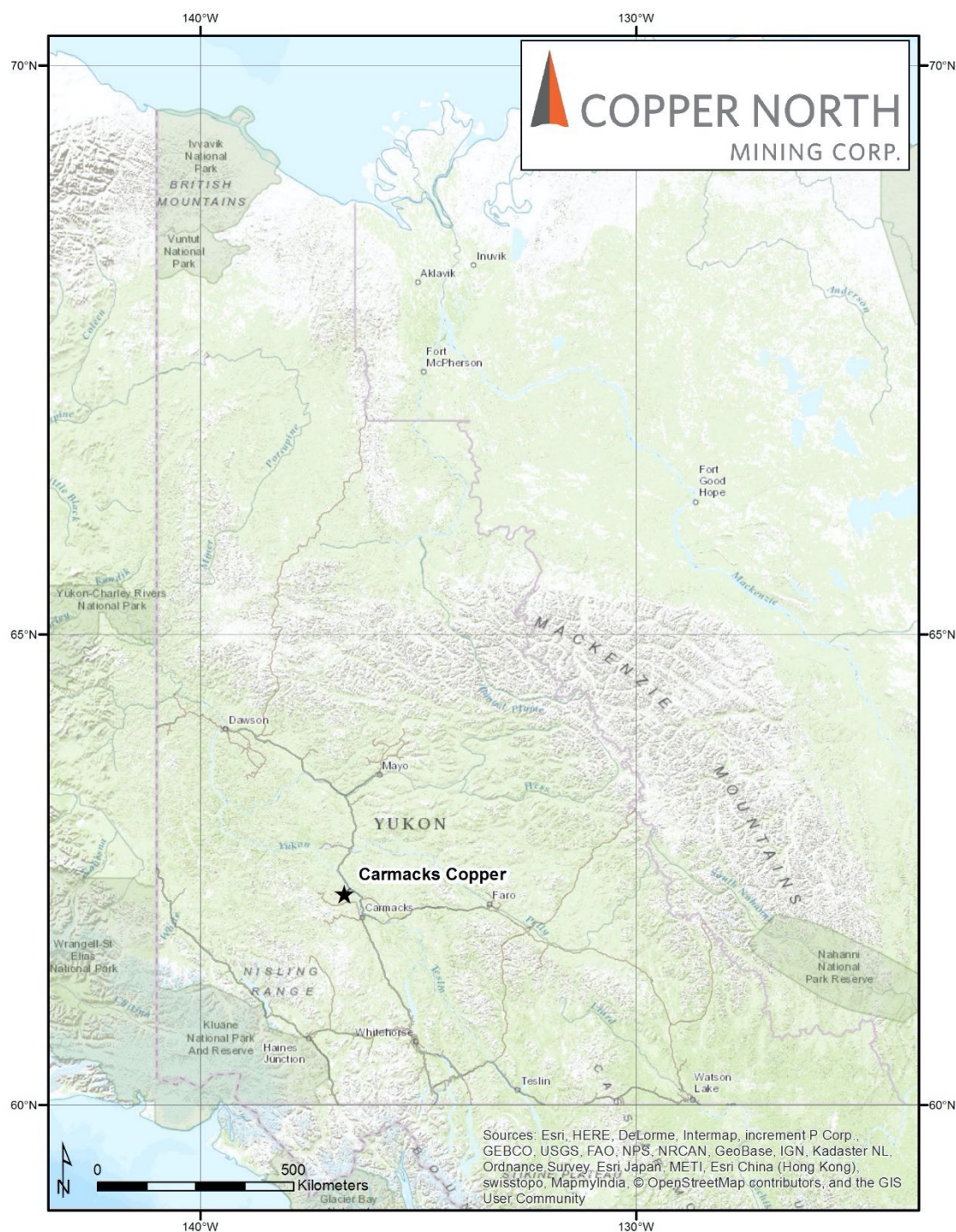
## **1.0 INTRODUCTION**

This Annual Report has been prepared by Copper North Mining Corp. and covers the period from January 1, 2019 to December 31, 2019. The report summarises the exploration activities conducted during 2019 and details the location and magnitude of related disturbances. The Carmacks Copper-Gold-Silver Project (the Project) remains at an exploration and development stage – no construction has yet begun at the proposed mine site.

### **1.1 Location and Access**

The Carmacks property is located at Williams Creek, in the Dawson Range, approximately 200 km north of Whitehorse, and 37 km northwest of Carmacks, Yukon (Figures 1 and 2; NTS mapsheet 115I07 at 62° 20' N 136° 41' W)

Access to the property is by road. The Freegold Road runs from Carmacks northwest for approximately 34 km and then north for 13 km via the Carmacks Copper access road, crossing Merrice Creek and Williams Creek, to the exploration camp. The gravel-surface Freegold Road is maintained by Yukon Government and is readily passable from spring through fall. The Carmacks Copper access road is narrow and has rough and steep sections, requiring a 4x4 vehicle, especially after heavy rains.



**Figure 1. Location of the Carmacks Copper-Gold-Silver Project, Yukon Territory, Canada.**



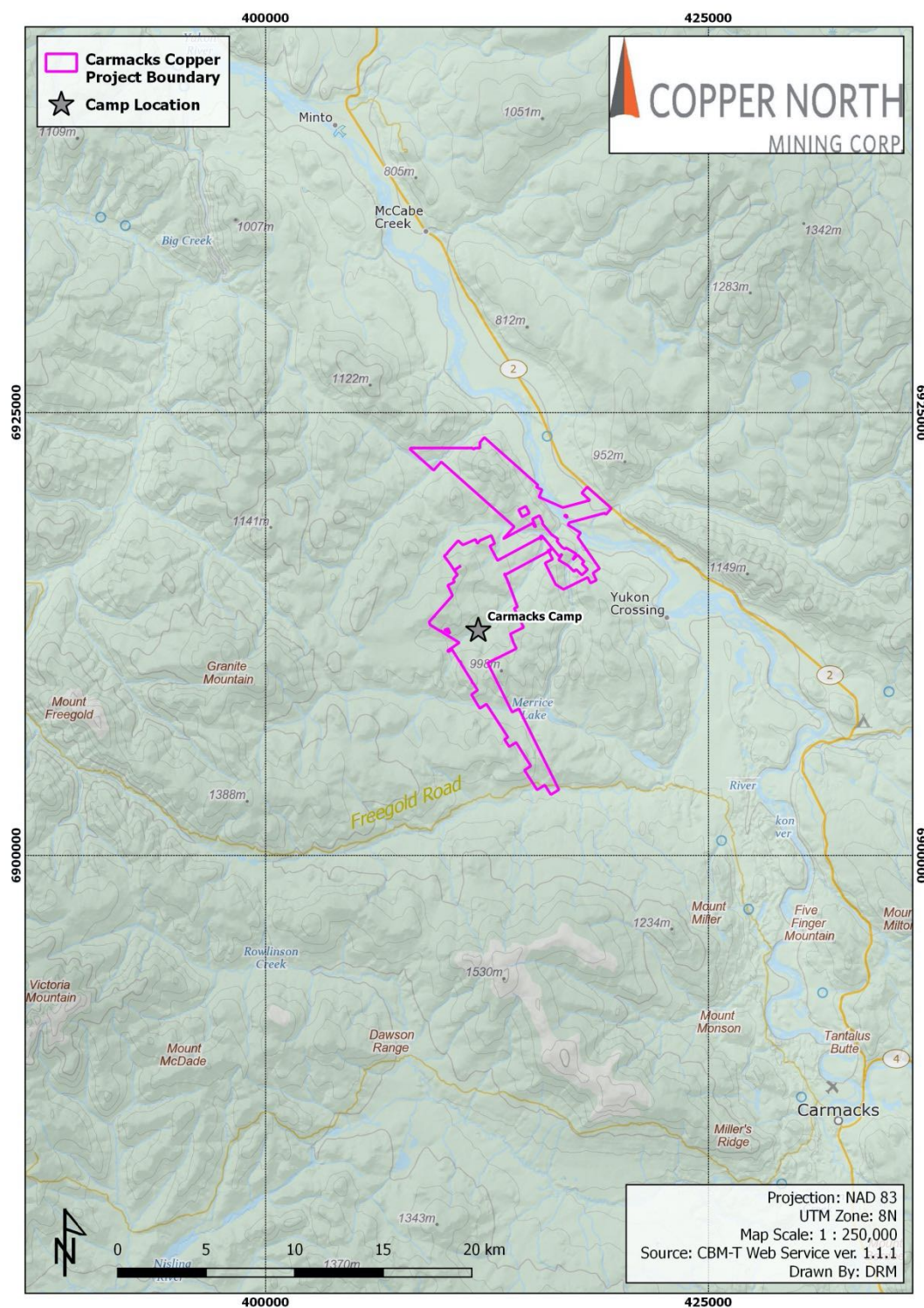


Figure 2. Location of the Carmacks Copper-Gold-Silver Project, Yukon Territory, Canada.

## **2.0 PHYSIOGRAPHY AND CLIMATE**

The property is in the Dawson Range Mountains. The area is characterized by gently rolling hills that are generally less than 1800 m elevation and are covered by black spruce, white spruce, pine, poplar, birch, and alder trees at lower elevations and alpine grasses and scrub willows at higher elevations and in the alpine terrain.

North facing slopes are generally underlain by permafrost and are generally swampy or boggy with much less tree growth and thick sphagnum moss cover. South facing slopes are generally drier and, in some locations, are free of permafrost.

The climate of the property area is generally fairly-dry in the summer months with most precipitation occurring in July and early August. In the winter months, snow accumulation is generally less than 2 m. Temperatures generally range from -40 °C in winter to 30 °C in summer. Snow begins accumulating in mid to late September and is mostly melted by mid to late May. Forest fires can pose a hazard during spring and summer in dry years.

## **3.0 2019 EXPLORATION PROGRAM – SUMMARY OF ACTIVITIES**

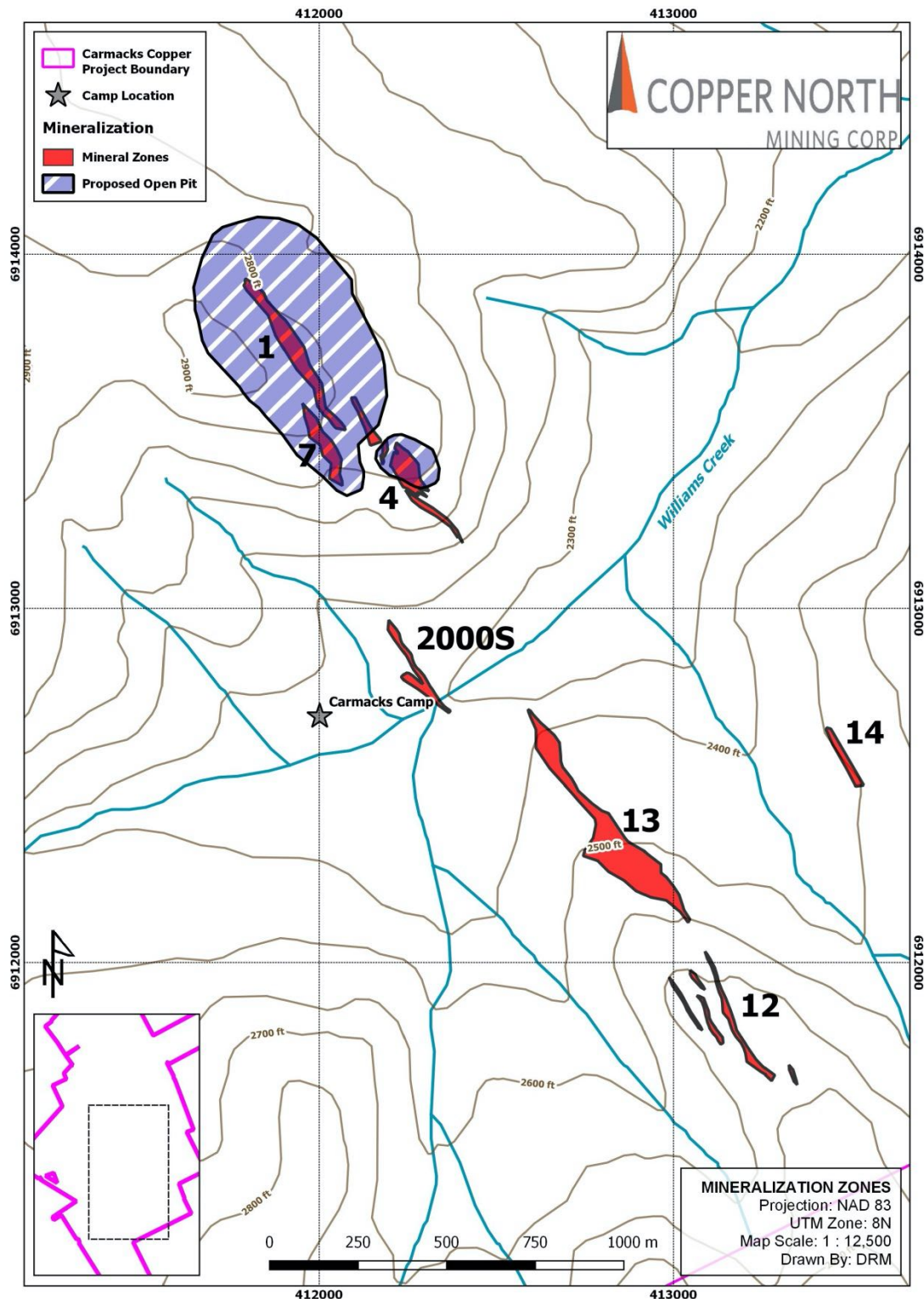
Copper North did not conduct an exploration program in 2019.

### **3.1 Total Length and Width of Corridors**

No new corridors were created in 2019.

### **3.2 Total Volume of Trenching per Claim**

No trenching was done in 2019.





**3.3 Number of New Clearings per Claim and Purpose**

No new clearings were developed in 2019.

**3.4 Total Length and Width of New Access Roads**

No new access roads were constructed during 2019.

**3.5 Total Length of Road Upgrades**

No road surfaces were upgraded during 2019.

**3.6 Total Length and Width of New Trails**

No new trails were developed in 2019.

**3.8 Total Amount of Explosives**

No explosives were used in the 2019.

**3.9 Total Disturbed Area**

No areas were disturbed in 2019.

**3.10 Underground Material Moved to Surface**

No underground development has occurred on the property.

**3.11 Reclamation Activity Description**

No reclamation activities were conducted in 2019.

**3.12 Status of Camp**

The camp buildings and trailers were winterized in October 2017 by draining the water systems, boarding up the windows with plywood, and removing fuel from heating stove barrels. All food, recyclable containers, and garbage was removed from the camp. The core shack, office, and storage shed were locked with padlocks. The remaining buildings and trailers were left open for leisure use by the local community. The camp has remained in this winterized condition through 2019.

### **3.13 Status of Fuel Storage**

Approximately 14 empty drums and 7 full/partial drums remain in the fuel storage.

### **3.14 Bulk Sampling Update**

No bulk samples were taken in 2019.

## **4.0 WILDLIFE LOGS**

. No wildlife observations were made in 2019.

## **5.0 MAPS**

No new areas of disturbance were developed in 2019 and no new disturbance maps were developed.

## 6.0 CAMP LAYOUT

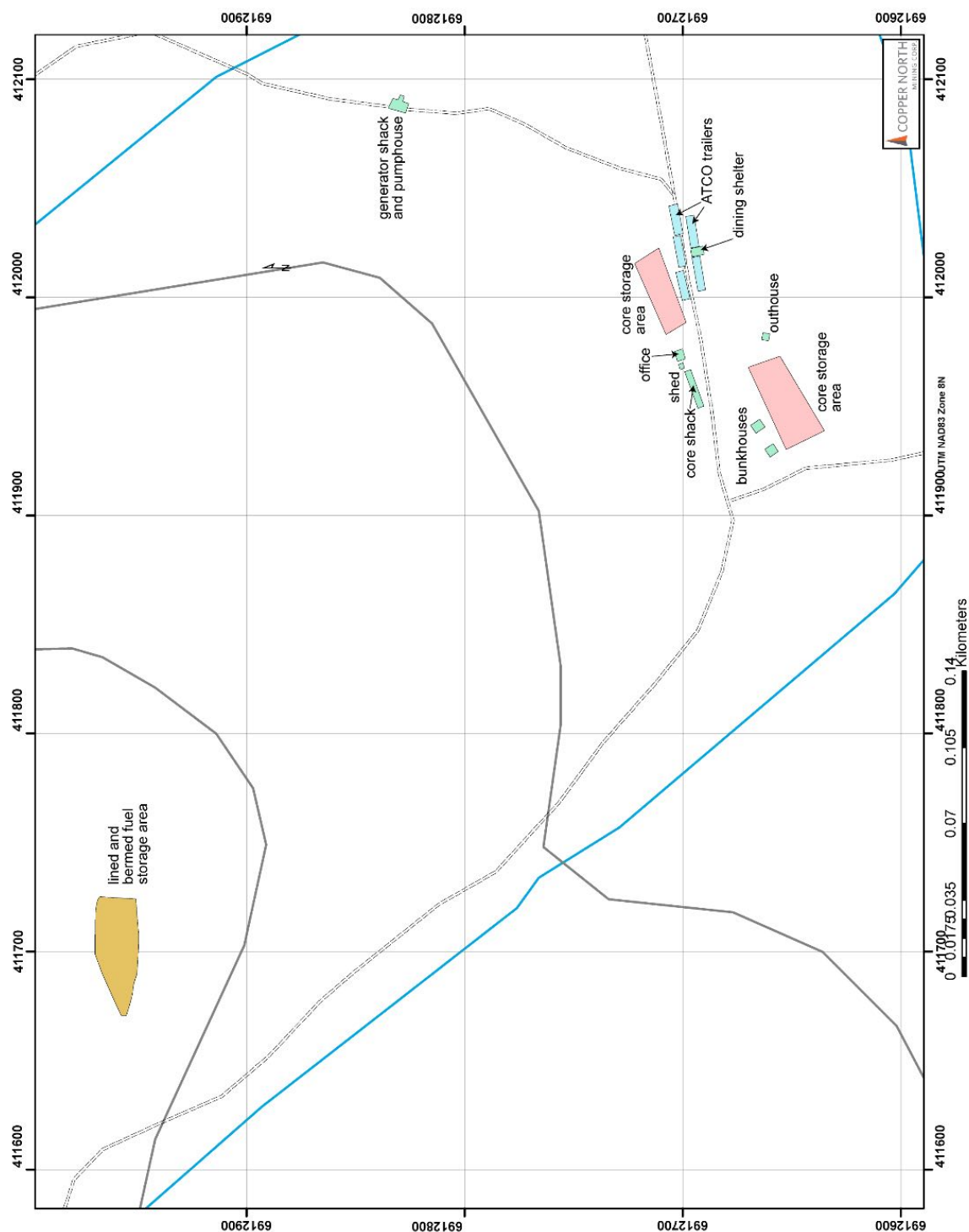


Figure 4. Carmacks Camp Layout.