Geophysical and Geological Report on

Heather Lakes Aggregate

YMEP Grant #2018-056

Whitehorse Mining District, Yukon Territory

by

William LeBarge, P. Geo.

Geoplacer Exploration Ltd.

for

All-In Exploration Solutions Inc.

Location of Land Use Permit: 60°39'5.6"N and 135°06'01"W
NTS map sheet: 105 D/11
Mining District: Whitehorse
Dates of Work: July 24-26, 2018
Date: January 19, 2019

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Executive Summary

The following is the final report on geophysical work conducted by Geoplacer Exploration Ltd. on the Heather Lakes Aggregate prospect for All-In Exploration Solutions Inc. under YMEP Grant Number YMEP18-056. The Heather Lakes Aggregate project is aimed towards evaluating a potential gravel source within the city limits of Whitehorse, Yukon Territory.

The area of the Heather Lakes Aggregate prospect is held under Land Use Permit 2018-S785. This activity in the permit is listed as Soil Testing (Geotechnical), valid until April 10, 2020. The permittee is All-In Exploration Solutions Inc.

Between July 24 and July 26, 2018, five resistivity geophysical surveys totalling 1.5 line-km were completed on the property, and four R/C (Reverse Circulation) drill holes totalling 52 metres were drilled along or near the resistivity lines. In addition, two shallow test pits were excavated.

Bedrock contacts interpreted on the profiles were undulating and varied from 5 metres to 21 metres. High resistivity boulder-rich glacial till was interpreted as overlying a low resistivity granite bedrock, and in places, a somewhat higher resistivity bedrock which could be an indication of other lithologies such as limestone or shale.

The drill holes and test pits intersected bedrock and/or the water table near the depths predicted by the resistivity surveys. In addition, there were discernable subtle differences in resistivity response between units interpreted as glacial till and those interpreted as glaciofluvial or alluvial gravel. However, R/C drill samples do not allow for an accurate distinction between glacial till, glaciofluvial gravel, and silty/sandy layers. Thus, it was not possible to use drill log stratigraphy to calibrate the interpreted contacts within the geophysical surveys. Detailed stratigraphic information such as garnered from test pits, trenches or sonic drilling (which would recover a stratigraphically-intact core sample) would enable a more accurate interpretation and calibration of the resistivity profile results.

The exploration program to date indicates that there may be a significant amount of aggregate source material in the project area. However, the nature, volume and engineering suitability of this material is still undetermined and warrants further investigation.

A program of excavator test-pitting, bulk-sampling, granulometric (grain-size distribution) evaluation and sonic drilling is recommended. Additional resistivity geophysical surveys, drill holes and test pits should also be conducted to fill in the unevaluated southern and western extents of the project area.

Introduction

The following is the final report on geophysical work conducted by Geoplacer Exploration Ltd. on the Heather Lakes Aggregate prospect for All-In Exploration Solutions Inc. under YMEP Grant Number YMEP18-056.

Location and Access

The Heather Lakes aggregate project lies within the City Limits of Whitehorse, Yukon (Figure 1). The geographic coordinates of the centre of the project are 60°39'5.6"N and 135°06'01"W, on NTS Map Sheet 105D/11, in the Whitehorse Mining District.

Access to the property can be gained via the Alaska Highway, taking a left turn at Km 1419 (the intersection with Robert Service Way), then by travelling west along the South Access Road (towards Hamilton Boulevard) a distance of 680 metres to the roundabout. This is followed by a left (south) turn onto an unnamed connector which intersects the McLean Lake Road, and travelling a distance of 3 km to the intersection with the Whitehorse Copper Haul Road. From that point, a left turn is taken towards the south and travel is continued along the Whitehorse Copper Haul Road a distance of approximately 1.5 km. At that point on the right (west) are a number of trails which intersect the project area.

Personnel and Dates of Work

Between July 24 and July 26, 2018, five resistivity geophysical surveys were completed on the property by William LeBarge of Geoplacer Exploration Ltd, with assistance from Don Duncan of Duncan General Contracting.

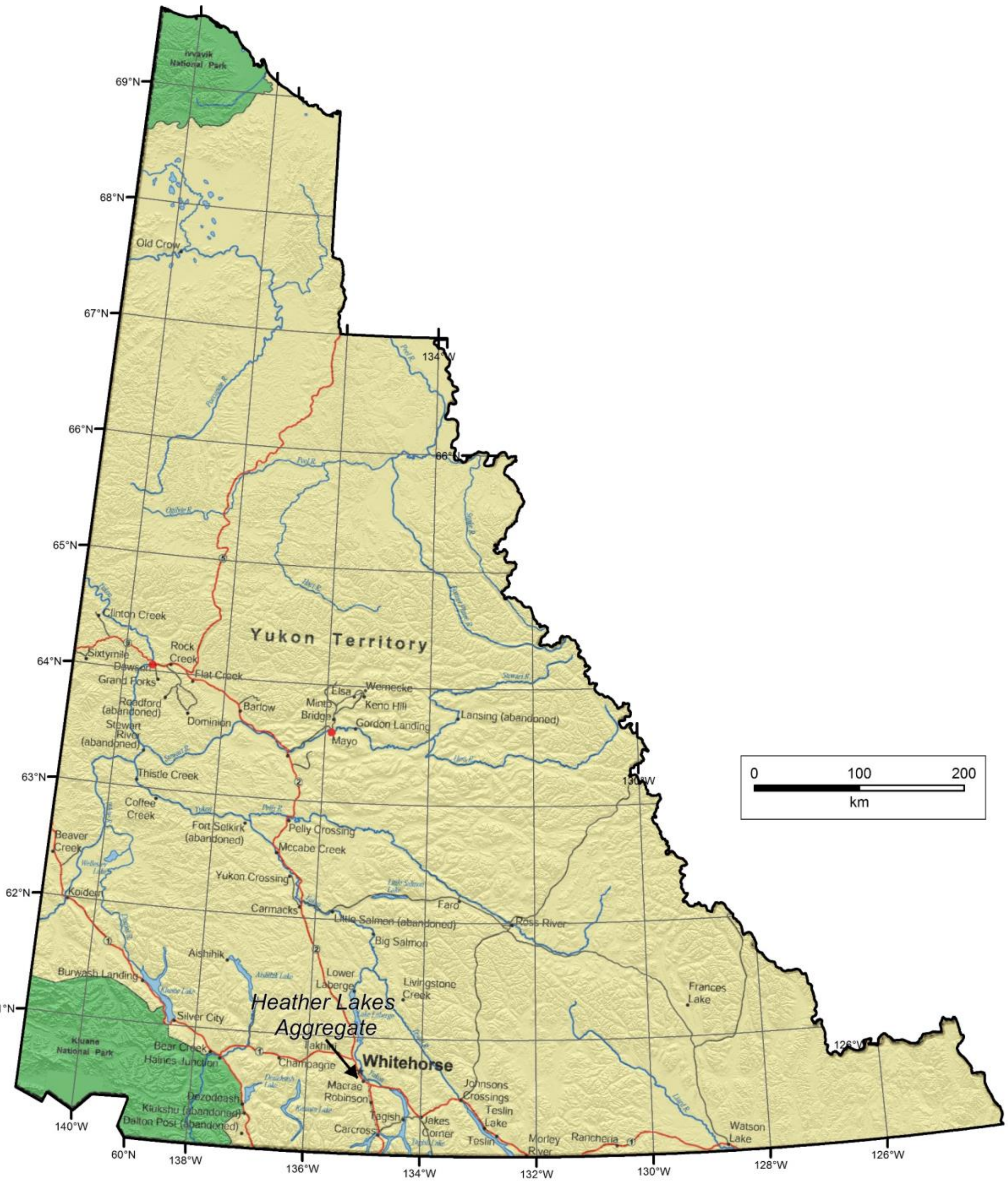

Figure 1 - Location of the Heather Lakes Aggregate Project, Yukon.

Land Tenure

The area of the Heather Lakes Aggregate prospect is held under Land Use Permit 2018-S785. This activity in the permit is listed as Soil Testing (Geotechnical), valid until April 10, 2020. The permittee is All-In Exploration Solutions Inc. Several Quartz claims overlap the area of the lease. These are shown in Table 1. Surveyed land parcels also overlap the lease area. These are shown in Table 2.

Table 1 – Quartz Claims overlapping Land Use Permit 2018-S785, Heather Lakes Aggregate prospect.

Grant Number	Tenure Type	Claim Name	Owner Name	Staking Date	Recorded Date	Expiry Date	District Name
YC08843	Quartz	GIN 22	Josh Bailey - 100%	7/1/1998	7/2/1998	12/2/2021	Whitehorse
YC19492	Quartz	GIN 45	Kluane Drilling Ltd. - 100%	6/11/2002	6/12/2002	1/1/2022	Whitehorse
YC19494	Quartz	GIN 47	Kluane Drilling Ltd. - 100%	6/11/2002	6/12/2002	1/1/2022	Whitehorse
YC46594	Quartz	JUICE 39	Kluane Drilling Ltd. - 100%	3/1/2006	3/16/2006	3/16/2021	Whitehorse
YC19493	Quartz	GIN 46	Kluane Drilling Ltd. - 100%	6/11/2002	6/12/2002	1/1/2022	Whitehorse
YC66232	Quartz	JUICE 51	Kluane Drilling Ltd. - 100%	10/5/2007	10/10/2007	1/1/2022	Whitehorse
YC46592	Quartz	JUICE 37	Kluane Drilling Ltd. - 100%	3/1/2006	3/16/2006	3/16/2021	Whitehorse
YC19495	Quartz	GIN 48	Kluane Drilling Ltd. - 100%	6/11/2002	6/12/2002	1/1/2022	Whitehorse

Table 2 – Surveyed land parcels overlapping Land Use Permit 2018-S785, Heather Lakes Aggregate prospect.

Parcel Designator	CLSR Plan	LTO Plan	Remarks	Parcel State
LOT 91 QUAD 105D/11	FB9195 CLSR YT	9195 LTO YT	LOT 91 GROUP 5 PLAN 55101 CLSR	ACTIVE
LOT 153 GROUP 5	FB10717 CLSR YT	10717 LTO YT	LOT 153 GROUP 5 CLAUDE MINERAL CLAIM	ACTIVE
LOT 152 QUAD 105D/11	FB10802 CLSR YT	10802 LTO YT	LOT 152 GROUP 5 PLAN 55057 CLSR	ACTIVE
LOT 151 QUAD 105D/11	FB10802 CLSR YT	10802 LTO YT	LOT 151 GROUP 5 PLAN 55057 CLSR	ACTIVE

Local Bedrock Geology and Mineral Occurrences

Figure 2 shows the bedrock geology of the Heather Lakes Aggregate area, after Yukon Geological Survey (2018). The project area is part of the Whitehorse Copper Belt, with several well-known copper-gold mines and mineral occurrences (Heon, 2004, and many others). Copper and gold-bearing skarns were formed where Mid-Cretaceous Whitehorse Suite granodiorite (unit mKgW) intruded into upper Triassic limestone (unit UTrAK2) and upper Triassic greywacke, pebble conglomerate and mudstone (unit uTrAK3). The granodiorite dominates the northern extent of the project area, and it is abruptly fault-bounded to the south by the clastic mudstone, greywacke and pebble conglomerate. There are two nearby mineral occurrences, #105D 099 DAWN, and #105D 057 POLAR (Yukon Minfile, 2018). Both mineral occurrences are copper skarns.

Plate 1 – View from the Whitehorse Copper Haul road of a road cut on the east side of the project area, near the start of line RES18-AIE-03. Sediments at this location are a late Pleistocene (McConnell) ice-marginal complex of laminated glaciolacustrine silt, glacial till and glaciofluvial gravel. Photo taken July 24, 2018.

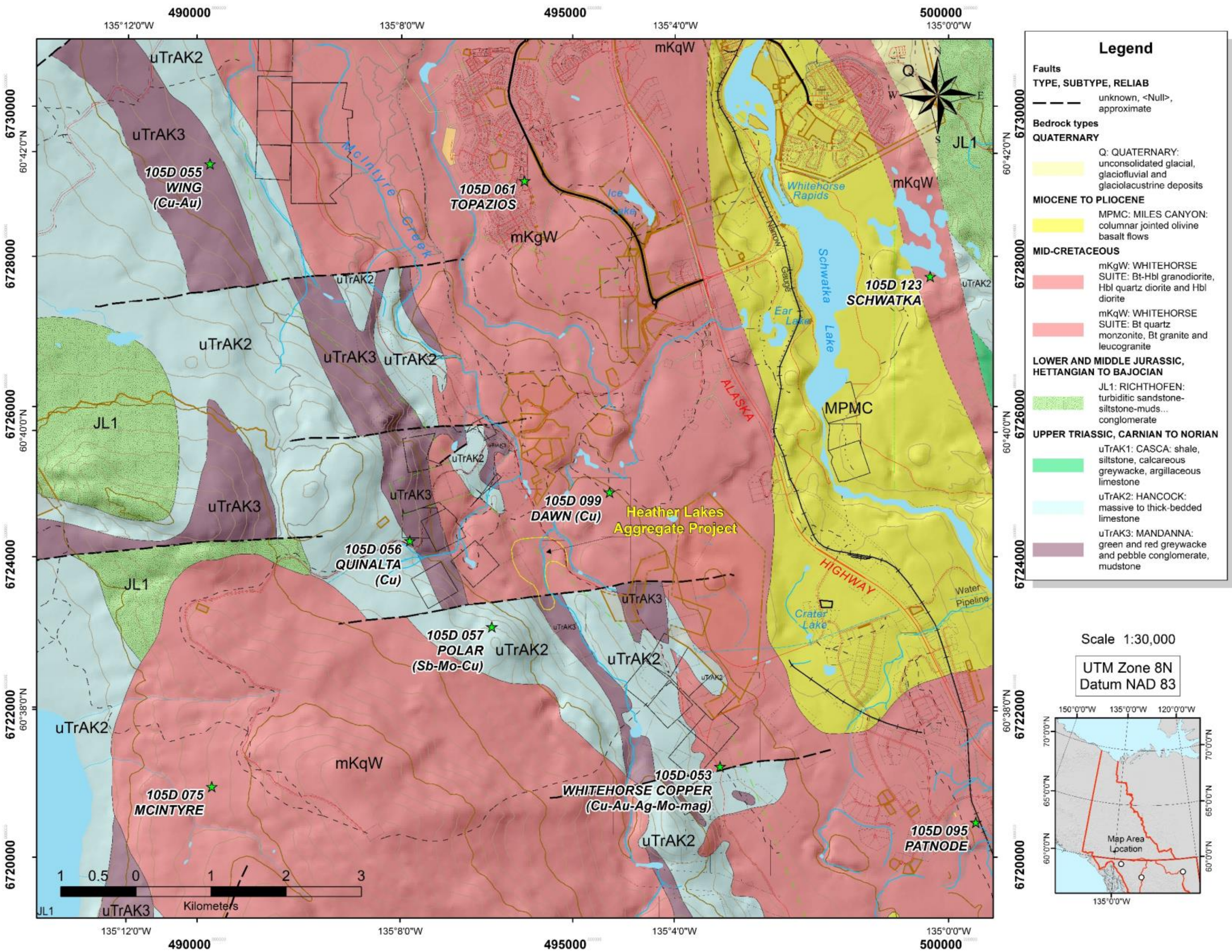

Figure 2 - Bedrock Geology of the Whitehorse area including the Heather Lakes Aggregate Project, modified after Yukon Geological Survey, (2018).

Surficial Geology

The Whitehorse area was glaciated during the most recent glacial episode (Duk-Rodkin, 1999). A complex of Late Pleistocene (McConnell) glacial till, glaciolacustrine and glaciofluvial deposits dominate the hills and the Yukon river valley around Whitehorse.

Figure 3 shows the surficial geology according to the digital files of the Yukon Geological Survey (2018). The area of the Heather Lakes Aggregate is mapped as dzsMM (gravel, silt and sand-dominated McConnell moraine), and dszC (gravel, sand and silt dominated colluvium). Immediately to the east, a meltwater channel is incised into the McConnell moraine, and it consists of a veneer of glaciofluvial gravel of McConnell age (map unit gFGvM). A small modern stream transects the property, and recent alluvium lines its banks along the watercourse.

Plate 2 – Test Pit 18-01 was excavated along Resistivity Line RES18-AIE-04. The stratigraphy consisted of 3 metres of gravel overlying a fine silt. Bedrock was not reached.

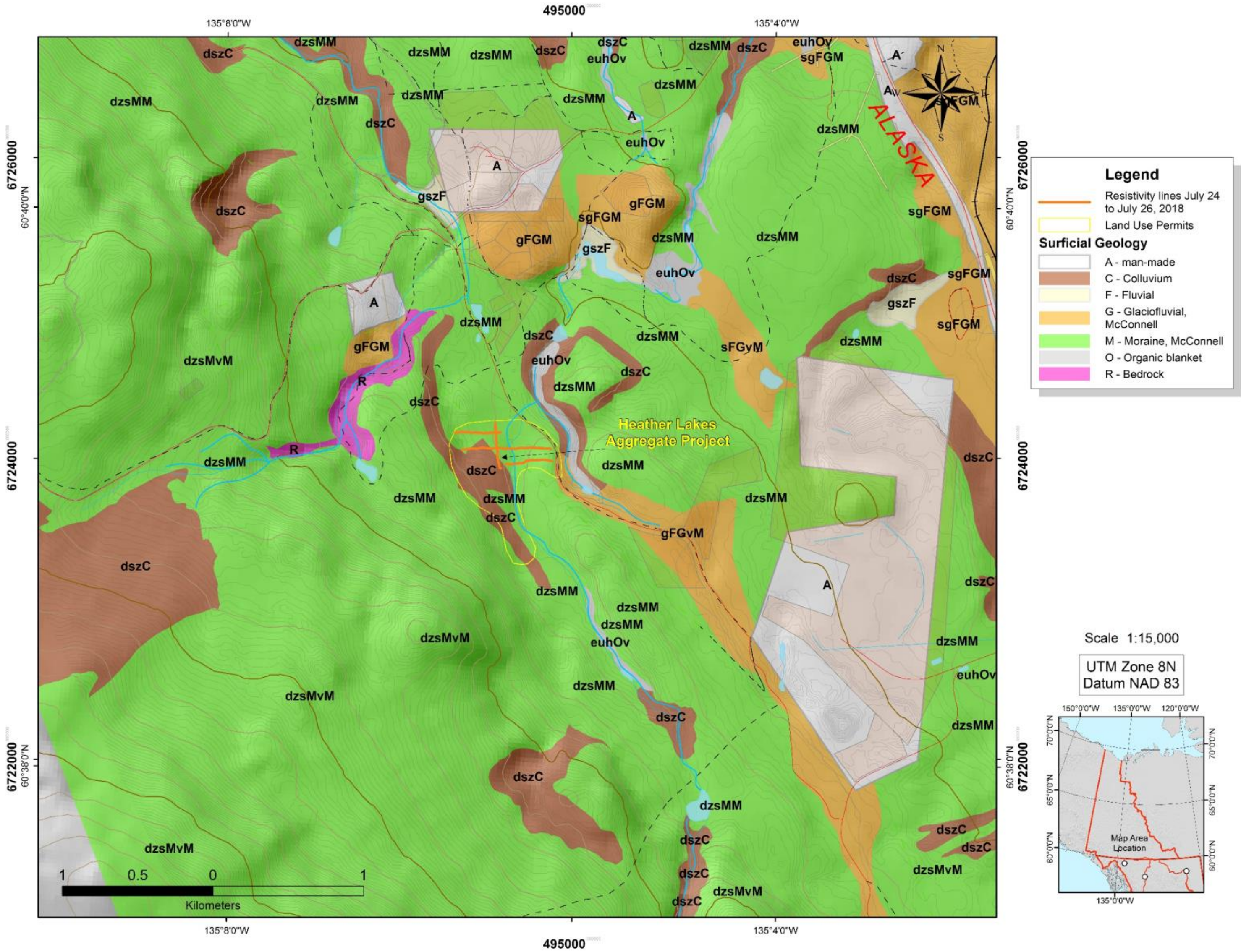

Figure 3 – Surficial geology of the Whitehorse area including the Heather Lakes Aggregate project, after Yukon Geological Survey, 2018. The area is dominated by glacial deposits of late Pleistocene (McConnell) age. Details in text.

2018 Exploration Program

R/C Drilling and Excavator Test Pitting

Four R/C (Reverse Circulation) drill holes totalling 52 metres were drilled along or near the resistivity lines. In addition, two shallow test pits were excavated by a Hitachi EX200 excavator. The coordinates and descriptions of these drill holes and pits are listed in Table 3. The drill holes and pits are plotted on the profiles and maps following.

Table 3 – Geographic coordinates and descriptions of 2018 drill holes and test pits.

Name	Depth ft	Depth m	Latitude	Longitude	Description
DH18-01	25	7.62	60.6516	-135.0971	@20-25 ft bedrock
DH18-02	45	13.7	60.6532	-135.1006	@45 ft water
DH18-03	50	15.24	60.6523	-135.0999	@45-50 ft water
DH18-04	40	12.1	60.6522	-135.0971	@40 ft water and bedrock
Test Pit 01	10	3.04	60.6532	-135.1013	pebble cobble gravel on silt
Test Pit 02	8	2.5	60.6531	-135.1006	stratified pebble cobble gravel

Plate 3 - Test Pit 18-02 was excavated along resistivity line RES18-AIE-05. The stratigraphy consisted of an imbricated sandy pebble-cobble gravel. Bedrock was not reached.

Resistivity Surveys

Introduction

Between July 24 and July 26, 2018, five 300 metre resistivity geophysical surveys were conducted on the property, totalling 1.5 line-km. The surveys were facilitated by pre-cut lines completed earlier by a chainsaw crew.

Methodology

The resistivity technique injects an electrical current into the subsurface through stainless steel spikes and then measures the remaining voltage at various distances away from the injection point. Ground materials have different resistances to the current, and give data points in a cross section of the subsurface. With the data points, a tomogram or pseudo section can be created representing changes of resistivity in the ground. Data was collected using Geotest software, while the inversion and data filtering was completed with RES2DINV software. Data points with poor contact resistance were exterminated and noisy data was filtered statistically with root mean squared data trimming. Two-dimensional tomograms were produced using least squares damped inversion parameters to display the resistivity properties and to display potential contacts.

The two-dimensional images are used for preliminary interpretations of bedrock structure. The images were interpreted by William LeBarge.

General principles and assumptions of electrical resistivity are:

1. Low resistivity can indicate thawed and water saturated areas, as well as fine-grained material.
2. Very high resistivity values can be due to ice rich material and frozen or highly disturbed ground.
3. Dry gravels, cobbles and boulders generally have high resistivity values.
4. The contrasts between values is more important in determining contacts than the absolute values found with resistivity data.

Limitations and Disclaimer

The interpreted sections provide an estimate of the conditions beneath the surface to the depths conducted and are within the accuracy of the system and methods. The data becomes more uncertain with depth and are more accurate toward the surface and is further complicated if there is permafrost present in the region. The materials are interpreted based upon local geology observed, as well as geologic knowledge of the area. Certain materials may be similar in composition and result in uncertain results. The accuracy of the information presented is not guaranteed and all mine development is the client’s responsibility. William LeBarge of Geoplacer Exploration Ltd. accepts no liability for any use or application of these data by any and all authorized or unauthorized parties.

General Results

Good data and contact resistance were obtained in all of the surveys, and the lack of permafrost aided in the interpretations. However, groundwater effects were evident in some areas, which complicated interpretation as contrasts between low and high resistivity values may have been partially a reflection of varying groundwater conditions rather than strictly lithological boundaries.

The geographic coordinates of the endpoints of the surveyed lines are shown in Table 4, and the lines are plotted on Figure 4. The interpreted profiles are shown as Figures 5 to 9.

Table 4 – Endpoint coordinates of 2018 resistivity geophysical surveys.

Resistivity Lines- Heather Lakes Aggregate, July 2018					
Line Name	Length (m)	Start Point		End Point	
		Latitude	Longitude	Latitude	Longitude
RES18-AIE-01	300	60.652304	-135.094023	60.652291	-135.099535
RES18-AIE-02	300	60.652336	-135.099286	60.652239	-135.104835
RES18-AIE-03	300	60.651574	-135.093875	60.651376	-135.099482
RES18-AIE-04	300	60.653294	-135.100115	60.653261	-135.105682
RES18-AIE-05	300	60.653848	-135.100739	60.651127	-135.100103

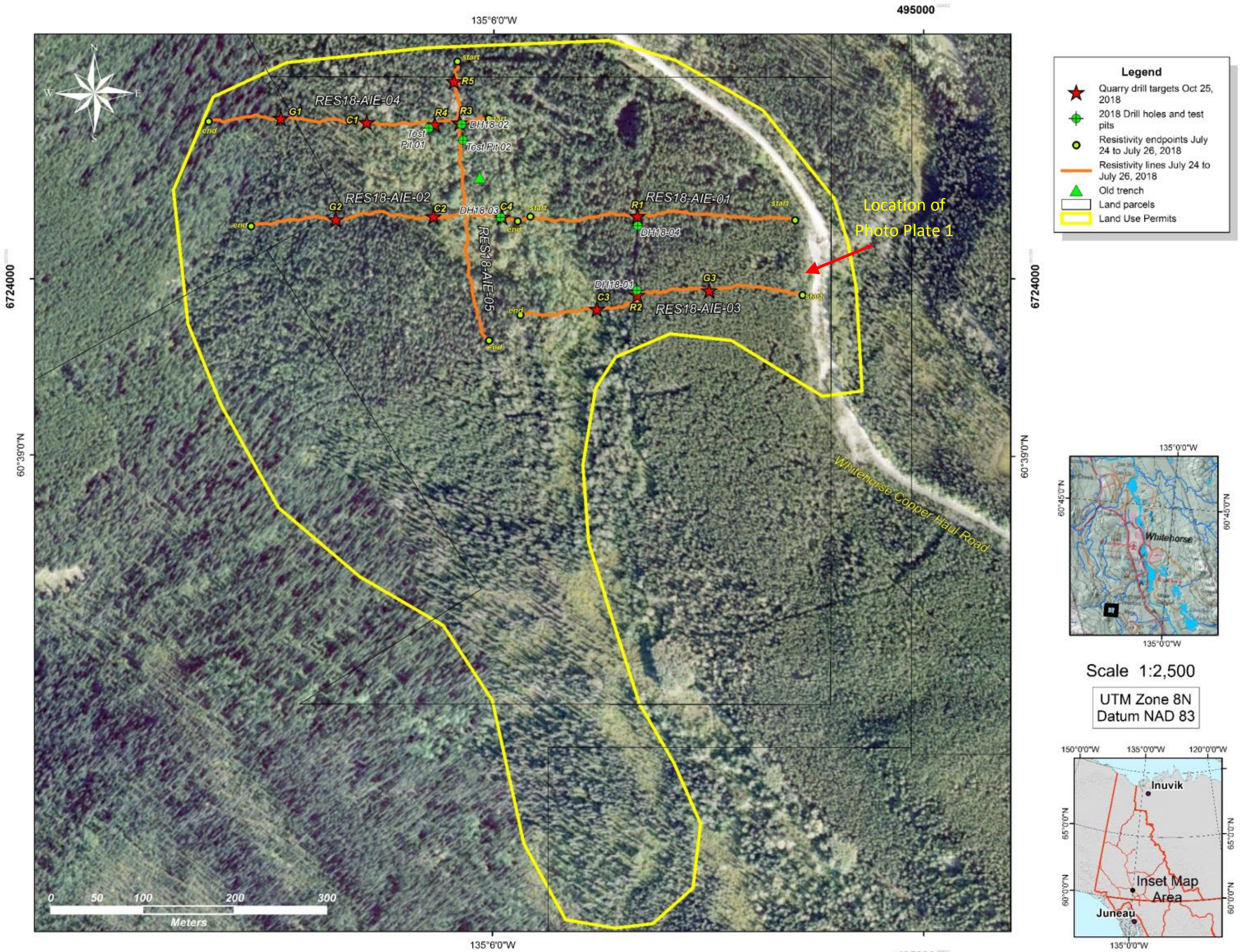

Figure 4 – Satellite photo showing the location of the 2018 resistivity lines conducted on the Heather Lakes Project area. Drill holes, test pits and drill targets are also shown.

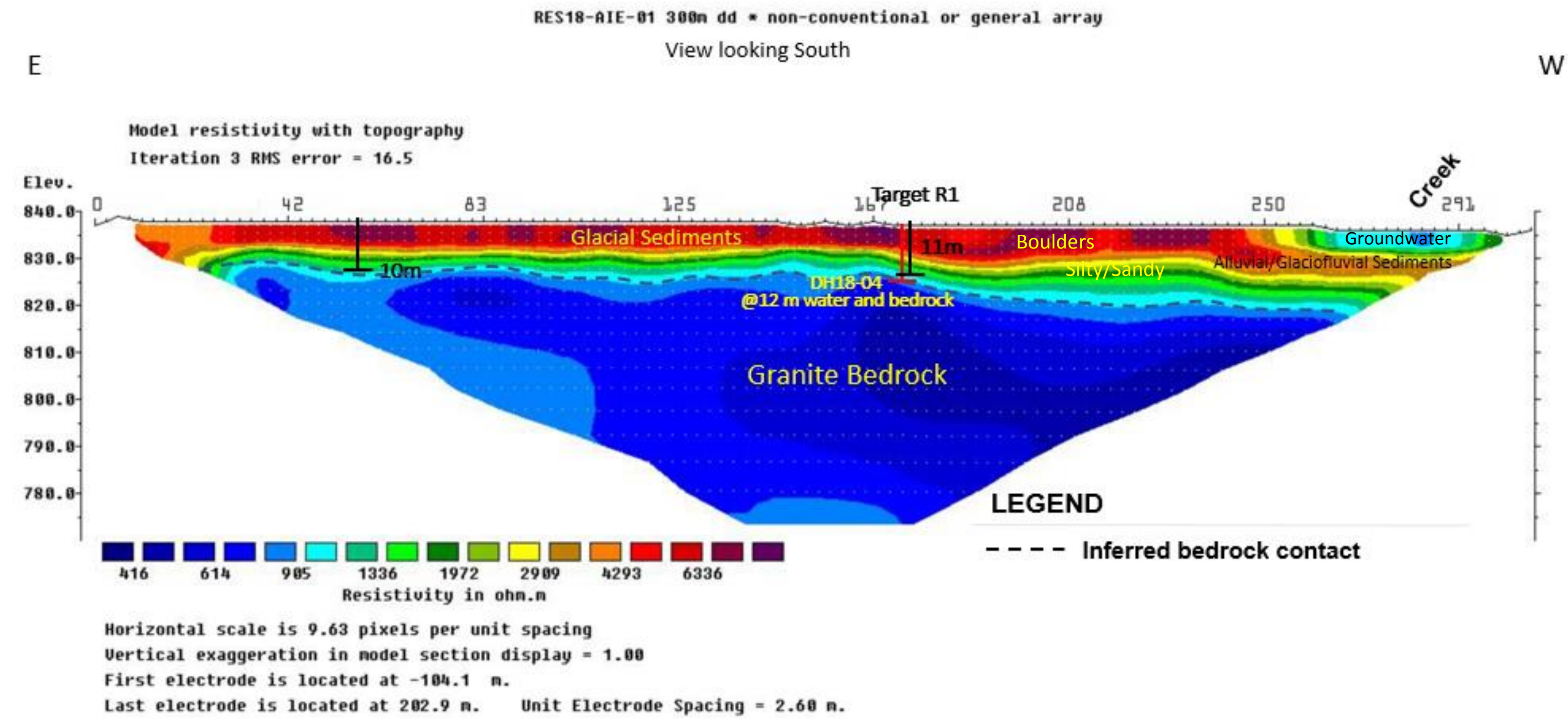

Figure 5 – Resistivity Line RES18-AIE-01. The interpreted undulating bedrock contact varies from 10 metres to approximately 18 metres. High resistivity glacial till with boulders are interpreted as overlying a moderate resistivity value silty/sandy layer on a low resistivity granite bedrock. On the west side of the profile, mixed alluvial and glaciofluvial sediments occur near the active creek, with accompanying low resistivity groundwater.

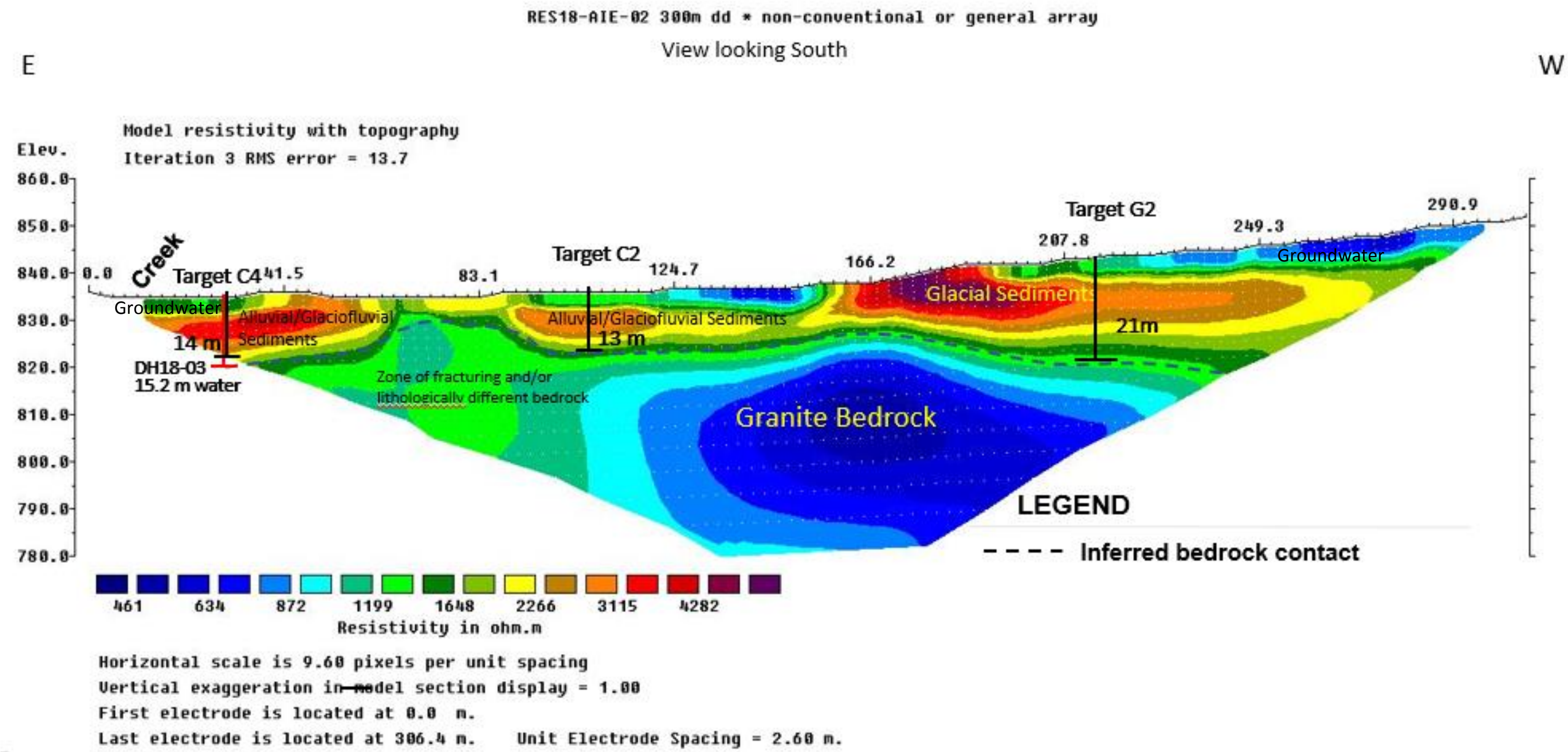

Figure 6 - Resistivity Line RES18-AIE-02. The interpreted undulating bedrock contact varies from 5 metres to approximately 21 metres. High resistivity glacial till with boulders are interpreted as overlying a low resistivity granite bedrock on the centre/west. Bedrock on the east side appears to have higher resistivity than the granite, which could be indicative of lithologies such as limestone or shale, and/or a result of faulting or fracturing. This feature can also be seen on profile RES18-AIE-05. On the east side and in the centre of the profile, mixed alluvial and glaciofluvial sediments occur, capped by lower resistivity groundwater.

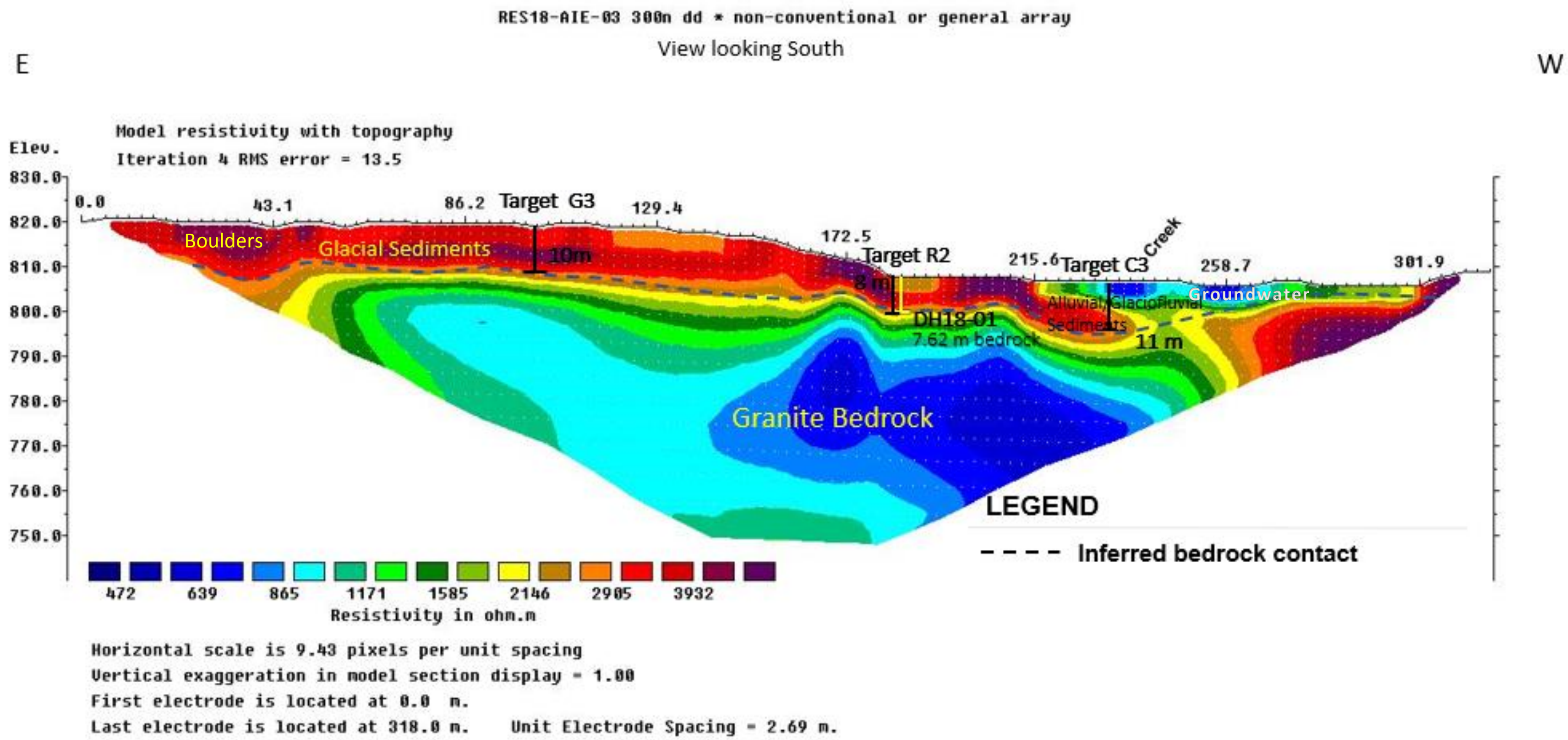

Figure 7 - Resistivity Line RES18-AIE-03. The interpreted undulating bedrock contact varies from 10 metres to approximately 12 metres. High resistivity glacial till with boulders are interpreted as overlying a low resistivity granite bedrock. On the centre and west side of the profile, mixed alluvial and glaciofluvial sediments occur, capped by lower resistivity groundwater.

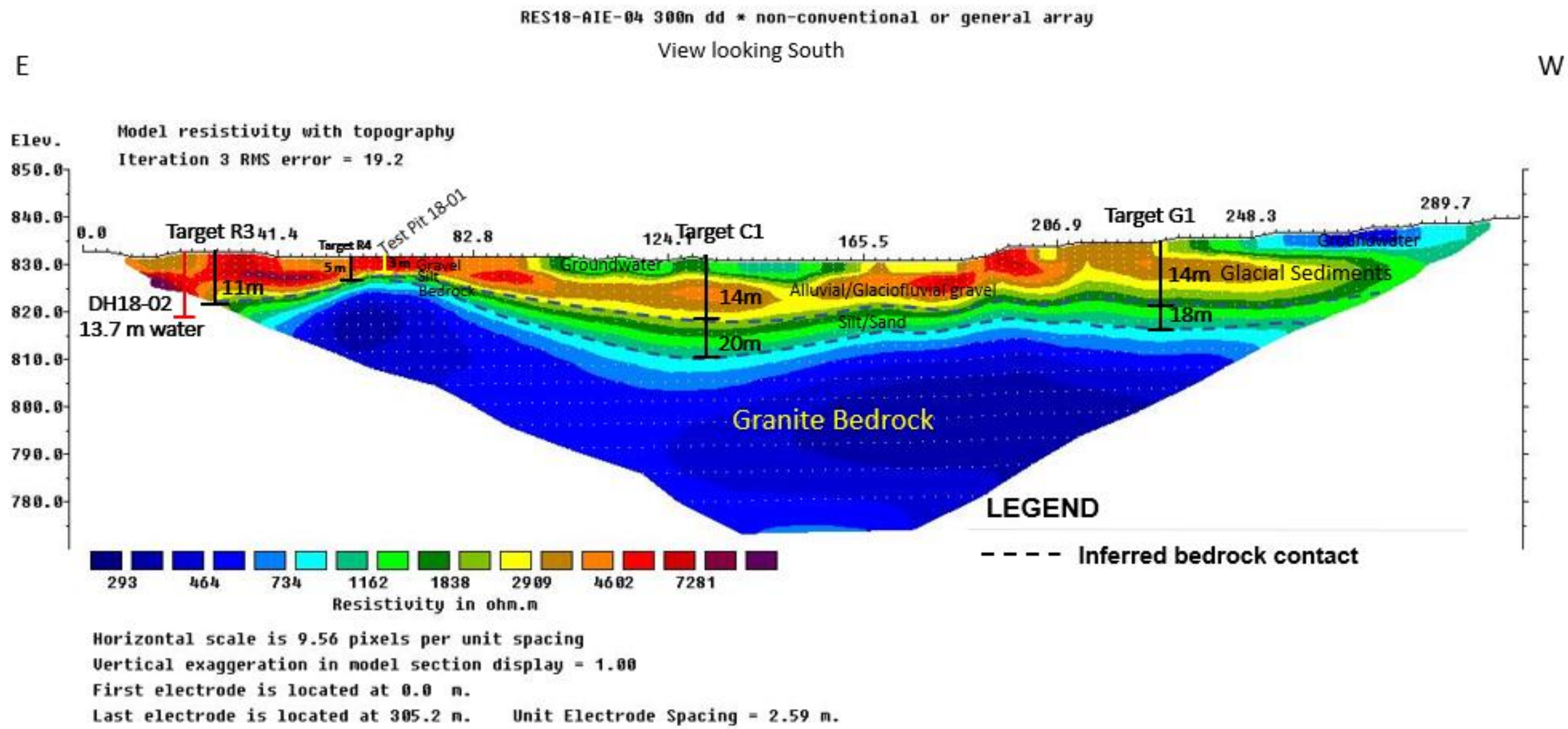

Figure 8 - Resistivity Line RES18-AIE-04. Generally, high resistivity glacial till with boulders are interpreted as overlying a low resistivity granite bedrock. The interpreted undulating bedrock contact varies from 11 metres to approximately 14 metres, but may extend up to 20 metres. On the centre of the profile, mixed alluvial and glaciofluvial sediments occur over a possible silty/sandy layer.

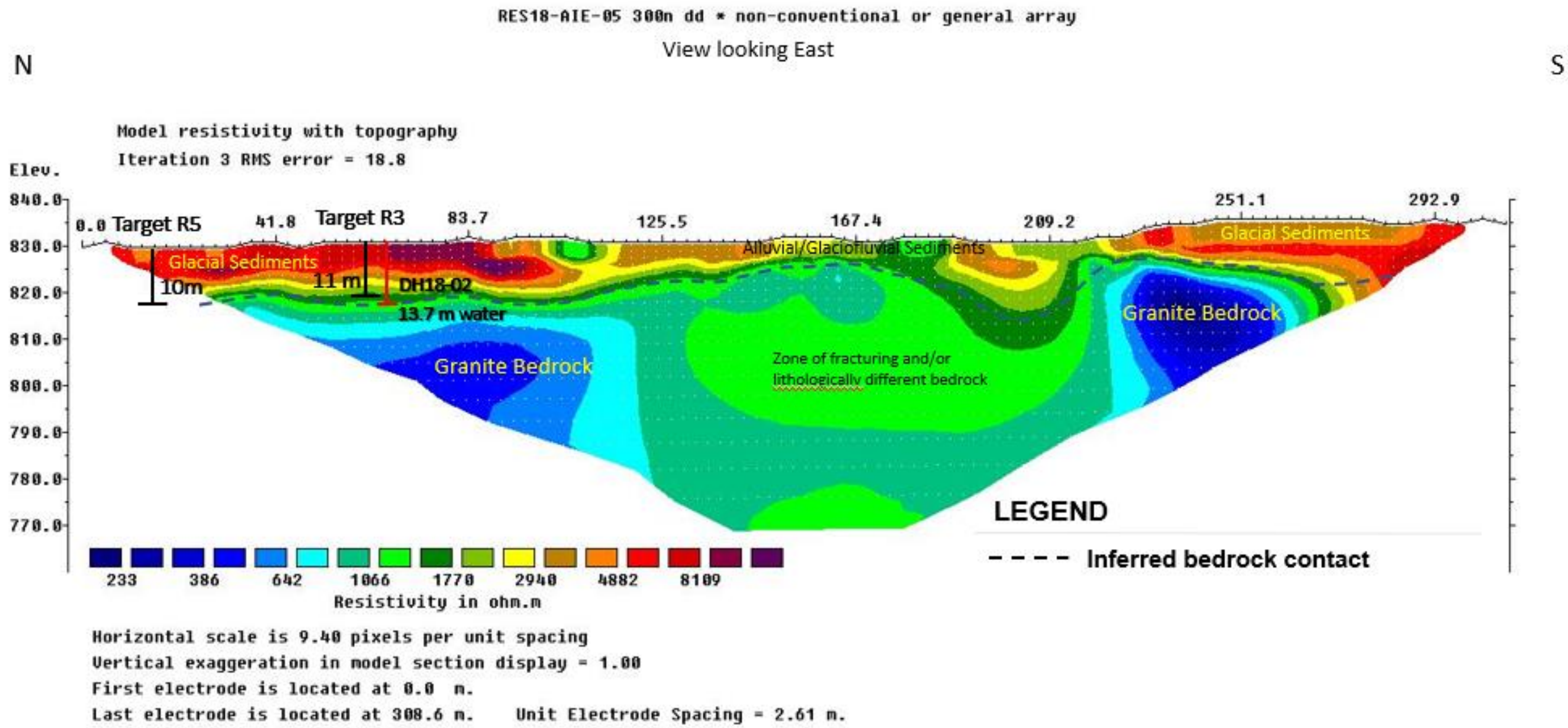

Figure 9 - Resistivity Line RES18-AIE-05 was run perpendicular to all other lines. Generally, high resistivity glacial till with boulders are interpreted as overlying a low resistivity granite bedrock. The interpreted undulating bedrock contact varies from 5 metres to approximately 15 metres. On the centre of the profile, mixed alluvial and glaciofluvial sediments occur over a bedrock with higher resistivity than the surrounding granite. This may be due to differing lithologies such as limestone or shale, and/or fracturing. The same feature can be seen on profile RES18-AIE-02.

Conclusions and Recommendations

Overall, the data response was good and contact resistances were low. In all profiles, distinctive transitions were observed between contoured resistivity values, and those were interpreted to represent the contacts between glaciolacustrine, glaciofluvial and glacial materials and the granite or limestone bedrock. Groundwater effects with lower resistivity were observed where the resistivity surveys crossed the active creek, and on the surface on the western side of the property. Bedrock contacts interpreted on the profiles were undulating and varied from 5 metres to as much as 21 metres. An apparent bedrock high occurs on the east side of profiles RES18-AIE-02 and RES18-AIE-04. This appears to be continuous through the centre of connecting perpendicular profile RES18-AIE-05.

In general, high resistivity boulder-rich glacial till was interpreted as overlying a low resistivity granite bedrock, and in places, a somewhat higher resistivity bedrock which could be an indication of other lithologies such as limestone or shale. There may also be accompanying faulting or fracturing in this zone, which was especially evident in profiles RES18-AIE-02 and RES18-AIE-05. In places near the centre of the property, an area of moderate resistivity occurs in a topographic depression near the active creek, which may be representative of a complex of alluvial and glaciofluvial sediments. Profile RES18-AIE-04 indicated a potential silty/sandy layer (with low to moderate resistivity values) between the higher resistivity alluvial/glaciofluvial gravel and the low resistivity granite bedrock. Corroboratively, a silt/fine sand layer was intersected along this profile in Test Pit 18-01, at approximately 3 metres depth beneath a gravel layer.

Table 5 shows that the drill holes and test pits (although limited in number) did in fact intersect bedrock and/or the water table near the depths predicted by the resistivity surveys. Fortunately, due to the lack of permafrost in this area, there are discernable subtle differences in resistivity response between glacial till (high resistivity) and glaciofluvial or alluvial gravel (moderate resistivity). As the chosen method of drilling (R/C – reverse circulation) results in a non-intact sample comprised of rock chips, silt and sand, it is usually not possible to distinguish individual types of unconsolidated sediment (glacial till, glaciofluvial gravel, silt and sand) from each other within the stratigraphy. Thus, without detailed lithological logs, it is not possible to further calibrate the geophysical surveys in order to more accurately predict the types of materials which are indicated on the resistivity profiles.

The exploration program to date indicates that there may be a significant amount of aggregate source material in the project area. However, the nature, volume and engineering suitability of this material is still undetermined and warrants further investigation.

A program of excavator test-pitting, bulk-sampling, granulometric (grain-size distribution) evaluation and sonic drilling (which will recover a stratigraphically-intact core sample) is recommended. Additional geophysical surveys, drill holes and test pits should also be conducted to fill in the unevaluated southern and western extents of the project area. Table 5 outlines a number of recommended additional targets and target areas, which are also plotted on the profiles.

Table 5 – Description and coordinates of 2018 drill targets and nearby drill holes.

Target Name	Type	Possible depth to bedrock (m)	Nearest Drill Hole/Pit	Actual Depth (m)	Probable Material	Line (s)	Latitude	Longitude
C1	alluvial drill target	14			Alluvial	RES18-AIE-04	60.65325	-135.102519
C2	alluvial drill target	13			Alluvial	RES18-AIE-02	60.652334	-135.101188
C3	alluvial drill target	11			Alluvial	RES18-AIE-03	60.651432	-135.09794
C4	alluvial drill target	14	DH18-03	15.2	Alluvial	RES18-AIE-02	60.65233	-135.099824
G1	glacial drill target	14			Glaciofluvial/Glacial	RES18-AIE-04	60.653288	-135.104228
G2	glacial drill target	21			Glacial	RES18-AIE-02	60.652302	-135.10313
G3	glacial drill target	10			Glacial	RES18-AIE-03	60.651614	-135.095708
R1	road drill target	11	DH18-04	12.0	Glacial/Alluvial	RES18-AIE-01	60.652338	-135.097137
R2	road drill target	8	DH18-01	7.62	Alluvial	RES18-AIE-03	60.65157	-135.097135
R3	road drill target	11	DH18-02	13.7	Glaciofluvial	RES18-AIE-04,05	60.653248	-135.100674
R4	road drill target	5	Test Pit 18-01	3.0	Glaciofluvial	RES18-AIE-04	60.65323	-135.101166
R5	road drill target	10			Glaciofluvial	RES18-AIE-05	60.653652	-135.100786

Statement of Qualifications

William LeBarge

I, William LeBarge, of 13 Tigereye Crescent, Whitehorse, Yukon, Canada, DO HEREBY CERTIFY THAT:

1. I am a Consulting Geologist with current address at 13 Tigereye Crescent, Whitehorse, Yukon, Canada, Y1A 6G6.
2. I am a graduate of the University of Alberta (B.Sc., 1985, Geology) and the University of Calgary (M.Sc., 1993, Geology – Sedimentology)
3. I am a Practicing Member in Good Standing (#37932) of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC).
4. I have practiced my Profession as a Geologist continuously since 1985.
5. I am President and sole shareholder of Geoplacer Exploration Ltd., a Yukon Registered Company.

Dated this 18th day of January, 2019

William LeBarge, P. Geo.

References

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