Aster Funds Ltd Satellite-Based Long Wave Infrared (LWIR) & Satellite Synthetic Aperture Radar (SAR) Mapping, Marshall Lake Property, Summit Lake Area, Ontario.

Report Prepared for:
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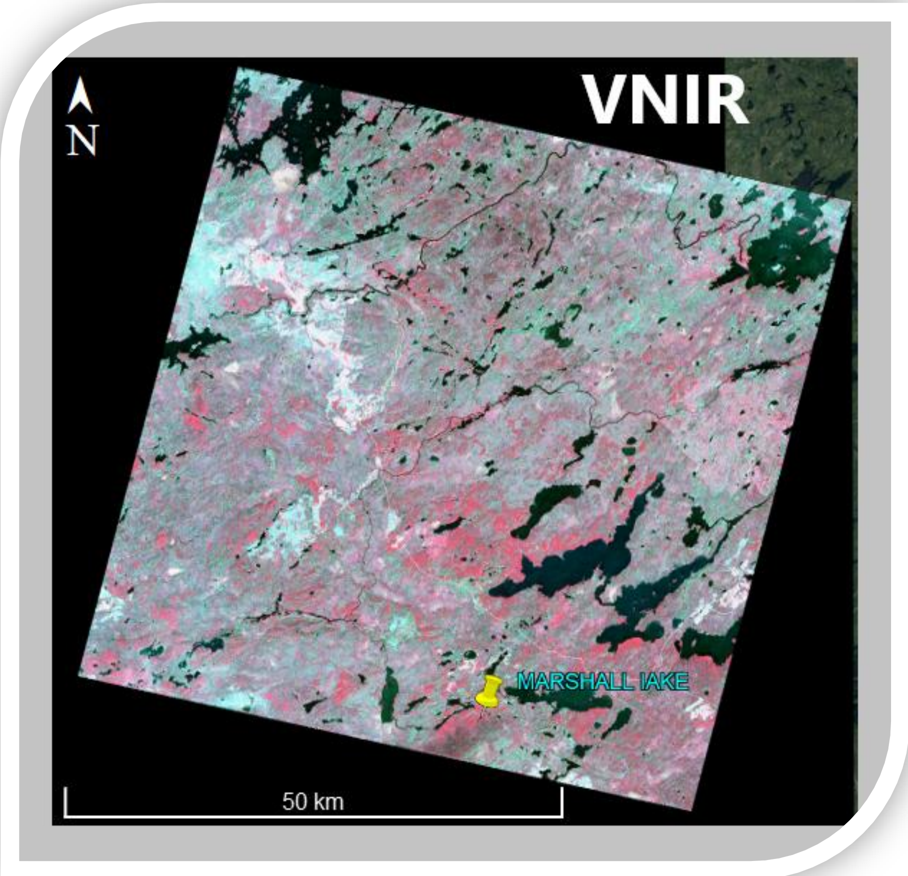

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June 20th, 2020

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Aster Funds Limited Project Number ML2003

Effective Date: 20th June 2020

Notice/Avis

This Report was prepared in accordance with the terms of a Scope of Work agreed with Copper Lake Resources Ltd., Toronto, Ontario. Estimates, information, conclusions, and recommendations are consistent with the information received from outside sources, information generated as a result of any work overseen by Aster Funds Ltd., and the assumptions and conditions specified in this Report.

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(Frontispiece: Marshall Lake Survey Area –VNIR false colour Aster scene collected on August 20th 2002).

1.0 Introduction and Scope

This report was prepared by Aster Funds Ltd., of a satellite long wave infrared (LWIR) spectral survey over a 700 square kilometre area of northern Ontario, north north-west of Geraldton, Ontario. The survey area is centred on the Marshall Lake property located 50 kilometres north east of Lake Nipigon, Ontario.

The survey area and surrounding region is vegetated but given the emissivity property of minerals, penetration through moss, moderate vegetation, and trees of the Boreal forest and overburden is possible for the longwave infrared [LWIR] camera of the Japanese Aster satellite in orbit some 705 kilometres above the Earth's surface.

Vegetation cover is a serious limitation to the visible/near infrared [VNIR] and shortwave infrared [SWIR] cameras of the Terra satellite, which sense only the top millimetre of the earth's surface; thus VNIR and SWIR data was not utilized for this survey area.

LWIR analysis, through proprietary processing of ASTER satellite data using a "jigsaw" algorithm to stitch Aster scenes together, leaving out cloud and cloud shadow in conjunction with spectral unmixing of ASTER thermal data, was used to map and identify mineral distribution over the property and its environs. The ground-penetrating nature of infrared radiation in the long-wave bands and the emissive properties of minerals allows for sixteen (16) spectral endmembers to be derived for the survey area from outcrops, shallow till cover and beneath vegetation.

Maps for each of the sixteen LWIR endmembers were produced for the 700sq. kilometre survey area.

The generated ASTER LWIR data was integrated and interpreted in relation to the geological, structural, geographic and mineral deposit data available for the Marshall Lake property and its environs to define target areas for further exploration.

Interpretation of the ASTER data on a property scale was assisted by utilizing the Geological Survey of Ontario database (digital records of geology; geophysics; historic and operating mines; mineral occurrences and drilling) to determine endmember (mineral) association with the OGS mineral occurrences reported for the area. Seventeen mineral occurrences are recorded within the 700 square kilometre survey area while approximately 90 mineral occurrences dominated by base metals are recorded for an area within a 50km radius of the property.

Target Vector Mineral (TVM™) areas ofkey indicator/pathfinder minerals were identified for base metals within the Marshall Lake property and on its borders.

Site visits and ground inspection are required to further evaluate and interpret the data generated.

No site visits were made by Aster Funds Ltd. to the survey area during the preparation of this report.

2.0 Terms of Reference

The principal goals of the report are twofold to:

1. Review and make a preliminary Aster Funds Ltd interpretation of the longwave infrared data from the Terra satellite and/or the ALOS satellite, and synthetic aperture radar data from the Sentinel A and B satellites.
2. Outline exploration target(s) on the property and its environs (700 sq. km area).

2.1 Sources of Information

The information in this report has been obtained from the following sources.

- Raw Aster Funds Ltd analytical data
- Ontario Geological Survey(OGS) for regional geology (1:250,000), geophysics, mineral occurrences etc.
- SEDAR for NI 43-101 Technical Reports and regulatory filings

2.2Disclaimer

This report represents the professional opinions of Aster Funds Ltd as to the interpretations to be made and conclusions drawn in light of information made available to, the inspections performed by, and the assumptions made by the company using its professional judgment and reasonable care. This document has been prepared based on a Scope of Work agreed with Copper Lake Resources Ltd. and is subject to inherent limitations in light of the Scope of Work, the methodology, and analytical procedures used. This document is meant to be read as a whole, and portions thereof should not be read or relied upon unless in the context of the whole.

3.0 Reliance on Other Experts

In this report, information was used from Professional Geoscientists of Copper Lake Resources Ltd with respect to the analysis of the Aster Funds Ltd information in the context of the Marshall Lake property.

4.0 Project Location

The Marshall Lake Property is located 90 kilometres directly north of Beardmore, a small town on the Trans-Canada Highway and 40 kilometres north east of the northern shore of Lake Nipigon. Thunder Bay lies approximately 250 kilometres to the south south-west on the north western shore of Lake Superior (Figure 1).

Figure 1: Location Map Marshall Lake Property

TheMarshall Lake Property is comprised of 696 unpatented claims and 54 mining leases. The property area totals approximately 15,112 hectares of which 91% or 13,793 hectares are covered by the spectral survey. Unpatented mining claims comprise the bulk of the property with the 54 leases located together in the north central part of the property which approximates to 1,636 hectares (Figure 2 overleaf). The mining leases have 21 year terms.

The unpatented mining claims are registered 100% either to Copper Lake Resources Ltd. or 50% Copper Lake Resources Ltd. and 50% Rainy Mountain Royalty Corp. A breakdown of the ownership with respect to the number of claims owned by each party was not made.

Land tenure information for the claims was that as posted by the Ontario Ministry of Northern Development and Mines (MNDM)on the MLAS system on May 25th 2020, are subject to the disclaimer on validity of information therein present.

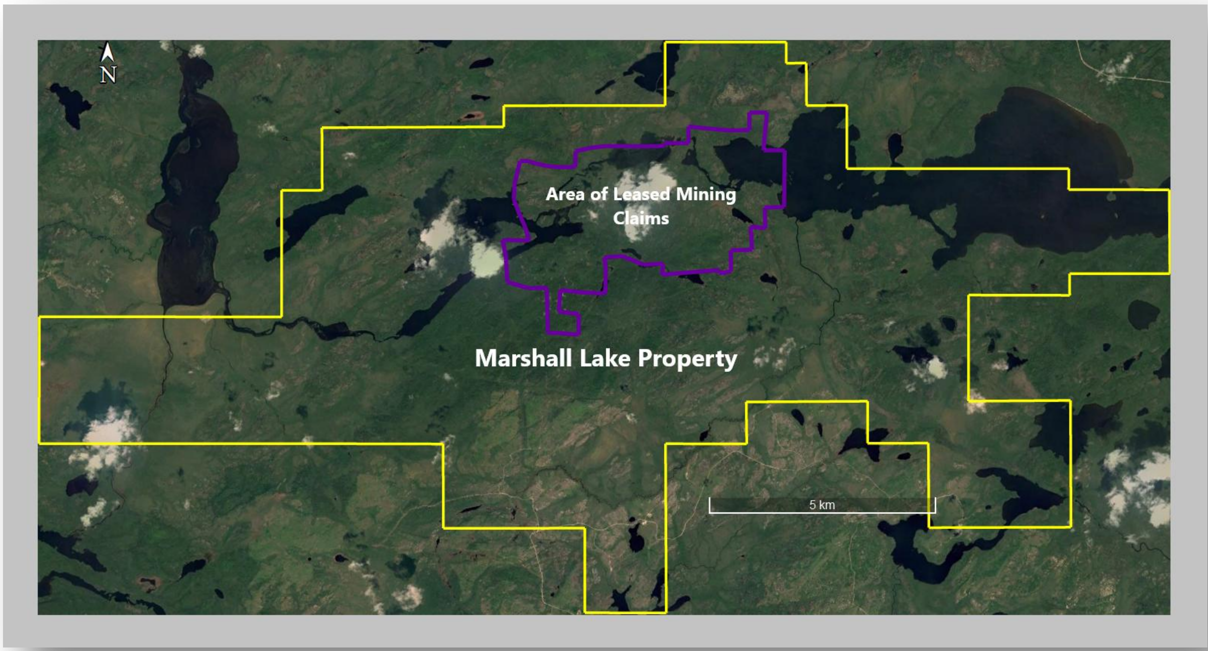

Figure 2: Marshall Lake Property

The Aster Funds Ltd claim outline /data is not intended as a property title search or confirmation of legal claim ownership or title and the information provided is believed to be accurate as of the date of this report but which is not guaranteed.

Hart (2016) describes the property as follows “it lies within the central plateau section of the Boreal Forest Region. Topography in the area has moderate relief, with elevations ranging from 320 meters above sea level at the lakes, to 380 meters above sea level on some of the cliffs in the area. There are a few high hills with excellent exposure and vegetation consisting of poplar, birch, black spruce and jack pine. Low valleys dominated by cedar swamp, tamarack and black spruce typify other areas (Bennett and Middleton, 2009). Generally, lower lying areas have poor outcrop exposure”.

5.0 Spectral Surveys

5.1 ASTER and the TERRA Satellite

The **A**dvanced **S**paceborne **T**hermal **E**mission and **R**eflection **R**adiometer (**ASTER**) is a Japanese electronic imaging sensor on board the Terra satellite. In 1999, Terra was launched into Earth orbit by NASA and ASTER began collecting data in February 2000. It is a platform with three imaging systems at an orbit height of 705 kilometres above the Earth's surface.

ASTER provides high-resolution images of Earth in 14 bands of the electromagnetic spectrum, from visible to thermal infrared light. The image resolution ranges from 15 to 90 metres (m). Data generated by ASTER is used to create detailed maps of land surface temperature, mineral emissivity, reflectance and elevation.

ASTER's three subsystems utilize

- Visible and near infrared (VNIR),
- Shortwave infrared (SWIR)

and

- Longwave infrared (LWIR).

The VNIR and SWIR camera sensors sample the electromagnetic spectrum from 0.5 to 2.4 microns, but only from the top millimetre of the surface, at 30 m spatial resolution. This presents a significant limitation in glaciated zones, for example, although in certain regions of the high arctic and Greenland it is ideal for mapping iron mineralized outcrops.

The Aster shortwave infrared [SWIR] camera failed at the end of 2007 and so no current SWIR imagery is available over the Marshall Lake Property survey area though earlier data is archived.

The LWIR sensor achieves better surface penetration, due to the minerals' emissivity, which enables it to probe beneath moderately dense vegetation, moss, cloud and transported cover. Water, snow and iceare a problem for thermal imaging as it swamps the signal. Depth penetration depends on the difference between the target spectrum and the host rock, as well as the high-purity mineral (endmember) volume present.

The LWIR systems involve the detection of emitted radiation instead of reflected radiation with the exploration applications of LWIR based on using multiple wavelength bands to identify emission features that are diagnostic of specific minerals and rocks. More than 300 minerals and other elements can be identified for LWIR compared to 49 for SWIR.

The satellite pixel size for each ASTER LWIR processed image is 90 m, consisting of five bands imaged at 8.2910, 8.6340, 9.0750, 10.6570 and 11.3180 microns, respectively.

Although clouds and vegetation have previously limited the capabilities of ASTER thermal imagery, Aster Funds Ltd. has developed several proprietary algorithms and other unmixing techniques that overcome such obstacles. The algorithms separate the thermal response of minerals, clouds and vegetation decomposing the five-band ASTER thermal image into sixteen (16) spectral endmembers (mineral abundances) for the survey area.

Interpretation of the mineral abundances is carried out by comparing their corresponding spectral endmembers to a known set of standards namely three hundred and twenty four minerals (324) library spectra collected by Johns Hopkins University for LWIR endmembers and to a library of forty nine (49) mineral spectra collected by the USGS for SWIR endmembers.

Anomaly maps for the LWIR endmembers are then generated for a suite of the 16 most abundant minerals within the area of the survey. The spectral analysis surveys and subsequent interpretations return highly precise images for targeted mineral exploration.

5.2LWIR Data Processing

For data processing the following steps were undertaken:

Step #1: Obtain best image.

The best images of the survey area were selected utilizing the "jigsaw" algorithm to stitch Aster scenes together, leaving out cloud and cloud shadow.

Step #2: Digitally remove water bodies.

The water bodies in the area were isolated and removed as they interfere with the thermal signals. Thermal signatures cannot be imaged through water, snow, cloud or cloud shadow. The shapefile data for the lakes, waterways for this region of Ontario was of such poor quality and resulted in incomplete isolation of certain water bodies. To a certain extent, this may be fixed by digitizing shapefiles in GIS software.

Step #3: Separate reflectance from emission effects.

Long wave infrared can collect spectral reflectance emanating from the rocks regardless of whether it is day or night. If the data package selected in Step 1 was taken during the day, reflectance spectra given sunlight was isolated from the emission spectra of the rocks.

Step #4: Derive spectral endmembers and their abundances

There may be upwards of 2500 separate minerals on an exploration property that can be identified by the Aster sensor on the Terra satellite. Aster Funds Ltd has found empirically that sixteen endmembers is the most that can be determined on a first pass, given constraints of time and correlation coefficient. The mathematical construct to derive spectral endmembers is beyond the scope of this Report, but each endmember so determined corresponds to a geologically meaningful unit implicit in an exploration strategy. Interpretation consists of the process of correlating and contouring the distribution and intensity of specific endmembers related to specific deposit types.

Step #5: Correlate endmembers to minerals

Interpretation of the mineral abundances was carried out by comparing their corresponding spectral endmembers to 324 library spectra collected by Johns Hopkins University. The closet matches with their correlation coefficients are tabulated overleaf (Figure 3).

Step #6: Production of geo-referenced endmember/mineral maps

Individual plots for each endmember abundance was compiled for the 700 sq.km survey area. The various endmember colour patterns on the maps reflect the degree of endmember abundance from low endmember abundance (blue) to high endmember abundance (red). White areas reflect absence of the endmember. The abundance images are supplied as geotiff images (Appendix I).

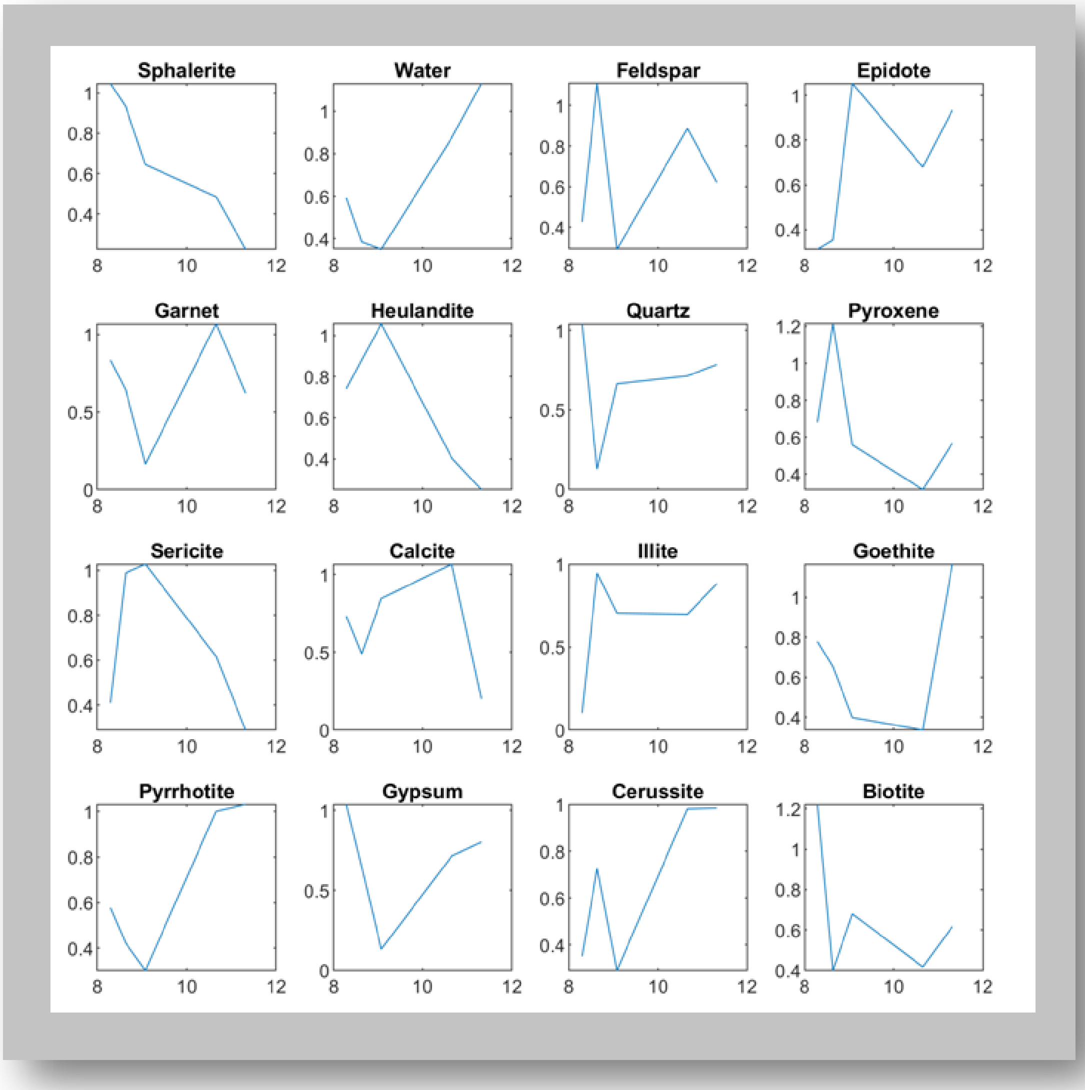

Figure 3: LWIR Spectral Endmembers and Interpreted Minerals

The closest matches of the spectra with John Hopkins mineral library and their correlation coefficients are shown below in Figure 4. Care should be taken with this interpretation as the relative coarse spectral resolution of five bands imaged at 8.2910, 8.6340, 9.0750, 10.6570 and 11.3180 microns means that many spectra look alike.

ENDMEMBER NUMBER	INTERPRETED MINERAL	CORRELATION COEFFICIENT
Em 1	Sphalerite	99%
Em 2	Water	99%
Em 3	Feldspar	83%
Em 4	Epidote	98%
Em 5	Garnet	98%
Em 6	Heulandite	98%
Em 7	Quartz	97%
Em 8	Pyroxene	98%
Em 9	Sericite	98%
Em 10	Calcite	100%
Em 11	Illite	93%
Em 12	Goethite	98%
Em 13	Pyrrhotite	99%
Em 14	Gypsum	100%
Em 15	Cerussite	95%
Em 16	Biotite	100%

Figure 4: LWIR Endmembers and Mineral Correlations

To improve resolution prior to the identification of the specific minerals, the survey area was resampled by cubic convolution methods of database verification. In the cubic convolution method, the sixteen closest pixels to the input pixel are averaged, and the average value is assigned to the output pixel. While this method is preferred to bilinear methods or nearest neighbour analysis, the processing time is vastly larger. A comparable method within resource calculation would be the Ordinary Kriging algorithm with an isotropic search ellipse.

As a result of the resampling, the effective resolution of the Target Vector Minerals in the Aster Funds Ltd analysis is 30 metres.

5.3 Aster Survey Area

The Aster spectral LWIR survey was conducted over an area of approximately 700 square kilometres (blue irregular rectangular area) centred on the Marshall Lake claim block (yellow) (Figure 5 overleaf).The claim block inside the survey area is approximately 13,793 hectares in size and marks the area where interpretation of the Aster Long Wave Infrared (LWIR) endmember minerals was undertaken utilizing Target Vector Mineral (TVM™) methodology.

A single tile satellite covers 91% of the Marshall Lake property.

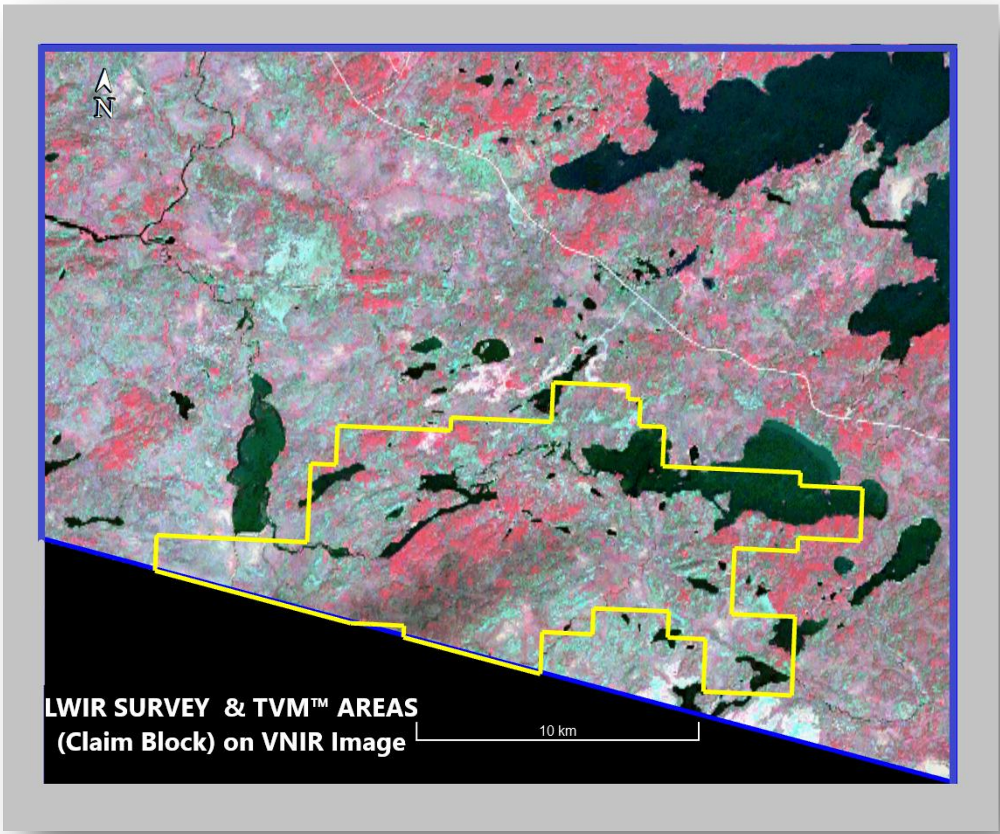

Figure 5: Marshall Lake LWIR Survey Area

5.4 Synthetic Aperture Radar (SAR)

The Japanese ALOS (Advanced Land Observation) satellite has a 14 day revisit time and is an L-band synthetic aperture radar system. The 23.5 cm L-band wavelength permits penetration of vegetation but high soil moisture may limit surface penetration to a few centimeters (at most) in these terrains.

In highest resolution mode, ALOS images have a spatial resolution of 2.5m. The estimates of dielectric constants [DCs] presented here have a spatial resolution of 25m and were collected in 2018 by the ALOS-2 satellite. If Copper Lake would like a fine resolution follow up of the defined SAR anomalies, and especially those which confirm mineral trends within defined exploration sectors on the Marshall Lake Property, this can be discussed.

5.4.1EstimatingDielectric Constants (DC's) from SAR Imagery

Synthetic aperture radar may be sourced from the ALOS-2 satellite or the Sentinel A and B satellites of the European Space Agency. A microwave is transmitted in horizontal (H) and vertical (V) polarization, and the return backscatter is received in both H and V polarizations. The dual polarization of both systems (VV and VH for Sentinel and HH and HV for ALOS) may be used to estimate dielectric constants (DCs) for reflectors on the surface and hence inferences of likely minerals present may be made.

The multi-polarized backscatter of a radar wave is dependent on two physical parameters: the incidence angle of the wave on the target and the DC of the material comprising that target. Given a multi-polarized SAR image, one can invert the measured VH and VV or HH and HV reflectance's for each pixel to obtain per pixel estimates of the DC and incidence angle as defined by nonlinear equations.

The DC is the ability of a material to retain a charge and varies from 0 for free air to 80.10 for water at 20 °C. Quartz has a DC of 6.53 and olivine 6.77 and both are fairly resistive. Talc (pyrophyllite) is 9.4, dolomite is 8.45 while chromite is 11.03 and serpentinite is 11.48.

The target minerals for the Marshall Lake survey area all have high DCs:

- Sphalerite (70) and pyrrhotite (81).

A 25m spatial resolution coloured coded conductivity estimates are supplied as the geotiff image (Appendix II).

6.0 Marshall Lake Survey Area -Setting

6.1 Geology &Mineralization.

To assist in the interpretation of the endmember images, bedrock geology maps at 1:250,000 scale and geophysical maps were downloaded from the Ontario Geological Survey.

Geologically the greater part of the Marshall Lake property is underlain by felsic to intermediate volcanic rocks with the elliptical tonalite Summit pluton occurring in the north western and western part of the property and the diorite-monzodiorite-granodiorite of the Deeds pluton is found on the south eastern margins of the property. In the eastern and south eastern part of the property a sedimentary rock sequence that includes magnetite-chert-oxide facies iron formation is found. Gabbroic intrusions occur in the north east claim boundary at Marshall Lake.

Approximately three kilometres north of the Marshall Lake property the east west Wabigoon-English River Sub-Province terrane boundary bisects the survey area. The survey area north of the boundary is dominated by granite-granodiorite rocks with a narrow 0.5km to 2km wide band of metasediments and iron formation rocks separating the granites from the boundary (Figure 6).

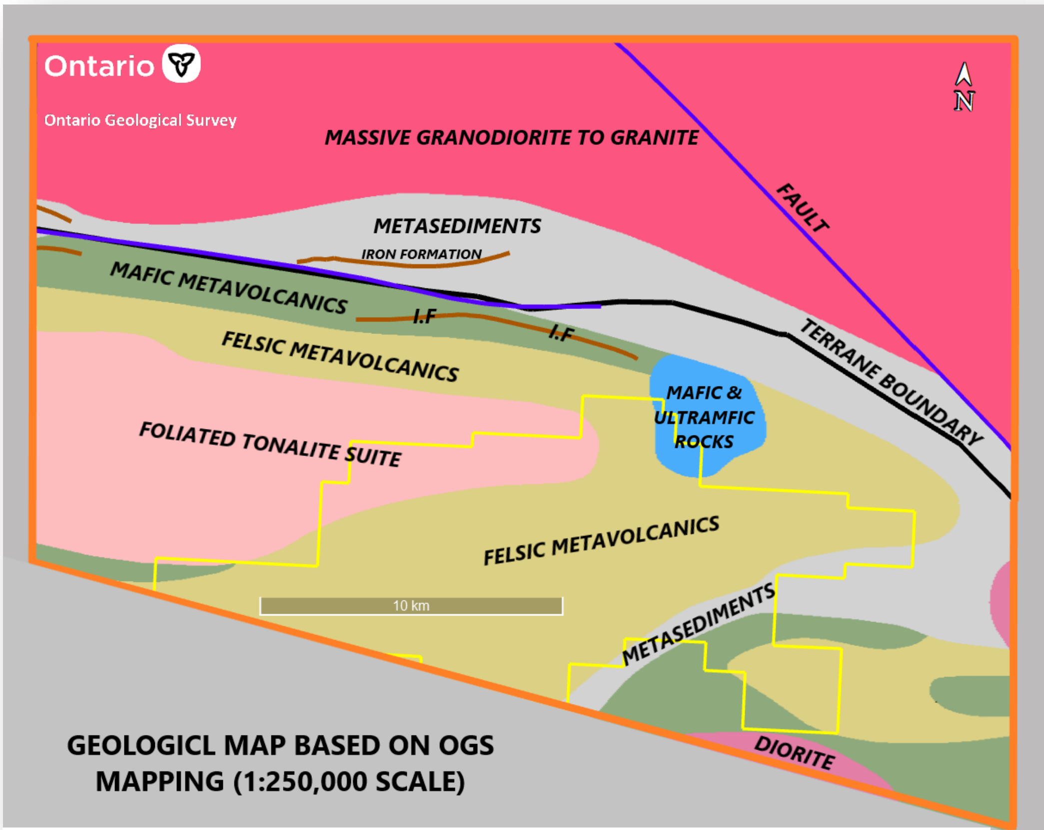

Figure 6: OGS Bedrock Geology in the Survey Area

6.1.1 Regional Geology

Geologically the northern half of the survey area is within the English River Subprovince while the southern half including the Marshall Lake property is located in the eastern portion of the Wabigoon Subprovince. The following description of the Wabigoon Subprovince is from Percival et al. (2006) in Hart (2016).

“The eastern Wabigoon domain is a composite terrane with greenstone belts and intervening granitoid plutons that show variable Mesoarchean and Neoarchean origins. The supracrustal rocks have been divided into several assemblages. In the northwest, the 3000-2902 Ma Toronto and Tashota, and ~2739 Ma Marshall assemblages may represent a continental margin sequence built on the Mesoarchean Winnipeg River terrane. The central part of the belt is dominated by rocks of oceanic affinity including tholeiitic basalts of the 2780-2769 Ma Onaman assemblage, 2738 Ma Willet back-arc rocks, and theoverlying 2734-2722 Ma calc-alkaline Metcalfe-Venus assemblage of continental affinity. Across thesoutheastern Wabigoon domain, the 2740-2734 Ma calc-alkaline Elmhirst-Rickaby assemblage ispossibly built on Mesoarchean Marmion-age substrate. Unconformably overlying clastic rocks weredeposited after 2710 Ma. At least two sets of structures are present in the eastern Wabigoon domain: east-west-striking D1 folds and foliation (<2709 Ma) and east-west-striking, dextral transpressive D2structures and related shear zones most notable across the Humboldt Bay high strain zone.”

6.1.2 Property Geology

Geological mapping as outlined in Hart (2016) differs from that of the OGS for the eastern one third of the property as seen in Figure 7 overleaf.The following description of the property geology is from Stott and Straub (1999), Stott et al. 2002 in Hart (2016).

“The property is underlain by the ~2739 Ma (million year) Marshall Assemblage which is composed of a thick sequence of calc-alkalic dacite lavas and pyroclastic deposits that wraparound the synvolcanic 2736 Ma Summit pluton. The assemblage can be subdivided into several separate sequences of flows and tuffaceous units. The lower half of the assemblage, east of the Summit pluton, is composed of very thickly bedded tuff with minor lapilli-tuff beds. In many areas these deformed, biotite-altered and recrystallised rocks are difficult to distinguish from subvolcanic porphyry intrusions or high level cryptodomes. Most of the strata on eastern Marshall Lake are composed of massive to autobrecciated dacite flows and intrusions with intervening tuffaceous sequences that define a north-striking, openly folded stratification. The Albert-Gledhill metasedimentary assemblage separates the main volcanic center from a flow and dome complex, in eastern Marshall Lake, composed of dacitic flows and amphibole-garnet-bearing autobreccia. The trace element geochemistry and neodymium 24isotopic characteristics of this assemblage are consistent with a calc-alkalic, continental margin arc constructed on Mesoarchean crust.

The Marshall assemblage is interpreted to be a submarine eruptive sequence, containing evidence of synvolcanic faults, associated hydrothermal discharge zones and intensely altered rock especially in

the vicinity of the base metal deposits. The metamorphism in the area ranges from upper greenschist tolower amphibolite facies.”

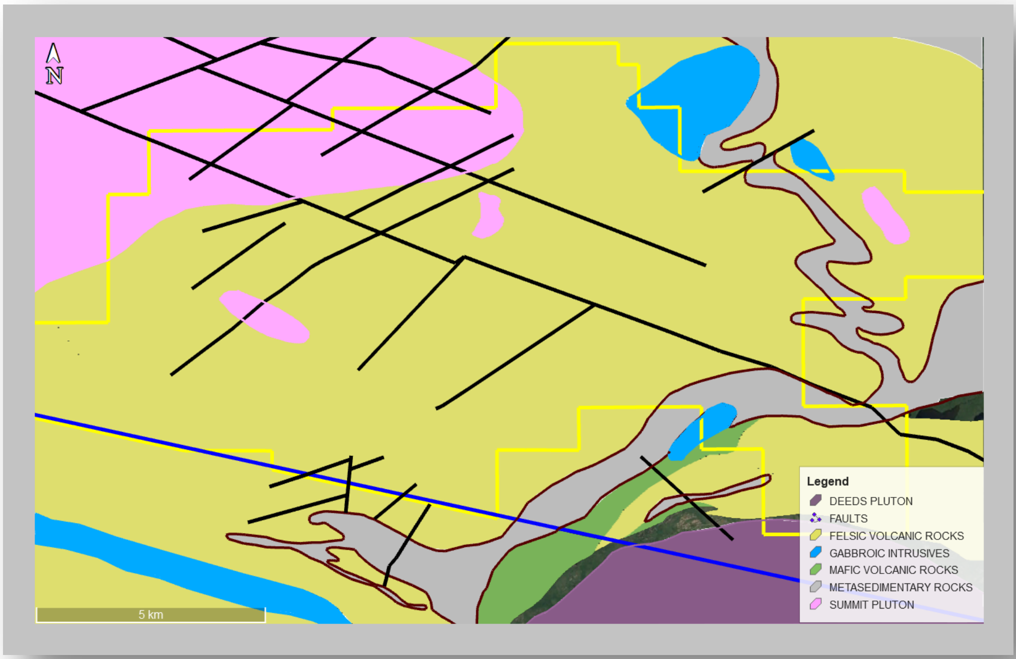

Figure 7: Property Bedrock Geology Map (after Hart, 2016)

The OGS high resolution aeromagnetic residual magnetic intensity images of the property and the survey area appear to agree with the 2016 mapping in Figure 7 above.

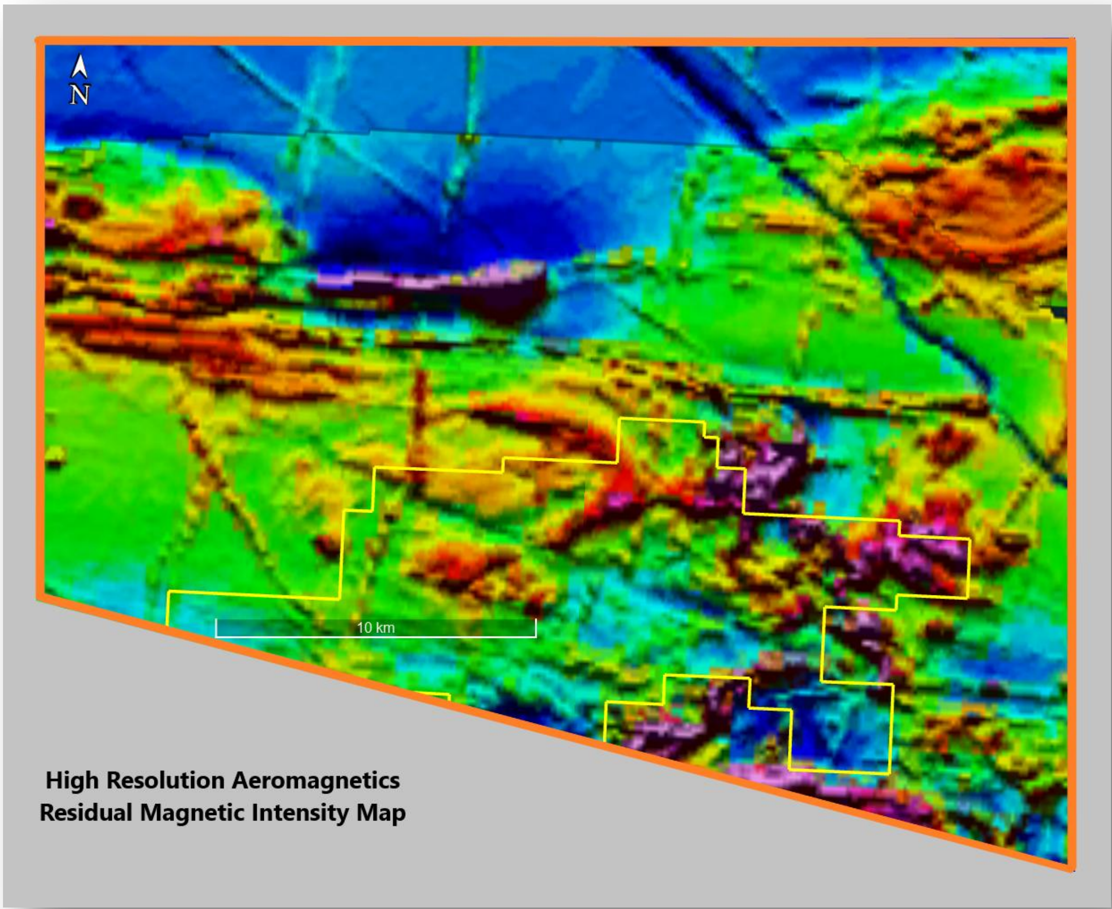

Figure 8: Aeromagnetic Map

6.1.3 Area Mineralization

One hundred and five (105) mineral occurrences are recorded by the OGS within a 50 kilometre radius of the Marshall Lake property (Figure 9).

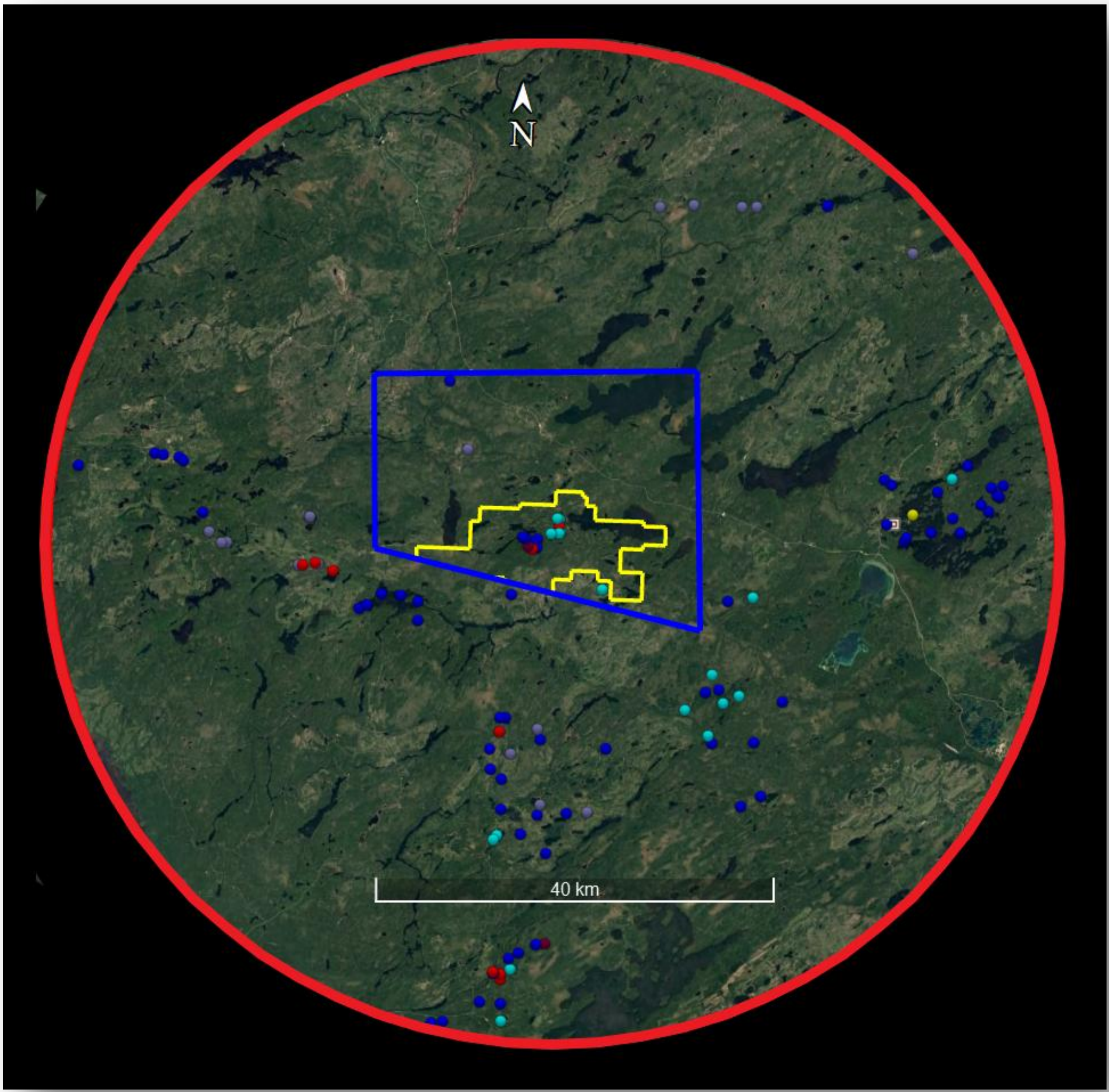

Figure 9: Mineral Occurrences Within a 50 Km Radius of the Property

Mineral occurrence locations present in the area (Figure 6.4) include:

- Past Producing Mine Without Reserves (Yellow - 1)
- Developed Prospects With Reserves (Red dots - 9)
- Developed Prospects Without Reserves (Burgundy dots - 2)
- Prospects (Grey dots - 15)
- Occurrence (Dark Blue dots - 61)
- Discretionary Occurrence (Light Blue dots –17)

Mineral Occurrences are described as *"*Mineralization is present in 2 dimensions as indicated by surface rock sampling (channel or grab) and/or isolated diamond drill intersection(s). At least one sample must meet the minimum requirements for a mineral occurrence*".*

Discretionary Occurrence is described as *"*An occurrence or deposit that does not meet any of the defined criteria, but is entered into the MDI database based upon a subjective decision by a MNDM geologist*".*

Prospects are described by the OGS as"Mineralization present in three dimensions, indicated by diamond drilled intersections and surface rock sampling. Mineralization occurs for significant distances along strike and down dip with a minimum of three intersections that meet the minimum requirements for a Prospect*".*

The chart below details the breakdown of the mineral occurrences recorded with base metals Copper, Nickel & Zinc comprising 46% of all occurrences with precious metals at 38%. The remaining 16% includes iron, lithium, beryl, platinum group metals, molybdenum and uranium.

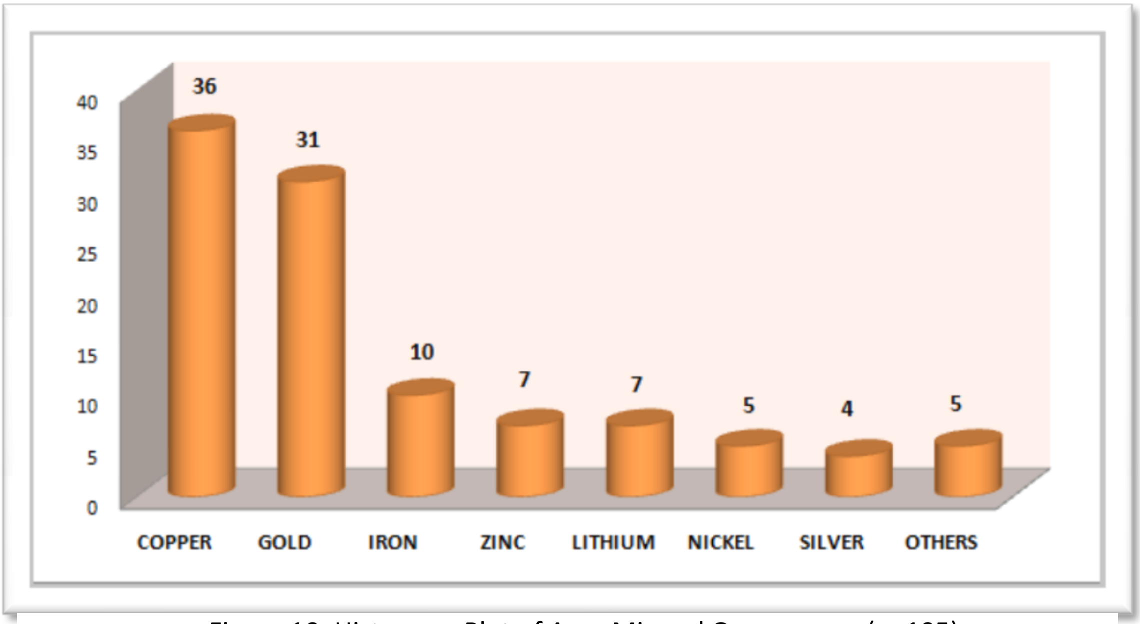

Figure 10: Histogram Plot of Area Mineral Occurrences (n=105)

6.1.4 Survey Area and Property Mineralization

"The Marshall Lake area is host to numerous occurrences of base metal mineralization. Several distinct types of mineralization and alteration are present. The bulk of the surface-exposed mineralization in the area occurs as fine disseminations throughout the altered sequence of volcanic rocks. Based on field relationships, this mineralization appears to coincide with silica-sericite alteration. This alteration generally hosts stratiform, stringer and disseminated mineralization." (Hart 2016).

The OGS database only recorded sixteen (16) mineral occurrences in the survey area with the majority (14) within the Marshall Lake property. The low number of mineral occurrences minimizes the ability to define Target Vector Minerals (TVM's™) utilizing computer modelling. Hart (2016) reports that "well over 112 known mineral occurrences of base-metal mineralization outcrop over an extensive area across the entirety of the Marshall Lake property". However, Aster Funds Ltd. was only able to find locations for twenty seven (27) significant mineralization occurrences from the 2010 and 2016 Technical Reports. With the OGS occurrences a total of thirty one (31) mineral locations were utilized to determine TVM's (Figure 11), overleaf.

The majority of the occurrences are located in the central part of the property which has been extensively drilled (Figure 12).

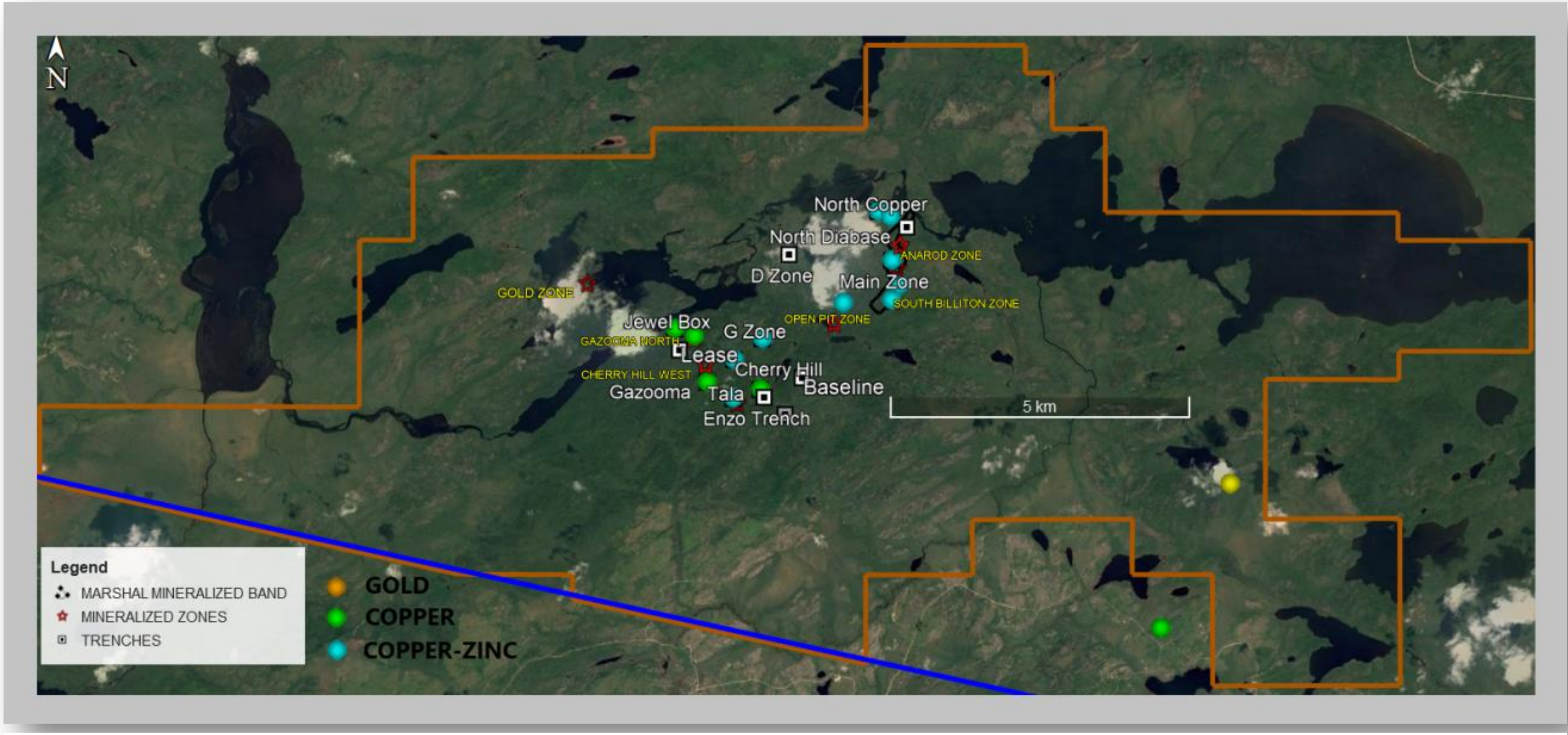

Figure 11: Mineral Occurrences - Property Based

The majority of the occurrences are located in the central part of the property which has been extensively drilled (Figure 12)

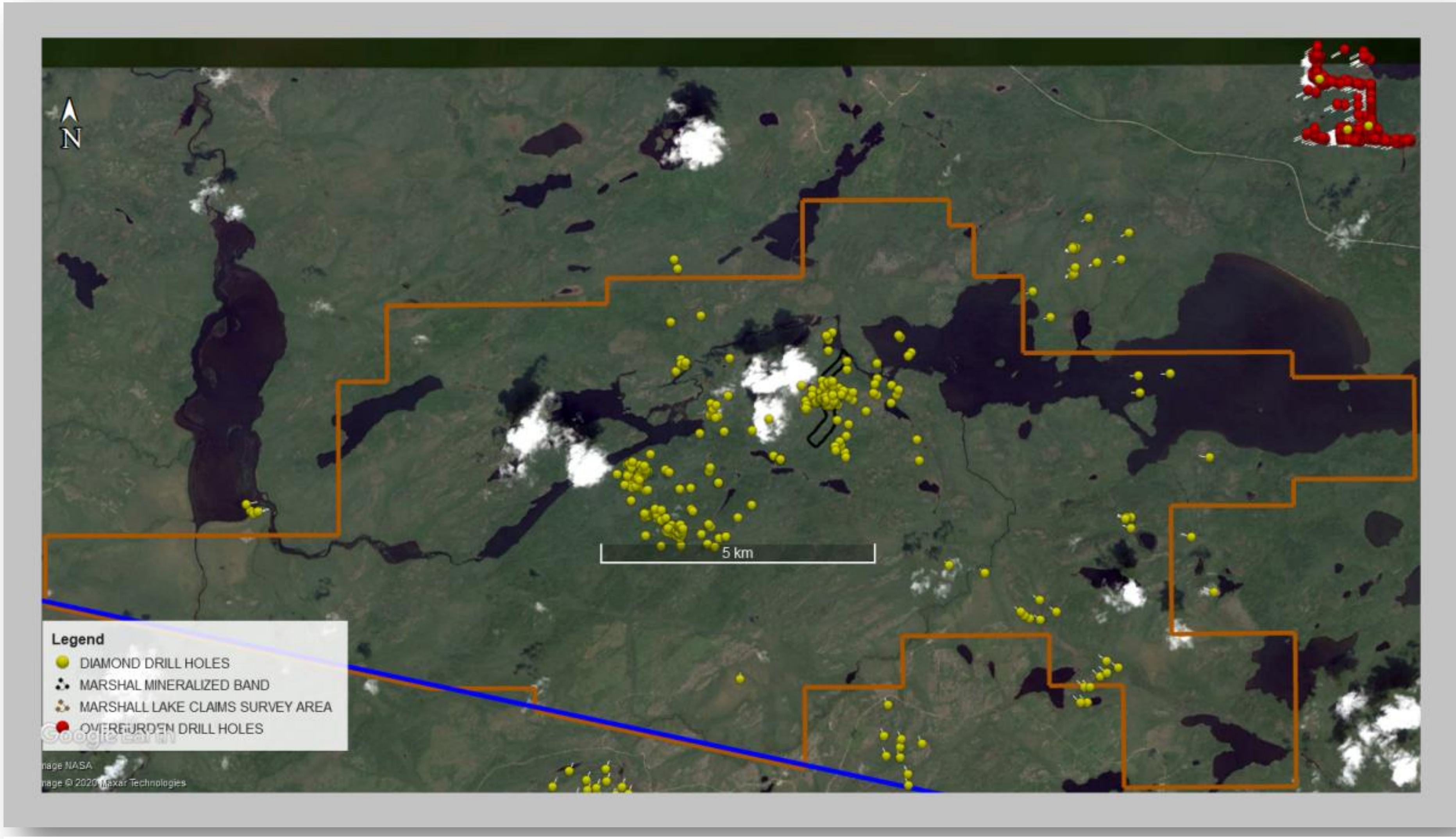

Figure 12: Marshall Lake Property Drillholes

The drilling data supplied information on the potential overburden thickness within the survey area and specifically within the property (Figure 13). Where data is available, overburden thickness is generally less than 15 metres with a narrow band of >16metres in the north eastern part of the property. Deep overburden (>16 m) occurs over the Iron Formation north of the property. Based on 40,000+ sq. kilometres of spectral surveying over Northern Ontario and Quebec, the LWIR signal is retrievable up to 16 metres.

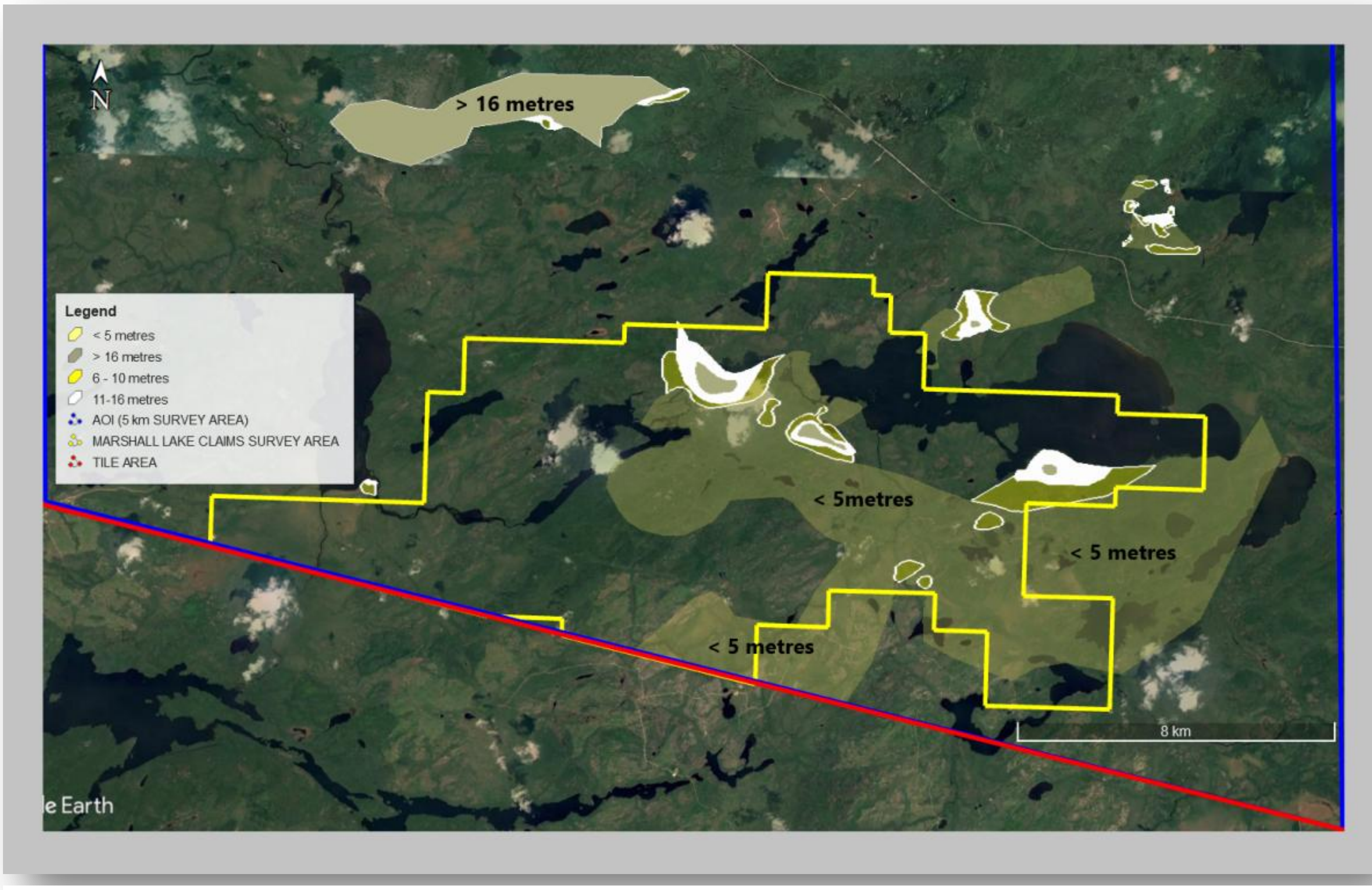

Figure 13: Thickness of Overburden (m)

The chart below details the breakdown of the property mineral occurrences which are dominantly base metals; Copper and Copper-Zinc mineralization.

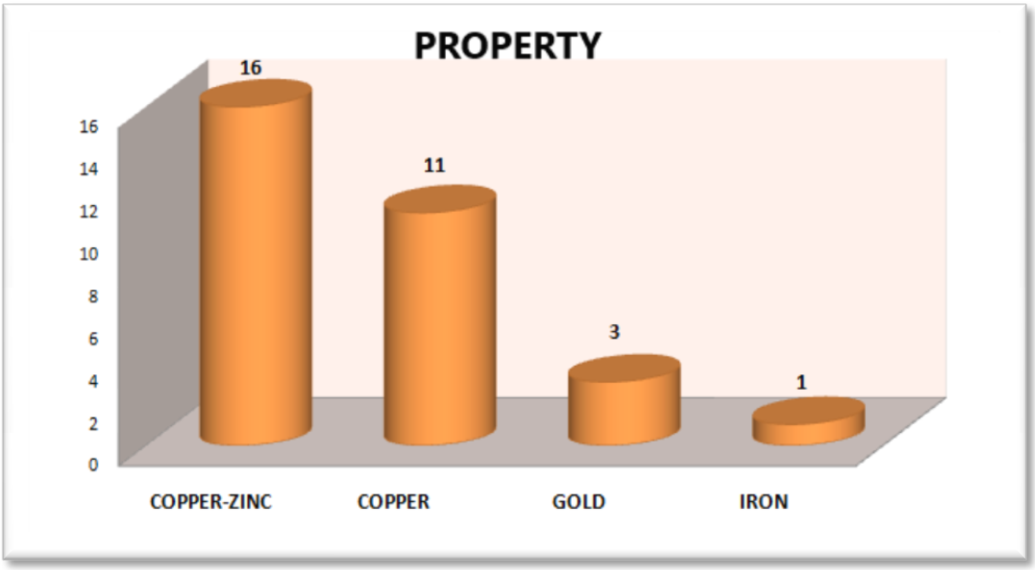

Figure 14: Histogram Plot of Property Mineral Occurrences (n=31)

Descriptions of mineralization present on the property from the 2010 and 2016 technical reports with respect to host rock(s), alteration minerals, "ore" minerals and accessory minerals are important to the interpretation of the LWIR spectral data. The relevant information from the Technical reports is summarised below:

- Mineralization appears to coincide with silica-sericite alteration. Seritisation will indicate areas of intense sodium depletion from the destruction of albite(Nielsen et al 2010).
- Biotite and anthophylite may also indicate an original VHMS mineral alteration assemblage.
- Ubiquitous sulphide disseminations in thin metamorphic garnetiferous-amphibolite (actinolite hornblende)lenses throughout the major showings
- Mineralization exists in order of abundance, pyrite, chalcopyrite, sphalerite, silver minerals, galena, gold, pyrrhotite and magnetite.
- Mineralization occurs as massive sulphide lenses, stratabound / stringer / disseminated sulphides hosted within hydrothermally altered felsic rocks

The spectral survey identified the six highlighted minerals (yellow) above plus goethite which could be oxidized chalcopyrite and cerussite a lead carbonate (silver/galena) equivalent endmember minerals as present in the survey area and the property.

Detailed descriptions of VHMS deposits, metasomatism and metamorphism of VHMS deposits all contain important information for interpretation of the Aster spectral LWIR data.

7.0 ASTER Analysis

The relatively coarse spectral and spatial resolution of Aster means that identification of specific minerals is tentative and needs to be viewed in conjunction with other exploration datasets, geological models and geochemical samples. In essence, the imagery requires extensive ground confirmation of this or any interpretation.

7.1. General

Individual LWIR endmember maps for the sixteen interpreted minerals for the survey area are to be found in Appendix I. The endmember colour patterns on both sets of the maps reflect the degree of endmember abundance from low endmember abundance (blue) to high endmember abundance (red). White areas reflect absence of the endmember.

The Aster LWIR survey mapped four metallic sulphide/oxides/carbonates in the survey area:

- Em#1, interpreted as Sphalerite (zinc sulphide) with a 99% co-ordination coefficient.
- Em#12, interpreted as Goethite (oxide) with a 98% correlation coefficient. Goethite is important as it may be indicative of mineralization. Goethite is the weathered product of sulphide minerals.
- Em#13 interpreted as Pyrrhotite (iron sulphide) with a 99% correlation co-efficient
- Em#15 equates to Cerussite (lead oxide) with a 95% correlation co-efficient

These “metallic “oxides and sulphides indicate that mineralization processes were active in the survey area. Their abundance maps can be directly used to assist in defining areas for exploration.

7.2 Endmember Patterns Associated With Property Mineralization

Each 90 x 90 m image pixel emits a thermal signal which is imaged by the satellite and it is assumed that the received 5-band signal is the sum of the thermal emittances of the material in the pixel. Thus, the sixteen (16) endmember abundances for each mineral occurrences element/commodity were extracted and the dominant endmember/mineral determined

Thus, the sixteen (16) endmember abundances for each location for the two different types of mineralization were extracted and the dominant and sub-dominant endmember minerals determined by statistical correlation for base metals in the Marshall Lake property.

The dominant and sub-dominant endmember minerals were determined for the main two types of mineralization/mineral occurrences copper (Cu), and copper- zinc (Cu-Zn) present on the Marshall Lake property (Figure 14).

The LWIR abundances over the copper mineralization/occurrences have the frequency distribution for dominant endmembers as shown overleaf in Figure 15:

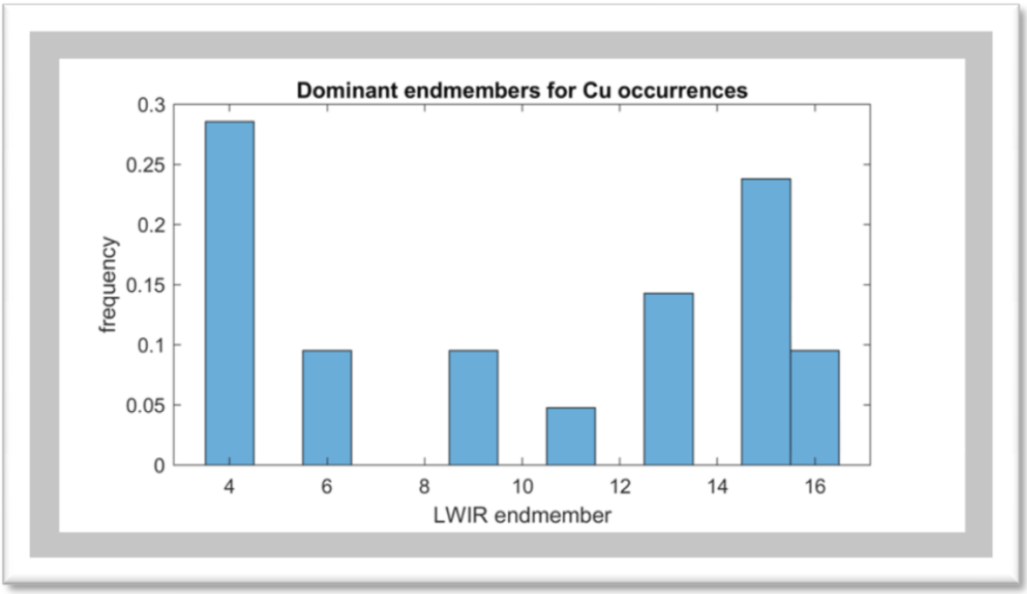

Figure 15: Histogram of Dominant LWIR Endmembers Over Cu Occurrences

Three dominant and four sub-dominant endmembers were identified over the copper occurrences. The dominant endmembers in order of dominance are:

- Epidote (Em#4; rock-forming silicate)
- Cerussite (Em#15; lead oxide mineral)
- Pyrrhotite(Em#13; iron oxide mineral)

(Epidote > Cerussite > Pyrrhotite)

While the four sub-dominant endmembers, three of equal dominance, are:

- Heulandite (Em #6)
- Sericite (Em#9)
- Biotite (Em#16)
- Illite (Em #11)

(Heulandite =Sericite=Biotite> Illite)

The LWIR abundances over the copper-zinc mineralization/occurrences have the frequency distribution for dominant endmembers as shown overleaf in Figure 16. Seven (7) LWIR endmembers were identified as dominant and sub-dominant minerals spatially related to the copper-zinc mineralization.

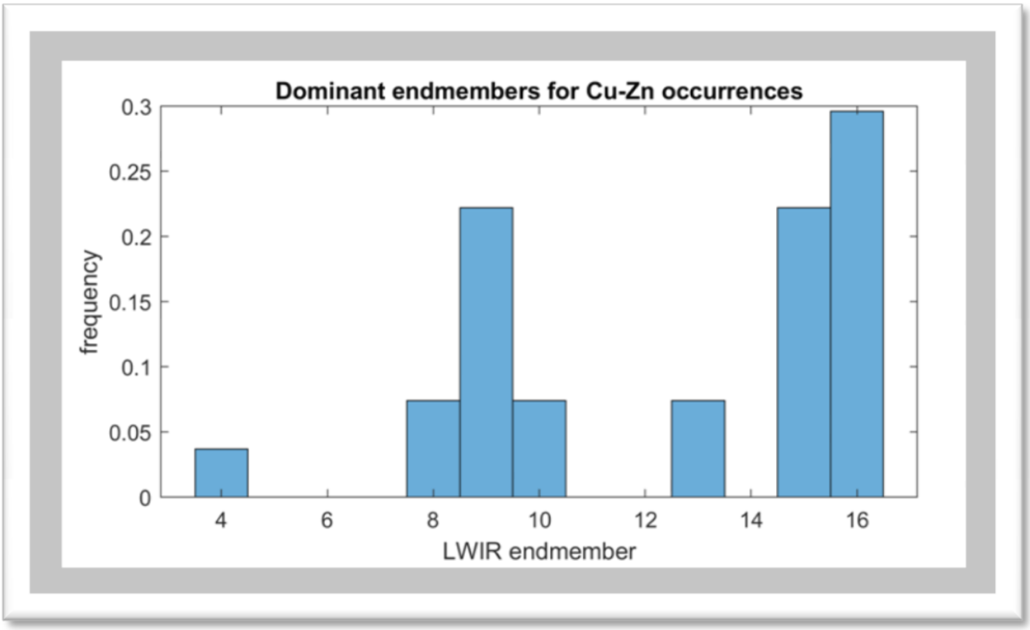

Figure 16: Histogram of Dominant LWIR Endmembers over Cu-Zn Occurrences

Three dominant and four sub-dominant endmembers were identified over the copper-zinc occurrences. The dominant endmembers are Biotite followed by Cerussite and Sericite of equal dominance:

- Biotite (Em#16)
- Cerussite (Em#15)
- Sericite (Em#9)

(Biotite > Cerussite = Sericite)

While the four sub-dominant endmembers, three of equal dominance, are:

- Pyroxene (Em #8)
- Pyrrhotite(Em#13)
- Calcite (Em#10)
- Epidote (Em#4)

(Pyroxene =Pyrrhotite = Calcite>Epidote)

The dominant mineral(s) high abundances especially metallic oxides/sulphides are the primary vector minerals that either individually or collectively can be used to locate mineralization. Overall, the dominant endmember minerals found spatially associated with the known mineralization in the area are known as Target Vector Minerals TVM’s™.

7.3 Target Vector Minerals

The LWIR Target Vector Minerals (TVM™) identified for the copper and copper-zinc mineral occurrences in the Aster Funds Ltd survey area can be used in many different ways to define target areas for mineral exploration.

By combining the various TVM's™ for the target mineralization (copper and copper-zinc) being sought, a general map can be produced for an area indicating prospectivity for like mineralization. Maps for copper and copper-zinc using the dominant TVM™ for these elements show that 60%of the property area is prospective for copper while over 90% of the property is prospective for copper-zinc.

This proprietary technique is very useful in outlining potential exploration areas for examination on a regional scale. The greater the number of mineral data points in an area the better the precision in delineating areas and identifying TVM's™.

To define specific target areas for different elements/commodities, a number of TVM™ methods are used:

- **Direct Endmember Vector Mineral.**Sphalerite and Chalcopyrite are the ores mineral for zinc and copper and as such can be used as TVM's™ for zinc and copper by outlining areas of high abundamce (Anomalous) which become target areas for exploration. Similarly, pathfinder minerals, for example Pyrrhotite a well known pathfinder mineral for nickel can be used directly to define target areas where it is in high abundance.
- **Commodity Specific Target Vector Minerals**–The TVM's™ identified for Copper and Copper-Zinc mineralization on the property from the LWIR survey are found in Section 7.2 of this report. The relevant TVM™data, for example Copper, is utilized by overlapping the TVM's™ for Copper (Epidote, Cerussite, Pyrrhotite, Heulandite, Sericite and Biotite) either as endmember outlines or anomalies Once plotted the overlap areas are colour coded (white for area of two endmember overlap, blue for area of three endmember overlap, green for four endmember overlap, yellow for five overlapping endmember area and red for six). This technique further defines potential mineral trends and target areas for exploration in geographic specific areas for Copper exploration. When combined with geology, geophysics and geochemistry then target areas for exploration can be further defined and ranked.
- **Metallic Target Vector Minerals.** Where more than three metallic oxide/sulphide/carbonate mineral endmembers occur they can be used as TVM's™ to outline target areas of metallic concentration by using the TVM™ overlap method. In the Marshall Lake survey area four metallic TVM's™ are present, Sphalerite, Pyrrhotite, Goethite and Cerussite.
- **Conceptual Target Vector Minerals.**In the absence of known mineral occurrences in a survey area but geological data suggests an environment for a commodity deposit type(epithermal gold, VMS etc) then specific minerals (ore, gangue, pathfinder, alteration etc.) associated with the particular deposit

type if present in the sixteen endmembers can be used as Target Vector Minerals (TVM's).

7.3.1 Direct LWIR Endmember Target Vector Minerals

Sphalerite, the ore mineral for zinc was identified as a LWIR endmember mineral occurring in the survey area and it can be used to define target areas for base metal exploration specifically areas of high abundance (green, yellow and red coloured areas). Seven (7) small target areas for zinc are outlined with two of the targets on the property associated with faulting (Figure 17).

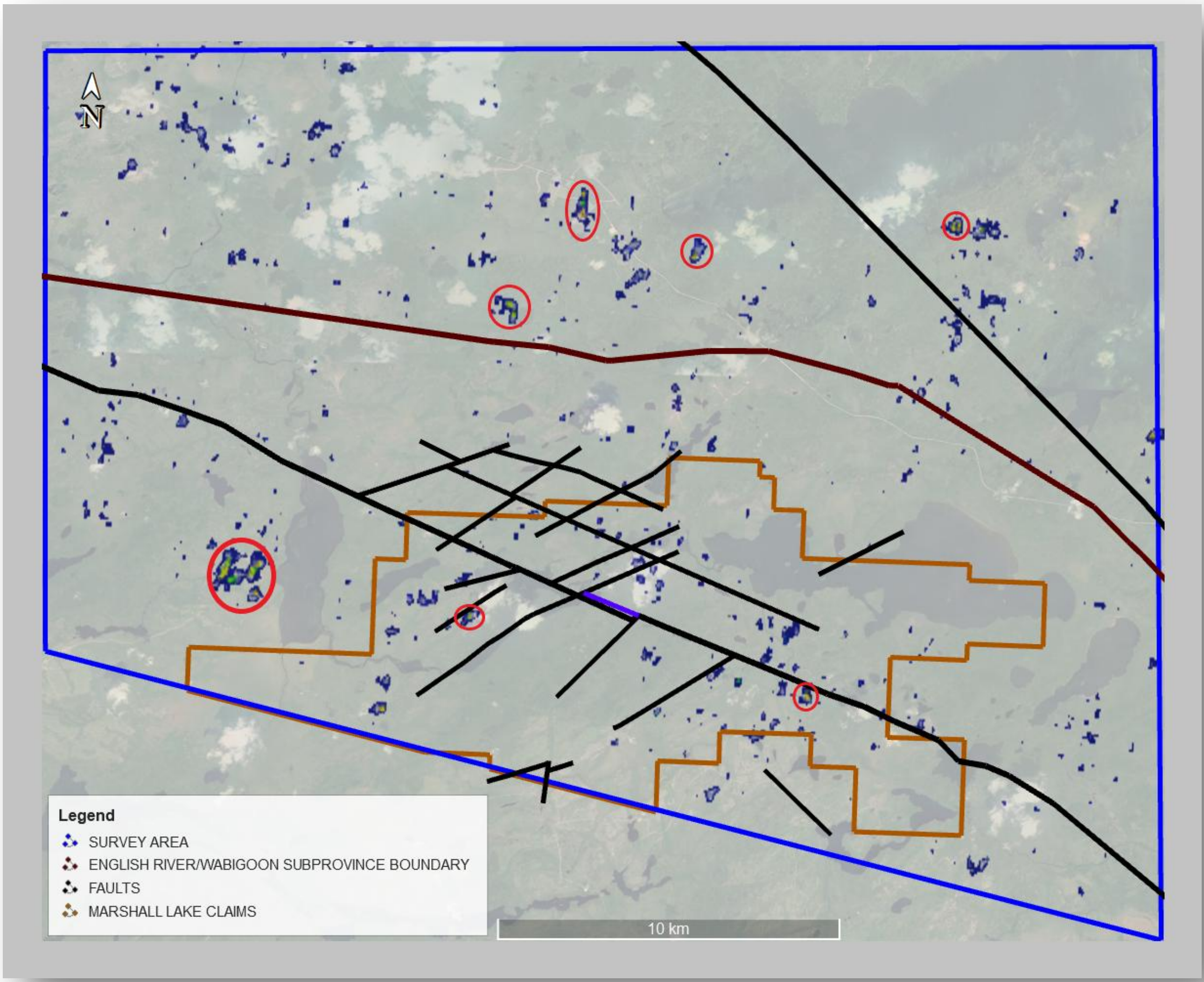

Figure 17. Sphalerite Target areas – Survey area

Pyrrhotite, a pathfinder mineral for nickel was identified as a LWIR endmember mineral occurring in the survey area and areas of high abundance (green, yellow and red coloured) are used to define target areas for base metal exploration. As an example, pyrrhotite areas of abundance are target areas for exploration (Copper/Nickel) as shown in Figure 18 below.

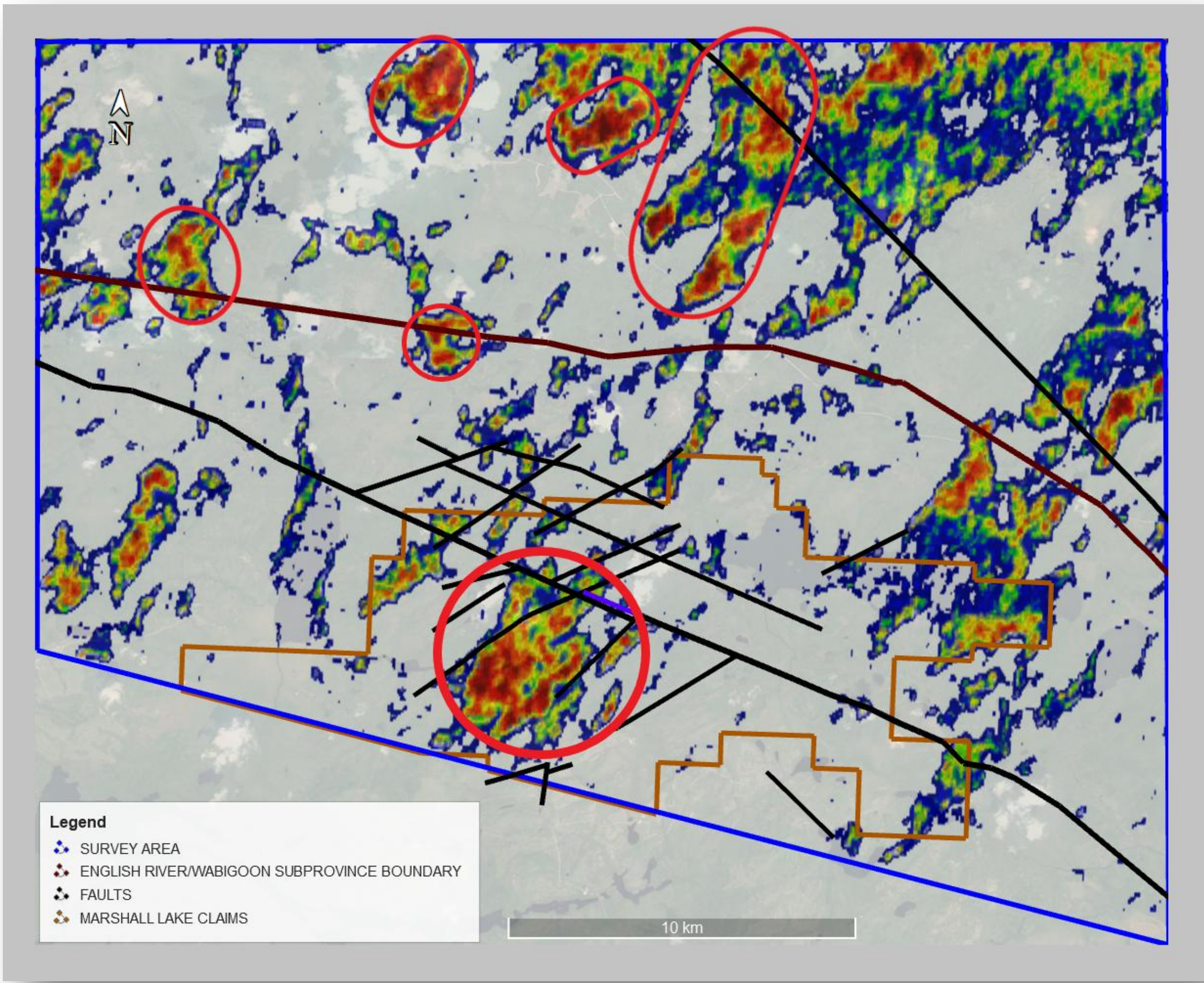

Figure 17: Pyrrhotite Endmember and Targets

7.3.2Commodity Specific Target Vector Minerals (TVM's™)

LWIR TVM's™ for two specific commodities were identified for the survey area:

- Copper
- Copper-Zinc.

7.3.2.1 LWIR Copper Target Vector Minerals (TVM's™)

Seven Copper TVM's™ were identified but only six of the endmember minerals were used as TVM's™ as Em #11, illite, has a frequency of <0.05 (Figure 15).

The order of dominance over copper occurrences is as follows:

Epidote (Em #4) > Cerussite (Em #15) > Pyrrhotite (Em #13) > Heulandite (Em #6) = Sericite (Em #9) = Biotite (Em #16)

Plotting of only the three dominant TVM's™ (Epidote (Em #4) > Cerussite (Em #15) > Pyrrhotite (Em #13)) would give broad areas of mineral overlap and trends for exploration. It is a very useful tool to cover large areas (>500sq kms) to outline areas of interest for detailed TVM™ analysis or grass roots exploration. For areas up to 500 sq. kms, plotting and processing of the six TVM™ minerals results in better defined TVM™ overlap areas with specific TVM™ trends and well defined target areas.

On the Marshall Lake property the Copper TVM™ analysis outlined a number of 3, 4 and 5 Copper TVM™ overlap areas and trends having copper mineralization potential (Figure 19).

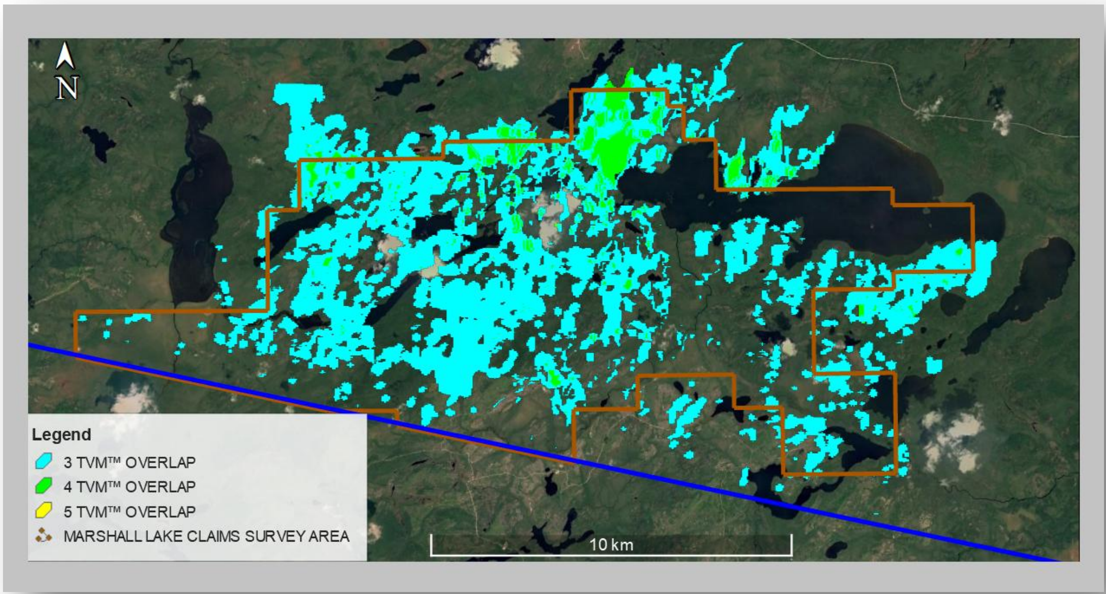

Figure 18: Copper TVM Overlap Map (3,4, and 5 TVM's)

Overall approximately 60% of the property contains 3 copper TVM™ overlap areas with no discernible trends. There are over one hundred, 4 Copper TVM™ overlap areas (green coloured) including sixteen 5 TVM™ overlap areas (yellow coloured). Plotting of the 4 & 5 TVM's™ show distinct N-S and a NNE-SSW trends (Figure 20). The majority of the 4 and 5 Copper TVM™ overlap areas occur in the northern half of the property with a number of them located outside the northern boundary of the property.

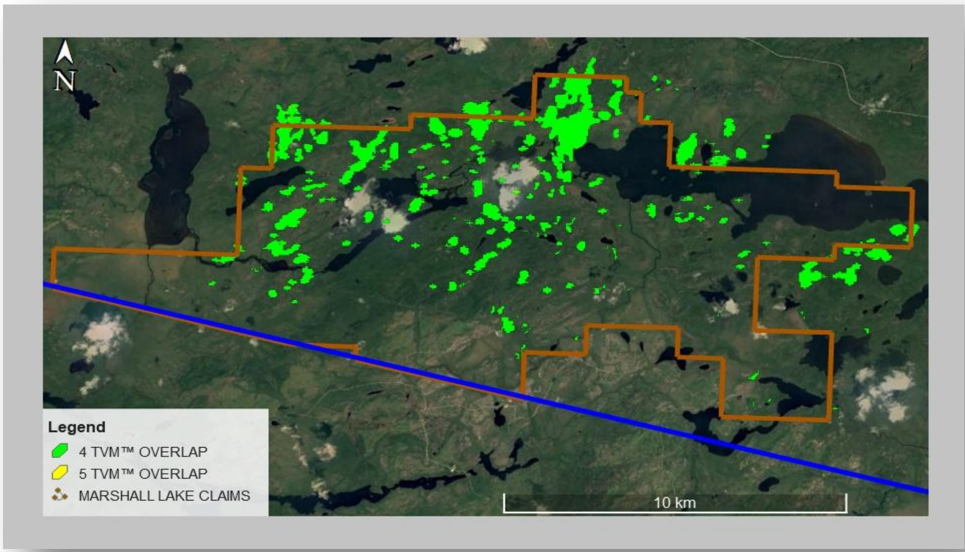

Figure 19: Copper TVM Overlap Map (4 and 5 TVM's)

Theoretically any and all of the one hundred plus 4 & 5 TVM™ overlap areas have potential for copper mineralization as they contain four/five out of the six minerals spatially associated with copper mineralization on the property. To define priority Copper target areas, those TVM™ areas with 4 and 5 Copper TVM™ overlap were selected, marked #1, #2, #3, #4, #7 and #8 on Figure 21 below. Targets #5 and #6 have only 4 TVM™ overlap areas, where the large Target #5 is associated with mapped felsic volcanic rocks at the eastern nose contact with the Summit pluton while Target #6 occurs at the intersection of two faults.

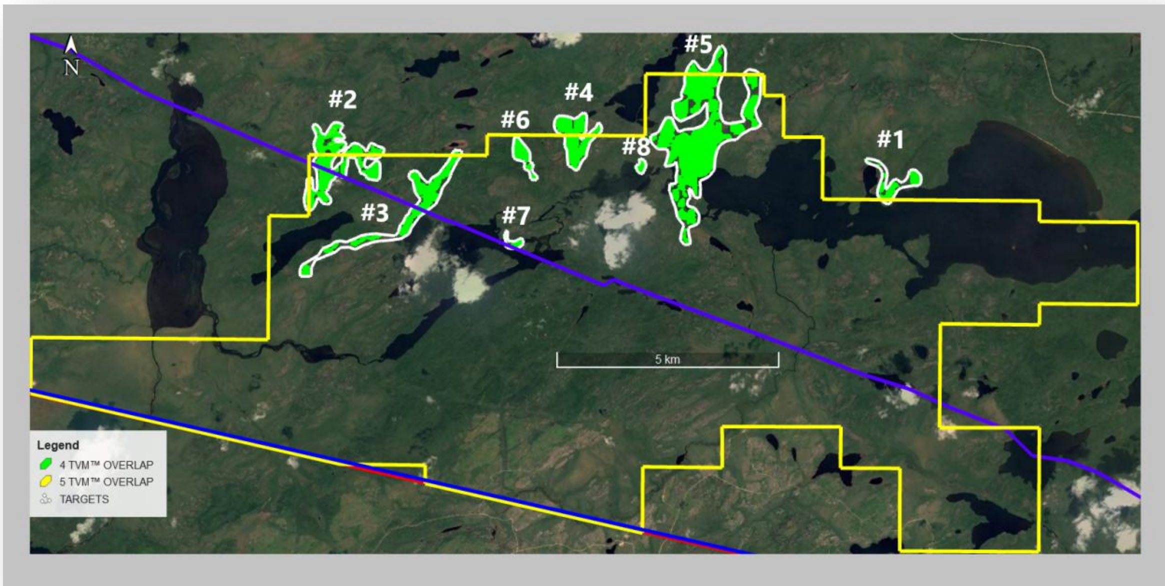

Figure 20: Copper TVM Target Map

All of the eight Copper target areas lie north of the “prominent northwest-trending fault that is locally named the Moose Lake fault which passes through the northern arm of Gripp Lake. Along the northeastern shore of Gripp Lake, adjacent to the fault, locally intense and pervasive hematization and epidotization of the rock accompany brittle fractures that parallel the fault"(Hart 2016). Target #7 sits adjacent to the Moose Lake fault at this location where the spectral survey endmember #4 (epidote) shows high epidote abundance. Epidote abundance continues eastwards to the property boundary forming a narrow east-west band paralleling the Moose Lake fault and its subsidiary north east-south west faults (Appendix I).

Geologically Targets #2, #3(northern half), #4, #5 (western edge), #6 & #8 are spatially associated with the Summit Pluton while Targets #3 (southern half), #5 (bulk of the target area) and #7 flank the southern and eastern nose boundary of the pluton associated with felsic volcanic rocks. The linear, north-east trending Target #1 is the only target completely outside of the property boundary and is located on and directly adjacent to faulted folded metasediments sandwiched between felsic volcanic rocks.

7.3.2.2 LWIRCopper-Zinc Target Vector Minerals (TVM's™)

Seven Copper-Zinc TVM's™ were identified but only six of the endmember minerals from Figure 16 were used as TVM's™. Em #4, epidote, has such a low frequency distribution over Copper-Zinc occurrences (<0.05 Chart #4) that it was disregarded as a TVM™. Endmember #1, Sphalerite, an ore mineral of zinc is in its own right a TVM™ was added to the six TVM's™ below.

The order of dominance over Copper-Zinc occurrences is as follows:

Biotite (Em #16) > Cerussite (Em #15) = Sericite (Em #9) > Pyroxene (Em #8) = Pyrrhotite (Em #10) = Calcite (Em #10).

Processing and plotting of <u>only</u> the three dominant TVM's™, Biotite, Cerussite and Sericite outlined seven broad north-north-east trending areas of 2 and 3 Copper-Zinc TVM™ mineral overlap from west to east across the property (Figure 22).

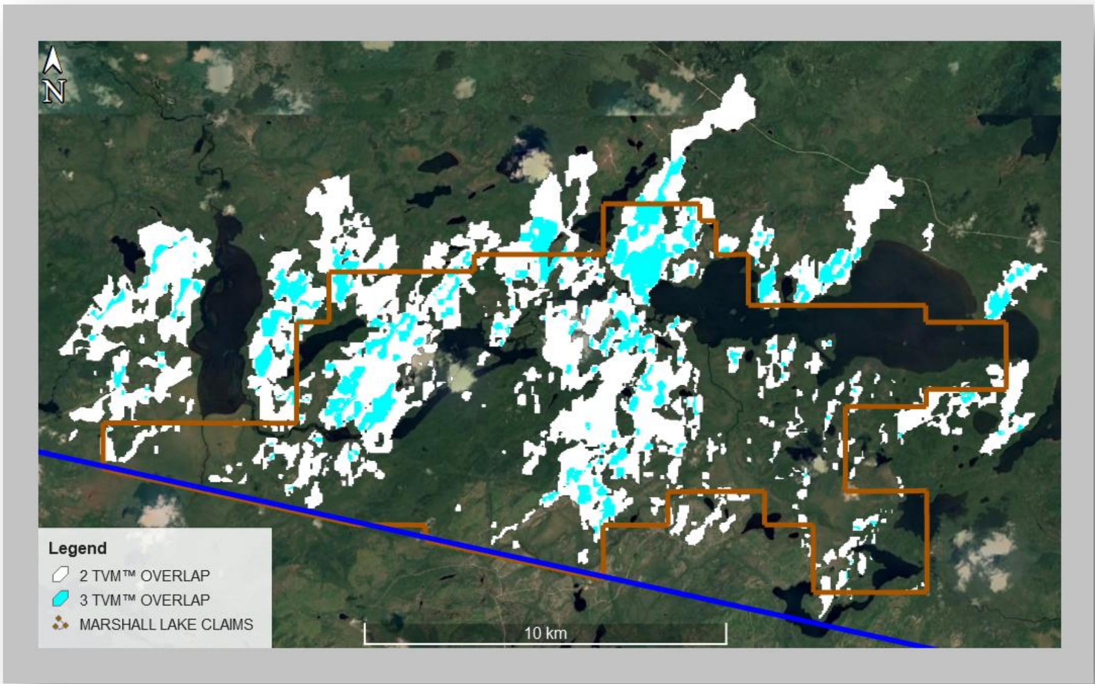

Figure 21: Copper-Zinc 2 and 34 TVM Overlap Map

Processing and plotting of the six identified Copper-Zinc TVM's™ plus the Sphalerite TVM™ resulted in a similar Copper-Zinc TVM™ overlap distribution as for that in Figure 22 above. The Copper-Zinc TVM™ overlap pattern clearly outlined a number of narrow (<200m) bands of 5 &6 TVM's™, 3 to 5 kms long trending NNE in three distinct geographic areas (Figure 23). In addition the TVM™ overlap technique identified seven individual locations in four geographic areas that contain six out of seven overlapping Copper-Zinc TVM's. Two of these areas are outside of the property and all are priority targets for investigation (Figure 23).

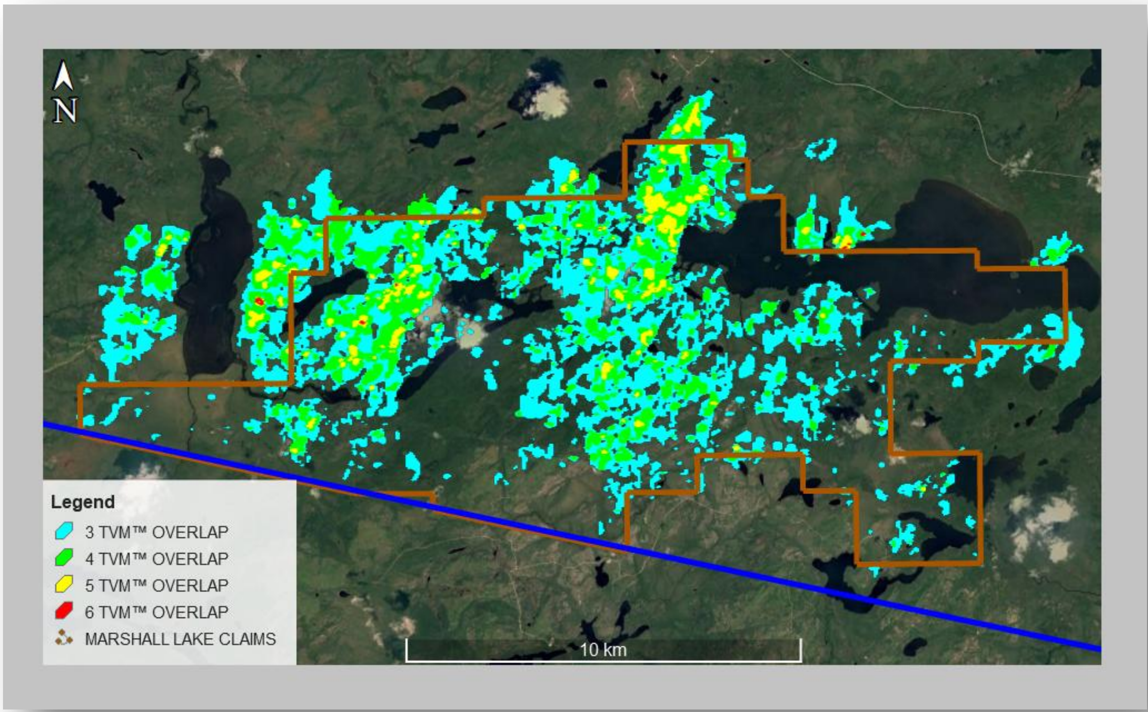

Figure 23: Copper-Zinc TVM™ Overlap Map

The six Copper-Zinc target areas are shown in Figure 24 overleaf with Targets #1 and #5 coincident with the Copper TVM™ Targets #1 and #5 (Figure 21)

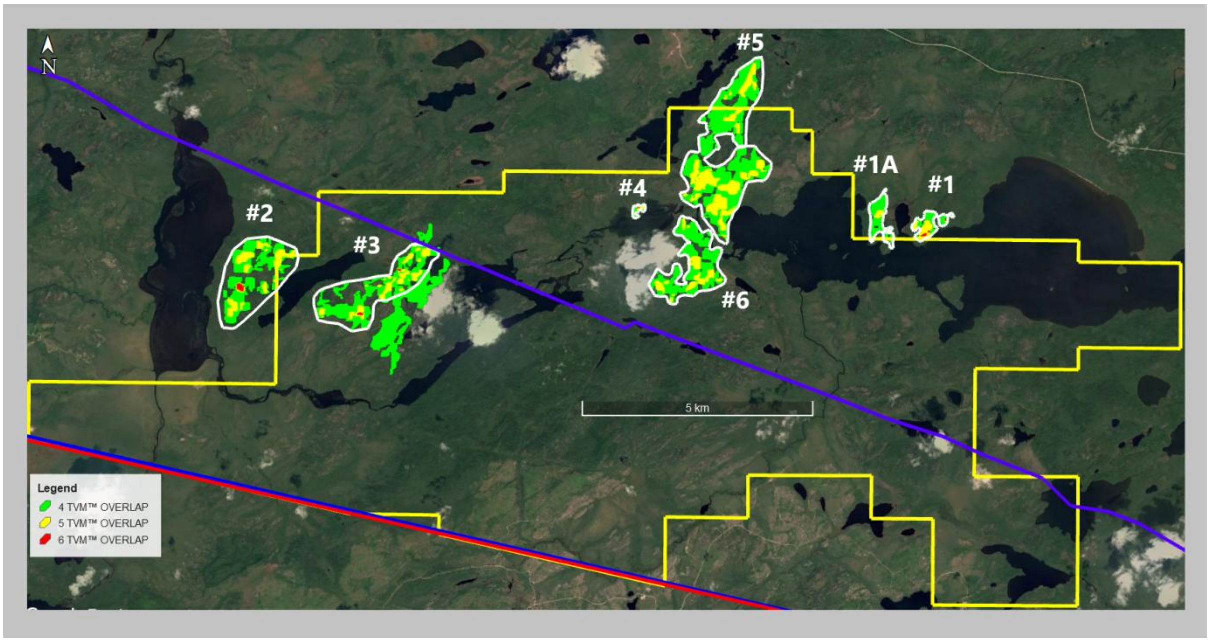

Figure 22: Copper-Zinc TVM Target Map

Details on the six Copper-Zinc targets including TVM™ overlap images, geological settings, size and airborne residual magnetic intensity are described in the pages that follow.

Target #1 and Target #1A: (45ha&50 ha)

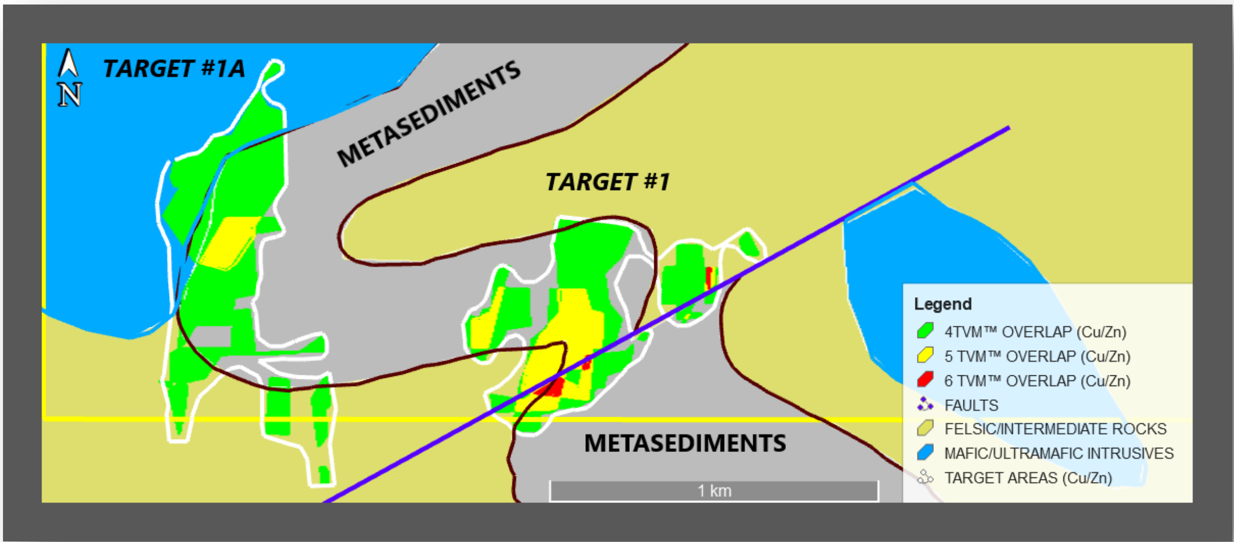

Figure 23: Geology and Targets #1 and #1A

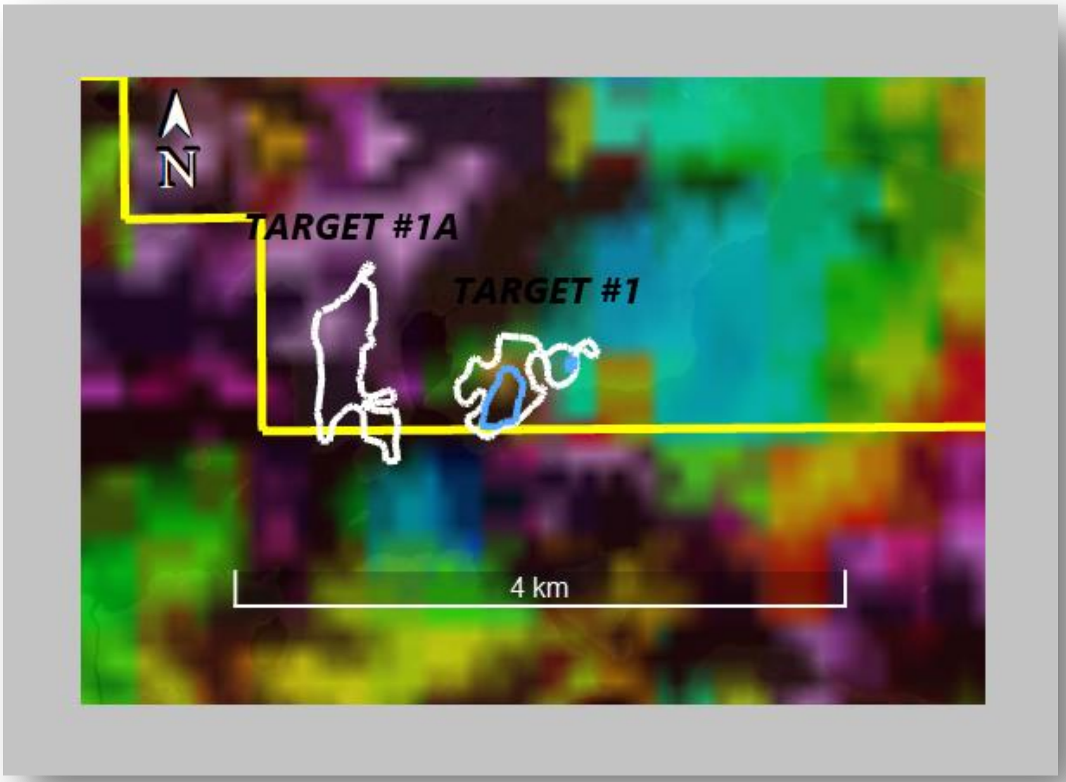

Figure 24: Residual Magnetic Intensity - Targets #1 and #1A

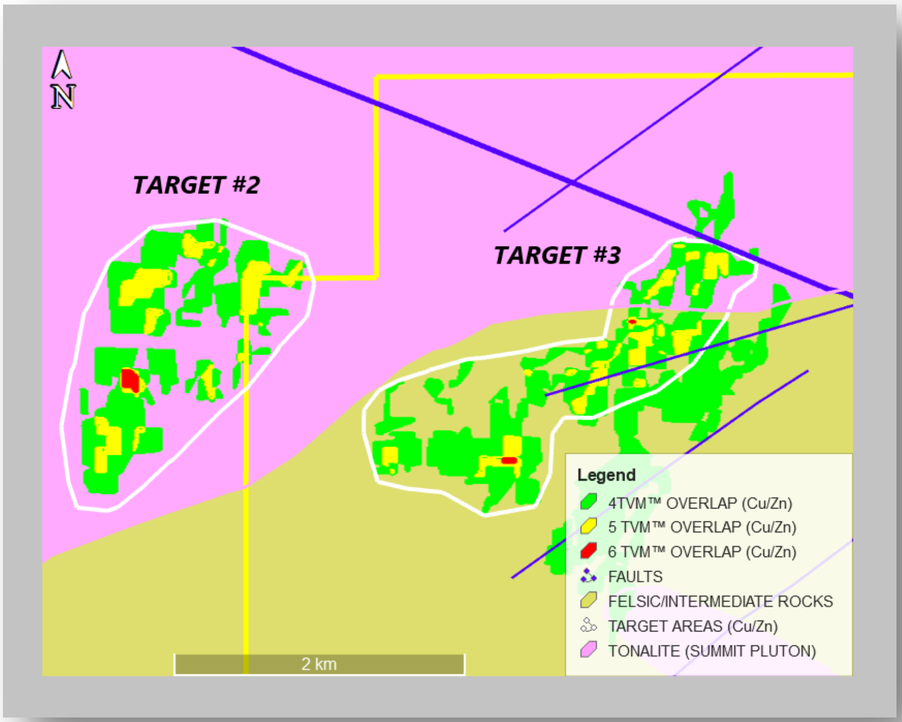

Figure 25: Geology - Targets #2 and #3

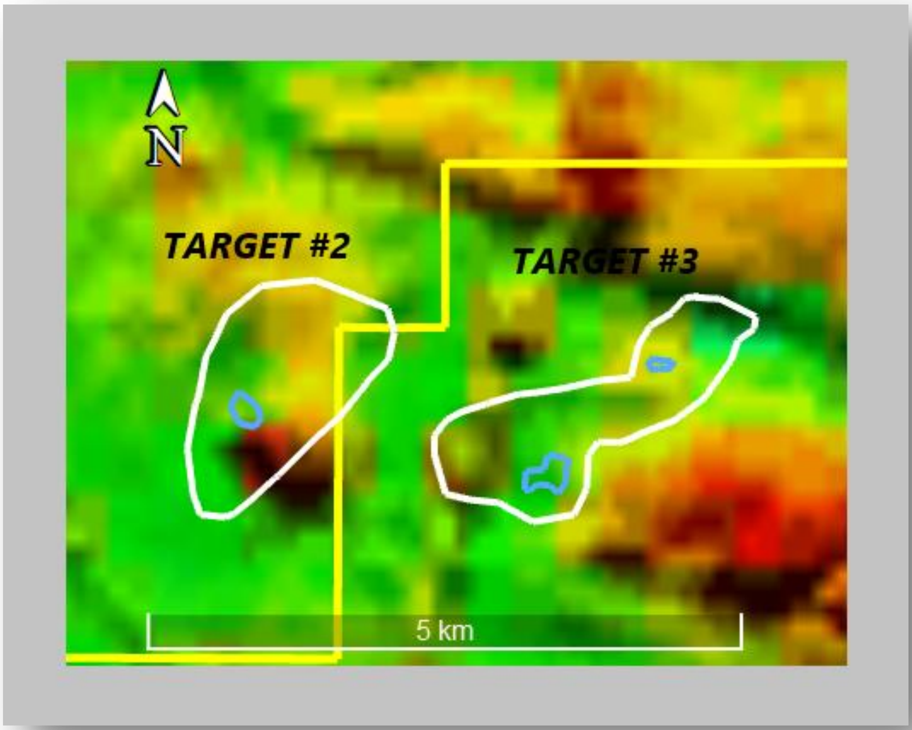

Figure 26: Residual Magnetic Intensity - Targets #2 and #3

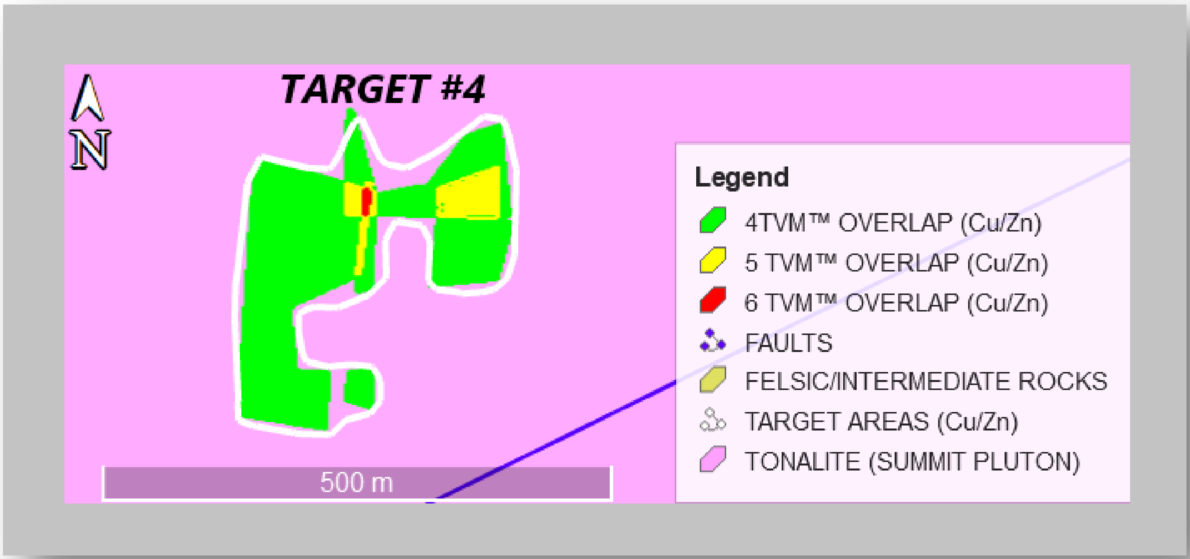

Figure 27: Geology - Target #4

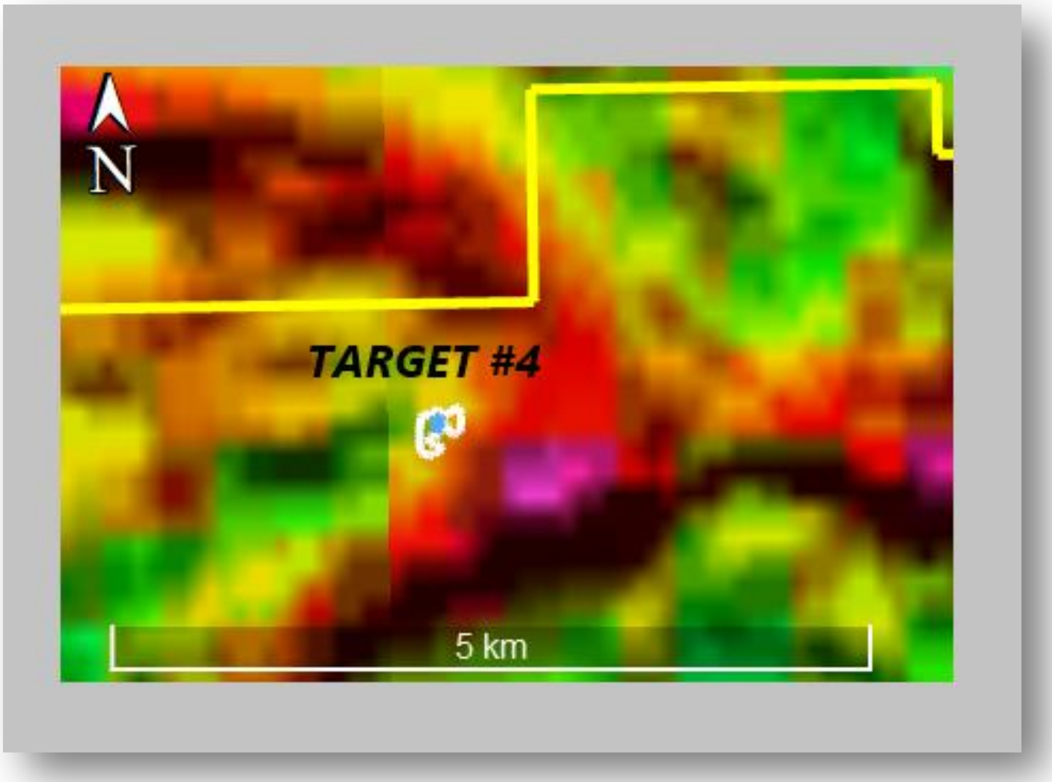

Figure 28: Residual Magnetic Intensity - Target #4

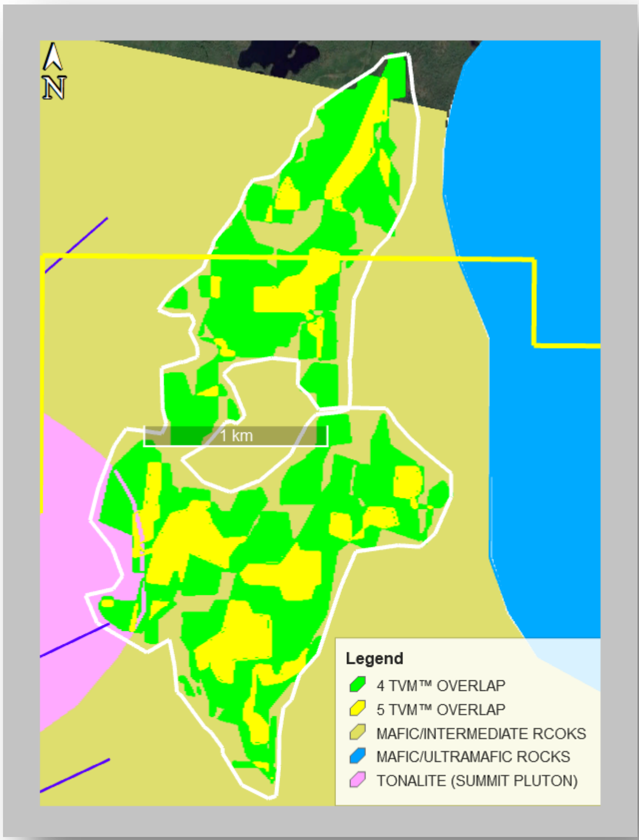

Figure 29: Geology - Target #5

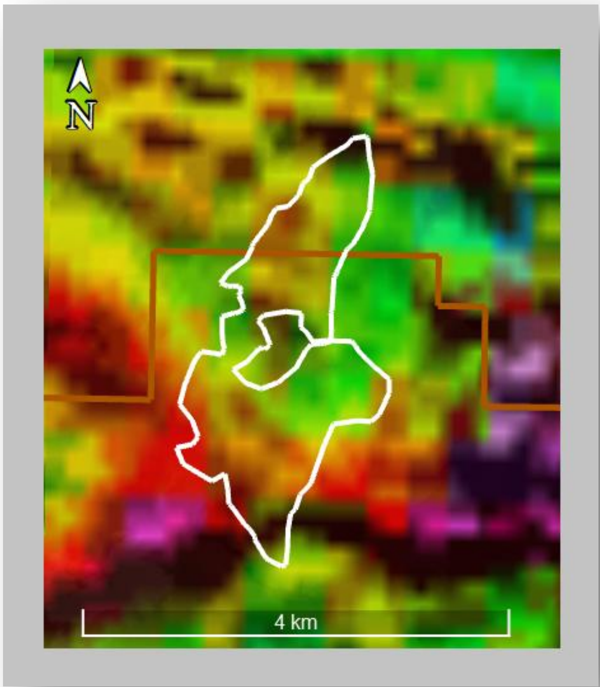

Figure 30: Residual Magnetic Intensity - Target #5

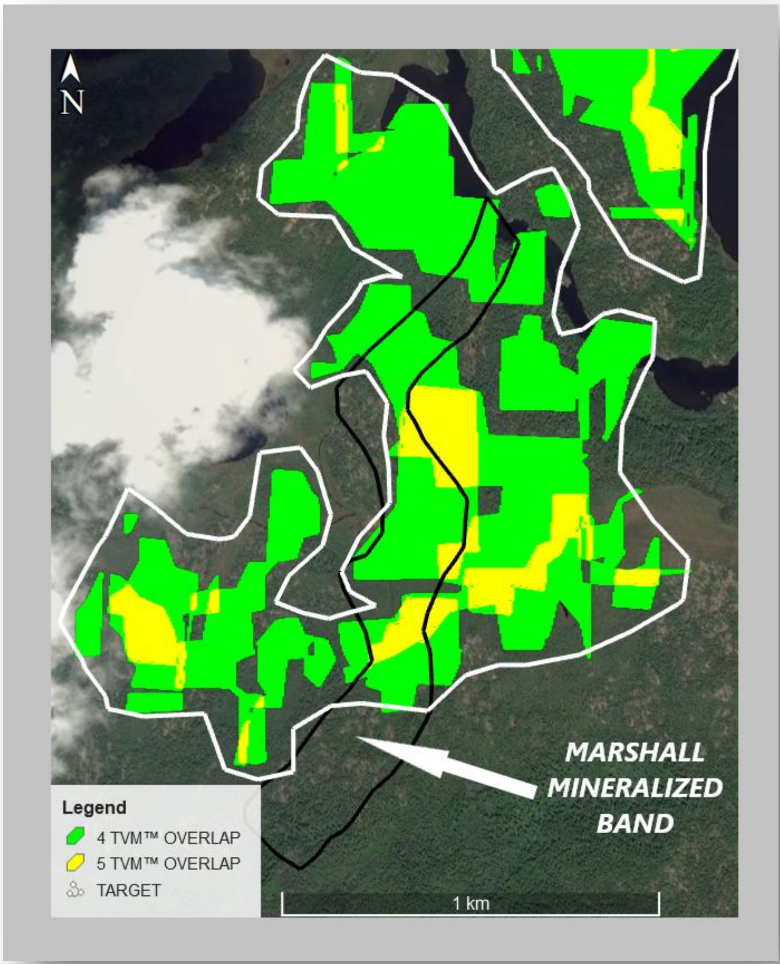

Figure 31: Geology - Target #6

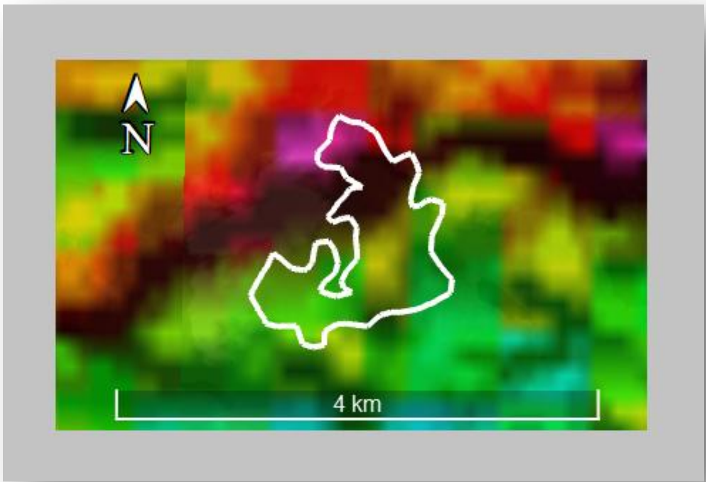

Figure 32: Residual Magnetic Intensity - Target #6

7.3.3 LWIR Metallic Target Vector Minerals (TVM's™)

Four of the sixteen endmember minerals identified in the survey area are defined as "metallics" and in order of abundance are:

Cerussite>Pyrrhotite = Goethite >Sphalerite

Two are sulphides, one an oxide and one a carbonate. Utilizing the same TVM™ overlap methodology, plotting of the metallic TVM™ distribution outlined three broad areas of metallic (sulphide/oxide/carbonate) concentrations (Figure 35 below). The red circles (5) represent areas where all four Metallic TVM's™ are present and represent target areas for investigation.

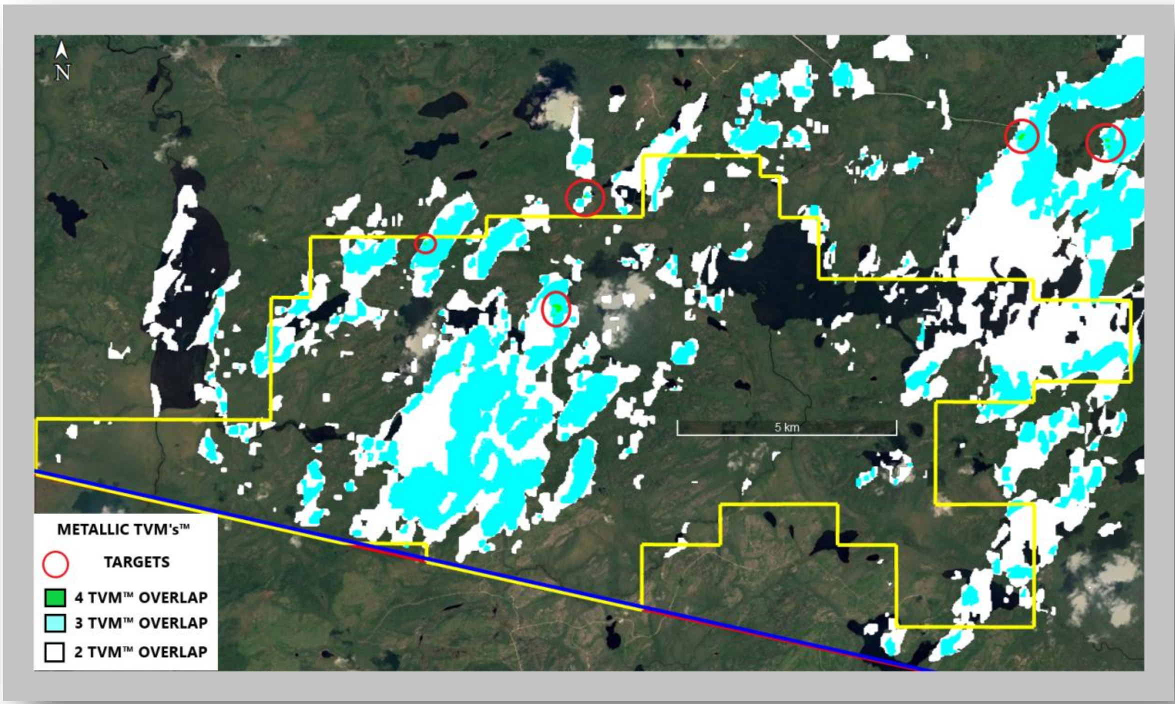

Figure 33: Metallic TVM Overlap Map

When the known mineral occurrences and excavations are plotted with respect to the Metallic TVM's™ overlap only the mineralization (Copper & Copper-Zinc) south of the Moose Lake Fault is found to be spatially associated with the Metallic TVM's™. There is no Metallic TVM™ spatial association with the mineralization north of the fault (Figure 36 overleaf). The area of mineralization was extensively drilled and based on the overburden depths recorded, overburden is less than 5 metres thus ruling out overburden depth as a reason for the difference. Difference in mineralization styles north and south of the fault or faulting of the VHSM package with its mineral zonation could account for the difference observed.

Generally the Metallic TVM's™ need not be genetically related to individual commodity mineralization and may just reflect metallic precipitation and mineralizing fluid pathways. However in this location because of the geology and VHMS mineral deposit model, it is probable that the Metallic TVM's™ reflects the VHMS mineralization system.

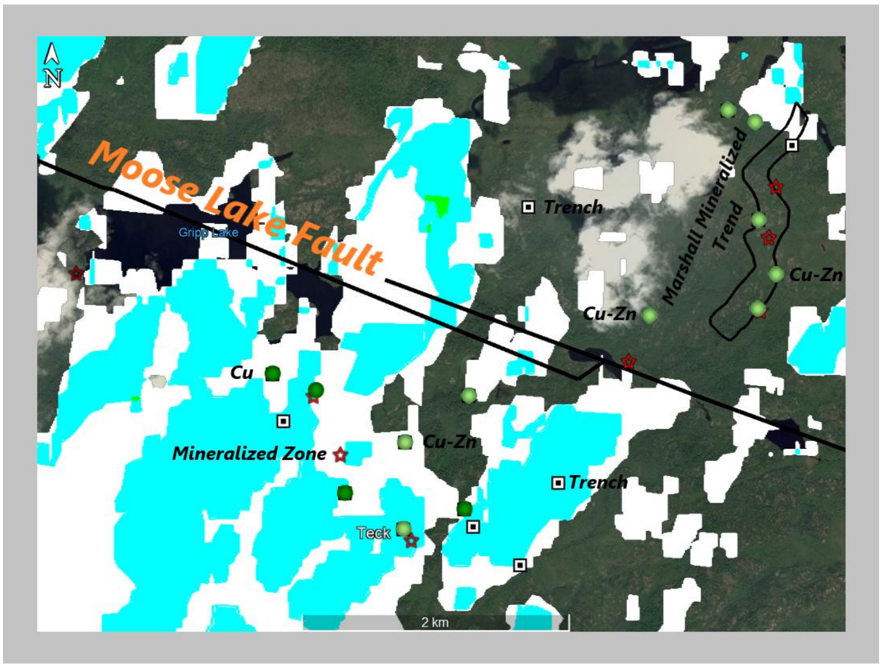

Figure 34: Metallic TVM Overlap Map with Mineralization

7.4 Exploration Target Areas

The various LWIR TVM™ overlap maps for Copper, Copper-Zinc and Metallic's for Marshall Lake outlined a number of target areas:

- Copper TVM™: 8 Targets ranging from 5 ha to 380 ha
- Copper-Zinc TVM™: 6 Targets ranging from 5 ha to 360 ha
- Metallic TVM™: 5 Targets, all less than 10ha

A number of techniques are used to develop exploration target areas utilizing and integrating the TVM™ data:

1. Combining the higher TVM's (4, 5, 6) areas for Copper and (4 & 5) for Copper-Zinc with the 3 and 4 Metallic TVM™ areas and the resulting overlap areas for Copper- Metallic and/or Copper- Zinc Metallic define potential target areas.
2. Combining the higher TVM's (4 & 5) areas for Copper with (4, 5 & 6) Copper-Zinc TVM's areas outlines target areas where the Copper/Copper-Zinc TVM's™ overlap.

For the Copper-Metallic and Copper-Zinc Metallic targets only a few small target areas were outlined. However for the Copper/ Copper-Zinc TVM™ overlap twenty three (23) individual target areas ranging in size from 0.5 ha to 190 ha were outlined. They can be grouped into 8 general exploration target areas as outlined in Figure 37 overleaf.

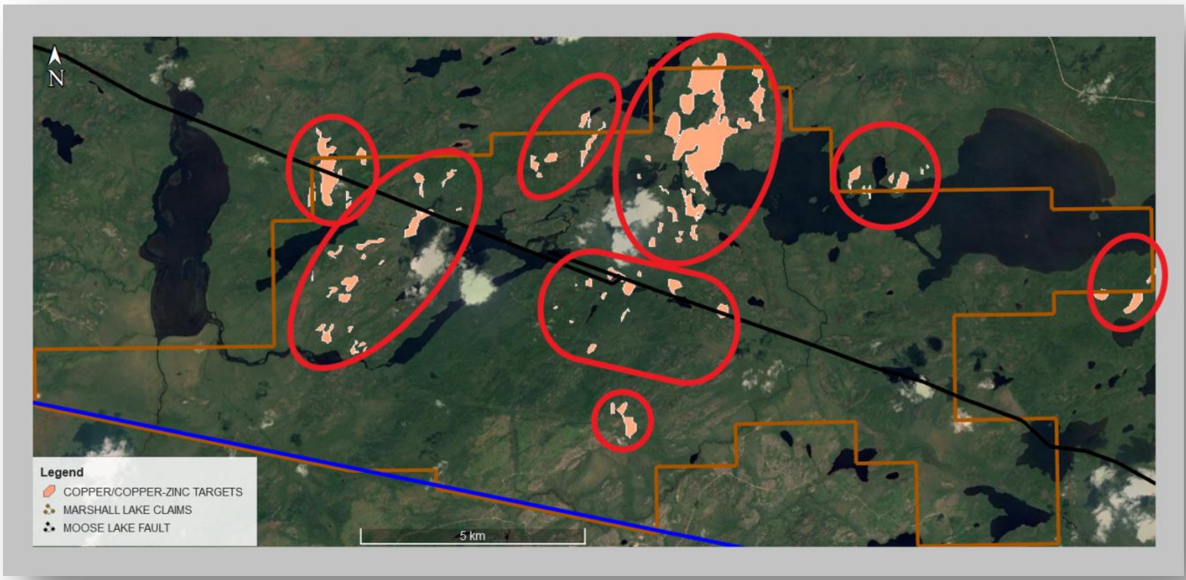

Figure 35: Cu/ Cu-Zn TVM Overlap Map - Target Areas

Four of the areas occur over mapped felsic volcanics, two over metasedimentary rocks in the east and two over the Summit Pluton in the northwest. A number of individual targets are spatially related to faults.

The above exploration targets in conjunction with the targets generated by the Copper, Copper-Zinc and Metallic TVM™ overlap should be integrated with other technical datasets in order to prioritize all the targets for field investigation.

7.5 SAR – Synthetic Aperture Radar Data

The synthetic aperture radar is potentially important in providing additional evidence for mineralization in the survey area and the SAR response over the survey area is compelling (Appendix II). However, more discussion is needed on the electromagnetic response in order to ascertain relative importance of SAR responses.

Figure 38 overleaf shows the induced polarization response of typical geological units, which can be used to illustrate synthetic aperture response parameters. The basic igneous and metamorphic rocks are seen at the top of the table. The 'blue/green response' of the 'igneous and metamorphic rocks are separated by a wide gap of conductivity from massive sulphides and graphite. The 'light yellow' of the clays and tills of glacial sediments fill the area between. The only other unit in the table that shows a strong conductivity is salt water with fresh water in the moderate zone. Water also has the effect of isolating the SAR response.

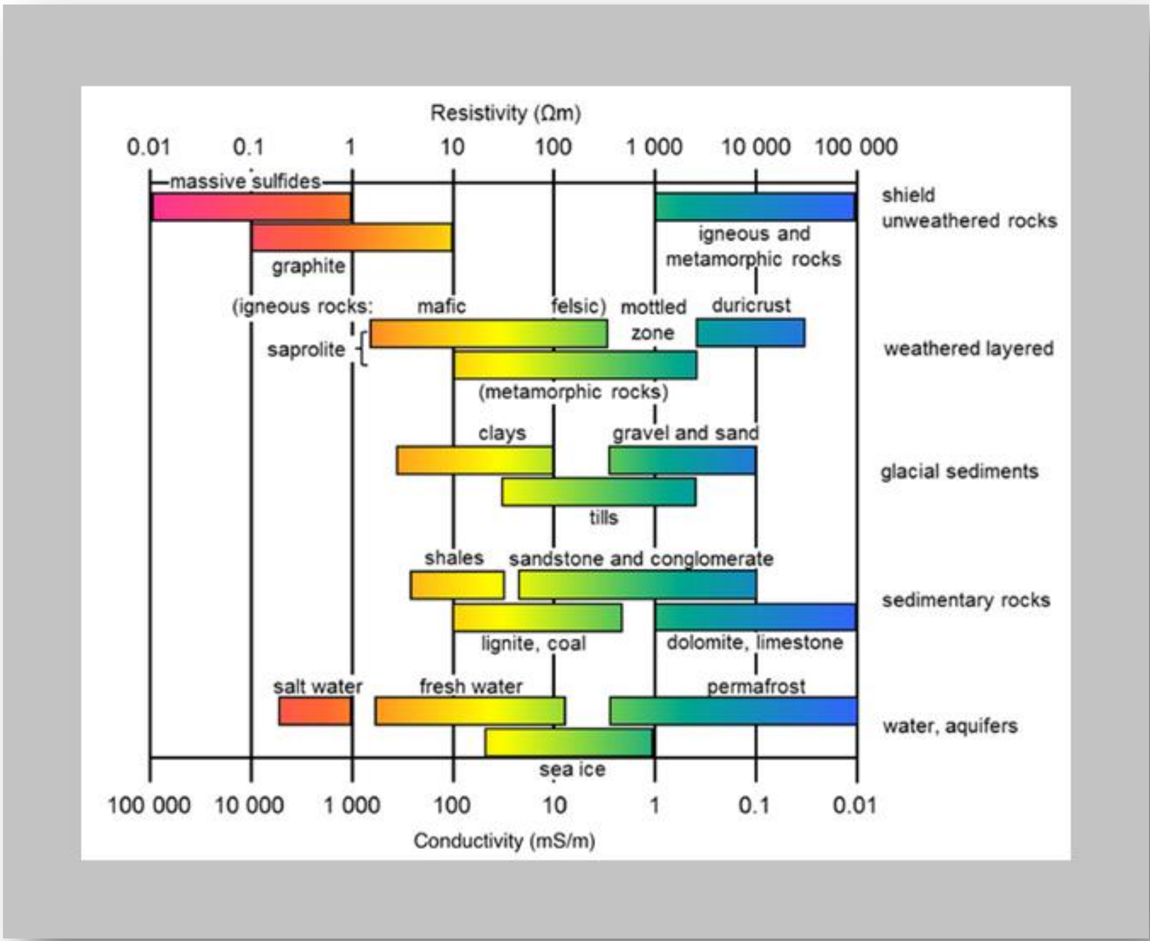

Figure 36: Resistivity and Chargeability of Various Lithologies

If the SAR response is not the fresh water that constitutes a significant percentage of the survey area and the underlying rock type is igneous and metamorphic rocks (felsic), then the SAR response can only be:

1. Some quantity of sulphide mineralization
2. Graphite
3. Glacial clays/tills

or combination of all three. The mineral occurrences are all located in areas of thin glacial overburden and the Gazooma North, Lease and Lin associated with moderate to high (green yellow & red) conductivity(Figure 39 overleaf). The majority of the remainder of the mineral occurrences are spatially associated with low (blue) conductivity perhaps “disseminated sulphide mineralization in local shears and silicified zones across the entire map area”(Hart 2016).

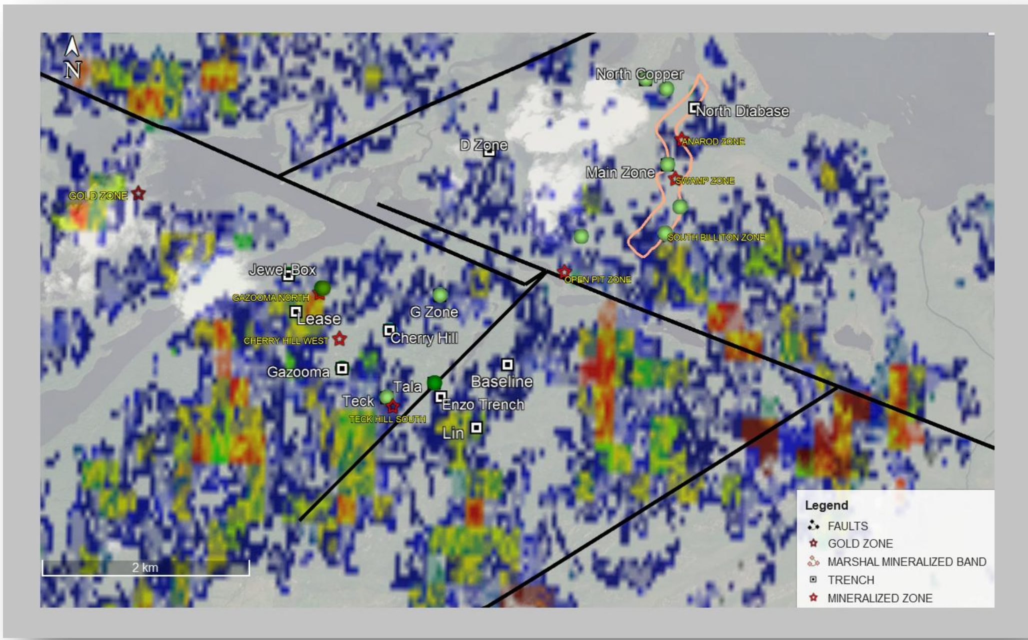

Figure 37: SAR Conductivity with Faulting and Mineralization

To highlight areas of conductivity, the moderate to high conductive areas (green, yellow & red on the map) were outlined/filled in red for the property and the eight Copper/Copper-Zinc target areas plus the Copper-Copper Zinc Target #2 area were superimposed on them. The resulting map shows that the majority of the target areas contain zones of moderate to high conductivity (Figure 40).

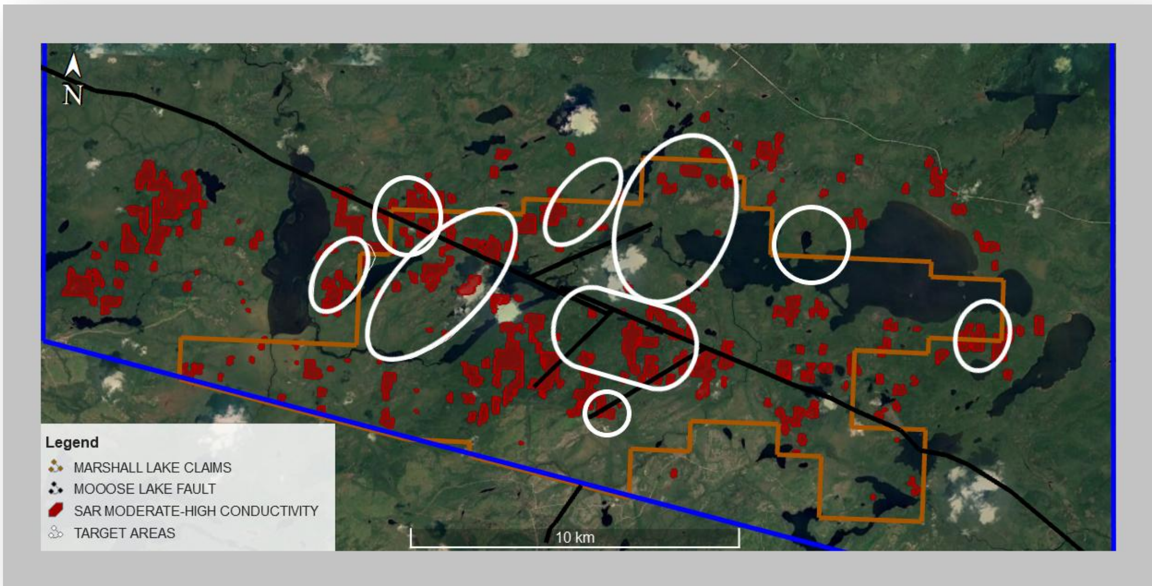

Figure 38: Moderate to High SAR Conductivity and TVM Target Areas

8.0 Conclusions

Long Wave Infrared (LWIR) Aster thermal imagery proved useful in outlining a number of Copper and Copper-Zinc target areas for exploration on the Marshall Lake property and on its northern and eastern boundary outside the staked area. Seven target areas are outside the areas of known mineralization while a further two target areas cover 60% of the known mineralization and possible mineralization extensions. LWIR surveys in Northern Ontario and Quebec, Canada have been shown by a number of surveys to be an effective tool for precious and base metal exploration applicable in glaciated terrains where variable depths of overburden exist. For the greater part of the Marshall Lake property, overburden is probably less than 15 metres.

Aster Funds Ltd LWIR Target Vector Minerals (TVM™) were identified for Copper and Copper-Zinc by determining the endmember abundance maxima over the mineral occurrences and excavations. Processing and plotting of the LWIR TVM™ data outlined a number of locations for further exploration having characteristics of the Marshall Lake VHMS style mineralization. Part or all of six target areas are outside the property and staking of these is recommended.

Various mineral abundance maps were estimated from an Aster thermal image of the Marshall Lake property and surrounding survey area (Appendix I). The mineral endmembers spatially associated with mineral occurrences, namely base metals, in the survey area were identified. Six endmember minerals, two sulphides, an oxide and a carbonate– iron, zinc and lead were identified. Goethite, an oxide is likely a weathered sulphide such as chalcopyrite. Pyrrhotite and sphalerite are in their own right pathfinder minerals for nickel and zinc. Both are found associated with the property mineralization while cerussite a lead carbonate and weathering product of galena is possibly related to the same mineralization. The mineralogy of VHMS massive sulfide consists of over 90% iron sulfide, mainly in the form of pyrite, with chalcopyrite, sphalerite and galena also being major constituents.

The mineral abundance maps produced for the survey area should be useful target vectors when correlated to other exploration datasets such as geochemistry, geophysics (gravity, magnetics, radiometrics and EM) as well as structural geology interpretations.

Application of this TVM™ technique to areas outside the Marshall Lake property survey area should produce further target areas for exploration.

The various mineral abundances presented in this report need to be correlated with geological information and fieldwork to improve the interpretation and generate other reliable exploration targets.

References

Hart, T. R. 2016. Technical Report (NI 43-101) on the Marshall Lake Property, Summit Lake Area, Sollas Lake Area, Willet Lake Area and Gzowski Township, Ontario.

Nielsen, P.,Middelton, R.S. and Bennettn, A.J. 2010. Technical Report on the Marshall Lake Property,Northwestern, Ontario.

http://copperlakeresources.com/properties/marshall-lake/

APPENDIX I

LWIR ENDMEMBER ABUNDANCE

SURVEY AREA

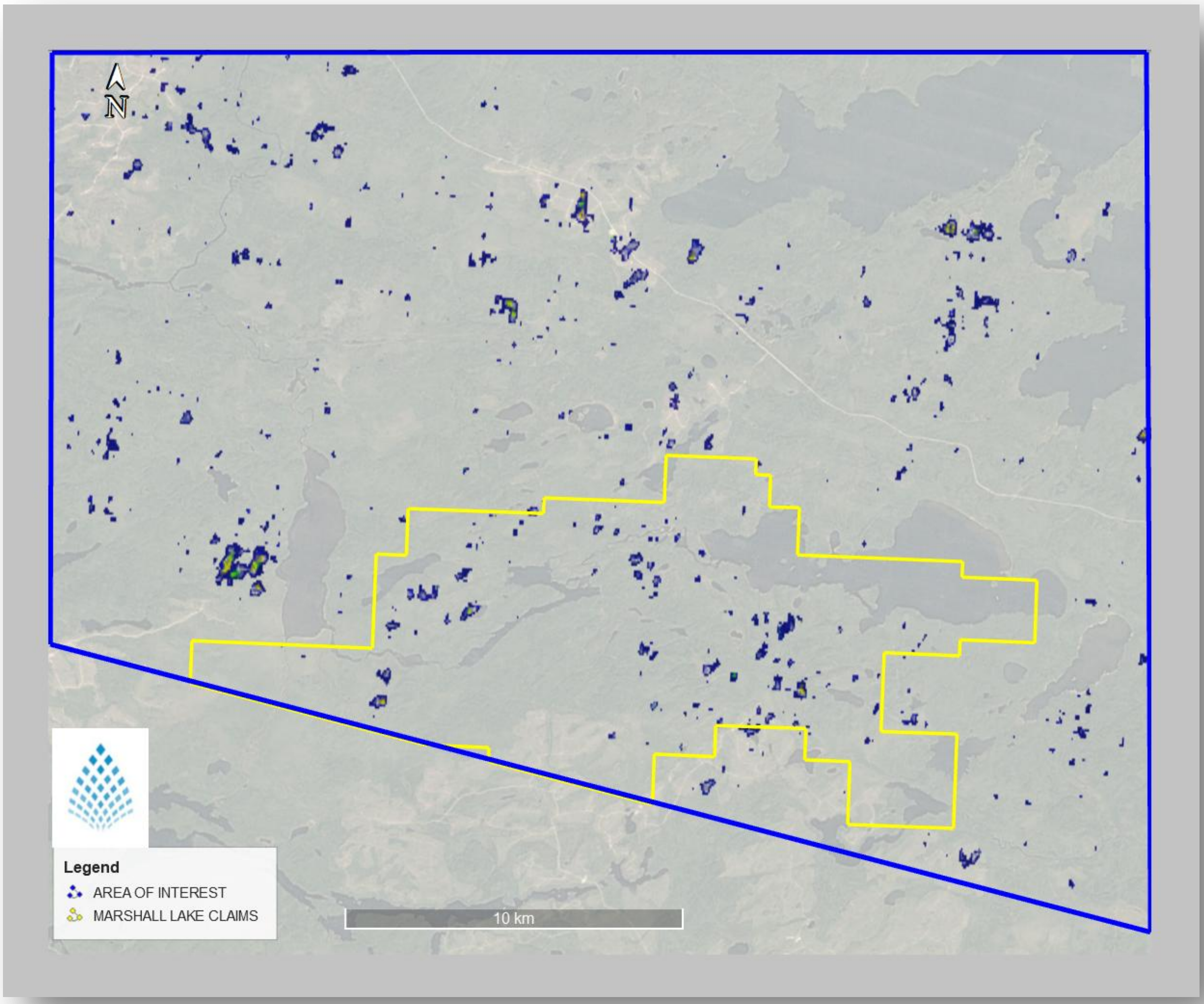

Figure 39: Endmember #1 - Sphalerite

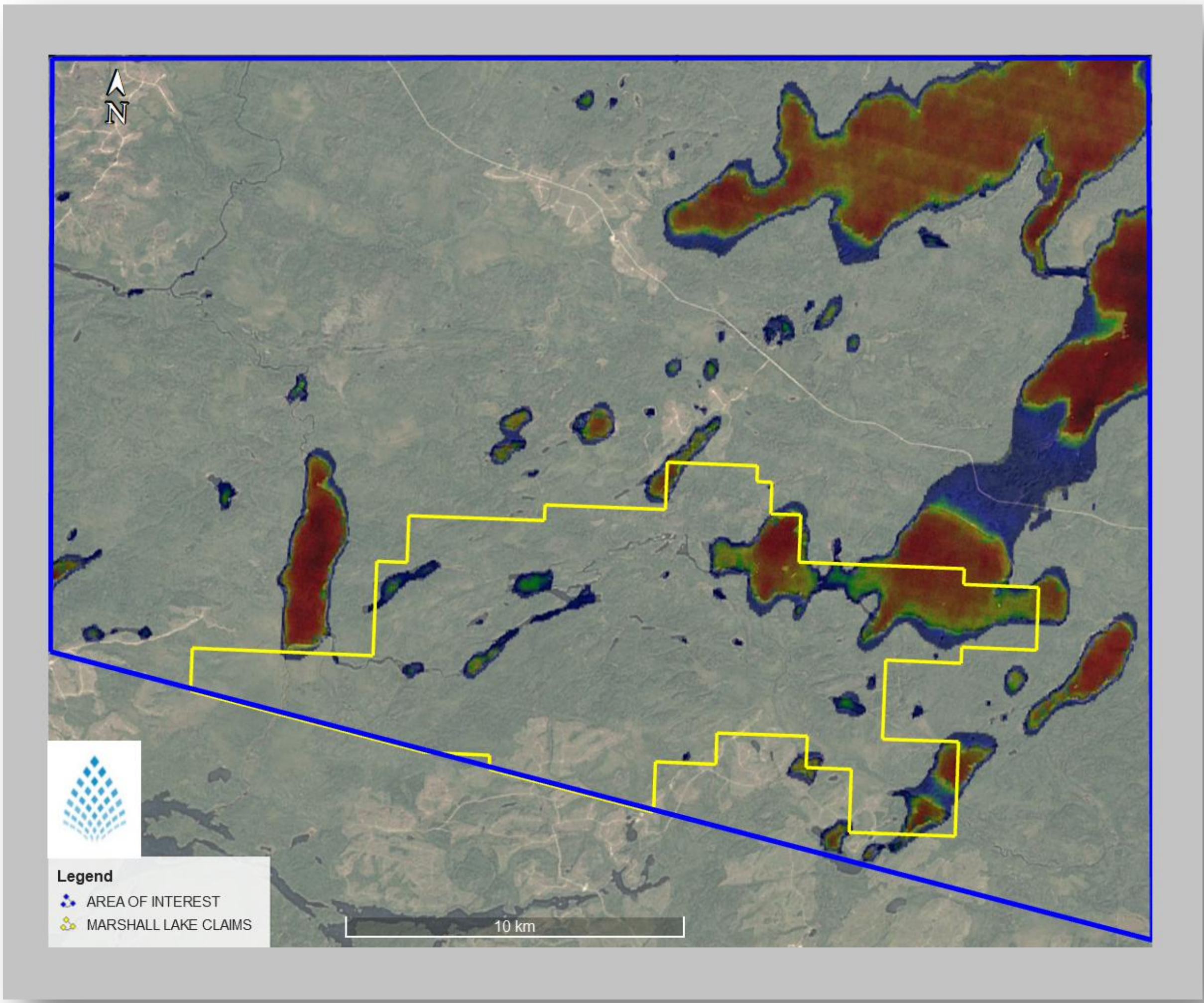

Figure 40: Endmember #2- Water

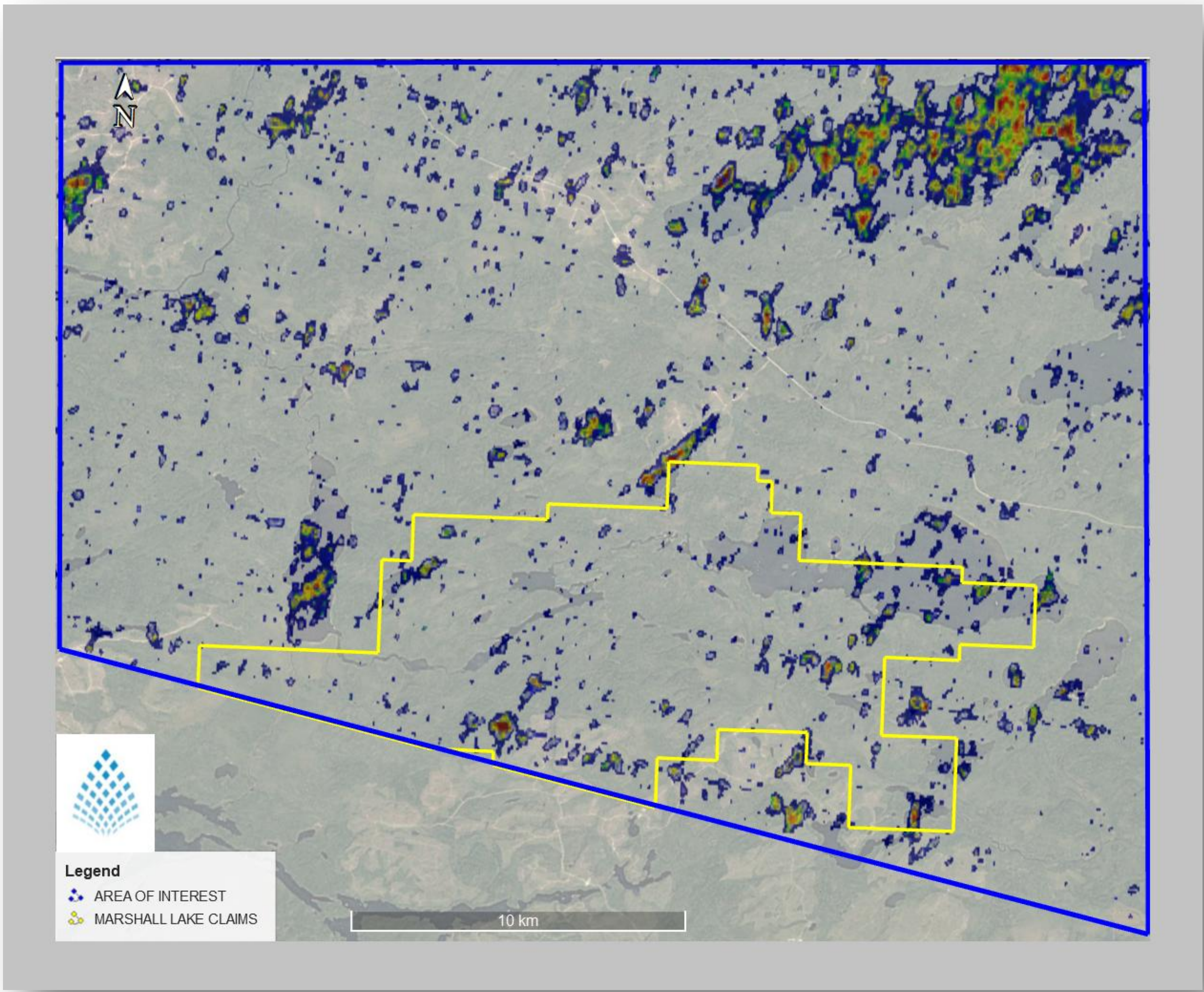

Figure 41: Endmember #3 - Feldspar

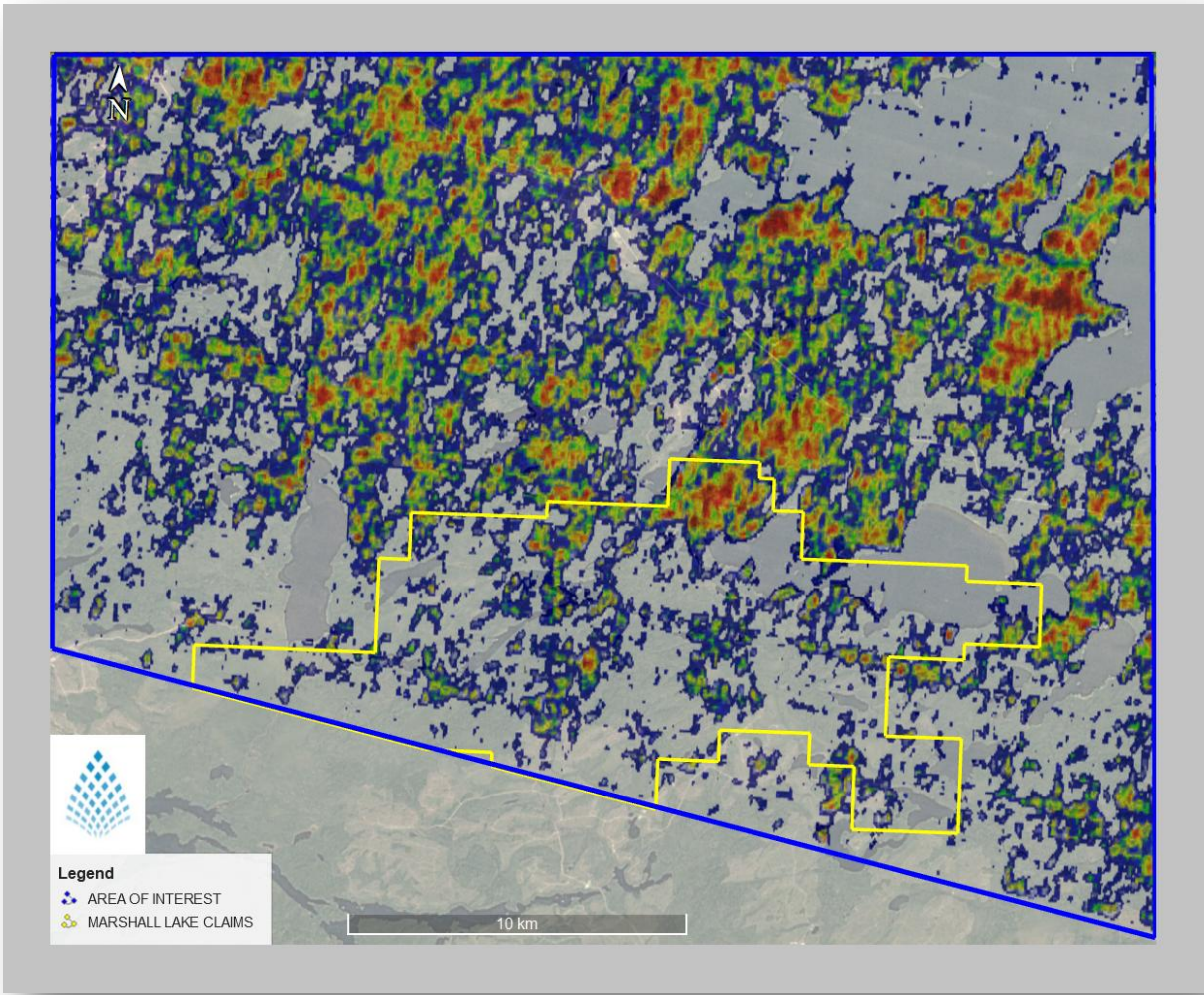

Figure 42: Endmember #4 - Epidote

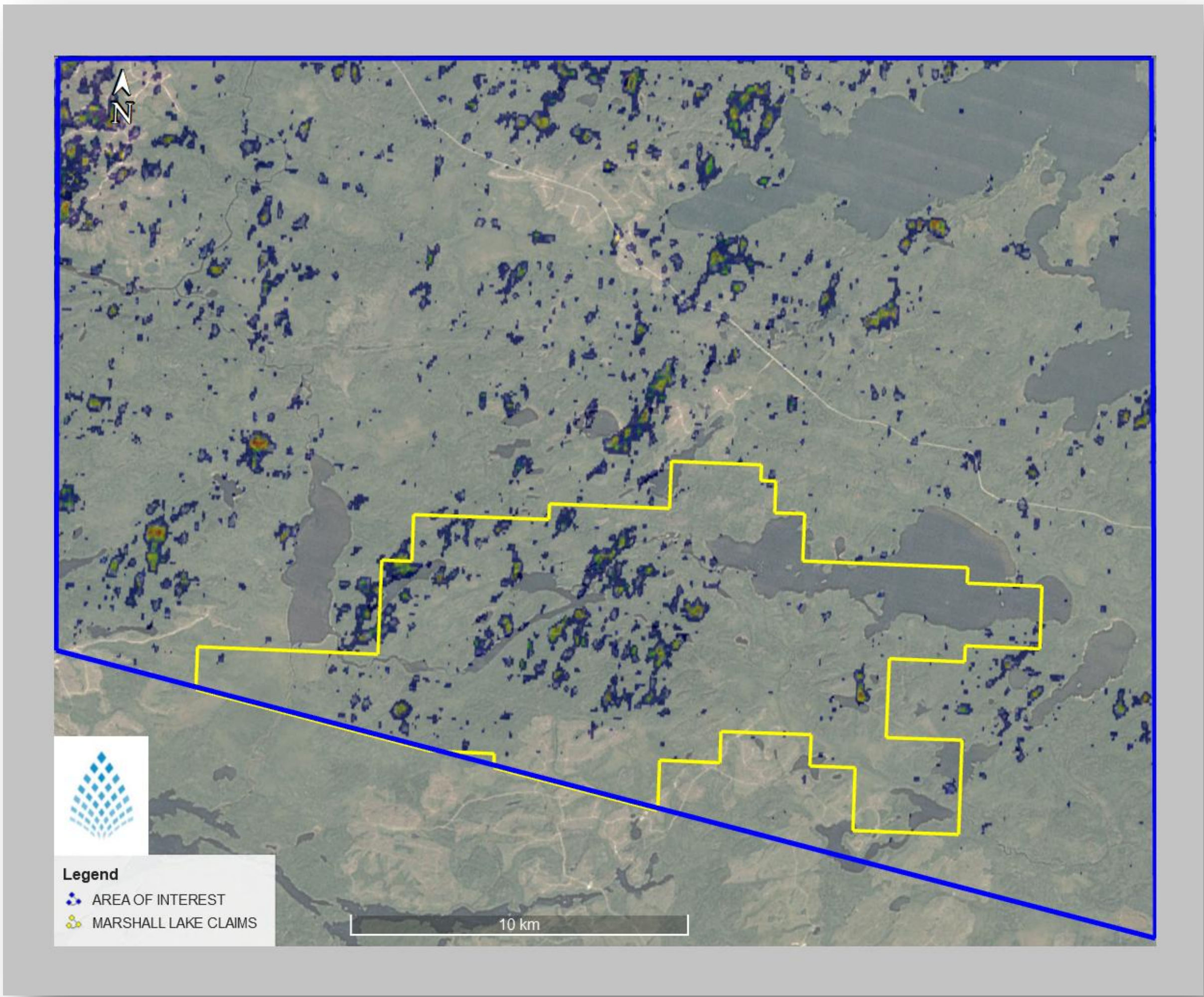

Figure 43: Endmember #5 - Garnet

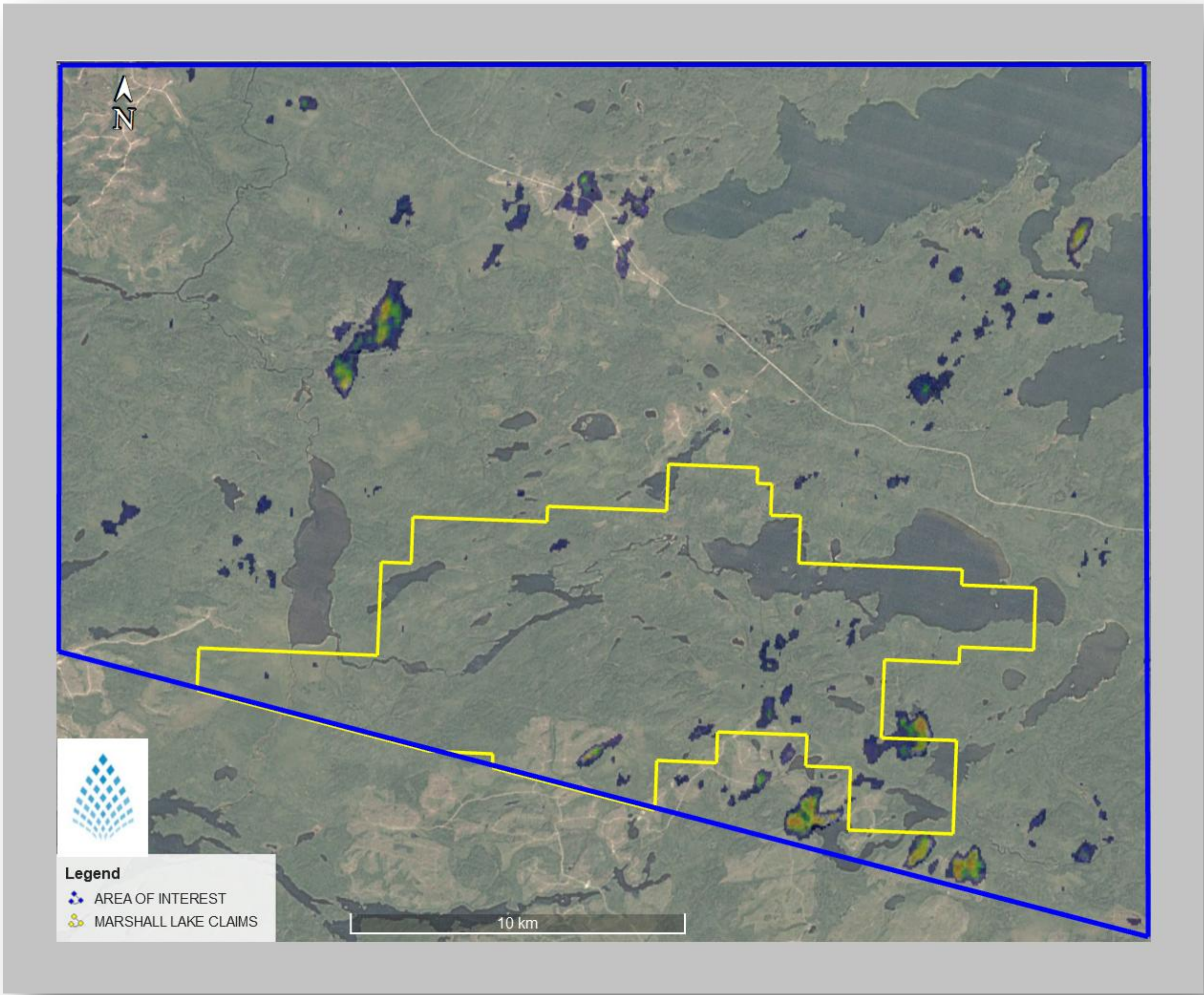

Figure 44: Endmember #6 - Heulandite

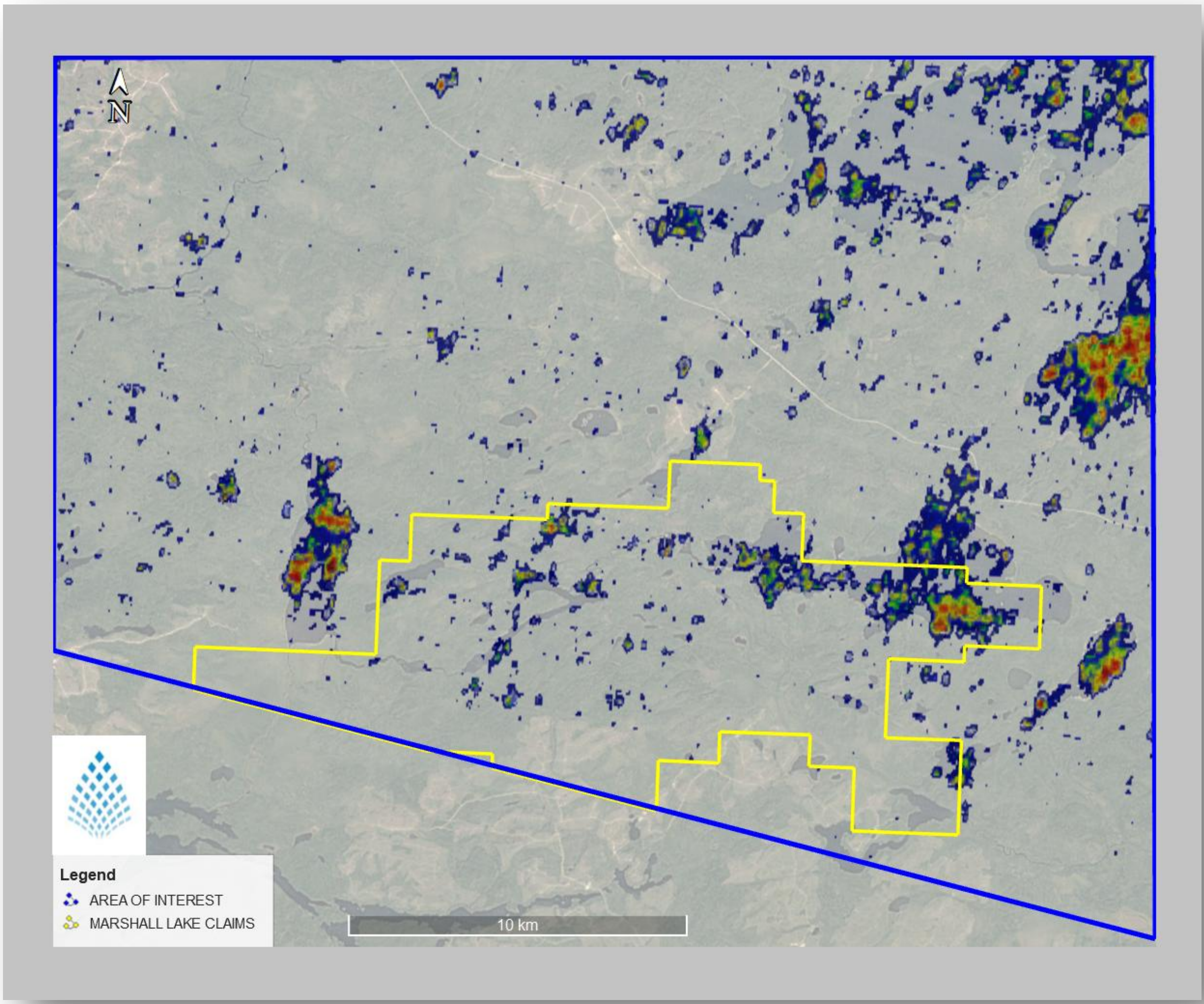

Figure 45: Endmember #7 - Quartz

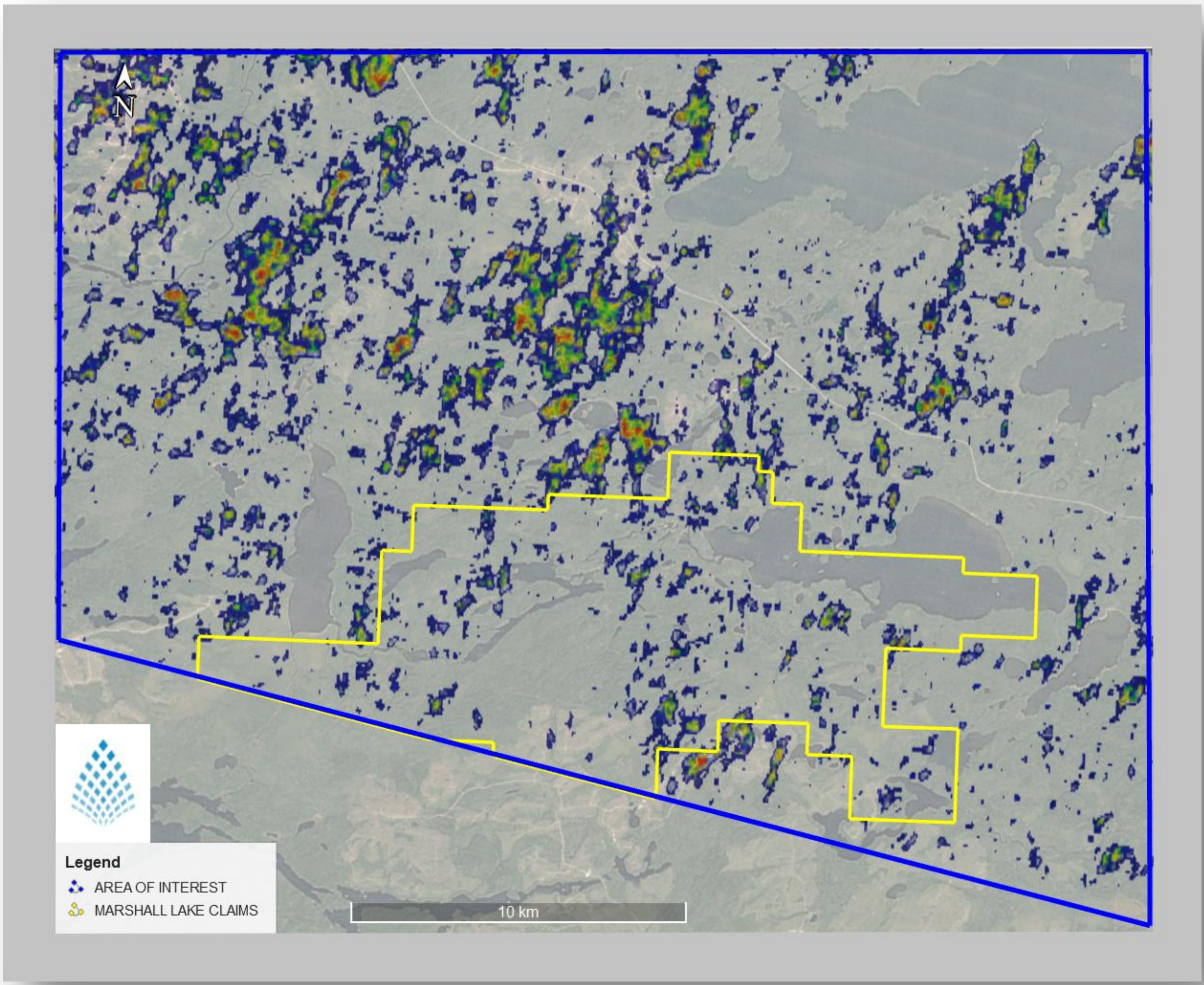

Figure 46: Endmember #8 - Pyroxene

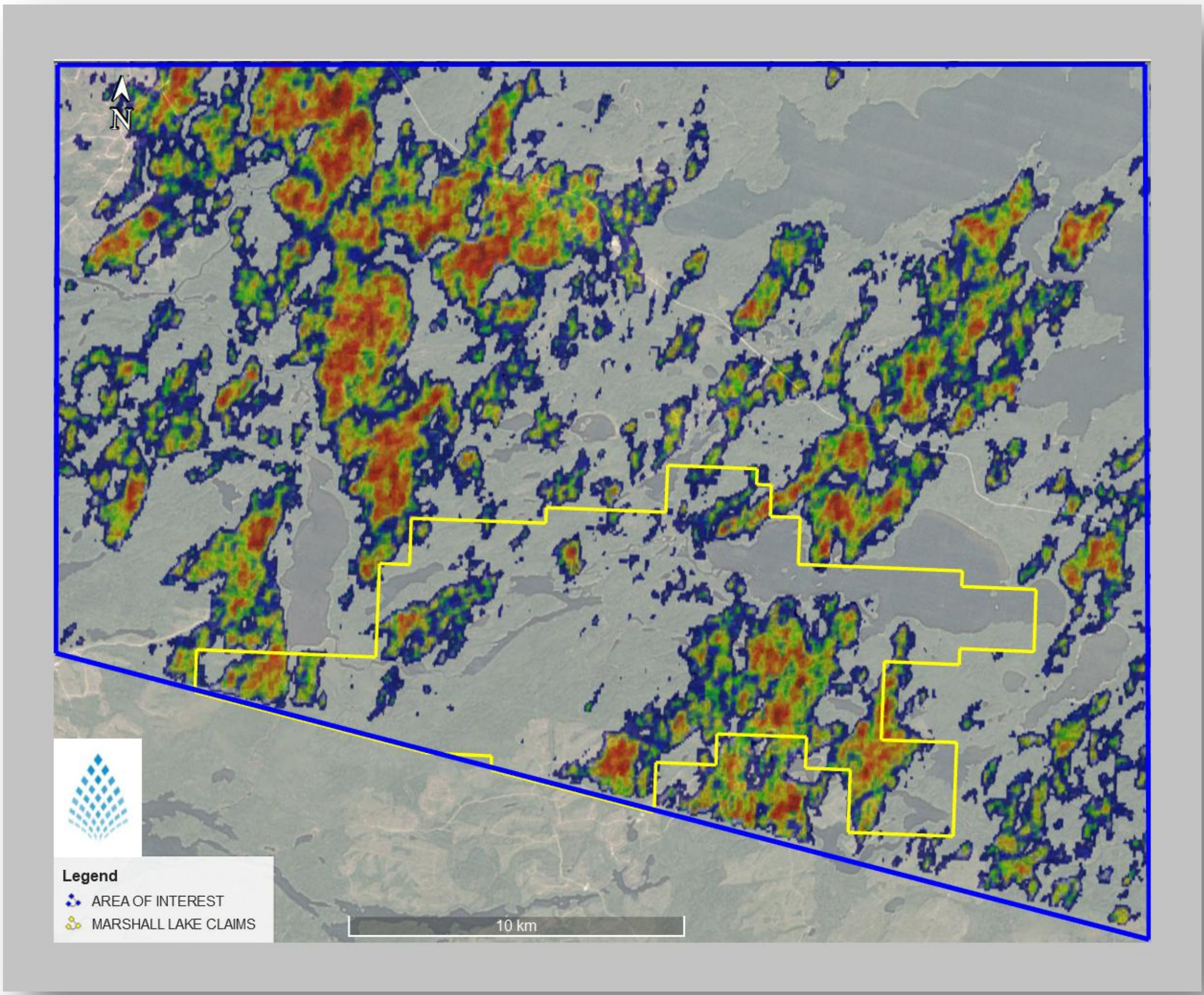

Figure 47: Endmember #9 - Sericite

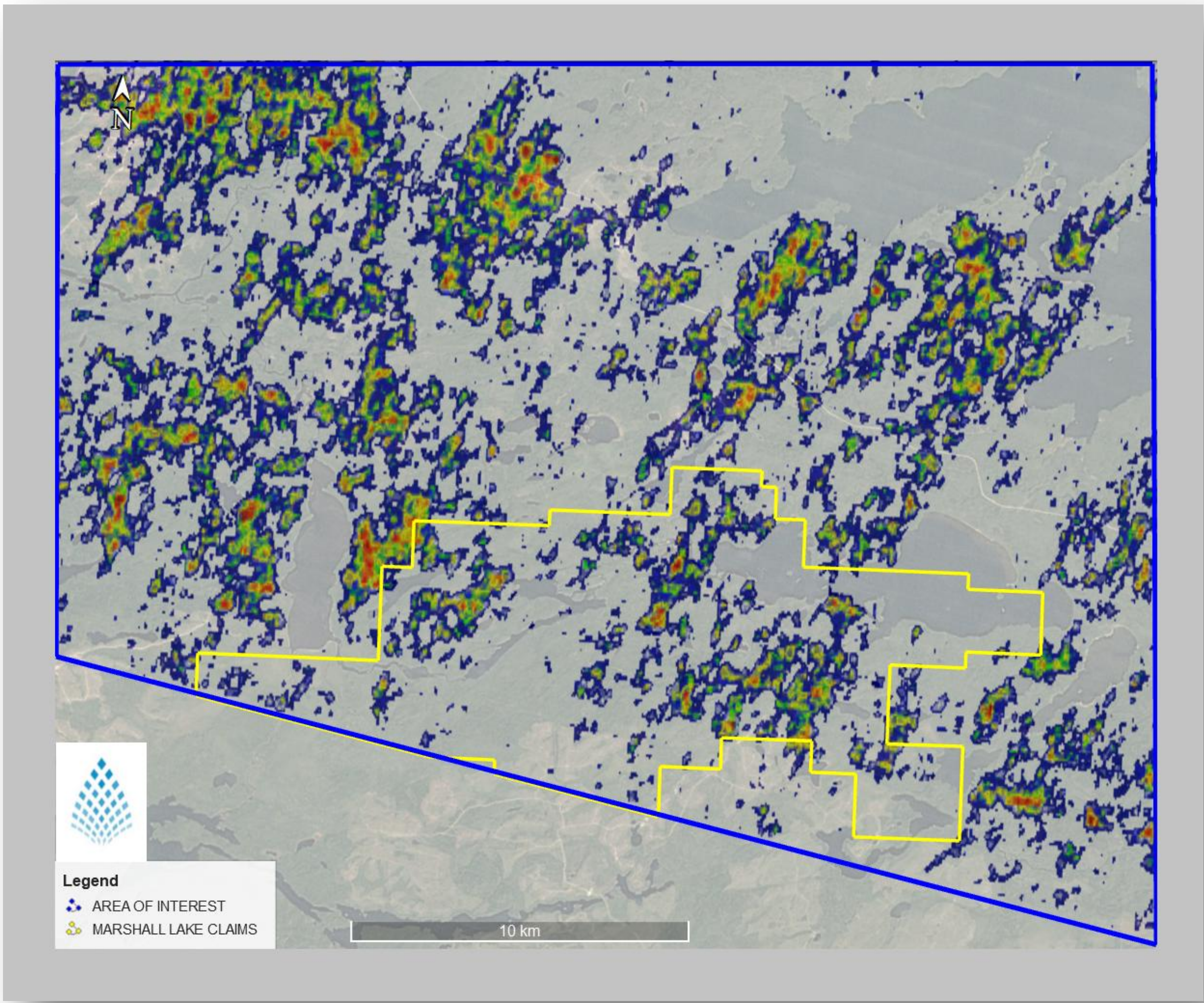

Figure 48: Endmember #10 - Calcite

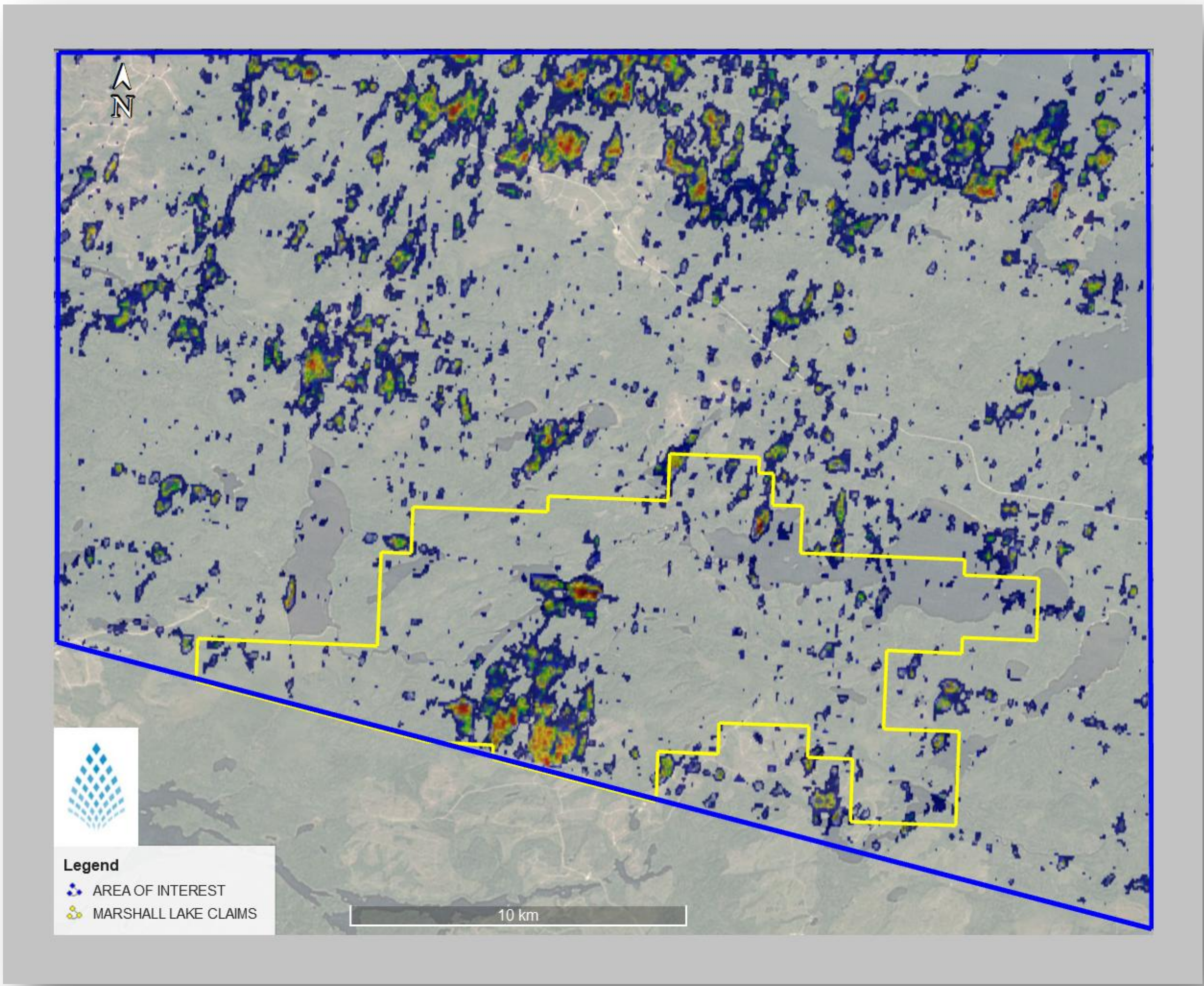

Figure 49: Endmember #11 - Illite

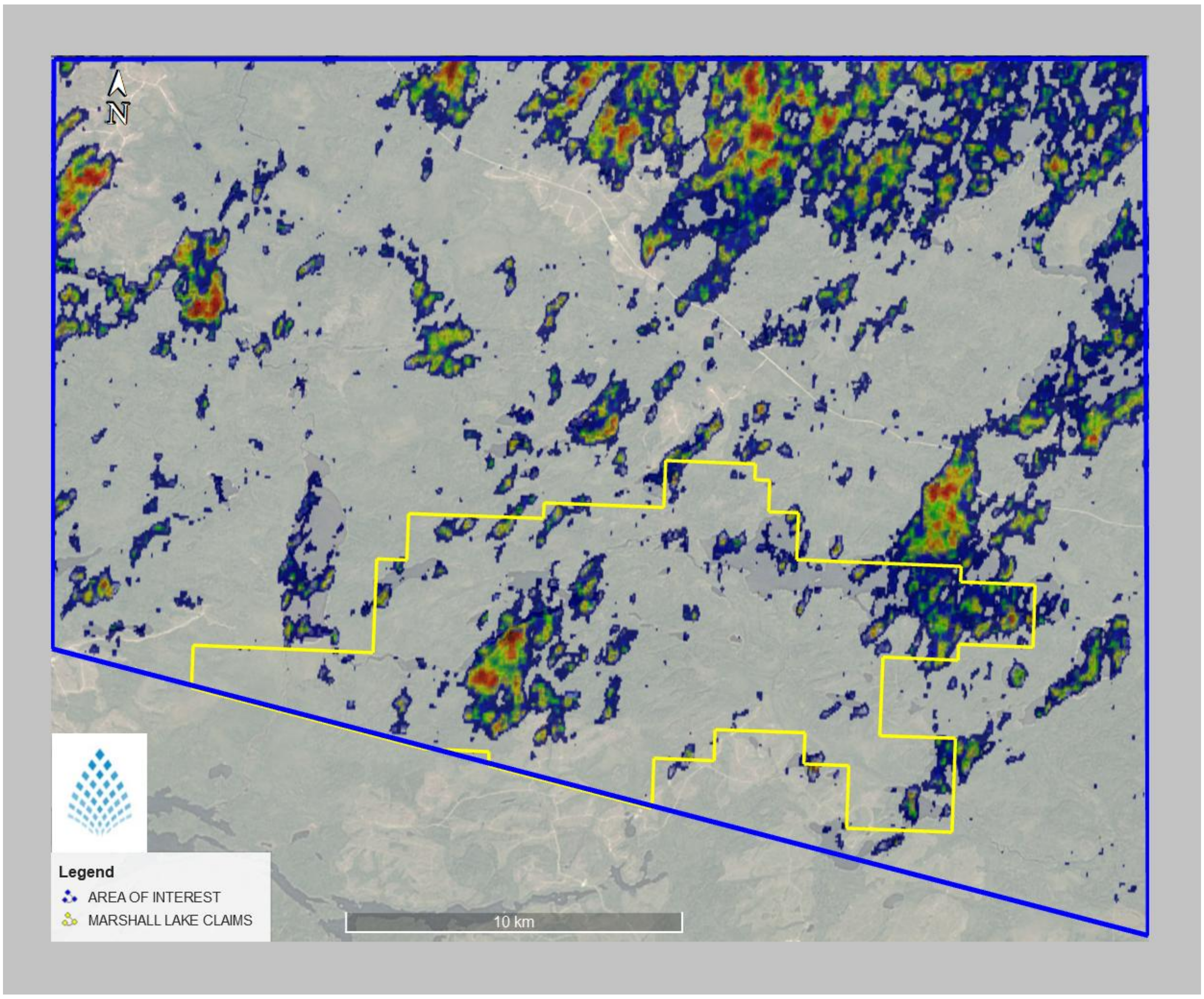

Figure 50: Endmember #12 Goethite

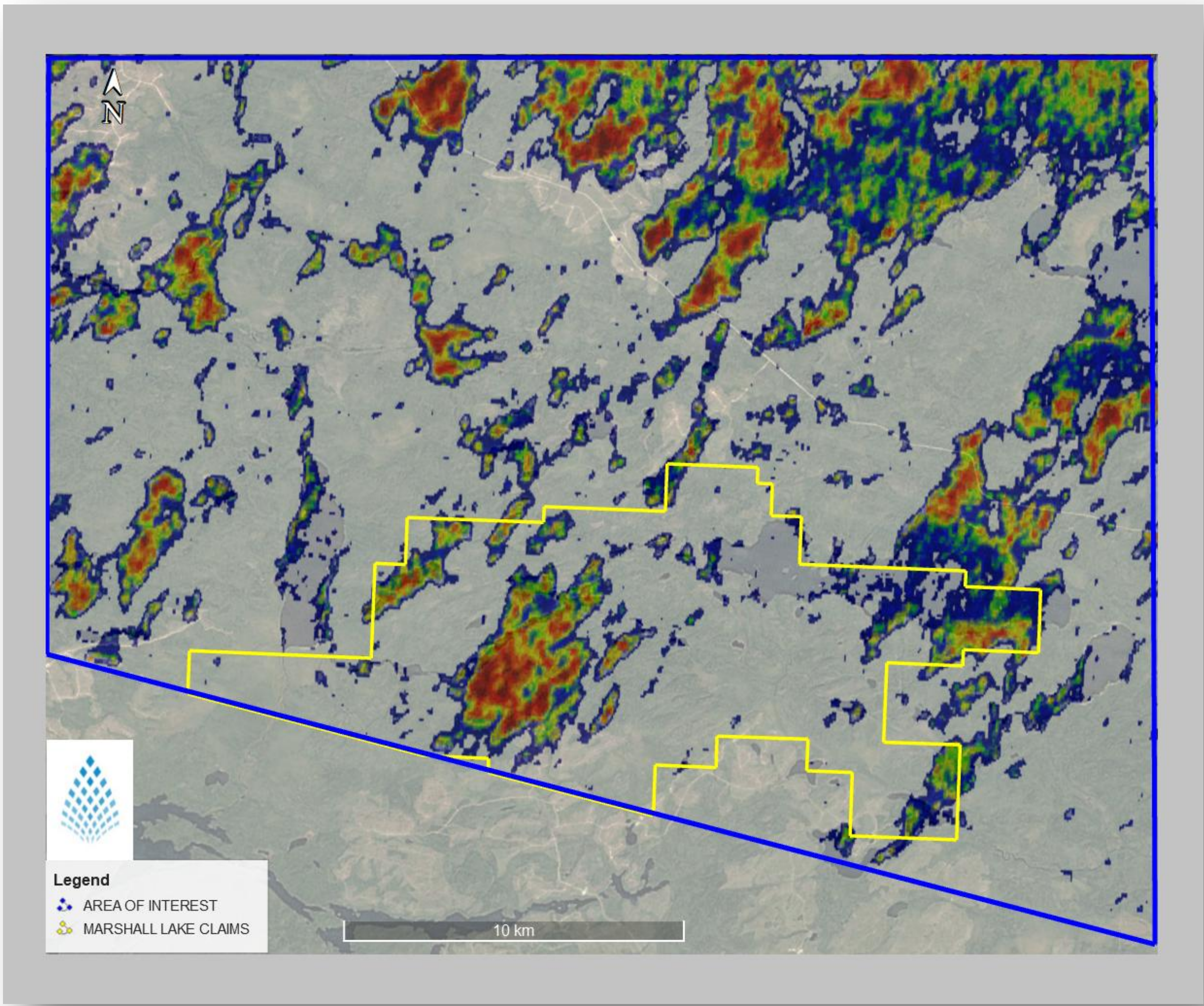

Figure 51: Endmember #13 - Pyrrhotite

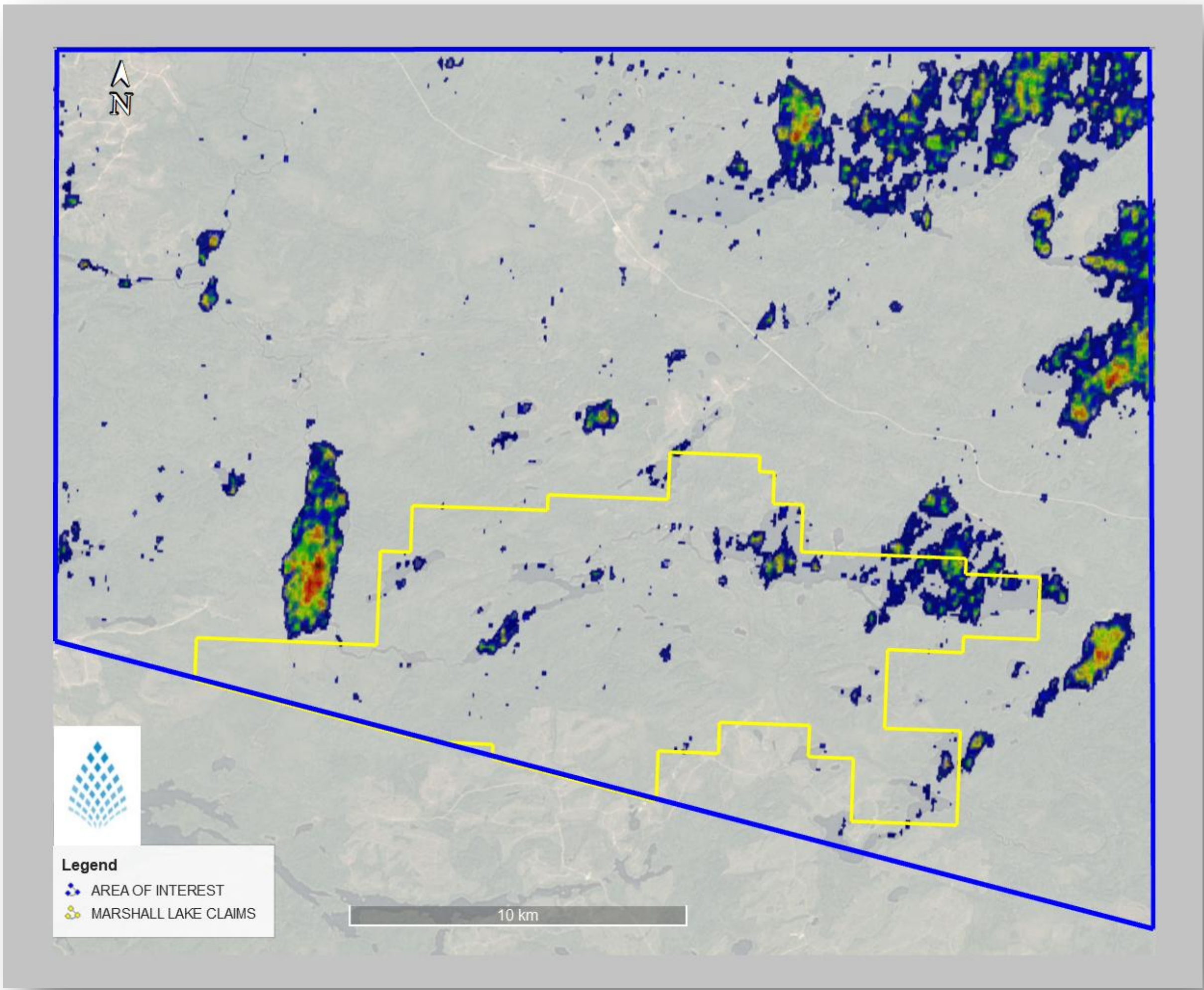

Figure 52: Endmember #14 - Gypsum

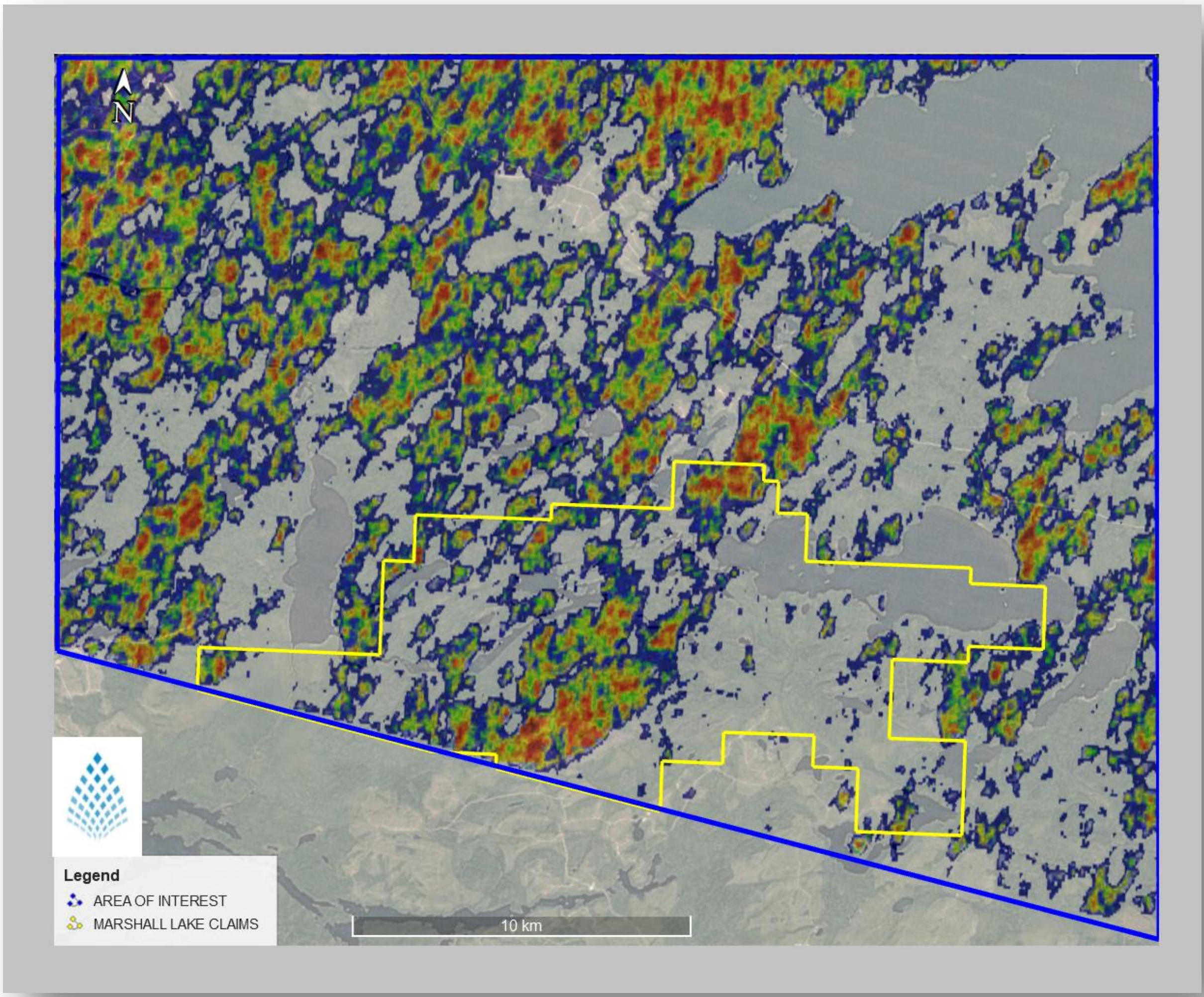

Figure 53: Endmember #15 - Cerussite

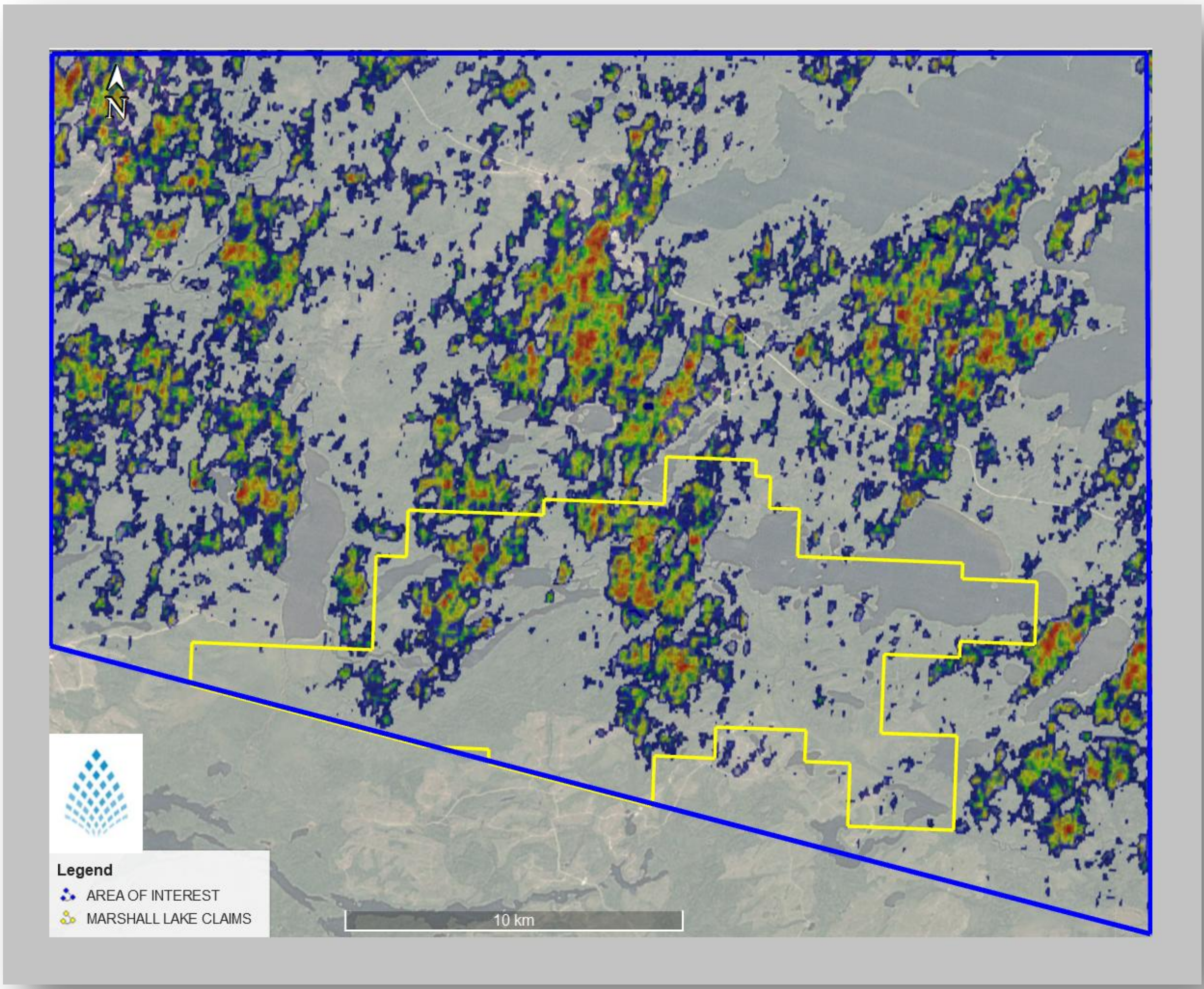

Figure 54: Endmember #16 - Biotite

APPENDIX II

SYNTHETIC APERTURE RADAR (SAR)

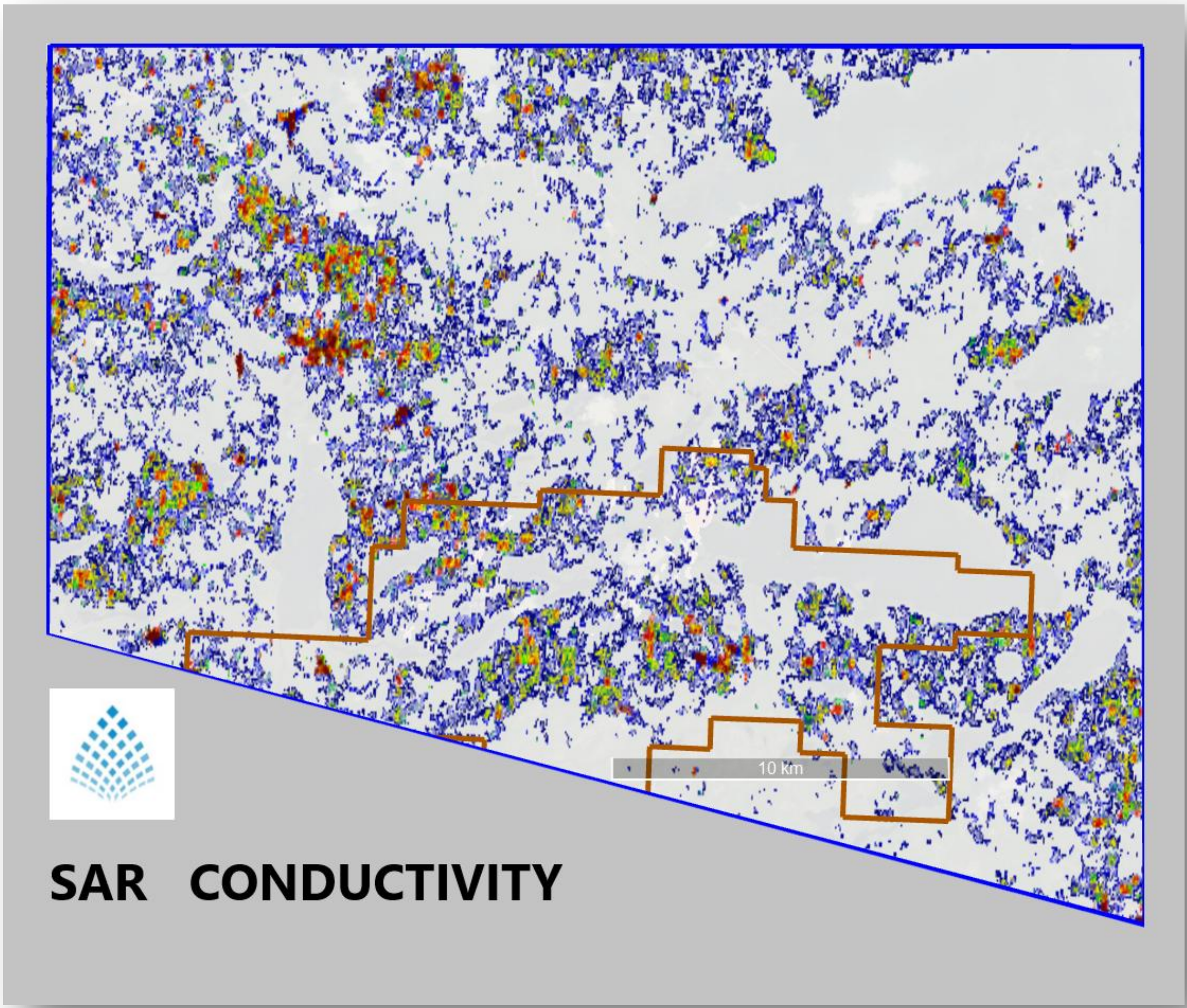

Figure 55: Synthetic Aperture Radar Conductivity