

Technical Report on the  
Marshall Lake Property

Summit Lake Area, Sollas Lake Area, Willet Lake Area, and Gzowski townships, Ontario

42L05 and 42L06

**43-101 TECHNICAL REPORT**

for Copper Lake Resources Ltd.

Thomas R. Hart, P.Geo.

June 7<sup>th</sup>, 2016

## Table of Contents

<b>1.0 SUMMARY .....</b>	<b>1</b>
<b>2.0 INTRODUCTION .....</b>	<b>3</b>
2.1 Terms of Reference .....	3
2.2 Sources of Information.....	3
2.3 Terminology.....	3
2.4 Unit of Measure and Abbreviations .....	4
<b>3.0 RELIANCE ON OTHER EXPERTS.....</b>	<b>4</b>
<b>4.0 PROPERTY DESCRIPTION AND LOCATION .....</b>	<b>5</b>
4.1 Location .....	5
4.2 Description and Ownership .....	5
4.3 Nature of Copper Lake Resources Interest.....	10
4.4 Environment and Permitting .....	11
<b>5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY .....</b>	<b>11</b>
<b>6.0 HISTORY .....</b>	<b>13</b>
6.1 Pre-2006 Historical Exploration Summary .....	14
6.2 East West Resources (2006 to 2009) .....	18
6.2.1 East West Resources Drilling and Trenching Programs .....	18
6.2.2 East West Resources VTEM Surveys.....	18
6.2.3 East West Resources IP and Magnetic Surveys .....	19
6.3 White Tiger Mining (2010 to 2013).....	19
6.3.1 White Tiger Mining Drilling Programs .....	19
6.3.2 White Tiger Mining IP Survey .....	20
7.1 Regional Geology.....	22
7.2 Property Geology .....	23
7.3.1 Gripp Tuff Sequence.....	24
7.3.2 Marshall Tuff Sequence and Marshall Mineralized Band .....	24
7.3.3 Camp Flow and Dome Complex and the Moose Creek Tuff .....	25
7.3.4 Marshall Creek Tuff Sequence .....	25
7.3.5 Deeds and Dog Island Flow and Dome Complex.....	26
7.3.6 Deeds Island Tuff .....	26
7.3.7 East Marshall Flow and Dome Complex.....	26
7.3.8 Sedimentary Rocks .....	26

7.3.9 Mafic Intrusive Rocks .....	26
7.3.10 Felsic Intrusive Rocks .....	26
7.3.11 Proterozoic Dykes.....	27
7.3.12 Structural Geology.....	27
7.3.13 Fault Zones .....	28
7.4 Mineralization .....	28
7.5 Marshall Lake Conceptual Model .....	30
8.0 DEPOSIT TYPES .....	31
8.1 Volcanogenic Massive Sulphide.....	31
9.0 EXPLORATION.....	34
9.1 Geophysical Compilation and Interpretation.....	34
9.2 Surface Geological Re-interpretation .....	40
10.0 DRILLING .....	42
10.1 Pre-2006 Drilling.....	42
10.2 East West Resources 2006 to 2008 Drilling .....	42
10.3 White Tiger 2010 to 2013 Drilling .....	46
10.3.1 Significant Results from 2010 Drilling Program .....	46
10.3.2 Significant Results from 2011 Drilling Program .....	46
10.3.3 Significant Results from 2012 Drilling Program .....	46
10.3.4 Significant Results from 2013 Drilling Program .....	47
11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY .....	48
11.1 East West Resources 2006 to 2008 Drilling .....	48
11.2 White Tiger 2010 to 2013 Drilling .....	48
11.2.1 Sample Preparation.....	49
11.2.2 Sample Security .....	49
11.2.3 Analyses.....	49
11.3 2016 Site Visit .....	50
11.3.1 Analysis - 2016 Samples .....	50
12.0 DATA VERIFICATION .....	51
12.1 East West Resources 2006 – 2008 Drilling.....	51
12.2 White Tiger 2010 to 2013 Drilling .....	51
12.3 2016 Site Visit .....	51
13.0 ADJACENT PROPERTIES .....	53

<b>13.1 VW Nickel Deposit</b> .....	53
<b>13.2 B4-7 Deposit</b> .....	53
<b>13.3 BAM East Gold Prospect</b> .....	54
<b>14.0 MINERAL PROCESSING AND METALLURGICAL TESTING</b> .....	54
<b>15.0 MINERAL RESOURCE ESTIMATES</b> .....	54
<b>16.0 OTHER RELEVANT DATA AND INFORMATION</b> .....	55
<b>17.0 INTERPRETATION AND CONCLUSIONS</b> .....	55
<b>18.0 RECOMMENDATIONS</b> .....	57
<b>19.0 REFERENCES</b> .....	60
<b>20.0 STATEMENT OF THE QUALIFIED PERSON</b> .....	66

## List of Figures

<b>Figure 4.1:</b>	Marshall Lake Property Location Map (Natural Resources Canada, 2002).	<b>5</b>
<b>Figure 4.2:</b>	Tenure map for Marshall Lake Property, Northwestern Ontario.	<b>10</b>
<b>Figure 5.1:</b>	Marshall Lake Accessibility Map.	<b>12</b>
<b>Figure 5.2:</b>	Historical Marshall Lake Camp During East West Resources Drilling Program (2006 to 2008).	<b>13</b>
<b>Figure 7.1:</b>	Major Tectonostratigraphic Assemblages of the Onaman – Tashota greenstone belt, showing orientation and distribution of Proterozoic diabase dyke swarms, Eastern Wabigoon Subprovince (modified from Stott et al., 2002).	<b>23</b>
<b>Figure 7.2:</b>	Property geology map for Marshall Lake (modified from Stott and Straub, 1999).	<b>24</b>
<b>Figure 7.3:</b>	Local geology map of Marshall Lake showing location of mineralized zones.	<b>29</b>
<b>Figure 7.4:</b>	Conceptual model of the Marshall Lake felsic volcanic center from the Summit pluton to the Camp flow and dome complex. Note the size of the mineralized bands is exaggerated for illustration (Straub, 1999).	<b>31</b>
<b>Figure 8.1:</b>	Idealized VMS deposit showing a strataform lens of massive sulphide overlying a discordant stringer sulphide zone within an envelope of altered rock (alteration pipe); modified from Gibson (2005).	<b>32</b>
<b>Figure 8.2:</b>	The genetic model for the formation a VMS type deposit. (Franklin et al., 2005)	<b>34</b>
<b>Figure 9.1:</b>	Inversion blocks of airborne magnetic data. Voxels shown in susceptibility (SI) units with isoshells (after McKenzie et al., 2015).	<b>35</b>
<b>Figure 9.2:</b>	Overview of the resistivity-depth images, with isoshells around conductive features (after McKenzie et al., 2015).	<b>36</b>
<b>Figure 9.3:</b>	Ground magnetic data on the Marshall Lake Property. The Main Open Pit D Zone block outlined in the north and the Teck Hill block is displayed in the southwest. The magnetic 1VD of the Marshall Lake VTEM survey is underlain.	<b>38</b>
<b>Figure 9.4:</b>	Main Zone inversion results: conductivity. Viewed from the south-east (McKenzie et al., 2015).	<b>39</b>
<b>Figure 9.5:</b>	Teck Hill inversion results: conductivity (McKenzie et al., 2015).	<b>40</b>
<b>Figure 9.6:</b>	Marshall Lake Geological Interpretation (McKenzie et al. 2015).	<b>41</b>

<b>Figure 10.1:</b>	Location of East West Resources Drill Holes from 2006 to 2008.	<b>45</b>
<b>Figure 10.2:</b>	Close Up of the East West Resources Drill Holes from 2006 to 2008.	<b>45</b>
<b>Figure 10.3:</b>	Location of the White Tiger Mining Drill Holes from 2010 to 2013.	<b>48</b>
<b>Figure 17.1:</b>	Conductive anomaly ML_VTEM_001, offset from modelled Billiton zone. Drill hole MAR-07-11 noted to intersect mineralization at depth (McKenzie et al. 2015).	<b>56</b>
<b>Figure 17.2:</b>	Chargeable coincidence of ML_VTEM_001 (denoted by isoshells). Anomalous area contains relatively little drill testing.	<b>57</b>

## List of Tables

<b>Table 4.1:</b>	Tenure table for Marshall Lake Property mineral claims.	<b>7</b>
<b>Table 4.2:</b>	Tenure table for Marshall Lake Property leases.	<b>8</b>
<b>Table 6.1:</b>	Marshall Lake Historical Drilling (after Amukin, 1989; Campbell, 1995; Nielsen et al. 2010).	<b>21</b>
<b>Table 6.2:</b>	Marshall Lake Historical Trenching (Nielsen et al. 2010).	<b>22</b>
<b>Table 9.1:</b>	Anomalies selected from RDI products.	<b>37</b>
<b>Table 9.2:</b>	Marshall Lake Consolidated Stratigraphic Legend (McKenzie et al. 2015).	<b>41</b>
<b>Table 10.1:</b>	Summary of Collar Information for East West Resources Drilling 2006 to 2008.	<b>43</b>
<b>Table 10.2:</b>	Summary of Collar Information for White Tiger Resources Drilling 2010 to 2013.	<b>47</b>
<b>Table 12.1:</b>	Grab sample results from May 19, 2016 site visit.	<b>53</b>
<b>Table 13.1:</b>	Open-pit and underground resources for B4-7 deposit.	<b>54</b>
<b>Table 18.1:</b>	2016 Recommended Budget and Timeline for the Marshall Lake Project.	<b>59</b>

## List of Appendices

**Appendix A:** Analytical Certificate for Results from 2016 Site Visit

## 1.0 SUMMARY

Copper Lake Resources Ltd. is a public mineral exploration company, registered under the corporations act in the Province of British Columbia and listed on the Toronto Stock Exchange Venture (TSX-V) Exchange and the Frankfurt Exchange. Copper Lake commissioned Thomas Hart, P.Geo., to provide a technical report on the Marshall Lake Property to complete a review of the updated exploration potential for the Marshall Lake property. In 2015, Copper Lake Resources engaged in a re-interpretation of historical geophysical pole-dipole induced polarization/resistivity surveys (IP/RES), ground magnetic surveys (ground mag), and Geotech's helicopter-borne time-domain electromagnetic (VTEM) survey which proposed a revised geological interpretation that outlines previously unexplored targets on the property.

This report was prepared in compliance with NI 43-101 standards to provide a summary of scientific and technical data pertaining to the Marshall Lake Property completed by Copper Lake Resources Ltd. as well as recommendations for future work.

The Marshall Lake Property is located 30km west of Nakina and approximately 252km northeast of Thunder Bay, Ontario. The property consists of 43 mineral claims (539 claim units) with an area of 8,864 ha and 89 mining leases with an area of 1,566.17ha for a total land position of 10,430.17ha. The leases have a 21-year term. All the leases have mining rights and many of the leases include surface rights. Copper Lake Resources entered into an option agreement, dated July 6, 2010, with Rainy Mountain Royalty Corp. and Marshall Lake Mining PLC to acquire up to a 50% joint venture interest in the Property through the issuance of shares and commitment to expenditures. To date, Copper Lake has acquired a 37.5% interest in the property and recently announced the acquisition of 31.25% interest from Marshall Lake Mining for 68.75% interest in the property and retains the option to increase the interest to 75% over the next 14 months.

The Marshall Lake property has been explored since the 1954 discovery of Cu-Zn mineralization at the Teck Hill occurrence south of Gripp Lake. More than 112 known occurrences of base-metal mineralization outcrop across the Marshall Lake property. The best explored occurrences are the sulphide disseminations in thin metamorphic garnetiferous-amphibolite (actinolite-hornblende) lenses, as observed at the Teck and Billiton showings where the Marshall Mineralized Band has been mapped. Additionally, within minor fold closures disseminated to massive lenticular sulphide shoots are common, which potentially represent mobilized sulphides.

Located in the eastern portion of the Wabigoon Subprovince, the Marshall Lake Property is underlain by rocks of the ~2739 Ma Marshall assemblage, which may represent a continental margin sequence built on the Mesoarchean Winnipeg River terrane. The Marshall assemblage is composed of a thick sequence of calc-alkalic dacite lavas and pyroclastic deposits that wrap around 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 recrystallized 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.

Numerous occurrences of base metal mineralization are present in the Marshall Lake area, which are described as strata-bound Cu-Zn-Ag-Pb sulphides hosted in an intermediate to felsic volcanoclastic. Resulting in the classification of the mineralization as volcanogenic massive sulphides. The host lithofacies of the mineralization includes tuffaceous to lapilli tuff, which are capped by ferruginous chert. The bulk of the surface-exposed mineralization occurs as fine disseminations throughout a silica-sericite altered sequence of volcanoclastic rocks. Since the copper-zinc sulphide mineralization has the characteristics of volcanogenic massive sulphide, a combination of alteration, geological mapping to define stratigraphy, and geophysical surveys are probably the best guides for the future exploration programs.

A recent geological re-interpretation of the Marshall Lake area incorporating numerous historical company interpretations, government mapping, regional geophysics, and historical detailed geophysics provides a model for the Marshall Lake property that presents a coherent geological model for the numerous mineral occurrences located on the property. The new geological interpretation presents new exploration potential along strike of the Mineralized Band to the southwest. The correlation of the various mineralized zones to the same stratigraphic horizon brings a completely new way of understanding conductors present in the electromagnetic data.

This new geological re-interpretation of the property highlights a number of exploration targets that should be re-examined as well as the continued development of new exploration targets. It is recommended that a thorough compilation of historical data and review of the geophysical and geological targets be completed with the objective of defining additional targets for follow-up by diamond drilling. It is recommended that the following \$3,000,000 exploration program be completed:

- The conductive anomalies identified from the Geotech survey are recommended for EM plate modelling and ground truthing;
- The ground magnetic dataset could be updated with infill lines and tied together into one master grid;
- The anomalies identified by each IP/Resistivity inversion block should be compared to available drill result to determine if each anomaly was fully properly drill tested, followed by ground truthing the more subtle, near surface features;
- It is recommended that the drill hole database for the Marshall Lake property be fully updated and digitized;
- The Billiton surface exposures be mapped and systematically sampled in detail to aid in the understanding of controls on mineralization;
- A systematic review and prioritization of all targets with the objective of identifying the top 3-8 exploration targets for the development of a small drilling campaign of 5-8 holes designed to intersect the top 3-8 exploration targets. Electromagnetic borehole surveying should be completed to aid in the improvement of the three-dimensional understanding of the mineralization;

## 2.0 INTRODUCTION

### 2.1 Terms of Reference

Copper Lake Resources Ltd. commissioned Thomas Hart, P.Ge, to provide a technical report on the Marshall Lake Property to complete a review of the update exploration potential for the Marshall Lake property. In 2015, Copper Lake Resources engaged in a re-interpretation of historical geophysical pole-dipole induced polarization/resistivity surveys (IP/RES), ground magnetic surveys (ground mag), and Geotech's helicopter-borne time-domain electromagnetic VTEM (VTEM) which proposed a revised geological interpretation that outline previously unexplored targets on the property. The recommendations in this current report are based on the results of that work. This report was prepared in compliance with NI 43-101 standards to provide a summary of scientific and technical data pertaining to the Marshall Lake Property completed by Copper Lake Resources Ltd. as well as recommendations for future work.

Copper Lake Resources, Ltd. is a junior exploration company, registered under the corporations act in the Province of British Columbia listed on the Toronto Stock Exchange Venture (TSX-V) Exchange and the Frankfurt Exchange.

This report has been prepared under the supervision of Thomas Hart, a Qualified Person as per the definition of NI 43-101 with the assistance of Craig Fitchett, P.Ge. Thomas Hart is an independent qualified person as per the regulations of the TSX and accepts responsibility for the entire report and is a registered Professional Geoscientist registered with the Association of Professional Geoscientists of Ontario (APGO). The author has completed a site visit on May 19<sup>th</sup>, 2016. Drill core from the RM zone is stored at the Rainy Mountain Royalty camp located near the property, along the Kinghorn logging road. Copper sulphide mineralization was observed within this drill core, and appears to have been systematically sampled. Additionally, numerous drill roads, drill casings and trenches were observed along the length of the property and grab samples of typical mineralized material from the Mineralized Band were collected from the Billiton trench on the east end of the property.

### 2.2 Sources of Information

Technical information presented in this report is derived from a variety of sources, including technical reports and scientific publications. The majority of the information collected for reporting historical work completed on the property and adjacent area were collected from assessment file records of the Ontario Ministry of Northern Development and Mines (MNDM), downloaded from the NMDM site and System for Electronic Document Analysis Retrieval (SEDAR). This property was the subject of a previous 43-101 report by Nielsen et al. (2010) completed for East West Resources and Marshall Lake Mining and posted on SEDAR. All documents used herein are listed at the end of the report (see 19.0 REFERENCES). Historical records and scientific publications are available from public resources. Aside from data collected from public domain sources, geological, diamond drilling, and geophysical data were supplied by Copper Lake Resources Ltd.

### 2.3 Terminology

**Ground Magnetic survey:** The measurement of the Earth's total magnetic field, less <field effects>, in order to map the location and size of ferrous objects (U.S. Environmental Protection Agency, 2011).

**Induced polarization (IP):** An exploration method involving measurement of the slow decay of voltage in the ground following the cessation of an excitation current pulse (time-domain method) or low

frequency variations of earth impedance (frequency-domain method). Also known as the overvoltage method. Most of the stored energy involved with IP is chemical involving variations in the mobility of ions and variations because of the change from ionic to electronic conduction where metallic minerals are present (Sheriff, 1991).

**VTEM or Versatile Time Domain Electromagnetic Surveying:** is Geotech's proprietary time-domain electromagnetic helicopter-borne system. This system comprises of a coincident, vertical dipole transmitter-receiver configuration to produce a symmetric system response, allowing for asymmetry in the measured EM profile due to the conductor dip (Geotech Ltd., 2015).

## **2.4 Unit of Measure and Abbreviations**

All geographic positions and map coordinated are reported in Universal Transverse Mercator (UTM) using the datum of NAD83, Zone 16N. All monetary figures quoted in this report are in Canadian dollars (CAD\$).

The Metric System is the primary system of measure and length used in this Report and is generally expressed in kilometers (km), meters (m) and centimeters (cm); volume is expressed as cubic meters (m<sup>3</sup>), mass expressed as metric tonnes (t), area as hectares (ha), and gold and silver concentrations as grams per tonne (g/t). Some of the historical work on the property was stated in Imperial measurements and have been converted during the compilation work completed by Copper Lake, including feet (ft), ounces (oz) and ounces per short ton (oz/t). Conversions from the Metric System to the Imperial System are provided below and quoted where practical. The conversion for lengths were as follows: 1 inch equals 2.54 centimeters and 1 foot equals 0.3048 meters. The conversion used for imperial to metric gold values was 1 troy ounce per short ton equals 34.2857 grams per metric tonne. Metals and minerals acronyms in this report conform to mineral industry accepted usage and the reader is directed to [www.maden.hacettepe.edu.tr/dmmrt/index.html](http://www.maden.hacettepe.edu.tr/dmmrt/index.html) for a glossary.

Abbreviations include ppb = parts per billion; ppm = parts per million; Mt = million tonne; t = tonnes (1000 kilograms); and SG = specific gravity, kilovolt is kV; million years ago is Ma; induced polarization is IP; very low frequency electromagnetics is VLF; net smelter return is NSR.

## **3.0 RELIANCE ON OTHER EXPERTS**

The geological information in this report is not reliant on individuals who are not considered to be qualified persons. The author is dependent on an internal company document authored by Jenna McKenzie, P.Geol., Dr. Julie Selway, P.Geol., and Craig Fitchett, P.Geol., for work completed between 2013 and 2015 on a Geophysical and Geological Interpretation of compiled surface geology and historical geophysical surveys that are publically available through assessment reports on the MNM website.

Land tenure information for claims has been obtained from the MNM web site, which contains a disclaimer as to the validity of the provided information. Additionally, the client provided the author with the details of the underlying options agreements that are currently in place between the various parties; legal documentation has not been reviewed.

The author did not review legal, political, surface rights, water rights or other non-technical issues which might indirectly relate to this report. The author relied on Copper Lake Resources counsel for the legal status of mineral tenure regarding the patents, and environmental liability. The report is based upon information believed to be accurate at the time of certification, but which is not guaranteed.

## 4.0 PROPERTY DESCRIPTION AND LOCATION

### 4.1 Location

The Marshall Lake Property is located 30km west of Nakina and approximately 252km northeast of Thunder Bay, Ontario (Fig. 4.1). The closest towns to the property are Armstrong and Nakina. Armstrong and Nakina are connected by the Canadian National Railway. Access is by all-weather gravel road from Hwy 11 and the main CNR rail line is within 22km to the south of the Property. The Marshall Lake Property is located within the Thunder Bay Division, northeast of Lake Nipigon. The majority of the Property is within NTS Sheet 42L05, but three mineral claims are in NTS Sheet 42L06. Most of the property is within the Summit Lake Area, but a few claims are in Willet Lake Area, Gzowski and Sollas Lake Area.

The center of the leases on the Property is UTM coordinates: 457595m E, 5586003m N, Zone 16 and longitude / latitude: 87° 35' 49.07" W, 50° 25' 28.29" N.



Figure 4.1: Marshall Lake Property Location Map (Natural Resources Canada, 2002).

### 4.2 Description and Ownership

The Marshall Lake property consists of 43 mineral claims (539 claim units) with an area of 8,864ha and 89 mining leases with an area of 1,566.17ha for a total land position of 10,430.17ha (Fig. 4.2). The leases have a 21-year term. All the leases have mining rights and many of the leases also have surface rights. Currently, there is enough assessment credits stored in the reserves to hold the Marshall Lake property in good standing until the end of September 2016. At which point further assessment work will need to have been completed. All the claims and leases are contiguous.

Claim posts and corners of the property are generally established with the aid of handheld GPS receivers; whose accuracies are in the order of +/- 10 meters. The claims can be brought to lease when they qualify under regulations set out by the Ministry of Northern Development Mines of the Province of Ontario. A map showing the claims is presented in Figure 4.2 and a list of the claims is presented in Tables 4.1 and 4.2. Currently exploration is supported from Thunder Bay, Beardmore, Aroland and Geraldton, Ontario.

The Marshall Lake property was the result of the amalgamation of three separate option agreements under a 50:50 joint venture between Rainy Mountain Royalty Corp (formerly East West Resource Corporation) of Thunder Bay, Ontario, and Marshall Lake Mining PLC (formerly Eyeconomy Holdings PLC) of the United Kingdom. The claims and leases were originally jointly owned on a 50-50 basis held by Rainy Mountain Royalty and Marshall Lake Mining PLC. The Joint Venture agreement between the East West and Eyeconomy was signed on May 17, 2005 where by all work on the consolidation of land under the JV on the Marshall Lake project area would be funded on a 50:50 bases. The Marshall Lake project was formed through the acquisition of certain claims and leases through the subsequent execution of three separate option agreements with Carey Lance, NWT Copper Mines and Teck Cominco Corporation during 2006. Rainy Mountain Royalty (RMO) was the operator and under the terms of the JV acquired and had title of claims however all property acquired falls under the terms of the JV. Either party can be diluted should at any point they decide not to fund their share of the project under a prescribed dilution formula. Should either party's interest fall below 10% their ownership will be converted to a 1% NSR, which could be acquired for \$1.0M.

Pursuant to an option agreement signed between RMO and Carey Lance dated 16 June, 2006, the Joint Venture acquired a 100% interest in the mineral rights for 33 mineral claims comprising 421 claim units located in the Sollas Lake and Summit Lake area, Thunder Bay mining division, Ontario. The mining claims essentially surround the NWT and Teck leases, with the exception of the #4204000 and #4204001 claims which occur "within" the NWT block. In consideration therefore, East West Resources at the time was required to issue 200,000 common shares in two stages and pay \$150,000 in stages over seven years. A 2% net smelter royalty (NSR) is being retained by the Carey Lance, 1% of which may be purchased for \$1-million and the Joint Venture has the right of first refusal to purchase the remaining 1%.

A 100% interest was acquired from NWT Copper Mines Ltd. through an option agreement dated October 20, 2006 for 86 leases and 2 claims by making three option payments of \$25,000 for a total of \$75,000 and \$1-million in exploration expenses over three years. A work commitment of \$55,000 for backhoe trenching of mineral showings was completed as part of the exploration program. NWT retains a 2% net smelter return royalty (NSR) on base metals and a 3% NSR on precious metals where 1% of either royalty may be bought on a first-right-of-refusal basis under the terms of the option agreement. The option agreement falls under the JV. As part of this agreement, a 1% NSR to NWT also applies to two additional claims, #4204000 and #4204001 covered under the Lance option. In connection with this NSR, Rainy Mountain Royalty is required to pay an annual advance royalty of \$25,000, which payments are credited against royalties otherwise payable to NWT. All annual advance royalty payments have been paid to date and such payments are shared on a 50:50 bases with Copper Lake Resources pursuant to an option agreement dated July 6, 2010, as amended, as referred to herein.

Under the December 2, 2006 option agreement with Teck Cominco, East West Resources (Rainy Mountain Royalty) issued to Teck Cominco and Mr. Nelson Baker 250,000 units with each unit consisting of one share and one two-year share purchase warrant priced at 13 cents. East West Resources was also

committed to spend \$100,000 on the three leases within three years (Dec. 31, 2009). The option agreement signed by RMO falls under the terms of the Marshall Lake JV. The three mining leases are #101273, #101274 and #101275, formerly designated as claims KK22684, KK22696 and KK22697. Mr. Baker retained a 0.1% net smelter (NSR) royalty and Teck Cominco a 1.9% NSR. Based on the terms of the Teck Agreement, Teck had a “back-in” right for a 5-year period from the date that the Joint Venture completed its initial \$100,000 exploration commitment. The initial commitment was completed by March 28, 2008, and, Teck’s back-in right expired on March 28, 2013. Teck has subsequently sold/assigned its 1.9% NSR on the properties under this agreement to an entity called Sandstorm Gold Ltd. The Teck NSR may be reduced to 0.9% by purchasing the other 1% NSR for \$2.0 M, with this amount escalated by 10% per year beginning in 2012. The leases cover the southern extensions of the Teck Hill area.

**Table 4.1:** Tenure table for Marshall Lake Property mineral claims.

Township	Claim Number	Recording Date	Claim Due Date	Work Required	Total Applied	Total Reserve	Recorder Holder (100% Option)
Sollas Lake	4207314	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Sollas Lake	4207315	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Sollas Lake	4207316	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Sollas Lake	4207317	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	1195406	1992-Oct-07	2018-Oct-07	\$3,200.00	\$76,800.00	\$3,940.00	Rainy Mountain Royalty Corp
Summit Lake	1195407	1992-Oct-07	2019-Oct-07	\$400.00	\$10,000.00	\$8,278.00	Rainy Mountain Royalty Corp
Summit Lake	1234628	2007-Aug-08	2016-Aug-08	\$4,800.00	\$33,600.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	1234634	2007-Aug-08	2016-Aug-08	\$6,000.00	\$42,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	3011538	2006-Aug-28	2016-Aug-28	\$6,000.00	\$48,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	3014196	2006-Aug-28	2016-Aug-28	\$6,000.00	\$48,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	3014197	2006-Aug-28	2016-Aug-28	\$6,000.00	\$48,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	3014200	2006-Sep-11	2016-Sep-11	\$6,400.00	\$51,200.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	3014201	2006-Sep-11	2016-Sep-11	\$2,400.00	\$19,200.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4204000	2005-Jun-03	2017-Jun-03	\$400.00	\$4,000.00	\$87,916.00	Rainy Mountain Royalty Corp
Summit Lake	4204001	2005-Jun-03	2016-Jun-03	\$1,200.00	\$10,800.00	\$614.00	Rainy Mountain Royalty Corp
Summit Lake	4204004	2005-Oct-19	2017-Oct-19	\$1,200.00	\$12,000.00	\$2,380.00	Rainy Mountain Royalty Corp
Summit Lake	4204433	2005-Oct-20	2016-Oct-20	\$2,800.00	\$25,200.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4204434	2005-Jul-22	2016-Jul-22	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4204435	2005-Jul-22	2016-Jul-22	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4204436	2005-Jul-22	2016-Jul-22	\$6,000.00	\$54,000.00	\$332.00	Rainy Mountain Royalty Corp
Summit Lake	4204437	2005-Jul-22	2016-Jul-22	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4204438	2005-Jul-22	2016-Jul-22	\$4,800.00	\$43,200.00	\$307.00	Rainy Mountain Royalty Corp
Summit Lake	4204439	2005-Jul-22	2016-Jul-22	\$6,000.00	\$54,000.00	\$181.00	Rainy Mountain Royalty Corp
Summit Lake	4204440	2005-Sep-19	2016-Sep-19	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4204441	2005-Jul-22	2016-Jul-22	\$6,400.00	\$57,600.00	\$70,768.00	Rainy Mountain Royalty Corp
Summit Lake	4204442	2005-Oct-20	2016-Oct-20	\$1,600.00	\$14,400.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207318	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207319	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207320	2005-Aug-18	2016-Aug-18	\$4,800.00	\$43,200.00	\$0.00	Rainy Mountain Royalty Corp

Summit Lake	4207321	2005-Aug-18	2017-Aug-18	\$6,000.00	\$60,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207322	2005-Aug-18	2017-Aug-18	\$6,000.00	\$60,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207323	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207355	2005-Sep-23	2016-Sep-23	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207356	2005-Sep-23	2016-Sep-23	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207357	2005-Oct-20	2016-Oct-20	\$1,200.00	\$10,800.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207410	2005-Aug-18	2016-Aug-18	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4207413	2005-Sep-19	2016-Sep-19	\$5,200.00	\$46,800.00	\$1,531.00	Rainy Mountain Royalty Corp
Summit Lake	4207414	2005-Sep-19	2016-Sep-19	\$6,000.00	\$54,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4211246	2006-Sep-11	2016-Sep-11	\$6,000.00	\$48,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4213141	2007-Feb-23	2017-Feb-23	\$6,000.00	\$48,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4213142	2007-Feb-23	2017-Feb-23	\$6,000.00	\$48,000.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4221033	2007-Oct-02	2016-Oct-02	\$6,400.00	\$44,800.00	\$0.00	Rainy Mountain Royalty Corp
Summit Lake	4221034	2007-Oct-02	2016-Oct-02	\$6,400.00	\$44,800.00	\$0.00	Rainy Mountain Royalty Corp

**Table 4.2:** Tenure table for Marshall Lake Property leases.

Claim Number	Type	Expiry Date	Lease	Township	Short Description	Area (ha)	Tenure Rights
KK22684	Lease	2029-Nov-30	108305	Summit Lake	KK22684	13.175	MRO
KK22696	Lease	2029-Nov-30	108303	Summit Lake	KK22696	21.007	MRO
KK22697	Lease	2029-Nov-30	108304	Summit Lake	KK22697	10.720	MRO
KK22753	Lease	2031-Jun-30	108677	Summit Lake	KK22753	25.309	MRO and SRO
KK22798	Lease	2031-Jun-30	108656	Summit Lake	KK22798	14.949	MRO and SRO
KK22799	Lease	2031-Jun-30	108655	Summit Lake	KK22799	16.653	MRO and SRO
KK22800	Lease	2031-Jun-30	108652	Summit Lake	KK22800	18.361	MRO and SRO
KK22801	Lease	2031-Jun-30	108651	Summit Lake	KK22801	13.298	MRO and SRO
KK22802	Lease	2031-Jun-30	108650	Summit Lake	KK22802	12.339	MRO and SRO
KK22808	Lease	2031-Jun-30	108676	Summit Lake	KK22808	22.464	MRO and SRO
KK23034	Lease	2031-Jun-30	108649	Summit Lake	KK23034	16.244	MRO and SRO
KK23035	Lease	2031-Jun-30	108648	Summit Lake	KK23035	20.242	MRO and SRO
KK23036	Lease	2031-Jun-30	108647	Summit Lake	KK23036	20.206	MRO and SRO
KK24194	Lease	2030-Nov-30	108453	Summit Lake	KK24194	12.792	MRO and SRO
KK24195	Lease	2030-Nov-30	108452	Summit Lake	KK24195	13.229	MRO and SRO
KK24196	Lease	2030-Nov-30	108451	Summit Lake	KK24196	18.842	MRO and SRO
KK24197	Lease	2030-Nov-30	108450	Summit Lake	KK24197	23.520	MRO and SRO
KK24198	Lease	2030-Nov-30	108449	Summit Lake	KK24198	22.893	MRO and SRO
KK24199	Lease	2030-Nov-30	108448	Summit Lake	KK24199	12.901	MRO and SRO
KK24200	Lease	2030-Nov-30	108447	Summit Lake	KK24200	11.032	MRO and SRO
KK24201	Lease	2030-Nov-30	108446	Summit Lake	KK24201	12.586	MRO and SRO
KK24202	Lease	2030-Nov-30	108445	Summit Lake	KK24202	14.787	MRO and SRO
KK24203	Lease	2030-Nov-30	108444	Summit Lake	KK24203	12.877	MRO and SRO
KK24204	Lease	2030-Nov-30	108443	Summit Lake	KK24204	10.324	MRO
KK24205	Lease	2030-Nov-30	108454	Summit Lake	KK24205	14.318	MRO and SRO
KK24301	Lease	2031-Jun-30	108665	Summit Lake	KK24301	18.255	MRO and SRO
KK24302	Lease	2031-Jun-30	108664	Summit Lake	KK24302	15.698	MRO and SRO
KK24303	Lease	2031-Jun-30	108663	Summit Lake	KK24303	17.750	MRO and SRO
KK24304	Lease	2031-Jun-30	108646	Summit Lake	KK24304	14.727	MRO and SRO
KK24305	Lease	2031-Jun-30	108645	Summit Lake	KK24305	15.487	MRO and SRO
KK24306	Lease	2031-Jun-30	108644	Summit Lake	KK24306	23.055	MRO and SRO
KK24310	Lease	2031-Jun-30	108662	Summit Lake	KK24310	14.965	MRO

Claim Number	Type	Expiry Date	Lease	Township	Short Description	Area (ha)	Tenure Rights
KK24311	Lease	2031-Jun-30	108661	Summit Lake	KK24311	13.921	MRO
KK24312	Lease	2031-Jun-30	108660	Summit Lake	KK24312	18.166	MRO
KK24313	Lease	2031-Jun-30	108659	Summit Lake	KK24313	19.304	MRO
KK24314	Lease	2031-Jun-30	108658	Summit Lake	KK24314	15.787	MRO
KK24315	Lease	2031-Jun-30	108657	Summit Lake	KK24315	17.899	MRO
KK24316	Lease	2031-Jun-30	108669	Summit Lake	KK24316	24.447	MRO and SRO
KK24317	Lease	2031-Jun-30	108671	Summit Lake	KK24317	14.994	MRO and SRO
KK24319	Lease	2031-Jun-30	108654	Summit Lake	KK24319	14.969	MRO and SRO
KK24320	Lease	2031-Jun-30	108653	Summit Lake	KK24320	25.835	MRO and SRO
KK24321	Lease	2031-Jun-30	108668	Summit Lake	KK24321	17.895	MRO and SRO
KK24322	Lease	2031-Jun-30	108670	Summit Lake	KK24322	14.423	MRO and SRO
KK24328	Lease	2031-Jun-30	108672	Summit Lake	KK24328	16.098	MRO and SRO
KK24329	Lease	2031-Jun-30	108667	Summit Lake	KK24329	17.296	MRO and SRO
KK24330	Lease	2031-Jun-30	108666	Summit Lake	KK24330	8.005	MRO and SRO
KK24346	Lease	2031-Jun-30	108675	Summit Lake	KK24346	37.644	MRO and SRO
KK24347	Lease	2031-Jun-30	108674	Summit Lake	KK24347	38.915	MRO and SRO
KK24348	Lease	2031-Jun-30	108673	Summit Lake	KK24348	34.787	MRO and SRO
TB321308	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL	373.476	MRO and SRO
TB321309	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321310	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321311	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321312	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321313	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321314	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321315	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321380	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321381	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321382	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321383	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321384	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321385	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321386	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321387	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321388	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321389	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB359982	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB359983	Lease	2026-Nov-30	107795	Summit Lake	TB321308 ETAL		
TB321713	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26	228.214	MRO
TB321714	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321715	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321716	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321717	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321718	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321719	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321720	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321721	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321722	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321723	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321724	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321725	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		
TB321726	Lease	2029-Mar-31	108233	Summit Lake	TB321713-26		

MRO = mining rights only, SRO = surface rights only



Copper Lake Resources Ltd. (the Company) entered into an option agreement, dated July 6, 2010, with Rainy Mountain Royalty Corp. and Marshall Lake Mining PLC (the Optionors) whereby the Company was granted an option to acquire up to a 50% joint venture interest in the Marshall Lake Property. Under the option agreement, the Company is required to incur \$4,000,000 in expenditures on the property over five years and issue 2,000,000 shares over a four-year period. The Company will earn a 12.5% joint venture interest in the Marshall Lake Property for every \$1,000,000 in expenditures incurred and for every 400,000 shares issued. The exception was that for the initial 12.5% interest the Company was required to issue 800,000 shares to the Rainy Mountain Royalty Corp. Additionally, once the Company has completed its share issuance and spending requirements, it has the additional option to increase its joint venture interest to 75% by incurring such additional property expenditures as are necessary to take the Marshall Lake Property to bankable feasibility stage.

On July 16, 2015 Copper Lake Resources announced a one-year extension of the earn-in agreement until 15 July, 2017. Copper Lake Resources to date has completed sufficient work commitments to hold a 37.50% interest in the Marshall Lake Property, while each of the Optionors currently holds a 31.25% interest. Copper Lake Resources can earn up to a 50% interest in the property by spending an additional \$1,000,000 by July 15, 2017. The Company can earn a further 25% by completing a bankable feasibility study. In consideration for the extension, joint venture partners Marshall Lake Mining Limited and Rainy Mountain Royalty Corp. ("the Optionors") each received 500,000 common shares of the Company.

On May 05, 2016 Copper Lake Resources announced an agreement to acquire a 31.25% interest in the Marshall Lake property from Marshall Lake Mining Limited, increasing the Company's interest in the property to 68.75%. For this, Copper Lake would issue a maximum of 34,268,738 common shares and a principal amount of \$350,000 of 12% five year unsecured subordinated convertible debentures to MLMP. The total consideration is valued at \$2,063,000.

#### **4.4 Environment and Permitting**

The author relied on Copper Lake Resources counsel, and there was no indication that the Property is subject to any known environmental liabilities outside of the responsible code of conduct and current environmental guidelines and policies. The Mining Act of Ontario covers the permits required for exploration and no further permits for exploration are required at this time.

Copper Lake Resources currently holds an Exploration Permit (No. PR13-10293) on TB 4204000 effective from 2013-JUL-11 TO 2016-JUL-10 for the following activities: Line Cutting, Physical, & Drilling.

### **5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY**

The property is located approximately 390km north-northeast of the City of Thunder Bay, Ontario and can be easily accessed by following Highway 11/17 west of the City of Thunder Bay to Highway 11 at Nipigon, Ontario. Access to the property is by all-weather gravel road (Kingham) from Hwy 11, which is located approximately 7km east of Jellicoe. After traveling approximately 125km north, the Kinghorn Road intersects the southern portion of the Marshall Lake property. Further access from this point is by ATV or on foot. Additionally, the property can be accessed from the Ogoki road, which begins north of Geraldton and south of Nakina. About 55km along the Ogoki road an ATV trail exits to the left (south) and leads to the north side of Marshall Lake (Fig. 5.1).

The municipality of Greenstone, composed of the communities of Beardmore (92km), Jellicoe (80km) Geraldton (88km), Long Lac and Nakina is the most proximal population center to the property and is of sufficient size to provide most exploration needs on the property. Analytical facilities are available from a number of certified laboratories in Thunder Bay (Fig. 5.1).

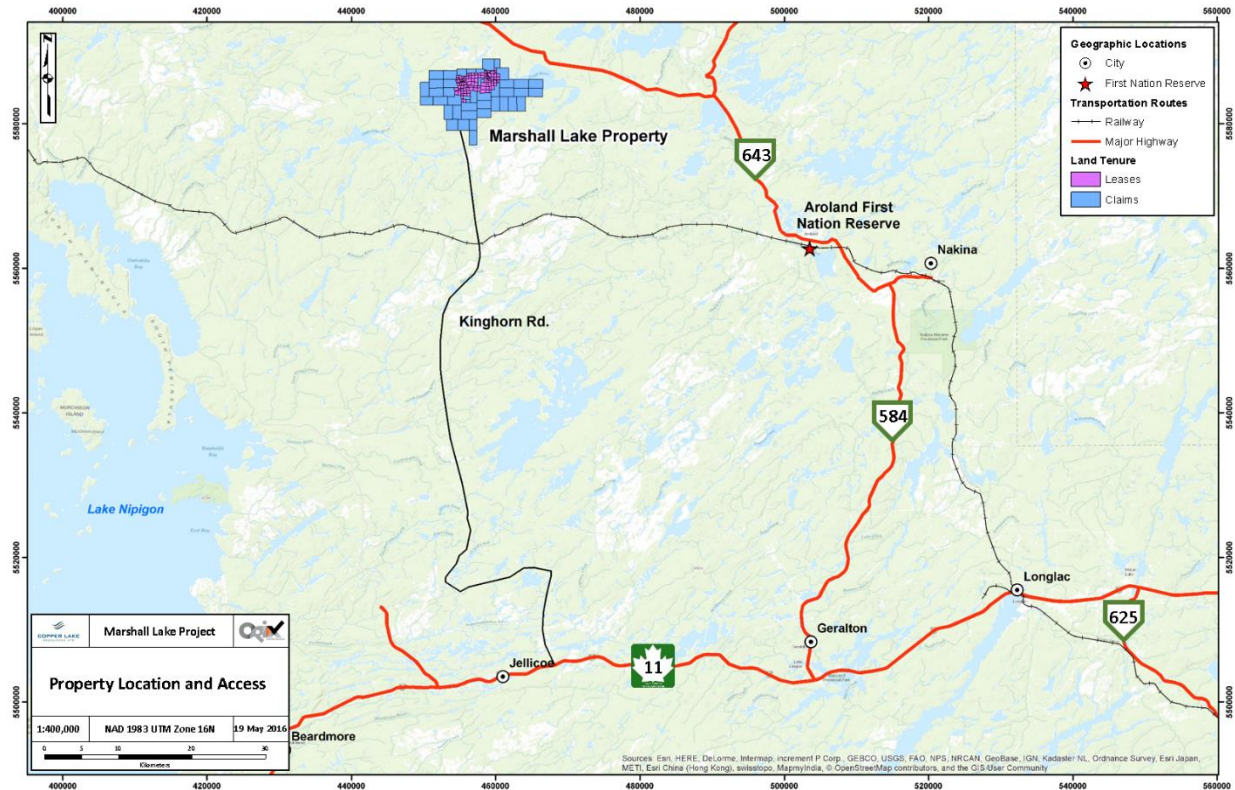


Figure 5.1: Marshall Lake Accessibility Map.

The Marshall Lake property is connected by road to the main CN rail line, which lies 22km south of the property along the Kinghorn Road. Aroland First Nation is the closest source of power; the community lies 55km from the property following the Ogoki road (HWY 643) to the north eastern edge of the property. Water is available from many nearby lakes and rivers and field personnel are available from the nearby communities of Aroland, Geraldton, Beardmore and Thunder Bay.



**Figure 5.2:** Historical Marshall Lake Camp During East West Resources Drilling Program (2006 to 2008).

The property 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. The snow free season occurs from approximately April to October with temperatures as high as 35 degrees Celsius; while the winter season occurs from November to March with temperatures as low as -50 degrees Celsius.

Some of the waterways in the area, including the Marshall-Gripp-Summit lakes system, Marshall Creek, and the Ombabika and Powitik rivers, are navigable at high water levels. Several waterfalls obstruct the courses of the Powitik and Gripp rivers. Marshall Lake is drained to the south by Marshall Creek and to the west by the Gripp River which also drains the waters of Gripp Lake and discharges into Summit Lake. Summit Lake is unusual because it lies between two drainage basins, draining to the north (Powitik River) and to the south (Ombabika River), and is only about 2.4 m deep.

## **6.0 HISTORY**

In 2006 Rainy Mountain Royalty Corporation together with Marshall Lake Mining PLC acquired a 100% stake in the property for the first time since its discovery in 1954. This allowed complete coverage of the Main Billiton Zone, peripheral satellite deposits, the Teck Hill showing and the interpreted stringer deposits. A variety of geophysical surveys were conducted on the property, including Induced Polarization (IP), Airborne Electro-magnetic (AEM) and magnetics, which resulted in subsequent

trenching of zones and diamond drilling programs ensued to test the targets. Specific attention was focused towards establishing an inferred resource of portions of the stringer zone (Gazooma, Gazooma North, and Teck Hill), along with identifying a possible extension to mineralization to the southern region of the property at the felsic conformity with the regional banded iron formation (proposed by Forslund (2008)). In 2010, the Joint Venture optioned the project to Copper Lake Resources. To date, Copper Lake focused its recent exploration work on the Gazooma North Zone (now called the RM Zone). Work in the RM Zone was predominantly concentrated on copper stringer style shallow mineralization and a large part targeted IP chargeability anomalies. None of the historical programs ever explored the possibility that massive sulphide mineralization could potentially be associated with the stringer zones. The following sections of historical exploration activities have been compiled from various assessment reports on file at the MNM and are easily accessed by the public.

## **6.1 Pre-2006 Historical Exploration Summary**

- 1952 Kennco Explorations (Canada) Ltd. conducted an airborne electromagnetic (AEM) and MAG survey over the entire area.
- 1954 Teck Corporation discovered a high grade Cu/Zn showing to the south of Gripp Lake.
- 1955 Teck Corporation carried out magnetic surveys, EM surveys followed by a 20-hole diamond drilling program.
- 1955 Consolidated Marbenor Mines Ltd. drilled four diamond-drill holes, totaling 678m in length on the eastern shore of Summit Lake and intersected minor amounts of gold and copper.
- 1955 New Goldvue Mines Ltd. and Prospectors Airways Co. Ltd. conducted geophysical surveys (MAG, EM) in the Little Marshall Lake area, following holes (eight for 764m and eight for 917m, respectively) and found iron formation and graphite. Both of these areas are away from the Marshall Lake property.
- 1958 George Langford carried out geological mapping for the Ontario Ministry of Northern Development and Mines, Ontario Geological Survey.
- 1961 Teck Corporation carried out a 12-hole diamond drilling program for 1420m.
- 1962 Min-Ore Mines Ltd. carried out a six-hole diamond drilling program.
- 1962 Sheridan Geophysics Ltd. carried out an EM survey, a magnetic survey and an extensive diamond drilling program for more than 3000m on behalf of Jacobus Mining Corp.
- 1963 Marshall Lake Mines (with G. Reid) carried out a two-hole program for 105m.
- 1965 Vincent Feely carried out a seven-hole diamond-drilling program for 301m (possibly north of the area).
- 1967 Marshall Lake Mines Ltd. carried out a four-hole diamond drilling program for 610m.
- 1968 Kendon Copper Mines Ltd. carried out a diamond drilling program of over 50 holes for more than 3600m. A "reserve" was estimated for the Kendon Zone of 242,000 ton grading 1.45% copper, 4.76% zinc and 2.8oz/t silver in November, 1969. The resource is historic in nature and does not conform to 43-101 standards.

- 1969 NWT Copper Mines Ltd. carried out a 13-hole diamond drilling program, as well as a property report. NWT also drilled 723.2m of drilling on other zones.
- 1970 A.S. Bayne carried out a feasibility study resulting in the calculation of a 1,174,810tons resource on the Main Billiton zone grading 0.82% copper, 2.71% zinc, 1.77oz/t silver and 0.006oz/t gold based on 58 holes which was completed prior to NI43-101. This zone is east of the Kendon zone for which a separate historical resource was estimated.
- 1971 Teck Corporation carried out an EM survey, a magnetic survey and self-potential survey.
- 1973 NWT Mines acquired the Kendon Copper Mine property and consolidated the Main Billiton area.
- 1973 St. Josephs Exploration optioned the properties and transferred them to a new holding company, Giant Gripp Mines. They drilled 11 holes.
- 1974 Giant Gripp Mines Inc. carried out a MAG, a horizontal loop electromagnetic (HLEF) and a VLF-EM survey.
- 1975 Imperial Oil optioned the Teck Hill and Main Billiton properties from Teck Corp and Giant Gripp respectively consolidating the Marshall Lake property.
- 1976 Imperial Oil conducted IP surveys, detailed geological mapping and rock chip sampling.
- 1977 Imperial Oil conducted additional geophysical and geological mapping surveys and diamond drilling.
- 1981 Corporation Falconbridge Copper carried out a ground magnetic survey, VLF-EM and soil geochemistry, followed by a geological report and plans.
- 1983 Corporation Falconbridge Copper carried out a three-hole diamond drilling program with assays and a report by G. Wells.
- 1989 S.E. Amukun carried out a geological program, Precambrian Geology: Little Marshall Lake Area.
- 1990 T. Keast carried out the writing of a report of work by Granges Inc. for NWT Copper Mines Ltd.
- 1992 Giant Gripp Mines Inc. carried out a diamond drilling program.
- 1993 H. Hugon wrote a report on the structure of the Marshall Lake for Challenger Minerals Ltd.
- 1994 Challenger Minerals Ltd. carried out an EM survey as well as diamond drilling with assays.
- 1995 Ian Campbell wrote the report for the airborne EM survey, airborne magnetic survey, and a five-hole diamond-drilling project for Consolidated Abitibi Resources.
- 1996 NWT Copper Mines Ltd. carried out a diamond drilling program.
- 2000 G. Stott carried out geological mapping for the Ontario Ministry of Northern Development and Mines, Ontario Geological Survey.
- 2006-2008 East West Resources and Eyeconomy acquire the entire Marshall Lake property and completed exploration including mapping and prospecting, trenching (31 trenches

completed and sampled), drilling (58 holes), Induced Polarization, Magnetics, and VTEM surveys.

2010-2013      White Tiger Mining drilled 37 diamond drill holes at the RM Zone and completed additional IP surveys.

In 1952, Kennco Explorations (Canada) Ltd. conducted an airborne electromagnetic (AEM) and MAG survey on a larger area that included all of the map area.

The initial mining activity of the map area was triggered by the discovery of copper-zinc mineralization by prospectors of Teck-Hughes Gold Mines Ltd. (now Teck Corporation Ltd.) in the fall of 1954, about 1.6km south of Gripp Lake (Langford, 1959). In the ensuing staking rush, most of the Gripp Lake-Marshall Lake area was staked.

In the winter of 1954-1955, Teck-Hughes Gold Mines Ltd. put down 20 diamond-drill holes (numbered 1 to 20) for a total length of 2557m. The company also carried out exploration work including trenching, ground and airborne electromagnetic (EM) and magnetic (MAG) surveys, and geological mapping. In 1961, an additional 12 diamond-drill holes (numbered 21 to 32) totaling 1420m in length were collared. In 1971, MAG, self-potential (SP) and Very Low Frequency Electromagnetic (VLFEM) surveys were also completed on the "Teck Showing".

Following the staking rush, the Billiton Company excavated trenches that exposed copper-zinc mineralization south of the western end of Marshall Lake (Langford, 1959). Several owners have since acquired the "Billiton Showing" and have performed exploration work.

In 1962, Jacobus Mining Corp. Ltd. Hired Sheridan Geophysics Ltd. to conduct geophysical surveys which resulted in follow-up diamond drilling totaling over 3000m in the Marshall Lake area.

Kendon Copper Mines Ltd. acquired the claims west of and including the leased claim KK23033 (presently TB346422). In the spring of 1968, an IP survey was completed on part of the Kendon property. Between August 1968 and July 1970, over 50 diamond drill holes totaled over 3600m in length. Boreholes names were designated according to the zone numbers and completed on the D, S, B, N, K, M (the "Billiton Showing"), J and F zones by Kendon Copper Mines Ltd. The core recovered from three diamond-drill holes (MT series) was used for mill test purposes. Exploration up to November 1969 indicated estimated reserves at the Kendon property of 242,000 tons averaging 1.45% copper, 4.76% zinc and 2.8oz/t silver (Sullivan, 1970).

N.W.T. Copper Mines Ltd. held the ground east of KK23033. In 1968 and 1969, this company conducted additional geophysical surveys on the "Billiton Showing". Diamond drilling, totaling 2461m in length was put down on the eastern extension of the main (M) zone of Kendon Copper Mines Ltd.; 723.2m of preliminary testing of five other mineralized zones (Bayne, 1970) was carried out as well. In 1970, a feasibility study of the main zone of N.W.T. Copper Mines Ltd. was conducted by the consulting engineering firm of A.S. Bayne and Company. The company described an area of indicated and inferred mineralization east of claim KK23033 amounting to 1,065,760 tons to a depth of 300m grading 0.82% copper, 2.71% zinc, 1.77oz/t silver and trace amounts of gold (Bayne, 1970).

By 1973, N.W.T. Copper Mines Ltd. had acquired the Kendon Copper Mines property and hence the entire strike length of the Billiton showing. In 1973, St. Joseph Explorations Ltd. optioned 45 leased and

21 unleased claims off N.W.T. Copper Mines Ltd., which were then transferred to a new holding company, Giant Gripp Mines Inc. The exploration surveys conducted by St. Joseph Explorations Ltd. included a magnetic survey, horizontal loop electromagnetic (HLEF) survey, a VLF-EM survey, and a total of 11 diamond drill holes.

In October 1975, Imperial Oil Limited entered into an option agreement with Giant Gripp Mines Inc. and Teck Corporation Ltd. to investigate a large block of claims in the Gripp Lake-Marshall Lake area including the original Billiton and Teck prospects. In the summer of 1976, several surveys including IP work, detailed geological mapping and rock trenching were conducted. In 1977, Imperial Oil Limited conducted additional geophysical and geological surveys and diamond drilling.

In the 1960s and 1970s, several individuals conducted exploration work on parts of the Marshall Lake geological map area away from the Marshall Lake project. In 1965, V. Feeley collared seven diamond drill holes (total length of 302m) on the eastern border of the map area north and south of Marshall Lake. F. Koosel conducted magnetic surveys, EM surveys and rock trenching in the area north of Little Marshall Lake and south of Lake "B" (informal name) in 1971. R. Pelky completed two diamond drill holes totaling 152m in length for C. Gonzales in 1973.

Activity conducted during the 1977 field season included prospecting, rock trenching, geological mapping, ground geophysics and diamond drilling by employees of Imperial Oil Limited. Prospecting and rock trenching were also performed by various individual prospectors on their claims in the Gripp Lake area. Additional staking in the map area in 1977 was conducted in the area south and west of Phillips Lake after the completion of the field component of this report.

In the last half of 1992, Challenger Minerals Ltd carried out an extensive compilation review of all existing data. This was followed by a one-month field geological examination and an eight-hole, 3022 feet, diamond drill program (Campbell, 1993). Results were considered very positive and a comprehensive exploration program was recommended for the property in 1993.

The 1994 exploration program consisted of diamond drilling, surface and borehole PEM geophysical surveys, limited geological mapping, and lithogeochemical data manipulation. Diamond drilling was subcontracted to St. Lambert Drilling Co. of Valleyfield, P.Q., and, the geophysical surveys to Crone Geophysics of Mississauga, Ontario (Campbell, 1997).

The drilling was a continuation of a drill campaign started in November 1993, and consisted of finishing hole CML 93-11, and three additional drill holes totaling 5978 feet. Concurrent with the drilling, approximately 45 line-kilometers of surface DEEP-EM geophysics was completed, and, borehole geophysics was performed on five-drill holes (Campbell, 1997).

During the summer months, data manipulation of whole rock geochemical data was completed which clearly outlines areas of intense hydrothermally altered felsic volcanic rocks. Analyses of major and trace element geochemistry indicates the majority of the supracrustal rocks comprising the sampled areas to be calc-alkaline dacitic felsic volcanics (Campbell, 1997).

During 1995, a multistage exploration program was completed on the Marshall Lake property by Consolidated Abitibi Resources Ltd. The program included a five-hole, 7,335 feet, diamond drill program and subsequent borehole PEM on three of the holes, followed by geological and structural mapping,

lithogeochemical sampling, a 350 line-kilometer airborne electromagnetic survey, and finally data manipulation and interpretation (Campbell, 1997).

Based on this work it was concluded that the Marshall Lake property contains similarities with other VMS camps:

- a rusty, felsic agglomeratic unit found east of the Main Zone, stratigraphy about the rose petal alteration and,
- a bedded pyrite-sericite schist unit with local cherty beds found to the southeast of the Billiton zone.

The bedded pyrite-sericite schist was interpreted represent a hiatus in volcanism and appears to be laterally equivalent to the agglomerate unit. The unit also marks a change in volcanism from predominantly dacite-rhyodacite to dacite-andesite (Campbell, 1997).

The identification of these two units in their relative stratigraphic position was considered significant (Campbell, 1997).

Another major conclusion is that the Main Zone mineralization appears to occupy the axial planar hinge zone to a large scale second phase fold. Based on regional tectonics which generated the folds, secondary remobilization of any mineralization along a hinge structure would be from east to west, a consequence of northwest directed compression (Campbell, 1997).

## **6.2 East West Resources (2006 to 2009)**

East West Resource Corporation (now called Rainy Mountain Royalty Corp) explored the Marshall Lake copper-zinc-silver-gold property from 2006 to 2009. The exploration efforts discovered copper stringer style mineralization at the Gazooma, North Gazooma, Teck Hill, Cherry Hill, Main zone, Lease, Jewel Box, G-Zone, D-Zone, Open Pit, Anarod, North Zone, West Zone, Swamp Zone, South Zone as well as unnamed showings on the west and south sides of Gripp Lake. These areas consist primarily of copper mineralization, although additional zinc mineralization was discovered near the historical Billiton zone (Nielsen, 2010).

### **6.2.1 East West Resources Drilling and Trenching Programs**

East West Resource Corporation's exploration effort on the Marshall Lake copper-zinc-silver-gold property consisted of diamond drill programs conducted in December 2006, May-September 2007 and May-June 2008 as discussed in the 43-101 report written by Nielsen et al. (2010). These efforts were directed at the Gazooma, North Gazooma, Teck Hill, Cherry Hill areas where extensive copper mineralization exists.

In total, East West Resources drilled 58 drill holes between December 2006 and June 2008 as summarized in the Table 6.1. Additionally, East West Resource Corporation excavated 31 trenches on the property during the 2006 to 2008 program as summarized Table 6.2.

### **6.2.2 East West Resources VTEM Surveys**

Two Versatile Time-Domain Electromagnetic Survey ("VTEM") survey was flown by Geotech in 2007 on the Marshall Lake Property (Geotech Ltd., 2007) for East West Resources. The first survey was completed between February 25<sup>th</sup> and 26<sup>th</sup>, and second survey completed between September 20<sup>th</sup> and October 13<sup>th</sup>. A total of 1486.9 line-km were flown covering 219.3km<sup>2</sup>. The block was covered at a traverse line spacing of 150 m in different directions to meet geological target specifications. Tie lines

were flown perpendicular to traverse lines. The mean terrain clearance of the survey was 80m, amounting to an approximate 40m height of the VTEM system and 65m height of the magnetic sensor. Further survey information can be found in the two final survey reports by Geotech Ltd. (2007), which are filed for assessment credit with the MNDM.

The surveys produced a large number of quality anomalies, and helped map out the geometry and extent of mineralization. In the eastern portion of the property near surface anomalies were found in two distinct geological environments; in a gabbroic intrusion in contact with iron formation with potential Co-Ni-PGE mineralization; and within the volcanic pile in proximity to sulphide facies banded iron formation south of Main and Billiton occurrences, and an area likely to host zinc rich massive sulphide deposits. In addition, deeper anomalies were detected beneath the Gazooma and Teck zones.

### **6.2.3 East West Resources IP and Magnetic Surveys**

Between November 2007 and March 2008, a staged ground geophysical program was completed using seven different cut-line grids; totaling 144 line-km. A total of 118.8 line-kilometers was covered with an IP survey. Two main ground magnetic surveys were completed. The first covered D Zone, Open Pit and Main Zone and was a total of 106.8 line-km. The second covered the Teck Hill area and covered a total 25.1 line-km, for a total of 131.9 line-km of ground magnetic data on the property (Grant, 2007; Grant, 2008).

The IP surveys were successful in locating and outlining a number of conductive zones and defining enough of their strike lengths and directions so they could be drill tested. Mise a la Masse was also conducted on the Gazooma area from a surface showing in order to better understand the striking direction. The results were recorded as negatives due to strength and closeness of the zone to surface. However, the results on line 200m south and 45m west indicate that the showing is trending east to slightly northeast and is currently unconstrained to the east. Additionally, the zone also appears to be dipping slightly south to near vertical. The second area of the Mise a la Masse survey coverage was from drill hole GAZ-06-02 that was collared at line 225m south and 45m west and drilled north at -60° angle to intersect the showing first read with Mise a la Masse. The current injection point was 22 meters down hole and lines 175m south, 200m south, 225m south, 250m south, base line 0 west, 50m west and 100m west were read at 25 meter intervals. The results were again negative numbers, which would suggest that the source is too near surface for proper results. However, the shape of the zone was outlined. The strike of the zone appears to be in an east-west direction again open to the east. The zone also appears to expand in a northwest direction from the injection point (Grant, 2007; Grant, 2008).

## **6.3 White Tiger Mining (2010 to 2013)**

White Tiger Mining (Now called Copper Lake Resources) optioned the Marshall Lake project in 2010 from East West Resources. Between 2010 and 2013, White Tiger Mining completed 4 separate drilling campaigns for a total of 37 diamond drill holes in the RM Zone (Tab. 6.1). The company also completed some additional IP surveying and 2D and 3D IP modelling. Drilling was focused on relatively shallow IP anomalies, which coincided with copper stringer zones in the RM Zone. The following summary of the drilling campaigns is extracted from reports filed with the MNDM (Gibson and Cempírek, 2013 & Gibson, 2014) and press releases that have been filed on SEDAR.

### **6.3.1 White Tiger Mining Drilling Programs**

Diamond drilling on the Marshall Lake property in 2010 consisted of 13 holes (GAZ-10-15, GAZ-10-16, GAZN-10-09 to GAZN-10-19) with a total length 2427.99m. These thirteen holes were drilled from

October 1<sup>st</sup> to November 6<sup>th</sup>, 2010. Road work and mobilization of the drill to the Marshall Lake property at the beginning of the program occurred on July 30<sup>th</sup>, 2010.

Diamond drilling on the Marshall Lake property in 2011 was comprised of 11 holes (RMZ-11-20 to RMZ-11-30) with total length 1940.97m. These eleven holes were drilled from March 10<sup>th</sup> to April 15<sup>th</sup>, 2011 and then from September 16<sup>th</sup> to October 5<sup>th</sup>, 2011. Mobilization of the drill to the Marshall Lake property at the beginning of the program occurred on September 14<sup>th</sup>, 2011.

Diamond drilling on the Marshall Lake property in 2012 was comprised of 10 holes (RMZ-12-30 to RMZ-12-39) with total length 2662.17m. These ten holes were drilled from September 2<sup>nd</sup> to October 3<sup>rd</sup> 2012 and then from December 3<sup>rd</sup> to December 16<sup>th</sup> 2012.

Drilling in 2013 was intended to test one of four prominent 3D chargeability anomalies identified from the IP inversion modelling, while simultaneously filling in and consolidating the drill pattern between the RM and the RM-South zones. Three drill holes were completed totaling 460.85m of drilling between March 19<sup>th</sup> and March 24<sup>th</sup>, 2013.

### **6.3.2 White Tiger Mining IP Survey**

Exsics Exploration Limited, completed a detailed IP and downhole Mise a la Masse surveys, for White Tiger Mining, over a portion of their claim holdings in the Summit Lake Area, Ontario. The purpose of this program was to locate and define favorable geological setting for copper, zinc, silver and gold deposition (Grant, 2011).

The two phase of the ground geophysical program commenced on the March 7<sup>th</sup>, 2011 with the Mise a la Masse surveys of holes GAZN-10-11 and RMZ-11-21 which were completed by the March 15<sup>th</sup>, 2011. The second phase started on the May 5<sup>th</sup>, 2011 and was completed on the May 16<sup>th</sup>, 2011 and consisted of surface IP across lines 350mN to 800mN and lines 50mW to 550mW (Grant, 2011).

In all, a total of 12.2 kilometers were covered by the surface IP survey with an additional 11.2 kilometers covered by the down hole Mise a la Masse survey. The lines cover the areas: Gripp Lake West, D Zone, Main Zone, Open Pit, Gazooma and Teck Hill (Grant, 2011).

**Table 6.1:** Marshall Lake Historical Drilling (after Amukin, 1989; Campbell, 1995; Neilsen et al. 2010).

<b>Year</b>	<b>Company</b>	<b>Number of Holes</b>	<b>Meters (m)</b>	<b>Location</b>
1955	Teck	20	2557	Teck Hill
1961	Teck	12	1420	Teck Hill
1962	Min-Ore Mines	6	?	Main Billiton
1962	Jacobus Mining Corp	63	3306.1	Main Billiton
1963	Marshall Lake Mines	2	105	Main Billiton
1965	Vincent Feeley	7	301	Possibly outside area
1965	Marshall Lake Mines	5	?	Main Billiton
1967	Marshall Lake Mines	4	610	Main Billiton
1968-70	Kendon Copper Mines	50	3600	Main Billiton
1969	NWT Copper Mines*	13	2461	Main Billiton
1969	NWT Copper Mines	?	723.2	Other Zones
1973	St Joseph's Exploration	11	460.3	Main Billiton
1974	J. McDermott	6	310.6	Main Billiton
1975	J. McDermott	4	114.9	Main Billiton
1976	Giant Gripp Mines	1	32	Gripp Lake
1977	Imperial Oil	30	3011.1	Main Billiton and Teck Hill
1978	Imperial Oil	6	513.3	Gripp Lake
1983	Falconbridge Copper	3	1706	Giant Gripp and Dungarvon
1992	Giant Gripp Mines	8	921.1	Main Billiton
1994	Challenger Minerals	6	3126.9	Main Billiton and South Billiton
1995	Consolidated Abitibi Resources	5	2236.3	Main Billiton and Gripp Lake
1996	NWT Copper Mines	2	1062	Main Zone and Teck Zone
2006	East-West Resources	14	1166	Gazooma
2007	East West Resources	24	2538.4	Teck Hill Showings
2008	East West Resources	20	2914.95	Gazooma and Gazooma North
2010	White Tiger	13	2427.99	RM (Gazooma North)
2011	White Tiger	11	1940.47	RM (Gazooma North)
2012	White Tiger	10	2662.17	RM (Gazooma North)
2013	White Tiger	3	460	RM (Gazooma North)
<b>Total</b>		<b>359</b>	<b>42687.78</b>	

**Table 6.2:** Marshall Lake Historical Trenching (Neilsen et al. 2010).

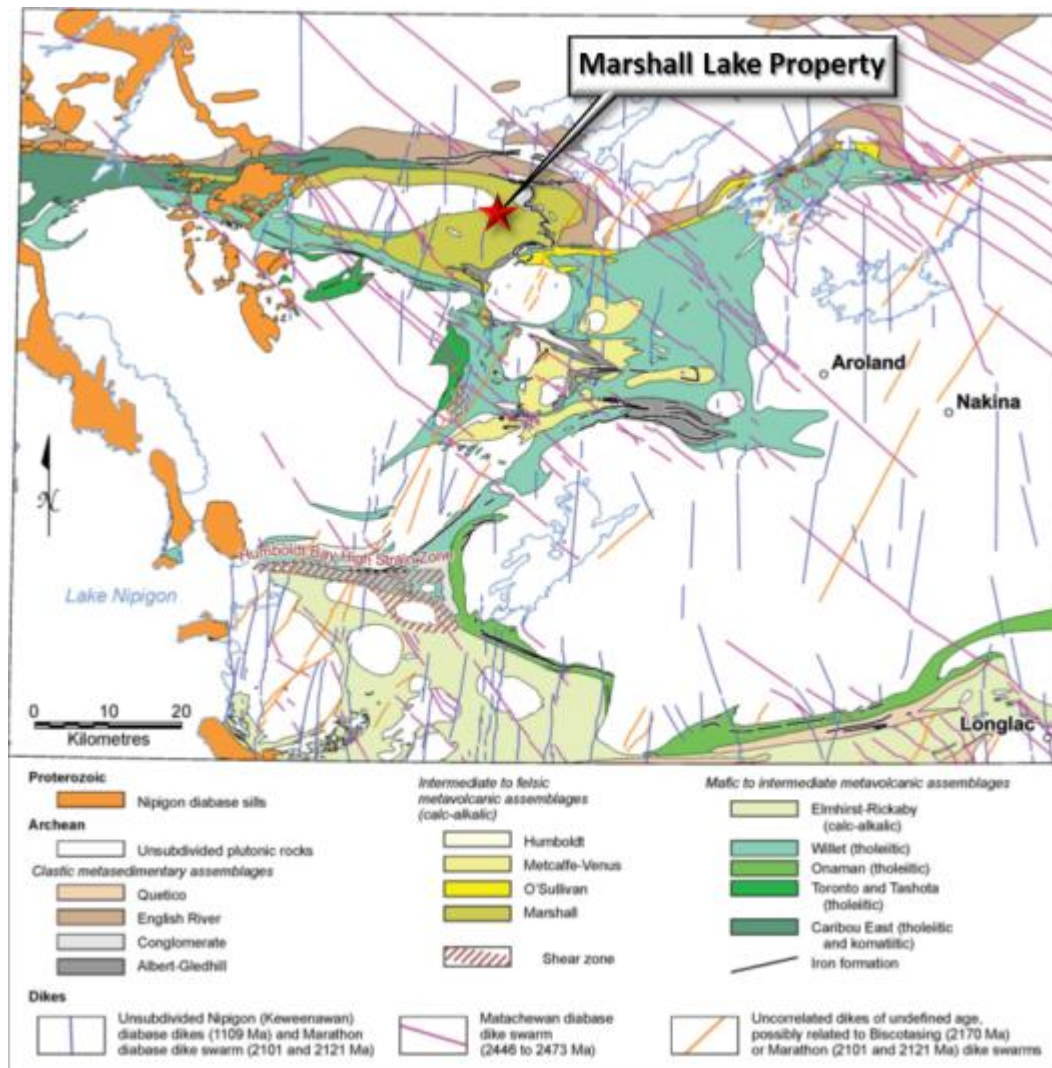
Years	Company	Target	Number of Trenches	Area
2006-2008	East-West	Cherry Hill	1	Gazooma NE
2006-2008	East-West	Teck Hill	2	Teck Hill
2006-2008	East-West	Lease	4	Gazooma North
2006-2008	East-West	Tala	6	Tech Hill East
2006-2008	East-West	Jewel Box	1	North RM/Gazooma North
2006-2008	East-West	Gazooma	1	Gazooma
2006-2008	East-West	G Zone	1	
2006-2008	East-West	Enzo	1	East Teck Hill
2006-2008	East-West	Lin Zn	1	East Teck Hill
2006-2008	East-West	Baseline Series	7	East Teck Hill
2006-2008	East-West	D Zone	3	"VTEM 6" area
2006-2008	East-West	North Copper	1	NE Teck Hill
2006-2008	East-West	Main Zone	1	Main Billiton
2006-2008	East-West	North Diabase	1	North Billiton
Total			31	

## 7.0 GEOLOGICAL SETTING AND MINERALIZATION

### 7.1 Regional Geology

The following description of the Wabigoon Subprovince is from Percival et al. (2006) and the references found in those papers. The Marshall Lake Property is located within the eastern portion of the Wabigoon Subprovince of the Superior Province (Fig. 7.1).

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 the overlying 2734-2722 Ma calc-alkaline Metcalfe-Venus assemblage of continental affinity. Across the southeastern Wabigoon domain, the 2740-2734 Ma calc-alkaline Elmhirst-Rickaby assemblage is possibly built on Mesoarchean Marmion-age substrate. Unconformably overlying clastic rocks were deposited 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 D2 structures and related shear zones most notable across the Humboldt Bay high strain zone. A 2694 Ma pluton provides a lower limit on the age of D2 deformation. Two general models have been proposed for formation of the Wabigoon domains: (1) an ensialic rift setting; and (2) an oceanic setting followed by accretion to the Winnipeg River terrane.



**Figure 7.1:** Major Tectonostratigraphic Assemblages of the Onamna – Tashota greenstone belt, showing orientation and distribution of Proterozoic diabase dyke swarms, Eastern Wabigoon Subprovince (modified from Stott et al., 2002).

## 7.2 Property Geology

The following description of the property geology is from Stott and Straub (1999), Stott et al. 2002, and the references found in those papers. The property is underlain by the ~2739 Ma Marshall Assemblage which is composed of a thick sequence of calc-alkalic dacite lavas and pyroclastic deposits that wrap around 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

isotopic characteristics of this assemblage are consistent with a calc-alkalic, continental margin arc constructed on Mesoarchean crust.

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 to lower amphibolite facies. The metamorphic mineral products of synvolcanic alteration within the dacitic rocks include: garnet, pink andalusite, fine-grained staurolite, and rare kyanite spatially associated with andalusite. A map of the Property geology is shown in Figure 7.2.

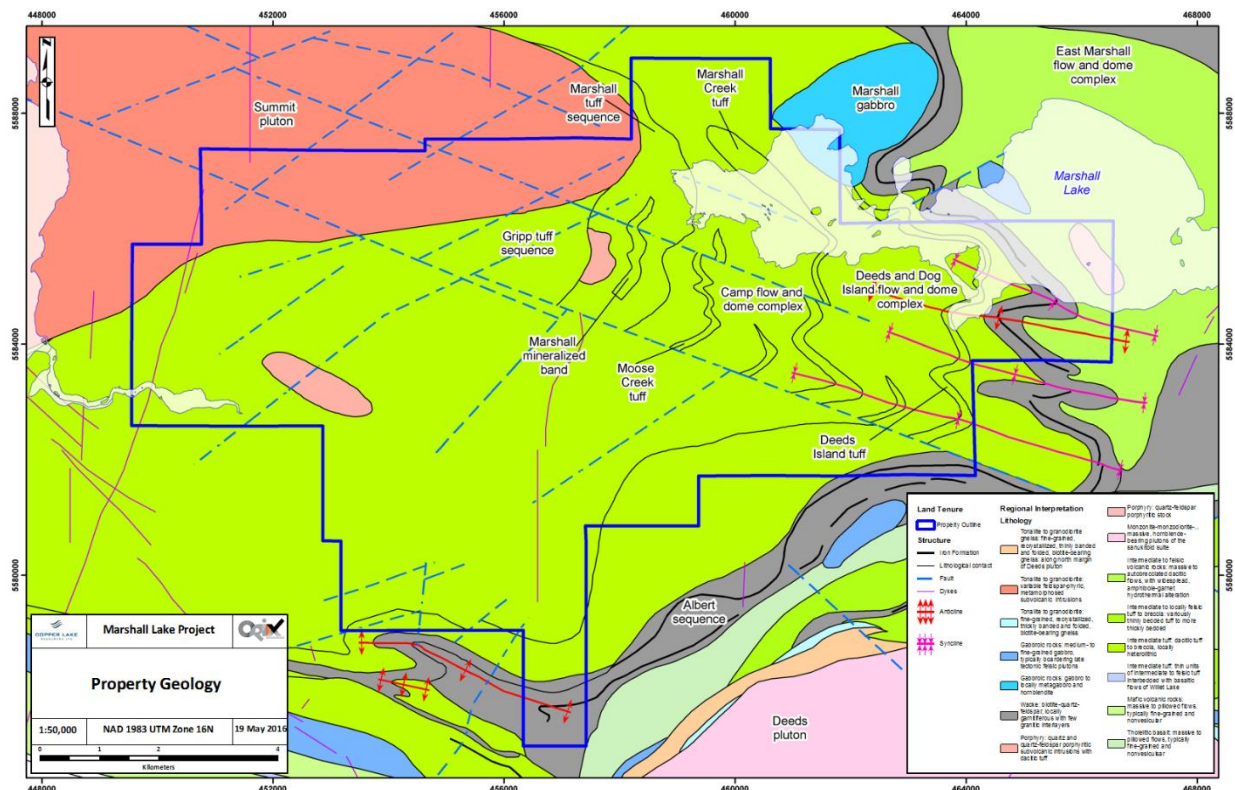


Figure 7.2: Property geology map for Marshall Lake (modified from Stott and Straub, 1999).

### 7.3.1 Gripp Tuff Sequence

Much of the Gripp sequence, the lowermost sequence, is composed of very thickly bedded, altered dacitic tuff with widespread disseminated coarse biotite alteration and areas of acicular amphibole alteration. The basal section of the Gripp tuff sequence is intruded by the Summit pluton. Alteration includes widespread fine-grained disseminated garnet, biotitization especially in the upper part of the sequence, very fine-grained staurolite encrusted along fractures accompanied in a few places by andalusite; and net-veins of very fine-grained white feldspar with acicular amphibole.

### 7.3.2 Marshall Tuff Sequence and Marshall Mineralized Band

The Marshall Tuff Sequence is composed of several dacitic tuffaceous units varying from ash tuff to crystal and lapilli tuff. The Marshall Tuff Sequence is host to several zones of VMS mineralization and alteration. The Marshall Mineralized Band contains the bulk of the identified mineralization in the area. The base of the Marshall Sequence is a thickly bedded quartz crystal tuff containing small zones of lapilli-

size material and is locally weakly altered and mineralized. This is overlain by the mineralized band, which varies from slightly quartz phenoclastic to a fine ash material that is finely laminated. This mineralized zone has been pervasively altered and metamorphosed to an assemblage of biotite, albite, and quartz, with minor garnet and rare amphibole. Superimposed on this alteration zone are discordant aluminosilicate-rich zones, defined by the presence of sericite, andalusite, and minor albite. Locally, in the vicinity of mineralization, this aluminosilicate alteration is associated with intense silicification and sulphidization. The areas of most intense alteration contain variable amounts of stratabound and stringer VMS mineralization such as the North Diabase, Adnarod, Main Zone, Bog Zone, and South Zone. Overlying the mineralized band is a series of progressively less altered tuffs, followed by a sequence of bedded coarse ash to fine lapilli tuff. Both of these units are affected by the discordant aluminosilicate alteration that underlies the Moose Creek Tuff.

### **7.3.3 Camp Flow and Dome Complex and the Moose Creek Tuff**

The three dacitic flow and dome complexes (i.e., Camp complex, Deeds and Dog Island complex, East Marshall complex) are exposed in the eastern half of Marshall Lake and comprise thick dacitic flows and autobreccia. Individual, massive flow units can be identified, which grade upwards (eastwards) to autobreccia and hyaloclastic tuff breccia. In places, the brecciated upper part of flow units is indistinguishable from pyroclastic breccia. Iron-enrichment alteration (amphibole-garnet  $\pm$  magnetite) of the matrix of autobrecciated to hydrofractured flows appears to be more intensely developed in the eastern part of Marshall Lake.

The Camp flow and dome complex is defined by much smaller domes and flows than in the two complexes to the east. Numerous zones or areas of autoclastic breccia are present along the margins of the inferred domes. These zones are useful for distinguishing individual units and accordingly, several dome or flow units are mapped in this area. The units vary in texture from aphanitic to quartz- and/or feldspar porphyritic with 1 to 3% phenocrysts ranging 1 to 2mm in size. Locally some of these units are magnetic.

The Moose Creek Tuff is a fine- to medium-grained ash tuff, with local rare beds containing small lapilli-size material. The tuff varies from quartz porphyritic to aphanitic throughout the area. The Moose Creek Tuff is an interflow tuff, possibly derived from the break-down of autoclastic breccia or massive flow. Sections of this tuff are silicified, and often contain 3 to 5% disseminated and fracture-filling pyrite. In addition to silicification, aluminosilicate alteration is commonly associated with the mineralization in the tuff.

Alteration within the Camp complex is weak, and where present it is discordant in nature. Local, small discordant zones of sulphidization and silicification underlie the Moose Creek Tuff. These zones of aluminous alteration are composed of sericite, andalusite, staurolite, and albite, with scarce kyanite in a few locations. This alteration locally changes outwards into zones containing a garnet-amphibole assemblage.

### **7.3.4 Marshall Creek Tuff Sequence**

The Marshall Creek Tuff is a sequence of thickly to thinly bedded tuff that is very fine-grained to feldspar- and rarely quartz-porphyritic. Most commonly, beds are composed of homogeneous fine-grained ash tuff, with small sections that appear to display local grading.

### **7.3.5 Deeds and Dog Island Flow and Dome Complex**

The Deeds and Dog Island flow and dome complex appears to be composed of multiple, possibly nested domes with flows and autoclastic breccia of dacitic to rhyodacitic composition. The flows and domes of this area are typically porphyritic, with feldspar dominant. Both aphanitic and quartz porphyritic volcanic rocks are present but limited in volume. Feldspar phenocrysts typically comprise 1 to 3% of the rock, up to 7%; they vary in size between flow units, ranging from 1 to 5mm in diameter. Quartz phenocrysts are generally smaller and less abundant.

This stratigraphic sequence has been affected by a pervasive iron-enrichment alteration, which increases in intensity upwards through the section. This alteration is represented by a mineral assemblage of garnet + hornblende  $\pm$  magnetite  $\pm$  pyrrhotite that preferentially affects the more permeable autobrecciated units. The alteration almost completely replaces the original breccia matrix and, to variable degrees, pervades the fragments. This alteration is also weakly disseminated in the thick, massive portions of the flows. Locally, it completely replaces the host, leaving only hints, such as relict fragments and remnant quartz phenocrysts, as to the nature of the original rock type.

### **7.3.6 Deeds Island Tuff**

A sequence of dacitic tuff to lapilli tuff, up to approximately 400m thick, lies above the Deeds and Dog Island flow and dome complex. The unit is well exposed on eastern Deeds Island. The tuff appears to be thinly to thickly bedded but the bedding is discontinuous.

### **7.3.7 East Marshall Flow and Dome Complex**

The eastern half of Marshall Lake appears to be occupied by a massive to autobrecciated dacitic flow and dome complex. This massive sequence is separated from the main assemblage by the Albert metasedimentary sequence and is enveloped by metasedimentary rocks. It may represent a separate volcanic center adjacent to the Marshall volcano. The autobreccia facies of this complex displays a strong alteration to a garnet-amphibole assemblage.

### **7.3.8 Sedimentary Rocks**

Sedimentary rocks form major stratigraphic markers in the region. The clastic units are generally composed of wacke-sandstone and mudstone. Magnetite-chert oxide facies iron formation, within the Albert clastic metasedimentary sequence, strikes southwards across the centre of Marshall Lake, forming a distinct aeromagnetic high and providing a valuable constraint on the stratigraphic framework of the area. This D<sub>2</sub>-folded aeromagnetic marker continues southwards into the Albert - Willet lakes area.

### **7.3.9 Mafic Intrusive Rocks**

Gabbroic intrusions occur locally within the Marshall assemblage. Some appear to be synvolcanic dykes close to postulated synvolcanic faults. The most significant mafic intrusion, the Marshall Gabbro is a late tectonic body centered on the north shore of Marshall Lake. This is a semi-circular body composed of an outer zone of hornblendite and a core of gabbro.

### **7.3.10 Felsic Intrusive Rocks**

Synvolcanic porphyry intrusions, larger than local sills, have been identified at the south end of Gripp Lake, west of Gripp Lake and in the center of eastern Marshall Lake.

The Summit pluton is an elliptical body with its long axis parallel to the subprovince boundary. It is composed of quartz phyric tonalite with amphibole or biotite-amphibole and is metamorphosed and deformed by D2. Consequently, it is interpreted as a synvolcanic pluton although it intrudes the lowermost stratigraphic section of tuff and incorporates tabular inclusions of dacitic tuff.

#### **7.3.11 Proterozoic Dykes**

Middle to Late Proterozoic mafic dykes postdate all other bedrock geology in the area. These dykes typically range from 10m to 40m in width and grain sizes depend on this thickness. Many of these dykes display an ophitic texture suggesting that they are diabase rather than gabbro.

#### **7.3.12 Structural Geology**

The entire volcanic assemblage, west of the Albert sequence, appears to be facing consistently eastwards. In the tuffaceous sequences, evidence for stratigraphic way-up directions is only locally noted in thin, graded beds. However, upward gradations from massive dacitic flows to autobreccia and hyaloclastic breccia face consistently eastwards in the eastern half of Marshall Lake. In addition, there is no evidence of refolding of strata, which supports the general observation that the strata face eastwards. Bedding (S0) of pyroclastic deposits is typically very thick (> 1m) across the region.

A widely observed D1 flattening foliation lies parallel to the bedding and trends northwards throughout the area. This fabric might be related to burial since there is no evidence to indicate that this bedding-parallel foliation is associated with folding. The only folds observed in this region are associated with D2 deformation and the aeromagnetic map patterns illustrate large open D2 folding of the supracrustal strata. Bedding and D1 foliation dip consistently eastwards, away from the Summit pluton. Dips vary from moderate to shallow in the west and steepen in the eastern half of Marshall Lake across the massive dacitic flows of the dome and flow complexes.

The entire Marshall-Gripp lakes region forms a large east-plunging D2 antiform that in part might be governed by the curvilinear shape of the large dacitic volcano, which appears to be centred in the vicinity of Summit Lake. D2 structures are the dominant tectonic features in the region. This deformation is characterized by open to tight folds of the S0/S1 foliation and by an axial planar cleavage and planar mineral alignment (S2) that trends eastwards and dips steeply to the south. West of the East Marshall flow and dome complex, the accompanying stretching lineation, L2 plunges consistently eastwards, parallel to the F2 fold axes, and is most intense in the central core of the large antiform. The mesoscopic F2 folds are commonly accompanied by crenular F2 folds, especially in thinly laminated tuffaceous beds that have been silicified, which preserved the fabric from the transposition effects of D2 observed in places where the D2 folding is tight. In the East Marshall flow and dome complex, the S2 foliation dips northwards and L2 becomes a down-dip lineation, plunging northwards. This change in orientation continues along the northern part of the belt to the O'Sullivan Lake area (Stott and Parker 1997).

The only late tectonic intrusion in the map area is the Marshall Gabbro, with which there is no evidence of an associated D3 contact strain aureole in the adjacent volcanic rocks, in contrast to the presence of strain aureoles around the late intrusions in the central Onaman-Tashota belt (Stott and Straub 1999).

### 7.3.13 Fault Zones

Fault zones are not well exposed but are marked by linear topographic depressions such as strings of elongate lakes and bogs. Most of the northwest- and northeast-trending faults are late-tectonic features (D4) that crosscut the D2 structures. The most prominent northwest-trending fault is the locally named 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.

The Moose Lake fault appears to continue and merge with the Pashkokogan fault along the English River. Wabigoon boundary. Limited evidence of displacement among these brittle fractures is consistent with right-handed transcurrent movement along the fault. Although the contact of the greenstone belt with the English River metasedimentary terrane appears to be un-faulted northwest of Marshall Lake, there is some evidence of a WNW-trending high strain zone close to and parallel to the subprovince boundary in the unit of unsubdivided gabbro and amphibolitized basalt. This high strain might continue to the Pashkokogan fault zone along the English River – Wabigoon subprovince boundary.

A synvolcanic age for some faults is locally inferred from indirect evidence. One fault in particular trends westwards along Gripp Creek near the old Marshall Lake drill campsite and its synvolcanic heritage is apparent from several lines of evidence:

- The silicification of dacitic tuff is most intense near the fault and diminishes southwards.
- The volcanic sequence transected by the fault is a pile of very thickly bedded dacitic tuff but an elongate, fault-parallel body of massive to autobrecciated dacite formed within this pile and apparently extruded from the fault. The autobrecciated portion of this effusive body occupies an area of approximately 200 by 200 m in the vicinity of the Marshall Lake drill campsite. Fine-grained mafic dykes occur along and in the vicinity of the fault.
- The altered tuffaceous strata on the southern side of the fault cannot be traced across the fault.

### 7.4 Mineralization

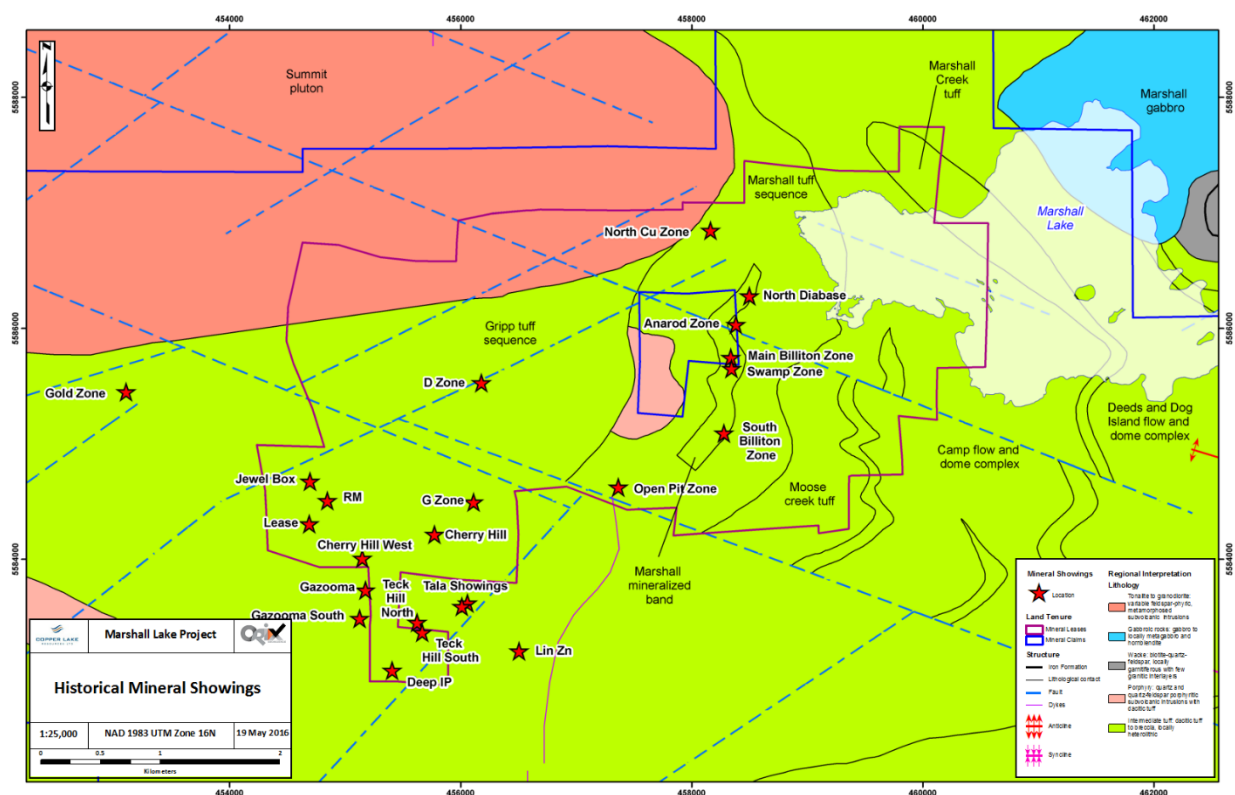
The following description of the Wabigoon Subprovince is from Stott and Straub (1999), Straub (2000, 1999) and the references found in those papers. Marshall assemblage is interpreted to be a submarine eruptive sequence, containing evidence of synvolcanic faults, associated hydrothermal discharge zones and intensely altered rock especially in the vicinity of the base metal deposits. Historically, the volcanic massive sulphide mineralization associated with the Marshall Lake volcanic center was described as stratabound horizon of Cu-Zn-Ag-Pb occurrences in an intermediate to felsic volcanoclastic, containing tuffaceous to lapilli tuff facies, which are capped by ferruginous chert.

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. Locally these zones of mineralization are deformed, but no evidence of significant remobilization of the mineralization is evident. Although the degree of deformation in these rocks has hindered previous mapping and exploration ventures, success may be achieved in this area through detailed mapping of both the

structural and lithological controls on mineralization. The presence of a distinct mappable package of rocks that contains stratiform accumulations of copper- and zinc-rich sulphides makes this region a significant target.

Well over 112 known mineral occurrences of base-metal mineralization outcrop over an extensive area across the entirety of the Marshall Lake property. Significant mineralized showings are illustrated on Figure 7.3. The mineral occurrences are spatially associated with the felsic calc-alkaline fragmental meta-volcanic rocks consisting of the following types:

1. Ubiquitous sulphide disseminations in thin metamorphic garnetiferous-amphibolite (actinolite-hornblende) lenses throughout the major showings, such as Teck and Billiton (Main).
2. Disseminated to massive lenticular sulphide shoots that represent migrated metal concentrations in the nose areas of minor folds, such as the Main Zone in the Marshall Mineralized Band.
3. Disseminated sulphide mineralization in local shears and silicified zones across the entire map area.



**Figure 7.3:** Local geology map of Marshall Lake showing location of mineralized zones.

Main Billiton Zone is the most economically important deposit on the project, which was discovered in association with the Marshall Mineralized Band, by Teck-Hughes Gold Mines Ltd. in 1954. This zone is not a massive sulphide horizon, and exists as five lenses of stratabound / stringer / disseminated sulphides hosted within hydrothermally altered felsic rocks striking 1.5km. It is hosted within aphanitic

to weakly quartz-porphyritic finely bedded laminated volcanoclastics and a laminated cherty tuffaceous unit (Straub, 2000). Mineralization exists in order of abundance, pyrite, chalcopyrite, sphalerite, silver-minerals, galena, gold, pyrrhotite and magnetite.

The Marshall Lake Mineralized Band represents a period during which concurrent mineralization occurred or that a favourable laminated or porous trap focused hydrothermal alteration. However, suggests that the mineralization appears to have been remobilized or concentrated by later folding.

The mining leases cover ten additional base metal showings including the east extension of the Main Billiton Zone. The zones in part follow the trend of the Marshall Lake Mineralized Band that was not previously recognized by the original workers in the 1950's - 1970's. The majority of the zones contain high copper and/or silver values which are typical of a VMS stringer zone.

The Main Billiton, South and North Diabase zones contain copper – zinc – silver mineralization and are inferred to represent examples of massive sulphide lenses. Whereas, results for the G, North Copper, D, Lease and Jewel Box Zones are enriched in copper – silver mineralization and are examples of stringer style zones.

## **7.5 Marshall Lake Conceptual Model**

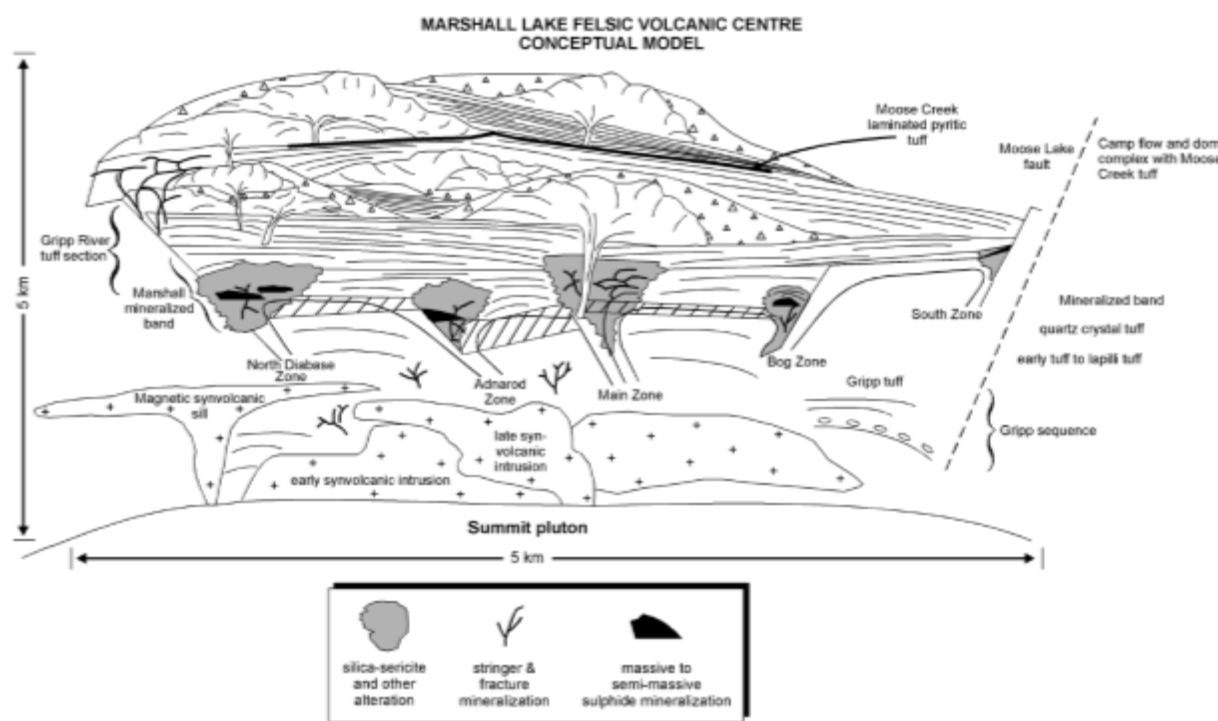
Straub (1999) presented a conceptual model of the Marshall Lake felsic volcanic center from the Summit pluton to the Camp flow and dome complex (Figure 7.4). The volcanoclastic rocks have been termed the Marshall Tuff Sequence with the most notable package being the Marshall Mineralized Band. The stratigraphic section mainly consists of laminated to bedded volcanoclastic rocks, with intervening zones of more massive rock. The grain size of the volcanoclastic units varies from fine to coarse ash with local zones of crystal and lapilli rich material.

The lowermost part of the Marshall Sequence contains massive to well-laminated, quartz phenoclastic to aphanitic tuff, which are locally graded. These rocks are intruded by massive, aphanitic to weakly porphyritic subvolcanic sills and possible cryptodomes. Rocks in this sequence generally vary from relatively unaltered to locally moderately altered with biotite, andalusite, and silica. In zones of increased alteration, these rocks typically contain up to 5% disseminated and fracture-fill sulphide, and rare zones of semi-massive to massive sulphide mineralization.

Overlying this lower part of the Marshall sequence is a mineralized stratigraphic package, termed the Marshall Mineralized Band. This sequence is composed of aphanitic to weakly quartz phenoclastic, thinly bedded to laminated volcanoclastic rocks with interdigitated sections of massive felsic material. This package of rocks is host to the most significant alteration and mineralization in the region. The laminated portions of this package are the host to many of the massive to semi-massive sulphide occurrences. This mineralized band can be traced along a strike length of over 1.5km and continues farther south beyond the Main Zone towards the Moose Lake fault. This distinctive package of rocks represents either a period during which concurrent mineralization took place or a favourably laminated and porous trap for subsequent hydrothermal alteration.

Above this mineralized and altered sequence there is a package of relatively unaltered, medium bedded to laminated volcanoclastic rock. These tuffaceous rocks (between the Marshall mineralized band and the Camp flow and dome complex) vary in grain size from ash to fine lapilli, and locally exhibit crude normal gradation that indicates the younging direction is towards the east. These rocks form what

appear to be single depositional packages of generally 2 to 3m in thickness and exhibit a systematic decrease in bed thickness and grain size upwards from a base of massive and medium-bedded units to more thinly bedded and laminated units at the top. Weak, disseminated amphibole and garnet, plus localized discordant aluminosilicate (andalusite + sericite) alteration, characterize this package of rock.

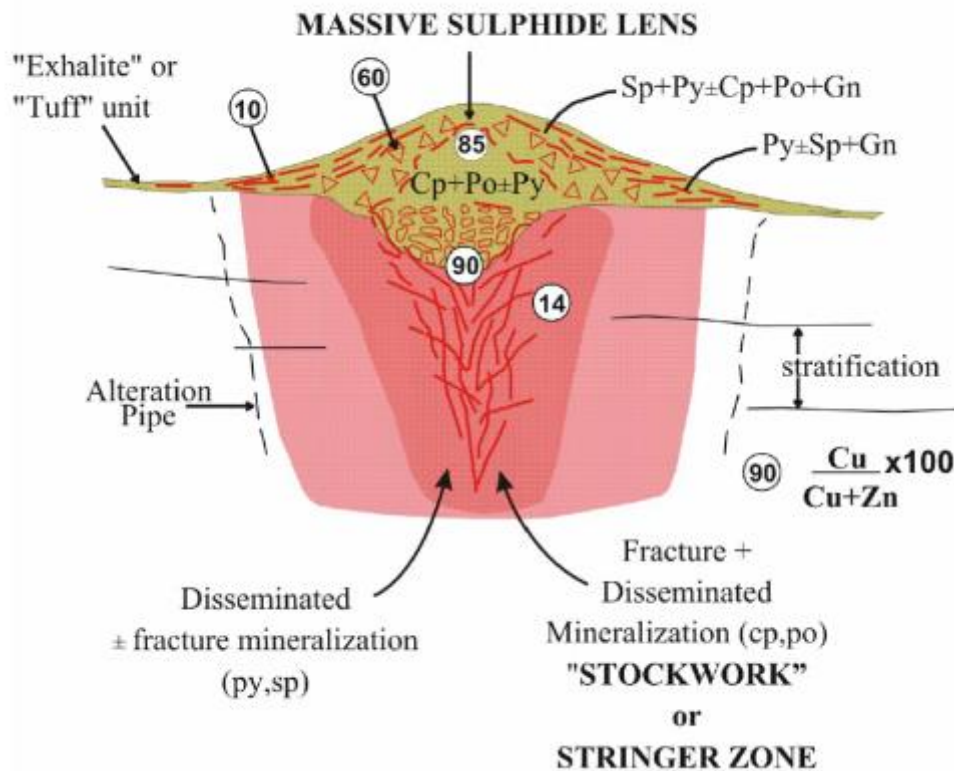


**Figure 7.4:** Conceptual model of the Marshall Lake felsic volcanic center from the Summit pluton to the Camp flow and dome complex. Note the size of the mineralized bands is exaggerated for illustration (Straub, 1999).

## 8.0 DEPOSIT TYPES

### 8.1 Volcanogenic Massive Sulphide

The following description of the volcanogenic massive sulphide model is from Franklin et al. (2005), Gibson et al. (2000) and the references found in those papers. Volcanogenic massive sulphide ore deposits or VMS are a type of metal sulphide ore deposit, mainly Cu-Zn-Pb which are associated with and created by volcanic associated hydrothermal events in submarine environments. They are syn-volcanic accumulations of sulphide minerals that occur in geological domains characterized by submarine volcanic rocks. The deposits are composed of iron sulphides with subordinate amounts of chalcopyrite, sphalerite and galena. Generally, a deposit consists of a stratiform lens of massive sulphide containing the bulk of the mineralization within hydrothermally altered rocks of the stratigraphic footwall. VMS deposits are the result of special hydrologic, geothermal and topographic conditions on the ocean floor. They are predominantly stratiform accumulations of sulphide minerals that precipitate from hydrothermal fluids on or below the seafloor in a wide range of ancient and modern geological settings. In modern oceans they are synonymous with sulphurous plumes called black smokers. They represent a significant source of the world's Cu, Zn, Pb, Au, and Ag ores.



**Figure 8.1:** Idealized VMS deposit showing a strataform lens of massive sulphide overlying a discordant stringer sulphide zone within an envelope of altered rock (alteration pipe). Base metal zonation indicated by numbers in circles with the highest numbers being Cu-rich and the lower numbers more Zn-rich (Py = pyrite, Cp = chalcopyrite, Po = pyrrhotite, Sp = sphalerite, and Gn = galena; modified from Gibson, 2005).

The typical economic deposit may consist of several individual massive sulphide lenses or stock-work zones and contains 1-10 million tonnes of ore with an average grade of 2-10% Cu + Zn + Pb. The largest of these deposits contain in excess of 100 million tonnes of ore. These deposits tend to form in clusters creating a mineralized region on average about 32km in diameter. VMS deposits characteristically will show a zonation in ore (Fig. 8.1), gangue and hydrothermal alteration minerals both outwards and upwards in the system from the core of the stock-work zone and the base of the massive sulphide lens at the top. The gangue minerals present are mainly quartz and pyrite or pyrrhotite. The metal zonation is caused by the changing physical and chemical environments of the circulating hydrothermal fluid within the wall rock forming a core of massive pyrite and chalcopyrite, with a halo of chalcopyrite-sphalerite-pyrite grading into a distal sphalerite-galena and galena-manganese and finally a chert-manganese-hematite facies. The mineralogy of VMS massive sulphide consists of over 90% iron sulphide, mainly in the form of pyrite, with chalcopyrite, sphalerite and galena also being major constituents. Magnetite is present in minor amounts; as magnetite content increases, the ores grade into massive oxide deposits.

Volcanogenic hosted massive sulphide deposits are distinctive in that ore deposits are formed in close temporal association with submarine volcanism and are formed by hydrothermal circulation and exhalation of sulphides which are independent of sedimentary processes, which sets VMS deposits apart from sedimentary exhalative (SEDEX) deposits. A common theme to all environments of VMS deposits through time is the association with rift environments. The Noranda or Kuroko type deposits are

typically associated with bimodal sequences. Bimodal-mafic VMS deposits are associated with environments dominated by mafic volcanic rocks, but with up to 25% felsic volcanic rocks, the latter often hosting the deposits.

VMS related metasomatism could greatly affect the geochemistry of a rock. The effects of hydrothermal alteration work in such a way that certain elements are leached out of the rock by hot fluids and precipitated elsewhere. There are several key elements to a VMS type system that need to be understood in order to understand how the geochemistry will vary in different locations within the system. Perhaps the most critical element in the system lies at the base of the sequence and acts as a driving force (heat source) for the entire system. This comes in the form of an intrusion of some sort, usually a sub-volcanic sill. Just above this there is a high temperature reaction zone where dehydration reactions occur. The excess water will act as the primary hydrothermal fluid and will leach metals from the high temperature reaction zone. The typical geochemistry of one of these high temperature reaction zones will tend to be depleted in metals (e.g. Cu, Zn, Fe), but enriched in the elements that were left behind (e.g. Si, Ca, Na). The uppermost part of the high temperature reaction zone will be highly silicified (or in some cases calcified) to the point where it becomes a “cap” and this insulates the upper zone from the heat. In order for the metal rich fluids to penetrate this cap, the system must be part of an extensional tectonic regime where normal faults can transect the cap and penetrate down into the high temperature reaction zone. These faults are usually created as rift-associated normal faults or normal faults on the margin of a caldera system. The fluids can now cool and precipitate their metals in the fractured area beneath the seafloor. If the fluid does not cool enough for certain metals to precipitate then they escape through seafloor vents, commonly known as “black smokers”. Seawater will also be drawn into the marginal fractures and convect through the rocks to further alter the chemistry of the precipitation zone. A typical geochemical signature that one might expect in this zone would be characterized by enrichment in Mg, K and  $\text{SO}_4$ , but depleted in Na and Si (Fig. 8.2).

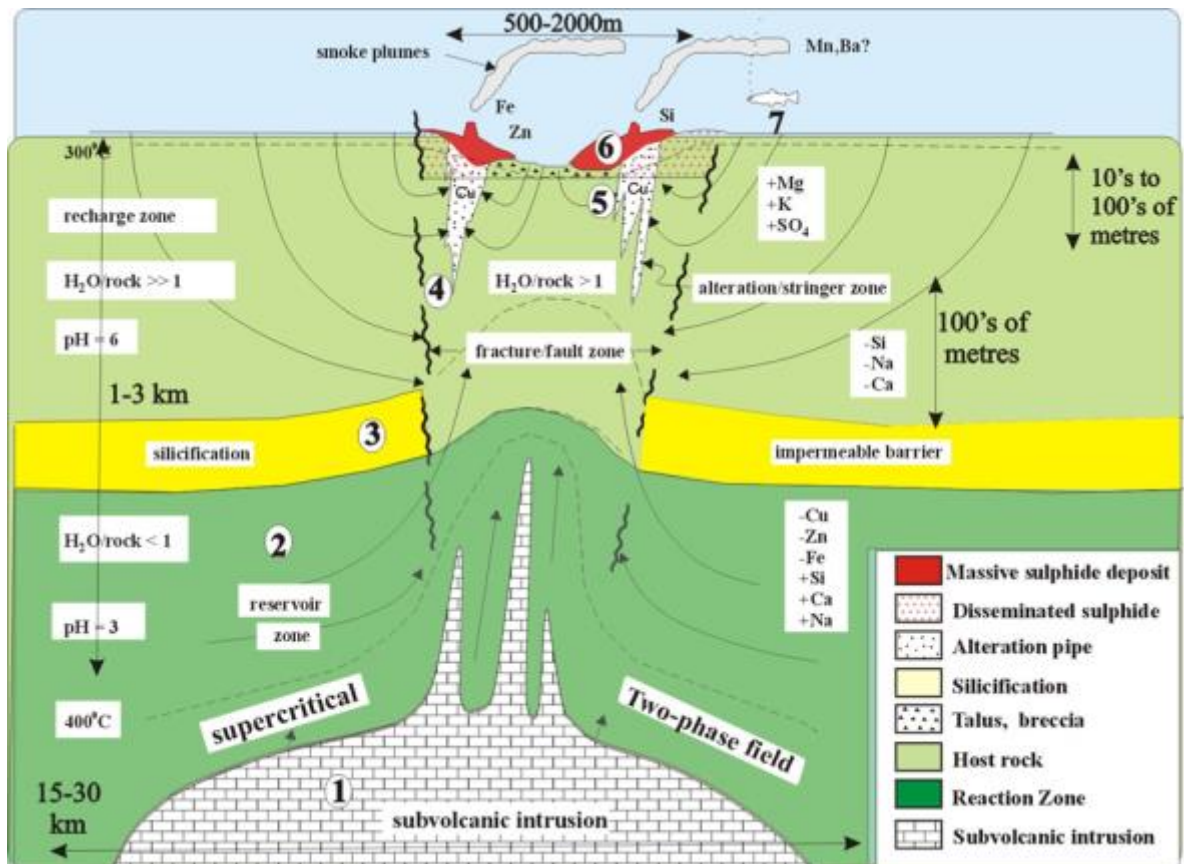


Figure 8.2: The genetic model for the formation a VMS type deposit. (Franklin et al.,2005)

## 9.0 EXPLORATION

Caracle Creek International Consulting was commissioned by Copper Lake to conduct a compilation and review of three geophysical surveys on the Marshall Lake property. The following description of the work is taken from the report written by McKenzie et al. (2015). Airborne VTEM data was examined and reprocessed by Geotech to identify conductive anomalies with relevant depth extent. Ground magnetic data was digitized, transformed from grid to world coordinates, and was used to identify structures. IP/Resistivity survey data was compiled, digitized, transformed from grid to world coordinates, assessed for quality-control and inverted for further analysis. This analysis was a comparison of the inverted data against known mineralized zones to be used for drill target identification.

In tandem to this compilation, Orix Geoscience Inc. undertook a complete re-organization and compilation of data. Existing GIS data was re-organized and re-named and assessment reports for the area were re-named and catalogued. A full re-interpretation of surface geology using historical map work was completed.

### 9.1 Geophysical Compilation and Interpretation

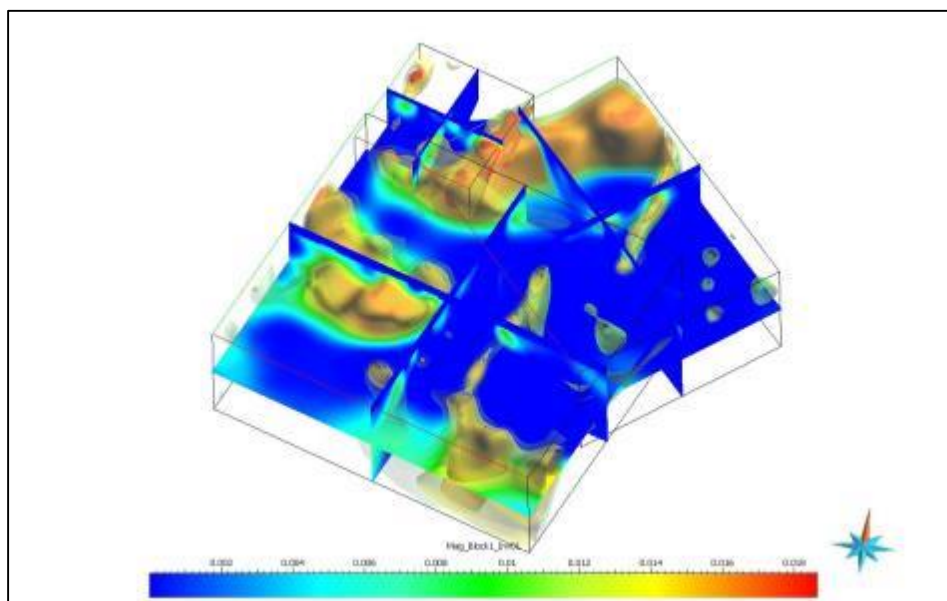
The geophysical compilation consisted of updating the location information of the ground surveys using most recent GPS location information, processing and conducting quality control on all datasets, and conducting inversion for better depth and lateral resolution of targets.

The historical geophysical surveys included: Geotech’s helicopter-borne time-domain electromagnetic system VTEM™ (“VTEM”), ground magnetic surveys (“ground mag”), and pole-dipole induced polarization/resistivity surveys (“IP/RES”). The final results were then loaded into the 3D platform Gocad to review in conjunction with the compiled historic drill hole data and integrate these results to provide new drill targets for investigation.

#### 9.1.1 TEM Survey: Magnetic filters, Magnetic Inversions and Resistivity Depth Images

Standard grid filters of the magnetic data were calculated by Caracle Creek: Total Magnetic Intensity, Reduction to Pole, First Vertical Derivative, Analytic Signal and Digital Elevation Model, as well as ‘enhanced’ products to facilitate regional targeting and interpretation. The enhanced products included: tilt derivative, horizontal derivative of the tilt derivative, total horizontal derivative, second vertical derivative, ‘Area’ filter, and ‘Edge’ filter.

The magnetic data was inverted with a 30m cell-size mesh using the UBC-GIF MAG3D inversion code. The area was broken into three separate cubes, to account for the various survey line orientations. The resulting mesh for the three separate cubes as shown in Figure 9.1.

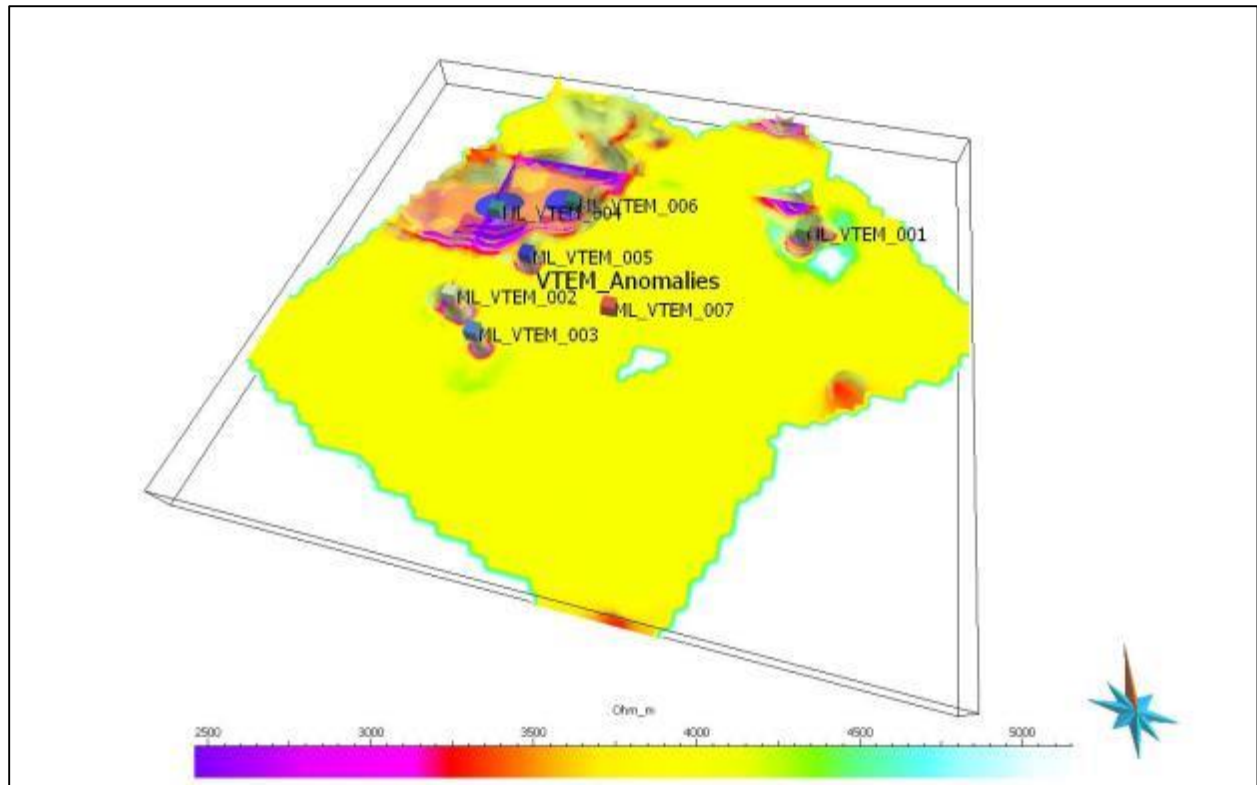


**Figure 9.1:** Inversion blocks of airborne magnetic data. Voxels shown in susceptibility (SI) units with isoshells (Purple = 0.02 SI, Red = 0.01 SI, Orange = 0.008 SI, Yellow = 0.006 SI, Green = 0.004 SI) (after McKenzie et al., 2015).

The results highlight the presence of the Proterozoic diabase dyke, as well as an approximately 900m of horizontal dextral movement on the Moose Lake Fault. A larger, regional response is noted in the north and west of the property and may represent the presence of an intrusion.

Geotech Ltd initially provided Conductivity Depth Images (“CDIs”) for each line. Geotech later indicated that CDIs were generated based on layered earth model; however, this method has been found to be inappropriate for Canadian environments. Geotech reprocess each survey line generating a Resistivity Depth Images (“RDIs”), which transform the EM decay data into an equivalent resistivity versus depth cross-section (Meju, 1998).

The final results were loaded into Gocad and isoshells were created to highlight the most conductive features (Fig. 9.2). Seven of the best anomalies were selected from this reprocessed data and are listed in Table 9.1.



**Figure 9.2:** Overview of the resistivity-depth images, with isoshells around conductive features (Blue = 1000ohm-m, purple = 1500ohm-m, red = 2000ohm-m, orange=2500ohm-m, yellow = 3000ohm-m, teal = 3500ohm-m) (after McKenzie et al., 2015).

**Table 9.1:** Anomalies selected from RDI products.

ANOM_ID	X_NAD83	Y_NAD83	TOPO	Log (AppRes)	GRADE	Dimensions (m)	Volume (m <sup>3</sup> )	COMMENTS
ML_VTEM_001	458325	5585400	339.12	6.40	1	600x300x300	54,000,000	SW of Billiton zone; Drill
ML_VTEM_002	455175	5583750	372.52	7.27	1	400x250x300	30,000,000	Tested in Gazooma holes; Requires deeper drilling
ML_VTEM_003	455550	5583375	386.52	8.04	1	175x175x300	9,187,500	Tested by TK holes; Requires deeper drilling
ML_VTEM_004	455175	5584950	329.39	8.05	2	700x350x150	36,750,000	Large anomaly north of RM Zone
ML_VTEM_005	455700	5584425	339.89	7.92	2	150x250x300	11,250,000	NE of Gazooma holes; Review with topography; Extension of ML_VTEM_004
ML_VTEM_006	455925	5585250	325.40	8.23	2	450x350x100	15,750,000	Smaller extension, isolated conductive core; Model
ML_VTEM_007	456675	5583975	355.04	8.34	3	200x225x100	4,500,000	Lower priority - deeper target; Model

### 9.1.2 Ground Magnetics

The ground magnetic data was updated using the georeferenced line-station grid determined from the GPS and DXF line paths provided by Copper Lake.

After digitizing the data and geo-referencing according to the local GPS information, the resultant ground magnetic results were found to have very good correlation with the magnetic data collected in the Geotech airborne VTEM surveys, adding extra confidence to the geo-referencing of the local lines and station coordinates. The diabase dyke in the northeastern portion of the property is well defined. Two east-west striking linear features are noted in the Teck Hill grid, as well as a northwest striking linear. All three features are not distinguishable on the airborne magnetic data.

An inversion block was attempted on the Teck Hill block given the equal line spacing and observation of subtle structures. The mesh encompassed the survey block, with a cell size of 20m and depth extent of 1000m. However, it was determined that the magnetic inversion results were meaningless and the magnetic features were too subtle and high-frequency for 3D inversion. Further processing and smoothing could be undertaken, but may not add value given the positive results found in the VTEM magnetic inversion.

### 9.1.3 Induced Polarization

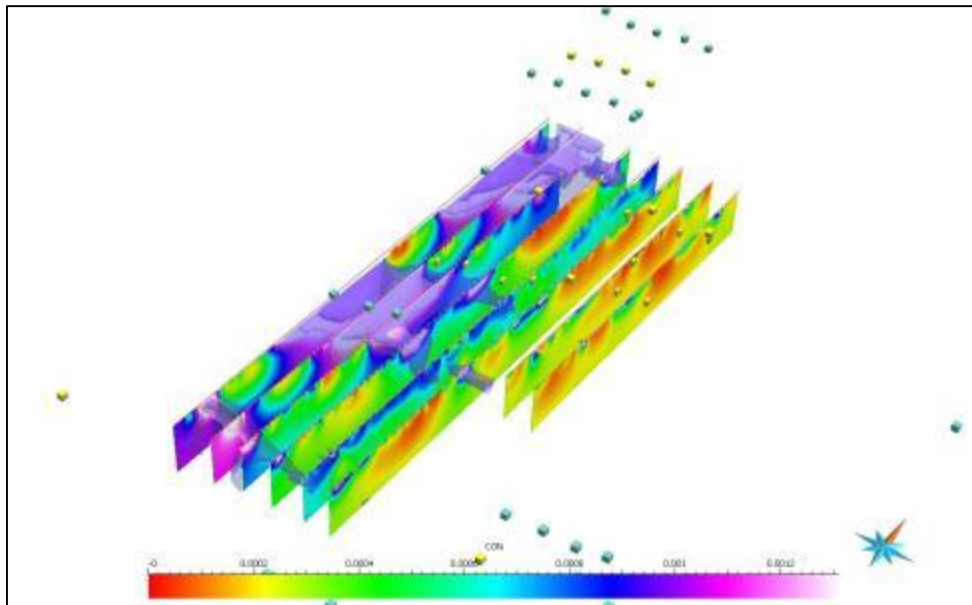
Geo-referencing information was estimated by the master local line/station DXF provided by Copper Lake Resources. Individual datasets were imported into Geosoft Oasis Montaj, assigned NAD83, UTM Zone 16N coordinates and recalculated for apparent resistivity and chargeability. Pseudosections were generated for each line and compared to historical documentation for quality control.

### *Gripp Lake West*

The Gripp Lake West lines were originally provided by Exsics with the D Zone dataset. Once the local coordinates were examined, it was noted that the local line and station coordinates were not previously identified on Copper Lake's master GPS location file. After discussion with Gordon Gibson of Copper Lake, it was suggested to place this survey according to their local positions. This places the survey to the north of the D Zone block. Due to this problem it was recommended that the lines have their coordinates re-surveyed prior to drilling any identified anomalies.

### *D Zone*

The results of the D Zone lines denote a subtle 10mV/V chargeable anomaly striking east northeast aligning with the known mineralization. This chargeable feature has a shallow, discrete conductive association. To the north and south, portions of these lines have broader conductive anomalies that extend to 120 m depth and correlated well with the VTEM RDI results. These anomalies were recommended for further investigation.

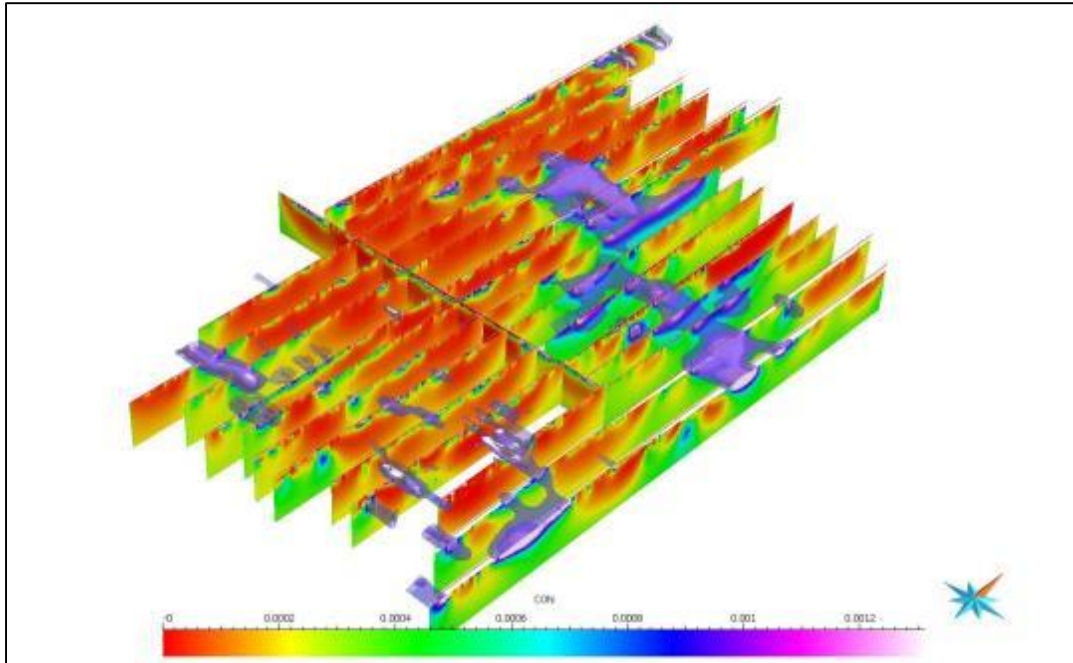


**Figure 9.3:** D Zone inversion results: conductivity. Isoshells: white = 0.0025 S/m, purple = 0.0020 S/m, pink = 0.0015 S/m, blue = 0.0010 S/m (McKenzie et al., 2015).

### *Main Zone*

The Main Zone survey encompassed the Billiton Zone as well as the showings: Anarod, Swamp Zone and South Billiton Zone. Several discrete, moderate-to-highly chargeable features (25 – 35 mV/V) are noted on these lines, although there is less continuity between lines than the other IP/Res blocks on the Marshall Lake property. This lack of continuity could be a function of the different generations of IP/Res surveys conducted.

Discrete, conductive features are noted both to the northwest and south of the Billiton zone, ranging from 1.2 – 2.0 mS/m. These anomalies have very limited drill testing, and were recommended for follow up.



**Figure 9.4:** Main Zone inversion results: conductivity. Viewed from the southeast (McKenzie et al., 2015).

#### *Open Pit Zone*

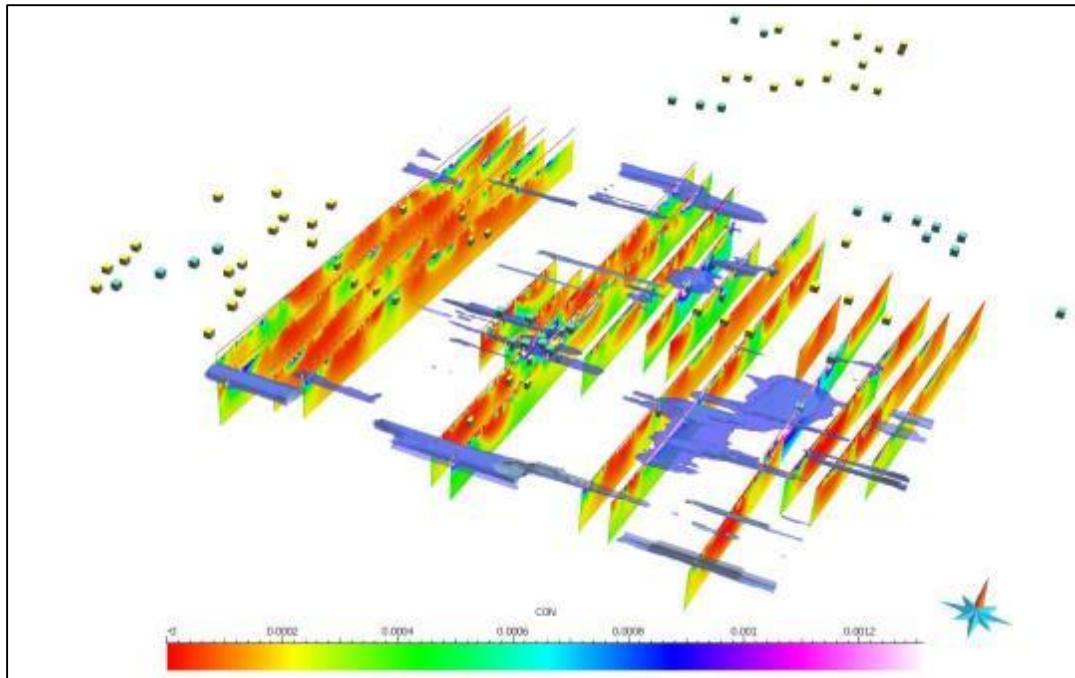
A moderate 15 – 20 mV/V chargeable feature is noted in the southern portion of this grid. A more coherent 1.2 – 2.0 mS/m conductive feature is noted in the northern portion of the survey, adjacent to the Open Pit prospect. These features were recommended for further follow up.

#### *Gazooma*

Several moderate-to-highly chargeable features are noted, with amplitude range of 30 – 40 mV/V. The Gazooma showing has a core chargeability of 30 – 35 mV/V. The remaining chargeable features are untested. A few shallow, conductive features ranging from 1.2 – 1.6 mS/m are noted on the survey lines. These may be caused by surficial geology and ground trothing was recommended.

#### *Teck Hill*

A total of 24 lines were inverted on the Teck Hill area, with line coverage generally more disjointed than the other survey blocks on the property. Some chargeable features were noted ranging from 20 – 25 mV/V, with limited drill testing of the features in the west and central portions of the grid. A similar chargeable feature noted in the eastern portion of the grid is also untested. The central and eastern anomalies have shallow conductive association, whereas the western anomaly is offset from a conductive anomaly identified by the VTEM resistivity depth imaging. Overall, it was recommended that these anomalies should be ground truthed and maybe worth additional follow up.



**Figure 9.5:** Teck Hill inversion results: conductivity (McKenzie et al., 2015).

## 9.2 Surface Geological Re-interpretation

The geological re-interpretation of the Marshall Lake area consisted of updating the Ontario Geological Survey's regional map (P3424; Stott et al., 2000) with more recent information available from assessment work completed in the area. There was new data collected in the field. The interpretation involved incorporating numerous historical company interpretations, government mapping, regional geophysics, and detailed geophysics. The objective of this process was to determine if integrating a D1 fold axis is geologically consistent and provides stratigraphic continuity to the localization of mineralized zones.

Geologist Ian Campbell (1994) inferred the presence of an early deformation event based on the exploration efforts completed by Challenger Minerals Ltd. This deformation event is manifested in development of a F1 anticline with a north-south trending fold axis. The Ontario Government geologists were not able to document enough evidence from outcrop mapping to support incorporating the fold into the regional interpretation. However, the volcanic stratigraphy is challenging in that it is comprised of felsic volcanoclastics with similar characteristic throughout. In addition, the Government geologist report a strongly developed S2 fabric throughout, which obscures much of the earlier fabrics in the rocks (S0 and S1).

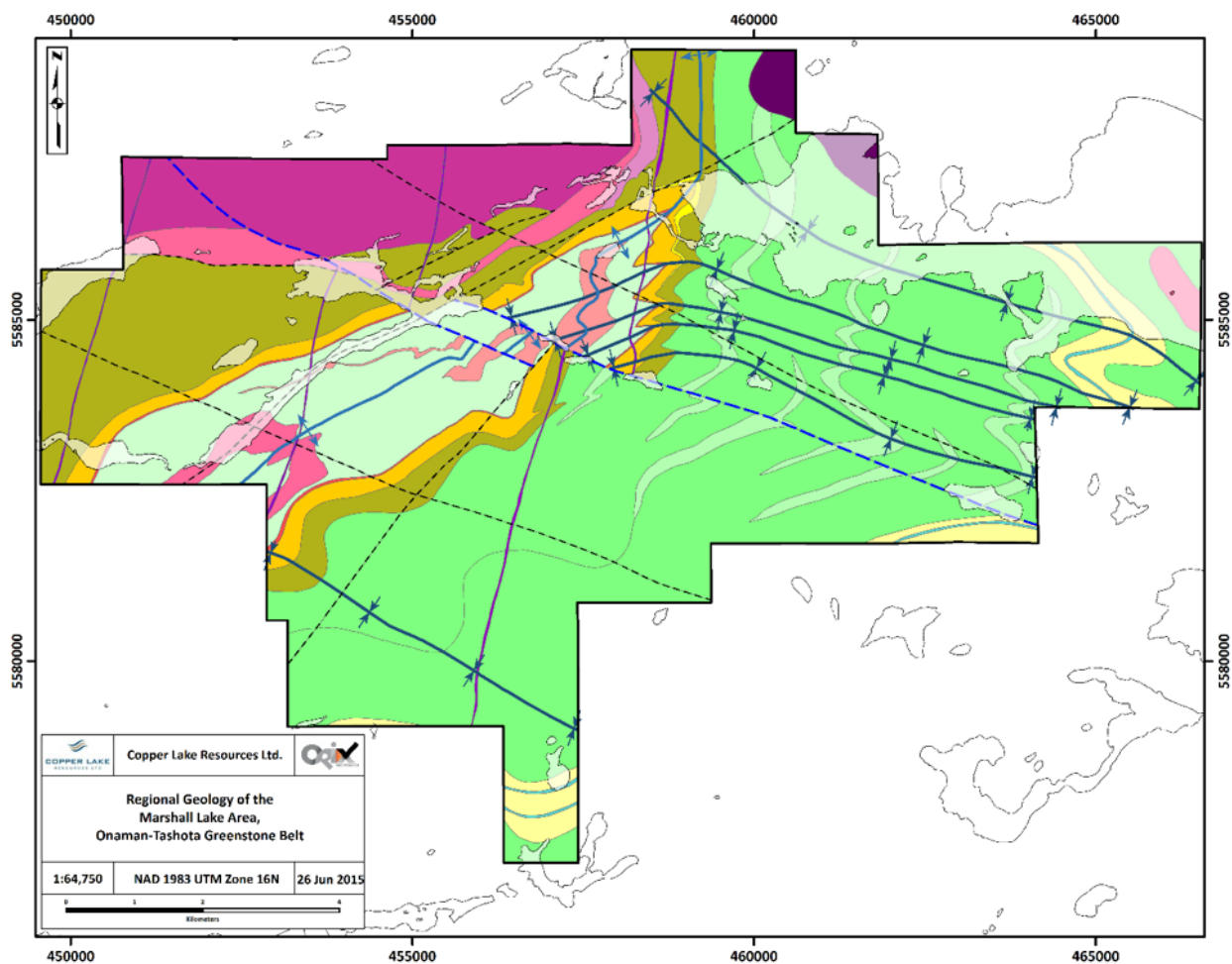
A re-interpretation of the geology was completed incorporating the D1 fold, which interprets an anticline fold (D1) with an axis that trends north-south (Figure 9.10). The D1 fold is then refolded by a series of D2 folds that are clearly evident in the magnetic signature from the iron formation contained within the Albert Sequence.

Later brittle deformation has resulted in a series of northwest-southeast faults, which includes the Moose Lake Fault. These faults result in significant displacement of the stratigraphy, with an apparent 700 - 900m horizontal dextral movement on the Moose Lake Fault. As well, in the regional magnetic

map there is clearly a series of northeast-southwest lineaments, although there is little evidence of displacement along these structures.

**Table 9.2:** Marshall Lake Consolidated Stratigraphic Legend (McKenzie et al. 2015).

Codes	Name	Colour
PDIA	Proterozoic Diabase Dykes	Purple
GABB	Late Tectonic to Post-Tectonic Gabbroic Intrusion	Dark Purple
STON	Summit Lake Pluton - Tonilitic Phase	Light Purple
MTON	Summit Lake Pluton - Marginal Phase	Light Purple
IRFM	Albert Sequence - Chemical Sedimentary Sequence	Light Blue
ALBT	Albert Sequence - Clastic Sedimentary Sequence	Yellow
MDDI	Deeds and Dog Island Flow and Dome Complex - Deeds Island Tuff & Undifferentiated Tuff Horizons	Light Green
TDDI	Deeds and Dog Island Flow and Dome Complex - Massive Flows	Light Green
TCAM	Camp Flow and Dome Complex - Marshall Creek Tuff & Undifferentiated Tuff Horizons	Light Green
MCAM	Camp Flow and Dome Complex - Massive Flows	Light Green
PCAM	Camp Flow and Dome Complex - Moose Creek Laminated Pyritic Tuff	Light Green
FDYK	Synvolcanic Felsic Sills	Pink
FINT	Synvolcanic Felsic Intrusion (Coherent and Fragmental Facies)	Pink
UMAS	Marshall Sequence - Upper Gripp River Section	Yellow
RMAS	Marshall Sequence - Rhyolitic Tuff with Intercalated Chert Bands	Yellow
LMAS	Marshall Sequence - Lower Gripp River Section	Yellow
MMAS	Marshall Sequence - Mineralized Band	Red
GRPP	Gripp Sequence	Light Green



**Figure 9.6:** Marshall Lake Geological Interpretation (McKenzie et al. 2015).

The D1 fold results in changes to the stratigraphy west of the fold axis; however, there are no changes to the age relations of the stratigraphic units, only a change to the distribution of the units. The D1

anticline folds the younger Marshall sequence around to the west side of the property, including the Mineralized Band, resulting in a correlation of the various mineralized zones to this single stratigraphic horizon. The core of the fold is occupied by a syn-volcanic intrusion that is composed of a massive porphyritic phase and a marginal fragmental phase; interestingly there is mineralization that is associated with the fragmental phase.

The new interpretation of the property scale geology presents new exploration potential along strike of the Mineralized Band to the southwest. The correlation of the various mineralized zones to the same stratigraphic horizon brings a completely new way of understanding conductors in the electromagnetic data. For example, a significant conductor that exists south of the Billiton deposit, now correlates with the same stratigraphic units that host the Billiton deposit, implying the potential presence of base metal sulphides. Based on the dimension of the conductive shell in the forward modeling completed by Caracle Creek, it is possible that this zone is equivalent to, or larger than the Billiton deposit.

This work provides a great starting point to understanding the structural complexities of the Marshall Lake area. This includes a complete re-interpretation of the alteration systems and controls on mineralization. The Marshall Lake sequence is now present on the western side of the fold axis, and is inferred to be younging towards the west. This results in structural complexities if the concept of the Summit Pluton being the heat source for the alteration-mineralization is to remain the prevailing hypothesis. It was recommended that ground truthing should be completed to confirm that this interpretation is correct.

## **10.0 DRILLING**

### **10.1 Pre-2006 Drilling**

No review of pre-2006 drilling on the property as this data is being considered to be historical in nature.

### **10.2 East West Resources 2006 to 2008 Drilling**

The following details regarding the diamond drilling programs completed by East West Resources between 2006 and 2008 were extracted from the 43-101 report by Nielsen et al. (2010). This data has not been reviewed by the author and is being considered to be historical in nature.

Results produced for the spring 2007 drilling program included 2.45% copper, 47.6 g/tonne silver over 14.8 meters, and 1.67% copper, 32g/tonne silver, 0.37g/tonne gold over 22.50 meters, at the Gazooma Zone.

New discoveries were also made during this drilling program. The first hole drilled at an occurrence called North Gazooma intersected 0.71% copper over 31.9 meters, and drilling a VTEM anomaly 4km to the east, south of the Billiton occurrence, produced results of 0.94% copper, 1.03% zinc, 49 g/t silver over 15 meters.

Three holes were completed on North Gazooma during the 2007 drilling campaign. GAZN-07-02 (0.71% Cu over 32m) drilled in March 2007, confirm both lateral and depth continuity of mineralization at Gazooma North.

Between May and June of 2008 a diamond drilling program was completed, totaling 2914.95 meters distributed over 20 drill holes. Due to the wet weather conditions, the drill pad locations were limited. Many targets were left untested and can only be addressed in winter conditions. Five anomalies

detected in gabbro in the eastern section of the property were drill tested in May 2008. Pyrrhotite sulphides were found to be the cause of the anomalies. Five anomalies in the volcanic pile were drilled, and again pyrrhotite sulphides were the cause of the anomalies; however, minor zinc sulphides and wall-rock alteration was observed, resembling characteristics consistent with a VMS system.

Out of the total holes completed in 2008, 10 drill holes tested the depth extension of the Gazooma, Teck Hill and North Gazooma areas. Three holes on Gazooma intersected copper zones 100-150m down dip from the original trench exposure.

Three holes tested the Teck Hill showing along the IP anomaly trending towards Gazooma. Resulting in good intersections of copper mineralization; thereby, further demonstrating a possible relationship between Gazooma and Teck Hill.

One hole was also drilled 100m south of the original Teck Hill discovery made in 1954 and 1m of massive chalcopyrite was intersected at 93 m, which was followed by another 30m of stringer and disseminated chalcopyrite. This gives over 140m of sulphides down dip from the surface showing and confirmation of a wide spread copper zone within the felsic volcanics.

In total, East West drilled 58 drill holes between December 2006 and June 2008 as summarized in the Table 10.1.

**Table 10.1:** Summary of Collar Information for East West Resources Drilling 2006 to 2008.

Drill Hole	Year	Easting (NAD 83)	Northing (NAD 83)	Elevation	Azimuth	Dip	Depth (m)
GAZ-06-01	2006	455167	5583704	327	15	-45	57
GAZ-06-02	2006	455167	5583703	327	15	-60	42.4
GAZ-06-03	2006	455163	5583648	368	0	-45	134.6
GAZ-06-04	2006	455169	5583695	365	180	-50	32
MAR-06-01	2006	458188	5585753	341	150	-45	60
MAR-06-02	2006	458188	5585753	341	150	-60	81
MAR-06-03	2006	458234	5585769	341	140	-45	51
MAR-06-04	2006	458234	5585769	341	140	-60	81
MAR-06-05	2006	458262	5585784	341	160	-45	51
MAR-06-06	2006	458262	5585784	341	160	-60	81
MAR-06-07	2006	458395	5585869	341	160	-45	99
MAR-06-08	2006	458395	5585869	341	160	-60	87
MAR-06-09	2006	458459	5585888	348	160	-45	147
MAR-06-10	2006	458459	5585888	359	160	-60	162
DZ-07-01	2007	456388	5585152	335	0	-50	73.6
G-07-01	2007	456113	5584450	341	0	-50	95
GAZ-07-05	2007	455141	5583717	327	99	-45	66
GAZ-07-06	2007	455139	5583690	327	98	-45	75
GAZ-07-07	2007	455165	5583738	365	88	-45	92
GAZ-07-08	2007	455116	5583727	330	88	-45	185
GAZ-07-09	2007	455111	5583750	332	83	-45	86
GAZ-07-10	2007	455087	5583725	333	88	-45	158
GAZ-07-11	2007	455164	5583717	327	90	-45	158

Drill Hole	Year	Easting (NAD 83)	Northing (NAD 83)	Elevation	Azimuth	Dip	Depth (m)
GAZN-07-01	2007	455075	5584766	347	0	-50	53
GAZN-07-02	2007	454971	5584498	324	0	-50	79.7
GAZN-07-03	2007	454758	5584637	348	0	-50	80
GAZN-07-04	2007	454663	5584585	351	0	-50	92
GAZN-07-05	2007	454984	5584119	352	0	-45	66
MAR-07-11	2007	458395	5585327	360	320	-50	140
NWT-07-01	2007	455619	5584036	377	0	-45	148
TH-07-01	2007	456130	5583468	380	6	-45	49.1
TH-07-02	2007	455588	5583439	380	6	-45	45
TH-07-03	2007	456091	5583516	348	188	-45	128
TK-07-01	2007	455613	5583336	374	6	-45	90
TK-07-02	2007	455613	5583336	374	6	-90	84
TK-07-03	2007	455247	5583593	370	6	-45	194
TK-07-04	2007	455244	5583137	373	180	-55	125
TK-07-05	2007	455250	5583595	370	45	-45	176
GAZ-08-12	2008	455017	5583676	334	90	-60	198.12
GAZ-08-13	2008	454965	5583720	334	90	-50	305
GAZ-08-14	2008	455013	5583699	334	90	-60	316.14
GAZN-08-06	2008	454969	5584490	323	0	-60	103.65
GAZN-08-07	2008	454941	5584495	323	0	-45	112
GAZN-08-08	2008	454994	5584488	324	0	-45	100.58
MG-08-01	2008	462200	5587100	340	40	-45	140
MG-08-02	2008	461890	5587560	340	40	-45	149.36
MG-08-03	2008	462650	5587975	340	30	-45	118.87
MG-08-04	2008	462900	5588850	340	30	-45	140.21
SA-08-01	2008	465040	5582200	335	30	-45	88.39
SA-08-02	2008	464650	5583180	335	30	-45	104.19
SA-08-03	2008	463580	5583350	335	30	-45	106.68
SA-08-04	2008	463500	5583540	335	40	-45	97.54
SA-08-05	2008	459232	5580279	335	200	-50	92
SC-08-01	2008	469700	5589600	342	40	-50	213.36
TK-08-06	2008	455437	5583509	375	6	-45	128.52
TK-08-07	2008	455419	5583360	375	6	-45	126
TK-08-08	2008	455430	5583446	375	6	-45	131.06
TK-08-09	2008	455571	5583340	375	90	-90	143.28

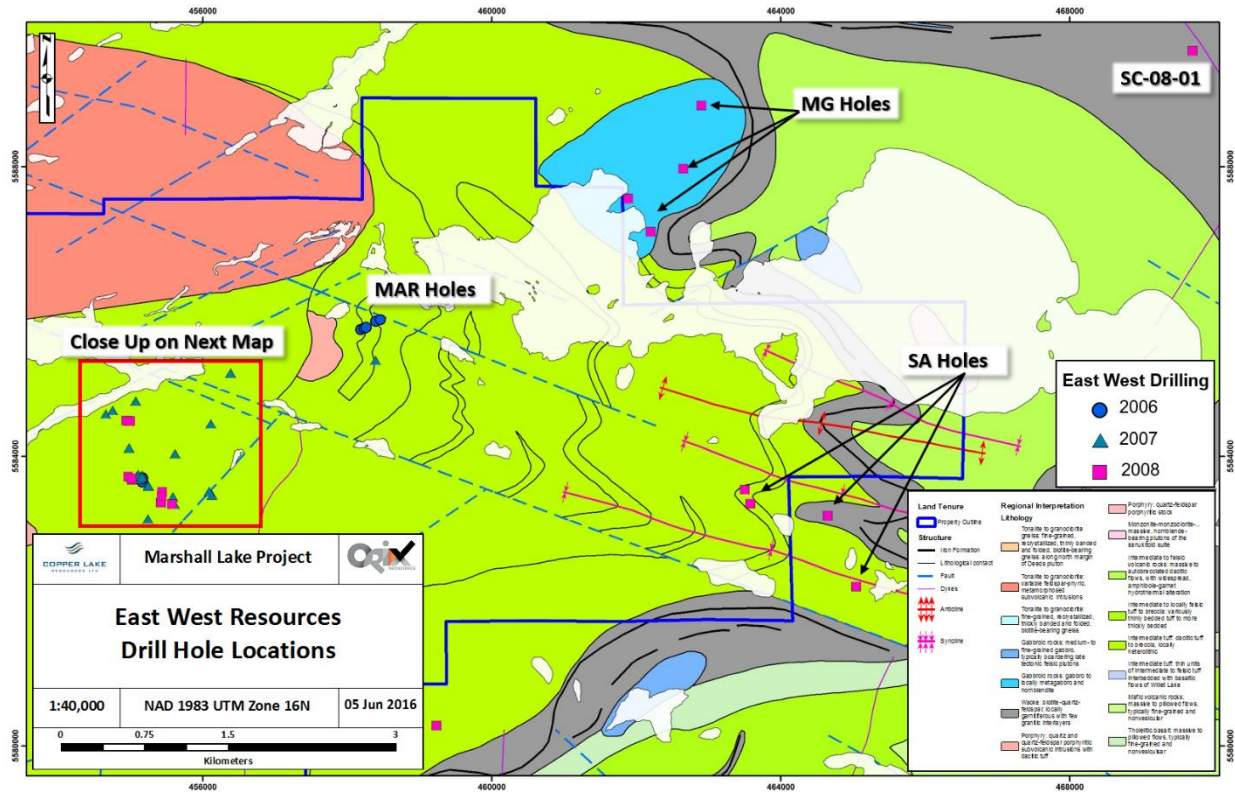


Figure 10.1: Location of East West Resources Drill Holes from 2006 to 2008.

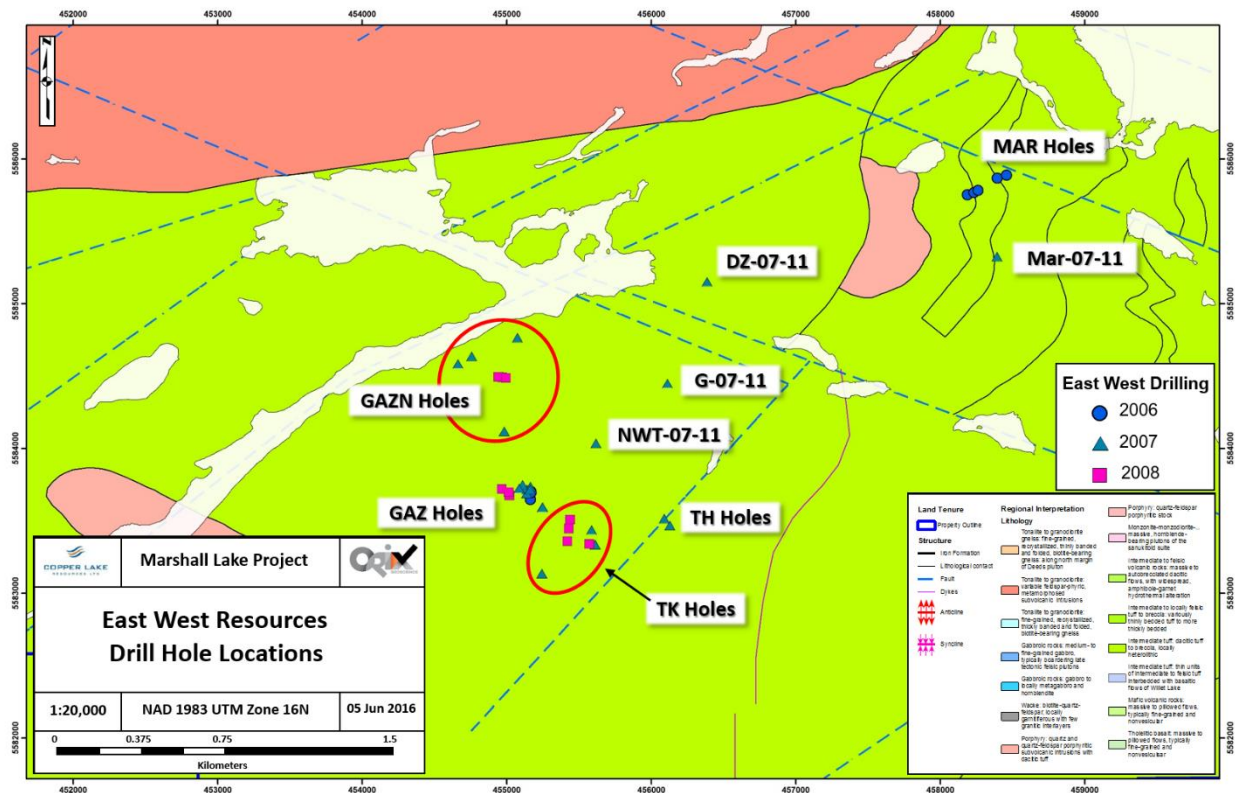


Figure 10.2: Close Up of the East West Resources Drill Holes from 2006 to 2008.

### **10.3 White Tiger 2010 to 2013 Drilling**

The following details regarding the diamond drilling programs completed by White Tiger Resources between 2010 and 2013 was extracted from the reports by Gibson and Cempírek (2013) and Gibson (2014). According to the reports filed with the MNDM and press releases that have been filed on SEDAR, the work was supervised by G. Gibson, P.Geo. This data has not been reviewed by the author and is considered to be historical in nature. The following is a summary of the information obtained from those sources.

#### **10.3.1 Significant Results from 2010 Drilling Program**

GAZN-10-11: Intersected 32.6 meters of 1.04% Cu, 5.13g/t Ag and 0.15g/t Au, including 5 meters grading 3.53% Cu, 18.16g/t Ag and 0.52g/t Au.

GAZN-10-13: Intersected a wide section of high silica rhyolite with chalcopyrite in two prominent zones which assayed 0.43% Cu, 1.77g/t Ag and 0.07g/t Au over 14 meters and 0.44% Cu, 2.48g/t Ag and 0.24g/t Au over 31.5 meters.

GAZN-10-15: Intersected 23 meters of 1.34% Cu, 6.75g/t Ag and 0.29g/t Au, including 5 meters grading 4.08% Cu, 20.6g/t Ag and 1.12g/t Au.

GAZN-10-17: Intersected a 37-meter-wide zone of high silica rhyolite containing wide spread chalcopyrite and a footwall chloritic alteration zone with higher concentrations of chalcopyrite. Assays yielded 0.48% Cu, 2.07g/t Ag and 0.04g/t Au over 37 meters, including 1.12% Cu, 5.87g/t Ag and 0.13g/t Au over 7.2 meters.

GAZN-10-18: Intersected a high grade zone of mineralization assaying 0.86%Cu, 4.78g/t Ag and 0.09g/t Au over 10 meters including 1.27% Cu, 6.96g/t Ag and 0.11g/t Au over 6.13 meters.

#### **10.3.2 Significant Results from 2011 Drilling Program**

The 11 drill holes in the RM Zone, RMZ-11-20 to RMZ-11-30, were designed to test IP anomalies and surface mineralization. This work resulted in discovery of a new zone of copper mineralization (the RM South zone). Continued testing extended the RM-South zone along strike and down plunge.

RMZ 11-28: Intercepted 7 meters of 2.5% copper, 8.9 grams/tonne silver and 0.067 grams/tonne gold near surface. The RM-South Zone remains open to the northwest and, based on the assay results for drill hole RMZ 11-28, the Company believes that the grades are significantly improving in that direction.

#### **10.3.3 Significant Results from 2012 Drilling Program**

RMZ 12-30 was designed as an extension of drill hole RMZ 11-30. Collared in the RM Zone, this drill hole passed beyond and constrains the western strike extent of the RM Zone after penetrating a total of 67 meters of copper mineralization.

RMZ 12-31 intercepted a near surface zone from 49 to 67 meters, was then extended to 270 meters and intersected a new zone of copper mineralization between 241 and 265 meters.

RMZ 12-32 was drilled in the RM-South Zone below drill holes RMZ 11-21 and -23 and intersected copper mineralization between 68m and 106m.

RMZ 12-33 was designed to test the western strike extent of significant copper mineralization previously encountered. The hole intersected 22 meters of copper mineralization between 147m and 169m.

#### 10.3.4 Significant Results from 2013 Drilling Program

RMZ 13-39 continued in the earlier drill hole RMZ-12-39 and extended its depth from 356m to 383m. Note that hole RMZ-12-39 was originally designed as a step off to the east of the RM-South zone. Erratic copper mineralization had been encountered between 33m and 121m. The extension resulted in additional copper mineralization between 357m to 361m.

RMZ 13-40 targeted the center of the 30+ mV/V chargeability response from the IP inversion model. This drill hole returned one of the widest and most continuous copper intersections yet encountered in the RM zone.

All core drilling from 2010 to 2013 was NQ size, carried out by DJ Drilling Ltd. of Aldergrove, BC. In total, White Tiger drilled 37 drill holes between 2010 and 2013 as summarized in the Table 10.2.

**Table 10.2:** Summary of Collar Information for White Tiger Resources Drilling 2010 to 2013.

Drill Hole	Year	Easting (NAD 83)	Northing (NAD 83)	Elevation	Azimuth	Dip	Depth (m)
GAZ-10-15	2010	455037	5583713	336	98	-45.5	202.69
GAZ-10-16	2010	454967	5583663	336	97.1	-61.6	151.22
GAZN-10-09	2010	454970	5584463	326	356.4	-62.7	167.07
GAZN-10-10	2010	454948	5584468	326	6.5	-44	165.24
GAZN-10-11	2010	454949	5584441	331	1.3	-44.9	211.84
GAZN-10-12	2010	454923	5584469	325	359.4	-45.4	163.11
GAZN-10-13	2010	454993	5584463	325	3.4	-47.9	169.51
GAZN-10-14	2010	454994	5584438	327	1.7	-45.7	205.74
GAZN-10-15	2010	454947	5584416	326	356.3	-46.1	260.91
GAZN-10-16	2010	454922	5584419	326	2.8	-45.7	203
GAZN-10-17	2010	454880	5584404	326	5.5	-46	160.06
GAZN-10-18	2010	454948	5584392	327	3.3	-44.3	236.23
GAZN-10-19	2010	454880	5584426	325	0	-45.7	131.37
RMZ-11-20	2011	454847	5584188	318	1.3	-45.6	102.41
RMZ-11-21	2011	454785	5584232	327	358.1	-44.5	203
RMZ-11-22	2011	454746	5584240	330	359.8	-46	65.84
RMZ-11-23	2011	454783	5584206	327	359.6	-45.8	337.11
RMZ-11-24	2011	454782	5584306	329	7.1	-45.4	151.18
RMZ-11-25	2011	454761	5584229	329	349.3	-45	303.89
RMZ-11-26	2011	454731	5584253	333	4.3	-44	151.47
RMZ-11-27	2011	454712	5584271	335	355.8	-45	135.03
RMZ-11-28	2011	454690	5584296	334	0.8	-43.5	117.96
RMZ-11-29	2011	454805	5584333	331	2.8	-43.5	197.21
RMZ-11-30	2011	454966	5584564	318	219.4	-44.3	175.87
RMZ-12-30	2012	454966	5584564	318	219.4	-44.3	459.45
RMZ-12-31	2012	454692	5584405	324	205	-46	270.36
RMZ-12-32	2012	454734	5584181	324	25	-45	331.2
RMZ-12-33	2012	454662	5584387	325	105	-45	227.4

Drill Hole	Year	Easting (NAD 83)	Northing (NAD 83)	Elevation	Azimuth	Dip	Depth (m)
RMZ-12-34	2012	454663	5584415	321	205	-45	127.1
RMZ-12-35	2012	454782	5584181	327	2.3	-45.6	403.56
RMZ-12-36	2012	454610	5584231	330	25	-45	140.8
RMZ-12-37	2012	455027	5584461	329	0	-45	181.7
RMZ-12-38	2012	454885	5584578	318	132	-45	164.9
RMZ-12-39	2012	454810	5584211	331	1.5	-43.6	355.7
RMZ-13-39	2013	454810	5584211	331	1.5	-43.6	383.13
RMZ-13-40	2013	454844	5584333	326	356.7	-46	221.3
RMZ-13-41	2013	454844	5584358	333	0.4	-47.8	212.14

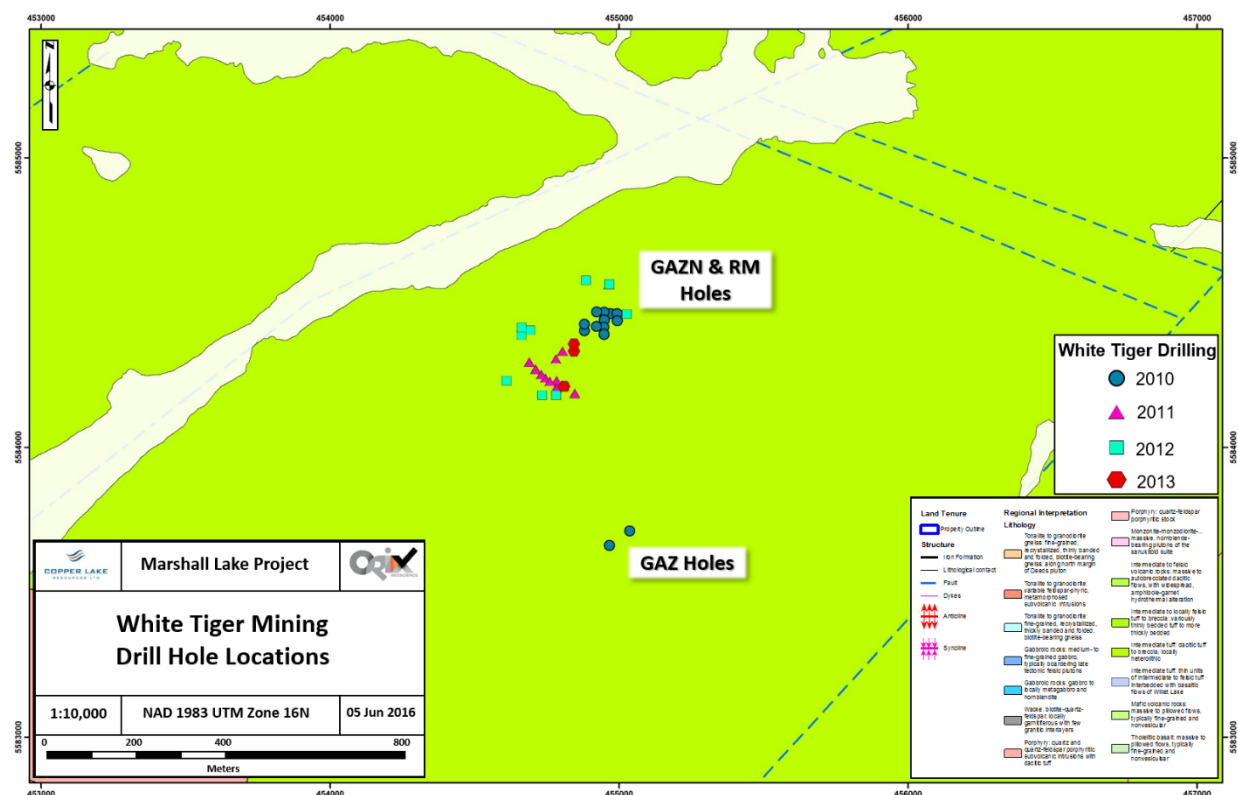


Figure 10.3: Location of the White Tiger Mining Drill Holes from 2010 to 2013.

## 11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

### 11.1 East West Resources 2006 to 2008 Drilling

The procedures regarding the sample procedures, sample security and analyses for the 2006 to 2008 drilling are described in detailed in the 43-101 report by Nielsen et al. (2010). This work has not been reviewed in detail but the procedures referred to by Nielsen et al. (2010) appear to meet the industry standard and are appropriate for an early stage exploration drill program.

### 11.2 White Tiger 2010 to 2013 Drilling

The following details regarding the sample procedures was extracted from the reports by Gibson and Cempírek (2013) and Gibson (2014) for the 2010 to 2013 drill programs. The author has not reviewed

the procedures associated with these drill programs although a number of comments can be made by the author following the site visit of May 19, 2016.

#### **11.2.1 Sample Preparation**

All drill core was transported to the Marshall Lake Camps from the drill site. The core was taken to the core shack and logged by one of the project geologists. Sample intervals were chosen based on the presence of sulphides. Sampled sections of core were from sulphide zones and other disseminated sulphide occurrences. Drill core barren of sulphides was also sampled for whole rock analysis as representative samples of various rock units in order to define the lithologies present on the Marshall Lake property.

The author observed that the sampled core was cut in half using a core saw, and half of the core was returned to the core tray with the start of the sample interval marked by a portion of the sample tag. The other half of the core would be the material sent to the laboratory for analyses.

The author also observed that presence of an Oreas 50c reference material on site, which is believed to be the standard material used for the White Tiger drill programs. There was also a crushed material present on site, which may have been used as a blank material. The core present on site for these drill programs appears to have been properly sampled for an early stage exploration program.

#### **11.2.2 Sample Security**

All cut drill core samples were stored on site until being sent to ALS Chemex in Thunder Bay, Ontario for primary crushing, and then forwarded onto ALS Chemex in North Vancouver, British Columbia

There is no indication that any aspect of the sample preparation was conducted by an employee, officer, director or associate of the company.

#### **11.2.3 Analyses**

The following analytical methods were listed as being used on the 2010 to 2013 drill programs by Gibson and Cempírek (2013) and Gibson (2014).

The split drill core samples were crushed in their entirety to 90% passing 2 millimeters and the crusher was cleaned with barren rock between samples. From the coarse rejects a sub-sample of one kilogram was split and pulverized to 85% passing 75 microns. The pulverizer was cleaned with silica sand between samples. From each pulp, a 100-gram sub-sample was split and shipped to the ALS Chemex laboratory in Vancouver, British Columbia for assay. The remainder of the pulp and the rejects are held at the preparation laboratory in Thunder Bay for future reference. The ALS Chemex quality system complies with the requirements of the international standards ISO 9001:2000 and ISO 17025:2005 and operates at all laboratory sites ([www.alsglobal.com/Mineral/DivisionProfile.aspx](http://www.alsglobal.com/Mineral/DivisionProfile.aspx)).

Samples were submitted for a multi-element analysis by the ME-ICP41 technique which involved the prepared sample being digested with aqua regia in a graphite heating block. After cooling, the resulting solution is diluted to 12.5 mL with deionized water, mixed and analyzed by ICP-AES. The analytical results are corrected for inter element spectral interferences. It should be noted that in the majority of geological matrices, data reported from an aqua regia leach should be considered as representing only the leachable portion of the sample.

Unmineralized sample selected for lithogeochemical analyses were analyzed by the ME-MS81 method which involved mixing 0.20g of sample with 0.90g of lithium metaborate flux. This mixture is fused in a furnace at 1000°C, cooled, and dissolved in 100mL of 4% HNO<sub>3</sub> / 2% HCl solution. The resulting solution is then analyzed by ICP-mass spectrometer (MS). Some base metal oxides and sulphides may not be completely decomposed by the lithium borate fusion, and results for Ag, Co, Cu, Mo, Ni, Pb, and Zn will not likely be quantitative by this method.

Method ME-XRF06 was used to determine the major oxide values and involves a calcined or ignited sample (0.9g) being added to 9.0g of lithium borate flux (50 % - 50 % Li<sub>2</sub>B<sub>4</sub>O<sub>7</sub> – LiBO<sub>2</sub>), mixed well and fused in an auto fluxer between 1050 - 1100°C. A flat molten glass disc is prepared from the resulting melt. This disc is then analyzed by X-ray fluorescence spectrometry.

Gold analyses were by the Au-AA23 method which involves a prepared sample fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents as required, inquarted with 6mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested in 0.5mL dilute nitric acid in the microwave oven, 0.5mL concentrated hydrochloric acid is then added and the bead is further digested in the microwave at a lower power setting. The digested solution is cooled, diluted to a total volume of 4mL with de-mineralized water, and analyzed by atomic absorption spectroscopy against matrix-matched standards.

### **11.3 2016 Site Visit**

During the May 19, 2016, a set of five grab samples were collected from the Mineralized Band of the Billiton Zone where the Band is exposed in a historical trench located on the east end of the property. The samples were selected as being representative of the base metals mineralization and alteration observed in the trench and described as being typical for the Billiton Zone in surface sampling and historical drilling. A sample description and the site location, obtained from a handheld GPS, were noted on a pre-numbered sampling booklet. The samples were transported by the author from the site to the ALS Chemex offices in Sudbury, Ontario.

The samples were analyzed by ALS Minerals with the sample preparation consisting of drying as required, and crushing to 70% less than 2 mm or better using a jaw and/or roller crusher. The crushed sample was split using a riffle splitter and an approximately 250g split was pulverized to 85% less than 75 microns or better using a ring and puck grinding mill. The pulverized splits of the samples were transported by ALS Chemex to their facility in North Vancouver for analyses.

#### **11.3.1 Analysis - 2016 Samples**

All samples were analyzed by the fire assay, Au-ICP21, technique that requires a 30g aliquot be fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents as required, inquarted with 6mg of gold-free silver. The resulting lead button is cupelled to remove the lead and yield a precious metal bead. The bead is digested in 0.5mL dilute nitric acid in the microwave oven. Then 0.5mL concentrated hydrochloric acid is added and the bead is further digested in the microwave at a lower power setting. The digested solution is cooled, diluted to a total volume of 4mL with de-mineralized water, and analyzed by inductively coupled plasma-atomic emission spectrometry (ICP-AES) against matrix-matched standards. The upper and lower limits for gold by this method are 10.0 and 0.001 ppm respectively.

Samples were analyzed for multiple elements using a 4 acid near total digestion method, ME-MS61. A 0.25g aliquot of the sample is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. Dilute

hydrochloric acid is then added to the residue and analyzed by ICP-AES. Following this process, the results are reviewed for high concentrations of bismuth, mercury, molybdenum, silver and tungsten and diluted accordingly and are then analyzed by ICP-MS. Results are corrected for spectral inter-element interferences. The analytical certificate is included in Appendix A, where the detection limits for this method can be located. A four acid digestion is able to dissolve most minerals; however, the term “near-total” is used as the sample matrix properties may dictate what elements are quantitatively extracted.

During the May 19, 2016, a set of five grab samples were collected from the Mineralized Band of the Billiton Zone where the Band is exposed in a historical trench located on the east end of the property. The samples were selected as being representative of the base metals mineralization and alteration described as being typical for the Billiton Zone in surface sampling and historical drilling. A sample description and the site location, obtained from a handheld GPS, were noted on a pre-numbered sampling booklet. The samples were analyzed by ALS Chemex with the sample preparation consisting of drying as required, and crushing to 70% less than 2 mm or better using a jaw and/or roller crusher. The crushed sample was split using a riffle splitter and an approximately 250 g split was pulverized to 85% less than 75 microns or better using a ring and puck grinding mill. The pulverized splits of the samples were transported by ALS-Chemex to their facility in North Vancouver for analyses.

## **12.0 DATA VERIFICATION**

### **12.1 East West Resources 2006 – 2008 Drilling**

Details regarding the data verification for the 2006 to 2008 drilling are described in detail in the 43-101 report by Nielsen et al. (2010). The procedures referred to by Nielsen et al. (2010) appear to meet the industry standard and are appropriate for an early stage exploration drill program.

### **12.2 White Tiger 2010 to 2013 Drilling**

The author observed that presence of an Oreas 50c reference material on site, which is believed to be the standard material used for the White Tiger drill programs. There was also a crushed material present on site which may have been used as a blank material. There has been no detailed review of the analytical result for these drill programs, so the author cannot comment on the use, or the analytical results for, the reference material or the assumed blank. The analyzes were completed at ALS Chemex (Canada) and in the past experience of the author there should be not problems with the analytical results as these methods are commonly employed and suitable for VMS exploration.

During the May 19th, 2016 site visit, drill core from the RM zone stored at the Rainy Mountain Royalty camp located near the property was also briefly examined. Copper sulphide mineralization was observed within this drill core, and appears to have been systematically sampled. Based on the observed core, the sampling protocol for these drill programs appears to have been proper for an early stage exploration program.

### **12.3 2016 Site Visit**

No drilling was completed as part of the current phase of work on the Marshall Lake property, as the current review of the property is based on the recent re-interpretation of the historical geophysical pole-dipole induced polarization/resistivity surveys (IP/RES), ground magnetic surveys (ground mag), and Geotech’s helicopter-borne time-domain electromagnetic (VTEM) survey. This re-interpretation identified a number of previously unexplored targets on the property that are contingent on the accurate location of the historical drill holes rather than the historical assay database. During the May 19, 2016 site visit, GPS locations were obtained for six drill holes completed in 2006 in the area of

conductor ML\_VTEM\_001 which appears to have not been properly tested by hole MAR-07-11. These six holes MAR-06-03, -04, -05, -06, -07, and -08 all returned GPS locations within <5 m of the locations used during the recent re-interpretation. This high level of agreement in the drill hole locations for the more recent drill holes suggests hole MAR-07-11 is properly located and did not properly test conductor ML VTEM 001. However, the location of the older historical drill holes is more problematic and will require more detailed ground truthing to determine their accuracy.

Also during the May 19th, 2016 site visit, drill core from the RM zone stored at the Rainy Mountain Royalty camp, located near the property, was briefly examined. Copper sulphide mineralization was observed within this drill core, and appears to have been systematically sampled.

The samples from the Billiton Zone were collected to verify the nature of the mineralization as reported in the historical work completed on the property. Assay results for the 2016 samples collected confirm the present of mineralization typical of a VMS style of mineralization as reported by previous workers (e.g. Nielsen et al., 2006). However, the values returned by the 2016 sample are not necessarily properly representative of the tenor on mineralization, as they were grab samples and not systematic, unbiased sampling which would be better represented by the historical diamond drilling results.

Sample P240506 is the Oreas 50c reference material, which is recommended for gold-copper porphyry systems, was used as it was available in the core shack of the East West Resource camp. The analytical results for this sample compare well with the recommended values published by Oreas. Although containing metals in a range comparable to the mineralization on the Marshall Lake property, a more suitable standard for VMS mineralization should be considered in the future.

**Table 12.1:** Grab sample results from May 19, 2016 site visit.

Sample	Ag (ppm)	Cu (ppm)	Cu (%)	Pb (ppm)	S (%)	Zn (ppm)	Zn (%)	Au (g/t)
P240501	193	30600	3.06	1230	>10.0	20000	2.00	1.29
P240502	190	36400	3.64	1220	>10.0	62500	6.25	0.485
P240503	71	16350	1.64	120	9.04	4590	0.46	0.078
P240504	12	2990	0.30	90	2.21	230	0.02	0.014
P240505	52	1390	0.14	460	3.47	3490	0.35	1.125
P240506	2	7220		20	0.89	100		0.842
OREAS 50c		7420	0.742		0.944			0.836

## 13.0 ADJACENT PROPERTIES

The Junior Lake property of Landore Resources Ltd. hosts the VW Nickel, B4-7 Nickel-Copper, and the Bam Gold zones in an area approximately 20km west to southwest to of the Marshall Lake property. These deposits are hosted in the ~2740 Ma tholeiitic mafic Willet Assemblage of the Eastern Wabigoon and are not known to be related to the VMS mineralization hosted within the Marshall Assemblage located on the Marshall Lake Property.

### 13.1 VW Nickel Deposit

The VW Nickel deposit is located at Ketchikan Lake, and is the closest to the Marshall Lake Property. The deposit is a low grade nickel copper  $\pm$  platinum group elements (PGE)  $\pm$  gold-bearing disseminated to veined sulphide deposit dominated by pyrrhotite, potentially of epigenetic, hydrothermal origin. A mineral resource was estimated at cut-off grade of 0.25% Ni to be 3.7 million tonnes of Indicated Resource averaging 0.442% Ni and 0.72 million tonnes of Inferred Resource averaging 0.444% Ni (Routledge and Scott, 2010). Minor metals in the deposit, i.e. Cu, Co, Pt, Pd, and Au, were also estimated, however, the precious metals are low and will not likely be payable in concentrate. A preliminary open pit resources at a cut-off grade of 0.25% Ni, are 613,000 tonnes of Indicated Resource averaging 0.430% Ni and 98,000 tonnes of Inferred Resource averaging 0.487% Ni. Underground resources at an NSR cut off of \$75/tonne are 518,000 tonnes of Indicated Resource averaging 0.827% Ni and 84,000 tonnes of Inferred Resource averaging 0.786% Ni. Exploration potential exists along strike to the east and west of the VW deposit as well as at depth

### 13.2 B4-7 Deposit

The B4-7 deposit is located 3km northwest of the VW deposit and consist of a low-grade nickel-copper $\pm$ platinum group element (PGE) $\pm$ Au-bearing massive to veined sulphide deposit dominated by pyrrhotite, which may represent an example of a structurally modified magmatic Ni-Cu deposit. In 2013, RPA released a 43-101 report which outlined the deposit as perspective for both open-pit and underground mining Pressacco (2013). As a result, two cut-off grades are suggested for the project. Table 13.1 summarizes the Mineral Resource estimate for both underground and open pit components. Mineral Resources are estimated using average long-term metal prices (US\$) of \$9.00/lb nickel, \$3.50/lb copper, \$16.00/lb cobalt, \$1,700/oz platinum, \$800/oz palladium, and \$1,300/oz gold, and a US\$/C\$ exchange rate of 1.03. Open Pit Mineral Resources are reported at an NSR cut-off value of \$23. Underground Mineral Resources are reported at an NSR cut-off value of \$58.

**Table 13.1:** Open-pit and underground resources for B4-7 deposit.

Zone	Tonnes (000 t)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Total NSR (\$)	NiEq (%)
<b>Indicated Resources:</b>									
Open Pit	849	0.69	0.46	0.06	0.12	0.56	0.03	82.55	1.22
Underground	1,846	0.70	0.46	0.07	0.15	0.54	0.03	83.76	1.24
<b>Total</b>	<b>2,655</b>	<b>0.70</b>	<b>0.46</b>	<b>0.07</b>	<b>0.14</b>	<b>0.55</b>	<b>0.03</b>	<b>83.37</b>	<b>1.24</b>

### 13.3 BAM East Gold Prospect

This new gold prospect is located northeast of the B4-7 Ni/Cu deposit, approximately midway along a 2.7-kilometer-long, east-southeast to west-northwest trending MaxMin geophysical anomaly (MM-7) at the western end of which is located the historical BAM gold zone discovered by Landore in 2003 Landore Resource Ltd., press release dated April 4, 2016). MM-7 has not previously been drill tested. Following the positive results from the two holes 0415-517/8 (reported 14th March 2016), Landore completed an additional 5 NQ diamond drill-holes totaling 564 meters. Gold mineralization was reported for four of the hole additional holes with hole 0416-519 intersecting 40.75m at 1.82 grams/tonne (g/t) gold with two high grade intersections of 2.25m at 10.28g/t and 3.00m at 5.74g/t indicating that the mineralization could be coalescing with depth. This latest drilling has extended the BAM East Gold Prospect over 100 meters along strike and to 100 meters down dip and remains open to the east and west along strike and at depth.

## 14.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Kendon Copper Mines Ltd. acquired the claims west of and including the lease TB346422 (formerly KK23033) in 1968. Between August 1968 and July 1970, over 50 diamond drill holes totaling over 3600m in length, designated according to the zone numbers, were completed on the D, S, B, N, K, M (the "Billiton Showing"), J and F zones by Kendon Copper Mines Ltd. The core recovered from three diamond drill holes (M series) was used for mill test purposes. The three holes, m-1, m-2 and m-3, totaled 1,111ft (339m) on the main or "K" zone. The results of the metallurgical testing completed on the core from these holes is not known and are considered historical in nature.

## 15.0 MINERAL RESOURCE ESTIMATES

Historically the work by A. S. Bayne (1970) calculated that there is a resource of 1,174,810 tons on the Main Billiton zone grading 0.82% copper, 2.71 % zinc, 1.77oz/t silver and 0.006oz/t gold based on 58 holes. This resource calculation was completed prior to the current NI43-101 guidelines and should not be relied on as an accurate estimate of the size and grade of the mineralization at the Main Billiton zone.

The Teck Hill showing was previously known as the north and south showing and the following historical mineral resource was quoted by Neilsen et al. (2010). The historical North resource estimation was 132,342 tons grading 1.10% copper. The historical South resource estimation was 346,921 tons grading 1.01% copper. Both of these resource calculations were completed prior to the current NI43-101 guidelines and should not be relied on as an accurate estimate of the size and grade of the mineralization at the Teck Hill showings.

None of these historical resource calculations have been reviewed by the author, and do not presently conform to National Instrument 43-101 Standards of Disclosure for Mineral Projects. These historic resource estimates should not be relied on.

## **16.0 OTHER RELEVANT DATA AND INFORMATION**

The author of this document concludes that no other information, relevant data or explanations are necessary to ensure that this report is understandable or misleading in any way.

## **17.0 INTERPRETATION AND CONCLUSIONS**

The geological re-interpretation of the Marshall Lake area incorporated numerous historical company interpretations, government mapping, regional geophysics, and detailed geophysics. It provides a coherent geological model for the numerous mineral occurrences located on the property that was generally lacking in the previous geological interpretations of the area (McKenzie et al. 2015). This geological interpretation presents new exploration potential along strike of the Mineralized Band towards the southwest. The correlation of the various mineralized zones to the same stratigraphic horizon brings a completely new way of understanding the various conductors and mineral occurrences on the property.

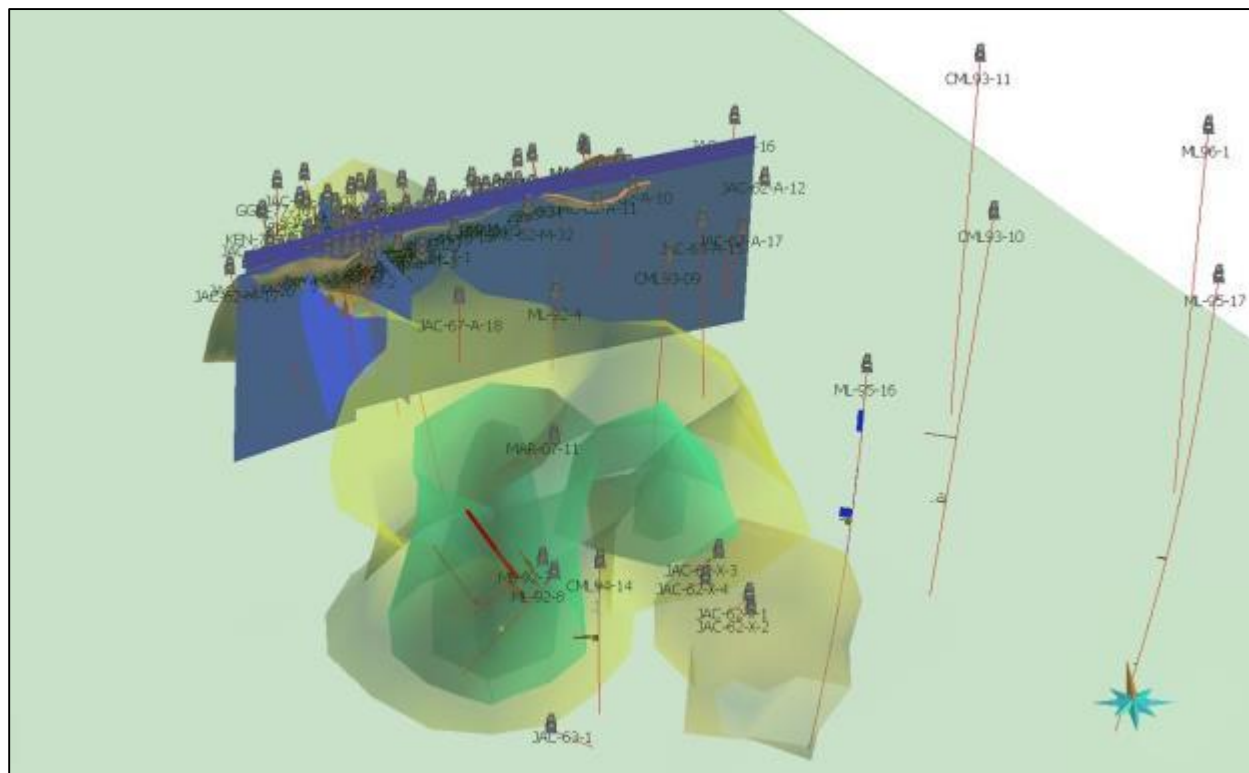
The support of the geological interpretation by the detailed electromagnetic survey adds to the strength of this interpretation. Evidence such as the magnetic signature from the iron formation contained within the Albert Sequence supporting the refolding of the D1 fold by a series of D2 folds is important. Especially as the change to the geological interpretation results in changes to the stratigraphy west of the fold axis and could not be supported by previous regional mapping by the Ontario Geological Survey (Stott and Straub, 1999). However, the new interpretation does not change the age relations of the stratigraphic units, it only changes to the distributions of the units.

Folding of the Marshall sequence, including the Mineralized Band, around to the west side of the property results in a correlation of the various mineralized zones to a single stratigraphic horizon. The core of the fold is occupied by a synvolcanic intrusion that is composed of a massive porphyritic phase and a marginal fragmental phase. The presence of mineralization associated with the fragmental phase of the intrusion suggests that it may be occupying a synvolcanic structure that controls the hydrothermal system, an integral part of the VMS model.

A re-interpretation of the controls on the hydrothermal system that has generated alteration and mineralization should be considered. This new geological interpretation introduces the structural complexities of a D1 fold that was not previously considered. Further work will be required to refine the interpretation, understand the structural history, and develop a better conceptual model for the formation of the mineralization. As an element of this work, considerations should be given to how a subaerial volcanic setting would affect the development of a deposit, as opposed to the historically considered model of a subaqueous formation commonly applied to VMS hydrothermal systems. Future exploration efforts need to focus on understanding the volcanic architecture of the Marshall Lake Volcano, which a deeper understanding of the environment of formation which may aid in the targeting and development of new mineralization in this area.

The inversion of the magnetic data of the VTEM dataset assisted in highlighting larger-scale structural and geological boundaries. The reprocessing of the electromagnetic data to produce resistivity depth images (“RDIs”) identified seven discrete conductors of high interest. One of the most interesting

conductor is ML\_VTEM\_001, a conductive anomaly approximately 600 m x 300 m x 300 m, is immediately southeast of the Billiton Zone, and has not been well tested. Drill hole MAR-07-11 intersects a portion of this conductive anomaly, with mineralization reported at depth but did not continue through the conductor (McKenzie et al. 2015).

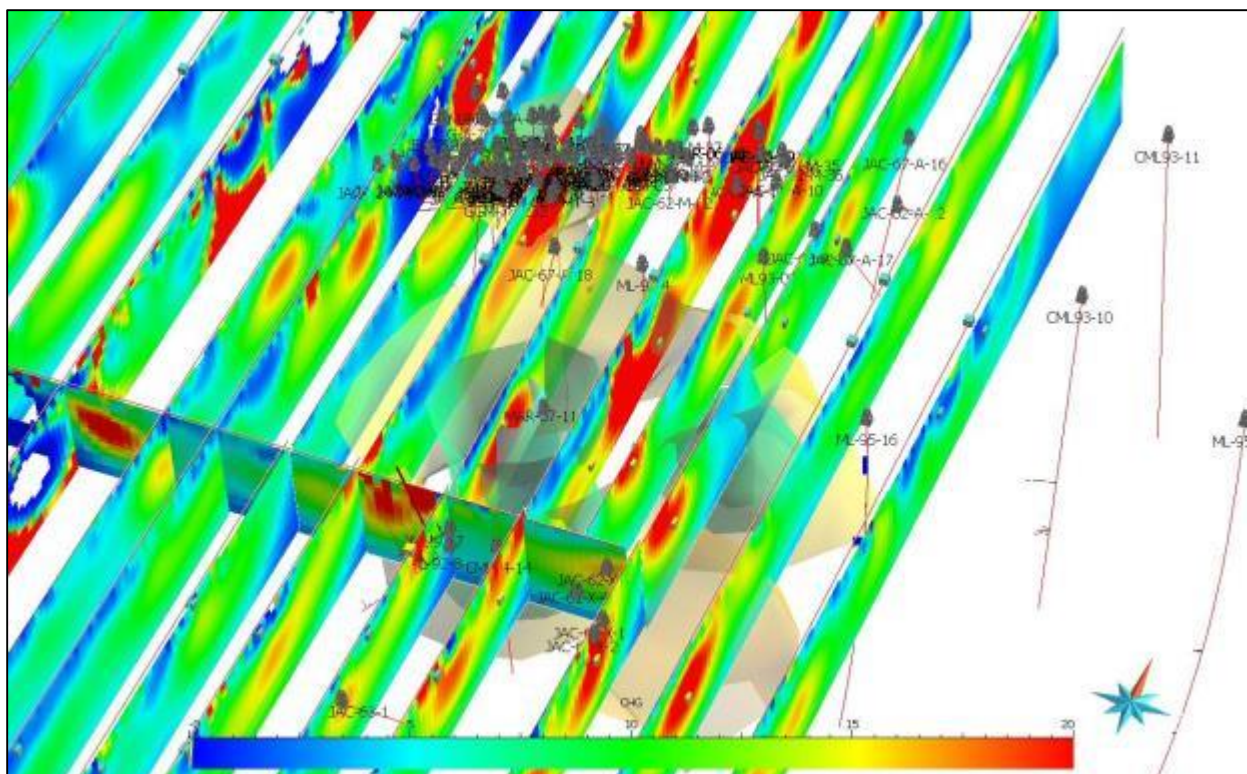


**Figure 17.1:** Conductive anomaly ML\_VTEM\_001, offset from modelled Billiton zone. Drill hole MAR-07-11 noted to intersect mineralization at depth (McKenzie et al. 2015).

The ground magnetic results aligned very well with the anomalies defined by the VTEM magnetic dataset, adding confidence in the positioning of the local line/station grid. This magnetic data further defined discrete structures and lineaments and may be beneficial for the overall geological and structural interpretation of the property. It is recommended to infill lines and tie the data bases together into one master grid. Lines should be surveyed perpendicular to the most relevant structures.

The Gripp Lake West IP/Res lines denoted some weakly chargeable and moderately conductive features. The positioning of these survey lines is of lower confidence since their lines/stations were not noted on the master line/station grid file. An attempt to properly locate these survey lines should be made, and re-surveying of 1-2 IP/Res lines is recommended if drill testing is to be conducted in this area.

The Billiton Zone is noted to be a highly chargeable, 35 – 40 mV/V feature, due to its disseminated copper-sulphide mineralization. As discussed above, ML\_VTEM\_001 is offset to the southeast of the Billiton Zone and the IP inversion results show chargeable coincidence with this anomaly (Fig. 17.2). This area remains relatively untested and requires further follow-up.



**Figure 17.2:** Chargeable coincidence of ML\_VTEM\_001 (denoted by isoshells). Anomalous area contains relatively little drill testing (McKenzie et al. 2015).

The Teck Hill grid contains a chargeable anomaly in the west coincident with ML\_VTEM\_003, and drill tested by TK-07 and TK-08 holes. It is recommended to review the results of drilling in this area to determine if this feature has been fully tested. The central and eastern chargeable features require similar review and follow up.

## 18.0 RECOMMENDATIONS

The new geological – geophysical interpretation of the Marshall Lake property has proposed a new framework for interpreting and understanding the historical geological and geophysical data and leads to a number of existing features that should be re-examined as well as the continued development of new exploration targets. This re-interpretation should be ground truthed through the collection of additional structural and volcanic stratigraphy information from the trenches and outcrops in area where major changes in the existing interpretation is proposed. During the ground truthing phase it would be of value to review the geochemical data to determine if there is chemostratigraphy that can be mapped out and aid in understanding controls on mineralization. It is also recommended that a thorough compilation of historical data and review of the geophysical and geological targets be completed with the objective of defining targets for follow-up by diamond drilling.

- 1) The conductive anomalies identified from the resistivity depth imaging conducted by Geotech may be associated with massive sulphides. These anomalies are recommended for EM plate modelling and ground truthing anomalies, and drill testing the best anomalies.

- 2) The ground magnetic dataset could be updated with infill lines and tied together into one master grid, to assist with the ongoing interpretation of the structure and geological boundaries on the property.
- 3) The chargeable and conductive features identified by each IP/Resistivity inversion block should be compared to available drill result and the isoshells outlined by the RDI anomalies, to determine if each anomaly was properly drill tested. Ground truthing of the more subtle, near surface features, is recommended.
- 4) Collection of additional structural and volcanic stratigraphy information from the trenches and outcrops in area where major changes in the existing interpretation is proposed. Particularly, it is recommended that the Billiton surface exposures be mapped and sampled in detail to aid in the understanding of controls on mineralization as well as exploration targeting.
- 5) Review the lithogeochemical data to determine if there is chemostratigraphy that can be mapped out and aid in understanding controls on mineralization and the collection of additional samples, if required, to assist in the lithogeochemical interpretation
- 6) It is recommended that the drill hole database for the Marshall Lake property be fully updated and digitized

A systematic review and prioritization of all targets is recommended, with the objective of identifying the top 3-8 exploration targets for a small drilling campaign of 5-8 holes. Any drilling or rock sampling should include the collection of physical rock properties to aid in the refinement of the geophysical exploration techniques as well as constraining the model results. It is also recommended that electromagnetic borehole surveying should be completed to aid in the improvement of the three-dimensional understanding of the mineralization.

An estimated budget and timeline is presented in Table 18.1, below.

**Table 08.1:** 2016 Recommended Budget and Timeline for the Marshall Lake Project (Note: All dollar values in the chart are quoted in thousands of dollars; therefore, the total budget is \$3,000,000.00).

MARSHALL LAKE 2 YEAR BUDGET	2016									2017						Subtotal	TOTAL
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
REPORT: 43-101	\$ 25														\$25	\$25	
PHASE 1: Compilation and Target Generation																\$145	
Geo: Complete Surface Map		\$10													\$10		
Geo: Build regional drillhole database		\$50													\$50		
Gchm: Build regional surface sample database		\$20													\$20		
Gphy: Plate modelling			\$20												\$20		
Targeting exercise (identify)			\$30												\$30		
Targeting exercise (prioritize)				\$15											\$15		
PHASE 2: Geological Mapping and Geophysics																\$295	
Gphy: Ground surveys (follow-up Airborne)					\$120										\$120		
Geo: Ground truth targets (from Phase 1; 1.5 wks)*					\$40										\$40		
Gchm: Sample Billiton surface for Au (2 days)*					\$10										\$10		
Geo: Ground truth geological interpretation (1 wk)*					\$25										\$25		
Geo: Regional mapping (3 wks)*				\$75											\$75		
Geo: Ground truth airborne anomalies (from Phase 2; 1 wk)					\$25										\$25		
PHASE 3: Follow-up Drilling (\$200/m all in)																\$1,500	
DH: FALL 2016: Drill (6-10 holes; ~3000m)					\$600										\$600		
Gphy: FALL 2016: Borehole EM						\$150									\$150		
DH: WINTER 2017: Drill (6-10 holes; ~3000m)									\$600						\$600		
Gphy: WINTER 2017: Borehole EM										\$150					\$150		
PHASE 4: Follow-up Exploration																\$735	
Reporting (Assessment/Internal)												\$25			\$25		
Plan contingent on results of Phases 1, 2, and 3													\$710		\$710		
GENERAL AND ADMINISTRATION																\$300	
Legal, audit and regulatory	\$35	\$25	\$20	\$10	\$10	\$20	\$5	\$10	\$5	\$10	\$5	\$10	\$5	\$5	\$175		
Office and administration	\$15	\$15	\$15	\$5	\$10	\$5	\$10	\$5	\$10	\$5	\$10	\$5	\$10	\$5	\$125		
TOTAL		\$195			\$1,030			\$205			\$795			\$775	\$3,000	\$3,000	

Assumptions: QP (50%) + Sr Prj Geo + Geo = \$2,300/day; Field Accommodation & Meals = \$175/day per person; Assays = 15 samples per day \* \$75/sample (includes QAQC)

## 19.0 REFERENCES

- Amukum S.E., 1989, Precambrian geology of the Little Marshall Lake area: Ontario Geological Survey, Report 267.
- Barrett, T. J. and MacLean, W.H., 1994, Chemostratigraphy and hydrothermal alteration in exploration for VMS deposits in Greenstone and younger volcanic rocks, in Lentz, D.R., ed., Alteration and Alteration processes associated with ore-forming systems: Geological association of Canada, Short Course Notes, v. 11, p. 433-467.
- Barrie, C.T., Gorton, M.P., Naldrett, A.J. and Hart, T.R., 1991, Geochemical constraints on the petrogenesis of the Kamishotia gabbroic complex and related basalts, western Abitibi Subprovince, Ontario, Canada: Precambrian Research, v. 50, p. 173-199.
- Barrie, C.T. and Hannington, M.D., 1999. Introduction: Classification of VMS deposits based on host rock composition, in Barrie, C.T., and Hannington, M.D., ed., Volcanic-Associated Massive Sulfide deposits: Processes and examples in modern and ancient settings: Reviews in Economic Geology, v. 8, p. 2-10.
- Bayne, A.S., 1970, Report on examination and feasibility study, NWT Copper Mines Ltd; Marshall Lake area, district of Thunder Bay, Ontario, Canada: Unpublished report to the president and directors, dated October 23, 1970.
- Bennett, N.A., Middleton, R.S., 2009, Report of the Diamond Drilling on the Marshall Lake Property Drill Holes GAZN-08-06 to GAZN-08-08: Thunder Bay Mining Division, Assessment Report.
- Bernier, L.R., Pouliot, G. and MacLean, H.H., 1987, Geology and metamorphism of the Montauban North Gold Zone: A metamorphosed polymetallic exhalative deposit, Grenville Province: Economic Geology, v. 82, p. 2076-2090.
- Blackburn C.E., Johns, G.W., Ayer, J. and Davis, D.W., 1991, Wabigoon Subprovince: Ontario Geological Survey, Special Volume 4, Part 1, p.303-381.
- Campbell, I., 1993, Report on the 1992 diamond drill program on the Marshall Lake property by Challenger Minerals Ltd: Unpublished Report.
- Campbell, I., 1994, Report on the 1994 exploration program of the Marshall Lake property by Challenger Minerals Ltd: Unpublished Report.
- Campbell, I., 1995, Report on the 1995 Exploration Program. Marshall Lake Property. Nakina, Ontario, NTS 42L/5: Consolidated Abitibi Resources Ltd: Unpublished Report.
- Campbell, I., 1997, Report on the 1996 Exploration Program. Marshall Lake Property. Nakina, Ontario, NTS 42L/5: Avalon Ventures Ltd.: Unpublished Report.
- Card, K.D., 1990, A review of the Superior Province of the Canadian Shield; A product of Archean accretion: Precambrian Research, v. 48, p. 99-156.

- Card, K.D. and Ciesielski, A., 1986 Subdivisions of the Superior Province of the Canadian Shield: Geoscience Canada, v. 13, p. 5-15.
- Card K.D and Poulsen, K., 1998, Archean and Paleozoic geology and metallogeny of the southern Canadian Shield: Exploration and Mining Geology, CIM., v. 7, p. 181-215.
- Clark, A.M., 1975, Hey's Mineral Index. Mineral Species, varieties and synonyms: Natural History Museum Publications. Chapman and Hall.
- Connelly, J.N., 1983, Alteration and mineralization in the Gripp Lake area, northwestern Ontario: Unpublished B.Sc. Thesis, Ottawa, Ontario, Carleton University.
- Deer, W.A., Howie, R.A. and Zussman, J., 1965a, Chain Silicates, in Rock Forming Minerals, v.1: London, Longmans, 528 p.
- Deer, W.A., Howie, R.A. and Zussman, J., 1965a, Ortho and ring silicates, in Rock Forming Minerals, v.1: London, Longmans, 528 p.
- Franklin, J.M., 2007, Volcanogenic massive sulphide deposits, Part 1: Classification: Franklin Geosciences Ltd, Unpublished Report.
- Franklin, J.M., 2008, Personal Communication: Thunder Bay
- Franklin, J.M., Gibson, H.L., Jonasson, I.R. and Galley, A.G., 2005, Volcanogenic Massive Sulfides: Economic Geology, 100th Anniversary Volume, p. 523-560.
- Franklin, J.M., Sangster, D. M. and Lydon, J.W., 1981, Volcanic associated massive sulphide deposits, in B.J. Shinner., ed., Economic Geology, 75th Anniversary Volume, p. 485-627.
- Forslund, N.R., 2008, Hydrothermal Alteration in the southern felsic volcanics at Marshall Lake, Northwestern Ontario: Unpublished B.Sc. Thesis, Thunder Bay, Ontario, Lakehead University.
- Galley A.G., Hannington, M.D. and Jonasson, I.R., 2007, Volcanic Massive Sulphide Deposits, in Goodfellow, W.D., ed., Mineral Deposits of Canada: A synthesis of major deposit-types, district metallogeny, the evolution of geological provinces and exploration methods: Geological Association of Canada, Mineral Deposits Division, Special Publication No. 5, p. 141-161.
- Geotech Ltd., 2007, Report on a Helicopter-Borne Versatile Time Domain Electromagnetic Geophysical Survey, Marshall Lake Property: Geotech Ltd.
- Geotech Ltd., 2015, VTEM™ (Versatile Time Domain Electromagnetic) System (<http://www.geotech.ca/vtem>).
- Gibson, G. and Cempirek J., 2013, Report on the Diamond Drilling on the Marshall Lake Property, Drill Holes GAZ-10-15, GAZ-10-16, GAZN-10-09 to GAZN-10-19, RMZ-11-20 to RMZ-11-30, and RMZ-12-30 to RMZ-12-39, MNDM Assessment Report.

Gibson, G., 2013, Review of Exceptional Drill Results to Date for Marshall Lake Property, Ontario, News Release No. 13-11, SEADAR.

Gibson, G., 2014, Report of the IP Inversion Modelling and Core Drilling on the Marshall Lake Property Drill Holes RMZ-13-39, RMZ-13-40 and RMZ-13-41, MNMD Assessment Report.

Gibson, H.L. 2005, Volcanic-hosted ore deposits, in Marti, J., and Ernst, G. G. J. ed., Volcanoes in the Environment, 1st ed., New York, Cambridge University Press, p. 333-386.

Gibson, H.L., Kerr, D.J., and Cattalani, S., 2000, The Horne mine: geology, history, influence on genetic models, and a comparison to the Kidd Creek mine: Exploration and Mining Geology, v.9, p. 91-111.

Gibson, H.L. and Watkinson, D.H., 1990, Volcanogenic massive sulfides of the Noranda cauldron and shield volcano, in The Northwestern Quebec Polymetallic Belt: A summary of 60 years of Mining Exploration., in Pive, M., Verpaalst, P., Gagnon, Y., Lulin, J.-M., Riverin, G., and Simard, A, ed., Canadian Institute of Mining and Metallurgy and Petroleum, Special Volume 43, p. 119-232.

Grant, J.C., 2007, Geophysical Report for East West Resources Corporation on the Teck Hill Grid, Marshall Lake Property, Summit Lake Area, Thunder Bay Mining Division, Northwestern Ontario.

Grant, J.C., 2008, Geophysical Report for East West Resources Corporation on the Marshall Lake Project, Summit Lake Area, Thunder Bay Mining Division, Northwestern Ontario.

Grant, J.C., 2011, Geophysical Report for White Tiger Mining Corp. on the Teck Hill Grid, Marshall Lake Project, Summit Lake Area, Thunder Bay Mining Division, Northwestern Ontario.

Hall, D.H. and Brisbin, W.C., 1982, Overview of regional geophysical studies in Manitoba and northwestern Ontario: Canadian Journal of Earth Sciences, v. 19, p. 2049-2059.

Hugon, H., 1993, Marshall Lake Structural Model: Internal Company Report for Challenger Minerals Ltd.

James, R.S., Grieve, R.A.F. and Park, L., 1978, The petrology of cordierite-anthophyllite gneisses and associated mafic and pelitic gneisses at Manitouwadge, Ontario: American Journal of Science, v. 278, p. 41-63.

Keast, T., 1990, NWT Copper Mines Ltd #523. Report of Work: Granges Inc., Unpublished report.

Langford, F.F., 1959, Geology of the Gripp Lake Area, Ontario Ministry of Northern Development and Mines, Ontario Geological Survey, Annual Report Volume.

Lockwood, M.B. and Franklin, J.M., 1986, Implications of chemical trends within the chloritoid-altered volcanic rocks of the Wawa Belt: Ontario Geological Survey Geoscience Grant Research program, Annual Report. 1985-86, 28 p.

McKenzie, J., Selway, J., Fitchett, C., 2015, Geophysical and Geological Interpretation Report, Marshall Lake Property, Northwestern Ontario, Internal Company Document.

Meju, Maxwell A., 1998, Short Note: A simple method of transient electromagnetic data analysis: *Geophysics*, v. 63, p. 405-410.

Middleton, R.S. and Rajnovich, L., 2007, East West Resource Corporation and Eyeconomy Holdings plc: Thunder Bay, Ontario, Marshall Lake claim map, Unpublished Report.

Middleton, R.S. and Laarman, J., 2008, Report on the Diamond Drilling: Marshall Lake Property Drill Holes: GAZ-07-07 through to GAZ-07-11, NWT-07-01, TH-07-01, GAZN-07-01 through to GAZN-07-05, G-07-01, DZ-07-01, MAR-06-01 through to MAR-07-11: Thunder Bay Mining Division, East West Resource Corporation, Unpublished Report.

Moon, C.J., Whately, M.K.G. and Evans, A.M., 2006, Introduction to Mineral Exploration, 2nd Edition: Hoboken, Blackwell Publishing, 496 p.

Morton, R.L., 1983, Marshall Lake Report: Corporation Falconbridge Copper, Unpublished Report.

Moser, D., 1994, The geology and structure of the mid-crustal Wawa gneiss domain – A key to understanding tectonic variation with depth and time in the Late Archean Abitibi-Wawa Orogen: *Canadian Journal of Earth Sciences*, v. 31, p. 1064-1080.

Nason, P., 2008, Characterisation of an Archean VMS Alteration System with specific reference to the Copper-Rich Stringer Zone at the Marshall Lake Property, Northwestern Ontario: Unpublished dissertation, Exeter, UK, University of Exeter.

Natural Resources Canada, 2002, Map of Ontario  
(<http://www.nrcan.gc.ca/earthsciences/geography/atlas-canada/reference-maps/16846>)

Newman, W.R., 1962, File 63.1177, Assessment Files Research Office, Toronto, ON.

Nielsen, P., Middleton, R.S., and Bennett, N.A., 2010, NI 43-101 and 43-101F1 Technical Report on the Marshall Lake Property, Northwestern Ontario, Latitude 50° 23' N, Longitude 87° 32' W For East West Resource Corporation and Marshall Lake Mining PLC.

Percival, J.A., McNicoll, V.J., Brown, J.L. and Whalen, J.B., 2004, Convergent margin tectonics, central Wabigoon Subprovince, *Canadian Journal of Earth Sciences*, v. 43, p. 1085-1117.

Percival, J.A., Sanborn-Barrie M., Skulski T., Stott G.M., Helmstaedt H., & White D.J., 2006, Tectonic Evolution of the Western Superior Province for NATMAP and Lithoprobe Studies, Canada: *Precambrian Research*, v. 132, p. 213-244.

Pitney Bowes Software, 2015, Product Data Sheet - EM Flow v5.0  
([http://www.pitneybowes.com/content/dam/pitneybowes/pbencom/en/legacy/docs/international/enc\\_omau/pdf/products/geophysics/em-flow/EMFlow\\_v5\\_Data\\_Sheet.pdf](http://www.pitneybowes.com/content/dam/pitneybowes/pbencom/en/legacy/docs/international/enc_omau/pdf/products/geophysics/em-flow/EMFlow_v5_Data_Sheet.pdf)).

Poulsen, K.H., Borradaile, G.J. and Kehlenback, M.M., 1980, An inverted Archean succession at Rainy Lake, Ontario: *Canadian Journal of Earth Sciences*, v. 17, p. 1358-1369.

Roscoe, S.M. and Card, K.D., 1993, The reappearance of the Huronian in Wyoming: Rifting and drifting of ancient continents: *Canadian Journal of Earth Sciences*, v. 30, p. 2475-2480.

Shirey, S.B. and Hanson, G.N., 1986, Mantle heterogeneity and crustal recycling in Archean granite-greenstone belts: Evidence from Nd isotopes and trace elements in the Rainy Lake area, Superior Province, Ontario, Canada: *Geochimica Cosmochimica Acta*, v. 50, p. 2631-2651.

Sheriff, Robert E., 1991, *Encyclopedic Dictionary of Exploration Geophysics* : Tulsa, Society of Exploration Geophysicists, 376 p.

Stockwell, C.H., 1982, Proposals for time classification and correlation of Precambrian rocks and events in Canada and adjacent areas of the Canadian Shield, Part 1: A time classification of Precambrian rocks and events: *Geological Survey of Canada, Paper 80-19*, 135 p.

Stott, G.M. and Corfu, F., 1991, Uchi Subprovince, in *Geology of Ontario: Ontario Geological Survey, Special Volume 4*, p. 135-246.

Stott, G.M., Davis, D.W. and Parker, J.R., 1998, Observations of the Tectonic framework of the eastern Wabigoon Subprovince, in Harrap, R.M., and Helmstaedt, H.H., ed., *Western Superior Lithoprobe Transect, Fourth Annual Workshop, March 23-24, 1998: Lithoprobe Report #65*, Lithoprobe Secretariat, University of British Columbia, p. 74-76.

Stott G.M. and Straub, K.H., 1999, The Marshall Lake volcano on the northern margin of eastern Wabigoon Subprovince, northwestern Ontario: *Ontario Geological Survey, ORF 6000*.

Stott, G.M., Davis, D.W., Parker, J.R. Straub, K.H. and Tomlinson, K.Y., 2002, *Geology and Tectonostratigraphic Assemblages, eastern Wabigoon Subprovince, Ontario; Ontario Geological Survey, Preliminary Map P.3449*.

Straub, K.H., 1999, Mineralization and alteration within the Marshall Lake intermediate to felsic volcanic centre, east Wabigoon Subprovince, in *Summary of Field work and other activities 1999: Ontario Geological Survey, Open File Report 6000*, p. 24-1 to 24-10.

Straub, K.H., 2000, Geochemistry of hydrothermal alteration and its relation to Base Metal mineralization in the Marshall Lake area, Northern margin of the Onaman-Tashota Greenstone Belt, in *Summary of Field work and other activities 2000: Ontario Geological Survey, Open File Report 6032*, p. 26-1 to 26-14.

Straub, K.H., Stott, G.M. and Phillips J., 2000, *Precambrian Geology, Marshall Lake Area, Onaman-Tashota Greenstone Belt, Ontario Ministry of Northern Development and Mines: Ontario Geological Survey, Map P3424*.

Sullivan, D.W., 1970, *Assessment Files Research Office, Division of Mines, Toronto*.

Teck-Cominco, *Archives of Marshall Lake Area Exploration Programs*, Vancouver, British Columbia.  
U.S. Environmental Protection Agency, *Environmental Geophysics*, 2011, *Magnetic Methods* ([http://www.epa.gov/esd/cmb/GeophysicsWebsite/pages/reference/methods/Surface\\_Geophysical\\_Methods/Potential\\_Field\\_Methods/Magnetic\\_Methods.htm](http://www.epa.gov/esd/cmb/GeophysicsWebsite/pages/reference/methods/Surface_Geophysical_Methods/Potential_Field_Methods/Magnetic_Methods.htm)).

Wells, G.S., 1982, Summary Report, 1981: Marshall Lake Projects PN038, 039, 040, 045, NTS-42-L-5: Corporation Falconbridge Copper, Unpublished Report.

## 20.0 STATEMENT OF THE QUALIFIED PERSON

I, Thomas R. Hart do hereby certify that:

- 1) I reside at 2404 Algonquin Road, Sudbury, Ontario P3E 5V1,
- 2) I graduated with an H.B.Sc. (Geology) degree in 1980 from the University of Western Ontario, and with a M.Sc. (Geology) degree in 1984 from the University of Toronto.
- 3) I have been practicing my profession in Canada since 1984, as an exploration geologist (an employee and independent consultant) on lode gold and base metal projects with exploration/mining companies in Canada at both a grass roots and advanced exploration stage, and as a mapping geologist with the Ontario Geological Survey.
- 4) I am a member of the Association of Professional Geoscientists of Ontario, the Prospectors and Developers Association of Canada, the Society of Economic Geologists, and the Geological Association of Canada.
- 5) I have read the definition of "Qualified Person" set out in National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- 6) I have prepared this report titled Technical Report on the Marshall Lake Property, Summit Lake Area, Sollas Lake Area, Willet Lake Area, and Gzowski townships, Ontario, 42L05 and 42L06, 43-101 TECHNICAL REPORT for Copper Lake Resources Ltd. dated June 6<sup>th</sup>, 2016.
- 7) I had no prior involvement with the Property, and this report is based on a site visit to the property completed on May 19, 2016.
- 8) I have not earned the majority of my income during the preceding three years from Copper Lake Resources Inc. or any associated or any affiliated companies.
- 9) I do not own, directly or indirectly, any interest in the properties or securities of Copper Lake Resources Inc. or any associated or any affiliated companies.
- 10) I am independent of the issuer applying all of the tests in section 3.5 of the Companion Policy of National Instrument 43-101.
- 11) I have read National Instrument 43-101 and Form 43-101F1 and have prepared this report in compliance with the Instrument and Form; as of the date of the certificate, to the best of my knowledge, information and belief, this report contains all the scientific and technical information required to be disclosed to make this report not misleading, and I am not aware of any material fact or material change with regard to the Property that would make the report misleading.

Signed and sealed this 7<sup>th</sup> day of June, 2016 in the City of Sudbury, Ontario

{signed and sealed}

Thomas R. Hart, M.Sc., P.Geo.