Results of a Mobile Metal Ions Process (MMI-M) Soil Geochemical Orientation Survey on the Ratte Lake Property (Ontario), Geofortune Resources Corporation.

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#### **EXECUTIVE SUMMARY**

Two Mobile Metal lons soil geochemical sampling transects were established at the Ratte Lake property of Geofortune Resource Corporation. The aim was to assess mineral potential in the area by first determining the optimum depth for MMI sample collection from vertical profiling sampling along Line 1. Subsequent to having determined this depth the assessment of geochemical responses along this sampling transect were undertaken. A second transect (Line 2) approximately 450 m to the west was established and samples collected from the optimum sampling depth as determined on Line 1. Both surveys haves successfully demonstrated that MMI-M partial extractions on soil samples collected from this landscape environment can isolate MMI-M precious- and base metal anomalies and lithologically-sensitive element responses. The optimum depth of sample collection for the property is between 20 cm and 30 cm below the zero datum or the point at which soil formation is initiated for this landscape environment.

On Line 1 a multi-element and multi-sample commodity element response is documented from the northern portion of the sampling transect. The main commodity element response includes Cu, Pb, Ga, Ag and +/-Au with associated lithologically-sensitive element responses for Sc, U and Th. Line 2 is marked by two areas of elevated responses and includes weakly elevated Au, Ag, Cu, and Zn with associated Ce, Mg and Ti at or near UTM northing 5,600,300 m and elevated Cu, Ag, Au with high-contrast Zn (RR=97) and associated Ti and Mg at or near UTM northing 5,599,950 m.

The most significant anomaly in the Ratte Lake survey occurs on Line 2 and consists of the highcontrast AuRR of 138 and the adjacent 4-sample AgRR (maximum of 94RR).

The area assessed with MMI sampling transect Line 2 should be prospected for any signs of mineralization or related alteration. If shallow overburden is present a program of overburden stripping can provide information on the cause of the Au-Ag anomaly on this line. Additional MMI surveys would be warranted in this area. The area of Line 2 MMI sampling transect is interpreted to be more highly prospective than that of Line 1.

Sampling materials collected for MMI analysis are effective and appropriate sample media for an MMI survey on the property.

The analyses generated by the MMI-M extraction are accurate and precise and are effective for the detection of low- to high-contrast anomalies.

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#### PREAMBLE

The exploitation of mineral commodities in the near-surface geological environment has become increasingly difficult due to the exhaustion of mineralization exposed at surface and the mantling of prospective bedrock by glacially transported till and its derivatives. Thick glaciofluvial and glaciolacustrine sediments and residual soils topped by organic deposits make mineral exploration in these terrains challenging. For this reason a plethora of innovative exploration geochemical selective and partial digestions, coupled with state-of-the-art instrumentation capable of measuring concentrations in the parts per billion (ppb) and sub-parts per billion ranges, have been developed. These techniques offer the explorationist tools to "see through" overburden and derive useful mineral exploration data for integration with geology and geophysics and ultimately for drill-testing multivariate anomalies. Disrupted overburden, such as that observed with logging practices (scarification), tends to complicate MMI responses although modified sampling practices can be adopted to rectify this disturbed environment. Areas affected by landslide and industrial activity such as mining operations and exploration diamond drilling are also complicating factors.

The proprietary Mobile Metal Ions Process (MMI) is a high resolution soil geochemical technique that has been utilized on a wide range of commodity types from base and precious metals to diamonds worldwide. The Technology has also been utilized to map bedrock lithologies in overburden covered terrain. The Process is based upon proprietary partial extraction techniques, specific combinations of ligands to keep metals in solution, and relies on strict adherence to sampling protocols usually established during an orientation program. Increased spatial and amplitude resolution compared to conventional geochemistry is achieved by detaching and analyzing adsorbed ions from the surface of soil particles with specially designed chemicals.

Geochemical data resulting from MMI analysis of improperly collected soils cannot be ameliorated with univariate and/or multivariate statistical and graphical solutions. These recently arrived, surface adsorbed ions better reflect subsurface sources, than bound or incorporated forms of the same elements, which have been mechanically dispersed in soils, and contribute "noise" to the geochemical signal. The MMI extractants have been designed to both detach adsorbed ions reproducibly and provide an analytical medium for reproducible low-level analysis in ICPMS instruments. Typically less than 10% of the total metal content of a soil is adsorbed and used for MMI analysis. However, "backgrounds" for the technique are extremely low. Consequently when signal to noise ratio for MMI is compared to signal to noise ratio for conventional geochemistry, sharper, greater-contrast peaks over mineralization are found. This is particularly advantageous in

areas of cover, subdued outcrop, or where metal zonation or "fingerprinting" is used to infer geology from soil geochemistry.

The recognition of anomalies in geochemical data has progressed from simple visual inspection in small data sets to multivariate, parametric and non-parametric or robust statistical methods for large datasets usually extracted from regional geochemical surveys. Derived parameters from these statistical exercises, such as factor scores or discriminant functions, have been successfully utilized in reducing a large number of potentially useful variables to a select few variables that identify and localize anomalous geochemical signatures. These statistical approaches have been required to manipulate accurate and precise, low-cost, multi-element geochemical data.

The MMI technology uses a different approach to exploration geochemistry by analyzing soils for a select few commodity elements upon which to base property evaluations. Having stated this, the MMI-M multi-element suite that could be utilized to analyze inorganic soils from the Armstrong property orientation survey offers analyses for 53 elements. This large number of elements consists of a multi-element suite that reports ppb and sub-ppb analyses for base and precious metals, pathfinder elements for these commodities, as well as elements useful for mapping bedrock geology obscured by residual soils, glacial overburden and its derivatives. The large number of elements in the database provides an opportunity to assess an area of interest for a wide range of metallic mineral deposits with only minor drawbacks in terms of lower limits of determination. For the Armstrong property orientation survey all 53 elements were analyzed in the initial sample suite from Line 1. Vertical profiling was undertaken on both Lines 1 and 2 however only samples from line 1 were analyzed for full suite MMI-M. The only samples collected from Line 2 were those from the optimum sampling depth as described by the Line 1 results: 20-30 cm. Based on a review of data for Line 1 a select suite of 8 elements were chosen for analysis in Line 2 samples. These included Ag, Au, Ce, Cu, Mg, Pb, Ti and Zn.

Data is commonly presented in several ways. Data from the laboratory is supplied as spreadsheets, with individual elements in soils presented in ppb. For individual elements, contour plots in ppb can be produced in a number of software packages. Stacked bar charts (usually across strike) can provide a very good pictorial presentation of the multi-element data, and the relationships between the soil geochemistry of various elements. To do this it is often convenient to calculate the signal to noise ratio, or response ratio for each element at each sampling point. Data for all elements can then be plotted on a common (response ratio) scale. The background for each element is calculated from the lowest quartile (25%) of values for each element. Interpretation

consists predominantly of examining the various methods of data presentation, locating anomalous values or patterns, and assessing the significance of these. Experience, and/or orientation surveys over known mineralization are important in this process. For the Ratte Lake property orientation survey data are interpreted using both non-transformed geochemical data and as response ratios.

#### **TERMS OF REFERENCE**

The author of this report was contracted by Geofortune represented by Mr. Jason Lin and Mr. Nick Zeng. An informal meeting was held by telephone with e-mail follow-up to review the needs of data interpretation for the Armstrong property. Subsequent to these discussions the author was retained to undertake the interpretation of the orientation survey at Armstrong with the aim of identifying the optimum sampling depth for future MMI surveys on these properties. The location of the Armstrong property is given in Figure 1. The results of this survey are presented below.





Figure 1. Location of the Armstrong-Ratte Lake Property.

#### PREFERRED APPROACH TO MOBILE METAL ION SOIL GEOCHEMISTRY

In MMI surveys there are some general approaches that are used to guide sample collection including preferred depths of sampling and these are described briefly here. Additional information is also available from the SGS Mineral Services website (<u>www.sgs.com/geochemistry</u>). The intellectual property that is MMI Technology has been purchased by SGS and as such SGS Mineral Services is the sole provider of this service.

Soil samples, each weighing approximately 250 grams, are usually collected at variable sample spacing along single transects over known mineralized zones or extrapolated trends of these zones. Alternatively, in the absence of a known mineralized zone over which to undertake the orientation survey a geophysical anomaly, structure or a lithology with a unique bulk chemical composition can be used. Generally, 25-m stations in precious metal exploration and up to 50 m in the case of base metals are the routine spacing. Sample spacing should be established on the basis of a "best-estimate" of the likely target being sought with estimates from historical data or exploration results from nearby programs. Initially, samples are often collected at a closer spacing until it is determined that a larger spacing is appropriate to the target being sought. For an orientation survey, vertical profiling based on four 10 cm samples collected incrementally below the zero datum provides the best depth where the highest-contrast and most representative MMI signal resides. This approach permits the assessment of the signature related to known mineralization, structures, geophysical anomalies or variability in landscape environment.

#### DATA TREATMENT AND PRESENTATION

In exploration surveys where sampling and analytical protocols have been determined by an orientation survey, analytical data is examined visually for analyses less than the lower limit of detection (<LLD) for ICP-MS. Data <LLD are replaced with a value ½ of the LLD for statistical calculations and graphical representation. For most exploration surveys, MMI data is plotted as response ratios. For the calculation of response ratios the 25th percentile is determined using the software program SYSTAT (V13) and the arithmetic mean of the lower quartile used to normalize all analyses. The normalized data represent "response ratios" which are then utilized in subsequent plots. Zeros resulting from this calculation are replaced with "1". Response ratios are a simple way to compare MMI data collected from different grids, areas and environments from year to year. This normalized approach also significantly removes or "smooths" analytical variability due to inconsistent dissolution or instrument instability. For the Ratte Lake property orientation survey

the interpretation of lateral variability along the two sampling transects is based on both concentration and response ratios.

Analytical data as received from SGS Mineral Services (Vancouver, B.C.) is presented in Appendix 1. Descriptive data are given in Appendix 2. The variation in concentration of MMI-M suite elements on the Armstrong property is discussed in a geochemical narrative based on horizontal bar charts produced with SYSTAT (V13) software and bubble plots produced with IOGAS software (V4.4). The bubble plots and gridded data plots are presented in Appendix 3 and are also inserted in the text below.

#### SAMPLE COLLECTION

Soil samples were collected with a shovel and a plastic vinyl trowel from a shallow 40 cm deep pit. Four samples were collected at 10 cm increments starting below the organic soil layer and extending downwards. These sub-samples were placed in pre-labeled medium-sized ZIPLOC bags. No further preparation was undertaken. A total of 39 samples were collected from two transects for analysis. Figure 2 shows the distribution of samples collected in total from the property. Sample transect 1 or Line 1 is the eastern line and Line 2 the western line. The lines are separated by approximately 450m.



Figure 2. Two sampling transects consisting of 39 sites where vertical profiling was undertaken.

#### DATA CHARACTER AND QUALITY

Analytical data for this survey are presented in Appendices 1 and 2 along with all work sheets derived for this report.

#### **Histograms**

All of the elements presented in Figure 3 have a positively skewed data distribution resulting from a significant number of analyses at or below the LLD. Those elements with a long "tail" are likely to have highly elevated concentrations of that particular element and hence the possibility of an anomalous response. This would seem to be true for all elements in Figure 3.





#### **Tukey Box Plots**

Tukey Box plots can be used in a variety of ways to assess geochemical data. In the Ratte Lake orientation survey the data for selected elements is examined with box plots to ascertain which elements have the widest spread of concentration and accordingly the greatest likelihood of comprising background and anomalous populations. A review of the plots in Figure 4 indicates the following ranking in terms of range in concentration for the 8 selected elements:

Ti>Ce>Cu>Pb>Zn>Ag>Mg>Au. Outliers are recognized for each of these elements and suggestive of a unique or anomalous data population.



#### Box Plots (common Y axis)





#### Figure 4. Tukey Box plots for selected elements, Ratte Lake MMI-M orientation survey.

#### Replicate Analyses of the Analytical Blank (Table 1)

The assessment of data quality in the Ratte Lake MMI orientation survey is somewhat hindered by the small number of samples used in the survey. Nevertheless, the data quality is interpreted to be excellent. Replicate analyses of the analytical blank records no significant laboratory-based contamination. Minimal amounts of elements in blanks analyzed by the MMI-M method were detected in analyses of the analytical blank however at these concentration levels significant contamination of the sample analyses by extraneous materials during sample analysis is interpreted to be nil.

# Table 1. Summary of contaminants (red) in replicate analyses of the analytical blank, Lines 1 and 2.

Line 1									
ANALYTE	Ba	Cu	La	Mn	Nd	Th	Ti	U	Zr
METHOD	GE_MMI_M								
DETECTION	10	10	1	10	1	0.5	3	1	5
UNITS	ppb								
BLANK	<10	<10	1	<10	<1	<0.5	<3	<1	<5
BLANK	<10	<10	<1	10	<1	<0.5	<3	<1	<5
BLANK	<10	<10	<1	<10	<1	<0.5	<3	<1	<5
BLANK	<10	<10	1	<10	1	0.5	<3	<1	<5
BLANK	<10	<10	<1	10	1	0.5	<3	1	<5
BLANK	10	<10	<1	10	<1	<0.5	4	<1	<5
BLANK	<10	<10	<1	10	<1	<0.5	<3	<1	<5
BLANK	<10	<10	<1	10	1	<0.5	<3	<1	6
BLANK	<10	10	<1	10	<1	<0.5	3	<1	<5
BLANK	<10	10	<1	10	<1	<0.5	3	<1	<5
BLANK	<10	<10	<1	40	<1	<0.5	<3	<1	<5
<b>BLANK</b>	<10	<10	<1	<10	1	07	-3	<1	<5

#### Line 2

ANALYTE	Au	Ag	Cu	Pb	Zn	Се	Mg	Ti
METHOD	GE_MMI_M							
DETECTION	0.1	1	10	10	20	5	1	3
UNITS	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb
BLANK	<0.1	<1	<10	<10	<20	<5	<1	<3

#### **Simple Linear Regression**

Simple linear regression was used to assess the reproducibility of duplicate analytical pairs for select elements. These pairs of analyses are two analyses of sub-samples collected from the same parent sample during routine analysis in the laboratory. For all samples a 95<sup>th</sup> percentile ellipse is plotted with the data points. From the point of view of reproducibility the data are excellent. Figure 5 illustrates the excellent reproducibility for the duplicate pairs and Table 2 summarizes analytical results for these samples from Lines 1 and 2. There was only a single analytical duplicate pair for the Line 2 analyses and the observed correspondence between the original and duplicate analytical pair is excellent.

ANALYTE	Ag1	Ag2	Au1	Au2	Ce1	Ce2	Cu1	Cu2	Pb1	Pb2	Zn1	Zn2
Method	MMI- M		MMI- M		MMI- M		MMI- M		MMI- M		MMI-M	
Detection	1		0.1		5		10		10		20	
Unit	ppb		ppb		ppb		ppb		ppb		ppb	
ARM14- 1026D	0.5	0.5	0.1	0.1	404	328	470	390	120	100	20	20
ARM14- 1030D	1	1	0.1	0.05	544	537	590	550	80	80	30	30
ARM14- 1032A	13	17	0.05	0.05	131	107	110	100	240	230	20	30
ARM14- 1036B	1	1	0.5	0.4	300	318	110	110	130	120	70	40
ARM14- 1038B	5	6	0.05	0.05	172	196	110	120	100	110	20	20

Table 2. Results for Line 1 analytical duplicates.

#### Line 2 analytical duplicate pair.

ANALYTE	Au	Ag	Cu	Pb	Zn	Ce	Mg	Ti
METHOD	GE_MMI_M							
DETECTION	0.1	1	10	10	20	5	1	3
UNITS	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb
Analytical								
Duplicate								
ARM-14-1004								
С	<0.1	3	120	330	290	173	5	10400
REP-ARM-14-								
1004 C	0.1	4	130	320	290	180	4	10200





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Figure 5. Simple Linear Regression analysis for analytical duplicate pairs.

#### **Replicate Analyses of Internal Standards**

Despite only minimal iterations of the analysis of the internal reference materials the visual assessment of the data in Table 3 indicates good agreement exists between the recommended or expected standard values and those observed in the analytical portion of this study.

MMI Standard Internal Reference Materials						
ANALYTE	Ag	Au	Ce	Cu	Pb	Zn
METHOD	GE_MMI_M	GE_MMI_M	GE_MMI_M	GE_MMI_M	GE_MMI_M	GE_MMI_M
DETECTION	1	0.1	5	10	10	20
UNITS	ppb	ppb	ppb	ppb	ppb	ppb
MMISRM18 Observed						
Values	22, 23	9.2, 8	27, 27	970, 950	270, 300	870, 660
MMISRM18 Expected						
Values	25	9.7	20	780	325	733
MMISRM19 Observed						
Values	24	4.6	22	1990	820	2130
MMISRM19 Expected						
Values	25	5	19	2137	647	2254

# Table 3. Summary of observed and expected values for internal reference materials MMISRM18 and MMISRM19.

#### **Element Correlations**

Table 4 summarizes the correlation coefficients for the 8 elements common to lines 1 and 2 at the Ratte Lake property. The most significant correlations include those for Ag-Pb (0.6), Pb-Ti (0.62) and Ce-Mg (0.79). Lesser correlations include Ce-Pb (0.46), Mg-Pb (0.47), Mg-Ti (0.39), Ce-Cu (0.38), Ti-Zn (0.33), Ag-Cu (0.3), Pb-Zn (0.26), Cu-Pb (0.24), Cu-Mg (0.17) and Mg-Ag (0.17). The correlations in this small dataset illustrate significant control of lithology (Ce, Ti and Mg: mafic lithologies) over base and precious metal associations. The absence of correlation between Au and Ag is noted as is the lack of correlation between Au and any of the other 7 elements analyzed in the Line 1 and 2 samples.

Correlation	Ag	Au	Ce	Cu	Mg	Pb	Ti	Zn
Ag	1	0.022	0.25	0.3	0.17	0.6	0.075	0.12
Au	0.022	1	-0.057	-0.022	-0.079	-0.12	-0.086	-0.055
Ce	0.25	-0.057	1	0.38	0.79	0.46	0.17	-0.1
Cu	0.3	-0.022	0.38	1	0.17	0.24	-0.062	-0.078
Mg	0.17	-0.079	0.79	0.17	1	0.47	0.39	0.041
Pb	0.6	-0.12	0.46	0.24	0.47	1	0.62	0.26
Ti	0.075	-0.086	0.17	-0.062	0.39	0.62	1	0.33
Zn	0.12	-0.055	-0.1	-0.078	0.041	0.26	0.33	1

#### Table 4. Correlation coefficient matrix, 8 selected elements, Lines 1 and 2.

## AREAL DISTRIBUTION OF ANOMALOUS RESPONSES IN THE RATTE LAKE MMI-M ORIENTATION SURVEY

#### Horizontal Bar Charts and Lateral Bubble Plots

The variation in concentration in the MMI-M data from the 2 sampling transects at the Ratte Lake orientation survey is described in the following section. The data from vertical profiling along Line 1 is examined with horizontal bar charts and bubble plots depicting changes in concentration along the sampling transect at the optimum sampling depth. The lateral bubble plots will pinpoint anomalous responses along the sampling transect whereas the horizontal bar charts will provide the optimum sample depths for subsequent exploration survey sample collection. Line 2 results build on analyses from the optimum sample depth as determined along Line 1 and variation along the sampling transect are depicted with bubble plots as well.

#### **Horizontal Bar Charts**

Review of the plots in Figure 6 indicates the optimum sampling position for commodity and lithologically-sensitive elements occurs between 20-30 cm with some elements (Sc, Th, U and Zr) maximized at the 30-40cm depth although the difference between the 20-30 cm and the 30-40 cm depths is minimal. Gold, Cu, Ce, K and Mn are all maximized at 20-30 cm. The results for Zn are equivocal. The maximum Zn response of 40 ppb occurs in the 0-10 cm sample however both the 20-30 cm and 30-40 cm samples record 30 ppb and it is suggested this difference is minor and will likely not hinder the recognition of bona fide Zn anomalies in samples collected at 20-30 cm. The optimum sampling depth for MMI surveys in the Ratte Lake area is interpreted to be 20-30 cm. Lateral bubble plots will be constructed based on this depth.





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#### Lateral Bubble Plots (Figures 7 through 26)

Lateral bubble plots were prepared for samples collected from the 20-30 cm depth on Line 1 representing the optimum depth for the collection of MMI soil samples on the Ratte Lake property. Data from both lines was used to calculate response ratios and the bubble plots below are constructed on the basis of response ratios ("RR"). Plots from Line 1 as well as Lines 1 and 2 are presented below along with a geochemical narrative.

#### Line 1 Bubble Plots

#### Commodity Element Responses (Au, Ag, Cu, Zn, Pb, Ga)

Au (ppb; Figure 7): Two samples of very low-contrast responses are noted from the last five samples on the northern portion of the transect. Whether these responses are **bona fide** is equivocal as reproducing MMI Au responses at this concentration level is uncertain at best.



Figure 7. Variation in Au contents in 20-30 cm soil samples, Ratte Lake.

**Ag (ppb; Figure 8):** Silver responses are weakly elevated over the southern half of the sampling transectwith a single sample elevated response of 15 ppb occurring near the north end of the transect. In this position there is no exact correspondence with the Au responses but is in the same general area.



Figure 8. Variation in Ag contents in 20-30 cm soil samples, Ratte Lake.

**Cu (ppb; Figure 9):** A zone of elevated Cu is apparent in five of six samples at the northern end of the transect. The highest Cu response (800 ppb) occurs at the last sample site on the transect suggesting the anomaly is not truncated but is open to the north.



Figure 9. Variation in Cu contents in 20-30 cm soil samples, Ratte Lake.

**Zn (ppb; Figure 10):** Zinc responses along the transect are modest with numerous samples reporting 30 ppb over the most northerly seven samples on the line. The responses are not indicative of a Zn anomaly but the consistent 30 ppb response does occur in the same area as elevated Au, Ag and Cu. The peak response of 70 ppb occurs approximately in the midpoint of the transect.



Figure 10. Variation in Zn contents in 20-30 cm soil samples, Ratte Lake.

**Pb (ppb; Figure 11):** The northern portion of the sampling transect is marked by elevated Pb in seven samples with values ranging between 100 ppb and 320 ppb. This is in general correspondence with the Cu anomaly described earlier and encapsulates the Au and Ag responses.



Figure 11. Variation in Pb contents in 20-30 cm soil samples, Ratte Lake.

**Ga (ppb; Figure 12):** An intermittent but elevated Ga response is noted from the most northerly seven samples on the sampling transect. It is noted that the two most northerly samples are low-contrast but the overall pattern for Ga is one of coincidence with the Cu-Pb-Au-Ag anomaly described above.



Figure 12. Variation in Ga contents in 20-30 cm soil samples, Ratte Lake.

#### Lithologically-Sensitive Element Responses (K, Mn, Sc, Th, U, Zr)

**K (ppb; Figure 13):** Low K responses are noted from the area of the multi-element commodity element anomaly (Au, Ag, Cu, Pb, Ga). Higher K responses are noted from the southern portion of the sampling transect.



Figure 13. Variation in K contents in 20-30 cm soil samples, Ratte Lake.

**Mn (ppb; Figure 14):** Manganese responses are considered to be non-definitive along the entire length of the sampling transect. A single sample response of 2970 ppb occurs in the southern portion of the transect. There is no correspondence with the commodity element anomaly defined along the northern segment of the transect.



Figure 14. Variation in Mn contents in 20-30 cm soil samples, Ratte Lake.

**Sc (ppb; Figure 15):** The Sc responses are strongly elevated in the three most northerly samples on the transect with values ranging between 33 ppb and 200 ppb. Elevated Sc is most commonly associated with Fe-rich lithologies. The elevated Sc responses correspond with the commodity element anomaly.



Figure 15. Variation in Sc contents in 20-30 cm soil samples, Ratte Lake.

**Th (ppb; Figure 16):** Two of the three most northerly samples on the transect are marked by elevated Th to 54 ppb. These responses correspond with the location of the commodity element anomaly described earlier.



Figure 16. Variation in Th contents in 20-30 cm soil samples, Ratte Lake.

**U (ppb; Figure 17):** The U response along the transect closely resembles that for Th with four of the six most northerly samples having elevated U (to 21 ppb). Again these responses are coincident with the multi-element commodity anomaly.



Figure 17. Variation in U contents in 20-30 cm soil samples, Ratte Lake.

**Zr (ppb; Figure 18):** There are elevated Zr responses within the seven most northerly samples on the transect however the elevated responses are interspersed with much lower responses giving a "saw tooth" pattern. It is difficult to see the correspondence between the commodity element anomaly and these elevated Zr responses.



Figure 18. Variation in Zr contents in 20-30 cm soil samples, Ratte Lake.

#### Line 2 Bubble Plots

For the construction of the bubble plots for Lines 1 and 2 (below) samples were combined for the calculation of response ratios. Results were then plotted. It can be observed that because the magnitude of the responses for the 8 selected elements along Line 2 are generally greater than those for Line 1 the Line 1 responses appear to be somewhat muted. This is an indication that the geophysical anomaly being tested by Line 2 is more prospective than that being assessed by Line 1.

#### Commodity Element Responses (Au, Ag, Cu, Zn, Pb)

**AuRR (Figure 19):** There are two significant responses along Line 2 for Au. The first is a single sample response of 6.9 ppb or a RR of 138 times background. This is a very high AuRR for the glacial landscape environment. The second area of interest occurs near the southern end of the sampling line where values of 0.6 ppb (RR=12) and 0.5 ppb (RR=10) are documented. These responses are very low contrast RR.



Figure 19. Variation in AuRR in 20-30 cm soil samples, Armstrong-Ratte Lake.

**AgRR (Figure 20):** The AgRR define an anomalous response in a similar area as the AuRR with some correspondence noted. There is a four sample Ag anomaly with maximum RR of 94 times background apparent on Line 2. This anomaly is immediately adjacent to the very high-contrast AuRR of 138 described above. The southern portion of the sampling transect also has four elevated AgRR in the same area as the 0.6 ppb and 0.5 ppb Au responses.



Figure 20. Variation in AgRR in 20-30 cm soil samples, Armstrong-Ratte Lake.

**CuRR (MMI-M; Figure 21):** Copper responses are very low-contrast on Line 2. There is some correspondence with AgRR on the sampling line including both northerly and southerly areas of the line. There does not appear to be a bona fide CuRR anomaly on Line 2.



Figure 21. Variation in CuRR in 20-30 cm soil samples, Armstrong-Ratte Lake.

**ZnRR (Figure 22):** Zinc is elevated near UTM northing 5,600,300 m (two sample moderate- to low-contrast anomaly RR=29, 16) and near UTM northing 5,599,950 m (one sample high-contrast anomaly RR=97). There is some correspondence with elevated AgRR.



Figure 22. Variation in ZnRR in 20-30 cm soil samples, Armstrong-Ratte Lake.



PbRR (Figure 23): There are no elevated Pb responses on Line 2.

Figure 23. Variation in PbRR in 20-30 cm soil samples, Armstrong-Ratte Lake.

#### Lithologically-Sensitive Element Responses (Ce, Mg, Ti)

**CeRR (MMI-M; Figure 24):** Cerium responses are low- to very low-contrast. There is an area of weakly elevated CeRR just south of UTM northing 5,600,250 m which corresponds to elevated Pb, Cu, Ag and possibly Au.



Figure 24. Variation in CeRR in 20-30 cm soil samples, Armstrong-Ratte Lake.

**MgRR (Figure 25):** MgRR are low-to very low-contrast on Line 2. The highest RR occur near UTM northing 5,599,900 on the southern end of the transect in association with elevated Zn, Cu, Ag and Au.



Figure 25. Variation in MgRR in 20-30 cm soil samples, Armstrong-Ratte Lake.

**TiRR (Figure 26):** Strongly elevated TiRR are documented from 2 locations on Line 2. The first is near UTM northing 5,600,300 m where elevated Mg, Ce, Pb, Zn, Cu +-Au has been described. The second area occurs south of UTM northing 5,599,950 m in association with elevated Mg, Ce, Zn, Ag and +-Au.



Figure 26. Variation in TiRR in 20-30 cm soil samples, Armstrong-Ratte Lake.

#### **OBSERVATIONS**

#### **Data Quality**

Based on analytical duplicates, two standard reference materials (MMISRM18 and AMISO169) and replicate analyses of the analytical blank the analytical data is interpreted to be excellent and not a hindrance to the recognition of bona fide MMI anomalies. The absence of any detectable metals in the analytical blank indicates the lack of contamination in the laboratory environment.

#### **Optimum Sampling Depth**

The optimum sampling depth on the Armstrong-Ratte Lake property is determined to be between 20 cm and 30 cm below the zero datum or the point at which soil formation is initiated in this landscape environment.

#### **Anomaly Location and Morphology**

#### Line 1

Sample collection from the 20-30 cm depth along Ratte Lake transect Line 1 has defined a multielement commodity anomaly consisting of Cu+Pb+Ag+Ga+/-Au. This anomaly is likely open to the north based on the presence of a high-contrast Cu response at the northern extreme of the sampling transect and similar responses for the other commodity elements. There are associated lithologically-sensitive element responses associated with the commodity element anomaly and these include Sc-U-Th. This association is suggestive of iron-rich felsic lithologies. Scandium is most commonly associated with Fe-rich lithologies and the iron-rich character could be related to the presence of alteration, mineralization or primary bulk chemical composition of the lithologies underpinning the survey area.

#### Line 2

There appears to be two general areas of elevated multi-element responses on this sampling transect. These two areas occur at or near UTM northing 5,600,300 m in the northern portion of Line 2 and at or near UTM northing 5,599,950 m near the southern portion of the line. The more northern anomaly is characterized by weakly elevated Au, Ag, Cu, Zn, Ce, Mg and Ti. The southern anomaly comprises elevated Cu, Ag, Au, Mg and Ti as well as a very high-contrast ZnRR of 97 times background.

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Undoubtedly the most significant response on this line is the single sample AuRR (RR=138) and multi-sample AgRR (RR=94, 88, 26, 14). There is no exact correspondence between the Au and Ag responses however the high-contrast Au occurs immediately beside the 4-sample Ag anomaly.

#### CONCLUSIONS AND RECOMMENDATIONS

# The following conclusions are evident from the MMI-M orientation surveys undertaken on the Ratte Lake property:

- The survey has successfully demonstrated that MMI-M partial extractions on soil samples collected from the Ratte Lake landscape environment can isolate MMI-M precious- and base metal anomalies and lithologically-sensitive element responses.
- 2. The optimum depth of sample collection for the Armstrong-Ratte Lake property is between 20 cm and 30 cm below the zero datum or the point at which soil formation is initiated for this landscape environment.
- 3. The main commodity element response includes Cu, Pb, Ga, Ag and +/-Au on Line 1 with associated lithologically-sensitive element responses include Sc, U and Th. Line 2 is marked by two areas of elevated responses and includes weakly elevated Au, Ag, Cu, and Zn with associated Ce, Mg and Ti at or near UTM northing 5,600,300 m and elevated Cu, Ag, Au with high-contrast Zn (RR=97) and associated Ti and Mg at or near UTM northing 5,599,950 m.
- 4. The most significant anomaly in the survey is the high-contrast AuRR of 138 and the adjacent 4-sample AgRR (maximum of 94RR).
- 5. The area of Line 2 MMI sampling transect is interpreted to be more highly prospective than that of Line 1.
- Sampling materials collected for MMI analysis are effective and appropriate sample media for an MMI survey on the property.
- 7. The analyses generated by the MMI-M extraction are accurate and precise and are effective for the detection of low- to high-contrast anomalies.

#### The recommendations that flow from this survey are as follows:

- Additional exploration surveys based on Mobile Metal Ions soil geochemistry should be based on samples collected between 20 and 30 cm beneath the zero datum or the point at which sample formation is initiated for the Ratte Lake landscape environment.
- 2. Samples should be collected from a hand dug pit with vinyl trowels.

- 3. The area assessed with MMI sampling transect Line 2 should be prospected for any signs of mineralization or related alteration. If shallow overburden is present a program of overburden stripping can provide information on the cause of the Au-Ag anomaly on this line. Additional MMI surveys would be warranted in this area.
- 4. Historic geological information should be collated to determine if previous operators undertook any exploration surveys in the area with particular attention being paid to ground geophysical surveys.

February 10<sup>th</sup>, 2015 Mark Fedikow Mount Morgan Resources Ltd., Lac du Bonnet, Manitoba

#### CERTIFICATE of AUTHOR

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I, Mark A.F. Fedikow, HB.Sc. M.Sc., Ph.D., P.Eng. P.Geo., C.P.G. does hereby certify that:

1. I am currently a self-employed Consulting Geologist/Geochemist with a field office at:

#### 50 Dobals Road North P.O. Box 629 Lac du Bonnet, Manitoba R0E 1A0

- I graduated with a degree in Honors Geology (B.Sc.) from the University of Windsor (Windsor, Ontario, Canada.) in 1975. In addition, I earned an M.Sc. in geophysics and geochemistry from the University of Windsor and a Doctor of Philosophy (Ph.D.) in exploration geochemistry from the School of Applied Geology, University of New South Wales (Sydney) in 1982.
- 3. I am a Member of the Association of Professional Engineers and Geoscientists of Manitoba. I am also a Fellow of the Association of Applied Geochemists, and a Member of the Prospectors and Developers Association of Canada. I hold a valid Prospectors license in Manitoba. I am registered as a Certified Professional Geologist with the American Institute of Professional Geologists (Westminster, Colorado, U.S.A.).
- 4. I have worked as a geologist for a total of thirty-nine years since my graduation from university; as a graduate student, as an employee of major and junior mining companies, the Manitoba Geological Survey and as an independent consultant.
- 5. I am responsible for the preparation of the technical report titled "Results of a Mobile Metal Ions Process (MMI-M) Soil Geochemical Orientation Survey on the Ratte Lake Property (Ontario) of Geofortune Resources Corporation".
- 6. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
- 7. I am independent of the issuer applying all of the tests in National Instrument 43-101.
- 8. I consent to the filing of the Technical Report with any stock exchanges or other regulatory authority and any publication by them, including electronic publication in the public company files on the web sites accessible by the public, of the Technical Report.

Dated this 10th Day of February, 2015

Signature of Qualified Person

<u>"M.A.F. Fedikow"</u>. Print name of Qualified Person

Original Signed by Mark Fedikow