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- ASSESSMENT REPORT -

*Geological mapping carried out on claims
1197342, 1210908, 1210909, 1210910, 1214648 and 1246290*

(Barry Property, Norman Township)

Table of Contents

Table of Contents	1
List of Figures and Tables	1
1- Property Description and Location	2
2 - Accessibility and Physiography	3
3 - Mapping Program	3
4 - LiDAR Coverage	4
5 - Regional Geologic Setting	4
6 - Property Geology	4
Lithology Descriptions.....	6
Mineralization	6
Structures.....	7
7 - References	8
8 - Qualifications	9

List of Figures and Tables

Fig. 1. Location and accessibility of the Barry claims. (Coordinates in UTM zone 17, NAD 27.)	2
Table 1. Barry Property claim status as of August 27, 2015	3
Table 2. Sample locations and description	5
Table 3. Table 3. Assay summary of mineralized samples from the Barry property	7

Appendix A – Maps

Appendix B – LiDAR Report

Appendix C – Cost Statement

Appendix D – Assays

Appendix E – Invoices and Receipts

1- Property Description and Location

The Barry Property consists of 6 claims - 1197342, 1210908, 1210909, 1210910, 1214648 and 1246290 -, located towards the northwestern corner of Norman Township (Fig. 1), about 30 km north of the City of Greater Sudbury. The claims cover a total of 160 ha. Assessment work with a total value of \$2,400 is needed for claims 1210908, 1210909 and 1210910 before November 27, 2015, and \$800 for claim 1197342 before January 17, 2016, in order to keep them in good standing (Table 1). A total credit of \$2,906 was filed for claims 1214648 and 1246290 in September, 2015 (RW150901 – approval pending) (Table 1).

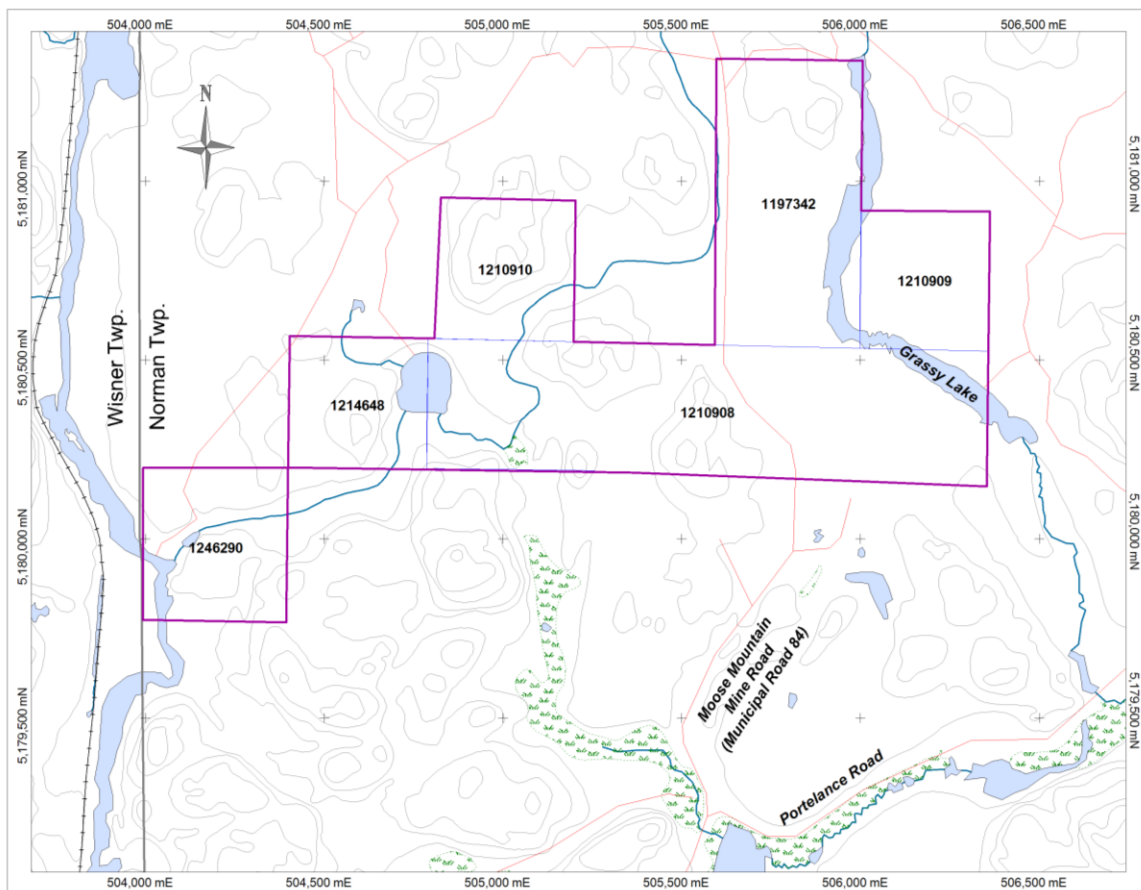


Fig. 1. Location and accessibility of the Barry claims. (Coordinates in UTM zone 17, NAD 27.)

Table 1. Barry Property claim status as of August 27, 2015

Claim Number	Township	Area (ha)	Units	Holder	Recorded Date	Work Due Date	Status	Work (\$) Required	Work (\$) Reserve
1197342	Norman	32	2	A. Barry	17-Jan-2011	17-Jan-2016	A	800	138
1210908	Norman	64	4	A. Barry	27-Nov-1995	27-Nov-2015	EXT	3,200	156
1210909	Norman	16	1	A. Barry	27-Nov-1995	27-Nov-2015	A	400	0
1210910	Norman	16	1	A. Barry	27-Nov-1995	27-Nov-2015	EXT	800	0
1214648	Norman	16	1	A. Barry	29-May-2009	09-Sept-2015*	EXT	400	0
1246290	Norman	16	1	A. Barry	29-May-2009	09-Sept-2015*	EXT	400	0

*assessment report (RW150901) waiting for approval

2 - Accessibility and Physiography

The Barry property is located along Moose Mountain Mine Road (Municipal Road 84), approximately 8 km north of the town of Capreol, Ontario (Fig. 1). The property is easily accessible by foot, trucks and all-terrain vehicles as several usable trails go in or near all of the individual claims. The best access route for claims along, and west of, Moose Mountain Mine Road is either by foot immediately off the road (claims 1197342 and 1210908) or via a trail beginning at 505780E, 5180392N (NAD 27), heading west. The trail is truck-accessible to about 200m, from which point the use of all-terrain-vehicles is recommended. Claims 1246290 and 1210910 are reached by following this trail to its end, whereas a junction to south about 1 km from MR 84 leads to claim 1214648. Claim 1210909 is separated from the rest of the property by a significant water body (Grassy Lake) and can be accessed from a road running north from Portelance Road.

The property has diverse physiography with flat open forest and dense forest with lots of topographic relief, predominantly N-S trending cliff faces forming rolling hills and deep valleys, west of Moose Mountain Mine Road, whereas the eastern section is generally flat with extremely poor exposure. Swamps and creeks occur throughout the property; the two most significant water bodies are Grassy Lake in the east and a small lake straddling the boundary of claims 1214648 and 1210908.

3 - Mapping Program

The aim of the 2015 mapping program on the Barry property was to get familiar with local geology and produce a detailed geological map that can act as a base for future surface exploration in the area. The first stage of the geological mapping focused on claims 1214648 and 1246290 (assessment report RW150901 waiting for approval), whereas the second stage covered the rest of the property. On these

four claims, a two-person field crew spent a total of 8 days mapping at a 1:2,000 scale. 17 grab samples (accompanied by 4 QA/QC samples) were submitted for TPM+ICP assays (Table 2), out of which two samples were also analyzed for whole rock composition. Digitizing, sample processing and report writing required 4 days in total. The compiled outcrop map with geological interpretation of the property is attached in Appendix A (Fig. A1).

4 - LiDAR Coverage

The mapping program was aided by digital elevation models generated from LiDAR data. A LiDAR survey was completed in late April to early May, 2015, over Wallbridge Mining properties, including the Barry claims. Technical specifications of the survey are given in Appendix B. Fig. A2 in Appendix A shows the 2-m and 0.5-m elevation contours overlying the Barry property. Lineaments identified based on LiDAR data will be field proofed and incorporated into the geological model of the area.

5 - Regional Geologic Setting

The Barry property is located on the North Range of the Sudbury Structure, ~450m north of the SIC contact. The area is dominated by strongly deformed, amphibolite facies, tonalite- to granodiorite-gneiss of the Neoproterozoic Levack Gneissic Complex (~2700-2640 Ma; Krogh et al., 1984), with local Paleoproterozoic Matachewan diabase dyke segments (2473 ±16/-9 Ma and 2446 ±3 Ma; Heaman, 1997) cutting the gneisses.

Sudbury Breccia, a pseudotachylite created from the shock wave associated with the 1850 Ma Sudbury Event, occurs as irregular veins and belts in the footwall rocks of the SIC.

The proximity of the property to the contact of the SIC in a structurally complex area suggests the possibility of more proximal footwall type deposits.

6 - Property Geology

The regional bedrock geology compilation put out by the Geological Survey of Canada (Open File 4570) indicates that the Barry Property is underlain by tonalite- to granodiorite- gneiss of the Levack Gneiss Complex (Ames et al., 2005). Wallbridge's 1:2,000 scale mapping (Fig. A1) confirmed that felsic gneiss is the most dominant unit, contains mafic and intermediate packages of lesser significance. Matachewan diabase dikes mainly occur in the central portion of the property and have an average NNE-SSW trend.

Sudbury Breccia frequently appears as several cm thick veins along lithological contacts, but also forms massive outcrops on claims 1214648, 1210908 and 1197342.

Table 2. Sample locations and description (cpy = chalcopyrite, DIA = diabase, IGN = intermediate gneiss, MGN = mafic gneiss, po = pyrrhotite, py = pyrite, SDBX = Sudbury Breccia)

Sample ID	E NAD27	N NAD27	Sample Type	Date Sampled	Rock Type	Py %	Po %	Cpy %	Field Description
P448470	504676	5180256	GRAB	14/5/2015	SDBX	1			SDBX with some oxidation and alteration.
P448471	504541	5180278	GRAB	14/5/2015	SDBX	3		2	Hot SDBX cut by a dark pink vein (feldspar?) with clots of py and cpy.
P448472	504541	5180276	GRAB	14/5/2015	SDBX	3		2	Hot SDBX cut by a dark pink vein (feldspar?) with clots of py and cpy.
S034351	504071	5179956	GRAB	23/8/2015	MGN	2			Mafic gneiss with a felsic pod containing a >1cm clot of py.
S034352	504091	5179900	GRAB	23/8/2015	MGN	1		0.1	Pink vein with feldspar and elongated amphiboles with trace cpy cross cutting mafic gneiss.
S034356			Standard						Standard
S034357			Blank						Blank
S034254	505510	5180250	GRAB	9/9/2015	SDBX				Hot SDBX. Green altered matrix with GR and MDIA inclusions. Highly oxidized fractures.
S034259	505535	5180177	GRAB	11/9/2015	IGN	0.5		0.5	Rusty outcrop on side of trail. Trace cpy+py, mineralization follows gneissic foliation.
S034359	505101	5180550	FLOAT	26/8/2015	FGN				Float with py in vein.
S034360	505112	5180531	GRAB	26/8/2015	DIA				Diabase sample being tested as potential QD.
S034361	505210	5180461	GRAB	9/9/2015	DIA			0.1	Diabase with possible trace cpy in veinlet.
S034362	505059	5180451	GRAB	9/9/2015	DIA	1		0.1	Py and cpy in DIA with possible trace malachite in fracture.
S034364	504995	5180227	GRAB	9/9/2015	DIA	1		0.1	Diabase with cpy/py in epidote alteration.
S034365	504986	5180227	GRAB	9/9/2015	DIA				Diabase sample being tested as potential QD.
S034367	505752	5181177	GRAB	11/9/2015	MGN	2			MGN with pods of coarse-grained light green epidote.
S034368	505762	5181181	GRAB	11/9/2015	MGN	10		10	MGN with massive py and po mineralization.
S034369	505767	5181173	GRAB	11/9/2015	MGN	3			MGN with epidote alteration and pyrite disseminated throughout.
S034370	505755	5181177	GRAB	11/9/2015	FGN	3			Coarse-grained epidote alteration in a quartz vein within felsic gneiss.
S034372			Standard						Standard
S034373			Blank						Blank

Pleistocene glaciation removed soil from local topographic highs and filled topographic lows with unconsolidated glacio-fluvial sediments.

Lithology Descriptions

Levack Gneiss

Archean rocks of the Levack Gneiss Complex are the most abundant lithology outcropping in the area. These metamorphic rocks vary in composition from felsic to intermediate and mafic, and contain locally strong gneissosity with variable orientations. Felsic gneisses are most common and contain medium to coarse-grained feldspars, quartz, micas, and other minor phases. Mafic gneisses are less abundant and are more fine-grained and contain predominantly amphiboles and dark micas. Locally felsic and mafic gneisses are interlayered.

Matachewan Diabase

Mafic dikes exhibit fine- to coarse-grained plagioclase phenocrysts, indicative to the Matachewan Diabase dike swarm. These rocks are typically weakly magnetic, fine-grained, and contain trace disseminated pyrite. Inferred strike of dikes, based on local contact relationships, is roughly NNE-SSW.

Sudbury Breccia

The breccia contains clasts of the host rocks, usually felsic gneiss and diabase which are centimeter- to meter-sized. The clasts are supported in a fine-grained green matrix with conchoidal fracturing habit. The matrix locally contains black mica porphyroblasts suggesting it has experienced heat-induced alteration after its formation. Locally the breccia matrix contains trace disseminated pyrite; a chalcopyrite-pyrite-actinolite vein cutting the breccia was observed in one instance.

Mineralization

Sulphide-rich (up to 30%) mafic-intermediate gneiss is exposed over a ca. 15m x 15m area in the northern part of claim 1197342, about 200m east of Moose Mountain Mine Road. The mineralized outcrop was blasted prior to Wallbridge acquiring the land. Blebby to massive pyrrhotite and pyrite, in variable proportions, occur mainly along gneissic banding and less commonly in later cross-cutting fractures. Locally the host gneiss has light green epidote alteration occurring in discrete pods or as patches of pervasive alteration, both of which have locally abundant coarse-grained pyrite clots. In the discrete pods, epidote is coarse grained and elongate suggesting it may be related to fluids produced from the Sudbury Igneous Complex and the later regional epidote alteration commonly observed in the region.

Four samples were submitted for geochemical analysis from the pyrrhotite-pyrite showing, each containing different styles or quantities of mineralization (Table 2). These samples include (1) S034367 that is a mafic gneiss with pods of coarse grained light green epidote and trace pyrite, (2) S034368 that is a gneiss that contains ~30% massive pyrite and pyrrhotite, (3) S034369 that is composed of several pieces of epidote and pyrite altered gneiss, and (4) S034370 that is a quartz vein which has superimposed coarse-grained light green epidote alteration with ~5% pyrite clots.

A mineralized vein, about 10 cm in width, was found and sampled (samples P448471 and P448472; Table 2) on claim 1214648. The vein contains few-cm nests of chalcopyrite (60%) and pyrite (20%) associated with actinolite (20%) and cuts Sudbury Breccia. Pink alteration is focused along fractures forming vein-like features with diffuse contacts and hosts most of the mineralization. The Sudbury breccia hosting this alteration and mineralization has biotite porphyroblasts, and a dark green matrix, but is locally altered a light greenish grey colour. In both these claims, trace amounts of chalcopyrite occur in few-mm quartz veins, occasionally associated with feldspar and epidote.

Assay results of mineralized samples are summarized in Table 3. None of the aforementioned samples contained significant amounts of Cu, Ni or PGEs.

Table 3. Assay summary of mineralized samples from the Barry property

	Au	Pt	Pd	Cu	Ni	S
	<i>ppm</i>	<i>ppm</i>	<i>ppm</i>	<i>ppm</i>	<i>ppm</i>	<i>%</i>
P448471	0.009	<0.005	0.003	700	111	0.50
P448472	0.001	<0.005	0.001	616	60.9	0.57
S034367	<0.001	<0.005	0.001	48	148	0.16
S034368	0.01	<0.005	0.003	240	91	>10.0
S034369	0.006	<0.005	0.001	566	114	2.32
S034370	<0.001	<0.005	0.001	13	11	0.56

Structures

The main structures on the property are N-S trending cliff faces which are likely the result of normal faulting. Locally, geological contacts between mafic intrusions and the gneisses are present and typically trend NW-SE but also NE-SW. Swarms and stockworks of N-S trending quartz veinlets (0.1-5 cm wide) are common cutting all lithologies.

7 - References

Ames, D.E., Buckle, J., Davidson, A., and Card, K., 2005, Sudbury bedrock compilation: Geological Survey of Canada, Open File No. 4570, geology, color map, and digital tables, scale 1:50,000.

Heaman, L.M., 1997, Global mafic magmatism at 2.45 Ga: remnants of an ancient large igneous province?: *Geology*, v. 25, p. 299–302.

Krogh, T.E., Davis, D.W., and Corfu, F., 1984, Precise U-Pb zircon and baddeleyite ages for the Sudbury Area: Ontario Geological Survey Special Volume 1, p. 431–446.

8 - Qualifications

I, Györgyi Tuba, do hereby certify that:

1. I reside at 1491 Kingslea Court, Sudbury, Ontario, Canada, P3A 3P6.
2. I graduated from Eötvös Loránd University (Hungary) in 2007 with an M.Sc. in Geology and in 2012 with a Ph.D. in Geology and have been practicing my profession ever since.
3. I am currently employed as a Geologist with Wallbridge Mining Company Limited.
4. This technical report has been prepared by myself and other members of Wallbridge staff.
5. As an employee, and an insider, of Wallbridge Mining Company, I do not qualify as an independent Qualified Person.



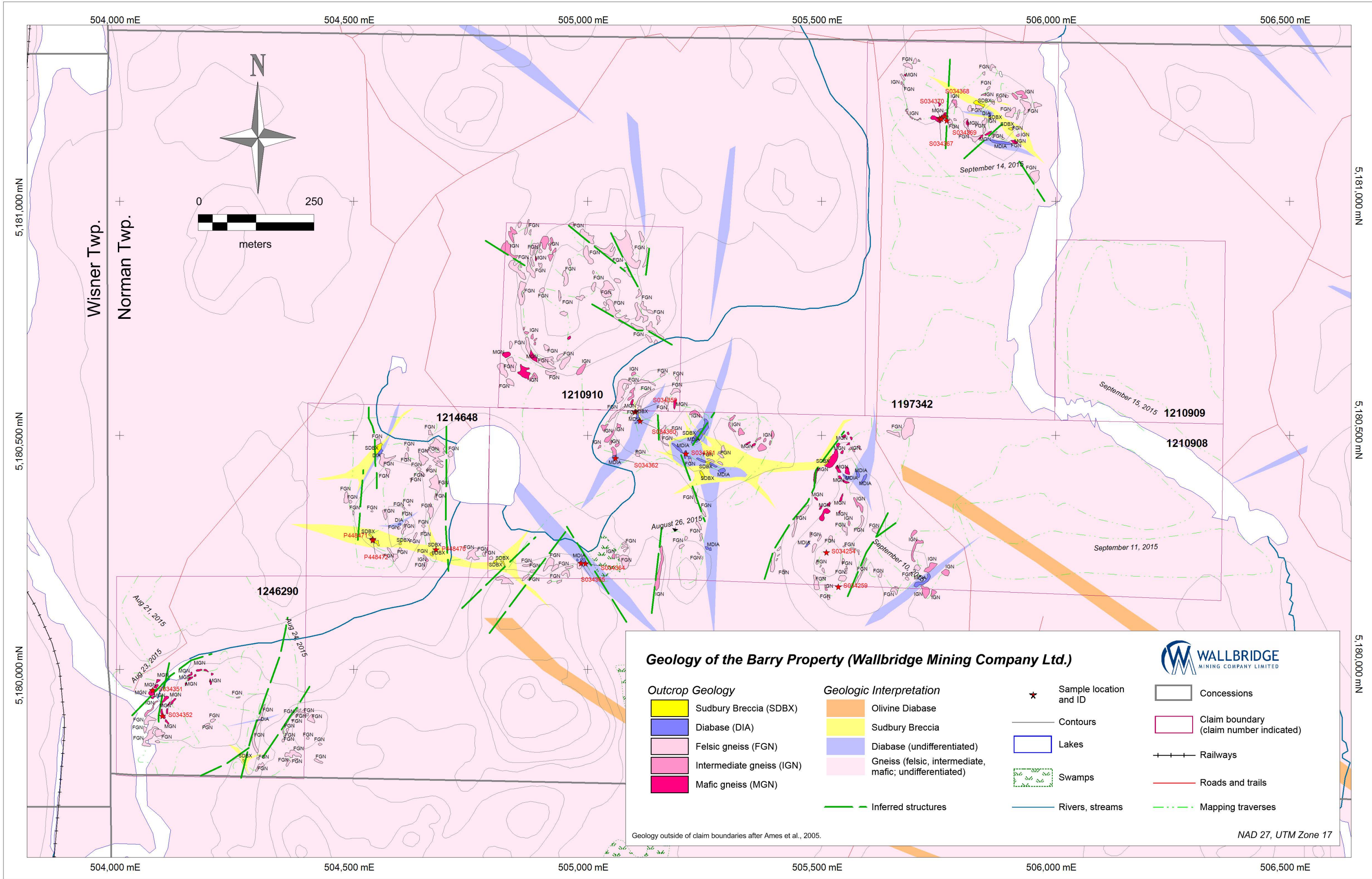
Györgyi Tuba, Ph.D.

Wallbridge Mining Company Ltd.

129 Fielding Rd.

Lively, ON, P3Y 1L7

Appendix A: Maps

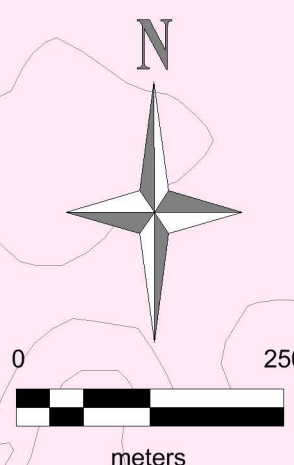


504,000 mE 504,500 mE 505,000 mE 505,500 mE 506,000 mE 506,500 mE

5,181,000 mN
5,180,500 mN
5,180,000 mN

5,181,000 mN
5,180,500 mN
5,180,000 mN

Wisner Twp.
Norman Twp.



Geology of the Barry Property (Wallbridge Mining Company Ltd.)

Outcrop Geology

- Sudbury Breccia (SDBX)
- Diabase (DIA)
- Felsic gneiss (FGN)
- Intermediate gneiss (IGN)
- Mafic gneiss (MGN)

Geologic Interpretation

- Olivine Diabase
- Sudbury Breccia
- Diabase (undifferentiated)
- Gneiss (felsic, intermediate, mafic; undifferentiated)
- Inferred structures

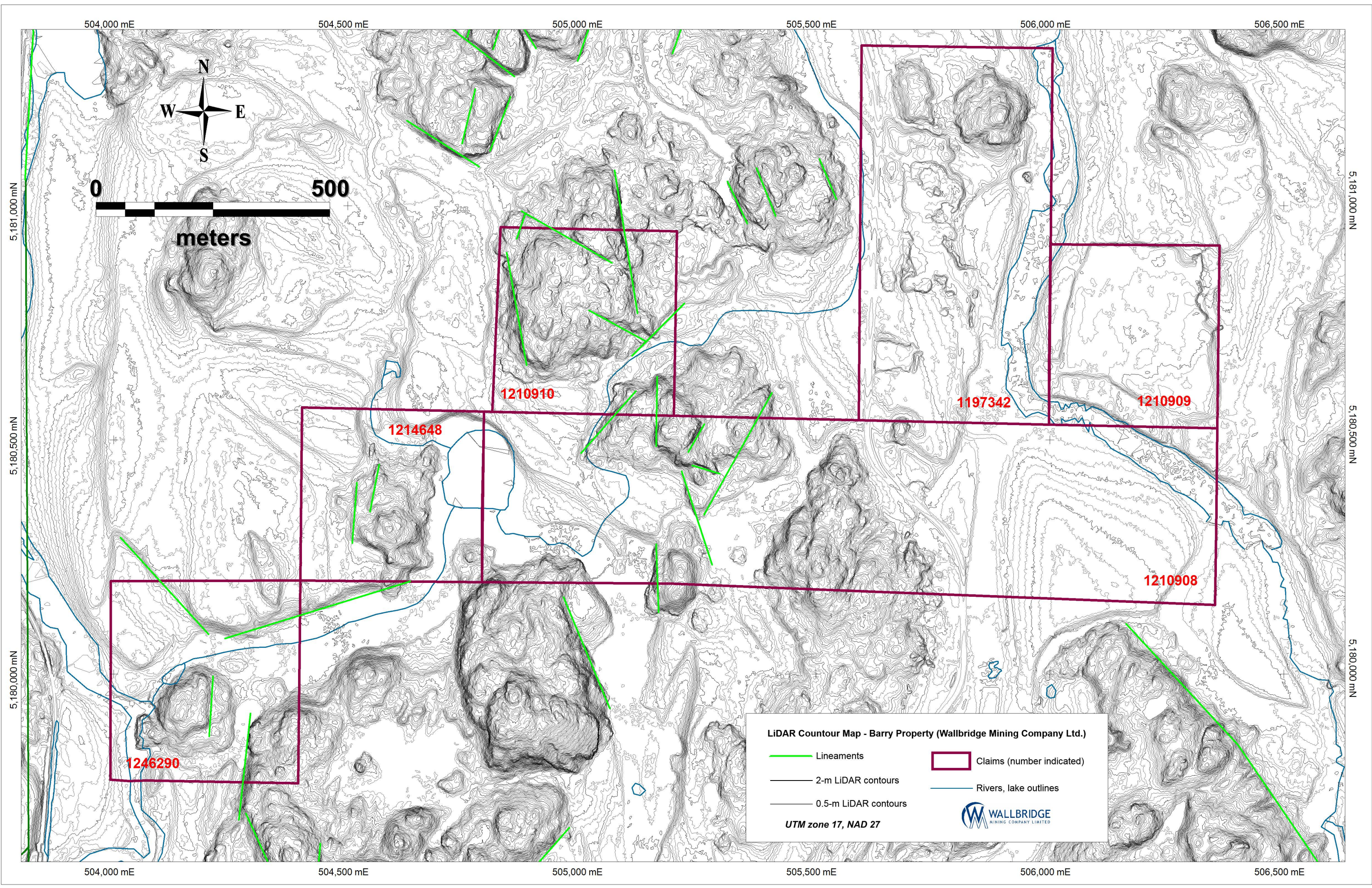
- Sample location and ID
- Contours
- Lakes
- Swamps
- Rivers, streams

- WALLBRIDGE**
MINING COMPANY LIMITED
- Concessions
- Claim boundary (claim number indicated)
- Railways
- Roads and trails
- Mapping traverses

Geology outside of claim boundaries after Ames et al., 2005.

NAD 27, UTM Zone 17

504,000 mE 504,500 mE 505,000 mE 505,500 mE 506,000 mE 506,500 mE



LiDAR Countour Map - Barry Property (Wallbridge Mining Company Ltd.)

Lineaments	Claims (number indicated)
2-m LiDAR contours	Rivers, lake outlines
0.5-m LiDAR contours	

UTM zone 17, NAD 27

PHB

ARPENTEURS-GÉOMÈTRES

Arpentage

Gestion de projets agricoles

Glissements de terrain

Projets miniers Erosion des sols

Infrastructures routières et pipeline

Zones à risque d'inondations

Complexe hydro-électrique

Études environnementales

Réseaux de lignes électriques

Foresterie et gestion forestière

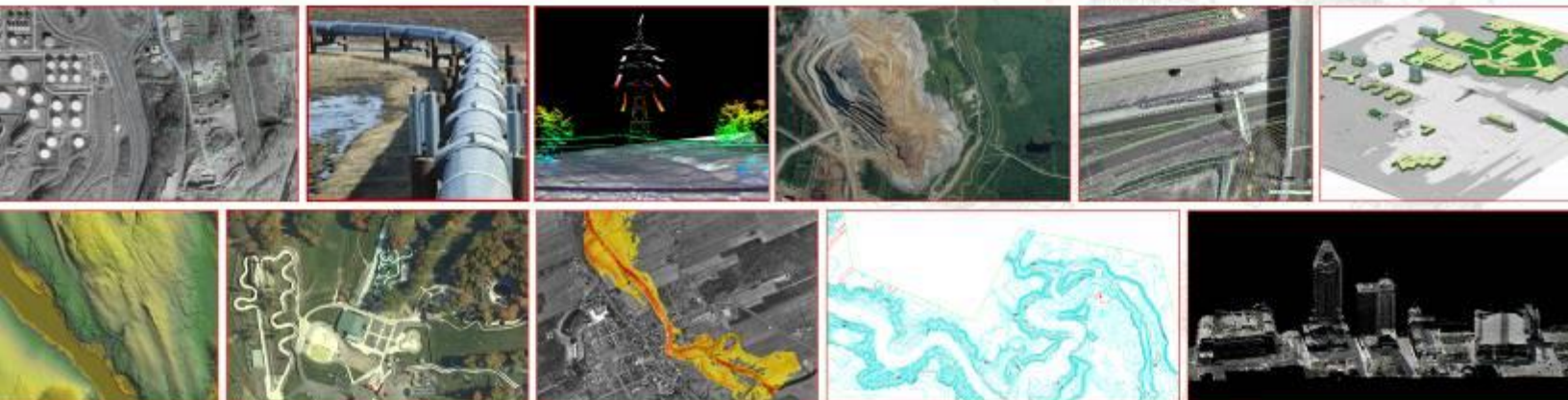
Imagerie de plan
d'urbanisme

Wallbridge Mining Company Limited

LiDAR survey

TECHNICAL REPORT

July 15th, 2015



T 1.450.430.9266 F 1.450.437.2923

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TABLE OF CONTENTS

PROJECT OBJECTIVES	2
LOCATION	2
CLIENT.....	2
OPERATIONAL CONTEXT.....	2
AIRBORNE LASER SURVEY	2
LASER PROCESSING	4
REPORT AND DELIVERABLES	5
REFERENCE SYSTEM	6
TECHNICAL SPECIFICATIONS	7
LIDAR OPTECH ALTM GEMINI	7
ANNEX 01	9
CALIBRATION REPORT LIDAR	9
ANNEX 02.....	20
CONTROL POINTS.....	20
ANNEX 03.....	22
GPS - PPP	22

➤ **PROJECT OBJECTIVES**

LiDAR acquisition for an area of about XXX km² near Sudbury, Ontario

➤ **LOCATION**

Near Sudbury, Ontario

➤ **CLIENT**

Contact Natalie MacLean
Company Wallbridge Mining Company Limited

➤ **OPERATIONAL CONTEXT**

Field operations

Airborne Laser Survey

Office Operations

Laser Processing (adjustments, classification)
Report and Deliverables

➤ **AIRBORNE LASER SURVEY**

Instrument

Piper Navajo, registered C-GOVX
(Aeroscan)

Airborne laser system

Model Optech ALTM Gemini No. 07sen209
Previous Maintenance March 2015
See technical specifications in annex

Flight Parameters

Debit	70 000 Hz
Scanning Frequency	38 Hz
Scanning Angle	24 degrees (on both sides of the nadir)
Flight Height	900 m above ground
Flight Speed	77 m/s
Scanning Width	764 m
Overlap	20%
Theoretical Density	1 points each square meter

Returns

Number	Four (4) Maximum per impulsion
Types	First returns, last returns, singular returns, intermediate returns
Intensity	Associated to each of the returns, for each of the impulsions

GPS base station

Permanent GPS Base station PHB	Base stations set up by PHB The official coordinates for the GPS base stations: PPP download through NRCAN (see Annexe 03: GPS-PPP for more detail)
--------------------------------	--

Periods

(local time)	Session 119-1	Apr 29 th , 2015	10:35am-2:44pm
	Session 120-1	Apr 30 th , 2015	11:06am-3:46pm
	Session 120-2	Apr 30 th , 2015	5:32pm-7:17pm
	Session 121-1	May 1 st , 2015	9:17am-1:07pm
	Session 121-2	May 1 st , 2015	3:20pm-6:06pm
	Session 122-1	May 2 nd , 2015	9:15am-12:26pm

Software

PosPac of Trimble (Trajectory Calculations)
DashMap of Optech (Laser Point Calculations)

➤ **LASER PROCESSING**

Adjustment

MÉTHODOLOGY

Iterative process enabling the improvement of the parameters of the calibration of the airborne laser system so as to ensure a proper coherence between flight lines

SOFTWARE

TerraMatch of the TerraSolid family

Classification

MÉTHODOLOGY

Automatic classification of ground points with the help of an algorithm developed internally, only the last returns and the singular returns are used during this classification

Edition of the classification of the ground points by experimented technicians

SOFTWARE

TerraScan of the TerraSolid family

Control Method

Control Sites completed by PHB

Closures

Result obtain from the verification with the laser data

Average = 0.002 m

Standard Deviation = 0.016 m

(See annex 2 for details)

Precision

The closures obtained enable to confirm that the airborne laser survey respects the project standards

Cutting

By tiles(1000 m by 1000 m)



REPORT AND DELIVERABLES

Digital deliverables

FIELD OPERATIONS

Airborne laser survey

Calibration report of the airborne laser system - Annex 1

OFFICE OPERATIONS

Laser Processing

Limit of the Project (DXF)

Tile Index 1km by 1km (DXF)

Classified LiDAR point cloud (LAS Format)

Digital elevation model (TXT format (X, Y, Z))

Digital surface model (TXT format (X, Y, Z))

Intensity images (GeoTIFF)

Contour lines (DWG, DXF and MapInfo)

Technical report (PDF)

➤ **REFERENCE SYSTEM**

Projection

Universal Transverse Mercator (UTM), zone 17

Horizontal Datum

NAD83 Original

A handwritten signature in blue ink, appearing to read 'E. Chalifour', written over a white rectangular background.

Eric Chalifour, a.-g., B.Sc.
Director

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Technical Specifications

Lidar Optech ALTM Gemini

Optech **ALTM GEMINI**

Airborne Module

Operating altitude 150 - 4,000 m nominal
 Horizontal accuracy 1/5,500 x altitude; 1-sigma

Elevation accuracy

Laser rep rate (kHz)	500 m altitude	1000 m altitude	2000 m altitude	3000 m altitude	4000 m altitude
33	< 5 cm	< 10 cm	< 15 cm	< 20 cm	< 25 cm
50	< 5 cm	< 10 cm	< 15 cm	< 20 cm	n/a
70	< 5 cm	< 10 cm	< 15 cm	n/a	n/a
100	< 10 cm	< 10 cm	< 15 cm	n/a	n/a

Range capture Up to 4 range measurements for each pulse, including last

Intensity capture 12 bit dynamic range for each measurement

Scan frequency Variable; maximum 70 Hz
Optional 100 Hz

Scan angle Variable from 0 to $\pm 25^\circ$, in increments of $\pm 1^\circ$

Scanner Product Scan angle x scan frequency $\leq 1,000$

Roll compensation 5 Hz update rate
(Scan angle + Roll comp. angle = 30° , i.e., $\pm 20^\circ$ scan allows $\pm 10^\circ$ compensation)

Swath width Variable from 0 to 0.93 x altitude (m)

Position Orientation System Applanix - POS/AV including internal 12 channel dual frequency 10 Hz GPS receiver

Spot distribution Sawtooth, uniform across 90% of scan

Laser repetition rate 33 kHz (max. altitude (AGL) 4.0 km)
50 kHz (max. altitude (AGL) 3.0 km)
70 kHz (max. altitude (AGL) 2.5 km)
100 kHz (max. altitude (AGL) 2.0 km)

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 inquiries@optechintl.com

MULTIPULSE . THE SCIENCE OF PRECISION

Data storage hard drives Ruggedized removable media
Typical 7 hr. continuous log time
@ 100 kHz, freely configurable

Beam divergence Dual divergence 0.25 mrad or 0.8 mrad

Laser classification Class IV (FDA CFR 21)

Power requirements 28 VDC, 35 A (maximum)

Operating temperature (ambient) Control rack: $+10^\circ\text{C}$ to $+35^\circ\text{C}$
Sensor head: -10°C to $+35^\circ\text{C}$

Storage temperature -10°C to $+50^\circ\text{C}$

Humidity 0 - 95% non-condensing

Control Rack

Vibration-isolated case
 DimensionS 65 cm x 59 cm x 49 cm
 weight 53.2 kg
 Cables/laptop 7.6 kg/3 kg

Sensor Head

Fits standard camera mounts or mounts directly to floor

Dimensions 26 cm x 19 cm x 57 cm
 Weight 23.4 kg
 Minimum opening 19.2 cm x 25.5 cm (flight direction)

Processing Software

Survey Suite Differential kinematic GPS solution
 Trajectory optimization from multiple base stations
 XYZ point calculations module
 Vegetation classification/
 extraction feature
 Windows XP compatible

GPS Ground Support

Multiple base stations Any dual frequency receiver with Rinex output



ANNEX 01

Calibration Report LiDAR



ALTM
Annual Maintenance Report

Client: PHB
System Serial Number: 07SEN209
System Model: Gemini
Location of Service: Boisbriand, QC
Service Start Date: 02-Mar-15
Service End Date: March 6, 2015
Warranty Number: ST 7292 - Annual Maintenance
ST 7431 - Power Cable Connector
ST 7034 - Intensity Variations
ST 5506 - POS AV Logging Issues

Service Performed By: Julia Zhu

System Owner Representative: Adrian Salazar

Optech Incorporated
Airborne Survey Products
300 Interchange Way
Vaughan, Ontario, Canada L4K 5Z8

Telephone: +1 905 660 0808 Facsimile: +1 905 660 0829 Website: www.optech.ca
24/7 Optech Services: +1 905 532 3750 or optech_services@optech.ca

0061523/Rev A

January 2010

Contents

	Page
1 OVERVIEW.....	1
1.1 Purpose	1
1.2 Scope.....	1
2 SERVICE METHODOLOGY.....	2
2.1 Outline of services	2
2.2 Service results and comments	2
2.3 Services conclusion	4

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SUMMARY

The ALTM system, model number Gemini, bearing serial number 07SEN209, has been serviced as per Optech's standard annual maintenance procedures.

SYSTEM CONFIRMATION AND ACCEPTANCE

Optech Incorporated, by virtue of the signature on the title page of this report, hereby certifies that the ALTM system, model number Gemini, with serial number 07SEN209, has been successfully serviced as listed in the summary.



ALTM Annual Maintenance Report

1 Overview

1.1 Purpose

The ALTM Maintenance Report represents the work completed and the confirmation of the ALTM system performance after service.

1.2 Scope

This report contains ALTM system service information for the indicated system only.



2 Service Methodology

2.1 Outline of services

Hardware Service description
<p>Annual Maintenance was carried out on the system.</p> <ul style="list-style-type: none"> - New laser fiber cap is provided to replace the one lost. - ST 7431: provided new Junction Box and power cables. - ST 7034: upgraded Rx logic firmware, checked related wirings inside of sensor head. - ST 5506: upgraded POS firmware and POS AV controller, is able to clean POS internal drive.
General comments
<p>The system was maintained fine.</p>

2.2 Service results and comments

Completed	Comments
<input checked="" type="checkbox"/> Inspect all cables	Inspected and recorded part numbers
<input checked="" type="checkbox"/> Photograph the ALTM system	Completed
<input checked="" type="checkbox"/> Perform overall system inspection	Completed, no damage
<input checked="" type="checkbox"/> Inspect, clean, and photograph laser fiber	Inspected and cleaned
<input checked="" type="checkbox"/> Clean laser power supply filter	Cleaned
<input checked="" type="checkbox"/> Clean chassis filter (3070 onwards)	Cleaned
<input checked="" type="checkbox"/> Clean chassis	Cleaned
<input checked="" type="checkbox"/> Inspect and clean accessible optics (inside the sensor)	Inspected and cleaned mirrors
<input checked="" type="checkbox"/> Record laser head serial number	Recorded



ALTM Annual Maintenance Report

Completed	Comments
<input checked="" type="checkbox"/> Record IMU serial number	Sagem 055
<input checked="" type="checkbox"/> Check fan bearings	Checked, function normally
<input checked="" type="checkbox"/> Perform standard hardware upgrades/enhancements	Checked, in current type
<input type="checkbox"/> Check galvo movement (pre-3070)	N/A
<input checked="" type="checkbox"/> Check flip-in lens operation	Checked, moves to correct positions
<input checked="" type="checkbox"/> Check shutter operation	Checked, operation normally
<input checked="" type="checkbox"/> Record sensor head power supply voltages	Recorded, within specifications
<input checked="" type="checkbox"/> Chassis power display on PDU (3070 onwards)	Checked, function normally
<input checked="" type="checkbox"/> Check laptop configuration and ALTM program versions	Configuration correct, ALTM 2.6.30 and POS AV 5.2
<input checked="" type="checkbox"/> Verify system firmware information	ACP 739c_rc2
<input checked="" type="checkbox"/> Copy configuration file (3070 onwards)	Completed
<input checked="" type="checkbox"/> Record firmware checksums using XILINX tool (3070 onwards)	Recorded
<input type="checkbox"/> Record board and firmware register shown on labels (pre-3070)	N/A
<input type="checkbox"/> Perform video annotation, VTR, and video monitor functional test	N/C
<input checked="" type="checkbox"/> Perform POS functional test and record POS/AV settings	Completed, function normally
<input checked="" type="checkbox"/> Record alignment period	Recorded



ALTM Annual Maintenance Report

Completed	Comments
<input checked="" type="checkbox"/> Record laser power supply information	Recorded
<input checked="" type="checkbox"/> Perform laser system performance characterization (POF, POW, and pulse shape)	Completed, all within specs
<input checked="" type="checkbox"/> Measure and record T0 voltage	Measured, within specs
<input checked="" type="checkbox"/> Measure laser DC offset	Measured and recorded, within spec
<input checked="" type="checkbox"/> Measure receiver APD voltage and temperature	Completed, normal
<input checked="" type="checkbox"/> Record scanner offset	Recorded, within spec
<input checked="" type="checkbox"/> Perform functional testing with 4 returns (with JPOD) (3070 onwards)	Completed, normal
<input checked="" type="checkbox"/> Test eye safety function (with JPOD)	Tested, function normally
<input type="checkbox"/> Check high-low gain CFD threshold (with JPOD)	N/C
<input type="checkbox"/> Perform functional testing with 2 returns (pre-3070) (with JPOD)	N/A
<input checked="" type="checkbox"/> Test shot-to-shot angle (delta angle) noise – scanning and profile (with JPOD)	Tested and recorded
<input checked="" type="checkbox"/> Test multipulse and variable modes (with JPOD) (Gemini only)	Tested, work normally

N/A = Not applicable
N/C = Not checked.

2.3 Services conclusion

Result	Comments
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	The system was ground tested successfully.



ALTM Annual Maintenance Report

ANNEX 02

Control points

Number	Easting	Northing	Known Z	Laser Z	Dz
1	515790.503	5163101.031	346.439	346.460	+0.021
2	515790.497	5163101.023	346.455	346.460	+0.005
3	515790.505	5163101.026	346.448	346.460	+0.012
4	515790.479	5163101.007	346.455	346.461	+0.006
5	515790.466	5163101.007	346.450	346.461	+0.011
6	515737.934	5163099.654	345.857	345.859	+0.002
7	515745.595	5163099.839	345.918	345.938	+0.020
8	515752.481	5163096.575	345.914	345.930	+0.016
9	515760.041	5163094.357	345.874	345.862	-0.012
10	515767.770	5163096.363	345.913	345.898	-0.015
11	515773.266	5163101.770	345.972	345.945	-0.027
12	515775.311	5163109.544	346.012	345.998	-0.014
13	515773.132	5163117.255	346.041	346.022	-0.019
14	515767.347	5163122.665	346.024	346.037	+0.013
15	515759.747	5163124.384	346.021	345.996	-0.025
16	515751.966	5163121.930	345.930	345.923	-0.007
17	515746.716	5163115.898	345.911	345.885	-0.026
18	515744.022	5163106.437	345.915	345.910	-0.005
19	515730.571	5163096.336	345.796	345.796	+0.000
20	515722.334	5163092.297	345.766	345.771	+0.005
21	515714.954	5163088.271	345.763	345.773	+0.010
22	515707.679	5163083.867	345.776	345.780	+0.004
23	515700.879	5163079.298	345.796	345.835	+0.039
24	515693.687	5163074.394	345.839	345.820	-0.019
25	515686.269	5163069.335	345.877	345.902	+0.025
26	515768.131	5163088.900	345.839	345.845	+0.006
27	515770.592	5163081.943	345.760	345.751	-0.009
28	515761.541	5163079.432	345.744	345.724	-0.020
29	515753.217	5163080.565	345.760	345.783	+0.023
30	515745.158	5163083.411	345.799	345.814	+0.015
31	515738.153	5163083.631	345.808	345.805	-0.003
32	515730.569	5163080.147	345.682	345.686	+0.004
33	515722.879	5163075.300	345.691	345.703	+0.012
34	515715.208	5163069.954	345.674	345.682	+0.008
35	515707.422	5163064.618	345.699	345.720	+0.021

Average dz	+0.002
Minimum dz	-0.027
Maximum dz	+0.039
Average magnitude	0.014
Root mean square	0.016
Std deviation	0.016

ANNEX 03

GPS - PPP



CSRS-PPP (V 1.05 34613)



4674

Data Start	Data End	Duration of Observations
2015-04-29 14:01:30.000	2015-04-29 19:08:30.000	5h 6m 60.00s
Apri / Aposteriori Phase Std	Apri / Aposteriori Code Std	
0.015m / 0.005m	2.0m / 0.772m	
Observations	Frequency	Mode
Phase and Code	L1 and L2	Static
Elevation Cut-Off	Rejected Epochs	Observation & Estimation Steps
10.000 degrees	-0.08 %	1.00 sec / 30.00 sec
Antenna Model	APC to ARP	ARP to Marker
TRM60158.00	L1= 0.085 m L2= 0.081 m	1.350 m

(APC = antenna phase center; ARP = antenna reference point)

Estimated Position for 46741190.15o

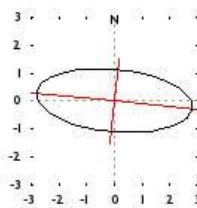
	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (1997)	46° 37' 12.0552"	-80° 47' 56.6011"	310.167 m
Sigmas(95%)	0.009 m	0.022 m	0.041 m
Apriori	46° 37' 12.048"	-80° 47' 56.618"	315.157 m
Estimated - Apriori	0.239 m	0.364 m	-4.990 m

Orthometric Height
CGVD28 (HTv2.0)

345.668 m

(click here for model and accuracy)

95% Error Ellipse (cm)
 semi-major: 2.820cm
 semi-minor: 1.110cm
 semi-major azimuth: 95° 21' 1.52"



UTM (North) Zone 17

5162958.809m(N) 515384.862m(E)

Scale Factors
 0.99960291 (point)
 0.99955425 (combined)

(Coordinates from RINEX file used as apriori position)



CSRS-PPP (V 1.05 34613)



4674

Data Start	Data End	Duration of Observations
2015-04-30 14:40:00.000	2015-04-30 20:11:00.000	5h 30m 60.00s
Apri / Aposteriori Phase Std		Apri / Aposteriori Code Std
0.015m / 0.005m		2.0m / 0.939m
Observations	Frequency	Mode
Phase and Code	L1 and L2	Static
Elevation Cut-Off	Rejected Epochs	Observation & Estimation Steps
10.000 degrees	0.08 %	1.00 sec / 30.00 sec
Antenna Model	APC to ARP	ARP to Marker
TRM60158.00	L1= 0.085 m L2= 0.081 m	1.350 m

(APC = antenna phase center; ARP = antenna reference point)

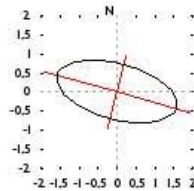
Estimated Position for 46741201.15o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (1997)	46° 37' 12.0547"	-80° 47' 56.6019"	310.136 m
Sigmas(95%)	0.006 m	0.013 m	0.026 m
Apriori	46° 37' 12.063"	-80° 47' 56.652"	312.969 m
Estimated - Apriori	-0.248 m	1.069 m	-2.832 m

**Orthometric Height
CGVD28 (HTv2.0)**

345.637 m
(click here for model and accuracy)

95% Error Ellipse (cm)
 semi-major: 1.628cm
 semi-minor: 0.723cm
 semi-major azimuth: 104° 37' 31.17"



UTM (North) Zone 17

5162958.793m (N) 515384.845m (E)

Scale Factors
 0.99960291 (point)
 0.99955425 (combined)

(Coordinates from RINEX file used as apriori position)



CSRS-PPP (V 1.05 34613)



4674

Data Start	Data End	Duration of Observations
2015-05-01 12:26:30.000	2015-05-01 17:24:00.000	4h 57m 30.00s
Apri / Aposteriori Phase Std		Apri / Aposteriori Code Std
0.015m / 0.005m		2.0m / 0.919m
Observations	Frequency	Mode
Phase and Code	L1 and L2	Static
Elevation Cut-Off	Rejected Epochs	Observation & Estimation Steps
10.000 degrees	-0.07 %	1.00 sec / 30.00 sec
Antenna Model	APC to ARP	ARP to Marker
TRM60158.00	L1= 0.085 m L2= 0.081 m	1.350 m

(APC = antenna phase center; ARP = antenna reference point)

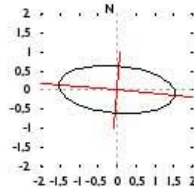
Estimated Position for 46741210.15o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (1997)	46° 37' 12.0547"	-80° 47' 56.6022"	310.141 m
Sigmas(95%)	0.005 m	0.012 m	0.023 m
Apriori	46° 37' 12.087"	-80° 47' 56.579"	309.523 m
Estimated - Apriori	-0.997 m	-0.493 m	0.618 m

Orthometric Height
CGVD28 (HTv2.0)

345.642 m
(click here for model and accuracy)

95% Error Ellipse (cm)
semi-major: 1.541cm
semi-minor: 0.611cm
semi-major azimuth: 95° 8' 41.36"



UTM (North) Zone 17

5162958.793m(N) 515384.838m(E)

Scale Factors
0.99960291 (point)
0.99955425 (combined)

(Coordinates from RINEX file used as apriori position)



CSRS-PPP (V 1.05 34613)



4674

Data Start	Data End	Duration of Observations
2015-05-01 18:36:30.000	2015-05-01 22:29:30.000	3h 53m 0.00s
Apri / Aposteriori Phase Std		Apri / Aposteriori Code Std
0.015m / 0.005m		2.0m / 0.942m
Observations	Frequency	Mode
Phase and Code	L1 and L2	Static
Elevation Cut-Off	Rejected Epochs	Observation & Estimation Steps
10.000 degrees	0.11 %	1.00 sec / 30.00 sec
Antenna Model	APC to ARP	ARP to Marker
TRM60158.00	L1= 0.085 m L2= 0.081 m	1.350 m

(APC = antenna phase center; ARP = antenna reference point)

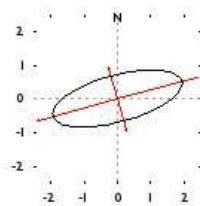
Estimated Position for 46741211.15o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (1997)	46° 37' 12.0549"	-80° 47' 56.6019"	310.142 m
Sigmas (95%)	0.007 m	0.016 m	0.026 m
Apriori	46° 37' 12.067"	-80° 47' 56.658"	311.183 m
Estimated - Apriori	-0.362 m	1.190 m	-1.040 m

Orthometric Height
CGVD28 (HTv2.0)

345.643 m
(click here for model and accuracy)

95% Error Ellipse (cm)
semi-major: 2.009cm
semi-minor: 0.692cm
semi-major azimuth: 74° 52' 16.83"



UTM (North) Zone 17

5162958.799m(N) 515384.845m(E)

Scale Factors
0.99960291 (point)
0.99955425 (combined)

(Coordinates from RINEX file used as apriori position)



CSRS-PPP (V 1.05 34613)



4674

Data Start	Data End	Duration of Observations
2015-05-02 12:40:30.000	2015-05-02 16:49:30.000	4h 9m 0.00s
Apri / Aposteriori Phase Std		Apri / Aposteriori Code Std
0.015m / 0.005m		2.0m / 0.917m
Observations	Frequency	Mode
Phase and Code	L1 and L2	Static
Elevation Cut-Off	Rejected Epochs	Observation & Estimation Steps
10.000 degrees	-0.11 %	1.00 sec / 30.00 sec
Antenna Model	APC to ARP	ARP to Marker
TRM60158.00	L1= 0.085 m L2= 0.081 m	1.350 m

(APC = antenna phase center; ARP = antenna reference point)

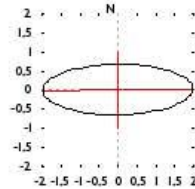
Estimated Position for 46741220.15o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (1997)	46° 37' 12.0550"	-80° 47' 56.6020"	310.145 m
Sigmas(95%)	0.005 m	0.016 m	0.025 m
Apriori	46° 37' 12.102"	-80° 47' 56.628"	308.633 m
Estimated - Apriori	-1.466 m	0.559 m	1.512 m

**Orthometric Height
CGVD28 (HTv2.0)**

345.646 m
(click here for model and accuracy)

95% Error Ellipse (cm)
 semi-major: 1.973cm
 semi-minor: 0.661cm
 semi-major azimuth: 89° 16' 5.44"



UTM (North) Zone 17

5162958.802m(N) 515384.842m(E)

Scale Factors
 0.99960291 (point)
 0.99955425 (combined)

(Coordinates from RINEX file used as apriori position)



CSRS-PPP (V 1.05 34613)



7586

Data Start	Data End	Duration of Observations
2015-04-30 21:07:00.000	2015-04-30 23:38:30.000	2h 31m 30.00s
Apri / Aposteriori Phase Std	Apri / Aposteriori Code Std	
0.015m / 0.005m	2.0m / 0.703m	
Observations	Frequency	Mode
Phase and Code	L1 and L2	Static
Elevation Cut-Off	Rejected Epochs	Observation & Estimation Steps
10.000 degrees	0.09 %	1.00 sec / 30.00 sec
Antenna Model	APC to ARP	ARP to Marker
TRM60158.00	L1= 0.085 m L2= 0.081 m	1.535 m

(APC = antenna phase center; ARP = antenna reference point)

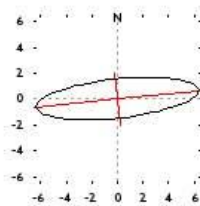
Estimated Position for 75861202.15o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (1997)	46° 37' 12.1587"	-80° 47' 56.1593"	310.273 m
Sigmas (95%)	0.013 m	0.051 m	0.049 m
Apriori	46° 37' 12.152"	-80° 47' 56.172"	312.186 m
Estimated - Apriori	0.220 m	0.275 m	-1.913 m

Orthometric Height
CGVD28 (HTv2.0)

345.774 m
(click here for model and accuracy)

95% Error Ellipse (cm)
semi-major: 6.362cm
semi-minor: 1.512cm
semi-major azimuth: 84° 11' 21.80"



UTM (North) Zone 17

5162962.027m (N) 515394.249m (E)

Scale Factors
0.99960291 (point)
0.99955423 (combined)

(Coordinates from RINEX file used as apriori position)

Appendix C: Cost Statement

Information withheld for client confidentiality.

Appendix D: Assays

See accompanying PDF: [2_56352_012_AppendixD_Assays](#)

Appendix E: Invoices and Receipts

Information withheld for client confidentiality.