

### ASSESSMENT REPORT TITLE PAGE AND SUMMARY

#### TITLE OF REPORT: Assessment Report – LiDAR Survey

#### TOTAL COST: \$153,944.71

AUTHOR(S): Elisabeth Ronacher, PhD, P.Geo.

SIGNATURE(S): Climberth Remochen

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): MX-13-208/June 15, 2011 to December 15, 2014 STATEMENT OF WORK EVENT NUMBER(S)/DATE(S): SOW #:5450362; July 10, 2012 – May 25, 2013

YEAR OF WORK: 2012 PROPERTY NAME: Decar

TYPE OF REPORT (Type of Survey): Technical (LiDAR Remote Sensing) CLAIM NAME(S) (on which work was done): see Appendix A

COMMODITIES SOUGHT: Ni

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:093K039, 093K040, 093K041, 093K043, 093K064, 093K068, 093K072, 093K089

 MINING DIVISION: Omineca

 NTS / BCGS:093K

 LATITUDE: \_\_\_54\_\_\_\_° \_\_54\_\_\_\_\_' \_\_\_30.5\_\_\_\_"

 LONGITUDE: \_\_\_-125\_\_\_\_\_° \_\_21\_\_\_\_' \_\_\_31\_\_\_\_" (at centre of work)

 UTM Zone:
 10
 EASTING: 350,000

OWNER(S): Cliffs Natural Resources Exploration Canada Inc., Incorporation #A0078400

MAILING ADDRESS: 200 Public Square, Suite 3300, Cleveland, Ohio, USA 44114-2315

OPERATOR(S) [who paid for the work]: Cliffs Natural Resources Exploration Canada Inc.

CONSULTAN(S)[who completed the work]: Terra Remote Sensing Inc.; Caracle Creek International Consulting Inc.

MAILING ADDRESS: same as above

REPORT KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude. **Do not use abbreviations or codes**) Lidar, topography, orthophoto, awaruite, nickel alloy

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: see Appendix B

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (in metric units)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other: Lidar	388.66 km2	All except 895909, 895910	\$153,944.71
Airborne			
GEOCHEMICAL (number of samples	analysed for)		
Soil			
Silt			
Rock			
Other			
DRILLING (total metres, number of h	oles, size, storage location)		
Core			
Non-core			
RELATED TECHNICAL			
Sampling / Assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale/area)			
PREPATORY / PHYSICAL			
Line/grid (km)			
Topo/Photogrammetric (scale	, area)		
Legal Surveys (scale, area)			
Road, local access (km)/trail			
Trench (number/metres)			
Underground development (m	netres)		
Other			\$150.044.74
		COST	\$153,944./1

## Appendix A

Tenure Number	Claim Name		
559615	WILL 1		
559616	WILL 2		
559617	WILL 3		
559618	WILL 4		
575674	WILL 5		
575675	WILL 6		
575677	WILL 7		
575678	WILL 8		
575679	WILL 9		
575680	WILL 10		
575681	WILL 11		
575682	WILL 12		
575683	WILL 13		
575684	WILL 14		
575686	WILL 15		
594247	BAP 1		
594248	BAP 2		
594249	BAP 3		
594250	BAP 4		
594251	BAP 5		
594252	KAR 1		
594254	KAR 2		
594255	KAR 3		
594256	KAR 4		
594257	KAR 5		
594258			
594259	KAR 7		
594260	KAR 8		
594262	KAR 9		
594263	KAR 10		
602564			
602566			
603803	VAN 1		
669586	BAP 6		
669625	BAP 7		
669645	BAP 8		



Tenure Number	Claim Name
669665	BAP 9
839601	MID 1
839604	MID 2
839607	MID 3
839610	MID 4
839615	MID 5
839617	MID 6
839618	MID 7
839620	MID 8
839621	MID 9
839622	MID 10
895893	NEY 1
895899	NEY 2
895902	NEY 3
895904	NEY 4
895905	NEY 5
895907	NEY 6
895911	NEY 9
895912	NEY 10
895913	NEY 11
895914	NEY 12
1013225	



### Appendix B

#### **References to Previous Assessment Work and Assessment Report Numbers**

- Britten, R., 2009, Field Season 2008, Geology and Geochemistry, Decar Property, BC. B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #30793, 70 p.
- Britten, R., 2010: Field Season 2009 Geology and Geochemistry, Decar Property, BC. B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #31334, 51 p.
- Britten, R., and Rabb, T., 2011, Field Season 2010, Airborne gradient magnetic and IP Geophysical Surveys, Decar Property, BC: BC Geological Survey Branch Assessment Report #31999, 94 p.
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- McIntyre, J.F., and McIntyre, R.F., 1995, Report on Diamond Drilling Grenn 1-4 Mineral Claims; Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #24094, 58 p.
- Mowat, U., 1988, Geochemical Sampling on the Van Group, Klone Group, Mid Claim, Omineca M.D.: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #17173, 105 p.
- Mowat, U., 1988, Geochemical Sampling, Prospecting and Mapping on the Van Group, Klone Group, and Mid Claim; Omineca M.D.: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #18089, 189 p.
- Mowat, U., 1990, Mapping and Drilling Program on the Mount Sidney Williams Property; Omineca M.D.: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #20541, 97 p.
- Mowat, U., 1991, Drilling Program on the Mount Sidney Williams Property; Omineca M.D.: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #21870, 73 p.
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- Mowat, U., 1997, A Geochemical/Petrographic Report on the Mount Sidney Williams Property, Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #24906, 46 p.
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- Mowat, U., 1999, Mapping and Sampling on the Mount Sidney Williams Property, Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #26062, 45 p.
- Mowat, U., 2001, Mapping and Sampling on the Mount Sidney Williams Property, Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #26445, 31 p.

- Mowat, U., 2002, Sampling on the Mount Sidney Williams Property, Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #26993, 34 p.
- Mowat, U., 2004, Sampling on the Mid and Klone 7 Claims, Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #27375, 25 p.
- Mowat, U., 2005, Sampling on the One-Eye 1 and Klone 1 Claims, Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #27605, 32 p.
- Mowat, U., 2007, Sampling and Grid Preparation on the Klone 5 and Klone 6 Claims, Omineca Mining Division, B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #28806, 33 p.
- Palich, J. and Qian, W., Earth Probe Survey Interpretation Report, Decar Nickel Property, Mt. Sidney Williams, British Columbia: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #33135, 72 p
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- Ronacher, E., Harnois, L. and Baker, J., Decar Nickel Property, British Columbia, Canada: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #33414, 518 p.
- Shaede, E.A., 1990, Prospecting and Geochemical Report on BC Claim Record #10602; Omineca Mining Division: B.C. Ministry of Energy, Mines and Petroleum Resources Assessment Report #20243, 16 p.
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	COST STATEMENT				
Exploration Work type	Comment	Days			Totals
		1 -	<u> </u>		
Personnel (Name)* / Position	Field Days (list actual days)	Days	¢0.00	Subtotal ¢0.00	
			<b>φ0.00</b>	\$0.00	\$0.00
Airborne Exploration Surveys	Line Kilometres / Enter total invoiced amount			+	4000
Aeromagnetics			\$0.00	\$0.00	
Radiometrics			\$0.00	\$0.00	
Gravity			\$0.00	\$0.00	
Digital terrain modelling			\$0.00	\$0.00	
Other (specify)			\$0.00	\$0.00	
		<b></b>	<b>.</b>	\$0.00	\$0.00
Aerial photography	Area in Hectares / Enter total invoiced amount or list personnel	Hectares	¢0.00		nount
LANDSAT			\$0.00	\$0.00	
Lidar	Terra Remote Sensing Inc./Caracle Creek International Consulting Inc.	38866.0	\$0.00	\$153,669.00	
		1		\$153,669.00	\$153,669.00
Ground Exploration Surveys	Area in Hectares/List Personnel			¢0.00	
Regional	note: e	expenditure	es here	\$0.00	
Reconnaissance	should be	captured in	n Personne	\$0.00	
Prospect	field ex	<i>xpenditure</i>	s above	\$0.00	
Underground	Define by length and width			\$0.00	
irenches	Define by length and width			\$0.00 \$0.00	¢0.00
Ground geophysics	Line Kilometres / Enter total amount invoiced list personnel	No.	Rate	Subtotal	\$0.00
Radiometrics			\$0.00	\$0.00	
Magnetics			\$0.00	\$0.00	
Gravity			\$0.00	\$0.00	
Digital terrain modelling	note: expenditures for your crew in the field		\$0.00	\$0.00	
SP/AP/EP	should be captured above in Personnel		\$0.00	\$0.00	
IP	field expenditures above		\$0.00	\$0.00	
AMT/CSAMT			\$0.00	\$0.00	
Resistivity			\$0.00	\$0.00	
Complex resistivity			\$0.00	\$0.00	
Seismic refraction			\$0.00	\$0.00	
Well logging	Define by total length		\$0.00	\$0.00	
Geophysical interpretation			\$0.00	\$0.00	
Petrophysics			\$0.00	\$0.00	
Other (specify)			\$0.00	\$0.00	\$0.00
Geochemical Surveying	Number of Samples	No.	Rate	Subtotal	<i>\$</i> 0.00
<b>E</b>			\$0.00	\$0.00	
Drill (cuttings, core, etc.)			\$0.00	\$0.00	
Stream sediment	note: This is for accave or		\$0.00	\$0.00	
Bock	laboratory costs		\$0.00	\$0.00	
Water	,		\$0.00	\$0.00	
Biogeochemistry			\$0.00	\$0.00	
Whole rock			\$0.00	\$0.00	
Petrology Other (specify)			\$0.00 \$0.00	\$0.00 \$0.00	
	l		<b>40.00</b>	\$0.00	\$0.00
Drilling	No. of Holes, Size of Core and Metres	No.	Rate	Subtotal	
Diamond			\$0.00	\$0.00	
Reverse circulation (RC)			\$0.00	\$0.00	
Other (specify)			\$0.00 \$0.00	\$0.00	<u> </u>
			+	\$0.00	\$0.00
Reclamation	Clarify	No.	Rate	Subtotal	
After drilling			\$0.00	\$0.00	
Monitoring Other (specify)			\$0.00	\$0.00	
	I		<b>40.00</b>	40.00	\$0.00
Transportation		No.	Rate	Subtotal	
			\$0.00	\$0.00	
Accommodation & Food	Pates ner dav	No	Pato	\$0.00	\$0.00
	naws per uay	110.	\$0.00	\$0.00	
	·		+	\$0.00	\$0.00
Miscellaneous		No.	Rate	Subtotal	
			\$0.00	\$0.00	+0
					şu.00
TOTAL Expenditures					\$153,669,00
		1		1	

### ASSESSMENT REPORT - LIDAR SURVEY

DECAR NICKEL PROPERTY, British Columbia, Canada



CLIFFS NATURAL RESOURCES EXPLORATION CANADA INC. 200 Public Square, Suite 3400 Cleveland, OH, 44114 USA

May 15, 2013

BC Geological Survey Assessment Report 33953a

Prepared By:

CARACLE CREEK INTERNATIONAL CONSULTING INC. Elisabeth Ronacher, PhD, P.Geo.

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This report has been prepared by Caracle Creek International Consulting Inc. (Caracle Creek) on behalf of Cliffs Natural Resources Exploration Canada Inc.

2013

Issued by: Sudbury

### **DATE AND SIGNATURE PAGE**

This Report, titled "Assessment Report – LiDAR Survey, Decar Nickel Property, British Columbia, Canada", and dated May 15, 2013 was prepared and signed by the following Qualified Persons:

"signed and sealed"

Elisabeth Ronacher, PhD, P.Geo. May 15, 2013 Sudbury, Ontario



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Appendix 1 – Certificates of	Qualified Persons
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Appendix 2 – Claim map (1:50,000)

Appendix 3 - LiDAR Report

Appendix 4 – LiDAR data (digital: provided on DVD)

Appendix 5 – Orthophoto (1:10,000) (digital: provided on DVD)

### **1.0 SUMMARY**

Caracle Creek International Consulting Inc. ("Caracle Creek") was contracted by Cliffs Natural Resources Exploration Canada Inc. ("Cliffs") to manage a LiDAR (Light Detection and Ranging) survey at the Decar Property (the "Property"), British Columbia.

The Decar Property is located ~90 km northwest of Fort St. James, British Columbia, Canada and consists of 60 mineral claims covering 24,516.961 hectares (ha). Cliffs and First Point Minerals Corp. ("First Point") are parties to an option agreement dated November 12, 2009 as amended. Effective as of September 12, 2011, Cliffs owns 51 % interest in the Decar Property.

The earliest publicly available reports of exploration in the area of the Decar Property are from 1974; since then, prospecting, mapping, sampling and drilling has occurred on the Property and the nickel alloy awaruite was first reported in 1996.

The Property is located within the Cache Creek Terrane which consists of the Sitlika assemblage and the Cache Creek complex. The mineralized peridotites of the Property belong to the Trembleur ultramafic unit of the Cache Creek complex, a part of an obducted Upper Paleozoic and Lower Mesozoic ophiolite sequence. The peridotites are variably serpentinized. The nickel alloy awaruite (Ni<sub>2-3</sub>Fe) formed during serpentinization of peridotite containing nickeliferous olivine.

The LiDAR survey provided accurate elevation data for and an orthophoto of the Property. This information is important for geological interpretations and to produce an accurate geological model of the mineralized zones. The orthophoto helps with planning future geological activities at Decar.

### 1.1 Introduction

Caracle Creek International Consulting Inc. ("Caracle Creek") was contracted by Cliffs Natural Resources Exploration Canada Inc. ("Cliffs") of Cleveland, OH, USA to manage a LiDAR (Light Detection and Ranging) survey at the Decar Property (the "Property") to obtain accurate elevation data and an orthophoto of the Property. The purpose of this Assessment Report ("the Report") is to provide details of the LiDAR survey. The survey was completed by Terra Remote Sensing Inc. of Sidney, BC. The total area surveyed is 388.66 km<sup>2</sup>.

The Property is centered on UTM 350,000 mE and 6,087,000 mN (Nad 83, Zone 10) and can be accessed from the town of Fort St. James, BC, located ~90 km southeast of the Property, on Forestry Roads. The Property consists of 60 mineral claims currently held by Cliffs and First Point Minerals Corp.

### 1.2 Units

The Metric System is the primary system of measure and length used in this Report and is generally expressed in kilometres (km), metres (m) and centimetres (cm); volume is expressed as cubic metres (m<sup>3</sup>), mass expressed as metric tonnes (t), area as hectares (ha), and metal concentrations as grams per tonne (g/t) or %. Conversions from the Metric System to the Imperial System are provided below and quoted where practical. Many of the geologic publications and more recent documents now use the Metric System but older documents almost exclusively refer to the Imperial System. 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 for a glossary.

Abbreviations include Mt = million tonne; t = tonne (1000 kilograms); SG = specific gravity; lb/t = pound/ton; and, st = short ton (2000 pounds).

Dollars are expressed in Canadian currency (CAD\$) unless otherwise noted. Where quoted, Universal Transverse Mercator (UTM) coordinates are provided in the datum of Canada, Nad83, Zone 10 North.

### **1.3 Software Programs**

The following software programs were used in support of the exploration and to produce this report:

- Microsoft Word
- Microsoft Excel
- ArcGIS: ArcMAP
- TerraSolid
- Bentley Microstation V8

### 2.0 PROPERTY DESCRIPTION AND LOCATION

### 2.1 Location

The Decar Property is located in central British Columbia, Canada (Figure 2-1), ~650 km north of Vancouver and ~90 km northwest of the town of Fort St. James. The Property is centered on UTM 350,000 mE and 6,087,000 mN (Nad 83, Zone 10) or latitude of 54°54'30.5" N and longitude of 125°21'31" W.

The Property consists of 60 mineral claims covering an area of 24,516.961 hectares (ha; Table 2-1).



Figure 2-1: Location of the Decar Property in British Columbia, Canada.

### 2.2 Description and Ownership

The Decar Property consists of 60 mineral claims (<u>https://www.mtonline.gov.bc.ca/mtov/searchTenures.do</u>; Table 2-1; Figure 2-2). Claims 575682, 895893, 895899, 669586, 559616, 594259, 559615 and 559618 overlap with legacy claims where the overlap is not owned by Cliffs. The claims shown in Figure 2-2 show the claim size as owned by Cliffs. Figure 2-2 also shows an area around Middle River where mineral rights are restricted (Mineral Reserve Site 326751). Mineral reserve site are typically located around water bodies.



#### Table 2-1: List of the Decar claims.

559615WILL 1Cliffs (100%)2022/Nov/14GOOD357.3328*559616WILL 2Cliffs (100%)2022/Nov/14GOOD432.5449*559617WILL 3Cliffs (100%)2022/Nov/14GOOD464.7642559618WILL 4Cliffs (100%)2022/Nov/14GOOD446.3543*575674WILL 5Cliffs (100%)2022/Nov/14GOOD446.491
559616WILL 2Cliffs (100%)2022/Nov/14GOOD432.5449*559617WILL 3Cliffs (100%)2022/Nov/14GOOD464.7642559618WILL 4Cliffs (100%)2022/Nov/14GOOD446.3543*575674WILL 5Cliffs (100%)2022/Nov/14GOOD446.491
559617         WILL 3         Cliffs (100%)         2022/Nov/14         GOOD         464.7642           559618         WILL 4         Cliffs (100%)         2022/Nov/14         GOOD         446.3543*           575674         WILL 5         Cliffs (100%)         2022/Nov/14         GOOD         446.491
559618         WILL 4         Cliffs (100%)         2022/Nov/14         GOOD         446.3543*           575674         WILL 5         Cliffs (100%)         2022/Nov/14         GOOD         446.491
575674 WILL 5 Cliffs (100%) 2022/Nov/14 GOOD 446.491
575675 WILL 6 Cliffs (100%) 2022/Nov/14 GOOD 446.6277
575677 WILL 7 Cliffs (100%) 2022/Nov/14 GOOD 465.1909
575678 WILL 8 Cliffs (100%) 2022/Nov/14 GOOD 464.954
575679 WILL 9 Cliffs (100%) 2022/Nov/14 GOOD 464.7194
575680 WILL 10 Cliffs (100%) 2022/Nov/14 GOOD 465.1944
575681 WILL 11 Cliffs (100%) 2022/Nov/14 GOOD 446.3825
575682 WILL 12 Cliffs (100%) 2022/Nov/14 GOOD 239.275
575683 WILL 13 Cliffs (100%) 2022/Nov/14 GOOD 390.3963
575684 WILL 14 Cliffs (100%) 2022/Nov/14 GOOD 223.3712
575686 WILL 15 Cliffs (100%) 2022/Nov/14 GOOD 316.2419
594247 BAP 1 Cliffs (100%) 2022/Nov/14 GOOD 446.7796
594248 BAP 2 Cliffs (100%) 2022/Nov/14 GOOD 335.142
594249 BAP 3 Cliffs (100%) 2022/Nov/14 GOOD 465.4306
594250 BAP 4 Cliffs (100%) 2022/Nov/14 GOOD 446.7009
594251 BAP 5 Cliffs (100%) 2022/Nov/14 GOOD 390.8791
594252 KAR 1 Cliffs (100%) 2022/Nov/14 GOOD 464.5283
594254 KAR 2 Cliffs (100%) 2022/Nov/14 GOOD 464.2908
594255 KAR 3 Cliffs (100%) 2022/Nov/14 GOOD 464.2925
594256 KAR 4 Cliffs (100%) 2022/Nov/14 GOOD 427.2731
594257 KAR 5 Cliffs (100%) 2022/Nov/14 GOOD 371.629
594258 Cliffs (100%) 2022/Nov/14 GOOD 464.5249
594259 KAR 7 Cliffs (100%) 2022/Nov/14 GOOD 403.6543*
594260 KAR 8 Cliffs (100%) 2022/Nov/14 GOOD 297.1894
594262 KAR 9 Cliffs (100%) 2022/Nov/14 GOOD 408.7169
594263 KAR 10 Cliffs (100%) 2022/Nov/14 GOOD 389.9172
602564 Cliffs (100%) 2022/Nov/14 GOOD 18.5831
602566 Cliffs (100%) 2022/Nov/14 GOOD 148.6645
603803 VAN 1 Cliffs (100%) 2022/Nov/14 GOOD 464.5101
669586 BAP 6 Cliffs (100%) 2022/Nov/14 GOOD 239.4223*
669625 BAP 7 Cliffs (100%) 2022/Nov/14 GOOD 446.9644
669645 BAP 8 Cliffs (100%) 2022/Nov/14 GOOD 446.9353
669665 BAP 9 Cliffs (100%) 2022/Nov/14 GOOD 446.9093
839601 MID 1 Cliffs (100%) 2022/Dec/03 GOOD 74.4049
839604 MID 2 Cliffs (100%) 2022/Dec/03 GOOD 446.663
839607 MID 3 Cliffs (100%) 2022/Dec/03 GOOD 427.8813
839610 MID 4 Cliffs (100%) 2022/Dec/03 GOOD 465.2844
839615 MID 5 Cliffs (100%) 2022/Dec/03 GOOD 427.8998
839617 MID 6 Cliffs (100%) 2022/Dec/03 GOOD 464.9013
839618 MID 7 Cliffs (100%) 2022/Dec/03 GOOD 464.7451
839620 MID 8 Cliffs (100%) 2022/Dec/03 GOOD 427.3905
839621 MID 9 Cliffs (100%) 2022/Dec/03 GOOD 464.3255
839622 MID 10 Cliffs (100%) 2022/Dec/03 GOOD 148.5494
895893 NEY 1 Cliffs (100%) 2022/Sep/02 GOOD 441.0489*
895899 NEY 2 Cliffs (100%) 2022/Sep/02 GOOD 454.7532*
895902         NEY 3         Cliffs (100%)         2022/Sep/02         GOOD         446.9179
895904         NEY 4         Cliffs (100%)         2022/Sep/02         GOOD         465.5218



Tenure Number	Claim Name	Owner <sup>1</sup>	Good To Date	Status	Area (ha)
895905	NEY 5	Cliffs (100%)	2022/Sep/02	GOOD	390.9092
895907	NEY 6	Cliffs (100%)	2022/Sep/02	GOOD	465.5372
895909	NEY 7	Cliffs (100%)	2022/Sep/02	GOOD	447.1129
895910	NEY 8	Cliffs (100%)	2022/Sep/02	GOOD	447.1553
895911	NEY 9	Cliffs (100%)	2022/Sep/02	GOOD	465.7621
895912	NEY 10	Cliffs (100%)	2022/Sep/02	GOOD	465.7422
895913	NEY 11	Cliffs (100%)	2022/Sep/02	GOOD	335.3133
895914	NEY 12	Cliffs (100%)	2022/Sep/02	GOOD	446.5605
1013225		Cliffs (100%)	2013/Sept/26	GOOD	632.3375
TOTAL	60			-	24,516.961

\*this claim overlaps with a legacy claim. The area listed is the actual area owned by Cliffs and does not include the overlap area.



Figure 2-2: Map showing the mineral claims of the Decar Property. A map at a scale of 1:50,000 is shown in Appendix 2

Cliffs and First Point are parties to an option agreement dated November 12, 2009 and amended on September 12, 2011. Effective as of September 12, 2011, Cliffs owns 60 % interest in the Decar Property. Cliffs has the option to increase its interest to:

- 1. 65 % by completing a NI43-101 prefeasibility study
- 2. 75 % by completing a bankable feasibility study.

Upon completion of Cliffs earn-in to the Project the parties will enter into a joint venture. The parties' initial participating interests in the joint venture will equal their respective interests in the Decar property at the time the joint venture is formed. If Cliffs' or First Point's interest be reduced to 10 %, this interest will be converted to 1 % NSR. First Point, in addition to holding a participating interest in the joint venture, will retain a 1% NSR, which will increase to 2% if First Point is the party whose participating interest is diluted to less than 10%. Cliffs is the operator of the Decar Property.

The surface rights are owned by the Crown. Parts of several claims at the east end of the Property overlap with "district lots" (Figure 2-3). In British Columbia, district lots are primary parcels of land that have been surveyed (www.ltsa.ca). The Crown may have sold these lots to private individuals who may own the surface rights. Exploration in this area can still occur but any exploration activity needs to be announced to the surface rights holders. Caracle Creek reviewed the status of the district lots on the Government of British Columbia website (https://www.mtonline.gov.bc.ca/mtov/home.do) and did not notice any reference to mineral rights. A small part of the claims in the southwest overlap with Rubyrock Lake Provincial Park. No exploration can occur in the area of the Provincial Park.

Caracle Creek is not aware of any royalties, back-in rights, payments, or other agreements and encumbrances to which the property is subject to other than the ones mentioned above.

A Mineral & Coal Exploration Activities & Reclamation Permit, issued by the Ministry of Energy and Mines, is required to explore in British Columbia. A permit (MX-13-208) has been granted and is valid until December 15, 2014; this permit covers the exploration recommended in this Report.

Caracle Creek is not aware of any significant factors and risks that may affect the access, title, or the right or ability to perform work on the Property.





Figure 2-3: Map showing surface rights distribution on the Cliffs claims. Most of the surface rights (purple) are held by the Crown. Some (green) are held by private individuals.

## 3.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

### 3.1 Access

The Decar Property can be legally accessed from Fort St. James, located ~90 km southeast of the Property, on Forestry Roads. From Fort St. James, Stuart Lake Highway/BC-27N leads to Tachie Road after 2.3 km. After 39 km on Tachie Road, a right turn (north) leads to Leo Creek Forestry Road and after 38.5 km on Leo Creek Forestry Road a left (northwest) turn leads to Leo-Kazcheck Forestry Road (300 Road). At the 348 km mark a left turn (west) leads to Leo-Sakenichie Forestry Road (900 Road). At the 902 km mark, a left turn (southeast) leads

onto the Leo-Middle Forestry Road (700 Road) which leads to the Property. At the 728 km mark, a right turn (west) leads onto Baptiste Creek Forestry Road. The Baptiste prospect and the exploration camp are located on Baptiste Creek Forestry Road at 9 km from the turn from the Leo-Middle Forestry Road (Figure 3-1).

Fort St. James offers all services including accommodation, stores, gas stations, a bank and medical services. The closest city is Vanderhoof (54 km southeast of Fort St. James) and the closest airport is in Prince George (152 km southeast of Fort St. James). The town of Smithers is located ~120 km by air from the Property. A seasonally operating ferry across Babine Lake can be used to reach Smithers during the summer months. Smithers also has a commercial airport.

A rail line runs along the east bank of Middle River, immediately east of the claim block. The rail line is operated by the British Columbia Railway Company.

### 3.2 Climate and Vegetation

Average temperature and precipitation data for 1971-2000 from Environment Canada (<u>www.climate.weatheroffice.gc.ca/climate\_normals/</u>) for Fort St. James (closest weather station to the property) indicate that the daily average temperature ranges from -11.3°C in January to 15.3°C in July. The highest average accumulation of rain for a month is 48.1 mm in June. The highest average accumulation of snow for a month is 49 cm in November. The highest average snow depth is 48.4 cm in December.

Drilling can be conducted year round except during the period of May 15 to June 15 which is the calving season of the mountain caribou (BC Ministry of Environment Order U-7-003). Geological mapping and outcrop sampling can be conducted June to October when there is no snow on the ground.





Figure 3-1: Map showing the access to the Property from Fort St. James, BC.

The Property is covered with dense forest in the lower elevations. The dominant trees are sub-alpine fir, hybrid white spruce and paper birch. Minor Douglas fir and trembling aspen also occur. In addition, Whitebark Pine occurs in the Mt. Sydney Williams area. Typical understorey consists of sitka alder, Douglas maple and various berries. Some of the tree populations on the Property have been degraded by natural threats including blister rust and mountain pine beetle infestation.

### 3.3 Physiography

The Property is characterized by elevation changes from  $\sim$  700 m near Middle River to the peak of Mt. Sidney Williams (1986 m). Mt. Sidney Williams forms the centre of the Property. Sidney Creek forms a deep valley; the creek drains into Trembleur Lake.

#### 3.4 Infrastructure and Local Resources

Water is readily available from local streams, rivers and lakes. The nearest power line is located east of Middle River, immediately east of the claim block.

The population of Fort St. James is 2,278 people (Statistics Canada, <u>www.statcan.gc.ca</u>). Unskilled labour is readily available in the area.

Logging is ongoing in the general area and associated infrastructure, including logging roads, is present.

Discussion on potential tailings storage areas, potential waste disposal areas and potential processing tailings storage area for mining operations is not relevant to this project at this time.

### 4.0 HISTORY

Several companies completed exploration on the Decar Property (Table 4-1).

Company	Year	Exploration	Results
Geological Survey	1942	prospecting	found 9 chromite occurrences
of Canada		r from B	
D. Stelling	1974	rock chip sampling	Cr values between 0.2 % and 0.4 %; best result 0.72 %
Mountaineer Mines	1979	prospecting	found the "Van Decar Creek" deposit
Ltd.			*
		trenching, sampling	17.8 % Cr to 38.9 % Cr
Northgane	1982	airborne VLF-EM and	delineated 2 NW striking magnetic anomalies
Minerals Ltd.		magnetometer	
Lacana Mining	1987	rock, soil, silt and heavy mineral	Pt potential determined to be poor, Au-bearing soil
Corp./U.Mowat		sampling	anomalies were found
	1988	soil, silt rock sampling	soil sampling unsuccessful due to swampy conditions
		,	and overburden
		prospecting, mapping	silicified zones were identified to have elevated Au
		trenching	1.29  oz/t Au (=36.5  g/t)
Viceroy Resource	1990	mapping	map at a scale of 1:1,000
Corp./U.Mowat		7 1 111 1 4 4 11 205 2	
		/ drill holes totaling 305.3 m	elevated Au was found in serpentinized sections of the
Minnova Ina /II	1001	5 drill holes totaling 511 4 m	Au values below expectations: best Au value was 4010
Minnova nic./U. Mowat	1991	5 drift holes totalling 511.4 III	nph
Tervl Resources	1994	742.7 m of drilling	no mineralization intersected
Corp./U.Mowat	1771	, 12., in of anning	
U. Mowat	1996	geochemical and petrographic	awaruite was discovered
		analyses	
U. Mowat	1997	sampling and metallurgical testing	61 % of all samples contain 1500 to 1599 ppm Ni; Ni
			may be extracted economically
U. Mowat	1998	mapping, sampling	diorite in the West Peak area interpreted to host a gold-
	1000		bearing porphyry
U. Mowat	1999	mapping, sampling on Mid claims	listwanite and talc zones found
		metallurgical analysis on the 1994	150 mesh produces more elevated Ni values than 100

Table 4-1: List of companies that completed work on the Decar Property.



Company	Year	Exploration	Results
		drill hole pulps	mesh fraction
U. Mowat	2000	mapping, sampling of West Peak area	only weak sulfide mineralization found
U. Mowat	2002	sampling near Mt. Sidney Williams	results inconclusive
U. Mowat	2003	sampling on Mid claims	no mineralization found
U. Mowat	2004	soil sampling on One-Eye and Klone 1 claims	up to 2399 ppb Au detected
U. Mowat	2006	soil and rock sampling	soil sampling did not return significant values; rock samples contained up to 1731 ppm Ni and 927 pm Cr.
Noranda Exploration Company Ltd.	1989	prospecting and sampling near Baptiste Creek	no significant metal values were reported
Global Metals Ltd.	1994/1995	remote sensing on Green claims	satellite images used to plan drilling program
	1995	29 drill holes totaling 498.4 m	drilling delineated an estimated 2,800,000 kg of jade and tremolite
First Point Minerals Corp.	2007	rock sampling	average Ni grade of 60 samples was 0.21 % Ni
-	2008	rock and soil sampling	presence of awaruite confirmed
	2009	mapping, rock sampling at the Sidney, Baptiste and Van	Ni values ranged from 1142 to 2753 ppm
Cliffs Natural Resources/First Point Minerals Corp.	2010	Airborne magnetic and ground IP surveys	Magnetic anomalies were delineated; no correlation between IP response and awaruite mineralization was determined
eorp.	2011	Diamond drilling: 36 drill holes, 11,161 m; downhole rock property survey	Delineated mineralized zone
	2012	Diamond drilling: 34 drill holes, 16,494.75 m; downhole rock property survey	Estimated resource and completed Preliminary Economic Assessment

### 4.1 Geological Survey of Canada – 1942

During the summer of 1942, J.E. Armstrong and H.W. Little, of the Geological Survey of Canada, conducted prospecting and found several chromite deposits in the ultrabasic rocks of the Pauline Group area (Stelling, 1974). Nine chromite deposits were found in the dunites and peridotites exposed in the Middle River Range which lies southwest of the village of Middle River (Guinet, 1980).

### 4.2 Douglas Stelling – 1974

In August 1974, Douglas Stelling performed rock chip sampling and prospecting on claims #130968-130971, dubbed Pauline #1-4 (the Pauline Group), located at latitude 54° 54' and longitude 125° 23' which is about 2 miles (3.2km) east of Mount Sidney Williams and about 3 miles (4.8km) west of the Middle River. The assaying was done by Min-En Laboratories Ltd. Chromite disseminated in dunite returned assay values of 0.2% to 0.4%

Cr with a best assay result of 0.72%. A selected sample of dunite with massive chromite returned a value of 9.8% Cr (Stelling, 1974).

### 4.3 Mountaineer Mines Limited – 1979

From September to October 1979, Mountaineer Mines Ltd. conducted reconnaissance prospecting on the Cr 1-5 claims within the Omineca mining division, with the goal of establishing the location of chromite showings. A serpentinized peridotite-dunite batholith (the Trembleur intrusions) was found to underlie Mount Sydney Williams, with several serpentinized peridotite-dunite sills outcropping both Mount Sydney Williams and Tsitutl Mountain. The main zone, known as the Van Decar Creek deposit, is an irregular-shaped lens occurring at 3700 feet (1127.8m) and noted to be approximately 5 feet (1.5m) wide by 40 feet (12.1m) long. The main showing is 5 feet (1.5m) by 25 feet (7.6m) in area and contains at least 50% Cr. A hand trench was dug and sampled. Assays returned values from 17.8% Cr to 38.9% Cr. More prospecting was recommended to test the extent of the dunite bodies (Guinet, 1980).

### 4.4 Northgane Minerals Limited – 1982

On March 13, 1982, Western Geophysical Aero Data Ltd., on behalf of Northgane Minerals Ltd., conducted an airborne VLF-EM and magnetometer survey of approximately 310 line kilometers on the Cr 1 to Cr 6 claims in the Omineca mining division. The survey was performed to define boundaries of the ultrabasic rocks and identify trends for further chromite exploration. Two areas of magnetic highs were determined to be striking northwest, separated by a prominent northwest trending low. The highs were interpreted to be zones of ultrabasic rocks. Anomalies of very high magnetic intensity within the magnetic high zones were interpreted to be serpentinized phases (Pezzot and Vincent, 1982).

### 4.5 Ursula Mowat – 1987-2006

In **July, September, and October, 1987**, the Mount Sidney Williams area was explored by Lacana Mining Corporation under option agreement from Mowat. Rock, soil, silt, and heavy mineral samples were taken over the Van 1-2, Klone 1-2, and Mid claims. Klone 3-8 and One-Eye 1 claims were also staked at this time. The platinum potential of the property was determined to be very poor. Only one sample returned any Pt/Pd values (55/73ppb). Gold values up to 3780ppb were returned from a rusty-weathering listwanite. Quartz veins varying from 20cm to 3m in width returned low Au values of maximum 43ppb. Gold-bearing soil anomalies (up to 19,900ppb Au) and soils with high arsenic content were interpreted to indicate zones of auriferous listwanite that are overburden covered. Additional prospecting was recommended (Mowat, Jan.1988).

In **July to September 1988**, Lacana Mining Corporation, still under option agreement from Mowat, carried out an exploration program on the Klone Group and Van Group (~UTM 346103E, 6086085N). Line cutting, soil sampling, silt sampling, rock sampling, prospecting and mapping, and trenching were performed on the property. Some prospecting and soil sampling was also conducted on the Mid Claim. Silicified zones were found to have higher gold values. Soil geochemistry was determined to be misleading due to broken listwanite zones along with an overburden of swamp-like conditions and glacial outwash containing listwanite debris. Trench #1, located approximately 200 m northwest of Tear Drop Lake, is on a fault zone and returned values up to 1.29 oz/t (36.5g/t) Au and was recommended for extension (Mowat, Dec. 1988).

From **July to August 1990**, a mapping and drilling program was conducted on the Mount Sidney Williams property by the Viceroy Resource Corporation. Viceroy acted as the operator on the project and shared exploration expenditures with Channel Resources Ltd, who held the property under option from U. Mowat. Mapping concentrated in areas of known listwanite at a scale of 1:1000. Seven holes totaling 305.3m was drilled. Silicified zones, shear zones, listwanite, and some serpentinized sections of ultramafic were found to carry gold. The best value was found in a bleached section of norite in Hole 6 and returned 5830ppb Au. Future geophysical surveys were recommended (Mowat, 1990).

In **August 1991,** Minnova Inc. conducted a 511.4m, 5 hole, BQ drilling program on the Mount Sidney Williams property, which was 100% owned by U. Mowat. Overall, gold values returned were determined to be very low and most holes missed their target or failed to prove mineralization with depth. A best gold value returned was 4910 ppb in hole 3 (Mowat, 1991).

In **July 1994**, Teryl Resources Corp. conducted a program of drilling and minor soil sampling on the Mount Sidney Williams gold property, which was 100% owned by U. Mowat. Ten holes totalling 742.7m were drilled. The drilling failed to intersect any gold-bearing mineralization, but did reveal carbonate listwanite zones in the ultramafics and volcaniclastics, as well as numerous thrust faults. The drill program affirmed that geophysical readings are not reliable in this region. Thirty-one follow-up drill holes were recommended. A total of 58 soil samples were collected and analysed by ICP; no results were discussed. All soils were deemed residual (Mowat, 1994).

In **July 1996** First Point Minerals collected outcrop grab samples as well as core samples from previous drilling from the Mount Sidney Williams property in order to perform geochemical and petrographical analysis to assess the property prior to entering into an option agreement with Ursula Mowat. Results from these analyses revealed that nickel that had been previously discovered in rock and soil samples was from either disseminated awaruite or nickel-iron alloy rather than from nickel in silicates. Further testing was recommended to test the potential of a

large, low-grade nickel-cobalt-gold-chromite open pit deposit (Mowat, Jan. 1997). First Point optioned the property as a result of the 1996 sampling.

From **June to August 1997** Ursula Mowat and First Point Minerals Corporation conducted a sampling and metallurgical testing program on Mowat's Mount Sidney Williams Property in order to test the feasibility of an awaruite and/or nickel deposit. Ni values up to 2353 ppm were found in late stage dunites. The majority of samples taken (61%) fell between 1500 and 1599 ppm Ni. Awaruite was found to be present and metallurgical work performed on two samples by Process Research indicated that it may be processed by magnetic separation. The metallurgical tests included magnetic separation, gravity separation, and sulphuric acid leach tests (Mowat, Nov. 1997). First Point dropped the option in late 1997.

In **July 1998**, Ursula Mowat completed mapping and sampling in the West Peak and Baptiste Creek areas of the Mount Sidney Williams property. Sampling indicated that mineralized diorite in the West Peak area, an area located between approximately 400m and 5km west of West Lake, may host a gold-bearing porphyry. Silt samples also indicated several possible new locations for gold exploration. Thin section examinations revealed that not all silvery minerals in the area are awaruite, which, due to its malleable nature, is smeared in drill core and thus more dominantly visible. Other silvery minerals were hematite (and potentially magnetite; Mowat, 1998).

In **June 1999** Ursula Mowat commissioned mapping and sampling on the Mid claim. In **August 1999** rock samples were collected and analyzed throughout the Mount Sidney Williams property. Potentially economic listwanite and talc zones in the Mid claim were described. Drill core pulps from hole 94-10 of the 1994 drilling program were also re-analyzed to compare optimal grind size for Ni extraction. A finer grind of ~150 mesh size was determined to produce more elevated nickel values than the ~100 size fraction (Mowat, 1999).

During **August 2000** a previously unexplored area of the West Peak location was mapped and sampled on behalf of Mowat. Ultramafics sampled in the West Peak area were not prospective for Pt or Pd bearing mineralization. However, weak sulphide mineralization in the volcanics was weakly Pt and Pd bearing (Mowat, 2001).

In **August 2002**, rock samples were collected and analyzed from selected areas of the Mount Sidney Williams property by Ursula Mowat in order to try and locate the source of several geochemical anomalies outlined by previous sampling. Results were inconclusive (Mowat, 2002).

In **July 2003**, new clear cuts on the Mid claim and outcrops on the Klone 7 claim were examined and sampled by Mowat. Rock samples were analyzed for Au, Pt, and Pd. No mineralization of economic significance was revealed (Mowat, 2004).

In **September 2004** soil sampling was conducted on the One-Eye 1 (claim #239772) and Klone 1 (claim #239554) claims, west of Van Decar Creek and Mount Sidney Williams. Mowat was the operator of this program. Gold was found throughout the sampled area, from trace levels up to 2399 ppb Au on the Klone 1 claim (Mowat, 2005).

In **July 2006**, on behalf of Mowat, baseline and grid lines were established to assist in locating and mapping a quartz-carbonate-talc +/- mariposite zone mentioned in a thesis by H.W. Little in 1947. Soil and rock samples were also collected. Due to poor soil development and till, soil sampling returned no significant gold values. Rock samples returned values up to 1731 ppm Ni and 927 ppm Cr (Mowat, 2007).

### 4.6 Noranda Exploration Company Limited – 1989

In June 1989, Eric A. Shaede, with assistance from Noranda Exploration Company Ltd., staked and prospected a 20 unit claim over the Baptiste Creek canyon. None of the rock or silt samples collected contained any gold or base metals. Only one rock sample contained elevated arsenic (Shaede, 1990).

### 4.7 First Point – 2007-2010

In **August 2007** First Point conducted a field program of prospecting and rock sampling on the Decar Property in an effort to determine the economic potential for disseminated nickel-iron (Ni-Fe) alloy targets. Sixty rock samples were collected and analyzed with an average value of 0.21% Ni. The program was successful in locating ultramafic rocks with nickel grades potentially suitable for low grade bulk mineable targets (Voormeij and Bradshaw, 2008).

From **July to September 2008** First Point collected rock and soil samples from the Decar property. Nickel-iron alloy (awaruite) was confirmed to be present over wide areas of the property, with nickel content ranging from 68 to 85%. Metallurgical testing, mapping, sampling, magnetic surveys, and a drill program were recommended to follow up the extent and economic feasibility of the mineralization (Britten, 2009).

In **June and October 2009** bedrock mapping was completed and rock and sediment samples were collected by First Point under an option-joint venture with Cliffs Natural Resources. Rocks were analyzed with a Niton XRF analyzer. Nickel values ranged from 1142 to 2753 ppm over the Baptiste, Sidney, and Van Target areas. The best stream sediment sample returned 4791ppm Ni. Detailed metallurgical testing and geophysical surveys were recommended for future work (Britten, 2010).

In **2010**, First Point commissioned a ground induced polarization survey was completed on the Baptiste and Sidney targets by P. E. Walcott and Associates to differentiate coarse-grained from fine-grained awaruite. However, no correlation between IP response and awaruite mineralization was observed. (Britten and Rabb, 2010).

### 4.8 Cliffs Natural Resources Exploration Canada Inc. – 2010-2012

In 2010, Cliffs Natural Resources Exploration Canada Inc. commissioned a helicopter-borne magnetic gradiometer survey on the entire property. The survey was completed by Aeroquest International Ltd. A total of 1,638 line km at a line spacing of 150 km was flown. Several zone of strong magnetic response were delineated (Britten and Rabb, 2010).

In 2011, Cliffs completed diamond drilling program consisting of 36 drill holes totalling 11,465 m on the Property. Thirty five holes were drilled on the Baptiste project with the goal to estimate a resource at that prospect. One hole was drilled at the Target B area, ~5 km north of Baptiste. Peridotite in all holes was mineralized. In the south-west of Baptiste, the ore body is cut off by a fault, but it is open in all other directions including at depth.

In 2012, further 34 drill holes totalling 16,494.75 m were drilled. All holes were drilled in the Baptiste prospect area (on claims 575675, 575677, and 575684). The purpose of the 2012 drill holes was to increase the resource estimated based on the 2011 drilling (Ronacher et al., 2013).

Downhole geophysical rock property surveys were completed in selected boreholes in 2011 and 2012. Significant rock property contrasts were determined between the mineralized peridotite and barren, cross-cutting dykes. In addition, Acoustic and Optical Televiewer surveys obtained data on structural features and lithological contacts. This information was used to build a geological model for the purpose of estimating a mineral resource.

### 5.0 GEOLOGICAL SETTING AND MINERALIZATION

### 5.1 **Regional Geology**

The Decar Property is located in the Intermontane Belt of central British Columbia (Figure 5-1). The Intermontane Belt consists of sedimentary, mafic and ultramafic volcanic and plutonic rocks. The belt formed starting in the Early Jurassic when island arcs collided with the North American continent.

Decar is located within the Cache Creek Terrane (Figure 5-2) which consists of the Sitlika assemblage and the Cache Creek Complex (Figure 5-3). The Sitlika assemblage to the west of the property consists of two components: A Permian-Triassic volcanic unit, and an overlying Upper Triassic to Lower Jurassic clastic sedimentary unit (Schiarizza and MacIntyre, 1998). The Cache Creek Complex is a sequence of upper Paleozoic and lower Mesozoic oceanic rocks imbricated by a series of west-directed thrust faults occurring in Early to Middle Jurassic time (Schiarizza and MacIntyre, 1998). Schiarizza and MacIntyre (1998) define four lithotectonic units within the Cache Creek Complex. The Trembleur ultramafic unit and the overlying North Arm Succession are interpreted as mantle and crustal portions, respectively of an ophiolite sequence that is in thrust contact with the clastic sedimentary rocks of the Sitlika assemblage to the west. The eastern part of the complex consists of a succession of pelagic metasedimentary rocks in faulted contact with the ophiolite sequence to the west. These metasedimentary rocks are referred to as the phyllite-chert unit of the Cache Creek Complex. The eastern margin of the Cache Creek belt is made up of thick limestone units that are in stratigraphic and/or fault contact with the phyllite-chert unit.

Geological contacts are typically faulted or sheared by a combination of thrust faults formed during obduction of the Cache Creek and Stikine Terranes. These faults are later cross cut by right lateral strike slip shear along regional northwest trending faults such as the Pinchi Fault, east of the Decar Property. The regional northwest trending faults are later cross cut by northeast trending right lateral strike slip faults such as the Trembleur Lake Fault and the Tildesly Creek Fault (Britten and Rabb, 2011).





Figure 5-1: Regional geological map showing the location of the Decar Property in the Intermontane Belt of British Columbia.

### 5.2 Local Geology

The Decar claims occur within or are adjacent to the clastic sedimentary unit of the Sitlika assemblage and two of the litho-tectonic units of the Cache Creek Complex defined by Schiarizza and MacIntyre (1998). The two litho-tectonic units are the Trembleur ultramafic complex and the North Arm succession. The older Trembleur ultramafic unit lithologies are predominantly pyroxene-phyric peridotites (harzburgite), lesser fine grained ultramafics, and dunites. The dominant alteration types are serpentinization and carbonate-silicification with lesser talc-listwanite alteration. The Trembleur ultramafic unit is interpreted to be the mantle and lower crustal portion of an ophiolite sequence. The North Arm Succession lithologies consist of diabasic to gabbroic intrusives, cherts, limestones, phyllites, and diabase and hornblende-feldspar porphyry dikes. Alteration is

localized with zones of strong chlorite and epidote alteration with disseminated pyrite and quartz-carbonate veining. The North Arm succession is interpreted to be the crustal portion of the ophiolite sequence mentioned in the description of the Trembleur ultramafic unit. The clastic sedimentary unit of the Sitlika Assemblage consists of slate, siltstone, and sandstone. Bedding units are typically steeply dipping, likely folded, and are bound by fault contact with the older Trembleur ultramafic unit. The Trembleur Ultramafic unit and the North Arm Succession juxtapose one another and the older Trembleur unit overthrusts the younger North Arm Succession (Schiarizza and MacIntyre, 1998).



Figure 5-2: Decar Property shown on a terrane map.

### 5.3 **Property Geology**

The Trembleur ultramafic complex measures more than 15km northwest to southeast and is on average 5.5 km wide on the Decar property. The Trembleur ultramafic complex represents the oldest rocks on the Decar property; the predominant rock type of the complex is peridotite with minor dunite. The ultramafic complex is in

faulted contact with metavolcanic and sedimentary rocks of the Sitlika Assemblage. The faulted contact is inferred due to the absence of the upper portions of an idealized ophiolite sequence. Massive gabbro, likely coeval with the ophiolite sequence, intrudes the metavolcanics to the west of the claim block. Intrusions consisting of stocks and dykes vary in composition and are most likely younger than the ophiolite sequence (Schiarizza and MacIntyre, 1998). Rock type descriptions were compiled from Schiarizza and MacIntyre (1998), Britten and Rabb (2011) and logging by Caracle Creek.

### 5.3.1 Rock Types

**Peridotite:** Peridotite is dark green to black, varies from 10-40% medium grained pyroxene group minerals in a medium grained, relict olivine-rich matrix that is strongly serpentinized. The texture is generally massive with locally foliated textures and structural overprinting. Micro-fracturing, breccias, pseudo-breccias, and penetratively deformed (schistose) textures are also common features of the unit.

**Dunite:** Dunite occurs as pods, layers, breccia fragments, and boudinaged fragments within the peridotite. It is generally fine grained and featureless with the exception of shear zones where it is incorporated to form tectonic breccia with ductile boudinaged fragments within the more resistant ground mass. It typically occurs along the western margin of the Baptiste target area and the Mount Sidney Williams ridge. There are fragments of peridotite in pods of dunite and both can contain awaruite.

**Gabbro:** Gabbro occurs as fine to medium grained stocks and 5-10m wide dykes up to 50 m in length that trend northeast to east in the southern end of the Decar claims. Stocks measure  $\sim$ 100 m in length and are elongated to the west and northwest. The texture is typically massive; the gabbros are interpreted to be a layer of the ophiolite sequence between the peridotite and the metavolcanic rocks.

**Metavolcanic rocks:** The metavolcanic rocks consist of basalts, crystal-ash tuff, and rare trachyte. The basalts are generally featureless with variable chlorite and local epidote alteration and are massive to brecciated in texture. The metavolcanic rocks mostly occur as two panels along the southwestern edge of the Baptiste target, and in the central portion of the Decar Property northeast of the Sidney target. The southwestern panel is relatively continuous and approximately 700m thick. It consists of sedimentary rocks (described below) in addition to the metavolcanic rocks and is in fault contact with the ultramafic rocks. The metavolcanic rocks northeast of the Sidney target have a more dismembered character than the southern panel and are poorly exposed at the surface. The metavolcanic rocks generally do not contain magnetite.

**Mudstone:** Mudstones or phyllites occur as thin beds dipping 60° to the southwest and are approximately 100 m thick on average. Minor chert and rare limestone are also associated with the phyllite. This unit is structurally up

section of the metavolcanic rocks west of the Baptise target. In the panel north of the Sidney target, sedimentary rocks are mostly black phyllite and mudstone with minor tuff and dip vertically on the southwest part of the panel.



Figure 5-3: Property geology map (modified from McIntyre and Schiarizza, 1998).

**Phyllite:** A thinly bedded unit of significant thickness composed of phyllite, slate, and mudstone is in fault contact to the southwest of the two metavolcanic panels (described above) due to a major northwest trending fault. These sedimentary units are considered to be part of the Sitlika Assemblage. The bedding of the clastic sediment facies is at 75° to the southwest with tight folding structures locally.

**Intermediate Intrusions:** A medium grained feldspar porphyry stock intrudes Fe-carbonate altered ultramafics in the southwest area of the property. The intrusion is too small to be shown on Figure 5-3. The stock is approximately 600 m long, trends to the east and forms a topographic high. Alteration is sericite-chlorite-Fe carbonate-calcite with Fe-oxide staining and sulphides in the intrusion and the peridotite country rock. Several

smaller dykes and other irregular intrusions typically trend northwest and west and are spatially associated with intense pervasive Fe-carbonate-silicification which is magnetite destructive in the peridotites.

**Overburden:** The Decar Property is covered by large sections of overburden including: talus, scree, glacial till, glacial fluvial, glacial lacustrine, alluvial, and other general surface cover.

### 5.3.2 Structure

The ultramafic rocks appear to have undergone multiple breakage and brecciation events prior to and during serpentinization. Cross-cutting microveinlets are abundant. At the outcrop level these relationships are not discernible according to Britten and Rabb (2011). Post alteration faults and shear zones are marked by brittle features such as slickensides, gouge, fault breccia, and shear fabrics. Two major fault zones as indicated by northwest trending, sub vertical structures were delineated where the southernmost fault makes up the boundary between the peridotite of the east Baptiste target and the metavolcanics in the west Baptiste target. Foliations within the ultramafic rocks dip sub vertical and trend to the northwest with broad zones that are thought to mimic diffuse faults or shear zone. Strong schistosity and shear fabrics present in the phyllite unit and the ultramafics on the southwest side of the property suggest a fault contact (Britten and Rabb, 2011).

Cumulate layers observed in the peridotite are typically small, rare, and discontinuous in nature. Dips are variable with several sub-vertical attitudes and azimuths varying from north to northeast. Britten and Rabb (2011) suggests that the deformation could be related to a northerly trending fold axis but note that there is no indication of similar deformation events in overlying metavolcanic panels. The metavolcanic rocks may represent a lithological unconformity that was underthrust by the Trembleur ultramafic and later translated (Britten and Rabb, 2011).

### 5.3.3 Alteration

The two major alteration types of the peridotites on the Decar property are serpentinization and Fe carbonate alteration/silicification. The peridotites on the Property are serpentinized to varying degrees; however, there are several parts of the Property that have not been explored within the northwest portion. Serpentinization of the peridotites consists of chrysotile, lizardite, and secondary magnetite as well as minor brucite, awaruite and chromite with trace amounts of pentlandite and heazlewoodite where mostly olivine has been altered in the peridotites and dunites. Rare, discontinuous crack-seal carbonate micro-veinlets are later stage than all serpentinization-possibly indicative of subsiding metasomatism and brittle deformation (Britten and Rabb, 2011). Pyroxenes are partially to completely altered to serpentine or tremolite and magnetite with minor brucite (Britten and Rabb, 2011).

Several small sericite+chlorite+Fe-Mg carbonate(s)+magnetite±sulphides (primarily pyrite) altered feldsparporphyry intrusions are spatially associated with an alteration assemblage of Fe-carbonate-silica in the southeast part of the property. This area is dominated by Fe-Mg carbonate alteration with a strong Fe-staining caused by weathering of Fe carbonate alteration. North to northeast trending, moderately east dipping, later stage en echelon quartz veins cross-cut alteration zones in the western end of the feldspar-porphyry intrusion. Listwanite dominates locally with pyrite and rare chalcopyrite associated with this alteration assemblage (Britten and Rabb, 2011).

#### **Mineralization** 5.4

The mineralization consists of the nickel-iron alloy awaruite ( $Ni_{2,3}Fe$ ). Awaruite is pervasively disseminated in serpentinized peridotite; it occurs as relatively coarse grains between <50 to 400  $\mu$ m in size. Awaruite has been observed throughout the entire extent of the peridotite but four zones of stronger mineralization have been delineated. The four zones are the Baptiste, Sidney, Target B and the Van prospects (Figure 5-3). The mineralization formed during serpentinization as a result of the break-down of nickeliferous olivine and the formation of the nickel-iron alloy. The high-grade mineralization appears to trend NW-SE, parallel to a major fault.

The largest target on the Decar Property is the Baptiste prospect. The currently known length of continuous mineralization at the Baptiste prospect is  $\sim 3$  km in the east-west direction and the approximate width is between 600 m and 1.5 km. The depth of the mineralization at Baptiste has not been determined to date because several drill holes end in mineralization. Most 2011 drill holes were 300 m deep and most 2012 holes were 600 m deep. A fault forms the edge of the mineralized zone in the southwest. Lower grade mineralization exists in the north and northwest but the mineralization is open in the south-east.

Caracle Creek estimated a mineral resource for the Baptiste prospect (Ronacher et al., 2013; Table 5-1).

1	able 5-1: Resource esti	mated for the Baptiste pr	ospect (Ronacher et al., 2	2013)
	<b>Resource</b> Category	Quantity (Tonnes) <sup>2</sup>	Grade DTR <sup>3</sup> Ni (%)	Contained Ni (Tonnes)
	Indicated	1,159,510,000	0.124	1,437,800
	Inferred	870,400,000	0.125	1,088,000

-----1 00100

<sup>1</sup> Reported at a cut-off grade of 0.06 DTR Ni %. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

Tonnes have been rounded to the nearest 10,000. Grade has been rounded to three (3) significant digits.

The mineral resources were also constrained with a whittle pit.

 $^{3}$ DTR Ni is Ni that can be separated by magnetic techniques, e.g. Davis tube analysis. DTR Ni is hosted by awaruite, Ni<sub>2-3</sub>Fe

The length, width, depth and continuity of the mineralization at Target B, Sidney and Van have not been determined to date.

Significant portions of all three target areas are occluded by surficial overburden (Britten, 2011).

### 6.0 **DEPOSIT TYPES**

The ore mineral at Decar is the Ni-Fe alloy awaruite (Ni<sub>2</sub>Fe to Ni<sub>3</sub>Fe). Awaruite is hosted by serpentinized peridotite. The mineral forms during serpentinization of peridotite whereby nickeliferous olivine is altered to serpentine minerals and awaruite (+magnetite) under conditions of low oxygen fugacity (Frost, 1985).

Terrestrial awaruite was first described from the west coast of the South Island of New Zealand where it was found in heavy black sand (Ulrich, 1980). It occurs in peridotites in several locations worldwide, including the Dumont nickel deposit, Quebec (Staples et al., 2011). At the Dumont deposit, awaruite occurs as grains of < 1mm; awaruite is spatially associated with magnetite and chromite blebs and occurs where serpentinization is near complete (Staples et al., 2011). Although sulfides are abundant in the Dumont deposit, there are zones where only the Ni-alloy is present.

### 7.0 LIDAR SURVEY

A LiDAR (Light Detection and Ranging) survey was completed by Terra Remote Sensing Inc. ("Terra Remote") of Sidney, British Columbia. The field portion of the survey was executed on July 10, 12 and 17, 2012. Subsequent to the data collection in the field, data processing was completed in the fall of 2012. The final results were delivered in January 2013. The purpose of the survey was to obtain accurate elevation data of the property; a digital orthophoto for the Decar property was also taken.

A Piper Navajo fixed-wing aircraft equipped with a combined GPS/INS (Global Positioning System/Inertial Navigation System) for aircraft attitude and position was used to fly the survey. The aircraft base was in Burns Lake, BC, ~80 km southwest of Decar. The aircraft covered a total of 388.66 km<sup>2</sup>. The aircraft flew in lines which were laid out according to terrane, weather during the survey and LiDAR shadow issues associated with steep slopes. A total of a 703 lines spaced approximately 700 m were flown. Survey parameters are listed in Table 7-1. Figure 7-1 shows the orthophoto as collected by Terra Remote.

The survey was completed on all claims except 895909 and 895910.



Table 7-1	: LiDAR	survey	parameters.
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Average flying height	1150 m above ground level
Average flying speed	234 km/hour
Pulse repetition frequency	100 kHz
Swath speed	34 times/second
Average point density <sup>1</sup>	1 point/m <sup>2</sup>

The accuracy of the LiDAR points is better than  $\pm$  20cm on hard surfaces. The LiDAR point density is  $\geq$  1 point/m<sup>2</sup>. The LiDAR points were converted to 1 m contours; LiDAR contours are not smoothed like cartographic contours. Therefore, they are more accurate. The resolution of the digital orthophoto is 15 cm/pixel.

Post-survey processing included running various algorithms on the data to clean the data from atmospheric noise (moisture, aerosols, etc.) and to define the bare earth surface.

### 7.1 **Quality Control**

Calibration flights were conducted at the Burns Lake regional airport (YPZ). These flights were performed immediately after the completion of the project acquisition and consisted of two opposing flight lines along the runway and two perpendicular flight lines in relation to the runway. The pattern allowed Terra Remote to calibrate the system and solve for roll, pitch, and heading and validate the system accuracy.

Four ground control points in the project area and one ground control point in the calibration area were collected by Terra Remote's ground survey team using a Bell 206B helicopter stationed at the Decar camp. The points were in an area that was free of obstruction above the elevation mask and of features that could contribute errors associated with multipath; the areas were also on a hard surface, so that LiDAR-derived elevations could be checked for accuracy. The points used concurrent observations from BC Active Control Station (BCACS) located in Prince George (BCPG), BC (Table 7-2).

Station Name	Easting (m)	Northing (m)	Known Elevation (m)	Laser Elevation (m)	Difference (know-laser elevation)
1011	340921.595	6086219.704	1778.568	1778.650	0.082
4009(2)	355703.735	6091410.097	729.924	729.740	-0.184
BASE	349289.383	6079744.162	1029.428	1029.320	-0.108
4009	348955.800	6083221.358	992.189	991.880	-0.309

 Table 7-2: Results of the LiDAR quality control using ground check points

Further technical details are provided in Appendix 3.



### 7.2 **Results**

The LiDAR elevation data are provided in Appendix 4 (digital). The orthophoto is shown in Figure 7-1. In Appendix (digital) the orthophoto is also provided at a scale of 1:10,000.



Figure 7-1: Orthophoto taken during the LiDAR survey.

### **8.0 INTERPRETATION AND CONCLUSIONS**

The Decar Nickel Property consists of 60 mineral claims and is located ~90 km northwest of Fort St. James, British Columbia, Canada. Cliffs and First Point are parties to an option agreement and effective as of September 12, 2011, Cliffs owns 60 % interest in the Decar Property.

Nickel is hosted by ultramafic rocks of the Cache Creek Terrane. The nickel alloy awaruite (Ni<sub>2-3</sub>Fe) was first reported in the Decar peridotites in the 1990s. Awaruite forms during serpentinization of the peridotite.

The LiDAR survey provided accurate topographic information which was required for geological interpretations and to produce an accurate geological model of the mineralized zones. The orthophoto helps with planning future geological activities at Decar.

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Appendix 1

**Certificates of Qualified Persons** 

#### Elisabeth Ronacher

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#### **CERTIFICATE OF QUALIFIED PERSON**

I, Elisabeth Ronacher, do hereby certify that:

- 1. I am employed as Managing Geologist for the geological consulting firm of Caracle Creek International Consulting Inc. Canada ("Caracle Creek").
- 2. I am responsible for the Assessment Report titled "Assessment Report LiDAR Survey, Decar Nickel Property, British Columbia, Canada" dated May 15, 2013 and prepared for Cliffs Natural Resources Exploration Canada Inc.
- 3. I hold the following academic qualifications: M.Sc. Geology (1997), University of Vienna, Vienna, Austria; Ph.D. Geology (2002), University of Alberta, Edmonton, Canada.
- 4. I am a member in good standing of the Association of Professional Geologists of Ontario (APGO), member # 1476, the Association of Professional Engineers and Geoscientists of British Columbia, member # 37651, the Society of Economic Geologists (SEG) and the Society for Geology Applied to Mineral Deposits (SGA).
- 5. I have worked on exploration projects worldwide (including Canada, Mongolia, China, Austria) and have worked on Au, Cu, base metal, Cu-Ni PGE and U deposits since 2003.
- 6. I visited the Property on October 5 and 6, 2011 and on September 12 and 13, 2012.
- 7. As of the date of this certificate, to the best of my knowledge, information and belief, this assessment report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 15<sup>th</sup> Day of May, 2013

Ambeth Romocher

Elisabeth Ronacher, Ph.D., P.Geo. Managing Geologist, Caracle Creek Canada

Appendix 2

Claim Map



Appendix 3

**Lidar Report** 



**Data Acquisition Report** 

# Aerial Survey – LiDAR Central BC

Prepared for:

**Caracle Creek International Consulting** 

Submitted by:

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January 18, 2013

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## APPENDIX A – GEO BC BCACS REPORT



### CONTACT AND BUSINESS INFORMATION

## **Primary Contacts**

Terra Remote Sensing Inc. 1962 Mills Road Sidney, B.C. V8L 5Y3 (250) 656-0931 www.terraremote.com

### Primary contact for contract and project execution:

Taylor Davis 1-800-814-4212 taylor.davis@terraremote.com

### **Business Information**

Firm Name:	Terra Remote Sensing, Inc.
Legal Entity:	Terra Remote Sensing, Inc.
Business Address:	1962 Mills Road, Sidney, B.C.
Phone:	250-656-0931
Fax Number:	250-656-4604
Website:	www.terraremote.com
Location of Offices:	Sidney -BC, Bellevue -WA, Valparaiso -Chile
Approx. # of Employees:	70
No. of years in business:	12, Terra Remote Sensing, Inc.



### **OVERVIEW**

### Introduction

On July 10<sup>th,</sup> 12<sup>th</sup>, and 17<sup>th</sup>, 2012, TRSI with a total of 3 crew members (ground surveyor, flight system operator and pilot) collected LiDAR and orthophotography over the "Decar" project site at central BC close to Burns Lake using a combined GPS/INS System (Inertial Navigation System) for aircraft attitude and position as well as laser range data to obtain spatial surface data. A total of 388.66 km<sup>2</sup> was covered on this mission (see Figure 1 in Project area section).

Calibration flights were conducted at the Burns Lake regional airport (YPZ) in BC, Canada. These flights were performed immediately after the completion of the project acquisition, which consisted of multiple opposing flight lines along the runway and multiple perpendicular flight lines in relation to the runway. This pattern allows us to calibrate our system and solve for roll, pitch, and heading and validate system accuracy.

A Canadian Helicopter's Bell 206B was used to ferry the ground survey team to the project site and back to the Burns Lake airport for nightly data checks for data integrity, completeness and coverage. Following each day of data collection, the ground control data was combined with the Internal Measurement Unit (IMU) and LiDAR data from the airborne data to generate a solution to verify that an acceptable relative and absolute accuracy were achieved. In addition, the data coverage achieved during each day of acquisition was used to plan the flights for the following day.



## **Project Area**

The project area acquired is depicted in Figure 1 below.

### Caracle Creek International Consulting - Central BC UTM NAD83 Zone 10 Total Area: 388.66 km<sup>2</sup>



Figure 1: Project Area

2



### PROJECT SPECIFICATION

Site Size: 388.66 km<sup>2</sup> Projection: UTM Zone 10 Datum: NAD 83 CSRS Geoid: HT 2.0

### Accuracy:

- LiDAR Points: a relative accuracy of +/-15 cm and absolute accuracy of 20 cm
- Orthophoto: 15 cm pixel digital color orthophoto mosaics.

### Point Cloud Density:

This project was flown to achieve approximately 2 points per square meter shot density. Taking random samples throughout the project area, the average point density for a single flight line is 1  $pts/m^2$ . Due to the fact that overlapping flight lines covers the majority of the area, the point density averages closer to 2  $pts/m^2$ .

### Control:

- Four static control points with photo targets within the project area to validate aerial data
- One static control point with photo target in the calibration area (Burns Lake regional airport)

### DATA CHECKS AND ACCURACY VERIFICATION

A total of four control points were positioned in the project area over three days. All four were targeted so that horizontal positioning could be verified. The location of each site was chosen based on the requirement that the points had to be in an area that was free of obstruction above the elevation mask, free of features that could contribute errors associated with multipath and on a relatively hard flat surface so that the LiDAR-derived elevations could be checked for accuracy. All of these requirements were met during the positioning of BASE, 1011, 4009 AND 4009(2). These points used concurrent observations from BC Active Control Station (BCACS) located in Prince George (BCPG), BC. All static stations were geo-referenced to NAD83 (CSRS) 4.0.0.BC.1/CGVD28. Table 1 illustrates the comparison of elevations obtained from the LiDAR-derived EDM with independently positioned point. Figure 2a - 2d illustrates locations of these base stations and their photo targets.

Stations	Easting (m)	Northing (m)	Known Z (m)	Laser Z (m)	Dz (m)	STATISTIC	RESULT (m)
1011	340921.595	6086219.704	1778.568	1778.65	0.082	Average dz	-0.13
4009(2)	355703.735	6091410.097	729.924	729.74	-0.184	Minimum dz	-0.309
BASE	349289.383	6079744.162	1029.428	1029.32	-0.108	Maximum dz	0.082
4009	348955.8	6083221.358	992.189	991.88	-0.309	Average magnitude	0.171
						Root mean square	0.192
						Std deviation	0.164

 Table 1 - Vertical control report comparing elevation from LiDAR-derived DEM and static points



STATION	1011
DATE OF SURVEY	July 10th, 2012
SURVEYOR	Y. Jiao
HORIZONTAL DATUM	NAD83CSRS
VERTICAL DATUM	CGVD28
GEOID	HTv2.0
PROJECTION	UTMz10 North
LINEAR UNIT	meters
EPOCH	2002.00
LATITUDE (+/-D M S)	54 53 51.51877
LONGITUDE (+/-D M S)	-125 28 50.78793
ELLIPSOIDAL HEIGHT (m)	1768.991
EASTING	340921.595
NORTHING	6086219.704
ELEVATION (m)	1778.568



Figure 2a: GPS Control Station 1011

STATION	4009(2)	under an
DATE OF SURVEY	July 10th, 2012	and a stand of the st
SURVEYOR	Y. Jiao	
HORIZONTAL DATUM	NAD83CSRS	
VERTICAL DATUM	CGVD28	
GEOID	HTv2.0	
PROJECTION	UTMz10 North	
LINEAR UNIT	meters	
EPOCH	2002.00	
LATITUDE (+/-D M S)	54 56 55.45581	
LONGITUDE (+/-D M S)	-125 15 11.03133	The second secon
ELLIPSOIDAL HEIGHT (m)	719.768	
EASTING	355703.735	
NORTHING	6091410.097	
ELEVATION	729.924	

Figure 2b: GPS Control Station 4009(2)



STATION	BASE	
DATE OF SURVEY	July 10th-13th, 2012	
SURVEYOR	Y. Jiao	
HORIZONTAL DATUM	NAD83CSRS	
VERTICAL DATUM	CGVD28	
GEOID	HTv2.0	
PROJECTION	UTMz10 North	
LINEAR UNIT	meters	
EPOCH	2002.00	
LATITUDE (+/-D M S)	54 50 31.53423	
LONGITUDE (+/-D M S)	-125 20 49.29035	
ELLIPSOIDAL HEIGHT (m)	1019.360	
EASTING	349289.383	
NORTHING	6079744.162	
ELEVATION (m)	1029.428	

Figure 2c: GPS Control Station BASE

STATION	4009
DATE OF SURVEY	July 12th, 2012
SURVEYOR	Y. Jiao
HORIZONTAL DATUM	NAD83CSRS
VERTICAL DATUM	CGVD28
GEOID	HTv2.0
PROJECTION	UTMz10 North
LINEAR UNIT	meters
EPOCH	2002.00
LATITUDE (+/-D M S)	54 52 23.57140
LONGITUDE (+/-D M S)	-125 21 14.52140
ELLIPSOIDAL HEIGHT (m)	982.244
EASTING	348955.800
NORTHING	6083221.358
ELEVATION (m)	992.189

Figure 2d: GPS Control Station 4009



## **PROJECT COMPLETION AND DATA GAPS**

Due to weather and time constraints, several small data gaps exist within the project boundary. Figure 2 below indicates the approximate size and location of the missing areas. Please refer to the client index for accurate size and locations for these polygons.



Figure 2: Data Voids

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## Appendix A: GEO BC BCACS Report

GeoBC						
BRITISH	COLUMBIA	ACTIVE	CONTROL	SYSTEM		

GPS ACTIVE CONTROL POINT as of 2012/05/02

STATION:BCPGGEODETIC MARK:106526'ULL NAME:BCACS - Prince George ACPCLASS:BCACS PrimaryJOCATION:Prince George, B.C., Canada				
Installed on 2m alumi	nium pillar on the roof of City Works building at 18 Ave & Ospika Blvd			
- 2006/08/24 MARKER COORDINATES:	Latitude 53 54 29.24580 N Longitude 122 47 46.36966 W Ellipsoid Height 601.845 Orthometric Height 614.965			
GEODETIC ATTRIBUTES:	Datum/Ellipsoid = NAD83(CSRS) 4.0.0.BC.1 Geoid Model = HTV2.0 N = $-13.12$ xi = $-0.78$ s eta = $6.31$ s			
- 2006/04/07 MARKER COORDINATES: - Preliminary	Latitude 53 54 29.229 N Longitude 122 47 46.325 W Ellipsoid Height 604.5 Orthometric Height 691.5			
GEODETIC ATTRIBUTES: Geoid N = xi = eta =	Datum/Ellipsoid = NAD83/WGS 84 Model = HT2.0 -13.119			
REFERENCE NETWORKS: Inner:				
Outer:				
COLLOCATION TIES: - nil				

ANTENNA HEIGHT: > vertical distance measured to antenna reference point

- 2006/04/07	03:00UT	0.000m
GPS RECEIVER:		
- 2006/12/04 - 2006/04/07	22:00UT 03:00UT	Leica GRX1200 PRO GG s/n 351093 Leica SR530 s/n# 82195
FIRMWARE:		
<pre>- 2012/05/02 - 2011/09/12 - 2011/02/22 - 2010/09/08 - 2010/05/05 - 2009/05/05 - 2008/10/31 - 2008/02/26 - 2007/03/06 - 2006/04/07</pre>	17:26UT 15:55UT 15:40UT 14:45UT 18:30UT 14:00UT 15:00UT 16:30UT 16:09UT 03:00UT	Firmware 8.15 / ME 3.019 Firmware 8.20 / ME 3.019 Firmware 8.10 / ME 3.019 Firmware 8.0 Firmware 7.80 Firmware 7.50 Firmware 6.00 Firmware 5.62 Firmware 5.10 Firmware ver. 5.00
ANTENNA (diagra	um below):	
- 2006/12/04	22:00UT	Leica Choke Ring - GLONASS with LEIS Dome
- 2006/04/07	03:00UT	SN 200012 (LEIAIS04GG LEIS) Leica Choke Ring with LEIS Dome sn# 103106
ANTENNA CABLE: - 2006/04/07	03:00UT	
CLOCK: - 2006/04/07	03:00UT	GPS Receiver Internal Clock
COMPUTER HARDWA	ARE:	
- 2006/04/07	03:00UT	N/A
MODEMS:		
- 2006/12/04 - 2006/04/07	N/A Lantronix	MSS100
UNINTERUPTABLE - 2006/04/07	POWER SUPPLY: 03:00UT	:

#### STATUS:

AGENCY: GeoBC Prince of British Columbia CONTACT: Vern Vogt P. Eng. Province of British Columbia GeoBC 3400 Davidson Ave. Victoria, BC, Canada V8Z 3P8 Tel: (250) 952-6571 Fax: (250) 952-4188 email: vern.vogt@gov.bc.ca

#### ANTENNA DIAGRAM:

2006/12/04	DM T Style Leica Choke Ring	g with Leica dome(LEIAT504GG LEIS)
	 Phase Center + \ 	< 0.1159 L2 < 0.0854 L1
+	Antenna	+   
+	+======   =====+	+ <0.0000 ARP &
	Aluminum Pillar	Marker

Operational



ARP ... Antenna Reference Point BCACS ... British Columbia Active Control System NAD83(CSRS) ... North American Datum 1983 Canadian Spatial Reference System WGS84 ... World Geodetic System 1984 Appendix 4

Lidar Data

(digital: provided on DVD, approx. data volume: 10 GB)

Appendix 5

**Orthophoto (1:10,000)** 

(digital: provided on DVD)