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## ALBANY PROJECT – BLOCK 4F Graphite Deposit - 2013 Drill Program Assessment Report

Porcupine Mining District, Ontario Pitopiko River, Feagan Lake Areas NTS: 42K/01,02, 42F/15,16



August 10, 2015

Glenda Carey, B.Sc.

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#### 1.0 Summary

Zenyatta Ventures Limited's ("Zenyatta") Albany Graphite deposit is a unique hydrothermal graphite deposit situated within two near surface breccia pipes intruding host syenitic country rock. The deposit is within Zenyatta's Block 4F claim block, located in the James Bay Lowlands region of northwestern Ontario, Canada (Figures 1 and 2). Block 4F is presently part of Zenyatta's group of six Albany claim blocks which also includes Blocks 1C, 2C, 4A, 4B and 4E (Figure 2). The claim blocks are all located within in the Porcupine Mining District of the province of Ontario. Albany Block 4F is presently held 100% by Zenyatta.

Previously in 2010, Zenyatta contracted Geotech Limited to conduct an airborne magnetic and electromagnetic (VTEM) geophysical survey on the entire Albany Project claim blocks. Results of the airborne survey outlined several magnetic and electromagnetic geophysical targets that prompted Zenyatta's 2011 and 2012 drilling programs. In the fall of 2011, Zenyatta drilled one hole (Z11-4F1) targeting a strong VTEM conductor. The conductor was intersected by this first drill hole and was explained by the presence of several *graphite mineralized breccia* zones. In 2011, graphite increased in value due to a higher amount of technical demands for graphite; therefore, in 2012, Zenyatta continued with additional exploration drilling (Phase II) on the graphitic breccia zones and drilled eight more holes, Z12-4F2 to Z12-4F9.

Historical government mapping in the area included work done by Ontario Geological Survey (OGS) geologist Greg Stott. He interpreted the region's Precambrian geology (Stott et. al., 2007) based on government airborne geophysical surveys and limited geological data from exploratory diamond drilling conducted in the area. Stott grouped the Precambrian basement rocks into separate terranes and basins. Claim Block 4F overlies the boundary between the "Quetico Basins" in the south and the "Marmion Terrane" rocks in the north section of the block. Historical company exploration in Block 4F area has been limited. Documented assessment work from the Ministry of Northern Development and Mines (MNDM) includes ground geophysical surveys conducted by Nagagami River Prospecting in 1959, airborne and ground magnetometer surveys, and diamond drilling carried out in the 1960s by Algoma and in 1978 by Shell Canada.

Based on the research conducted to date by Dr. Andrew Conly (Lakehead University, Thunder Bay) it appears that the graphite was deposited hydrothermally and was related to the ascent of a  $CO_2$ -rich magma. The deposit is a unique example of an epigenetic graphite deposit in which

a large volume of highly crystalline, fluid-deposited graphite occurs within an igneous host. The deposit is interpreted as a vent pipe breccia that formed from CO<sub>2</sub>-rich fluids that evolved due to pressure-related degassing of syenites of the Albany Alkalic Complex. Petrography indicates that the graphite-hosting breccias range in composition from diorite to granite. Graphite occurs both in the matrix, as disseminated crystals, clotted to radiating crystal aggregates and veins and along crystal boundaries, and as small veins within the breccia fragments.

The 2013 Phase III drill program included drilling an additional 48 NQ drill holes (Z13-4F10 to 4F57) and 6 HQ drill holes (Z13-4FM01 to 4FM06) all of which targeted graphitic zones within the two adjacent igneous-related breccia pipes. From March 26, 2013 to November 6, 2013 Zenyatta completed 54 holes (27 on each breccia pipe) for a total of 22,463 m.

Every drill hole intersected significant graphite mineralized breccia zones. The drilling program was required to prepare an NI 43-101 compliant **Mineral Resource Estimate** which was contracted to RPA Inc., of Toronto, Ontario. RPA estimated the *Indicated Mineral Resources* to total *25.1 Mt* at a grade of 3.89% Cg and to contain *977,000t Cg;* and *Inferred Mineral Resources* total *20.1 Mt* at a grade of 2.20% Cg, containing *441,000t Cg.* 

Results of the Phase III drilling program were successful in defining a robust graphite mineral deposit. Some of the significant, higher grade graphitic carbon intersections include the following zones (weighted averages):

- 5.06% Cg over 360 m in Z13-4F10
- 4.47% Cg over 219 m in Z13-4F13
- 5.51% Cg over 128 m in Z13-4F20
- 6.94% Cg over 115 m in Z13-4F28
- 5.21% Cg over 86 m in Z13-4F36
- 7.44% Cg over 117 m in Z13-4F43
- 6.75% Cg over 218 m in Z13-4F45
- 5.36% Cg over 260 m in Z13-4FM03

### 2.0 Introduction

In 2013, Zenyatta Ventures Limited ("Zenyatta") initiated a Phase III detailed diamond drilling program to test additional graphite mineralized zones hosted by both the East and West breccia pipes and included a total of 48 NQ diamond drill holes (Z13-4F10 to Z13-4F57) and 6 HQ (Z13-4FM01 to Z13-4F06) metallurgical drill holes. Each drill hole target is briefly described in Table 1. This extensive drill program was carried out to evaluate the inferred and indicated graphite resource estimates necessary to fulfill the requirements for a NI43-101 Resource Estimate Technical Report. The NI43-101 Technical Report was prepared by an independent company, RPA Inc. (RPA) and conforms to NI43-101 Standards of Disclosure for Mineral Projects. This report is available for public viewing on the SEDAR and Zenyatta websites.

Previously in 2011, Zenyatta initiated the Block 4F, Phase I exploration drill program which included one diamond drill hole, Z11-4F1. This hole was drilled into a strong electromagnetic (EM) anomaly located west of the Nagagami River. Drill hole Z11-4F1 (discovery hole) intersected several zones of *highly conductive graphitic brecciated granitic to syenitic gneiss*, explaining the strong EM anomaly. In 2012, Zenyatta initiated a Phase II drill program to continue exploration for graphite mineralization and drilled eight additional holes (Z12-4F2 to Z12-4F9) targeting graphite brecciated zones. Results from the 2013 drill program showed extensive graphite mineralized zones up to 440 metres downhole (Z13-4FM03).

In 2012 and 2013, bench scale metallurgical tests on the mineralized samples indicated that the graphite can be concentrated to 99.9% purity. Zenyatta believes that this high-purity product will command higher prices and is aiming to compete in the high-purity synthetic graphite market. The 2013 drilling program demonstrated that a large volume of graphite exists hosted within the two breccia pipes. The independent RPA study reported estimates of *Indicated* Mineral Resources totaling 25.1 million tonnes (Mt) at an average grade of 3.89% graphitic carbon (Cg), containing 977,000 tonnes of Cg. *Inferred* mineral resources are estimated to total 20.1 Mt at an average grade of 2.20% Cg, containing 441,000 tonnes of Cg (RPA, 2014).

# Table 1: Block 4F 2013 Phase III Drill Targets

Drill Hole ID	Date	Target Description			
Z13-4F10	March 26 – 30	The purpose of this drill hole was to test the diameter of the East Pipe on the 4F property.			
Z13-4F11	March 30 - April 08	Z13-4F11 was collared to the north of hole Z13-4F10 to test the graphitic breck mineralization intersected by Z13-4F10 at depth.			
Z13-4F12	April 09 – 14	Collared to the northeast of the East Pipe. The purpose of this drill hole was to test the East Pipe from the northeast.			
Z13-4F13	April 14 – 22	Drilled from the eastern flank of the same breccia pipe to intersect the breccia at a vertical depth of 150 m from the surface.			
Z13-4F14	April 23 - May 03	This drill hole intersected two graphite mineralized breccia zones with minor intervals of graphite overprinted syenite which have also been intruded by later unmineralized mafic to intermediate dykes.			
Z13-4F15	May 04 - 08	The purpose of this hole was to test the East Pipe at depth from the southwest.			
Z13-4F16	May 09 - 16	This hole was collared approximately 100 metres behind hole Z13-4F12. The purpose of this hole was to intersect the East Pipe at a vertical depth of 132 metres.			
Z13-4F17	May 17 - 23	Positioned to the east of the East Pipe approximately 100 m east of drill hole Z13-4F12 to test the graphitic breccia at depth.			
Z13-4F18	May 24 – 29	Collared to test the East Pipe at depth from northwest.			
Z13-4F19	May 29 -02	Designed to test the East Pipe at depth from the northeast.			
Z13-4F20	June 03 - 06	Planned to test the southern portion of the East Pipe at depth from northeast.			
Z13-4F21	June 06 – 10	Collared to test the graphitic breccia at depth.			
Z13-4F22	June 10 - 12	Collared 40 m northwest of drill hole Z13-4F21 to test the upper part of the E Breccia Pipe at depth.			
Z13-4F23	June 13 - 14	Collared 40 m northwest of drill hole Z13-4F22.			
Z13-4F24	June 15 – 17	The purpose of this hole was to test the south end of the East Pipe at depth.			
Z13-4F25	June 17 – 19	This hole was drilled to a depth of 213.00 m to test the East Pipe from the northeast.			
Z13-4F26	June 20 – 28	This hole was designed to test the West Pipe at depth from the southwest.			
Z13-4F27	June 28 - July 05	This drill hole was designed to test the West Pipe from the southeast.			
Z13-4F28	July 05 – 09	The purpose of this drill hole was to test the southwestern limit of the East Pipe.			
Z13-4F29	July 09 – 13	The purpose of this drill hole was to test the West Pipe from northwest.			
Z13-4F30	July 14– 17	This hole was drilled to test the northwestern limit of the West Pipe at depth.			
Z13-4F31	July 18 – 22	This hole was collared directly north of the west pipe to help establish the north contact of the pipe.			
Z13-4F32	July 22 – 26	This hole was drilled to test the southeastern boundary of the West pipe at depth.			
Z13-4F33	July 22 - Aug 02	This hole was drilled to test the southwestern boundary of the West Pipe at depth.			
Z13-4F34	August 02 – 08	This hole was drilled to test the eastern boundary of the West pipe at depth.			
Z13-4F35	August 08 – 14	The purpose of drill hole Z13-4F35 was to test the extension of the northwestern limit of the East Pipe at depth.			
Z13-4F36	August 14 - 18	The purpose of this drill hole was to test the extension of the northwestern limit of the East Pipe at a shallower depth than Z13-4F35. This collar location was moved closer to the pipe.			
Z13-4F37	August 18 - 22	The purpose of this drill hole was to drill from the southwest of the East Pipe to fill in missing data; this hole was suggested by RPA.			
Z13-4F38	August 23 - 28	Drill hole Z13-4F38 was stepped out from Z13-4F37 to fill in missing information below that hole; this hole was also suggested by RPA.			

Z13-4F39	August 29 - Sept. 2	This drill hole was collared to test the north-northwest boundary of the West Pipe near surface.
Z13-4F40	Sept.2 – 6	The purpose of drill hole Z13-4F40 was to establish the western boundary of the West Pipe.
Z13-4F41	Sept.6 – 10	Drill hole Z13-4F41 was collared to the northwest of the West Pipe.
Z13-4F42	Sept.10 - 12	The purpose of this drill hole was to define the northwestern contact of the graphitic breccia. It was drilled from the same location as drill hole Z13-4F41 but at a -75° inclination to intersect the contact at depth.
Z13-4F43	Sept.12 - 14	This drill hole was collared to the southeast of the East Pipe. The purpose of this drill hole was to define the southeastern contact of the graphitic breccia.
Z13-4F44	Sept.12 - 17	Drill hole Z13-4F44 was collared to the north of the West Pipe. The purpose of this drill hole was to define the northern contact of the graphitic breccia in the West Pipe.
Z13-4F45	Sept.14 - 17	Drill hole Z13-4F45 was collared to the southeast of the East Pipe. The purpose of this drill hole was to define the southeastern contact of the graphitic breccia at depth.
Z13-4F46	Sept. 18 - 22	Drill hole Z13-4F46 was collared to the east of the West Pipe. The purpose of this drill hole was to define the eastern contact of the graphitic breccia.
Z13-4F47	Sept. 18 - 22	The purpose of this drill hole was to test the northern contact of the East Pipe from the north.
Z13-4F48	Sept. 22 - 26	This drill hole was collared to the east of the West Pipe. The purpose of this drill hole was to define the eastern contact of the graphitic breccia.
Z13-4F49	Sept. 26 - 27	Drill hole Z13-4F49 was collared to the east of the West Pipe. The purpose of this drill hole was to define the eastern contact of the graphitic breccia.
Z13-4F50	Sept. 27 - 29	Drill hole Z13-4F50 was collared from the southeast of the West Pipe. The purpose of this drill hole was to define the southeastern contact of the graphitic breccia.
Z13-4F51	Sept. 27 - Oct 1	Drill hole Z13-4F51 was collared to test the West Pipe from the southeast.
Z13-4F52	Sept. 30 - October 3	Drill hole Z13-4F52 was collared to the south of the West Pipe. The purpose of this drill hole was to define the southwestern contact of the graphitic breccia.
Z13-4F53	October 1 - 5	Drill hole Z13-4F53 was collared approximately 60 m behind drill hole Z13-4F51 to test the West Pipe at depth.
Z13-4F54	October 3 - 6	Drill hole Z13-4F54 was collared on the eastern edge of the West Pipe. The purpose of this drill hole was to help establish the geology of the core of the graphitic breccia.
Z13-4F55	October 5 - 8	The purpose was to test the eastern boundary of the West Pipe at a shallower depth.
Z13-4F56	October 7 - 13	Drill hole Z13-4F56 was collared at relatively the same location as drill hole Z13-4F40.
Z13-4F57	October 9 - 12	Drill hole Z13-4F57 was collared northwest of the West Pipe. This drill hole tested the northwestern boundary of the West Pipe at depth.
Z13- 4FM01	August 20 - 29	The purpose of this drill hole was to obtain material to be tested for metallurgical purposes; it was drilled at a steep angle in order to drill down the pipe.
Z13- 4FM02	August 30 - Sept. 5	The purpose of drill hole Z13-4FM02 was to obtain more material to be tested for metallurgical purposes.
Z13- 4FM03	Sept. 6 - 11	The purpose of drill hole Z13-4FM03 was to obtain more material to be tested for metallurgical purposes.
Z13- 4FM04	October 13 – 21	Drill hole Z13-4FM04 was the first of three holes that were planned and drilled on the West Pipe in order to obtain material for metallurgical testing.
Z13- 4FM05	October 22 – 29	Z13-4FM05 was the second of three planned holes drilled on the West Pipe with an HQ core size to obtain material for metallurgical testing.
Z13- 4FM06	October 30 - November 6	Drill hole Z13-4FM06 was the third of three holes that were drilled on the West Pipe in order to obtain material for metallurgical testing.

### 3.0 **Property Description, Location and Agreements**

Zenyatta originally held a group of claim blocks (the Property) located in a large area of twenty townships north of Lake Superior and west of James Bay, Canada, within the Porcupine Mining District of northern Ontario, Canada (Figure 1). Block 4F is now part of six claim groups (1C, 2C, 4A, 4B, 4E, & 4F) that presently make up the Albany Project and include a total of 157 claim blocks, 2356 claim units and 37,696 hectares (Figure 2). The claim blocks were originally staked under an agreement between Cliffs Natural Resources Exploration Canada Inc. (CNRECI), an affiliate of Cliffs Natural Resources Inc. (Cliffs) and Eveleigh Geological Consulting Inc. (EGC) to explore for Cu-Ni-PGM mineralization. The Project is located west of the communities of Constance Lake First Nation and Hearst, Ontario, within 30 km of the Trans-Canada Highway (Highway 11).

At the time of Zenyatta's Initial Public Offering in December 2010, the Albany claims were 25% owned by Zenyatta and 75% owned by CNRECI, as defined by the 2010 Amended Albany Option and Joint Venture Agreement. The majority of these claims were staked during the summer and fall of 2009, followed by additional staking in the winter and spring of 2010. This report covers Block 4F, which contains the Albany graphite deposit and is 100% owned by Zenyatta.

Zenyatta's Albany **Graphite Project** claims (Block 4F) were staked during the months of March, May and June of 2010. Presently, Block 4F has a total of **61 claim blocks**, **826 claim units**, for a total of **13,216 hectares** (Figure 3, Table 2). The yearly work required costs to keep the total claims in good standing amounts to **\$330,400**. The property is not subject to any known environmental issues, and no abandoned mine workings or tailings are present on the property. Table 2, presented below lists the entire Block 4F claims and expiry dates. Currently, all claims are in good standing until 2016; claim P4255105 which hosts the graphite deposit has a 2021 due date and over \$1.4 million in reserve.

In November 2012, Zenyatta reached an agreement with CNRECI and acquired 100% ownership of Claim Block 4F. Prior to this date and according to the agreement, Zenyatta had already exercised its right and acquired an 80% interest in Claim Block 4F by having spent a total of \$10 million on exploration on the larger group of Albany Project claims. After acquiring Cliffs' remaining 20% interest in the Claim Block 4F, Zenyatta now holds a 100% interest.

Pursuant to the terms of the transaction, Zenyatta and Cliffs agree to the following with respect to the Claim Block 4F:

- a. Zenyatta will issue to Cliffs (or its designated affiliate) a total of 1,250,000 Zenyatta shares as follows: (i) 500,000 shares upon signing the agreement (completed); (ii) 250,000 shares to be issued upon completion of a pre-feasibility study; and (iii) 500,000 shares to be issued upon completion of a feasibility study; and
- b. Zenyatta will grant Cliffs an NSR royalty of 0.75% on the Claim Block 4F, of which 0.5% can be purchased at any time for C\$ 500,000.

There is an additional underlying 2% NSR royalty on Claim Block 4F that was granted to EGC of which 1.0% can be purchased at any time for C\$ 1,000,000. This royalty was part of the original 2009 Project Agreement between CNRECI and EGC, which subsequently became a part of the 2010 Amended Albany Option and Joint Venture Agreement between Zenyatta, Cliffs, CNRECI, and EGC.

Additionally, in order to exercise the Second Option and earn an 80% interest on the remaining Albany Property claims Zenyatta had to drill not less than 3,000 m on the other claims (Blocks 3A, 3B and 4E; 3A and 3B have since been dropped) by December 31, 2014. A total of 2384 m were drilled on 3A and 3B in November and December, 2013 leaving a minimum of approximately 616 m remaining to be drilled on Block 4E (Carey, 2014b). It should be noted that Cliffs granted Zenyatta a three month extension beyond the December 31, 2014 deadline and the required drilling (625 m) was completed in early February, 2015 (Carey, 2015).

The Block 4F claim group (Figure 3) is located in Constance Lake First Nation's (CLFN) Traditional Territory. On July 18, 2012, Zenyatta and CLFN announced that they had signed an Exploration Agreement for a mutually beneficial and co-operative relationship regarding exploration and pre-feasibility activities on the Albany Project. Among other things, CLFN will participate in an implementation committee and receive, along with certain other First Nation communities, preferential opportunities for employment and contracting. Zenyatta also agreed to contribute to a social fund for the benefit of CLFN children, youth, and elders, which was completed in 2012 and 2013.



Figure 1: Albany Block 4F Location Map



Figure 2: Albany Project Claim Blocks



Figure 3: Albany Project Block 4F Claims

ALBANY BLOCK 4F CLAIMS - 2015							
Claim ID	Block #	# Units	Hectares	Recorded Date	Due Date	Work Required	Ownership
4255101	4F	16	256	Mar17/2010	Feb 28/2016	\$6,400	Zenyatta
4255102	4F	16	256	Mar17/2010	Feb 28/2016	\$6,400	Zenyatta
4255103	4F	16	256	Mar17/2010	Feb 28/2017	\$6,400	Zenyatta
4255104	4F	16	256	Mar17/2010	Feb 28/2017	\$6,400	Zenyatta
4255105	4F	16	256	Mar17/2010	Feb 28/2021	\$6,400	Zenyatta
4255106	4F	16	256	Mar17/2010	Feb 28/2017	\$6,400	Zenyatta
4255107	4F	16	256	Mar17/2010	Feb 28/2017	\$6,400	Zenyatta
4255108	4F	16	256	Mar17/2010	Feb 28/2016	\$6,400	Zenyatta
4255109	4F	16	256	Mar17/2010	Feb 28/2016	\$6,400	Zenyatta
4255110	4F	13	208	Mar17/2010	Feb 28/2017	\$5,200	Zenyatta
4257701	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257702	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257703	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257704	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257705	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257706	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257707	4F	12	192	May10/2010	Feb 28/2017	\$4,800	Zenyatta
4257708	4F	12	192	May10/2010	Feb 28/2017	\$4,800	Zenyatta
4257709	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257710	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257711	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257712	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257713	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257714	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257715	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257716	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257717	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257718	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257719	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257720	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257721	4F	9	144	May10/2010	Feb 28/2017	\$3,600	Zenyatta
4257722	4F	4	64	May10/2010	Feb 28/2017	\$1,600	Zenyatta
4257723	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257724	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257725	4F	16	256	May10/2010	Feb 28/2017	\$6,400	Zenyatta
4257726	4F	11	176	May10/2010	Feb 28/2017	\$4,400	Zenyatta
4257727	4F	9	144	May10/2010	Feb 28/2017	\$3,600	Zenyatta
4257728	4F	6	96	May10/2010	Feb 28/2017	\$2,400	Zenyatta
4257734	4F	4	64	May10/2010	Feb 28/2017	\$1,600	Zenyatta

# Table 2: Block 4F Claim Status

4248214	4F	4	64	June4/2010	Feb 28/2017	\$1,600	Zenyatta
4255111	4F	7	112	Mar17/2010	Feb 28/2016	\$2,800	Zenyatta
4255112	4F	10	160	Mar17/2010	Feb 28/2016	\$4,000	Zenyatta
4257730	4F	14	224	May10/2010	Feb 28/2016	\$5 <i>,</i> 600	Zenyatta
4257731	4F	12	192	May10/2010	Feb 28/2016	\$4,800	Zenyatta
4257732	4F	12	192	May10/2010	Feb 28/2016	\$4,800	Zenyatta
4257733	4F	14	224	May10/2010	Feb 28/2016	\$5 <i>,</i> 600	Zenyatta
4257735	4F	7	112	May10/2010	Feb 28/2016	\$2 <i>,</i> 800	Zenyatta
4257736	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257737	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257738	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257739	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257740	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257741	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257742	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257743	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257744	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257745	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257746	4F	16	256	May10/2010	Feb 28/2016	\$6,400	Zenyatta
4257747	4F	2	32	May10/2010	Feb 28/2016	\$800	Zenyatta
3002472	4F	4	64	May10/2010	Feb 28/2016	\$1,600	Zenyatta
3002473	4F	4	64	May10/2010	Feb 28/2016	\$1,600	Zenyatta
61		826	13216			\$330,400	

## 4.0 Accessibility, Climate, Physiography, Local Resources and Infrastructure

### 4.1 Accessibility

Access to most of the 4F claim block can be gained using helicopter, but boat or canoe access can be used along the Nagagami River in the central area of the claim block. Old forestry logging roads reach the southeast boundary of the claim block leading to several old quad trails through previously harvested forests just east of the Nagagami River (*see Figures 2 and 3*). The winter access trail joins the end of the all-weather forestry road to the drill site and it can be reached by travelling northwards up the Pitopiko Road from the Trans-Canada Highway. This was added as a safety route to be used in emergency situations.

#### 4.2 Climate

The Albany claims are situated in northern Ontario where there are various climates and weather extremes. Most of the region has a continental climate with warm to hot summers (June, July and August) with 25 to 35°C, and cold winters (December to March) with temperatures ranging from -10 to -35°C with lows down to -45°C. Generally, precipitation ranges from 600 mm to around 900 mm.

Lakes and swamps are typically frozen and suitable for diamond drilling from December to April. Exploration can take place year round with minor breaks during the spring thaw and winter freeze-up. Mining operations can take place all year round.

### 4.4 Physiography

The claims are situated within the Hudson Bay-James Bay Lowlands area where the topography is essentially flat, low-lying and swampy. Overburden averages 45 m in the Block 4F deposit area with little or no outcrop exposure; Paleozoic limestone cover rocks are exposed in the bottom and along the banks of the Nagagami River. There are many creeks flowing between peat bogs throughout the area. The Nagagami River flows north through the property with several meandering tributaries flowing in from the east and west. The Pitopiko River flows into the west side of the Nagagami. Vegetation is dominated by wetlands with some areas of spruce and alder trees, and cedar swamps. Spruce and alder trees are also abundant along the banks of the Nagagami River so (Figures 4 and 5).



Figure 4: Oblique View of Topography in the Deposit Area - Looking West



Figure 5: Vertical View of Drill Pads in the Deposit Area with the Nagagami River on the Right and the Pitopiko River on the Left (North is up)

### 4.3 Local Resources and Infrastructure

The claims are located approximately 50 km north of Highway 11 and the Canadian National Railway. The town of Hearst, population of approximately 5000 (see Figure 6), is located approximately 50 km southeast of the property and has many facilities to keep an exploration camp well supplied. These include hotels, restaurants, a hospital, hardware stores, gas stations, a mining supply store and an airport. Float plane and helicopter services are also available in Hearst. Mining personnel, equipment, and supplies can also be accessed from Timmins, a major mining and exploration centre.

There is currently no permanent infrastructure on the Property. An all-weather logging road runs within approximately five kilometres of the graphite deposit – access from that point is via a winter trail. The Project is near the communities of Constance Lake First Nation and Hearst. The nearest airport is in Hearst, approximately one hour by car. The Timmins airport with scheduled flights is approximately four hours away by road. A power transmission line and a natural gas pipeline run along the Trans-Canada Highway, 30 km south of the Project. A rail line is located 70 km away (Figure 6).



Figure 6: Albany Block 4F Infrastructure Map

### 5.0 Previous Work

Zenyatta's Albany Block 4F claim group covers ground that was selected based on geophysical information from OGS airborne magnetic maps, the geological interpretation (Stott, 2008) of these maps, and additional geological and geophysical data from historical exploration reports provided by MNDM. Past exploration work has been limited in this area of the James Bay Lowlands and mostly consisted of a small number of geophysical surveys and diamond drill projects. The following is a brief summary of the reported historical exploration work carried out in the Block 4F area:

**1959**: A ground magnetic and electromagnetic survey was initiated on claims held by *Nagagami River Prospecting Syndicate* in the Feagan Lake/Pitopiko River Townships area. The geophysical survey was carried out by Koulomzine and Brossard Limited but was not fully completed because of an early spring breakup. Results of the survey showed three magnetic anomalies defining basement geology contacts and several vertical-loop electromagnetic conductors. The report states that "*the general lenticular nature of the conductors and their occurrence in the vicinity of a diabase dyke may suggest the presence of sulphide lenses that could contain base metals; one anomaly (magnetic & EM) could be due to some disseminated mineralization" (Koulomzine, 1959). They recommended drilling four holes to investigate the EM anomalies, but there is no record that these holes were ever drilled.* 

**1961**: *Algoma Ore Properties Limited* flew an aeromagnetic survey in the Nagagami River and Pitopiko Townships area. The survey outlined a horseshoe-shaped anomaly which was confirmed on the ground in the same year. This led to further exploration in 1963.

**1963**: *Algoma Ore Properties Limited* flew an airborne magnetometer survey in the Nagagami River area, located forty miles northwest of Hearst, Ontario. The survey was flown by Hunting Survey Corporation. The survey results indicated two large low intensity circular shaped anomalies (Anomalies #1 and #2), underlying the Paleozoic limestones. Interpretation of the anomalies inferred that they were caused by a complex syenitic to gabbroic intrusion. It was reported that Anomaly #1 could be associated with a basic intrusive, hosting magnetite, and thought to be mildly interesting for iron ore, niobium, and sulphides. Anomaly #2 was interpreted to be associated with an alkaline and carbonatite complex and could contain columbium and other rare earth elements (REEs). Algoma recommended follow-up work to include a ground magnetometer survey over the anomalies and a diamond drill program (Venn, V.R., 1964).

**1964 - 1967**: *Algoma Ore Properties Limited* continued exploration in the Nagagami River area. Ground work involved grid cutting followed by a ground magnetometer survey and claim staking. Algoma drilled nine holes (located in the Albany blocks *4E* and *4F*) for a total of 4,868 feet. Holes 1-64 to 7-64 were drilled in Block 4E. Two holes were drilled in Anomaly #2 (drill holes 8-64 and 9-64) and reported to be located near the northern boundary of *Block 4F*. Erratic sampling was done on the core, along with petrographic studies. The core was tested with scintillometer and samples were taken where radioactive responses occurred; assay results indicated columbium (Cb<sub>2</sub>O<sub>5</sub>)

content to be 0.02% to 0.04%. Drilling on Anomaly #2 intersected coarse syenite rock with 3-5% magnetite. It was concluded that the ground magnetometer survey and the diamond drilling verified the airborne survey fairly well, and although drilling did not intersect any ore minerals, the structure was still geologically interesting. Algoma reported that minerals of economic potential could possibly be associated with other parts of the structure and they recommended that the property be referred to other companies interested in intrusive structures (Venn, V.R., 1964).

**1978**: *Shell Canada Explorations Limited* initiated a diamond drill program in the area based on results of an airborne geophysical survey. Drill logs were available from MNDM, but no report was submitted with the logs. One hole, drill hole 7609-78-1, was drilled within Bock 4F in the Pitopiko River Area and it was reported to have Intersected "graphitic syenite breccia". Unfortunately, it was not possible to locate the historic drill site but it appears to have likely been drilled on the East Pipe.

**1999**: The **Ontario Geological** Survey (OGS) released aeromagnetic geophysical maps for the Hudson Bay and James Bay Lowlands areas, *Geophysical Data Set 1036* (see *Figure 7 for Block 4F area*).

**2008:** The *Ontario Geological Survey* (OGS) Precambrian Geology Map P.3599 was published: *Hudson Bay and James Bay Lowlands Region Interpreted from Aeromagnetic Data* (Stott, 2008; see *Figure 5 for Block 4F area*).

**2010 to 2012:** Exploration work conducted by **Zenyatta Ventures Limited** includes the initial 2010 helicopter-borne geophysical survey (VTEM Max and magnetometer) which identified airborne EM and magnetic anomalies (Geotech, 2010a; Geotech, 2010b). Follow-up drilling in Block 4F during the fall of 2011 included one drill hole (Z11-4F1) which intersected several mineralized zones of graphitic breccia (Carey and Dalby, 2012). In 2012, Zenyatta continued with a Phase II diamond drill program and drilled eight more holes (Z12-4F2 to Z12-4F9) on the graphite deposit (Carey, 2012). Results were very encouraging and several additional graphite mineralized zones were intersected; however, Zenyatta was unsure of the size, geometry and attitude of the zones.

**2013:** Exploration work in Block 4F conducted by **Zenyatta Ventures Limited** included a large loop surface DPEM survey by Crone Geophysics and Exploration Ltd. The survey confirmed the presence of two discrete breccia pipes and was used to plan the resource drill program (Crone, 2013a; Crone, 2013b; Legault et al. 2015). Between March and November 2013, Zenyatta drilled 54 holes totalling 22,463 m (Z13-4F10 to Z13-4F57 and Z13-4FM01 to Z13-4FM06) in the graphite deposit area which is located approximately 14 km to the southeast of the 4E block. Also in 2013, Geotech performed a higher powered VTEM max survey over the newly staked 4F Extension claims to the north of 4F which included the Block 4E claims (Geotech, 2013). Additionally, Zenyatta also drilled two reconnaissance drill holes on Block 4F to test two weaker conductive zones which were defined by the 2010 VTEM survey. The EM conductors were most likely explained by zones of disseminated pyrrhotite and/or by zones of massive pyrrhotite mineralization (Carey, 2014a).

### 6.0 Geological Setting

#### 6.1 Regional Geology

The Albany claims were staked based on geological information acquired from OGS Map P3599, Precambrian Geology of the Hudson Bay and James Bay Lowlands Region. Stott et al. (2007) interpreted the regional tectonic subdivisions and mapped the Albany claim blocks as part of the English River Basins, the Marmion Terrane, and the Quetico Basins of the Superior Province of the Canadian Shield (Figure 7). Based on the interpretation of Sage (1988), it appears that the Nagagami Alkalic Rock Complex underlies most of Claim Blocks 4E and 4F.

The following is a summary of the major rock units in the area, as cited in Geotech (2010b): The relatively flat-lying Hudson Bay and James Bay Lowlands consist mostly of carbonate rocks of Paleozoic to Mesozoic age. These sedimentary rocks cover a significant portion of the Precambrian rocks of Northern Ontario and, therefore, have impeded the understanding of the Precambrian geology and the tectonic framework across this region of Ontario. The region's Precambrian geology is based mainly on available re-processed aeromagnetic data and limited drill hole information. The results provide a general framework of interpreted supracrustal belts, plutonic subdivisions, major faults, and Proterozoic mafic dykes (Figure 7).

#### **Quetico Subprovince**

The Quetico Subprovince is an east-northeast trending, 10 km to 100 km wide by 1,200 km long belt of variably metamorphosed and deformed clastic metasedimentary rocks and granitoids located in the west-central part of the Superior Province. The metamorphic grade varies from greenschist to amphibolite to local granulite facies. The metasedimentary rocks were deposited before 2696 Ma. The Quetico intrusions near Atikokan are typically small (<1 km<sup>2</sup>) and form sills, plugs, and small stocks composed of a variety of lithologies, mainly wehrlites, clinopyroxenites, hornblendites, monzodiorites, syenites, foidites and silicocarbonatites. They are locally enriched in Ni-Cu and PGEs (Vaillancourt et al., 2003).



Figure 7: Regional Tectonic Subdivisions Map of Northern Ontario (Stott et. al., 2008)

### Marmion Terrane / Subprovince

The Marmion Terrane consists predominately of metamorphosed felsic intrusive rocks. The 3.0 to 2.7 billion year old rocks are interpreted as an assemblage of continental fragments. These rocks were once also interpreted as part of the Western Wabigoon and Winnipeg River terranes (MNDM, Government of Ontario).

### **English River Subprovince**

The English River Subprovince is an east-trending 30 km to 100 km wide by 650 km long belt of metasedimentary and granitoid rocks located in the west-central Superior Province. The metasedimentary rocks contain detrital zircons as young as 2698 Ma and the granitoid rocks range between 2.65 and 2.70 Ga (Vaillancourt et al., 2003).

#### Nagagami Alkalic Rock Complex

Limited data and observations obtained from drill logs and drill core, together with aeromagnetic data, suggest that the Nagagami River Alkalic Rock Complex (NRARC) is composed of two ring-shaped subcomplexes with more mafic rims and more leucocratic cores. Aeromagnetic data interpretation may indicate that the northern subcomplex is cut by the southern subcomplex, indicating the southern subcomplex is younger. The middle-to-late Precambrian diabase dykes, which are characterized by linear northwest-trending aeromagnetic patterns, do not crosscut the aeromagnetic signature of the NRARC. This indicates that the complex is younger than the regional diabase dyke swarm. Sage (1988) concluded that this observation, together with the fresh and unmetamorphosed nature of the rock point to a Late Precambrian age, is equivalent to the dominant period of alkali magmatism in Ontario. Regional structural controls on the emplacement of the subcomplexes have not been unambiguously identified, but the NRARC lies on trend with the extension of the northeast-striking Gravel River Fault.

The dominant rock type is an amphibole-pyroxene syenite which varies from fine- to coarsegrained, and locally displays a trachytoidal texture. A coarse-grained nepheline-bearing phase appears restricted to the southern subcomplex. A very coarse-grained pegmatitic phase and a minor granite phase have also been identified. Petrographic analysis indicates that the NRARC has strong similarities to the pyroxene- bearing syenites of the Port Coldwell Alkalic Rock Complex.

Based on the fact that the intrusion underwent unsuccessful testing for iron and niobium in 1964 by the Algoma Ore Properties Division of Algoma Steel Corporation, it was previously recommended that future exploration of the complex should be directed towards the type of mineralization found in equivalent syenitic rocks of the Port Coldwell Alkalic Rock Complex (Sage, 1988).

#### Albany Alkalic Complex

The Albany Alkalic Complex (AAC) (Conly, 2014), which hosts the graphitic breccia pipes, occurs to the south of the two Nagagami Alkalic subcomplexes. This intrusion appears to be crosscut by the northwest-trending middle to late Precambrian diabase dykes suggesting that it predates the dyke swarm. Initial work by Dr. Conly indicates that the AAC "syenite" corresponds to a range of quartz-poor to moderate quartz-bearing felsic rocks that are albite dominant. Compositionally, the rocks of the AAC range from quartz syenite to diorite with quartz monzonite

being the most common composition (Conly and Moore, 2015). All drilling by Zenyatta has focused on the immediate area which hosts the graphite deposit. The limits of the intrusion are based on geophysical interpretation.

#### 6.2 **Property Geology and Graphite Mineralization**

The bedrock in the Block 4F region of the James Bay Lowlands area is covered by a layer of overburden and flat-lying, Paleozoic sedimentary cover rocks. Consequently, no historical surface geological mapping projects have been carried out in the area and most of the geology has been geophysically inferred (Figure 8). The average overburden thickness (from holes Z13-4F10 to 4F48; Z13-4FM01 to 4FM06) is approximately 45 m and ranges from 28 m to 55 m. Precambrian geology in the southern section of Block 4F, according to Stott's Precambrian Geology Map (see Figure 9), consists of mostly paragneiss and migmatite metasedimentary rocks, and mafic with related intrusive rocks of the Quetico Subprovince. The northern section of Block 4F is underlain with metamorphosed tonalite to granodiorite, foliated to gneissic with minor supracrustal inclusions of the Marmion Terrane/Subprovince. Both subprovinces have been intruded with a younger alkalic intrusive suite made up of alkalic syenite, ijolite, associated mafic and ultramafic rocks and carbonatite (Stott, 2008). The two graphitic breccia pipes are hosted within the AAC (Figure 9).

The 2013 drilling intersected flat-lying Paleozoic sediments above the Precambrian rocks and thicknesses ranged from 0 m to 16 m. The erosional unconformity is located on the southern portion of the property and trends approximately east-west (Figure 9). The most abundant Precambrian rock types intersected by Zenyatta drilling include: graphitic brecciated syenitic gneiss, graphitic brecciated syenite, graphitic overprint syenitic gneiss, graphitic brecciated granite, graphitic brecciated granitic gneiss, and graphitic overprint granitic gneiss. Unmineralized rock types included: syenitic gneiss, syenite, granitic gneiss, granite, diorite, schist, monzonite, and mafic to intermediate dykes.

A dominant rock type that was intersected in many drill holes is a late, massive, cross-cutting, barren sill which, based on petrography, has been classified as an olivine-aegirine alkali syenite (James, 2013) (Figure 17). Based on current drill information, the sill dips shallowly to the southeast at 10° to 15° and likely emanates from a northwest-trending dyke that is located on the southwest side of the West Pipe and was intersected at the top of hole Z12-4F02. The sill ranges in thickness from approximately 55 m in the vicinity of the West Pipe and then appears

to narrow and bifurcate towards the East Pipe with thicknesses of 12 m and 28 m (Figure 17). James (2013) suggests that the peralkaline nature of the samples is consistent with the apparent rift-type magmatic environment from which they originated. An association with silica undersaturated silicate rocks such as nepheline syenites and carbonatites is to be expected as these types of associations are recognized in a continental rift setting. Interestingly, Conly and Moore (2015) have identified an unmineralized porphyritic, hypabyssal subvolcanic monzodiorite/foid (nepheline) monzodiorite which appears to have intruded along the margins of the West Pipe and postulate that it may have played a critical role in the formation of the graphite deposit. This unit was logged as a porphyritic intermediate dyke.

All rock types intersected in drill holes Z13-4F10 to Z13-4F57 and Z13-4FM01 to Z13-4FM06 are described in detail in the accompanying drill logs in Appendix I and shown graphically on the drill sections which are located at the back of the report.



Figure 8: Block 4F First Vertical Derivative Airborne Magnetics (OGS, 1999; Geotech, 2010)



Figure 9: Block 4F Interpreted Geology (after Stott, 2008)

## 7.0 Deposit Type

The "Arc of Fire" consists of several large multi-phased mafic-ultramafic-alkalic complexes forming an arc line approximately 150 km long. One of these complexes, called the Nagagami River Alkaline Ring Complex, shows similarities to the Mid-Continent Rift related Coldwell Complex on the north shore of Lake Superior. The "Arc of Fire" is believed to also represent a deep seated Proterozoic structure that may be related to the 1.1 Billion year old Mid-Continent Rifting. The Mid-Continent Rift is a known deep seated structural environment that hosts a number of significant mineral deposits around Lake Superior, including the recently discovered Rio Tinto's Eagle and Tamarack Cu-Ni deposits and Magma Metal's (now Panoramic Resources) Thunder Bay North (TBN) PGM deposit. Rifting environments around the world are host to many large mineral deposits due to a tapping of the copper-nickel rich mantle by way of the structural conduits and traps for metal transport and deposit. Interestingly, Zenyatta was exploring for Cu-Ni-PGM mineralization and accidentally discovered a large graphite deposit when it tested a very large conductive body on the 4F Block.

Most economic geologists and geophysicists are familiar with graphite as a nuisance in geophysical exploration due to its excellent electric conductivity that produces an identical geophysical response to that of massive sulphide mineralization. Graphite commonly occurs in metasedimentary rocks as a result of the conversion of organic matter through regional or contact metamorphism. Graphitization of organic matter is well understood, however, the heating and compression of organic matter in situ is only one of the ways in which graphite is produced in nature. Another is the precipitation of solid carbon (i.e., graphite) from natural carbon-fluids such as those containing CO<sub>2</sub>, CO, and/or CH<sub>4</sub>.

Somewhat simplified, there are three different processes leading to the formation of economic graphite deposits (Harben and Kuzvart, 1996):

- Contact metamorphism of coal deposits Graphite formed under these conditions is characterized by incomplete structural ordering and crystallization, resulting in low value "amorphous" graphite with its main market in foundry applications.
- 2. Syngenetic flake graphite deposits The formation of these deposits involves the alteration of carbonaceous organic matter to graphite during regional metamorphism.
- 3. Epigenetic graphite deposits The formation of these deposits is associated with migrating supercritical carbon-bearing (C-O-H) fluids or fluid-rich magmas. The formation

of the carbon-bearing fluids is most often a consequence of high temperature (granulite facies) metamorphism, but magmatic degassing can also produce graphite. Fluid precipitated graphite is well-ordered and can be a source of highly valued crystalline lump or vein-type graphite.

The Albany deposit is a unique example of an epigenetic graphite deposit in which a large volume of highly crystalline, fluid-deposited graphite occurs within an igneous host. The deposit is interpreted as a vent pipe breccia that formed from CO<sub>2</sub>-rich fluids that evolved due to pressure-related degassing of syenites of the Albany Alkalic Complex (Figure 10) and is described below (Conly, 2014a; Conly, 2014b; Conly and Moore, 2015).

#### STAGE 1 – Emplacement of Host Syenites Forming the Albany Alkalic Complex:

Emplacement of the Albany breccia pipes is estimated to be Mesoproterozoic to Neoproterozoic based on cross-cutting relationship with the Paleoproterozoic Matachewan and Hearst quartz diabase dyke swarms and Mesoproterozoic Sudbury olivine tholeiite dyke swarm. Magma emplacement may also be structurally controlled by the Gravel River Fault which, in part, defines the southern margin Albany Alkalic Complex and separates the Marmion Terrane (to the north) and the Quetico Subprovince (to the south).

#### STAGE 2 – Fluid Generation and Breccia Pipe Development:

The two breccia pipes formed as a result of a degassing magma, resulting in segregation of a CO<sub>2</sub>-bearing fluid, which occurred in response to depressurization of the magma at mid to shallow crustal levels, and accumulation of CO<sub>2</sub> at the top of the ascending dyke. Possible sources for the carbon include: i) generation of primary CO<sub>2</sub>-rich syenite; and ii) assimilation of carbonaceous Quetico metasedimentary rock by syenitic magmas. The co-existence of angular to rounded breccia fragments is evidence of mixing of juvenile fragments with earlier entrained material which has been subject to a greater extent of mechanical erosion due to rapid and turbulent upflow of the CO<sub>2</sub>-fluid.

#### STAGE 3 – Graphite Deposition:

Graphite deposition likely occurred rapidly due to the sudden depressurization and quenching (from supercritical fluid to gas) of the  $CO_2$ -fluid which, in turn, is due to the dyke head breaking the surface and venting  $CO_2$  gas (Figure 10). Surface venting is

evidenced from the extent of the graphite breccias to the unconformity with the overlying Paleozoic rock. Such rapid depressurization would have also imploded the walls of the vent complex; it is consistent with the higher proportion of angular syenite fragments relative to rounded syenite fragments and fragments of Archean country rock, and with localized production of xenoliths with minimal transport. Rapid deposition of graphite inferred from its fine crystal size (laths typically 100  $\mu$ m to 300  $\mu$ m long) and high abundances of discrete crystals and fine crystal aggregates. Coinciding with the changes in pressure, a rapid decrease in temperature would have inhibited growth of coarser crystalline graphite and led to the crystallizing of the degassing syenite magma at depth.

#### **STAGE 4** – Post Mineralization Magmatic and Erosional Events:

Post-mineralization events include the following (listed in temporal succession):

- · Emplacement of late-stage barren olivine-aegirine syenite sills
- Intrusion of aplite and other felsic dykes
- Erosion of upper levels of the Albany Alkalic Complex and supergene alteration
- Deposition of Paleozoic carbonate rocks and Quaternary glacial sediments



Figure 10: Albany Graphite Deposit Model (from Conly, 2014a)

### 8.0 Mineralization

The following description of the graphite mineralization is based on RPA (2014):

Preliminary petrography indicates that the graphite hosting breccias range in composition from diorite to granite, and are generally described as "syenite". Graphite occurs both in the matrix, as disseminated crystals, clotted to radiating crystal aggregates, veins and along crystal boundaries, and as small veins within the breccia fragments. In addition to graphite, the matrix consists primarily of quartz, alkali feldspar and plagioclase feldspar with minor phlogopite and amphibole and trace amounts of pyrite-pyrrhotite and magnetite. Alteration is minor, and is most pronounced as a paleo-weathering profile in the upper 20 m of the breccia pipes where bleaching and late, carbonate-filled fractures are common. The stockwork graphitic veins can be several centimetres wide while the veinlets and hairline fractures are millimetre and submillimetre scale. Breccia fragments are dominantly massive to weakly foliated syenite (>95%) with minor to trace chlorite-biotite-rich schist fragments, and mafic to intermediate dyke fragments. Occasional solid graphite fragments and rare altered fragments of unknown origin were also observed. Breccia fragments are angular to subangular to subrounded and range in size from subcentimetre to approximately 1 m, most being between 3 cm and 30 cm. Dyke and graphite fragments range from 1 cm to 5 cm (Figure 11). Rapid deposition of graphite inferred from its fine crystal size (laths typically 100 µm to 300 µm long) and high abundances of discrete crystals and fine crystal aggregates.



#### Figure 11: Core Photographs of Albany Graphite Mineralization

Description of the photographs (provided by Dr. Conly; RPA, 2014):

- A) Weathering-related alteration of brecciated and carbonate-veined syenite just below the unconformity with the overlying Paleozoic carbonate rocks (Z12-4F2, West Pipe).
- B) Carbonate veining in weakly to moderately brecciated syenite with weak graphite overprint (Z13-4F10, East Pipe). Sample is taken just below the highly weathered zone.
- C) Graphite veining in barren syenite (Z12-4F6, West Pipe).
- D) Aplite dyke crosscutting moderately brecciated syenite with weak to moderate graphite overprint of syenite fragments (Z12-4F9, East Pipe).
- E) Typical angular breccia texture of graphite mineralization (Z12-4F10, East Pipe).
- F) Rounded syenite breccia fragments indicating more extensive mechanic erosion due to turbulent flow within the vent complex (Z12-4F3, West Pipe).
- G) Laminated graphite intercalated with finely milled fragments (Z13-4F51, West Pipe). The laminated texture is interpreted to be the result of flow banding.
- H) Highly altered syenite breccia with weak to no graphite mineralization (Z13-4F26, West Pipe). This style of alteration occurs at depth and is not associated with weathering-related alteration observed at the top of the breccia pipes.
- I) Graphite mineralized breccia fragment partially rimmed by pyrite-pyrrhotite in a graphite and milled silicate matrix (Z13-4F26, West Pipe).
## 9.0 2013 Exploration Program

The following section is based on RPA (2014):

#### 9.1 Surface Time-Domain EM Survey

Crone Geophysics & Exploration Ltd. (Crone) was contracted by Zenyatta to perform surface time-domain EM (TDEM) surveys on the Property during February and March 2013. Crone targeted the drill-confirmed East and West graphitic breccia pipes that were initially identified in Geotech's 2010 airborne VTEM survey. Crone anticipated that surface TDEM surveys could be influenced by the top, presumably flat edge of the pipe as well as any of the vertical faces if the pipe had a significant depth extent. The survey design incorporated both an in-loop mode (Loop 1) to couple with the top, flat edge of the body and an out-of-loop mode (Loop 2) to couple with the steeply dipping edges (Crone, 2013).

The processed data from Loop 1 showed two separate isolated response patterns, apparently the result of two separate breccia pipes (Figure 12). The response pattern of the in-loop surveys is dominated by the top edge of these conductive sources and in the modelling results, excellent fits were obtained with the assumption of these being due to thin units. Bodies of varying thicknesses were utilized as well, but gave little appreciable difference in the modelling studies, suggesting the response patterns were indeed dominated by the relatively flat-lying tops of these bodies.

Overall, the modelled plates from Loop 1 and Loop 2 provided a robust model for targeting purposes. After drilling the first few holes, it was concluded that the channel 22 contoured plan map of the TDEM data provided a close correspondence to the actual outline of the breccia pipes for drill planning purposes (Legault et al., 2015).

Subsequent to Loop 1, Loop 2 was positioned with the loop located just north of the conductive features/breccia pipe identified from TDEM results. This loop was positioned to provide optimal coupling with any near vertical or steeply dipping edges. As with Loop 1, the Loop 2 results suggest the presence of two isolated bodies.

Crone completed numerical modelling on Loop 1 and 2 datasets. The results provided excellent fits with the observed data.

The TDEM ground survey appears to have outlined the lateral extent of two graphite breccia pipes (inferred from previous drilling results), although the boundary of the model is considered roughly approximate. The Western anomalous zone (West Pipe) is characterized by a rough circular response pattern with a slight elongation in the northeast-southwest direction and the Eastern anomalous zone (East Pipe) is characterized by an elongate ovoid-shaped source with its long axis oriented in a north-northwest–south-southeast sense (Figure 12).



Figure 12: Loop 1 Contoured Channel 22 Total Field TEM image with superimposed East and West Pipe boundaries (red) and drill holes (from Legault et. al., 2015)

### 9.2 Borehole Probing

In late 2013, Zenyatta contracted DGI Geoscience Inc. (DGI) to survey seven boreholes (Z13-4F14, -4F16, -4F17, -4F18, -4F26, -4F27, and -4F34) with three probes: an Acoustic Televiewer (ATV), a Focused Density probe, and a Full Waveform Sonic probe. Two of the seven holes (Z13-4F18 and Z13-4F34) were also surveyed for magnetic susceptibility, inductive conductivity, apparent resistivity, natural gamma, and fluid temperature. A total of

3,192 m was logged. Results were provided as strip logs and Wulff stereoplots and were incorporated into the Preliminary Economic Assessment (PEA) (RPA, 2015). Density and rock quality designation (RQD) data correlated well with Zenyatta's drill logs.

#### 9.3 Reconnaissance Drilling

In 2013, Zenyatta also drilled two reconnaissance drill holes (702 m total) on Block 4F to test two weaker conductive zones which were defined by the 2010 VTEM survey. No graphite was intersected and the EM conductors were most likely explained by zones of disseminated pyrrhotite and/or by zones of massive pyrrhotite mineralization (Carey, 2014).

### **10.0 Diamond Drilling Results**

From March 26, 2013 to November 6, 2013 Zenyatta completed 54 holes (27 on each breccia pipe) for a total of 22,463 m (Figure 13). Diamond drill holes were collared using NQ (47.6 mm core diameter) equipment for the 48 resource drill holes and HQ (63.5 mm core diameter) for the six metallurgical drill holes. Drilling was contracted to Chibougamau Diamond Drilling Ltd. (Chibougamau) of Chibougamau, Quebec. Chibougamau utilized their custom built helicopter transportable, fully hydraulic drill rigs which are capable of drilling up to 1000 m of NQ core and 800 m of HQ core. All holes were drilled with a stabilized core barrel (outer tube) in order to reduce the deflection of the hole. The program commenced with one drill and a second rig was added later in August 2013 to drill the holes required for metallurgical testwork. Expedition Helicopters Inc. of Cochrane, Ontario was contracted to provide helicopter support (Eurocopter AS350 AStar SD2) for the duration of the drill program. The drill, supplies, equipment and crews were mobilized/demobilized and moved by helicopter. Drill core was delivered via helicopter to the core shack twice daily at crew change.

The drill program was designed and supervised by Peter Wood (VP Exploration, P.Eng, P.Geo.) and all field logistics were managed by Jeff Pinksen (Field Manager). The core was logged and sampled by the following geologists: Ardian Peshkepia (M.Sc., P.Geo.), Michael Roberts (B.Sc., P.Geo.) and Clayton Kennedy (B.Sc.), and technical support services were provided by Asini Exploration Inc. (CLFN) and Texploration Limited.

A total of 23,878 samples from the 2011, 2012 and 2013 programs were submitted for assay (graphitic carbon and total sulphur) of which 94 were core duplicate samples, 1,119 were reject duplicate samples, 1,179 were blanks and 1,177 were Zenyatta's Certified Reference Material (standards). Additionally, 857 samples of representative graphite mineralized samples, graphite overprinted material and unmineralized host rock were submitted for specific gravity measurements.

It should also be noted that the drill core samples taken in 2011 and 2012 drill programs were previously analysed for total carbon only. Consequently, the sample pulps, some reject material and split core were re-assayed by ALS for graphitic carbon and total sulphur in 2013 and the database was updated accordingly. The assay results for these older holes are provided in Appendix 4.

#### **10.1 Field Procedures**

Holes were spotted using a hand held GPS. Three pickets were used to mark the location of each new drill hole - one to mark the collar and the other two were set up as front sights which provided the hole azimuth (Figure 13). A Silva compass was used to set the azimuth and in many cases the actual azimuth of the hole as measured by the Reflex APS (Azimuth Pointing System) was off and likely due to minor local magnetic interference. After the holes were spotted the drill pads were cleared using chain saws and were typically cut from 15 m to 20 m in diameter (Figures 4 and 5).

All the collar locations were initially surveyed with a Garmin hand-held GPS and then later, where possible, all the drill holes were also surveyed with a Reflex APS to accurately determine the collar coordinates (UTM E, UTM N and elevation) dips and azimuths (Figure 14).

After the drill hole had been completed and the drill rig had moved off the hole the drill site was inspected and all garbage was collected and removed from the site. Casings were usually capped unless the casing has been cut or damaged by the drill when it was moved off the site. At each hole or group of holes an aluminum tag with the hole number scribed on it was stapled to a wooden picket which was then hammered into the soil beside the casing(s) (Figure 15).



Figure 13: Assembled drill floor with collar and sighting pickets



Figure 14: Measuring drill hole collar coordinates, azimuth and dip with a Reflex APS



Figure 15: Clean drill site with capped casing and labeled collar picket

The first few drill holes (Z13-4F10 to Z13-4F16) were collared along a radial pattern at azimuths of 0°, 45°, 90°, 180°, 225°, 270° and 315° in order to determine whether the shape of the surface TEM survey's geophysical signature defines the shape of the conductive body. Once this was confirmed, the holes were laid out to best define the geometry of the breccia pipes and to yield sufficient contact pierce points for the resource estimate.

A drill hole location map is presented below in Figure 16, the drill hole information is summarized in Table 3, and a summary of significant assay results is presented in Table 4. Additionally, diamond drill logs are in Appendix 1 and certified assay certificates from ALS Minerals can be found in Appendix 2. A 1:1,000 scale drill hole plan map and 1:500 scale vertical cross sections are also provided at the back of the report. After logging each drill hole, the Zenyatta geologists summarized the geology and mineralization that was intersected and these descriptions are presented in the following section.



Figure 16: Albany Graphite Deposit Diamond Drill Hole Location Map

Hole ID	Pipe	Start Date	End Date	UTM East (NAD 83, Zone 16)	UTM North (NAD 83, Zone 16)	Dip (°)	Azimuth (°)	Length (metres)	Sample Assays
Z13-4F10	East	26/03/2013	30/03/2013	682950.8	5545797.6	69.2	183.7	438.0	392
Z13-4F11	East	30/03/2013	08/04/2013	682953.4	5545932.4	67	181.6	684.0	600
Z13-4F12	East	09/04/2013	14/04/2013	683023.8	5545824.8	50.2	228.8	366.0	247
Z13-4F13	East	14/04/2013	22/04/2013	683100.5	5545700	49.8	276.5	424.5	322
Z13-4F14	East	23/04/2013	03/05/2013	683088.6	5545590.4	49.5	315.3	668.0	520
Z13-4F15	East	04/05/2013	08/05/2013	682862.3	5545606	50.4	53.4	411.8	307
Z13-4F16	East	09/05/2013	16/05/2013	683095.8	5545894.4	51.1	231.1	530.8	463
Z13-4F17	East	17/05/2013	23/05/2013	683198.5	5545698	50.6	277	508.7	268
Z13-4F18	East	24/05/2013	29/05/2013	682809.3	5545810.4	49.6	118.6	432.0	374
Z13-4F19	East	29/05/2013	02/06/2013	682949.6	5545831.6	50.1	230.4	291.0	221
Z13-4F20	East	03/06/2013	06/06/2013	683014.5	5545768	50.2	231.1	302.4	238
Z13-4F21	East	06/06/2013	10/06/2013	682888.9	5545675.2	51.2	47.3	291.0	228
Z13-4F22	East	10/06/2013	12/06/2013	682862.3	5545706	49.8	51.3	261.0	198
Z13-4F23	East	13/06/2013	14/06/2013	682836.6	5545743.2	49.9	48.4	270.0	210
Z13-4F24	East	15/06/2013	17/06/2013	682917.1	5545635.2	49.8	46.4	252.0	194
Z13-4F25	East	17/06/2013	19/06/2013	682981.5	5545801.6	45.9	224.5	213.0	151
Z13-4F26	West	20/06/2013	28/06/2013	682393.1	5545566	49.6	50.5	617.6	125
Z13-4F27	West	28/06/2013	05/07/2013	682709.4	5545570.4	51.6	295	561.0	136
Z13-4F28	East	05/07/2013	09/07/2013	683014.5	5545766	49.2	199.8	339.0	273
Z13-4F29	West	09/07/2013	13/07/2013	682393.7	5545721.6	50	109.7	423.0	368
Z13-4F30	West	14/07/2013	17/07/2013	682436.5	5545802.5	50.4	138.5	390.0	329
Z13-4F31	West	18/07/2013	22/07/2013	682516.6	5545848.4	49.7	181.2	396.0	306
Z13-4F32	West	22/07/2013	26/07/2013	682597.1	5545571.6	50.3	301.3	459.0	373
Z13-4F33	West	27/07/2013	02/08/2013	682681.7	5545803.6	50.1	229.6	540.0	459
Z13-4F34	West	02/08/2013	08/08/2013	682717.5	5545702.4	46.2	275.4	530.6	446
Z13-4F35	East	08/08/2013	14/08/2013	682749.8	5545646.4	50	51.3	522.0	388
Z13-4F36	East	14/08/2013	18/08/2013	682791.8	5545693.6	49.3	45.1	363.0	303
Z13-4F37	East	18/08/2013	22/08/2013	682858.4	5545550	50.4	42.2	390.0	340
Z13-4F38	East	23/08/2013	28/08/2013	682805.3	5545495.2	50.8	43.5	509.6	472
Z13-4F39	West	29/09/2013	02/09/2013	682383.6	5545700.8	50.3	119.9	381.0	322
Z13-4F40	West	02/09/2013	06/09/2013	682380.9	5545782.4	49.3	116.3	411.0	319
Z13-4F41	West	06/09/2013	10/09/2013	682434.9	5545820	50.6	116.8	378.0	298
Z13-4F42	West	10/09/2013	12/09/2013	682433.5	5545820	74.5	115.6	237.1	185
Z13-4F43	East	12/09/2013	14/09/2013	683020.7	5545613.6	48.6	331.2	231.0	172
Z13-4F44	West	12/09/2013	17/09/2013	682605.8	5545834.4	49.6	227.8	507.0	421
Z13-4F45	East	14/09/2013	17/09/2013	683021.6	5545614	69.4	330.1	381.0	327
Z13-4F46	West	18/09/2013	22/09/2013	682648.2	5545680.8	50.7	300.7	411.0	325
Z13-4F47	East	18/09/2013	22/09/2013	682923	5545908.8	47.5	196.6	285.0	233
Z13-4F48	West	22/09/2013	26/09/2013	682668.1	5545716.4	49.5	299.4	387.1	294
Z13-4F49	West	26/09/2013	27/09/2013	682630.9	5545645.6	55	299.8	390.0	305
Z13-4F50	West	27/09/2013	29/09/2013	682558.1	5545595.2	49	301.6	381.6	314

# Table 3: 2013 Drill Hole Location Data & Core Samples

Z13-4F51	West	27/09/2013	01/10/2013	682581.7	5545622.4	49.7	305.7	405.0	299
Z13-4F52	West	30/09/2013	03/10/2013	682518.8	5545573.6	51.5	298.3	303.1	237
Z13-4F53	West	01/10/2013	05/10/2013	682632.6	5545594	50	302.8	462.0	358
Z13-4F54	West	03/10/2013	06/10/2013	682583	5545671	50.2	299.6	305.7	234
Z13-4F55	West	05/10/2013	08/10/2013	682605	5545707	50	299.7	342.0	255
Z13-4F56	West	07/10/2013	13/10/2013	682384	5545780	63.1	113.8	498.0	444
Z13-4F57	West	09/10/2013	12/10/2013	682341	5545722	50	119	393.0	329
Z13-4FM01	East	20/08/2013	29/08/2013	682957	5545700.4	85	332	624.6	609
Z13-4FM02	East	30/08/2013	05/09/2013	682938.5	5545724.4	88	43.6	513.4	492
Z13-4FM03	East	06/09/2013	11/09/2013	682934.6	5545706.4	86.5	43	465.0	229
Z13-4FM04	West	13/10/2013	21/10/2013	682460	5545670	85	135	448.5	412
Z13-4FM05	West	22/10/2013	29/10/2013	682490	5545647	85	185	489.3	431
Z13-4FM06	West	30/10/2013	06/11/2013	682511	5545742	85	45	447.0	372
								22462.4	17467

#### **10.2 Drill Hole Descriptions**

**<u>Z13-4F10</u>**: This hole intersected a felsic intrusive rock (syenite?) with weak to locally moderate graphitic overprinting from 46.85 m to 72.71 m downhole. From 86.48 m to 131.71 m, this hole intersected graphitic breccia with minor syenite intervals (1-3 m thick) with moderate to locally good graphitic content as graphitic flooding in the matrix and as randomly oriented, 1-3 mm wide, graphitic veinlets. From 131.71 m to 134.58 m, granodiorite with graphitic overprinting was intersected, and from 134.58 m to 209.19 m graphitic breccia was intersected. From 209.19 m to 265.14 m, a dark grey to black granodiorite with weak to moderate graphite overprinting was intersected. This unit was followed by 144.65 m of graphitic breccia with minor syenite intervals from 273.31 m to 280.12 m and from 283.69 m to 286.09 m with a weak graphitic overprint. Several dykes of felsic and mafic composition with no graphitic overprinting were intersected in this hole from 292.11 m to 394.72 m. These dykes vary in width from 0.5 m to 3.5 m. This drill hole was stopped at 438.00 m within a greenish-grey, fine- to medium-grained, olivine-aegirine syenite.





**<u>Z13-4F11</u>**: This hole started in a syenite unit with weak graphitic overprinting from 48.67 m to 168.48 m. It intersected the following: syenite with graphitic overprinting from 169.75 m to 219.80 m; granodiorite with graphitic overprinting from 227.15 m to 283.5 m; and, alternating intervals of graphitic breccia, graphitic overprinting and non-mineralized rock from 460.58 m to 545.52 m which averaged 5.23% Cg over 84.94 m downhole. This drill hole intersected a number of mafic dykes of variable widths from 219.80 m to 316.40 m; the widest mafic dyke was intersected from 219.80 m to 227.15 m. In the bottom half of the hole, the dykes are primarily of intermediate and felsic composition and vary in width from 1-3 m for the felsic dykes, and a 28.95 m intermediate dyke was intersected from 341.30 m to 370.25 m downhole. From

393.00 m to 423.30 m, drill hole Z13-4F11 intersected a syenite unit with weak graphitic overprinting followed by a 135.42 m thick graphitic breccia section with minor syenite and dyke intervals. From 596.00 m to 649.85 m, the hole intersected a greenish-grey olivine-aegirine syenite unit followed by a medium- to coarse-grained syenite with weak gneissic banding down to 677.00 m. From 683.80 m to 684.00 m, a conductive graphite overprinted unit, possibly graphitic breccia, with trace pyrite and carbonate veinlets at the upper contact was intersected.

Drill hole **Z13-4F12** intersected syenite from 57.35 m to 93.40 m. From 93.40 m to 123.80 m, 30.40 m of syenite with weak graphitic overprinting was intersected. From 112.00 m to 119.00 m, Z13-4F12 intersected a fault zone which was a mixture of altered mafic dyke with quart-carbonate veinlets, fault gouge, clay and fractured, blocky to crumbly core. The first graphitic breccia unit intersected in this drill hole was from 123.80 m to 186.54 m and was followed by a weak to moderate graphite overprinted syenite unit from 186.54 m to 191.65 m. The second graphitic breccia section was intersected from 213.00 m to 240.20 m which was followed by a syenite unit with weak graphitic overprinting that extended down to 323.25 m. This unit is followed by a medium-grained, massive syenite with weak gneissic banding and no visible graphite.

**Z13-4F13:** This drill hole started in weathered syenite from 66.00 m to 74.00 m, followed by a syenite section with weak to locally moderate graphitic overprinting from 74.00 m to 147.53 m downhole (73.53 m core length). The graphitic breccia was intersected from 147.53 m to 168.40 m (20.87 m core length) and from 178.27 m to 315.00 m (136.73 m core length). The first breccia interval contains good to very good graphite as graphitic flooding in the matrix and as locally massive graphitic veins up to 10 cm wide, as well as minor, 1-3 m wide syenite sections. A 9.87 m thick graphite overprinted syenite unit separates the two breccia intervals. The second graphitic breccia interval intersected in this hole extends from 178.27 m to 315.00 m (136.73 m core length) with few thin, 1-3 m, weak graphite overprinted syenite sections. This drill hole was stopped at 425.50 m depth in a greenish-grey, medium-grained, massive olivine-aegirine syenite unit with no visible graphite.



<u>Z13-4F13/308.00 m</u> – From 307.0 to 315.0 m, graphitic breccia sections alternate with less fractured/vein syenite.

Drill hole **Z13-4F14:**This drill hole intersected two graphite mineralized breccia zones with minor intervals of graphite overprinted syenite which have also been intruded by later unmineralized mafic to intermediate dykes. The first mineralized section is from 185.96 m to 332.28 m totalling 146.32 m and the second zone is 82.24 m long from 434.25 m to 516.49 m. Individual graphite breccia units range in thickness from 1.11 m to 41.87 m. Both breccia sections occur within an envelope of graphite overprinted syenite that extends for several metres. This drill hole was stopped at a depth of 668.00 m in unmineralized syenite.

**<u>Z13-4F15:</u>** This drill hole intersected mineralized graphitic breccia from 172.00 m to 256.74 m. Well mineralized breccia sections within this interval range in thickness from 10.37 m to 30.11 m for a total length of 84.74 m downhole. Minor syenite sections with moderate graphite overprinting occur within the breccia intervals and range in thickness from 1.55 m to 5.23 m. The moderately graphite overprinted syenite extends for approximately 100 m downhole to 365.15 m. This drill hole was stopped at a depth of 411.80 m.

Drill hole **<u>Z13-4F16</u>** intersected graphitic breccia from 291.00 m to 353.25 m with intercalated sections of syenite with weak graphitic overprinting ranging in thickness from 3.00 m to 7.70 m. This interval contains moderate graphite within the breccia and assayed 4.20% Cg over 62.25 m. A second graphitic breccia interval was intersected from 390.36 m to 393.27 m. From 393.27 m to 518.33 m this hole intersected an olivine-aegirine syenite sill and a massive medium-grained syenite with locally weak to very weak graphitic overprinting as discrete hairline fracture-filling conductive veinlets. The hole was stopped at 530.80 m into an intermediate dyke with no visible graphite.



<u>Z13-4F16/333.00 m</u>- Graphitic breccia with dark grey syenite fragments in graphite flooded matrix.

**<u>Z13-4F17</u>**: This drill hole intersected massive syenite with no graphite overprinting from 60.00 m to 237.00 m. From 237.00 m to 342.40 m the drill hole intersected 105.40 m of syenite with weak to locally moderate graphite overprinting. From 343.00 m to 385.00 m, several graphitic breccia intervals were intersected ranging in width from 2.70 m to 7.90 m. The graphitic breccia contains moderate to locally good graphite mainly as graphitic flooding in the matrix and as fracture-filling graphite veinlets. The graphitic breccia intervals are separated by syenite sections of comparable thickness (2.00 m to 5.80 m) with weak to moderate graphite overprinting. The graphitic breccia occurs within an envelope of syenite with moderate graphite overprinting that extends from 5.00 m to 13.00 m. A second graphitic breccia section was intersected from 410.10 m to 419.48 m and from 424.68 m to 425.61 m. From 430.90 m to 466.98 m, this drill hole intersected a 36.08 m thick section of olivine-aegirine syenite containing a felsic dyke. The hole was stopped at 508.75 m in syenite with a weak graphitic overprint.

Drill hole **Z13-4F18:** From 135.97 m to 285.95 m this drill hole intersected several well mineralized graphitic breccia intervals that range in thickness from 1.90 m to 40.78 m. These graphitic breccia sections alternate with weak to moderate graphite overprinted syenite intervals that range in thickness from 1.19 m to 23.40 m. From 285.95 m to 432.00 m this drill hole intersected several medium- to coarse- grained syenite sections with weak graphite overprinting that have been intruded by numerous mafic to intermediate dykes ranging from 1.0 m to 4.0 m thick.

**<u>Z13-4F19</u>**: This hole intersected well mineralized graphitic breccia from 69.80 m to 138.00 m that included 5.45 m of hematite altered syenite with strong fracture-filling graphite content from 80.55 to 86.00 m. A massive syenite unit with weak graphitic overprinting was intersected from

153.00 m to 171.00 m. This drill hole was shut down at 291.00 m in a massive syenite gneiss with very weak and local fracture-filling graphite veinlets.

Drill hole **Z13-4F20:** This drill hole intersected 106.10 m of well mineralized graphitic breccia from 77.35 m to 181.60 m including two thin (<3.0 m thick), weakly graphitic syenite intervals. The bottom half of this drill hole intersected a weak graphite overprinted syenite intruded by numerous mafic to intermediate dykes that range in thickness from 1.78 m to 19.00 m.

**<u>Z13-4F21</u>**: This drill hole intersected massive syenite with weak graphite overprinting from 59.00 m to 90.00 m. Graphitic breccia with good graphite mineralization was intersected for 102.00 m from 90.00 m to 192.00 m downhole. This drill hole intersected massive syenite from 192.00 m to 291.00 m with local weak graphite overprinting. This section of syenite has been intruded by two mafic dykes 2.60 m and 7.00 m thick with a weak graphite overprint.

Drill hole **<u>Z13-4F22</u>** intersected massive syenite with weak graphite overprinting from 62.40 m to 90.10 m. From 90.10 m to 187.30 m it intersected 97.20 m of graphitic breccia with good graphite content in the matrix and as fracture-filling veinlets. From 187.30 m to the end of the hole at 261.00 m this drill hole intersected massive syenite with locally weak graphite overprinting and a 1.10 m thick graphitic breccia section from 191.77 m to 192.87 m.

**<u>Z13-4F23</u>** intersected massive syenite with weak graphite overprinting from 60.10 m to 112.15 m. From 112.15 m to 178.45 m it intersected 66.30 m of graphitic breccia with good graphite content in the matrix and as fracture-filling veinlets. From 178.45 m to 224.30 m this hole intersected massive syenite with weak graphite overprinting. This drill hole was stopped in massive syenite at 270.00 m.

Drill hole **<u>Z13-4F24</u>**: This drill hole intersected massive syenite with weak graphite overprinting from 57.20 m to 86.00 m. From 86.00 m to 178.40 m it intersected 92.40 m of graphitic breccia. This drill hole was stopped at 252.00 m in massive syenite with weak graphite overprinting.

**<u>Z13-4F25</u>** intersected 75.80 m of well mineralized graphitic breccia from 62.25 m to 138.05 m. From 145.00 m to 157.65 m this hole intersected massive syenite with up to 20% graphitic breccia as several 15-90 cm wide brecciated sections with moderate graphite content. Drill hole <u>**Z13-4F26**</u> intersected well mineralized graphitic breccia from 100.57 m to 220.98 m for a total length of 120.41 m downhole. This breccia interval is interrupted by three weakly to moderately graphite overprinted syenite sections that vary in thickness from 3.03 m to 13.34 m. Few dykes of various composition and ranging in thickness from 1.12 m to 4.50 m also intrude this graphitic breccia interval. A second well mineralized graphitic breccia interval of 15.32 m thick was intersected from 205.66 m to 220.98 m. From 28.00 m to 317.76 m this drill hole intersected graphitic breccia mixed with a syenite section with moderate to strong graphite content that has been intrude by an 8.00 m thick, unmineralized intermediated dyke. The deepest graphitic breccia interval in this hole was intersected for 17.79 m from 409.96 m to 427.75 m downhole. From 427.75 m to the end of the hole, this drill hole intersected unmineralized syenite intruded by numerous intermediate dykes that vary in thickness from 1.03 m to 11.02 m. A 1.91 m thick fault zone with weak fracture-filling graphite was intersected at 556.49 m.

Drill hole **Z13-4F27:** This drill hole intersected several well mineralized graphitic breccia intervals from 257.50 m to 486.73 m. A well mineralized 27.16 m thick graphitic breccia section was intersected from 257.50 m to 284.66 m downhole. A 4.60 m thick graphitic breccia interval was intersected at 422.00 m. From 432.22 m to 441.27 m this hole intersected 9.05 m of well mineralized graphitic breccia. Finally, from 470.87 m to 486.73 m, this drill hole intersected well mineralized graphitic breccia intervals alternating with syenite sections.

**<u>Z13-4F28</u>**: This drill hole intersected 105.50 m of graphitic breccia from 94.30 m to 209.80 m. The top part of this interval from 94.30 m to 153.00 m is primarily well-fractured syenite with good graphite mineralization as fracture-filling veinlets. From 153.00 m to 209.80 m, this drill hole intersected the typical graphitic breccia with polymictic subangular fragments several centimetres in size in a graphite flooded matrix. The mineralized interval occurs within a graphite overprinted syenite envelope that extends for approximately 30 m on either side of the breccia body. This drill hole was stopped at 339.00 m depth in massive syenite with weak graphite overprinting.



<u>Z13-4F28/108.00 m</u> – Graphitic breccia mainly as fracture-filling veins and graphite flooding in matrix; some sections (5-15 cm) almost massive graphitic veins.

**Z13-4F29:** This drill hole intersected graphitic breccia starting at a 60.00 m depth at the end of casing. Three main breccia intervals were intersected between 60.00 m and 275.84 m and range in thickness from 24.60 m to 62.80 m. The first graphitic breccia interval extends from 60.00 m to 84.60 m over 24.60 m of core length. From 120.70 m to 183.50 m (62.80 m core length), this drill hole intersected well mineralized graphitic breccia with few (less than 2 m thick) intervals of unmineralized syenite and felsic and intermediate dykes. From 225.35 m to 275.84m to 339.35 m, this hole went through a series of intermediate dykes that cut through unmineralized, coarse, massive syenite units. Z13-4F29 was stopped at 423.00 m in what appears to be a thick massive, fine- to medium-grained olivine-aegirine syenite sill.

**<u>Z13-4F30</u>** intersected well mineralized graphitic breccia starting at 63.00 m at the end of the casing. This drill hole intersected four graphitic breccia sections that range in width from 11.15 m to 66.08 m. The main graphitic breccia intervals were intersected from the top of the hole down to 184.85 m. A 64.10 m thick breccia interval was intersected from 228.00 m to 292.10 m. This deeper breccia contain less graphite than the breccia at the top of the hole and appears to contain subrounded polymictic fragments of variable size in a fine-grained, dark grey, weakly conductive matrix. This drill hole was stopped at 390.00 m in a coarse-grained olivine-aegirine syenite similar to the one intersected in drill hole Z13-4F29.

Drill hole **Z13-4F31:** After a sedimentary unit, the hole intersected a small section of overprinted syenite before intersecting the graphitic breccia at 67.00 m. This breccia package is 125.10 m wide, ending at 192.10 m and has units of overprinted syenite separating the breccia zones. The breccia zones in this package range in width from 9.08 m to 61.35 m. At 300.00 m, after a section of no breccia and weak to no graphite overprinting, a second breccia package was

intersected down to 349.93 m. This secondary package consists of 1.13 m to 2.39 m brecciated zones separated by syenite with weak or no overprinting. The lithology between the two breccia packages is mostly diorite with a 44.85 m unit of felsic breccia (no graphite) spanning from 236.60 m to 281.45 m. Below the second breccia unit the rocks are predominantly olivine-aegirine syenite and diorite with the drill hole ending in the diorite.



<u>Z13-4F31/170.00 m</u> – Very dark grey to black graphitic breccia; the fragments range from 1 cm, and subrounded, to large 10 cm or greater size.

**<u>Z13-4F32</u>**: This drill hole intersected several graphitic breccia intervals starting from 119.75 m down to 298.28 m with individual graphitic breccia sections ranging in width from 1.00 m to 46.00 m. The best graphitic breccia interval was intersected over 74.50 m from 164.00 m to 238.50 m. A second well mineralized graphitic breccia interval was intersected from 288.00 m to 303.00 m over a core length of 15.00 m. From 303.00 m to 459.00 m this drill hole intersected mainly mafic to intermediate intrusive rocks with minor intervals of syenite with weak graphite overprinting. This drill hole was stopped at 459.00 m in unmineralized syenite.

**Z13-4F33** intersected several, well mineralized graphitic breccia intervals starting from 155.60 m down to 503.37 m. The individual graphitic breccia sections range in thickness from 2.0 to 52.0 m. The graphitic breccia encountered in this drill hole occurs in two main broad intervals. The first one starts from 155.60 m down to 301.00 m and includes several 5.0 m to 10.0 m thick graphitic breccia intervals including a 50.00 m thick, well mineralized graphitic breccia interval from 220.00 m to 270.00 m downhole. The graphitic breccia intervals occur within weakly overprinted syenite and range in thickness from 417.00 m to 440.00 m. A second graphitic breccia interval was intersected further downhole from 417.00 m to 440.00 m. A 20.50 m thick olivine-aegirine syenite unit separates this breccia interval from the deepest graphitic breccia zone intersected from 460.50 m to 503.37 m. This well mineralized graphitic breccia interval has been

interrupted by mafic to intermediate dykes with weak to locally moderate graphite overprinting. These dykes vary in thickness from 2.5 to 17.0 m. Drill hole Z13-4F33 was stopped at 540.00 m length in massive olivine-aegirine syenite.

Drill hole <u>**Z13-4F34**</u> intersected two main graphitic breccia zones. The first one was intersected from 148.80 m to 306.15 m for a total down hole length of 157.35 m. Within this interval, graphitic breccia sections alternate with two graphite overprinted syenite units that are 19.85 m and 23.85 m thick. The thickest graphitic breccia interval within this upper zone extends for 71.90 m downhole from 204.85 m to 276.75 m. A 23.77 m thick graphitic breccia section was intersected from 282.38 m to 306.15 m. The second graphitic breccia zone was intersected from 417.30 m to 443.33 m for a downhole length of 26.03 m. This zone also includes graphite overprinted syenite sections intruded by 1.0 m to 2.3 m thick mafic and/or felsic dykes. From 306.15 m to 409.69 m, a relatively thick, 103.54 m interval is composed predominantly of olivine-aegirine syenite (77% of interval) with lesser older syenite host and some smaller intermediate dykes separating the two main graphitic zones. This drill hole was stopped at a 530.60 m depth in massive olivine-aegirine syenite.

**Z13-4F35:** This drill hole intersected three zones of graphite mineralization composed of graphitic breccia and syenite with moderate graphite overprinting. The first mineralized zone extends for 41.95 m downhole from 290.43 m to 332.38 m. The second interval was intersected from 347.60 m to 360.49 m downhole for a total length of 12.89 m. The deepest mineralized interval in this drill hole was intersected from 378.80 m to 380.00 m for 1.20 m downhole. This drill hole extended the graphite mineralization on the northwest boundary of the East Pipe to a vertical depth of approximately 280 m. This drill hole was stopped at 522.00 m in massive syenite after going through an approximately 60 m thick olivine-aegirine syenite unit.

**<u>Z13-4F36</u>** intersected an 81.93 m graphite package from 205.76 m to 287.69 m. The brecciated units within this package range in width from 7.03 m to 38.57 m. The units are separated by overprinted syenite and, in one instance, a small overprinted mafic dyke. This hole was stopped 19.90 m into an olivine-aegirine syenite unit which started at 343.10 m.



## <u>Z13-4F36/219.00 m</u> – Typical graphitic breccia.

Drill hole **<u>Z13-4F37</u>**: From 61.24 m to 212.10 m, this hole intersected a large amount of overprinted syenite with some minor overprinted mafic dykes and an intermediate dyke. It was not until 242.87 m that the graphitic breccia was intersected; at this depth a 68.03 m package was intersected to a depth of 310.90 m. For the most part, this package was all breccia with a small amount of syenite and a felsic dyke, both of which were overprinted and separating the breccia. The breccia intersections ranged in width from 11.40 m to 38.49 m. There was no overprinting observed below the depth of 357.51 m and the hole was stopped in a mafic dyke at 390.00 m.

**<u>Z13-4FM01</u>** intersected the graphitic breccia at a depth of 47.15 m; from this depth to 347.00 m the hole alternated between graphite overprinted syenite and breccia or graphite overprinted granodiorite and breccia, with the odd exception of a felsic or mafic dyke cutting through. The intersected breccia intervals ranged from less than 1.00 m to 33.28 m in width. At 347.00 m a 36.00 m olivine-aegirine syenite unit was intersected, and at 512.22 m a second 65.54 m olivine-aegirine syenite was intersected. Between these two large gabbro units the rock type is predominantly breccia separated by graphite overprinted syenite; again, the breccia ranged from less than 1.00 m up to 42.08 m with the breccia between these two gabbro units having a much stronger graphite matrix. There were more dykes in this area, especially mafic dykes. Below the second syenite unit was the older host syenite with no graphite overprinting, but there were two localized areas of breccia with graphite, one being 1.39 m from 577.76 m to 579.15 m. The hole was shut down in a massive syenite with no graphite overprinting. The hole did not produce enough material for metallurgical testing, so two more holes of a similar nature were planned.

Drill hole **Z13-4F38** hole intersected a larger package of breccia 102.40 m wide from 326.20 m to 428.60 m, but there are some areas separating the actual breccia units by up to 8.76 m, specifically from 368.69 m to 377.45 m. The breccia units range from 0.66 m to 19.80 m in width. In the lower part of this hole, from 410.00 m to 420.50 m, there are some severely faulted zones that may contribute to some of the mineralization in this area. The hole was stopped after intersecting 7.79 m of granite.

**<u>Z13-4F39</u>**: The graphitic breccia intervals intersected in this drill hole can be grouped in two main zones. The first zone extends for 50.30m downhole from 64.00m to 114.30m and contains two main syenite sections with variable degrees of graphite overprinting from 66.30 m to 72.82 m and from 103.30 m to 112.50 m. The second graphitic breccia interval intersected in this drill hole extends for 129.05 m downhole from 125.75 m to 254.80 m. This mineralized section contains two, less than 5.0 m thick syenite intervals with weak to moderate graphite overprinting. From 254.80 m to 285.00 m, the drill hole intersected syenite with weak to locally moderate graphite overprinting as fracture-filling graphite veinlets. This drill hole was stopped in massive, medium-grained olivine-aegirine syenite at 381.00 m.



<u>Z13-4F39/176.00 m</u> - Good graphite as fracture-filling veinlets and locally massive veins 5-10 cm wide.

In drill hole **Z13-4FM02** the first brecciated unit with graphite was intersected just below the top sedimentary unit at 50.54 m; from here to a depth of 276.29 m the breccia alternated with graphite overprinted syenite. From 276.29 m to 343.35 m, the dominant unit was still breccia, but other units were also present including a graphite overprinted granodiorite, smaller syenite units (up to 10.82 m), and a mafic unit that is altered and has a graphite overprint. The breccia units range from 1.41 m to 31.98 m in width. At 343.35 m, the hole intersected 41.10 m of olivine-aegirine syenite down to 384.45 m. Below this syenite unit there is more breccia with graphite in the matrix and graphite overprinted syenite alternating with one another. As in M01,

the breccia below the syenite seems to have a much higher graphite content. The breccia units below the syenite ranged from 1.51 m to 11.59 m in width. This hole was shut down in a massive syenite with no graphite overprinting. A third hole is planned in similar fashion to the last two metallurgical holes in order to be sure there is enough material for sampling.



<u>Z13-4FM02/338.00 m</u> – Graphitic breccia; in some areas there is more intense fracture-filling as opposed to the classic breccia look. At 338.0 to 339.0 m, core sample Q185521 assayed 12.15% Cg.

**<u>Z13-4F40</u>**: This drill hole intersected the graphitic breccia at a depth of 84.40 m downhole after approximately 22 m of syenite. This hole intersected several graphitic breccia intervals that range in thickness from 2.55 m up to 73.60 m. The drill hole also intersected a non-conductive felsic breccia, possibly the precursor of the graphitic breccia that extends from 220.80 m to 235.00 m. The main mineralized interval extends for 136.40 m from 84.40 m to 220.80 m. It is interrupted by three syenite sections with moderate to good graphite overprinting that range in thickness from 4.90 m to 9.50 m. The deepest graphitic breccia in this hole was intersected from 289.80 m to 306.17 m.

Drill hole **Z13-4F41** started in graphitic breccia at the end of casing at 63.90 m. The main graphitic breccia interval in this drill hole extends for 167.50 m from 63.90 m to 231.40 m. The mineralized breccia zones within this interval range in thickness from 5.35 m to 39.40 m. This interval also includes several syenite sections with weak to moderate graphite overprinting that range in thickness from 2.45 m to 6.80 m. A second graphitic breccia interval was intersected from 245.30 m to 255.80 m for a total length of 10.30 m downhole. The deepest graphitic breccia in this drill hole was intersected from 297.20 m to 304.90 m.

**Z13-4FM03:** The reason for drilling this hole was to obtain more material to be tested for metallurgical purposes. This hole was again planned to drill directly down the pipe to recover the most material for metallurgical testing. The first brecciated unit with graphite was intersected just below the top sedimentary unit at 47.23 m; from here to a depth of 249.60 m the breccia alternated with graphite overprinted syenite and a small intermediate dyke from 140.10 m to 142.44 m. From 263.34 m to 406.08 m there is still an abundance of breccia, but the units seem to be narrower and there are more types of rock separating the units including overprinted syenite, overprinted granodiorite, and olivine-aegirine syenite. The breccia units range from 0.97 m to 74.45 m in length with the latter being at the very top of the hole from 65.65 m to 140.10 m; there is also a 51.43 m unit from 142.44 m to 193.87 m. This hole was shut down in a massive syenite with no graphite overprint. This hole was stopped because enough material for metallurgical testing was acquired.

Drill hole **Z13-4F42** started in massive syenite with weak to locally moderate graphite overprinting. The graphitic breccia was intersected from 192.55 m to 236.24 m downhole indicating a steep dip of the contact to the southeast. This drill hole was stopped in olivine-aegirine syenite at 237.00 m.

**<u>Z13-4F43</u>**: This drill hole started in graphitic breccia right at the end of the casing at 60.00 m. The graphitic mineralization intersected in this drill hole is mainly as fracture-filling graphitic veins and veinlets, and several sections of graphitic flooding in a well fractured medium- to coarse-grained syenite. Well mineralized graphitic intervals that range in thickness from 3.50 m up to 86.70 m alternate with massive syenite sections with moderate to locally strong graphite overprinting that vary in thickness from 4.2 m to 8.0 m. The contact between the syenite sections and well mineralized sections are gradual and based on changes in the amount of graphite mineralization.



<u>Z13-4F43 at 219.00 m</u> – Graphitic breccia; well mineralized section with fracture-filling graphite veins and veinlets throughout.

**Z13-4F44** intersected the graphitic breccia directly below the sediment unit at 68.07 m, and this breccia package continued to a depth of 256.94 m for a total package width of 188.87 m; the units separating the breccia in this package are mostly overprinted syenite with a few porphyritic intermediate dykes also cutting through. Breccia units ranged in width from 1.88 m to 49.84 m. After a 42.79 m section of mostly graphitic rock, with the exception of a 1.23 m breccia from 271.10 m to 272.36 m, a second breccia package was encountered from 299.73 m to 376.87 m. In this 77.14 m package, the breccia was separated by overprinted syenite units. The breccia units in this smaller package ranged from 3.63 m to 18.47 m wide. Below the second breccia package the lithology is comprised of olivine-aegirine syenite, diorite, and porphyritc intermediate dykes. The hole was stopped after drilling 33.33 m into an unmineralized syenite.

Drill hole <u>Z13-4F45</u> started in syenite with moderate fracture-filling graphite from the end of the casing at 63.20 m. This drill hole intersected well mineralized graphitic breccia from 63.20 m to 295.10 m. Within this interval, graphitic breccia sections range in thickness from 1.16 m to 48.90 m. These graphitic breccia sections alternate with syenite intervals with moderate to good fracture-filling graphite overprinting. The contacts between the syenite sections and well mineralized sections are usually gradual and based on changes in the amount of graphite mineralization. The widest breccia section was intersected from 63.20 m to 183.70 m for a total length of 120.50 m. A second, well mineralized, graphitic breccia interval was intersected from 306.26 m to 325.93 m for a length of 19.67 m downhole. The deepest graphitic breccia interval in this drill hole was intersected from 338.95 m to 368.70 m for 29.75 m downhole. This drill hole was stopped in unmineralized olivine-aegirine syenite at 381.00 m.

**<u>Z13-4F46</u>** intersected graphitic breccia directly below the sediment at 73.00 m, and the major breccia package that consists of graphite-rich breccia separated by syenite and granodiorite units continues to a depth of 284.41 m. The syenite and granodiorite units in this package are weakly to moderately overprinted and have moderate graphite fracture-filling. The breccia units in the package range from 1.32 m to 52.22 m wide. A large 102.93 m olivine-aegirine syenite sill was intersected between 299.90 m and 402.83 m. This drill hole was stopped in the syenite at 411.00 m. As the hole intersected breccia directly below the sediments, a contact for the pipe was not located.

**<u>Z13-4F47</u>**: The graphitic breccia package was intersected at 124.25 m and continued for 78.31 m to a depth of 202.56 m. Breccia units in this package range in width from 16.24 m to 26.55 m and are separated by overprinted syenite and a small intermediate dyke. There was no overprinting observed below the depth of 207.00 m and the hole was stopped in unmineralized syenite at 285.00 m.

Drill hole <u>Z13-4F48</u> intersected graphitic breccia at 101.90 m after a unit of syenite/overprinted syenite. The major breccia package that consists mostly of graphite-rich breccia separated by syenite continues to a depth of 295.60 m. The syenite in this package is weakly to moderately overprinted, and has moderate graphite fracture-filling. The breccia units in the package range from 8.48 m to 34.38 m in width. From 227.68 m to 230.00 m, there was an overprinted feldspar porphyry/felsic dyke that seems to be rich in graphite. A large olivine-aegirine syenite unit was intersected at 295.60 m and continued to the end of the hole at 387.11 m.

**<u>Z13-4F49</u>**: The drill hole intersected the graphitic breccia package from 100.16 m to 207.00 m after a 38.16 m wide unit of overprinted syenite. Included in this breccia package between zones of breccia are units of overprinted syenite and porphyritic intermediate dykes. The breccia units in the package range from 2.61 m to 24.20 m wide. From 258.36 m to 311.24 m, there was a secondary graphitic-rich breccia zone with three units ranging from 1.57 m to 17.56 m in width; these were separated by olivine-aegirine syenite dykes. The hole was shut down after drilling 39.65 m of unmineralized late syenite sill.

**<u>Z13-4F50</u>** intersected graphitic breccia at 84.70 m after a 20.70 m unit of syenite/overprinted syenite. The major breccia package consisting mostly of graphite-rich breccia separated by syenite and porphyritic intermediate dykes continues to a depth of 239.71 m. The syenite in this

package is weakly to moderately overprinted, and has moderate graphite fracture-filling. The breccia units in the package range from 1.83 m to 69.47 m wide. Below the main breccia package, the rock consists of weakly overprinted syenite and granodiorite and olivine-aegirine syenite. The hole was shut down after drilling 16.05 m into the syenite.



**<u>Z13-4F50/90.00 m</u>** – Graphitic breccia with grey and pink sub-angular to sub-rounded fragments ranging in size from 0.5-40 cm with some larger >50 cm fragments.

Drill hole **<u>Z13-4F51</u>** intersected 77.00 m of graphitic breccia from 117.95 m to 194.95 m including a few sections of weakly overprinted syenite that range in thickness from 3.2 m to 14.0 m. A deeper mineralized interval was intersected from 232.66 m to 274.15 m for a total length of 41.49 m that includes 8.10 m of unmineralized syenite and intermediate dyke from 252.70 m to 260.80 m. This drill hole was shut down in unmineralized syenite after going through a relatively thick (approximately 93 m), unmineralized intrusive rock.

**<u>Z13-4F52</u>** intersected graphitic breccia at 91.05 m and continued in a package of breccia alternating with overprinted syenite for 89.75 m to a depth of 180.80 m. The syenite in this package is weakly to moderately overprinted, and has moderate graphite fracture-filling. The breccia units in the package range from 9.67 m to 33.94 m wide. From 180.80 m to 207.15 m, there is major fracturing in an apparent fault zone. And again at 249.00 m to 252.00 m there is a zone of rubble held together by fault gouge; the rock surrounding this area is also strongly fractured. These major structural zones are not seen as dominantly in any other holes to date. The rock between the two fault zones is predominantly granitic. Below the second fault zone is largely olivine-aegirine syenite in which the hole was shut down.

**<u>Z13-4F53</u>**: The graphitic breccia interval is interrupted by a 4.38 m syenite section and a 3.85 m porphyritic intermediate dyke. Two syenite intervals with weak graphite overprinting were

intersected from 282.30 m to 303.10 m. This section has been intruded by a 9.50 m thick, unmineralized porphyritic intermediate dyke. A second graphitic breccia interval in this drill hole was intersected for 12.16 m from 333.30 m to 345.46 m, followed by a 7.14 m syenite section with a weak graphite overprint. This drill hole was stopped at 462.00 m in an unmineralized intermediate dyke, after intersecting a relatively thick, unmineralized olivine-aegirine syenite sill from 354.15 m to 416.70 m.

Drill hole **Z13-4F54** did not start in graphitic breccia as expected, but instead intersected a syenite to weakly overprinted syenite from 64.94 m to 100.86 m. At this point the drill hole intersected a weak/subtle graphitic breccia with low conductivity to a depth of 144.08 m. A weakly overprinted syenite and a porphyritic intermediate dyke unit separated this first 43.22 m wide breccia from a second 33.34 m wide breccia which was also weakly conductive and more subtle than typical West Pipe breccia. Three smaller units of more typical graphitic breccia ranging in width from 2.86 m to 11.75 m were intersected between 205.58 m to 252.20 m. The hole was stopped 23.69 m into a larger olivine-aegirine syenite sill unit.

**<u>Z13-4F55</u>**: This drill hole intersected a wide and well mineralized graphitic breccia interval from the end of the casing at 67.50 m to 231.50 m for a total of 164.00 m downhole. This intersection includes few thin (0.7-2.3 m) mafic and intermediate dykes and few graphite overprinted syenite sections that range in thickness from 1.6 m to 5.3 m. Two smaller graphitic breccia intervals were intersected from 240.50 m to 249.86 m and from 259.64 m to 264.15 m. This drill hole was stopped at 342.00 m in a medium- to coarse-grained, massive olivine-aegirine syenite sill.

**<u>Z13-4F56</u>** intersected several graphite breccia units between 132.57 m and 264.13 m downhole with numerous 1 m wide overprinted gneiss and mafic dykes. A 40.0 m intermediate intrusive unit cuts off the upper graphitic breccia unit from the lower breccia. The lower breccia unit consist of several 3-9 m wide graphite breccias separated by gneiss and intermediate intrusive dykes throughout until 461.05 m where the hole finishes in a granodiorite unit at 498.00 m. This hole was very successful in testing the extent of the lower graphite breccia in the West Pipe. Further drill testing of this area is suggested.

Drill hole **Z13-4F57** intersected well mineralized graphitic breccia from 106.80 m to 211.00 m downhole for a total interval of 104.2 m. This interval included two syenite sections with weak graphitic overprinting for a total of 7.70 m, as well as a 2.63 m thick unmineralized porphyritic

intermediate dyke. A second graphitic breccia interval was intersected from 259.65 m to 287.80 m for a total thickness of 28.15 m that includes a 2.20 m thick unmineralized syenite section. A third, well mineralized graphitic breccia interval was intersected from 296.60 m to 321.15 m totalling 24.55 m. This breccia interval has been intruded by a 5.20 m wide unmineralized intermediate dyke. A 1.10 m thick graphitic breccia interval was intersected at 335.40 m following a weakly mineralized brecciated syenite section. This drill hole was stopped in unmineralized olivine-aegirine syenite sill at 393.00 m.

**<u>Z13-4FM04</u>**: After a small 2.45 m unit of overprinted syenite directly below the limestone sediments, graphitic breccia was intersected; this unit was part of a 138.17 m breccia package that included eight graphite-rich breccias separated by mostly overprinted syenite units and a small feldspar porphyry unit. The breccia units range from 2.70 m to 42.43 m in width. A total of 54.85 m of syenite, olivine-aegirine syenite sill, and diorite separate this first package from a second smaller package of graphite-rich breccia alternating with the same syenite. The breccia units in this second smaller package range from 2.45 m to 7.36 m wide. Finally, below the 32.13 m of syenite and an olivine-aegirine syenite sill, a third package of breccia was intersected from 309.96 m to 436.78 m downhole. This 126.82 m package includes breccia units ranging from 0.86 m to 25.35 m separated by predominantly olivine-aegirine syenite. The hole was shut down at 448.50 m after drilling through 11.72 m of unmineralized syenite, olivine-aegirine syenite.

**Z13-4FM05** was planned to drill directly down the pipe to recover the most material for metallurgical testing, as well as to test an area with little data at depth along the east side of the pipe. The first brecciated unit with graphite was intersected below a 4.05 m unit of overprinted syenite at a depth of 55.65 m. This first package which includes some small olivine-aegirine syenite units and feldspar porphyry dykes consists mainly of graphite-rich breccia and graphite overprinted syenite to a depth of 264.15 m. This gives a total core length of 208.50 m for the package with brecciated zones ranging in width from 6.55 m to 28.93 m. In the brecciated zone from 206.90 m to 228.92 m, there was a 2.51 m wide section of matrix dominant rock with <1 cm sized fragments from 220.04 m to 225.55 m. From 312.69 m to 407.62 m, below a thick olivine-aegirine syenite unit, there was a secondary brecciated package intersected. This 94.93 m package included more olivine-aegirine syenite and non-overprinted syenite sections, but the matrix of the brecciated zones in this package ranged from 1.41 m to 23.23 m wide. There

were also two units of breccia - one 13.51 m wide and the other 4.42 m wide between 421.72 m and 446.06 m downhole. After drilling 6.27 m into a quartz poor granite, the hole was stopped at a final depth of 489.32 m.

Drill hole **Z13-4FM06** hole intersected a graphite-rich breccia directly below the limestone sediments at a depth of 49.50 m and was the thickest of eight breccia units that made up a 183.02 m package of breccia, olivine-aegirine syenite sill, regular and overprinted syenite. The breccia units range from 6.57 m to 90.82 m in width. At a depth of 232.52 m, this package is terminated at the contact of a 64.19 m wide olivine-aegirine syenite sill. There are two small breccia units in the area below the lower contact of this sill. There is a second breccia package beginning at a depth of 358.87 m and continuing to a depth of 435.98 m. This package is again made up of graphite-rich breccia alternating with olivine-aegirine syenite as well as a feldspar porphyry unit. Breccia units in this package are 1.04 m to 21.46 m wide. The hole was stopped at 447.00 m after drilling through 11.02 m of a medium-grained syenite.

DRILLING RESULTS – COMPOSITE GRADE (Cg)									
HOLE ID	From (m)	To (m)	Total Length (m)	Composite Grade (% Cg)	HOLE ID	From (m)	To (m)	Total Length (m)	Composite Grade (% Cg)
Z13-4F10	49.00	409.79	360.79	5.06	Z13-4F37	83.00	355.00	272.00	2.00
including	49.00	209.19	160.19	6.86	including	186.00	341.00	155.00	3.09
Z13-4F11	393.00	596.00	203.00	3.01	Z13-4F38	248.00	457.00	209.00	2.21
including	460.58	545.52	84.94	5.23	including	314.70	421.00	106.30	3.92
712 / 1512	00.00	295.00	105.00	4.00	712 4520	64.00	227.20	262.20	2 21
ZIJ-4FIZ	90.00	203.00	195.00	4.00	ZIJ-4F39	04.00	327.30	203.30	5.21
including	95.00	241.10	140.10	3.21	menualing	141.00	257.00	110.00	0.01
Z13-4F13	95.15	315.00	219.85	4.47	Z13-4F40	81.00	306.17	225.17	2.59
includina	138.00	315.00	177.00	5.34	includina	84.40	235.00	150.60	3.00
Z13-4F14	118.00	544.00	426.00	3.02	Z13-4F41	63.90	255.83	191.93	3.77
including	146.00	332.28	186.28	4.87	including	75.00	191.40	116.40	4.78
Z13-4F15	60.00	360.00	300.00	2.16	Z13-4F42	54.00	236.24	182.24	1.24
including	132.00	256.74	124.74	4.64	including	191.40	236.24	44.84	3.07
Z13-4F16	258.00	393.27	135.27	2.25	Z13-4F43	61.00	231.00	170.00	6.99
including	291.00	353.25	62.25	4.20	including	61.00	178.00	117.00	7.44
713-4E17	236.64	129.00	102.36	1.67	713-AEAA	68.07	120.82	352 75	2 10
including	322.00	389 15	67 15	2.98	including	93.28	220.02	126 72	3.90
monading	022.00	000.10	07.10	2.00	moruanig	00.20	220.00	120.12	0.00
Z13-4F18	101.00	359.00	258.00	3.07	Z13-4F45	57.00	372.50	315.50	5.58
including	133.00	287.00	154.00	4.79	including	63.22	281.77	218.55	6.75
Z13-4F19	66.00	242.00	176.00	2.65	Z13-4F46	72.01	296.00	223.99	2.35
including	66.00	176.00	110.00	4.15	including	76.00	119.00	43.00	3.70
Z13-4F20	61.00	302.45	241.45	3.08	Z13-4FM01	48.00	512.22	464.22	4.47
including	61.00	189.00	128.00	5.51	including	48.00	303.50	255.50	5.46
740 4504	62.00	001.00	000.00	0.40	740 45400	5054	400.50	440.04	0.00
213-4F21	63.00	291.00	228.00	3.13	∠13-4FM02	50.54	490.58	440.04	3.83
incluaing	89.00	229.55	140.55	4.//	incluaing	50.54	261.33	210.79	5.79
713-4F22	63.00	261.00	198.00	3.51	713-4FM03	47.23	409.00	361 77	4 66
including	63.00	200.00	137.00	4 96		46 78	307.00	260.22	5 36
menuumy	05.00	200.00	157.00	4.30	menualing	40.70	307.00	200.22	0.00

Table 4: Significant Assay Results from the 2013 Drill Program

Z13-4F23	62.00	241.00	179.00	3.10	Z13-4F47	107.00	241.00	134.00	3.78
including	83.00	179.30	96.30	5.28	including	124.88	203.00	78.12	6.15
Z13-4F24	61.00	252.00	191.00	3.82	Z13-4F48	83.00	295.60	212.60	3.20
including	61.00	211.60	150.60	4.78	including	101.90	228.20	126.30	3.52
Z13-4F25	62.25	213.00	150.75	3.88	Z13-4F49	63.00	220.00	157.00	2.85
including	62.25	164.00	101.75	5.53	including	100.16	206.00	105.84	3.86
Z13-4F26	100.57	317.76	217.19	2.44	Z13-4F50	72.00	257.00	185.00	3.14
including	100.57	219.00	118.43	3.39	including	89.00	183.00	94.00	4.92
Z13-4F27	183.00	336.13	153.13	1.30	Z13-4F51	92.25	288.20	195.95	1.84
including	248.00	295.02	47.02	3.75	including	112.00	194.95	82.95	2.71
740 4500	70.00		000.00		740.4550	05.00	000.40	105.10	4.50
213-4F28	70.00	339.00	269.00	3.33	Z13-4F52	65.00	230.18	165.18	1.59
including	94.30	209.80	115.50	6.94	including	92.00	180.00	88.00	2.75
742 4520	60.00	202.00	242.00	2.00	742 4552	80.60	211 10	101 50	1.64
Z13-4F29	60.00	303.00	243.00	2.00	Z13-4F53	09.00	211.10	121.50	1.04
Including	61.00	161.00	100.00	2.78	incluaing	119.37	168.20	48.83	3.52
713-4E30	63.00	202 17	220 17	2.64	713-AE5A	64.94	281.00	216.06	1.80
including	63.00	102.00	120.00	2.04	including	82.00	201.00	135.33	2.40
menading	00.00	152.00	123.00	0.72	menualing	02.00	217.00	100.00	2.45
Z13-4F31	65.00	359.00	294.00	2.61	Z13-4F55	67.87	264.15	196.28	2.81
includina	65.00	204.63	139.63	4.13	includina	86.10	192.00	105.90	3.53
Z13-4F32	106.84	367.50	260.66	2.10	Z13-4F56	123.00	498.00	375.00	1.21
including	119.75	220.00	100.25	3.71	including	132.57	209.55	76.98	2.16
Z13-4F33	123.00	320.23	197.23	1.63	Z13-4F57	106.80	345.00	238.20	2.11
including	155.62	306.00	150.38	2.09	including	106.80	210.00	103.20	2.95
Z13-4F34	126.00	313.30	187.30	2.02	Z13-4FM04	49.00	436.78	387.78	2.08
including	211.00	300.00	89.00	3.07	including	50.22	188.39	138.17	3.26
Z13-4F35	184.00	361.53	177.53	2.15	Z13-4FM05	51.60	449.00	397.40	2.51
including	279.00	361.53	82.53	4.35	including	83.26	256.00	172.74	3.14
740 1705	05.00	000.00	005.00	0.10	740 471403	40.50	107.00	007 70	0.10
Z13-4F36	95.00	330.00	235.00	2.16	Z13-4FM06	49.50	437.00	387.50	2.12
including	203.00	289.00	86.00	5.21	including	61.00	163.00	102.00	4.20

Drilling information confirms the presence of widespread hydrothermal graphite mineralization which is focused in two vertical, conical-shaped breccia pipes. Graphite mineralization has

been intersected down to a minimum depth of 500 m and both pipes are still open at depth. The mineralization consists of clasts of graphite vein material, disseminated graphite matrix and discrete graphite veins, veinlets and hairline veins. The stockwork graphitic veins can be several centimetres wide while the veinlets and hairlines are millimetre and submillimetre scale. Figures 17 and 18 below, show the geometry of the vertical, conical-shaped breccia pipes which taper with depth. Note that the East Pipe has a consistent higher grade above the unmineralized sill than the West Pipe which is generally lower grade and more variable.



Figure 17: East and West Pipes – 3D view with breccia pipes (red), graphite overprinted host rock (green) and the shallow dipping, unmineralized sill (black) (RPA, 2014)



Figure 18: East and West Pipes – 3D view showing block model grade distribution (RPA, 2014) (Note that the low grade overprint mineralization is in green and the consistently higher grade of the East Pipe above the unmineralized sill)

#### 11.0 Sampling Method and Approach

All diamond drill core was processed in Zenyatta's secure core shack at Eagle's Earth camp located approximately 30 km south of the property on Highway 11 (Figure 19). After the core has been delivered to the core shack, the core technician removes the lids and lays the boxes out in sequence on the logging benches. All of the core was then rotated so that the fabrics are oriented in the same direction and all broken pieces are matched and aligned. The length of the drill core recovered is then compared to the depth marker blocks to check for misplaced blocks and any significant grinding or core loss. The from-to intervals were then marked on the box and also etched on an aluminum tag along with hole number and box number and the tag was then stapled to the end of the box. The core RQD was then measured along with spot magnetic susceptibility and conductivity readings using a KT10-S/C instrument at 3 m intervals down the length of the hole. The core was then marked up and logged and sampled by an experienced and qualified geologist. Geological descriptions and data were captured directly to a notebook computer using X-Logger software that was developed by R. Pattison of Winnipeg, Manitoba. This software utilizes Microsoft Access and enables the geologist to capture a variety of geological data including basic drill logs, collar survey data, orientation survey data, assay and geochemical samples, alteration, structural measurements, RQD measurements, magnetic susceptibility and conductivity measurements, etc. Lithological names were standardized and drop down menus used to reduce data input errors. Sampling of the core was based on visual estimates of graphitic breccia content and typically were taken at 1.0 m intervals but ranged from 0.5 m to 1.5 m intervals in well mineralized breccia material. Unmineralized material was typically sampled at 1.5 m to 2.0 m intervals and the entire drill hole was sampled. Samples did not cross geological contacts. The core samples that were selected for assay were clearly marked on the core and two tags were placed at the start of each sample run (the third tag remained in the sample book with a record of hole number and sample interval). One tag was to be placed in the sample bag and the other stayed with the remaining core after splitting. At this stage the core was then photographed in batches of four NQ boxes at a time for the complete drill hole (Figure 20).

All diamond drill core was split using a diamond-blade core saw. The method employed to pump water for cooling the saw blade involves two, 25 gallon plastic garbage cans. The water is drained from the saw base into the first garbage can, where the heavier solids drop out of suspension and collect at the bottom of the garbage can. The water then flows into the second garbage can to further allow the fine particulate material to settle out. The water in the second

garbage can is then drawn by pump into the core saw. The water was routinely changed every few days and at this time the sludge at the bottom of each garbage can was disposed of. After splitting, the core was then washed down with clean water to remove any cuttings that remained on the cut surface. After the core was split, one half was put into a sample bag and the other half is returned to the core tray. All sample bags contain individual sample tickets as well as having the sample number scribed on the outside of the sample bag in black marker. Each sample bag was then stapled closed. The remaining half of the core storage (Figure 21). All sample tickets were taken back to a secure location and all sample data were then transferred to a password protected computer at base camp. The rice bags were also sealed by Zenyatta company employees before being shipped to ALS Minerals Laboratory in Thunder Bay where all samples were opened, crushed and split into sub-samples and pulverized prior to being sent for analyses in Vancouver, Canada. See Appendix 2, at back of this report for all assay results (COAs) for the 2013 drill program.



Figure 19: Aerial View of Zenyatta's Core Shack



Figure 20: Example of Photographed Core – Drill Hole Z13-4F28



Figure 21: 2013 Drill Core in Storage Racks
# 12.0 Sample Security, Preparation, Analysis, Quality Assurance and Quality Control

As part of Zenyatta's diamond drilling program, sample chain of custody was maintained by Zenyatta from the sample collection point until delivery to a representative from the analytical laboratory or until shipped directly to the sample preparation facility. Following sample collection, samples were then packed into large rice sacks and tightly sealed using nylon tie wraps. The sacks were stored at Zenyatta's core shack until they were transported directly to the laboratory.

All samples were submitted to ALS Minerals, Thunder Bay, Ontario, for sample preparation. After ALS received the samples they verified them against the shipping documents and entered the samples into their tracing system. Sample preparation was conducted using ALS code PREP-31B. Each sample was dried, crushed and pulverized (1000 g to 85%) passing 75 µm for assaying. To avoid contamination, ALS cleaned the crushers and pulverizers with barren material after each sample. Before June 3, 2013, the pulp samples were shipped to the ALS Laboratory in Brisbane, Australia for Cg and total sulphur assays. After June 3, 2013, the pulps were shipped to ALS Laboratories in Vancouver, British Columbia for graphitic carbon (Cg) and total sulphur assays using the following methods:

- Carbon Graphitic carbon by LECO (C-IR18) (range: 0.02%-100%), and
- Sulphur Total Sulphur (LECO) (S-IR08) (range: 0.01%-50%)

ALS has ISO 9001:2008 and ISO 17025 Accreditation as per the Standards Council of Canada at all of its global laboratories.

A total of 22,932 samples (including QC samples) were submitted to ALS Group from April to November 2013 (drill holes 4F1 to 4F57 and metallurgical holes 4FM01 to 4FM04; assay data was still pending for holes 4FM05 and 4FM06 at the time of the QAQC report (Pastakia, 2013)). Zenyatta geologists routinely inserted standards and control samples into the sample stream in order to test the analytical quality control. QA/QC was also routinely monitored by Naaznin Pastakia (M.Sc.) and is described in detail in Pastakia (2013).

The following section is based on the reports by Pastakia (2013) and RPA (2014).

## **Quality Assurance and Quality Control**

Quality assurance (QA) consists of evidence to demonstrate that the assay data has precision and accuracy within generally accepted limits for the sampling and analytical method(s) used in order to have confidence in future resource estimations. Quality control (QC) consists of procedures used to ensure that an adequate level of quality is maintained in the process of sampling, preparing, and assaying the exploration drilling samples. In general, QA/QC programs are designed to prevent or detect contamination and allow assaying (analytical) precision (repeatability) and accuracy to be quantified. In addition, a QA/QC program can disclose the overall sampling – assaying variability of the sampling method itself.

## **Certified Reference Material**

Results of the regular submission of Certified Reference Materials (CRMs) are used to identify problems with specific sample batches and long-term biases associated with the regular assay laboratory. Zenyatta prepared custom in-house standards. Four different CRMs were prepared by CDN Resource Laboratories Ltd. in Langley, British Columbia and certified for both graphitic carbon (Cg) and sulphur (S): ZEN-1, ZEN-2, ZEN-3, and ZEN-4. Table 5 lists the mean and standard deviation for each CRM. A total of 1,134 CRMs were inserted with the 22,932 regular core samples submitted by Zenyatta to ALS, for a rate of approximately 1 in 20 samples.

CRM ID	Cg	I (%)	S (%)		
	Mean	Std. Dev.	Mean	Std. Dev.	
ZEN-1	0.91	0.045	0.316	0.025	
ZEN-2	3.13	0.125	0.374	0.018	
ZEN-3	7.42	0.415	0.305	0.017	
ZEN-4	14.12	0.99	0.306	0.016	

Table 5: Expected Values for Custom CRMS

A QC failure for a CRM was defined as an assay that fell outside either three standard deviations ( $\pm$ 3SD) or  $\pm$ 10% of the expected value. The CRM assay results are illustrated in Figure 22 and data are summarized in Table 6.



Figure 22: Certified Reference Material Results

СРМ	No.	Expected Cg (%)		Observe	ed Cg (%)	% of	Miclobalo
CRIVI		Average	Std. Dev.	Average	Std. Dev.	Expected	WISIADEIS
ZEN-1	489	0.91	0.045	0.96	0.04	105.3	4
ZEN-2	272	3.13	0.125	3.18	0.10	101.4	7
ZEN-3	243	7.42	0.415	7.71	0.21	103.9	1
ZEN-4	130	14.12	0.99	15.08	0.39	106.8	2
Total	1,134	*-Weighted Average				104.2*	14

Table 6: 3	Summary	of CRM	Results
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Fourteen cases were identified where either the CRM code was recorded incorrectly or there was a sample mix-up with an adjacent sample. Two CRMs (representing <1% of the submitted CRMs) where identified as QC failures based on sulphur results. As sulphur is of secondary interest, Zenyatta chose not to re-assay results based on these failures.

Figure 17 and Table 6 suggest that results may be biased high for three of the four CRMs. Additional discussion on this potential bias is provided below in the subsection titled Assay Check Samples. Overall, the average results are generally within ±10%. RPA considered the CRM results acceptable, but recommended that the expected values for the in-house CRMs be re-evaluated prior to the next drilling campaign.

#### Blanks

Contamination and sample numbering errors are assessed through blank samples, on which the presence of the elements undergoing analysis has been confirmed to be below the corresponding detection limit. A significant level of contamination is identified when the blank sample yields values exceeding 0.2% Cg, which is ten times detection limit of 0.02% Cg. The matrix of the blank sample should be similar to the matrix of the material being routinely analyzed.

A blank consisting of coarse-grained granite was purchased from Analytical Solutions Ltd., Toronto. A total of 1,128 blanks were submitted with the 22,932 field and QC samples for an insertion rate of about 5%, or approximately 1 in 20 samples. Blank assay results are plotted in Figure 23, and statistics are listed in Table 7. Based on these results, there is no evidence of systematic sample contamination.



Figure 23: Blank Results

Table 7: Summary of Blank Results

Criteria	Cg	S
No. of Cases	1,128	1,128
Minimum (%)	0.010	0.030
Maximum (%)	0.200	0.160
Arithmetic Mean (%)	0.030	0.110
Standard Deviation (%)	0.026	0.020
No. of Mislabeled Samples	1	1
No. of Failures	2	1

#### **Duplicates**

Field duplicates assess the variability introduced by sampling the same drill core interval. The duplicate splits are bagged separately with separate sample numbers so as to be blind to the sample preparation laboratory. The duplicates contain all levels of sampling and analytical error and are used to calculate field, sample preparation, and analytical precision. They are also a

check on possible sample over selection, that is, the sampler has either purposely or inadvertently sampled the drill core so as to preferentially place visible mineralization in the sample bag sent for analysis.

Coarse duplicates (or coarse reject duplicates) are duplicate samples taken immediately after the first crushing and splitting step. At Zenyatta's request, the coarse duplicates pairs were created by splitting the crushed sample in two equal parts. The coarse duplicates will inform about the subsampling precision, that is, they report the errors due to sample size reduction after crushing, and the errors associated with weighing and analysis of the pulp. In order to ensure repeatability conditions, both the original and the coarse duplicate samples should be submitted to the primary laboratory, in the same sample batch and under a different sample number, so that pulverization and assaying follow the same procedure.

Pulp duplicates consist of second splits of final prepared pulverized samples, analyzed by the same laboratory as the original samples under different sample numbers. The pulp duplicates are indicators of the analytical precision, which may also be affected by the quality of pulverization and homogenization. In order to ensure repeatability conditions, both the original and the pulp duplicate samples should be submitted to the primary laboratory, in the same sample batch, and under a different sample number, so that assaying follows a similar procedure.

Zenyatta incorporated core, reject, and pulp duplicates into the sample stream. Results are summarized below.

#### **Drill Core Duplicates**

Drill core duplicates consist of two quarter core samples; the other half of the drill core is left in the box. RPA recommended that Zenyatta instead submit two half core samples instead of quarter core, to maintain a consistent sample size.

Ninety-four pairs of drill core duplicate samples were submitted for analysis. The original and duplicate sample assay results are plotted in Figure 24 and statistics are summarized in Table 8. Results confirm that there has been no bias introduced by preferentially submitting the more mineralized half of the core for assay.



Figure 24: Scatterplot of Drill Core Duplicates

Element (units)	Criteria	No.	Original > Duplicate	Original < Duplicate	Original = Duplicate
	all	04	46	47	1
Cg (%)	samples	94	49%	50%	1%
		01	44	47	0
	> 5 X DL	91	48%	52%	0%
	all	04	28	45	21
S (%)	samples	94	30%	48%	22%
		05	27	43	15
	> 5 X DL	60	32%	50%	18%

\*Detection Limit

## **Reject Duplicates**

A total of 992 pairs of reject duplicate samples were submitted for analysis. The original and duplicate sample assay results are plotted in Figure 25 and statistics are summarized in Table 9.



Figure 25: Scatterplot of Reject Duplicates

Element (units)	Criteria	No.	Original > Duplicate	Original < Duplicate	Original = Duplicate
	all	002	414	426	152
Cg (%)	samples	992	42%	43%	15%
		670	319	311	49
	> 5 X DL	679	47%	46%	7%
S (%)	all	002	310	286	396
	samples	992	31%	29%	40%
		705	275	259	261
	> 5 X DL	795	35%	32%	33%

#### Table 9: Summary of Reject Duplicate Results

\*Detection Limit

One case was identified where the difference between reject duplicates was greater than  $\pm 100\%$  and average assays were greater than 0.1% Cg.

From the data above, RPA concluded that there was no bias evident between original and duplicate halves of the drill core. That is, there has been no selection bias introduced.

## Laboratory Pulp Duplicates

A total of 953 pairs of laboratory pulp duplicate samples were assayed for graphitic carbon and 809 for sulphur. The original and duplicate sample assay results are plotted in Figure 26 and statistics are summarized in Table 10.



Figure 26: Scatterplot of Pulp Duplicates

	Element (units)	Criteria	No.	Original > Duplicate	Original < Duplicate	Original = Duplicate		
		all	052	338	434	181		
Cg (%)	samples	900	35%	46%	19%			
		695	259	339	87			
	> 5 X DL	600	38%	49%	13%			
-		all	000	231	252	326		
S (%)	samples	809	29%	31%	40%			
		695	211	239	235			
		> 5 X DL	600	31%	35%	34%		
*D	*Detection Limit							

Table 10: Summary of Pulp Duplicate Results

RPA reported that laboratory reproducibility of assays on the same pulp and at the same laboratory fall within the expected ranges. Overall, the precision for the field, reject, and pulp duplicates is very good. Most duplicates are well within  $\pm 10\%$  to  $\pm 20\%$ .

#### 13.0 Resource Estimate

The following section is based on RPA (2014).

Diamond drilling has outlined two graphite mineralized breccia pipes with three-dimensional continuity, and size and grades that can potentially be extracted economically. RPA has reported that Zenyatta's protocols for drilling, sampling, analysis, security, and database management meet industry accepted practices. The drill hole database was verified by RPA and was found to be suitable for Mineral Resource estimation work.

In December 2013, Zenyatta announced its maiden resource estimate for the Albany Graphite Deposit. RPA estimated Mineral Resources for the Albany graphite deposit using diamond drill hole data available as of November 15, 2013, which included drill holes Z11-4F1, Z12-4F2 to Z12-4F9, Z13-4F10 to Z13-4F57 and Z13-4FM01 to Z13-4FM03 (RPA, 2014). The Mineral Resource estimate was based on a potential open pit mining scenario. RPA estimated Indicated Mineral Resources to total 25.1 Mt at an average grade of 3.89% Cg, containing 977,000 tonnes of Cg (Table 11 and Figure 27). In addition, Inferred Mineral Resources are estimated to total 20.1 Mt at an average grade of 2.20% Cg, containing 441,000 tonnes of Cg. Mineral Resources were constrained within a preliminary optimized pit shell in Whittle software. RPA also reported that the Mineral Resource estimate is insensitive to cut-off grade up to at least 2% Cg.

	Tonnage	Grade	Contained Graphitic Carbon
	(Mt)	(% Cg)	(t Cg)
Indicated			
East Pipe and Halo	10.0	5.60	560,000
West Pipe	15.1	2.76	417,000
Total Indicated	25.1	3.89	977,000
Inferred			
East Pipe and Halo	7.6	2.04	155,000
West Pipe	12.5	2.29	286,000
Total Inferred	20.1	2.20	441,000

#### Table 11: RPA Mineral Resource Estimate - November 15, 2013

Notes:

1. CIM definitions were followed for Mineral Resources.

2. Cg – graphitic carbon

3. Mineral Resources are estimated at a cut-off grade of 0.6% Cg.

4. Mineral Resources are estimated using a long-term price of US\$8,500 per tonne Cg, and a US\$/C\$ exchange rate of 1.0.

5. Bulk density is 2.6 t/m<sup>3</sup> in the pipes and 2.65 t/m<sup>3</sup> in the halo of the East Pipe.

6. Mineral Resources are constrained by a preliminary pit shell generated in Whittle software.

7. Numbers may not add up due to rounding.

Figure 27 below shows the classified blocks for the Albany graphite deposit while Figures 28 and 29 show the Cg grades for the West and East pipes in long section.



Figure 27: 3D View of Mineral Resource Classification

![](_page_84_Figure_0.jpeg)

Figure 28: West Pipe Long Section View Looking Northwest

![](_page_84_Figure_2.jpeg)

Figure 29: East Pipe Long Section View Looking Southwest

## 14.0 Interpretation and Conclusions

Zenyatta has discovered a unique, igneous hosted, hydrothermal graphite deposit at its 100% owned Claim Block 4F property. The Albany graphite deposit is located in the Superior Province of the Canadian Shield, at the terrane boundary between the Quetico Subprovince to the north and the Marmion Subprovince to the south. Preliminary petrography indicates that the graphite-hosting breccias range in composition from diorite to granite. Graphite occurs both in the matrix, as disseminated crystals, clotted to radiating crystal aggregates and veins and along crystal boundaries, and as small veins within the breccia fragments.

The Albany deposit is a unique example of an epigenetic graphite deposit in which a large volume of highly crystalline, fluid-deposited graphite occurs within an igneous host. The deposit is interpreted as a vent pipe breccia that formed from CO<sub>2</sub>-rich fluids that evolved due to pressure-related degassing of syenites of the Albany Alkalic Complex.

Zenyatta Ventures has completed the 2013, Phase III exploration program on the Albany graphite deposit and drilling has outlined two graphite mineralized breccia pipes with threedimensional continuity, and size and grades that can potentially be extracted economically (RPA, 2014). The resource drilling tested the extent of the graphitic breccia mineralization in order to establish the geometry of the breccia bodies based on the shape of their geophysical signatures. The first drill holes (Z13-4F10 to Z13-4F16) were collared along a radial pattern at azimuths of 0°, 45°, 90°, 180°, 225°, 270° and 315° to test whether the shape of the geophysical signature can be used to define the shape of the conductive body (RPA, 2014).

From March 26, 2013 to November 6, 2013 Zenyatta completed 54 holes (27 on each breccia pipe) for a total of 22,463 m. Diamond drill holes were collared using NQ (47.6 mm core diameter) equipment for the 48 resource drill holes and HQ (63.5 mm core diameter) for the six metallurgical drill holes.

A total of 23,878 samples from the 2011, 2012 and 2013 programs were submitted for assay (graphitic carbon and total sulphur) of which 94 were core duplicate samples, 1,119 were reject duplicate samples, 1,179 were blanks and 1,177 were Zenyatta's Certified Reference Material (standards). Additionally, 857 samples of representative graphite mineralized samples, graphite overprinted material and unmineralized host rock were submitted for specific gravity measurements.

RPA reported that Zenyatta's protocols for drilling, sampling, analysis, security, and database management meet industry accepted practices. The drill hole database was also verified to be suitable for Mineral Resource estimation work. RPA estimated Mineral Resources for the Albany graphite deposit using diamond drill hole data available as of November 15, 2013, which included drill holes Z11-4F1, Z12-4F2 to Z12-4F9, Z13-4F10 to Z13-4F57 and Z13-4FM01 to Z13-4FM03. The Mineral Resource estimate is based on a potential open pit mining scenario. RPA estimated the *Indicated Mineral Resources* to total *25.1 Mt* at a grade of 3.89% Cg and to contain *977,000t Cg;* and *Inferred Mineral Resources* total *20.1 Mt* at a grade of 2.20% Cg, containing *441,000t Cg.* 

At the time of the drilling, bench scale metallurgical test work in 2012 and 2013 indicated that the graphite could be concentrated using conventional milling and flotation methods and purified using a caustic bake process to yield 99.9% graphitic carbon. Zenyatta believes that this high-purity product will command higher prices and is aiming to compete in the high-purity synthetic graphite market.

## 15.0 Recommendations

The 2013 drill program has indicated that the Block 4F Property hosts a significant igneousrelated, hydrothermal graphite deposit which merits considerable additional work. Additionally, on June 1, 2015, Zenyatta announced the results of a positive PEA study and RPA recommended that the project should be advanced to the pre-feasibility stage (RPA, 2015).

Additional future drill programs could include the following:

- Carry out a geotechnical drill program at pit wall locations to enhance geomechanical and rock mechanics assessments to confirm appropriate pit wall slope angles and stability. Also carry out specific hydrological/hydrogeological studies utilizing the geotechnical drill holes to refine dewatering needs in the open pit over the LOM.
- Consider upgrading areas of Inferred Mineral Resources to Indicated Mineral Resources. RPA noted that this is not necessarily required to advance to the prefeasibility stage as current Indicated Resources are adequate for the open pit production scenario described in the PEA.
- Recover more graphite mineralized material (>200 tonnes) via HQ or PQ drill holes to provide feed for a demonstration plant. Based on full-scale production rate of 30,000 tonnes per year of final product and a 1:5,000 scale factor a demonstration plant would produce 6 tonnes of product per year, or 20 kilograms a day.

RPA has proposed the following budget for the pre-feasibility study (RPA, 2015):

Item	C\$'000s
Geotechnical Drilling and Analysis (including hydrogeology)	600
Market Development Work	1,000
Metallurgical Testwork	1,600
Community Engagement	200
Environmental Baseline Studies (one year of a multi-year program including geochemistry)	600
Pre-Feasibility Study	500
Total	4,500

## Table 12: Proposed Budget

## 16.0 Statement of Qualification

I, Glenda Carey, of 218 London Drive, Thunder Bay, Ontario, do hereby certify that:

**1.** I hold a **Bachelor of Science Degree in Earth Science (1989)** from Memorial University of Newfoundland, St. Johns, Newfoundland and Labrador;

**2.** I have practiced my profession in Newfoundland and Labrador, NWT, Alberta, Nunavut and Ontario since 1989 and have been employed directly by mining and exploration companies, the Government of Nunavut, and the Government of Newfoundland and Labrador;

**3.** I am presently an employee of Zenyatta Ventures Limited based in Thunder Bay, Ontario as a Geologist for the company;

**4.** Permission is granted to Zenyatta Ventures Limited to use this report in a prospectus or other financial offering.

Date: August 10, 2015 at Thunder Bay, Ontario

Glenda Carey, B.Sc., Geologist Zenyatta Ventures Limited 1224 Amber Drive, Thunder Bay, Ontario, P7B 6M5 **Tel:** (807) 346-1660, **Fax:** (807) 345-4412

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#### **APPENDIX 1**

PHASE III - 2013 DRILL LOGS Z13-4F10 TO Z13-4F57 Z13-4FM01 TO Z13-4M06

#### **APPENDIX 2**

PHASE III - 2013 CERTIFICATES OF ANALYSIS

## **APPENDIX 3**

List of Standards and Blanks Z13-4F10 to Z13-4F57 Z13-4FM01 TO Z13-4M06

HOLE ID	SAMPLE	SAMPLE	HOLE ID	SAMPLE	SAMPLE	HOLE ID	SAMPLE	SAMPLE
712-4E10	ID	Standard	712-4529	0180524	Standard	712-AEA6	ID N540664	Standard
Z13-4110	1.012205	Blank	712-/E28	0180535	Blank	Z13-41 40	N549004	Blank
Z13-4F10	1.012225	Standard	713-4F28	0180544	Standard	Z13-41 40	N549684	Standard
Z13-4F10	1.012225	Blank	712-4F28	0180555	Blank	Z13-4F46	N540605	Blank
Z13-4F10	1012235	Standard	713-4F28	0180564	Standard	Z13-41 40	N549704	Standard
Z13-4F10	1.012255	Blank	713-4F28	0180575	Blank	Z13-41 40	N540715	Blank
Z13-4F10	1.012265	Standard	713-4F28	0180584	Standard	713-4F46	N549724	Standard
Z13-4F10	1.012275	Blank	713-4F28	0180595	Blank	713-4F46	N549735	Blank
Z13-4F10	1.012285	Standard	713-4F28	Q180604	Standard	713-4F46	N549744	Standard
Z13-4F10	1.012295	Blank	713-4F28	0180615	Blank	Z13-4F46	N549755	Blank
Z13-4F10	1.012305	Standard	713-4F28	0180624	Standard	713-4F46	N549764	Standard
Z13-4F10	1012315	Blank	713-4F28	0180635	Blank	Z10 41 40	N549775	Blank
Z13-4F10	1.012325	Standard	713-4F28	0180644	Standard	713-4F46	N549784	Standard
Z13-4F10	1012335	Blank	713-4F28	0180655	Blank	Z10 41 40	N549795	Blank
Z13-4F10	1012345	Standard	713-4F28	0180664	Standard	713-4F46	N549804	Standard
Z13-4F10	1.012355	Blank	713-4F28	Q180675	Blank	713-4F46	N549815	Blank
Z13-4F10	1.012365	Standard	713-4F28	0180684	Standard	Z13-4F47	0156715	Blank
Z13-4F10	1.012375	Blank	713-4F28	Q180695	Blank	713-4F47	Q156724	Standard
Z13-4F10	1.012385	Standard	713-4F28	0180704	Standard	Z13-4F47	0156735	Blank
Z13-4F10	1.012395	Blank	713-4F29	Q180715	Blank	713-4F47	Q156744	Standard
Z13-4F10	1.012405	Standard	713-4F29	0180724	Standard	713-4F47	0156755	Blank
Z13-4F10	1012415	Blank	713-4F29	0180735	Blank	713-4F47	0156764	Standard
Z13-4F10	1012425	Standard	713-4F29	Q180744	Standard	713-4F47	Q156775	Blank
Z13-4F10	1012435	Blank	713-4F29	Q180755	Blank	713-4F47	Q156784	Standard
Z13-4F10	L012445	Standard	Z13-4F29	Q180764	Standard	Z13-4F47	Q156795	Blank
Z13-4F10	L012455	Blank	Z13-4F29	Q180775	Blank	Z13-4F47	Q156804	Standard
Z13-4F10	L012465	Standard	Z13-4F29	Q180784	Standard	Z13-4F47	Q156815	Blank
Z13-4F10	L012475	Blank	Z13-4F29	Q180795	Blank	Z13-4F47	Q156824	Standard
Z13-4F10	L012485	Standard	Z13-4F29	Q180804	Standard	Z13-4F47	Q156835	Blank
Z13-4F10	L012495	Blank	Z13-4F29	Q180815	Blank	Z13-4F47	Q156844	Standard
Z13-4F10	L012505	Standard	Z13-4F29	Q180824	Standard	Z13-4F47	Q156855	Blank
Z13-4F10	L012515	Blank	Z13-4F29	Q180835	Blank	Z13-4F47	Q156864	Standard
Z13-4F10	L012525	Standard	Z13-4F29	Q180844	Standard	Z13-4F47	Q156875	Blank
Z13-4F10	L012535	Blank	Z13-4F29	Q180855	Blank	Z13-4F47	Q156884	Standard
Z13-4F10	L012545	Standard	Z13-4F29	Q180864	Standard	Z13-4F47	Q156895	Blank
Z13-4F10	L012555	Blank	Z13-4F29	Q180875	Blank	Z13-4F47	Q156904	Standard
Z13-4F10	L012565	Standard	Z13-4F29	Q180884	Standard	Z13-4F47	Q156915	Blank
Z13-4F10	L012575	Blank	Z13-4F29	Q180895	Blank	Z13-4F47	Q156924	Standard
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Z13-4F10	L012595	Blank	Z13-4F29	Q180915	Blank	Z13-4F47	Q156944	Standard
Z13-4F10	L012605	Standard	Z13-4F29	Q180924	Standard	Z13-4F47	Q156955	Blank
Z13-4F10	L012615	Blank	Z13-4F29	Q180935	Blank	Z13-4F47	Q156964	Standard
Z13-4F10	L012625	Standard	Z13-4F29	Q180944	Standard	Z13-4F47	Q156975	Blank
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Z13-4F10	L012645	Standard	Z13-4F29	Q180964	Standard	Z13-4F48	N549835	Blank

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Z13-4F11	N473004	Standard	Z13-4F29	Q180984	Standard	Z13-4F48	N549855	Blank
Z13-4F11	N473015	Blank	Z13-4F29	Q180995	Blank	Z13-4F48	N549864	Standard
Z13-4F11	N473024	Standard	Z13-4F29	Q181004	Standard	Z13-4F48	N549875	Blank
Z13-4F11	N473035	Blank	Z13-4F29	Q181015	Blank	Z13-4F48	N549884	Standard
Z13-4F11	N473044	Standard	Z13-4F29	Q181024	Standard	Z13-4F48	N549895	Blank
Z13-4F11	N473055	Blank	Z13-4F29	Q181035	Blank	Z13-4F48	N549904	Standard
Z13-4F11	N473064	Standard	Z13-4F29	Q181044	Standard	Z13-4F48	N549915	Blank
Z13-4F11	N473075	Blank	Z13-4F29	Q181055	Blank	Z13-4F48	N549924	Standard
Z13-4F11	N473084	Standard	Z13-4F29	Q181064	Standard	Z13-4F48	N549935	Blank
Z13-4F11	N473095	Blank	Z13-4F29	Q181075	Blank	Z13-4F48	N549944	Standard
Z13-4F11	N473104	Standard	Z13-4F29	Q181084	Standard	Z13-4F48	N549955	Blank
Z13-4F11	N473115	Blank	Z13-4F29	Q181095	Blank	Z13-4F48	N549964	Standard
Z13-4F11	N473124	Standard	Z13-4F29	Q181104	Standard	Z13-4F48	N549975	Blank
Z13-4F11	N473135	Blank	Z13-4F29	Q181115	Blank	Z13-4F48	N549984	Standard
Z13-4F11	N473144	Standard	Z13-4F29	Q181124	Standard	Z13-4F48	N549995	Blank
Z13-4F11	N473155	Blank	Z13-4F29	Q181135	Blank	Z13-4F48	N550004	Standard
Z13-4F11	N473164	Standard	Z13-4F30	Q181144	Standard	Z13-4F48	N550015	Blank
Z13-4F11	N473175	Blank	Z13-4F30	Q181155	Blank	Z13-4F48	N550024	Standard
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Z13-4F11	N473195	Blank	Z13-4F30	Q181175	Blank	Z13-4F48	N550044	Standard
Z13-4F11	N473204	Standard	Z13-4F30	Q181184	Standard	Z13-4F48	N550055	Blank
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Z13-4F11	N473224	Standard	Z13-4F30	Q181204	Standard	Z13-4F48	N550075	Blank
Z13-4F11	N473235	Blank	Z13-4F30	Q181215	Blank	Z13-4F48	N550084	Standard
Z13-4F11	N473244	Standard	Z13-4F30	Q181224	Standard	Z13-4F48	N550095	Blank
Z13-4F11	N473255	Blank	Z13-4F30	Q181235	Blank	Z13-4F48	N550104	Standard
Z13-4F11	N473264	Standard	Z13-4F30	Q181244	Standard	Z13-4F48	N550115	Blank
Z13-4F11	N473275	Blank	Z13-4F30	Q181255	Blank	Z13-4F48	N550124	Standard
Z13-4F11	N473284	Standard	Z13-4F30	Q181264	Standard	Z13-4F48	N550135	Blank
Z13-4F11	N473295	Blank	Z13-4F30	Q181275	Blank	Z13-4F48	N550144	Standard
Z13-4F11	N473304	Standard	Z13-4F30	Q181284	Standard	Z13-4F48	N550155	Blank
Z13-4F11	N473315	Blank	Z13-4F30	Q181295	Blank	Z13-4F48	N550164	Standard
Z13-4F11	N473324	Standard	Z13-4F30	Q181304	Standard	Z13-4F49	Q156984	Standard
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Z13-4F11	N473344	Standard	Z13-4F30	Q181324	Standard	Z13-4F49	Q157004	Standard
Z13-4F11	N473355	Blank	Z13-4F30	Q181335	Blank	Z13-4F49	Q157015	Blank
Z13-4F11	N473364	Standard	Z13-4F30	Q181344	Standard	Z13-4F49	Q157024	Standard
Z13-4F11	L012664	Standard	Z13-4F30	Q181355	Blank	Z13-4F49	Q157035	Blank
Z13-4F11	L012675	Blank	Z13-4F30	Q181364	Standard	Z13-4F49	Q157044	Standard
Z13-4F11	L012684	Standard	Z13-4F30	Q181375	Blank	Z13-4F49	Q157055	Blank
Z13-4F11	L012695	Blank	Z13-4F30	Q181384	Standard	Z13-4F49	Q157064	Standard
Z13-4F11	L012704	Standard	Z13-4F30	Q181395	Blank	Z13-4F49	Q157075	Blank
Z13-4F11	L012715	Blank	Z13-4F30	Q181404	Standard	Z13-4F49	Q157084	Standard
Z13-4F11	L012724	Standard	Z13-4F30	Q181415	Blank	Z13-4F49	Q157095	Blank
Z13-4F11	L012735	Blank	Z13-4F30	Q181424	Standard	Z13-4F49	Q157104	Standard
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Z13-4F16	N469724	Standard	Z13-4F35	Q183415	Blank	Z13-4F55	N551004	Standard
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Z13-4F16	N469744	Standard	Z13-4F35	Q183435	Blank	Z13-4F55	N551024	Standard
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Z13-4F16	N469784	Standard	Z13-4F35	Q183475	Blank	Z13-4F55	N551064	Standard
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Z13-4F16	N469804	Standard	Z13-4F35	Q183495	Blank	Z13-4F55	N551084	Standard
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Z13-4F16	N469824	Standard	Z13-4F35	Q183515	Blank	Z13-4F55	N551104	Standard
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Z13-4F20	N471544	Standard	Z13-4F39	N547604	Standard	Z13-4FM01	N547484	Standard
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Z13-4F20	N471564	Standard	Z13-4F39	N547624	Standard	Z13-4FM01	N547504	Standard
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Z13-4F20	N471675	Blank	Z13-4F39	N547735	Blank	Z13-4FM02	Q185244	Standard
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Z13-4F20	N471695	Blank	Z13-4F39	N547755	Blank	Z13-4FM02	Q185264	Standard
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Z13-4F21	N471715	Blank	Z13-4F39	N547775	Blank	Z13-4FM02	Q185284	Standard
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712-4521	NA7106A	Standard	Z13-4F40	N548074	Standard	Z13-4FIVIUZ	0185525	Blank
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213-4-22	114/19/5	Biarik	213-4-40	11548035	Dialik	213-41-11/02	Q 160044	Standard

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Z13-4F22	N472115	Blank	Z13-4F40	N548175	Blank	Z13-4FM02	Q185684	Standard
Z13-4F22	N472124	Standard	Z13-4F40	N548184	Standard	Z13-4FM02	Q185695	Blank
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Z13-4F22	N472155	Blank	Z13-4F40	N548215	Blank	Z13-4FM02	Q185724	Standard
Z13-4F22	N472164	Standard	Z13-4F40	N548224	Standard	Z13-4FM03	Q156004	Standard
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Z13-4F22	N472184	Standard	Z13-4F40	N548244	Standard	Z13-4FM03	Q156024	Standard
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Z13-4F23	N472204	Standard	Z13-4F40	N548264	Standard	Z13-4FM03	Q156044	Standard
Z13-4F23	N472215	Blank	Z13-4F40	N548275	Blank	Z13-4FM03	Q156055	Blank
Z13-4F23	N472224	Standard	Z13-4F40	N548284	Standard	Z13-4FM03	Q156064	Standard
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Z13-4F23	N472324	Standard	Z13-4F41	N548384	Standard	Z13-4FM03	Q156164	Standard
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Z13-4F23	N472344	Standard	Z13-4F41	N548404	Standard	Z13-4FM03	Q156184	Standard
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Z13-4F23	N472304	Standard	Z13-4F41	N548424	Standard	Z13-4FM03	Q156204	Standard
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Z13-4F23	N472415	Stondard	Z13-4F41	N540404	Stondord	Z13-4FIVIU3	Q100//0	Stondard
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Z13-4F24	N472475	Blank	Z13-4F41	N548535	Blank	Z13-4FM03	Q185835	Blank
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Z13-4F20	N472004	Stopdard	Z13-4F43	N540930	Didi IK Stondord	Z13-4FIVIU4	Q159024	Stanuard
Z13-4F20	N472005	Stanuard	Z13-4F43	N540944	Block	Z13-4FIVIU4	Q159035	Stondord
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712 4526	N47204E	Stariuara	Z13-4F43	N540904	Black	Z13-4FIVIU4	0150064	Didi IK Standard
213-4-26	11472915	віапк	213-4-43	11548975	віапк	213-4-1404	Q159064	Standard
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Z13-4F26	N472955	Blank	Z13-4F43	N549015	Blank	Z13-4FM04	Q159104	Standard
Z13-4F26	N472964	Standard	Z13-4F43	N549024	Standard	Z13-4FM04	Q159115	Blank
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Z13-4F26	N472995	Blank	Z13-4F43	N549055	Blank	Z13-4FM04	Q159144	Standard
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713_4E26	NA7279A	Standard	Z13-41-44 713-AEAA	0156525	Blank	Z13-4FW05	0150/75	Blank
712_AE26	NA72725	Blank	Z13-41-44 712-AEAA	0156544	Standard	Z13-4FW05	0150/9/	Standard
Z13-4F26	NA7274A	Standard	Z13-4F44	0156555	Blank	713-4FM05	0150405	Blank
713-4F26	N472755	Blank	Z13-AFAA	0156564	Standard	713-4FM05	0150504	Standard
713-4F26	N473764	Standard	713-4F44	0156575	Blank	713-4FM05	0159515	Blank
Z13-4F26	N473775	Blank	Z13-4F44	Q156584	Standard	Z13-4FM05	Q159524	Standard
Z13-4F26	N473784	Standard	Z13-4F44	Q156595	Blank	Z13-4FM05	Q159535	Blank
213 41 20	11713104	Standaru	213 41 44	Q 100090	Diani	213 41 100	Q 103000	Diant

Z13-4F26	N473795	Blank	Z13-4F44	Q156604	Standard	Z13-4FM05	Q159544	Standard
Z13-4F26	N473804	Standard	Z13-4F44	Q156615	Blank	Z13-4FM05	Q159555	Blank
Z13-4F26	N473815	Blank	Z13-4F44	Q156624	Standard	Z13-4FM05	Q159564	Standard
Z13-4F26	N473824	Standard	Z13-4F44	Q156635	Blank	Z13-4FM05	Q159575	Blank
Z13-4F26	N473835	Blank	Z13-4F44	Q156644	Standard	Z13-4FM05	Q159584	Standard
Z13-4F27	N473844	Standard	Z13-4F44	Q156655	Blank	Z13-4FM05	Q159595	Blank
Z13-4F27	N473855	Blank	Z13-4F44	Q156664	Standard	Z13-4FM05	Q159604	Standard
Z13-4F27	N473864	Standard	Z13-4F44	Q156675	Blank	Z13-4FM05	Q159615	Blank
Z13-4F27	N473875	Blank	Z13-4F44	Q156684	Standard	Z13-4FM05	Q159624	Standard
Z13-4F27	N473884	Standard	Z13-4F44	Q156695	Blank	Z13-4FM05	Q159635	Blank
Z13-4F27	N473895	Blank	Z13-4F44	Q156704	Standard	Z13-4FM05	Q159644	Standard
Z13-4F27	N473904	Standard	Z13-4F45	N549064	Standard	Z13-4FM05	Q159655	Blank
Z13-4F27	N473915	Blank	Z13-4F45	N549075	Blank	Z13-4FM05	Q159664	Standard
Z13-4F27	N473924	Standard	Z13-4F45	N549084	Standard	Z13-4FM05	Q159675	Blank
Z13-4F27	N473935	Blank	Z13-4F45	N549095	Blank	Z13-4FM05	Q159684	Standard
Z13-4F27	N473944	Standard	Z13-4F45	N549104	Standard	Z13-4FM05	Q159695	Blank
Z13-4F27	N473955	Blank	Z13-4F45	N549115	Blank	Z13-4FM05	Q159704	Standard
Z13-4F27	N473964	Standard	Z13-4F45	N549124	Standard	Z13-4FM05	Q159715	Blank
Z13-4F27	N473975	Blank	Z13-4F45	N549135	Blank	Z13-4FM05	Q159724	Standard
Z13-4F27	N473984	Standard	Z13-4F45	N549144	Standard	Z13-4FM05	Q159735	Blank
Z13-4F27	N473995	Blank	Z13-4F45	N549155	Blank	Z13-4FM05	Q159744	Standard
Z13-4F27	Q180004	Standard	Z13-4F45	N549164	Standard	Z13-4FM05	Q159755	Blank
Z13-4F27	Q180015	Blank	Z13-4F45	N549175	Blank	Z13-4FM05	Q159764	Standard
Z13-4F27	Q180024	Standard	Z13-4F45	N549184	Standard	Z13-4FM05	Q159775	Blank
Z13-4F27	Q180035	Blank	Z13-4F45	N549195	Blank	Z13-4FM06	Q159784	Standard
Z13-4F27	Q180044	Standard	Z13-4F45	N549204	Standard	Z13-4FM06	Q159795	Blank
Z13-4F27	Q180055	Blank	Z13-4F45	N549215	Blank	Z13-4FM06	Q159804	Standard
Z13-4F27	Q180064	Standard	Z13-4F45	N549224	Standard	Z13-4FM06	Q159815	Blank
Z13-4F27	Q180075	Blank	Z13-4F45	N549235	Blank	Z13-4FM06	Q159824	Standard
Z13-4F27	Q180084	Standard	Z13-4F45	N549244	Standard	Z13-4FM06	Q159835	Blank
Z13-4F27	Q180095	Blank	Z13-4F45	N549255	Blank	Z13-4FM06	Q159844	Standard
Z13-4F27	Q180104	Standard	Z13-4F45	N549264	Standard	Z13-4FM06	Q159855	Blank
Z13-4F27	Q180115	Blank	Z13-4F45	N549275	Blank	Z13-4FIVIU6	Q159864	Standard
Z13-4F27	Q180124	Standard	Z13-4F40	N549284	Standard	Z13-4FIVIU0	Q159875	Blank
Z13-4FZ7	Q180135	Blank	Z13-4F40	N549295	Blank	Z13-4FIV100	Q159884	Standard
Z13-4FZ7	Q100144	Blonk	Z13-4F43	N549304	Blonk	Z13-4F1000	Q159695	Standard
Z13-4F27	0120164	Standard	Z13-4F45	N549313	Standard	Z13-4FW00	Q159904	Blank
Z13-4F27	0180175	Blank	Z13-4F45	N549324	Blank	Z13-4FW00	0150024	Standard
Z13-41 Z1 713-4E27	0180184	Standard	712-AEA5	N549333	Standard	Z13-41 1000	0150035	Blank
713-4F27	0180104	Blank	Z13-4F45	N540255	Blank	713-4FM06	0150044	Standard
713-4F27	0180204	Standard	Z13-4F45	N540364	Standard	713-4FM06	0150055	Blank
713-4F27	Q180215	Blank	713-4F45	N549375	Blank	713-4FM06	Q159964	Standard
Z13-4F27	Q180274	Standard	Z13-4F45	N549384	Standard	Z13-4FM06	Q159975	Blank
713-4F27	Q180225	Blank	713-4F45	N549395	Blank	713-4FM06	Q159984	Standard
Z13-4F27	Q180244	Standard	Z13-4F45	N549404	Standard	Z13-4FM06	Q159995	Blank
Z13-4F27	Q180255	Blank	Z13-4F45	N549415	Blank	Z13-4FM06	Q160004	Standard
213 41 21	Q 100200	Diank	213 41 43	110-13-110	Dianik	213 41 100	3 10000 <del>4</del>	Standard

Z13-4F27	Q180264	Standard	Z13-4F45	N549424	Standard	Z13-4FM06	Q160015	Blank
Z13-4F27	Q180275	Blank	Z13-4F45	N549435	Blank	Z13-4FM06	Q160024	Standard
Z13-4F27	Q180284	Standard	Z13-4F46	N549444	Standard	Z13-4FM06	Q160035	Blank
Z13-4F27	Q180295	Blank	Z13-4F46	N549455	Blank	Z13-4FM06	Q160044	Standard
Z13-4F27	Q180304	Standard	Z13-4F46	N549464	Standard	Z13-4FM06	Q160055	Blank
Z13-4F27	Q180315	Blank	Z13-4F46	N549475	Blank	Z13-4FM06	Q160064	Standard
Z13-4F27	Q180324	Standard	Z13-4F46	N549484	Standard	Z13-4FM06	Q160075	Blank
Z13-4F27	Q180335	Blank	Z13-4F46	N549495	Blank	Z13-4FM06	Q160084	Standard
Z13-4F27	Q180344	Standard	Z13-4F46	N549504	Standard	Z13-4FM06	Q160095	Blank
Z13-4F27	Q180355	Blank	Z13-4F46	N549515	Blank	Z13-4FM06	Q160104	Standard
Z13-4F27	Q180364	Standard	Z13-4F46	N549524	Standard	Z13-4FM06	Q160115	Blank
Z13-4F27	Q180375	Blank	Z13-4F46	N549535	Blank	Z13-4FM06	Q160124	Standard
Z13-4F27	Q180384	Standard	Z13-4F46	N549544	Standard	Z13-4FM06	Q160135	Blank
Z13-4F28	Q180395	Blank	Z13-4F46	N549555	Blank	Z13-4FM06	Q160144	Standard
Z13-4F28	Q180404	Standard	Z13-4F46	N549564	Standard	Z13-4FM06	Q160155	Blank
Z13-4F28	Q180415	Blank	Z13-4F46	N549575	Blank	Z13-4FM06	Q160164	Standard
Z13-4F28	Q180424	Standard	Z13-4F46	N549584	Standard	Z13-4FM06	Q160175	Blank
Z13-4F28	Q180435	Blank	Z13-4F46	N549595	Blank	Z13-4FM06	Q160184	Standard
Z13-4F28	Q180444	Standard	Z13-4F46	N549604	Standard	Z13-4FM06	Q160195	Blank
Z13-4F28	Q180455	Blank	Z13-4F46	N549615	Blank	Z13-4FM06	Q160204	Standard
Z13-4F28	Q180464	Standard	Z13-4F46	N549624	Standard	Z13-4FM06	Q160215	Blank
Z13-4F28	Q180475	Blank	Z13-4F46	N549635	Blank			
Z13-4F28	Q180484	Standard	Z13-4F46	N549644	Standard			
Z13-4F28	Q180495	Blank	Z13-4F46	N549655	Blank			
Z13-4F28	Q180504	Standard			1	4		
Z13-4F28	Q180515	Blank						

## **APPENDIX 4**

RE- ASSAY RESULTS OF 2011 AND 2012 PULPS, REJECT AND CORE MATERIAL For Holes Z11-4F1, Z12-4F2 to Z12-4F9