Feasibility Study

Bissett Creek Graphite Project
Ontario, Canada

Volume I

Prepared for:

Northern Graphite Corporation
Suite 201, 290 Picton Avenue
Ottawa, Ontario

August 23, 2012

Prepared by:

G Mining Services Inc.
7900 Taschereau Blvd.
Building D, Suite 200
Brossard, Québec
Canada J4X 1C2

IMPORTANT NOTICE

This report was prepared as a National Instrument 43-101 Technical Report, in accordance with Form 43-101F1, for Northern Graphite Corporation by G Mining Services Inc. The quality of information, conclusions, and estimates contained herein is based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report.

Northern Graphite Corporation is authorized to file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities law, any other use of this report by any third party is at that party's sole risk.

Feasibility Study

Bissett Creek Project
Ontario, Canada

Northern Graphite Corporation

Suite 201, 290 Picton Avenue
Ottawa, ON, K1Z 8P8
Tel: 613-241-9959 • 613-241-6005
E-mail:
Web Address: www.northerngraphite.com

G Mining Services Inc.

7900 W. Taschereau Boulevard.
Suite D-200, Brossard, Québec
Canada J4X 1C2
Tel: (450) 465-1950 • Fax: (450) 465-6344
E-mail: l.gignac@gmining.com
Web Address: www.gmining.com

August 23, 2012

Compiled by:

N. Ménard ing. (Signature)

Nicolas Ménard, ing.
Engineering Consultant
G Mining Services Inc.

Reviewed by:

(Signature)

Louis Gignac, ing., M.Sc.,D.Eng.
President
G Mining Services Inc.

Qualified Persons

Prepared by:

Louis Gignac, ing., M.Sc., D.Eng.
President
G Mining Services Inc.

Date: Aug 23.2012

Robert Marchand, ing.,
Vice President, Mine Engineering
G Mining Services Inc.

Date: Aug 23, 2012

Robert Ménard, ing.
Vice President, Engineering & Construction
G Mining Services Inc.

Date: Aug 23 2012

Andy Phillips, P.Eng.
Senior Engineer
Knight Piésold Ltd.

Date: Aug 23, 2012

Steven R. Aiken, P.Eng.
Manager Environmental Services
Knight Piésold Ltd.

Date: August 23/2012

Qualified Persons

Date: August 23, 2012

Ahmed Bouajila, ing.,
Vice President, Metallurgy & Mineral Processing
G Mining Services Inc.

Date: August 23 2012

Nicolas Ménard, ing.,
Engineering Consultant
G Mining Services Inc.

Date: August 23, 2012

Daniel Houde, ing.
General Manager - Projects
Met-Chem Canada Inc.

Date: 23-08-2012

François Thibert, M.Sc., P.Geo.
Senior Geologist
SGS Canada Inc.

Date: August 23, 2012

Gilbert Rousseau, ing., B Sc.A
Senior Mining-Metallurgical Engineer
SGS Canada inc.

Qualified Persons

, ing.

Date: 23/08/12

Antoine Champagne, ing., #OIQ 137814
Project Manager
G Mining Services Inc.

Table of Contents

List of Figures

List of Tables

List of Appendices

1. SUMMARY

1.1 Introduction and Participants

Northern Graphite Corporation ("Northern Graphite") retained the services of G Mining Services Inc. ("G Mining") to produce a National Instrument 43-101 ("NI-43-101") compliant bankable Feasibility Study with the collaboration and contribution of the following specialized consultants for specific areas of the Study:

Table 1.1: Feasibility Study Participants

Area	Participant
Mineral Resources	SGS Canada Inc.
Metallurgical Test Works, Supervision and Reporting	SGS Lakefield
Mineral Processing Methods, Metal Recoveries and Flow Sheets	SGS Canada Inc.
Environment and Social Studies	Knight Piésold Ltd.
Roads, Tailings Management Facilities and Water Management	Knight Piésold Ltd.
Closure Plan, Environmental Management Plan, Permitting	Knight Piésold Ltd.
Process Plant Engineering	Met-Chem Canada Inc.
Mineral Reserves and Mine Plan	G Mining Services Inc.
Infrastructures, Support Buildings and Power Generation	G Mining Services Inc.
Capital and Operating Costs, Financial Model	G Mining Services Inc.
Overall Coordination, Conclusion and Recommendations	G Mining Services Inc

The effective date of this report is August 23rd, 2012.

1.2 Property Description and Location

The Bissett Creek project is located in the Maria Township, in Ontario. It is located approximately 53 km east of the city of Mattawa. It is accessible by the Trans-Canada Highway (Hwy 17) and by the existing Bissett Creek Road.

The property consists of 17 mining claims covering approximately 2,424 ha and a mineral lease of approximately 564 ha. These holdings are registered at the Ministry of Northern Development and Mines of the province of Ontario.

Three (3) prospectors are entitled to a royalty of CAD 20/t of graphitic carbon concentrate when the mine will be operational.

1.3 History

The property was first staked in 1980 by Frank Tagliamonte and Associates. It subsequently changed hands in the 80s and 90s and is currently owned by Northern Graphite.

Drilling programs were conducted in the 80s. Core samples are not available from those drilling campaigns. Economic analysis was conducted in the past for this project. KHD Humbolt Wedag. (“KHD”) conducted a full Feasibility Study on the project in 1989. However, collapse of the world prices of graphitic carbon prevented the previous owner from moving the project to the implementation phase.

SGS Canada completed a Preliminary Economic Assessment (“PEA”) in 2010, which was revised in February, 2011. Northern Graphite undertook an additional drilling program in 2010 and following the release of results in 2011, SGS Canada updated the resources estimate for the Bissett Creek Project in May 2011. The results of the PEA and the resource update convinced Northern Graphite to proceed with a full Feasibility Study for the project.

1.4 Geological Setting and Mineralization

The Bissett Creek property lies within the Ontario segment of the Central Gneiss Belt of the Grenville Structural Province. Mapping of the area indicates that the Bissett Creek property and the surrounding area are underlain by Middle Pre-cambian meta-sediments. The host rock to the graphite is a medium to coarse-grained, grey, quartz-rich gneiss. The three (3) main gneisses that are found on the property are the graphitic gneiss, the barren gneiss and the transitional graphitic gneiss. The Bissett Creek deposit is classified as disseminated flake graphite in silica-rich meta-sediments.

Graphite seems to be associated with biotite. Sulphides appear in the graphitic gneiss at a sulphur content ranging between 0.8% and 1.86%. The western edge of the graphitic gneiss is truncated by erosion. The eastern limit of graphite outcrop is determined by the overlying barren gneiss contact. The limits of graphitic gneiss exposure form an irregular area with a north-south length of 2.1 km; east-west dimensions reach a maximum of 1.2 km. The graphitic gneiss exposure tapers dramatically toward the north and south before being lost through structural displacement or erosion.

1.5 Exploration, and Drilling

Exploration programs have been completed by various groups, starting in 1984 with Princeton Resources Corporation (“Princeton”). A major program was conducted by Princeton in 1985, where a total of 5,156 m were drilled and a 4,000 t bulk sample was extracted for pilot plant testing. Additional drilling occurred in 1986 and 1987.

In 2007, Industrial Minerals Inc. ("IMI") retained SGS Canada-Géostat to prepare a PEA. A total of six (6) vertical diamond drill holes of NQ size were completed, for a total of 246 m. Drilling was aimed at confirming grade and graphite flakes size in an area that was investigated in the '80s.

In 2010, Northern Graphite conducted another drilling program supervised by SGS Canada-Géostat. The main objectives of the drilling program were to validate historical data, to extend the mineralized zone and to transform inferred resources into indicated resources.

A summary of all drilling programs are presented in Table 1.2

Table 1.2: Drilling Summary

	Percussion	Geotech	# DDH	Zone "NE"		ZONE "A"		ZONE "B"		ZONE "C"		Total DDH
				#DDH	m	#DDH	m	#DDH	m	#DDH	m	m
1984			4	4	187.8	0	0.0	0	0.0	0	0.0	187.8
1985			102	93	4,751.8	3	129.5	3	162.8	3	112.2	5,156.3
1986			6	6	274.3	0	0.0	0	0.0	0	0.0	274.3
1987	82		45	33	1,581.9	0	0.0	12	572.1	0	0.0	2,154.0
Sub Total	**82**		**157**	**136**	**6,795.8**	**3**	**129.5**	**15**	**734.9**	**3**	**112.2**	**7,772.4**
2007			6	6	246.4	0	0.0	0	0.0	0	0.0	246.4
2010		17	51	24	1,380.9	21	1,168.0	6	378.0	0	0.0	2,926.9
Total	**82**	**17**	**214**	**166**	**8,423.1**	**24.0**	**1,297.5**	**21.0**	**1,112.9**	**3.0**	**112.2**	**10,945.7**

1.6 Samples Analyses and Data Verification

Graphite is evaluated and marketed on its flake size, carbon content and ash content. Flake size is determined with standard “tyler” sieve size openings. The ash content is determined by qualitative spectrographic analysis. The determination of carbon content can be determined by three (3) different assay methods:

- Double loss on ignition analysis;
- Flotation product produced; loss on ignition;
- Organic carbon removal; measurement of the inorganic carbon (LECO)

During the course of this project, the carbon content was evaluated using various methods, including flotation, double loss-on-ignition and acid-bath with LECO finish. The LECO method was considered to produce the most reliable readings. However, subsequent pilot and plant/bulk sample and locked cycle testing have demonstrated that LECO underestimates the graphitic carbon content by 4-12%.

Only the 2010 drilling program had a state-of-the-art QA/QC programs with blanks, standards and duplicates; results were entirely satisfactory. There is no documentation on the QA/QC procedures followed for the drilling in the 1980s. Data verification was conducted, using five twin holes where high grade zones had been intersected in historical drill holes. Results showed a fair to good correlation between the 2010 twin drillholes and historical drill holes for both grades and mineralized thicknesses.

1.7 Metallurgical Testworks

Extensive metallurgical testworks were conducted by SGS Lakefield in 2010-2011. Flotation tests were performed to evaluate the expected recovery of the commercial plant. Variability tests were also conducted in order to validate if the ore body is homogeneous in terms of graphitic carbon (“Cg”) recovery, concentrate grade and flake size.

As a final demonstration of the proposed flowsheet, SGS Lakefield operated a pilot plant in order to confirm the concentrate recovery and grades and size distribution of concentrated flakes. From the pilot plant results, the following parameters were used for mass balance and project economics:

- Recovery: 92.7% to 94.7%
- Concentrate flake distribution and grade:

- +48 mesh: 48.4 % at 95.1% C
- +80 mesh: 28.2 % at 94.5% C
- +100 mesh: 4.8 % at 97.3% C
- -100 mesh: 18.6 % at 94.8% C

The Bissett Creek pilot plant campaign demonstrated the suitability of the proposed flowsheet despite concerns that the bulk sample was partly weathered. As a result of this and the lack of operating time to optimize the circuit, the metallurgical performance of the pilot plant was slightly inferior compared to the laboratory program that was completed on a Master composite and eight variability composites.

1.8 Mineral Resources

Deposit modeling and resource estimation were conducted by SGS Canada-Géostat. Only the drillhole intercepts assayed with the LECO analytical method were retained for the resource estimation. Data compilation and statistics defined search ellipse and grade interpolation in the block model was performed with ordinary kriging and verified with inverse distance.

Due to the absence of assay certificates, sample rejects or residual core for all the historical (1980s) drillholes, SGS-Géostat decided to classify the Bissett Creek resources only in the indicated and inferred categories. Table 1.3 summarizes the mineral resources at different cut-off grades.

Table 1.3: Bissett Creek Flake Graphite Deposit Mineral Resources (Diluted)

	Indicated			Inferred		
%Cg Cut-Off	Tonnage (tonnes)*	Cg% by LECO	In Situ Graphite** (tonnes)	Tonnage* (tonnes)	Cg% by LECO	In Situ Graphite** (tonnes)
0.986	25,983,000	1.81	470,300	55,038,000	1.57	864,100
1.227	24,588,000	1.85	454,900	50,472,000	1.62	817,600
1.5	19,954,000	1.99	397,100	33,672,000	1.81	609,500
1.75	16,031,000	2.50	298,000	14,584,000	2.21	473,300
2	11,921,000	2.50	298,000	14,584,000	2.37	345,600

Relative density used 2.63t/m^3
10% dilution; 90% mine recovery
*Rounded to nearest 1 K
**Rounded to nearest 1 K
Effective date September 12th 2011
CIM definitions for mineral resources were followed

1.9 Mineral Reserves

Mineral reserves based on a final pit design were established at an optimized cut-off grade of 1.2% Cg using indicated resources only. The final reserves are listed in Table 1.4:

Table 1.4: Final Reserves

Reserves (Indicated)				
	Tonnage (000t)	**Grade (% Cg)**	**In-Situ Cg (t)**	**Stripping Ratio**
Phase 1	3663	2.28	83516	0.64
Phase 2	9048	1.85	167388	0.37
Phase 3	6266	1.71	107149	0.62
Total	18977	1.89	358055	0.51

The mineral reserves include a dilution factor of 7.8% at a grade of 0.5% Cg and mining losses of 10%.

1.10 Mine Planning and Operations

The optimized mine uses three phases. As shown on Table 1.5, Phase 1 is near surface with the smallest tonnage, but the highest grade and best economics. Phase 2 is the dip extension of Phase 1, and contains the largest ore tonnage at the average grade of the reserves and enjoys a low stripping ratio. Finally, Phase 3 has a mid-level ore tonnage, but at the lowest grade and lesser economics.

Table 1.5: Mineral Reserves by Phase

Mineral Reserves				
Phases	**Tonnage (000t)**	**Grade (% Cg)**	**In-Situ Cg (t)**	**Stripping Ratio**
Phase 1	3,663	2.28	83,516	0.64
Phase 2	9,048	1.85	167,388	0.37
Phase 3	6,266	1.71	107,149	0.62
Total	**18,977**	**1.89**	**358,055**	**0.51**

Important requirements for the final mine plan were the following:

a.) Increase head grades to the mill in the initial years of production while maintaining a reasonable stripping ratio;
b.) Supply blasted rock and glacial till for tailings dam construction during preproduction period;
c.) Allow for tailings disposal in mined-out pits in year 13 for sulphides tailings and in year 16 for non-sulphide tailings.

The pre-production tonnage of 953,000 t includes 426,000 t of rock and 309,000 t of overburden for roads and dam construction and 218,000 t of ore for initial production (three months). The mining rate is fixed at 1.48 Mtpy for the first 12 years of operations and can be reduced to 0.94 Mtpy thereafter. This mining rate enables to complete mining in Phase 1 by the end of year 4 and in Phase 2 by the end of year 12 as required. The corresponding milling schedule for the first five years of operations totals 4,200,000 t at a head grade of 2.22% Cg; the mill feed for the next five years is 4,200,000 t at a grade of 1.7% Cg. This is made possible by stockpiling lower grade ore when possible.

Considering the relatively small tonnage mined yearly and the strong desire by Northern Graphite to limit upfront capital requirements, it was decided early in the Study to use contract mining as the basis for mine operations. Typically in Northern Ontario, different contractors will handle drilling and blasting operations and materials handling; often the first contractor can be a sub-contractor of the second one.

On the basis of 6 m benches, the chosen contractor will likely use drills capable of drilling 10-15 cm diameter hole on a pattern resulting in a powder factor of 0.8 kg/m^3. Explosives would be entirely emulsion.

Loading and hauling operations will likely use 40-50 t capacity trucks with 5-6 m^3 loading equipment. Overburden will be free-digging and blasted rock should have a maximum size of 0.6 m. The waste storage facilities are on average 1.0 km from the pit ramp and the haulage distance from the pit to the primary crusher is 2.1 km. The maximum lift from the final pit bottom is 80 m and the maximum height of the waste storage facilities is 25 m. Mine operating costs are presented in Table 16.3 based on quotes obtained and review of actual contactors costs.

Table 1.6: Mine Operating Costs

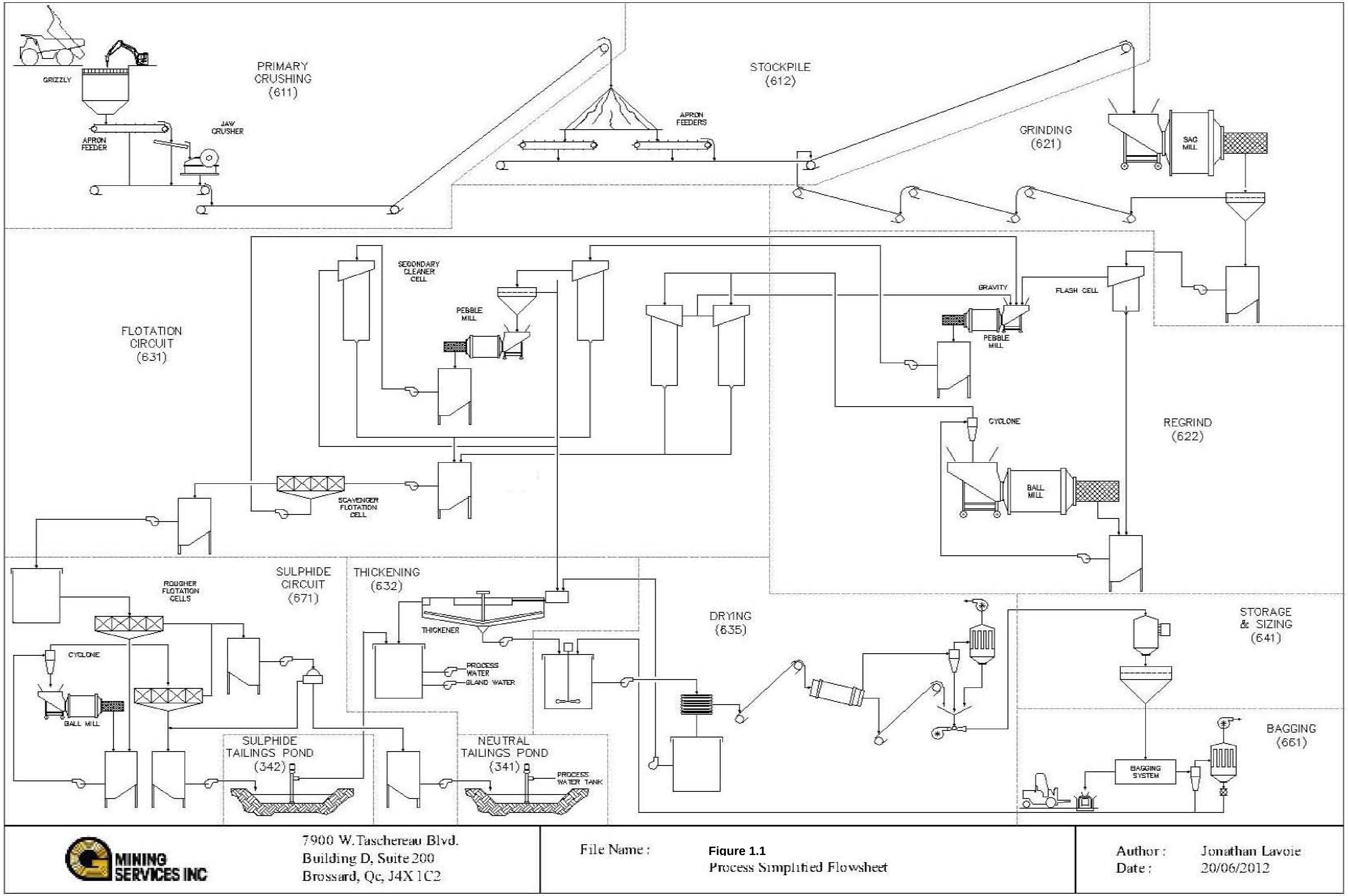
Description	Overburden (CAD/t)	Waste (CAD/t)	Ore (CAD/t
Drilling and Blasting	-	0.85	1.15
Materials Handling	1.85	2.30	2.70

The owner's representatives will be responsible for contract management, surveying and grade control; this will require three engineer / geologist / technician at a yearly cost of CAD 389,000.

1.11 Processing Methodology

The processing plant was designed for a yearly throughput of 839,500 tpy. The process flowsheet uses proven methods widely used in the mineral industry and is shown in Figure 17.1. Ore from the mine will be crushed by a jaw crusher, and conveyed to a stockpile. Crushed ore will then be reclaimed to the concentrator building. The ore will then go through successive steps of grinding, flotation and screening on progressively finer particles. The objective is to produce a high grade graphite concentrate, but also to preserve as much as possible the large size of the graphite flakes to maximize value of the concentrates. The graphite concentrate will be thickened to remove excess water, before being filtered and dried. The moisture content of the final product will be below 1%. After the screening into several fractions, the concentrate can be bagged and sold on either a given fraction-basis or on a blended basis.

Figure 1.1: Simplified Flowsheet



1.12 Infrastructures

The project will require specific infrastructures to be built in order to support the mining and processing operations. A natural gas-fired power plant of 5 MW will be installed on site. A natural gas line of approximately 15 km will be build along the upgraded Bissett Creek Road to provide natural gas to the generators.

Support buildings and infrastructures will include water pumping stations, water treatment for waste water disposal and for potable use. A dry storage warehouse will be built near the processing plant. Offices and an assay and metallurgical laboratory will be included inside the concentrator building. Services such as change rooms and lunch room will be integrated into the office complex.

A diesel storage area will be built in order to store fuel for the owner's fleet and for the mining contractor.

The access road will be upgraded to facilitate site access. A haul road will be built to allow haulage of ore to the processing facility. Services roads will be built to allow access to the tailings management facilities and to the pumping stations.

The tailings will be stored in two separate storage facilities. The non-deleterious tailings management facility will store the neutral, non-acid generating tailings. The sulphides tailings management facility will store the tailings with acid generating potential; these tailings will be kept under water to avoid chemical reaction with the ambient air.

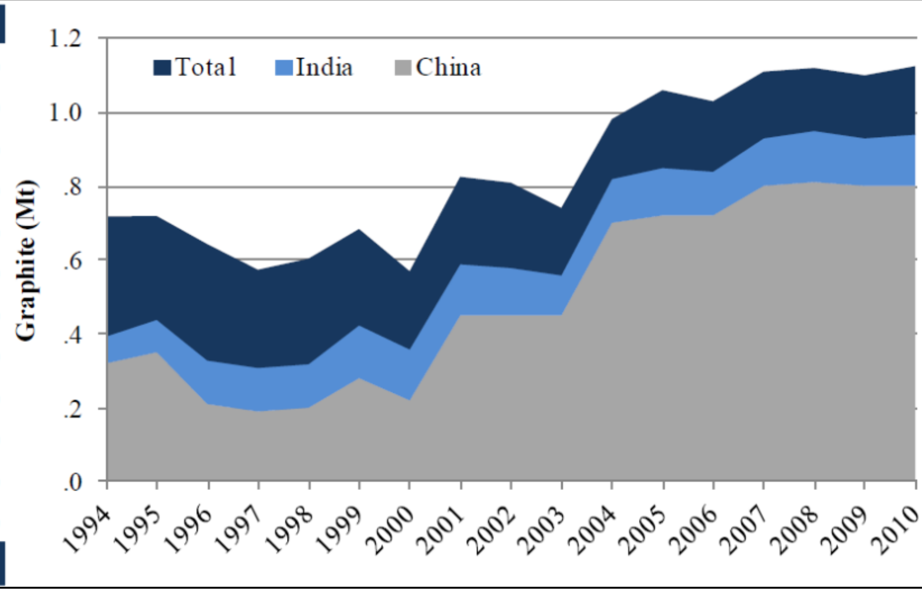
1.13 Market Study

Industrial Minerals reported that the natural graphite supply was 1,019,000 t in 2011, including 565,000 t as flake graphite and 450,000 t as amorphous graphite.

Recent production of natural graphite has come predominantly from China (over 70%) and India (12%) as shown in Figure 19.1. Even if China has the largest reserves and could continue to grow its production, Chinese production has been flat in recent years; this is explained by the introduction of a 20% export duty, a 17% VAT, new regulatory and environmental measures and consolidation of the existing producers. It appears that Chinese government policies currently discourage the export of raw materials in favor of value-added products. This capping of Chinese production and exports at the time of growing demand explains the improved pricing experienced in the last five years.

Figure 1.2: Production of Natural Graphite

Country	Production (t)
Brazil	76,000
Canada	25,000
China	800,000
India	140,000
North Korea	30,000
Madagascar	5,000
Mexico	7,000
Norway	2,000
Romania	20,000
Sri Lanka	8,000
Ukraine	6,000
Other Countries	185,000
Total for 2010	**1,125,000**



Source: Industrial Alliance Securities Inc.-USGC

Based on the production profile on Figure 19.1, it can be concluded that demand was relatively stable through the 1990s, but grew at 4-6% per year starting in 2000. This growth was explained by increased consumption of graphite in both the traditional use of graphite mainly due to accelerated development in the BRIC countries and from advances in the use of graphite in high technology.

Industrial Minerals reports that 80% of natural graphite demand is driven by industrial applications. The dominant market, with 39% of demand, is refractories which is in turn dependant on steel and refined metal production. Demand for refractories is expected to maintain its share of the market going forward. Brake linings, foundries and lubricants represent about 26% of demand; increased use of graphite in friction materials, packings and gaskets was driven by reduced use of asbestos globally.

Industrial Minerals indicates that batteries are the fastest growing market for graphite with growth at 15-25% per year; consumption is driven by requirements for portable electronics (mobile phones, smartphones and tablets). A significant and growing portion of demand comes from high-tech applications because of its use in batteries as anode material; natural graphite anodes are favored by all battery technologies. The battery sector is predicted to increase its share of graphite consumption from 8% to 10% in the next five years. The introduction of electric vehicle batteries may create a significant impact in the future, especially for vehicles requiring batteries of 10 kWh and above.

Graphite prices are published by the periodical Industrial Minerals Magazine, as an indication of market position with a high and low value reflecting the carbon content and overall quality of the product. The quoted prices are on a basis of CIF European port. Since Northern Graphite targets the Americas for selling its products, the CIF European port prices should correspond to FOB Bissett Creek and the land transportation would be absorbed by the client.

Like for all commodities, it is near impossible to forecast accurately future prices for graphite. We considered historical prices reported by Industrial Minerals for the three relevant products produced at Bissett Creek. We also took into account that premiums in excess of CAD 600/t could be available for the concentrates of very large flakes, such as the +50 mesh (XL) and the +32 mesh (XXL) fractions, which can represent almost 50% of Bissett Creek total production. Obviously, we used the concentrate flake distribution and grades determined from metallurgical testing and reported in Section 13 and the possibilities of blended products.

Finally, it was decided to retain four price scenarios to assess the value of the Bissett Creek Project. Scenario 1 represents the last 24-months average graphite price for the likely combination of standard and blended products from Bissett Creek. Scenario 3 is based on the last 12-months average. Finally, a premium paid for the extra large flake graphite would increase the average realized price for the entire production by USD 200/t of concentrate in Scenarios 2 and 4.

Table 1.7: Graphite Prices

Description	USD/t
Scenario 1: 24 months average	2,100
Scenario 2: 24 months average + premium	2,300
Scenario 3: 12 months average	2,600
Scenario 4: 12 months average + premium	2,800

1.14 Environmental and Impact Assessment Permitting

Knight Piésold led the environmental studies and permitting process for the Project. Baseline characterization programs were completed between 2010 and 2012 on hydrogeology, hydrology aquatic environment, terrestrial environment, meteorology and geochemistry. The baseline studies were conducted to identify the potential environmental impacts during construction, operation and closure phases of the Project.

A draft Project Description was sent out to the Canadian Environmental Assessment Agency ("CEAA") and the Ministry of Northern Development and Mines ("MNDM") on March 2, 2012. The Project Description was circulated to the various provincial and federal government agencies for review. Following the review Northern Graphite received confirmation that the Project, as defined in the Project

Description, is not subject to the Ontario Environmental Assessment Act or the Canadian Environmental Assessment Act.

It should be noted that the construction of the natural gas pipeline will likely require Environmental Assessment coverage under the Ontario Environmental Assessment Act; however, the permitting, construction and maintenance of the pipeline is being carried out by Enbridge Inc.

Geochemistry of the ore and waste rock was studied and results showed that the graphitic gneiss showed a potential to generate acid drainage. Most of the waste rock samples were classified as non-acid generating. Low grade ore and marginal ore currently considered as waste may have an acid generation potential that will need to be managed during the life of the project.

Because sulphides are associated with the graphite mineralization, testing was commissioned at SGS-Lakefield and demonstrated that sulphides could be concentrated in a sulphide tailings, representing 3% of the total tailings tonnage and characterized as acid generating; this results in the quasi-totality of tailings being neutral and non-acid generating. Each tailings stream would have its own tailings management facility. The sulphides tailings management facility will keep a water cover above the tailings bed to prevent physical contact of the tailings material to prevent any oxidation and generation of acid water.

The project will need to meet Air Quality and Noise Level Standards stipulated by Ontario's MOE. Due to Bissett Creek's remote location, it is expected that the processing power plant and operations will meet the standards by using normal control practices.

The project components are located in several sub-basins of the Grant and Mag Creek watersheds. Hydrometric monitoring was conducted to monitor stream flows. The linkage between surface and groundwater was investigated. Mine dewatering could have an impact on water flows at Mag Creek; with the current data available, it is possible that seepage to the mine pit could minimally reduce Mag Creek flow from 1 to 4%. Samples of surface water were analyzed. Results indicate that the majority of the surface water sites have an elevated aluminum and iron concentrations.

The property includes wetlands. An assessment was conducted in July 2011. Consultation with the Ministry of Natural Resources confirmed that the wetlands on site are part of a much larger wetland complex. A wetland Environmental Impact Statement ("EIS") will be prepared in conjunction with the Ministry of Natural Resources and include mitigation and avoidance strategies as well as outline Best Management Practices.

Investigations performed on the local wildlife concluded that ten species at risk are present within the Bissett Creek property. Northern Graphite will be required to obtain a permit under the Endangered Species Act ("ESA") should any activities results in the damage of the threatened species habitat.

The employment generated by the Bissett Creek mine is evaluated at 88 positions. Those positions will benefit the nearby communities.

An Environmental Management Plan ("EMP") will be implemented for the Bissett Creek mine prior to development. It will provide a framework for dealing with environmental risks associated with the development, operation and closure of the Bissett Creek.

In addition to the EMP, Bissett Creek must prepare and submit a closure plan. This closure plan must explain the steps to be followed during the operation of the mine and at the end of production in order to reclaim the site and to demobilize the infrastructures and equipment. The closure plan must be approved by the MNDM and financial guarantees must be funded.

Even though there is no provincial or federal Environmental Assessments required for the Bissett Creek Mine; there are a number of provincial and federal permits, licences and approvals that need to be obtained prior to mine development. They are listed in Table 1.8.

Table 1.8: List of Licences, Permits and Approvals

Provincial Permit (Agency)	Act	Regulations
Work Permit (MNR)	Public Lands Act	O.Reg 453/96
Work Permit (MNR)	Public Lands Act	O.Reg 973/90
Approval (MNR)	Lakes and Rivers Improvement Act	N/A
Burning Permit (MNR)	Forest Fire Prevention Act	O.Reg 207/96
Environmental Compliance Approval (MOE)	EPA Ontario Water Resources Act	O.Reg. 561/94
Permit (CBO)	Ontario Bldg Code	N/A
Certificate of Approval (MOE)	Safe Drinking Water Act	O.Reg 169/03 O.Reg 170/03
Approval (MOE)	Clean Water Act	O.Reg 287/07
Generator Registration Report (MOE)	EPA	O.Reg 347/90
Permit to Take Water >50,000 L (MOE)	Ontario Water Resources Act	O.Reg 387/04
Verification of amended Closure Plan (MNDM)	Mining Act	O.Reg 240/00
Permit (MNR)	Endangered Species Act	N/A
Federal Permit (Agency)	**Act**	**Regulations**
Approval (TC)	Navigable Water Protection Act	Navigable Waters Works Regulations

1.15 Capital and Operating Costs

The Initial Capital Costs estimates for the project were developed with a ± 15% accuracy and are listed in Table 1.9:

Table 1.9: Initial Capital Costs Estimates

Description	Pre-Production (CAD 000)
Infrastructure	9,383
Power and Electrical Distribution	11,665
Tailings & Water Management	6,671
Mobile Equipment	1,711
Mine Infrastructure	50
Processing Facilities	39,933
Construction Indirects	14,163
General Services	5,758
Pre-Production / Commissioning	4,234
Contingency	9,357
Total	**102,925**

No escalation was built into the capital cost estimate and the estimates were made during the 1st Quarter 2012. Sustaining capital was estimated at CAD 7,492,000. Initial working capital is CAD 4,165,000

The operating costs estimates are provided in Table 1.10 for mining costs and in Table 1.11 for processing, power, general administration and technical services.

Table 1.10: Mining Costs

Description	CAD/t		
	Phase 1	Phase 2	Phase 3
Overburden	1.85	1.85	1.85
Waste – Drill and Blast	0.85	0.85	0.85
Waste – Load and Haul	2.30	2.30	2.30
Pre-Shearing	Nil	0.09	0.125
Ore – Drill and Blast	1.15	1.15	1.15
Ore – Load and Haul	2.70	2.70	2.70
Stockpiling	0.30	0.30	0.30

Table 1.11: Operating Costs (Processing, Power & G&A)

Description	CAD/t ore
Processing Costs	
Manpower	3.64
Grinding Media	1.25
Reagents	0.86
Consumables	1.34
Bagging	0.23
Sub Total	**7.32**
Power	2.29
General Administration	2.94
Technical Services	0.47

Average mining costs, including technical services, over the mine life of Bissett Creek are estimated at CAD 5.79/t of ore milled. Similarly the processing and power costs will average CAD 9.60/t of ore milled over the mine life.

The economic analysis is based on the four price scenarios presented in Table 1.12 and an exchange rate of CAD 1 = USD 1. All capital expenditures and operating costs were estimated in the 1st Quarter 21012; no inflation factor was added to costs. Consequently, the economic analysis is done in constant dollars. Estimated closure costs required additional finding CAD 3,570,000 before the start of construction.

The financial analysis uses the net present value (“NPV”) and internal rate of return (“IRR”) of all project cash flows starting with the initial construction. Project cash flows assume financing with equity without any project debt. It takes into account federal and provincial income taxes and the Ontario mining duties to produce after-tax financial returns. Average production of graphite concentrate and mine cash cost of production are presented in Table 12.2.

Table 1.12: Average Production Graphite Concentrate and Mine Cash Costs Production

Description	First 5 Years	Mine Life
Yearly Graphite Concentrate:		
Production	18,600	15,580
Mine Cash Cost:		
(CAD/t Ore Milled)	18.89	18.29
(CAD/t of Concentrate)	851	968

On the basis of the financial projections detailed in Section 22, the Project economic returns are presented in Table 1.13.

Table 1.13: After Tax Net Present Values and IRR

	Price Scenario 1	Price Scenario 2	Price Scenario 3	Price Scenario 4
	CAD 2,100/t	**CAD 2,300/t**	**CAD 2,600/t**	**CAD 2,800/t**
NPV 0% (CAD M)	207.9	257.7	331.2	379.9
NPV 5% (CAD M)	86,8	116.4	159.6	188.0
NPV 8% (CAD M)	46,9	69.9	103.2	125.0
IRR	13.7%	16.4%	20.0%	22.4%

The sensitivity analyses show that the Project economics are most sensitive to the price received for the graphite concentrates; the after-tax undiscounted NPV varies by CAD 25 M for every price change of CAD 100/t of concentrate.

1.16 Conclusion and Recommendations

On the basis of all the engineering studies, cost price scenarios and economic analyses performed in the Feasibility Study, we believe that the financial returns are sufficiently robust to justify the required investment to bring the Bissett Creek Project to commercial production.

Its production level, when compared to the total market, should enable its introduction in the supply of large and extra-large flake graphite products, without impacting the supply-demand relationship and resulting prices.

The following subsequent tasks are recommended to possibly reduce risks and improve the economics of the Bissett Creek Project:

1. Conduct additional in-fill drilling, sampling and assaying to upgrade resources for the first ten years of production in the measured category
2. Apply major focus on grade control and develop use of flexible bench height to improve head grades to the mill.
3. Use of single contractor to perform mining operations and earthwork during construction.
4. Investigate differences between Cg Leco assays and calculated head grades during metallurgical testing. A possible gain in concentrate production could be realized if Cg Leco assays are proved slightly conservative.
5. The waste material containing low level of graphite may be PAG. Further characterization and evaluation of quantities of material involved are required to finalize the management plan.

2. INTRODUCTION

2.1 General

The present National Instrument 43-101 Technical Report ("NI 43-101") on the Bissett Creek Project ("Project") has been prepared at the request of Northern Graphite Corporation ("Northern Graphite").

The Report was prepared by G Mining Services Inc. ("G Mining") in cooperation with Northern Graphite personnel and with the collaboration and contribution of specialized consultants for specific areas of the Feasibility Study (**"**Study**"**).

Northern Graphite initiated the Study to develop the project with a production rate of 15,000-18,000 tpy of graphitic flakes using technical data obtained and developed from 1989 to 2011 on the following aspects: geology, mine development, metallurgy, geotechnical survey and environmental review. In addition to these technical aspects, an economic evaluation of the Project has been completed based on estimated capital and operating expenditures, covering the various elements of the proposed mine operation and process recovery methods. An overview of the Graphitic Carbon Market and a survey of recent market prices were conducted in order to evaluate the mine revenues and growth in consumption and demand for graphitic flakes.

The Bissett Creek deposit, which hosts graphitic carbon, is situated within the Canadian Shield and consists of one deposit. The Bissett Creek deposit was initially discovered and explored in 1980 by Frank Tagliamonti and Associates. The property changed hands and was also held in joint ventures in the following decade. Exploration and metallurgical test works were conducted. The subsequent fall of the graphite price in the mid 90s put the project on hold for many years.

In 2002, Industrial Mineral Canada Inc. ("IMI"), a company incorporated in Canada (Canadian TSX-V), domiciled in Oakville, Canada, took over the property and attempted to develop a dry process flowsheet for the recovery of the graphite flakes. This proved unsuccessful.

In April 2009, IMI, under new management, reviewed the past documentation and decided to proceed with a Preliminary Economic Assessment Study ("PEA"). The conclusion of this study, along with the recovery of world price for graphite, encouraged IMI to request G Mining to produce a Feasibility Study. IMI changed the company name to Northern Graphite Corporation in 2010.

Exports of graphite from China have decreased in recent years due to the need to service the growing domestic market and government discouragement of exports through decreased subsidies, increased taxes and export licenses.

The opportunity to develop new supply sources of natural graphite – particularly large flake, high-carbon grades – is in contrast with the 1990s when China was flooding an oversupplied market and driving out the competition. Many large consumers are requesting non-Chinese sources due to uncertain Chinese supply.

2.2 Qualification of Participants

Information provided in this Report is based on the work executed by specialized consultants with the participation of Northern Graphite. The consultants contributing to the Study are listed in Table 2.1:

Table 2.1: Feasibility Study Participants

Area	Participant
Mineral Resources	SGS Canada Inc.
Metallurgical Test Works, Supervision and Reporting	SGS Lakefield
Mineral Processing Methods, Metal Recoveries and Flow Sheets	SGS Canada Inc.
Environment and Social Studies	Knight Piésold Ltd
Roads, Tailings Management Facilities and Water Management	Knight Piésold Ltd
Closure Plan, Environmental Management Plan, Permitting	Knight Piésold Ltd
Process Plant Engineering	Met-Chem Canada Inc.
Mineral Reserves and Mine Plan	G Mining Services Inc.
Infrastructures, Support Buildings and Power Generation	G Mining Services Inc.
Capital and Operating Costs, Financial Model	G Mining Services Inc.
Overall Coordination, Conclusion and Recommendations	G Mining Services Inc

Capital and operating cost estimates were produced using information and quantities provided by the participants listed above.

2.3 Sources of Information

G Mining was mandated by Northern Graphite to coordinate the Feasibility Study and prepare a NI 43- 101 compliant Technical Report. Table 2.2 provides a detailed list of qualified persons and their contribution to this Report.

Table 2.2: List of Qualified Persons

Section	Participant
Resources, Geology and Exploration	Francois Thibert, SGS Canada Inc
Reserves and Mine Plan	Antoine Champagne, G Mining Services Inc.
Tailings Management and Road Designs	Andy Phillips, Knight Piésold Ltd
Environmental and Social Studies, Permitting and Closure Plan	Steve Aiken, Knight Piésold Ltd
Process Plant Engineering	Daniel Houde, Met-Chem Canada Inc.
Infrastructures	Nicolas Ménard, G Mining Services Inc.
CAPEX , OPEX	Nicolas Ménard, G Mining Services Inc.
Recovery Methods and Process Flowsheets	Gilbert Rousseau, SGS Canada Inc.
Metallurgical Testworks	Ahmed Bouajila, G Mining Services Inc.
Pricing	Ahmed Bouajila, G Mining Services Inc.
Financial Model	Robert Marchand, G Mining Services Inc.
Overall Review	Robert Ménard / Louis Gignac, G Mining Services Inc,
Summary and Conclusions	Louis Gignac, G Mining Services Inc.

G Mining reviewed and compiled the information provided by other consultants for completion of this NI 43-101 Report. However, each consultant remains fully responsible for their own work as agreed upon the signature of their respective Certificates of Authors that comply with NI 43-101 regulations.

Each participant was aware of the extent of this report and was aware of the responsibilities associated with the role of Qualified Persons. Each participant brought their experience and knowledge. Table 2.3 provides the list of authors who contributed to the writing of this Report.

Table 2.3: List of Authors

Section	Title	Qualified Persons
1.0	Summary	Louis Gignac, G Mining Services Inc.
2.0	Introduction	Nicolas Menard, G Mining Services Inc.
3.0	Reliance on Other Experts	Nicolas Menard, G Mining Services Inc.
4.0	Property Description and Location	Nicolas Menard, G Mining Services Inc.
5.0	Accessibility, Climate, Local Resources, Infrastructures and Physiography	Nicolas Menard, G Mining Services Inc.
6.0	History	Nicolas Menard, G Mining Services Inc.
7.0	Geological Setting and Mineralization	Francois Thibert, SGS Canada Inc.
8.0	Deposit Types	Francois Thibert, SGS Canada Inc.
9.0	Exploration	Francois Thibert, SGS Canada Inc.
10.0	Drilling	Francois Thibert, SGS Canada Inc.
11.0	Sample Preparation, Analyses and Security	Francois Thibert, SGS Canada Inc.
12.0	Data Verification	Francois Thibert, SGS Canada Inc.
13.0	Mineral Processing and Metallurgical Testing	Ahmed Bouajila, G Mining Services Inc.
14.0	Mineral Resources Estimates	Francois Thibert, SGS Canada Inc.
15.0	Mineral Reserve Estimates	Louis Gignac, G Mining Services Inc.
16.0	Mining Methods	Louis Gignac, G Mining Services Inc.
17.0	Processing Methodology	Ahmed Bouajila, G Mining Services Inc.
18.0	Project Infrastructures	Nicolas Ménard, G Mining Services Inc.
19.0	Market	Ahmed Bouajila, G Mining Services Inc.
20.0	Environmental Studies, Permitting and Social or Community Impact	Steve Aiken, Knight Piésold Ltd
21.0	Capital and Operating Costs	Nicolas Menard, G Mining Services Inc.
22.0	Economic Analysis	Robert Marchand, G Mining Services Inc.
23.0	Adjacent Properties	None
24.0	Other Relevant Data and Information	Nicolas Menard, G Mining Services Inc.
25.0	Interpretation and Conclusions	Louis Gignac, G Mining Services Inc.
26.0	Recommendations	Louis Gignac, G Mining Services Inc.
27.0	References	Nicolas Menard, G Mining Services Inc.

2.4 Site Visits

Site visits were conducted by the following Qualified Persons:

- Gilbert Rousseau, Eng. - SGS Canada Inc. (September 15th to 17th, 2010)
- Francois Thibert, M.Sc .Geo. - SGS Canada Inc.(September 15th to 17th, 2010)
- Andy Phillips, Eng. - Knight Piésold Ltd (June 29th, 2011);

- Steve Aiken, Eng - Knight Piésold Ltd (June 29th, 2011);
- Robert Menard, ing. – G Mining Services Inc. (June 29th, 2011);
- Nicolas Menard, ing. – G Mining Services Inc. (June 29th, 2011);

The effective date of the Feasibility Study is August 23rd, 2012.

This Report was prepared according to the guidelines set out under “Form 43-101F1 Technical Report” of NI 43-101 Standards of Disclosure for Mineral Projects

2.5 Terms of Reference

The currency used for all costs is presented in Canadian Dollars (CAD), unless specified otherwise. Quantities are generally stated in Système International d’Unités (SI) metric units, the Canadian standard and international practice, including metric tonnes (tonnes, t) for weight, and kilometres (km) or metres (m) for distance. Abbreviations used in this Report are listed in Table 2.4.

Table 2.4: List of Abbreviations

Symbol	Abbreviation	Symbol	Abbreviation
µg/m^3	Microgram per cubic meter	bank	Volume of material in situ
µm	Microns, micrometre	BQ	Drill core size (3.65 cm diameter)
ft	Feet	BSG	Bulk Specific Gravity
in	Inch	BWI	Bond Ball Mill Work Index
$	Dollar sign	CAD	Canadian Dollar
%	Percent sign	CAPEX	Capital Expenditures
% w/w	Percent solid by weight	CDP	Closure and Decommissioning Plan
$/kWh	Dollar per kilowatt hour	cfm	Cubic feet per minute
°	Degree	CI	Confidential Interval
°C	Degree Celsius	COG	Cut Off Grade
2D	Two Dimensions	AI	Abrasion Index
3D	Three Dimensions	AMSL	Above Mean Sea Level
C	Total Carbon	Cg	Graphitic Carbon
C	Total Carbon	Cg	Graphitic Carbon
AWG	American Wire Gauge	FVNR	Full Voltage Non Reversible
d	Day	g	Grams
d/w	Days per week	gal	Gallons
d/y	Days per year	GEMS	Global Earth-System Monitoring Using Space
dB	Decibel	GPS	Global Positioning System

Symbol	Abbreviation	Symbol	Abbreviation
dB(A)	A-weighted decibels	GR	Granular
DDH	Diamond drill hole	h	Hour
deg	Angular degree	H	Horizontal
DGPS	Differential Global Positioning System	h/d	Hour per day
E	East	h/y	Hour per year
EA	Environmental Assessment	ha	hectare
EAB	Environmental Assessment Board	HDPE	High Density Poly-Ethylene
EBS	Environmental Baseline Study	HFO	Heavy Fuel Oil
EHS	Environmental Health and Safety	hp	Horse power
EIA	Environmental Impact Assessment	HQ	Drill core size (4.4 cm Diameter)
EIS	Environmental Impact Statement	HVAC	Heating Ventilation and Air Conditioning
EMP	Environmental Management Plan	I/O	Input / Output
EOH	End of Hole	ICP	Inductively Coupled Plasma
EP	Environmental Permit	IRR	Internal Rate of Return
EPA	Environmental Protection Agency	IT	Information Technology
EPCM	Engineering, Procurement and Construction Management	Fe	Iron
ER	Electrical Room	ft	Feet
FDS	Fused Disconnect Switch	mg/l	Milligram per litre
KE	Kriging Efficiency	min	Minute
kg	Kilogram	min/h	Minute per hour
kl	Kilolitre	ml	Millilitre
km	Kilometre	mm	Millimeter
km/h	Kilometre per hour	mm/d	Millimeter per day
kPa	Kilopascal	Mm^3	Million cubic meters
KSR	Kriging Slope Regression	MSE	Mean Squared error
kt	‘000 tonnes	Mt	Million tonnes
kV	Kilovolt	MV	Medium Voltage
kVA	Kilovolt ampere	MW	Megawatts
kW	Kilowatt	My	Million years
kWh	Kilowatt-hour	N	North
kWh/t	Kilowatt-hour per metric tonne	Nb	Number
l	Litre	NE	Northeast
L	Line	NFPA	National Fire Protection Association
LFO	Light Fuel Oil	NGR	Neutral Grounding Resistor
LOI	Loss On Ignition	NI	National instrument
LOM	Life of Mine	Nm^3/h	Normal cubic meter per hour
LV	Low Voltage	NPV	Net present value
m	Meter	NQ	Drill core size (4.8 cm diameter)

Symbol	Abbreviation	Symbol	Abbreviation
m/h	Meter per hour	NTP	Normal Temperature and Pressure
m/s	Meter per second	O/F	Overflow
m^2	Square meter	OB	Overburden
m^3	Cubic meter	OD	Outside Diameter
m^3/d	Cubic meter per day	OK	Ordinary Kriging
m^3/h	Cubic meter per hour	OPEX	Operating Expenditures
m^3/y	Cubic meter per year	SMU	Smallest Mining Unit
mA	MilliAmpere	SW	Switchgear
MCC	Motor Control Center	t	Metric Tonne
P&ID	Piping and Instrumentation Diagram	t/d	Metric tonne per day
PGGS	Permit for Geological and Geophysical Survey	t/h	Metric tonne per hour
ph	Phase (electrical)	t/h/m	Metric tonne per hour per meter
pH	Potential Hydrogen	$t/h/m^2$	Metric tonne per hour per square meter
PLC	Programmable Logic Controller	t/m^2	Tonne per square meter
psi	Pounds per square inch	t/m^3	Tonne per cubic meter
PVC	Polyvinyl Chloride	t/y	Metric tonne per year
QA/QC	Quality Assurance / Quality Control	TIN	Triangulated Irregular Network
RCMS	Remote Control and Monitoring System	TOR	Terms of Reference
RER	Rare earth roll magnetic separator	Totox	Sum of major oxides and LOI
RMSE	Root Mean Squared Error	tpd	Tonne per day
rpm	Revolution per minute	tph	Tonne per hour
RWI	Bond Rod Mill Work Index	Tph/m	Tonne per hour per meter
S	South	tpy	Tonne per year
S/R	Stripping ratio	TSS	Total Suspended Solids
SAG	Semi-Autogenous Grinding	U/F	Underflow
sec	Second	USD	United States Dollar
Set/y/unit	Set per year per unit	USGPM	US Gallon per minute
SG	Specific Gravity	UTM	Universal Transverse Mercator
SMC	SAG Mill Comminution	v	Vertical
SPT	Standard Penetration Tests	V	Volt
VAC	Ventilation and Air Conditioning	X	X Coordinate (E-W)
VFD	Variable Frequency Drive	XRD	X-Ray Diffraction
W	Watt	XRF	X-Ray Fluorescence
WHO	World Health Organization	y	Year
wt	Weight	Y	Y Coordinate (N-S)
		Z	Z coordinate (depth or elevation)

2.6 Disclaimer

G Mining has not performed an independent verification on land title and tenure or on legal ownership information such as property title and mineral rights and has relied on information provided by Northern Graphite.

There is no assurance that the project implementation will be realized – the report reflects G Mining's best judgment in light of the information available at the time of preparation of this Report.

3. RELIANCE ON OTHER EXPERTS

3.1 Reliance on Other Experts

This Report has been prepared by G Mining Services Inc. (“G Mining”) for Northern Graphite Corporation (“Northern Graphite”). The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to G Mining at the time of the preparation of this Report;
- Assumptions, conditions and qualifications as set forth in this Report; and,
- Data, reports, and opinions provided by Northern Graphite and other third party sources listed below have been used in this report by G Mining. G Mining reviewed this information to the best of their knowledge. Third parties are considered as experts in their respective fields and are accountable for the information they have produced for G Mining and Northern Graphite.

G Mining relied on the following reports and opinions for information beyond their area of technical expertise:

- Information on property holdings, leases, agreements and legal status of property title was provided by Northern Graphite. G Mining did not review the title and ownership and expresses no opinions on this subject;
- Information of the property and project history was provided by Northern Graphite;
- Information on Geological Setting, Deposit Model, Exploration Drilling and Sampling Method and Approach has been provided by Francois Thibert, P. Geo., SGS Canada Inc. (“SGS Canada”), acting as Qualified Person;
- Information on Sample Preparation, Analyses and Security provided by SGS Canada;
- Information on Exploration Data Verification provided by SGS Canada;
- Information on Resources Estimate provided by SGS Canada;
- Information on Metallurgical Test Works provided by SGS Lakefield Inc. (“SGS Lakefield”) and Northern Graphite acted as Metallurgical Test Work Supervisor;
- Recovery Methods and flowsheets were developed by SGS Canada.
- Information on Tailings and Water Management, Roads, Environmental / Social Studies, Permitting and Closure Plan were provided by Knight Piésold Ltd (“KP”); and,

- Information on Market Overview was obtained from several sources as mentioned in Section 19.

This Report is intended to be used by Northern Graphite as a Technical Report with Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes contemplated under provincial securities laws, any other use of this Report by any third party is at that party’s sole risk.

This, or portions of this Report, are not to be reproduced or used other than to fulfill Northern Graphite’s obligations pursuant to Canadian provincial securities legislation including disclosure on SEDAR, and if Northern Graphite chooses to do so, to support financings, without G Mining‘s prior written permission in each specific instance.

4. PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Bissett Creek property is located in Maria Township, Ontario, approximately 300 km north-northeast of Toronto, as shown in Figure 4.1.

The property (Figure 4.2) is located south of the Trans-Canada Highway (Highway 17), approximately 53 km east of the town of Mattawa.

4.2 Property Description

The property, consisting of a group of 17 unpatented mineral claims covering approximately 2,424 ha and a mineral lease #106693 issued in 1993 for 21 years covering 564.6 ha, is shown on Figure 4.3.

The total property area is 2,988.6 ha, whereas the well explored area is about 60 ha.

Figure 4.1: Property Location

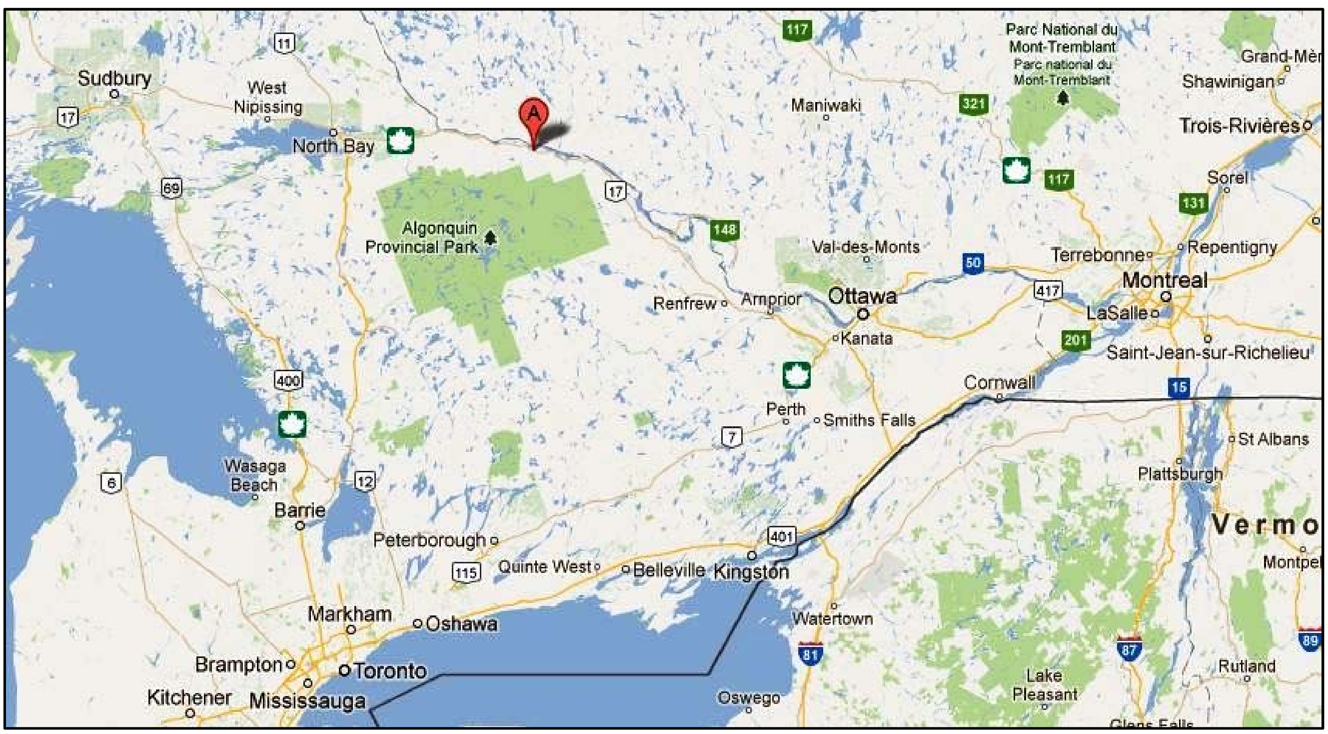
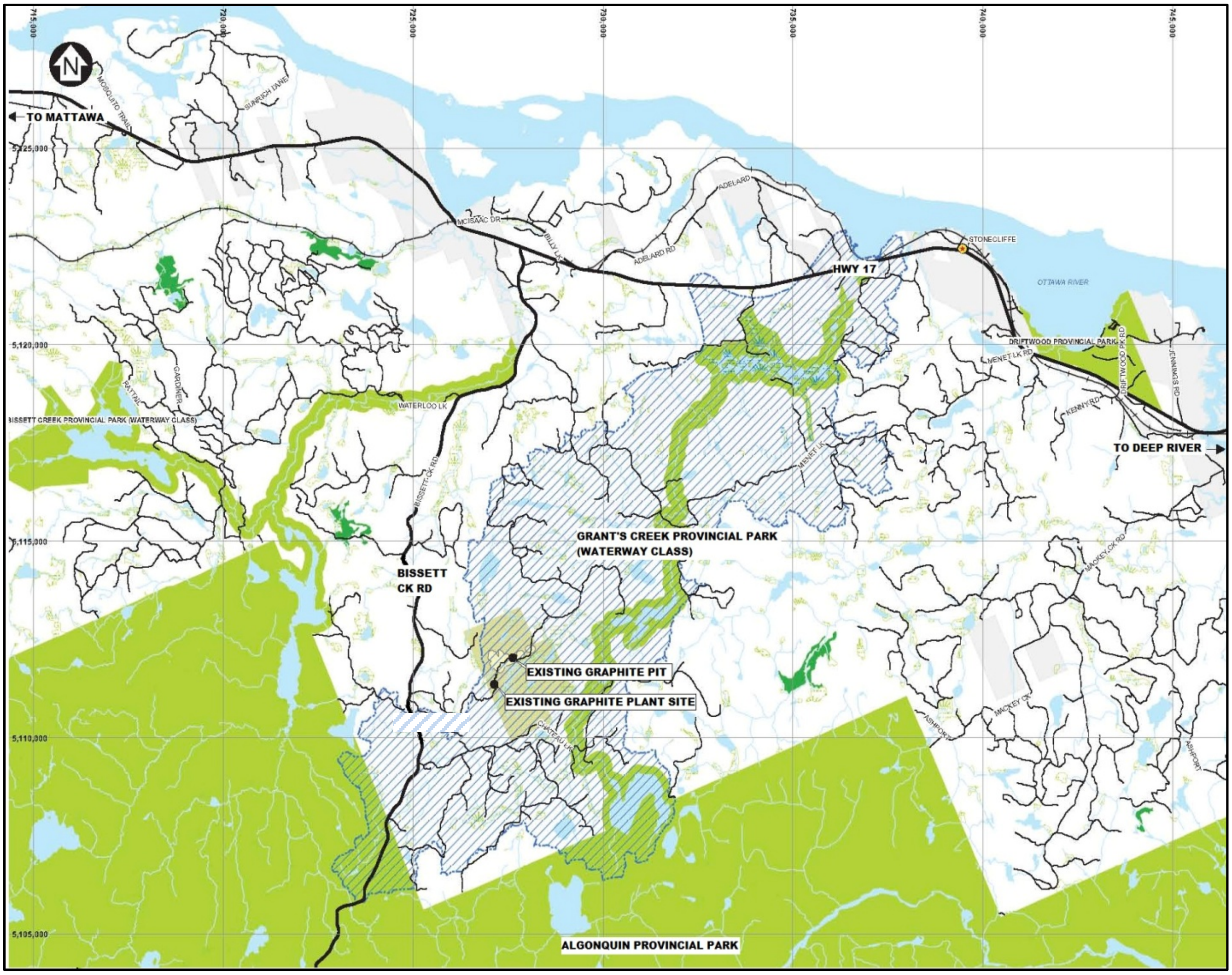


Figure 4.2: Property - Surrounding Area



4.3 Property Title

The mining lease is registered in the name of Northern Graphite at the Land Registry Office in Pembroke, Ontario. The lease was granted on September 1, 1993 for a term of 21 years. The lease is renewable for an additional 21-year term. The unpatented mineral claims are in good standing and are registered with the Ontario Ministry of Northern Development and Mines (“MNDM”). The summary is provided in Figure 4.4.

Figure 4.3: Property Description

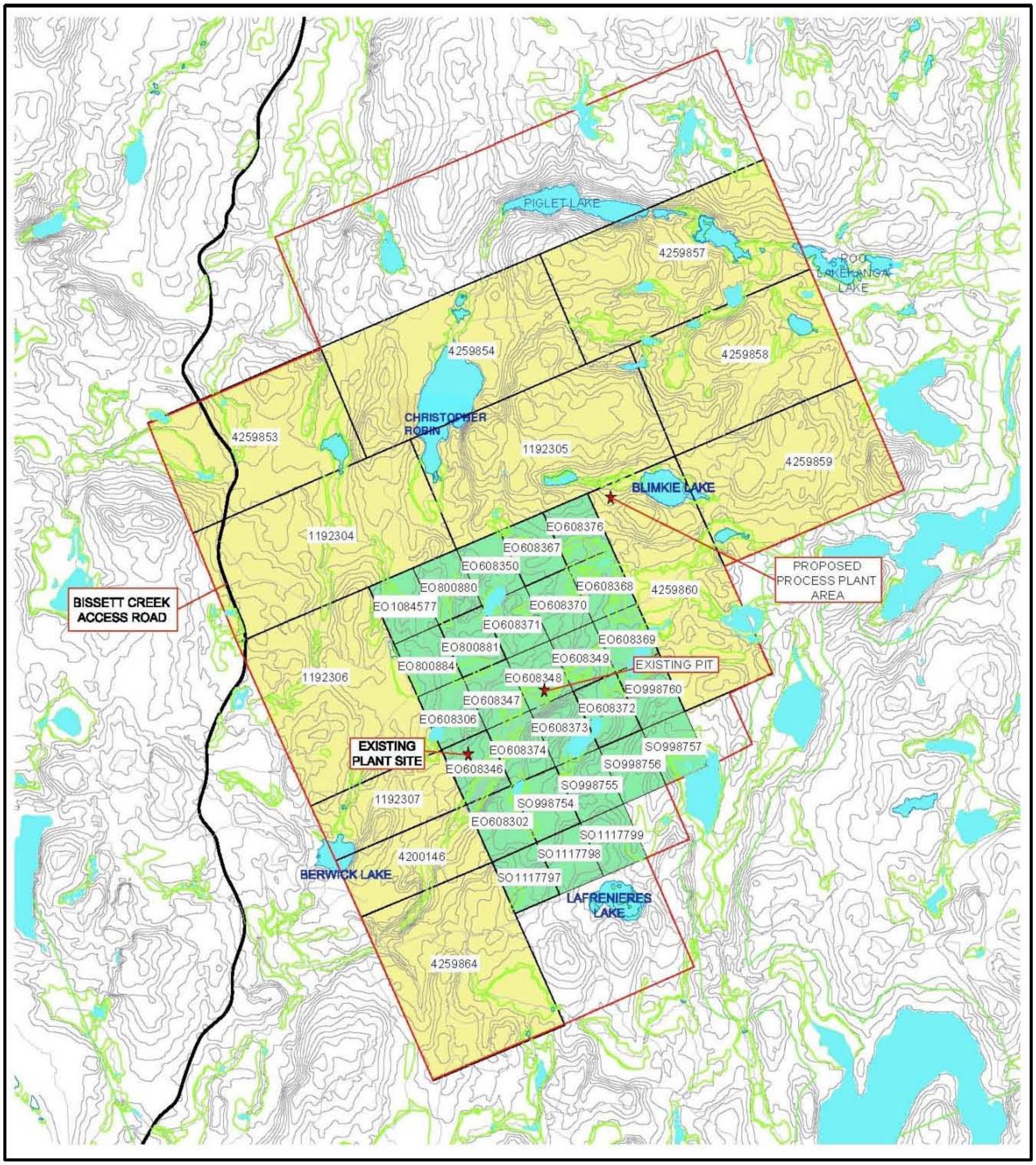


Figure 4.4: Active Mining Claims Summary

Ontario

Ministry of Northern
Development and Mines

SOUTHERN ONTARIO Mining Division - 400757 - NORTHERN GRAPHITE CORPORATION

Township/Area	Claim Number	Recording Date	Claim Due Date	Status	Percent Option	Work Required	Total Applied	Total Reserve	Claim Bank
MARIA	1192304	2009-Nov-16	2013-Nov-16	A	100 %	$ 4,000	$ 8,000	$ 0	$ 0
MARIA	1192305	2009-Nov-16	2013-Nov-16	A	100 %	$ 4,000	$ 8,000	$ 0	$ 0
MARIA	1192306	2009-Nov-16	2013-Nov-16	A	100 %	$ 3,600	$ 7,200	$ 0	$ 0
MARIA	1192307	2009-Nov-16	2013-Nov-16	A	100 %	$ 1,200	$ 2,400	$ 2,712	$ 0
MARIA	4200146	2006-Jun-15	2013-Jun-15	A	100 %	$ 1,200	$ 6,000	$ 312	$ 0
MARIA	4259853	2011-Mar-18	2015-Mar-18	A	100 %	$ 3,200	$ 6,400	$ 0	$ 0
MARIA	4259854	2011-Mar-18	2015-Mar-18	A	100 %	$ 4,000	$ 8,000	$ 0	$ 0
MARIA	4259855	2011-Mar-18	2013-Mar-18	A	100 %	$ 4,000	$ 0	$ 0	$ 0
MARIA	4259856	2011-Mar-18	2013-Mar-18	A	100 %	$ 4,000	$ 0	$ 0	$ 0
MARIA	4259857	2011-Mar-18	2015-Mar-18	A	100 %	$ 4,000	$ 8,000	$ 0	$ 0
MARIA	4259858	2011-Mar-18	2015-Mar-18	A	100 %	$ 3,200	$ 6,400	$ 84,436	$ 0
MARIA	4259859	2011-Mar-18	2015-Mar-18	A	100 %	$ 3,200	$ 6,400	$ 0	$ 0
MARIA	4259860	2011-Mar-18	2015-Mar-18	A	100 %	$ 3,200	$ 6,400	$ 0	$ 0
MARIA	4259861	2011-Mar-18	2013-Mar-18	A	100 %	$ 400	$ 0	$ 0	$ 0
MARIA	4259862	2011-Mar-18	2013-Mar-18	A	100 %	$ 800	$ 0	$ 0	$ 0
MARIA	4259863	2011-Mar-18	2013-Mar-18	A	100 %	$ 2,400	$ 0	$ 0	$ 0
MARIA	4259864	2011-Mar-18	2014-Mar-18	A	100 %	$ 3,600	$ 3,600	$ 0	$ 0

4.4 Legal Surveys

The Land Registry Office has registered Survey Plan No. 49R-112003 on record. The leased lands are comprised of Lots 21,22,23,24 and 25 in Concessions 4 and 5, part of the Mag Lake bed, part of the unnamed lake, Lots 23,24,25, the north half of Lots 21 and 22, Concession 3, in the Geographic Township of Maria, designated as Parts 1,2,3 and 5 on Plan 49R-11203.

4.5 Rights and Obligations Associated with Mining Titles

The holder of a mining lease has the right to develop and mine the property consistent with existing Provincial and Federal regulations.

4.6 Property Ownership and Agreements

Northern Graphite owns 100% of the property. There is an existing royalty agreement which is described in Section 4.8.

4.7 Surface Rights

The mining lease pertains to both mineral and surface rights. The description is provided in Figure 4.5.

Figure 4.5: Mineral Lease Description from MNDM

Ontario

Ministry of Northern Development and Mines

TENURE ATTRIBUTES

Tenure Type:	Lease	**Sub-TenureType:**	21 Year
Lease or Licence:	106693	**Tenure Rights:**	Mining and Surface Rights
Start Date:	1993-Sep-01	**Lease Expiry Date:**	2014-Aug-31

LAND ATTRIBUTES

Status:	Active	**Area in Hectares:**		564.569	
Township or Area:	MARIA				
Description:	EO608302 ET AL Mining Claims EO608302, -306, -346-350, 367-374, -376, EO800880-881, -884, EO998754-757, SO1084577 & SO111797-799, being parts Lots 21 to 25 in Con 3, 4 & 5, parts 1, 2, 3 & 5 on 49R11203, part of the bed of Mag Lake & the bed of the unnamed lake				
Location No:		**Section or Block No:**			
Survey Plan:	49R11203	**Part on Plan:**	1-3, 5	**CLM No:**	
Land Registry Office:	PEMBROKE (RENFREW)	**Parcel No:**		**PIN No:**	57021-0001(R)

Claim Numbers	Lot	Concession	Claim Numbers	Lot	Concession
EO608350	23	05	EO608306	25	04
EO608346	25	04	EO608372	22	04
EO800880	24	05	EO800884	25	05
SO1084577	25	05	EO608371	23	05
SO1117798	24	03	EO800881	24	05
EO608370	22	05	SO1117797	21	03
EO608349	22	04	EO608374	24	04
EO608376	21	05	SO998757	21	03
EO608348	23	04	SO998756	22	03
EO608302	25	03	EO608368	21	05
SO1117799	23	03	EO608347	24	04
EO608373	23	04	EO608369	21	04
EO608367	22	05	SO998755	23	03
SO998760	21	04	SO998754	24	03

OWNER ATTRIBUTES

Owner: NORTHERN GRAPHITE CORPORATION

4.8 Royalties and Other Encumbrances

The Bissett Creek mining lease block is located in the central part of the Bissett Creek property. Northern Graphite has a 100% interest in the property. An advance royalty of CAD 27,000 is paid to the three original geologists (Paul C. McLean, Frank P. Tagliamonte, and Pierre G. Lacombe) since 2002, which is converted into a royalty of CAD 20.00/t of graphite carbon concentrate produced when the mine is operational. A 2.5% NSR on any other minerals derived from the property will also be paid to these same geologists.

4.9 Environmental Liabilities

There are no environmental liabilities. There is an existing Closure Plan (“CP”) for the site from a previous attempt at a dry processing operation. The existing CP and posted financial assurance would cover the removal of any buildings currently on site. As the previous process was dry, there are no tailings facilities to manage or water quality issues. An amended CP will be filed shortly which will address future on site operations.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURES AND PHYSIOGRAPHY

5.1 Accessibility

The property is accessible by using the existing Bissett Creek Road. This road intersects the Trans-Canada Highway (Highway 17) at approximately 53 km east of the town of Mattawa. The Trans-Canada Highway links the two (2) major cities of North Bay and Ottawa. Figure 5.1 shows the Bissett Creek Road at the junction with the Trans-Canada Highway. The existing Bissett Creek Road is a well maintained gravel road built by logging companies. At some 11 km from the junction with Highway 17, the Bissett Creek Road intersects the access road to the project site. This road was used by exploration and drilling crews and loggers. It will need upgrade.

Figure 5.1 Access Road at Junction from Highway 17

5.2 Climate

The city of Petawawa maintains the most complete data on climate. The historical data were obtained from Environment Canada's web site. The climate in Ontario is generally continental, although modified by the Great Lakes located to the south. In this area, precipitations increase from the northwest to the southeast. Table 5.1 and Table 5.2 provide Petawawa's weather statistics which are relatively similar to Bissett Creek in terms of temperature and climate, due to the proximity of both areas.

Table 5.1: Temperature - Petawawa

Temperature ^{o}C Daily Average	
January	-12.9
February	-11.1
March	-4.3
April	4.4
May	11.9
June	16.1
July	19.1
August	17.6
September	12.5
October	6.3
November	-0.4
December	9.4

Table 5.2: Precipitation – Petawawa

Precipitation Daily Average		
Precipitation (mm)	**Rain**	**Snow**
January	7.6	53.9
February	9.7	42.2
March	29.5	33.9
April	51.3	11.6
May	67.3	1
June	83.3	0
July	76.5	0
August	81.1	0
September	78.9	0.1
October	72.1	3.3
November	46.2	23.1
December	14.7	59.5

5.3 Local Resources

Local resources for labor, material, supplies and equipment will be insufficient in the nearby community to support the implementation of the project. The project will have to source labor, material and services from cities located more than 60 minutes from the site. The closest city that can sustain the activity of a construction and mining project is North Bay. North Bay and its surrounding area have extensive experience in the mining industry. Skilled mining contractors, consultants and suppliers will be available to support the project and its operations. Mattawa (the nearest town) may provide some of the workforce for minor services, supplies, and room and board. The community of Deep River can also provide room and board.

All major services are available in North Bay. This city is located approximately 110 km to the northwest of the Bissett Creek project site. The city of Ottawa is also in close proximity to the project and services and consultants are also available.

During operations, Bissett Creek will have to source its key personnel outside of the immediate area. Some key employees could be incited in moving in the area. Some labor could be available in the nearby communities, but would require training.

5.4 Infrastructures

Existing infrastructures are listed in this section. Existing roads will require upgrading. The existing buildings can be used for temporary construction facilities and for long-term storage.

5.4.1 Roads

The site is accessible by Highway 17 junction to the Bissett Creek Road. It is a gravel road that is used by local loggers. The road width can sustain personnel movement and transport of construction material and equipment. However, for health and safety reasons, some bends may require tree clearing to improve visibility. Minor surface upgrades and drainage may also be required.

A 4 km section of road will be upgraded and built from the Bissett Creek Road to reach the processing plant area and services building.

5.4.2 Services Building and Ancillary Facilities

A dry process pilot plant building is available on site. It was built by a previous owner. This building is currently being considered to be used during construction for long term equipment storage. It will also be used by the mining contractor for maintenance of his fleet.

At the moment there are no catering and sleeping facilities to accommodate workers on site. Nearby towns can provide accommodations for construction crews and ultimately housing for full time employees.

5.4.3 Energy Supply

Electrical power is currently unavailable at the site. The option of building a power line from the site to the existing power grid in the area has not been selected for this project. The utility provider (“Hydro One”) was not interested in allowing a tie-in to this line because it is 230 kV. A power line in the Deep River area was considered to provide power to site. It would however require the construction of a 44 km power line to link the process plant to this transmission line and it was not considered economically feasible because of the distance. Under either scenario, the Company would have required a secondary source to dry the graphite concentrate

The Company plans to build a natural gas line from the main distribution pipe line (owned by Trans Canada Pipelines). Enbridge will be the agent that builds the pipeline and supplies the gas. A 15 km gas line will be needed to supply the company-owned power plant. The power plant will be co-generating power and heat, and the excess heat will be used to dry the graphitic flakes and heat the buildings during the winter months.

Electrical power at the site is currently provided by a small diesel power generator.

5.4.4 Water Supply

There is currently no water supply to the existing infrastructures. Nearby ponds are available as a water source to provide for the process requirement. A well will also be drilled on the property to supply the potable water treatment plant and provide drinking water to the site.

5.5 Physiography

The property is located on rolling hill terrain. The elevation above sea level ranges from 270 to 320 m. The property is covered by a mixed forest of conifers and hardwoods. Merchantable red and white pine occurs near the western margin of the property. Rock exposures are found in road cuts and ridge crests. Overburden contains normally sandy, glaciofluvial deposits over ridge areas and glacial lake and stream sediments at lower elevations. Lower lying areas tend to be swampy and covered by moderately thick growth of stunted cedar and swamp grasses. Recognized overburden depth on the property is variable, ranging from 0 to 10 m thick in the swampy areas.

6. HISTORY

6.1 Prior and Current Ownership

The property was first staked by Frank Tagliamonte and Associates in 1980. Donegal Resources Ltd. (“Donegal”) optioned the property in the same year. Limited work was performed by Donegal prior to its relinquishing the option. In 1981, Hartford Resources Inc. (“Hartford”) optioned the property and staked an additional 24 claims. In 1984, Princeton Resources Corporation (“Princeton”) acquired a 100% interest in the Bissett Creek property through its acquisition of Hartford. In November 1986, North Coast Industries Ltd. (“North Coast”) entered into an option agreement with Princeton whereby North Coast would earn a 58% interest in the property by building a batch testing plant, extracting bulk sample and producing flake product for end user tests. North Coast was awarded its 58% in June of 1987, and subsequently acquired Princeton's remaining 42% interest on February 6, 1989.

A Feasibility Study was undertaken on the project. It was completed in 1989. The collapse of world graphite prices due to China flooding the market prevented project implementation.

In 2002, Industrial Minerals Canada Inc. (“IMI”) took over the property and attempted to develop a dry process for graphite recovery. Poor engineering and flawed designed parameters resulted in very little product being recovered so that continuous operation proved impossible. IMI changed its name to Northern Graphite Corporation (“Northern Graphite”) in December 2009.

6.2 Exploration and Drilling History

Exploration and drilling occurred on the property starting in the early 80s until 2010. The details of the exploration and drilling campaigns are provided in Sections 9 and 10 of this Report.

6.3 Previous Economic Evaluation

In April 2007, IMI through a new management group, proceeded to review the past documentation and determined that there was sufficient data to proceed with a preliminary assessment study. Graphite prices had recovered significantly and the demand for graphite in some applications was increasing at double digit rates. Geostat Systems International Inc. of Blainville, Quebec (“Geostat”) was contracted to produce a National Instrument 43-101 (NI 43-101”) report and negotiations started with the various companies and agencies to implement a process plant on site

Following the 2007 Geostat report, a Preliminary Economic Assessment ("PEA") was produced by SGS Canada Inc. This report was issued on July 16, 2010. At the request of Northern Graphite, the PEA was revised and issued as a revision on February 2, 2011.

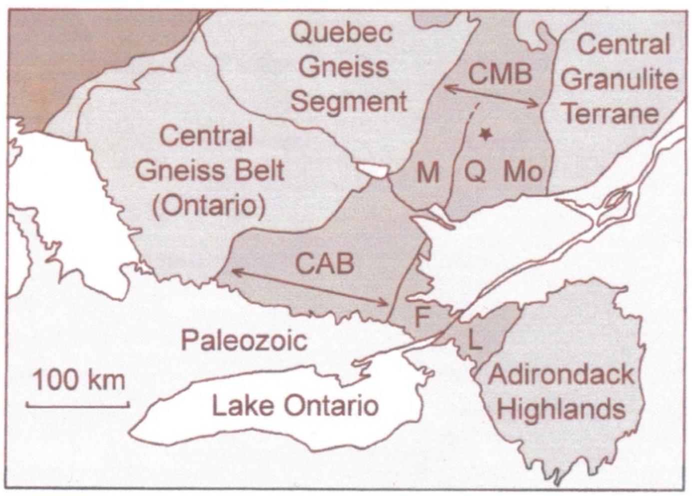
7. GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional and Local Geology

According to Schwerdtner et al. (2009), the Southwestern Grenville province is made of largely of granitic gneisses, metavolcanic and metasedimentary schists and typical impure marbles. It is composite, both lithologically and structurally, but two principal divisions have been recognized (**Error! Reference source not found.**) the Central Gneiss Belt (CGB) and the Central Metasedimentary Belt (CMB). The Quebec portion of the CGB is known also as the Quebec Gneiss Segment. In central and south-eastern Ontario, the combined size of the CGB and CMB accounts for more than 85% of the surface area of the western most Grenville Province, the balance consisting of the Grenville Front Tectonic Zone ("GFTZ").

The Bissett Creek property lies within the Ontario segment of the CBG of the Grenville Structural Province (Figure 7.1).

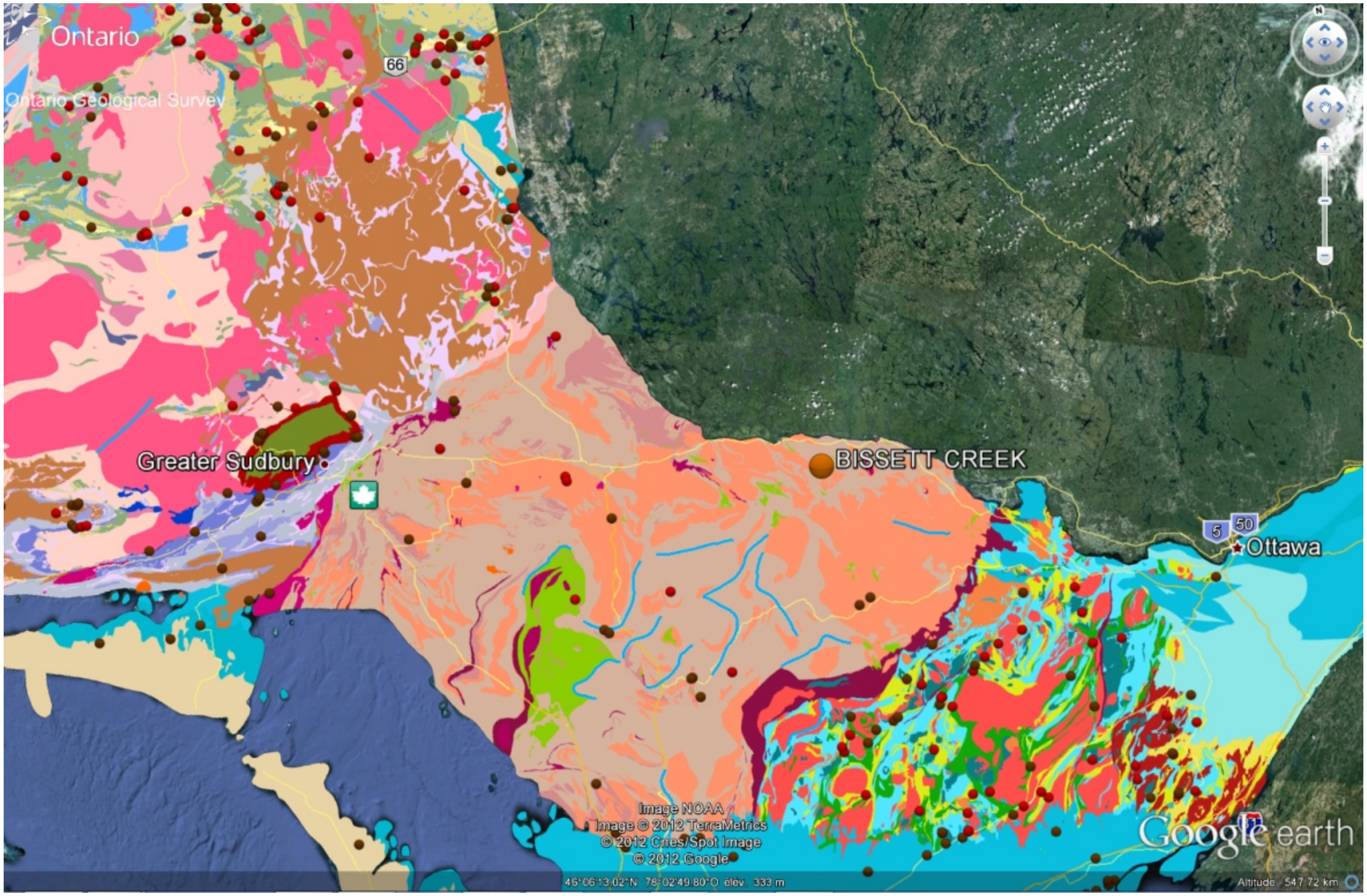
Figure 7.1: Major litho-structural Subdivisions of the Grenville Province (from Schwerdtner et al., 2009). .



The Grenville Province in the southeastern part of the Canadian Shield is part of a much larger orogeny that extends in the subsurface across the North American craton from Labrador through Quebec and Lake Huron and as far southwest as Texas and Mexico (Rankin et al., 1993), and which is represented in Scandinavia by the Sveconorwegian Province (Gower et al., 1990). Its northwest margin, the Grenville Front, is a pronounced crustal-scale fault, marked at the surface by zones of southeast-dipping mylonite which truncate the structural trends that characterize the older, neighboring Archean cratons and Paleoproterozoic orogens.

Relatively deep levels or orogenically thickened crust are exposed in its interior, witnessed by the prevalence of high-grade metamorphic rocks including large tracts of granulite and local relics of eclogite. The Grenville orogeny is interpreted to have been initiated as a major compressional event resulting from continent-continent collision whose effects terminated at ~1.0 Ga (e.g. Windley, 1989, 1993; Davidson, 1995).

Figure 7.2: Regional Geology and Property Location



The boundary between the east-trending, steeply folded Huronian sediments and the northeast-trending, southeast-dipping gneiss Si-C rocks, known as the Grenville Front, is generally accepted as the focus of thrust faulting (Davidson et al. 1985). This thrust faulting becomes increasingly penetrative to the southeast and is associated with parallel zones of intense shearing and mylonitization. The GFTZ is up to 30 km wide (Lumbers 1978) and consists of a series of granitoid units (the Grenville Front Granites, Davidson et al. 1985) and gneisses with a strong northeast-trending foliation (Wynn-Edwards 1972). Graphite occurrences have not been documented from this zone.

The CGB and CMB are differentiated on the basis of metamorphic grade, structural style, lithology and contact relationships. Both the GFTZ and Central Metasedimentary Belt Tectonic Zone ("CMBTZ") are comprised of gneiss and high strain tectonites.

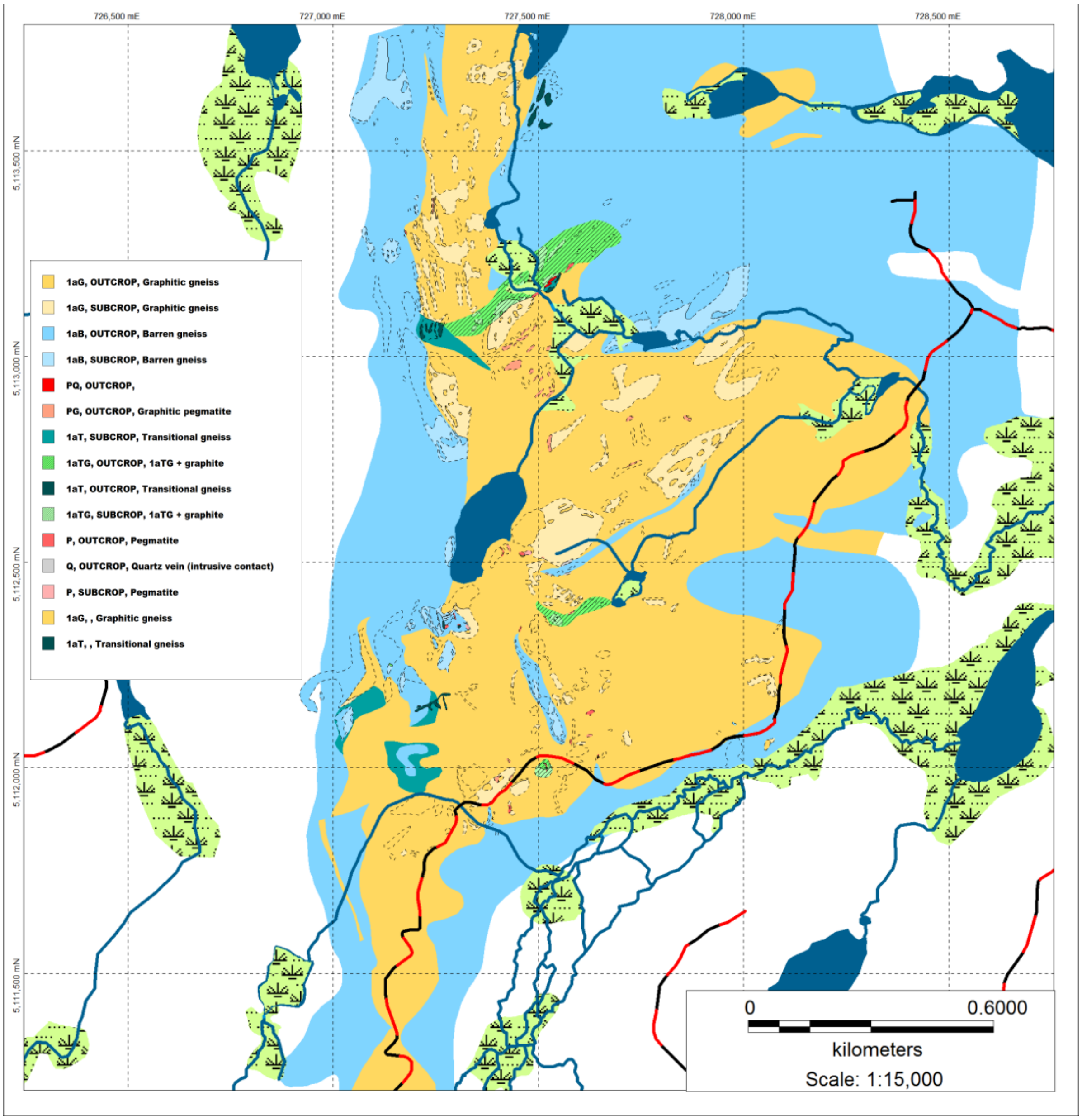
The CGB, situated between the GFTZ and the CMBTZ, comprises high-grade paragneisses and orthogneisses of upper amphibolite to granulite grade. The igneous rocks range from granite to anorthosite in composition, and display various degrees of conformability with their surrounding rocks (Davidson et al. 1981, 1985, 1986). Mapping by Davidson and co-workers (Davidson and Morgan 1981; Davidson et al. 1982; Culshaw et al. 1983; Davidson 1984; Davidson et al. 1986) defined several lithotectonic domains based on lithology, structure, and grade of metamorphism. Individual domains are separated by narrow zones of highly tectonized rocks, mylonites, and ductile shears. The attitudes of the tectonite zones and differences of lithology and metamorphic grade showed that some domains have been structurally emplaced above one another and form a stack of thrust layers pushed to the northwest. Davidson et al (1981-1986) have recognized three thrust sheets composed of distinct structural sub-domains. Graphite which occurs as crystalline flake disseminated within the semi-pelitic or quartzofeldspathic gneisses seem to be confined only in the first or relatively older thrust sheet. It constitutes thin units of considerable strike length. These units occur in every domain that comprises the lowest thrust sheet, within sequences of highly deformed paragneisses, orthogneisses and migmatites of upper amphibolite to granulite grade. The contacts between the graphite rocks and non-graphite bearing rocks are generally sharply defined. The graphite bearing units of the CGB range in composition and texture from quartzofeldspathic gneiss to quartz-biotite schists to semipelitic gneisses. The mineralogy of these units is similar with respect to the major constituents: graphite ranges up to 15% by volume; quartz varies from 50% to 80%; feldspar is present in varying amounts with biotite comprising up to 10% by volume. Sulphides are present throughout and are generally oxidized, giving the rock a rusty appearance. Graphite also occurs in higher structural thrust sheet, as pods of disseminated flake in the marble tectonite units, which have a more restricted strike length. The significance of the restriction of the siliceous flake graphite deposits to the relatively older thrust sheet could presumably reflect the structural history and the provenance of this member.

The CMB, bounded on its southern margin by Paleozoic rocks, consists of lower grade volcanic and metasedimentary rocks, and a variety of igneous intrusions. Graphite occurs as disseminated flake and replacement-type deposits within the marble units. Historically, Ontario graphite production has come from the CMB.

7.2 Property Geology

Mapping by S.B. Lumbers, 1976, of the Ontario Department of Mines, indicates that the Bissett Creek property and surrounding area are underlain by Middle Precambrian meta-sediments. The siliceous metasedimentary graphitic unit occurs in the first or relatively older thrust sheet of Davidson's (1981 to 1986) interpretation of the CGB. The host rock to the graphite is a medium to coarse-grained, grey, quartz-rich gneiss that appears to represent a particular sedimentary facies that collected organic debris and has since then undergone metamorphism and suffered considerable elongation. Foliation is defined by alignment of graphite and biotite flakes while lineation is defined by quartz rods and feldspathic ribbons. Feldspar, usually plagioclase, sillimanite and garnet are present, and the host unit contains tremolite and relatively high amounts of sphene. The rock weathers to a rusty gossan. The mineralogy assemblage may be a reflection of depositional differences in the original sediments, superimposed by differences in metamorphism. These highly deformed and recrystallized rocks have been folded into northwest trending, northeast dipping recumbent folds which are refolded by large broad open folds. A significant amount of remobilization of quartz and feldspar occurred during metamorphism and as much as 10% of the rock is migmatite.

Figure 7.3: Property Geology



For mapping purposes on the property (Figure 7.3), the rocks are divided into graphitic gneiss, transitional graphitic gneiss, and barren gneiss. In 2011, a mineralogical and petrographic study was completed helping refining the facies description.

7.2.1 Graphitic Gneiss

The graphitic gneiss is a distinctive recessive weathering unit, commonly exposed as a red-brown to pale yellow-brown weathering surface along rock cuts, hill tops and occasional cliff faces. It is described as a medium grained, light grey, banded, biotite and amphibole rich calcareous quartzo-feldspathic gneiss, containing 2 to 5% homogeneously disseminated graphite flakes. Diffused sulphide (mostly pyrite) occurs throughout the unit and the S content varies from 0.8% to 1.86%. Graphite seems to be intimately associated with biotite and it occurs in concentrations from 1 to 10% by volume and a flake size range of 1 to 6 mm in diameter. Pyrite and pyrrhotite occur in concentrations ranging from 1 to 5% but are rarely observed in outcrop because of weathering. Un-weathered, the rock unit is pale to medium grey in color. As indicated by drilling, the graphite gneiss has a thickness that varies from 25 m to approximately 75 m, gently to moderately south-east dipping from 5 to 20 degrees. It is uniformly mineralized by low grade flake graphite in the range of 1 to 2%.

Higher grades occur within and near the structural base of the unit forming bands that range in thickness from 3 to 30 m and dipping 5 to 20 degrees south. This forms a sub-unit composed of a medium to fine grained, dark to medium grey, banded, biotite rich quartzo-feldspathic paragneiss, containing 4 to 10% homogeneously distributed graphite flakes which are intimately associated with biotite and sulphides. Proportion of disseminated sulphides (mostly pyrite with some pyrrhotite) is slightly increased in this portion of the graphitic gneiss. Chemical analyses show that the S content varies from 0.4% to 1.5%.

Several barren granitic gneiss horizons with thicknesses ranging from 1 m to 20 m have been observed showing angular relationships with the graphitic gneiss.

The western edge of the graphitic gneiss is truncated by erosion. The eastern limit of graphite is determined by the overlying barren gneiss contact. The limits of graphitic gneiss exposure form an irregular area with a north-south length of 2.1 km. East-west dimensions reach a maximum of 1.2 km. The graphitic gneiss exposure tapers dramatically toward the north and south before being lost through structural displacement or erosion. On a smaller scale, broad open folds are recognized and vertical faults have been recognized and inferred from drill m core. These faults have easterly and east-north-easterly strikes and occur at intervals of 200 to 250 m.

7.2.2 Barren Gneiss

The graphitic gneiss unit is sandwiched between the upper barren non-calcareous gneiss, which forms the hanging wall of the deposit and similar lower barren gneiss which forms the footwall. All barren gneissic units appear to be sub-horizontal. The barren gneiss is a medium-grained, banded, pale to dark grey-green, mostly leucocratic, resistant weathering, non-calcareous unit, often occurring as steep-sided outcrops. Black biotite (up to 25% of volume), dark green to black amphiboles and red garnets (few mm about 5% of volume) distinguish the units from the graphite bearing varieties. These barren granitic gneisses may be defined as orthogneiss. Granitic gneiss, amphibolite gneiss, amphibolite (metagabbro), ultramafite (amphibolite) and some rare anorthosite were also intersected in drill holes as part of the hangingwall / footwall barren gneiss sequence.

7.2.3 Transitional Graphitic Gneiss

The transitional gneiss is a biotite-muscovite-garnet quartzofeldspathic gneiss. Muscovite is the distinguishing mica and garnets are a characteristic mauve colour. It occurs near the footwall and hanging walls or as small lenses within the graphitic gneiss horizon. The unit may contain variable concentrations of graphite. On surface it is usually barren and contains no sulphides.

7.2.4 Intrusive Units

Two minor intrusive units have been observed on surface. These are dykes and sills of coarse grained biotite-muscovite-quartz-feldspar pegmatites and a dark green lamprophyre. The pegmatite forms small, blocky, white, resistant outcrops. A coarse grained pink biotite-quartz-feldspar-pegmatitic phase is also recognized but this unit is believed to be the product of peak regional metamorphism and is probably much older. The pink pegmatite tends to be weakly foliated and occurs in sills, sub-parallel to gneissosity. Contacts are generally gradational. Lamprophyre dykes of Cambrian age are commonly observed in drill core, where they occur as dykes along vertical faults.

7.3 Mineralization

In Ontario graphite occurs in both the Superior and Grenville structural provinces but the more important graphite deposits have been found historically in the Grenville Province. In the Superior Province it is associated with gold and base metal deposits occurring in carbonaceous sediments and shear zones. In the Grenville Province, graphite occurs within both the CGB and the CMB. Disseminated flake and “amorphous” graphite occurs in certain marble units in the CGB, within siliceous gneiss units in the CGB and within some of the marble units of the CMB. Prior production from Ontario has come from graphite deposits within the marbles of the CMB which are locally of higher grade. Economic deposits now are being found in the siliceous metasediments of the CGB. The lower grade of deposits in the CGB is offset by their larger size and amenability to open pit mining.

At Bissett Creek, the graphite mineralization is well characterized by homogeneously distributed graphite flakes (about 1 to 5 mm in size and 3 to10% of volume) within biotite schists with variable content of amphibole, clinopyroxene, chlorite, carbonate and graphite. Ubiquitous trace minerals included sphene, apatite, garnet and zircon. Sulfides were reported as trace amounts, usually as pyrite and pyrrhotite. On the basis of the graphite content and variation of the gneissic facies, the graphitic gneiss can be divided into:

- Biotite rich quartzo-feldspathic and graphitic gneiss, paragneiss;
- Biotite rich quartzo-feldspathic and graphitic gneiss; and,
- Diopside-tremolite-biotite rich quartzo-feldspathic and graphitic gneiss.

Graphite flakes occur disseminated in the graphitic gneiss horizon and are in variable concentration in the transitional gneiss. The diopside-tremolite-biotite-graphite bearing gneiss is mostly located in the upper part of the mineralized graphitic horizon whereas the graphite rich paragneiss (up to 10% graphite) sub-unit generally confined at the base. Graphite generally forms slender, oval to sub-rounded planar flakes averaging 0.3-1.5 mm long and 0.03-0.07 mm wide. These commonly occur adjacent to flakes of biotite of similar size or are associated with patches of pyrrhotite. Much less commonly, books of a few flakes are contorted or warped, and minor quartz or less commonly biotite occurs between the individual flakes.

The overall size distribution of the graphite flakes observed in core samples throughout the deposit does not show a direct relationship to the total graphitic carbon of the analysis. Large flakes are generally present independently of the percentage grade of the graphite, making the graphite gneiss horizon prospective along its entire length.

It was noted that the weathered horizon, some 2-4 m thick, was a more friable form of the gneiss that the fresher rock without any noticeable change in the graphite content or flake size. This weathered material has the potential to be comminuted much more easily than the fresh rock and with probably better liberation of full-sized graphite flakes.

8. DEPOSIT TYPES

The classification scheme most widely accepted for graphite deposits was introduced by Cameron (1960). It classifies known graphite deposits into five categories reflecting the different types of graphite. The five types of deposits are:

- Disseminated flake graphite in silica-rich meta-sediments;
- Disseminated flake graphite in marbles;
- Metamorphosed coal seams;
- Vein deposits; and,
- Contact metasomatic or hydrothermal deposits in metamorphosed calcareous sediments or marble.

The geology of each type is different. Deposits of category 1 or 2 are usually disseminated flake graphite and those of category 3 and 5 consist of micro crystalline or amorphous graphite. Economic deposits in the 19th and early 20th centuries were of types 1 and 5. Deposits of greatest economic importance today are of types 1 and 3.

The Bissett Creek Project would fall within the first category. The crystalline graphite flakes are disseminated in silica-rich meta-sediments associated with older rocks, notably those of Precambrian age, which have undergone a high degree of regional metamorphism, forming gneisses, schists, and quartzites. The host rocks vary from quartz-mica schists, to quartz-feldspar-biotite gneisses with and without garnet, to semi-pelitic schists. The original character of the host rock in most cases has been obliterated by the metamorphism involved. The overall composition, mineralogy and geological setting indicate a sedimentary rock, usually quartz-rich, as the host.

The graphite occurs as flakes disseminated throughout the unit, usually defining the foliation. Flake size reflects the grain size of the host rock, and varies from finer than a millimeter (“mm”) to over a centimeter (“cm”) in width. If mica is present, the mica and graphite are frequently inter-layered. The grade of this type of deposit varies from one to two weight percent to upwards of ten weight percent in deposits such as those in the Malagasy Republic.

Impurities in flake graphite are usually the common minerals of the host rock, particularly quartz, feldspar, mica, amphibole and garnet. With the exception of the mica, most of these minerals are easily separated.

The strike length of the host unit is usually in the range of hundreds of metres up to several kilometers. Concentrations of graphite tend to occur along the host unit, and these graphitic sections themselves can be several hundreds of metres in strike length. Their width, however, is, variable.

Garland (1987) concluded that because of 1) the disseminated nature of the graphite; 2) the restriction to a particular type of meta-sedimentary horizon; 3) the restriction of this type of horizon to sub domains of Davidson's first or relatively older thrust sheet; 4) the carbon isotopes being similar to those from other biogenic; and 5) the REE patterns of the graphite separates were similar to the parent rock, which has patterns similar to those for greywackes indicate that the graphite has formed in place from organic debris deposited with the sediment. The distribution of the graphite within the meta-sedimentary unit reflects a primary distribution of carbonaceous material within the original sediment.

9. EXPLORATION

In 1982 Hartford Resources Ltd. carried out a program of line cutting/ VLF-EM surveying and trenching.

In 1984 Princeton Resources Corporation ("Princeton Resources") completed a program of property reconnaissance, road and grid line surveys, followed by geological mapping, trenching, trench sampling, bulk sampling and diamond drilling. The existing grid in the central area of the property, originally cut at a line spacing of 300 ft, was surveyed by "hip-chain" and compass methods. The grid lines were renumbered sequentially at even intervals but do not represent 100 m intervals. Stations were re-established along the lines at 25 m intervals. Considerable errors in line bearings were detected which made it impractical to use the grid for geological mapping. In cases where grid lines were employed for mapping, loop traverses were run to known points. Trenching was carried out with a track mounted backhoe, compressed air drilling and blasting. Five (5) trenches having a total length of 285 m were excavated and blasted. A total of 40 samples weighing approximately 25 kg each were taken. Trenches averaged 1 to 2 m in width and ranged in depth from 0.5 to 2 m. In addition to the trenching and diamond drilling, a bulk sample weighing in excess of 15 t was taken from a high grade surface zone near Trench T84-5 in the northeast area of the property. This sample was shipped to Sudbury for milling tests and assay. This work outlined significant tonnages of potentially economic graphite mineralization, both flake size and grade. This tonnage includes the extension of previously known surface occurrences and the discovery of a new higher grade zone which does not come to surface.

In 1985 Princeton continued their exploration work with the extension of geological grid mapping over the center of the property, magnetic survey, diamond drilling, and bulk sampling. A pilot plant was constructed on site and 4,000 t were mined from three sites. Grid mapping outlined a much larger area of graphitic gneiss than was previously known, in particular, sections of the western limits of known graphite, and a large area lying between the B and E zones.

In early 1986, bulk sampling was initiated by Princeton and some 3,630 t of material was drilled, blasted and partially stockpiled. Initial sites were chosen on the basis of grade, overburden depths and ease of access. The pits were grade contoured to establish pit limits, and then field surveyed to establish actual rock volumes and physical limits. An air-track drill was also used to increase the sample density and refine the grade contours. Holes were drilled on 5 m centres and 2 m centres on lines between the existing 10 m spaced diamond drill holes. Air track holes were also drilled adjacent to core holes for comparison of assay results to determine if air track cuttings could be used for grade control. The pits were initially drilled on a blast pattern of 4 ft x 3 ft x 10 ft and taking the pattern down to 3 ft x 3 ft x 10 ft to obtain much better fragmentation.

From its option in 1986 up to 1989, North Coast Industries (North Coast) undertook extensive exploration and evaluation work on the property. North Coast completed geological mapping at 1 in = 100 ft and outcrop sampling in the "NE", "A", "B", and "C" zones. Outcrop samples for prospecting and grade mapping purposes were taken over at least 0.3 m of bedding section as rough chip samples. Surface sampling highlighted one large zone of consistent strong mineralization along the western edge of "C" zone. Trench sampling was also completed in 5 trenches (T-87-1 to 5) totaling 700 m in length. Trenches 87-1 through 87-4 were dug through the bedrock with an excavator and chip sampled longitudinally down the total bottom surface of each trench in 5 ft lengths. Trench 87-5 was drilled and shallowly blasted to fresh rock and sampled on the side walls. Only samples taken from the sidewalls of trench 87-5 returned consistent and representative assay values that being the only trench sampled across the gneissosity. In addition to the Princeton 3,630 t bulk sample, North Coast has collected a number of smaller bulk samples for bench testwork by KHD Humbolt Wedag ("KHD") and a large 6,668 t bulk sample for pilot scale testing by EKOF Flotation GmbH ("EKOF") and KHD. Further detailed evaluation studies consisted of ore reserve calculations, mine planning, estimates of associated capital and operating costs, extensive metallurgical evaluation, process design, environmental assessment, graphite flake quality evaluation, flake concentrate end user testing and market analysis. North Coast engaged KHD to review the pilot plant flow sheet and equipment, to make process recommendations, and to perform test work on samples and concentrate from the pilot plant. Based on the positive conclusions of the "Prefeasibility Study for the Bissett Creek Graphite Project" issued in December 1987 by KHD, a full Feasibility Study was completed by KHD in April 1989 for operation of a graphite beneficiation plant with mining facilities and necessary infrastructure. Proven and probable reserves were estimated at 20 Mt at an average grade of 3.18% C, equating to 640,000 tonnes of contained flake graphite. This resource estimate is not compliant with the current National Instrument 43-101 (NI 43-101) regulations and is presented herein just as an historical reference.

In 2007 Industrial Minerals Inc. ("IMI") mandated Geostat Systems International ("Geostat") to produce a NI 43-101 compliant technical report. The small exploration program, consisting in drilling and surveying key topographic features as well as the 2007 drill collars, confirmed the historical grade values and graphite flake size in an area defined in the 1980's.

In 2010-2011 Northern Graphite added more drilling and completed topographic and geophysical surveys. JSA International Geoconsulting Ltd. contracted the firm Perron, Hudon, Bélanger to perform a high definition LIDAR topographic airborne survey over the property on an area of approximately 53 km^2. Ground points for laser data control were collected using a GPS-RTK and validated using base station PPP results to control the vertical precision of the LIDAR survey. The validation of the verification points (PPP) is to measure the precision of the GPS survey. The LIDAR (ALTM Gemini) was installed on a plane from the Aeroscan Company. The raw Laser data were processed using Optech Dashmap software and the TerraScan software was then used to perform adjustment and classification. Each flight session was independently calibrated to correct roll, pitch and heading of the plane. An automated classification and clean-up of the Laser points was performed using many quality control checks to attain an accurate terrain representation. The remaining points were processed manually to preserve important slope change and to remove gross errors. The digital terrain model was compared with topographical data acquired during the survey. Results analysis shows that the average precision of the survey data is ± 20.0 cm in height for areas of little snow and of ± 50.0 cm in height in areas of snow. The process results shows that 0.003% points were rejected during acquisition.

Insight GeophySi-Cs Inc. ("Insight") was contracted to perform Time Domain Induced Polarization / Resistivity surveys. A total of 12,800 m of lines were surveyed along thirteen N-S lines 100 m apart. Station separation was between 50 and 1,400 m and sampling intervals were at 12.5 and 25 m. UBC-2D Inversion of Insight Section and Tuned Gradient were completed on three on line 727200 E, 727600 E and 728000 E. The application of the Insight Section and Tuned Gradient arrays on the Bissett Creek Project was successful at locating and delineating the graphitic carbon present on the property. A positive association between high chargeability\low resistivity and graphitic carbon has been shown to be consistent with previous diamond drill hole results. The use of a metal factor ratio has been employed to better illustrate this association and appears to have been effective. The main anomaly which appears to be relatively untested by drilling seems to be consistent along the strike of the grid dipping slightly to the south east and is shown to be within 100 m of surface. Attempts to determine the location of higher grade zones relative to lower ones were not very conclusive, probably because of the limited geological input.

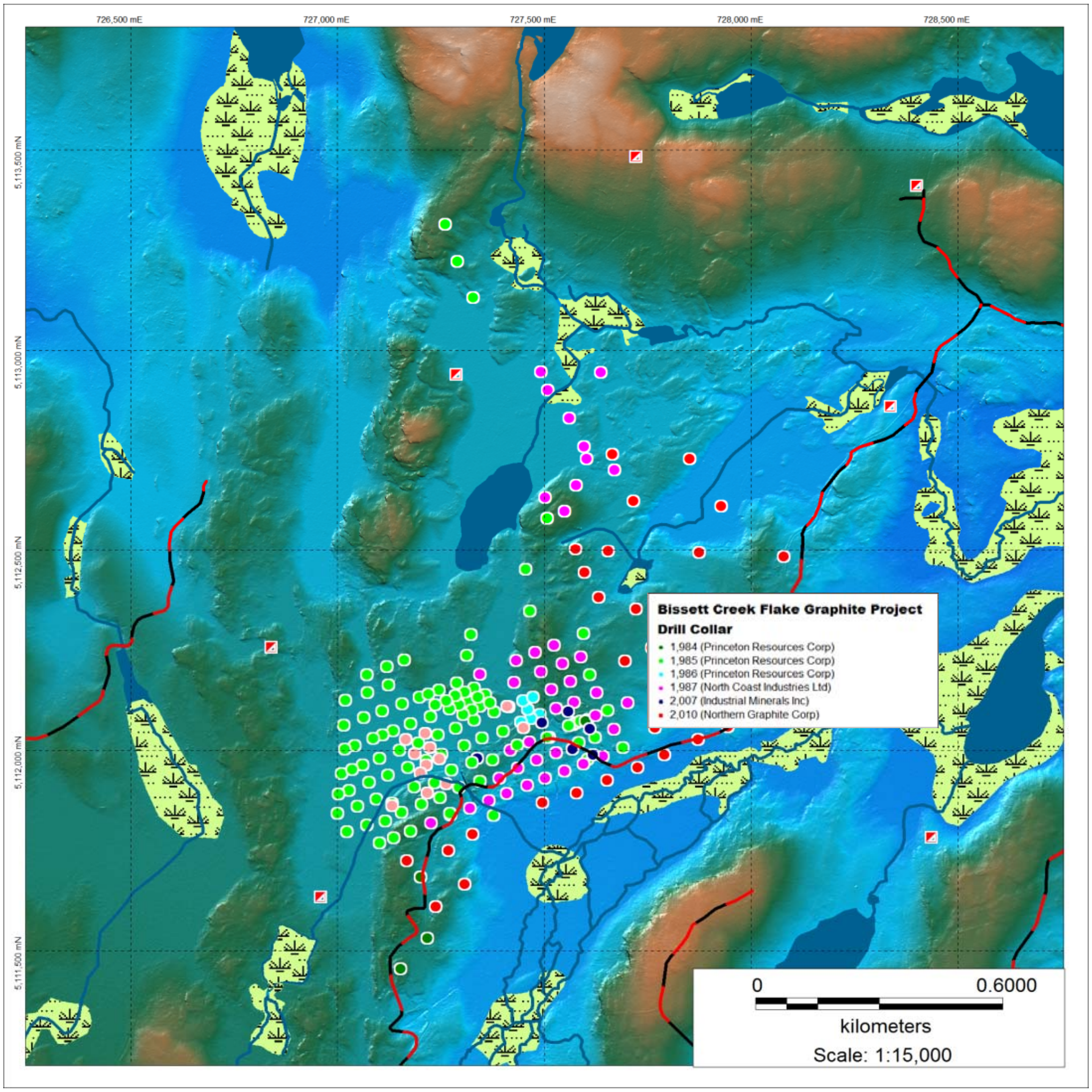
10. DRILLING

A total of 214 diamond drill holes have been drilled on the Bissett Creek Flake Graphite Project for a total of 10,946 m (Table 10.1). An additional 82 percussion holes and 21 geotechnical holes have also been drilled (Table 10.1). Most of the drilling have been concentrated in the “NE” Zone (169 dh for 8,423 m of drilling), followed by the “A” Zone one (24 ddh for 1,298 m of drilling) and the “B” Zone (21 ddh for 1,113 m of drilling) as illustrated in Figure 10.1.

Table 10.1: Drilling Summary

	Percussion	Geotech	# DDH	Zone “NE”		ZONE “A”		ZONE “B”		ZONE “C”		Total DDH
				#DDH	m	#DDH	m	#DDH	m	#DDH	m	m
1984			4	4	187.8	0	0.0	0	0.0	0	0.0	187.8
1985			102	93	4751.8	3	129.5	3	162.8	3	112.2	5156.3
1986			6	6	274.3	0	0.0	0	0.0	0	0.0	274.3
1987	82		45	33	1581.9	0	0.0	12	572.1	0	0.0	2154.0
Sub Total	**82**		**157**	**136**	**6795.8**	**3**	**129.5**	**15**	**734.9**	**3**	**112.2**	**7772.4**
2007			6	6	246.4	0	0.0	0	0.0	0	0.0	246.4
2010		17	51	24	1380.9	21	1168.0	6	378.0	0	0.0	2926.9
Total	**82**	**17**	**214**	**166**	**8423.1**	**24.0**	**1297.5**	**21.0**	**1112.9**	**3.0**	**112.2**	**10945.7**

Figure 10.1: Diamond Drill Hole Collar Location



Starting in 1984, Princeton Resources Corporation ("Princeton") drilled a total of 317 m of BQ diameter core in 7 holes to drill test Zone South (2 holes), North (1 hole), and Northeast (4 holes). All seven holes were vertical and no deviation measurements were reported. Drilling highlighted the higher grade graphite horizon in the Northeast Zone and showed that the graphitic horizon had a thickness of about 30 m.

A major drill program was undertaken in 1985 by Princeton where 99 new vertical BQ diamond drill holes were added and 3 holes were deepened for a total footage drilled of 3,131 m. This total includes about 30 shallow unnamed test holes which were drilled to outline surface sample sites. The shallow hole length totalled 106 m. The combined 1984-85 drilling totals 5,450 m in 106 diamond drill holes and 30 unnamed test holes. Ninety-three holes were drilled in the Northeast Zone. The majority were drilled at 64 m x 46 m spacing. A smaller grid spacing of 23 m x 23 m was used in one area and one fence of holes was drilled at a 10 m spacing to determine the continuity of the graphite horizons.

The 1985 drilling program outlined in the western Northeast Zone a total of 3.8 Mt of flake graphite bearing gneiss grading an average of 3.05% graphitic carbon ("Cg") using a 2.5% Cg cut-off grade. This resource estimate is not compliant with the current National Instrument 43-101 (NI 43-101) regulations and is presented herein just as an historical reference. Resource calculations were based on blocks measuring 70 x 70 x 10 m with block sides oriented parallel to the zone's dip and strike directions. Most of the tonnage is near surface with close to 3 Mt of the 3.8 Mt within 34 m of the bedrock surface. This tonnage occurs in three higher grade horizons dipping gently southeast and contained within an envelope of lower grade graphitic gneiss. Grade and thickness decrease in the southwest, northeast and down dip directions. In cross-section, true thicknesses range from 15 to 30 m. Commonly, a second horizon with a thickness ranging from 3 to 6 m occurs in the same section. The larger horizons are traceable over a 350 m strike length. The resource estimate was not evaluated in terms of mining feasibility and no mining dilution or stripping ratio had been calculated. Complete data on the relationship of graphitic carbon assays to full scale flotation was not available and further information was also needed to be gathered on the phyisical properties of the final product.

In 1986, 6 diamond drill holes for a total of 274.3 m were all drilled in a tight grid spacing of the Northeast zone. These holes were probably drilled by North Coast Industries ("North Coast").

North Coast's 1987 drill program included 67 percussion holes drilled strictly for assay, using a Gardner-Denver 750 c.f.m. airtrack drill with a vacuum, filter and screen system. Holes were drilled to 60 ft where possible and the whole length was sampled in 10 ft length. Additionally, a total of 1,206.9 m of N-DBGM diameter core was drilled in 26 holes and 947 m of BQ diameter core was drilled in 19 holes. Diamond drilling was concentrated in the Northeast Zone (33 ddh) and the B zone (12 ddh). All holes were vertical.

All 1980's drill hole collars were surveyed in 1988 by triangulation using total station by R. M. Blais & Associates Ltd. for CEC Engineering Ltd. Collar coordinates were reported on maps in a local mine grid system in imperial units and converted to a metric system in UTM NAD27 zone 17 projection system. The conversion (i.e. translation and rotation) from the local mine grid system to the UTM NAD27 system is unknown. There are no digital records of the information and none of the historical casings could be found in the field for resurveying.

In 2007, Systèmes Geostat International Inc. ("Geostat") services were retained by Industrial Minerals Inc. to prepare a Preliminary Economic Assessment ("PEA") technical report compliant with the standards of the Canadian Securities Administrator's NI 43-101. An additional 6 vertical diamond drill holes of NQ size were completed in the "Northeast" zones for 246.9 m in the area of Pit #1 and #3 ("Pencil Zone"). Drilling was aimed at confirming grade and graphite flakes size in an area that had been investigated in the 1980's. The diamond drill holes were bored by George Downing Estate Drilling Ltd. between August 1 and August 9, 2007. All 6 holes of the 2007 drill program intersected mineralized gneiss. There was no overburden at drill site locations. The graphitic gneiss foliation being sub horizontal, the vertical holes cut mineralized thicknesses from 30 m up to 49 m. Drilling confirmed that the main graphitic gneiss body at Bissett Creek is made up of various consistently mineralized zones and that graphite flakes were observed in all 6 holes. A parting parallel to the foliation was observed within the first 1 to 3 m due to surface weathering. Pyrite was observed in almost every hole, in trace up to 1 % in the core. A block model of 10 m N x 10 m E x 5 m Z was used and a fixed specific gravity of 2.63 was employed. A first NI 43-101 compliant resources statement was published that showed a total of 14.6 Mt grading 2.24% graphitic carbon (Cg) in the indicated category and an additional 18.0 Mt grading 2.21% Cg in the inferred category using a 1.5% Cg cut-off grade. The indicated resources were within a well drilled perimeter of approximately 64 m x 46 m while the inferred were adjacent to this perimeter, but with extension limited by the lack of drilling.

The 2007 drill collars were surveyed with differential GPS by Mesures Lasertech Inc. in the UTM NAD 83 zone 17 projection system.

Northern Graphite's 2010 drilling program was jointly planned in part with Geostat as a follow up to the PEA Report recommendations (Table 10.2). In the "Northeast" Zone, the drilling program was three fold. Firstly, five historical holes (BC-85-020, BC-85-027, BC-86-006, BC-85-070, BC-87-036) were selected to be twinned (SGS-10-001 to -005) in order to validate historical drill results where high grade zones had been intersected. Since none of the historical drill hole casings could be located in the field, collars were located on georeference historical maps and were assumed to be within 5 m of actual location. Secondly, an additional 8 holes (SGS-B1-001 to -004; SGS-B2-001 to -004) were planned to validate the mineralized zone continuity in between the 50 m spaced historical drill hole sections.

Table 10.2: Northern Graphite 2010 Drilling Proposal

Hole #	Garmin GPS	Azimuth	Dip	Comments
BC-10-01	17 T 727174 5111729	0	-90	
BC-10-02	17 T 727242 5111615	0	-90	Bring inferred to indicated & pit extension - Hole 1 & 3; HG 2?
BC-10-03	17 T 727308 5111678	0	-90	
BC-10-04	17 T 727329 5111797	0	-90	Bring inferred to indicated within the pit & expand resource down below swamp
BC-10-05	17 T 727265 5111750	0	-90	
BC-10-06	17 T 727503 5111864	150	-70	
BC-10-07	17 T 727577 5111898	150	-70	
BC-10-08	17 T 727649 5111931	150	-70	
BC-10-09	17 T 727724 5111965	150	-70	All angled holes on edge of pit & swamp to bring inferred to indicated and increase pit if dam to divert the water is a possible option
BC-10-10	17 T 727796 5111995	150	-70	
BC-10-11	17 T 727870 5112030	150	-70	
BC-10-12	17 T 727943 5112062	150	-70	
BC-10-13	17 T 727766 5112054	0	-90	
BC-10-14	17 T 727831 5112100	0	-90	
BC-10-15	17 T 727909 5112122	0	-90	
BC-10-16	17 T 727993 5112145	0	-90	All inferred resource brought into indicated category Hole 14 & 15 within current pit Holes 15 to 20 to join two pits together
BC-10-17	17 T 727983 5112209	0	-90	
BC-10-18	17 T 727892 5112171	0	-90	
BC-10-19	17 T 727950 5112295	0	-90	
BC-10-20	17 T 727858 5112255	0	-90	
BC-10-21	17 T 728176 5112247	0	-90	Bring inferred within eastern pit to indicated and increase the pit further out to the East
BC-10-22	17 T 728142 5112330	0	-90	
BC-10-23	17 T 727921 5112365	0	-90	
BC-10-24	17 T 727830 5112327	0	-90	Test inferred resource and bring to indicated category and further expand pit outline Hole 25 being the HG and 23 & 24 questionable?
BC-10-25	17 T 727698 5112228	0	-90	
BC-10-26	17 T 727636 5112386	0	-90	
BC-10-27	17 T 727598 5112447	0	-90	Further increase inferred into indicated category and expand Andre's pit scenario
BC-10-28	17 T 727553 5112521	0	-90	
BC-10-29	17 T 727762 5112263	0	-90	
BC-10-30	17 T 727720 5112361	0	-90	
BC-10-31	17 T 727655 5112506	0	-90	
BC-10-32	17 T 727762 5112502	0	-90	
BC-10-33	17 T 727713 5112624	0	-90	
BC-10-34	17 T 727663 5112746	0	-90	All exploration holes at approx 120m square pattern to increase inferred resource & blue sky possibility Note: Some holes will probably need to be moved a bit depending on swamp situation
BC-10-35	17 T 727867 5112498	0	-90	
BC-10-36	17 T 727812 5112620	0	-90	
BC-10-37	17 T 727760 5112742	0	-90	
BC-10-38	17 T 727974 5112495	0	-90	
BC-10-39	17 T 727923 5112617	0	-90	
BC-10-40	17 T 727875 5112738	0	-90	
BC-10-41	17 T 728081 5112491	0	-90	
BC-10-42	17 T 728027 5112613	0	-90	Note: Hole # 41, 42 & 43 could be pushed a bit further East to get more information on geology but category
BC-10-43	17 T 727983 5112735	0	-90	
BC-10-50	17 T 727433 5113281	0	-90	
BC-10-51	17 T 727588 5113293	0	-90	
BC-10-52	17 T 727751 5113265	0	-90	Blue sky resource to the North of Property (North dipping limb)
BC-10-53	17 T 727934 5113225	0	-90	
BC-10-54	17 T 727697 5113421	0	-90	
BC-10-55	17 T 727502 5113432	0	-90	
SGS proposed holes (validation program)				
SGS-2010-01	17 T 727130 5111870	0	-90	Twin Hole
SGS-2010-02	17 T 727270 5111845	0	-90	Twin Hole
SGS-2010-03	17 T 727415 5112110	0	-90	Twin Hole
SGS-2010-04	17 T 727220 5111970	0	-90	Twin Hole
SGS-2010-05	17 T 727450 5112060	0	-90	Twin Hole
SGS-2010-B1-1	17 T 727185 5111992	0	-90	Block 1 in-fill drilling to test mineralization continuity
SGS-2010-B1-2	17 T 727226 5112012	0	-90	Block 1 in-fill drilling to test mineralization continuity
SGS-2010-B1-3	17 T 727164 5112038	0	-90	Block 1 in-fill drilling to test mineralization continuity
SGS-2010-B1-4	17 T 727211 5112056	0	-90	Block 1 in-fill drilling to test mineralization continuity
SGS-2010-B2-1	17 T 727219 5111898	0	-90	Block 2 in-fill drilling to test mineralization continuity
SGS-2010-B2-2	17 T 727265 5111920	0	-90	Block 2 in-fill drilling to test mineralization continuity
SGS-2010-B2-3	17 T 727203 5111944	0	-90	Block 2 in-fill drilling to test mineralization continuity
SGS-2010-B2-4	17 T 727245 5111961	0	-90	Block 2 in-fill drilling to test mineralization continuity
Modified location				
SGS-2010-B2-4	17 T 727240 5111965	0	-90	Location modified
BC-10-03	17 T 727304 5111672	0	-90	
BC-10-04	17 T 727327 5111794	0	-90	Bring inferred to indicated within the pit & expand resource down below swamp
BC-10-05	17 T 727268 5111759	0	-90	

11. SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Background

Graphite is evaluated and marketed on the following basis:

- Flake size (mesh size);
- Carbon content of cleaned flakes (carbon content of concentrate); and
- Ash content (amount of oxides and carbonates still present in graphite flakes after concentration).

Those evaluation methods are generally accepted and used by the industrial graphite users. However, these are all concentrate measurements and one must start with a base line assessment of the mineralization.

Flake size is determined with standard sieve tests using standard "tyler" sieve size openings. The "ash contents" are determined by qualitative spectrographic analysis on the graphitic flake. The determination of contained carbon in the flake poses a different problem. The industry accepts a variety of determination methods, as described below:

a.) Double loss on ignition analysis;

b.) Flotation product produced; loss on ignition;

c.) Organic carbon removal; measurement of the inorganic carbon (LECO).

The double-loss-on ignition method was the most accepted in the graphite industry; however it is very slow and cumbersome for use in drill core and large numbers of geologic samples. Also, the method does not eliminate all the organic carbon in the sample and the industry does not credit the organic portion of a concentrate.

During the course of the project’s exploration programs, the graphitic carbon (“Cg”) content was determined using various methods, including flotation, double loss-on-ignition (“LOI”), and acid-bath with LECO finish. The type and extent of certain volatiles observed in the Bissett Creek samples makes quantitative analyses for graphite content problematic. Consequently, it was determined that the acid-bath LECO method produced the most reliable results to use for ore resource estimations. Even though different acid digestion procedures might have been used through time to remove organic carbon prior to the measurement of the inorganic carbon (LECO), all those samples were retained for the current ore resource estimation. Geostat 2007 drilling program, aimed at giving a certain level of confidence with respect to the use of historical data, was able to reproduce similar grades and thicknesses to those intersected by historical holes. Therefore, results are considered reliable for the purposes of this current ore resource estimation.

11.1.1 Drilling Campaign 1984 - 1985

Two analytical methods were used during the exploration drilling program. The first method used (Flotation) was to determine if an acceptable flake product could be recovered from the rock and then a determination of the carbon content of the graphite flakes was made. All drill core samples were visually estimated by the site geologists to determine their graphite content. A substantial correction factor was needed to correlate the visual estimates with the chemical assays of the contained graphite. The average reduction factor was estimated to be a little less than four, but it is very apparent that the factor could be as high as 8 and as low as 2. Some preliminary estimates of grade were made by using the results of the preliminary metallurgical test work, but once the main 1985 drill program was underway Lakefield Research Inc ("Lakefield") carried out more definitive metallurgical testing and assayed some of the then current drill core samples for contained Cg content by chemical means. An initial 90 samples were assayed by Lakefield. Subsequent assaying was carried out by Erana Mines Ltd. ("Erana") who was advised to use similar equipment and procedures to that used by Lakefield. Erana reran an initial 42 samples previously assayed by Lakefield with reasonable correlations. The second method (LECO) allows direct analysis of material without initial separation of the graphitic flake. This technique also eliminates all the organic carbon material and reads only the inorganic carbon content. To provide analytical checks, initially in the program, alternate samples were sent to Lakefield Research in Lakefield and Porto Metal Mills Ltd. in Sudbury.

- The Flotation method entailed taking 5 kg of material, crushing same and by flotation methods producing a graphitic flake concentrate. From this, flake size distributions and ash contents were determined. Carbon contents were determined by LOI; and,
- The LECO method procedure used is to remove any carbon in carbonates by an acid bath, followed by a short term ignition of the sample at 3000°F. The gas that is given off is then passed through various adsorption tubes to remove all constituents that might interfere with the determination of the amount of carbon dioxide ("CO_2") produced and then the carbon dioxide is itself adsorbed. The amount of graphite is calculated from the weight of CO_2 that has been adsorbed.

11.1.2 Drilling Program 1986 – 1987

As the exploration drilling program progressed between 1986 and 1987, the majority of samples were prepared and analyzed at a site facility with regular checks conducted at Lakefield in Lakefield, Ontario (every tenth sample) and KHD Humbolt Wedag ("KHD") facilities in West Germany. The carbon content determination was done using two methods, the double-loss-on-ignition (LOI) and by LECO:

- A detailed procedure was prepared for site sample preparation. 2.25 in diameter drill core was split in half, recorded, tagged, and then taken to the sample preparation room. Data was recorded in a log book and the moisture content of the sample determined. The sample was then dried at 105 - 100°C. All samples were crushed in a jaw crusher to minus one half inch. The whole sample was twice put through the smallest jaw crusher so that the largest particle was 4 mm. All samples were split in half using a Jones rifle. Half the sample was discarded and the other half was split again. This was repeated until the last split was two 1000 g samples. One half was saved in a suitably labelled plastic bag in case it was required for check purposes. The other half was put into a metal pan, dried and then pulverized in a disk pulveriser so that the whole sample was 95% minus 100 mesh. The sample was rolled on a rolling paper until it was thoroughly mixed. About 250 to 300 g was cut out of this and placed in a marked envelope for the lab. At the lab, each sample was rolled 20 times on a rolling cloth and 25 g was cut out of it into a 100mesh screen where it was rolled again. Another 25 g was cut out and added to the first cut on the 100mesh screen. The screen is tapped so that all -100 mesh goes through the screen. All +100 mesh is transferred into a mortar and crushed until 100% of the sample goes through the 100 mesh screen. The 50 g sample is transferred back to the rolling paper and rolled thoroughly before being put into marked envelopes. A small Coors crucible was weighed to the nearest tenth of a milligram (W-1). One half gram of the sample is transferred to the crucible and weighed to the nearest tenth of a milligram (W-2);
- The Double loss on ignition (LOI) method procedure was described in detail by KHD;
- The moisture content is obtained by weighting 1 g of sample at exactly ± 0.0001 g in a porcelain bowl and dried in a dryer at 106°C±2°C until constant weight is obtained. The bowl is weighted again after cooling. Moisture percentage is determined by: difference in weight / original weight x 100;
- The ash content is obtained by weighting 1 g of sample ground to minus 70 µm at exactly ± 0.0001 g in a porcelain bowl that has been heated to 1000°C prior to analysis. This sample is then pretreated in a de-asher at 600 - 700°C for one hour. The sample is burnt in a muffle furnace at 875 - 900°C under addition of oxygen for 4 to 5 hours. The sample is then cooled down in desiccators and weighed again. Ash determination is obtained by: A% (without water) = ((weight

of ash in analytical wet sample in grams – 100) ⁄ weight of analytical wet samples in grams)) × (100 ⁄ (100 - water content of wet sample in mass %));

- The volatile content is obtained by weighting 1 g of sample ground to minus 70 µm at exactly ± 0.0001 g in a porcelain bowl that has been heated to 1,000°C prior to analysis. This sample is treated in a muffle furnace at 375 - 400°C with permanent access to air (oxygen loaded but not pure oxygen) until constant weight has been gained (±2 hours). Volatile determination is obtained by: V= ((weight of wet sample in grams - weight of remaining coke of wet sample in grams) ⁄ weight of wet sample in grams × 100) - water content of wet sample in mass %;
- The Cg is determined by: 100 - (% of ash+% volatiles); and,
- The automated LECO method procedure uses 4 to 5 kg samples dried in a drying oven at 105 to 110°C. The whole sample is crushed through a laboratory jaw crusher set to give an all minus 3mm product. The whole sample is passed through a riffle sampler. One half is retained and the other half is rejected. The riffling procedure is repeated until the retained sample weighs 500 g to 1000 g. The 500 g to 1,000 g sample is pulverized through a disc pulveriser (80% passing minus 100mesh). 250 g of the sample is taken into a sample bag. Five (5) g of sample is weighed into a 250 ml beaker. 100 ml of 10% nitric acid is added and the sample is filtered. The solids are washed on the filter paper with distilled or de-ionized water. Solids are washed and are dried in the beaker in a drying oven at 105 to 110°C. Dried solids are weighted (2 g). The dried solids are pulverized using a mortar and pestle. Duplicate 200 g samples are weighted out. Leco apparatus is used to get duplicate carbon analyses (a1 and a2). If difference between a1 and a2 is greater than 0.1% carbon, then repeat the Leco analysis, in duplicate. % graphitic carbon is reported as: (a1+a2)/2 × w2 / w1.

11.1.3 Drilling Campaign 2007

In 2007, all core samples were prepared at Ortech Laboratory (Ontario) and assayed at Activation Laboratories Ltd (Ontario) for graphitic carbon using double-acid digestion; one into five samples assayed for total carbon (“C”).

- Drill core was first stored in 15 ft boxes. Once logged and measured, core boxes were first photographed and then core was cut in two with a rock saw along its long axe. One half of the core was sampled (approximately in 5 ft length) and shipped to the prep laboratory for crushing and the other half was stored for archiving. Boxes were numbered, tagged and stored in a warehouse on site. The possible tampering of the samples was considered almost inexistent since the core was split, bagged and sealed by Geostat personnel up to the time of shipment to the prep laboratory and analysis;

- Sample preparation was assumed to be the following since the procedure could not be verified. 5 kg samples were crushed up to 75% passing 2 mm, 250 g samples were split and pulverize (hardened steel) to 95% passing 105 um;
- The graphitic carbon analytical procedure uses 0.5 g sample digested with hydrochloric and perchloric acids to remove all forms of carbon with the exception of Cg. The residue is vacuumed filtered and dried. Accelerator material is added to the dried filter. The inductive elements of the sample and accelerator couple with the high frequency field of the induction furnace. The pure oxygen environment and the heat generated by this coupling cause the sample to combust. During combustion, carbon-bearing elements are reduced, releasing the carbon, which immediately binds with the oxygen to form carbon monoxide ("CO") and CO_2, the majority being CO_2. Carbon is measured as CO_2 in the IR cell as gases flow through the IR cells. CO_2 absorbs IR energy at a precise wavelength within the IR spectrum. Energy from the IR source is absorbed as the gas passes through the cell, preventing it from reaching the IR detector. All other IR energy is prevented from reaching the IR detector by a narrow band pass filter. Because of the filter, the absorption of IR energy can be attributed only to CO_2. The concentration of CO_2 is detected as a reduction in the level of energy at the detector.
- The C analytical procedure included the addition of accelerator material to be added to a 0.2 g sample. During combustion, carbon-bearing elements are reduced, releasing the carbon, which immediately binds with the oxygen to form CO and CO_2, the majority being CO_2. Also, sulphur-bearing elements are reduced, releasing sulphur, which binds with oxygen to form sulphur dioxide ("SO_2"). Sulphur is measured as sulphur dioxide in the first IR cell. A small amount of CO is converted to CO_2 in the catalytic heater assembly; SO_2 is converted to SO_3, while sulphur trioxide ("SO_3") is removed from the system in the cellulose filter. Carbon is measured as CO_2 in the IR cell as gases flow through the IR cells. The concentration of CO_2 is detected as a reduction in the level of energy at the detector. An Eltra CS-2000 is used for the analysis.

11.1.4 Previous QA/QC Procedures

QA/QC procedures in the 1980's were not available for review and comment. They were certainly different than those currently used; however, it has been documented that extensive testing was done on site and numerous check samples were assayed by industry-known laboratories. Assay results were reviewed and used for ore reserve estimations by a number of reputable engineering firms including Kilborn, Cominco, KHD, Bacon Donaldson and Pincock Allen & Holt. In 2007, Geostat Systems International Inc. ("Geostat") did not carry an extensive QA/QC program during their independent drilling campaign; however, Actlab internal quality control was considered adequate and satisfactory.

11.2 Sample Preparation and Analyses

For the 2010 exploration drilling program, core sample preparation and analyses were performed by SGS Minerals Services, Toronto Laboratory in Don Mills, Ontario, and the results are certified by laboratory manager for SGS in Vancouver, B.C. SGS Minerals Services Geochemistry (Toronto) is accredited by Standards Council of Canada ("SCC") and conforms to the requirements of ISO/IEC 17025 for specific tests as indicated on the scope of accreditation which can be found at http://www.scc.ca/en/search/palcan/sgs

Following discussions between Northern Graphite Corporation ("Northern Graphite") and Lakefield during the preparation of the master composite for metallurgy testing, it was decided to reanalyze the Head Samples material at Don Mills to establish if there were any significant biases in the determination of Cg between Lakefield and Don Mills given the slightly different methods adopted. The repeat analyses indicated that no significant bias existed, and that the Don Mills methods could be reliably used for the exploration samples. There was also some advantage to using the Don Mills methods as total S could be determined by LECO at the same time as C since more sulphur ("S") data was required for the environmental assessment.

SGS's slightly different approach does not measure graphitic carbon directly with the instruments but Cg results are indirectly calculated by subtracting the carbon in the carbonates from the C. This implies determining C by LECO and total CO_2 by coulometry for each sample. This approach assumed that the only other form of carbon in the samples, other than graphitic carbon, is contained within the carbonates and that no organic carbon is present.

The calculation for graphitic carbon is obtained by:

1.) Dividing the molecular weight of carbon (12.0107) by the molecular weight of CO_2 (44.0095) to calculate the ratio of C: CO_2 (0.2729115);
2.) Multiplying the C: CO_2 ratio by the reported % CO_2 to calculate the % carbon in CO_2; and,
3.) Subtracting the % carbon in CO_2 from the reported C LECO to calculate the Cg of the sample.

According to SGS, these methods have been fully validated for the range of samples typically analysed. Method validation includes the use of the certified materials, replicates and blanks to calculate accuracy, precision, linearity, range, and limit of detection, limit of quantification, specificity and measurement uncertainty.

11.2.1 Sample Preparation (PRP89)

The samples were dried at 100°C +/- 10°C for 24 hours, if received wet. The next step involves crushing to reduce the sample size to 2 mm 10 mesh (9 mesh Tyler). The sample is then split via a riffle splitter continuously in order to divide the sample into a 250 g sub-sample for analysis and the remainder is stored as a reject. Pulverizing is done using pots made of either hardened chrome steel or mild steel material. Crushed material is transferred into a clean pot and the pot is placed into a vibratory mill. Samples are pulverized to 85% passing 75 micron (200 mesh).

11.2.2 Determination of Total Carbon and Total Sulfur by LECO (CSA01V and CSA06V)

0.2 g crushed and pulverized rocks samples were combined in tared ceramic crucibles with 1 scoop of iron chips, which is an accelerator that facilitates the ignition of small sample size or non-ferrous samples, and 1 scoop of LECOCEL, which also facilitates the ignition of samples for combustion analysis. The sample is weighed, varying with sample size used, into a tared ceramic boat and loaded into the LECO CS-244 Carbon/Sulphur analyser where it combusts in a furnace at 1350^{o}C. The sample is combusted in a purified oxygen stream using a LECO HF-100 induction furnace. Carbon and sulphur are converted to CO_2 and SO_2 respectively and measured by infrared cell and the results printed automatically in % CO and S.

11.2.3 Determination of Carbon Dioxide (CO_2) using a Coulometric CO_2 Coulometry (CSB02V)

The crushed and pulverized samples are weighed in coulometer test tubes. $CaCO_3$ apparatus is used to acidify samples, using dilute perchlorate acid and heat. The evolved CO_2 from the samples is measured by the CO_2 coulometer. The results are documented as % CO_2.

Preparation blanks and reference materials are analysed randomly within the batch, one replicate every 12 samples. All QC samples are verified using LIMS. The acceptance criteria are statistically controlled and control charts are used to monitor accuracy and precision. Data that falls outside the control limits is investigated and repeated as necessary.

11.3 Quality Assurance and Quality Control Procedures

Northern Graphite implemented a QA/QC program in 2010 consisting of inserting A) a field duplicate sample in every hole; B) an analytical standard after every 35 or 40 drill core samples, intermittent with the blank sample; and C) a blank sample after 35 or 40 samples, intermittent with the standard sample. The reference material, not certified, was provided by SGS Laboratory in Lakefield, Ontario. The blank sample consisted of barren granitic gneiss sampled from drill hole BC-10-03 between 0.5 and 3.6 m.

11.3.1 Reference Material

The reference material was originally prepared from a 150 kg non-oxidized bulk sample originally ordered to initiate metallurgical testing. It consisted of broken material from existing stockpile, core from 2004 hydrogeological holes drilled by Knight Piésold Ltd (“KP”) within the pit and one of SGS holes drilled in 2007. The 150 kg of non-oxidized material was crushed to nominal ½” and thoroughly blended. A 40 kg sub-sample was split out, stage-crushed to -10 mesh, and homogenized. Five 100 g head samples were cut using a rotary splitter and each of the five head samples was pulverized. The pulverized samples were screened on a 106 microns (150 mesh) screen to ensure that no large graphite flakes remain that could bias the results. The 106 microns oversize was subjected to repeated pulverization until all material passes through the screen or alternatively, the +106 and -106 microns fractions can be weighted and submitted both of them for chemical analysis. Head grade was then calculated using the weights and assay results of both size fractions. All products were submitted in triplicate for LECO (C and Cg) and double LOI method at SGS. Subsequently, the same 15 pulps were analyzed at SGS Don Mills Laboratory for comparison. In addition to the total and Cg analysis, the carbon in the carbonates was determined using Coulometric CO_2 coulometry allowing $CaCO_3$ estimation. Results and descriptive statistics are presented in Table 11.1 and Table 11.2

Table 11.1: Head Sample Assay Results from Lakefield and Don Mills

	SGS Mineral Services - Don Mills						SGS Mineral Services - Lakefield					
ANALYTE	S	C(t)	CO2(carb)	C(g)	C(g)	C(g)/C(t)	C(t)	C(g)	LOI@500°C	LOI@950°C	LOI/C(g)	C(g)/C(t)
METHOD	CSA10V	CSA10V	CSB02V	CSD05V	CALC.	MEAS.						
DETECTION	0.01	0.01	0.01	0.05								
UNITS	%	%	%	%			%	%	%	%		
1A	0.97	1.39	0.26	1.34	1.32	0.96	1.38	1.32	<0.05	1.97	1.49	0.96
1B	0.94	1.42	0.26	1.33	1.35	0.94	1.42	1.38	<0.05	1.97	1.43	0.97
1C	0.95	1.39	0.25	1.32	1.32	0.95	1.34	1.25	<0.05	1.97	1.58	0.93
2A	0.92	1.42	0.27	1.34	1.35	0.94	1.39	1.30	<0.05	2.00	1.54	0.94
2B	0.94	1.39	0.25	1.33	1.32	0.96	1.39	1.31	<0.05	1.96	1.50	0.94
2C	0.96	1.41	0.26	1.37	1.34	0.97	1.42	1.28	<0.05	1.99	1.55	0.90
3A	0.90	1.42	0.25	1.35	1.35	0.95	1.40	1.29	<0.05	2.00	1.55	0.92
3B	0.92	1.44	0.25	1.37	1.37	0.95	1.40	1.36	<0.05	2.02	1.49	0.97
3C	0.92	1.37	0.25	1.33	1.30	0.97	1.38	1.32	<0.05	1.96	1.48	0.96
4A	0.92	1.37	0.26	1.33	1.30	0.97	1.35	1.37	<0.05	1.95	1.42	1.01
4B	0.90	1.34	0.26	1.30	1.27	0.97	1.37	1.28	<0.05	1.95	1.52	0.93
4C	0.90	1.36	0.25	1.31	1.29	0.96	1.35	1.24	<0.05	1.95	1.57	0.92
5A	0.95	1.38	0.26	1.32	1.31	0.96	1.38	1.26	<0.05	1.95	1.55	0.91
5B	0.92	1.39	0.26	1.36	1.32	0.98	1.37	1.29	<0.05	1.94	1.50	0.94
5C	0.94	1.40	0.26	1.36	1.33	0.97	1.40	1.30	<0.05	1.98	1.52	0.93
DUP-2C			0.27									
DUP-5B				1.32								

Table 11.2: Descriptive Statistics for Head Sample Assayed in Lakefield and Don Mills

		C(t)	CO2(carb)	C(g) meas	C(g) calc		C(t)	C(g) meas	LOI
Mean	DON MILLS	1.39	0.26	1.34	1.32	LAKEFIELD	1.38	1.30	1.97
Standard Error		0.006864	0.001594	0.005474	0.006864		0.006208	0.010764	0.00597349
Median		1.39	0.26	1.33	1.32		1.38	1.3	1.97
Mode		1.39	0.26	1.33	1.32		1.38	1.32	1.95
Standard Deviation		0.026583	0.006172	0.021202	0.026583		0.024044	0.04169	0.02313521
Sample Variance		0.000707	3.81E-05	0.00045	0.000707		0.000578	0.001738	0.00053524
Kurtosis		-0.21014	-0.40385	-0.76512	-0.21014		-0.54516	-0.38152	-0.2435526
Skewness		-0.14667	0.311574	0.091933	-0.14667		-0.184	0.478968	0.74550719
Range		0.1	0.02	0.07	0.1		0.08	0.14	0.08
Minimum		1.34	0.25	1.3	1.27		1.34	1.24	1.94
Maximum		1.44	0.27	1.37	1.37		1.42	1.38	2.02
Count		15	15	15	15		15	15	15

As there was insufficient material from the original Head Sample material to use as a standard, a new cut of the same material was taken at Northern Graphite's request to be used as reference material for the 2010 drilling campaign. After homogenization this new bulk sample was assayed at Lakefield for Cg (Report CA02677-JUL10) and returned a value of 1.25% Cg which is lower than the original Head Sample material (similar to the observed mean at Don Mills). Unfortunately, this single assay for reference material (Cg = 1.25%; Report CA02677-JUL10) did not provide enough data for statistical calculation to set control limits.

In order to address issues relative to the use of this single assay reference material, a reference material round robin program was put in place. Twenty-nine (29) of the original standards inserted in the 2010 drill sampling sequence were re-assayed at SGS Don Mills Laboratory in order to document the reproducibility of the results. Three batches of 10 sub-samples each were sent to SGS, Activation Laboratories Ltd.,("Actlabs") both in Ontario, and ALS Canada Ltd. in Vancouver for carbon content determination (total, carbonates and graphitic). The sub-samples were drawn from the jar containing the pulverized material used as reference material and stored on site at Bissett Creek. After assessing each lab performance and carrying out statistical analysis to identify outliers, Actlabs results were excluded for the purpose of assigning C and $CaCO_3$ concentration values to the reference material. Results from the re-assaying of the original 29 inserted standards have been retained. A recommended value for C and $CaCO_3$ was calculated from the average of the n = 3 sets of results.

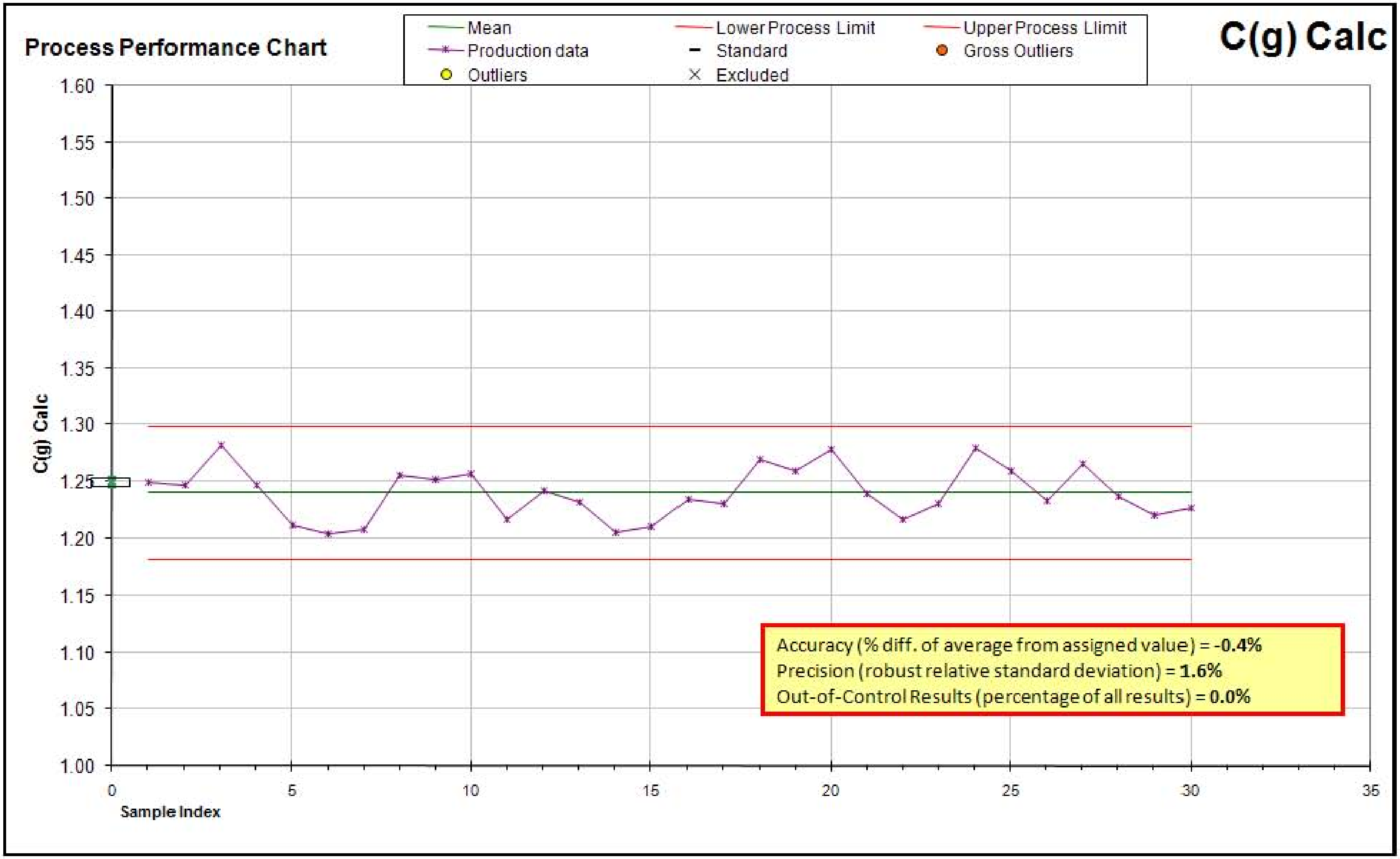
The 95% confidence interval was estimated using the formula $X \mp ts/\sqrt{n}$ where X is the estimated average, s is the estimated standard deviation of the laboratory averages, and t is the 0.025 tail-value from Student's t-distribution with n-1 degrees of freedom. The recommended values and 95% confidence intervals for the Calculated Cg has been set at 1.249 (+/- 0.003) %. The 95% confidence interval for the estimate of the declared value reflects the uncertainty in estimating the true value for the calculated Cg content of the reference material. The interval is chosen such that, if the same procedure as used to estimate the declared value were used again and again, then 95% of the trials would give intervals that contained the true value. It is a reflection of how precise the trial has been in estimating the declared value. It does not reflect the variability any particular laboratory will experience in its own repetitive testing.

There was one single, non-certified and prepared from project material, Reference Material used as analytical standards during the 2010 drill program. The recommended value and its 95% confidence interval were set at 1.249 (+/- 0.003) % for calculated Cg. Analytical standards were inserted within the sampling sequence after every 35 or 40 drill core samples, intermittent with the blank sample. A total of 30 standards were submitted with core samples sent to SGS Don Mills Laboratory.

Table 11.3: Summary of Reference Material

Description	All results	Gross Outliers Excluded
Number of results	30	30
Average	1.2401	1.2401
Process Limit		0.0505
Accuracy: (% Difference of Average from Assigned Value)	-0.0074	-0.0074
Precision: Relative Standard Deviation (Robust)	0.0157	0.0157
Number of Outlying Results (Outside Process Limit)	0	0

Figure 11.1 Bissett Creek Project – Standard Results for 2010 Drill Program



In order to determine the laboratory performance when analysing the reference material, it is suggested to accumulate a history of the test results obtained, and plot them on a control chart. The appropriate centre line and control limits for this chart are based on the average level and variability exhibited in the laboratory's own data. This chart provides a clear picture of the long-term stability or otherwise of the laboratory testing process, providing good clues as to the causes of any problems.

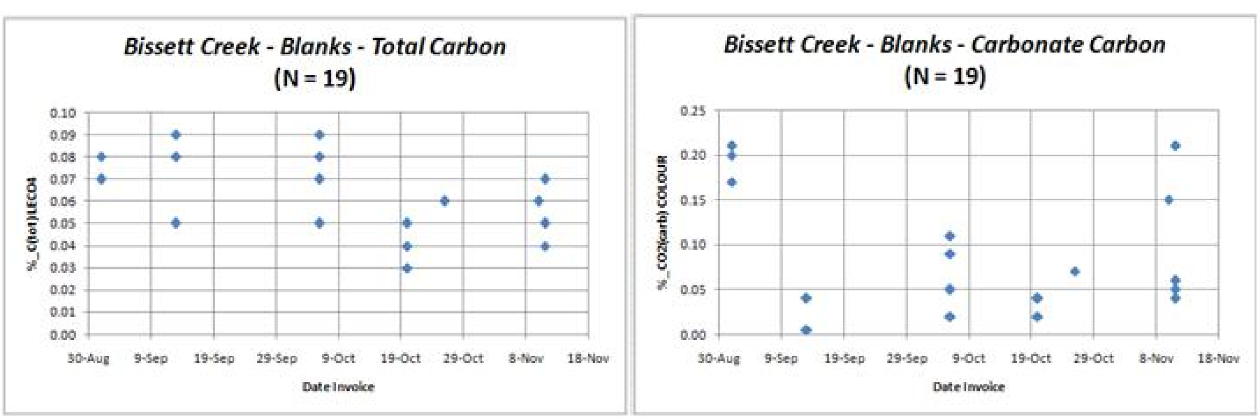
The results are presented in Figure 11.2: Assays for Blanks for C Figure 11.1 and Table 11.3. All 30 samples fall between process limits that show an acceptable variability and there are no outliers. Accuracy, overall precision and percentage of out-of-control results are all good.

11.3.2 Laboratory Performance for Blank Samples

Barren coarse material ("a blank") is submitted with samples for crushing and pulverizing to determine if there has been contamination or sample cross-contamination in preparation. Elevated values for blanks may also indicate sources of contamination in the analytical procedure. Blank material was assembled from drill core samples between 0.5 and 3.6 m in drill hole BC-10-03 and consisted of barren tonalitic-granitic gneiss. This material, even though was assayed for major and minor elements at the Ontario Geological Survey Laboratory in Sudbury (On), was never assayed previously for its carbon content.

Blanks are inserted in the sample series after every 35 or 40 samples, intermittent with the standard sample. During the 2010 drill program, a total of 19 blanks were submitted with the samples for C and $CaCO_3$ analysis extending over a period of approximately 2 months and a half. Forty-two percent of the blanks assayed for C had values less than 0.05%, which is five times the detection limit of 0.01% (Figure 11.2). The remaining 58% of the blanks reported assays between 0.05% and 0.10%. Precision of the estimate of 0.062% C is ± 12% with a margin of error at 95% confidence of ± 0.007. This may indicate that the blank material may have contained some carbon (organic since it is close to surface).

Figure 11.2: Assays for Blanks for C and Carbonate Carbon



Fifty-three percent of the blanks assayed for $CaCO_3$ had values less than 0.05%, which is five times the detection limit of 0.01% (Figure 11.2). Sixteen percent of the blanks assayed between 0.05% and 0.10% and the remaining 32% reported assays above 0.1%. Precision of the estimate of 0.083% C (carb) is ± 35% with a margin of error at 95% confidence of ± 0.029. Values at the beginning of the program and at the end might be considered suspect but also might reflect the composition of the blank itself.

Overall, there is no evidence of systematic carbon contamination based on the blanks that were inserted.

11.3.3 Core Duplicates

Drill Core duplicate samples were generally taken in every hole within well mineralized sections by splitting the remaining ½ drill core sample into a ¼ core drill sample. A total of 30 quarter drill core duplicates were submitted to the laboratory during the 2010 drill program.

There were 30 core duplicate C assays and all pairs reported assays greater than 0.05% (five times detection limit). The reproducibility of 93% of these 30 assay pairs was within ±20% (Figure 11.3 and Table 11.4). Sign test shows differences to be significant since C values from duplicate samples are above original samples in a proportion of 30%, well outside the interval of acceptable proportions around 50% established between 31.74% and 68.26% at the 95% confidence level. On the other hand, the paired t-Test analysis concluded that the difference of means of C values between the original and the duplicate samples is not statistically significant at the 95% level. Part of this difference could be explained from the inhomogeneous distribution of graphite flakes in the gneissic rock. Precision, calculated as the mean of the absolute difference between pair over pair average, is 6.2%.

Figure 11.3: X-Y Plot and Mean vs. % Relative Difference plot for C

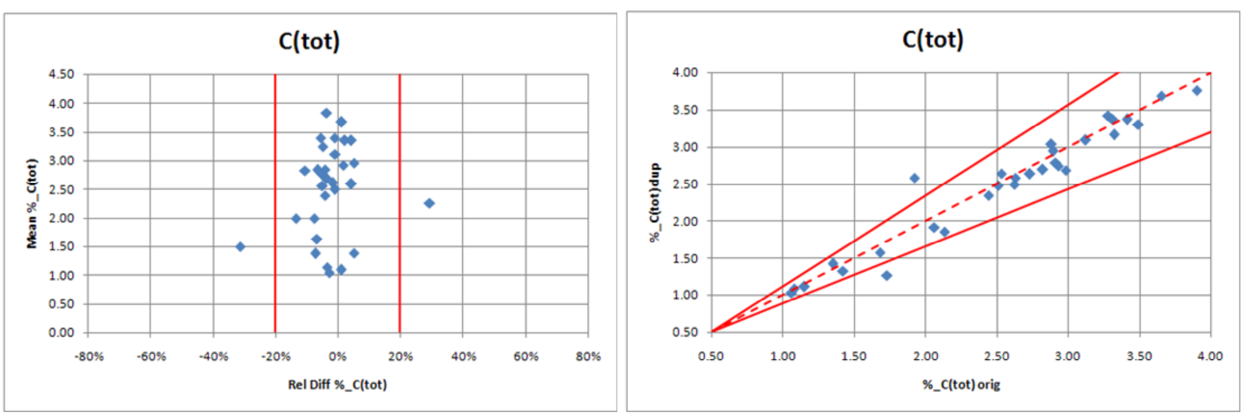


Table 11.4: Percentage of Core Duplicate Pairs Reporting within Specific Ranges for $CaCO_3$ Assays

Criteria	N	N = Falling Within					
All Samples	30	±5%	±10%	±20%	25%	±50%	> ±50%
		18	27	28	28	30	0
		60%	90%	93%	93%	100%	0%
> 5 x d.l.	30	18	26	28	28	30	0
		60%	87%	93%	93%	100%	0%

There were 30 core duplicate $CaCO_3$ assays and 19 pairs reported assays greater than 0.05% (five times detection limit). The reproducibility of 50% of these 19 assay pairs was within ±20% and only 63% of the assay pairs were within ±50% (Figure 11.4 and Table 11.5). Sign test shows differences to be not significant for $CaCO_3$ and the paired t-Test analysis concluded that the difference of means of $CaCO_3$ values between the original and the duplicate samples is not statistically significant at the 95% level. Precision, calculated as the mean of the absolute difference between pair over pair average, is 15.3%.

Figure 11.4: X-Y Plot and Mean vs. % Relative Difference Plot for $CaCO_3$

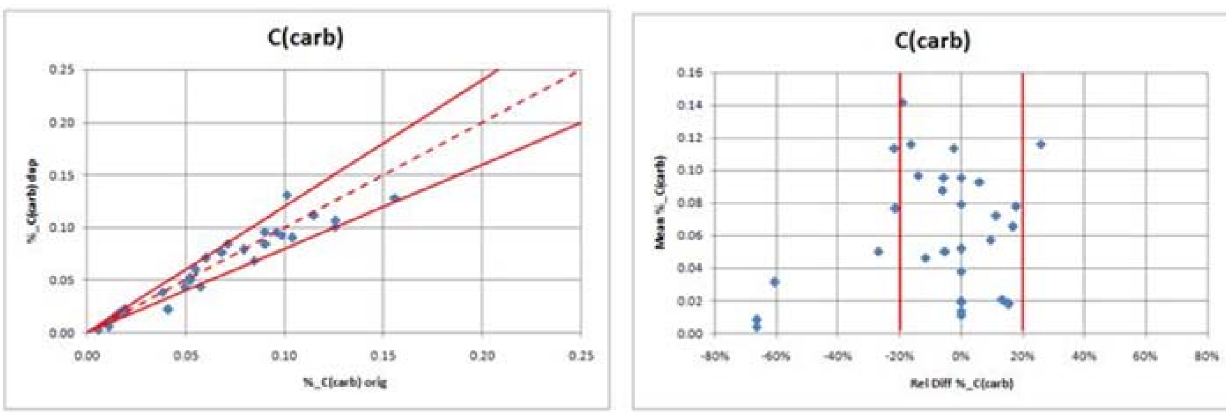


Table 11.5: Percentage of Core Duplicate Pairs Reporting within Specific Ranges for $CaCO_3$ Assays

Criteria	N	N = Falling Within					
All Samples	30	±5%	±10%	±20%	±25%	±50%	> ±50%
		9	14	23	25	27	3
		30%	47%	77%	83%	90%	10%
> 5 x d.l.	19	4	9	15	17	19	0
		13%	30%	50%	57%	63%	0%

11.3.4 <u>Lab Reject Duplicates</u>

Lab reject duplicates were not assessed.

11.3.5 <u>Lab Pulp Duplicates</u>

SGS routinely assays a second aliquot of the sample pulp. The data are used by the laboratory for their internal quality control monitoring and are automatically reported to clients. The assays for pulp duplicates provide an estimate of the reproducibility related to the uncertainties inherent to the analytical method and the homogeneity of the pulps. The precision or relative percent difference calculated for the pulp duplicates indicates whether pulverizing specifications should be changed and/or whether alternative methods should be considered.

There were 37 laboratory duplicate $CaCO_3$ assays and 25 pairs reported assays greater than 0.05 % (five times detection limit). The reproducibility of 100% of these 25 assay pairs was within ±20% (Figure 11.5 and Table 11.6). Sign test shows differences to be not significant for $CaCO_3$ and the paired t-Test analysis concluded that the difference of means of $CaCO_3$ values between the original and the duplicate samples is not statistically significant at the 95% level. Precision, calculated as the mean of the absolute difference between pair over pair average, is 6.9%.

Figure 11.5: X-Y Plot and Mean vs. % Relative Difference Plot for $CaCO_3$

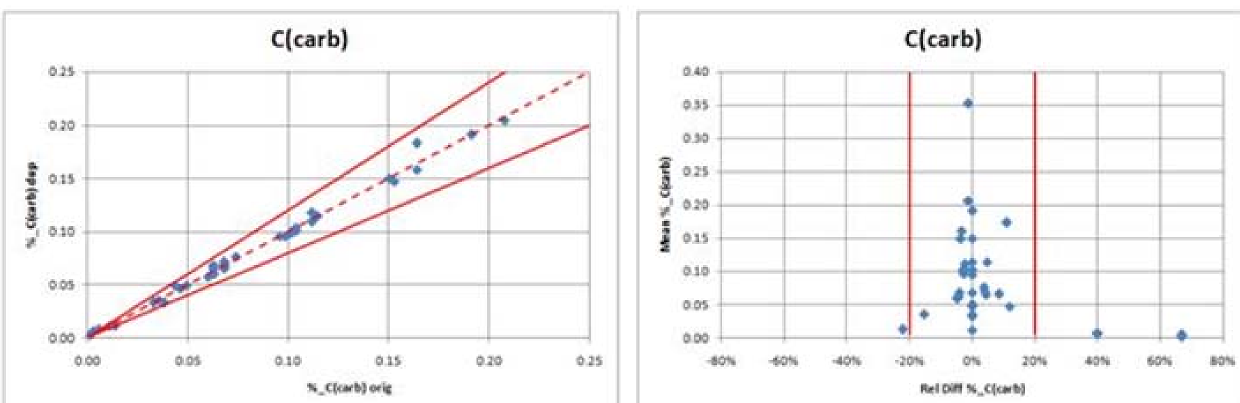


Table 11.6: Percentage of Laboratory Pulp Duplicate Pairs Reporting within Specific Ranges for Carbonate Assays

Criteria	N	N = Falling Within					
All Samples	37	±5%	±10%	±20%	±25%	±50%	> ±50%
		28	29	32	33	35	2
> 5 x d.l.	25	76%	78%	86%	89%	95%	5%
		23	24	25	25	25	0
		92%	96%	100%	100%	100%	0%

11.3.6 Conclusions and Recommendations

Because there were no set control limits established for the reference material and there was no carbon values assayed for the blank, there was no real control of the performance of SGS Don Mills Laboratory during the 2010 drill program by Northern Graphite. Once these control limits were established, some conclusions could then be drawn.

Nineteen (19) blanks were submitted with the samples for C and $CaCO_3$ analysis. It is difficult to conclude if there was any systematic carbon contamination or not based on the blanks inserted with samples. The fact that 58% of the blanks reported assays between 5 and 10 times the detection limit might only reflect the presence of carbon of different forms in the blanks.

Analytical standards were inserted within the sampling sequence after every 35 or 40 drill core samples, intermittent with the blank sample. A total of 30 standards were submitted with core samples sent to SGS Don Mills Laboratory. All 30 samples fall between process limits that show an acceptable variability and there are no outliers. Accuracy, overall precision and percentage of out-of-control results are all good.

Drill core duplicates were inserted 30 times. Ninety-three percent of the drill core duplicates reproduce within ±20%. A bias has been noticed between the original and duplicate halves of the drill core, average Cg being lower in the duplicates. On the other hand, difference of means of C values between the original and the duplicate samples is not statistically significant.

One hundred percent of the pulp laboratory duplicates reproduced within ±20%, which is expected as the finer grain sizes provide more reproducible sub-samples.

The QA/QC review of the Bissett Creek Flake Graphite has illustrated many of the issues when assaying for graphitic carbon. In order to address some of those, SGS Geostat recommends that:

- Preparation of new pulp standards from project materials should be undertaken under the supervision of an experienced professional. It involves the selection of sample material from either drill core or outcrop to provide the project with standards to assess the accuracy of high grade, average grade and cut-off grade assays. Once the pulp standards are prepared they should be submitted to at least 6 (more if possible) different laboratories in batches of 8 to 10 samples of each standard and results are compiled to determine mean values (range of "acceptable" values). Control standards developed for a specific project must be strictly monitored with respect to a reasonable shelf life and/or the effects of oxidation or degradation over time. A total of 2 to 3 control standards are recommended; one for cut-off grade, one for average grade and one for high grade.

- Results for control standards, blanks and replicates should be monitored as received. Assay batch data should not be transferred to a database until the results are verified. If the results for control standards and blanks are not deemed acceptable, immediate corrective action should be taken;
- Due to the observed bias between measured and calculated graphite carbon and also because the low percentage of reproducibility for $CaCO_3$, it is recommended that graphite carbon be assayed directly. Whether samples should be digested with acid or not prior to assaying should be discussed with the assigned laboratory chemist; and,
- It is highly recommended to get a better understanding of all different steps of the analyses process from preparation to assaying through laboratory site visit and discussions with lab chemists.

12. DATA VERIFICATION

12.1 Twin Hole Validation Results

In order to validate historical drill results, SGS Geostat recommended to twin five holes where high grade zones had been intersected in historical drill holes. Historical samples were assayed for Graphite Carbon ("Cg") by LECO with acid digestion. Samples obtained in 2010 were assayed by determining Total Carbon by LECO and Carbonate Carbon ("$CaCO_3$") by measuring Carbon Dioxide ("CO_2") by the CO_2 coulometer. The percentage of Cg in the sample is obtained by subtracting the amount of carbon within the CO_2 from the total carbon.

Holes BC-85-020 and SGS-10-002, drilled on section N25+00, both intersected two mineralized intervals within approximately 4 m between each other. The first mineralized interval intersected by DDH SGS-10-002 returned 1.97% Cg over 21 m, which is 6.63% lower compare to the original mineralized interval of 2.11% Cg over 21.03 m intersected in BC-85-020. Composite lengths are identical. The second mineralized interval intersected by DDH SGS-10-002 returned 3.27% Cg over 22.6 m, which is 9.94% higher compare to the original mineralized interval of 2.98% Cg over 24.37 m intersected in BC-85-020. Composite length is 7.26% smaller in the twin hole.

Holes BC-85-027 and SGS-10-001, drilled on section N25+75, both intersected the mineralized interval within approximately 5.7 m between each other. The mineralized interval intersected by DDH SGS-10-001 returned 2.55% Cg over 30.6 m, which is 25.12% lower compare to the original mineralized interval of 3.41% Cg over 24.96 m intersected in BC-85-027. Composite length is 22.60% greater in the twin hole.

Holes BC-86-006 and SGS-10-005, drilled on section N26+50, both intersected the mineralized interval within approximately 16.5 m between each other. The mineralized interval intersected by DDH SGS-10-005 returned 2.99% Cg over 14.55 m, which is 2.90% lower compare to the original mineralized interval of 3.08% Cg over 18.29 m intersected in BC-86-006. Composite length is 20.44% smaller in the twin hole.

Holes BC-85-070 and SGS-10-004, also drilled on section N26+50, both intersected the mineralized interval within approximately 11.5 m between each other. The mineralized interval intersected by DDH SGS-10-004 returned 3.23% Cg over 24.2 m, which is 2.55% higher compare to the original mineralized interval of 3.12% Cg over 32.61 m intersected in BC-85-070. Composite length is 25.80% smaller in the twin hole.

Holes BC-87-036 and SGS-10-003B, drilled on section N27+00, both intersected the mineralized interval within approximately 4.2 m between each other. The mineralized interval intersected by DDH SGS-10-003B returned 2.54% Cg over 22.2 m, which is 9.23% higher compare to the original mineralized interval of 2.32% Cg over 21.18 m intersected in BC-87-036. Composite length is 4.80% greater in the twin hole.

Table 12.1: Comparative Results from the Twin Hole Drill Program at Bissett Creek

DDH	Section	%_C(g) LECO	From(m)	To(m)	Length(m)	Summary	Relative % Diff. C(g)	Relative % Diff. Length
BC-85-020	N25+00	2.11	17.07	38.10	21.03	2.11 % C(g) over 21.03m	-6.63%	-0.12%
		2.98	51.82	76.20	24.37	2.98 % C(g) over 24.37m		
SGS-10-002		1.97	17.00	38.00	21.00	1.97 % C(g) over 21m	9.94%	-7.26%
		3.27	56.00	78.60	22.60	3.27 % C(g) over 22.6m		
BC-85-027	N25+75	3.41	15.54	40.53	24.96	3.41 % C(g) over 24.96m	-25.12%	22.60%
SGS-10-001		2.55	5.40	36.00	30.60	2.55 % C(g) over 30.6m		
BC-86-006	N26+50	3.08	23.47	41.76	18.29	3.08 % C(g) over 18.29m	-2.90%	-20.44%
SGS-10-005		2.99	27.45	42.00	14.55	2.99 % C(g) over 14.55m		
BC-85-070	N26+50	3.12	15.85	48.46	32.61	3.12 % C(g) over 32.61m	3.55%	-25.80%
SGS-10-004		3.23	17.60	41.80	24.20	3.23 % C(g) over 24.2m		
BC-87-036	N27+00	2.32	19.96	41.15	21.18	2.32 % C(g) over 21.18m	9.23%	4.80%
SGS-10-003B		2.54	12.00	34.20	22.20	2.54 % C(g) over 22.2m		

Numerous factors may explain differences in grade and thickness between twin and historical holes. Distance between paired holes might be greater than assumed due to the historical hole collar location imprecision. This might lead to greater grade and thickness variability between the holes. Differences in analytical methods can significantly account for the grade variability. SGS-10-001 and BC-85-027 paired hole shows the greatest grade difference. It is mainly accounted by the much lower grade in the upper portion of the historical hole. Other than this, grade variation is within 10% and shows no systematic analytical bias, as twin holes show as much high composite grade than historical holes do.

Paired t-Test has been used to compare means for grade and thickness of the 5 pairs of hole. Twin hole results have an average Cg assay 3.2% lower than the historical holes but this result is not statistically significant at the 95% level. Twin hole results have an average composite length 5.1% lower than the historical holes but this result is not statistically significant at the 95% level.

Results of the twin drill hole program show a fair to good correlation between 2010 drill holes and historical drill holes (Table 12.1). The primary objective of the program was to test for grade and thickness of the proposed mined area. The twin holes validated both. Variability might be accounted by analytical method differences and true distances between paired holes. Thus, SGS Geostat considers historical drill data to be of acceptable quality to be included in the final Project database.

12.2 Check Assay Results

SGS Geostat completed independent analytical checks of drill core duplicate samples taken from selected Northern Graphite 2010 drill holes. A total of 33 core duplicates (1/4" core) have been collected from holes SGS-10-B2-002 and BC-10-021 by François Thibert, independent Qualified Person, and submitted for Carbon ("C"), Cg, $CaCO_2$ and Silicon Carbon ("Si-C") at SGS Minerals Laboratory in Toronto, Ontario.

Check samples were analysed with the same analytical procedures used during the 2010 exploration drill program by determining C by LECO and $CaCO_3$ by measuring CO_2 by the CO_2 coulometer. The percentage of Cg in the sample is obtained by subtracting the amount of carbon within the CO_2 from the C.

The statistical analysis (Table 12.2 and Table 12.3) shows that the mean C for the duplicate samples is 3.75% higher than for the original samples with 55% of the duplicate sample values greater than the original sample values. Paired t-Test analysis shows that this result is not statistically significant at the 95% level. The relative percent difference between duplicate and original samples is on average between 12-15%, which could reflect the difficulty to give an accurate grade estimate of a >2 kg core sample from a 0.2 g pulp sub-sample.

The mean $CaCO_2$ for the duplicate samples is 2.70% lower than for the original samples with 58% of the duplicate sample values greater that the original sample values. Paired t-Test analysis shows that this result is not statistically significant at the 95% level. The relative percent difference between the duplicate and the original samples is on average 25%, which, again, reflects the difficulty to give an accurate grade estimate of a 2 kg core sample from a 0.1 g pulp sub-sample. This should have minimal impact on the calculated Cg value considering that the average amount of C in the carbonates is low (0.07%).

Table 12.2: Descriptive Statistics for 33 Original Samples and Core Duplicates

	ORIGINAL ASSAY			CHECK ASSAY					
	Ctot	*CO2*	*Cg calc*	*Ctot*	*CO2*	*SiC*	*Cg meas*	*Cg calc (1)*	*Cg calc (2)*
Mean	1.594	0.265	1.521	1.653	0.258	0.031	1.576	1.574	1.583
Standard Error	0.178	0.056	0.181	0.199	0.043	0.006	0.201	0.202	0.202
Median	1.59	0.16	1.50	1.69	0.17	0.005	1.58	1.593	1.594
Mode	1.59	0.08	#N/A	1.95	0.07	0.005	1.58	#N/A	#N/A
Standard Deviation	1.0202	0.3190	1.0372	1.1442	0.2493	0.0359	1.1573	1.1582	1.1586
Sample Variance	1.0408	0.1018	1.0759	1.3092	0.0621	0.0013	1.3394	1.3414	1.3424
Kurtosis	-1.0055	12.6073	-1.0189	-0.9739	2.5498	-0.3384	-1.0151	-0.9739	-0.9710
Skewness	0.1643	3.1473	0.2272	0.2252	1.6556	1.1110	0.2583	0.2875	0.2860
Range	3.40	1.68	3.41	3.88	0.965	0.095	3.865	3.887	3.886
Minimum	0.04	0.02	0.01	0.04	0.005	0.005	0.005	0.004	0.007
Maximum	3.44	1.70	3.43	3.92	0.97	0.1	3.87	3.891	3.893
Sum	52.59	8.74	50.20	54.56	8.505	1.01	52.02	51.935	52.238
Count	33	33	33	33	33	33	33	33	33

Figure 12.1: Correlation Plot for Independent Check Samples

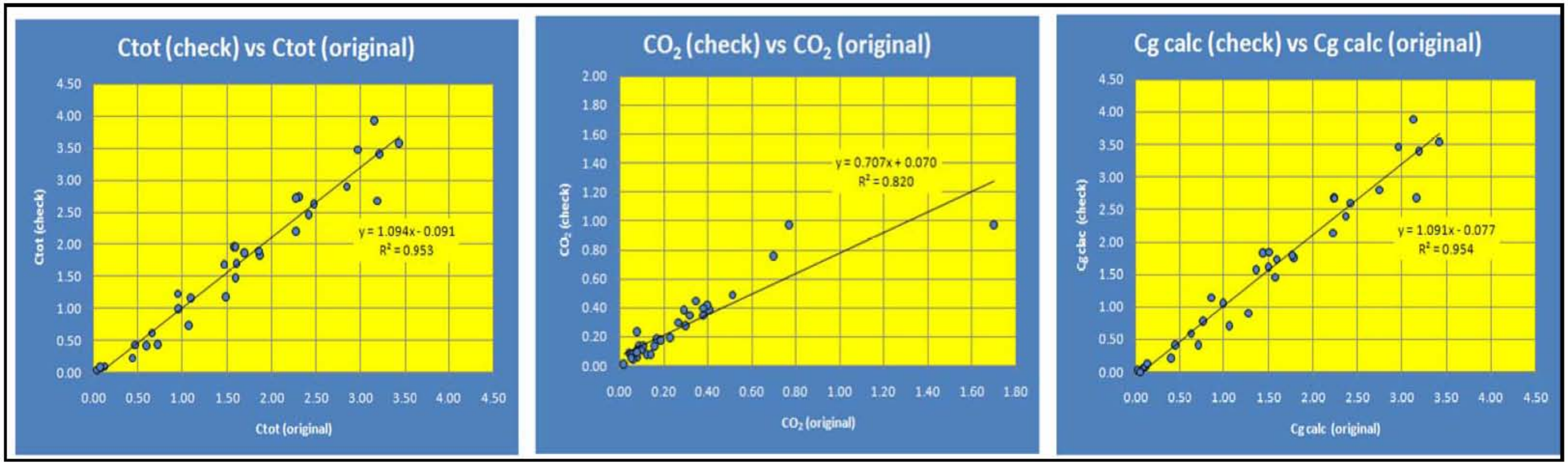


Table 12.3: Statistical Analysis for Ctot and Carbonate CO_2

Statistical Analysis: Ctot

Criteria	Count	Original >= Duplicate	Original < Duplicate
All samples	33	15	18
		45%	55%
Ctot >= 0.6%	27	9	18
		33%	67%
0.6% =< Ctot < 3%	23	8	15
		35%	65%
3% =< Ctot < 20%	4	1	3
		25%	75%

		Samples within % Relative Difference	
		±10%	±25%
All samples	33	16	28
		48%	85%
Ctot >= 0.6%	27	14	23
		52%	85%
0.6% =< Ctot < 3%	23	12	19
		52%	83%
3% =< Ctot < 20%	4	2	4
		50%	100%

Statistical Analysis: CO2

Criteria	Count	Original >= Duplicate	Original < Duplicate
All samples	33	14	19
		42%	58%
CO2 >= 0.2%	14	6	8
		43%	57%
0.2% =< CO2 < 0.6%	11	5	6
		45%	55%
0.6% =< Ctot < 20%	3	1	2
		33%	67%

		Samples within % Relative Difference	
		±10%	±25%
All samples	33	10	22
		30%	67%
CO2 >= 0.2%	14	7	12
		50%	86%
0.2% =< CO2 < 0.6%	11	6	10
		26%	43%
0.6% =< Ctot < 20%	3	1	2
		33%	67%

Results of the independent check sampling program show fairly good reproducibility of the data (Figure 12.1) and therefore, SGS Geostat considers those acceptable. The lack of precision for both C and $CaCO_2$ could reflect the flaky nature of this type of mineralization, similar to the gold nugget effect. Sampling 3 m core interval plays certainly a role in reducing this effect but the very small size of the analytical fraction is such that it may not be representative of the whole core sample. Because it has a direct consequence on the precision of the calculated Cg (mean relative percent difference of 21%, or 16% if sample 13633 is excluded), it is recommended to analyze at least two pulp sub-samples from the same pulverized split and average the two values. This could certainly give a better estimate of the grade.

As part of this check assay program, duplicate core samples were analyzed for Silicon Carbon to determine if other form of carbon could be present in the rock. There is on average 0.03% Si-C in the check samples, representing on average 0.009% of C in the Si-C. When comparing the measured Cg with the calculated Cg (with or without considering the Si-C), it was noted that

- The mean of the calculated Cg with the Si-C (Cg(1) = 1.574%) is identical to the mean of the measured Cg (Cg meas = 1.576%);
- The mean of the calculated Cg without the Si-C (Cg(2) = 1.583%) is 0.4% higher compared to the mean of the measured Cg (Cg meas = 1.576%). Sign test shows differences to be significant at the 95% confidence level but the paired T test analysis shows the differences to be not significant. This can be interpreted by the very small quantity of C in the form of Si-C (0.009% on average); and,
- Si-C could be artificial and not part of the ore, likely formed during communition (CANMET, personal communication). That could in part explain the difference often observed between the indirectly obtained calculated Cg and the measured Cg.

12.3 Digital Drill Hole Database

None of the original data computerized in the late 80's could be retrieved from Northern Graphite. Numerous unsuccessful attempts were made to contact various past stakeholders. Consequently, drill hole collar data including location, azimuth, length, and deviation, lithological descriptions and assay results have been compiled and mostly manually re-entered by François Thibert, independent Qualified Person, to build the Bissett Creek Project digital drill hole database. All imperial unit data were converted to the metric system.

As previously stated, none of the 1980's drill casings could be found in the field for resurveying and there are no digital records of the information. All 1980's drill hole collars were surveyed in 1988 by triangulation using total station by R. M. Blais & Associates Ltd. for CEC Engineering Ltd. Collar coordinates were reported on maps in a local mine grid system in imperial units and converted to a metric system in UTM NAD27 zone 17 projection system. The conversion (i.e. translation and rotation) from the local mine grid system to the UTM NAD27 system is unknown. Diamond drill collars have thus been positioned through georeferencing of historical scanned maps using the UTM NAD27 zone 17 grid as control points. Coordinates were first calculated in UTM NAD27 then converted to UTM NAD83. Relative position of diamond drill collar were validated using the original survey maps in local mine grid system (R. M. Blais & Associates, 1988) and drill sections (CEC Engineering, 1989). Most of the historical holes elevation values were adjusted relative to the 2010 Lidar survey. It is SGS Canada's opinion that the converted drill collar locations are within a 3 to 5 m radius of the original collars. Hole lengths, collar azimuth and dip were taken directly from the drill log hard copies. 2007 and 2010 collar data were supplied by Northern Graphite in a digital format and most of the collar location were field checked with a hand held GPS by the author during the site visit.

The lithology table was compiled from the drill log hard copies included in the various project reports. Only the major units were entered and the geology codes originally used were retained.

The assay table (Table 12.4) comprises assays from all diamond drill holes drilled on the property to date but excludes all sample assays from percussion and geotechnical holes as well as trenching and bulk sampling done in the 80's. The database consists of 3,090 samples that represent 8,306 m of core sampled from the 10,946 m of core drilled.

There are 2,815 samples for which there is a Cg LECO analysis that represents 91% of the dataset. Most of the missing LECO data comes from the 1987 holes for which logs are missing. Since there is an almost complete LECO dataset for the deposit, it is recommended to avoid using a predictive equation based on linear regression analysis to factor the missing data and just simply ignore those holes. Average sample length is 2.7 m.

Table 12.4: Assay Database Compilation

	1984	1985	1986	1987	2007	2010	TOTAL
# of records	39	1,065	90	817	162	917	3,090
Double LOI	39	1,024	90	817	0	0	1,970
C(g) LECO resources 2011	39	1,028	90	579	162	917	2,815
Double LOI & C(g) LECO	39	987	90	579	0	0	1,695
Length (m)	87	3,314	262	2,057	246	2,339	8,306

The histogram of the log transformed data (Figure 12.2) shows that the dataset consists of three different populations, one reflecting the barren gneiss, the other two reflecting the graphitic horizon and consisting of lower and higher grade sub-units. This is consistent with dataset taken individually and should not be an artifact of the different assay procedures used throughout the history of the project.

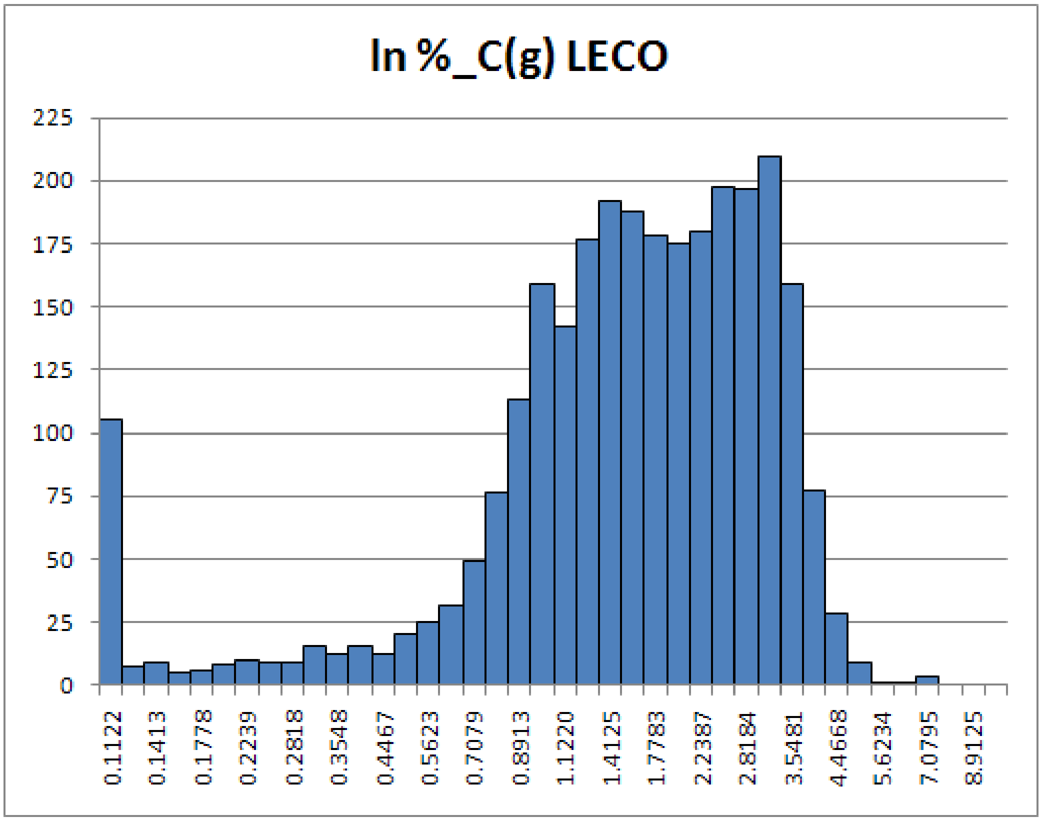
Assay data from the 1980's drilling was compiled from:

- "Preliminary Report on Geology, Diamond Drilling and Trenching on Bissett Creek Graphite Property" by Schmidt (January 1985) comprising % graphite data obtained by flotation and estimates of purity by LOI measurements done on final concentrates;
- "Summary Progress Report on the Bissett Creek Project for the 1985 Calendar Year" by William Hill Mining Consultants Limited (February 1986). It comprises % graphite data obtained by flotation, estimates of purity by LOI measurements done on final concentrates, and % Cg by LECO on samples that have been leached with nitric acid to remove carbonates;
- Photocopies of hand written spreadsheets comprising of Cg by double LOI and Cg by LECO with some reassay samples; and,
- Set of sections by North Coast Industries ("North Coast") from 1991 showing sample intervals with LECO data.

Most of those samples were assayed with on-site lab facilities and none of these results could be verified with laboratory assay certificates. QA/QC program reports, if any, were not available.

It was realized that from the 871 samples assayed in 1985, 310 (36%) samples had LECO values different in the hand written photocopies and 561 (64%) had identical values. Since it was presumed that the hand written photocopies post-dated the William Hill report, it was concluded that those 310 samples were re-assayed even though none of these assumptions could be verified in the existing available reports. A statistical test was thus performed to evaluate a possible bias between the two dataset. The test was not conclusive and it also showed that the average from the second set (avg. = 1.545) was slightly lower that the first set (avg. = 1.570) when comparing the 310 samples for which LECO data was different. Finally, the second dataset was compared and validated with the set of sections from North Coast (1991) that was presumed to have been generated from the database used for the various historical reported resource calculations. The actual compilation is presumed to reflect the original dataset even though neither the original digital data nor lab assay certificates could be found.

Figure 12.2: Histogram of Log Transformed LECO Original Assays, no Maximum Cut-off



The 2007 assay data have been compiled directly from Actlabs assay certificates and Geostat original log descriptions. The dataset consists of 162 measured Cg LECO results and 30 measured C LECO results. There was no QA/QC program set up for the 2007 drill program and Actlab quality control was considered sufficient.

The 2010 assay data have been compiled directly from SGS Mineral Services assay certificates and Northern Graphite original log descriptions. 917 samples were assayed for sulfur and C by LECO and for CO_2 in the carbonates by coloumetry. Cg results are calculated values as they are obtained by subtracting the amount of carbon in the carbonates from the total carbon. A QA/QC program was initiated for the 2010 drill program and consisted in inserting standard material, blanks and duplicates.

Even though SGS Geostat considered the current database adequate to support a mineral resources estimate, it should be clearly stated at this point that none of the 1980's data could be directly validated. The actual compilation is presumed to reflect the original dataset but none of the original digital data, laboratory assay certificates or QA/QC program reports was available. Drill core, sample rejects or pulps have all been destroyed. None of the drill casings could be found in the field. Historical data represents most of the information on which the resource estimate has been calculated to generate the economic model at the beginning of the project operation.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

The G Mining Services Inc. ("G Mining") team relied on two extensive metallurgical testing programs to develop and assert the processing and recovery schemes for the Bissett Creek deposits.

- Testing programs supervised by Cominco Engineering Services Limited ("CESL"), on behalf of a former owner, in the 1990s; and,
- Recent testing programs (2010-2012) sponsored by Northern Graphite Corporation ("Northern Graphite") at SGS Lakefield, provided in Appendix E of this report.

13.1 Historical Processing and Metallurgical Study

A metallurgical study was carried out in 1990 for North Coast Industries Ltd. ("North Coast"), the project owners at the time. Metallurgical development and the direction of testwork were provided by CESL.

The testwork was conducted at Ortech International (Ortech") and Bacon, Donaldson and Associates Limited. ("BDA") testing laboratories during January-June 1990. Detailed test results and their specific information of the ore samples are documented in a report title *"Metallurgical Testing of Bissett Creek Graphite Final Report"* by BDA in July 1990.

The purpose of the testwork was to confirm and/or improve the metallurgy developed in an earlier study, followed by the demonstration of the flowsheet in a continuous pilot plant operation. Further, the results of the pilot plant tests were used to form the basis of a production scale plant flowsheet development.

Metallurgical targets for the testwork were as follows:

a.) Overall concentrate grade of approximately 92-95% Cg;

b.) Overall graphite recovery to concentrates of 93-95% Cg; and,

c.) A high proportion of flakes in the +48 mesh size fraction, i.e. 50% by weight or greater.

13.1.1 Bench Scale Tests

Initial bench testwork was centered on grinding and flotation characteristics of the ore samples. Other parameters tested included pulp density, reagents and regrind requirements. Later a gravity step introduced for the upgrading of the +48 mesh fraction of flotation concentrates gave improved results.

Test F8 was a bulk bench test using a 24 kg sample and employing all the processing steps of the bench scale flowsheet. In this test, a bench scale flowsheet was finalized using the optimized process conditions, and following the achievement of the targeted results a decision was made to proceed to continuous pilot plant testing of the bulk ore.

Results of Test F8 using the optimized conditions are presented in Table 13.1.

Table 13.1: Bench-Test F8 Metallurgical Balance
(Using best of Regrind Tests

	Weight %	Assay % C(g)	Distr, %
Feed:	3.65	100.00	10.00
Concentrates:			
+ 48 mesh Cleaner Concentrate	2.62	92.53	66.3
-48 mesh + 100# Cleaner Concentrate	0.67	94.70	17.4
-100 mesh Cleaner Concentrate	0.38	92.65	9.6
Total	**3.67**	**92.94**	**93.3**
Tailings:			
Rougher Flotation Tailings	95.10	0.16	4.2
Combined Flotation Tailings	1.23	7.55	2.5
Total	**96.33**	**0.25**	**6.7**

13.1.2 Pilot Plant Tests

The optimized process flowsheet of Test F8 was scaled up and used as the basis for the pilot plant flowsheet which essentially remained intact throughout the pilot study with minor modifications to reagents and the upgrading of -48 mesh circuit products. A significant addition to the pilot circuit configuration was the inclusion of a unit cell within the grinding circuit.

A total of 30 t of ore was processed at a rate of approximately 360 kg/h in a number of pilot runs. Evaluation of results of each run led to circuit configuration improvements before proceeding with the next run.

Pilot Run #5 and #6B are considered to be the most successful tests, both from the operating and metallurgical points of view, and the summary of results are presented in Table 13.2.

Table 13.2: Pilot Plant Runs #5 and #6B Metallurgical Balance

	Pilot Run #5			Pilot Run #6B		
	Wt. %	**%Cg**	**Distr.**	**Wt. %**	**%Cg**	**Distr.**
Belt Feed:	100	3.40	100.00	100.00	3.56	100.00
Bulk Concentrates:						
Unit Cell Concentrate	3.64	69.25	74.9	3.76	71.30	75.4
Rougher Cleaner	1.20	62.50	22.1	1.17	64.14	21.1
Total	**4.84**	**68.10**	**97.0**	**4.93**	**69.60**	**96.5**
Final Concentrates:						
+48 mesh Concentrate	2.43	94.3	67.4	2.46	95.54	65.9
-48 mesh + 100 Concentrate	0.46	94.2	12.7	0.62	87.90	15.4
-100 mesh Concentrate	0.52	81.8	12.4	0.38	90.79	9.6
Total	**3.41**	**92.39**	**92.5**	**0.25**	**3.46**	**90.9**
Tailings:						
Rougher Tailings	95.16	0.11	3.1	95.06	0.13	3.5
-48 mesh Circuit Tailings	1.14	11.53	3.9	1.10	6.70	2.1
-100 mesh Circuit Tailings	0.30	7.00	0.6	0.34	32.83	3.5
Total	**96.60**	**0.27**	**7.6**	**96.50**	**0.33**	**9.1**

Results of Pilot Runs #5 and #6B demonstrated the following:

a.) The process flowsheet chosen, a combination of flotation, screening and gravity separation is a viable metallurgical route for the recovery of flake graphite from the Bissett Creek ore samples;

b.) The ore tested is highly amenable to concentration by conventional processing methods and equipment producing high grade graphite concentrates containing 81-96% Cg with 92-94% recoveries;

c.) 66-67% of graphite flakes in the feed can be concentrated into +48 mesh size fraction; and,

d.) The unit cell proved to be an important unit operation of the pilot flowsheet for the maximization of the recovery of graphite to the +48 mesh product.

13.1.3 Plant Flowsheet Development

Following the successful completion of the pilot plant test program at BDA, a production scale plant process flowsheet was developed for the treatment of the Bissett Creek ore using the process parameters established during the testing. Metallurgical results of Pilot Runs #5 and #6B were used as the basis for the development of the final plant flowsheet and the plant metallurgical balance.

The proposed plant process flowsheet was as follows:

1. The run-of-mine ore will be crushed in two stages and further communition will take place in a rod mill to achieve graphite flake liberation;
2. A flash cell will be included in the grinding circuit. Ground ore will go to rougher and cleaner flotation and the resultant concentrate will join flash cell concentrate for screening at 48 mesh;
3. The +48 mesh product will be gravity upgraded on shaking table producing the final +48 mesh concentrate while the -48 mesh screen undersize will be floated and screened at 100 mesh. Similarly, the +100 mesh concentrate.
4. Gravity tailings will be polished in a single regrind pebble mill, and flotation cleaner tailings recirculated back to the primary rod mill; and,
5. Final concentrate will be dewatered through a centrifuge prior to drying and packaging.

13.1.4 Variability Tests

Bench scale variability testwork was performed on ore samples with varying grades to assess their metallurgical response to the proposed flowsheet. Variability testing was performed on 7 samples provided by North Coast as representative of the Bissett Creek ore with graphitic carbon contents ranging from 1.35% Cg to 3.28% Cg covering a wide grade spectrum of the ore body. Results can be summarized as follows:

- Results of the variability testwork demonstrated that all samples were highly amenable to upgrading utilizing the conventional flotation and gravity techniques as developed in the previous bench-scale and pilot plant testwork;

- The variability tests produced flake graphite concentrates assaying 87-95% Cg with 91-95% recoveries. The distribution to the +48 mesh flake concentrate was, on average, 52.36% of total graphitic carbon content of the feed and it ranged from a low of 47.3% to a high of 65.32%;
- Summary of concentrate grade and recoveries along with their attendant head grades are presented in Table 13.3;

Table 13.3: Summary of the 1990s Variability Tests

Test No.	Head Grade % Cg	Products	Grade % Cg	Recovery %
F11	1.35	+48#	93.34	65.32
		-48 + 100#	90.30	15.45
		-100# Cinr	79.19	12.25
		total:	90.70	93.01
F12	2.47	+48#	89.03	56.84
		-48 + 100#	84.30	20.75
		-100# Cinr	84.15	16.43
		total:	87.07	94.02
F13	2.86	+48#	91.73	52.36
		-48 + 100#	89.10	26.40
		-100# Cinr	88.31	14.86
		total:	90.42	93.62
F14	2.71	+48#	92.16	50.78
		-48 + 100#	93.30	23.40
		-100# Cinr	90.05	19.54
		total:	91.99	93.72
F15	2.4	+48#	94.51	47.30
		-48 + 100#	95.28	32.37
		-100# Cinr	94.23	11.99
		total:	94.74	91.66
F16	3.28	+48#	92.89	48.33
		-48 + 100#	93.30	33.31
		-100# Cinr	91.83	13.34
		total:	92.88	94.98
F17	2.67	+48#	92.28	49.43
		-48 + 100#	94.29	31.18
		-100# Cinr	92.61	14.26
		total:	92.98	94.87

- Overall concentrate recoveries at mid-low nineties do not appear to be sensitive to changing head grades. The difference in recoveries for the whole range of grades tested is probably within the margin of test error and too small to draw any relationships; and,
- However, the distribution of the +48 mesh concentrates fluctuated significantly for the samples tested; the lowest head grade sample achieved the highest distribution at 65.3% while the highest head grade sample produced a +48 mesh concentrate with a 48.3% distribution. There is no satisfactory metallurgical explanation offered for this and further mineralogical examination of the ore samples was recommended at that time.

13.2 Recent Processing and Metallurgical Testing Program

The recent program was developed by SGS Lakefield based on the previous program outcomes. This program was aiming to develop and pilot test a final version of the processing flowsheet descriptions and results of this latest program are presented in the report *"An Investigation into the Recovery of Graphite from a Bulk Sample from Bissett Creek – June 21, 2012"* available in Appendix E.

13.2.1 Comminution Testwork

A series of comminution tests was completed to support the sizing of the crushing and grinding equipment and to quantify media wear. A summary of the results is provided in Table 13.4.

Table 13.4: Summary of Comminution Test Results

Sample Name	Relative Density	JK Parameters		CWI (kWh/t)	BWI (kWh/t)	AI (g)
		A x b	t_a			
Pilot Plant Composite	2.67	109	0.75	9.4	10.3	0.307
2010 Sample	2.71	104	0.99	-	14.1	-

The JK parameters a x b classify the Bissett Creek ore as "soft" when compared to the JK Tech database.

13.2.2 Bench Flotation Tests

A lab program was completed in 2010/2011 on a Master composite originating from the Bissett Creek deposit. This lab program generated a flowsheet and reagent conditions that were deemed suitable to produce a graphite concentrate grading at least 95% C and to maximize overall graphite recovery.

A series of batch flotation tests was completed to validate the flotation conditions prior to lock cycle testing.

Eight locked cycle tests were performed to optimize the processing flowsheet for the Bissett ore and to separate the tailings into a sulphide tailings stream and a low-sulphide tailings stream. Then eight different composites were submitted to locked cycle tests according to the final flowsheets. The composite samples were taken from locations across the ore body to confirm flake consistency.

The metallurgical results are summarized in Table 13.5 and Table 13.6. Assuming that the difference in recoveries for the whole range of grades tested is probably within the margin of test error and too small to draw any relationships, we can conclude that the variability tests do not demonstrate any meaningful correlation between:

- Head grades and concentrate grades;
- Head grades and recoveries; and
- Head grades and +80 mesh (flake) fraction in the concentrate product.

Table 13.5: Summary of Variability LCT Results

Test	Product	Weight %	Assay (%) C(t.g)*	Distribution (%) C (t.g)*
LCT LG-3	Final Concentrate	1.4	**93.5**	**96.8**
	Head (calc) Head direct	100.0	1.38 1.22	100.0
LCT LG-4	Final Concentrate	1.4	**93.7**	**95.2**
	Head (calc) Head (direct)	100.0	1.35 1.45	100.0
LCT MG-2	Final Concentrate	1.6	**96.5**	**97.7**
	Head (calc) Head (direct)	100.0	1.60 1.47	100.0
LCT MG-4	Final Concentrate	1.6	**95.4**	**96.8**
	Head (calc) Head (direct)	100.0	1.58 1.30	100.0
LCT HG-1	Final Concentrate	3.4	**93.7**	**99.1**
	Head (calc) Head (direct)	100.0	3.22 3.18	100.0
LCT HG-2	Final Concentrate	3.7	**95.5**	**96.2**
	Head (calc) Head (direct)	100.0	3.66 3.34	100.0
LCT HG-3	Final Concentrate	2.6	**95.3**	**97.1**
	Head (calc) Head (direct)	100.0	2.56 2.32	100.0
LCT HG-4	Final Concentrate	3.6	**95.9**	**98.3**
	Head (calc) Head (direct)	100.0	3.52 2.61	100.0

*The recoveries are calculated using a mix of total and graphite carbon assays. Since the total carbon analysis is not accurate at the lower grade (<5% C) we use the graphitic carbon results, while the total carbon is used for all other products (mainly concentrates)

Table 13.6: Size Fraction Analysis of Graphite Concentrates from LCTs

Composite	Flake Size Distribution - % retained (mesh)						
	+32	+48	+80	+100	+200	-200	>80
LG Pit #3	19.0	32.8	23.2	5.0	10.4	9.5	75.1
LG Pit #4	22.6	32.6	20.1	4.6	9.5	10.5	75.3
MG Pit #2	23.7	34.1	22.1	3.9	8.7	7.5	79.9
MG Pit #4	25.7	32.8	19.9	3.8	9.3	8.4	78.4
HG Pit #1	11.2	31.9	28.1	7.0	12.8	9.0	71.2
HG Pit #2	14.8	32.8	25.9	5.9	12.0	8.6	73.5
HG Pit #3	20.2	35.1	22.7	5.3	9.3	7.4	78.0
HG Pit #4	15.7	32.0	24.4	6.0	11.7	10.2	72.1
Minimum	11.2	31.9	19.9	3.8	8.7	7.4	71.2
Maximum	25.7	35.1	28.1	7.0	12.8	10.5	79.9
Average	19.1	33.0	23.3	5.2	10.5	8.9	75.4
StdDev	4.9	1.1	2.8	1.1	1.5	1.2	3.1
Rel StdDev	25.8	3.3	12.0	21.4	14.3	13.0	4.1

All composites responded well to the flowsheet and produced Cg recoveries between 95.2% and 99.1%. The corresponding concentrate grades ranged between 93.5% and 96.5% C.

Selected samples from the locked cycle tests were submitted for a basic environmental analysis to determine the most suitable flowsheet option to produce a large percentage of non-acid generating tailings and only a small tailings stream of acid generating material that requires special tailings handling. The combination of a sulphide rougher and cleaner circuit in combination with a magnetic separator that treats the combined rougher and sulphide 1st cleaner tails produced non-acid generating tailings with the lowest mass recovery into the high-sulphur tailings stream.

13.3 Pilot Plant Testing

In order to demonstrate the suitability of the proposed flowsheet on a larger scale and continuous operation, pilot scale testing trials were performed on approximately 110 t of a bulk sample originating from Northern Graphite's Bissett Creek deposit. The purpose of the pilot plant program was the following:

- Demonstration of the proposed flowsheet on a pilot plant scale;
- Production of concentrate and tailings for downstream testing; and,
- Development of engineering data to support the generation of process design criteria and results.

The bulk material sample was received in three 40 t dump trucks, stage-crushed to -5/8”, and homogenized with a front-end loader. A 100 kg sample was extracted for laboratory scale testing and as reference material. A representative sub-sample was submitted for chemical analysis giving the following results:

Table 13.7: Head Grade of the Bissett Creek Pilot Plant Composite

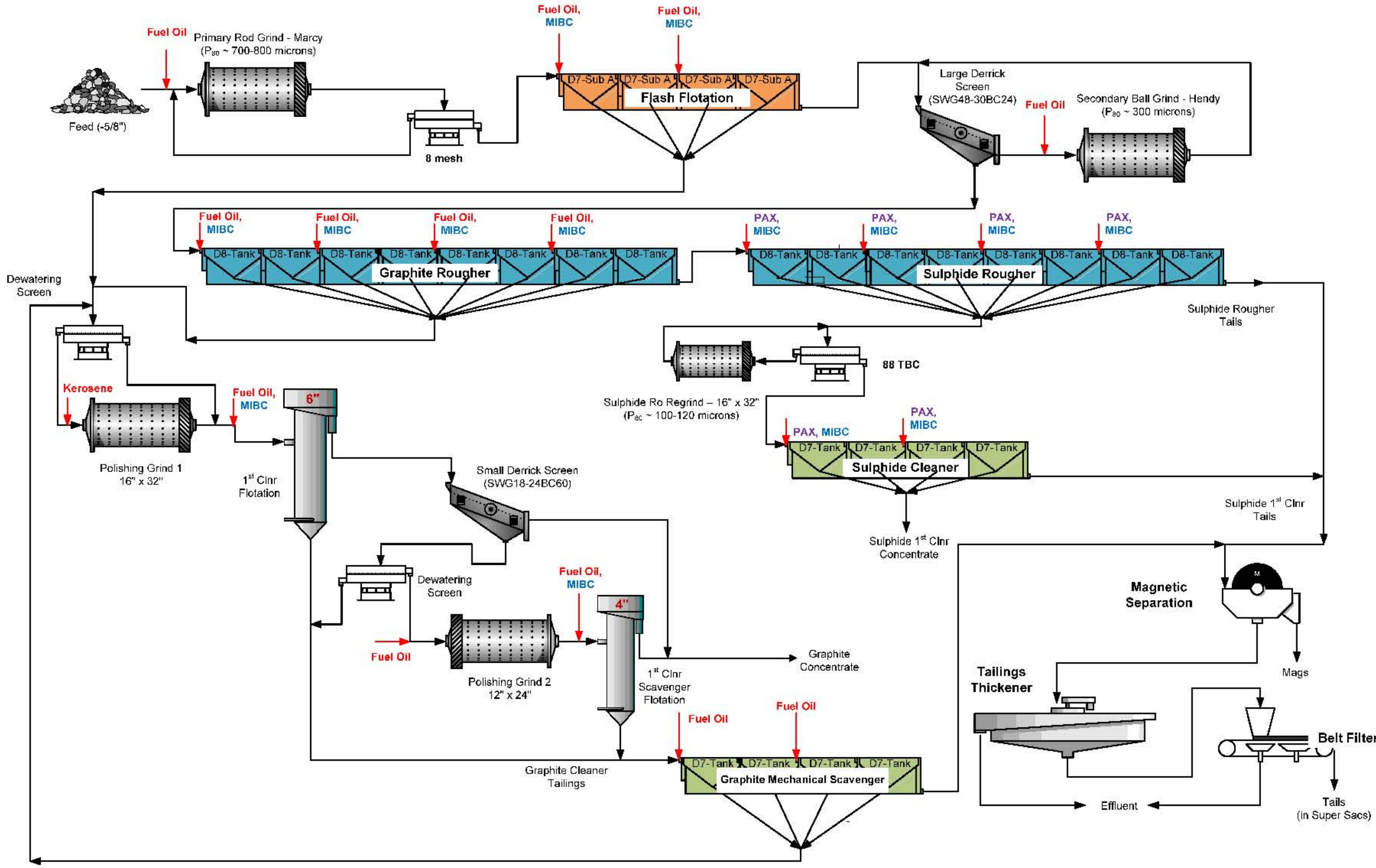
Assays (%)				
C (t)	**C (g)**	**TOC $_{leco}$**	**CO_3**	**S**
2.50	2.40	< 0.05	0.43	1.06

The circuit was configured based on the flowsheet that was developed on a Bissett Creek Master composite The pilot plant flowsheet is presented in Figure 13.1 including all reagent addition points.

The setup of the pilot plant was completed in late October 2011 and the circuit was commissioned during the second week in November. Over the course of the following four weeks, the circuit was operated for 17 shifts until December 8, 2011.

The results were communicated to Don Baxter of Northern Graphite, our engineering company G Mining, and SGS Geostat as they became available. Representatives of the three companies (Ahmed Bouajila, Nicolas Menard and Gilbert Rousseau) as well as Don Baxter were present on site throughout the four weeks of operation.

Figure 13.1: Bissett Creek Pilot Plant Flowsheet



Due to a series of mechanical and metallurgical challenges, the circuit was only optimized at the end of PP-14. An extended run commended on PP-15 and five successful surveys were completed during PP-16 and PP-17, which consisted of multiple cuts of each external and internal stream of the flotation circuit. The direct head assays of each product were then used with data reconciliation software BILMAT™ to generate a circuit mass balance. A summary of the five pilot plant mass balances are presented in Table 13.8. The graphite recoveries into the final concentrate ranged between 90.5% in survey PP-17B and 94.9% in survey PP-16C. The adjusted concentrate grades varied from 93.4% in PP-16C to 95.3% in PP-16A.

Table 13.8: Summary of Pilot Plant Mass Balances

Survey	Product	Wt %	Grade		% Distribution	
			C(t)	S(%)	C	S
PP-16A	Final Graphite Conc	2.3	95.3	0.04	92.1	0.1
	Graphite 1st Clnr Conc Screen O/S	1.3	94.1	0.05	53.2	0.1
	4" Column O/F	1.0	97.0	0.02	39.0	0.0
	Sulphide 1st Clnr Conc	1.9	1.93	28.0	1.5	48.0
	Mags	0.7	0.14	33.0	0.0	22.1
	Non-Mags	95.1	0.16	0.34	6.4	29.9
	Feed	100.0	2.43	1.08	100.0	100.0
PP-16B	Final Graphite Conc	2.4	94.4	0.01	94.5	0.0
	Graphite 1st Clnr Conc Screen O/S	2.2	95.2	0.01	87.9	0.0
	4" Column O/F	0.2	85.1	0.01	6.6	0.0
	Sulphide 1st Clnr Conc	1.8	1.65	23.2	1.3	41.6
	Mags	0.2	0.12	30.2	0.0	4.8
	Non-Mags	95.6	0.11	0.57	4.2	53.5
	Feed	100.0	2.38	1.01	100.0	100.0
PP-16C	Final Graphite Conc	2.4	93.2	0.01	94.9	0.0
	Graphite 1st Clnr Conc Screen O/S	1.4	90.5	0.01	52.8	0.0
	4" Column O/F	1.0	96.8	0.01	42.1	0.0
	Sulphide 1st Clnr Conc	1.8	2.15	23.2	1.6	41.6
	Mags	0.1	0.10	30.2	0.0	4.2
	Non-Mags	95.7	0.08	0.57	3.4	54.1
	Feed	100.0	2.35	1.01	100.0	100.0
PP-17A	Final Graphite Conc	2.3	93.4	0.01	91.6	0.0
	Graphite 1st Clnr Conc Screen O/S	1.5	91.2	0.02	56.6	0.0
	4" Column O/F	0.9	97.1	0.02	35.0	0.0
	Sulphide 1st Clnr Conc	1.9	1.43	27.5	1.1	45.7
	Mags	1.0	0.16	31.4	0.1	27.2
	Non-Mags	94.8	0.18	0.32	7.2	27.1
	Feed	100.0	2.38	1.12	100.0	100.0
PP-17B	Final Graphite Conc	2.6	95.2	0.01	90.5	0.0
	Graphite 1st Clnr Conc Screen O/S	2.3	95.0	0.01	80.2	0.0
	4" Column O/F	0.3	96.7	0.01	10.2	0.0
	Sulphide 1st Clnr Conc	1.6	1.93	34.0	1.1	41.9
	Mags	1.2	0.11	30.5	0.0	27.3
	Non-Mags	94.6	0.24	0.42	8.4	30.7
	Feed	100.0	2.74	1.29	100.0	100.0

Since the revenue for the graphite concentrate is highly dependent on the flake size distribution and the grade of each size fraction, the final concentrate from each survey was subjected to a size fraction analysis. The results of this analysis are presented in Table 13.9 and reveal that almost 50% of the concentrate mass consisted of +48 mesh flakes, which are considered a premium product. The +48 mesh fraction ranged between 43.1% and 58.5% by mass in the locked cycle variability tests compared to 45.7% to 49.8% in the pilot plant

Table 13.9: Size by Size Analysis of Final Graphite Concentrate

Size		PP-16A			PP-16B			PP-16C			PP-17A			PP-17B		
Mesh	μm	Ret. %	Grade % C(t)	Distr. (%)	Ret. %	Grade % C(t)	Distr. (%)	Ret. %	Grade % C(t)	Distr. (%)	Ret. %	Grade % C(t)	Distr. (%)	Ret. %	Grade % C(t)	Distr. (%)
48	300	49.1	97.7	49.8	49.9	95.1	49.8	49.2	92.7	48.7	48.2	94.4	48.0	45.4	95.4	45.7
65	212	19.6	93.6	19.0	19.3	93.5	19.0	20.8	91.8	20.4	20.6	94.3	20.5	20.2	94.2	20.1
80	180	8.0	97.9	8.1	7.6	96.2	7.7	8.0	97.3	8.3	8.4	96.0	8.5	8.7	97.9	9.0
100	150	5.0	97.8	5.1	4.6	97.8	4.8	4.4	97.5	4.6	4.9	96.7	5.0	5.2	96.8	5.3
150	106	7.8	97.6	7.9	7.3	98.5	7.5	6.2	99.3	6.6	7.3	98.0	7.5	8.5	96.6	8.7
Pan	-106	10.5	93.1	10.1	11.3	94.5	11.2	11.4	93.9	11.4	10.7	92.3	10.4	12.0	89.6	11.3
Total			96.4	100.0		95.2	100.0		93.6	100.0		94.8	100.0	100.0	94.9	100.0
P_{80}		379			380			379			378			374		

In conclusion, the Bissett Creek pilot plant campaign demonstrated the suitability of the proposed flowsheet despite concerns that the bulk sample was partly weathered. As a result of this and the lack of operating time to optimize the circuit, the metallurgical performance of the pilot plant was slightly inferior compared to the laboratory program that was completed on a Master composite and eight variability composites.

Based on the pilot plant results, the following parameters were used for mass balance and project economics:

- Recovery: 92.7% to 94.7%
- Concentrate flake distribution and grades:
  +48 mesh: 48.4% at 95.1% C
  +80 mesh: 28.2% at 94.5% C
  +100 mesh: 4.8% at 97.3% C
  -100 mesh: 18.6% at 94.8% C

14. MINERAL RESOURCES

This section summarizes details of the current mineral resources estimate updating the last mineral resource estimated and reported in the Technical Report "*Preliminary Economic Assessment on the Bissett Creek Graphite Property of Industrial Minerals, Inc. & Northern Graphite Corporation*" dated July 16, 2010 and revised February 02, 2011. This report is publically available on SEDAR.

SGS Geostat conducted the current mineral resources estimate to reflect on a) additional analytical data resulting from the 2010 diamond drill program; b) a complete reinvestigation of historical data; c) the acquisition of detailed topographic data; and d) an updated interpretation of the geological model.

Block model for the Bissett Creek flake graphite deposit was constructed using Geostat SectCad modeling software. The dimensions and model limits in UTM NAD83 coordinate system are shown in Table 14.1.

Table 14.1: Dimensions and Model Limits

Block Model Parameters in UTM NAD83 Coordinates				
Direction	**Block**	**Number of Blocks**	**Coordinates**	
Easting	10 m	149	727,000	728,490
Northing	10 m	129	5,111,350	5,112,640
Elevation	6 m	24	170	314

The models were constructed using standard procedures as follows:

- Develop a 2D digital surface model of the overburden from the detailed LIDAR topographic survey and the overburden thickness reported in the core log descriptions;
- Validate the drill hole database and convert the data into Geostat Geobase and SectCad software's format;
- Develop basic statistics to analyze mineral and non-mineral zones;
- Digitize geologic cross sections showing mineralized and non-mineralized zones for developing a 3D rock model;
- Model variograms to establish trends and ranges of sample influence for graphite grade modeling;
- 3D block modeling of graphite grades; and,

- Classify and tabulate the mineral resources into categories of indicated and inferred.

14.1 Data

The current MS-ACCESS format database «NorthernGraphite_BissettCreek_06Jun2011.accdb» contains collar, survey, lithology and analytical results information for 212 surface drill holes, consisting in 50 recent surface drill holes and 162 historical surface drill holes. All but 7 holes were drilled vertically. Drilling covers an area of 1.330 km by 1.970 km from 727,000 m E / 5,111,459 m N to 728,176 m E / 5,113,318 m N in the UTM NAD83 coordinate system. Most of the drilling was done on a grid oriented N068 on a general pattern of 64 m x 46 m spacing. There is some tighter drilling along some lines and some detailed drilling at 23 m x 23 m grid spacing was completed in one area. Recent drilling was completed on a wider 100 m x 100 m grid pattern on the same N068 oriented grid on the periphery of the "NE zone". Drill holes were drilled along strike and inclined mostly vertically, with respect to the moderate relief in terrain, to intercept the mineralization in such a manner as to obtain a reasonably true thickness of the mineralization.

Eight holes to the North (BC-10-041 to BC-10-045; BC-85-008 to BC-85-010) as well as two holes to the South-West (BC-84-001 and BC-84-002) were not used in the current resource model. All percussion drill holes as well as trench or pit assay results were excluded from the resource calculation because their methodology description was not thorough enough.

Bissett Creek database consisted of the following information:

- Drill hole name, northing, easting, collar elevation, azimuth, dip of drill hole from horizontal in UTM NAD83 zone 17 coordinate system;
- Assay values of percent graphitic carbon ("% Cg") determined by the double loss-on-ignition (DOUBLE LOI) and the LECO analytical methods; and,
- Geologic information describing lithology and mineralogy.

There are a total of 3,005 assayed intervals for which the carbon content determination was done using the double loss-on-ignition (DOUBLE LOI) and/or by LECO. From this total 2,745 of assayed intervals were assayed for Cg using the LECO analytical method (Table 14.2). Sample lengths averaged 2.7 m. The current mineral resources estimate only uses Cg assay results. It is in SGS Canada's opinion that the Double LOI analytical method overestimates the Cg grade because it measures also sulphides and carbon contained in the carbonates. Consequently, holes for which LECO data were not available were discarded (BC-87-041 to BC-87-045) because the use of a predictive equation based on linear regression analysis to factor the missing Cg data was not judged satisfactory

Table 14.2: Assay Database Compilation

	1984	1985	1986	1987	2007	2010	Total
# of records	39	1,014,	90	793	162	907	**3,005**
Double LOI	39	973	90	793	0	0	**1,895**
Cg LECO resources 2011	39	978	90	569	162	907	**2,745**
Double LOI & Cg LECO	39	937	90	569	0	0	**1,635**
Length (m)	87.44	3,172.53	261.66	2,017.69	245.19	2,309.00	**8,093.51**

Detailed topographic data were acquired through the completion of a 53 km^2 LIDAR survey on January 31, 2011. Adjustment and classification of the raw Laser data were performed using many parameters to attain an accurate terrain representation. Points were automated and manually processed to classify and clean the laser data while preserving important slope changes and to remove gross errors using many quality control checks. Analysis of results shows that the average precision of the survey data is ± 20 cm in elevation for areas of little snow and of ± 50 cm in elevation in areas of thicker snow coverage.

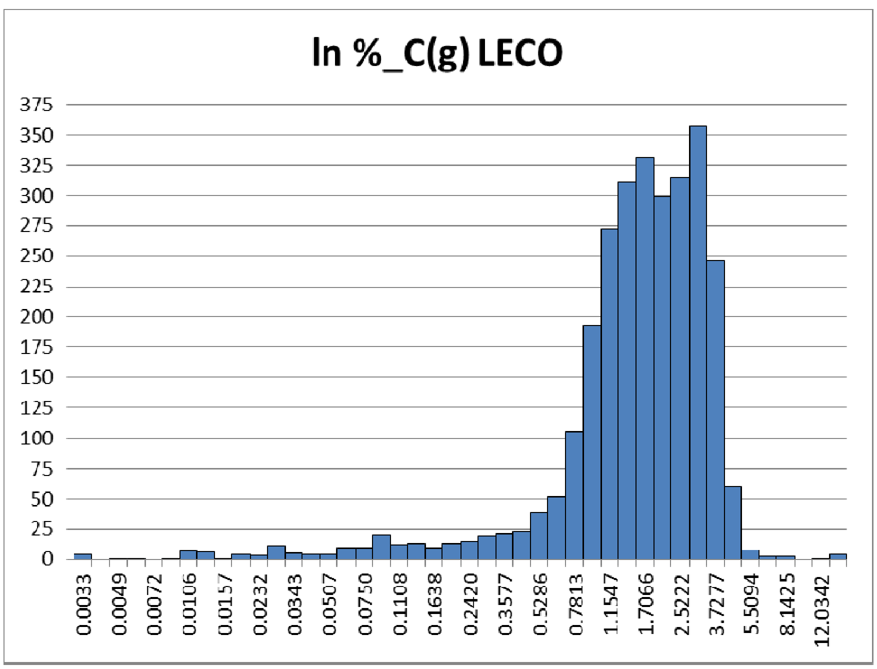
14.2 Geological Modeling

The histogram of the log transformed data (Table 14.3 and Figure 14.1) shows that the dataset consists of three different populations, one reflecting the barren gneiss, the other two reflecting the graphitic horizon and consisting of lower and higher grade sub-units. This is consistent with dataset taken individually and should not be an artifact of the different assay procedures used throughout the history of the project.

Table 14.3: Descriptive Statistics
LECO Original Assays, no Maximum Cut-off

Description	Cg (%) Leco
Mean	1.77
Standard Error	0.02
Median	1.59
Mode	1.25
Standard Deviation	1.11
Sample Variance	1.23
Kurtosis	19.77
Skewness	2.31
Range	14.63
Minimum	0.003
Maximum	14.63
Sum	4849.54
Count	2745

Figure 14.1: Histogram of LECO Original Assays

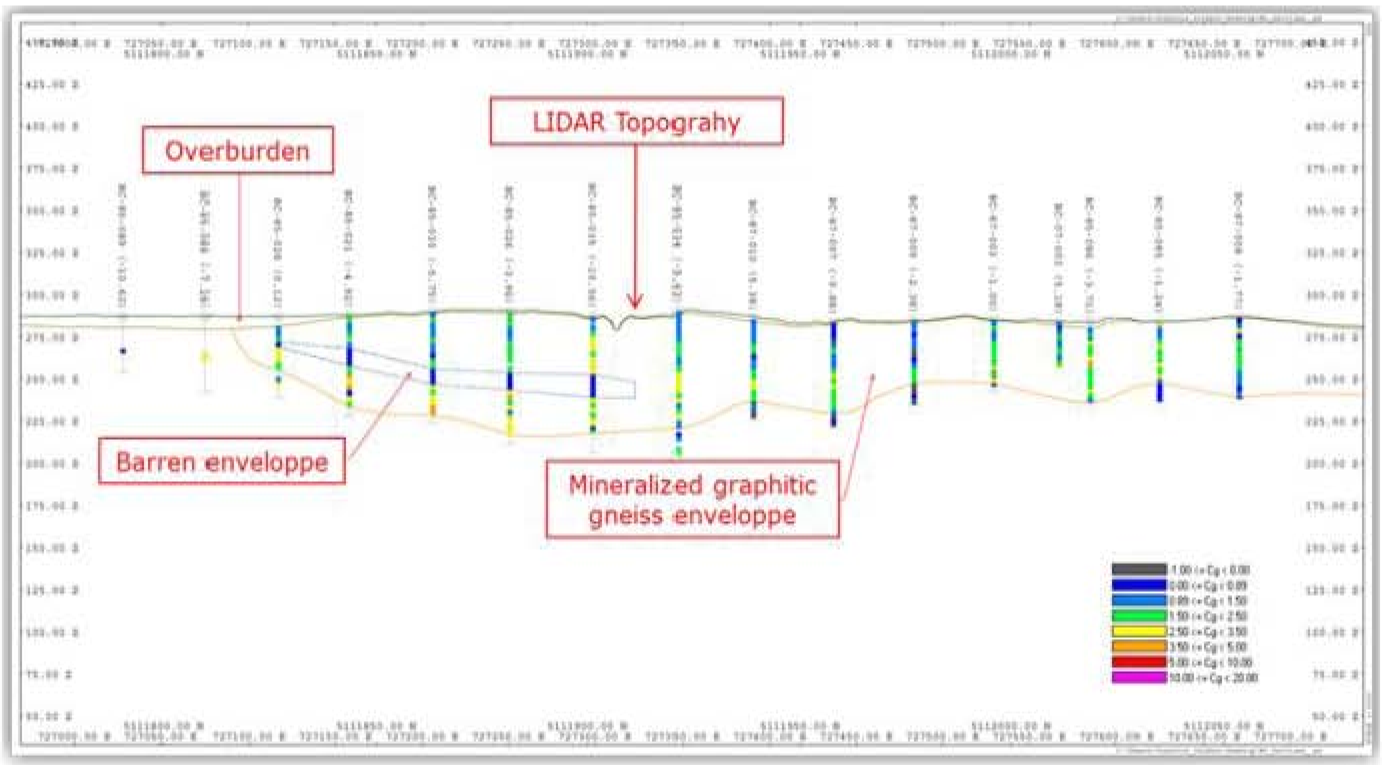


The hanging wall and footwall surfaces of the mineralized graphitic gneiss were digitally interpreted on thirty-eight N068°sections spaced 25 m apart along the northing starting at 2,300 N and up to of 3,200 N inclusively. The range of influence was projected half the distance to the next section. Mineralized and non-mineralized zones were outlined using the core logged lithological description and substantiated by the original sampled carbon graphitic assay results. No minimum % Cg cut-off grade was applied during the geological modeling as the interpretation is mainly based on the lithology description, continuity between sections and facies thickness relevant to mining. Consequently some low grade material may have been incorporated in the mineralized zones. The interpretation was validated by a set of orthogonal sections as well as a set of different plan views. For each hole, mineralized intervals were calculated within the mineralized zone. A 3D model was completed to outline the mineralized graphitic horizon and the inserted barren intervals.

A map of the overburden thickness was generated through diamond drill hole log compilation, historical surface mapping and LIDAR topography. The overburden surface was interpreted by subtracting the overburden thickness from the detailed topography surface. The resulting surface preserves the level of details of the LIDAR survey, mainly in areas of abrupt slope changes.

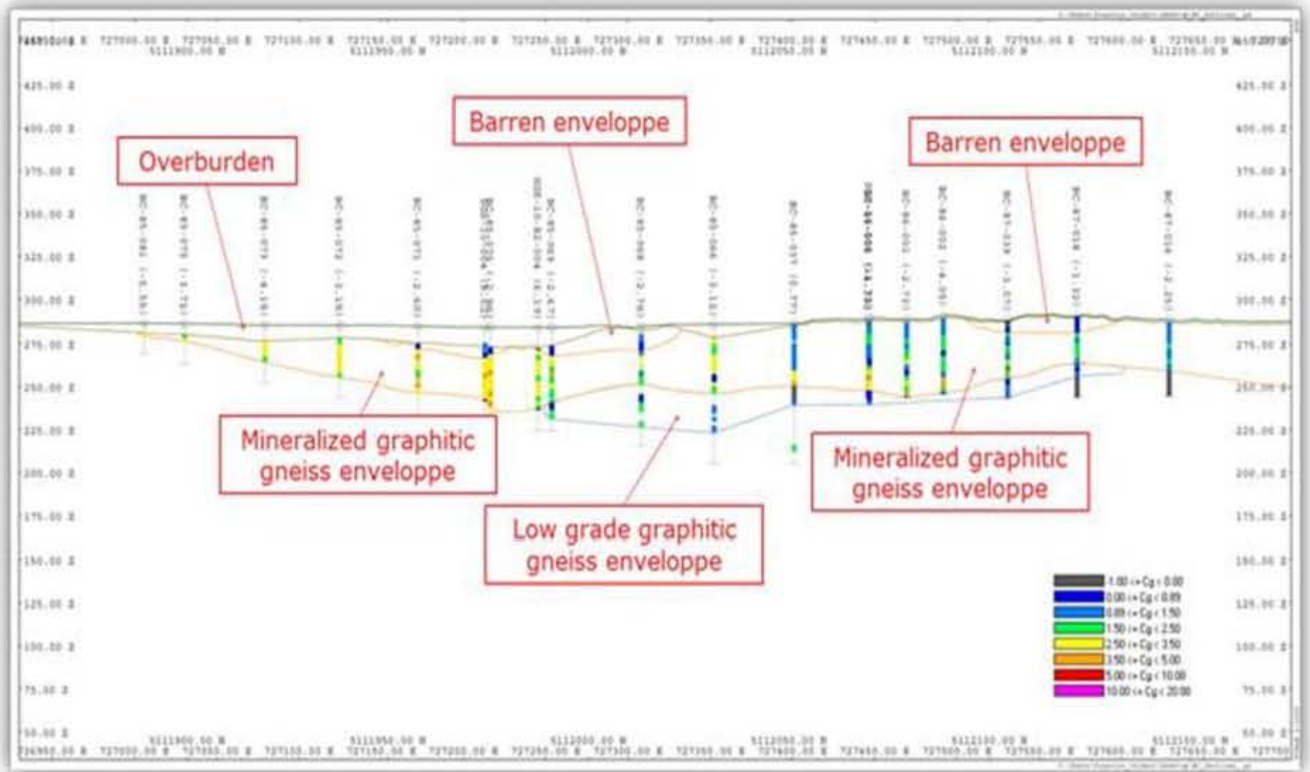
The overburden surface coincides most of the time with the hanging wall surface but not always. Non-mineralized gneisses of significant thickness and continuity in-between sections were also considered in the hanging wall and left out of the modeled mineralized zone as presented in Figure 14.2 and Figure 14.3.

Figure 14.2: Geological Cross-Section N25+50 (looking N338)



SGS Canada Inc. - Geostat

Figure 14.3: Geological Cross-Section N26+50 (looking N338)



SGS Canada Inc. - Geostat

14.3 Composite Data

The resources estimate method evaluates the grades of regular blocks inside the mineralized zone. Block average Cg grade is interpolated from composite samples within drill holes around the blocks. Composites are regular length samples calculated from the original samples within mineralized intervals. Composites were normally 6 m long, with a minimal 3 m length, to account for some internal dilution, to smooth the effect of high grade samples along with barren material, and to correspond to the bench height of 6 m selected by Northern Graphite. These lengths are considered suitable when compared to the block model dimension (10 m E x 10 m N x 6 m Z). Most drill hole intervals defining the modeled mineralized solids have been sampled continuously. Where sampling gaps in the mineralized intervals existed, 0% Cg grade was given, thus diluting the regular 6 m composites. A total of 1,073 regular 6 m composites were used for the block model interpolation.

Table 14.4: Descriptive LECO Assayed 6 m Composite Samples, no Maximum Cut-off

Bench Composites 6 m – CG (%) Leco	
Description	**Normal**
Mean	1.917800559
Standard Error	0.025255638
Median	1.79
Mode	1.27
Standard Deviation	0.827290809
Sample Variance	0.684410083
Kurtosis	2.85934899
Skewness	0.950031498
Range	7.38
Minimum	0
Maximum	7.38
Sum	2057.8
Count	1073

Figure 14.4: Histogram LECO Assayed 6 m Composite Samples, no Maximum Cut-off

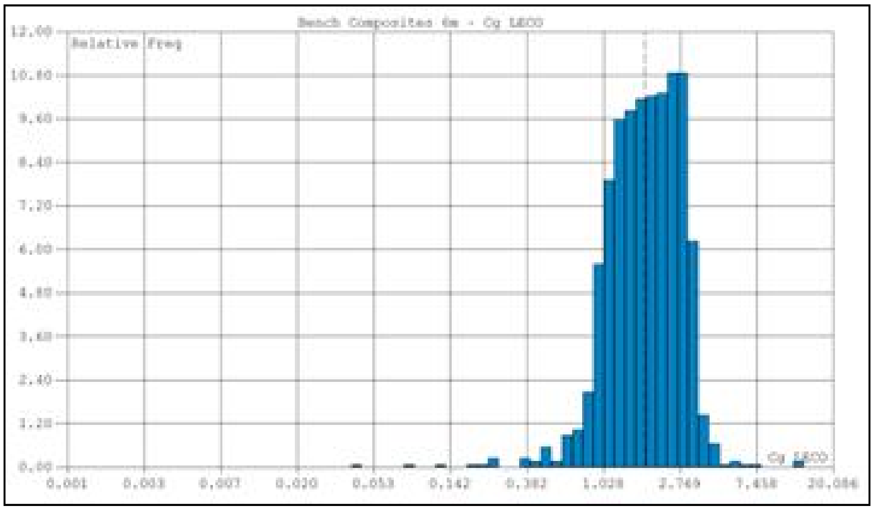
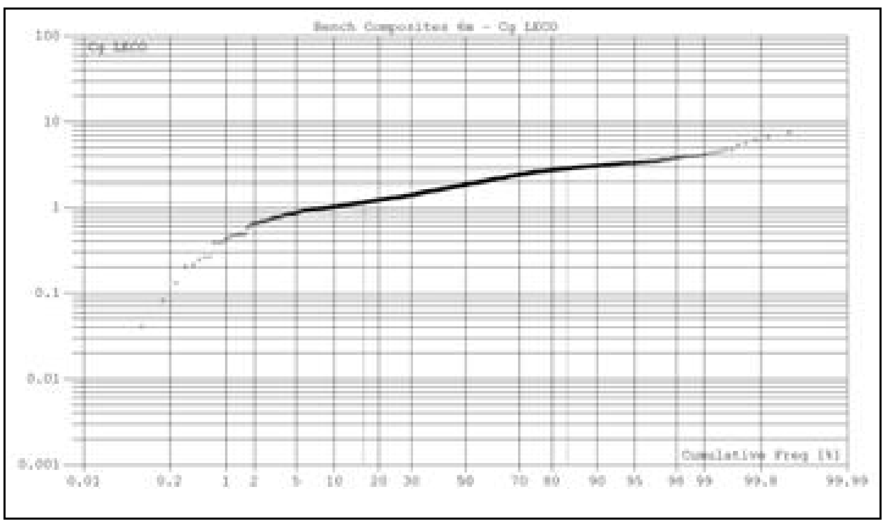


Figure 14.5: Cumulative Frequency Plots LECO Assayed 6 m Composite Samples no Maximum Cut-off



Log normal cumulative frequency plot of the 6 m composites grades shows a distribution approaching the normal law (Table 14.4, Figure 14.4 and Figure 14.5). Even if two grade populations and limited numbers of outliers are possible, it was considered satisfactory to combine these different grade populations for grade modeling because of the narrow range of grade zone classes. The histogram is showing that most of the % Cg values are within a tight normal distribution, the outlier near 10% Cg reflecting a localized rich zone. Consequently, no capping was applied to composites Cg grades.

14.4 Spatial Analysis

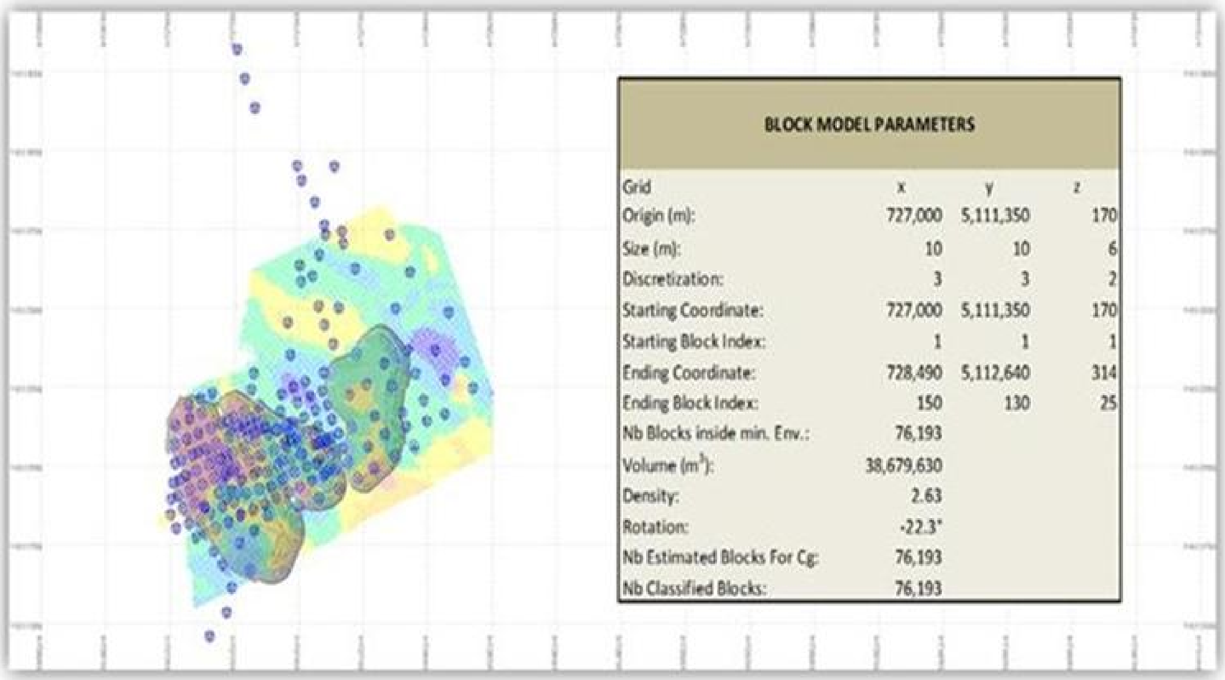
Correlograms were computed in various directions on the composited, un-capped Cg data to evaluate the range of influence and preferred direction of mineralization. Correlograms show maximum continuity of grade along the N135° direction within the horizontal plane with a range around 120 and 150 m (Figure 14.6). Correlogram in the vertical direction show very limited continuity. There is no nugget effect, hence showing good reproducibility of the data at short distances. Consequently, the correlogram model equation has no nugget effect, a sill value of 1 and an exponential function with ranges of 60 m, 30 m and 9 m with the long range oriented N135° in the horizontal plane (i.e. dip and a spin of 0).

Figure 14.6: Correlograms of 6 m Composite Samples, no Maximum Cut-off

14.5 Block Modeling

A block model of 10 m (E-W) by 10 m (N-S) by 6 m (vertical) was interpolated using geostatistical methods (ordinary kriging) within the mineralized envelope (Figure 14.7). The block model has been rotated by 22.3° to the North-West. The block model orientation and the block size selection were based on drill spacing, mineralized zone geometry and thickness, and the assumed mining bench height. The block model covers a strike length of approximately 1,300 m and it reaches a maximal depth of 100 m below surface. The block model was restricted to the mineralized envelope defined by the hanging wall and footwall surfaces of the mineralized graphitic gneiss. The percentage of volume of a block falling within the mineralized envelope was calculated for tonnage estimate and blocks with 100% of their volume falling within the barren envelopes were discarded. Where the mineralized envelope pinches out to the West and the North-West side of the deposit, blocks with too small of a volume percentage were also discarded. The final model contains 76,193 estimated blocks for a total volume of 38,679,630 m^3.

Figure 14.7: Collar Location, Block Model Extent and Block Model Parameters

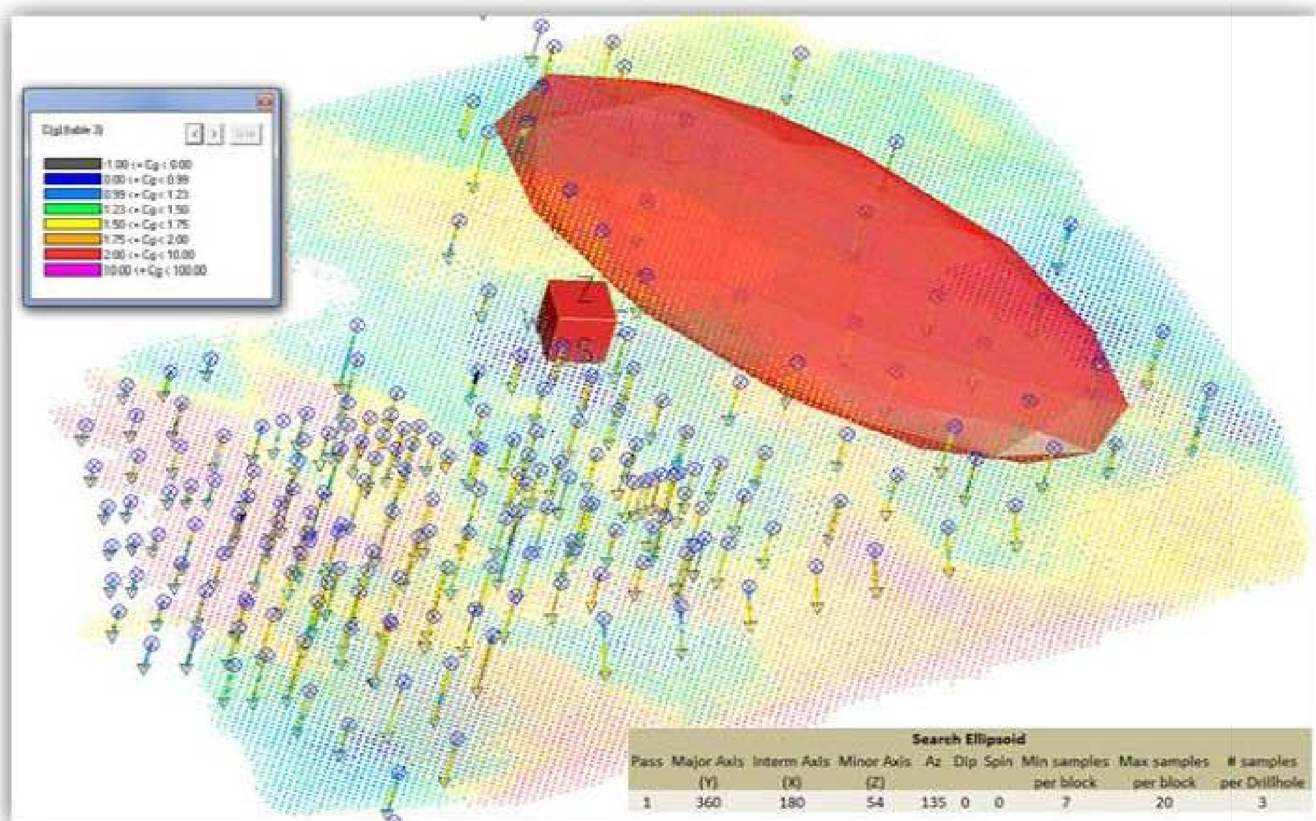


BLOCK MODEL PARAMETERS			
Grid	x	y	z
Origin (m):	727,000	5,111,350	170
Size (m):	10	10	6
Discretization:	3	3	2
Starting Coordinate:	727,000	5,111,350	170
Starting Block Index:	1	1	1
Ending Coordinate:	728,490	5,112,640	314
Ending Block Index:	150	130	25
Nb Blocks inside min. Env.:	76,193		
Volume (m^3):	38,679,630		
Density:	2.63		
Rotation:	-22.3°		
Nb Estimated Blocks For Cg:	76,193		
Nb Classified Blocks:	76,193		

SGS Canada Inc. - Geostat

The block interpolation was performed using just one pass considering the mineralization continuity, geometry, and thickness as well as drill spacing (Figure 14.8). This approach was also selected to better reflect the anticipated average grade of the mined material by avoiding high grading certain portion of the deposit with smaller search ellipsoid. A search ellipsoid oriented N135° with 360 m primary axis and

Figure 14.8: Anisotropic Search Ellipsoid for Grade Interpolation (sketch, oblique view)



Search Ellipsoid									
Pass	Major Axis (Y)	Interm Axis (X)	Minor Axis (Z)	Az	Dip	Spin	Min samples per block	Max samples per block	# samples per Drillhole
1	360	180	54	135	0	0	7	20	3

SGS Canada Inc. - Geostat

180 m secondary axis in the horizontal plane and a 54 m vertical search component was used to select the composite data. A minimum of 7 composites and a maximum of 20 composites from at least 3 holes were used to prevent one drill hole from contributing too many samples to the block being estimated. Sample weights within the search ellipsoid are those given by the correlogram model equation.

An average bulk density of 2.63 t/m^3 was used to calculate tonnage from the volumetric estimates of the resource block model. This value falls within the range of measures done by Northern Graphite on various facies of graphitic gneiss found on the property. Although those measures have not been validated by SGS Canada, it is considered valid for the current resource estimates.

The block model lognormal histogram and cumulative frequency plots shows a general distribution approaching the normal law with two grade populations (Table 14.5, Figure 14.9 and Figure 14.10). The higher grade material has been found near the footwall contact and it approaches the surface where the mineralized zones pinch out to the West and North-West. The lower grade material is generally found on a horizon on top of the high grade horizon.

Table 14.5 Descriptive Statistics, LECO Assayed Block Model by Ordinary Kriging

Block Model by Kriging (Cg%)	
Mean	1.806331
Standard Error	0.00187
Median	1.7
Mode	1.44
Standard Deviation	0.516138
Sample Variance	0.266398
Kurtosis	0.048107
Skewness	0.678155
Range	4.79
Minimum	0.6
Maximum	5.39
Sum	137629.8
Count	76193

Figure 14.9: Histogram, LECO Assayed Block Model by Ordinary Kriging

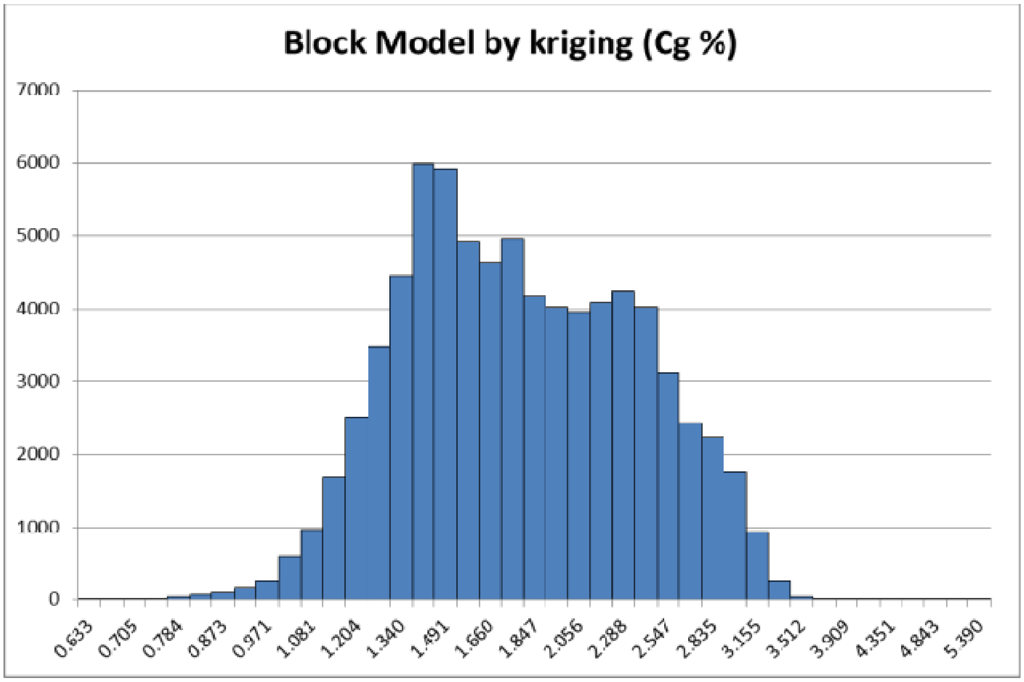
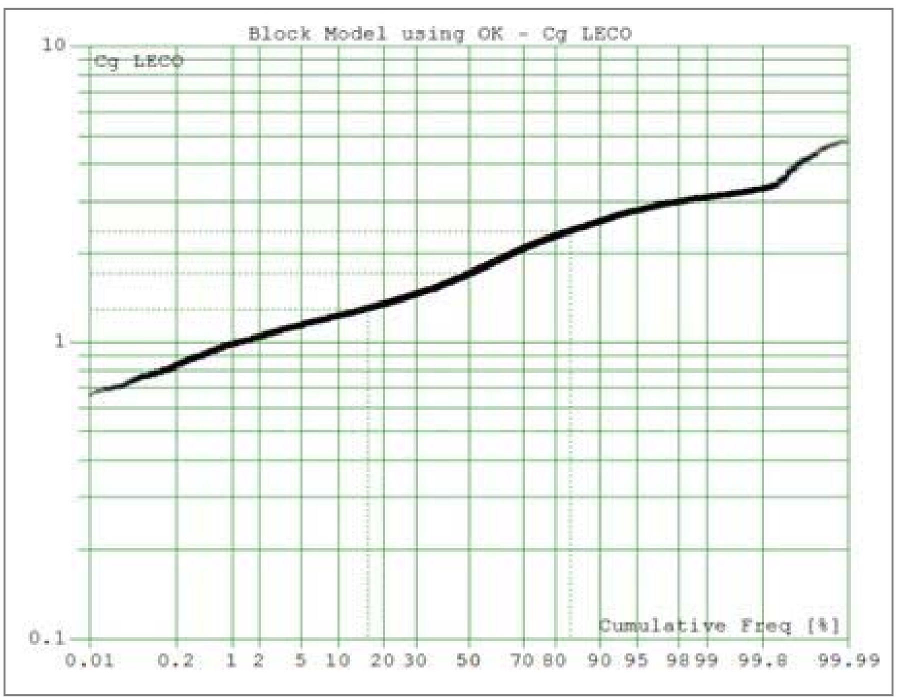


Figure 14.10: Cumulative Frequency Plots -
LECO Assayed Block Model by Ordinary Kriging



Validation of the resource block model results was conducted by 1) a visual estimate of the color-coded block grades and the surrounding composite samples; 2) by comparing the block model grade average and standard deviation to the composite samples used in the interpolation (Table 14.6 and Figure 14.11).

Similarly, the block model average grade and std. dev. interpolated by ordinary kriging (OK) can be compared to the model interpolated by inverse distance (ID2), in Table 14.7 and Figure 14.12. Comparisons presented in the following figures show excellent correlation between the two interpolation methods.

Table 14.6: Resource Block Model by OK vs 6 m Bench Composites

Description	Bench Composite 6 m (Cg %)	Blk Model Krg (Cg%)
Mean	1.9132	1.9216
Standard Error	0.0253	0.0187
Median	1.79	1.82
Mode	1.22	1.39
Standard Deviation	0.8211	0.6071
Sample Variance	0.6742	0.3686
Kurtosis	2.9518	0.4789
Skewness	0.9420	0.6453
Range	7.38	5.39
Minimum	0.00	0.63
Maximum	7.38	5.39
Sum	2022.20	2031.10
Count	1057	1057

Figure 14.11: Standard Deviation Plot
Resource Block Model by OK vs. 6 m Bench Composites

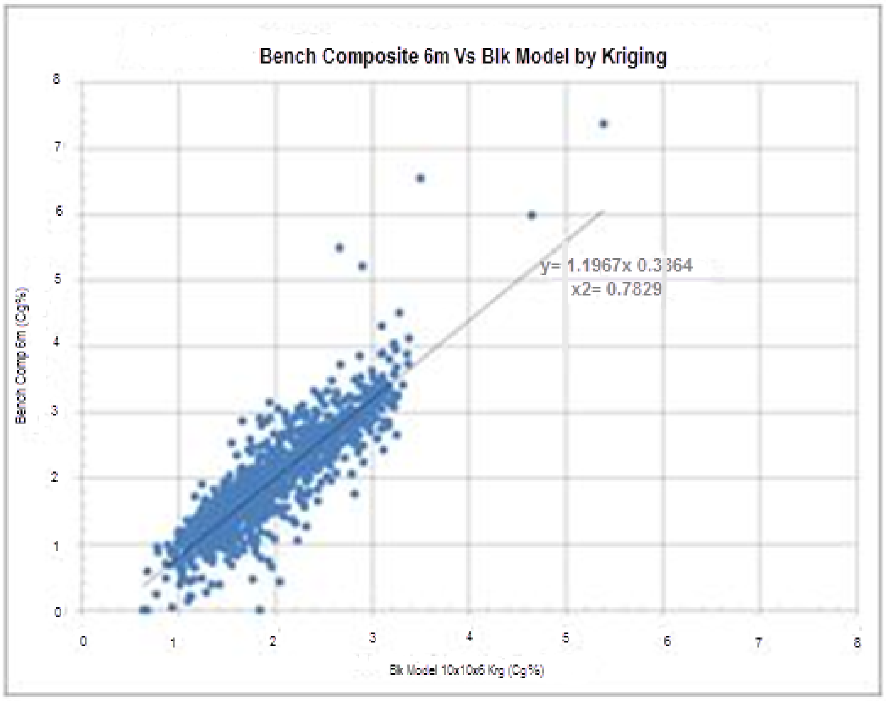
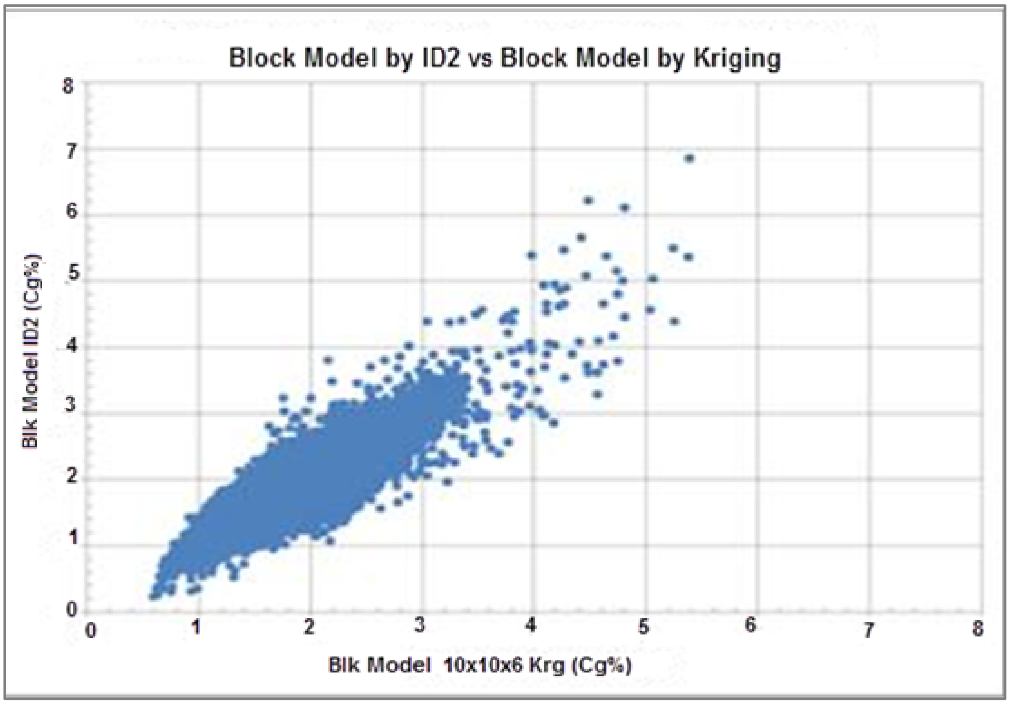


Table 14.7: Resource Block Model by OK vs Resource Block Model by ID^2

Description	Blk Model ID_2 (Cg%)	Blk Model Krg (Cg%)
Mean	1.7985	1.8044
Standard Error	0.0019	0.0019
Median	1.68	1.69
Mode	1.58	1.44
Standard Deviation	0.5079	0.5194
Sample Variance	0.2580	0.2698
Kurtosis	0.6674	0.0322
Skewness	0.7799	0.6840
Range	6.62	4.79
Minimum	0.23	0.6
Maximum	6.85	5.39
Sum	134536.13	134978.71
Count	74805	74805

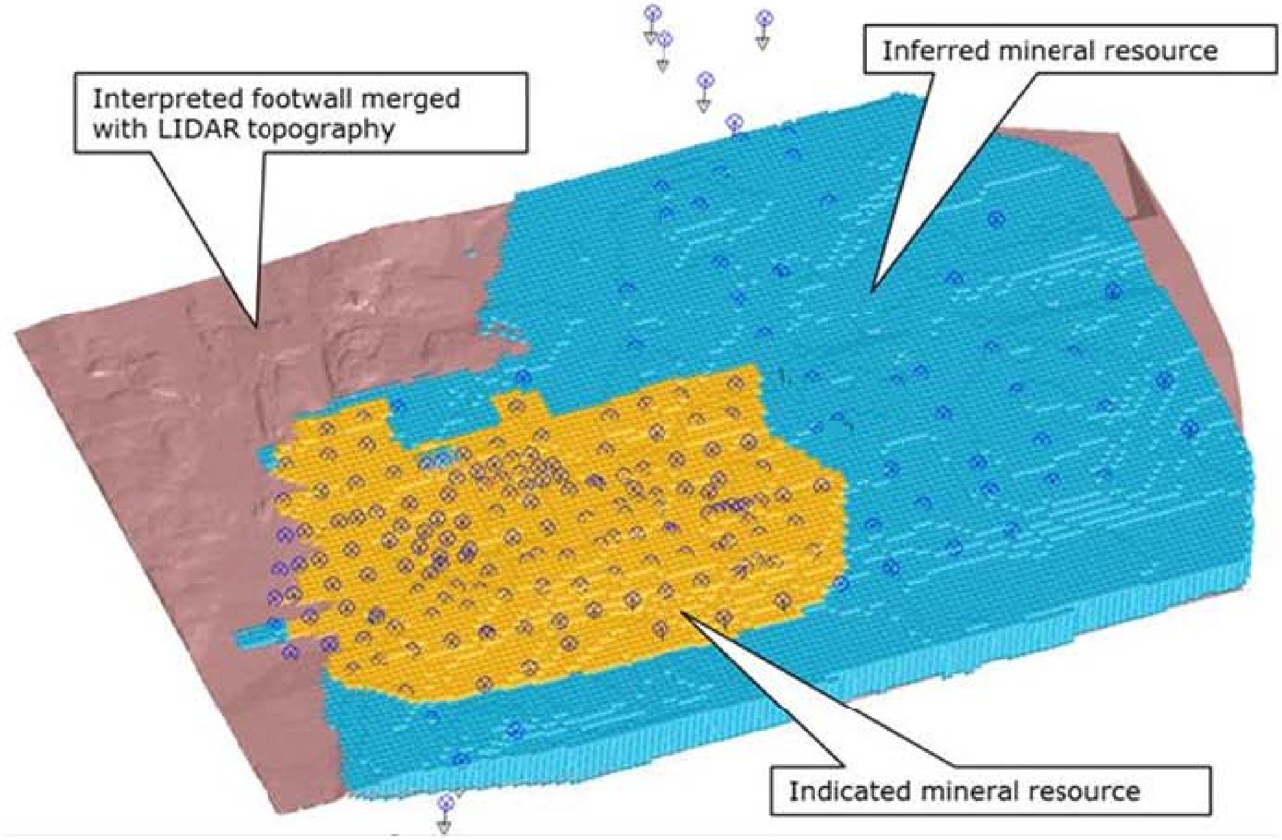
Figure 14.12: Standard Deviation Plot
Resource Block Model by OK vs. Resource Model by ID_2



14.6 Classification

Due to the absence of historical assay certificates, sample rejects or drill hole casings, it was decided that there would not be any resources classified as measured. Thus, mineral resources for the Project are classified into indicated and inferred categories. Factors used to determine the mineral resources classification follow the CIM requirements and guidelines which are primarily grade variability and spatial continuity of mineralization. The mineral resources were classified using an oriented ellipsoid of 80 m x 80 m x 20 m for the indicated category followed by manual editing of the final classification based on correlogram distance interpretation (Figure 14.13). There are 154 diamond drill holes within the indicated resource perimeter, including of 6 holes drilled in 2007 for SGS, 13 holes drilled for SGS in 2010, and 6 holes drilled in 2010 by Northern Graphite. This recent drilling represents only 16% of the total drilling within indicated perimeter.

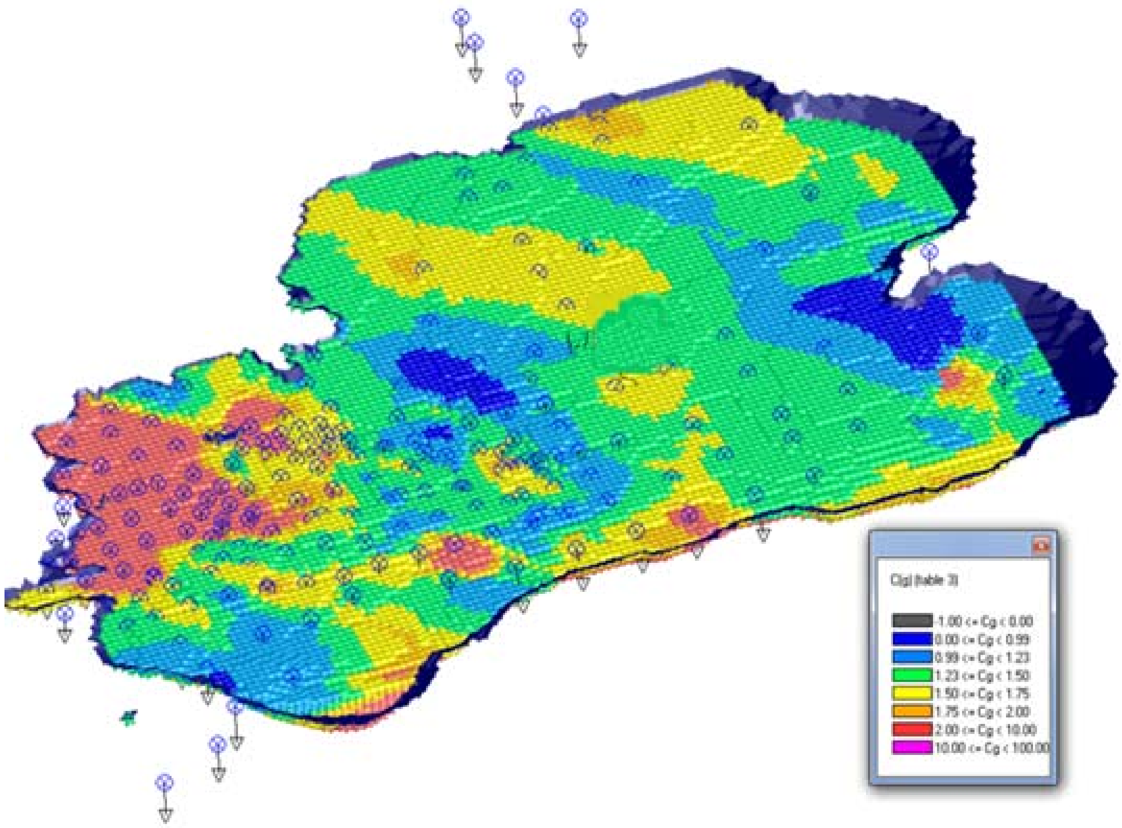
Figure 14.13: Mineral Resource Classification (sketch, oblique view)



14.7 Mineral Resource Estimation

In order to establish a reasonable prospect of economic extraction in an open-pit context, mineral resources were limited to an optimized Whittle pit shell using an average graphite price of USD 2,000/t, updated operating and capital costs, relative density of 2.63 t/m^3, 10% mine dilution and 90% mine recovery. A grade of 0% Cg was applied to the 10% diluted tonnes. The Whittle optimized pit was also restricted to an area 30 m North from a stream running along the southern extend of the block model (Figure 14.14).

Figure 14.14: Pit Optimization Parameters N Block Model Limited by Optimized Whittle Pit Shell (sketch, oblique view)



SLOPE SET		
Slope angle in Rock	45	deg
Slope angle in OVB	30	deg
PIT SHELLS OPTIMIZATION		
Waste Mining cost	4.00	C$/tonne
OVB Mining cost	3.30	C$/tonne
Ore mining recovery	90	%
Ore Dilution	10	%
Milling	10.60	C$/milled tonne
Administration	4.95	C$/milled tonne
Royalties	0.48	C$/milled tonne
Ore mining cost supplement	0.32	C$/milled tonne
Total ore based cost	**16.35**	**C$/milled tonne**
Mill recovery	95	%
Sell price[1]	2,000	US$/tonne
Sell cost[2]	0.17	US$/tonne
Exchange rate	0.96	C$/US$
OPERATIONAL SCENARIO		
CAPEX	78,500,000	C$
CAPEX Residual value	-	C$
Discount rate	8.00	%
Processing capacity	870,000	t/year

Sell price[1] *= 1,920 C$/tonne*

Sell cost[2] *= 0.163 C$/tonne*

As of September 12, 2011, the updated mineral resources for the Project using a Base Case cut-off grade of 0.986% Cg totals 25,983,000 t grading 1.81% Cg in the indicated category for 470,300 t of contained Cg; inferred resources total 55,038,000 t grading 1.57% Cg for 864,100 t of contained Cg. Table 14.8 summarizes the mineral resources for the Project at various cut-off grades.

Table 14.8: Bissett Creek Flake Graphite Deposit 2011 Updated Mineral Resources (Diluted)

	Indicated			Inferred		
%Cg Cut-Off	**Tonnage (tonnes)***	**Cg% by LECO**	**In Situ Graphite** (tonnes)**	**Tonnage* (tonnes)**	**Cg% by LECO**	**In Situ Graphite** (tonnes)**
0.986	25,983,000	1.81	470,300	55,038,000	1.57	864,100
1.227	24,588,000	1.85	454,900	50,472,000	1.62	817,600
1.5	19,954,000	1.99	397,100	33,672,000	1.81	609,500
1.75	16,031,000	2.50	298,000	14,584,000	2.21	473,300
2	11,921,000	2.50	298,000	14,584,000	2.37	345,600

Relative density used 2.63t/m^3
10% dilution; 90% mine recovery
*Rounded to nearest 1 K
**Rounded to nearest 1 K
Effective date September 12th 2011
CIM definitions for mineral resources were followed

Numerous parameters have been modified from the 2010 Preliminary Economic Assessment (“PEA”) to update the current resource estimate and comparison between the two might be difficult to make. Using the various pit outlines of the 2010 PEA and the 2011 block model, variation in tonnage and grade is explained by some of the factors listed below:

- The mineralized envelope has been modified by a new geological interpretation, more detailed topographic data, the insertion of barren envelopes and by redefining the overburden surface;
- A re-examination of the historical drill hole locations with historical drawings not available at the time of the 2010 PEA has led to move the location of a certain number of drill holes which obviously affected the interpolation of the block model;
- Lower average grades from the 2010 drilling affected the interpolation. Consequently, some tonnage below a certain cut-off grade was lost; and,
- Changes from 6 m long composites from 5 m long composites used in the 2010 PEA may have also affected the grade interpolation by slightly smoothing the results.

15. MINERAL RESERVES

15.1 Background

Mining reserves for Bissett Creek were established from the resources model prepared by SGS Géostat with a block size of 10 m (E-W) by 10 m (N-S) by 6 m (vertical). The block model was limited by the mineralized envelope defined by the hanging wall and footwall surfaces of the mineralized graphitic gneiss; similarly, envelopes of intercalated barren intervals within the graphitic horizon were also contoured in the model. Interpolation of graphitic carbon (Cg) grades within the mineralized envelopes was done by ordinary kriging using geostatistical parameters.

The resources model is a “percentage model” because only the percentage of block falling within the mineralized envelope was calculated for tonnage estimate; similarly, only mineralized intercepts within the mineralized envelope were used for the interpolation. Consequently, the initial resources calculation is undiluted. Consequently, SGS Géostat found appropriate to include a 10% dilution at zero grade and a 90% mine recovery factors for the final mineral resources. At a cut-off grade of 0.99% Cg, the mineral resources reported by SGS Géostat are as follows:

Table 15.1: Mineral Resources (SGS Géostat)

	Indicated	Inferred
Tonnage (000t)	25,983	55,038
Grade (% Cg)	1.81	1.57

Assays for resources calculations were for Cg as determined by the LECO method.

15.2 Open Pit Optimization

Open pit optimization was conducted to determine the optimal economic shape of the open pit in three dimensions. This task was undertaken using the Whittle software which is based on the Lerchs-Grossmann algorithm. The method works on a block model of the ore body, and progressively constructs lists of related blocks that can be mined economically. The method uses the economic values of the blocks to define a pit outline that has the highest possible total economic value, subject to the required pit slopes defined as structure arcs in the software.

Table 15.2 presents a summary of the parameters used in the optimization process. The selling price for graphitic carbon was USD 2,097/t conc. less a royalty of USD 20.00/t conc.

Table 15.2: Bissett Creek Optimization Parameters and Cut-off Grade Calculation

Selling Parameters		
In-situ Breakeven COG	0.853	% Cg
Diluted Grade	0.776	% Cg
Selling Price	2 097.00	USD/t conc.
Royalty	20.00	USD/t conc.
Net Selling Price	2 077.00	USD/t conc.
Exch. Rate	1.00	CAD/US$
Selling Price	2 097	CAD/t conc.
Royalty	20.00	CAD/t conc.
Net Selling Price	2 077.00	CAD/t conc.
Plant Recovery	92.7	%
Concentrate Grade	94.50	% Cg
Concentration Ratio	131.4	CR
Net Revenue	14.65	CAD/t ore
Ore Based Costs		
Processing Cost	11.30	CAD /t ore
G&A cost	3.00	CAD /t ore
Ore Premium Mining Cost	0.35	CAD /t ore
Total ore Based Cost	14.65	CAD/t ore
Profit	-	CAD/t ore
Mining Parameters		
Overburden Mining Cost	3.30	CAD/t mined
Waste Mining Cost	3.90	CAD/t mined
Ore Mining Cost	3.90	CAD/t mined
Mining Recovery	90	%
Mining Dilution	10	%
Overall Slope Angle in Overburden	26	deg
Overall Slope Angle in Rock	45	deg
Processing Rate		
Tonnes per day	2 500	tpd
Plant Availability	0.92	
Mill Throughput	839 500	t/yr

The plant recovery will start at 92.7% and increase to 94.7% following operating improvements and experience. For the optimization the conservative value was used.

The total ore based cost which includes processing costs, general services costs and ore premium mining cost due to the extra distance that the truck will travel to transport the ore to the plant is USD 14.65/t ore. The breakeven cut-off grade ("COG") base on the assumed product prices, recoveries and ore-based costs was 0.85% Cg.

The mining costs were initially estimated at CAD 3.30/t of overburden and CAD 3.90/t of rock. For the optimization, the mining dilution is fixed to 10% at a low grade and mining loss at 10%.

The overall slope angle for overburden and rock were established respectively at 26 degrees and 45 degrees.

In order to qualify for mineral reserves, only the measured and indicated resources were utilized in our open pit optimization process.

The pit shell results at various prices for Cg concentrate are presented in Table 15.3.

Table 15.3: Pit Shell Results, Measured and Indicated Only

Cg Price (CAD)/t conc)	Total Tonnage (t)	Ore Tonnage (t)	Strip Ratio	Cg Tonnage (t)	Cg Grade (%)
1 703	26 002 299	20 999 869	0.24	378 712	1.80%
1 786	26 421 284	21 364 616	0.24	383 103	1.79%
1 869	26 796 671	21 672 993	0.24	386 714	1.78%
2 077	27 491 338	21 979 701	0.25	390 728	1.78%
2 202	27 911 307	22 095 224	0.26	392 449	1.78%
2 285	28 005 022	22 116 929	0.27	392 784	1.78%

The optimal pit shell corresponding to a price of CAD 2,077/t of Cg concentrate produced with Lerchs-Grossman algorithm was used as a guideline for designing the final pit.

15.3 Open Pit Final Design

The final pit design process consists of designing ramp accesses to the bottom of each pit phase using the geotechnical recommendations guiding the bench geometry. The bench configuration is presented in Table 15.4.

Table 15.4: Bench Configuration

Material Type	Bench Configuration and Height (m)	Catch Bench Width (m)	Bench Face Angle (Deg.)	Design Inter-Ramp Slope Angle (deg.)
Overburden	Single Bench at the thickness of the overburden	10	26	26
Rock	Double Bench 2 x 6 m 12 m between catch benches	9.6	75	45

The ramps and haul roads are designed for the largest equipment, being a 45 t class haul truck. For double lane traffic, industry best-practice is to design a road width of at least 3.5 times the width of the largest vehicle, which corresponds to 22 m in our case. Ramp gradients were established at 10%.

Phasing of the pit was investigated by using the pushback chooser module in Whittle which iteratively searches for the best combination of pushbacks to maximize NPV. A mining width is specified between pushbacks to assure enough working room for equipment. Considering the anticipated size of mining equipment, a mining width of 70 m was assumed.

Mining will be accomplished with three phases to achieve the final pit limits. The objective of pit phasing is to improve economics by feeding the highest grade at a reasonable stripping ratio during the earlier years and to defer lower grades towards the latter years. Pit designs for each mining phase were realized using identical bench configurations as described in Table 15.4. The initial phase is centered on the higher grade material and is presented Figure 15.1. The second and final phases are presented in Figure 15.2.

It was necessary also to store sulphide tailings in the mined out Phases 1 and 2 in the 13th year of operations and non-sulphide tailings in the 16th year of operations. Consequently, the last Phase 3 and Phases 1 and 2 will be separated by a 26 m berm of in-situ rock and overburden glacial till to protect mining operations in Phase 3 from tailings disposals in Phases 1 and 2. Filling Phases 1 and 2 with tailings will progress to Elevation 266 by the time Phase 3 is mined out; the bottom of Phase 2 is at about Elevation 209.

Figure 15.1: Initial Bissett Creek Mining Phase

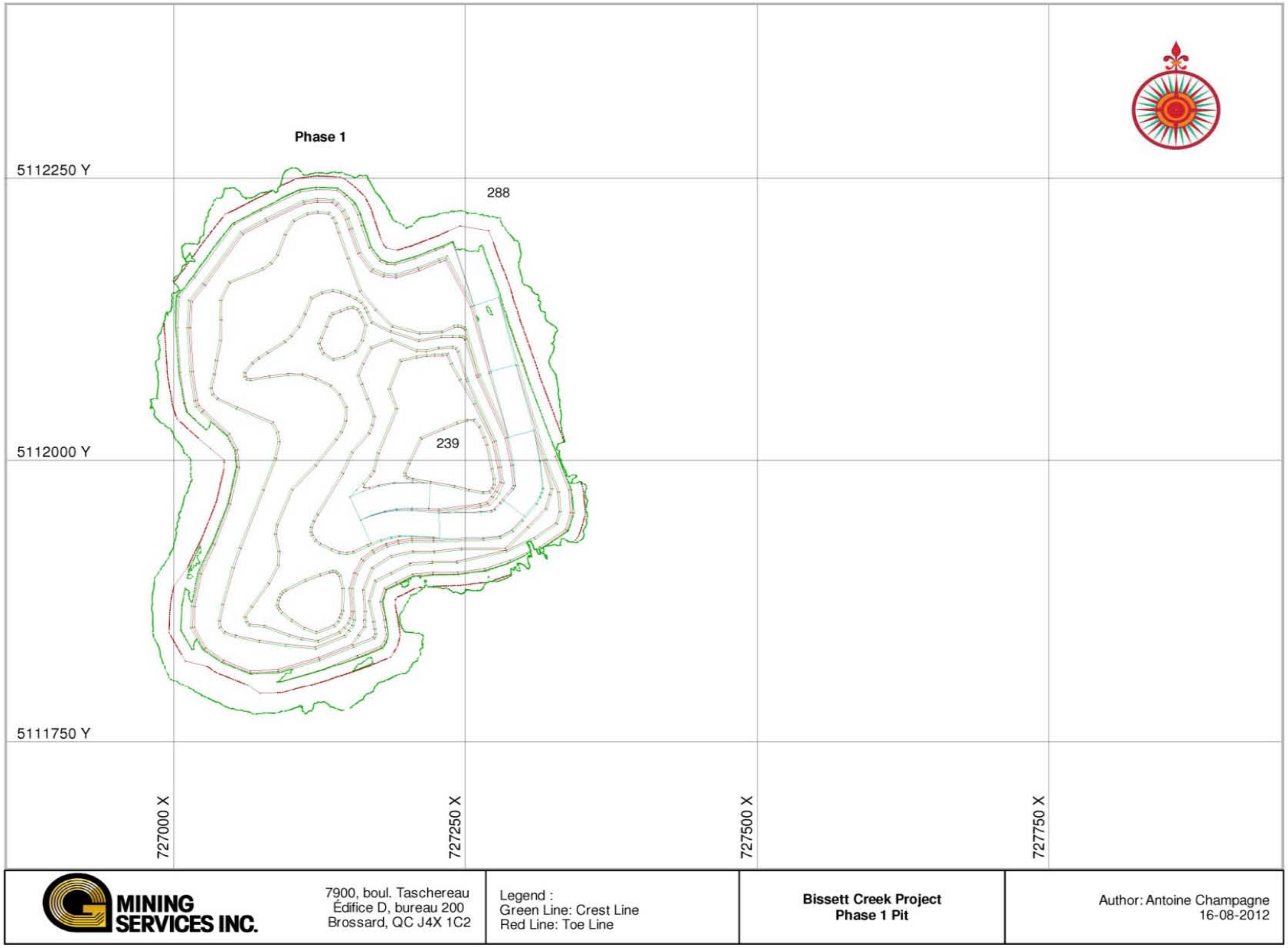
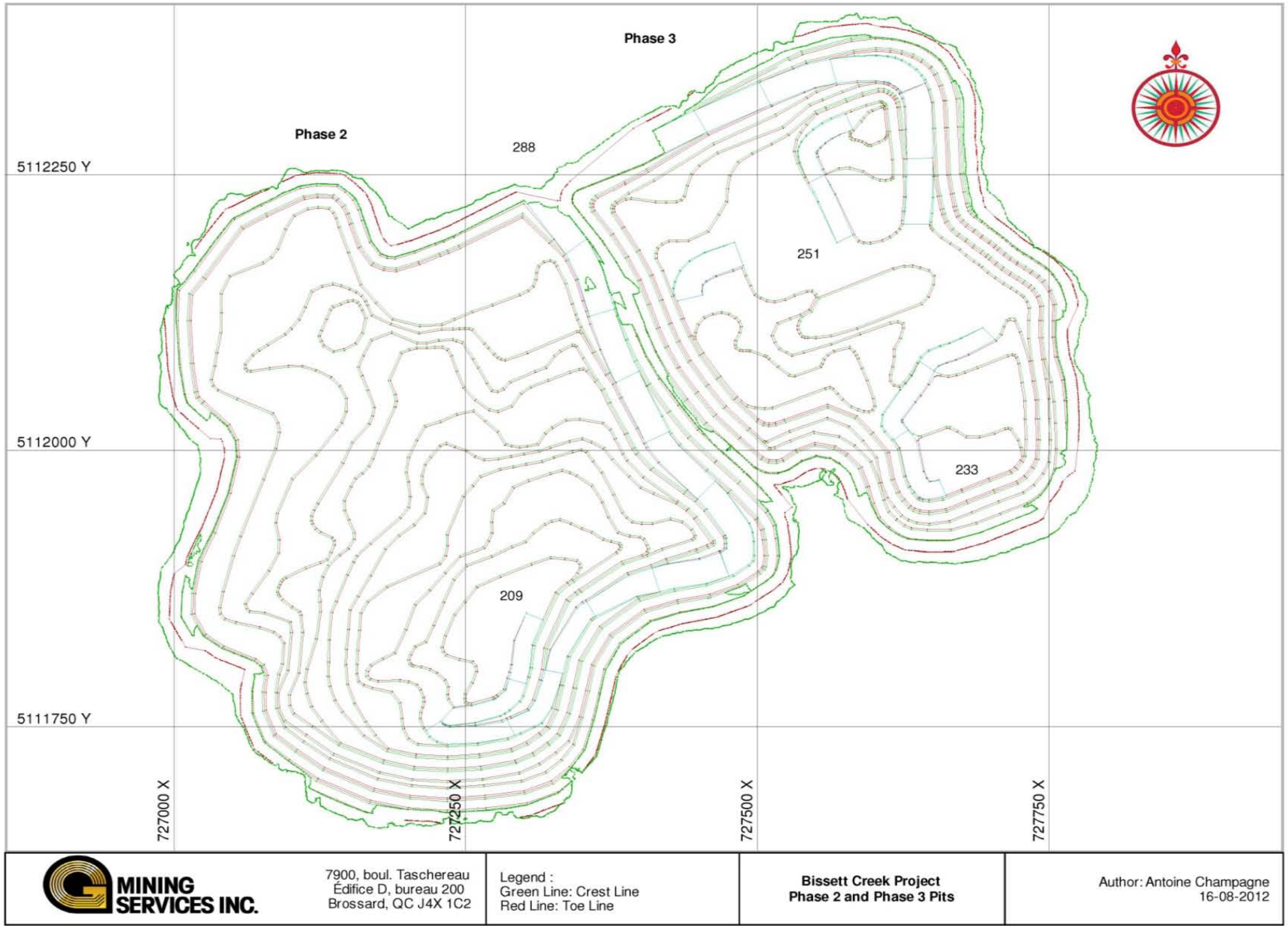


Figure 15.2: Second and Final Mining Phase



15.4 Mineral Reserves Estimates

The mineral reserves for the Bissett Creek Deposit are reported according to the Canadian Institute of Mining, Metallurgy and Petroleum's ("CIM") standards. According to these standards, Resource Model blocks classified as Measured and Indicated can be reported as proven and probable reserves. Owing to the above reporting standards, the Inferred Resources cannot be included as Reserves and so have not been included in our optimization and calculations.

Mining reserves were estimated by designing ore outlines or mining shapes around economic mineralization for every 6m bench. Only mineralization classified as indicated was considered when designing the ore outlines. Since there was no mineralization classified as measured, all mineral reserves are classified as probable at this time. After several cycles of mine planning and project evaluation it was decided to use a higher cut-off grade of 1.2% Cg instead of the breakeven 0.85% Cg for the mineral reserves and corresponding optimal mine plan. This marginal ore (0.85-1.2% Cg) is estimated at 1.66 Mt at 1.1% Cg and will be stockpiled separately and could be processed economically at the end of the current LOM. However, it is currently excluded from the mineral reserves and mill feed plan; it is accounted as waste for costing purposes. Inferred ore within the pit limits is estimated to be 1.53 Mt at 1.5 % Cg and is considered as waste material

The ore outlines include a 1 m dilution envelope around economic ore blocks and also enclose marginal material surrounded by economic mineralization. The dilution envelope and enclosed waste in most cases is mineralized, with an associated dilution grade. The mineral reserves are consequently inclusive of a 7.8% dilution at 0.5% Cg. A mining loss of 10 % was estimated at this time mostly because of low dips of the orebody and the inclined ore-waste contacts.

The total probable mineral reserves are estimated at 18.98 Mt at 1.89% Cg and are detailed by mining phase in Table 15.5.

Table 15.5: Mineral Reserves by Mining Phase

Phases	Ore Tonnage (kt)	Cg (%)
Phase 1	3,663	2.28%
Phase 2	9,048	1.85%
Phase 3	6,266	1.71%
Total	**18,977**	**1.89%**

Minimum Dilution: Average 7.8% at 0.5% Cg
Mining Recovery: 90%

16. MINE PLANNING AND OPERATIONS

Because the Bissett Creek graphitic carbon (Cg) deposit reaches surface and dips at about 20^{o} down to a depth of about 100 m, it is an ideal situation for open pit mining.

16.1 Mine Plan

As discussed in Section 15, the Whittle phase optimizer was used to determine three phases of mining with their respective size, grade and stripping ratios presented in Table 16.1.

Table 16.1: Mineral Reserves by Phase

Mineral Reserves				
Phases	**Tonnage (000t)**	**Grade (% Cg)**	**In-Situ Cg (t)**	**Stripping Ratio**
Phase 1	3,663	2.28	83,516	0.64
Phase 2	9,048	1.85	167,388	0.37
Phase 3	6,266	1.71	107,149	0.62
Total	**18,977**	**1.89**	**358,055**	**0.51**

Phase 1 is near surface with the smallest tonnage, but the highest grade and best economics. Phase 2 is the dip extension of Phase 1, and contains the largest ore tonnage at the average grade of the reserves and enjoys a low stripping ratio, Finally, Phase 3 has a mid-level ore tonnage, but at the lowest grade and lesser economics.

Important requirements for the final mine plan were the following:

a.) Increase head grades to the mill in the initial years of production while maintaining reasonable stripping ratio.

b.) Supply blasted rock and glacial till for tailings dam construction during preproduction period.

c.) Allow for tailings disposal in mined-out pits in year 13 for sulphides tailings and in year 16 for non-sulphide tailings.

Several mine plans were generated in order to satisfy those requirements. It was decided to consider the grade interval between 1.2% Cg and 1.6% Cg as low grade to be partially stockpiled initially and reclaimed at a later date.

The detailed mine plan is presented in Table 16.2. The pre-production tonnage of 953,000 t includes 426,000 t of rock and 309,000 t of overburden for roads and dam construction and 218,000 t of ore for initial production (three months). The mining rate is fixed at 1.48 Mtpy for the first 12 years of operations and can be reduced to 0.94 Mtpy thereafter. This mining rate enables to complete mining in Phase 1 by the end of year 4 and in Phase 2 by the end of year 12 as required. The corresponding milling schedule for the first five years of operations totals 4,200,000 t at a head grade d 2.22% Cg; the mill feed for the next five years is 4,200,000 t at a grade of 1.7% Cg. This is made possible by stockpiling 0.7 Mt of lower grade ore during the first five years of production and adding other 0.75 Mt to the stockpile during the next five years.

As additional information, mine planning was broken down on a quarterly basis for the pre-production period and the first two years of operations and annually thereafter. The corresponding end-of-period pit outlines are presented in Appendix I.

Finally, waste tonnage and marginal ore from the current mine plan can all be located mostly on the West waste disposal site and to a lesser tonnage on the South waste disposal site.

.

Table 16.2: Detailed Mine Plan

Phase 1 Ore	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	41	163	50	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	301
LG Grade (%)	1.37%	1.35%	1.42%	1.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%
HG Diluted Ore Tonnage (kt)	67	597	865	976	857	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,362
HG Grade (%)	1.82%	2.16%	2.30%	2.44%	2.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.36%
Total Diluted Ore Tonnage (kt)	108	760	915	1,024	857	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,663
Total Grade (%)	1.65%	1.98%	2.26%	2.40%	2.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.28%

Phase 2 Ore	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	93	-	-	-	59	595	459	526	479	103	13	-	-	-	-	-	-	-	-	-	-	-	-	-	2,328
LG Grade (%)	1.38%	0.00%	0.00%	0.00%	1.38%	1.42%	1.38%	1.36%	1.32%	1.33%	1.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%
HG Diluted Ore Tonnage (kt)	15	-	-	-	103	373	387	609	688	1,085	1,126	1,178	1,157	-	-	-	-	-	-	-	-	-	-	-	6,720
HG Grade (%)	1.66%	0.00%	0.00%	0.00%	1.85%	1.87%	1.92%	1.78%	1.80%	1.85%	1.97%	2.20%	2.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.02%
Total Diluted Ore Tonnage (kt)	108	-	-	-	162	968	846	1,135	1,167	1,188	1,139	1,178	1,157	-	-	-	-	-	-	-	-	-	-	-	9,048
Total Grade (%)	1.41%	0.00%	0.00%	0.00%	1.68%	1.59%	1.63%	1.59%	1.60%	1.80%	1.97%	2.20%	2.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.85%

Phase 3 Ore	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	2	-	-	-	-	-	-	-	-	-	-	-	-	209	284	487	461	440	173	86	58	90	76	46	2,413
LG Grade (%)	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.28%	1.31%	1.37%	1.40%	1.42%	1.45%	1.47%	1.42%	1.41%	1.38%	1.34%	1.38%
HG Diluted Ore Tonnage (kt)	-	-	-	-	-	-	-	-	-	-	-	-	-	18	25	33	123	202	537	652	706	685	678	195	3,853
HG Grade (%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.66%	1.66%	1.66%	1.77%	1.79%	1.83%	1.87%	1.99%	2.05%	2.00%	1.77%	1.92%
Total Diluted Ore Tonnage (kt)	2	-	-	-	-	-	-	-	-	-	-	-	-	227	309	520	584	642	710	739	764	775	754	241	6,266
Total Grade (%)	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.31%	1.34%	1.39%	1.48%	1.54%	1.73%	1.82%	1.94%	1.97%	1.94%	1.69%	1.71%

Total All Phases	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Total Tonnage (kt)	953	1,479	1,482	1,480	1,480	1,480	1,482	1,479	1,480	1,479	1,489	1,488	1,498	939	939	937	937	938	938	938	937	938	938	375	**28,504**
Waste Rock Tonnage (kt)	426	199	341	440	307	250	553	337	313	291	350	310	340	580	559	394	319	253	217	199	173	163	185	134	**7,636**
Overburden Tonnage (kt)	309	521	226	16	154	263	82	7	-	-	-	-	-	131	70	23	34	43	10	1	-	-	-	-	**1,892**
Strip Ratio	3.4	0.9	0.6	0.4	0.5	0.5	0.8	0.3	0.3	0.2	0.3	0.3	0.3	3.1	2.0	0.8	0.6	0.5	0.3	0.3	0.2	0.2	0.2	0.6	**0.5**
LG Diluted Ore Tonnage (kt)	136	163	50	47	59	595	459	526	479	103	13	-	-	209	284	487	461	440	173	86	58	90	76	46	**5,041**
LG Grade (%)	1.37%	1.35%	1.42%	1.38%	1.38%	1.42%	1.38%	1.36%	1.32%	1.33%	1.33%	0.00%	0.00%	1.28%	1.31%	1.37%	1.40%	1.42%	1.45%	1.47%	1.42%	1.41%	1.38%	1.34%	**1.38%**
HG Diluted Ore Tonnage (kt)	82	597	865	976	959	373	387	609	688	1,085	1,126	1,178	1,157	18	25	33	123	202	537	652	706	685	678	195	**13,935**
HG Grade (%)	1.79%	2.16%	2.30%	2.44%	2.45%	1.87%	1.92%	1.78%	1.80%	1.85%	1.97%	2.20%	2.38%	1.66%	1.66%	1.66%	1.77%	1.79%	1.83%	1.87%	1.99%	2.05%	2.00%	1.77%	**2.07%**
Total Diluted Ore Tonnage (kt)	218	760	915	1,024	1,019	968	846	1,135	1,167	1,188	1,139	1,178	1,157	227	309	520	584	642	710	739	764	775	754	241	**18,977**
Total Grade (%)	1.53%	1.98%	2.26%	2.40%	2.38%	1.59%	1.63%	1.59%	1.60%	1.80%	1.97%	2.20%	2.38%	1.31%	1.34%	1.39%	1.48%	1.54%	1.73%	1.82%	1.94%	1.97%	1.94%	1.69%	**1.89%**

Con't Table 16.2: Detailed Mine Plan

Ore Mined to Mill	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	-	109	8	-	-	112	-	-	-	-	-	-	-	-	-	487	461	440	173	86	58	90	76	46	2,146
LG Grade (%)	0.00%	1.38%	1.45%	0.00%	0.00%	1.42%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%	1.40%	1.42%	1.45%	1.47%	1.42%	1.41%	1.38%	1.34%	1.40%
HG Diluted Ore Tonnage (kt)	-	532	767	840	840	373	387	609	688	840	840	840	840	-	25	33	123	202	537	652	706	685	678	195	12,227
HG Grade (%)	0.00%	2.13%	2.32%	2.44%	2.45%	1.87%	1.92%	1.78%	1.80%	1.85%	1.97%	2.20%	2.38%	0.00%	1.66%	1.66%	1.77%	1.79%	1.83%	1.87%	1.99%	2.05%	2.00%	1.77%	2.06%
Ore Mined to Stockpile	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	136	54	42	47	59	483	459	526	479	103	13	-	-	209	284	-	-	-	-	-	-	-	-	-	2,895
LG Grade (%)	1.37%	1.29%	1.42%	1.38%	1.38%	1.42%	1.38%	1.36%	1.32%	1.33%	1.33%	0.00%	0.00%	1.28%	1.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.35%
HG Diluted Ore Tonnage (kt)	82	65	98	137	120	-	-	-	-	245	286	339	318	18	-	-	-	-	-	-	-	-	-	-	1,708
HG Grade (%)	1.79%	2.35%	2.17%	2.44%	2.45%	0.00%	0.00%	0.00%	0.00%	1.85%	1.97%	2.20%	2.38%	1.66%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.16%
LG Stockpile BOP Balance	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	-	136	73	115	162	222	705	712	1,007	1,335	1,438	1,451	1,451	1,451	1,660	1,496	1,177	921	724	594	494	418	353	267	18,361
LG Grade (%)	0.00%	1.37%	1.35%	1.37%	1.37%	1.38%	1.40%	1.39%	1.37%	1.35%	1.35%	1.35%	1.35%	1.35%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.35%
LG Stockpile Additions	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	136	54	42	47	59	483	459	526	479	103	13	-	-	209	284	-	-	-	-	-	-	-	-	-	2,895
LG Grade (%)	1.37%	1.29%	1.42%	1.38%	1.38%	1.42%	1.38%	1.36%	1.32%	1.33%	1.33%	0.00%	0.00%	1.28%	1.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.35%
LG Stockpile Withdrowals	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	-	117	-	-	-	-	452	230	151	-	-	-	-	-	448	319	255	198	129	101	76	64	86	267	2,895
LG Grade (%)	0.00%	1.35%	0.00%	0.00%	0.00%	0.00%	1.40%	1.39%	1.37%	0.00%	0.00%	0.00%	0.00%	0.00%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.35%
LG Stockpile EOP Balance	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
LG Diluted Ore Tonnage (kt)	136	73	115	162	222	705	712	1,007	1,335	1,438	1,451	1,451	1,451	1,660	1,496	1,177	921	724	594	494	418	353	267	-	18,361
LG Grade (%)	1.37%	1.35%	1.37%	1.37%	1.38%	1.40%	1.39%	1.37%	1.35%	1.35%	1.35%	1.35%	1.35%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	1.34%	0.00%	1.35%
HG Stockpile BOP Balance	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
HG Diluted Ore Tonnage (kt)	-	82	65	98	235	355	-	-	-	-	245	531	870	1,188	367	-	-	-	-	-	-	-	-	-	4,036
HG Grade (%)	0.00%	1.79%	2.35%	2.17%	2.33%	2.37%	0.00%	0.00%	0.00%	0.00%	1.85%	1.91%	2.03%	2.12%	2.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.09%
HG Stockpile Additions	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
HG Diluted Ore Tonnage (kt)	82	65	98	137	120	-	-	-	-	245	286	339	318	18	-	-	-	-	-	-	-	-	-	-	1,708
HG Grade (%)	1.79%	2.35%	2.17%	2.44%	2.45%	0.00%	0.00%	0.00%	0.00%	1.85%	1.97%	2.20%	2.38%	1.66%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.16%
HG Stockpile Withdrowals	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
HG Diluted Ore Tonnage (kt)	-	82	65	-	-	355	-	-	-	-	-	-	-	840	367	-	-	-	-	-	-	-	-	-	1,708
HG Grade (%)	0.00%	1.79%	2.35%	0.00%	0.00%	2.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.12%	2.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.16%
HG Stockpile EOP Balance	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
HG Diluted Ore Tonnage (kt)	82	65	98	235	355	-	-	-	-	245	531	870	1,188	367	-	-	-	-	-	-	-	-	-	-	4,036
HG Grade (%)	1.79%	2.35%	2.17%	2.33%	2.37%	0.00%	0.00%	0.00%	0.00%	1.85%	1.91%	2.03%	2.12%	2.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.09%

16.2 Mine Operations

Considering the relatively small tonnage mined yearly and the strong desire by Northern Graphite to limit upfront capital requirements, it was decided early in the Study to use contract mining as the basis for mine operations. Typically in Northern Ontario, different contractors will handle drilling and blasting operations and materials handling; often the first contractor can be a sub-contractor of the second one.

On the basis of 6 m benches, the chosen contractor will likely use drills capable of drilling 10-15 cm diameter hole on a pattern resulting in a powder factor of 0.8 kg/m3. Explosives would be entirely emulsion. Based on quotes obtained and review of actual contractors costs in current operations, drilling and blasting costs were estimated at CAD 0.85/t of waste and CAD 1.15/t of ore. The higher cost in ore is explained by the loss in productivity while drilling to allow sampling of cuttings at every meter in the mineralized zone and the need to adjust bench height to minimize dilution and ore losses from the inclined ore/waste contacts. It is also planned to conduct pre-shearing of the final pit walls and a cost of CAD 21/m^2 was estimated.

Loading and haulage operations will likely use 40-50 t-capacity trucks with 5-6 m^3 loading equipment. Overburden will be free-digging and blasted rock should have a maximum size of 0.6 m. The waste storage facility is on average 0.6 km from the pit ramp and the haulage distance from the pit to the primary crusher is 2.1 km. The maximum lift from the final pit bottom is 80 m and the maximum height of the waste storage facility is 25 m. Again, materials handling costs were estimated from contractor quotes and actual contractor costs and are presented in Table 16.3.

Table 16.3: Mine Operating Costs

	Overburden (CAD/t)	Waste (CAD/t)	Ore (CAD/t
Drilling & Blasting	-	0.85	1.15
Materials Handling	1.85	2.30	2.70

Materials handling include loading and handling, ramps preparation, bench and road maintenance, dump dozing and maintenance and mine dewatering (exc. Power).

The owner's representatives will be responsible for contract management, surveying and grade control; this will require three engineer / geologist / technician at a yearly cost of CAD 389,425.

17. PROCESSING METHODOLOGY

This section explains the design criteria and the processing steps to recover the graphitic carbon from the ore fed to the plant. A brief description of the flowsheet, including characteristics of the major process equipment, is provided.

17.1 Design Criteria

The design criteria for the Bissett Creek processing plant was based on Northern Graphite Corporation's ("Northern Graphite") direction and the results obtained from the metallurgical testing performed by SGS Lakefield during 2011.

The design criteria for the graphitic carbon processing plant were based on a continuous and homogenous feed of ore coming from the pit and the following parameters:

- Plant throughput: 839,500 Mt/yr (2,500 t/day);
- Plant circuit throughput: 104 t/h;
- Plant availability: 92%;
- Plant operating schedule: 365 d/y, 24 h/d;
- Crushing circuit utilization: 33%;
- Crushing circuit throughput: 315 t/h;
- Plant availability: 92%;
- Crushing ROM feed size: 80% minus 600 mm;
- SAG Mill feed size: 80% minus 170 mm; and,
- Flotation feed size (Flash cell): 80% minus 600 µm.

17.2 Flowsheets Development and Plant Description

The simplified flowsheet is presented in Figure 17.1; the proposed flowsheet does not contain any technological issues. All the processes selected are well established in the mineral processing industry. The general arrangement plan view is presented in Figure 17.2. The plant is located to be in proximity of the open pit mine to optimize the haulage distances, and in proximity to both tailings storage areas to reduce pumping distances.

17.2.1 Crushing and Reclaim

The run of mine ore will be hauled over a distance of approximately 2.1 km to the mill site. The ore will be dumped directly into the crusher feed hopper. When direct dumping is impossible, the ore will be stockpiled nearby and retrieved with a wheel loader.

A grizzly (611-GR-001) will be used to scalp the oversize rock coming from the mine. The grizzly will have 600 mm x 600 mm openings. A hydraulic rock breaker (611-RB-001) will be installed next to the grizzly/hopper assembly to break any oversized rock into smaller particles. The mine feed is then stored in a 140 t hopper (611-BN-001).

The hopper will feed an 11 m long x 2.3 m wide apron feeder (611-AP-001) operating on a variable speed drive. An inclined bar scalper (611-BS-001) will be used to screen the jaw crusher feed. The oversize of the bar scalper will fall by gravity into a 1,220 mm x 1,524 mm, 150 kW jaw crusher (611-CR-001) while the undersize, the crushed ore and the fines will be fed to a 1,220 mm wide, 11 kW sacrificial belt conveyor (611-CV-001). The sacrificial belt conveyor feeds the 916 mm wide, 45 kW stockpile feed conveyor (611-CV-002).

The crushed ore stockpile will have a live load capacity of 2,500 t, which is equal to the daily throughput of the processing plant. The reclaim equipment will be installed in a tunnel located under the stockpile. Two 6 m long x 1,2 m wide apron feeders (612-AP-001 & 612-AP-002) operating with variable speed drives will be used to feed the 915 mm wide, 30 kW SAG Mill feed conveyor.

Figure 17.1: Simplified Flowsheet

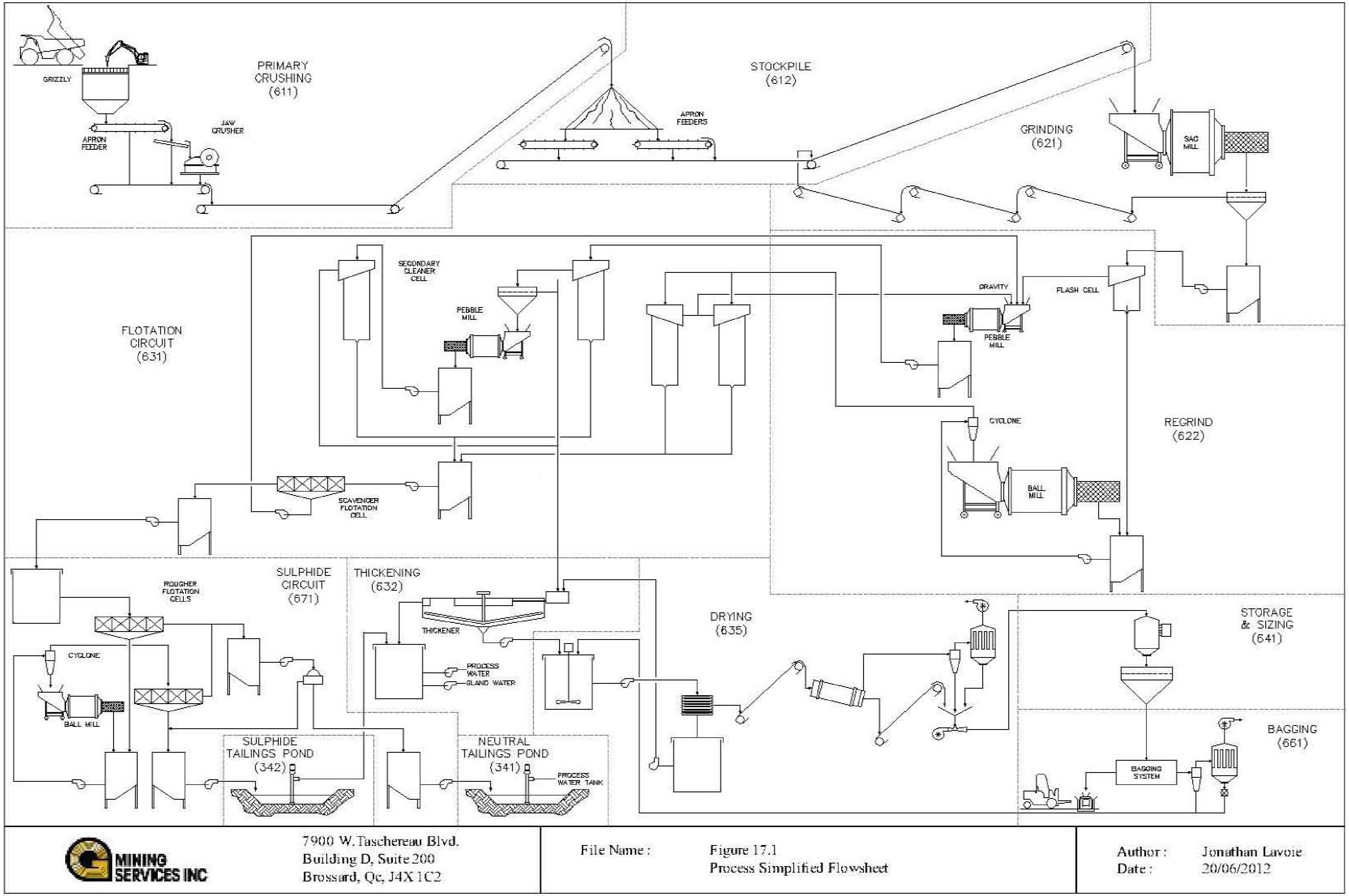
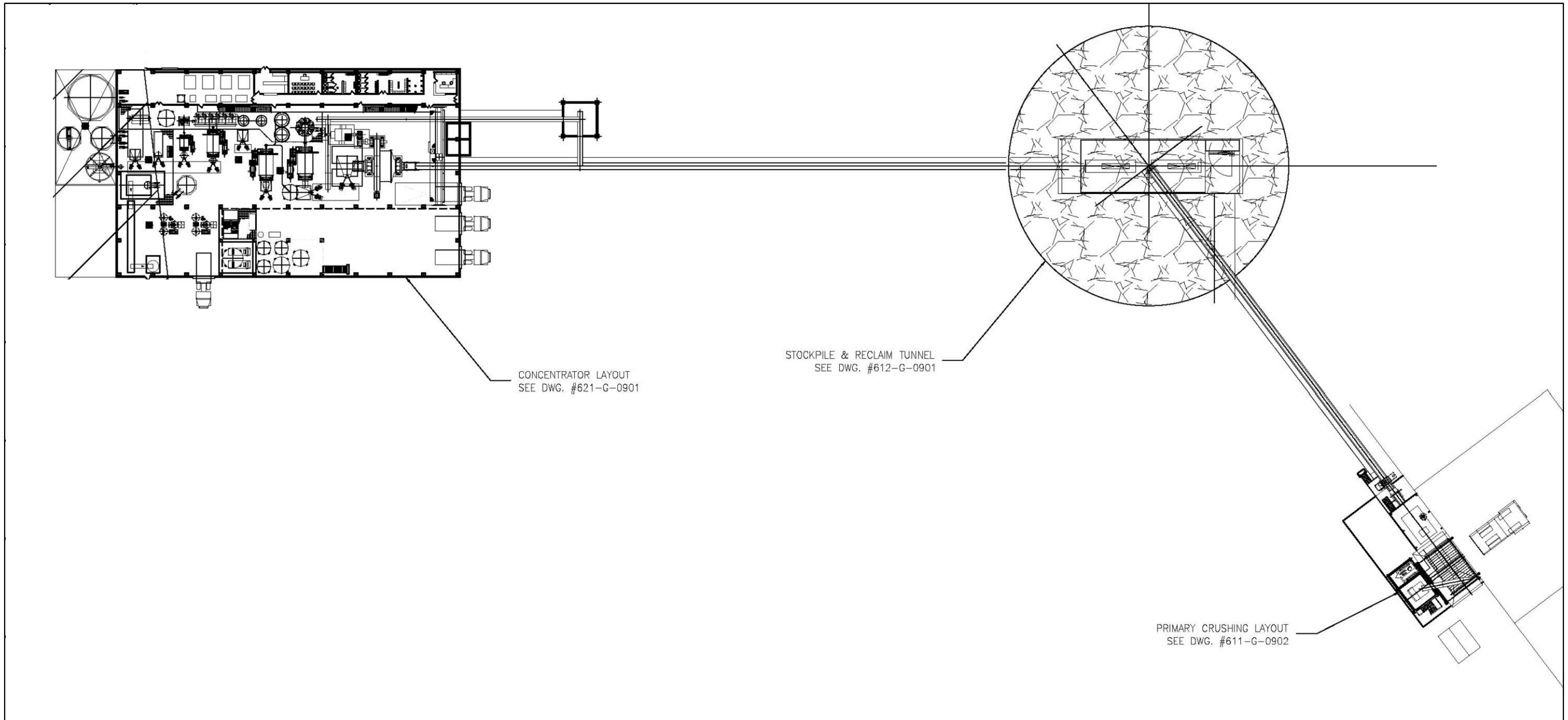


Figure 17.2: General Arrangement Plan View



MINING SERVICES INC.	7900. Taschereau blvd Building D, Suite 200 Brossard, QC J4X 1C2	**File Name:** **Figure 17.2** **General Arrangement Plan View**	**Author:** **Nicolas Ménard** **Date:** **August 16, 2012**

17.2.2 Grinding and Graphite Flotation

Primary grinding will be done by a 9 ft x 18 ft, 900 kW SAG mill (621-ML-001). The SAG mill discharges onto two (2) Simplicity 8 ft x 16 ft, double deck vibrating screens (621-SC-001, 002). On screen will be in operation while the second one will be a backup. The top deck has openings of 4.8 mm x 4.8 mm while the bottom deck's openings are sized at 1.2 mm x 25 mm. One (1) screen will be in operation while the second one will be stand-by. The discharge screen oversize is conveyed back to the SAG mill feed via three 610 mm wide belt conveyors (621-CV-001, 002, 003). The screen undersize is discharged to a pump box and pumped (621-PP-001, 002) to a 8 m^3 Outotec SkimAir-240 flash flotation cell (622-FC-001). An initial coarse grind is required to liberate the large flakes and minimize size attrition of the flakes.

Flash flotation cell concentrate is reground in a 7 ft x 10 ft, 150 kW pebble mill (622-ML-002) operating in open circuit. The pebble mill is operating with a light load such as to minimize degradation of the coarse graphite flakes. It is preferred to use small low density, non-metallic, spherical or short axis cylindrical grinding media, suitably 12.5 mm in diameter available commercially as Cylpebs. Such milling of the graphite concentrate serves to effectively polish the flakes surfaces so that resulting discharge from the mill may be easily concentrated, via flotation cleaners, to a level of 95% Cg.

The discharge of the regrind mill is being pumped (622-PP-003, 004) to the 1.22 m diameter x 6 m high flotation column primary cleaner (631-FC-003). Flash cell tailings are pumped (622-PP-001, 002) to a cluster consisting of 4 cyclones of 15 inches (with one cyclone stand-by) (622-CY-001). The cyclones underflow flows by gravity to a 10 ft x 16 ft, 700 kW regrind ball mill (622-ML-001). The overflow of the cyclones cluster reports to an arrangement of two (2) rougher flotation columns (631-FC-001, 002) of 1.83 m diameter x 10 m high. The tailings of the roughers are then directed to the scavenger flotation cell and then to the circuit final tailings.

The concentrate of the primary cleaner flotation column flows by gravity to a set of two Derrick Screens 1,220 mm x 1,524 mm, 210 microns (631-SC-001, 002). The screen oversize is sent to the 5 m diameter concentrate thickener (632-TH-001) as final product while the screen undersize is reground in a 7 ft x 10 ft, 150 kW pebble mill (631-ML-001) operating in open circuit. The discharge of the mill is pumped (631-PP-001, 002) to the 1.22 m diameter x 6 m high secondary cleaner (631-FC-004). Its concentrate flows by gravity to the concentrate thickener as final product. The tailings collected from the primary and secondary cleaners are pumped (631-PP-006, 007) to a scavenger bank of flotation cells (631-FC-005). The concentrate from the scavenger is pumped back (631-PP-008) to the primary pebble mill (622-MI-002) while the tailings report by gravity to the circuit final tailings to be finally pumped (631-PP-004,005) to the sulphides circuit.

17.2.3 Thickening, Filtering, Drying

Graphite concentrates from the secondary cleaner along with the primary cleaner +65 mesh fraction are allowed to settle in a 5 m diameter high-rate thickener (632-TH-001). The thickener is a free standing tank and its underflow is pumped by diaphragm pumps (632-PP-003, 004) to a 4-hour retention time holding tank (635-TK-001).

From the holding tank, the thickened concentrate is pumped (635-PP-004, 005) to a 158 m^2, 12 chambers filter press from Larox (635-FL-001). The filter cake will have a moisture content of approximately 15%. It will be conveyed (635-CV-001) to a 1.22 m diameter x 8.53 m long rotary dryer (635-DR-002) in order to reduce the moisture to less than 1%. The filtrate is pumped (635-PP-001, 002) back to the thickener. The thickener overflow discharges to the process water tank (632-TK-001). Process water will be distributed throughout the plant with the process water pumps (632-PP-001,002).

17.2.4 Graphite Storage and Sizing

Dried graphite discharges onto a 610 mm wide belt conveyor (635-CV-002) to feed a Macawber air transportation system (635-FA-001) to a 25 t bulk graphite bin (641-BN-001). The graphite discharges by gravity on a line-up of three (3) vibrating screens in series. Two (2) such line-ups will be installed. Each screen is 1.22 m x 1.83 m and manufactured by Derrick (641-SC-001, 002, 003, 004, 005, 006). The first screen will separate the graphitic flakes at +48 mesh. The second screen will separate the graphite flakes at +80 mesh The third screen will separate the graphitic flakes at +100 mesh.

Graphite flakes recovered from the oversize of the first screen (+48 mesh) and the oversize of the second screen (+80 mesh) will be transported by air transportation equipment to their respective 15 t storage bins. Graphite flakes recovered from the oversize of the third screen (+100 mesh) and the undersize of this third screen (-100 mesh) will be transported by pneumatic transfer systems to their respective 10 t storage bins. A fifth bin, with a 10 t storage capacity, will be available if one of the four (4) dedicated bins is full. Each storage bin will discharged by gravity to the bagging system. Rotary valves will be used at the discharge of each bin to feed the bagging system.

17.2.5 Bagging

The proposed bagging system for this project will be supplied by Cassier Engineering. The system includes a hopper and screw feeder (Flexicon system). The system also includes a bag handler, load cells and pallet roller conveyor. Bags will be of 1 t capacity. Once bags are full, they will be handled using a forklift and pallets. A graphite blending system will be installed to accommodate a wide range of products. The blended products will be available on demand.

A nearby storage area and racking will be available within the concentrator building to store the bagged graphite flakes. This will also be the loading area for trucks transporting the product to clients.

17.2.6 Sulphides Circuit

Tailings management requires that sulphides be separated from the tailings before being pumped to the tailings storage areas. Therefore, a sulphides flotation circuit will be used to eliminate more than 50% of the sulphides from the tailings stream thus producing chemically neutral tailings, which will be separately stored in a pond from a much smaller sulphide tailings pond.

Tailings are pumped (631-PP-004, 005) to a conditioner tank (671-TK-001) sized to allow for a two minute retention time. The conditioner overflows into a 4-cell Westpro DR 300 type flotation rougher (671-FC-001). Rougher tails are pumped to a magnetic separator, to remove pyrrhotite. The underflow of the magnetic separator is then pumped directly to the neutral tailings pond.

Rougher concentrate goes to a milling circuit consisting of one (1) 5 ft x 8 ft, 60 kW Ball mill operating with one cyclone. The cyclone overflow goes to a cleaner flotation cell. The concentrate of the cleaner cell is pumped (671-PP-005, 006) to a separate sulphides tailings pond.

17.2.7 Air Services

Compressed air will be required for instrumentation purposes and services throughout the concentrator building. Two (2) 94 kW screw compressors will be installed along with an air dryer and air receivers. One compressor will be in operation while one will be stand-by.

The flotation circuit also requires air input. The flotation columns will be fed by two 38 kW screw compressors while the flotation cells will operate with two air blowers. One compressor and one blower will be installed as stand-by.

A compressor will also be dedicated to the pneumatic transfer systems used in the drying and sizing areas.

17.2.8 Water Services

Water for process and services will be stored in one (1) tank located outside of the concentrator building. Process water will be recuperated from the thickener overflow, while fresh water will be reclaimed from the neutral tailings pond.

Recovered heat from the generators will be used in winter to prevent the water from freezing.

17.3 Reagents

17.3.1 Kerosene

Kerosene is the graphite collector; it will be purchased in 205 l drums and will be pumped directly to the SAG mill feed chute and to all pump boxes feeding the graphite flotation cells. Except for the addition of kerosene directly to the SAG mill, kerosene addition to the graphite circuit will be as required. Kerosene consumption is estimated at 159 g/t of ore milled.

17.3.2 MIBC

MIBC is the frothing agent and will also be purchased in 205 l drums and added to the holding tank (682-TK-001). MIBC will be pumped with dosing pumps (682-PP-001, 002, 003, 004, 005, 006) to the flash cell feed pump box and to all other flotation cells feed pump boxes in the graphite and sulphides circuits. Much like the kerosene, MIBC will be added to the graphite and sulphides circuits as required. MIBC consumption will be in the order of 88 g/t of ore milled.

17.3.3 Potassium Amyl Xanthate (PAX)

PAX is the sulphide collector and will be purchased in bulk bags and the solution will be prepared on site. A mixing tank (682-TK-002) and an agitator (682-AG-002) will be used to mix the chemical with water. The solution will then be transferred to the holding tank (682-TK-003) and pumped to the final graphite tailings pump box by a dosing pump (682-PP-010). The consumption of PAX will be in the order of 100 g/t of ore milled.

17.3.4 Flocculant

Flocculant will be bought in bulk bags and the solution will be prepared on site by a flocculant make-up package system such as SNF-Floerger. The flocculant will be transferred to a mixing tank (685-TK-002) and pumped to the holding tank (685-TK-001). A dosing pump (685-PP-001) will deliver the solution to the thickener feed well. Flocculant consumption will be in the order of 10 g/t of ore milled.

17.4 Process Control

Mill operation will be monitored by electronic control and instrumentation. A versatile PLC ("Programmable Logic Controller") interface will be installed in the mill control room.

17.4.1 General

The process control system is designed to support the following design objectives:

- Safety of personnel and equipment; and,
- Support maintenance staff in achieving high plant availability and provide data required for optimal maintenance management.

17.4.2 Description

The process control system is organized in three categories (levels);

- Level ''0'' - Field Networks and Instruments: (I/O Instruments, motor starters and drives, local control panels, remote I/O racks, PLCs provided with mechanical package);
- Level ''1'' - Equipment Control and Measurements: Consists of the gathering and diffusion of field signals and the processing of these signals for control purposes. (Integration functions, sequencing, timing, calculations, discrete logic, analogue and data acquisition); and,
- Level ''2'' - Process Control and Supervision: Consists of the Human-Machine Interface that will allow the operator to communicate with Equipment, transmitting commands via the main PLC processor. This also comprises the system that monitors trending and development, and will archive process data for later retrieval / analysis.

17.4.3 I/O Instruments

Field instruments ("inputs and outputs") are connected to PLCs to allow process monitoring (sensors) and control (actuators). A decentralized I/O architecture employs a series of standardized remote I/O racks located in proximity of field components (reducing control cable lengths). They are interconnected with optic fiber communication cables to a centralized PLC. This reduces the overall cable trays requirements. Remote I/O cabinets will respond to the corresponding Main PLC.

17.4.4 Motor Control Centers

Motor Control Centers ("MCCs") are used to control full voltage motors and Variable Frequency Drives ("VFDs") are used for variable speed motors. Motors are remotely controlled by the process control PLC via Ethernet communication. Every MCC bucket is provided with a communications device allowing full remote motor monitoring, control and protection.

17.4.5 Programmable Logic Controllers (PLC)

The PLC monitor status of all equipment and instruments. A program executes all functions and logic sequencing to operate the equipment as required and execute commands coming from the process control supervision. Programs are fully documented using tags and descriptors. Comments are included to clarify the programming. Programming is structured to simplify maintenance.

17.4.6 Process Control Supervision

Process Control Supervision is achieved by the human-machine Interface ("HMI"). The HMI is installed in the main control room to permit the remote control of the process plant area. Every PLC panel and remote I/O will have a local HMI installed on the panel door. This HMI is used to control motors locally.

17.4.7 Fiber Optic Cables

The optic fibre cables are used as the plant communications backbone. It is not affected by the electro-magnetic interference ("EMI") produced by power cables. Optic fibre cables can be installed in the same cable trays as the power cables, reducing installation and cable tray cost. Every PLC and remote I/O panel is interconnected with optic fibre cables.

17.4.8 Safety and Equipment Protection

Control systems shall be designed such that failures of any component or process equipment will cause the system to react in such a way that damage to equipment and injury to personnel will be prevented and operational equipment will not be left in an unsafe condition.

No equipment, motor or process shall automatically restart after a fault or after the clearance of an emergency stop. The control circuits shall be designed with safety in mind and therefore all controls shall be fail-safe.

17.5 Operating Modes

All equipment will have a pop up window indicating the operating mode, amps and status of motor. On major equipment, the process interlocks will be listed and unsatisfied interlocks will be indicated. If a motor trips due to motor protection, the fault will be display on pop up window.

The status of motor starter will be identified on the motor control pop up window.

17.5.1 Manual / Auto

When operating on Manual Mode, the control room operator will operate equipment using the HMI screen start and stop button. This mode considers safety and process interlocks. The Local/Remote selector must be set to Remote mode.

When operating on Auto mode, the equipment are operated by the PLC based on field conditions. This mode considers safety and process interlocks. The Local/Remote selector must be set to Remote mode.

17.5.2 Local / Remote

The Remote mode is used by the control room operator. In this mode the operator will select between the Auto mode or Manual mode. The control room operator is the only person to operate this function.

The Local mode permits operation of the equipment locally without any process interlocks. Safety interlocks remain. The local mode is used primarily for maintenance purposes. In order to transfer equipment into local mode, the maintenance technician must communicate with the control room operator and request that the control room operator make the switch to Local mode. When maintenance is complete, the control room operator must be contacted again to return to remote mode.

17.5.3 Lockout Equipment Information

The maintenance technician will request the control room operator to switch the equipment to local mode (for maintenance). Motor Starter status shall be indicated on the local touch screen. If the motor starter is energized, the message ‘’ In Service ’’ shall be visible in black on green background. If the motor starter is de-energized ‘’ Out of Service ‘’ shall be visible in black on red background. This information is useful when equipment need to be locked out. The same information is displayed on the control room HMI pop up window for each individual motor.

This information screen should be consulted in the lockout procedure to ensure the correct equipment has been locked out. Final confirmation of lockout should be an attempt to start the equipment in local mode which bypasses all operation interlocks.

18. PROJECT INFRASTRUCTURES

18.1 General

This chapter covers all of the infrastructures, ancillary buildings and support systems required to complement the operations. Most of the facilities listed below will be built during construction, while others require upgrades from their current state.

18.2 Communications

The site is currently serviced by a telecommunication provider. However, the location of the processing plant and the services buildings suffers from poor service. Upgrades will be required during construction and the operation phases.

Internet and land lines services will be supplied through a satellite dish. The dish will be installed on the roof of the processing plant. From there, internet and phone services will be distributed by hard wire and wireless signal throughout the processing plant building. Overland optic fibre will be used to provide services to remote locations such as the pumping station at the fresh water pond, reclaim water pumping stations at the sulphides tailings pond and at the neutral tailings pond and to ancillary buildings.

A signal booster will be installed to provide better coverage as well as cellular phone services to the area. Cellular phones will be the main communication channel during the construction period. During operation, cellular phones will be required for emergency situation and to facilitate communication between staff members.

A radio transmitter will be installed on the property to provide radio communication for the mining department. A repeater tower will be required to allow radio coverage to the pit, tailings area and tailings ponds. Radios will be provided in all mining equipment and pick-up trucks. The dispatch office will be located in a portable office trailer, located close to the concentrator building. It will be equipped with radios to facilitate the coordination of the mining fleet. Health and safety agents and environmental personnel will also be provided with a portable radio.

18.3 Roads

Access roads already exist to the property but upgrades are required on most of them. Additional roads will also be required to service the tailings, the pit and the crushing plant. Knight Piésold Consulting (“KP”) conducted an assessment on the roads required for the project. This document is provided in Appendix L.

18.3.1 Haulage Road

The routing of the haul road as shown in Figure 18.1 will be north-south and follow the pit on its western edge. It will follow the eastern side of the main waste rock stockpile, and extend 2 km from the pit to the crusher feed hopper. It will also stretch south to the existing facilities, which will be used as the mining contractor's offices and maintenance facilities. A second waste dump is also planned 1 km south of the pit. These roads will be built with mine overburden material and cut material. The crown will be crushed aggregate and used as final grade. The road will be12.2 km wide and 3 km long. The maximum slope design will be 8%.

Two (2) culvert water crossings will be necessary. Culverts will be used at all water crossings.

18.3.2 Access Road

The site is accessible by the Bissett Creek Road (Figure 18.1). This existing road is currently used by loggers and local residents. During project implementation, upgrades will be required. Drainage and signage will be improved; tree cutting will be needed to improve visibility as well as proper crowning with proper aggregate. These upgrades will be executed on the 11 km section from Highway 17 to the junction with the road providing access to the processing plant access road.

From the existing Bissett Creek Road, a new 4 km road will be built as well as proper signage in order to access the processing plant site. It will be used by personnel during construction as well as for transportation and operations. The road will be built with waste material from mine pre-production. Crushed aggregate will be used for the final grade.

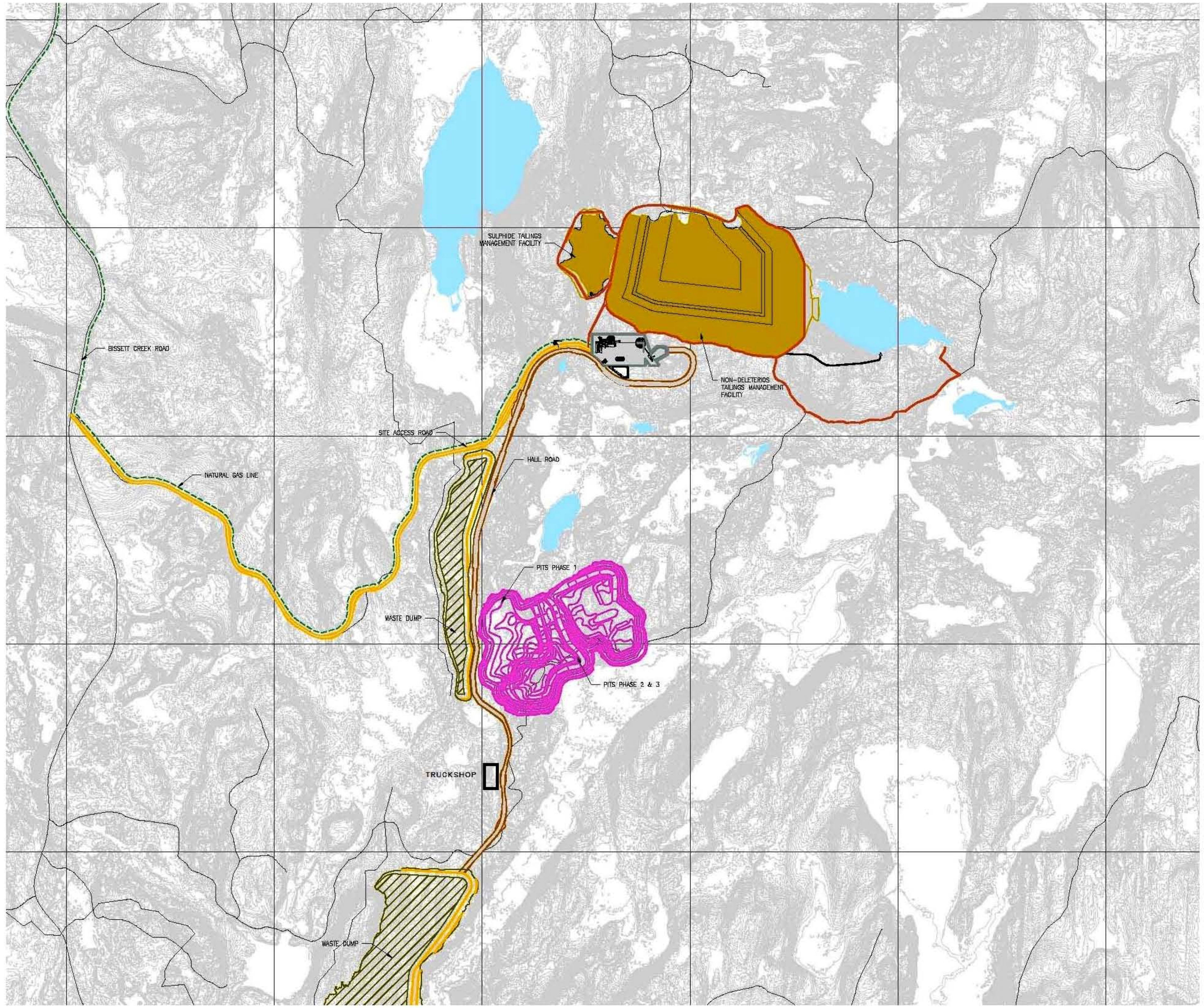
A total of three (3) culvert type water crossings will be required. Culverts will be used at all water crossings.

18.3.3 Services Roads

The processing plant will be linked by road to the two (2) tailings areas. This road will circumscribe both the neutral tailings pond and the sulphides tailings pond, and will allow light vehicles to circulate over the tailings dams. This road will be used for construction of the ponds, for pipeline installation, power line installation and for general maintenance during operation.

A road will also be built to access the pumping station at Blimkie Lake. A section of road will be built to link the water control weir on Blimkie Lake's eastern edge to the existing road surrounding the property.

Figure 18.1: infrastructures General Arrangement



The width of the roads will be 8.2 m. It will be built with waste from the mining pre-production and from overburden from general earthwork during the construction period. Final grading will be completed with crushed aggregate.

18.4 Water

The monthly precipitation in the Deep River area is shown in Table 18.1:

Table 18.1 Monthly Precipitation (mm)

Month	Mean
January	71
February	59
March	65
April	68
May	84
June	92
July	100
August	94
September	113
October	95
November	94
December	78

18.4.1 Reclaim Water

Water will be reclaimed from both tailings ponds. The sulphides tailings pond reclaim water station will provide the process water tank with a constant flow of 5.7 m^3/hr. The pumping station will consist of two (2) pumps with a capacity of 5.7 m^3/hr and 2.25 kW each. One (1) pump will deliver the flow while the second one will be stand-by. The pipeline will be made of a 75 mm HDPE line. The overall piping distance will be 800 m. In the event of heavy rain or flood, a stand-by pump with a design pumping rate of 200 m^3/hr will be installed to provide water to the plant and avoid discharge to the environment.

The neutral tailings pond reclaim water station will be located on the southern shore of Blimkie Lake. Water will be pumped to the process water tank. Two (2) pumps will be installed, each providing a pumping capacity of 167 m^3/hr. One (1) pump will deliver the flow while the other one (1) will be stand-by. The Blimkie Lake pumping station will supply water to the process water tank and to the fire water tank. A small diesel generator will be installed as backup power.

18.4.2 Mine Dewatering

Mine dewatering will be executed with diesel motor driven pumps. One (1) pump will be required, and a second pump will be available as backup. Each pump will have the capacity to pump the estimated water for the worst month of the year. From past data, the months from June to September are the wettest month for mine dewatering. However, the largest amount of water to be pumped will occur during snow melt. It is expected that 38 m^3/hr will be pumped during that period. One pump will be in operation while the second one will be stand-by. Water from mine dewatering will be directed to a settling pond with percolation water from the waste dumps. Overflow from the settling pond can be used in the mill or discharged in the environment if it meets quality requirements.

18.4.3 Sewage

The sewage and waste water generated from the site sanitary services will be treated through a sewage treatment plant, as proposed by Seprotech. The system, a containerized aerator and digester circuit, has proven its efficiency in similar climates. Discharge water quality will meet federal and provincial regulations.

18.4.4 Potable Water

Groundwater will be pumped from two (2) wells, drilled close to the processing plant, and pumped to a potable water treatment plant. The treatment plant is containerized and will have a treatment capacity of 19 l/min. Treated water will be distributed through the potable water network. The potable water network will supply the showers, wash rooms, lunch rooms and the laboratory.

18.5 Tailings Management Facilities

The Tailings Management Facilities will be located north of the process plant facilities (Figure 18.1).

Two (2) tailings ponds will be required. One (1) facility will be used to store the sulphides tailings, while the second one will store the non-deleterious neutral tailings. KP conducted a study on tailings management. The detail of their work is provided in Appendix L.

18.5.1 Non-deleterious Neutral Tailings Pond

The non-deleterious neutral tailings pond will store 97% of the total volume of the tailings generated by the processing plant. The initial construction will consist of three (3) embankments, located on the east, south and west sides of the pond area. The starter dams will be built to an elevation of 296.5 m during the initial construction period. The dam height will then be increased on a yearly basis.

Additional dams will be required on the northern side of the tailings pond. The non-deleterious Tailings Management Facility will be sufficient for 15.5 years of production, at a 839,500 tpy throughput at the plant.

After 15.5 years, the non-deleterious neutral tailings will be pumped to a mined-out open pit and stored there, until closure.

The east embankment will be built with semi-permeable material to allow seepage of the water from the tailings pond area to Blimkie Lake. In addition to the seepage of water through the east embankment, a floating barge with two (2) vertical turbine pumps will be installed. Each pump will be driven by a 56 kW electric motor and provide a pump rate of 350 m^3/hr. In normal circumstances, one (1) pump will be in operation and one (1) will be stand-by. Should heavy rain or snow melts flood the pond, both pumps will be available to work simultaneously. A discharge pipeline will be designed to allow both pumps to operate at the same time. The discharge pipeline will be installed from the barge to Blimkie Lake.

18.5.2 Sulphides Tailings Pond

The sulphides tailings pond will store 3% of the total volume of tailings produced by the processing facilities. The pond will be located on the western side of the non-deleterious neutral tailings pond. Tailings will be submerged below the water level, in order to avoid physical contact with ambient air. A one (1) m water cover will be kept above the tailings level.

During the construction period, the starter dams will be built at an elevation of 313 m. Four dams will be built: one (1) on the north side, one (1) on the south side, one (1) on the east side and one (1) on the west side. Each dam will be lined with a 100 mils HDPE liner, to avoid seepage of water from the tailings pond to the surroundings.

The pump will be operated to avoid any discharge to the environment. The volume capacity of the pond will be designed so that any major flood can be contained inside. Excess water will be pumped back to the mill.

Additional works during operations are required to elevate each on the four (4) dams to reach a final elevation of 316.5 m. These works will be completed by the end of year 2.

The sulphides tailings pond will be in use for the first 12 years of operations. After the twelfth year of operation, the sulphides tailings will be pumped to a mined-out open pit and submerged in water.

18.5.3 Blimkie Lake Weir

Water from the non-deleterious neutral tailings pond will seep through the east embankment or be pumped from the tailings pond. This water will flow to Blimkie Lake. As described in sub-section 18.4.1, the processing plant will use water from the sulphides tailings reclaim water pumps and from the Blimkie Lake pumping station. KP provided a preliminary design of this infrastructure, which is available in Appendix L.

The water balance shows that 167 m^3/h of water will be provided from Blimkie Lake, and 5.7 m^3/h of water will be provided by the sulphides reclaim pumps. In order to keep the water level high enough in Blimkie Lake, a water level control weir will be built on the east side of Blimkie Lake. Water level will be maintained between 283.5 to 284.4 m.

The weir will be made of concrete. A stop log control gate structure will be provided and a walkway will be installed to allow maintenance crews to access the stop log structure.

18.6 Stormwater Pond

In order to control spills that may occur at the processing plant or the surrounding area, the final grade of the plant area will drain towards the south. A stormwater pond will be built to collect rain water and other possible spills. The pond will be located between the processing plant pad and the haul road as shown in Figure 18.2.

Should water contained in the pond be contaminated, portable pumps will be used to pump the contaminated water back to the processing plant or to the tailings management facilities. If need be, contaminated water could also be trucked out of site to treatment facilities.

18.7 Fuel

Delivery of fuel will be done by tankers. Fuel will be stored in ISO approved tanks. Two (2) horizontal tanks of 50,000 l each will be installed close to the truck shop. A total of 100,000 l of storage will be available to the mine fleet and the mobile equipment.

18.8 Power Supply and Distribution

Power for the project will be produced by natural gas generators. A gas pipeline from Enbridge Inc. ("Enbridge") will be built to supply the power plant. Heat recovery from exhaust gases and from the cooling water loop will also be implemented for costs savings.

18.8.1 Power Plant

The proposed power plant will consist of five (5) generators with individual outputs of 1 MW each at ISO conditions. The design of the power plant is to meet an average power demand of 3.3 MW and a peak demand of 4 MW of electrical power, with one (1) generator installed as stand-by. The plant will operate under an N+1 philosophy.

Proposals have been requested from several vendors. The selected proposal was for General Electric – Jenbacher JMS 320 GS-NL generators. In addition to producing electrical power, the generators exhaust and cooling water will run through a heat recovery system. This energy will be used in the process dryer, for heating of the buildings and for heating of the water required for showers and sanitary services. The generators will provide power with an output voltage of 4,160 V at 60Hz. The generators will be connected to the power plant switchgear. Upon a "black start", a smaller 400 kW generator will supply the power required to energize the power plant auxiliaries necessary to start the first 1 MW generator and also other essential loads of the power plant. Once a natural gas generator is operating, the black start generator is switched off-line.

18.8.2 Heat Recovery

To reduce overall operation costs, heat recovery at the power plant is a major aspect of this project. Two (2) sources have been identified to reduce gas and electricity consumption: jacket cooling water and exhaust gases.

The waste heat available within the exhaust gases will be used in the graphite drying circuit.

Exhaust gases will be pushed to an air/air exchanger. The clean hot air will then go through the rotary dryer, while the exhaust gases will be released to the atmosphere. The recovered heat from two (2) generators' is sufficient to complete the drying process.

A natural gas burner will be installed on the rotary dryer as a backup only.

The generator jacket cooling water will be used for heating of the buildings and water services. The cooling water, exiting the generators' enclosures, will be pumped to water/glycol heat exchangers. Water for the showers and services for the concentrator building will be pre-heated by glycol. Space' heating will be through the use of glycol heating coils. Electricity output from two (2) generators is sufficient for the peak monthly consumption, expected in the coldest month of the winter.

Since four (4) generators will be spinning during operations, additional energy is available for future expansions.

18.8.3 Natural Gas Line

Northern Graphite Corporation ("Northern Graphite") received a proposal from Enbridge to supply the project with natural gas. A 17 km natural gas pipeline of 100 mm diameter will be built to supply the power plant.

The tie-in with the existing pipeline will be located at the intersection of the Bissett Creek Road and Highway 17. A metering station will be installed south of Highway 17. Two pressure regulators will be provided on the distribution line. The gas pressure will be reduced three times through pressure regulators before being consumed at the power plant and processing plant. The required gas pressure at the power plant is 5 PSI. The pipeline will follow the Bissett Creek Road and the access road to site, as shown in Figure 18.1. The modulating valves and regulators station will be located beside the power plant area.

Distribution to each generator at the power plant and within the concentrator building will be done through overland piping. Natural gas will be required for the boilers as well as for the graphite dryer as backup only.

Enbridge has conducted a Preliminary Assessment for the construction of the pipeline. Their findings are provided in Appendix K – Natural Gas Pipeline Assessment.

18.8.4 Power Distribution

Power distribution throughout the property will be via overhead power lines at 4,160 Volts. Lines will be built to feed the following areas:

- Sulphides pond reclaim pumps;
- Blimkie Lake reclaim pumps;
- Crushing plant;
- Fuel storage area; and,
- Neutral Tailings Management Facility.

18.9 Buildings and Services

This section describes the buildings and services required to support the operation.

18.9.1 Truck Shop

An existing maintenance facility is located at the current pilot scale processing plant. This building will require upgrades. Power will be required, and insulation will also be improved. This installation will be available to the mining contractor, for minor maintenance works, spare parts storage and will also provide the mining staff with office space. The truck shop is located approximately 650 m south of the pit (Figure 18.1).

18.9.2 Warehouse

The warehouse will be located south of the processing plant building (Figure 18.2). It will be a 35 m long x 18.2 m wide canvas-type building, as proposed by MegaDome. It will be used for cold storage; a small workshop could be installed inside the building if needed. It will be equipped with two (2) garage doors. This warehouse will also be used during construction for long term storage of critical equipment.

18.9.3 Main Offices

The main offices will be located within the process plant building. It will consist of:

- Fifteen (15) single occupancy offices;
- One (1) multiple occupancy office;
- Two (2) lunch rooms and wash rooms;
- One (1) conference room; and,
- Senior and administration staff.

Senior and administration staff will be located on the third level. Foreman and operation staff will be located on the second floor; the control room will also be located on the second floor. A training room will be available of the first floor.

18.9.4 Dry and Change Room

Change rooms will be provided to both male and female staff. They will be located on the first floor of the processing plant, close to personnel entry.

18.9.5 Laboratory

The laboratory will be located on the second floor inside the process plant building. The laboratory will consists of a sample receiving / preparation room, a metallurgical lab room and an assay lab, including the LECO analyser room.

Two (2) working stations will be available for the laboratory staff. Dust collection hoods will be installed over each counter. A dust collector, located in the mechanical room on the first floor, will be used to remove dust and particles from ambient air.

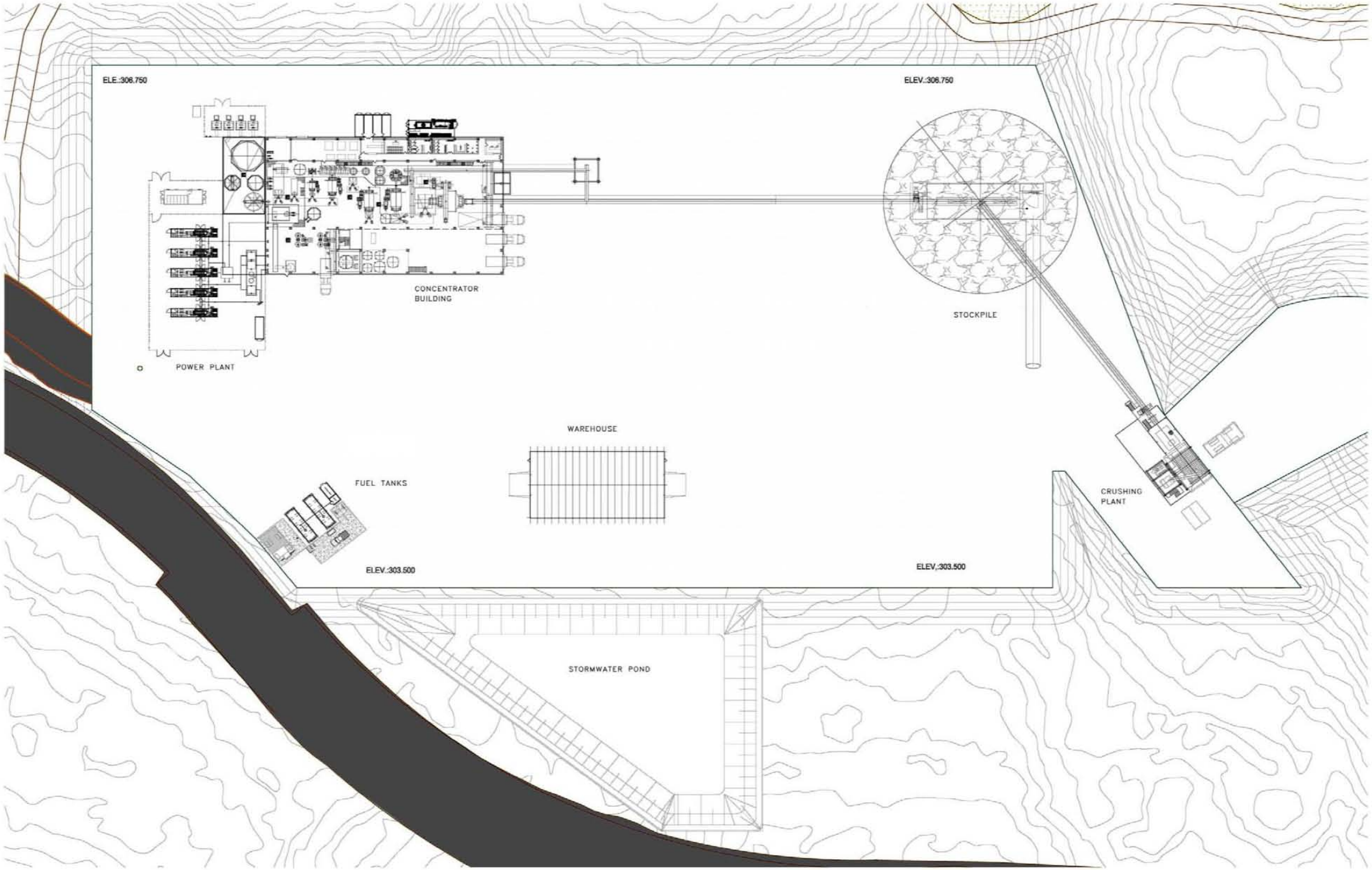
18.9.6 Shops and Services

A mechanical room and tool crib will be built in the north-west corner of the processing plant. This room will house water pumps, compressors, air dryer, air receivers, flotation blowers, HVAC equipment and dust collector for the laboratory.

18.10 Camp

No room and board facilities will be built for this project. Lunch rooms will be provided to workers and personnel.

Figure 18.2: Ore Handling Processing General Overall Site Layout



18.11 Fire Protection

The fire protection network will be supplied from the fresh water tank. Three (3) distribution pumps will be installed: One (1) diesel pump, one (1) electric pump and one (1) jockey pump. A 400 m^3 capacity fire water tank will be used as first line defense in case of fire emergency. The generator heat recovery system will maintain the tank above freezing and heat tracers will be installed where necessary.

These pumps will be located in the processing plant building's mechanical room. Fire protection piping in the processing plant will be provided by water cabinet and sprinklers pressurized by the fire protection pumps. Fire extinguishers will be added inside the concentrator building.

Buried HDPE pipes will provide fire protection to ancillary buildings such as the cold storage building, the LFO storage area and the crushing plant. Fire cabinets and fire extinguishers will be installed inside the concentrator building. Sprinklers will be installed inside the warehouse. As all conveyors are located outside, conveyors with hoods will be protected by a dry fire protection system.

A total of nine (9) fire hydrants will be distributed around the property's main installations, such as the warehouse, the diesel storage area, the crushing plant, the power plant and the concentrator building.

Each generator will be protected by an individual system. Each system will be stored in a nearby 40' container.

18.12 Security

A security office will be located at the entrance of the processing plant. Security officers will verify the identity of the workers or visitors. No metal detectors will be installed. One (1) gate house will be located close to the processing plant. Security checks on vehicles requesting access to the property will be executed from this building.

19. MARKET

Information on the natural graphite market was based on the following reports:

- *"Flake Graphite Market Study, with Emphasis on the Bissett Creek Deposit, Ontario, Canada"* by Peter H. Hawken Inc., January 2008;
- *"The Economies of Natural Graphite",* 7th Edition Roskill Information Services, 2009;
- *"Graphite – Black Gold of the 21st Century",* Industrial Alliance Securities, May 2012; and,
- *"The Natural Graphite Report – Executive Summary",* Industrial Minerals Magazine, August 2012.

Graphite is a natural form of carbon characterized by its hexagonal crystalline structure. It occurs naturally in metamorphic rocks such as marble, schist and gneiss. The same element crystallizing in an octahedral system becomes a diamond. It is a lustrous black carbon mineral, unctuous, and relatively soft with a hardness of 12 on the Moh's scale. It occurs naturally in the earth's crust and is the most abundant form of pure carbon.

It is an excellent conductor of heat and electricity and has a high melting temperature of 3,500^{o}C. It is extremely resistant to acid, chemically inert and highly refractory. Because of these underlying physical and chemical properties, there is a global market for graphite. This commercial market is composed of three distinct type of graphite:

- Flake Graphite: From extra large flake (+48 mesh to fine flake (+200 mesh).
- Amorphous Graphite: Less than 200 mesh in size;
- Crystalline Lump Graphite (mind source);

19.1 Supply

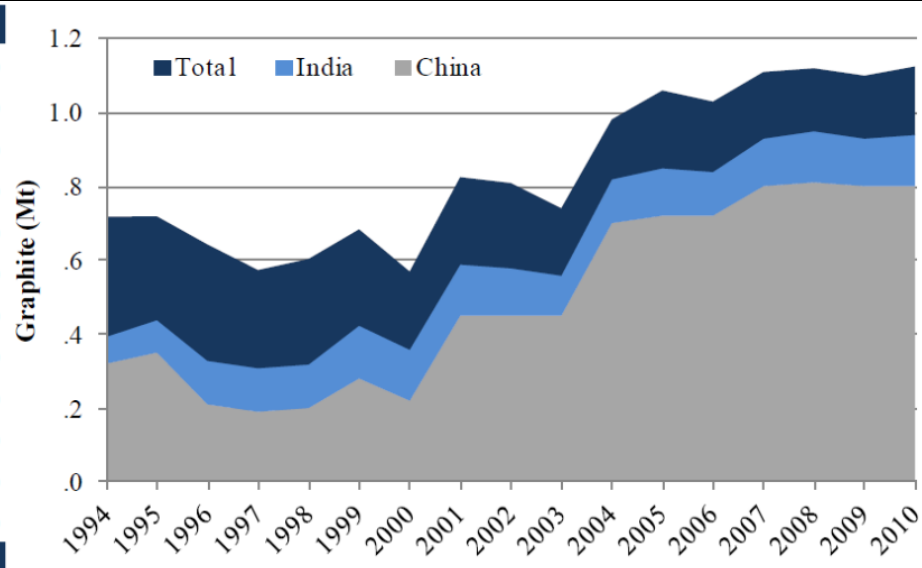
As reported by Industrial Minerals, the natural graphite supply was 1,019,000 t in 2011, including 565,000 t as flake graphite and 450,000 t as amorphous graphite.

Recent production of natural graphite has come predominantly from China (over 70%) and India (12%) as shown in Figure 19.1. Even if China has the largest reserves and could continue to grow its production, Chinese production has been flat in recent years; this is explained by the introduction of a 20% export duty, a 17% VAT, new regulatory and environmental measures and consolidation of the existing producers. It appears that Chinese government policies currently discourage the export of raw materials in favor of value-added products. This capping of Chinese production and exports at the time of growing demand explains the improved pricing experienced in the last five years.

In response to higher prices, the majority of new supply is expected to come from Canada and Brazil. Under its Base Forecast, Industrial Minerals expects supply to reach 1,347,000 t by 2016 for a 32% increase over five years.

Figure 19.1: Production of Natural Graphite

Country	Production (t)
Brazil	76,000
Canada	25,000
China	800,000
India	140,000
North Korea	30,000
Madagascar	5,000
Mexico	7,000
Norway	2,000
Romania	20,000
Sri Lanka	8,000
Ukraine	6,000
Other Countries	185,000
Total for 2010	**1,125,000**



Source: Industrial Alliance Securities Inc.-USGC

19.2 Demand

Based on the production profile on Figure 19.1, it can be concluded that demand was relatively stable through the 1990s, but grew at 4-6% per year starting in 2000. This growth was explained by increased consumption of graphite in both the traditional use of graphite mainly due to accelerated development in the BRIC countries and from advances in the use of graphite in high technology.

Industrial Minerals reports that 80% of natural graphite demand is driven by industrial applications. The dominant market, with 39% of demand, is refractories which is in turn dependant on steel and refined metal production. Demand for refractories is expected to maintain its share of the market going forward. Brake linings, foundries and lubricants represent about 26% of demand; increased use of graphite in friction materials, packings and gaskets was driven by reduced use of asbestos globally.

Industrial Minerals indicates that batteries are the fastest growing market for graphite with growth at 15-25% per year; consumption is driven by requirements for portable electronics (mobile phones, smartphones and tablets). A significant and growing portion of demand comes from high-tech applications because of its use in batteries as anode material; natural graphite anodes are favored by all battery technologies. The battery sector is predicted to increase its share of graphite consumption from 8% to 10% in the next five years. The introduction of electric vehicle batteries may create a significant impact in the future, especially vehicles requiring batteries of 10 kWh and above.

Industrial Minerals projects a Base Case demand of 1,235,000 t of natural graphite in 2016 with a Bullish Case of 1,528,000 t for a possible increase of 16-44% over five years. Also the refractories and batteries sectors require the same grade of medium to large flake graphite (+80 mesh, +85% C), which will correspond to the major portion of the Bissett Creek graphite concentrates and should assist its marketing because of its proportionally higher demand.

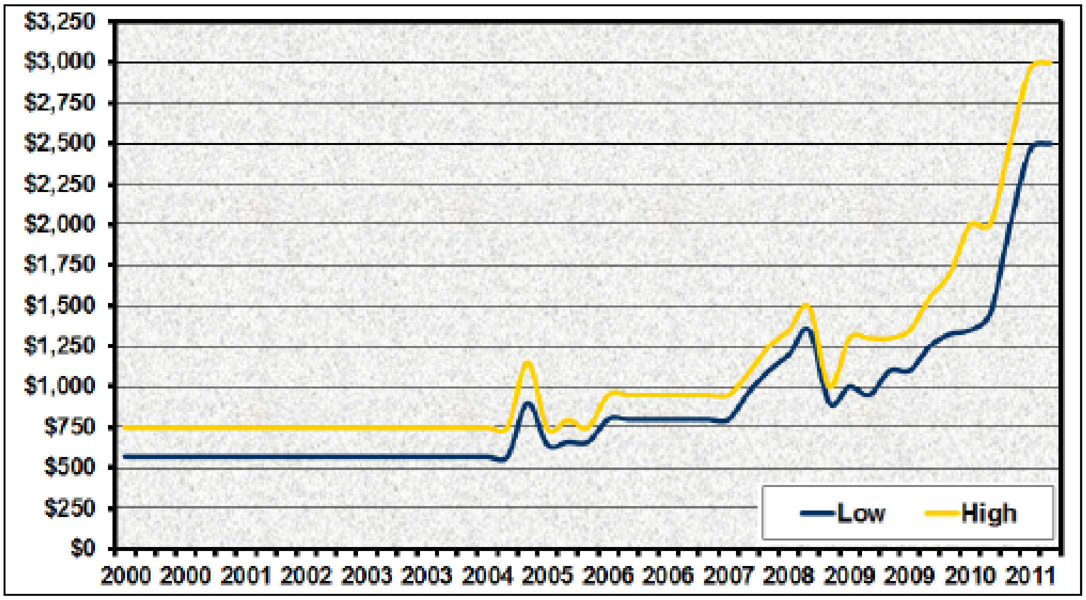
19.3 Prices

Like most industrial minerals, natural graphite is not traded on any commodity exchange. Prices are negotiated on a contract basis between producers and consumers. A number of factors are incorporated into the price, including carbon content, presence of ash or impurities, flake size, location of the market, and the quantity of graphite purchased. Well-established producers, with guaranteed consistency can demand higher prices than a new, unknown supplier. In the case of flake graphite, size and distribution of flakes is an important factor. Flake graphites command a premium over amorphous graphite, particularly those containing large size flakes or with high carbon content.

Graphite prices are published by the periodical Industrial Minerals Magazine, as an indication of market position with a high and low value reflecting the carbon content and overall quality of the product. The quoted prices are on a basis of CIF European port. Since Northern Graphite targets the Americas for selling its products, the CIF European port prices should correspond to FOB Bissett Creek and the land transportation would be absorbed by the client.

Figure 19.2 presents graphite (Large flakes + 80 mesh, 94-97% C) prices for the 2000-2011 period. During Chinese total domination of the market, prices were stable for relatively long period of time.

Figure 19.2: Graphite Price 2000-2011: Large Flake +80, 94-97% C



Source: Industrial Alliance Securities Inc.

Starting in 2006 when Chinese production stabilized and demand continued to increase strongly, normal market forces of supply and demand impacted prices. Major price increases were experienced from 2006 to mid-2011, with some fluctuations in 2008-2009 caused by the global financial crisis and deep recession. This re-adjustment of prices was also common to most metals, minerals and commodities in general during that period and can be explained by higher energy prices and general inflation, currency appreciation in producing countries, and difficulties and time lags in bringing new production on streams; Following some consolidation among producers, it appears that more discipline has also prevailed on the supply side.

Figure 19.3, Figure 19.5 and Figure 19.4 present graphite prices, as reported by Industrial Minerals, for the three standard products expected from Bissett Creek; in addition to the above standards, blended products will be added to the Bissett Creek product mix. Recently graphite have declined for the first time in three years due to softening in the Chinese economy and its effects on the steel industry, and to weak economies in the US and Europe.

Figure 19.3: Historic Prices; +80 mesh Graphite Flakes

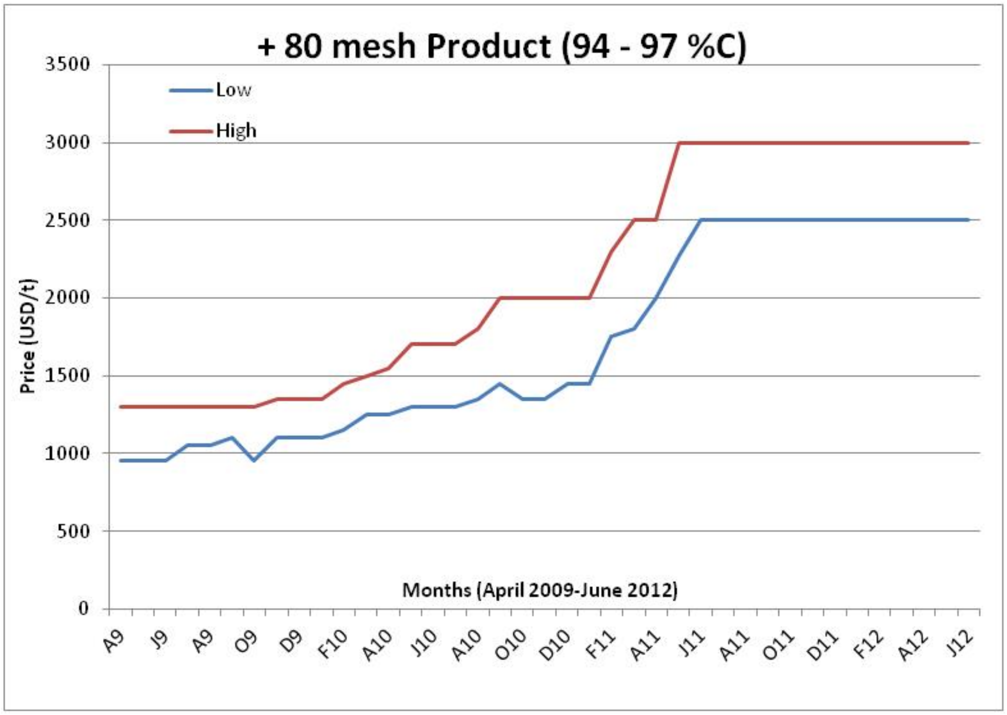


Figure 19.4: Historic Prices; -80 / +100 mesh Graphite Flakes

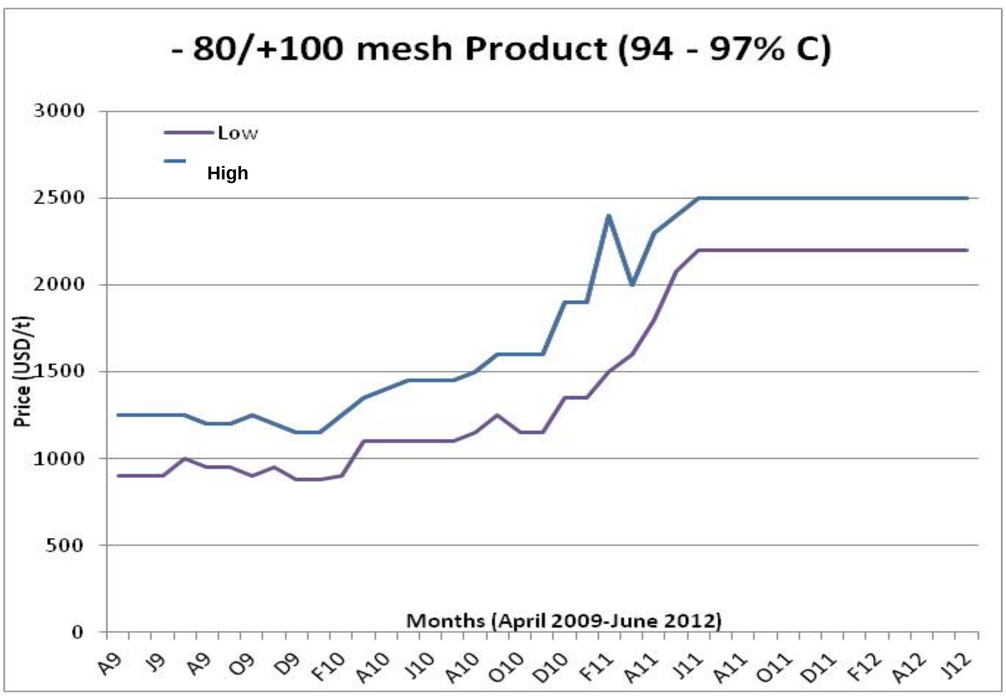
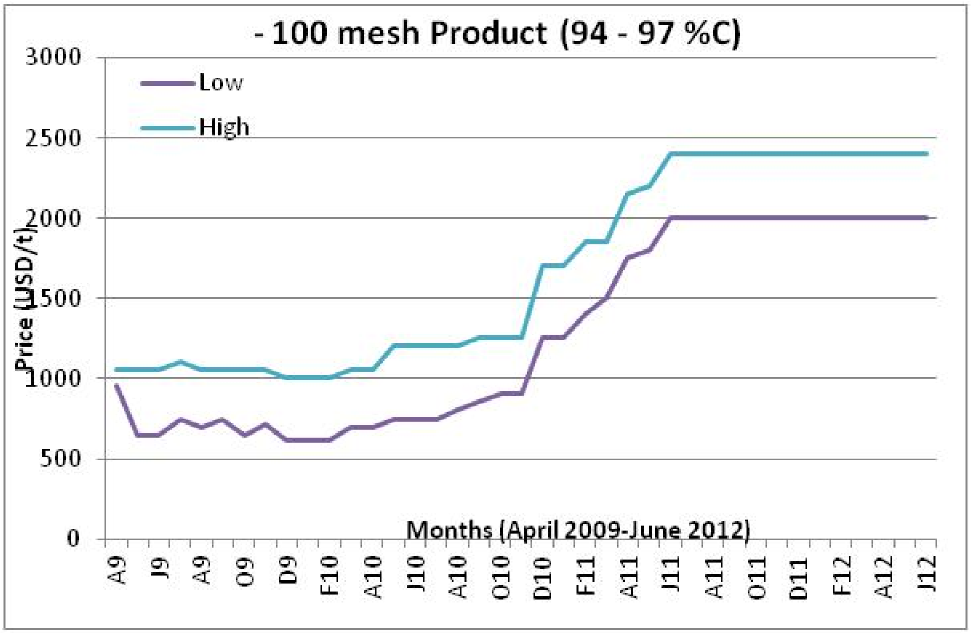


Figure 19.5: Historic Prices; -100 mesh Graphite Flakes



Like for all commodities, it is near impossible to forecast accurately future prices for graphite. However, the increased demand of commodities mostly due to economic growth in developing countries has caused a major impact on pricing as supply is lagging demand in most markets. It is believed that this situation will also prevail on the graphite market because new supply in industrial minerals is particularly difficult to finance due to its of lack of visibility and relatively small markets.

The Study considered prices reported by Industrial Minerals for the three relevant products shown in Figure 19.3, Figure 19.4, and Figure 19.5. It was also taken into account that premiums in excess of CAD 600/t could be available for the concentrates of very large flakes, such as the +50 mesh (XL) and the +32 mesh (XXL) fractions, which can represent almost 50% of Bissett Creek total production. Obviously, we used the concentrate flake distribution and grades determined from metallurgical testing and reported in Section 13 and presented in Table 19.1 follows.

Table 19.1: Concentrate Flake Distribution and Grades

Product Size	Grade % C	Distribution %
+48 mesh	95.1	48.4
+80 mesh	94.5	28.2
+100 mesh	97.3	4.8
-100 mesh	94.8	18.6

Because of the many variables involved and the recent recalibrations of the graphite market, it was decided to retain four price scenarios to assess the value of the Bissett Creek Project. Scenario 1 represents the last 24-months average graphite price for the likely combination of standard and blended products from Bissett Creek. Scenario 3 is based on the last 12-months average. Finally, a premium paid for the extra large flake graphite would increase the average realized price for the entire production by USD 200/t of concentrate in Scenarios 2 and 4.

Table 19.2: Graphite Prices

Description	USD/t
Scenario 1: 24 months average	2,100
Scenario 2: 24 months average + premium	2,300
Scenario 3: 12 months average	2,600
Scenario 4: 12 months average + premium	2,800

Consequently, Scenario 1 is the least favorable and Scenario 4 is the most favorable financially.

20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACTS

20.1 Introduction

To support the early phases of project planning, data from recent baseline characterization programs completed in 2010 to 2012, as well as information from historical studies dating back to 1988 were utilized. The characterization studies completed include; hydrogeology, hydrology, aquatic environment, terrestrial environment, climate and meteorology and geochemistry.

The baseline study programs were conducted to identify the potential impacts envisaged during the construction, operation and closure of the Bissett Creek Project. The characterization programs focused on defining specific components including; aquatic environment, terrestrial environment, hydrology, hydrogeology, meteorology, air quality, and geochemistry (acid rock drainage and metal leaching prediction). These findings were integrated into the project designs to reduce, and to the greatest extent possible, avoid potentially adverse environmental impacts.

Northern Graphite Corporation (“Northern Graphite”) engaged the federal and provincial governments early in the planning process. Inter-agency meetings were held in Pembroke in 2011 and 2012. In addition, Northern Graphite used letters, e-mails and phone calls to communicate Project updates. Comments received during the consultations with the provincial and federal governments were integrated into the Project Description. For instance, pre-consultations with the Department of Fisheries and Oceans and Transport Canada resulted in the re-design of the Neutral Tailings Management Facility out of Blimkie Lake.

A draft Project Description was sent out to the Canadian Environmental Assessment Agency (“CEAA”) and the Ministry of Northern Development and Mines (“MNDM”) March 2, 2012. The Project Description was circulated to the various provincial and federal government agencies for review. Following the review Northern Graphite received confirmation that the Project, as defined in the Project Description, is not subject to the Ontario Environmental Assessment Act or the Canadian Environmental Assessment Act.

It should be noted that the construction of the natural gas pipeline will likely require Environmental Assessment coverage under the Ontario Environmental Assessment Act; however, the permitting, construction and maintenance of the pipeline is being carried out by Enbridge Inc.

20.2 Geology and Geomorphology

20.2.1 Geology

The Bissett Creek graphite deposit occurs in a belt of the Ontario Gneiss, a segment of the Grenville Province of Pre-Cambrian rocks of the Southern Canadian Shield. The main rock type is a quartzofeldspathic gneiss which is reportedly an upper amphibolite grade of metamorphism. The Ontario Gneiss is distinguished from other formations in the Grenville by having a dominant northwestern foliation.

Ontario Geological Survey mapping in 1976 by S.B. Lumbers reports that the property area is underlain by Middle Pre-Cambrian metasediments. These are gneisses with medium to coarse-grained, quartz, biotite-k-feldspar and quartz plagioclase feldspar units. The beds are highly deformed and lie in northwest trending, northeast dipping recumbent folds. A significant amount of remobilization of quartz and feldspar occurred during the metamorphism and as much as 10% of the rock is migmatite.

For mapping purposes on the property, the rocks are divided into graphite gneisses, transitional graphite gneisses and barren gneisses. The graphite gneiss occurs as a pale yellow to brown weathering surfaces on some hilltops and in occasional cliff faces. It is described by Lumbers as calcareous quartz-feldspar gneiss with minor biotite and amphibole. The samples taken by Ainsworth-Jenkins Holdings Inc. returned low calcium values, suggesting that some of the graphite mineralization had only minor carbonate content. Minor iron sulphides and biotite are the main sources for the light limonitic colouration of the characteristic weathered surfaces. The graphite content of the gneiss is difficult to estimate in hand specimen because it tends to be aligned as flakes parallel to the foliation. Viewing such a foliation plane shows the graphite to advantage and it is easy to overestimate the grade on such a surface. Drill results indicate that the bulk of the graphite occurs with a graphitic carbon grade of between 1% and 10%.

The graphite gneiss horizon has a thickness of approximately 75 m as demonstrated by drilling. In the area of the drilling, it dips eastward at 5 to 25 degrees. The graphite horizon is sandwiched between an upper barren non-calcareous gneiss and a similar lower unit. These are pale to dark green units with biotite, dark green amphiboles and red garnets.

The transitional gneiss is an intermediate unit that has muscovite and biotite with mauve garnets in the quartz-feldspar gneiss. This may occur near the foot wall and hanging walls or as small lenses within the graphitic gneiss horizon. The lenses are not large enough to cause significant dilution during mining and could be separated by a shovel operator as waste by virtue of the colour contrast.

Two minor intrusive units were identified on the surface within the claims. These have been emplaced as minor dykes and sills of lamprophyre and migmatitic quartz-feldspar pegmatites with biotite and muscovite.

The Bissett Creek graphite is a metasedimentary deposit of unspecified sub-type. The original sediments were probably carbon rich - low iron sandstones that either developed crystalline graphite from the confined metamorphism and destruction of the carbonates or from the reworking of carbonaceous material in the sediments.

20.2.2 Physiography

The Project is located within the Ottawa-Bonnechere Graben on the Canadian Shield close to the Ontario-Quebec border. The Project is situated on rolling hilly terrain with the elevation ranging between 270 to 320 metres above sea level (masl). The Project is situated within the Msl-R (Monteagle - Rock) soil complex which is composed of sandy loam (Monteagle), rock outcrop, peat and muck (Canadian Department of Agriculture, 1964). Overburden depth on the property is variable ranging from 0 to 10 m thick in areas covered in peat. Drainage is typically good but is poor in areas of low elevation that have predominately organic soils.

20.3 Acid Rock Drainage Potential

Acid Rock Drainage (“ARD”) and Metal Leaching (“ML”) are naturally occurring processes and historically go hand in hand with mining operations. Materials containing high quantities of sulphides tend to have high ARD and ML potential. Acid generation occurs when minerals containing sulphide and elemental sulphur are exposed to the weathering effects of oxygen and water. Mining activities such as blasting, excavating, crushing and processing greatly increase the surface area of sulphide-bearing rocks which promotes ARD and ML.

20.3.1 Previous Acid Rock Drainage and Metal Leaching Investigations

Erickson Environmental Consultants Limited investigated the geochemistry of the ore and waste rock in 2004 (Terra Technical Services Ltd, 2004). Graphitic zone, gneissic zone and barren zone samples were analysed. Based on the tests, an overlap between the three zones in terms of ML and ARD potentials was observed; none of the samples tested were completely void of ARD or ML potential. The graphitic, gneissic and transition zone samples showed potential to generate acidic drainage on exposure to oxidizing conditions. Based on these studies it was determined that natural leaching may release aluminum, boron, zinc and iron at concentrations exceeding Ontario Provincial Water Quality

Objectives (“PWQO”). Based on these results it was apparent that control measures would be required to minimize potential environmental impacts related to the management and storage of tailings, waste rock and ore on the Bissett Creek property.

20.3.2 2011 – 2012 Acid Rock Drainage and Metal Leaching Results

Following the results of the previous ARD/ML studies completed by Erickson Environmental Consultants Ltd., Northern Graphite initiated another ARD and ML characterization program in 2011. The purpose of the additional geochemical studies was to further characterize the ARD and ML potential of the waste rock and tailings.

As mentioned above, it was determined that the sulphides tend to be associated with the ore. This relationship allows the majority of the sulphides to be removed during processing by adding a separate sulphides circuit to the mill process. The separation of the sulphides results in the creation of two tailings streams; a sulphide tailings stream and a neutral tailings stream. Geochemical testing was completed on the neutral tailings and waste rock; test results are discussed below.

Underwater storage of the sulphide tailings was chosen as the most effective means of preventing ARD and reducing ML. Underwater storage of tailings is recommended as an effective way to reduce and/or prevent ARD and ML. Due to the low solubility of oxygen in water, underwater disposal can reduce sulphide oxidation, thus reducing acid generation and ML to levels that do not give rise to environmental concern. Monitoring of the surface water quality within the sulphide TMF will be conducted to ensure that the sulphide materials remain stable over time.

20.3.3 Waste Rock

Twelve rock samples, initially identified as waste rock, were analysed in 2011. The rock samples were obtained by a geologist from various drill core. The 12 samples were subjected to various tests including, Modified Acid Base Accounting (“ABA”), Whole Rock Analysis, Synthetic Precipitation Leach Tests (SPLP 1312), trace metal analysis and Net Acid Generating tests.

The total concentrations of metals in the samples were compared to the average crustal abundances (Price et al, 1997). Only cadmium (Cd) exceeded the average continental crust abundance by greater than 10 times (one order of magnitude). This indicated the potential for this metal to be released into the environment from the waste rock represented by these samples. All other metals were considered similar to average crustal abundance and were observed to be within one order of magnitude.

Results from the NAG and NAG leachate tests indicated a range of 0 to 2 kg H_2SO_4/t at NAG pH 4.5 and at NAG pH 7 the results ranged from 0 to 4.8 kg H_2SO_4/tonne. The NAG pH ranged from 3.52 to 7.6. Based on these results the majority of the rock samples tested can be classified as non-acid generating. Samples J162120, J162121 and J162125 did show acid generating potential.

SPLP leachate test were performed on the rock samples. The final pH of the samples tested ranged from 5.56 to 9.44 which are outside of the PWQO levels for surface waters. Other PWQO exceedances include: aluminum (Al) in all samples tested; iron (Fe) in the majority of the waste rock samples tested; and cobalt (Co) in one of the samples tested.

The results of the modified ABA test indicate that the majority of the samples tested have a sulphide content <0.2% except for sample J162120. The samples contained total sulphur concentrations of 0.013 to 0.381%. The NP/AP ratios ranged from 0.89 to 18.8 and the NPP ranged from -1.08 to 9.47 t $CaCO_3$/1000 t. These test results indicate that the rock ranges from potentially acid generating to uncertain and non-potentially acid generating based on screening criteria adopted from MEND, 2009.

Based on the results of these tests samples, J162120, J162121 and J162125 would be classified and handled as low grade ore and not as initially identified as waste rock. The material represented by these samples would be segregated from the waste rock and temporarily stockpiled adjacent to Waste Rock Storage Area A. This low grade ore would be processed through the mill. Drainage from this temporary low grade ore stockpile will be monitored and directed to a settling pond near the Open Pits and used in the mill as process water.

20.3.4 Neutral Tailings

Northern Graphite retained SGS Minerals Services ("SGS") to analyze tailings samples from the pilot plant test. A bulk sample was collected and sent to SGS for analysis. The neutral tailings were assessed for their potential for ARD and ML. The various kinetic and static tests performed on the tailings included; Modified Sorbek ABA, SPLP 1312, Humidity Cell and NAG tests. A Humidity Cell test was initiated at SGS Lakefield on May 24th, 2012. The Humidity Cell test is being conducted on a sample of neutral tailings to simulate the long-term weathering reactions and to predict the future potential for ARD and ML.

Net-Acid Generating (NAG) analysis was conducted on the non-sulphide bearing pilot plant tailings material with a reported 0 kg H_2SO_4/t (pH 4.5 and 7.0). The final pH of the test effluent was reported at 7.48 therefore these results indicate that the tailings will not be acid generating. Furthermore, the non-sulphide tailings were also tested for their ABA potential. The reported NP/AP ratio of 3.76 indicates that the tailings are potentially non-acid generating.

Effluent leaving the Tailings Management Facilities will be required to meet the levels established within the Environmental Compliance Approval ("ECA") issued by the Ministry of the Environment.

20.4 Air Quality

Air emission sources from the Project will include power generation, mining operations, ore handling, transport and processing, as well as waste rock handling and transport. Particulate matter, predominantly consisting of PM_{10} (particles less than 10 microns in diameter) is an air quality contaminant of concern for the Project. Particulate matter, primarily as fugitive dusts, will be generated from mining activities within the open pit (drilling, blasting, and loading of haul trucks), and from haul truck traffic along the haul roads (road dust). Mitigation of fugitive dusts will be completed through the implementation of a Fugitive Dust Best Management Practices ("BMP") Plan which will identify the potential sources of fugitive dusts and outline the mitigation measures that will be implemented to control dust generation. Respirable particles $PM_{2.5}$ (particles smaller than 2.5 micron in diameter) will be produced to a lesser extent from vehicle exhausts and mobile equipment.

Project related emissions from fuel combustion in mining equipment, haul trucks and the power plant will include CO, CO2, NOx, and SO2. Fuel use will be continuous throughout the construction and operations phases. After closure, no further greenhouse gas emission will occur.

The current baseline conditions in the Project area are representative of a rural wilderness setting with no local sources of air contaminants. Air quality, in terms of ozone and $PM_{2.5}$, is monitored by the MOE in Petawawa, which is 66 km to the east of the Project. The Petawawa station rates air quality as predominantly good to very good. Moderate air quality is reported occasionally, usually due to elevated levels of ozone. A station in North Bay, 110 km to the west of the Project, has air quality index levels similar to Petawawa. There are no Ministry of Environment ("MOE") stations close to the Project which monitor CO or SO_2.

The MOE have ambient air quality criteria ("AAQC") and point-of-impingement air quality standards for various contaminants, including target pollutants associated with mining projects. Point-of-impingement standards for Project facilities are set out in O. Reg. 419/05, however, discharge of contaminants from motor vehicles, for example haul trucks, are exempt from this regulation. Preliminary dispersion modeling for the proposed natural gas power plant indicates that NO_X concentrations, at point of impingement, the current Project property boundary, will be significantly less than the 24-hour threshold of 200 $\mu g/m^3$ set out in O. Reg. 419/05. The modeling results are presented in Appendix J. The AAQC criteria would be used to assess the significance of any effects of emissions from all Project components. The ambient air quality limit is the maximum concentration at the closest off-site receptor used for assessing impacts and compliance.

20.5 Noise

The MOE identifies three classes of acoustic environment, with regard to the assessment of sound produced by industrial operations, and to classify ambient background noise environments (MOE 1995). These classes are defined by the MOE as follows (MOE, 1995):

Class 1 Area: means an area with an acoustical environment typical of a major population centre, where the background noise is dominated by the urban hum.

Class 2 Area: means an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 Areas, and in which a low ambient sound level, normally occurring only between 23:00 and 07:00 hours in Class 1 Areas, will typically be realized as early as 19:00 hours.

Other characteristics which may indicate the presence of a Class 2 Area include:

- Absence of urban hum between 19:00 and 23:00 hours;
- Evening background sound level defined by natural environment and infrequent human activity; and,
- No clearly audible sound from stationary sources other than from those under impact assessment.

Class 3 Area: means a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as the following:

- A small community with less than 1000 population;
- Agricultural area;
- A rural recreational area such as a cottage or a resort area; or
- A wilderness area.

The Bissett Creek Graphite Project is best classified as a Class 3 Area due to the remote location and the fact that there are no existing industries or developments at the site.

The appropriate environmental sound level guidelines are found in the MOE Publication NPC-232, “Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)”. The acoustical descriptor used is L_{eq}, which is the Energy Equivalent Continuous Sound Level based on an averaging of the sound energy over a defined time period. The time period referenced in the MOE guidelines is one hour.

No mitigation is required for any source that does not exceed 45 dBA (one hour L_{eq}), at any off-site receptor of concern between the hours of 0700 and 1900 hours. Between 1900 and 0700 hours, the limit is 40 dBA. The 40 dBA and 45 dBA limits are referred to as the “minimum exclusion” limits.

20.6 Hydrology

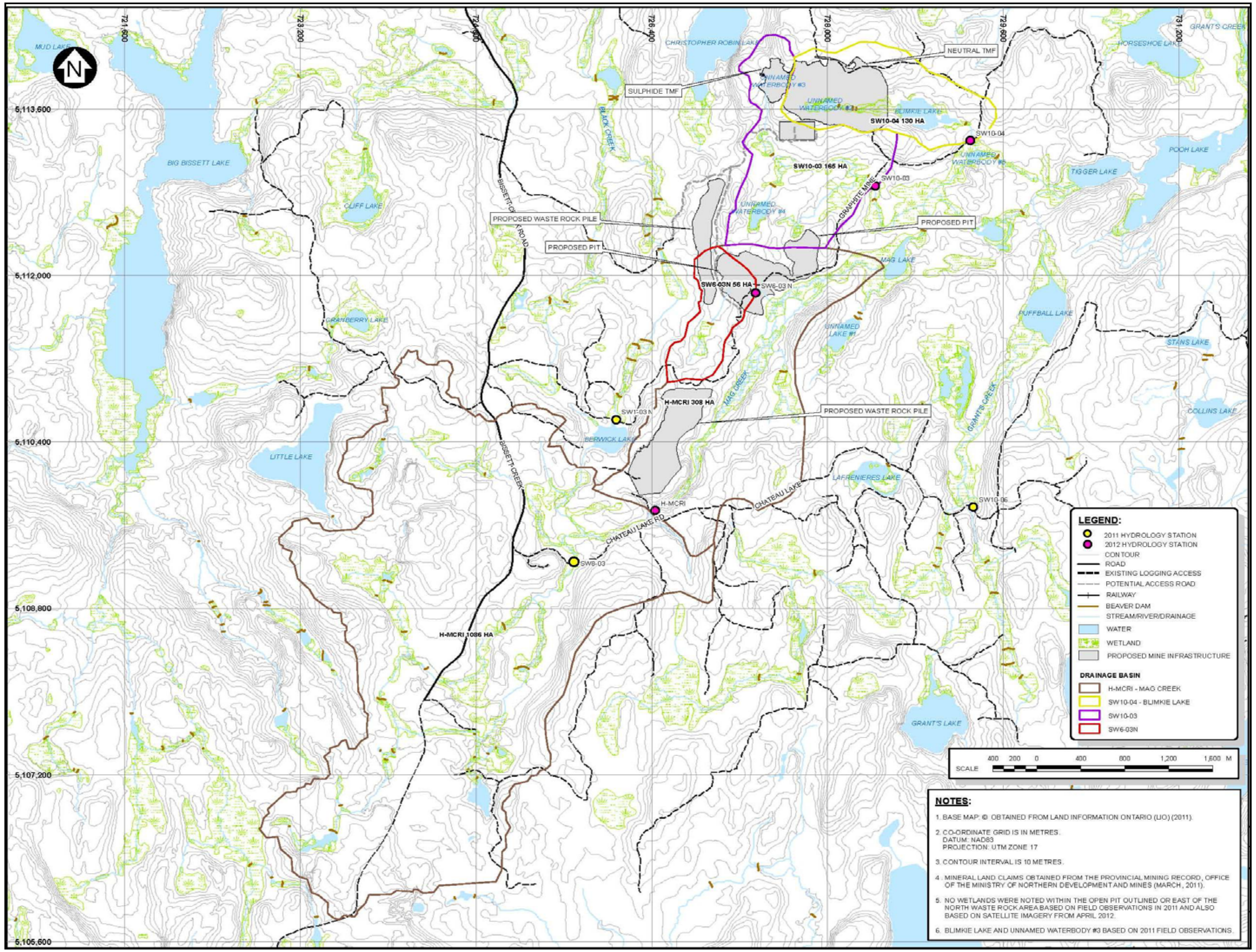
Several components of the Project, such as the Tailings Management Facilities, Plant Site, Waste Rock Areas and the open-pit are located within the Grant’s Creek watershed. The proposed access road is located in the Bissett Creek watershed and crosses Black Creek. Streams within the Bissett Creek and Grant’s Creek watersheds are relatively low gradient. Stream flow is lowest in winter and smaller streams freeze completely to the bed. Stream flow is highest during the spring freshet which is driven by snowmelt and spring rains over frozen ground. Flow recedes through the summer and increases with fall rains. Both the Grant’s Creek and Bissett Creek drain north into the Ottawa River. The streams located within the Bissett Creek property drain to the east and eventually drain into Grant’s Creek.

Stream flow dynamics are influenced by wetlands, small lakes and beaver ponds. The storage provided by these reservoirs attenuates peaks in flow and increases evaporation loss. Moreover, flood events can occur due to beaver dam failure.

The main Project components are located in several sub-basins of the Grant's and Mag Creek watersheds (Figure 20.1) Seven hydrometric monitoring stations were established in 2011 to monitor stream flow (Figure 20.1). Throughout the open water season of 2011, instantaneous flow measurements were obtained during six site visits. In March 2012, stream flow monitoring continued at the five sites most likely to be impacted by the Project. Two of these stations, H-MCR1 and SW10-04, were equipped with pressure transducers and data loggers in the spring of 2012. The H-MCR1 site was chosen because it is located on Mag Creek, upstream of the proposed pit locations. SW10-04 was chosen as it is downstream of Blimkie Lake. Monthly site visits are ongoing in 2012 to establish a robust relationship between stage and discharge at these sites.

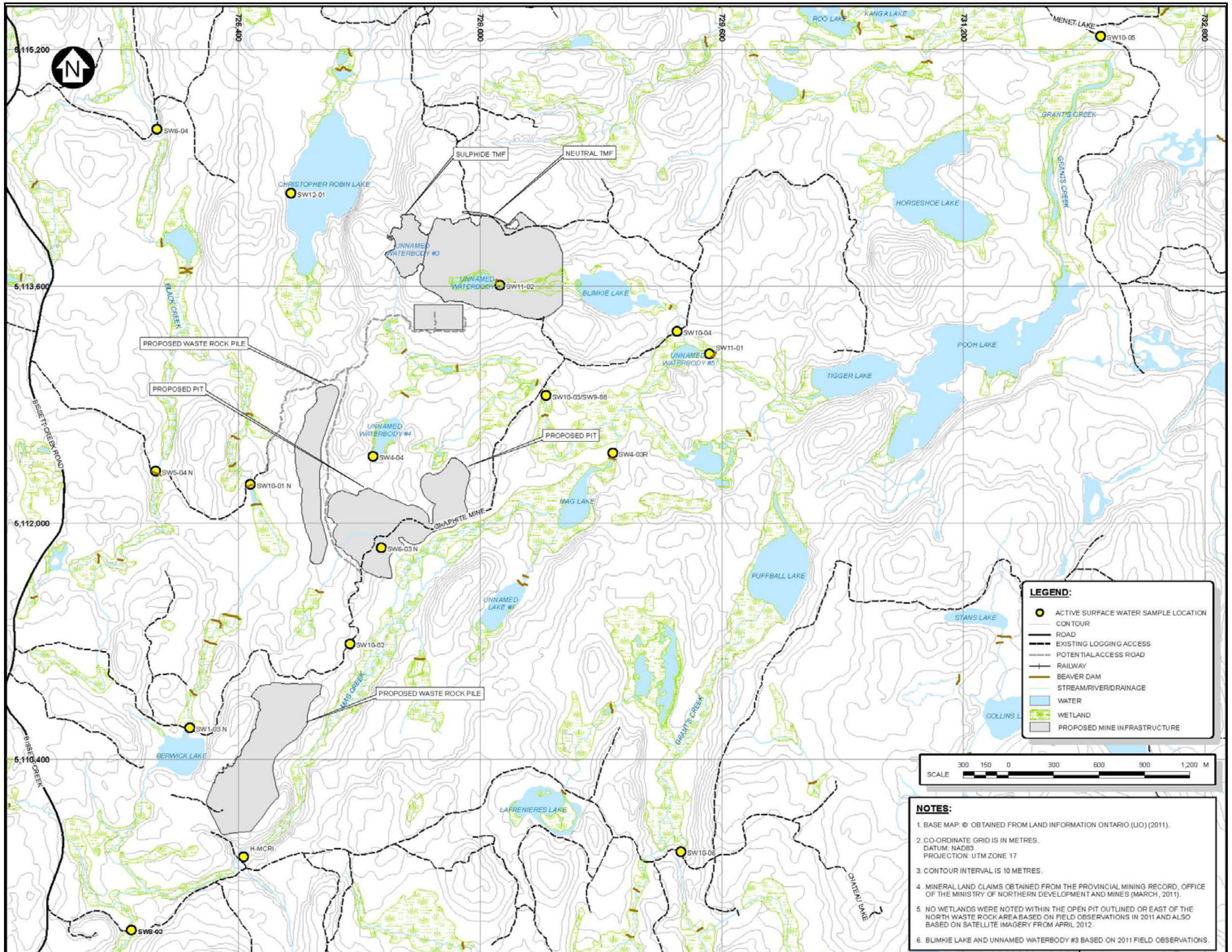
Flows in Mag Creek are the highest of all Project sites as it has the largest drainage area. Flows in Mag Creek typically range from approximately 185 l/s in the spring to 28 l/s in the summer. Flows in smaller streams, such as SW10-04, range from 27 l/s in the spring to 0.23 l/s in the summer. Several of the small streams have variable base flow conditions as they are regulated by beaver dam seepage.

Figure 20.1: Drainage Basins and Hydrology Stations



Knight Piésold CONSULTING	**Company Address:**	**1650 Main Street West North Bay, ON, P1B 8G5**	**File Name: Drainage Basins and Hydrology Stations**	**Author: SWK Date: 17JUL'12**

Figure 20.2: Surface Water Monitoring Locations



Knight Piésold CONSULTING	Company Address:	1650 Main Street West North Bay, ON, P1B 8G5	File Name: Surface Water Monitoring Well Locations	Author: SWK Date: 17JUL'12

There are two active regional stream flow stations operated by the Water Survey of Canada ("WSC") with similar basin characteristics in the region. Annual flow patterns at the WSC stations in the area are very similar to Project stations, with low flows during the winter months when precipitation falls predominantly as snow, high flows during the spring and early summer months due to snowmelt, low flows during the warm summer months, and increased flows during the fall months. The short term flow record collected at Project sites will be compared to longer term WSC data in order to estimate potential variability in future flows.

20.7 Surface Water – Groundwater Linkage

Of particular importance to the Project is the linkage between surface water and groundwater systems within the Grant's Creek watershed. Mine dewatering has the potential to affect surface water systems by drawing down the local groundwater table. Reducing the groundwater table could impact local groundwater discharge sources that serve to maintain stream base flow, and wetland environments. There is also the potential for enhanced direct leakage from surface water systems, such as lakes and ponds, to depressurized groundwater systems.

To evaluate these potentials, a preliminary hydrogeological assessment was conducted to evaluate the potential effects of pit dewatering on the surrounding hydrogeological regime and local surface waters. As a result of the hydrogeological investigations it was determined that seepage rates into the pits would occur at a rate of between 5.6 and 7.3 l/s based on the worst case scenarios for each pit phase.

The maximum drawdown cone was also evaluated based on measured and assumed hydraulic conductivities within the overburden and bedrock units. The drawdown cone was estimated for the worst case scenario (max pit depth) using a steady state analytical approach. The drawdown cone was estimated to extend approximately 500 m radially from the center of the Phase 2 pit.

The potential influence on Mag Creek was determined using the above information and the following assumptions:

- A hydraulic conductivity value for overburden of 1 x 10^{-5}m/s;
- A hydraulic conductivity value for the bedrock of 1 x 10^{-7}m/s; and,
- A creek length of 300 m that is expected to be influenced by the pit (i.e., direct leakage losses from the creek channel). The creek was set back 45 m from the pit perimeter for the modeling.

The calculated seepage from Mag Creek based on the assumptions provided above is approximately 2 l/s. This seepage rate corresponds to between a 4% and <1% reduction in flow when compared to measured discharges from Mag Creek in 2011.

The analysis was based on assumptions regarding the subsurface conditions. Uncertainties in the analysis may result in higher losses from Mag Creek. One of the key sources of uncertainty is the hydraulic conductivity value of the bedrock material. As previously discussed the hydraulic conductivity values selected for the calculation were based on the results of the closest hydraulic testing. Hydraulic testing of shallow bedrock is generally variable and other testing in the project site indicates that the hydraulic conductivity value could be higher than the testing in closest proximity to the deposit area. Other uncertainty includes limited data regarding the overburden thickness and interaction with the open pit.

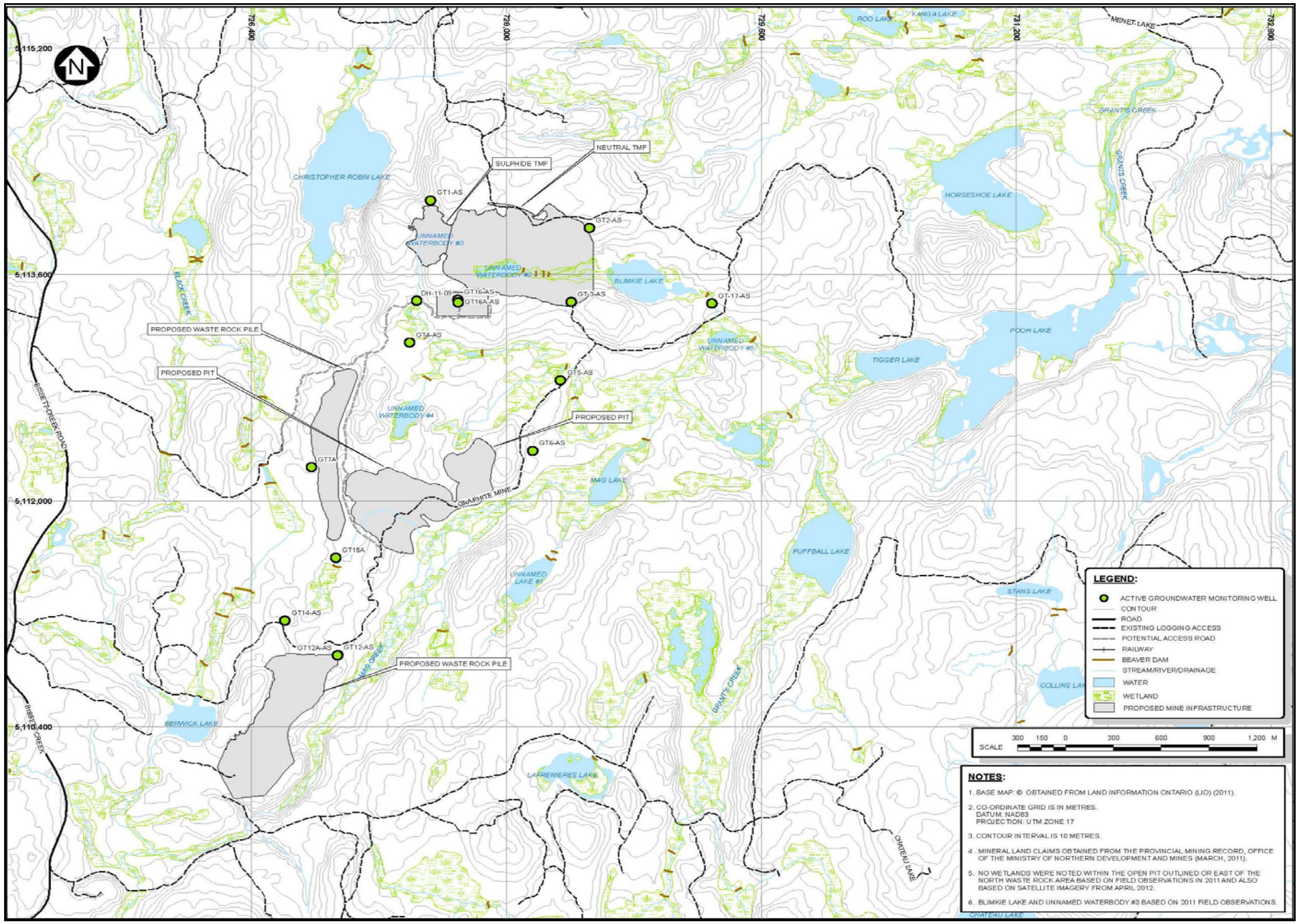
20.8 Surface Water Quality

Surface water quality characterization programs have been conducted periodically between 1988 and 2012. The most recent baseline monitoring program was initiated in 2010. In order to capture the natural variability in the data samples are collected seasonally over multiple years. The program will continue to run through construction and into operations Figure 20.2Figure 20.3 illustrates the locations of the active baseline surface water quality sampling sites. The majority of surface water sites, based on percentage of exceedances for MISA and PWQO, between 1988 and 2010, had elevated Aluminum and Iron concentrations. This suggests that surface waters in the area have naturally elevated concentrations of these parameters. Other parameters that exceeded the PWQO include; pH, Phenols and Cobalt and to a lesser degree Zirconium, Phenol, Dissolved Oxygen, Lead, Nickel, Vanadium, and Zinc.

20.8.1 Sediment Quality

Sediment samples were collected at three separate locations two of which were situated on Grant's Creek (SW10-06 and SW10-05) while the third was located within Unnamed Waterbody #5. These three sample locations are illustrated on and labelled as near field, far field and reference sites. Samples obtained within Grants Creek had limited occurrences of parameters with concentrations greater than the Ontario Provincial Sediment Quality Guidelines ("PSQG"). Total organic carbon and Cadmium were above the (PSQG) lowest effect levels ("LEL"). Conversely, sediment obtained from Unnamed Waterbody #5 had many parameters with concentrations greater than the PSQG LEL including Mercury, Cadmium, Chromium, Copper, Nickel, Lead and Zinc. Total organic carbon was above the PSQG Severe Effect Level in Unnamed Waterbody #5.

Figure 20.3: Groundwater Monitoring Well Locations



Knight Piésold CONSULTING	Company Address: 1650 Main Street West North Bay, ON, P1B 8G5	File Name: Ground Water Monitoring Well Locations	Author: SWK Date: 17JUL'12

20.8.2 Benthic Macroinvertebrate Communities

Benthic macroinvertebrate communities were sampled in conjunction with the sediment samples within Grant's Creek and Unnamed Waterbody #5 as illustrated on Figure 20.3 (labelled as near field, far field and reference areas). Benthic macroinvertebrates are excellent bio-indicators as they are sensitive to changes in their surrounding environments (i.e. water quality and sediment). For this reason they can be utilized to help determine the health of an ecosystem and for monitoring impacts caused by pollutants and sediment disturbances.

Samples collected upstream of SW10-06 had a mean population density of 312 individuals and a mean of 16 taxa per replicate sample. Results were similar upstream of SW10-05 with a mean population density of 292 individuals per replicate sample and a mean of 22 taxa per replicate sample. Population density and taxa richness was notably lower in Unnamed Waterbody #5. Unnamed Waterbody #5 had a mean of 91 individuals per replicate sample and a mean of 7 taxa per replicate sample.

20.9 Groundwater

20.9.1 Historical Data

A field investigation was completed by Mr. Dan Cook, P. Eng. of Crest View Environmental Inc. on April 24 and 25, 2003 to locate any existing exploration drillholes drilled in 1985 and 1987 that could be used for groundwater monitoring purposes. The investigation identified well 87P-33 and artesian well 85 019 as being suitable for this purpose and the wells were subsequently developed for groundwater monitoring use.

In early October 2003, Erana Mines Ltd. contracted Colbar Resources of Sudbury to drill and install four groundwater monitoring wells. Three of the four wells were located along the perimeter of the proposed 5 -year extraction zone at the time and were suitable for groundwater monitoring purposes. These wells were identified as DH-1, DH-2 and DH-4. Monitoring well DH-2 has since been damaged (knocked over) and can no longer be included in the monitoring program.

In August 2004 Knight Piésold installed three new groundwater monitoring wells to increase the area of the monitoring program. One well (DH-04-05) was installed upstream and two wells were installed downstream (DH-04-06 and DH-04-07) of the planned reject storage areas and the mill at the time.

20.9.2 2010-2012 Characterization Program

Further hydrogeological and groundwater quality assessments were initiated at the mine site in 2010 to compliment the proposed mine design. A total of 14 new groundwater monitoring wells were installed at the mine site from 2010 to 2012 to establish baseline conditions within the proposed Project footprint. **Error! Reference source not found.** illustrates the location of the active groundwater monitoring wells.

20.10 Groundwater Hydrogeology

20.10.1 Hydrostratigraphic Units

Geologic units which contain groundwater are referred to as hydrostratigraphic units. The hydraulic properties of the geologic units are influenced by several factors such as lithology, composition, grain size, strength, abundance of fractures, stress distribution, weathering and alteration. The hydrostratigraphic units interpreted at the project site are discussed below.

20.10.2 Unconsolidated Overburden

The overburden in the project area ranges in thickness from about 0.3 m to 5.5 m and includes intermittent layers of organics, sand, silt, gravel and cobbles (KPL, 2011). The organic layers consist of a woody peat with trace amounts of a fine to medium-grained sand and root inclusions. Test pits from the geotechnical site investigation (KPL, 2011) that were completed to the northeast of the deposit area indicate that there are low permeability units of around 1 m thickness overlying sand and gravel units. These low permeability units include fine sand and silt. Sand layers are medium to coarse-grained and are poorly graded, if at all. They are compact and moist. Gravel units include sub-angular to angular clasts, indicating glacial transport. They are light to dark grey or pink. Cobbles in the area are sub-angular and are poorly graded but illustrate stratification. The overburden in the deposit area will be pre-stripped and stockpiled for later redistribution.

20.10.3 Ontario Gneiss Complex

The Ontario Gneiss structure in the area consists of three main units: graphitic gneiss, transitional graphitic gneiss and barren gneiss. The mine development is within the graphitic gneiss and to some extent, the transitional graphitic gneiss. The graphitic gneiss is a distinctive recessive weathering unit, commonly exposed along rock cuts, hill tops, and occasional cliff faces. It is calcareous biotite-amphibole-quartzofelspathic gneiss (generally red-brown to pale yellow-brown weathering). Graphite, pyrite and pyrrhotite occur throughout. Graphite occurs in concentrations visually estimated to be from 1 to 10%. In an unweathered state the rock unit is pale to medium grey in colour. Fractured and jointed weathered bedrock was observed in some drill holes.

There were no substantial faults or folds identified with high permeability through which groundwater would interact with the pit.

20.10.4 Hydraulic Conductivity

The hydraulic conductivity of the overburden has been estimated based on descriptions of the material. Intermittent layers of sandy silt exists within the overburden cover (KPL, 2011) were estimated to be about 1 x 10^{-5}m/s (Freeze and Cherry, 1979). Coarser layers of sand with lenses of gravels and cobbles may have a higher hydraulic conductivity value of 1 x 10^{-4}m/s or greater.

Hydraulic conductivity values for the bedrock material were estimated based on packer testing (Lugeon) during drilling and falling head tests in completed groundwater monitoring wells.

20.10.5 Groundwater Levels

Groundwater levels in the area range from artesian conditions to about 10 m below ground surface. Groundwater is expected to be mainly recharged by the spring snowmelt and precipitation, which falls mainly during the spring and fall. Groundwater levels are lowest in early spring and sharply increase during April and May in response to snowmelt.

20.10.6 Groundwater Flow

Generally the groundwater flows east from the Grant's Creek watershed divide towards Mag Creek. Gradients in the area are expected to be relatively low. Given the rolling topography of the area, hydraulic gradients are higher at steep creek banks and lower in flatter areas.

20.10.7 Groundwater Quality

Groundwater monitoring has taken place between 2003 and 2012. Seasonal sampling (spring, summer, and fall) took place in 2004 and again in 2011. Seasonal sampling over multiple years ensures that the natural variability within measured parameters is captured within the baseline data. Ground water quality results were compared to Ontario Drinking Water Standards ("ODWS") and PWQO. Based on the percentage of both ODWS and PWQO concentration exceedances between 2003 and early 2011 for all wells, the majority of wells had elevated concentrations of hardness, Manganese, turbidity and Iron, which may be due to naturally elevated concentrations in the area. Elevated concentrations of cobalt, DOC and several other parameters were also noted. These parameters should be monitored to determine whether they were anomalous, due to natural concentrations or whether there is a contributing factor.

20.10.8 Soil Quality

Soils on site are expected to be in good condition. There are no known occurrences of contaminated soils on site.

20.11 Terrestrial

20.11.1 Terrestrial Environment

The Project is located within the Boreal Shield Ecozone. The dominant vegetation of the region is mixed-wood forest consisting of sugar maple, yellow birch, eastern hemlock, eastern white pine and beech. Well drained sites are comprised of red pine, white pine and red oak. Wetter sites are comprised of red maple, black ash, white spruce, tamarack and eastern white cedar.

The Bissett Creek property is largely composed of second growth mixed-wood forest. However, patches of Old Growth forest are located to the east and west of the property. Tree species identified on the property include poplar, white birch, white spruce, white pine, red pine, and balsam fir. Other plant species include beaked hazel, mountain maple, bush honeysuckle, fly honey suckle, low sweet blueberry, twin flower, velvet leaf blueberry and showy mountain ash. To a lesser extent blue bead lily, wild sarsaparilla, wild lily of the valley, starflower, large-leaved aster, ground pine, bunchberry, bracken fern, goldthread, rose twisted-stalk and spinulose wood fern. Small amounts of Schreber's moss and powder horn lichen are also present.

20.11.2 Wetlands

A wetland assessment was completed by a certified wetland evaluator in July 2011. Wetlands visited were the ones that would be most impacted by the Project footprint and were initially evaluated as 11 individual wetlands. However, some of the wetlands in the proposed footprint appeared to be part of a complex so the in-office evaluation was done as if the wetlands were a complex. Later consultation with the MNR confirmed that the wetlands were in fact part of a much larger wetland complex. It was determined during consultations that almost all of the wetlands in the area are provincially significant due to the topography. Based on this information a mutual agreement was made to treat the wetland as being a Provincially Significant Wetland. As such, a wetland Environmental Impact Statement ("EIS") will be prepared in conjunction with the local MNR. The wetland EIS will include mitigation and avoidance strategies as well as outline Best Management Practices that will be implemented during all phases of the Project.

20.11.3 <u>Local Wildlife</u>

Larger game animals in the region include moose, black bear and white tailed deer. Other fur bearers in the area include Muskrat, Beaver, Least Chipmunk, Red Squirrel, Gray Wolf, American Marten, River Otter, Red Fox and Raccoon. Ruffed Grouse is commonly spotted on site. In addition, several species of waterfowl have been observed on local lakes and marshes including the Common Loon, Hooded Mergansers, Wood Ducks, Black Ducks, and Teal and Pied-billed Grebes.

Herptiles in the area include; American Toad, Spring Peeper, Gray Treefrog, Chorous Frog, American Bullfrog, Eastern Red-spotted Salamander, Painted Turtle and Snapping Turtle.

20.11.4 <u>Species at Risk</u>

Knight Piésold completed both a Species at Risk (“SAR”) desktop study and a field assessment in 2011. The field program was focused on detecting SAR and potential SAR habitat. A summary of the provincially listed species, listed by the Committee of the Status of Species at Risk in Ontario (“COSSARO”), and species listed by the Committee on the Status of Endangered Wildlife in Canada (“COSEWIC”) with potential to be located on the Bissett Creek property. To date ten SAR listed under the Species at Risk Act and/or the Endangered Species Act have been identified within the Bissett Creek property including; Snapping Turtle, Blanding’s Turtle, Olive-sided Flycatcher, Barn Swallow, Common Nighthawk, Rusty Blackbird, Whip-poor-will, Eastern Wolf and the Canada Warbler.

The ESA has 2 sections that protect Species at Risk in Ontario; Section 9, which prohibits harming or harassing an Endangered or Threatened species; and Section 10, which prohibits damaging or destroying the habitat of an Endangered or Threatened species. Northern Graphite will be required to obtain a permit under the ESA should any activities result in the damage or destruction of habitat or the harm or harassment of Blanding’s turtle or Whip-poor-will.

20.12 Aquatic Plant and Animal Life

20.12.1 Aquatic Environment

The majority of the proposed activities and infrastructure is situated within the Grant's Creek watershed; however, certain aspects of the Project including the access road and natural gas pipeline will be partially located within the Bissett Creek watershed, as illustrated on Figure 20.1. Both Bissett Creek and Grant's Creek are tributaries to the Ottawa River located to the north of the Project. The earliest aquatic baseline work completed for the Project was conducted by the Environmental Applications Group Limited in July 1988. Since then several other programs have been conducted by other consultants and the MNR.

Fish communities in the area are diverse consisting of a mixture of warm water, cold water, and cool water species. Cool water fish species are predominate in waters within the proposed Project footprint. Beaver activity is quite common in the area creating habitat for warm and cool water species. However, the beaver dams also reduce the ability of fish, especially migratory fish species like brook trout, from migrating between lakes and streams. An overview of the fish species and habitat within potentially impacted waterbodies and watercourses is provided below.

20.12.2 Blimkie Lake

Blimkie Lake is located directly downstream of the proposed Neutral Tailings Management Facility and will serve as a polishing pond. Water remaining in the tailings will percolate through the tailings dam into Blimkie Lake. This water will be reclaimed and pumped back to the Processing Plant. A control weir will be located at the outlet of Blimkie Lake in order to control water levels in Blimkie. The weir will be utilized for monitoring the quantity of water leaving the basin. Water quality samples will also be obtained from this location.

The water within Blimkie Lake is clear but appears tea-stained in colour. The shallow margins of the lake were noted to be dominated by water lily rhizomes in the sediment. Blimkie Lake has a moderately sized beaver dam located at the eastern end in the location of the proposed weir. Water passing through the dam flows east and reports into Unnamed Waterbody #5 after passing under the mine site road. The sediment is loose brown organic matter that is easily disturbed, characteristic of waterbodies with beaver activity. Due to flooding caused by the beaver dam there are dead trees and stumps present within the shallow portions of the lake. Fallen trees also provide cover and habitat along the shoreline. Large boulders are sparsely located throughout the lake. This water body is also a relatively shallow, cool water environment as noted in the 2004 N.A.R. study with an depth profile temperature range from 20.7ºC to 18.6ºC (August 2004) in the top three metres. In addition to this, dissolved oxygen was measured at

0.23 mg/L at the 3.0 m depth indicating an anoxic zone at the bottom. In 2011, Blimkie Lake was sampled utilizing ten minnow traps and five gill nets. The gill nets were distributed around the lake to most effectively sample the waterbody but did not collect any fish. Fish species collected in the minnow traps included Golden Shiner (Notemigonus crysoleucas), Northern Redbelly Dace, Fathead Minnow, Finescale Dace, Northern Pearl Dace (Margariscus nachtriebi) and Brook Stickleback. Trout species are not present within Blimkie Lake.

20.12.3 Unnamed Waterbody #2

Unnamed Waterbody #2 is within the proposed area of the Neutral Tailings Management Facility where infilling of non-sulphide bearing tailings material will take place. This waterbody is located upstream of Blimkie Lake and has a beaver dam located at its eastern end. Multiple beaver dams are also located downstream between this waterbody and Blimkie Lake. The water is clear and has a distinct tea stained colour. At the time of sampling it was noted that the majority of the pond surface will be covered by water lilies as the sediment was dominated by rhizomes. As is common with past beaver activity the sediment is made up of a loose brown organic material that is easily disturbed. The deepest point in the pond is estimated at no more than 1.8 m. Due to the small size of the waterbody, approximately 1.1 ha, and its restricted depth little over-wintering habitat is present. During the 2011 fisheries survey ten minnow traps were set in Unnamed Waterbody #2. Five additional traps were also set throughout the beaver impoundments located downstream. Four fish species were collected in the minnow traps including Northern Redbelly Dace (Chromus eos), Fathead Minnow (Pimephales promelas), Finescale Dace (Chrosomus neogaeus) and Brook Stickleback (Culea inconstans). No fish were collected in the single 1.5 inch gill net that was set in Unnamed Waterbody #2 for 25 hours.

20.12.4 Unnamed Waterbody #3

Unnamed Waterbody #3 is within the footprint of the proposed Sulphide Tailings Management Facility that is planned to receive infilling of tailings with Acid Rock Drainage and Metal Leaching potential. Large woody debris such as fallen trees and stumps dominate the wetted area. Following a DFO site visit on May 2, 2011 it was decided to follow the DFO “Protocol for the detection of fish Species at Risk in Ontario Great Lakes Area” to sufficiently sample Unnamed Waterbody #3. As per Table 2 in the protocol, the minimum sampling effort required for a wetland environment to demonstrate that there is a high probability that fish species are not present is 50 sampling events/stations with appropriate gear. Five days were utilized for sampling this waterbody with an effort of 54 minnow traps set for a total of 1,142 hours. No fish species were collected in the minnow traps during that sample period. In addition, fish species were not observed within the wadeable portion of the waterbody during investigations. The beaver dam was removed from the outlet in September 2011. Very small isolated puddles of standing water remained within the basin. Other areas of silt and detritus have retained moisture and remain saturated.

20.12.5 Unnamed Waterbody #5

Water exiting Blimkie Lake flows through a beaver dam, down a moderate hill in two narrow meandering branches and then crosses under the mine site road via a corrugated steel pipe culvert into Unnamed Waterbody #5. Similar to the upstream water bodies, the water was clear and appeared tea-stained in colour. The majority of the waterbody will be heavily vegetated in the summer months as water lilies were already beginning to float on the surface in May. This waterbody was created in part by a broad beaver dam located at its eastern end. Water flows through and over this beaver dam and eventually reports to Tigger Lake. The sediment, as seen previously, is composed of detritus and silt that is best described as easily disturbed loose brown organic matter. Large boulders are present in proximity to the beaver dam and bedrock is present along the northern shoreline. The waterbody is surrounded by a wetlands dominated by shrubs, grasses and sedges. Undercut banks and large woody debris are present along the shoreline providing shelter and habitat for fish. The southeast shoreline is dominated by mature conifers. During the 2011 assessment five minnow traps were set in the inlet stream and 17 minnow traps were set around the waterbody. Two fish species were collected via the minnow traps in the inlet stream; finescale dace and brook stickleback. These species were also collected within Unnamed Waterbody #5 as well as Pumpkinseed (Lepomis gibbosus), Golden Shiner, Northern Redbelly Dace and Fathead Minnow. One 2 inch gill net set overnight collected 34 White Suckers (Catostomus commersonii).

20.12.6 Black Creek

Development of the proposed access road involves the construction of three water crossings two of which are located on Black Creek. Black Creek flows north towards the Ottawa River and is a cold water tributary of Bissett Creek. Both of the crossings located on Black Creek have existing culverts present. However, the culvert located at SW5-04 has collapsed and a temporary bridge has been placed over the stream. Beaver dams are present upstream of both crossings. Fish community surveys were completed in 2011 at these two locations using both active and passive fisheries gear. Fish species including Finescale Dace, Northern Redbelly Dace, Northern Pearl Dace and Creek Chub were observed at these crossings. Brook Trout were not present in these upper cool water reaches but they are present within the cold water environments located further downstream.

20.12.7 Unnamed Watercourse Downstream of Unnamed Waterbody #3

This Unnamed Watercourse is located downstream of Unnamed Waterbody #3 and will be potentially impacted by the construction of the sulphide tailings area and the proposed access road. This watercourse is ephemeral with a majority of the flow occurring during the spring freshet. No fish were observed within the stream; furthermore, fish are not present within Unnamed Waterbody #3. However, it is possible that fish use the lower sections of the stream during periods of higher flow.

20.12.8 Unnamed Waterbody #4

Unnamed Waterbody #4 is located to the north of the proposed open-pits. Typical of other waterbodies in the area beaver activity is prevalent with dams present at the outlet of the waterbody. The waterbody is surrounded by high banks on all sides except for the northern which is predominantly wetland. Water clarity is good but has a distinct tea-stained colour. The sediment is composed of loose brown organic materials and silt. The waterbody is heavily vegetated by a mixture of floating and submergent aquatic vegetation. Using minnow traps Northern Redbelly Dace, Fathead Minnow, Finescale dace and Brook Stickleback were collected during the 2011 aquatic baseline assessment

20.12.9 Berwick Lake

Berwick Lake is a small cool water waterbody located to the southwest of the Bissett Creek property and west of the proposed neutral waste rock pile. Two small inlets bring waters into the lake while a single outlet drains the lake north into Black Creek. The water appears clear but has a distinct tea-stained colour. Floating and submergent aquatic vegetation is present throughout a majority of the lake providing cover and habitat. During the 2011 aquatic baseline assessment Largemouth Bass were captured in the 10 minnow trap sets.

20.13 Landscape

Refer to physiography above.

20.14 Socio-Cultural

20.14.1 Location of Aboriginal Groups and Traditional Lands

The Project is situated within the Algonquins of Ontario Land Claim that is presently being negotiated by the Crown and the Algonquins of Ontario. This Land Claim involves numerous Algonquin communities including: Antoine, Bancroft, Bonnechere, Greater Golden Lake, Mattawa-North Bay, Ottawa, Shabot Obaadjiwan, Snimikobi, Pikwàkanagàn, and Whitney and Area (Ministry of Aboriginal Affairs, 2010) and is for the area from North Bay to Pointe L'Orignal, near Hawkesbury, which includes the Mattawa River watershed and the southern watershed of the Ottawa River (i.e. approximately the entire Ottawa Valley).

20.14.2 <u>Communities in Proximity to the Project</u>

The Bissett Creek property is located within an organized municipality that consists of the United Townships of Head, Clara and Maria. The municipality is made up of four small hamlets which include Mackey, Stonecliffe, Bissett Creek and Deux Rivières. Larger communities in proximity to the Project include; Deep River located 44 km east; Petawawa located 66 km east-southeast; Pembroke located 80 km southeast and Mattawa located approximately 53 km northwest.

20.14.3 <u>Employment</u>

Approximately 88 positions are anticipated during the production phase of the Project. Mine operations are divided into three areas, open pit personnel, mill personnel and general services personnel. Apart from the geologist and technicians, all other employees will be supplied by a mining contractor for open pit operations.

The estimated personnel required for the open pit operations will be 30 employees including:

- Mine Superintendent;
- Geologist;
- Mine Technician;
- Maintenance Foreman;
- Mechanics;
- Drillers;
- Truck Drivers;
- Loader Operator;
- Blasters; and,
- General Labourers.

For the efficient operation of the mill an approximate work force of 40 employees will be required. The mill will operate on three shifts per day and seven days per week. The following provides a breakdown of the manpower required:

- Mill Superintendent;
- Mill Clerk;
- General Foreman;
- Shift Foremen;
- Crusher Operators
- Grinding/Flotation Operators;
- Thickening, Filtration, Drying Operators;
- Bagging Operators;
- Metallurgical Technician;
- Assay Laboratory Technician;
- Samplers;
- Maintenance Planner;
- Mechanics;
- Electricians and Instrumentation Technician; and,
- Helpers / Laborers.

General services will require 18 employees:

- General Manager;
- Assistant to GM;
- HR & Safety Manager;
- Nurse Assistant;
- Accounting Manager;
- Accounting Clerks;
- Marketing Manager;

- Security Guards;
- Supply Chain Manager;
- Warehouse Clerks;
- Machinery Operator; and,
- Helper;

20.15 Archeology

Stage 1 and 2 archaeological assessments were conducted by Horizon Archaeology Inc. on the Bissett Creek property. Following the Stage 1 assessment a Stage 2 assessment was carried out. The Stage 2 assessment focused on areas of high archaeological potential. No archaeological sites were identified within the investigated areas. As a result of the assessments it was recommended that further assessment take place to the northeast of Blimkie Lake during construction.

20.16 Environmental Management Plan

An Environmental Management Plan ("EMP") will be implemented for the Bissett Creek Mine prior to development. The EMP will provide a framework for dealing with the environmental risks associated with the development, operation and closure of the Bissett Creek Mine. The EMP will include a description of the activities to be carried out on site and a description of the associated risks. The EMP will also include the following information:

- Controls (avoidance and mitigation strategies);
- Roles and responsibilities;
- Staff training programs;
- Emergency response plans;
- Inspections and maintenance ;
- Adaptive management; and,
- Reporting.

20.17 Closure, Decommissioning and Reclamation

In accordance with part VII of the Mining Act (O.Reg. 240/00) an amended Closure Plan will be submitted before construction or operations for the Project can commence. The amended Closure Plan for the Bissett Creek Graphite Project will be submitted for filing to the MNDM upon completion. The following section provides a summary of the activities that are scheduled during closure.

The primary closure objectives for the Project are to return the Bissett Creek property back to a physical and chemical condition similar to the pre-production state. This is to ensure both public safety and long-term environmental protection. Closure activities will include the removal of materials and equipment from the property and the removal of hazardous materials and wastes to a licensed disposal facility by a licensed contractor. Reclamation of the site will be undertaken to enhance natural recovery of the disturbed areas and allow for future use by people and wildlife.

The following is a list of various components of the Project that will require progressive rehabilitation during operations and/or remediation at closure:

- Open pits;
- Surface infrastructure (buildings and roads);
- Waste rock and overburden stockpiles;
- Contaminated soils (if any); and,
- Tailings Management Facilities.

It is estimated that a minimum of 2 years will be required to complete the closure and reclamation activities associated with the Project.

Physical inspections and environmental monitoring of the Project area will be conducted for a minimum of 5 years after the closure and reclamation activities have been completed in order to assess the physical and chemical stability.

20.18 Permitting Process

There are no provincial or federal Environmental Assessments required for the Bissett Creek Mine; however, there are a number of provincial and federal permits, licences and approvals that need to be obtained prior to mine development.

Table 20.1 presents a list of the anticipated key approvals, licences, and permits that will be required for the Project based on the present mine design. Permitting for the Bissett Creek Mine will take approximately 3 to 12 months following the filing of the Closure Plan amendment.

Table 20.1: List of Licences, Permits and Approvals

Permit/Approval	Agency	Act	Regulations	Trigger/Activity
Provincial				
Work Permit	MNR	Public Lands Act	O.Reg. 453/96 Work Permit - Construction - for construction of road facility to enable crossing of a water body	Work on water crossings. (culvert installations)
Work Permit	MNR	Public Lands Act	O.Reg. 973/90 Work Permits - for road or building construction on Public Land (Crown Land)	Any work that involves upgrading of existing roads or building new roads or trails on Crown Land
Approval	MNR	Lakes and Rivers Improvement Act	N/A	Water Retaining Structures (will include tailings dam, concrete weir)
Burning Permit	MNR	Forest Fire Prevention Act	O.Reg. 207/96 Outdoor Fires	Burning of removed vegetation
Environmental Compliance Approval(9)	MOE	EPA Ontario Water Resources Act	O.Reg. 561/94 Effluent Monitoring and Effluent Limits Industrial Minerals Sector; O.Reg. 419/05 Air pollution - Local Air Quality O.Reg. 337 - Ambient Air Quality Criteria	Industrial sewage works - tailings. Discharge of an airborne contaminant into the natural environment, including noise (generators, blasting etc.)
Permit	Chief Building Official	Ontario Building Code	N/A	Installation Class 4 leaching bed system (Septic System)
Permit/Approval	Agency	Act	Regulations	Trigger/Activity
Certificate of Approval	MOE	Safe Drinking Water Act	O. Reg. 169/03 Ontario drinking water quality standards. O.Reg. 170/03 Drinking water systems.	Potable water supply

Permit/Approval	Agency	Act	Regulations	Trigger/Activity
Approval	MOE	Clean Water Act	O. Reg. 287/07	Source Protection Plan
Generator Registration Report	MOE	EPA	O.Reg. 347/90 General - Waste Management	Storage and transportation of hazardous wastes
Permit to Take Water (>50,000 L)	MOE	Ontario Water Resources Act	O.Reg. 387/04 Water Taking	Taking more than 50,000 L per day (mill process water, dewatering, etc.)
Verification of amended Closure Plan	MNDM	Mining Act	O.Reg. 240/00 Mine Development and Closure Plan	Submission of amended Closure Plan
Permit	MNR	Endangered Species Act	N/A	Harm or harassment of a SAR or the damage or destruction of habitat of an endangered or threatened species
Federal Agency				
Approval	TC	Navigable Waters Protection Act	Navigable Waters Works Regulations	Installation of water intake in Blimkie Lake

Notes:

1. MNDMF - ONTARIO MINISTRY OF NORTHERN DEVELOPMENT, MINES AND FORESTRY.
2. MOE - ONTARIO MINISTRY OF THE ENVIRONMENT.
3. MNR - ONTARIO MINISTRY OF NATURAL RESOURCES
4. MOL- ONTARIO MINISTRY OF LABOUR.
5. EPA - ENVIRONMENTAL PROTECTION ACT.
6. DFO - DEPARTMENT OF FISHERIES AND OCEANS.
7. TC - TRANSPORT CANADA.

21. CAPITAL AND OPERATING COSTS

21.1 Capital Expenditures

The capital cost estimate for the project was developed at ± 15% accuracy. Costs are reported in Canadian Dollars (“CAD”).

According to standards established at the outset of the project, pricing of equipment, material and labour was estimated according to the following guidelines:

- Equipment proposals received specifically for the project;
- Equipment prices derived from recent project or from databases;
- Material prices based on quotations received from contractors; and,
- Labour rates based on quotations received from contractors.

Locally available material was used for estimation purposes and prices were sourced from regional suppliers.

No escalation was built into the capital cost estimates. The estimates were received during 1st Quarter 2012 (“1Q 2012”).

Labour rates were developed using hourly rates provided by contractors from the area. Due to the geographical location of the project, travel time and room and board were included in the hourly rates.

21.1.1 General Estimate Parameters

Quantities for each area of the project were estimated by the responsible firm and signatory party for each area. Unit costs have been derived from quotations received from contractors and vendors. The list of unit costs developed in the cost estimate is available in Appendix A of this report. Cost estimations include materials and labour. Transportation costs are not included in the cost breakdown per area. The costs have been compiled in a separate estimate, provided in the indirects.

21.2 Infrastructures and Roads

Capital costs for infrastructures and roads are provided in Table 21.1.

Table 21.1: Infrastructure Capital Expenditures

Description	1Q 2012 CAD
110 - Roads	
111 - Site Main Access Road	865,235
112 - Hauling Road	984,385
113 - Bissett Creek Road Upgrade	27,820
114 - Service Roads	432,954
120 - Workshops	
121 - Mine Truck shop / Warehouse	150,000
123 – Process Plant Workshop / Warehouse	50,000
130 - Administration Buildings	
131 - Administration Offices	2,003,965
132 - Gate Houses	73,973
160 - Laboratories	
161 - Assay Lab	497,997
180 - Fuel Systems	
181 - LFO Storage	448,715
182 - Natural Gas Pipeline & Distribution	3,658,363
190 - Other Facilities	
191 - Recycling / Sort Facility	50,000
193 - Warehouse & Cold Storage	140,037

The estimates include earthwork, construction material, equipment, and labour. The construction costs of the roads consider that construction material will be provided by the mine pre-production activities.

21.3 Electrical Infrastructures

The initial capital costs for the electrical infrastructures are listed in Table 21.2. They include all equipment and installations for power production and distribution. They also include the communications and information technologies installations. The electrical infrastructures are detailed in Section 18 of this report.

Table 21.2: Electrical Infrastructures Capital Costs

Description	1Q 2012 CAD
210 - Power Plant	
211 - Power Plant	7,437,225
212 - Heat Recovery	557,207
220 - Electrical Rooms	
221 - Plant Main Electrical Room	2,110,681
240 - Site Power Distribution	
241 - Power Lines	654,716
250 - IT and Communications Hardware	
251 - Communications Links / Server Rooms	213,095
252 - Plant Security System	96,822
260 - Substations	
261 - Process Plant Substation	595,521

21.4 Water Tailings Management

The initial capital costs for the water and tailings management facilities are listed in Table 21.3:

Table 21.3: Water Management Capital Expenditures

Description	1Q 2012 CAD
310 - Potable Water	
311 - Potable Water Wells	89,447
312 - Potable Water Treatment	268,629
340 - Tailings	
341 - Neutral Tailings Storage Pond	1,995,946
342 - Sulphides Tailings Storage Pond	949,757
343 - Tailings Reclaim Water Sump / Pumps	599,565
345 – Blimkie Lake Weir	174,280
348 – Lime Addition	152,330
350 - Mine Water Control	
351 - Pit Dewatering	232,366
360 - Plant Surface Water	
361 – Stormwater Pond	108,308
370 - Fire Water	
371 - Fire Water	1,857,901
380 - Sewage	
381 - Site Sewage Treatment	242,444

Details are provided in Section 18. Costs include earthwork, concrete and structure, mechanical and electrical equipment and labour. The pipeline from the pit to the process plant is included in the pit dewatering costs estimate.

21.4.1 Tailings Management Facilities

Two (2) tailings management facilities are required for this project. The largest storage pond will be used for non-deleterious tailings and will contain 97% of the total tailings generated by the processing plant. It is called the neutral tailings pond. Initial construction works includes three (3) starter dams with a crest elevation of 296.5 m.

The second storage facility will be the sulphides tailings pond. It will be used to hold 3% of the total tailings production. The initial construction works will include the construction of four (4) dams with a crest elevation of 313 m. The dams will be lined with 100 mils HDPE liners to avoid seepage of water to the environment.

Both tailings management facilities will be built using materials produced from mine pre-production. However, the construction material specifications require crushing and screening of the mine waste rock in order to produce acceptable material for dam construction.

A concrete weir will be built on the east side of Blimkie Lake to maintain the water level at its current level.

The tailings water reclaim pumping stations include both the sulphides pond and neutral pond reclaim stations. They include the reclaim pipelines to the processing installations.

21.4.2 Fire Water

The fire water estimate includes the fire pumps, the distribution network within the processing plant and throughout the property.

21.5 Mine Costs Estimate

The components to the mine pre-production capital expenditures include the mine contractor's fleet mobilization, pit clear and grub, overburden removal and pit pre-production mining. Mine maintenance facilities already exist and upgrades will be part of the contractor's mobilization cost.

The capitalized costs are evaluated based on pre-production quantities and unit costs obtained from contractors and actual operations. The mine pre-production is planned in such a way to provide enough material to support the construction of the tailings management facilities and roads.

The mine contractor will select the equipment sizing of his fleet based on a yearly pit mine production of 1,480,000 Mt/yr. The mining contractor will provide the mining fleet, operators, labour, consumables and maintenance. Drilling and blasting services will be provided by a specialized contractor.

The owner will be responsible to provide the mine management, and technical services. The pre-production mine costs are provided in Table 21.9.

In addition to mine pre-production, preparation costs for the waste rock stockpile and the ore stockpile are provided in Table 21.4.

Table 21.4: Mine Infrastructure Capital Costs

Description	1Q 2012 CAD
500 – Mine	
505 – Waste Rock Stockpile	31,404
510 – Ore Stockpile	18,210

21.6 Process Plant and Related Infrastructures

The initial capital costs estimate for the processing facility is provided in Table 21.5. The estimate includes earthwork, concrete and structural works, mechanical and electrical equipment and labour. Site preparation includes the preliminary earthworks for the processing facility

Quantities for the earthwork, concrete, structure and architecture were estimated by Met-Chem Canada Inc. (“Met-Chem”). The list of mechanical equipment is provided in Appendix C.

The estimate covers all costs and construction works related to the processing plant. It also includes the haul ramp to access the feed hopper of the crusher and the tailings pipelines to both tailings management facilities.

Area 621-Grinding, includes the costs estimate related to earthwork, concrete, structure and architecture for the concentrator building. The concentrator building will be 61 m x 36.5 m. It will be made of structural steel, and it will be insulated.

Preliminary concrete design was based on the geotechnical investigation conducted on site. The report is available in Appendix H.

Table 21.5: Processing Plant Capital Expenditures

Description	1Q 2012 CAD
600 – Process Plant General	
601 - Site Preparation	460,883
610 – Crushing and Ore Handling	
611 - Primary Crusher	4,592,401
612 - Ore Stockpile	5,147,649
620 - Grinding	
621 - Grinding	15,177,407
622 - Regrind Circuit	4,731,631
630 – Flotation, Thickening, Drying	
631 - Flotation Circuit	2,747,457
632 - Thickening	552,209
635 - Drying	1,481,636
640 – Storage and Drying	
641 - Storage and Sizing	1,538,137
660 - Bagging	
661 - Bagging	468,803
670 - Sulphides	
671 - Sulphides Treatment	1,703,776
680 – Plant Services	
681 - Compressed Air	770,287
682 - Reagents	258,946
685 - Flocculent	301,573

21.7 Project Indirects

The following tables present the project indirects:

Table 21.6 Mobile Equipment;

Table 21.7 Construction Indirects;

Table 21.8 General Services; and,

Table 21.9 Pre-production and Commissioning.

Table 21.6: Mobile Equipment Capital Expenditures

Description	1Q 2012 CAD
420 - Construction Vehicles & Equipment	
421 - Cranes and Material Handling	619,670
422 - Other Construction Equipment	847,000
423 - Equipment Rental	50,000
425 – Mobile Equip Fuel & Maintenance	194,390

Table 21.7: Construction Indirects

Description	1Q 2012 CAD
710 - Engineering, CM. PM	
711 - Site CM Staff and Consultants	3,250,000
712 - Site Office Expenses	220,500
713 - CM Staff and Consultants	989,850
714 – Off Site Office Expenses	169,000
715 - External Engineering	5,228,035
716 - Surveying	421,600
717 - QA / QC	186,000
718 - Commissioning / Vendors Reps	264,000
719 - Site Communication	97,250
720 - Construction Facilities & Services	
721 - Shops	96,000
722 - Construction Temporary Power	286,000
723 - Concrete Batch Plant	80,000
724 - Aggregate Plant	25,000
725 - Toilets / Ablution Units	71,000
728 - Construction Tools	550,000
729 - Contractors Indirects	2,228,800

Table 21.8: General Services

Description	1Q 2012 CAD
810 - Departments	
811 - General Administration	1,462,825
815 - Health & Safety	50,000
816 - Security	185,600
820 - Logistics / Taxes / Insurance	
821 - Freight	1,573,700
823 - Insurances	375,000
830 - Operating Expenses	
832 - Travel & Transportation	835,800
835 – Capital Spares	1,274,643

Table 21.9: Pre-production and Commissioning

Description	1Q 2012 CAD
910 - Mining Preproduction / Commissioning	
921 - Mine Operations Preproduction	3,498,938
950 - Process Plant Preproduction / Commissioning	
955 - Process Plant Management	83,535
956 - Process Plant Commissioning	403,722
957 - Power Plant Commissioning	117,789
958 - First Fill	130,098
990 - Contingency	
991 – Contingency (10%)	9,356,785

A 10% (or CAD 9,356,785 M) contingency was applied to the total estimated cost for direct and indirect capital costs.

No escalation was built into the capital costs estimates. The estimates were received during the 1Q 2012.

The following items are excluded from the capital cost estimate:

- Taxes and duties on imported goods and equipment during the construction period;
- Provincial and federal taxes;
- Weather delays – effects of unusual weather or loss of productivity due to environmental considerations;

- Lost time due to strikes or unrest including access to transportation routes; and,
- Force majeure.

21.7.1 Sustaining Capital

Sustaining capital is mainly required for the following:

- Progressive dam construction at Tailings Management Facilities;
- On-going dewatering;
- Waste rock stockpile expansion;
- Mine Phases 2 and 3; and,
- Future disposal of tailings to pit;
- Processing Facilities and Mobile Fleet allowances;

Sustaining capital is listed in Table 21.10.

Table 21.10: Sustaining Capital Costs

Description	1Q 2012 CAD
Waste Piles Preparation	280,000
Processing Facilities	1,700,000
Tailings and Water Management	3,400,000
Electrical Infrastructures	240,000
Mobile Equipment	1,800,000
Others	40,000

21.8 Total Capital Expenditures

Table 21.11 presents a summary of the total capital expenditures for the project. The total CAPEX is CAD 102,924,637 M.

Table 21.11: Total Capital Expenditures

Description	1Q 2012 CAD (000)
100 – Infrastructures	9,383
200 – Electrical Infrastructures	11,665
300 – Tailings & Water Management	6,671
400 – Mobile Equipment	1,711
500 – Mine Infrastructure	50
600 – Processing Plant	39,933
700 – Construction Indirects	14,163
800 – General Services	5,758
900 – Pre-production & Commissioning	4,234
990 – Contingency (10%)	9,357
Total	**102,925**

21.9 Operating Costs

21.9.1 General Estimate Parameters

The local delivered price for diesel is linked to the crude oil price. Brent crude oil price for the Base Case is USD 119/bbl. From that basis, the diesel price delivered to site is derived.

21.9.2 Mining Operating Costs

Mining costs are based on contract mining. Contractors will provide drill and blast, overburden removal, waste rock removal and ore mining. Contractors will be responsible to provide the mining fleet, operators, consumables and maintenance of their fleet and equipment. The drill and blast contractor will be responsible to manage the explosive.

The owner will provide the mine management and technical services, including grade control. A mine engineer will be responsible of the department. A geologist and a mine technician will be hired directly by the owner.

21.9.3 Processing Plant Costs

The processing costs include the manpower to operate the processing plant, as well as the crusher. It also includes the electrical power production and the consumption of natural gas. Consumables, reagents, and spare parts are also included in this estimate. Costs are calculated on a throughput of 839,500 tpy of ore.

21.9.3.1 Process Plant Manpower

The process plant manpower includes the operators, the maintenance department, the metallurgy and laboratory staff as well as the process plant management. A staff list and salaries are listed in Appendix F.

21.9.3.2 Power Costs

Power will be produced by a power plant owned by Northern Graphite. Electricity cost is derived from the cost of maintenance and efficiency of the machines selected. Energy costs include the cost for natural gas transportation, the cost of natural gas purchase and the operation and maintenance of the power plant. The different options for gas transportation to the project site have been provided by Enbridge. The purchase price of natural gas was obtained from the AECO price Index (November 2013 to March 2014) of CAD 3.46/GJ.

The total power consumption for the project includes:

- Processing equipment;
- Lighting;
- Support infrastructures and services; and,
- Pumping stations.

A utilization factor of 0.8 was considered for the total power consumption (kW/hr) calculations per year. The list of power consumptions, by area, is provided in Appendix F.

21.9.3.3 Consumables, Reagents and Spare Parts

Consumables, such as wear parts, liners, grinding media and lubricants that must be changed or replaced during the normal operation of processing operations, are included in the processing costs.

The various reagents required for ore processing and metal recovery are also included in the processing costs. Details are available in Appendix F.

Natural gas will also be used to pre-heat water services as well as make-up air for the HVAC systems.

21.9.4 General Services and Administration

General Services include general management, accounting, communications, environmental and social management, human resources, purchasing and procurement, marketing, health and safety and security protection. In most cases, these services represent fixed costs for the site as a whole. The General Services costs exclude certain costs such as transport of final products and environmental rehabilitation costs which are treated as separate line items in the financial model. Details are provided in Appendix F.

21.9.5 Total Operating Costs

A summary is presented in Table 21.12

Table 21.12: Total Operating Costs Summary

Description	1Q 2012 CAD / Mt
Processing Costs	7.32
Power Costs	2.29
G & A Costs	2.94
Technical Services	0.47
Drilling & Blasting (Waste)	0.85
Drilling & Blasting (Ore)	1.15
Overburden Removal	1.85
Waste Rock Mining	2.30
Ore Mining	2.70
Pre-Shearing (Phase 2)	0.09
Pre-Shearing (Phase 3)	0.125
Stockpile Adjustment	0.30

22. ECONOMIC ANALYSIS

22.1 Methodology

The financial analysis is based on the net present value ("NPV") and internal rate of return ("IRR") of all project cash flows starting with the project approval and development release. The valuation date on which these financial metrics are based is at the commencement of construction. All financial analyses presented are based on unlevered cash flow projections, with no provision made for debt financing.

This section presents all elements of the financial model including the graphite production and revenues, royalty payments, operating costs, capital expenditures, sustaining capital, working capital, closure and reclamation costs and taxation.

The financial analysis is performed both on a before-tax and on an after-tax basis with the cash flows estimated on a project basis only. Revenue and expenditure projections associated with the initial development and ongoing operation of the Project have been prepared using constant, First-Quarter 2012 CAD ("1Q 2012"), without provision for inflation.

22.2 Key Assumptions

22.2.1 Graphite Price

The graphite prices selected for the Feasibility Study are based on recent price history as described in Section 19. The graphite market has experienced major changes in recent years which resulted in an important increase in prices. In addition to much improved market pricing, the Bissett Creek graphite products include a major proportion of large flakes that could command an important premium from clients outside of the quoted products by Industrial Minerals magazine; however at this time, Northern Graphite Corporation ("Northern Graphite") has no specific agreement with clients for its large flakes. Because the graphite market is experiencing major positive changes and the high-quality of the Bissett Creek graphite products, it was decided to retain four price scenarios to assess the value of the Bissett Creek Project. Scenario 1 represents the last 24-months average graphite price for the likely combination of standard products from Bissett Creek. Scenario 3 is based on the last 12-months average. Industrial Minerals magazine, which is the most widely used source for graphite pricing, does not provide pricing for extra large flake material which will make up over 50% of Bissett Creek production. A premium paid for the large flake graphite would increase the average realized price for the entire production by USD 200/t of concentrate in Scenarios 2 and 4 representing less than 10%.

According to Northern Graphite, this premium could be as high as 20%

Table 22.1: Graphite Prices

Description	USD/t
Scenario 1: 24 months average	2,100
Scenario 2: 24 months average + premium	2,300
Scenario 3: 12 months average	2,600
Scenario 4: 12 months average + premium	2,800

22.2.2 Exchange Rate

All results are expressed in Canadian dollars ("CAD"). The CAD/US exchange rate is used to convert revenue from graphite sales into Canadian dollars. The base case exchange rate assumption for financial modelling is 1.00 CAD/USD.

22.2.3 Financing

Northern Graphite must finance the initial construction expenditures, working capital and any debt financial costs that occur during the construction period. The financial model assumes 100% equity financing and there are no provisions for debt financing. Prior to becoming cash flow positive, Northern Graphite would have to provide funding in the amount of CAD 106.5M related to the project expenditures only.

22.3 Taxes and Royalties

The Project is subject to three levels of taxation, which are mining duties, provincial income tax and federal income tax. A royalty agreement is in place and described below.

The existing tax pools for Northern Graphite as of September 31st, 2012 were taken into consideration in the tax calculations. The opening tax pool balances are presented in Table 22.2.

Table 22.2: Opening Tax Pool Balances

Description	(CAD)
Provincial and Federal Income Tax	
CCA 41a)	72,000
CCA Class 1	476,000
CCA Class 10	101,000
CCDE	804,000
CCEE	3,3991,000
Non Capital Losses (Tax Loss Carry Forwards)	13,686,000
Provincial Mining Tax	
Exploration and Development Expenses	5,718,000

22.3.1 Ontario Mining Duties

The Ontario mining tax is levied at a rate of 10% on mining profits in excess of CAD 500,000 derived from operations located in Ontario. Profit is determined by taking the gross revenue received on the sale of production output from the mine and deducting specified costs and expenses such as costs of mining, processing and transportation costs, depreciation at prescribed rates, exploration and development expenses, and processing allowances at prescribed rates. The first CAD 10 M of profit generated by a new mine is exempted from mining tax for a three year period.

Depreciation Allowance

Depreciation is allowed on mining assets on a 30% straight-line basis. For assets acquired prior to the beginning of production, 100% depreciation may be claimed up to the profit of the mine and no minimum depreciation is required except during the exempt period where a minimum of 30% must be taken.

Depreciation of processing and transportation assets is allowed on a 15% straight-line basis. No minimum depreciation is required except during the exempt period where 15% must be taken.

Exploration and development expenditures incurred in Ontario can be claimed in full in the year incurred and unclaimed expenditures can be carried forward indefinitely.

Processing Allowance

In the case of Bissett Creek, the annual processing allowance equals 8% of the cost of all processing assets. The allowance is constrained between 15% and 65% of operating income after deducting all expenses. Unused processing allowance cannot be carried forward.

Mining duties total CAD 13.9 M over the project life in Scenario 1.

22.3.2 Provincial Income Tax

In Ontario, corporations file a single combined income tax return and pay combined income tax instalments based on a corporate income tax base harmonized with federal definition of corporate taxable income. The tax rate is 10%.

Taxes paid to the provincial government over the project life are estimated at CAD 25.1 M in Scenario 1; tax payments start in the seventh year from the beginning of commercial production.

22.3.3 Federal Income Tax

Federal income tax is assessed on operating income, which is revenue net of operating expenses, depreciation on capital assets and deduction of exploration and pre-production development costs. Existing tax pools as described in Section 22.3 were considered in the tax calculation.

The federal tax rate applicable to resources profits is 15%.

Taxes paid to the federal government over the project life are estimated at CAD 37.7 M in Scenario 1; tax payments start in the seventh year from the beginning of commercial production.

22.3.4 Royalty

Production from the Project is subject to a royalty of CAD 20/t of graphitic carbon ("Cg") concentrate payable to the three original prospectors (Mr. Paul C. McLean, Mr. Frank P. Tagliamonte and Mr. Pierre G. Lacombe). Based on the sales of 358,548 t of concentrate, this royalty will total CAD 7.2 M over mine life or an average of CAD 312,000/y and has been provided for in the cash flow model. Another 2.5% NSR royalty is payable on any other minerals derived from the Property. As no other payable minerals were identified at this stage, this royalty is not considered in the financial model.

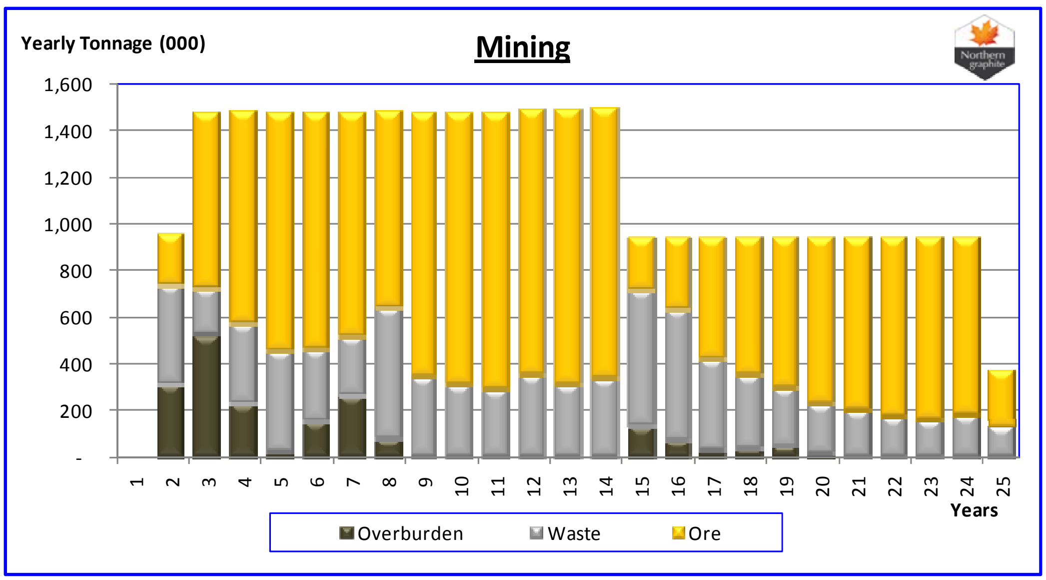
22.4 LOM Plan and Economics

Annual mill-feed averages 839,500 tpy of ore over Bissett Creek's life of mine (**"**LOM**"**) period of approximately 23 years, for a total of 19 Mt at an average grade of 1.89% Cg. In the open pit mine, a peak ore production level of 1,188,000 t is reached in the 9th year from the beginning of commercial production. A total of 7.6 Mt waste rock and 1.9 Mt of overburden will be removed over the project life resulting in an average (waste + overburden)/ore ratio of 0.5:1. The plan is composed of three distinct mining phases as shown in Table 22.3. Annual overburden, waste and ore production is shown in Figure 22.1.

Table 22.3: Mining Plan

Tonnage (000t)	Phase 1	Phase 2	Phase 3	Total
Overburden	1,202	377	313	**1,892**
Waste	1,665	2,794	3,177	**7,636**
Ore	3,772	8,941	6,264	**18,977**
Total	**6,639**	**12,112**	**9,754**	**28,505**

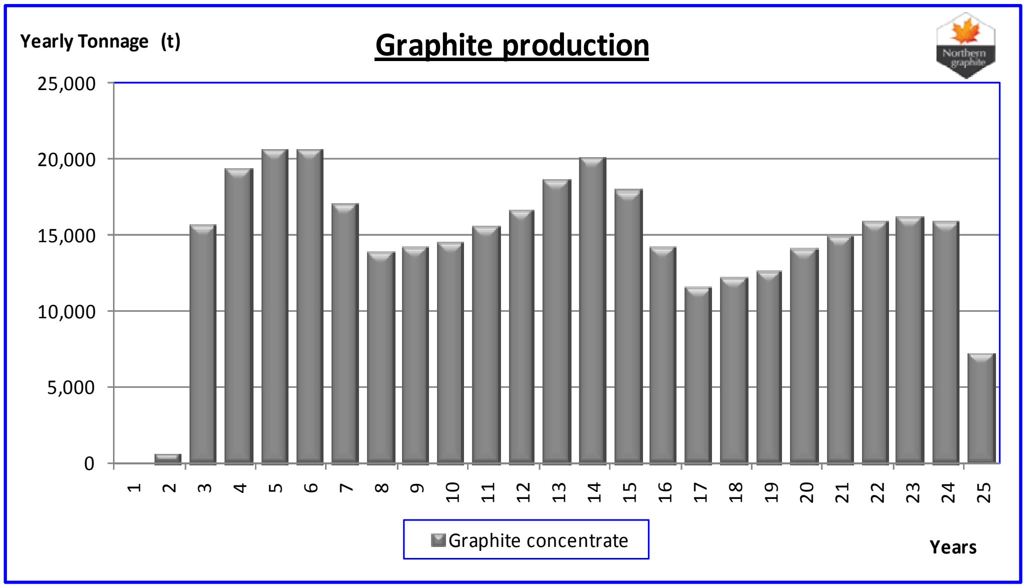
Figure 22.1: Annual Overburden, Waste and Ore Production



22.4.1 Graphite Production

The total graphite concentrate production from the Bissett Creek project is estimated at 358,548 t over a commercial production period of 23 years with an average annual production of 15,580 t. Metallurgical recovery is estimated to reach 94.7% during the third year following production start-up. Moisture content is expected to do less than 1% as described in Section 17. Figure 22.2 presents the graphite concentrate production profile over the years.

Figure 22.2: Graphite Concentrate Production Profile



22.4.2 <u>Gross Revenues</u>

At a graphite price of CAD 2,100/t of concentrate under Scenario 1, average annual sales are forecast to be CAD 32.7 M and LOM (23 years) gross sales are totalling CAD 752.9 M for Bissett Creek. After total royalty payment of CAD 7.2 M, the LOM net revenues are estimated at CAD 745.7 M.

Table 22.4summarizes the revenues associated with the four scenarios

Table 22.4: Gross Revenues

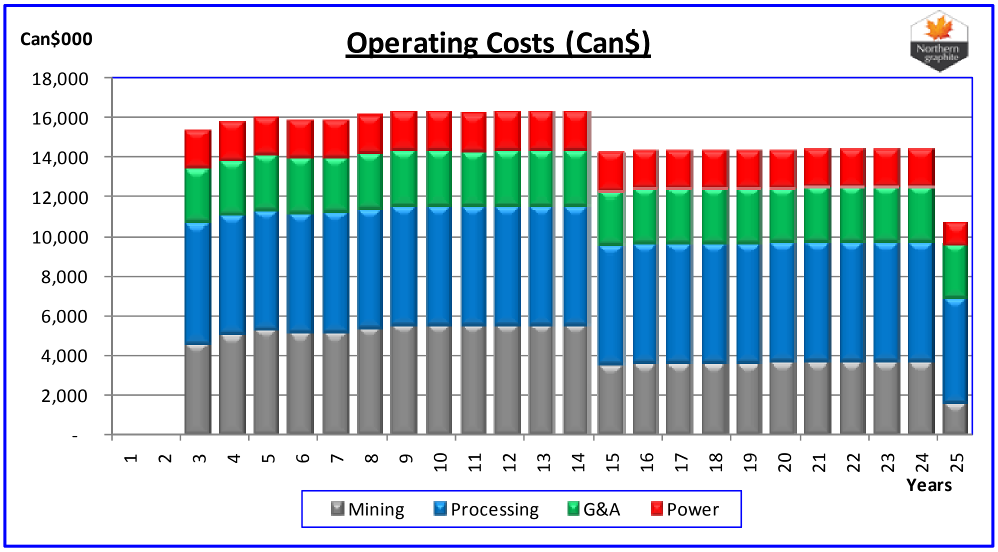
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
(CAD M)	**CAD 2,100/t**	**CAD 2,300/t**	**CAD 2,600/t**	**CAD 2,800/t**
Gross Sales	752.9	824.6	932.2	1,003.9
Royalty	7.2	7.2	7.2	7.2
Net Revenues	745.7	817.4	925.0	996.7

22.4.3 <u>Operating Costs</u>

The operating costs will total CAD 347.1 M over the mine life and average CAD 18.29/t of ore or CAD 968/t of graphite concentrate. The average operating cost for the first five years of operation is

CAD 851/t. Based on a graphite price of CAD 2,100/t of concentrate, the operating cash flow is estimated at CAD 398.6 M. The operating cost distribution is illustrated in Figure 22.3.

Figure 22.3: Operating Cost Distribution



22.4.3.1 Mining Costs

Mine operating costs were estimated from actual data and quotes from mine contractors, considering the overburden and rock conditions, haulage distance and relatively modest size of the pit operation.

The average mining cost for the mine life is CAD 5.32/t mined, including overburden, waste and ore mining, pre-shearing and re-handling costs. Some 953,000 t will be mined during the pre-production period including 218,000 t of ore.

The mine unit operating costs by activity are presented in Table 22.5; a breakdown of the costs incurred during pre-production and operating phases is also provided in Table 22.6.

Table 22.5: Mine Unit Operating Costs by Activity

Description	Phase 1 CAD/t	Phase 2 CAD/t	Phase 3 CAD/t
Overburden	1.85	1.85	1.85
Waste – Drill & Blast	0.85	0.85	0.85
Waste – Load & Haul	2.30	2.30	2.30
Pre-Shearing	Nil	0.091	0.125
Ore – Drill & Blast	1.15	1.15	1.15
Ore – Load & Haul	2.70	2.70	2.70
Stockpile adjustment*	0.30	0.30	0.30

*Cost applied to tonnage in and out of stockpile only

Table 22.6: Pre-production and Operating Phases Costs

Description	Period (000 CAD)	Phase 1 (000 CAD)	Phase 2 (000 CAD)	Phase 3 (000 CAD)	Total	CAD/t ore
Overburden	Pre-Prod	572			572	0.15
	Production	1,651	697	579	2,928	
	Total	**2,224**	**697**	**579**	**3,500**	
Waste	Pre-Prod	1,342			1,342	1.20
	Production	3,901	8,802	10,007	22,710	
	Total	**5,243**	**8,802**	**10,007**	**24,052**	
Ore	Pre-Prod	776			776	3.97
	Production	13,642	34,745	26,876	75,264	
	Total	**14,418**	**34,745**	**26,876**	**76,039**	
Total	Pre-Prod	2,690			2,690	5.32
	Production	19,195	44,244	37,462	100,901	
	Total	**21,885**	**44,244**	**37,462**	**103,591**	

If the technical services costs are added, the average mining costs over the mine life are estimated at CAD 5.79 per t of ore milled.

22.4.3.2 Processing Costs

The processing costs are estimated at CAD 7.32/t ore and total CAD 138.9 M over the mine life. Cost distribution is shown in Table 22.7

Table 22.7: Processing Costs

Description	CAD M	CAD/t ore	% of Total
Manpower	69.1	3.64	49.7%
Grinding Media	23.8	1.25	17.1%
Plant Reagents	16.2	0.86	11.8%
Consumables	25.4	1.34	18.3%
Bagging	4.4	0.23	3.1%
Total	**138.9**	**7.32**	**100%**

22.4.3.3 Power Costs

Power costs are estimated at CAD 0.079/kWh and average CAD 1.9 M/y for a total of CAD 43.4 M over project life. Power costs are shown in Table 22.8.

Table 22.8: Power Costs

Description	CAD M	CAD/t ore
Power Costs	43.4	2.29

22.4.3.4 General Administration and Technical Services Costs

General Administration and Services costs average CAD 2.8 M/y and total CAD 64.7 M over project life or CAD 3.41/t of ore.

Table 22.9: General Administration Costs

Description	CAD M	CAD/t ore
Manpower	33.0	1.74
Material, Supplies	22.8	1.20
Total	**55.8**	**2.94**

Table 22.10: Technical Services Costs

Description	CAD M	CAD/t ore
Manpower	6.6	0.35
Material, Supplies	2.3	0.12
Total	**8.9**	**0.47**

22.4.3.5 Closure Costs

According to the Ontario Ministry of Northern Development and Mines ("MNDM"), payments of financial assurance as regards to closure costs must be made prior to the start of work causing land disturbance. Closure costs are estimated at CAD 3,887,000. Considering a deposit already made in the amount of CAD 317,000, the remaining cost of CAD 3,570,000 is considered in the financial model and treated as an expenditure at the beginning of the project.

22.4.4 Capital Expenditures

The capital expenditures include initial capital and sustaining capital. The initial capital expenditures have been fully detailed in Section 21.

The initial project capital cost amount to CAD 102.9 M while sustaining capital is estimated at CAD 7.5 M. Expenditures are summarized in Table 22.11.

Table 22.11: Capital Expenditures

Description	Pre-Production (Initial Capex)	Production (Sustaining)	Total	% of Total
Waste Piles Preparation	0.05	0.28	0.33	0.3%
Processing Facilities	39.93	1.70	41.63	37.7%
Infrastructure	9.38	-	9.38	8.5%
Power	11.67	0.24	11.91	10.7%
Tailings & Water Management	6.67	3.43	10.10	9.1%
Mobile Equipment	1.71	1.80	3.51	3.2%
Indirects	14.16	-	14.16	12.9%
Pre-Prod / Commissioning	4.23	0.04	4.27	3.9%
General Services	5.76	-	5.76	5.2%
Contingency	9.36	-	9.36	8.5%
Total	**102.92**	**7.49**	**110.41**	**100%**

22.4.5 Working Capital

The following assumptions were used to estimate project working capital:

Account Receivable	Equivalent to one month of net revenues.
Production Inventory	Concentrate inventory (at cost) – 1250 t
Supplies Inventory	Equivalent to one month of processing supplies (reagents, bags, consumables). Mining supplies inventory is carried by contractor
Fuel Inventory	Equivalent to 80% of 30,000 l reservoir at CAD 1/l
Mechanical Spares	Estimated at CAD 990,351
Account Payable	Equivalent to one month of supplies, fourteen days of labour costs and one month of mining contractor costs

Working capital level reaches CAD 4.8 M.

22.4.6 Capital Depreciation

Capital expenditures are depreciated on a unit of production (“UOP”) method based on concentrate sales.

22.5 Financial Results

Under Scenario 1, the undiscounted cash flow is CAD 284.6 M before tax and CAD 207.9 M after tax; Figure 22.4 shows the yearly revenues, operating costs and capital expenditures. The internal rates of return (“IRR”) are 15.6% before tax and 13.7% after tax respectively. The payback period from the end of the pre-production period is approximately 5 years.

Table 22.12 shows the after tax Net Present Values and IRR of the four scenarios. It is evident that Scenario 1 is the most conservative and Scenario 4 is the most aggressive. If the current graphite market conditions would be maintained over the next 25 years, and Northern Graphite can proceed with its project shortly, the Bissett Creek would present financial returns in the range of Scenarios 3 and 4.

Figure 22.4: Yearly Revenues, Operating Costs and Capital Expenditures

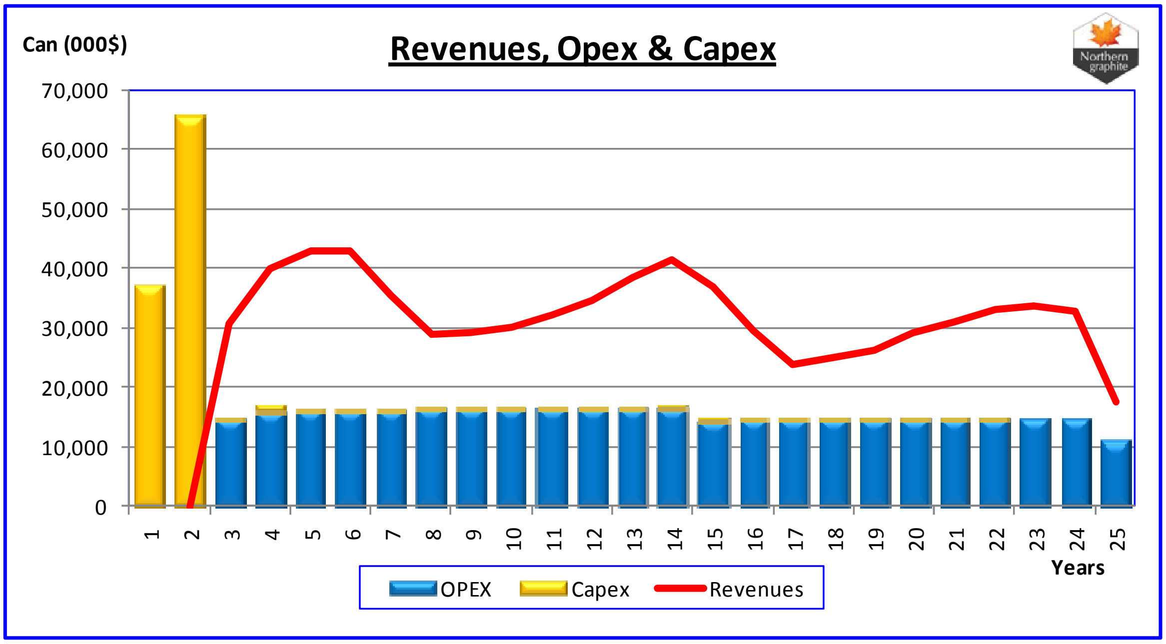


Table 22.12: After Tax Net Present Values and IRR

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
(CAD M)	**CAD 2,100/t**	**CAD 2,300/t**	**CAD 2,600/t**	**CAD 2,800/t**
NPV 0%	207.9	257.7	331.2	379.9
NPV 5%	86,8	116.4	159.6	188.0
NPV 8%	46,9	69.9	103.2	125.0
IRR	13.7%	16.4%	20.0%	22.4%

The cash flow details, including production, revenues, operating costs, capital expenditures and taxes are summarized in Table 22.13 and Table 22.14 for Scenario 1.

Table 22.13: Cash Flow Estimates and Financial Returns – Scenario 1

Northern Graphite
BISSETT CREEK
Project

CASHFLOW ESTIMATE (Can$)

SCENARIO 1 - 24 MTHS AVERAGE

MINING SERVICES INC

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
FINANCIAL PARAMETERS																												
EXCHANGE RATE	(CAN$/US$)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
GRAPHITE PRICE	(Can$/t)		$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	
PRODUCTION																												
Tonnage	(000t)		0.0	35.0	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	839.5	473.0	18,977
Grade	(% Cg)		0.00%	1.37%	1.89%	2.31%	2.44%	2.45%	2.02%	1.64%	1.67%	1.72%	1.85%	1.97%	2.20%	2.38%	2.12%	1.68%	1.37%	1.43%	1.49%	1.67%	1.76%	1.89%	1.93%	1.88%	1.51%	1.89%
Contained Graphite	(t)		0	480	15,893	19,425	20,521	20,530	16,979	13,798	14,061	14,432	15,490	16,565	18,502	19,939	17,798	14,114	11,481	12,031	12,518	14,041	14,815	15,849	16,162	15,779	7,154	358,356
Recovery	(%)		0.0%	90.0%	92.7%	93.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.6%
Recovered Graphite	(t)		0	432	14,733	18,201	19,434	19,442	16,079	13,067	13,316	13,667	14,669	15,687	17,521	18,882	16,854	13,366	10,873	11,394	11,854	13,297	14,030	15,009	15,306	14,942	6,775	338,828
Concentrate Grade	(% Cg)		0.0%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%	94.5%
Concentrate - dry	(t)		0	457	15,591	19,260	20,565	20,573	17,015	13,827	14,091	14,463	15,523	16,600	18,541	19,981	17,835	14,143	11,506	12,057	12,544	14,071	14,846	15,883	16,196	15,812	7,169	358,548
SALES	(t)		0	0	14,797	19,260	20,565	20,573	17,015	13,827	14,091	14,463	15,523	16,600	18,541	19,981	17,835	14,143	11,506	12,057	12,544	14,071	14,846	15,883	16,196	15,812	8,419	358,548
Inventory Level	(t)		0	457	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	0	
REVENUES	**(000$Can)**																											
Gross Revenue from sales	**TOTAL**		-	-	31,074	40,447	43,186	43,204	35,731	29,037	29,591	30,372	32,598	34,860	38,936	41,960	37,454	29,701	24,162	25,319	26,343	29,549	31,177	33,354	34,012	33,206	17,680	752,952
Refining	$US/t conc.																											
Royalty	(Can$/t conc.)	20.00	-	-	296	385	411	411	340	277	282	289	310	332	371	400	357	283	230	241	251	281	297	318	324	316	168	7,171
Net Revenues				**-**	**30,778**	**40,062**	**42,774**	**42,792**	**35,390**	**28,760**	**29,309**	**30,083**	**32,287**	**34,528**	**38,565**	**41,560**	**37,097**	**29,418**	**23,932**	**25,078**	**26,092**	**29,268**	**30,880**	**33,036**	**33,688**	**32,889**	**17,511**	**745,781**
OPERATING COSTS	**(000$Can)**																											
	Unit $	$/t ore mined																										
MINING - Overburden	**$1.85**	$0.15			964	418	30	285	487	152	13	-	-	-	-	-	243	130	43	63	80	19	1	-	-	-	-	2,928
MINING - Waste Rock	**$3.15**	$1.20			626	1,075	1,387	968	786	1,743	1,062	985	918	1,103	977	1,072	1,828	1,761	1,241	1,005	798	685	626	544	514	581	423	22,710
MINING - Ore (incl. pre-shearing and rehandling)		$3.97			3,016	3,512	3,867	3,865	3,869	3,468	4,424	4,514	4,543	4,367	4,508	4,433	1,400	1,685	2,291	2,501	2,689	2,914	3,007	3,089	3,126	3,056	1,119	75,264
TECHNICAL SERVICES		$0.47			389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	389	8,957
PROCESSING - Fixed		$3.64			3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	3,004	69,085
PROCESSING - Consumables/Reagents		$3.68			3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067	3,067.349	3,067	3,067	3,067	3,067	3,067	2,293	69,775
POWER		$2.29			1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920.417	1,920	1,920	1,920	1,920	1,920	1,115	43,364
G&A		$2.94			2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428	55,842
Inventory Adjustment		-$0.04			(784)																							(784)
TOTAL		**$18.29**	**-**	**-**	**14,631**	**15,814**	**16,093**	**15,928**	**15,951**	**16,171**	**16,308**	**16,308**	**16,269**	**16,279**	**16,294**	**16,314**	**14,280**	**14,385**	**14,384**	**14,376**	**14,376**	**14,427**	**14,443**	**14,442**	**14,449**	**14,446**	**10,771**	**347,141**
Costs/tonne of ore processed				$0.00	$17.43	$18.84	$19.17	$18.97	$19.00	$19.26	$19.43	$19.43	$19.38	$19.39	$19.41	$19.43	$17.01	$17.14	$17.13	$17.13	$17.12	$17.19	$17.20	$17.20	$17.21	$17.21	$22.77	$18.29
Costs/tonne concentrate (dry)					$938	$821	$783	$774	$937	$1,170	$1,157	$1,128	$1,048	$981	$879	$816	$801	$1,017	$1,250	$1,192	$1,146	$1,025	$973	$909	$892	$914	$1,502	$968
Operating Cash Flow			-	-	16,147	24,248	26,682	26,864	19,440	12,589	13,001	13,774	16,018	18,248	22,271	25,246	22,818	15,033	9,548	10,701	11,716	14,841	16,438	18,594	19,239	18,443	6,741	398,640
CAPITAL EXPENDITURES	**(000$Can)**																											
MINE EQUIPMENT	RBO	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MINE WASTE PILES	RBO	41	31	18	31	31	31	31	31	31	31	31	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	332
PROCESSING FACILITIES	PA	41	14,708	25,225	-	-	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	-	-	-	41,633
INFRASTRUCTURES	RBO	41	3,474	5,910	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,383
POWER	RBO	41	6,185	5,480	-	-	-	-	-	-	-	-	-	-	-	244	-	-	-	-	-	-	-	-	-	-	-	11,909
TAILINGS & WATER MANAGEMENT	RBO	41	558	6,113	170	1,030	185	201	170	170	170	170	170	170	170	214	170	267	-	-	-	-	-	-	-	-	-	10,098
MOBILE EQUIPMENT	RBO	41	890	821	-	50	50	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	-	-	-	3,511
INDIRECTS	RBO	41	6,520	7,643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,163
PRE-PRODUCTION/COMMISSIONING	RBO	41	-	4,234	-	-	-	15	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	4,273
GENERAL SERVICES	RBO	41	1,399	4,359	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,758
CONTINGENCY	RBO	41	3,376	5,980																								9,357
																												-
TOTAL			**37,141**	**65,783**	**201**	**1,112**	**267**	**447**	**401**	**401**	**401**	**401**	**401**	**370**	**370**	**682**	**370**	**467**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**-**	**-**	**110,417**
		PRE-PRODUCTION:		102,925																								
SALVAGE VALUE	**(000$Can)**																											
Mining Equipment																												-
Processing Equipment																												-
TOTAL Salvage Value			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CLOSURE COSTS																												
Closure - Financial Assurance			3,570																									3,570
Accrued Costs																												-

Table 22.14: Cash Flow Estimates and Financial Returns Scenario 1

Northern Graphite
BISSETT CREEK
Project

CASHFLOW ESTIMATE

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
DEPRECIATION	**(000$Can)**																											
Opening Balance			-	37,141	102,925	98,870	94,380	88,648	83,064	78,454	74,762	70,969	67,041	62,768	58,109	52,827	47,340	42,159	38,176	34,737	31,102	27,286	22,948	18,318	13,295	7,969	2,769	
Added			37,141	65,783	201	1,112	267	447	401	401	401	401	401	370	370	682	370	467	200	200	200	200	200	200	-	-	-	110,417
TOTAL Depreciation			**-**	**-**	**4,256**	**5,602**	**5,998**	**6,031**	**5,012**	**4,094**	**4,194**	**4,329**	**4,674**	**5,028**	**5,652**	**6,170**	**5,550**	**4,450**	**3,639**	**3,835**	**4,016**	**4,538**	**4,830**	**5,223**	**5,326**	**5,200**	**2,769**	110,417
Closing Balance			37,141	102,925	98,870	94,380	88,648	83,064	78,454	74,762	70,969	67,041	62,768	58,109	52,827	47,340	42,159	38,176	34,737	31,102	27,286	22,948	18,318	13,295	7,969	2,769	-	
WORKING CAPITAL	**(000$Can)**																											
Cash			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Accounts Receivable	0.083		-	-	2,565	3,338	3,565	3,566	2,949	2,397	2,442	2,507	2,691	2,877	3,214	3,463	3,091	2,452	1,994	2,090	2,174	2,439	2,573	2,753	2,807	2,741	1,459	
Production Inventory			-	-	1,236	1,026	978	968	1,172	1,462	1,447	1,409	1,310	1,226	1,099	1,021	1,001	1,271	1,563	1,491	1,433	1,282	1,216	1,137	1,115	1,142	-	
Supplies Inventory	0.083		-	-	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	153	
Fuel inventory			-	-	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	
Mechanical supplies			-	-	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	990	
Accounts payable	0.083	14	-	-	(829)	(862)	(885)	(872)	(874)	(892)	(903)	(903)	(900)	(901)	(902)	(904)	(734)	(743)	(743)	(742)	(742)	(747)	(748)	(748)	(748)	(748)	(547)	
TOTAL Working Capital	Mat ,Supplies	Labour	**-**	**-**	**4,165**	**4,696**	**4,851**	**4,856**	**4,441**	**4,160**	**4,179**	**4,207**	**4,294**	**4,396**	**4,604**	**4,774**	**4,552**	**4,173**	**4,008**	**4,032**	**4,058**	**4,168**	**4,235**	**4,335**	**4,368**	**4,328**	**2,079**	
BEFORE TAX CASH FLOW	**(000$Can)**																											
Net Revenues			-	-	30,778	40,062	42,774	42,792	35,390	28,760	29,309	30,083	32,287	34,528	38,565	41,560	37,097	29,418	23,932	25,078	26,092	29,268	30,880	33,036	33,688	32,889	17,511	745,781
Total Cash Costs			-	-	(14,631)	(15,814)	(16,093)	(15,928)	(15,951)	(16,171)	(16,308)	(16,308)	(16,269)	(16,279)	(16,294)	(16,314)	(14,280)	(14,385)	(14,384)	(14,376)	(14,376)	(14,427)	(14,443)	(14,442)	(14,449)	(14,446)	(10,771)	(347,139)
Depreciation			-	-	(4,256)	(5,602)	(5,998)	(6,031)	(5,012)	(4,094)	(4,194)	(4,329)	(4,674)	(5,028)	(5,652)	(6,170)	(5,550)	(4,450)	(3,639)	(3,835)	(4,016)	(4,538)	(4,830)	(5,223)	(5,326)	(5,200)	(2,769)	(110,417)
Closure costs			(3,570)																									(3,570)
Accrued Closure Costs			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EBIT			**(3,570)**	**-**	**11,891**	**18,646**	**20,683**	**20,833**	**14,428**	**8,495**	**8,807**	**9,445**	**11,343**	**13,220**	**16,619**	**19,076**	**17,267**	**10,583**	**5,909**	**6,866**	**7,700**	**10,303**	**11,608**	**13,371**	**13,913**	**13,243**	**3,972**	**284,654**
Add Depreciation			-	-	4,256	5,602	5,998	6,031	5,012	4,094	4,194	4,329	4,674	5,028	5,652	6,170	5,550	4,450	3,639	3,835	4,016	4,538	4,830	5,223	5,326	5,200	2,769	110,417
Less Capital Expenditures			(37,141)	(65,783)	(201)	(1,112)	(267)	(447)	(401)	(401)	(401)	(401)	(401)	(370)	(370)	(682)	(370)	(467)	(200)	(200)	(200)	(200)	(200)	(200)	-	-	-	(110,417)
Add Salvage Value			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less Changes in Working Capital			-	-	(4,165)	(531)	(155)	(5)	415	281	(19)	(27)	(88)	(102)	(208)	(170)	222	378	166	(24)	(27)	(109)	(67)	(100)	(32)	39	4,328	-
Before Tax Cash Flow			**(40,711)**	**(65,783)**	**11,781**	**22,606**	**26,260**	**26,412**	**19,453**	**12,468**	**12,581**	**13,346**	**15,529**	**17,777**	**21,693**	**24,394**	**22,670**	**14,945**	**9,514**	**10,477**	**11,489**	**14,532**	**16,170**	**18,294**	**19,207**	**18,483**	**11,069**	**284,654**
	Cumulative		(40,711)	(106,495)	(94,714)	(72,108)	(45,848)	(19,436)	17	12,485	25,066	38,412	53,941	71,718	93,411	117,805	140,474	155,419	164,933	175,410	186,900	201,431	217,601	235,895	255,103	273,585	284,654	
PV - Before tax	3%	173,454																										
	5%	123,756																										
	8%	71,735																										
IRR	**15.6%**																											
AFTER TAX CASH FLOW	**(000$Can)**																											
Before Tax Cash Flow			(40,711)	(65,783)	11,781	22,606	26,260	26,412	19,453	12,468	12,581	13,346	15,529	17,777	21,693	24,394	22,670	14,945	9,514	10,477	11,489	14,532	16,170	18,294	19,207	18,483	11,069	284,654
Mining Tax			-	-	-	-	-	-	41	-	41	624	838	1,067	1,473	1,769	1,513	726	275	314	392	712	895	1,116	1,178	794	188	13,958
Provincial Income Tax			-	-	-	0	(0)	0	-	-	1,143	1,274	1,477	1,678	2,040	2,304	2,085	1,386	885	1,002	1,099	1,383	1,527	1,722	1,784	1,748	588	25,125
Federal Income Tax			-	-	-	0	-	0	-	-	1,714	1,912	2,216	2,517	3,060	3,457	3,127	2,079	1,327	1,503	1,649	2,074	2,290	2,583	2,676	2,622	882	37,687
Sub-Total taxes			-	-	-	0	(0)	0	41	-	2,898	3,811	4,532	5,261	6,573	7,531	6,725	4,190	2,487	2,818	3,141	4,169	4,712	5,421	5,638	5,165	1,658	76,770
After Tax Cash Flow			**(40,711)**	**(65,783)**	**11,781**	**22,606**	**26,260**	**26,412**	**19,412**	**12,468**	**9,683**	**9,535**	**10,997**	**12,516**	**15,120**	**16,863**	**15,945**	**10,755**	**7,027**	**7,659**	**8,348**	**10,362**	**11,458**	**12,873**	**13,569**	**13,318**	**9,411**	**207,884**
	Cumulative		(40,711)	(106,495)	(94,714)	(72,108)	(45,848)	(19,436)	(24)	12,445	22,127	31,663	42,660	55,176	70,295	87,159	103,104	113,858	120,885	128,544	136,892	147,255	158,713	171,586	185,155	198,473	207,884	
PV - After tax	3%	124,445																										
	5%	86,786																										
	8%	46,933																										
IRR	**13.7%**																											

22.6 Sensitivity Analysis

Sensitivities to certain key parameters were undertaken in the financial model to appreciate variations to the Scenario 1 results. The sensitivity to graphite price, grade, recovery, operating costs and capital expenditures can be viewed on Table 22.15 to Table 22.19. The results are shown on an after tax basis. The project is mostly sensitive to variations of the graphite price. For every CAD 100/t of concentrate of variation in price, the after-tax, undiscounted NPV varies by CAD 25 M.

Table 22.15: Graphite Price Sensitivity

Cdn$M	-20%	-15%	-10%	-5%	Base	+5%	+10%	+15%	+20%
Graphite Price	**$1,680**	**$1,785**	**$1,890**	**$1,995**	**$2,100**	**$2,205**	**$2,310**	**$2,415**	**$2,520**
NPV 0% - After Tax	101.5	128.4	155.1	181.5	207.9	234.1	260.2	285.9	311.6
NPV 8% - After Tax	(3.7)	9.3	22.1	34.6	46.9	59.1	71.0	82.7	94.3
IRR	7.3%	9.0%	10.6%	12.2%	13.7%	15.1%	16.5%	17.8%	19.1%

Table 22.16: Graphitic Carbon Grade Sensitivity

Cdn$M	-20%	-15%	-10%	-5%	Base	+5%	+10%	+15%	+20%
Graphite Grade	**1.51%**	**1.61%**	**1.70%**	**1.79%**	**1.89%**	**1.98%**	**2.08%**	**2.17%**	**2.27%**
NPV 0% - After Tax	113.6	137.5	161.1	184.5	207.9	231.1	254.2	277.3	300.1
NPV 8% - After Tax	7.0	17.2	27.3	37.2	46.9	56.5	66.1	75.6	84.8
IRR	8.8%	10.2%	11.4%	12.6%	13.7%	14.7%	15.7%	16.6%	17.4%

Sensitivity on graphite recovery was also conducted. The base case recovery is 94.7%, however due to increasing recovery from 92.7% at start-up to 94.7% during the third year of operation, the mine life recovery averages 94.6%.

Table 22.17: Graphic Recovery Sensitivity

				Base			
Graphite Recovery	**93.4%**	**93.8%**	**94.2%**	**94.6%**	**95.0%**	**95.4%**	**95.8%**
NPV 0% - After Tax	201.8	203.9	206.0	207.9	210.2	212.3	214.4
NPV 8% - After Tax	44.2	45.2	46.1	46.9	47.9	48.9	49.8
IRR	13.4%	13.5%	13.6%	13.7%	13.8%	13.9%	14.0%

Table 22.18: Operating Costs Sensitivity

Cdn$M	-20%	-15%	-10%	-5%	Base	+5%	+10%	+15%	+20%
Operating Costs	**278**	**295**	**312**	**330**	**347**	**365**	**382**	**399**	**417**
NPV 0% - After Tax	256.2	244.1	232.1	220.0	207.9	195.8	183.6	171.3	159.1
NPV 8% - After Tax	69.0	63.6	58.0	52.5	46.9	41.3	35.7	30.0	24.3
IRR	16.3%	15.6%	15.0%	14.3%	13.7%	13.0%	12.3%	11.6%	10.9%

Table 22.19: Capital Expenditures Sensitivity

Cdn$M	-20%	-15%	-10%	-5%	Base	+5%	+10%	+15%	+20%
Capital Expendit.	**88.3**	**93.9**	**99.4**	**104.9**	**110.4**	**115.9**	**121.5**	**127.0**	**132.5**
NPV 0% - After Tax	230.0	224.5	218.9	213.4	207.9	202.4	196.8	191.3	185.8
NPV 8% - After Tax	67.4	62.3	57.2	52.1	46.9	41.8	36.7	31.6	26.5
IRR	17.9%	16.7%	15.6%	14.6%	13.7%	12.8%	12.1%	11.3%	10.7%

Figure 22.5: Cash Flow Sensitivity at 8% After Tax

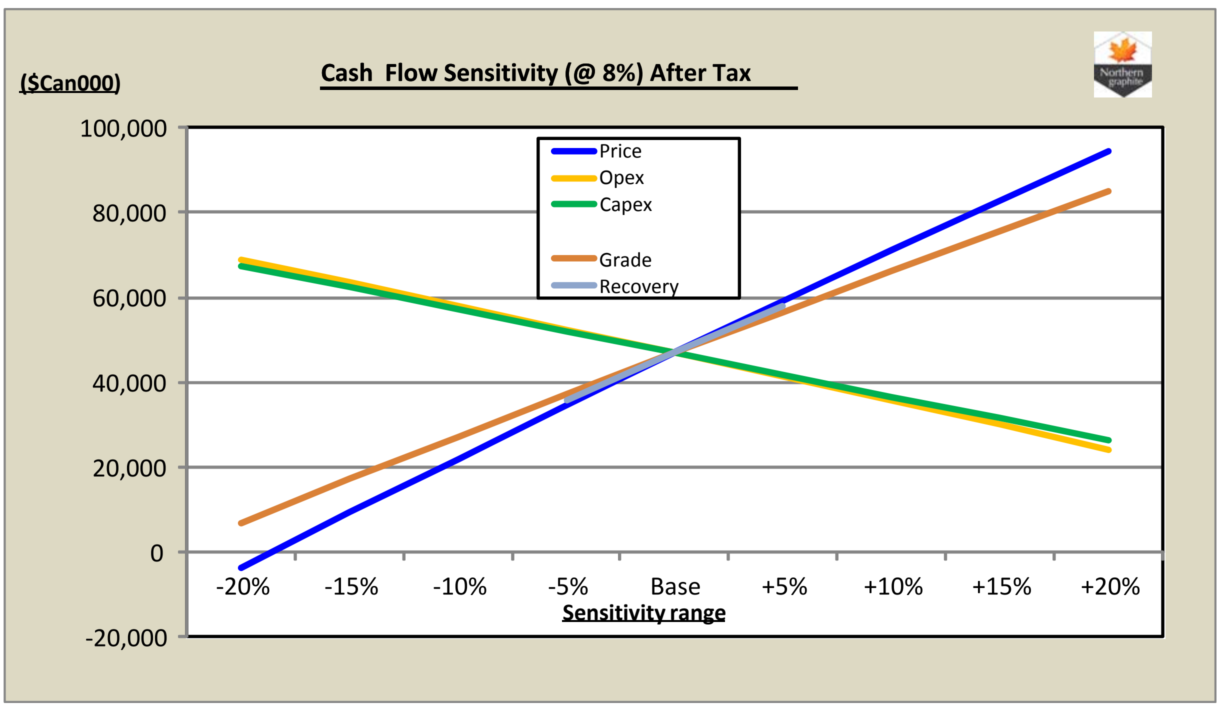
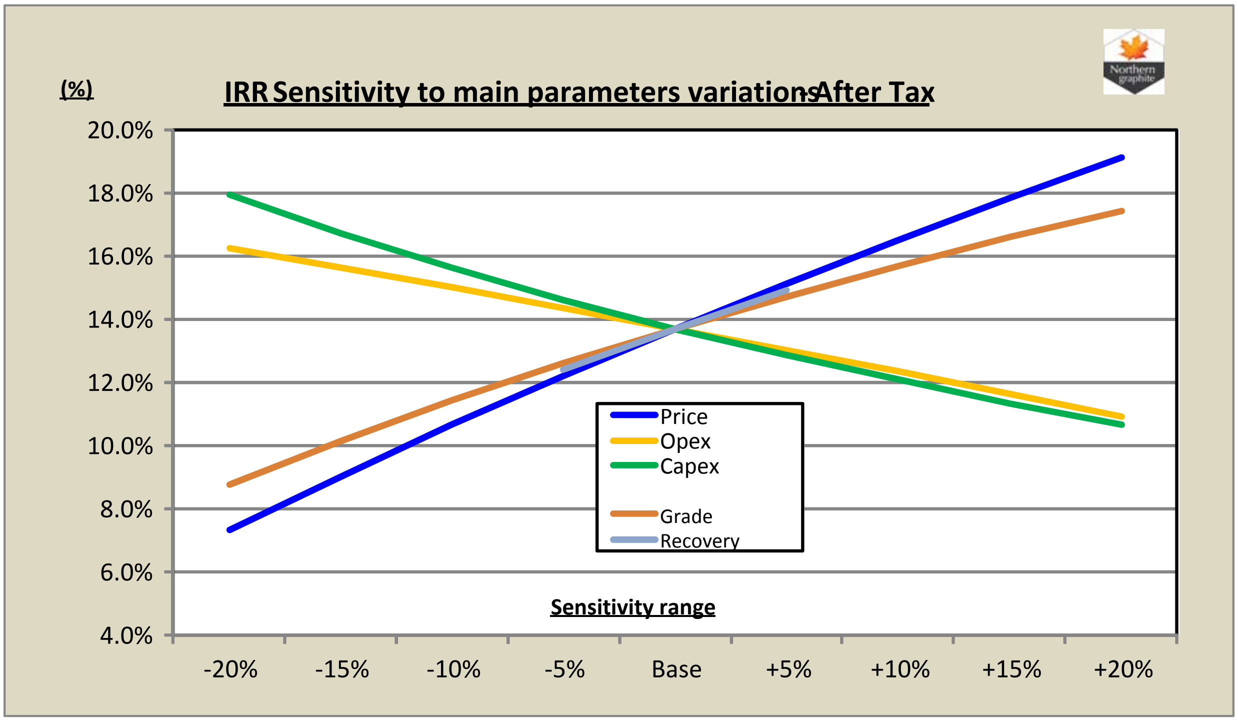


Figure 22.6: IRR Sensitivity to Main Parameters Variations – After Tax



23. ADJACENT PROPERTIES

Not applicable to this project

24. OTHER RELEVANT DATA AND INFORMATION

24.1 Project Implementation

24.1.1 Project Development Organisation

The project development philosophy for the project considers that Northern Graphite will hire a project management consultant ("**PMC**") who will act on behalf of the owner. The **PMC** will manage and supervise the engineering consultants.

The **PMC** will also execute the following responsibilities:

- Procurement tasks for all equipment and supplies;
- Logistics tasks;
- Project controls;
- Process all accounts payable documentation; and,
- Scheduling

Figure 24.1 shows the project management organizational chart for the project management and Figure 24.2 presents the organizational chart of the on-site construction management team.

Figure 24.1: Project Management Organizational Chart

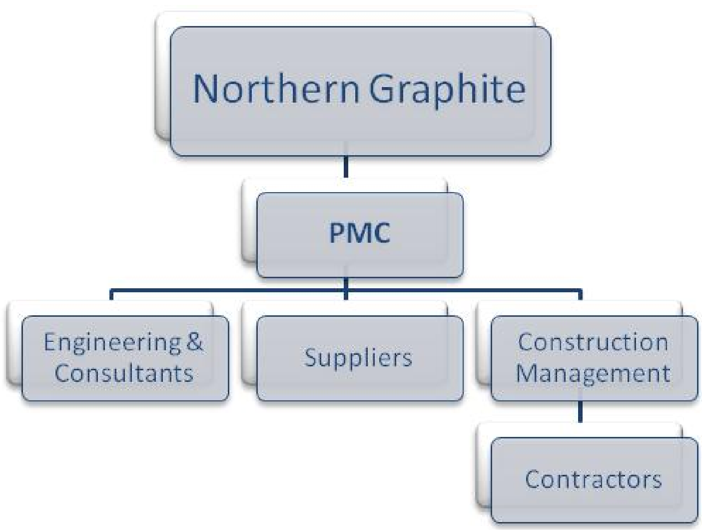
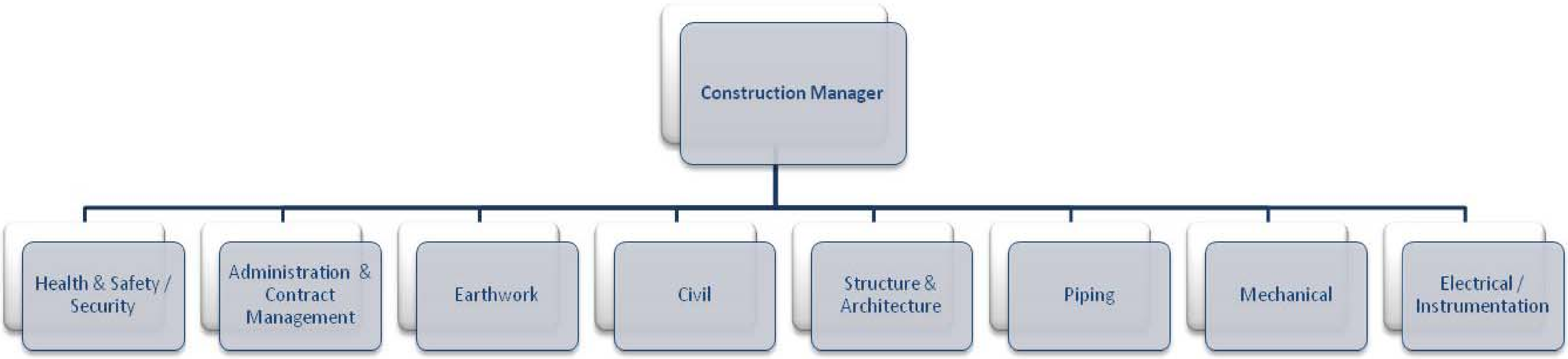


Figure 24.2: Construction Management



24.1.2 Project Controls

The project will be managed and controlled with the assistance of an earned-value project control methodology. The following software tools are used to support the project execution.

Autodesk Buzzsaw ("Buzzsaw") is a data management service that provides for the sharing of all relevant project data and information, such as drawings and specifications, with all project stakeholders – the owner and owner's project development team, engineers, consultants, suppliers, auditors, insurers, and contractors. Buzzsaw is also used to manage all documentation related to procurement – bid documents, proposals, technical documentation and manuals. Access to the Buzzsaw services is managed with a flexible system of access controls and protocols, such that each project stakeholders can only access or upload data pertaining to their scope of project involvement.

ARES Corporation Prism Project Manager ("Prism") is a construction job cost system used to budget and track all project costs through all phases of the project. Prism interfaces with the project scheduling software, Microsoft Project, in order to perform standard budget variance and earned value progress reports. Prism also interfaces with the accounting system to evaluate actual costs and labour hours for project tracking, and to forecast project estimate to complete ("ETC") costs.

24.1.3 Procurement and Logistics

The **PMC** will purchase all material for the project. This enables direct control over the procurement budget and schedule. The team performs equipment technical reviews and negotiations, analyses the total delivered cost, issues recommendations and produces the purchase orders or contractual documents upon owner's approval. The team coordinates logistics and assists suppliers. Freight forwarding is managed dynamically to minimize the freight transit times, and avoid transportation issues.

24.1.4 Construction

The **PMC** will provide the site construction management team and supplement the site staff with resources if required. Personnel that is planned to be kept after the pre-production period and become operations key personnel, will be directly hired by the owner.

Lump sum contracts will be considered when practical and cost reimbursable contracts will be awarded when preferable.

The owner will supply a 60 t crane, a 26 t boom-truck and a telehandler. The equipment will be pre-owned and refurbished. The owner will be responsible for all general lifting tasks on site.

The owner will contract the services of an operated concrete batch plant on site. All concrete requirements for the project will be supplied at owners cost and delivered to contractor.

A portable crushing plant will be mobilized on site by a contractor to provide material crushing and screening of various construction materials.

The owner will provide sanitary services, domestic water and general services as well as electrical supply throughout the project site at no cost to the contractors.

24.2 Construction Schedule

The construction schedule is presented in Figure 24.3. The project is expected to last 18 months, from the beginning of detailed engineering. Engineering of the processing plant is estimated to last 7 months.

The critical path of the project is identified as the start-up of the grinding circuit. Long lead items include the SAG mill and ball mill (52 weeks) as well as the natural gas generators (40 weeks).

The mine pre-production is expected to start 12 months before the commissioning of the process plant. The mine pre-production will generate the material required for the construction of the tailings management facilities dams and roads.

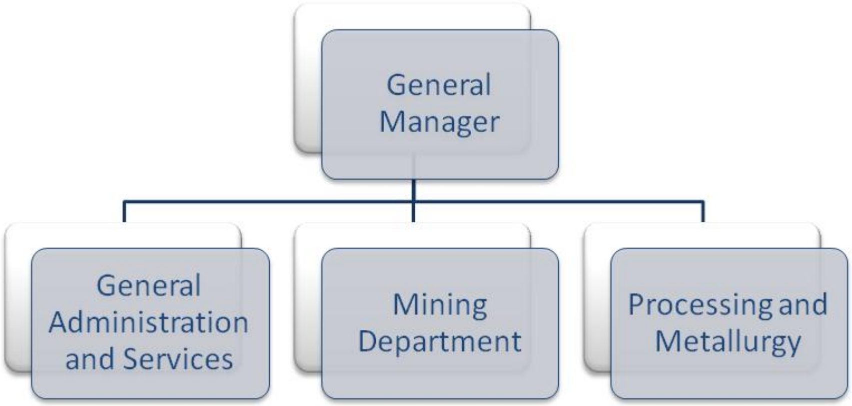
The construction schedule is based on the assumption that all financing and permits required to initiate mobilization on site of the project team and to start the construction works have been obtained. The commissioning schedule also assumes that all permits to start production have been received prior to start-up of the plant.

Figure 24.3: Construction Schedule

24.3 Operations – Organization Structure

Northern Graphite personnel will be responsible for the operation of the project, after construction. The proposed management structure for operations is presented in Figure 24.4.

Figure 24.4: Organizational Structure



An operation executive will report to Northern Graphite's CEO and Board of Directors. Operations will be grouped in three main departments: Mine, Process Plant, and General Services. The three departments will be staffed and organized progressively during the construction period and development phase. This arrangement will result in a seamless start of operations and achieve optimal results during the initial years of production.

24.3.1 Mine Department

The mine department will consist of one (1) mine engineer, one (1) mine geologist, and one mine technician.

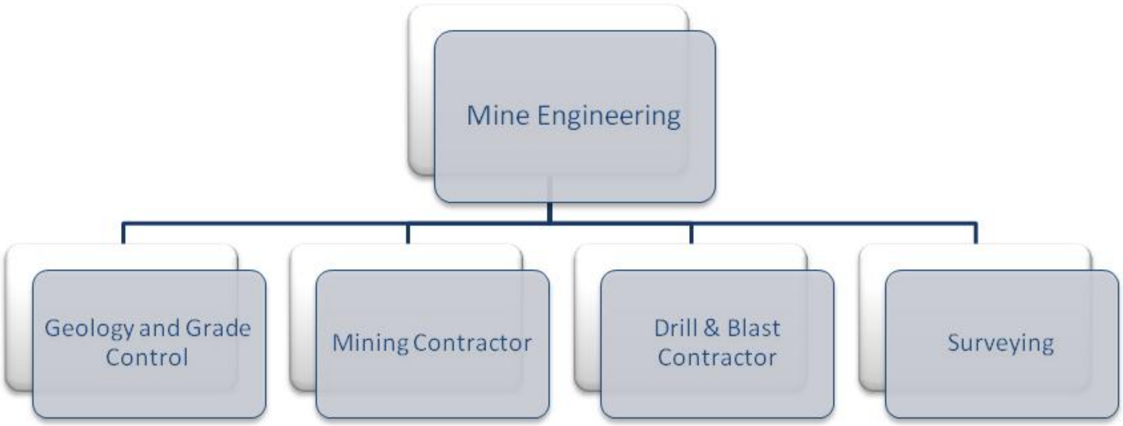
The mining activities will be conducted by contractors. A contractor will be selected to provide drill and blast services. This contractor will be responsible to provide and store explosives, and to provide all equipment to support the drill and blast activities.

A contractor will also be selected to execute the mining activities. This contractor will provide mining equipment such as haul trucks, excavators, loaders and dozers. Operators and foremen will be provided by the mining contractor.

All maintenance needs will be the responsibility of the contractors and included in the unit costs.

Both contractors will be supervised and supported by the owner's staff. The proposed overall mining department structure is presented in Figure 24.5.

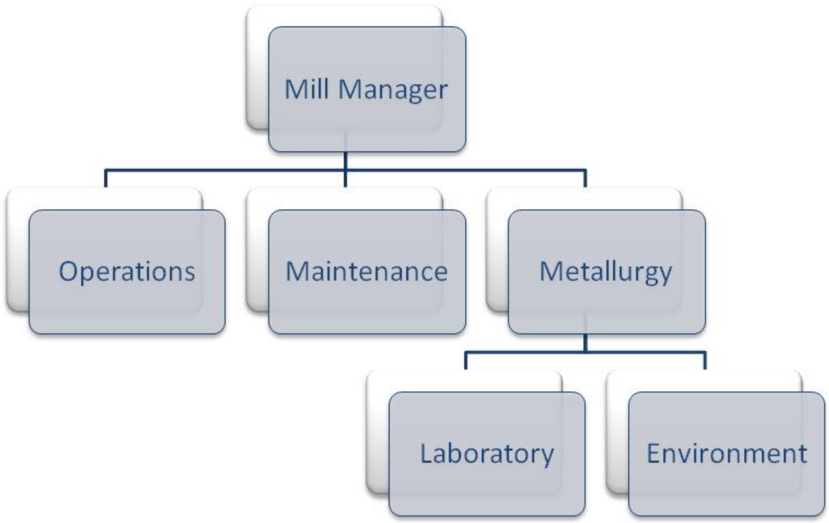
Figure 24.5: Mining Department Structure



24.3.2 Process Plant Department

The process plant department personnel will review and approve the mill engineering and procurement activities in the engineering phase of development. It will subsequently expand to monitor and supervise the mill construction activities, particularly piping, mechanical, electrical, instrumentation, and process control. It will also be involved in recruiting and training the mill workforce and prepare the purchase of parts and supplies during the pre-production period. Finally, the department will participate in the mill and power plant commissioning activities and operate both plants once commissioned. The overall structure is presented in Figure 24.6.

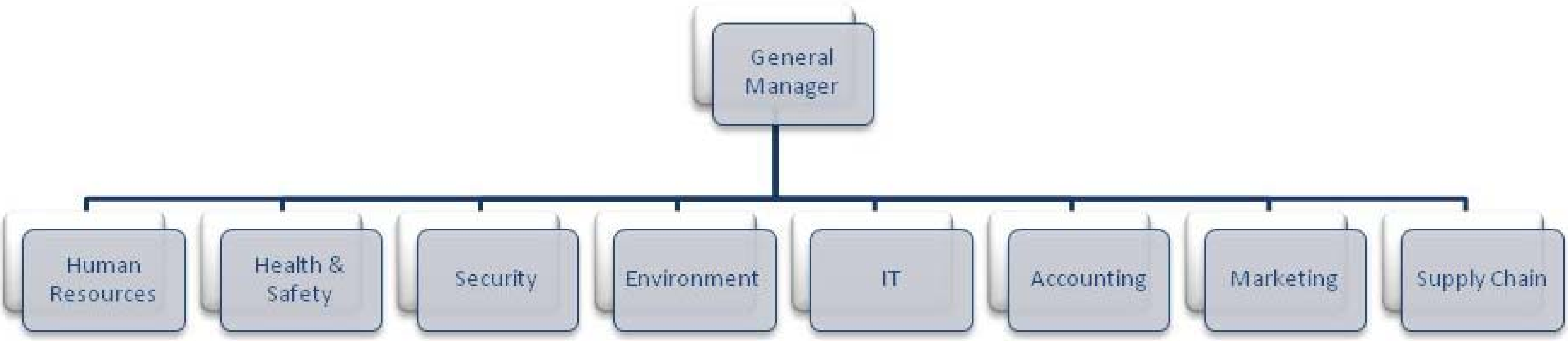
Figure 24.6: Process Plant Overall Structure



24.3.3 General Services Department

The previous groups require support and services that will continue during the production phase. They will be progressively established and organized. These services include general administration, accounting and control, purchasing and logistics, receiving and warehousing, human resources and training, health and safety, marketing and environmental management. Some external contributors will also provide support, such as freight forwarders. The General Administration and Services overall structure is presented in Figure 24.7.

Figure 24.7: General Administration and Services Structure



25. INTERPRETATION AND CONCLUSIONS

Located in Ontario, the Bissett Creek Project of Northern Graphite is in one of the best jurisdictions in the world for the development and operation of a mining project. Its environmental permitting process is well-defined and predictable and income and mining taxes are eventually profit-based and allow accelerated depreciation of its initial investment.

The Bissett Creek Project is easily accessed from Highway 17 between Ottawa and North Bay, two large population centers capable of supplying manpower and goods and services to the Project; a number of smaller villages between Ottawa and North Bay will likely be important sources of manpower. Electrical power will be generated on site from natural gas supplied by Enbridge from the Trans Canada pipeline along Highway 17; it proved to be the most economical alternative and power cost was estimated at CAD 0.079/kWh on the basis of a price of CAD 3.47/GJ for natural gas.

The Bissett Creek deposit is contained in a mineralized gneiss formation within the Ontario Central segment of the Gneiss Belt of the Grenville Structural Province. The limits of the graphitic gneiss formation form an east-west length of 1.2 km; it is exposed near surface to the north and dips at 5-20 degrees south.

Compilation of drill information and calculations of mineral resources by SGS-Canada Géostat resulted in Indicated Resources of 26 Mt at 1.81% Cg and Inferred Resources of 55 Mt at 1.57% Cg corresponding to a cut-off grade of 0.97% Cg. Following optimization of mine scheduling, pit operations are being sequenced in three phases with the following requirements:

a.) Increase head grades to the mill in the initial years of production while maintaining reasonable stripping ratio;

b.) Supply blasted rock and glacial till for tailings dam construction during pre-production period; and,

c.) Allow for disposal in mined-out pits in year 13 for sulphides tailings and in year 16 for non-sulphide tailings.

Mining reserves were established at 19 Mt at 1.89% Cg. Based on a mill throughput of 839,500 tpy, these reserves are sufficient for a 23-year mine life. In-fill drilling of inferred resources could increase reserves significantly when needed.

An extensive metallurgical testing program at SGS-Lakefield led us to select a 94.7% recovery of graphitic carbon in concentrates grading an average of 94.5% C based on pilot plant results with nearly 50% of the Cg concentrates in the +48 mesh size fraction. It is interesting to note that metallurgical testing results by SGS-Lakefield are similar to tests supervised by CESL eleven years earlier on different samples. The resulting process flowsheet uses common processing steps and equipment in the mineral industry.

A review of the graphite market indicates continued growth in consumption from both its traditional uses and the development of new applications for batteries and high technology. Demand and prices have increased significantly since 2006 and have stabilized in the last twelve months with some recent declines. Because of the uncertainty of future prices, the Study used four price scenarios, from conservative to aggressive, to evaluate the economics of the Bissett Creek Project, as shown in Table 22.12.

Table 25.1: After Tax Net Present Values and IRR

	Price Scenario 1	Price Scenario 2	Price Scenario 3	Price Scenario 4
	CAD 2,100/t	**CAD 2,300/t**	**CAD 2,600/t**	**CAD 2,800/t**
NPV 0% (CAD M)	207.9	257.7	331.2	379.9
NPV 5% (CAD M)	86,8	116.4	159.6	188.0
NPV 8% (CAD M)	46,9	69.9	103.2	125.0
IRR	13.7%	16.4%	20.0%	22.4%

On the basis of all the engineering studies, cost estimates, price scenarios and economic analyses performed as part of this Feasibility Study, we believe that the financial returns are sufficiently robust to justify the required investment to bring the Bissett Creek Project to commercial production.

The production level, when compared to the total market, should enable its successful introduction in the supply of large and extra-large graphite flake products, without impacting the supply-demand relationship and resulting prices.

When well established as a reliable supplier of quality products, Northern Graphite should be in excellent position to pursue a production expansion on the basis of its large resources at Bissett Creek.

26. RECOMMENDATIONS

Some recommendations were formulated by the various consultants involved in the Feasibility Study. These recommendations intend to possibly reduce risks and improve the economics of the Bissett Creek Project.

26.1 Resources and Reserves

SGS Geostat recommends further diamond drilling on the Bissett Creek deposit, the main objectives being to:

- Increase the level of confidence for the mineral resource classification within a perimeter that roughly defines the first 10 years of production; and,
- Acquire a validated and documented assay dataset within the area of historical drilling using standardized modern analytical procedures.

Although the variography study conducted for the current resource estimate has shown good continuity in all directions of the horizontal plane within a range of 120-150 m, the absence of historical assay certificates, drill core, sample rejects or drill hole casings as well as the current drill spacing (50 m) justify adding twin and in-fill holes. Current drill spacing is approximately 50 m along 50 m spaced N68° sections. The proposed drill program for a total of about 5,000 m of drilling would consist of 59 holes spaced 50 m along N68° sections in the middle of currently drilled sections.

The proposed program will mainly be focused within and on the immediate perimeter of the current indicated resources. A resource could then be estimated with the new drill data and then compared to the resource estimated from the historical data. Positive conclusions from this comparison study would upgrade the resources to the measured category for the initial 10 years of production.

26.2 Mining and Earthwork

Grade control will be very important to the financial success of the operation; significant additional costs were added when drilling in ore to be able to sample, assay and predict ore grades at every meter within the mineralized zone. In addition to the added information and control, it may prove highly beneficial to develop a flexible approach to bench height and be able to adjust to the ore-waste contacts of the shallow-dipping mineralized zone.

Current capital costs assume that some of the rock and overburden from the pit will be supplied by the mining contractor to an earthwork contractor for infrastructures, tailings dams and other site preparation during the construction period. Significant savings could be realized if all mining and earthwork were bundled in a single contract considering that continued tailings dam construction will be required during the operating phase.

26.3 Processing

It is common practice in the graphite industry to classify final concentrates on the basis of total carbon assays with the assumption that all carbonaceous and organic carbon is rejected in the rougher and cleaning stages. It was noted that calculated heads in the locked cycle tests and the pilot plant tests are generally 5-10% higher than assayed Cg heads determined by the LECO method. Consequently, recovery and concentrate production could be slightly underestimated since we used Cg assays as mill feed grade. Further comparative work between assay methods could clarify these differences.

Economic evaluation of the Project was based on the graphite recoveries and concentrate grades obtained from the stabilized pilot plant results. Because the bulk sample came from a near-surface partially oxidized portion of the deposit, metallurgical results were slightly inferior to the locked cycle tests on fresh core. Actual processing results may prove to be closer to the locked cycle test results.

Further to the owner’s experience it was decided to stockpile the crushed ore without a shelter. It must be noted that other operations in northern climates use shelters to cover the crushed ore stockpile.

26.4 Environment

We understand that environmental permit applications will be submitted shortly with the closure plan and closure cost estimates. Successful negotiations with the MNDM could result in some deferral of the financial guaranties for the closure costs, which would be an improvement on our financial assumptions; we assumed that guaranties were needed before the start of construction.

The Environmental Management Plan (“EMP”) needs to be finalized and implemented prior to Project development.

In order to proceed to project implementation all permits listed in Section 20 must be obtained.

Some tests indicated that waste rock with lower-grade mineralization in the deposit could be potentially acid generating (“PAG”). Additional testing is required to further confirm this situation and define the volume of waste rock and marginal ore presenting this environmental risk. Once this situation is better quantified, segregation and a final disposal method for this PAG material must be finalized.

26.5 Market

The graphite market consisted about 1.1 Mt of consumption in 2011 and has been dominated historically by Chinese producers. Because of increased domestic consumption and export barriers, Chinese supply was relatively contained in recent years; this resulted in an improvement in market fundamentals for producers and a substantial increase in prices for natural graphite.

The Bissett Creek graphite concentrates fulfill the market specifications for the standard graphite concentrate products, as defined and quoted by Industrial Minerals. However, Northern Graphite will have to provide customers with sample products to confirm quality and suitability for their purposes. Offtake agreements and purchase commitments have not traditionally been part of the graphite market as almost all product is sold on a spot basis with direct negotiation between the buyer and seller. Such agreements could support Northern Graphite's financing efforts for the Project.

There is a sub-market for concentrates of very large flakes- such as the +50 mesh (XL) and the +32 mesh (XXL) fractions, which can represent about 50% of the Bissett Creek total concentrate production. Significant premiums can be paid by certain clients for these products, but prices are privately negotiated between suppliers and consumers; there is no quoted market and research only gave indications as to the size of the premiums were provided. At the time of this Feasibility Study, there was no documentation or agreement supporting the accessibility to this sub-market for the Bissett Creek concentrates of very large flakes and the corresponding prices. The tonnage of these products that can be absorbed by the market and its impact on available premium has not been adequately demonstrated. Northern Graphite must focus some of its marketing effort to quantify the possible added financial benefits from its concentrates of very large flakes.

27. REFERENCES

Blais, R. (1992). *Stripping, Trenching and Overburden Drilling on Bissett Creek Crystalline Graphite Property.* Assessment Report 1991, North Coast Industries Ltd.

Bongarcon, F. (1990). *Bissett Deposit Preliminary Geostatistical Study of Graphite Reserves.* Summary Report, North Coast Industries Ltd.

C.E.C. Engineering Ltd. (1987). *Review of Exploration on the Bissett Creek Graphite Property, Maria Township, Ontario.* Internal Report, North Coast Industries Ltd.

Cameron, E. (1960). Graphite: Industrial Minerals and Rocks. *Seeley W. Mudd Series, AIME* (Chapter 20).

Cominco Engineering Services Ltd. (1990). *Metallurgical Investigation and Plant Flowsheet Development for the Bissett Creek Flake Graphite Ore.* Internal Report, North Coast Industries Ltd.

Cominco Engineering Services Ltd. (1990). *Metallurgical Report on the Variability Test Results of the Bissett Creek Flake Graphite Ore.* Internal Report, North Coast Industries Ltd.

Culshaw, N.G., Davidson, A., and Nadeau, L. (1983). Structural subdivisions of the Grenville Province in the Parry Sound - Algonquin region, Ontario. *Current Research, Part B, Geological Survey of Canada* (Paper 83-1B), pp. 243-252.

Davidson, A and Grant, S.M. (1986). Reconnaissance geology of western and central Algonquin Park and detailed study of coronitic olivine metagabbro, Central Gneiss Belt, Grenville Province of Ontario. *Current Research, Part B, Geological Survey of Canada* (Paper 86-1B), pp. 837-848.

Davidson, A. (1984). Identification of ductile shear zones in the southwestern Grenville Province of the Canadian Shield. (A. Kröner, & R. Greiling, Eds.) *Precambrian Tectonics Illustrated* , pp. 263-279.

Davidson, A. (1995). Tectonic history of the Grenville Province, Ontario. *Geological Survey of Canada , Field Trip Guidebook A5* (Open File 3142.)

Davidson, A., and Morgan, W.C. (1981). Preliminary notes on the geology east of Georgian Bay, Grenville Structural Province, Ontario. *Current Research Part A, Geological Survey of Canada* (Paper 81-1A), pp. 291-298.

Davidson, A., Culshaw, N.G., and Nadeau, L. (1982). A tectono-metamorphic framework for part of the Grenville Province, Parry Sound region, Ontario. *Current Research, Part A, Geological Survey of Canada* (Paper 82-1A), pp. 175-190.

Davidson, A., Nadeau, L., Grant, S.M., and Pryer, L.L. (1985). Studies in the Grenville Province of Ontario. *Current Research, Part A, Geological Survey of Canada* (Paper 85-1A), pp. 463-483.

Garland, M. (1897). Graphite in the Central Gneiss Belt of the Grenville Province of Ontario. *Mines and Minerals Division, Ontario Geological Survey* (Open File Report 5649), p. 222.

Garland, M. (1991). The Geology of the Cal Graphite Flake Graphite Deposit. *Ontario Geological Survey* (Open File Report 5816), p. 61.

Gower, C.F., Rivers, T. and Ryan, B. (1990). Mid-Proterozoic Laurentia-Baltica. *Geological Association of Canada* (Special Paper 38), p. 581.

Hawken, Peter H. (2008*). Flake Graphite Market Study, with Emphasis on the Bissett Creek Deposit, Ontario, Canada.*

Industrial Alliance Securities (2012). *Graphite – Black Gold of the 21st Century.*

Industrial Minerals Magazine (2012), *The Natural Graphite Report – Executive Summary.*

Insight Geophysics Inc. (2011). *Geophysical Survey Interpretation Report, Bissett Creek Project.* Internal Report, Northern Graphite Corp.

Kilborn Engineering (B.C.) Ltd. (1989). *Bissett Creek Flake Graphite Project, Maria Township, Ontario: Geology, Ore Reserve and Mining Feasibility Study.* Internal Report, North Coast Industries Ltd.

Knight Piésold Ltd. (2011). *Bissett Creek Mine 2011 Geotechnical Site Investigation Summary.* Internal Report, Northern Graphite Corporation.

Lakefield Research. (1985). *Mineralogical Examination of 15 DDH Core Samples.* Progress Report Number One, Princeton Resources Corp.

Lumbers, S. (1978). Geology of the Grenville Front tectonic zone in Ontario. (A. Currie, & Mackasey, W.O., Eds.) *Toronto '78, Field Trips Guidebook, Geological Association of Canada* , pp. 347-361.

Lumbers, S. (1976). Mattawa-Deep River Area (Eastern Half), District of Nipissing and County of Renfrew. *Ontario Division of Mines, Preliminary Map p. 1197, Geological series, scale 1:63,360 (1 inch to 1 mile)* .

Mac Pherson, A.J., CAL Graphite Corporation (1993). *Grinding and Concentration Recovery Graphite.*

Mac Pherson, A.J. (1992*). Proposed Autogenous Grinding.*

Perron, Hudon, Bélanger. (2011). *LIDAR Data Capture Project, Mattawa Mining Site.* Internal Report, Northern Graphite Corp.

Pincock, Allen & Holt Inc. (1990). *Ore Reserve and Preliminary Mining Plan, Bissett Creek Flake Graphite Project.* Internal Report, North Coast Industries Ltd.

Rankin et al. (1993). Proterozoic rocks est and southeat of the Grenville front. *Geological Society of America, The Geology of North America , C-2* (ch. 5), pp. 335-461.

Schmidt, U. (1986). *Geology and 1985 Diamond Drilling, Bissett Creek Graphite Property, Maria Township, Ontario.* Internal Report, Princeton Resources Corp.

Schmidt, U. (1985). *Preliminary Report on Geology, Diamond Drilling and Trenching on Bissett Creek Graphite Property (Tagliamonte Property).* Internal Report, Princeton Resources Corp.

Schwerdtner, W.M., Dickin, A.P., and Robin, P.-Y.F. (2009). Rocks, structures and tectonic scenario: Introduction to the Grenville Province of Ontario. *AGU-GAC-MAC-CGU-IAH Joint Assembly Field Trip Guidebook* , p. 27.

SGS Canada Inc. (2011). *Preliminary Economic Assessment on the Bissett Creek Graphite Property.* NI 43-101 Technical Report, Industrial Minerals Inc. & Northern Graphite Corp.

Stantec Consulting Ltd. (2010). *Bissett Creek Graphite Mine Project Development Plan.* Internal Report, Northern Graphite Corp.

Taner, M. F. (2011). *Report on the Samples Studied by CANMET from Bissett Creek Graphite Deposit belonging to the Northern Graphite Corporation at Maria Township, Ontario.* Internal Report, Northern Graphite Corp.

William Hill Mining Consultants Limited. (1986). *Summary Progress Report on the Bissett Creek Project for the 1985 Calendar Year.* Internal Report, Princeton Resources Corp.

Windley, B. (1989). Anorogenic magmatism and the Grenville orogeny. *Canadian Journal of Earth Sciences , 26*, pp. 479-489.

Windley, B. (n.d.). Proterozoic anorogenic magmatism and its orogenic connections. *Geological Society of London , 150*, pp. 39-50.

7th Edition Roskill Information Services (2009). *The Economies of Natural Graphite*.

28. CERTIFICATES AND CONSENTS

CERTIFICATE OF AUTHOR

To Accompany the Report entitled

"NI 43-101 Technical Report – Bankable Feasibility Study of the Bissett Creek Project, Canada for Northern Graphite Corporation" dated August 23rd, 2012.

I, Louis Gignac, ing., M.Sc. D. Eng do hereby certify that:

1) I am President and Principal of G Mining Services Inc. with an office at 7900, Taschereau Blvd, Building D, Suite 200, Brossard, Québec, Canada, J4X 1C2;

2) I am a graduate from Laval University, Québec with B. Sc.A. in Mining Engineering (1973), from the University of Minnesota, USA, with a M.Sc, in Mineral Engineering (1974), and from the University of Missouri-Rolla, USA, with a Doctorate of Engineering (D.Eng) in Mining Engineering (1979).

3) I am a registered member of "Ordre des Ingénieurs du Québec" (#24041);

4) I have worked in the mining industry continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;

6) I have participated in the preparation of this technical report and sections 1, 15, 16, 25 and 26;

7) I have not visited the project site;

8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Graphite Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Graphite Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Northern Graphite Corporation, or any associated or affiliated companies;

12) I have read NI 43-101 and Form 43-101F1 and have prepared sections 1, 15, 16, 25 and 26 of the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23rd day of August 2012.

Louis Gignac, ing., M.Sc., D.Eng.
President
G Mining Services Inc.

INGÉNIEUR · ENGINEER
LOUIS P. GIGNAC
24041
QUÉBEC

CERTIFICATE OF AUTHOR

To Accompany the Report entitled

"NI 43-101 Technical Report – Bankable Feasibility Study of the Bissett Creek Project, Canada for Northern Graphite Corporation" dated August 23rd, 2012.

I, Robert Marchand, ing., do hereby certify that:

1) I am Vice President – Mining Engineering with G Mining Services Inc. with an office at 7900, Taschereau Blvd, Building D, Suite 200, Brossard, Québec, Canada, J4X 1C2;

2) I am a graduate from Laval University, Québec with B. Sc.A. in mining Engineering in 1982;

3) I am a registered member of "Ordre des Ingénieurs du Québec" (#44928);

4) I have worked in the mining industry continuously since my graduation from university. I have been involved in mining operations, engineering, management and financial evaluations in the mineral industry for 29 years;

5) I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;

6) I have participated in the preparation of section 22 of this technical report;

7) I have not visited the project site;

8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Graphite Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Graphite Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Northern Graphite Corporation, or any associated or affiliated companies;

12) I have read NI 43-101 and Form 43-101F1 and have prepared section 22 of the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23rd day of August 2012.

Robert Marchand, ing.

INGÉNIEUR · ENGINEER
Robert Marchand
44928
QUÉBEC

Robert Marchand, ing.,
Vice President – Mining Engineering
G Mining Services Inc.

CERTIFICATE OF AUTHOR

To Accompany the Report entitled

"NI 43-101 Technical Report – Bankable Feasibility Study of the Bissett Creek Project, Canada for Northern Graphite Corporation" dated August 23rd, 2012.

I, Steve Aiken, P.Eng., do hereby certify that:

1) I am Manager Environmental Services for Knight Piésold Ltd.;
2) I am a graduate of the University of Waterloo Ontario, Bachelor Applied Science – Geological Engineering;
3) I am a registered member of "Professional Engineers Ontario" (90340902);
4) I have worked as a Participant in studies and implementation of mining projects for over 20 years;
5) I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;
6) I have participated in the preparation of section 20 of this technical report;
7) I have visited the project site on numerous occasions including June 29, 2011;
8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;
9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Graphite Corporation, or any associated or affiliated entities;
10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Graphite Corporation, or any associated or affiliated companies;
11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Northern Graphite Corporation, or any associated or affiliated companies;
12) I have read NI 43-101 and Form 43-101F1 and have prepared section 20 of the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and

technical information that is required to be disclosed to make the technical report not misleading.

This 23rd day of August, 2012.

LICENSED PROFESSIONAL ENGINEER
S. R. AIKEN
AUG 23 2012
PROVINCE OF ONTARIO

Steve Aiken, P.Eng.
Manager Environmental Services
Knight Piésold Ltd.

CERTIFICATE OF AUTHOR

To Accompany the Report entitled

"NI 43-101 Technical Report – Bankable Feasibility Study of the Bissett Creek Project, Canada for Northern Graphite Corporation" dated August 23rd, 2012.

I, Ahmed Bouajila, ing., do hereby certify that:

1) I am Senior Metallurgist acting as Vice President Metallurgy and Ore Processing for G Mining Services Inc;

2) I am a graduate of the Laval University with a B.Sc. A. (Mining Engineering) in 1986 and a M.Sc. in mineral processing in 1988.

3) I am a Professional Engineer registered with the Association of Professional Engineers of the province of Quebec (OIQ-Licence: 106943);

4) I have practiced my profession continuously since 1992. I have over 20 years' experience in mineral processing and metallurgical testing, consulting, engineering and R&D. Prior to joining G Mining, I worked for CRM and COREM as mineral processing engineer, researcher, team leader and director. As a mineral processing Engineer, I lab and pilot test, develop, audit retrofit and optimize mineral processing schemes for iron ore, base & precious metal and industrial minerals for existing and developing projects in Canada and oversee.

5) I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;

6) I contributed towards Sections 13, 17 and 19 of this technical report;

7) I have not personally visited the SGS pilot testing facility and assisted to one of the pilot trials;

8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Graphite Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Graphite Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Northern Graphite Corporation, or any associated or affiliated companies;

12) I have read NI 43-101 and Form 43-101F1 and have prepared sections 13, 17 and 19 of the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23rd day of August, 2012

ing. (# 106943)

Ahmed Bouajila, ing. M.Sc.,
Vice President – Metallurgy and Ore Processing
G Mining Services Inc.

CERTIFICATE OF AUTHOR

To Accompany the Report entitled

"NI 43-101 Technical Report – Bankable Feasibility Study of the Bissett Creek Project, Canada for Northern Graphite Corporation" dated August 23rd, 2012.

I, Nicolas Ménard, ing., do hereby certify that:

1) I am a Consultant - Mechanical Engineer with G Mining Services Inc. with an office at 7900, Taschereau Blvd., Building D, Suite 200, Brossard, Québec, Canada;

2) I am a graduate from École Polytechnique de Montréal, with B. Eng. in Mechanical Engineering in 2002;

3) I am a registered member of "Ordre des Ingénieurs du Québec" (130840);

4) I have worked as a Participant in studies and implementation of mining projects continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;

6) I have participated in the preparation of sections 2, 3, 4, 5, 6, 18, 21, 24, and 27 of this technical report;

7) I have visited the project site on June 29, 2011;

8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Graphite Corporation, or any associated or affiliated entities;

10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Graphite Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Northern Graphite Corporation, or any associated or affiliated companies;

12) I have read NI 43-101 and Form 43-101F1 and have prepared sections 2, 3, 4, 5, 6, 18, 21, 24 and 27 of the technical report in compliance with NI 43-101 and

Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23rd day of August 2012.

Nicolas Ménard, ing.,
Consultant – Mechanical Engineer
G Mining Services Inc.

CERTIFICATE OF AUTHOR

To Accompany the Report entitled

"NI 43-101 Technical Report – Bankable Feasibility Study of the Bissett Creek Project, Canada for Northern Graphite Corporation" dated August 23rd, 2012.

I, François Thibert, M.Sc., P.Geo. do hereby certify that:

1) I am acting as a Senior Geologist for SGS Canada Inc.;

2) I am a graduate from HEC Montreal (Quebec), Certificate in Project Management in 2010; University of Montreal (Quebec) Master of Science (M.Sc.) in Igneous Petrology (1993); University of Montreal (Quebec); Bachelor of Science (B.Sc.) in Geology (1987);

3) I am a registered member of "Ordre des Géologues du Québec" (1444), and geologist and Qualified Person (QP) under NI 43-101;

4) I have worked as a Participant in studies and implementation of mining projects for 22 years;

5) I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;

6) I have participated in the preparation of sections 7, 8, 9, 10, 11, 12 and 14 of this technical report;

7) I have visited the project site on September, 16, 2010;

8) I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report;

9) Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Graphite Corporation, or any associated or affiliated entities;

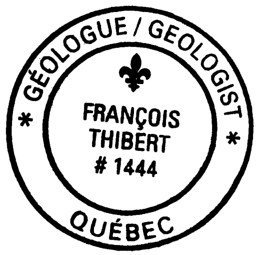
10) Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Graphite Corporation, or any associated or affiliated companies;

11) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Northern Graphite Corporation, or any associated or affiliated companies;

12) I have read NI 43-101 and Form 43-101F1 and have prepared section 18.2 of the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

This 23rd day of August 2012.

François Thibert, M.Sc., P. Geo.
Senior Geologist
SGS Canada Inc.



MINING SERVICES INC.

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Louis Gignac**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

Louis Gignac, ing., M.Sc., D.Eng.,
G Mining Services Inc.

INGÉNIEUR · ENGINEER
LOUIS P. GIGNAC
24041
QUÉBEC

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Robert Marchand**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

Robert Marchand, ing.,
G Mining Services Inc.

INGÉNIEUR · ENGINEER
Robert Marchand
44926
QUÉBEC

MINING SERVICES INC.

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Robert Ménard**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

Robert Ménard, ing., OIQ. # 25632
G Mining Services Inc.

Knight Piésold
CONSULTING

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Andy Phillips**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August, 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

Andy Phillips, P. Eng.
Knight Piésold Ltd.

Knight Piésold
CONSULTING

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Steve Aiken**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August, 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

LICENSED PROFESSIONAL ENGINEER
S. R. AIKEN
AUG 23 2012
PROVINCE OF ONTARIO

Steve Aiken, P. Eng.
Knight Piésold Ltd.

G MINING SERVICES INC.

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Ahmed Bouajila**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

ing (#106943)

Ahmed Bouajila, ing.,
G Mining Services Inc.

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Nicolas Ménard**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

Nicolas Ménard, ing.,
G Mining Services Inc.

Met-Chem Canada Inc.
555, boul. René-Lévesque Ouest
3e étage
Montréal (Québec)
Canada
H2Z 1B1

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Daniel Houde**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August, 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

Daniel Houde, ing.
General Manager - Projects
Met-Chem Canada Inc.

INGÉNIEUR · ENGINEER
DANIEL HOUDE
39985
QUÉBEC

SGS

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **François Thibert**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August, 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

François Thibert, M.Sc., P.Geo
Senior Geologist
SGS Canada Inc.

GÉOLOGUE / GEOLOGIST
FRANÇOIS THIBERT
1444
QUÉBEC

SGS

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Gilbert Rousseau**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August, 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

Gilbert Rousseau

Gilbert Rousseau, ing., B.Sc.A
Senior Mining – Metallurgical Engineer
SGS Canada Inc.

G MINING SERVICES INC.

CONSENT OF QUALIFIED PERSON

Ontario Securities Commission
British Columbia Securities Commission
Alberta Securities Commission
TSX Venture Exchange

Dear Sirs/Mesdames:

Re: Northern Graphite Corporation – Technical Report

I, **Antoine Champagne**, consent to the public filing of the technical report entitled "NI-43-101 Technical Report – Bankable Feasibility Study of the Bisset Creek Project" and dated August 23rd, 2012 (the "Technical Report") prepared for Northern Graphite Corporation (the "Company").

I also consent to any extracts from or a summary of the Technical Report in the press release of the Company dated July 9, 2012 (the "Disclosure").

I certify that I have read the Disclosure and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 23rd day of August, 2012

ing
Antoine Champagne, ing., #01Q 137814
G Mining Services Inc.