Independent Technical Report for the Churchill River Mineral Sands Project, Labrador, Canada

Report Prepared for

North Atlantic Iron Corporation

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North Atlantic Iron Corporation

Report Prepared by

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Independent Technical Report for the Churchill River Mineral Sands Project, Labrador, Canada

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Cover: Satellite image of the project area.

IMPORTANT NOTICE

This report was prepared as a National Instrument 43-101 *Standards of Disclosure for Mineral Projects* Technical Report for North Atlantic Iron Corporation (North Atlantic) by SRK Consulting (Canada) Inc. (SRK). The quality of information, conclusions, and estimates contained herein are consistent with the quality of effort involved in SRK's services. The information, conclusions, and estimates contained herein are 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. This report is intended for use by North Atlantic subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits North Atlantic to file this report as a Technical Report with Canadian securities regulatory authorities pursuant to National Instrument 43-101. Except for the purposes legislated under provincial securities law, any other uses of this report by any third party is at that party's sole risk. The responsibility for this disclosure remains with North Atlantic. The user of this document should ensure that this is the most recent Technical Report for the property as it is not valid if a new Technical Report has been issued.

Executive Summary

Introduction

The Churchill River mineral sand project is an exploration project at the resource delineation stage located in Labrador, Canada, near the town of Happy Valley-Goose Bay. North Atlantic Iron Corp. (North Atlantic) holds a 100 percent interest in the tenements. North Atlantic is a joint-venture company formed between Grand River Ironsands Inc. (Grand River) and Petmin Limited (Petmin).

In early 2012, Petmin commissioned SRK Consulting (SA) (Pty) Ltd. (SRK SA) to prepare a Mineral Resource Statement for the project. In late 2012, SRK SA was requested to update the mineral resource model to incorporate additional drilling information acquired by Grand River during 2012.

On January 20, 2014, Muskrat Minerals Inc. (Muskrat), which currently holds a 40.3 percent interest in Grand River, disclosed publicly a Mineral Resource Statement for the Churchill River mineral sand project. Upon its review of this disclosure, the Ontario Securities Commission determined that certain economic disclosures related to the Churchill River mineral sand project did not comply with National Instrument 43-101 – Standards of Disclosure for Mineral Projects. To remedy this noncompliance, SRK Consulting (Canada) Inc. was commissioned by North Atlantic to compile a technical report supporting the disclosure of the mineral resources.

This technical report documents the first Mineral Resource Statement prepared for the Churchill River mineral sand project that follows the guidelines of the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1. The Mineral Resource Statement reported herein was prepared in conformity with the generally accepted CIM *Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines*.

Property Description and Ownership

The Churchill River mineral sand project comprises a series of exploration licenses covering approximately 372.25 square kilometres in the Goose Bay area of Labrador. The licenses are in good standing and wholly owned by North Atlantic. North Atlantic is a joint-venture company formed between Grand River and Petmin of South Africa. Grand River is the successor of Markland Resource Development (Markland). Muskrat owns a 40.3 percent interest in Grand River.

Geology and Mineralization

The Churchill River mineral sand project is located within the Proterozoic Grenville orogenic belt. In Labrador the orogenic belt is subdivided into an exterior thrust belt and an interior magmatic belt. The Wilson Lake Terrain, a subdivision of the exterior thrust belt, underlies much of the Churchill River drainage basin. Rifting following the Grenville Orogeny resulted in a series of grabens in the Lake Melville area, of which two host the Churchill River mineral sand.

The effects of the Wisconsinan ice sheet dominate the surface geology of the study area and are of particular interest for the mineral potential of North Atlantic's tenements. At the glacial maximum, the ice sheet completely covered the Goose Bay area. The lower Churchill River is characterized by a number of sandbars, most of which are partially or completely under water during times of high discharge. The Sandbars are composed of moderately to well-sorted silica sand with a considerable heavy mineral fraction. The heavy minerals form millimetre-scale lenses and layers within the river sands. The shores of the river are characterized by similar sand deposits found in the river.

Mineralization in the project area consists of a heavy mineral fraction in the fluvial, and possibly Aeolian, sand deposits. The main constituents of the heavy mineral fraction consist of titanomagnetite, hornblende, and magnetite.

Exploration Status

The exploration work conducted by Grand River was professionally managed and the used procedures are consistent with generally accepted industry best practices.

Between 2011 and 2012 the majority of tenements were covered by aeromagnetic surveys; in addition, North Atlantic conducted ground magnetic surveys over certain areas of the property.

Markland completed a total of 155 core boreholes (1,282.4 metres) with a small diameter, man-portable Pionjar direct push probe. Grand River utilized primarily Geoprobe direct push probes as well as a sonic drill for a limited number of boreholes. Between 2010 and 2012 Grand River completed 418 core boreholes and 17 core boreholes for a combined total of 6,068 metres.

On completion of the validation procedures, SRK considers the North Atlantic exploration database sufficiently reliable to support mineral resource evaluation.

Mineral Processing and Metallurgical Testing

A number of different metallurgical testwork programs have been completed to study the recovery of iron from the Churchill River mineral sand as well as to demonstrate the feasibility of producing pig iron from this concentrate. Batch beneficiation testswere completed at the Cardero Technologies laboratory looking into both gravity and magnetic separation methods to concentrate the magnetite and titano-magnetite minerals.

Extended pilot plant tests were also conducted based on magnetic separation to generate a bulk sample of iron concentrate for subsequent testing. Concentrate to pig iron tests were conducted at both the Midrex Technology Center in North Carolina and a test facility owned by Grand River in Easton, Pennsylvania.

The metallurgical testwork was supervised by Hatch Ltd. And the test results were reviewed by SRK. The stages involved in the processing of mineral sand to final pig iron are:

- Beneficiation or recovery of a high grade iron concentrate from the mineral sand plant feed;
- Raw material (concentrate) handling and composite briquette (CBQ) production;
- Production of direct reduced iron (DRI) from the composite briquettes; and
- Pig iron production from melting of the DRI.

In each stage, the ability to generate a usable intermediate product or final saleable product was demonstrated. It is clear that additional testwork is required to improve the efficiency of each processing stage.

From the 2012 demonstration plant operation, a combined magnetite and titano-magnetite concentrate recovery of only 52% is expected. This is based on a flowsheet comprised of only dry magnetic separation. The results show a ratio of 4.35:1 of titano-magnetite to magnetite production.

RHF tests produced a DRI of 77% iron metallization and 51% iron total. A significant amount of fines generated during cold briquette transportation and charging of the RHF negatively affected DRI metallization and furnace productivity. Melting tests showed it is reasonable to expect production of hot metal similar to New Zealand or Highveld composition and productivity.

Mineral Resource Estimate

The construction of the mineral resource model was a collaborative effort between North Atlantic and SRK personnel. The geological modelling, geostatistical analysis, variography, and mineral resource modelling were undertaken by Mark Wanless (Pr.Sci.Nat #400178/05) and Livhuwani Maake (Pr.Sci.Nat #400437/11). By virtue of their education, relevant project experiences, and affiliation to a recognized professional association, Mr. Wanless and Ms. Maake are Qualified Persons independent of North Atlantic for the purposes of National Instrument 43-101.

The mineral resources reported herein were estimated using a geostatistical block modelling approach informed from heavy mineral concentrate assay data collected in core boreholes. Resource domains were defined using a traditional wireframe interpretation constructed from a sectional interpretation of the drilling data. The interpretation of the boundaries of the heavy mineral occurrence considered lithological modelling undertaken by SRK.

The evaluation of the mineral resources involved the following procedures:

- Database compilation and verification;
- Generation of three-dimensional resource domains and verification;
- Data conditioning (compositing and capping), statistical analysis, and variography;
- Selection of estimation strategy and estimation parameters;
- Block modelling and grade estimation;
- Validation, classification, and tabulation;
- Assessment of "reasonable prospects for economic extraction" and selection of reporting assumptions; and
- Preparation of the Mineral Resource Statement.

The Mineral Resource Statement for the Churchill River deposit is presented in Table i and is reported at a cut-off grade of 5 percent by weight of heavy mineral concentrate. The mineral resource model was prepared in conformity with the Canadian Institute of Mining, Metallurgy and Petroleum's (CIM) *Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines* (November 2003) and are classified according to the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (November 2010). The effective date of the Mineral Resource Statement is January 15, 2013.

Table i: Mineral Resource Statement*, Churchill River Mineral Sands Deposit, Goose Bay, Newfoundland, SRK Consulting (South Africa) (Pty) Limited, January 15, 2013

Domain	Resource Category	Quantity (000't)	Heavy Mineral Concentrate Weight Percent	Fe_2O_3 Equivalent Weight Percent
Block 1	Measured	-	-	-
	Indicated	-	-	-
	Measured + Indicated	-	-	-
	Inferred	139,910	9.08	39.06
Block 2	Measured	-	-	-
	Indicated	35,510	10.50	38.10
	Measured + Indicated	35,510	10.50	38.10
	Inferred	39,200	9.88	37.44
Block 5	Measured	-	-	-
	Indicated	298,650	9.50	36.87
	Measured + Indicated	298,650	9.50	36.87
	Inferred	80,840	9.82	36.58
Combined	Measured	-	-	-
	Indicated	334,160	9.61	37.00
	Measured + Indicated	334,160	9.61	37.00
	Inferred	259,950	9.43	38.04

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates. Open pit mineral resources are reported at a cut-off grade of 5 percent by weight of heavy mineral concentrate.

Mineral resources are not mineral reserves and have not demonstrated economic viability. There is no certainty that all or any part of the mineral resources will be converted into mineral reserves. SRK is unaware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant issues that may materially affect the mineral resources.

Conclusion and Recommendations

The geological setting and character of the mineral sand delineated to date on the Churchill River mineral sand project are of sufficient merit to justify additional exploration expenditures. SRK recommends an exploration program that includes additional core drilling with the aim of upgrading the classification of the currently outlines mineral sand resources. As part of this program SRK recommends collecting specific gravity data to improve the confidence in the resource model. Geological and engineering studies are also recommended.

The proposed work program includes:

- Infill delineation core drilling (10,000 metres) to improve the confidence in the continuity of the mineral resources;
- Field geological investigations aimed at building a comprehensive specific gravity database;
- Engineering studies aimed at completing the characterization of the iron sand deposits and to support the evaluation of the economic viability of a mining project at a conceptual level.

The cost of the recommended work program is estimated at C$1.7M.

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1 Introduction and Terms of Reference

The Churchill River mineral sand project is an exploration project at the resource delineation stage located in Labrador, Canada, near the town of Happy Valley-Goose Bay. Since the discovery of iron-bearing sand on the property in the late 1800s, the property has seen only minimal exploration activity. Since 2002, Markland Resource Development Inc. (Markland) and its successor entities Grand River Ironsands Inc. (Grand River) and North Atlantic Iron Corp. (North Atlantic) have explored for iron-bearing mineral sand in the project area. North Atlantic was formed on September 15, 2010 as a joint venture vehicle between Petmin Limited (Petmin), and Grand River. In early 2012, Muskrat Minerals Inc. (Muskrat) was formed, and it acquired a majority share in Grand River. Muskrat currently holds a 40.3 percent interest in Grand River.

In early 2012, RK Consulting (SA) (Pty) Ltd. (SRK SA) was commissioned to prepare an initial Mineral Resource Statement for the Churchill River mineral sand project. In late 2012, SRK SA was requested to update the mineral resource model to incorporate additional drilling information acquired by Grand River during 2012.

On January 20, 2014, Muskrat disclosed publicly a Mineral Resource Statement for the Churchill River mineral sand project. Upon its review of this disclosure, the Ontario Securities Commission (OSC) determined that certain economic disclosures related to the project did not comply with Canadian Securities Administrators' National Instrument 43-101 – Standards of Disclosure for Mineral Projects. To remedy this noncompliance, SRK Consulting (Canada) Inc. (SRK Canada) was commissioned by North Atlantic on May 13, 2014 to compile a technical report supporting the disclosure of the mineral resources.

This technical report summarizes the technical information available on the Churchill River mineral sand project to support the disclosure of a Mineral Resource Statement pursuant to National Instrument 43-101. The report was prepared following Form 43-101F1 guidelines and in conformity with the generally accepted CIM *Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines*.

In the opinion of SRK, the geological and mineral resource models discussed herein are a reasonable representation of the global distribution of the heavy mineral sand occurrence identified on the property at the current level of sampling.

1.1 Scope of Work

The scope of work includes the compilation of a technical report documenting the construction of a mineral resource model for the heavy mineral occurrence mineralization delineated by drilling on the Churchill River mineral sand project in compliance with National Instrument 43-101 and Form 43-101F1 guidelines.

This work typically involves the assessment of the following aspects of this project:

- Topography, landscape, access;
- Regional and local geology;
- Exploration history;
- Audit of exploration work carried out on the project;
- Geological modelling;

- Mineral resource estimation and validation;
- Preparation of a Mineral Resource Statement; and
- Recommendations for additional work.

1.2 Work Program

The Mineral Resource Statement reported herein is a collaborative effort between North Atlantic and SRK personnel. The exploration database was compiled and maintained by North Atlantic and it was audited by SRK. The geological model and outlines for the heavy mineral occurrence were constructed by SRK from a two-dimensional geological interpretation provided by North Atlantic.

The Mineral Resource Statement reported herein was prepared in conformity with generally accepted CIM *Exploration Best Practices* and CIM *Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines*. This technical report was prepared following the guidelines of the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1.

The technical report was assembled in Toronto during the months of May, 2014.

1.3 Basis of Technical Report

This report is based on information collected by SRK during site visits performed between June 1 and 5, 2010, July 3 and 5, 2013, and September 23 and 26, 2013 and on additional information provided by North Atlantic throughout the course of SRK's investigations. SRK has no reason to doubt the reliability of the information provided by North Atlantic. Other information was obtained from the public domain. This technical report is based on the following sources of information:

- Discussions with North Atlantic personnel;
- Inspection of the Churchill River project area;
- Review and audit of exploration data collected by North Atlantic; and
- Additional information from public domain sources.

1.4 Qualifications of SRK and SRK Team

The SRK Group comprises of more than 1,400 professionals, offering expertise in a wide range of resource engineering disciplines. The independence of the SRK Group is ensured by the fact that it holds no equity in any project it investigates and that its ownership rests solely with its staff. These facts permit SRK to provide its clients with conflict-free and objective recommendations. SRK has a proven track record in undertaking independent assessments of mineral resources and mineral reserves, project evaluations and audits, technical reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies, and financial institutions worldwide. Through its work with a large number of major international mining companies, the SRK Group has established a reputation for providing valuable consultancy services to the global mining industry.

The geological modelling, geostatistical analysis, variography, and mineral resource modelling were undertaken by Mark Wanless, Pr.Sci.Nat (#400178/05) and Livhuwani Maake, Pr.Sci.Nat (#400437/11). By virtue of their education, relevant project experiences, and affiliation to a recognized professional association, Mr. Wanless and Ms. Maake are Qualified Persons independent of North Atlantic for the purposes of National Instrument 43-101. Mr. Wanless visited the Churchill River project on July 3 to 5, 2013.

This technical report was compiled by M. Sebastien Bernier, PGeo (PEGNL #05958) with the assistance of Dr. Lars Weiershäuser, PGeo (APGO#1504, PEGNL 07559). Dr. Weiershäuser visited the Churchil River project from June 1 to 5, 2010. Dr. Adrian Dance, PENG (APEGBC#37151) reviewed the mineral processing and metallurgical testing work completed under the supervision of Hatch Ltd. Dr. Dance did not visit the property.

Dr. Jean-François Couture, PhD, PGeo (APGO#0197), a Corporate Consultant with SRK, acted as a senior reviewer of drafts of this technical report prior to their delivery to North Atlantic Iron Corp. as per SRK internal quality management procedures.

1.5 Site Visit

In accordance with National Instrument 43-101 guidelines, Dr. Weiershäuser visited the Churchill River project on June 1 to 5, 2010, accompanied by Francis MacKenzie, president of Grand River. In addition, Mr. Wanless visited the project on July 3 to 5, 2013, and Dr. Couture on September 23 to 26, 2013.

The purpose of the site visit in 2010 was to validate procedures, review exploration procedures, define geological modelling procedures, examine core, interview project personnel, and collect all relevant information in order to develop best practice mineral exploration strategies for this deposit. The purpose of the site visits in 2013 was to review the deposit geology and the exploration work completed by North Atlantic, and advise on further exploration and technical studies that are warranted to advance the project.

SRK was given full access to relevant data and conducted interviews with Grand River personnel to obtain information on the past exploration work, to understand procedures used to collect, record, store and analyze historical and current exploration data.

1.6 Acknowledgement

SRK would like to acknowledge the support and collaboration provided by Grand River personnel for this assignment. Their collaboration was greatly appreciated.

1.7 Declaration

SRK's opinion contained herein and effective **January 15, 2013** is based on information collected by SRK throughout the course of SRK's investigations. The information in turn reflects various technical and economic conditions at the time of writing this report. Given the nature of the mining business, these conditions can change significantly over relatively short periods of time. Consequently, actual results may be significantly more or less favourable.

This report may include technical information that requires subsequent calculations to derive subtotals, totals, and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, SRK does not consider them to be material.

SRK is not an insider, associate or an affiliate of North Atlantic Iron Corp., and neither SRK nor any affiliate has acted as advisor to North Atlantic Iron Corp., its subsidiaries or its affiliates in connection with this project. The results of the technical review by SRK are not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

2 Reliance on Other Experts

SRK has not performed an independent verification of the land title and tenure information as summarized in Section 3 of this report. SRK did not verify the legality of any underlying agreement(s) that may exist concerning the permits or other agreement(s) between third parties, but has relied on Bennet Jones LLP as expressed in a legal opinion provided to the Canadian National Stock Exchange on March 26, 2012. A copy of the title opinion is proved in Appendix A the reliance applies solely to the legal status of the rights disclosed in Sections 3.1 and 3.2 below.

3 Property Description and Location

The Churchill River mineral sand project is located immediately to the west of the mouth of the Churchill River near the town of Happy Valley-Goose Bay in Labrador, Canada (Figure 1).

The Churchill River project comprises a series of exploration licenses covering approximately 372.25 square kilometres in the Goose Bay area of Labrador (Figure 2). The licenses are held by North Atlantic Iron Corporation (North Atlantic).

North Atlantic is a joint-venture company formed between Grand River Ironsands Inc. and Petmin Ltd. of South Africa. North Atlantic holds a 100 percent interest in the Grand River mineral sand project. Petmin has agreed to commit up to US$25 million in staged payments to North Atlantic to advance the project to the bankable feasibility stage. Petmin stands to earn a 40 percent interest in the project. The remaining 60 percent interest is held by Grand River Ironsands, which is held 42 percent by Muskrat Minerals Inc., a CNX-listed company, and 58 percent by private shareholders.

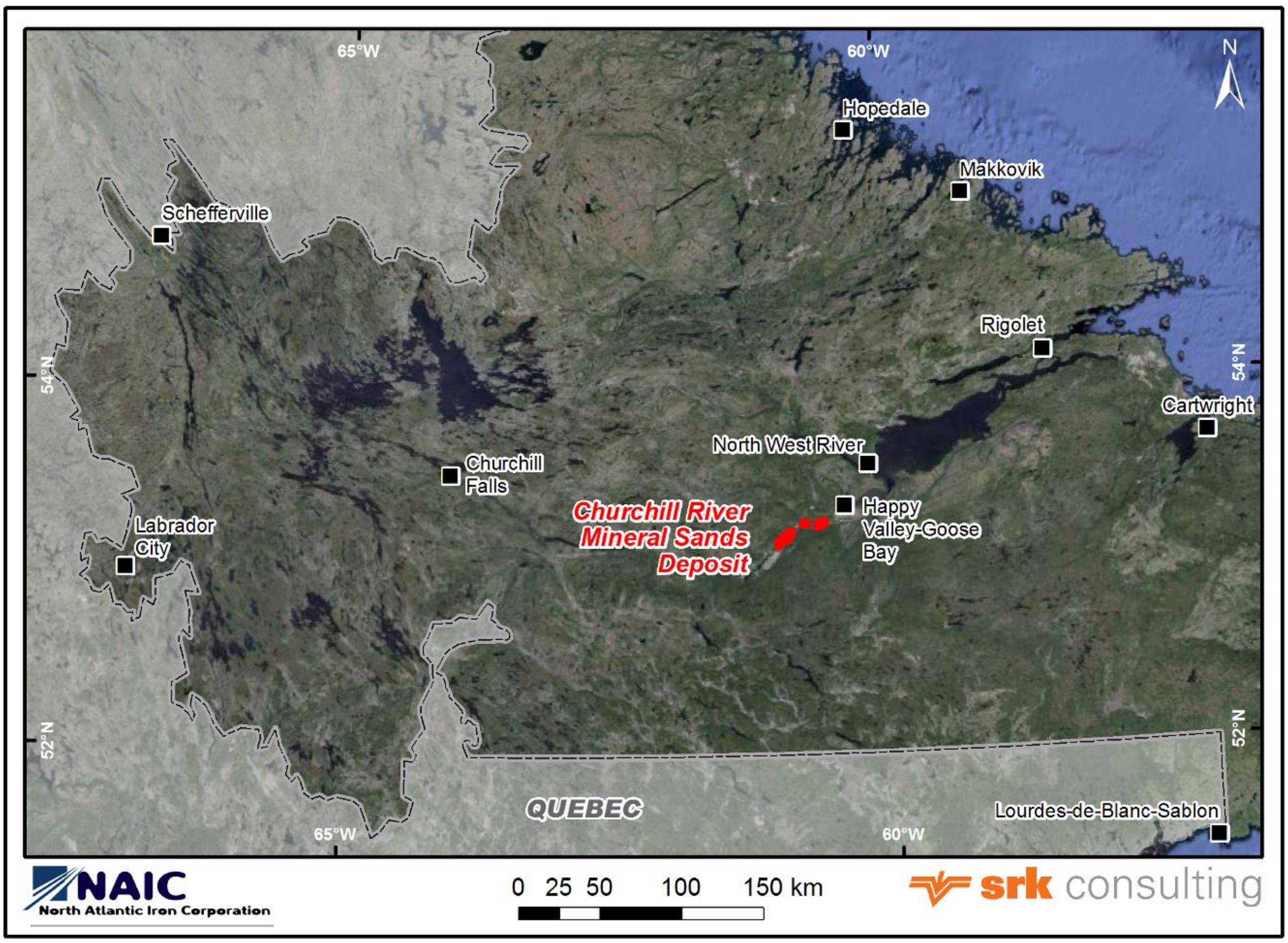

Figure 1: Location of North Atlantic's Tenements in Labrador

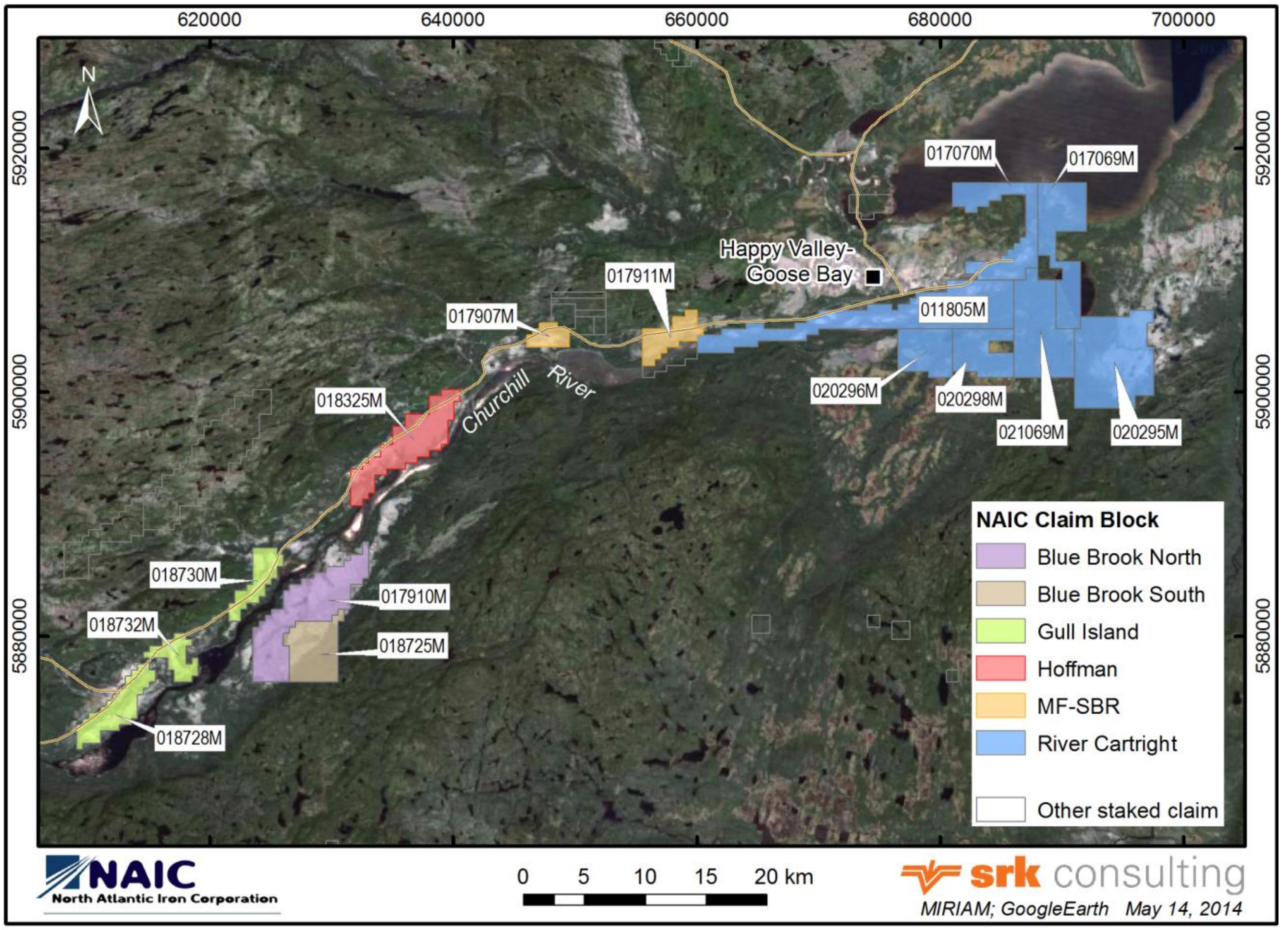

Figure 2: Distribution of North Atlantic's Claim Blocks Along the Churchill River

3.1 Mineral Tenure

North Atlantic's exploration properties are located in the Goose Bay region of Newfoundland and Labrador. The claims are located in central Labrador immediately to the east, west, south, southwest and southeast of the Town of Happy Valley-Goose Bay. The claims extend west of Muskrat Falls along the lower Churchill River to Hamilton Inlet and from the Churchill River to the boundary of the proposed Mealy Mountains National Park. The property comprises 1,489 claims in 15 claim blocks with a total area of approximately 372 square kilometres. The location of the property is illustrated in Figure 1, and Table 1 provides details of the claims. Mineral resources are located in licenses 018325M, 017907M, and 017911M.

Table 1: North Atlantic Iron Corp. Claims Status

Claim No	No Claims	Issued	Status	Renewal Date	NTS Map Location
011805M	233	2003/05/08	Active	2013/05/08	13F/07, 13F/08
014998M	245	2008/05/07	Active	2013/05/27	13F/01, 13F/08
017066M	169	2008/05/27	Active	2013/05/27	13F/01, 13F/08
017069M	120	2003/11/03	Active	2013/11/03	13F/08
017070M	106	2003/11/13	Active	2013/11/03	13F/08
017747M	192	2008/05/27	Active	2013/05/27	13F/01, 13F/08
017748M	166	2008/05/27	Active	2013/05/27	13F/01, 13F/08
017907M	23	2010/08/23	Active	2015/08/23	13F/07
017910M	158	2010/08/23	Active	2015/08/23	13F/03
017911M	44	2010/08/23	Active	2015/08/23	13F/02, 13F/07
018325M	114	2011/01/06	Active	2016/01/06	13F/03, 13F/02
018725M	84	2011/04/08	Active	2016/04/08	13F/03
018728M	66	2011/04/08	Active	2016/04/08	13C/14, 13F/03
018730M	44	2011/04/08	Active	2016/04/08	13F/03
018732M	36	2011/04/08	Active	2016/04/08	13F/03
Total	**1,489**				

3.2 Underlying Agreements

North Atlantic through direct ownership has a 100-percent interest in the lands forming the Churchill River mineral sand project.

On September 15, 2010, Grand River and North Atlantic signed a share purchase agreement with Petmin. On the same date a shareholders agreement was signed between the three parties. The share purchase agreement allows for a US$25 million investment by Petmin in Grand River and North Atlantic for a 40 percent ownership of the project. To date, Petmin has invested US$19 million for an ownership of 32.5 percent of Grand River and North Atlantic. Additionally, the agreement provides Petmin the option to acquire an additional 9.9 percent for a market determined rate (for a total possible ownership 49.9 percent). The option is exercisable only upon Petmin having invested the full US$25 million; the option is ending at 17:00 45 days after North Atlantic has completed and delivered a bankable feasibility study to Petmin.

Following the initial share purchase agreement, six addendums and amendments were signed between Grand River, North Atlantic, and Petmin between August 12, 2011 and March 22, 2014.

3.3 Permits and Authorization

North Atlantic has obtained all permits and certifications required from governmental agencies to allow for surface drilling and exploration activities on the Churchill River mineral sand project. North Atlantic applied for Exploration Approval and Notice of Planned Minerals Exploration Work permits with the Department of Natural Resources of Newfoundland and Labrador Mines Branch, Mineral Lands Division. Permits E110171, E110175, E110176, E110177, and E110254 were received allowing for airborne geophysics, ATV use and fuel storage, bulk sampling, geology, and geochemistry testing on the property in 2011.

North Atlantic applied for Exploration Approval and Notice of Planned Minerals Exploration Work permits with the Department of Natural Resources of Newfoundland and Labrador Mines Branch, Mineral Lands Division. Permits E120025, E120255, E120093, E120041, and E120026 were received allowing for ground geophysics, ATV use and fuel storage, geology and geochemistry testing on the property in 2012.

North Atlantic applied for Exploration Approval and Notice of Planned Minerals Exploration Work permits with the Department of Natural Resources of Newfoundland and Labrador Mines Branch, Mineral Lands Division. Permits E130042 and E130098 were received allowing for ATV use and fuel storage, geology and geochemistry testing on the property in 2013.

Other permits and authorization received from the government of Newfoundland and Labrador by North Atlantic include Commercial Cutting Permits (12-19-00445, 12-19-00437, and 12-19-00471), and Operating Permits (OP-55220, OP-8811, and OP-5237).

SRK is unaware of any other significant factors and risks that may affect access, title, or the right or ability to perform the exploration work recommended for the Churchill River project.

3.4 Environmental Considerations

There are no known environmental liabilities related to the Churchill River mineral sand project.

Mineral exploration work on the Churchill River mineral sand project is subject to Newfoundland and Labrador's mining regulations. Surface disturbance caused by exploration activity including drill pads and drill roads on patented claims are not normally subject to reclamation. Existing roads and the Churchill River provide access to most areas of the properties such that new water crossings or drill roads should not be necessary. North Atlantic has chosen coring and drilling equipment partially in light of a light environmental footprint. Direct push technology does not use drilling fluids, and drill sites remain relatively pristine once drilling operations have ceased.

3.5 Mining Rights in Newfoundland and Labrador

The Churchill River mineral sand project is located in Labrador, the mainland part of the province of Newfoundland and Labrador, a province that has a well understood permitting process in place and one that is coordinated with the federal regulatory agencies. As is the case for similar mine developments in Canada, the project may be subject to federal and provincial environmental assessment processes based on certain project triggers. Due to the complexity and size of such projects, various federal and provincial agencies have jurisdiction to either provide authorizations or permits that enable project construction to proceed.

Federal agencies that have significant regulatory involvement at the pre-production phase include the Canadian Environmental Assessment Agency, Environment Canada, Natural Resources Canada as well as Fisheries and Oceans Canada. On the provincial agency side, the Newfoundland and Labrador Department of Natural Resources, Ministry of Environment and Conversation, and the Ministry of Transportation and Works.

4 Accessibility, Climate, Local Resources, Infrastructure, and Physiography

4.1 Accessibility

The project area is located just outside of the town of Happy Valley-Goose Bay, which can be accessed by air through commercial carriers from Halifax, Nova Scotia; St. John's, Newfoundland; Montreal, Quebec; and a number of smaller regional airports such as Deer Lake and Gander, both located in Newfoundland. Road access to Goose Bay is provided by Route 510, also known as Cartwright Highway, or via the Trans Labrador Highway. The former is a 620 kilometre-long gravel highway that connects Goose Bay to Cartwright and travels south into the Labrador Straights and onto Blanc Sablon, Quebec. The latter is 530 kilometres long and primarily paved. Both roads are open year round. Seasonal ferry services connect Newfoundland to Labrador.

Local access to individual claims is via boat (for the claims on the Churchill River) or by season-specific off-road vehicles such as all-terrain vehicles or snowmobiles. All claims can be accesses via helicopter.

4.2 Local Resources and Infrastructure

Goose Bay is a major regional centre for Labrador and considerable resources are available locally. The construction of a large United States Air Force base at Goose Bay during the Second World War led to the establishment of the communities of Happy Valley and Goose Bay as the regional centre. The base is now home to the Royal Canadian Air Force and her allies for training purposes. The main runway is long enough that it provided a secondary landing site for the space shuttle fleet. A seaplane base that also provides airlifts to local communities and tourist lodges in the interior of Labrador is located in Otter Creek (Terrington Basin).

The population of the Happy Valley-Goose Bay is approximately 7,500. Goose Bay hosts a large, modern regional hospital with provincial Medevac services available to transport individuals from the coastal communities. The harbour and port facilities are capable of servicing ships up to approximately 25,000 deadweight tonnage. Container and limited bulk service is also available at the port.

The area provides multiple primary and secondary education facilities servicing both French and English language speakers, as well as tertiary education facilities, and university research facilities.

As an economic hub for the region, the area also has provincial and federal government offices; exploration supply and service contractors, including drilling supplies and rigs; helicopter services; construction equipment supply and services; and related accommodation, food, and fuel supplies. High-speed internet, fibre optics, and mobile phone service are available from the local regional provider.

Development of the Muskrat Falls hydroelectric project is underway. This project will substantially increase the supply of hydroelectric power in the region. The project is anticipated to be completed in 2017. Electricity is currently provided to the region by the Churchill Falls hydroelectric facility located 290 kilometres west of Goose Bay.

4.3 Climate

The climate is subarctic marked by long, cold, and snowy winters, and short, mild summers. Autumn and spring are very brief and last only a few weeks. The average high temperature stays below freezing for five months of the year and the low does so for eight months. Snowfall is very heavy, averaging nearly 460 centimeters per year, and occurs in all months except July and August. Precipitation, at nearly 950 millimetres, is significant year round and is heavy for the city's latitude.

4.4 Physiography

The area around Happy Valley-Goose Bay is characterized by lowlands, raised plateaus and terraces, paleo beach strand lines, and dune fields. The geomorphology of Goose Bay can be attributed to the Wisconsin Glaciation, subsequent rebound and sediment deposition of the Churchill River with possible input from the Goose, Kenamu, and Kenemish rivers, and the aeolian processes that occurred thereafter.

Raised terraces are observed along the north, and to a lesser extent to the south of the Churchill River. These raised terraces were once active alluvial environments. They were raised to their current elevation by isostatic rebound resulting from the melting of the Wisconsin ice sheet. The land has rebounded approximately 135 to 140 metres.

The lowlands of Lake Melville immediately to the east of Happy Valley-Goose Bay are bounded to the south and east by the Mealy Mountains where elevations reach 1,100 metres. The Lake Melville lowland is characterized by narrow sandy beaches, fringe and extensive bog wetlands, and deltas near major river outlets.

Terraces along the Churchill River are covered by a mixed forest consisting primarily of black spruce, white spruce, and white birch. In the area of License 17911M, the predominant vegetation consists of jack pine plantations, with black spruce on the edges.

In areas where there has been substantial forest fire damage due to natural causes, or insect infestation, secondary succession has begun with caribou moss, and alders. It is in these areas of sparsely populated vegetation, that dunes, if present, are visible.

The sand dunes are primarily parabolic, formed in the direction of the south-westerly prevailing winds. The dunes are well developed into dune fields in two areas, license areas 017907M on the north side of the river and on license numbers 017910M and 018725M on the south side of the Churchill River. In other areas isolated dunes form pronounced land forms, but they are limited in areal extent.

Sand bars formed in the present river channel of Churchill River are constantly shifting position and size. The frequency of the bar development increases east of Muskrat Falls. Larger and more static sand bars have substantial vegetation consisting of alders, mature stands of white birch, and black spruce. Examples of typical landforms in the project area are shown in Figure 3 A to D.

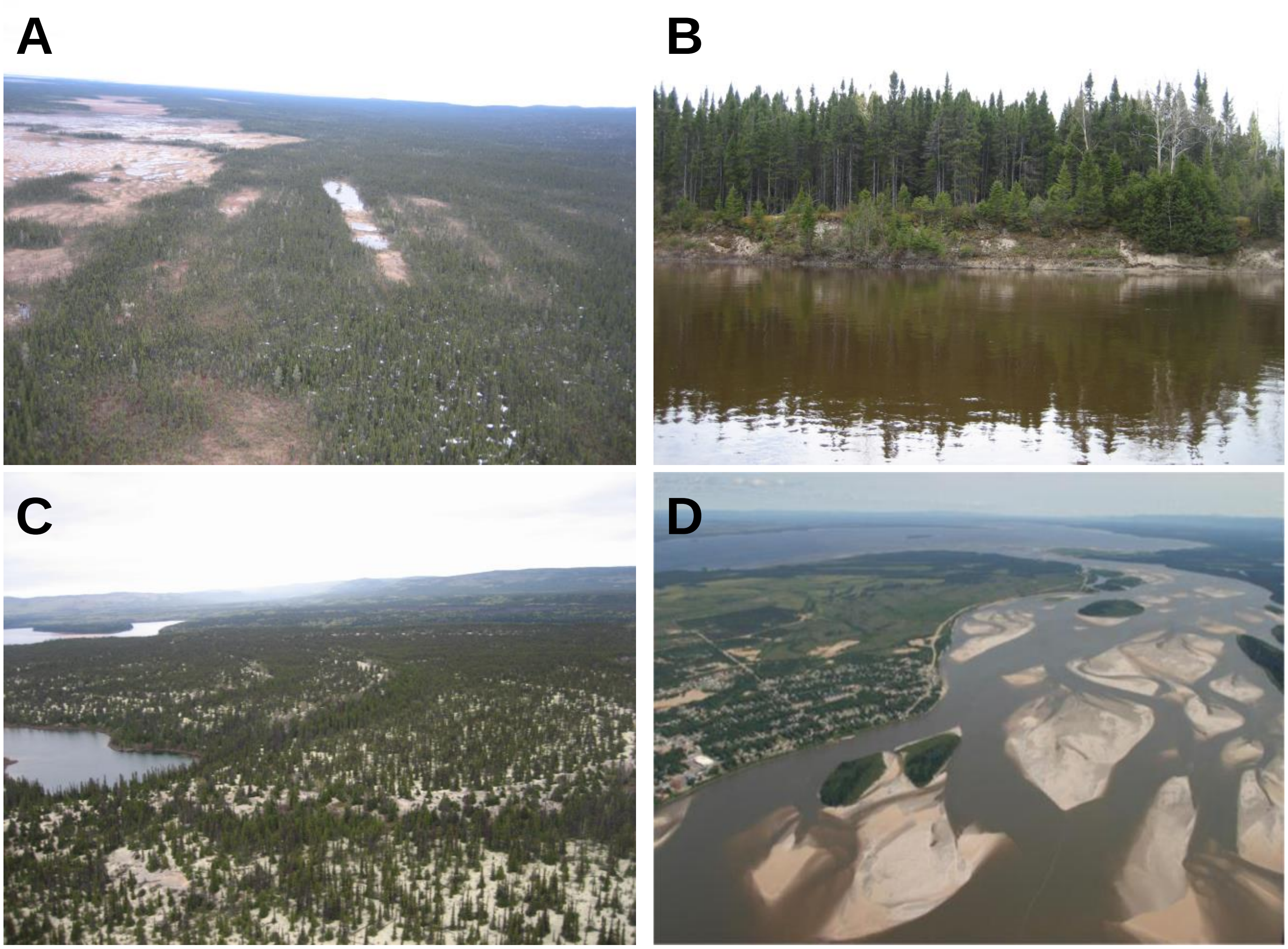

Figure 3: Typical Landscape in the Project Area

A: Beach strand lines visible as linear, locally water filled depressions and denser vegetation.

B: Riverbank of the Gravespine River branching off the Churchill River to the south.

C: Dunefield west of Muskrat Falls.

D: Sand bars in the Churchill River just outside of Happy Valley-Goose Bay.

5 History

The occurrence of heavy minerals in the fluvial sands of the lower Churchill River has been known since the late 19th century. However, the first scientific studies were initiated by government researchers in 1979. Studies by Bailey (1979) identified three potential hematite-ilmenite anomalous concentrations in the greater vicinity of the Goose Bay area as possible sources of the enriched sands in the Churchill River/Lake Melville region. These are:

- South of Red Wine Mountains in the Lake Wilson area;
- Mealy Mountains in the Lake Melville region; and
- A large anorthosite body north of Seal Lake Group (Harp Lake Complex).

In a later study, Meyer (1990) concluded that disseminated ilmenite, zircon, rutile, and other heavy minerals were eroded from gabbro-anorthosite massifs and metasedimentary gneisses during the late Wisconsinan Age by large fluvial drainage networks such as the Churchill River, and that the geology of the Goose Bay area appears conducive to titanium placer formation. Table concentrates prepared from samples collected at Happy Valley, Churchill River, and Epinette Point showed high concentrations of hematite and magnetite but low percentages of ilmenite (Mathieu and Boisclair, 1990).

The first commercial interest in the area occurred in 2002 when Markland Resource Development Inc. (Markland) acquired claims and conducted a series of studies that include surface sampling and mapping, followed by percussion coring and sampling using a small, man-portable probe. In 2008, Markland changed its name to Grand River Ironsands Inc. Exploration activities under Markland and Grand River Ironsands are covered in Section 8 and 9 of this report.

6 Geological Setting and Mineralization

6.1 Bedrock Geology

The Churchill River mineral sand project is located within the Proterozoic Grenville orogenic belt that stretches from Labrador in a southwesterly direction into northern Mexico. In Labrador, the orogenic belt is subdivided into an exterior thrust belt and an interior magmatic belt (Wardle et al., 1997). The project area is located in the exterior thrust belt, which has been interpreted as an amalgamation of small thrust terrains that were accreted to Laurentia between approximately 1,710 and 1,620 million years (Ma) ago. The Wilson Lake Terrain, a subdivision of the exterior thrust belt, located west of Gull Island, underlies much of the Churchill River drainage basin. It is composed mainly of meta-sedimentary gneiss and associated granitoid and mafic intrusions.

Following the Grenville Orogeny, the area stabilized, was uplifted, and then subjected to a period of extensional tectonic events associated with the development of the Lake Melville rift system during the Acadian Orogeny approximately 615 Ma ago (Wardle and Ash, 1984). This rift system has been identified from regional aeromagnetic data (Gower et al., 1986). Rifting produced a series of four fault bounded grabens in the Lake Melville area (Figure 4).

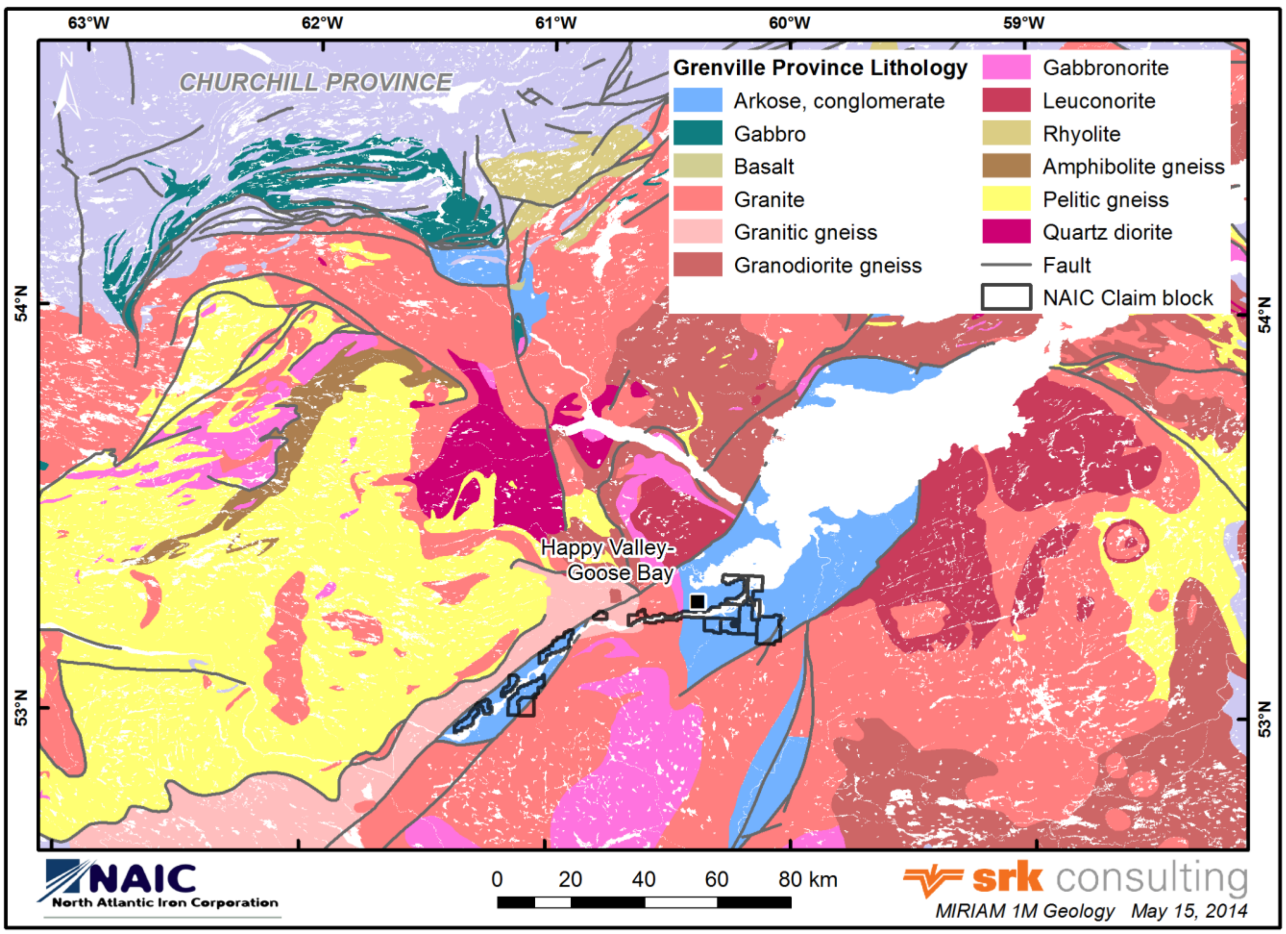

Figure 4: Regional Geology Setting

Two of these grabens host the Churchill River mineral sand deposit. One is located between Muskrat Falls and Gull Island and the other, larger graben, surrounds Goose Bay and the western half of Lake Melville. Sedimentary bedrock, composed of arkose and conglomerate, has been mapped in the eastern most of the four grabens, the Double Mer graben. Wardle et al (1997) suggest that these sedimentary rocks are also underlying the other grabens. They were deposited in the graben basins in the Neo-Proterozoic, commencing sometime after rifting approximately 545 to 610 Ma ago. The combination of arkose and conglomerates suggest they could be water lain sediments, evidence that the Churchill River may have been following its general course for over 500 million years.

6.2 Quaternary Geology

The following information has been extracted from Emory-Moore and Meyer, 1991 A and B; Vincent, 1989; and Blake, 1956.

Labrador has been subject to multiple periods of continental glaciation, the last of which was in the late Wisconsin, which extended from approximately 85,000 to 11,000 years ago. The project area was covered by the Laurentide ice sheet that was up to 3 kilometres thick, thinning at the edges. The Laurentide ice sheet hit its maximum extent approximately 20,000 years ago and then slowly retreated.

The effects of the Wisconsinan ice sheet dominate the surface geology of the study area and are of particular interest for the mineral potential of North Atlantic's tenements. At the glacial maximum, the ice sheet completely covered the Goose Bay area.

Evidence suggests that the Mealy Mountains located south of the current Lake Melville resulted in a deflection of the ice flow direction towards the east, approximately parallel to the Churchill River.

The erosional effect of the last de-glaciation was minimal and the glacial retreat was rapid, with postglacial processes dominated by accumulation of glacio-marine and glacio-fluvial deposits and re-deposition of sand and silt into the Churchill River and Lake Melville. The retreat of the ice was followed by marine flooding of the isostatically depressed Hamilton Inlet resulting in early fluvial and marine deposits in the Lake Melville lowlands and the lower valleys of the Churchill and Traverspine rivers. Initial isostatic rebound of the land was rapid with rates of approximately 15 centimetres per year resulting in numerous paleo-strand lines at a present elevation of up to 135 metres above the current sea level. The rate of isostatic rebound slowed significantly and is now estimated at approximately 6 millimetres per year (Blake, 1954). Due to the isostatic rebound during the Holocene Lake Melville has become increasingly isolated from the open sea as the water depth over the sills in the narrows shallowed, coupled with a steady sediment accumulation from the Northwest, Churchill, and Goose rivers.

The glaciofluvial deposits occur within major surface river valleys and in ice sheet marginal positions near the outer coasts. In the Labrador Trough far upstream of the Churchill River, some tills are reddish due to the incorporation of hematite. Further downstream glaciofluvial deposits of stratified sands and gravels are widespread (Figure 5).

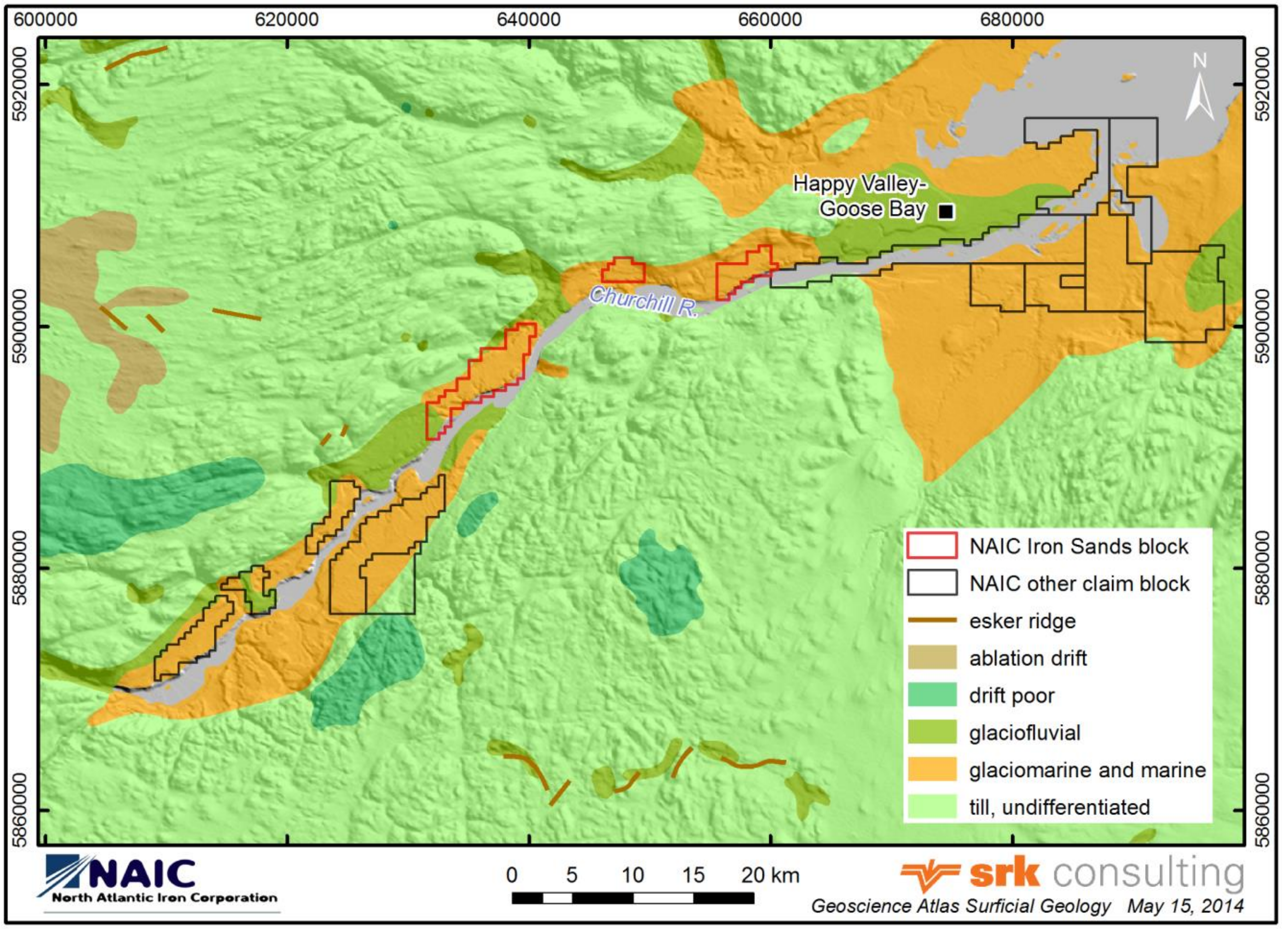

Figure 5: Quaternary Geology of the Project Area

6.3 Local Geology

The geology of the project area is characterized by sedimentological processes of the Churchill River and sediments in area the immediately surrounding the river. The lower Churchill River is characterized by a number of sandbars, most of which are partially or completely under water during times of high discharge. The relatively high flow rate of the Churchill River leads to a constant shift of the sandbars, which comprise of moderately to well-sorted silica sand with a considerable heavy mineral fraction. The heavy minerals, primarily hematitie, magnetite, and titano-magnetite form millimetre-scale lenses and layers within the river sands.

The shores of the river are characterized by similar sand deposits to those found in the river. Locally, the sand has been redeposited by Aeolian action; however, more recent vegetation has stabilized the sand deposits in almost all areas of the project area.

6.4 Mineralization

The magnetic minerals component of the fluvial and Aeolian sands is believed to have been derived from erosion of the bedrock, and also later Quaternary basin sediments that probably received their magnetic minerals from the same source. The magnetic minerals were likely transported, together with nonmagnetic components, by ice and meltwater action to produce potentially economic concentrations.

Mineralization in the project area consists of a heavy mineral fraction in the fluvial, and possibly Aeolian, sand deposits. The main constituents of the heavy mineral fraction consist of titanomagnetite, hornblende, and magnetite. Titanomagnetite accounts for approximately 30 to 55 percent, hornblende for approximately 7 to 20 percent, magnetite for approximately 5 to 12 percent, and garnets typically account for between 5 to 9 percent of the heavy mineral mass. These percentages were determined using mineral liberation analysis (MLA) of unspecified selected samples.

Table 2 shows individual MLA results, while Table 3 shows the distribution of elemental iron in minerals of the heavy mineral fraction of the sand. The heavy mineral fraction occurs as dark lenses and thin layers within the stratigraphic column (Figure 6 A) and can also be seen in ripples along sandbars and the shore of the Churchill River where the heavy minerals accumulate in the lows of the ripples (Figure 6 B).

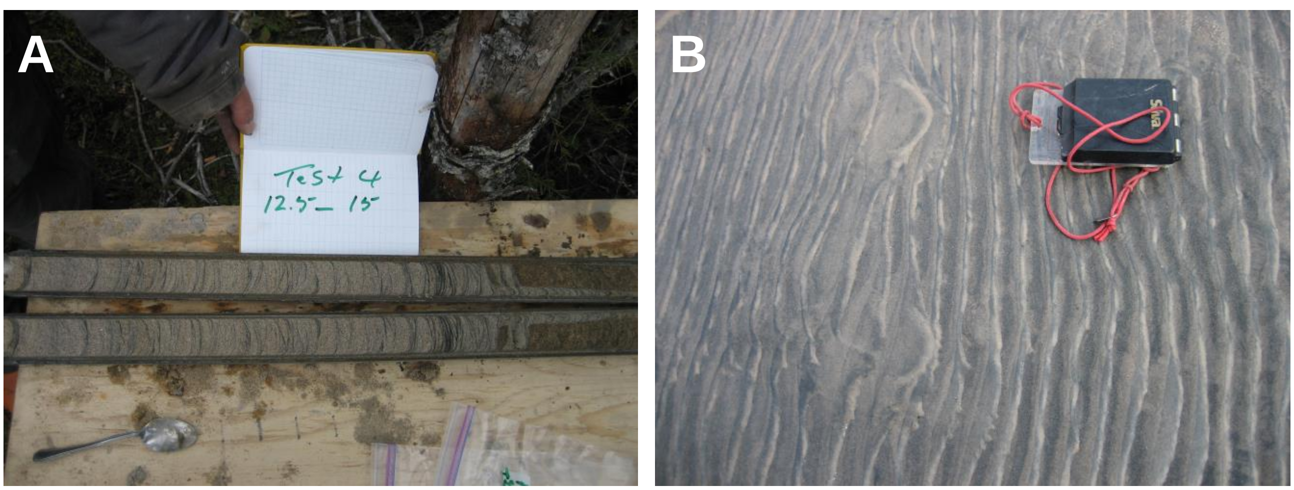

Figure 6: Occurrence of Dark Heavy Mineral Fraction in Sand

A: Laminated sand in 12.5 to 15 feet depth on the shore of the Travespine River.

B: Ripple marks on a sandbar in the Churchill River.

Table 2: Results from Mineral Liberation Analysis

Mineral	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%
Apatite	0.60	1.03	0.87	1.24	1.74	0.77	1.25	1.46	1.72	1.15	0.30
Biotite	1.67	2.00	1.24	3.09	3.75	0.68	2.64	2.50	2.29	0.92	0.86
Galena	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hornblende-Fe	12.32	19.32	9.91	16.52	20.92	11.99	20.98	18.55	18.02	14.89	7.03
K-Spar	0.17	0.19	0.11	0.81	0.15	0.13	0.38	0.10	0.20	0.10	0.14
Monazite	0.21	0.11	0.25	0.18	0.14	0.24	0.11	0.19	0.17	0.17	0.14
Quartz	1.08	1.31	0.62	2.81	1.35	1.01	1.65	0.86	1.23	0.93	0.94
Serpentine	0.01	0.01	0.00	0.00	0.00	0.03	0.01	0.01	0.01	0.01	0.01
Titanite	0.62	0.86	0.62	0.85	0.95	0.65	1.11	0.98	0.98	0.92	0.47
Ti_magnetite	45.00	34.67	48.22	32.95	27.01	46.33	29.75	31.23	32.49	40.85	55.79
Muscovite	0.41	0.50	0.24	0.71	0.57	0.34	0.48	0.33	0.50	0.29	0.51
Kyanite	3.55	5.28	2.87	5.03	6.41	3.31	4.89	6.31	5.59	3.99	2.08
Opx-Mg	4.11	5.01	3.03	4.40	5.58	3.84	3.79	5.24	4.90	4.24	2.92
Ilmenite	4.44	3.44	4.31	3.10	2.92	4.75	3.27	3.31	3.52	3.84	5.50
Plag-Na	0.54	0.64	0.33	2.27	0.69	0.56	1.41	0.39	0.71	0.42	0.61
Cpx-Mg	4.41	5.72	3.07	4.61	6.79	4.13	5.35	5.92	5.33	4.40	2.73
Chlorite-Fe	1.44	1.49	1.31	1.31	1.67	1.67	1.79	1.72	1.51	1.35	1.19
Cordierite	0.11	0.20	0.06	0.18	0.18	0.11	0.14	0.14	0.10	0.16	0.09
Albite	0.33	0.36	0.18	0.65	0.34	0.28	0.38	0.21	0.31	0.26	0.23
Piemontite	1.69	2.76	2.02	3.07	3.52	2.13	3.45	3.30	3.28	2.58	0.91
Chromite	0.05	0.02	0.04	0.02	0.03	0.05	0.05	0.03	0.01	0.06	0.05
Magnetite	9.12	6.65	11.80	7.96	6.03	9.54	6.78	7.64	8.04	9.28	11.32
Almandine	7.83	8.10	8.16	7.41	8.53	7.12	9.46	8.83	8.55	8.61	5.68
Rutile	0.16	0.14	0.18	0.21	0.15	0.11	0.10	0.21	0.12	0.22	0.24
Corundum	0.00	0.03	0.00	0.23	0.24	0.02	0.58	0.06	0.01	0.02	0.01
Zircon	0.14	0.18	0.56	0.39	0.35	0.23	0.23	0.49	0.39	0.37	0.24
Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low_Counts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No_XRay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Sample #	475,770	475,961	475,946	475,663	475,575	475,557	471,396	471,385	471,342	471,280	105,410

Table 3: Iron Distribution Within Heavy Mineral Fraction of Deposit Minerals

Mineral	Fe (%)	Fe (%)	Fe (%)	Fe (%)	Fe (%)	Fe (%)	Fe (%)	Fe (%)	Fe (%)	Fe (%)	Fe (%)
Hornblende-Fe	4.20	7.95	3.13	6.97	9.91	4.00	9.26	7.89	7.48	5.34	2.06
Ti_magnetite	66.01	61.39	65.45	59.84	55.07	66.54	56.49	57.12	58.00	63.08	70.42
Opx-Mg	1.55	2.29	1.06	2.06	2.94	1.42	1.86	2.47	2.26	1.69	0.95
Ilmenite	4.06	3.79	3.64	3.50	3.70	4.24	3.86	3.77	3.91	3.69	4.32
Magnetite	16.30	14.34	19.51	17.61	14.97	16.69	15.69	17.02	17.49	17.46	17.40
Almandine	5.70	7.11	5.49	6.68	8.62	5.07	8.90	8.01	7.56	6.59	3.56
Low_Counts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No_XRay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Sample #	475,770	475,961	475,946	475,663	475,575	475,557	471,396	471,385	471,342	471,280	105,410

7 Deposit Types

The Churchill River deposit is classified as a fluvial mineral sands deposit. The minerals of interest occur as grains within unconsolidated sediments that were carried to their present location by the Churchill River. The heavy mineral fraction of the sediments contains magnetite and titanomagnetite, the two principal iron-bearing minerals of interest in the deposit. The heavy minerals were carried to the project site by the Churchill River and its tributaries and were deposited in recent and paleo-river bars, and to a lesser extent, in paleo-beach strand lines. Within these deposit types, the stratified sand is inter-bedded with thin silt and clay layering. The land-based deposits upstream of the mouth of the Churchill River are deposited upon a thick, massive marine clay layer at depth.

There are two major sedimentary basins present along the course of the Churchill River, the Gull Island-Muskrat Falls and Cartwright-Lake Melville grabens. Over geological time, both of these basins have been the loci for the Churchill River delta.

There are four exploration targets derived from the two local sedimentary basins:

- Active river bars;
- Raised river bar terraces;
- Ancient and active river deltas; and
- Beach strand lines.

Two principal mechanisms were responsible for the transport of the mineral sands to their points of deposition in the Gull Island-Muskrat Falls and Cartwright-Lake Melville grabens: 1) glacier transport and 2) water transport. The glaciers transported large volumes of crushed and pulverized bedrock east from the Churchill River headwaters towards the coast and the deposit sites. Surface water easily eroded the unconsolidated glacial sediments putting them into suspension or entrained them in the bed load where they were first transported into the river's tributaries and then into the main river.

The Churchill River, which is long and wide, carried large loads of both suspended and bed load sediments. The sediments were eventually deposited in river bars and the delta. Some of the sediments were reworked and deposited in beach strand lines around the edge of the marine basin that formed in the grabens when the glaciers retreated.

Water flow rates in the Churchill River headwaters and main river body vary throughout the year. These flow rate changes have significant impact on the river's capacity to transport sediment. The ever changing water flow rates, sediment load, and sediment grain size are reflected in the mineral sand deposit. Sedimentary beds found in the river bars coarsen up during river flood conditions and then show a progressive decrease in sediment grain size as water flow rates decline. In recent times, the water flow rates have been moderated by the Upper Churchill hydro dam.

7.1 Active River Bars

The Churchill River is characterized by large sand bars between the Cartwright road bridge and the river mouth at Goose Bay. A small number of sand bars are also located west of the bridge. The sand bars shift frequently with the migration of the main river channels (Figure 7). The exposed bars cover approximately 40 percent of the river surface area, depending on the water level in the river, but they extend well beyond the exposed area below the water surface.

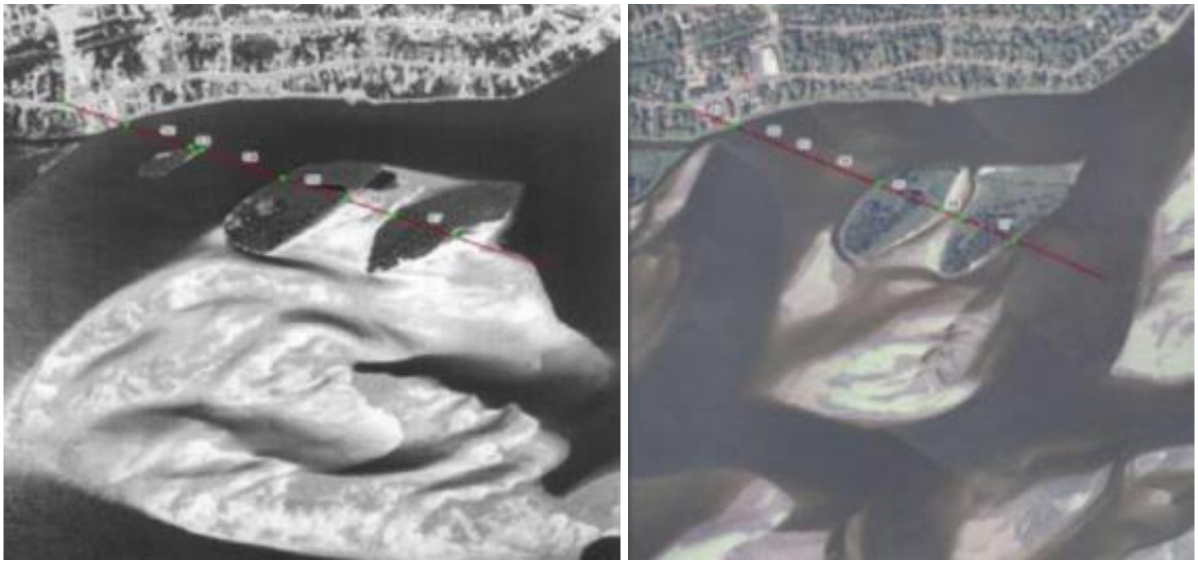

Figure 7: Changes to Sand Bars Immediately Outside Happy Valley-Goose Bay, Winter and Summer, 2013

7.2 Raised Terraces – River Bars

Ancient sand bars have been uplifted well above the current river level due to the significant isostatic rebound of the area after the last ice age resulting in sand bar deposited in the older river channel now perched above the river in raised terraces. The largest raised terrace block is the Cartwright Terraces seen below. The Cartwright Terraces cover an area of approximately 27.3 square kilometres. The steep banks marked by the arrows (Figure 8) were cut by the river as the land surface rebounded. These terraces contain a mixture of sand bars and infilled channels.

Figure 8: Wider Churchill River Shoreline with Arrows Indicating the Position of Raised Terraces

7.3 Beach Strand Lines

Beach strand lines form along the shore of a sea that experiences water level fluctuations during periods of transgression and regression. This environment can result in large accumulations of sediment along the beach in which heavy minerals are concentrated by the wave action.

In the Goose Bay area, the beaches show signs of slow, but steady regression of sea levels due to the isostatic rebound of the land. During and after the recession of the glacial ice sheet, beach strand lines formed around the shoreline of the large bay that formed in the Cartwright-Lake Melville graben. As the land rose, new beach strand lines formed on previously submerged areas that were covered by thick layers of marine clay resulting in a series of subparallel beach strand lines marking the receding shore line.

Light detection and ranging (Lidar) surveys are instrumental in detecting beach strand lines in densely vegetated areas.

7.4 Ancient and Active Deltas

The position of the Churchill River delta has migrated over time. Shortly after the glaciers retreated and marine waters flooded the depressed river valley, the delta was located near Gull Island west of the current location of Happy Valley-Goose Bay. As the land rebounded and marine water levels fell, the delta slowly migrated east to its present position at the juncture of the river with Goose Bay.

The purple line on Figure 9 is the current 30-metre contour elevation. The line marks the location of the oldest recognizable delta within the graben structure. The area south of this line up to a current elevation of approximately 135 metres above sea level is underlain by marine clays and/or beach strand lines. Because a significant fraction of the sediment load in the Churchill River is deposited in its delta, the area of the ancient delta(s) is prospective for heavy mineral sand occurrence.

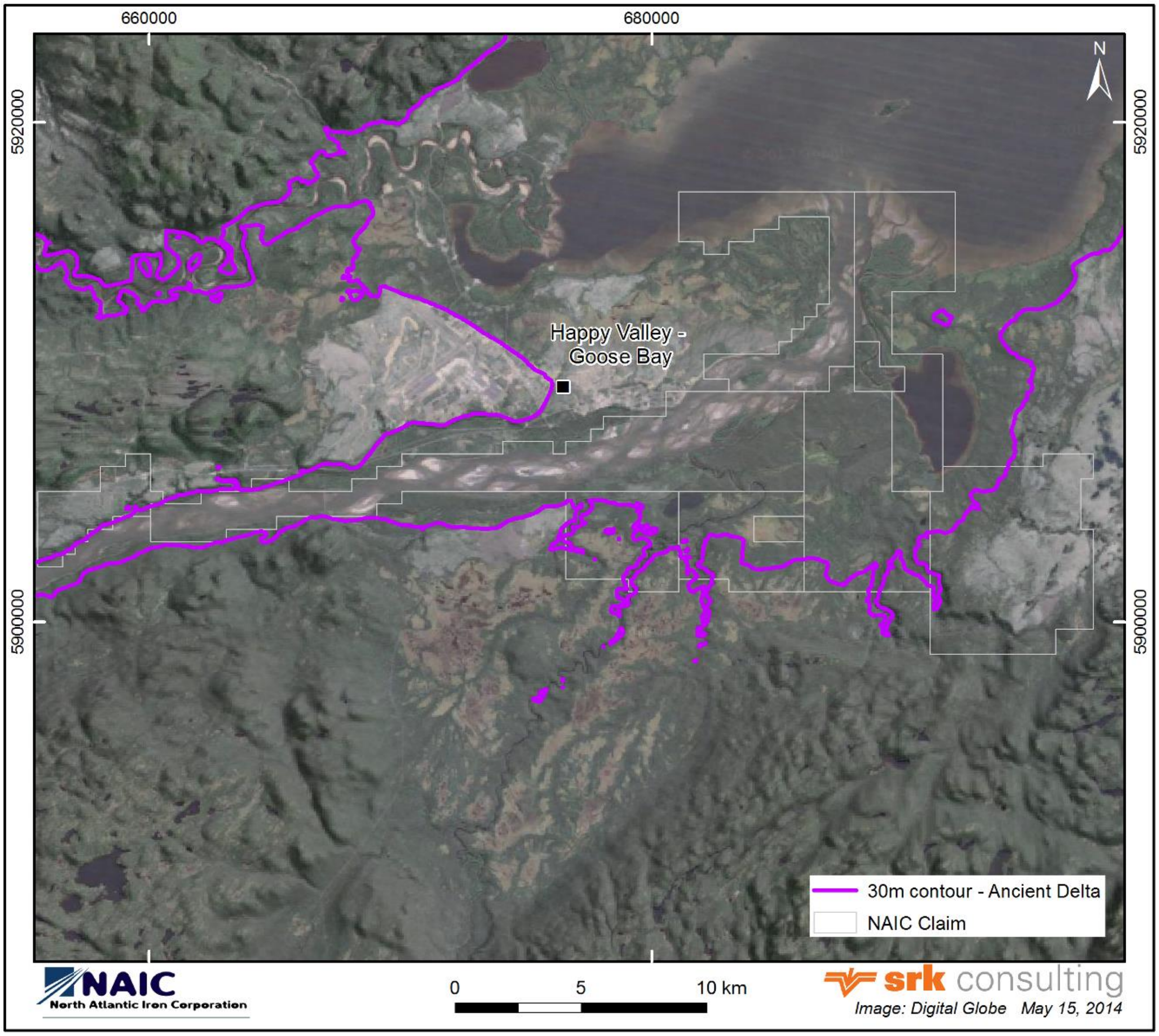

Figure 9: Current 30-Metre Contour Line Showing the Extent of the Ancient Delta of the Churchill River

8 Exploration

8.1 Airborne Surveys

In the summer of 2011 Grand River Ironsands Inc. (Grand River) commissioned Leading Edge Geomatics Ltd. (Leading Edge) from New Brunswick to complete a light detection and ranging (Lidar) survey over all exploration tenements to produce a highly detailed digital elevation model (DEM) of the exploration tenements. The Lidar survey was completed to provide accurate topographic data for use in:

- Defining topographic locations for the coring program;
- Modelling drainage patterns, slope orientations, and dips required for mine plans and environmental studies; and
- The study of both the paleo-topography and geology of the raised terrace, dune and beach strand line deposits.

In June 2011, Grand River commissioned Fugro Airborne Surveys Corp. (Fugro) from Mississauga, Ontario to complete a high resolution helicopter-borne MIDAS survey and data interpretation. The survey utilized two caesium vapour magnetometers mounted on a transverse rigid boom to allow collection and calculation of the horizontal gradient. The survey comprised 3,042 line kilometres in five individual survey blocks (Figure 10). Ground clearance was 30 metres over level terrain and 50 metres over hilly terrain, subject to the pilot’s discretion for safety. Survey parameters are shown in Table 4.

Fugro identified a number of horizontal anomalies at approximately 10-metre depth intervals. North Atlantic interpreted these anomalies to coincide with clay-rich layers encountered in boreholes completed in the Hoffman Block (Figure 2) indicating a well-stratified and repetitive sediment package in this area.

In June 2011, Grand River commissioned Aeroquest Ltd. (Aeroquest) from Mississauga to complete a helicopter-borne aeromagnetic survey using a single magnetometer. Ground clearance was 30 metres over level terrain and 50 metres over hilly terrain, subject to the pilot’s discretion for safety. Survey areas and parameters are shown on Figure 10 and in Table 5. Grand River commissioned Rockpoint Geophysics Inc. to complete a detailed data interpretation of the Aeroquest data, which showed reasonable correlation between dune location and orientation and the second derivative of the data (Figure 11). SRK was unable to determine other parameters of this survey.

Table 4: Fugro Survey Parameters

Block	Survey Area (km^2)	Flight Line Spacing (m)	Flight Line Direction	Tie Line Direction	Total Line Kilometres
1	164.2	100	000°/180°	090°/270°	1,807
2	56.3	100	000°/180°	090°/270°	620
3	15.8	100	090°/270°	000°/180°	177
Gull Island 1	32.1	100	051°/231°	141°/321°	353
Gull Island 2	7.2	100	036°/216°	126°/306°	85
Total	**275.6**				**3,042**

Table 5: Aeroquest Survey Parameters

Block	Flight Line Spacing (m)	Flight Line Direction	Tie Line Spacing (m)	Tie Line Direction	Total Line Kilometres
1	200	042°/222°	2,000	132°/312°	277
2	200	036°/216°	2,000	126°/306°	69
3	100	051°/231°	1,000	141°/321°	124
4	100	090°/270°	1,000	180°/360°	58
Total					**528**

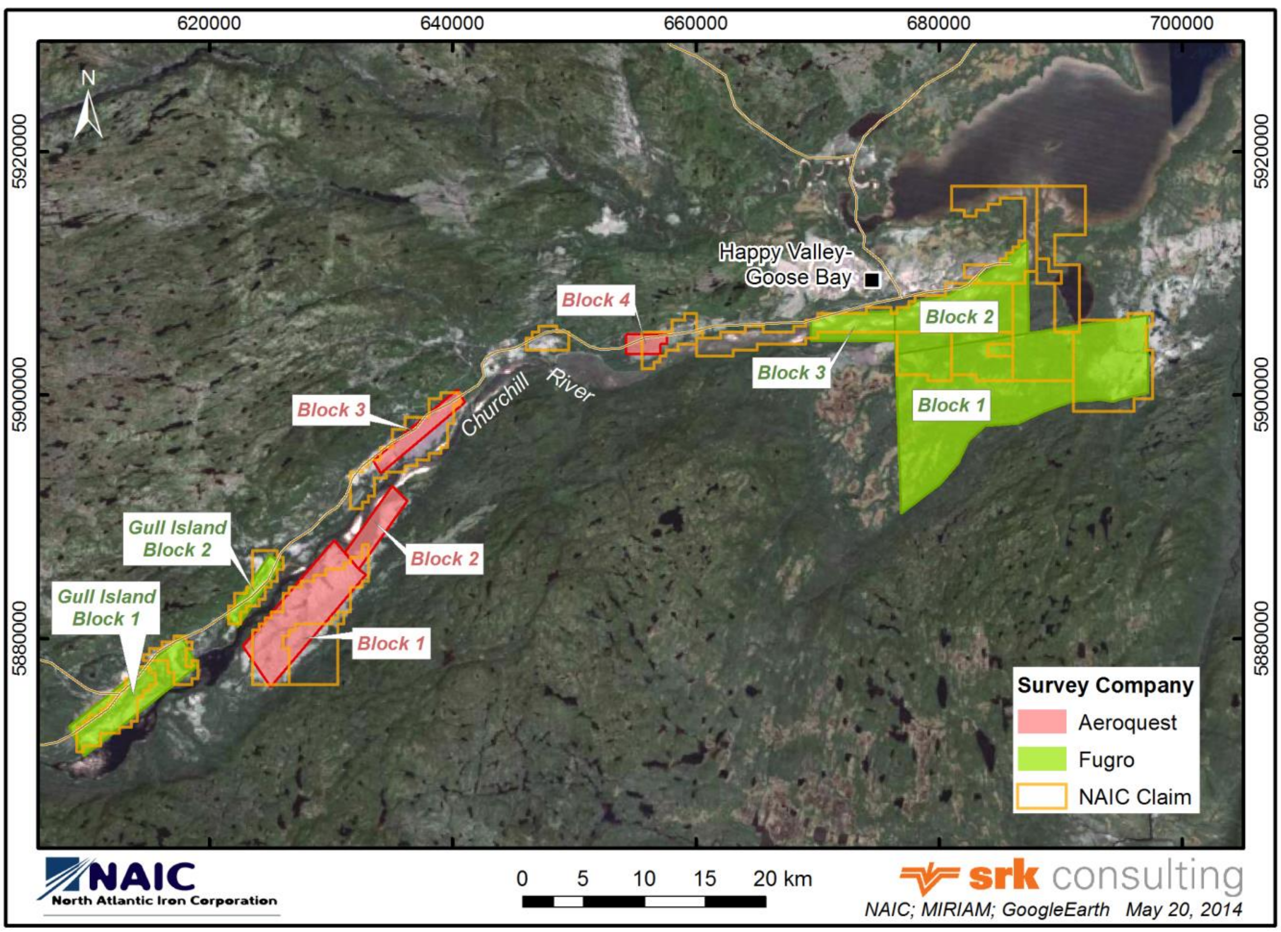

Figure 10: Size and Location of Areas Surveyed by Aeroquest and Fugro

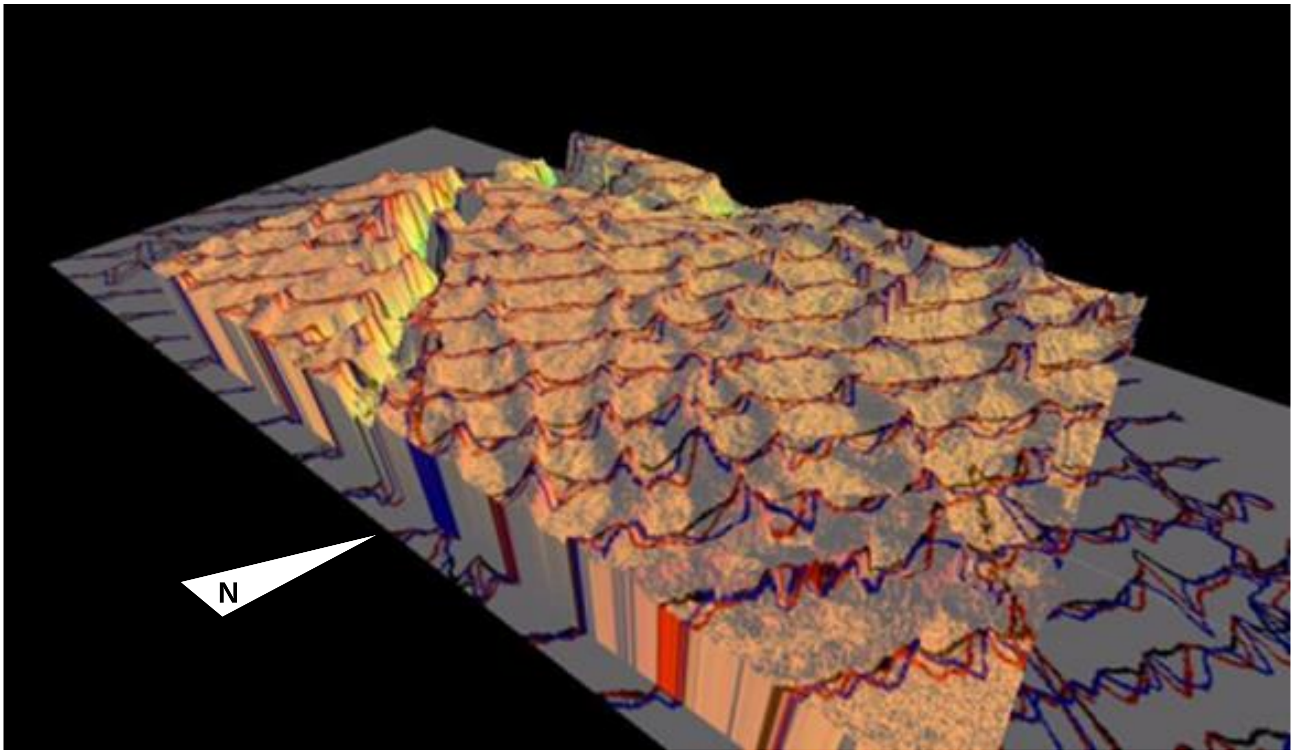

Figure 11: Topographic Highs and Magnetic Response in the Blue Brook Dune Field

3D view Lidar-generated topography data overlain by magnetic data showing a correlation between topographic highs (dunes) and magnetic response in the Blue Brook dune field. Survey lines are 200 metres apart.

8.2 Ground Surveys

In 2008, Grand River acquired a Gem Systems GSM-19 magnetometer to conduct ground electromagnetic surveys over three areas shown in Figure 12. Survey parameters are listed in Table 6.

In July 2008, Grand River commissioned GeoScott Exploration Consultants Inc. (Geoscott) from St. John's, Newfoundland to conduct a ground penetrating radar (GPR) and magnetic survey over three additional test sites (Figure 12) and was commissioned further to complete a data inversion on ground magnetic data acquired by Grand River in early 2008 and on data acquired by Geoscott. The surveys were designed to test ground magnetic surveys as means to map subsurface sediments, which was successful to a depth of approximately 18 metres.

In December 2012, Grand River commissioned Alpha Geophysics (Australia) Ltd. (Alpha Geophysics) to complete an electro-magnetic (EM-34) and resistivity survey. The survey comprised 30 line kilometres in 20 survey lines (including two tie lines) that ranged in length from 1 to 2 kilometres. Line spacing was at 250 metres (Figure 13). The scope of the survey was to:

- Determine the thickness of sand over the reported clay layer;
- Determine the thickness of the clay layer;
- Identify the material and its thickness underneath clay layer; and
- Determine the extent of the groundwater in the upper sand layer.

Table 6: Survey Parameters for 2008 Ground Magnetic Surveys

Grid	Station Spacing (metres)	Line Spacing (metres)	Number and Orientation of Lines
Winter 08 Survey – Grand River			
Eastern	3	N/A	5 lines joined in ring shape
Western	3	200	21 N-S and 1 NE
Northern	3	200	5 N-S and 1NE
July 2008 Survey – Geoscott			
Site 1	5	25	11 NW and 1 NE
Site 2	5	25	8 N-S and 1 NE
Site 3	5	25	13 N-S

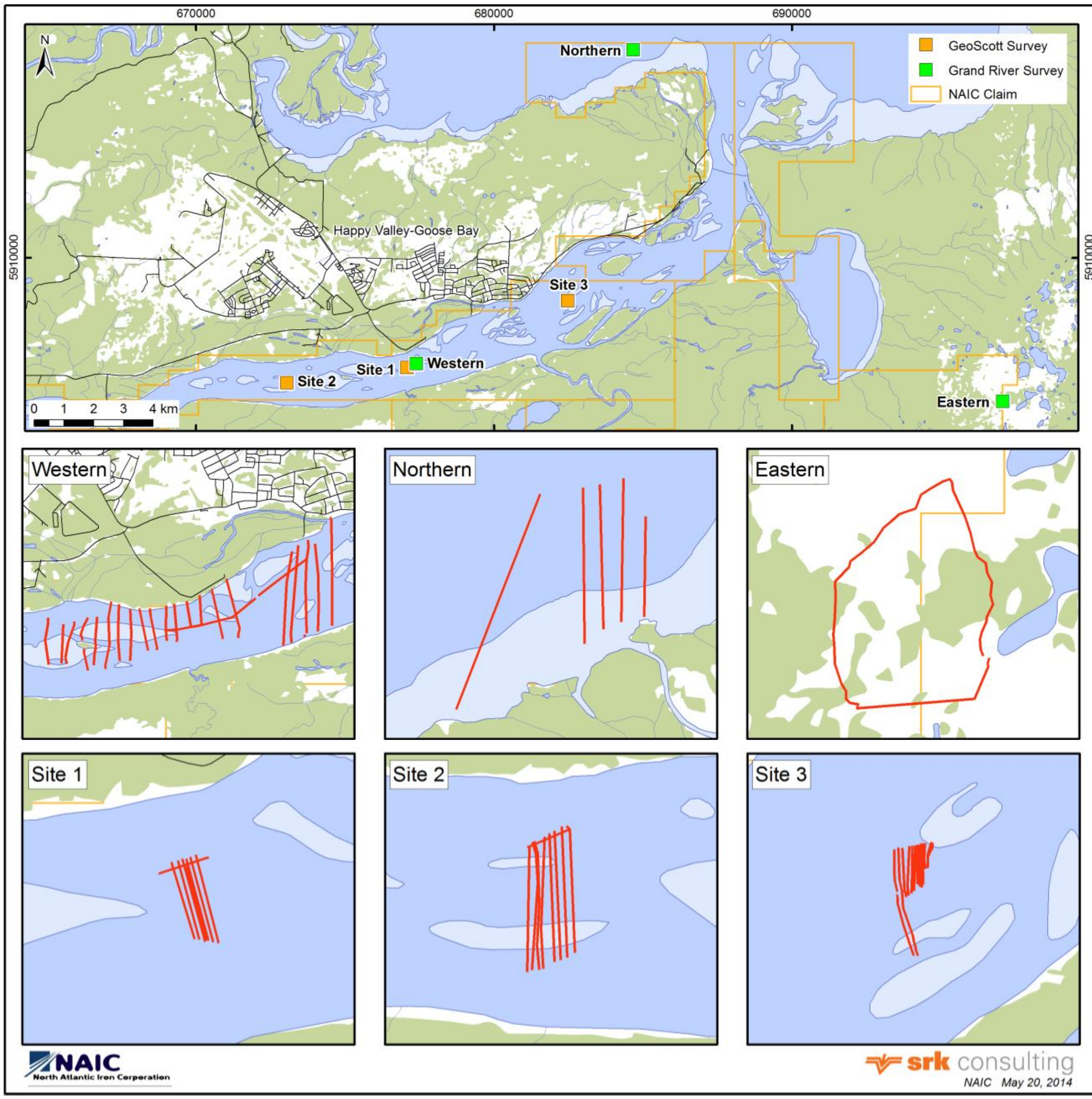

Figure 12: Location and Extent of 2008 Ground Magnetic Surveys

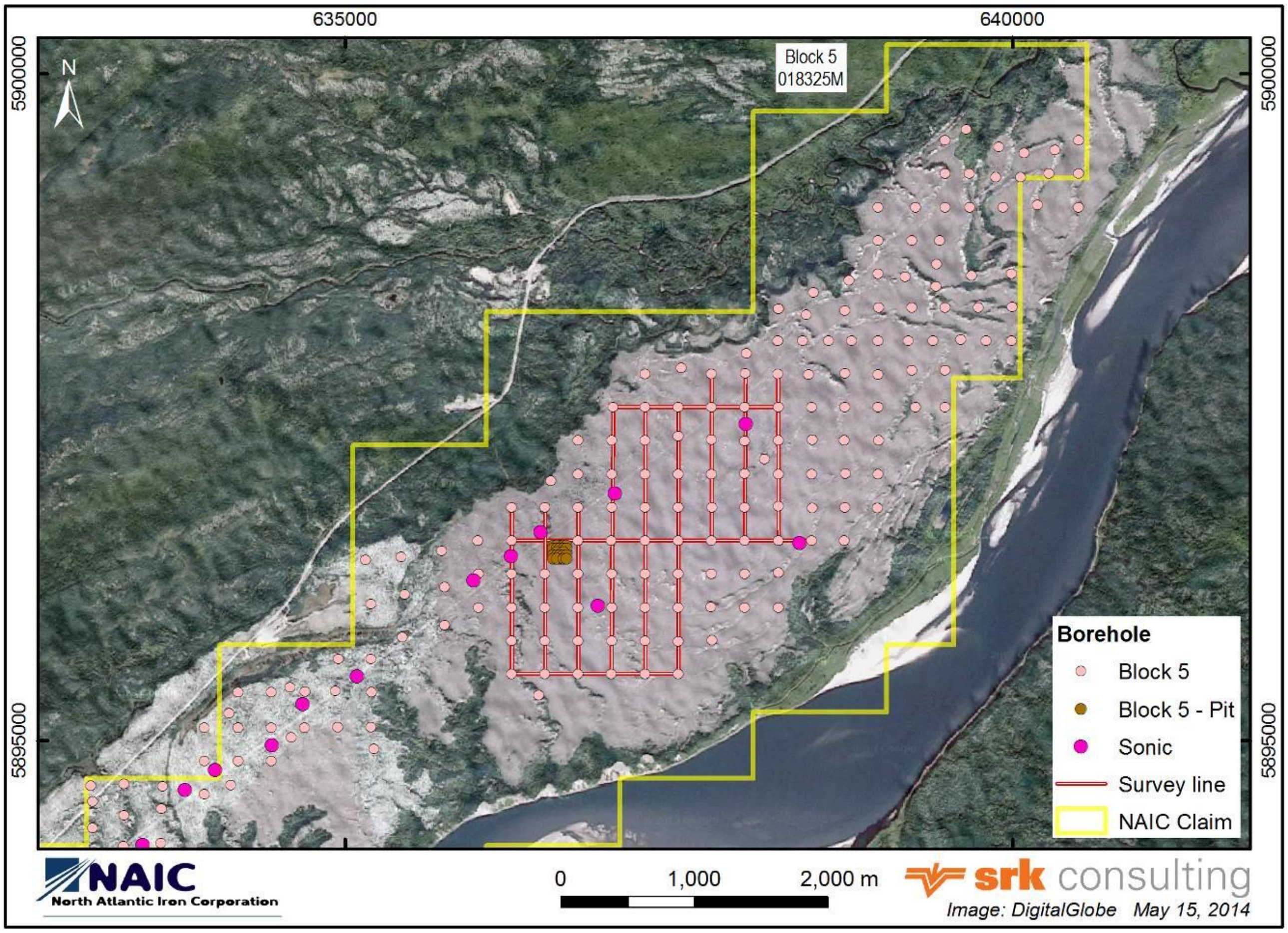

Figure 13: Block 5 EM and Resistivity Survey Lines

The electro-magnetic survey was conducted using two separate systems. The Geonics EM34-3 Ground Conductivity Meter (EM34) was used to collect conductivity measurements using 20-metre coil separations, and the Geonics EM34 to 3XL Ground Conductivity Meter (EM34XL) was used to collect data using 40-metre coil separations.

Data were collected at 40-metre intervals on all lines with both instruments separately. Data were collected in both horizontal-dipole and vertical-dipole modes at each survey location for both the 20-metre coil separation and 40-metre coil separation surveys, resulting in four separate measurements at each survey location. Both instruments were calibrated at the start of each line to account for instrument drift, except where the start of a line coincided with high voltage power lines. Noise levels became unacceptable 100 to 150 metres from the power lines and no data were collected in these areas. The 40-metre coil separation setup was more sensitive to the power lines resulting in fewer data near the power lines.

Alpha Geophysics completed a one-dimensional inversion of selected data using Interpex IX1Dv3 software. The resulting data fit well a two-layer model, consisting of a highly resistive layer underlain by a conductive layer. The depths obtained from the two-layer model correlates well with the clay layer in the core borehole data where the core boreholes intersected the clay layer. In most instances, coring did not reach the clay layer; in areas of these boreholes, the modelled clay layer is below the final depth of the core boreholes.

8.3 Bulk Sampling

In 2006, Markland Resource Development Inc. (Markland) carried out a bulk sampling program to obtain enough sample material for initial recovery, mineralogical, and metallurgical studies. Approximately 650 tonnes of material were collected from a maximum depth of approximately 3 metres (generally 1 – 1.5 metre depth) using a back hoe from ten sand bar sites south and east of Happy Valley-Goose Bay. Samples were processed using a single pass spiral separator with low intensity magnetic separation. Mineralogical and chemical analysis of the bulk sample material and the recovered heavy mineral concentrates was also conducted. In addition, preliminary beneficiation work related to recovery of minerals from the nonmagnetic fraction for the spiral concentrate was completed.

In 2007, Markland expanded the bulk sampling program and prepared two bulk samples from existing core material. The samples were designed to emulate run-of-mine production to an average depth of 10 metres. Core material for assembly of the samples was selected based on review of the drill logs and assay data to be representative of all areas of heavy mineral occurrence on the property. In most cases, complete core borehole intervals were available and were incorporated into the composite bulk sample.

In 2008, Markland collected additional bulk sample material from three sites in the Churchill River delta north of the river mouth. The sample material had a volume of approximately 300 litres and was collected by drilling a series of closely spaced Pionjar boreholes to a depth of 3 metres. The sample material was used to create a composite bulk sample for beneficiation tests.

Between May and June, 2012, Grand River undertook a bulk sampling program to obtain enough sample material for metallurgical pilot plant operation. The bulk sampling was completed by Kakatshu Construction Ltd. (Kakatshu) using an excavator and front end loader. Sampling was conducted in a well-explored area near Muskrat Falls (Figure 14).

Sample material was screened on site (Figure 15A), initially using a ¼ inch mesh size screen; however, given the overall grain size of the sand, and the clay layers encountered in the excavation site, this mesh size resulted in an abundance of “oversize” material which reported to the waste fraction, and slowed production rates, as the clay mixed with the finer material clogging the screen. Through consultations with Kakatshu and Cardero Resources Corp. (Cardero) staff, a ½ inch mesh screen was installed on May 12, 2012. The sample material was transported to Happy Valley-Goose Bay and stored in a hanger for further metallurgical testing.

Planned rehabilitation of the sample site (Figure 15B) was impossible after the provinces’ Crown Corporation, Nalcor Energy, petitioned and obtained the surface rights to the sample area in order to build a power substation for the Lower Churchill hydroelectric project currently under development at this location.

8.4 Mineralogical Studies

In November 2005, Markland commissioned 3R Associates of Houston, Texas, to conduct mineralogical studies, including x-ray fluorescence and quantitative evaluation of minerals by scanning electron microscopy (QUEMSCAN), on heavy mineral concentrates generated from bulk sample material using spiral concentrators. Results showed a large titanomagnetite concentration in the magnetic fraction of the sampled sand.

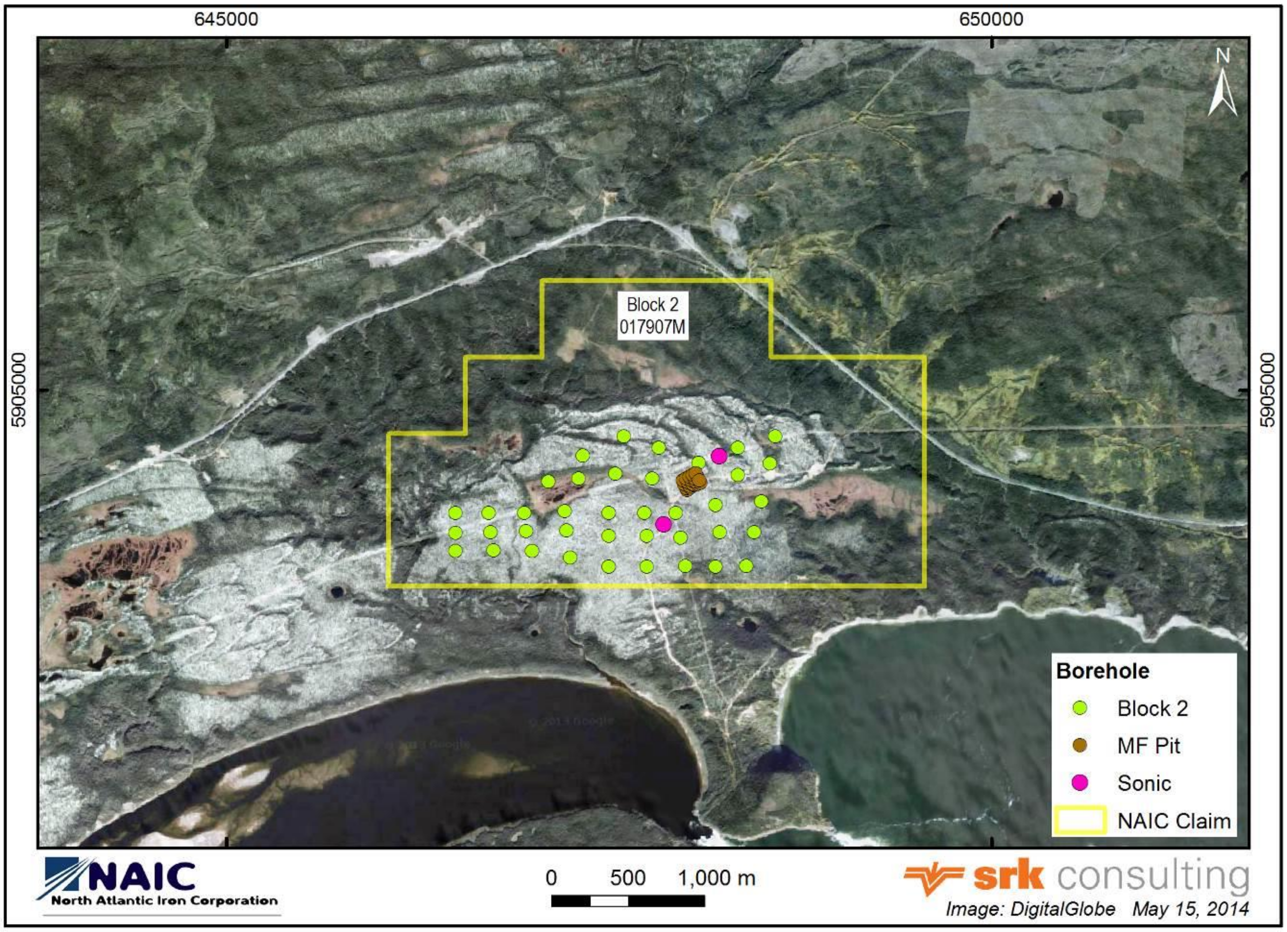

Figure 14: Location of Bulk Sample in Resource Block 2 North of Muskrat Falls

The bulk sample was taken in the area marked MF Pit. Muskrat Falls are visible on the lower edge of the image.

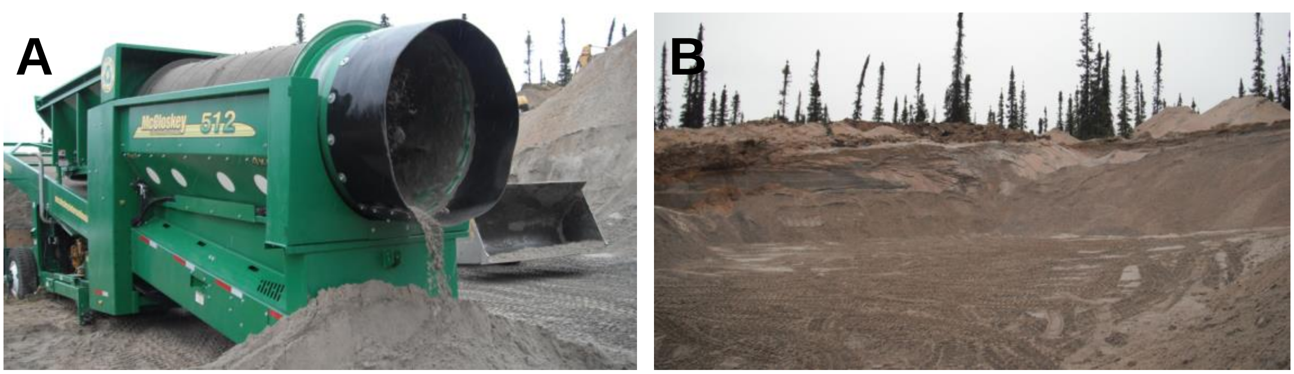

Figure 15: Muskrat Falls Excavation Site

A: Kakatshu screener.

B: Muskrat Falls excavation site with sloped pit walls.

9 Drilling and Trenching

Markland Resource Development Inc. (Markland) and Grand River Ironsands Inc. (Grand River) primarily used direct push tooling to obtain sand core samples during their respective exploration programs. Direct push equipment penetrates the ground without rotary actions; hence, the term "drilling" *sensu stricto* cannot be applied. Information about the coring activities has been described in this section as the product of the activities, that is a cylindrical sample of the target strata, is similar to true drill core. In this section the terms "drill" or "drilling" are used *sensu lato*.

9.1 Drilling by Markland (2002 – 2009)

Between 2002 and 2006 Markland tested several sites along the banks of the Churchill River and sand bars in the river for heavy mineral sands. Markland utilized a Pionjar probe, which is a small man-portable, gasoline powered probe to drive 2.5-foot-long split core tubes into the sand. The program lacked a systematic approach, and sample sites did not fall on a systematic grid.

In 2009 Markland expanded the activities to include terraces along the south side of the Churchill River below the Cartwright road bridge.

Between 2002 and 2009 a total of 155 Pionjar boreholes (1,282.4 metres) were completed (Figure 16). All boreholes were vertical, and typical depths did not exceed approximately 10 metres. Under optimal conditions depths of up to 20 metres were achievable with the equipment used by Markland.

SRK cannot comment on drilling and sampling procedures used by Markland as they are unknown.

9.2 Trenching by Markland

Markland completed limited trenching activity along steep river banks of the Travespine River. River banks are up to approximately 10 metres high and easily accessible by small boat. Markland collected an unknown number of samples from an unknown number of hand-dug channels that were dug vertically along the river banks approximately three kilometres south of where the Travespine River enters the Churchill River. Averages of 9.26 and 12.65 percent heavy minerals have been reported over 20 feet and 17.5 feet, respectively.

9.3 Drilling by Grand River (2010 – 2012)

Between 2010 and 2013 Grand River embarked on focused resource delineation drilling, primarily in three areas known as Block 1, Block 2, and Block 5. Additional boreholes were completed in the delta area of the Churchill River and on sand bars in the river just south of the town of Happy Valley-Goose Bay. A summary of the drilling information is shown in Table 7. Initially, Grand River used Pionjar equipment, but due to the limited production and depth penetration of this equipment changed to Geoprobe Systems® (Geoprobe) direct push equipment early in the program. Grand River employed Geoprobe 540 as well as Geoprobe 6620 units and used a maximum of three drills simultaneously. A limited number of core boreholes were completed using a sonic drill.

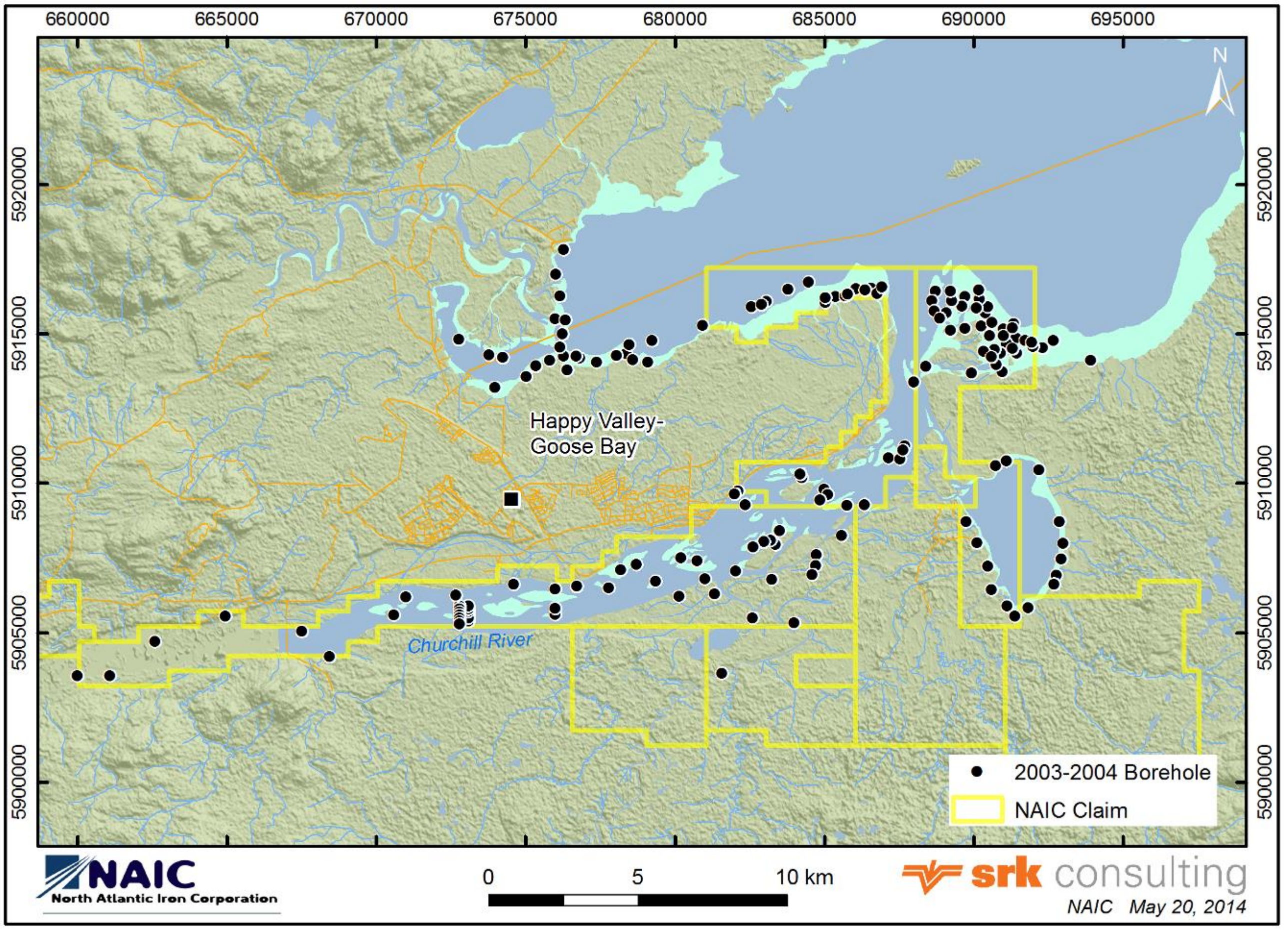

Figure 16: Location of Core Boreholes Completed by Markland Between 2002 and 2009

Table 7: Summary of Drilling by Grand River

Area	Year	Total Holes	Total Depth (m)	Drill Rig
License 011805M	2010	20	239.0	Pionjar
Block 1	2011	22	282.8	Geoprobe 540/6620
Block 2	2011	16	180.4	Geoprobe 540/6620
Block 5	2011	59	912.9	Geoprobe 540/6620
Block 1	2012	45	622.0	Geoprobe 540
Block 2	2011	25	356.0	Geoprobe 540
Block 5	2011	152	2,121.0	Geoprobe 540
Block 5	2012	17	455.5	Boart 600 Mini Sonic
River	2011	26	256.0	Geoprobe 540
River	2012	9	90.0	Geoprobe 540
Block 5 Pit	2012	24	250.0	Geoprobe 540
Block 2 Pit	2012	20	302.0	Geoprobe 540
Total		**435**	**6,067.6**	

Grand River initiated resource delineation drilling in October 2010 with targets on sand bars in the Churchill River. Drilling was carried out by Grand River personnel. Until freeze-up of the river, which prevented further access, Grand River completed 20 boreholes (239 metres) with Pionjar equipment. The target depth of the holes was 15 metres; however the average depth achievable with the equipment was approximately 12 metres.

The drilling program was carried out by an experienced team under contract and supervision of Grand River. Initial supervision was also provided by SRK to ensure that industry best practices were adhered to during drilling and sampling activities. Collar locations were identified on a map by Grand River personnel. Coordinates were given to a survey crew who marked the collar locations with a stake in the field. Surveys during the initial drilling program were completed by Parrott Surveys Ltd. from Goose Bay, Labrador; those for the infill program were performed by Global Echo Ltd, also from Goose Bay. Both companies utilized real time kinematic GPS receivers for sub-metre accuracy. Logging and sampling was carried out by Grand River personnel directly at the drill site.

In early 2011 Grand River reassessed their exploration strategy and shifted the focus of the drilling program to three areas on the north side of the Churchill River (Figure 17).

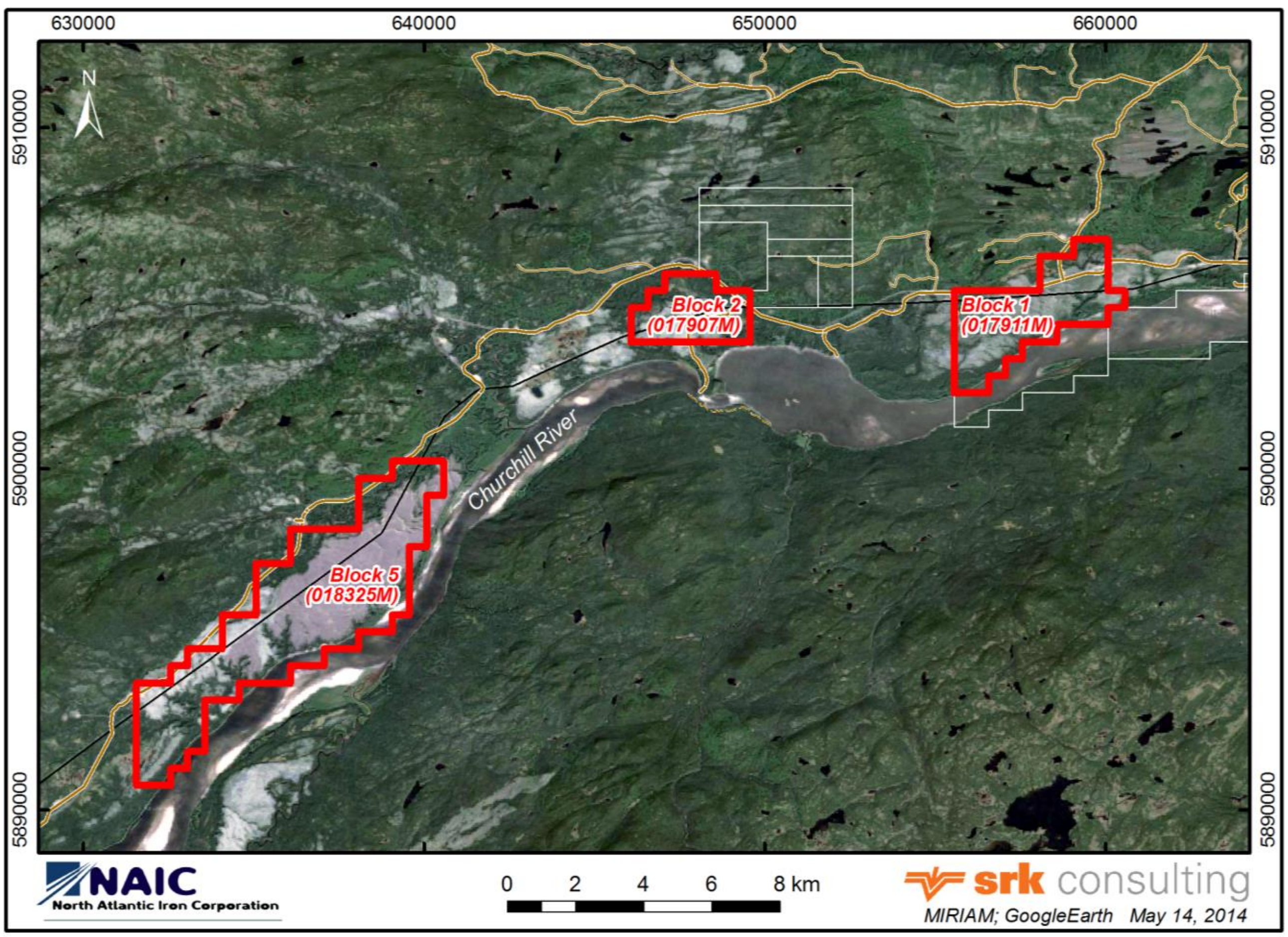

Figure 17: Size and Location of Three Main Exploration Targets During Drilling from 2011 Onwards

Targeting was aided by geophysical data. In addition, Grand River commissioned Strata Drilling Group (Strata) from Markham, Ontario to carry out the drilling program. Strata used equipment from Geoprobe to improve penetration depth and the production rate of drilling. Geoprobe equipment utilizes a triple tube system to retrieve sample material, which is collected in 4-foot (1.21 metres) clear plastic tubes that are easily transported for off-site logging and sampling. Drilling efforts were conducted following a more systematic approach with boreholes spaced approximately 500 metres apart and located on a grid. All boreholes were drilled vertically to a maximum depth of approximately 23 metres. None of the boreholes was surveyed; however, due to the short length no deviations are expected.

The initial drilling program in Block 1 (Figure 18) consisted of 22 boreholes (283 metres) located on a 500 metre grid. The boreholes penetrated to depths between 6.1 and 18.3 metres. Grand River collected 273 samples (including quality control samples) and submitted them for geochemical and mineralogical analysis. Results showed and average of 9.08 percent heavy mineral content (HMC) and 39.06 percent Fe_2O_3 equivalent.

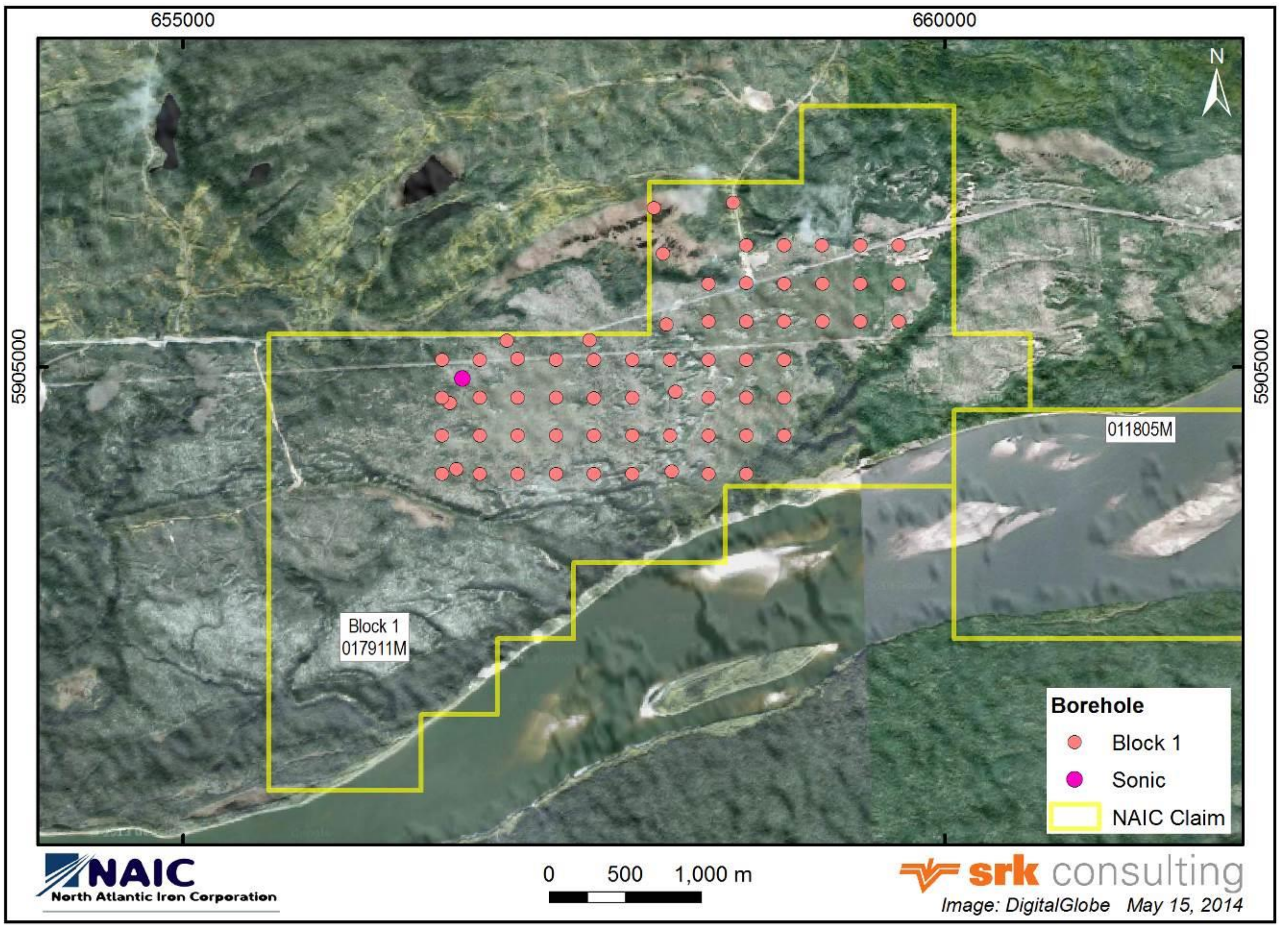

Figure 18: Drilling Pattern in Block 1

The drilling program in Block 2 (Figure 19) comprised 14 boreholes (180 metres). The drilling followed a similar grid pattern as in Block 5. Total borehole lengths varied between 6.1 and 14.6 metres. Grand River collected 160 samples (including quality control samples) that were sent for geochemical and mineralogical analysis. Results of these analyses yielded an average of 10.57 percent HMC with an average of 36.84 percent Fe_2O_3 equivalent.

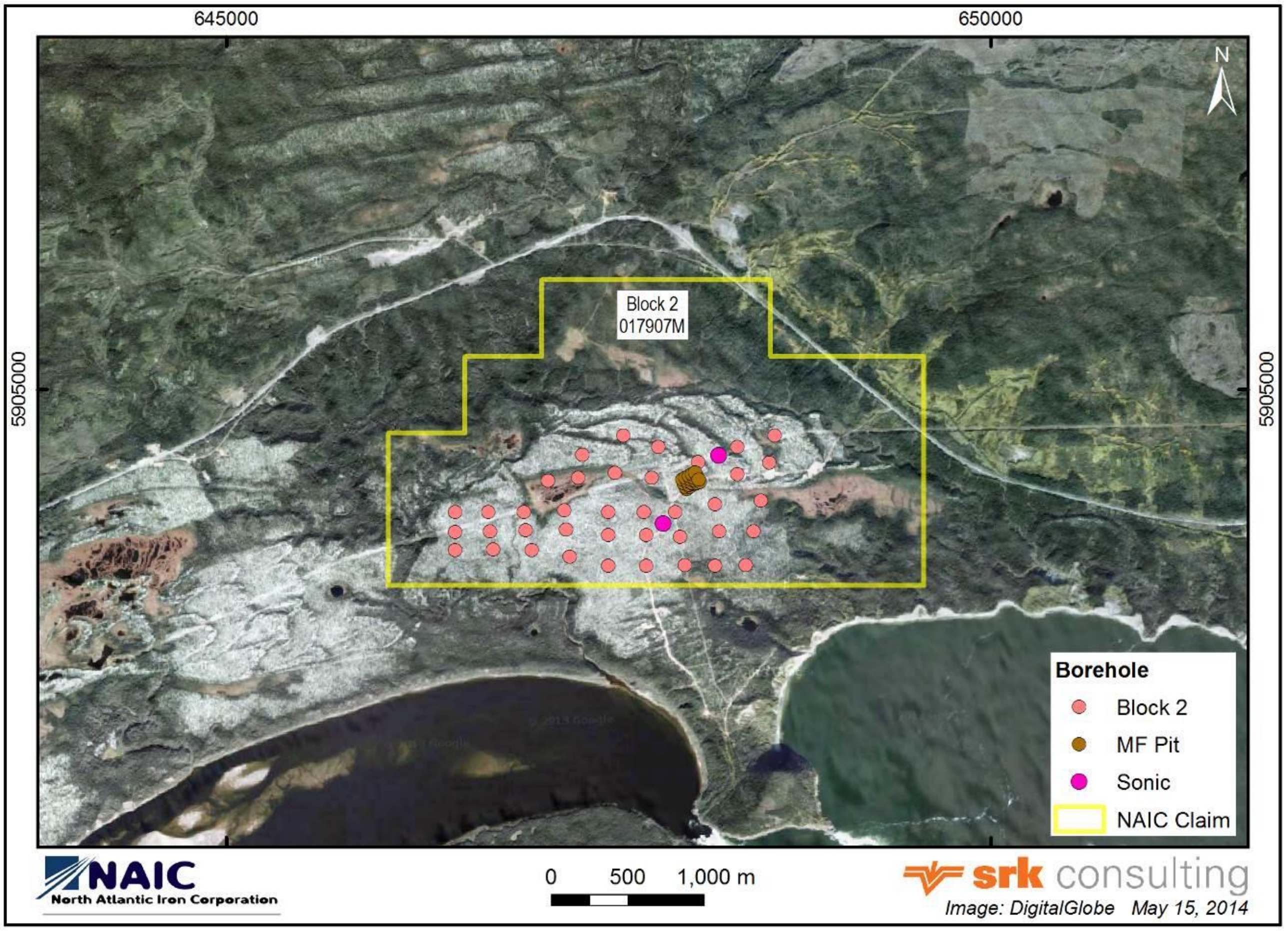

Figure 19: Drilling Pattern in Block 2

Finally, drilling in Block 5 (Figure 20) consisted of 59 boreholes (885 metres) with depth ranging from 8.5 to 23.2 metres. Grand River submitted a total of 812 samples, including quality control samples, for heavy mineral analysis. Initial results yielded 9.23 percent HMC that contained 37.9 percent Fe_2O_3 equivalent.

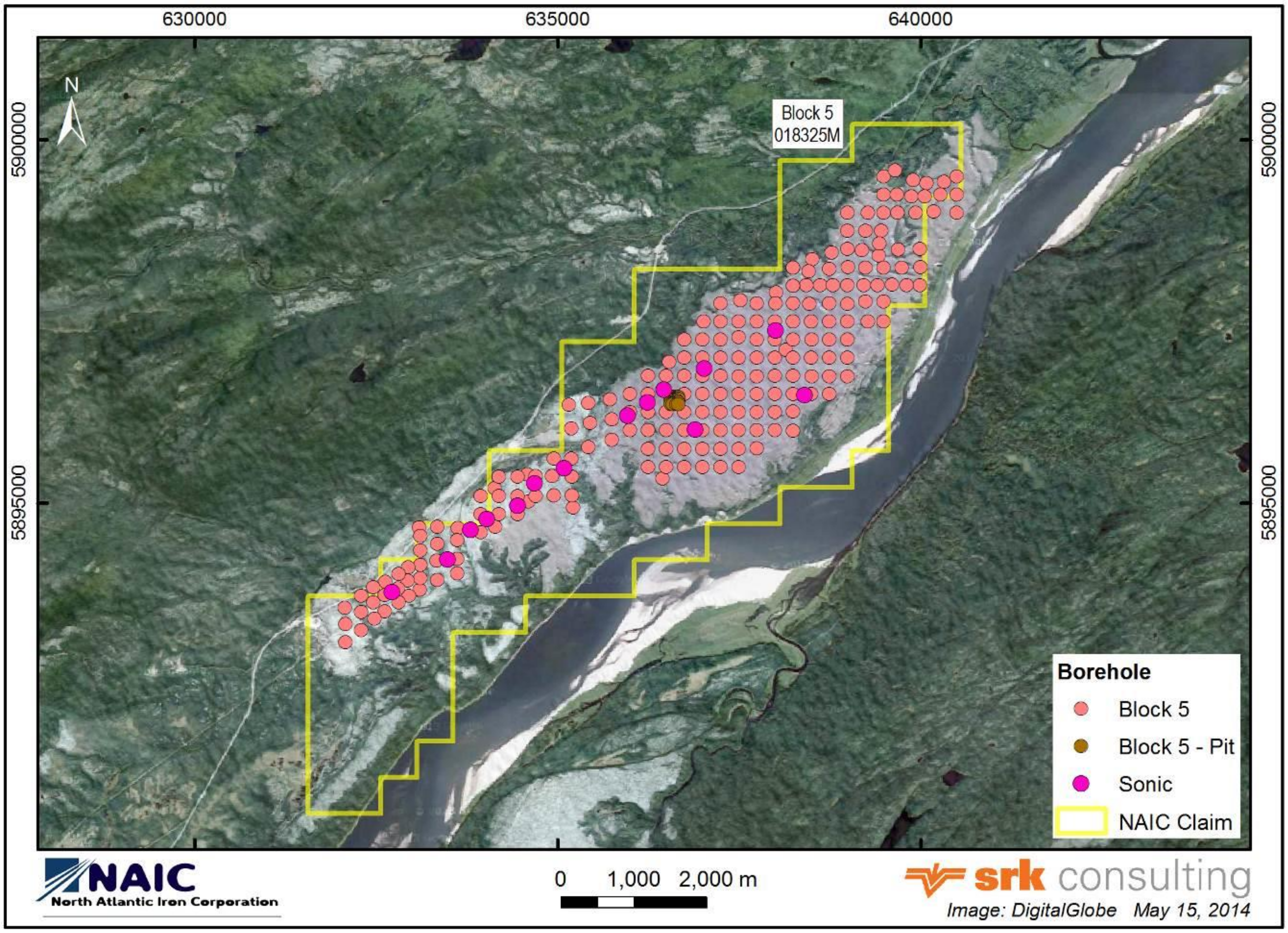

Figure 20: Drilling Pattern in Block 5

After the completion of the initial drilling program, Grand River executed a second program in the summer of 2011 to improve the confidence in the geological model. Prior to the commencement of this program Grand River purchased two Geoprobe 540 units and trained local crews in order to perform all future drill programs with in-house personnel. During this program boreholes were completed on 250-metre centres to fill in the 500-metre grid completed earlier in the year. In addition, Grand River tested two sites chosen for possible bulk sampling with closely spaced boreholes. Grand River implemented minor changes to standardize sample lengths to one metre and to increase confidence in the geological information gained from core logging.

The second drilling program focused on Block 2 and Block 5; no additional boreholes were drilled in Block 1.

The drilling program in Block 2 consisted of 25 boreholes (356 metres) on a 250-metre grid. The depths of boreholes ranged between 11 and 15 metres with an average depth of 14.24 metres. Grand

River collected 306 samples (including quality control samples) that were sent for geochemical and mineralogical analysis.

In addition to the infill drilling Grand River completed 20 boreholes (302 metres) on a 25-metre grid to test the drill site for bulk sampling. A total of 289 samples were collected for analysis.

Drilling in Block 5 comprised 152 boreholes (2,121 metres) with average depth of 13.9 metres. The longest borehole reached a depth of 18.0 metres. Drilling ceased in instances where clay layers were encountered within the borehole, or when groundwater was encountered near surface. Grand River collected 1,886 samples (including quality control samples) that were sent for geochemical and mineralogical analysis.

Similar to Block 2, Grand River completed 24 boreholes (252 metres) on a 25-metre grid to test the drill site for bulk sampling. A total of 219 samples were collected for analysis.

Due to favourable conditions in the fall of 2011 Grand River commenced drilling on License 011805 that covers part of the Churchill River and a number of sizeable sand bars (Figure 21). Boreholes were located on a 500-metre grid and reached depths of 7.2 to 9.5 metres. Grand River completed 26 boreholes (256 metres) on this license and collected 221 samples (including quality control samples) that were sent for geochemical and mineralogical analysis.

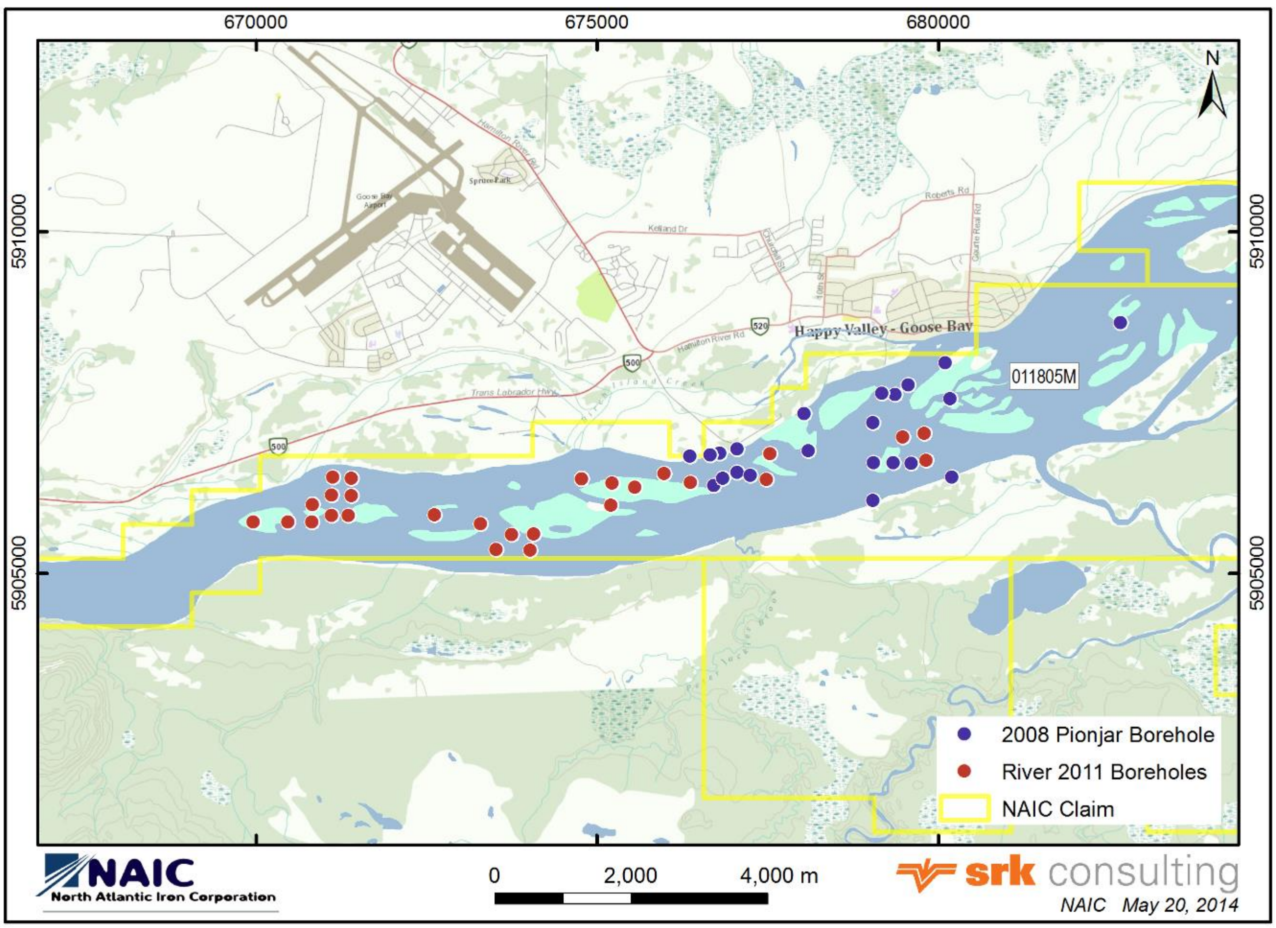

Figure 21: Drilling Pattern in License 011805

Grand River commenced infill drilling on Block 1 in the summer of 2012. Boreholes were drilled on a 250-metre grid. The program comprised 45 boreholes (622 metres) with lengths ranging from 8 to 15 metres. During this program only eight boreholes did not reach the target depth of 15 metres. Grand River collected 588 samples (including quality control samples) for geochemical and mineralogical analysis.

In late summer of 2012 Grand River completed 9 of 14 planned boreholes (90 metres) on License 017070M near the mouth of the Churchill River (Figure 22) on a loosely defined 500-metre grid. Grand River collected 70 samples (including quality control samples) for geochemical and mineralogical analysis.

Also in the summer of 2012 Grand River contracted Boart Longyear (Boart) from Mississauga, Ontario to complete a drill program using a sonic drill. This equipment was chosen to increase the penetration depth of the drilling and was largely designed as a "proof of concept" program. Boart completed 17 core boreholes (625.3 metres; Figure 18 to Figure 20; Table 8). A total of 14 boreholes were completed on Block 5, two boreholes on Block 2, one borehole on Block 1, and one borehole. The depth of the boreholes ranged from 24.4 to 50.2 metres. After the completion of the program, Boart installed five monitoring wells.

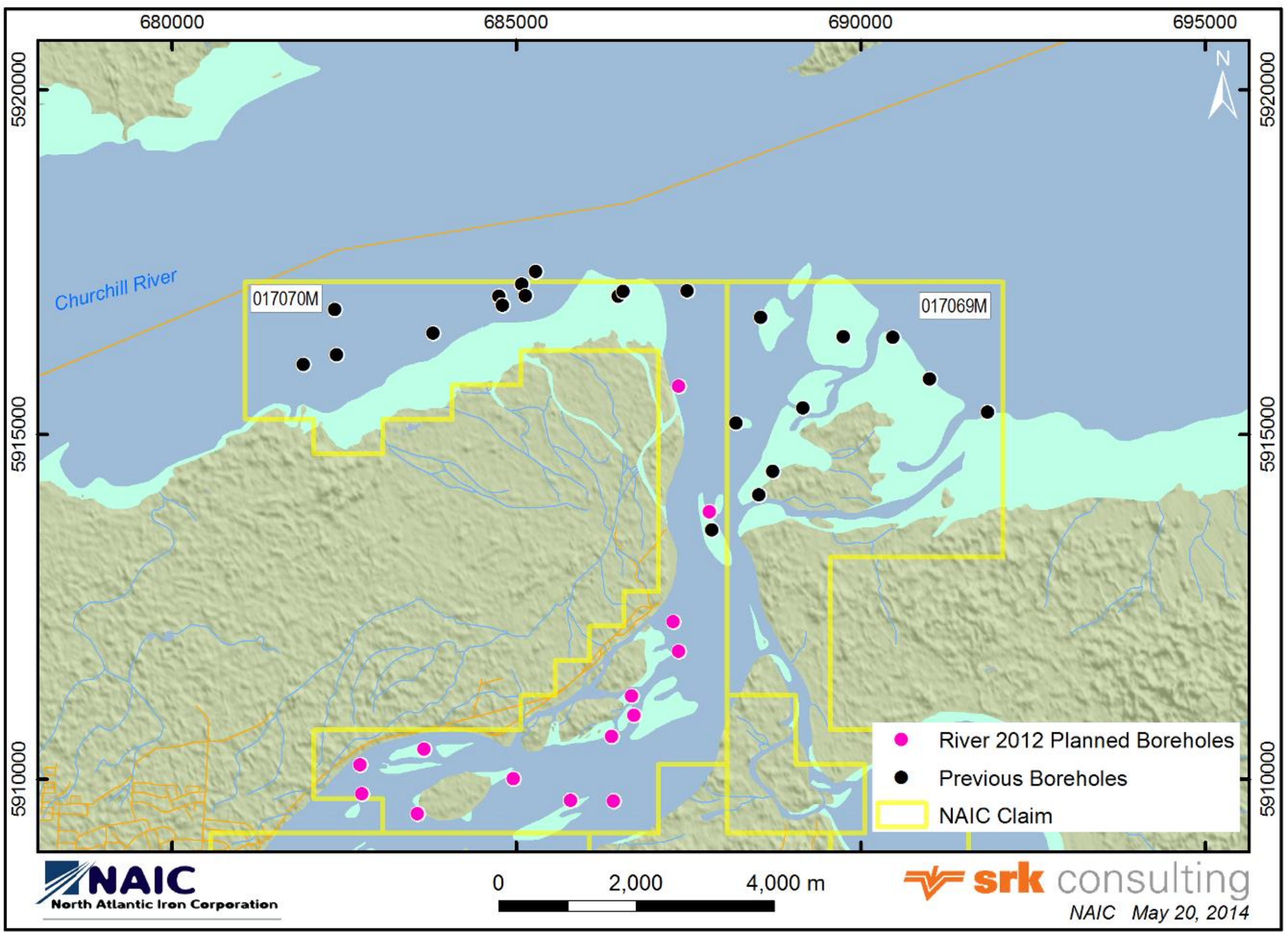

Figure 22: 2012 Planned Borehole Locations – Churchill River Claims

Table 8: Summary of the Sonic Boreholes

BHID	Easting	Northing	Elevation	Length (m)	Depth to Clay (m)	HM To EOH (%)	Fe_2O_3 (%)
Sonic 2	632,720	5,893,770	93.1	36.49	29.00	11.42	37.26
Sonic 5	633,488	5,894,220	92.1	39.54	36.00	9.51	34.52
Sonic 6	633,803	5,894,630	82.6	30.40	15.00	9.54	40.45
Sonic 7	634,031	5,894,783	82.9	33.44	24.38	9.02	37.97
Sonic 8	634,454	5,894,966	82.6	39.54	39.54	6.20	32.48
Sonic 9	634,684	5,895,273	83.5	33.44	27.43	8.89	37.09
Sonic 10	635,091	5,895,481	82.4	39.54	33.00	8.52	35.53
Sonic 11	635,965	5,896,202	79.0	33.44	30.48	7.72	34.87
Sonic 12	636,247	5,896,383	78.0	33.44	27.43	7.46	37.28
Sonic 13	636,470	5,896,565	78. 2	33.44	12.19	8.30	38.59
Sonic 14	637,024	5,896,854	76.7	33.44	15.24	5.22	37.92
Sonic 15	638,006	5,897,375	68.1	33.44	21.00	10.01	37.58
Sonic 17	647,860	5,904,126	60.4	39.54	24.30	9.76	29.80
Sonic 19	648,224	5,904,571	77.9	24.38	12.55	10.72	38.98
Sonic 20	656,835	5,904,925	72.0	42.60	28.00	10.14	36.34
Sonic 23	638,410	5,896,484	71.1	49.00	49.00	8.68	35.08
Sonic 24	636,897	5,896,010	76. 5	50.21	31.00	6.61	30.86

Sand core was collected at the drill site by Boart personnel using a plastic sleeves, which were tied off to create a bags. These were slid over the end of the core barrel; a combination of water pressure and mild vibration removed the sample from the core tube into the plastic sleeve. Approximately 5 feet (1.5 metres) of core was squeezed out using this technique, after which the water pressure and vibration were stopped. A second sleeve was then placed over the core tube and the last 5 feet were squeezed out.

The sonic drill program confirmed the presence of an approximately 1 metre thick clay layer at a typical depth of approximately 15 metres, and a much more substantial clay zone ranging in depth from approximately 20 to 40 metres below the topographic surface. This bottom clay zone is considered the limiting depth of the deposit.

9.4 SRK Comments

SRK is of the opinion that the drilling procedures adopted by Markland and Grand River conform to industry standard. The drilling pattern resulting from the current drilling is sufficiently dense to interpret the geometry and the distribution of heavy mineral concentration in the sand with adequate confidence.

Other than disclosed herein, SRK is not aware of any drilling, sampling or recovery factors that could materially impact the accuracy and reliability of the results.

10 Sample Preparation, Analyses, and Security

10.1 Markland (2002 – 2009)

10.1.1 Sample Preparation and Analysis

Markland Resource Development Inc. (Markland) submitted heavy mineral concentrate samples from the 2005 bulk sampling program to 3R Associates and to SGS Minerals Services (SGS) in Lakefield, Ontario for x-ray fluorescence. No further information about 3R Associates is available. The SGS laboratory in Lakefield (accredited laboratory number 184) is currently accredited by the Standards Council of Canada to CAN-P-159 and CAN-P-4E (ISO/IEC 17025:2005). However, SRK was unable to determine whether the laboratory was accredited in 2005 when the studies were completed. Markland also submitted samples to an undisclosed SGS laboratory for inductively coupled plasma optical emission spectrometry (ICP-OES).

Markland submitted core samples from the Pionjar drilling programs to the Mineral Engineering Centre of Dalhousie University (Dalhousie) in Halifax, Nova Scotia. The laboratory is a non-commercial research and teaching laboratory and as such is not accredited; however, it has participated in round robin tests for accredited commercial laboratories and follows Codes and Standards Group laboratory protocols for quality assurance and quality control, similar to commercial labs.

At Dalhousie, samples were dried, rotary split, bagged, and weighed. A subsample of each sample was split off using a rotary splitter and screened at 2 millimetres. The +2 millimetre fraction was weighed, and the -2 millimetre fraction weighed and then processed using heavy liquid separation tetrabromoethane (TBE) with a specific gravity of 2.95. The sinks were recovered and weighed and assayed by ICP-OES. The floats were recovered and weighed, with 20 percent of the floats assayed by ICP-OES in batches of 80 samples.

Outotec (USA) Inc. (Outotec) in Jacksonville, Florida was selected by Markland to develop a metallurgical flow sheet. SRK was not able to determine available accreditations for this laboratory.

10.1.2 Pionjar Samples

Sand samples were collected by Markland personnel at the drill site where they were logged and sampled. Sample bags were brought to Markland’s storage facility in Happy Valley-Goose Bay prior to shipment to Dalhousie or other laboratories. The sample length of 2.5 feet (75 centimetres) was determined by the split core barrel of the Pionjar dill. Samples were packaged in plastic sample bags and shipped in plastic pails.

10.1.3 Bulk Samples

The first bulk sample collected by Markland comprised approximately 650 tonnes of sand that were dug up using a back hoe from a maximum depth of approximately 3 metres. The sample material was loaded directly on a barge for transport across the Churchill River. The material was trucked from the barge to Markland’s warehouse in Happy Valley-Goose Bay.

The second bulk sample was composited from existing Pionjar core material. No further information exists regarding the number and location of boreholes, and the methodology of homogenizing used to create the composite sample.

The third bulk sample was obtained by drilling a series of shallow Pionjar boreholes. The sample material was taken from the split tubes used during drilling and was filled into plastic 20-litre buckets. The buckets were transported directly to Markland's warehouse in Happy Valley-Goose Bay.

10.2 Grand River (2010 – 2012)

10.2.1 Sample Preparation and Analysis

Grand River submitted sand samples from the Pionjar, Geoprobe, and sonic drilling programs to the Mineral Engineering Centre of Dalhousie University (Dalhousie) in Halifax, Nova Scotia. The laboratory is a non-commercial research and teaching laboratory and as such is not accredited; however, it has participated in round robin tests for accredited commercial laboratories. The sample preparation and assaying procedures were the same as those used under Markland.

Grand River used SGS in Lakefield for umpire assaying. SRK was unable to confirm assay methods and packages used by SGS during this study.

Grand River used Outotec in Oberursel, Germany for melt testing using the Stelco-Lurgi/Republic Steel-National Lead process. SRK was not able to determine available accreditations for this laboratory.

Grand River used Eriez Manufacturing Co. (Eriez) in Erie, Pennsylvania to complete magnetic separation tests at Eriez's technical centre. SRK was not able to determine available accreditations for this laboratory.

Grand River used Activation Laboratories Ltd. (Actlabs) in the initial phase of resource delineation drilling for geochemical analysis of samples before reverting back to Dalhousie. SRK was unable to determine which laboratory location samples were to. Actlabs is certified to ISO 9001:2008 and is ISO 17015 accredited for certain assay methods. SRK was unable to determine whether assay methods used by Grand River are covered under the accreditation.

Grand River used ALS Limited (ALS) for the analysis of metal concentrates. SRK was unable to determine the location of the laboratory used by Grand River. The management system of ALS laboratories is accredited to ISO 9001:2008 by QMI-SAI Global (QMI; Certificate Number CERT-0051 527).

Grand River used Andrew S. McCreath & Son, Inc. (McCreath) in Harrisburg, Pennsylvania for the analysis of metal concentrates. McCreath is ISO 17015 accredited by the American Association of Laboratory Accreditation as a commercial chemical laboratory. McCreath's accreditation covers a range of analytical methods; however, SRK was not able to determine whether t methods used by Grand River fall in this range.

10.2.2 Pionjar Sand Samples

Sand samples were collected by Grand River personnel at the drill site where it was logged, photographed, and sampled. After the core tube was extracted from the borehole, it was placed on a clean table and the split tube was opened slightly so that the sediment core could be cut with a knife. The split core tube was then opened completely revealing two core halves. Once the core was logged and photographed, sample material was collected with a spoon directly into plastic zip-loc-style sample bags that were marked with a sample number. Sample bags were brought to Grand River's storage facility in Happy Valley-Goose Bay prior to shipment to Dalhousie or other laboratories. Samples were shipped in plastic pails.

10.2.3 Geoprobe Sand Samples

Geoprobe coring equipment used by Grand River utilized the MC5 sample collection system comprising 5-foot-long (1.5 metres) clear plastic tubes into which the sample material is pushed during the coring. Colour coded caps on the tubes were used to mark top and bottom ends. Once the sample tubes were removed from the ground, they were cut lengthwise with the Geoprobe line cutter tool. In cases where liners were cracked or broken and sample spillage occurred, photographs were taken of the outside of the core box where the spill was observed. Photographs were taken of the open and exposed core using a metre stick for scale. A corresponding photo identification card with the borehole number and from-to information was included with each photograph. Samples bags were marked in the field prior to sand being placed in the bag by Grand River personnel. Once a sample was ready to be extruded, the bag with the appropriate depth written on it was placed over the drill rod, the sample was extruded, and the bag was tied off.

These samples were transported daily from the field to the core logging room. Sample bags were placed along a 1-metre-long measuring stick and the bags were opened. The collection of logging information included descriptions of grain size, grain shapes, grain sorting, and degree of wetness of the sand, a comment on the presence of visible heavy minerals both as bedded lamina or disseminations, and any general comments that were relevant to the sample interval. The larger sample was broken into 1-metre-long sample intervals in order to keep the assay data results consistent with the Geoprobe Drilling assay results. An assay sample number was assigned to the interval, and the sample was weighted. The entire core material was then collected into clear plastic bags with the corresponding assay tag and shipped to Dalhousie with appropriate chain of custody information, which included the shipping manifest, the sample numbers, the number of samples, and the sample weights.

10.3 Sonic Sand Samples

Sand samples were collected at the drill site by Boart personnel using a plastic sleeves, which were tied off to create a bags. These were slid over the end of the core barrel; a combination of water pressure and mild vibration removed the sample from the core tube into the plastic sleeve. Approximately 5 feet (1.5 metres) of the sand core was squeezed out using this technique, after which the water pressure and vibration were stopped. A second sleeve was then placed over the core tube and the last 5 feet were squeezed out. No additional information was available detailing core logging and sample preparation.

10.4 Specific Gravity Data

No specific gravity data were collected on this project.

10.5 Quality Assurance and Quality Control Programs

Quality control measures are set in place to ensure the reliability and trustworthiness of exploration data. These measures typically include written field procedures and independent verifications of aspects such as drilling, surveying, sampling and assaying, data management, and database integrity. Appropriate documentation of quality control measures and regular analysis of quality control data are important as a safeguard for project data and form the basis for the quality assurance program implemented during exploration.

Analytical control measures typically involve internal and external laboratory control measures implemented to monitor the precision and accuracy of the sampling, preparation, and assaying. They are also important to prevent sample mix-up and to monitor the voluntary or inadvertent contamination of samples.

Assaying protocols typically involve regularly duplicating and replicating assays and inserting quality control samples to monitor the reliability of the assaying results throughout the sampling and assaying process. Check assaying is normally performed as an additional test of the reliability of the assaying results; it generally involves re-assaying a set number of sample rejects and pulps at a secondary umpire laboratory.

10.5.1 Markland (2002 – 2009)

SRK is not aware of a quality control program implemented by Markland.

10.5.2 Grand River (2010 – 2012)

Grand River implemented external analytical quality control measures. These measures involved using control samples (blanks and field duplicates) at a rate of approximately 5 percent. Four iron standard materials and four silica blanks samples were also added to each batch of 80 samples submitted for multi-element IPS-OES analysis.

Twenty percent of raw (non-concentrated) sand samples were analyzed for whole rock chemistry. Sample splits of approximately 15 percent of these samples were sent to SGS as umpire check assays. Duplicate samples and iron and silica blank standards were also inserted into the SGS sample stream. Finally, approximately 10 percent of samples submitted to Dalhousie were renumbered at the laboratory and reinserted into the sample stream.

Sample Security

All sand and primary samples were under the care and supervision of the supervising filed geologist at all times. No issues with sample security were observed by Grand River. When the sample storage room was not in use, it was locked and isolated from the rest of the building until logging and sampling were completed. Core was brought to the core room daily at the end of coring activities.

10.6 SRK Comments

Grand River personnel used care in the collection and management of field and assaying exploration data. The analysis of the analytical quality control data is presented in the following section. In the opinion of SRK, the sampling preparation, security, and analytical procedures used by Grand River are consistent with generally accepted industry best practices and are therefore adequate. SRK considers that the exploration data collected by Grand River are of sufficient quality to support mineral resource evaluation.

The lack of quality control data and documented sampling and assaying protocols by Markland cast uncertainty in the reliability of the historical exploration data. Therefore, SRK agrees with Grand River not to use these data for geology and resource modelling purposes.

11 Data Verification

11.1 Verification by North Atlantic

The exploration work carried out on the Churchill River deposit was conducted by North Atlantic personnel and qualified subcontractors. North Atlantic implemented a series of routine verifications to ensure the collection of reliable exploration data. All work was conducted by appropriate qualified personnel under the supervision of qualified geologists. In the opinion of SRK, the field exploration procedures utilized by North Atlantic are consistent with generally accepted industry best practices.

The quality assurance and quality control program implemented by North Atlantic is comprehensive and was supervised by adequately qualified personnel. The exploration data was recorded digitally to minimize data entry errors. Core logging, surveying and sampling were monitored by qualified geologists and verified routinely for consistency. Electronic data was captured and managed in an electronic Sable Data Warehouse database.

Assay results were delivered by the primary laboratories electronically to North Atlantic. Analytical data were examined for consistency and completeness prior to being entered into the database. Sampling intervals that did not meet analytical quality control standards were re-assayed where necessary. Samples were originally analyzed by Actlabs, however based on the inconsistencies observed in the initial results, North Atlantic geologists elected to have all the samples re-analyzed. All the samples were subsequently analyzed at the Earth Science department of the Dalhousie University in Halifax, Nova Scotia, Canada (Dalhousie).

11.2 Verification by SRK

11.2.1 Site Visit

In accordance with National Instrument 43-101 guidelines, SRK visited the Churchill River mineral sand project in Newfoundland on various occasions between June 2010 and September 2013. At the time of the visits, surface drilling activities were ongoing on the project. The purpose of the site visits were to ascertain the geological setting of the project, witness the extent of the exploration work carried out on the property and also to assess logistical aspects and other constraints relating to conducting mining activities in this area. SRK reviewed the exploration database, the validation procedures, and the exploration procedures. SRK also defined the geological modelling procedures, as well as examined the core, and interviewed project personnel.

11.2.2 Verification of Analytical Quality Control Data

North Atlantic provided SRK with external analytical control data containing the assay results for the quality control data produced by North Atlantic during the core sampling program investigating the Churchill River deposit during the two distinct phases of exploration in 2012 and 2013. All data was provided in Microsoft Excel spreadsheets. SRK aggregated the assay results of the external analytical control samples for further analysis. Control samples (blanks and standards) were summarized on time series plots to highlight the performance of the control samples. Paired data (field duplicates and check assays) were analyzed using bias charts, quantile-quantile, and relative position charts. Selected quality control charts are available in Appendix B for Phase 1 and in Appendix C for Phase 2.

11.3 Phase 1 Drilling Program

11.3.1 Standards

The standard reference material utilized by North Atlantic is the commercial certified reference material SCH-1 obtained by CANMET Mining and Mineral Sciences Laboratories in Ottawa, Ontario. This certified reference material is designed for high-grade iron ore (60 percent iron content by weight). This certified reference material was diluted with silica flour by Dalhousie. The expected value supplied for the diluted in-house standard is 5.06 percent total iron and 7.23 percent for Fe_2O_3 equivalent. No standard deviation ranges were supplied with the diluted standard. SRK used a 5 percent bracket for evaluating the precision of the results.

During Phase 1, 53 diluted standards were submitted to Dalhousie. The results from Batch 5 slightly under report the expected value, a similar result is also observed for batches 10 to 14. This discrepancy may indicate some instrumental drift. However, internal certified material used by Dalhousie during the same period suggests the all analyses are within the 5 percent thresholds selected by SRK. Overall, approximately 9 percent of the results are below the lower threshold value, and only one value is above the upper threshold. Consequently, a slight conservancy to the results might have been introduced. SRK recommended that the batch results be more closely monitored in the future, and any deviations from the expected value should be addressed with the laboratory timeously.

11.3.2 Blanks

The blank samples are silica sand and are not expected to have any significant iron content. During Phase 1, 52 blanks were submitted to Dalhousie. Only two samples reported values higher than five times the iron detection limit of 0.05 percent iron, with a reported value of 0.370 percent iron (sample 471195) and 0.285 percent iron (sample 476060). SRK does not consider that the two slightly elevated values indicated systematic sample contamination; however SRK recommends that North Atlantic discuss the elevated values with the laboratory, and monitor future batches to ensure that any elevated values are addressed with the laboratory timeously.

11.3.3 Duplicates

Two types of duplicate sampling were undertaken. The first are were half sand core duplicate samples inserted into the sample stream as part of the initial sample submission to Actlabs, which were also analyzed in duplicates by Dalhousie. The second were rotary split samples submitted only to Dalhousie as part of the sample stream.

The simple statistic of the Actlabs duplicates revealed comparable results, with very little difference in the mean values of the original assays and their duplicates (39.10 and 39.05 percent Fe_2O_3 equivalent, respectively). There was good correlation between the two data sets. The half absolute relative difference (HARD) plot confirmed that the duplicates met the expected threshold precision of 10 percent, with approximately 95 percent of the data with a HARD value of less than 5 percent. The results indicated an acceptable precision between the pairs of duplicates.

The rotary split samples submitted to Dalhousie revealed a small difference between the original assay mean of 37.89 percent Fe_2O_3 equivalent and 37.34 percent Fe_2O_3 equivalent for the duplicate assay. The HARD plot confirmed the relatively poor precision of this data set; approximately 85 percent of the results had a hard value of less than 5 percent. The source of this bias has not yet been confirmed. SRK recommends that North Atlantic work with Dalhousie to determine the source of the possible bias.

11.3.4 Umpire Analysis

A set of 88 sand samples were sent to SGS in Canada and analyzed with X-ray fluorescence spectrometry (XRF), while the samples submitted to Dalhousie were analyzed using inductively coupled plasma optical emission spectroscopy (ICP-OES). Along with the 88 samples submitted to SGS, 11 standards and 10 blanks were also analyzed.

SRK compared the duplicate major oxide results from each laboratory and the heavy mineral concentrate duplicate samples using similar methods to those used for the initial and secondary duplicates analyzed at Dalhousie. Scatter plot and HARD plot both revealed that there was reasonable precision between the two laboratories; however there was a bias between the two laboratories. The HARD plot revealed that the data sets approximately met the benchmark of 95 percent of the pairs with HARD values of less than 5 percent. In the scatter plot, the majority of the results were within the 10 percent error; however, the SGS results were typically higher than the Dalhousie results. This bias was also seen in other variables and confirmed in the quantile-quantile (QQ) plots for Fe_2O_3 equivalent and SiO_2. In both cases, there was a bias with SGS returning higher results.

The heavy mineral concentrate duplicates analysis revealed that there is a degree of scatter in the data, however there was no indication of bias. The amount of scatter was relatively high, and SRK recommended that additional testing be done on the rotary splitting, to test the repeatability of the splitting at the same laboratory, and determine the natural variability in the subsampling process.

The 11 standards that were sent to SGS were the same in-house diluted standards that were used by Dalhousie. SGS analyses consistently returned a higher value than expected with an average value of 7.50 percent Fe_2O_3 equivalent compared to the expected 7.23 percent Fe_2O_3 equivalent. All but one sample returned results within the 5 percent threshold limit.

The 10 silica blanks included as part of the sample stream to SGS all returned within the acceptable limit of five times the lower detection limit for Fe_2O_3 equivalent. Consequently, there was no indication of sample contamination at SGS.

SRK concludes that even with the slightly different analytical method there is an unacceptable bias between the two laboratories. SRK recommends that North Atlantic needs to determine which laboratory is accurate, using certified reference material with values appropriate for the deposit, and engage with the laboratories to correct the bias. For resource estimation purposes only samples analyzed by Dalhousie were used.

11.4 Phase 2 Drilling Program

Problematic sources of error were identified by Dalhousie, primarily in the rotary splitting of the raw material, and were corrected prior to the analysis of the Phase 2 drilling results.

11.4.1 Standards

During Phase 2, two in-house standards and one commercial certified reference material were submitted to Dalhousie as part of the sample stream. The two in-house standards were prepared by Dalhousie; low-grade pulverised sand (SAND) and a pulverised heavy mineral concentrate (CONC).

In both cases, expected values were available. The commercial certified reference material FER-2 was produced by the Canadian Certified Reference Materials Project, which had supplied a certified value, but not certified upper and lower standard deviation limits.

For SAND, 14 percent of the samples were outside the upper and lower 5 percent limit returning values below 2.432 percent Fe_2O_3 equivalent and above 2.688 percent Fe_2O_3 equivalent. The remaining majority of the samples returned values within both the two standard deviations and the five percent threshold limit. All samples, except for sample 990862, returned values within the 5 percent limit for CONC but with 20 percent outside the two standard deviations limits. All the FER-2 samples returned values within the 5 percent threshold limit.

11.4.2 Blanks

The blank samples were silica sand and were not expected to have any significant iron content. Blank analysis for batches 1 to 24 revealed that four samples returned with values higher than five times the iron detection limit of 0.05 percent iron. These batches should be discussed with the laboratory, and repeat analyses done if necessary, according to the quality control protocol established by North Atlantic.

11.4.3 Duplicates

The duplicate pair samples were analyzed using basic statistics, and graphical plots (HARD and scatter) to evaluate and benchmark the precision of the analysis. The Fe_2O_3 HARD plot was marginally outside the acceptable degree of precision according to the SRK major constituent benchmark of 5 percent with 95 percent of the pairs with a HARD value less than 7 percent. The scatter plot for sample duplicate pairs of Fe_2O_3 showed a reasonable correlation, returning few pairs with values outside the 10 percent limit and a correlation coefficient of 0.828. That said, four of the samples plotted far from the rest of the duplicate pairs. SRK recommends that the anomalous sample be validated, according to the quality control protocol established by North Atlantic and the results of the validation recorded appropriately.

11.5 SRK Comments

SRK concludes that the discrepancies between SGS and Dalhousie have been rectified. The analytical results obtained during Phase 2 are sufficiently reliable for the purpose of mineral resource estimation. SRK recommends that North Atlantic continue monitoring closely the quality control samples to ensure that any deviations from the expected value should be addressed with the laboratory in a timely manner.

12 Mineral Processing and Metallurgical Testing

12.1 Introduction

A number of different metallurgical testwork programs have been completed by North Atlantic Iron Corp. to both recover an iron concentrate from the Churchill River mineral sand as well as demonstrate the ability to produce pig iron from this concentrate.

North Atlantic has conducted batch beneficiation tests in the Cardero Technologies laboratory looking into both gravity and magnetic separation methods to concentrate the magnetite and titano-magnetite minerals.

As a majority shareholder of North Atlantic, Grand River Ironsands Inc. conducted an extended pilot plant trial based on magnetic separation to generate a bulk sample of iron concentrate for subsequent testing. Concentrate to pig iron tests were conducted at both the Midrex Technology Center in North Carolina and a test facility owned by Grand River Ironsands Inc. in Easton, Pennsylvania.

The metallurgical testwork completed to date was supervised by Hatch Ltd. (Hatch 2014). In some cases, sections of their report have been reproduced here for clarity. SRK reviewed the test work results and prepared the following summary for inclusion in this technical report.

The stages involved in the processing of mineral sand to final pig iron are the following:

- Beneficiation or recovery of a high grade iron concentrate from the mineral sand plant feed;
- Raw material (concentrate) handling and composite briquette (CBQ) production;
- Production of direct reduced iron (DRI) from the composite briquettes; and
- Pig iron production from melting of the DRI.

The beneficiation will involve gravity and/or magnetic separation to exploit the higher density and magnetic susceptibility of the magnetite and titano-magnetite minerals. This processing can be a combination of wet or dry methods.

To generate CBQs, iron concentrate is mixed with reductant coal, hydrated lime and a binder and compacted to form briquettes.

Heating the CBQs in a rotary hearth furnace (RHF) under reducing conditions will generate partially metallized briquettes (HBI) or a compacted form of DRI.

Finally, the HBI is melted in a submerged arc furnace (SAF) to produce hot metal or pig iron. SAF off-gas is generally rich in carbon monoxide (90%) and would be recycled to the RHF as a fuel. The off-gas from the RHF would be low in calorific value, but its high temperature could be used in a steam turbine power plant or for material drying.

12.2 Beneficiation of Iron Concentrate

Testwork into the recovery of an iron concentrate has been completed by Cardero on a batch scale in 2011 and 2012, as well as a demonstration, pilot plant operation of a dry, magnetic separation flowsheet by Grand River in late 2012.

In 2013, North Atlantic arranged for additional spiral concentrator (i.e. gravity) testing by the Jingyu Mineral Beneficiation Equipment Co. Ltd. in Qinyang City, China.

12.2.1 Flowsheet Development (Cardero 2011)

A number of batch tests were conducted by Cardero on bulk samples from three mineralized zones (Blocks 1, 2 and 5) of the Churchill River deposit. A copy of the Cardero testwork report was analyzed by Hatch but not provided to SRK for their summary review.

A detailed review of the Cardero testwork is included in Hatch 2014 and resulted in the development of two flowsheets: 1) a dry process, involving magnetic separation and 2) a wet spiral, gravity process followed by dry magnetic separation. Both low-intensity magnetic separation (LIMS) and high-intensity magnetic separation (HIMS) stages were included in the flowsheets. Magnetite can be readily recovered using LIMS while titano-magnetite requires HIMS, due to its lower susceptibility.

Hatch included the following points in their summary comments of Appendix B:

- Flowsheet #1 (dry LIMS + HIMS) as tested at the Cardero laboratory had a low iron recovery of 30.2% and low concentrate grade of 45% Fe but was successfully simplified and used as the flowsheet for the pilot plant;
- Flowsheet #2 (wet spirals + dry LIMS + HIMS) as tested at the Cardero laboratory had better iron recovery and concentrate grade than Flowsheet #1. Spirals were not used in the pilot plant; and
- The four tests conducted to evaluate Flowsheets #1 and #2 proved that spirals and magnetic separation could be used to recover magnetite and titano-magnetite although concentrate grades and iron recoveries were low. Further testwork is needed to develop a commercially viable flowsheet.

As indicated above, the dry Flowsheet #1 was selected for use in the demonstration plant operation and consists of the following stages:

1. Drying of the run of mine iron sand feed in a fluid bed dryer;
2. Rougher stage: a dry LIMS rougher produces a concentrate that gets screened;
3. Screening of rougher concentrate: the rougher concentrate is screened at 180 microns (µm) and the undersize is fed to the cleaner; the oversize can either be rejected as tailings or be dry ground to passing 180µm and fed back to the rougher LIMS;
4. Cleaner stage: the -180µm rougher concentrate is fed to a LIMS cleaner (for the pilot plant, the LIMS can be arranged to operate as a rougher and then re-arranged to operate as a cleaner);
5. Scavenger stage: the tailings from the rougher feeds the scavenger HIMS drum; for the pilot plant, the HIMS could be arranged to operate as a scavenger and then re-arranged to operate as a scavenger-cleaner;
6. Screening of scavenger concentrate: the scavenger concentrate is screened at 180µm and the undersize fed to the scavenger-cleaner; the oversize could either be rejected as tailings or be dry ground to passing 180µm and fed back to the rougher; and
7. Scavenger-cleaner stage: the concentrate from the scavenger is cleaned.

The pilot plant flowsheet is shown in Figure 23, reproduced from the Grand River Ironsands summary report (2013).

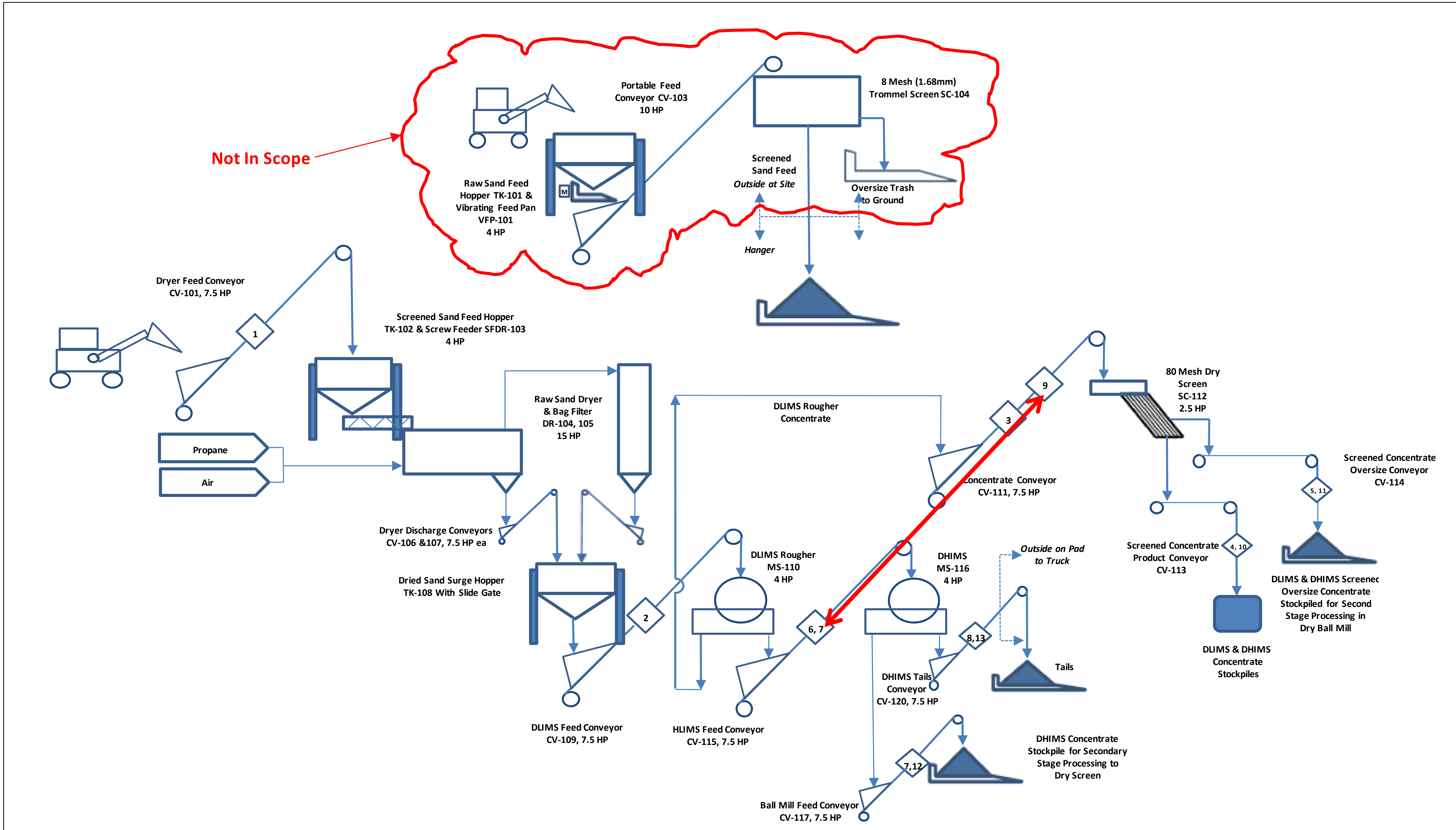

Figure 23: Demonstration Plant Magnetic and Screening Processing Flowsheet

Flowsheet #2 is similar to Flowsheet #1, but includes a wet spiral for a pre-rougher stage, no cleaner is needed and a re-scavenger is used instead of a scavenger-cleaner. Flowsheet #2 consists of the following stages:

1. Spiral pre-rougher stage: a wet gravity-separation spiral produces concentrate, middlings, and tailings; the concentrate is fed to a wet LIMS (or dried and fed to a dry LIMS) while the tails are rejected; the middlings can be rejected or processed probably first by screening at 180µm and rejecting the +180µm fraction to tails and feeding the -180µm fraction to the rougher, etc.;
2. Rougher stage: a wet LIMS produces a concentrate that is screened at 180µm;
3. Screening of rougher concentrate: the rougher concentrate is screened at 180µm and the undersize fed to the cleaner; the oversize can either be rejected as tailings or be dry ground to passing 180µm and fed back to the rougher or pre-rougher;
4. Scavenger stage: tailings from the rougher feed the scavenger dry HIMS drum; for the pilot plant, the HIMS can be arranged to operate as a scavenger and then re-arranged to operate as a scavenger-cleaner;
5. Screening of scavenger concentrate: the scavenger concentrate is screened at 180µm and the undersize fed to the scavenger-cleaner; the oversize can either be rejected as tailings or be dry ground to 180µm and fed back to the rougher; and
6. Re-scavenger stage: the tailings from the scavenger stage are fed to the re-scavenger.

A mineral separation plant was constructed in Goose Bay with the purpose of generating iron concentrate from raw sand found on the Churchill River mineral sand project. The pilot plant used Flowsheet #1 (as shown in Figure 23) as it did not require the use of water and thus simplified the permitting process and time. The concentrate that was produced from the pilot plant was then used in metallurgical programs designed to demonstrate the ability to produce pig iron through a production flowsheet designed by North Atlantic.

12.2.2 Pilot Plant Operation

In May and June 2012, approximately 7,500 tonnes of iron sand were collected using an excavator from a 100 by 100 metres area within the Muskrat Falls zone (Block 2), with the top 1 metre of overburden removed and stockpiled. The material was processed through a ½ inch (13 millimetres) trommel to remove any oversize or debris as well as any clay material. The sample is representative of the iron sand mineralization found in Block 2.

The average grade for this sample was 10.6% (by weight) heavy mineral content and 36.8% Fe_2O_3 equivalent; which represents a total iron assay of 2.73%. These assays are in line with the overall grade of the Inferred mineral resource of 9.4% heavy mineral content and 38.0% Fe_2O_3.

Of these 7,500 tonnes that were screened and delivered to the pilot plant in Goose Bay-Happy Valley, approximately 5,000 tonnes of dried sand were processed to generate iron concentrate. This material, while likely representative of the mineralization found at Muskrat Falls, may not be representative of the iron sands mineralization in other resource blocks.

Iron Concentrate Production (September to November 2012)

The demonstration plant operated from September to late November 2012, initially at 13 to 14 tonnes per hour (tph) and steadily decreased over time to 7 to 8 tph.

Daily plant logs over the entire pilot plant operation were kept to track the material balance and iron balances. The latter was determined using a handheld x-ray fluorescence instrument in the on-site quality control lab.

Material balances over specific operating periods are included in Table 9 as well as the total over the entire period. This table represents the iron concentrate pre-cleaning (pre-conc) comprised of two main products: magnetite (MAG) and titano-magnetite (TI-MAG).

Table 9: Pilot Plant Material Balances by Date

Product	Sept. 20, 2012 Tonnes	Oct. 21, 2012 Tonnes	Oct. 28, 2012 Tonnes	Nov. 4, 2012 Tonnes	Nov. 11, 2012 Tonnes	Total Tonnes	Total % Weight
MAG Pre-conc	23.6	4.85	6.40	6.1	6.0	47.0	0.92
+80# MAG	8.2	1.86	1.70	1.7	1.6	15.1	0.30
TI-MAG Pre-conc	130.5	33.40	39.40	41.8	46.2	291.2	5.69
Scav. Tails	2,430.8	502.68	632.81	579.6	579.2	4,725.2	92.24
Fugitive Dust	22.3	5.30	5.80	5.4	5.4	44.2	0.86
Total (Feed)	**2,615.4**	**548.09**	**686.11**	**634.6**	**638.4**	**5,122.7**	**100.00**
Summary of Pre-concentrate							
Total Pre-conc (t)	154	38	46	48	52	338	
Fe Grade (wt %)	41	37	38	35	39	39	
Fe Recovery (%)	53	57	56	58	69	56	
Cleaning of Pre-concentrate to Final Concentrate							
Total Final Conc (t)	95	25	30	31	34	214	
Fe Grade (wt %)	54						
Fe Recovery (%)	51						

Following the production of the pre-concentrate, cleaning operations commenced to generate a final concentrate. Samples were taken to determine a final concentrate yield and iron grade. Splits from each shift composite sample collected during the cleaning operations were taken by rotary riffle and combined at the appropriate weight percent into a blended sample. Splits of the blended samples were then prepared for third party assay by McCreath and ALS.

Results were received from both assay labs, and using both assays, the iron recovery to the final cleaned concentrates was calculated and shown in Table 10.

Table 10: Muskrat Falls Totals, Final Cleaned Concentrates and Iron Recovery

Product[1]	Total Weight (tonnes)	Fe[2] Grade (%)	Fe[2] Weight (tonnes)	Fe[3] Grade (%)	Fe[3] Weight (tonnes)
1st MAG Concentrate Blend (2)	19.5	62.22	12.1	62.26	12.1
1st TI-MAG Concentrate Blend (9)	75.7	50.46	38.2	50.45	38.2
2nd MAG Concentrate Blend (2)	20.0	60.93	12.2	60.92	12.2
2nd TI-MAG Concentrate Blend (11)	96.3	49.20	47.4	49.18	47.3
Grand Total	**211.5**	**51.96**	**109.9**	**51.95**	**109.9**
Feed Blend[4] (8)	5,122.7	4.08	209.0	4.02	205.9
Fe Recovery, %			52.6		53.4

1 Product blends derived from splits of each shift sample collected during cleaning operations (number in parentheses).

2 Fe grade reported from McCreath lab, by titration.

3 Fe grade reported from ALS lab, by fusion XRF.

4 Feed blend derived from splits of one daily sample for each week of plant operation (number in parentheses). Fe assays reported from McCreath and ALS labs.

The final cleaned concentrates represent 4% of the total weight of the sand processed, at over 52% iron recovery, as determined using two third party laboratory assays. Combined product iron concentrate after the cleaning stage was 211.5 tonnes, with a weighted mean average total iron content of 52%. The ratio of TIMAG to MAG production was 4.35 to 1.

The blended chemistry of the iron concentrate (MAG + TI-MAG), was calculated from two laboratory assay results and shown in Table 11.

Table 11: Assay Results for Blended MAG + TI-MAG Concentrate

Element (%)	Cardero – XRF	ALS	Element (%)	Cardero – XRF	ALS
MnO	0.12	0.35	S	0.01	0.00
PbO	0.18	0.01	C	0.00	0.02
CaO	0.31	1.04	TiO_2	12.20	9.50
MgO	0.70	1.53	V_2O_5	0.26	0.14
SiO_2	5.00	9.17	Na/K/Cl/F	0.02	
MoO_3	0.35		Na_2O		0.28
Cr_2O_3		0.13	K_2O		0.27
Fe_2O_3	62.00	62.60	Volatiles	0.00	
FeO	15.13	10.94	Other[3]	1.83	0.48
Al_2O_3	1.15	2.65	**Total**	**99.31**	**99.16**
P_2O_5	0.05	0.05	Total Fe	55.12	52.33

The pilot plant test results demonstrated that magnetic separation of an iron concentrate from the raw feed sand is possible. For a commercial pig iron plant, the iron is lower than average and the alumina is slightly high; a better grade of feed to the pig iron plant would reduce operating costs. Future testwork should focus on improving grades and iron recoveries.

12.2.3 Spiral Classification (April 2013)

Hatch proposed in their review of beneficiation that spiral classifiers be investigated to improve the mass recovery of iron to concentrate. In addition, testing of Knelson concentrators as an alternative to spirals for pre-concentration as they are more forgiving in feed % solids and tonnage fluctuations as well as clay content (noted in the bulk sample excavation).

A report by Qinlong Chemical Antiseptic Co. Ltd. (2013) summarises spiral classifier testwork conducted on a 450kg sample of North Atlantic mineral sand. The testing sample was taken from the rejects from initial 7,500 tonnes bulk sample not used for the pilot plant testing. The testing sampled is representative of the mineral sands in Block 2.

The report indicates an iron concentrate of 30% iron and more than 75% recovery could be achieved with a single stage of spiral classification.

Further testwork involving wet gravity concentrator is warranted to improve the recovery of iron to the final concentrate.

12.3 Pig Iron Production

The pig iron production process considered and tested by North Atlantic can be divided into three steps:

1. Raw material handling and composite briquettes (CBQ) production;
2. Reduced metalized briquettes (HBI) produced from CBQ in a rotary hearth furnace (RHF);
3. Pig iron production from the melting of HBI in a submerged arc furnace (SAF).

North Atlantic produced CBQ with a blend of North Atlantic iron concentrate produced from the pilot plant operation blended with coal, flux and a binder. Briquetting tests were conducted at two facilities – one owned by BPI Inc. and the other by Hasbro Metals.

Reduction tests occurred at the Midrex Technology Center, located in Charlotte, North Carolina, utilizing Midrex's pilot RHF. The HBI produced was shipped to Grand River's facility in Easton where it was smelted in a one megawatt (MW) submerged arc furnace to create the final pig iron product.

The reduction testwork conducted by North Atlantic (witnessed by Hatch) successfully demonstrated production of DRI from North Atlantic iron sand composite briquettes, a high volatile coal, hydrated lime and an organic binder.

The melt tests performed by North Atlantic at Grand River's facility successfully demonstrated the production of pig iron from cold briquettes and DRI. The melt tests resulted in a pig iron with a low carbon content of about 1.5% by weight. This content is below standard commercial levels for merchant pig iron and was achieved primarily due to a significant amount of fines present in the DRI and a charging practice that was not optimized for fines melting. The DRI fines were generated primarily from material handling practices that were specific to the pilot equipment used that will be avoided or mitigated in commercial production. North Atlantic produced DRI with a carbon content of more than 7%. If necessary, a carburization step can increase the carbon content of pig iron to desired levels and reduce coal consumption in the CBQ.

Parallel pilot plant trials were completed by Outotec in November 2013 to demonstrate their AusIron™ technology (Outotec 2013). Trials were conducted at a 4:1 blend of titano-magnetite to magnetite. A pig iron product of 93 to 95% Fe and 2 to 4% C was produced, but required a higher fuel and reductant consumption rate than normal.

12.3.1 Reduced Briquette Production (October 2013)

DRI production tests were performed at the Midrex RHF simulator located at the Midrex Technology Center. The test was run from October 7 to 15, 2013 and representatives of Hatch were present to witness the test.

The feed material used for the test was composite briquettes (CBQ) made from North Atlantic iron concentrate with two types of reductants: Asbury 4370 C met coke (MC) and Knight Hawk Illinois Basin #6 thermal coal (KH). A total of 49 short tons were processed with 83% being Knight Hawk coal based CBQ.

A detailed summary of the RHF test conditions is included in Hatch's report (2014). The following are the key findings from the test results:

- DRI of 77% iron metallization and 51% iron total was consistently produced from KH CBQ. Only 51% iron metallization was achieved with MC CBQ and 52% metallization with fines.
- DRI carbon content was 7, 10, and 11% for KH CBQ, MC CBQ and fines, respectively. These results indicate that poor carbon reactivity was achieved in fines and therefore poor reduction of iron oxides;
- Sulphur content of DRI was highest for KH CBQ at 0.9%. MC CBQ resulted in lowest sulphur content in DRI of 0.3%;
- A significant amount of fines generated during cold briquette transportation and charging of the RHF negatively affected DRI metallization and furnace productivity; and

- The residence time and metallization in actual operation can be improved by reducing the amount of fines charged in to the furnace. Thus, it can be concluded that the test confirmed 80% metallization can be considered for the RHF basis of design.

12.3.2 Pig Iron Production

The submerged arc furnace (SAF) melting tests were conducted at the Grand River Forks Specialty Metals (FSM) facility located near Easton, Pennsylvania. A total of five trials were completed as part of the smelter tests:

- Trials 1 to 3 were performed using CBQ made from North Atlantic iron concentrate, Asbury 4370 C met coke (MC) and Knight Hawk Illinois Basin #6 thermal coal (KH); and
- Trials 4 and 5 were performed using the pre-reduced DRI briquettes produced during the RHF tests performed by North Atlantic at the Midrex RHF simulator.

Hatch was invited to witness Trials 3, 4, and 5. Details of the Grand River SAF are included in Hatch's summary report of the results (Hatch 2014).

Table 12 shows the feed materials used for the three trials witnessed by Hatch. As can be seen, separate tests were run in Trial 3 for melting MC CBQ and KH CBQ. Table 13 summarizes the chemistry of the pig iron produced during the three trials.

A detailed summary of the pig iron production during the melting tests is included in Hatch's report (2014). The following are the key findings from the test results:

- DRI smelting test performed at the FSM facility resulted in pig iron of 95.7% iron and 1.6% carbon. The test was run continuously for eight heats over 27.5 hours (80% power on time);
- CBQ melt tests were performed with significant operational difficulties;
  - Metallurgical coal based CBQ resulted in pig iron with 97.6% iron and 2.4% carbon; and
  - Knight Hawk coal (high volatiles) based CBQ resulted in pig iron with 92.2% iron, 1.5% carbon, and a high silicon content of 5.1%.
- The carbon content of the pig iron produced from DRI ranged from 1.5 to 1.7%, which is lower than standard pig iron at 3.5 to 4.5%;
- All tests indicate most of the phosphorous in the feed materials will report to pig iron;
- The sulphur content of pig iron from DRI is higher than that from CBQ;
- The vanadium recovery was highest in the case of the DRI test, which could be attributed to lower a slag rate for this case;
- Due to short durations of continuous operations and small furnace size it is not practical to confirm specific productivity and energy consumption through this test; and
- It is reasonable to expect production of hot metal similar to New Zealand or Highveld composition and productivity.

Table 12: Feed Materials and Amount (Trials 3 to 5 only)

Trial #	3		4	5
	MC CBQ melt test	KH CBQ melt test	DRI melt test	DRI melt test
MAGCON	-	-	-	4.30%
KH CBQ	12.50%	92.50%	-	-
MC CBQ	85.80%	-	26%	10%
DRI	-	-	72%	83.80%
Lime	1.70%	-	-	-
Sand	-	7.50%	-	-
Hydrated Lime	-	-	2%	1.90%
Total (tonnes)	**1.6**	**4.0**	**6.2**	**11.2**

Table 13: Hot Metal and Slag Composition (Trials 3 to 5 only)

Trial #	3		4	5
	MC CBQ melt test	KH CBQ melt test	DRI melt test	DRI melt test
Hot Metal Composition				
Fe	96.79	92.18		95.73
C	2.36	1.51		1.56
S	0.33	0.3		1.07
P	0.05	0.06		0.08
Si	0.02	5.11		1.15
Ti	0.01	0.33		0.09
V	0.08	0.13		0.15
Others	0.38	0.38		0.17
Slag Composition				
SiO_2	25.2	30.58		29.19
Al_2O_3	24.3	25.73		14.99
TiO_2	18.8	16.27		21.65
CaO	14.95	14.98		20.82
MgO	6.27	4.71		7.12
FeO	4.09	2.17		1.52
S	0.12	0.56		1.16
P_2O_5	0.01	0.01		0
V	0.14	0.02		0.04
Others	6.13	4.97		3.51
B2	0.43	0.35		0.63

12.4 Conclusions

North Atlantic has conducted a significant amount of testwork into each of the processing stages from mineral sand to pig iron production:

- Beneficiation of an iron concentrate through gravity and/or magnetic separation;
- Handling of concentrate to a composite briquette production;
- RHF testing to reduce the CBQ to a form of DRI; and
- Melting tests in a SAF to pig iron.

In each stage, the ability to generate a usable intermediate product or final saleable product was demonstrated. It is clear that additional testwork is required to improve the efficiency of each processing stage.

From the 2012 demonstration plant operation, a combined magnetite and titano-magnetite concentrate recovery of only 52% is expected. This is based on a flowsheet comprised of only dry magnetic separation. The results show a ratio of 4.35:1 of titano-magnetite to magnetite production.

RHF tests produced a DRI of 77% iron metallization and 51% iron total. A significant amount of fines generated during cold briquette transportation and charging of the RHF negatively affected DRI metallization and furnace productivity. Melting tests showed it is reasonable to expect production of hot metal similar to New Zealand or Highveld composition and productivity.

12.5 Additional Testwork

Based on the results summarised to date, it is recommended that additional testwork be conducted to demonstrate further the viability of generating pig iron from the North Atlantic mineral sands material. The list below includes recommendations included in Hatch's summary report.

Future testwork should include the following:

Beneficiation

- Additional samples should be tested for beneficiation; this includes variability samples from each of the Blocks as well as samples collected at depth;
- A detailed mineralogical study to investigate improvements in iron concentrate grade and recovery through a combination of both gravity and magnetic separation; and
- Alternative gravity concentration methods including pinched sluice and Knelson concentrators; emphasis on the minimal use of water in the Goose Bay environment.

Pig Iron Production

- CBQ strength testwork;
- RHF testing with selected raw materials; and
- Trade off study into power generation vs. off-gas handling.

Mineral Sand Physical Properties

- The in situ bulk density of the material in each block of mineral sand;
- The slope angle of deposition and drawdown of in situ and damp processed materials;
- Moisture content and draining characteristics of the resource and iron products;
- Unconfined compressive strength of the ore. This will help define the pit angles and haul road slopes;
- Compressive strength when frozen (drained and saturated);
- Solids content for tailings deposition and water tie up for pumped tailings;
- Average silt content (-325 mesh or -40µm);
- Abrasion index for the mineral sand; and
- Bond Ball Mill Work Index (80 mesh or 180µm closing screen size).

It is understood that North Atlantic is planning to send additional samples of the pilot plant concentrates (MAG and TI-MAG) to a mineralogist for X-ray diffraction analysis.

13 Mineral Resource Estimates

In February 2013, following two phases of successful exploration and delineation drilling, SRK prepared an initial Mineral Resource Statement pursuant to Canadian Securities Administrators' National Instrument 43-101 for the heavy mineral occurrence of the Churchill River deposit.

SRK audited the exploration data provided by North Atlantic. Upon review, the project data was found to be sufficiently reliable to support the modelling of the boundaries of the heavy mineral occurrence with confidence and prepare an initial mineral resource evaluation.

The construction of the mineral resource model was a collaborative effort between North Atlantic and SRK SA personnel. The geological modelling, geostatistical analysis, variography, and mineral resource modelling were undertaken by Mark Wanless (Pr.Sci.Nat #400178/05) and Livhuwani Maake (Pr.Sci.Nat #400437/11).

The Mineral Resource Statement for the Churchill River deposit is presented in Table 14 and is reported at a cut-off grade of 5 percent by weight of heavy mineral concentrate. The mineral resource model was prepared in conformity with the Canadian Institute of Mining, Metallurgy and Petroleum's (CIM) *Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines* (November 2003) and are classified according to the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (November 2010). The effective date of the Mineral Resource Statement is January 15, 2013.

Table 14: Mineral Resource Statement*, Churchill River Mineral Sands Deposit, Goose Bay, Newfoundland, SRK Consulting (South Africa) (Pty) Limited, January 15, 2013

Domain	Resource Category	Quantity	Heavy Mineral Concentrate	Fe_2O_3 Equivalent
		(000't)	Weight Percent	Weight Percent
Block 1	Measured	-	-	-
	Indicated	-	-	-
	Measured + Indicated	-	-	-
	Inferred	139,910	9.08	39.06
Block 2	Measured	-	-	-
	Indicated	35,510	10.50	38.10
	Measured + Indicated	35,510	10.50	38.10
	Inferred	39,200	9.88	37.44
Block 5	Measured	-	-	-
	Indicated	298,650	9.50	36.87
	Measured + Indicated	298,650	9.50	36.87
	Inferred	80,840	9.82	36.58
Combined	Measured	-	-	-
	Indicated	334,160	9.61	37.00
	Measured + Indicated	334,160	9.61	37.00
	Inferred	259,950	9.43	38.04

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates. Open pit mineral resources are reported at a cut-off grade of 5 percent by weight of heavy mineral concentrate.

Mineral resources are not mineral reserves and have not demonstrated economic viability. There is no certainty that all or any part of the mineral resources will be converted into mineral reserves. SRK is unaware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant issues that may materially affect the mineral resources.

13.1 Mineral Resource Estimation Methodology

The mineral resources reported herein were estimated using a geostatistical block modelling approach informed from heavy mineral concentrate assay data collected in boreholes. Resource domains were defined using a traditional wireframe interpretation constructed from a sectional interpretation of the drilling data. The interpretation of the boundaries of the heavy mineral occurrence considered lithological modelling undertaken by SRK.

The evaluation of the mineral resources involved the following procedures:

- Database compilation and verification;
- Generation of three-dimensional resource domains and verification;
- Data conditioning (compositing and capping), statistical analysis, and variography;
- Selection of estimation strategy and estimation parameters;
- Block modelling and grade estimation;
- Validation, classification, and tabulation;
- Assessment of “reasonable prospects for economic extraction” and selection of reporting assumptions; and
- Preparation of the Mineral Resource Statement.

13.2 Resource Database

The Churchill River deposit database as of November 2012 comprises 284 boreholes and 42 closely spaced definition boreholes in pits. Exploration drilling data was received as a set of the following CSV format tables: header, survey (directional survey data), lithology, assays. The data were imported into CAE Studio 3 (Studio) for plotting, modelling, and validation. Validation tools were used to check for gaps in information, overlapping records, and data beyond the end of a borehole. Some errors were found but were corrected in collaboration with North Atlantic. The database includes 3,730 assay records.

Based on observations during the site visits and the review of the exploration database, SRK is satisfied that the exploration work carried out by North Atlantic has been conducted in a manner consistent with generally recognized industry best practices and that the exploration drilling data are sufficiently reliable for the purpose of supporting a mineral resource evaluation.

13.3 Mineralized Domain and Geological Modelling

SRK was provided a Lidar survey of the topography in the form of elevation points and outlines of the staked claim boundaries registered to North Atlantic in the form of ArcGIS shapefiles. Only portions of the Lidar survey relevant to the three resource blocks were used to generate the topographic profile. SRK simplified the Lidar database by using survey points on a 10-metre grid, which is sufficiently detailed to support the current drilling density of 250 metres.

13.4 Compositing and Capping

Sampling length between the different drilling phases varies from 1.00 metre to 1.22 metres. In the current database, about 75 percent of the samples have a length of 1.00 metre. Basic statistics for original heavy mineral concentrate and Fe_2O_3 equivalent are summarized in Table 15. Considering the relative regularity of the sample length, the original samples were not composited.

The impact of heavy mineral concentrate and Fe_2O_3 equivalent outliers was examined on the original sample data using visual assessment of the population distribution for all three blocks combined (Block 1, Block 2 and Block 5). Given the close to normal distribution of the data, and the lack of significant outliers in the data, SRK did not consider that the Fe_2O_3 data required further processing. Heavy mineral concentrate data was capped at 25 weighted percent with few outliers (approximately 1 percent) with grade above capping value.

Table 15: Basic Statistics of Original Samples

Variable	Sample Count	Minimum	Maximum	Mean	Standard Deviation	Variance	Coefficient of Variation
Heavy Mineral Concentrate	3,724	0.28	36.27	9.79	3.26	10.64	0.333
Fe_2O_3	3,730	0.10	62.02	37.00	5.50	30.28	0.150

13.5 Variography

SRK evaluated the spatial distribution of the heavy mineral concentrate, Fe_2O_3 equivalent and Clay/Mix Clay indicator (Block 2 and Block 5 only) using traditional variograms on capped assay data. All variogram modelling was performed using Isatis software.

SRK investigated several groupings of the data, such as claim area (Block 2 and Block 5) as well as sub-dividing the blocks by the terrace level. Most zones, when sub-divided, do not contain sufficient data to calculate an experimental variogram with an interpretable structure. The experimental variograms reveal evidence of multiple populations or possibly trends within the data, which may be a result of actual long range variability of the variables, or due to vertical changes of the variables, which are evidences at longer ranges. Since the geological logs are generated on the same scale as the sampling (1.00 to 1.22 metre) it is not possible to sub-divide the results by sedimentological characteristics such as grain size or sorting. The sedimentological characteristics vary vertically on a much shorter scale than the sample lengths, and so each sample is a composite of these vertical variations. The modelled variograms considered for the estimation are presented and summarized in Table 16 and Figure 24 for Block 1 while Table 17 and Figure 25 refers to Block 2 and Block 5.

Table 16: Variogram Parameters for Block 1

Variable	Structure	Contribution	Model	R1x (m)	R1y (m)	R1z (m)	Angle1 1	Angle1 2	Angle1 3	Axis 1	Axis 2	Axis 3
Heavy Mineral Concentrate	C0	2.87	Nugget	-	-	-	0	0	0	3	1	3
	C1	3.51	Sph	1800	2000	5	0	0	0	3	1	3
Fe2O3	C0	12.6	Nugget	-	-	-	0	0	0	3	1	3
	C1	4.00	Sph	600	750	5	0	0	0	3	1	3

1 The rotation angles are shown in CAE Studio 3 convention

Table 17: Variogram Parameters for Block 2 and Block 5

Variable	Structure	Contribution	Model	R1x (m)	R1y (m)	R1z (m)	Angle1 1	Angle1 2	Angle1 3	Axis 1	Axis 2	Axis 3
Heavy Mineral Concentrate	C0	2.15	Nugget	-	-	-	0	0	0	3	1	3
	C1	5.36	Sph	180	180	3	0	0	0	3	1	3
	C2	6.50	Sph	1380	1380	6.5	0	0	0	3	1	3
Fe2O3	C0	10.74	Nugget	-	-	-	0	0	0	3	1	3
	C1	9.38	Sph	240	240	6	0	0	0	3	1	3
	C2	3.76	Sph	1260	1260	12	0	0	0	3	1	3
Clay /Mix Clay	C0	0.02	Nugget	-	-	-	0	0	0	3	1	3
	C1	0.02	Sph	120	75	3.8	0	0	0	3	1	3
	C2	0.01	Sph	250	550	6	0	0	0	3	1	3

1 The rotation angles are shown in CAE Studio 3 convention

13.6 Block Model Definition

The criteria used in the selection of the block size included the core borehole spacing, geological understanding of the deposit and anticipated mining techniques. In collaboration with North Atlantic, SRK chose a block size of 250 by 250 by 1 metres for Block 1, and 125 by 125 by 1 metres for Block 2 and Block 5.

Subcells were used and allowed to split sufficiently to honour the geometry of the modelled heavy mineral fraction, with a minimum cell dimension of 10 metres on X and Y (50 metres in Block 1). On Z, the subcelling was allowed to split exactly on the constraining surface. Subcells were assigned the same grade as the parent cell. The models were not rotated. The characteristics of the block models are summarized in Table 18.

Table 18: Churchill River Project Block Models Specifications

Block	Axis	Block Size (m) Parent	Block Size (m) Subcell	Origin*	Number of Cells	Rotation Angles	Rotation Axis
1	X	250	50	630,750	125	-	-
	Y	250	50	5,890,250	85	-	-
	Z	1	Variable	0	125	-	-
2	X	125	10	646,295.4	21	-	-
	Y	125	10	5,903,691	21	-	-
	Z	1	Variable	0	150	-	-
5	X	125	10	630,750	85	-	-
	Y	125	10	5,890,250	85	-	-
	Z	1	Variable	0	150	-	-

* UTM Coordinates, Zone 20U

13.7 Estimation Strategy

The quantitative kriging neighbourhood analysis (QKNA) study completed by SRK reveals that a block size of 125 by 125 by 1 metres with a discretization of 5 by 5 by 1 metres, respectively, are optimal for the current drilling density in Block 2 and Block 5. The limited amount of drilling information in Block 1 prevented SRK from conducting such analysis. A discretization of 10 by 10 by 1 metres was applied in Block 1.

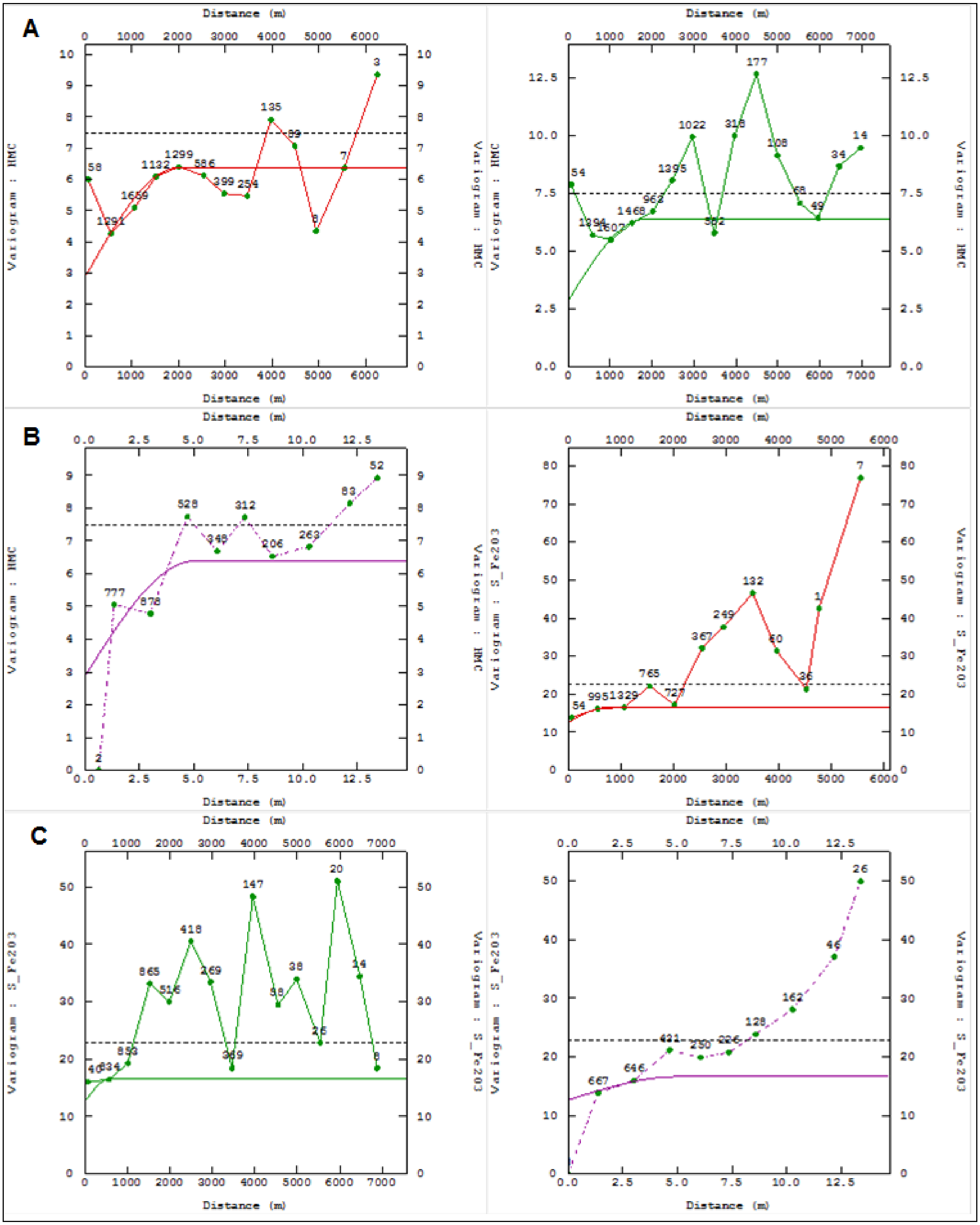

Figure 24: Directional Variogram for Heavy Mineral Concentrate (A and B) and Fe_2O_3 (C) for Block 1

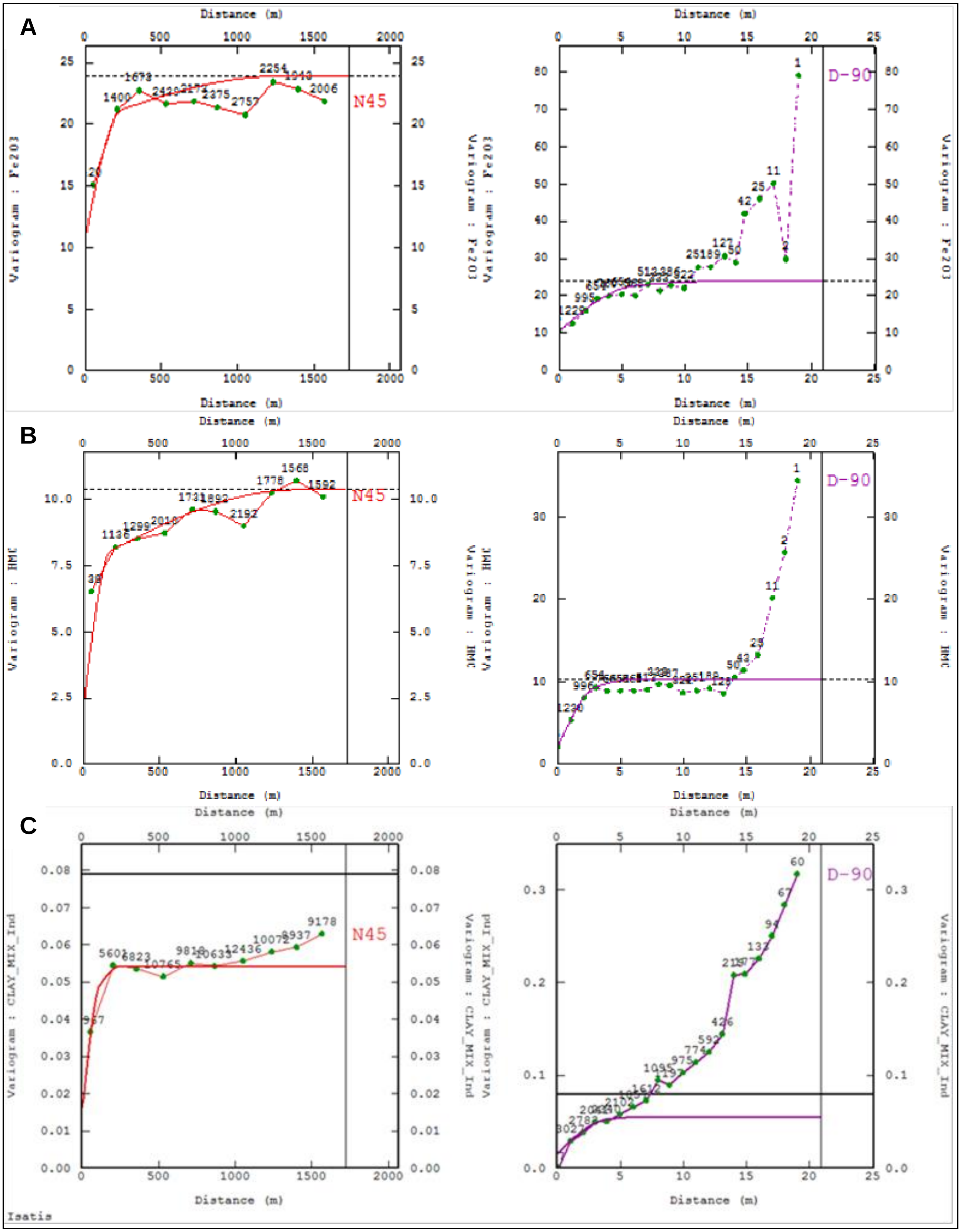

Figure 25: Directional Variogram for Heavy Mineral Concentrate (A), Fe_2O_3 (B), and Clay/Mix Clay (C) for Block 2 and Block 5

The block models were limited to 15 metres below topography, as this is the typical depth of drilling. Geological logs from the sonic drilling shows that there is often a thick clay layer starting between 10 and 20 metres below surface. The elevation of the start of the clay layer is locally stable and may reflect the position of slow flowing portions, or damming, of the river in the past.

Ordinary kriging algorithm was used for all estimates. The search parameters for Block 2 and Block 5 are summarized in Table 19. These parameters were selected after a quantitative kriging neighbourhood analysis of the core borehole data set was performed using the selected optimised block size. The first search range for the estimation was set at a range slightly longer than the short range modelled on both the heavy mineral concentrate and the Fe_2O_3 variogram of 180 and 240 metres, respectively. Three search passes were estimated to ensure the entire area of interest was informed.

The search parameters for the widely drilled Block 1 are summarized in Table 20. Different search parameters (Table 21) were used to estimate the blocks around the dense drilling in the pits areas of Block 2 and Block 5, as the initial estimates resulted in significant negative weights in these areas.

Table 19: Estimation Strategy Applied to Block 2 and Block 5

Axis	1st Pass	2nd Pass	3rd Pass
Interpolation method	OK	OK	OK
Octant search	No	No	No
Search Volume			
X (metres)	300	600	1,500
Y (metres)	300	600	1,500
Z (metres)	3	6	15
Minimum number of composites	8	8	5
Maximum number of composites	25	25	25
Maximum number of composites per core borehole	-	-	-

Table 20: Estimation Strategy Applied to Block 1

Axis	1st Pass	2nd Pass
Interpolation method	OK	OK
Octant search	No	No
Search Volume		
X (metres)	1,200	1,800
Y (metres)	1,200	1,800
Z (metres)	1.5	3
Minimum number of composites	5	3
Maximum number of composites	10	10
Maximum number of composites per core borehole	-	-

Table 21: Estimation Strategy Applied to the Pits in Block 2 and Block 5

Axis	1st Pass
Interpolation method	OK
Octant search	No
Search Volume	
X (metres)	100
Y (metres)	100
Z (metres)	3
Minimum number of composites	5
Maximum number of composites	8
Maximum number of composites per core borehole	4

An average density of 1.74 was applied for the calculation of the tonnages from the in situ volumes in all blocks.

SRK generated an indicator estimate to assess the clay content in Block 2 and Block 5. If a sampled interval contained any clay, a value of 1 was applied; otherwise, a value of 0 was used. The resulting kriged estimate was used as an estimation of the proportion of clay within a block. The tonnages of each block in the resource were discounted by the proportion of clay within the block. This factor resulted in an approximately 4 percent decrease in the tonnage for Block 2 and 9 percent decrease for Block 5 from the undiscounted estimate.

13.8 Resource Model Validation

To validate the block estimates, SRK visually compared the ordinary kriging model results on plans and sections and found similar trends in the mineralization. SRK also checked the global quantities and the average heavy mineral concentrate and Fe_2O_3 equivalent grade and found that the results were reasonably comparable to the informing data, within a 2 percent difference.

Block estimates were also validated using SWATH plots in all three directions. The plots show a good agreement between the informing data and the estimates in each block. The block model grades are, as expected, less variable than the core borehole grades.

13.9 Mineral Resource Classification

Block model quantities and grade estimates for the Churchill River mineral sand deposit were classified according to the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (November 2010) by Mark Wanless (Pr.Sci.Nat #400178/05) and Livhuwani Maake (Pr.Sci.Nat #400437/11).

Mineral resource classification is typically a subjective concept and industry best practices suggest that resource classification should consider the confidence in the geological continuity of the mineralized structures, the quality and quantity of exploration data supporting the estimates, and the geostatistical confidence in the tonnage and grade estimates. Appropriate classification criteria should aim at integrating these concepts to delineate regular areas at similar resource classification, while also considering the continuity of the targeted mineralization at the reporting cut-off grade.

SRK is satisfied that the geological and the estimation models for Churchill River deposit honour the current geological information and knowledge. The location of the samples and the assay data are sufficiently reliable to support resource evaluation and do not present a risk that should be taken into consideration for resource classification. The mineral resource model is informed by data from boreholes drilled with pierce points generally spaced approximately 250 to 500 metres apart. The geological information is sufficiently dense to demonstrate the continuity of the heavy minerals occurrence with a reasonable level of confidence.

On this basis, SRK considers that most of the blocks in the denser drilled areas of Block 2 and Block 5 can be classified in the Indicated category within the meaning of the CIM *Definition Standards for Mineral Resources and Mineral Reserves*. SRK considers that for those blocks the level of confidence in the geological continuity and grade estimates is sufficient to allow the appropriate application of technical and economic parameters to support mine planning and to allow the evaluation of the economic viability of the deposit.

All other modelled blocks were classified in the Inferred category as the confidence in the block estimates is insufficient to allow for the meaningful application of technical and economic parameters or to enable an evaluation of economic viability. Block 1 was entirely classified as an Inferred resource.

13.10 Preparation of Mineral Resource Statement

CIM *Definition Standards for Mineral Resources and Mineral Reserves* defines a mineral resource as:

"[A] *concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.*"

The "reasonable prospects for economic extraction" requirement generally implies that the quantity and grade estimates meet certain economic thresholds and that the mineral resources are reported at an appropriate cut-off grade that takes into account extraction scenarios and processing recoveries.

SRK did not conducted substantive testing of the reasonable prospects for economic extraction. The sand deposits are shallow and readily amenable to open pit extraction. Conceptual desktop studies suggest that a cut-off grade of 5 percent heavy mineral concentrate is reasonable to report mineral resources for the Churchill River deposit.

The Mineral Resource Statement for the Churchill River deposit is presented in Table 22.

Table 22: Mineral Resource Statement*, Churchill River Mineral Sands Deposit, Goose Bay, Newfoundland, SRK Consulting (South Africa) (Pty) Limited, January 15, 2013

Domain	Resource Category	Quantity	Heavy Mineral Concentrate	Fe_2O_3 Equivalent
		(000't)	Weight Percent	Weight Percent
Block 1	Measured	-	-	-
	Indicated	-	-	-
	Measured + Indicated	-	-	-
	Inferred	139,910	9.08	39.06
Block 2	Measured	-	-	-
	Indicated	35,510	10.50	38.10
	Measured + Indicated	35,510	10.50	38.10
	Inferred	39,200	9.88	37.44
Block 5	Measured	-	-	-
	Indicated	298,650	9.50	36.87
	Measured + Indicated	298,650	9.50	36.87
	Inferred	80,840	9.82	36.58
Combined	Measured	-	-	-
	Indicated	334,160	9.61	37.00
	Measured + Indicated	334,160	9.61	37.00
	Inferred	259,950	9.43	38.04

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates. Open pit mineral resources are reported at a cut-off grade of 5 percent by weight of heavy mineral concentrate.

Mineral resources were estimated in conformity with the generally accepted CIM *Estimation of Mineral Resource and Mineral Reserve Best Practices Guidelines*. The mineral resources may be affected by further infill and exploration drilling, which may impact positively or negatively future mineral resource evaluations. A small amount of material, approximately one million tonnes, which had a concentration lower than the reporting cut-off, has been included in the mineral resource as unavoidable dilution.

Other than discussed herein, SRK is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the mineral resource estimates.

14 Adjacent Properties

There are no adjacent properties that are considered relevant to this technical report.

15 Other Relevant Data and Information

There are no other relevant data available about the Churchill River project.

16 Interpretation and Conclusions

The exploration work conducted by North Atlantic was professionally managed and used procedures consistent with generally accepted industry best practices. After review, SRK is of the opinion that the exploration data collected by North Atlantic are sufficiently reliable to interpret with adequate confidence the boundaries of the heavy mineral sand occurrence on the Churchill River mineral sand project and support the evaluation and classification of mineral resources in accordance with the generally accepted CIM *Estimation of Mineral Resource and Mineral Reserve Best Practices Guidelines* and CIM *Definition Standards for Mineral Resources and Mineral Reserves*.

From recent drilling data, SRK defined three domains encompassing heavy mineral sand accumulations on the Churchill River mineral sand project. These domains were considered separately for resource modelling. SRK considers that the heavy mineral sand found at the Churchill River project is amenable to conventional open pit mining. SRK did not conduct substantive testing of the “reasonable prospects for economic extraction.” North Atlantic confirmed that its internal preliminary economic assessment suggested that a cut-off grade of 5 percent by weight of heavy mineral concentrate showed a positive economic return. This grade was used to report the mineral resource of the Churchill River deposit.

The three resource blocks considered for this resource model contain a significant mineral resource. SRK notes that the mineral resources occupy only a small footprint on the large Churchill River mineral sand project. There is a good potential to expand the mineral resource by conducting step-out drilling adjacent to the currently modelled heavy mineral sand occurrence.

The characteristics of the Churchill River mineral sand deposit are of sufficient merit to justify the ongoing engineering, environmental, and metallurgical studies aimed at completing the characterization of the heavy mineral sand occurrence.

17 Recommendations

The geological setting and character of the heavy mineral sand occurrence delineated to date on the Churchill River mineral sand project are of sufficient merit to justify additional exploration expenditures.

SRK recommends an exploration program that includes drilling with the aim of improving confidence in the distribution of heavy minerals in the sand deposit and upgrading the classification of the mineral resources. SRK recommends North Atlantic log and study the clay component in the sand deposit in more detail to increase the confidence of the mineral resource model. The in situ density of the sands should be measured during this program. At the conclusion of the proposed drilling program, the mineral resource model should be revaluated to incorporate the new data.

Finally, SRK recommends initiating environmental and engineering baseline studies to complete the characterization of the Churchill River deposit and to support the evaluation of the economic viability of a mining project at a conceptual level. In particular, soil geotechnical and hydrogeology investigations should be carried out to support the selection of an appropriate mining method and confirm the potential depth of open pit mining. These recommendations are in agreement with findings from Hatch Ltd. (Hatch) who recommend investigating:

- The in situ bulk density of the material in each block of mineral sand;
- The slope angle of deposition and drawdown of in situ and damp processed materials;
- Moisture content and draining characteristics of the resource and iron products;
- Unconfined compressive strength (UCS) of the sand, which will help define the pit angles and haul road slopes;
- Compressive strength when frozen (drained and saturated);
- Solids content for tailings deposition and water tie up for pumped tailings;
- Average silt content (-325 mesh or -40 micrometres);
- Abrasion index or the mineral sand; and
- Bond Ball Mill Work Index (80 mesh or 180 micrometres closing screen size).

SRK considers that approximately 10,000 metres of drilling is required to improve the confidence in the distribution of the heavy mineral component of the sand deposit in all three resource blocks.

SRK is unaware of any other significant factors and risks that may affect access, title, or the right, or ability to perform the exploration work recommended for the Churchill River mineral sand project. The cost of the proposed work program is estimated at C$1.66 million (Table 23).

Table 23: Estimated Cost for the Exploration Program Proposed for the Churchill River Mineral Sand Project

Description	Quantity	Unit Cost (C$)	Total Cost (C$)
Delineation Drilling (Infill)			
Sonic and Geoprobe drilling	10,000	75	750,000
Assaying	12,000	25	300,000
Subtotal			**1,050,000**
Geological Studies			
Specific gravity determinations	2,000	20	40,000
Subtotal			**40,000**
Engineering Studies (Scoping Study)			
Update resource model			80,000
Environmental and social impact baseline studies			200,000
Geotechnical studies			50,000
Mine engineering design			50,000
Preparation of PEA technical report			40,000
Subtotal			**420,000**
Total			**1,510,000**
Contingency (10%)			**150,000**
Total			**1,660,000**

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APPENDIX A

Legal Title Opinion by Bennet Jones LLP

Bennett Jones

Bennett Jones LLP
4500 Bankers Hall East, 855 - 2nd Street SW
Calgary, Alberta, Canada T2P 4K7
Tel: 403.298.3100 Fax: 403.265.7219

March 26, 2012

Canadian National Stock Exchange
220 Bay Street, 9th Floor
Toronto, ON M5J 2W4

Dear Sirs:

Re: Muskrat Minerals Incorporated – Application for Listing (CNSX)

We have acted as local counsel in the Provinces of Alberta and Ontario to Muskrat Minerals Incorporated (the "**Corporation**") in connection with its application (the "**Listing Application**") to list its common shares (the "**Common Shares**") on the Canadian National Stock Exchange (the "**CNSX**"). We understand that in connection with the Listing Application the Corporation proposes to enter into a listing agreement with the CNSX (the "**Listing Agreement**"). This opinion is furnished to you pursuant to paragraphs 6.1(e) and (f) of Policy 2 – *Qualifications for Listing* of the CNSX.

A. SCOPE OF REVIEW

We have examined such corporate and public records and other documents, reviewed such statutes and regulations and considered such questions of law, as we have considered relevant and necessary as a basis for the opinions hereinafter set forth. As to various questions of fact material to such opinions that we have not independently established or verified, we have relied upon: (i) certificates and other records of public officials and agencies; (ii) certificates of officers of the Corporation, including a certificate of the President and Chief Executive Officer of the Corporation (the "**Officer's Certificate**"), dated as of the date hereof, and addressed to us in contemplation of our opinions herein (a copy of which is attached hereto); and (iii) scanned copies of resolutions and other materials from the minute books of the Corporation. We have also made the assumptions set out below.

In this opinion letter, the term "**Alberta Securities Laws**" means the *Securities Act* (Alberta) and the regulations and rules thereunder and all policy statements, blanket rulings, orders, notices and directions issued by the Alberta Securities Commission ("**ASC**").

B. ASSUMPTIONS

In conducting all examinations we have assumed: (i) the genuineness of all signatures and the authority and legal capacity of all persons who signed documents examined by us; (ii) the authenticity of all documents submitted to us as originals; (iii) the conformity to authentic originals of all documents submitted to us as certified, conformed, notarial, facsimile, true, photostatic or scanned copies of original documents and the veracity and completeness of the information contained therein; (iv) the identity and capacity of all individuals acting or purporting to act as public officials; and (v) the accuracy of the records maintained by all public offices or agencies where we have searched or enquired or caused searches or enquiries to be conducted.

We have also assumed that:

(a) the resolutions and other materials contained in the minute books of the Corporation provided to us are accurate, complete and up-to-date in all respects and contain a complete record of minutes of meetings and written resolutions of the directors and shareholders of the Corporation, and no proceedings have been taken to revoke any such resolutions or such other materials or that would otherwise have the effect of rendering any such resolutions or other materials inoperative or ineffective;

(b) the Listing Agreement has been duly authorized, executed and delivered by CNSX and constitutes a legal, valid and binding obligation of, and is enforceable in accordance with its terms against, CNSX;

(c) all agreements and other documents submitted to us have been executed in the form reviewed by us, and have not been amended or modified since the dates on which they were submitted to us by written or oral agreement or by conduct of the parties thereto, or otherwise;

(d) the Corporation has received in full the consideration determined by the board of directors of the Corporation to have been payable in respect of each of the 26,983,333 Common Shares issued and outstanding; and

(e) all representations and certificates dated on or prior to the date hereof upon which we have relied continue to be accurate in all respects as of the time of delivery of this opinion.

C. JURISDICTIONS

We are qualified to practice law in the Provinces of Alberta and Ontario. Our opinions herein are restricted to, and we do not express any opinion on any laws other than, the laws of the Provinces of Alberta and Ontario and the federal laws of Canada applicable in the Provinces of Alberta and Ontario as of the date hereof. We have assumed that there is no foreign law (as to which we have made no independent investigation) that would affect the opinions set out herein.

D. OPINIONS

Based upon and subject to the foregoing and to the qualifications hereinafter expressed, we are of the opinion that:

1. The Corporation is a valid and subsisting corporation under the laws of the Province of Alberta and has the corporate power and capacity to carry on its business as now conducted by it and to own its properties and assets and is qualified to carry on business as a corporation under the laws of the Province of Alberta.

2. The Corporation has the corporate power and capacity to enter into the Listing Agreement and to perform its obligations set out therein, and the Listing Agreement has been duly authorized, executed and delivered by the Corporation and constitutes a legal, valid and binding obligation of the Corporation enforceable against the Corporation in accordance with its terms.

3. The Corporation is a "reporting issuer" under Alberta Securities Laws and is not on the list of defaulting reporting issuers maintained by the ASC.

4. The 26,983,333 Common Shares outstanding as at the date hereof have been validly issued as fully paid and non-assessable shares in the capital of the Corporation.

5. Any of the 1,900,000 Common Shares issuable upon the exercise of outstanding options to purchase Common Shares that are, as at the date hereof, subject to the share option plan of the

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Corporation (the "**Plan**") will, when validly issued in accordance with the terms of the Plan, be duly issued as fully paid and non-assessable shares in the capital of the Corporation.

E. RELIANCE AND QUALIFICATIONS

In giving the opinion in paragraph 1, with respect to the validity and subsistence of the Corporation as a corporation under the laws of the Province of Alberta, we have relied exclusively upon a Certificate of Status, dated March 26, 2012, issued under the *Business Corporations Act* (Alberta) by the Alberta Registrar of Corporations in respect of the Corporation.

In paragraph 2, our opinion with respect to the validity, binding effect and enforceability of the Listing Agreement is subject to the qualifications that such validity, binding effect and enforceability may be limited by:

(a) applicable bankruptcy, insolvency, limitation, moratorium, reorganization, liquidation, arrangement or other laws affecting creditors' rights generally;

(b) the general principles of equity, including that all equitable remedies, such as specific performance and injunctive relief, are in the discretion of the court having jurisdiction, and may, for example, not be available where damages are considered to be an adequate remedy;

(c) the equitable, statutory and inherent powers of a court to grant relief from forfeiture, to stay the execution of proceedings before it and to stay executions on judgments;

(d) applicable laws regarding limitations of actions;

and, in addition:

(e) rights to indemnity under the Listing Agreement may be limited or unavailable under applicable law;

(f) any provision of an agreement or document that a court of competent jurisdiction finds to be against public policy or unconscionable may not be valid, binding or enforceable and may render the remainder of the relevant agreement or document invalid, non-binding or unenforceable;

(g) any provision of an agreement or document providing for the recovery of fees, costs, expenses and other amounts from a party thereto or other person may be restricted by a court of competent jurisdiction to the recovery of a reasonable amount only, and counsel fees may be subject to taxation; and

(h) a court may decline to hear an action or other proceeding if it is contrary to public policy for it to do so or if it is not the proper forum to hear such action or proceeding.

In giving the opinion in paragraph 3, with respect to the Corporation's status as a reporting issuer under Alberta Securities Laws, we have relied exclusively upon a list of reporting issuers created as of March 23, 2012 and maintained by the ASC in accordance with ASC Policy 51-601 and posted on the ASC website at www.albertasecurities.com, an excerpt from which has been provided to you today.

In giving the opinions in paragraphs 4 and 5, with respect to certain factual matters, we have relied upon the Officer's Certificate.

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- 4 -

This opinion is being furnished in connection with the Listing Application for the sole use and benefit of the addressee hereof and may not be relied upon or distributed to any other person or used for any other purpose without our prior written consent. Our opinions herein are given as at the date hereof and are based upon laws in effect and facts in existence as of that date. We express no opinion as to the effect of future laws or judicial or regulatory decisions on the subject matter hereof, and disclaim any obligation or undertaking to advise any person of any change in law or fact that may come to our attention after the date hereof.

Yours truly,

Bennett Jones LLP

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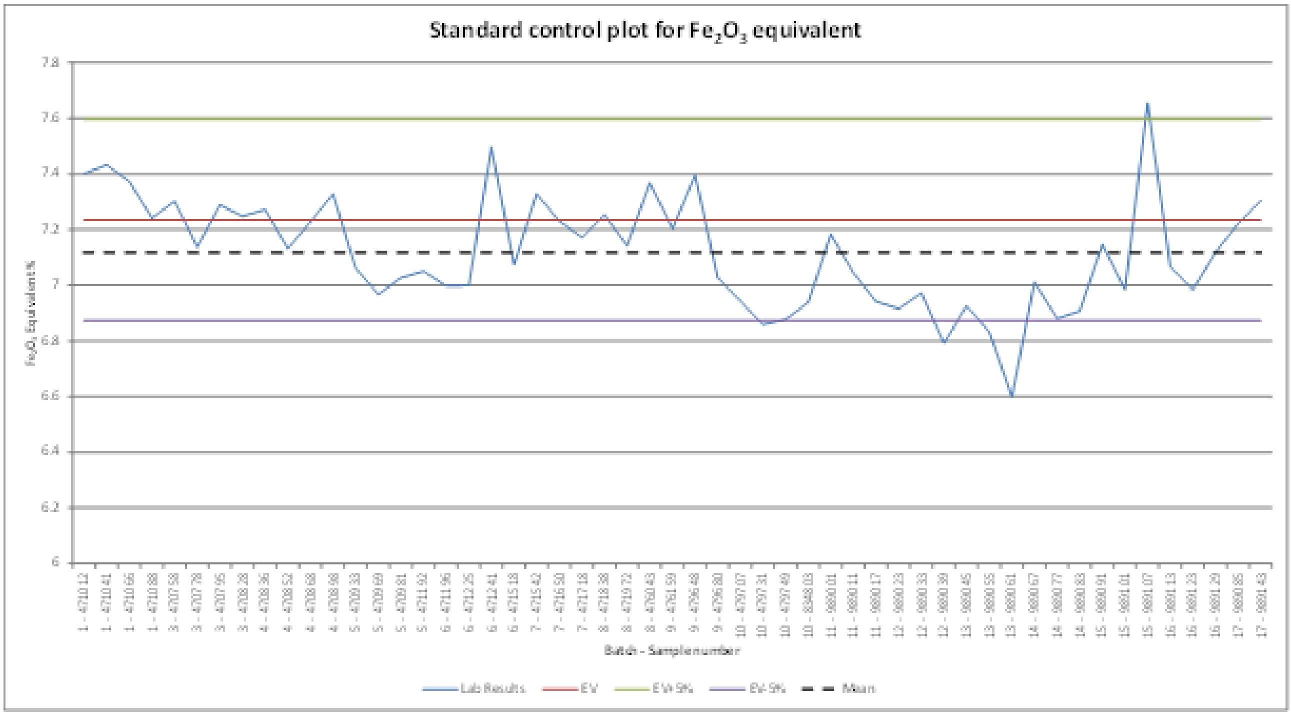
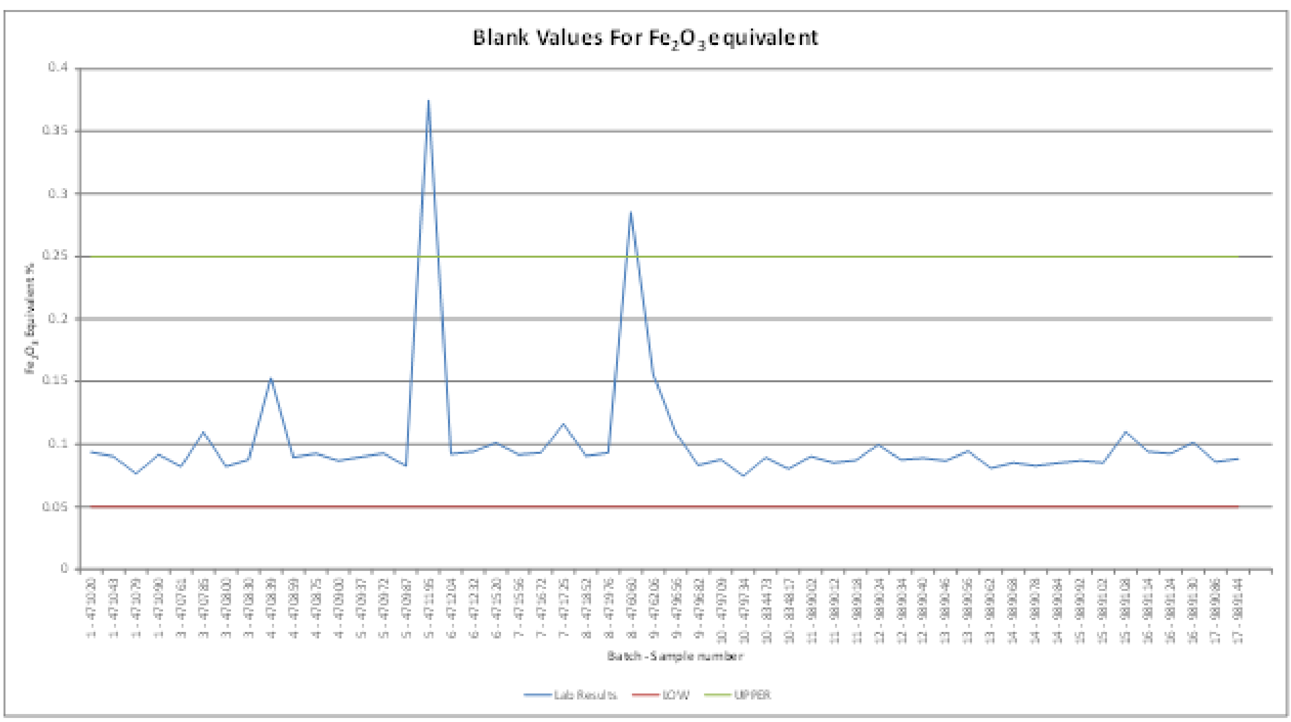
APPENDIX B

Analytical Quality Control Charts
Phase 1 Drilling Program

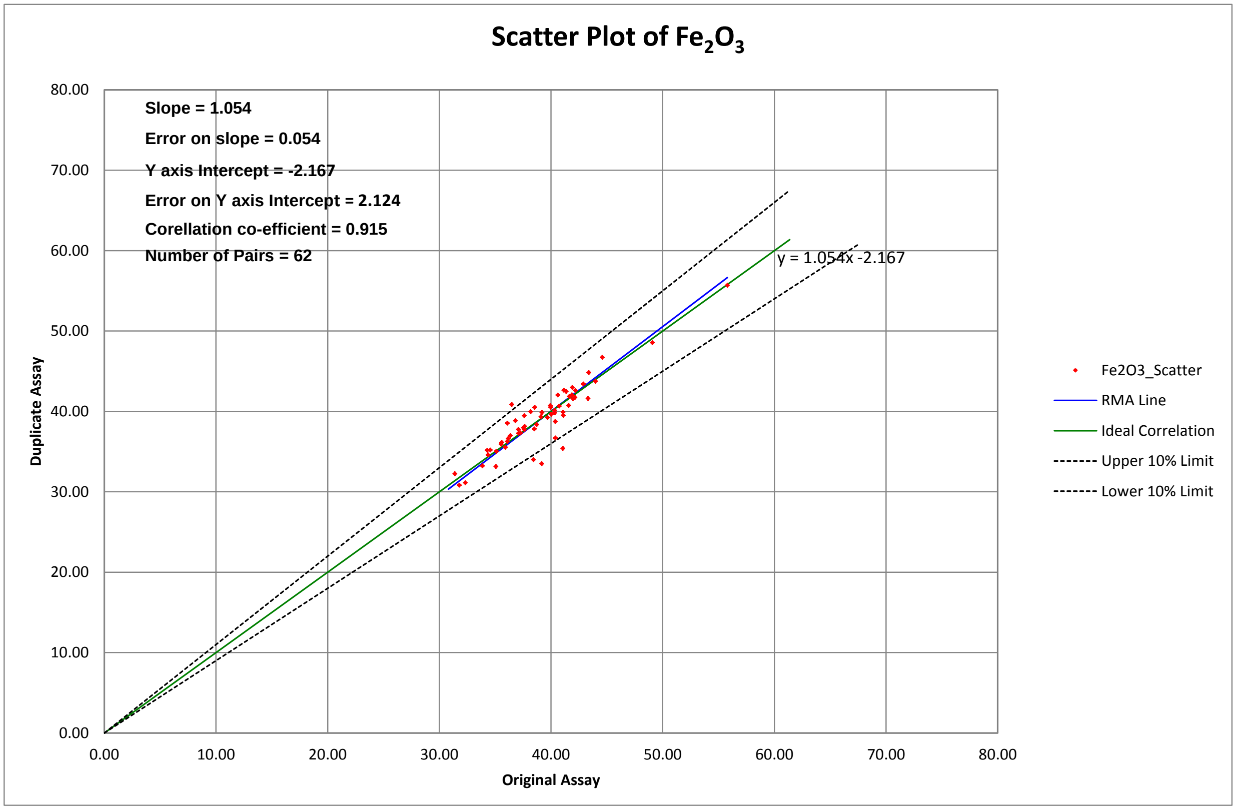
Standard control plot of the ICP-OES Fe2O3 equivalent results from the concentrate stream

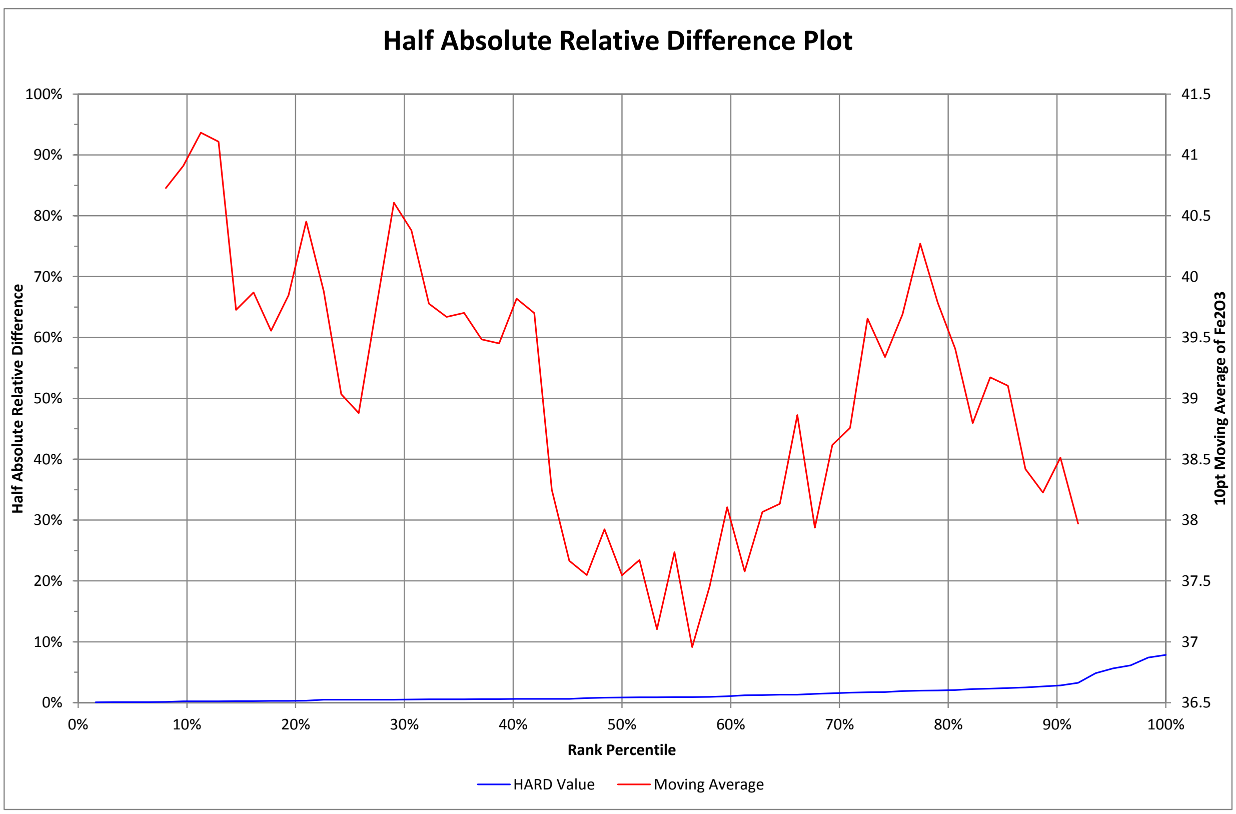


Blank control plot of ICP-OES Fe2O3 equivalent results from the concentrate stream

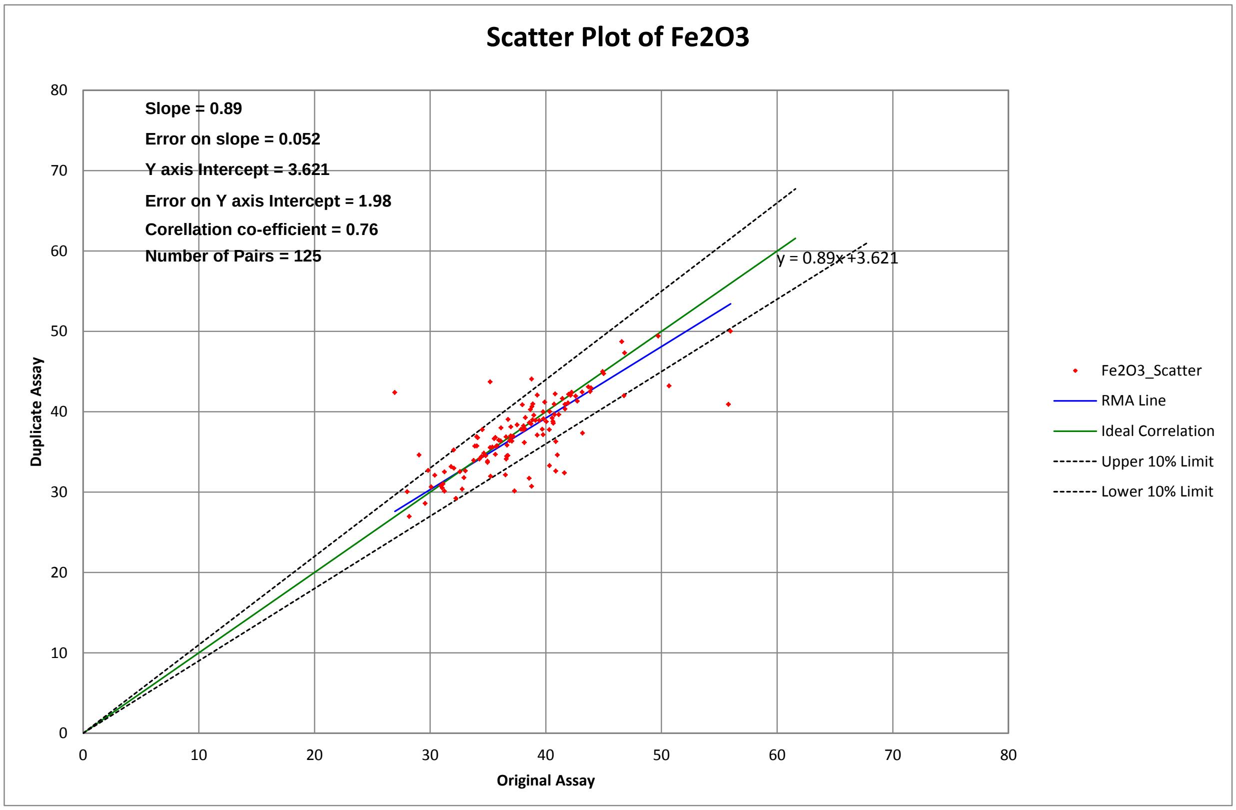


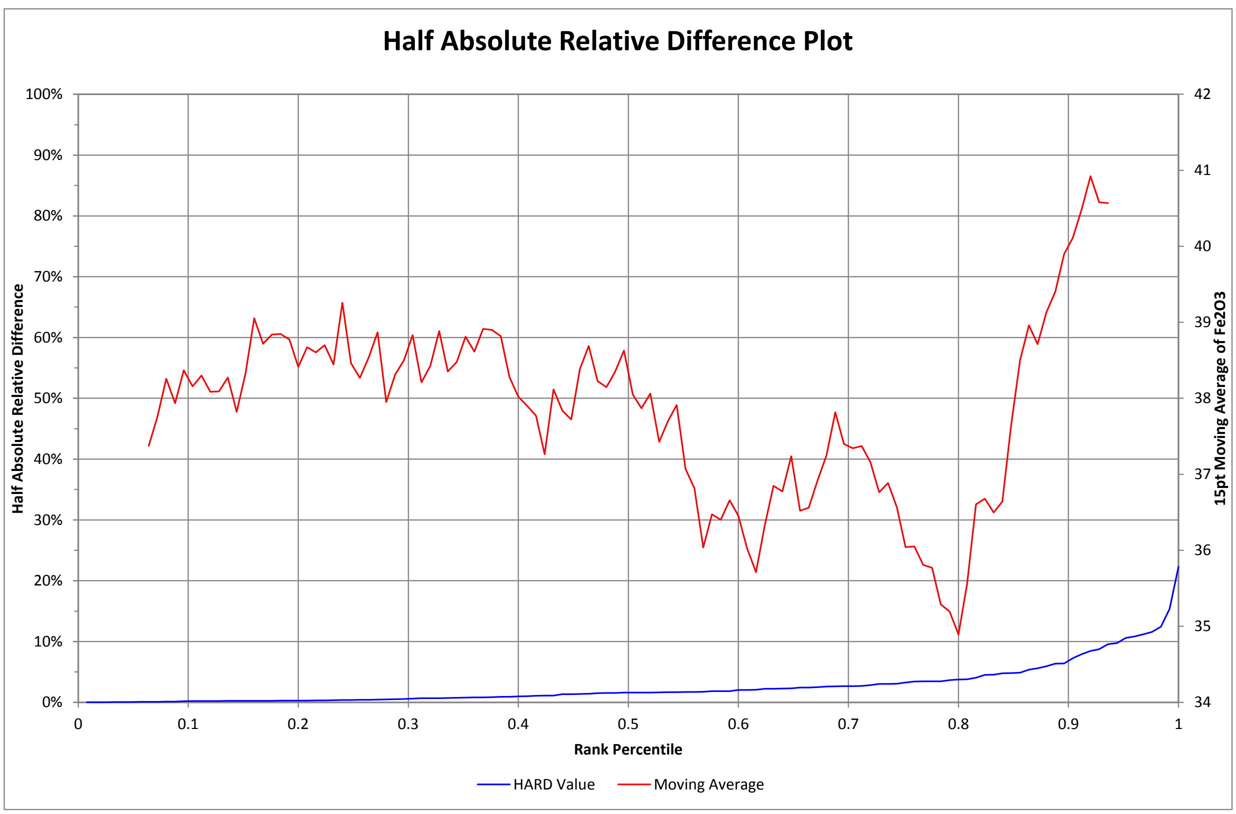
Scatter plot (upper) and HARD value (lower) plots of the ICP-OES Fe2O3 equivalent results from the concentrate duplicates dataset sent to Actlabs.





Scatter plot (upper) and HARD value (lower) plots of the ICP-OES Fe2O3 equivalent results from the concentrate duplicates dataset sent to Dalhousie

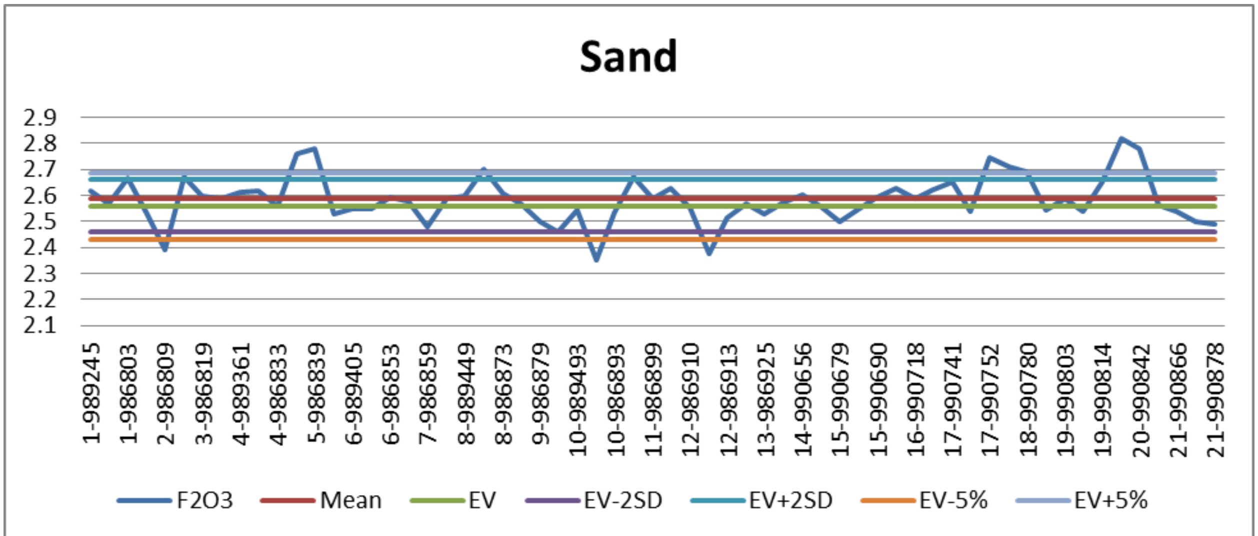


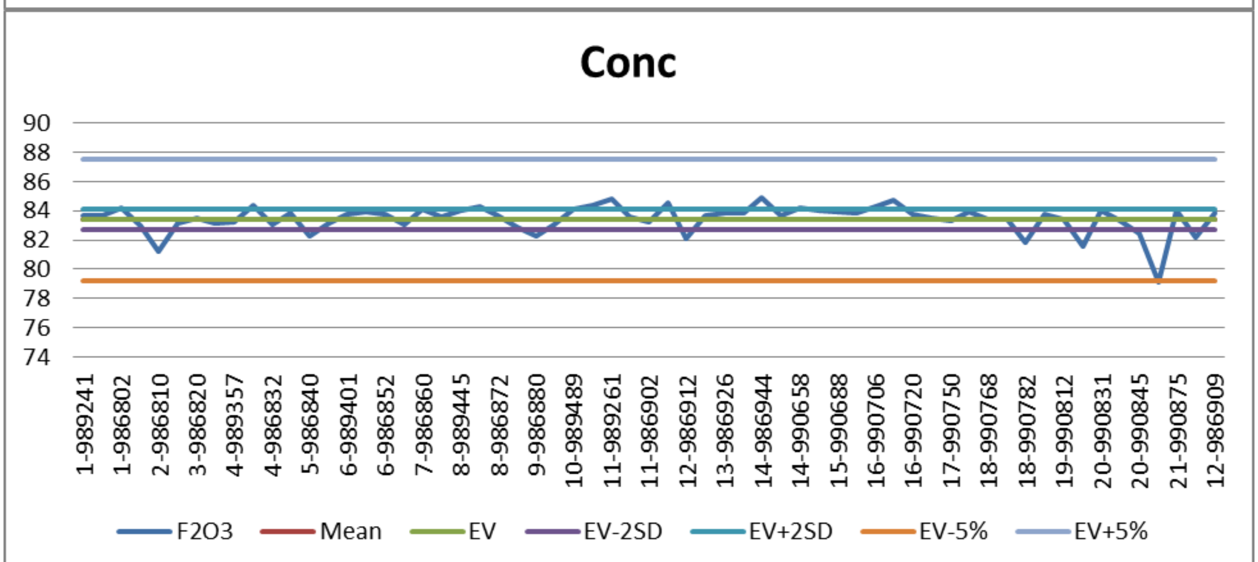


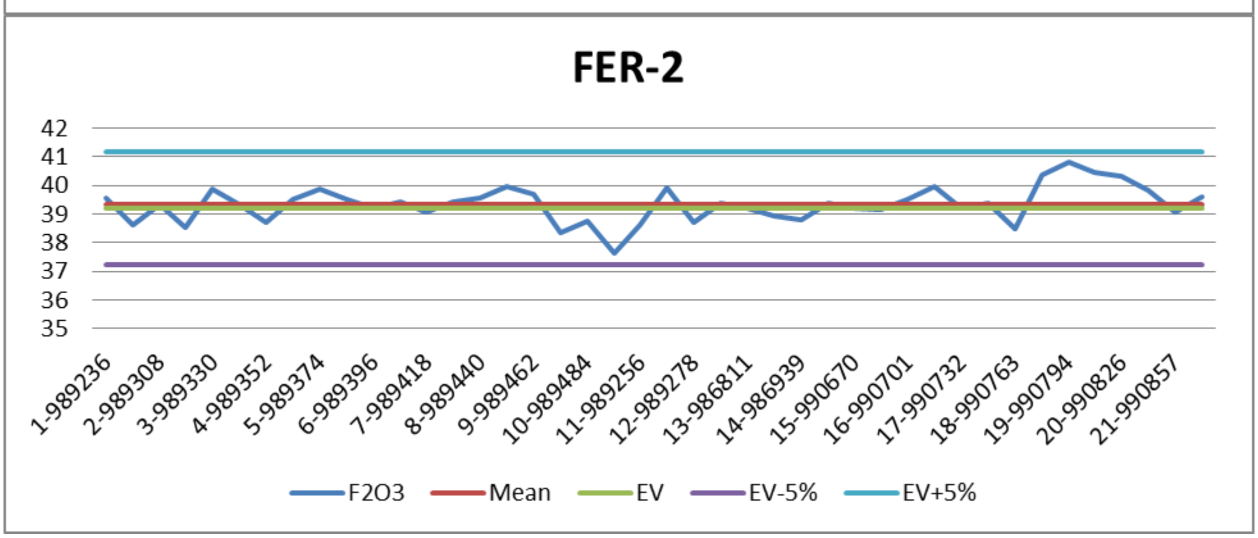
APPENDIX C

Analytical Quality Control Charts
Phase 2 Drilling Program

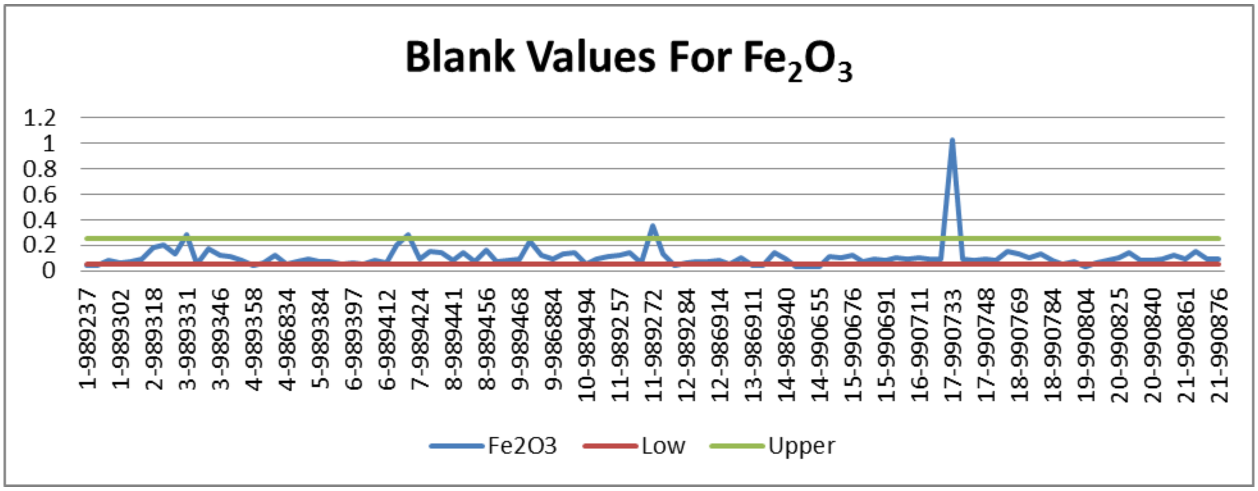
Standards control plot for Fe_2O_3



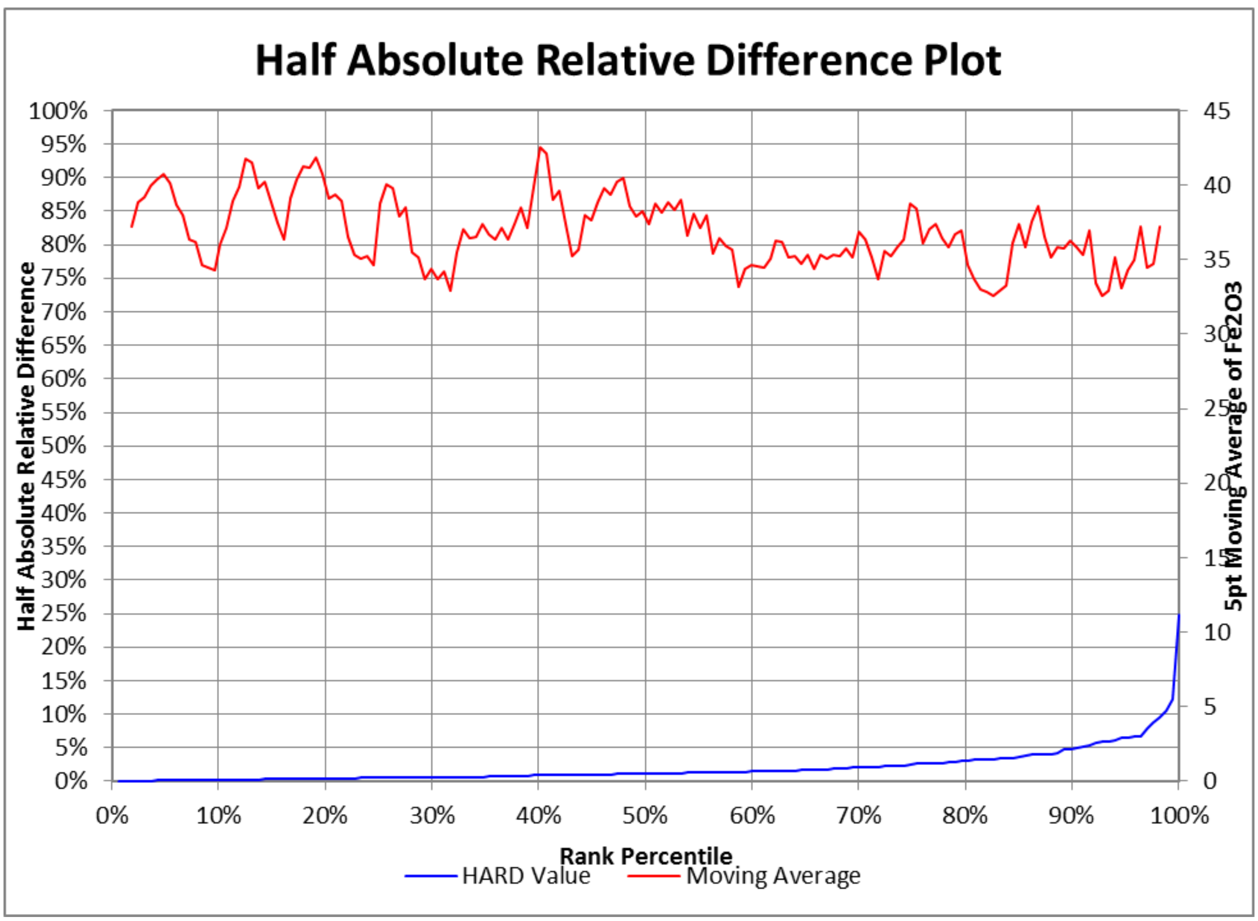




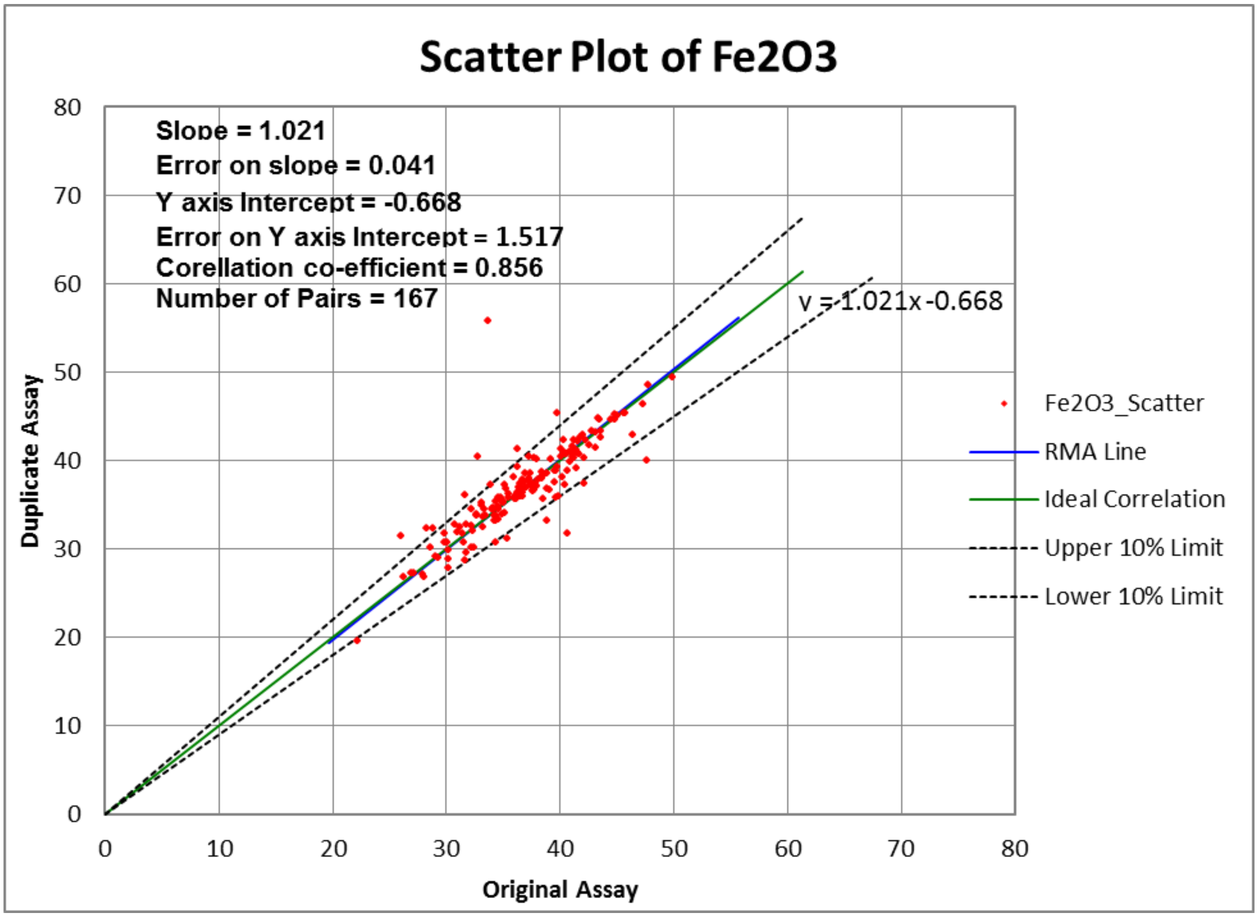
Blank validation plot for Fe_2O_3



Fe_2O_3 Duplicate analysis HARD plot



Fe_2O_3 Duplicate analysis Scatter plot



CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: **Independent Technical Report for the Churchill River Mineral Sands Project, Labrador, Canada**, with an effective date of **January 15, 2013**.

I, Mark Wanless, Pr.Sci.Nat do hereby certify that:

1) I am a Principal Geologist with the firm of SRK Consulting (South Africa) Pyt Ltd. (SRK) with an office at 265 Oxford Road, Illovo, Johannesburg, South Africa;
2) I am a graduate of the University of Cape Town in 1995, I obtained a BSc (Hons) Geochemistry. I have practiced my profession continuously since 1996;
3) I am a professional Geologist registered with the South African Council for Natural Scientific Professionals Registration no: 400178/05;
4) I have personally inspected the subject project from the third to the fifth of July 2013;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co- author of this report and responsible for Section 13 of the report and accept professional responsibility for that section of this technical report;
8) I have had no prior involvement with the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by North Atlantic Iron Corp. to prepare a technical report documenting the mineral resources on the Churchill River mineral sand project. The preceding report is based on site visits, a review of project files, and discussions with North Atlantic Iron Corp. personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Churchill River mineral sand project or securities of North Atlantic Iron Corp.; and
12) That, as of the effective date of this technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

[“signed and sealed”]
Mark Wanless Pr.Sci.Nat
Principal Geologist

Johannesburg, South Africa
June 17, 2014

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: **Independent Technical Report for the Churchill River Mineral Sands Project, Labrador, Canada**, with an effective date of **January 15, 2013**.

I, Livhuwani Maake, Pr.Sci.Nat do hereby certify that:

1) I am a Senior Geologist with the firm of SRK Consulting (South Africa) Pyt Ltd. (SRK) with an office at 265 Oxford Road, Illovo, Johannesburg, South Africa;
2) I am a graduate of the University of Cape Town; I obtained a BSc (Hons) Geology in 2006 and an MSc Geology in 2012. I have practiced my profession continuously since 2007;
3) I am a professional Geologist registered with the South African Council for Natural Scientific Professionals Registration no: 400437/11;
4) I have not personally visited the project area but relied on a site visit conducted by Mr Wanless a co-author of this technical report;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co- author of this report and responsible for Section 11, Appendix B and Appendix C of the report and accept professional responsibility for that section of this technical report;
8) I have had no prior involvement with the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by North Atlantic Iron Corp. to prepare a technical report documenting the mineral resources on the Churchill River mineral sand project. The preceding report is based on site visits, a review of project files, and discussions with North Atlantic Iron Corp. personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Churchill River mineral sand project or securities of North Atlantic Iron Corp.; and
12) That, as of the effective date of this technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

[“signed and sealed”]
Livhuwani Maake Pr.Sci.Nat
Senior Geologist

Johannesburg, South Africa
June 17, 2014

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: **Independent Technical Report for the Churchill River Mineral Sands Project, Labrador, Canada**, with an effective date of **January 15, 2013.**

I, Lars Weiershäuser, PGeo do hereby certify that:

1) I am a Senior Consultant (Geology) with the firm of SRK Consulting (Canada) Inc. (SRK) with an office at Suite 1300, 151 Yonge Street, Toronto, Ontario, Canada;
2) I graduated from the South Dakota School of Mines and Technology in Rapid City, South Dakota, USA with a MSc in Geology in 2000. I obtained a PhD in Geology from the University of Toronto in 2005. I have practiced my profession continuously since 2000;
3) I am a Professional Geoscientist registered with the Association of Professional Geoscientists of the province of Ontario (APGO #1504). I have submitted an application for membership to the Professional Engineers and Geoscientists of Newfoundland and Labrador;
4) I personally inspected the subject project between June 1 and 5, 2010;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the author of this report and responsible for Sections 1 to 10, 14 to 18, and Appendix A of the report and accept professional responsibility for those sections of this technical report;
8) I have had no prior involvement with the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by North Atlantic Iron Corp. to prepare a technical report documenting the mineral resources on the Churchill River mineral sand project. The preceding report is based on site visits, a review of project files, and discussions with North Atlantic Iron Corp. personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Churchill River mineral sand project or securities of North Atlantic Iron Corp.; and
12) That, as of the effective date of this technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Toronto, Canada
June 17, 2014

["signed and sealed"]
Lars Weiershäuser, PhD, PGeo
Senior Consultant (Resource Geology)

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: **Independent Technical Report for the Churchill River Mineral Sands Project, Labrador, Canada**, with an effective date of **January 15, 2013.**

I, Sébastien Bernier, do hereby certify that:

1) I am a Principal Consultant (Resource Geology) with the firm of SRK Consulting (Canada) Inc. (“SRK”) with an office at Suite 101, Regent Street South, Sudbury, Ontario, Canada;
2) I am a graduate of the University of Ottawa in 2001 with BSc (Honours) Geology and I obtained MSc Geology from Laurentian University in 2003. I have practiced my profession continuously since 2002. I worked in exploration and commercial production of base and precious metals mainly in Canada. I have been focussing my career on geostatistical studies, geological modelling and resource modelling of base and precious metals since 2004;
3) I am a Professional Geoscientist registered with the Ordre des Géologues du Québec (OGQ #1034), the Association of Professional Geoscientist of Ontario (APGO #1847) and Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL #05958);
4) I have not personally visited the project;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co-author of this report and responsible for Section 13 and accept professional responsibility for this section of this technical report;
8) I have had no prior involvement with the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by North Atlantic Iron Corp. to prepare a technical report documenting the mineral resources on the Churchill River mineral sand project in accordance with National Instrument 43-101 and Form 43-101F1 guidelines. This assignment was completed using CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines and Canadian Securities Administrators’ National Instrument 43-101 guidelines;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Churchill River mineral sand project or securities of North Atlantic Iron Corp.; and
12) That, as of the effective date of this technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

[“signed and sealed”]

Sudbury, Canada	Sébastien Bernier (PEGNL #05958)
June 17, 2014	Principal Consultant (Resource Geology)

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: **Independent Technical Report for the Churchill River Mineral Sands Project, Labrador, Canada**, with an effective date of **January 15, 2013**.

I, Adrian Dance, residing in West Vancouver, British Columbia do hereby certify that:

1) I am a Principal Consultant with the firm of SRK Consulting (Canada) Inc. ("SRK") with an office at Suite 2200-1066 West Hastings Street, Vancouver, BC, Canada;
2) I am a graduate of the University of British Columbia in 1987 where I obtained a Bachelor of Applied Science and a graduate of the University of Queensland in 1992 where I obtained a Doctorate. I have practiced my profession continuously since 1992 including eight years as a consultant and have experience working in a number of base metal flotation operations around the world;
3) I am a Professional Engineer registered with the Association of Professional Engineers & Geoscientists of British Columbia, license number 37151;
4) I have not personally visited the project;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am responsible for report Section 12 and co-authored Sections 16 and 17 and accept professional responsibility for those parts that I authored;
8) I have had no prior involvement with the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by North Atlantic Iron Corp. to prepare a technical report documenting the mineral resources on the Churchill River mineral sand project in accordance with National Instrument 43-101 and Form 43-101F1 guidelines. This assignment was completed using CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines and Canadian Securities Administrators' National Instrument 43-101 guidelines;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Churchill River mineral sand project or securities of North Atlantic Iron Corp.; and
12) That, as of the effective date of this technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

["signed and sealed"]
Adrian Dance, Peng
Principal Consultant

Vancouver, Canada
June 17, 2014