

## 1.0 INTRODUCTION

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This document is the Environmental Impact Assessment (EIA) Report for the Sisson Project (“the Project”) proposed by Sisson Mines Ltd. (“SML”, “the Proponent”). After submission of the Sisson Project EIA Report to governments in July 2013, Northcliff Resources Ltd. (the Proponent at the time) and Todd Minerals Ltd. entered into a limited partnership agreement to advance the development of the Sisson Project. As a result of this agreement, the Sisson Project is now being developed and advanced by Sisson Mines Ltd., on behalf, and as general partner, of the Sisson Project Limited Partnership. Thus, the Proponent of the Sisson Project is now Sisson Mines Ltd., and any references to Northcliff Resources Ltd. (Northcliff) in this document can be read as referring to Sisson Mines Ltd.

The Sisson Project involves the development of a tungsten and molybdenum mine near Napadogan, approximately 60 km directly northwest of Fredericton, in central New Brunswick. An EIA of the Project is required under the *Canadian Environmental Assessment Act (CEAA)* as well as under the New Brunswick *Environmental Impact Assessment Regulation–Clean Environment Act* (the “EIA Regulation”). Though the former *CEAA* was repealed in 2012 and replaced with the new *Canadian Environmental Assessment Act, 2012 (“CEAA 2012”)*, any environmental assessments at the comprehensive study level that had begun under the former Act (like the Sisson Project) would continue under the former Act; thus all references to the *CEAA* in this EIA Report are to the Act as it existed before the passage of *CEAA 2012*.

The Project location is shown in Figure 1.1.1. The Project involves the construction and operation of an open pit tungsten and molybdenum mine and associated facilities and infrastructure. An average of 30,000 tonnes per day (t/d) of ore will be extracted from the open pit, and processed in an ore processing facility to produce tungsten and molybdenum concentrates through various crushing, grinding, flotation and drying processes. Tungsten concentrate will be further refined on-site to produce a higher value crystalline tungsten product, known as ammonium paratungstate (APT). Products will be packaged and trucked to nearby rail facilities for subsequent transportation to market. Mining waste (*i.e.*, tailings and waste rock) will be stored in a tailings storage facility (TSF) along with mine contact water collected on-site and re-used in the ore processing plant. A new electrical transmission line will be constructed to supply electrical power to the mine site, and an existing transmission line and forest resource road will be relocated around the site. Following an approximate two year Construction period, the Project will operate for an estimated 27 years. Decommissioning, reclamation and closure will be conducted at the end of mining operations to restore the site to sustainable end land uses agreed with government, First Nations, and other stakeholders.

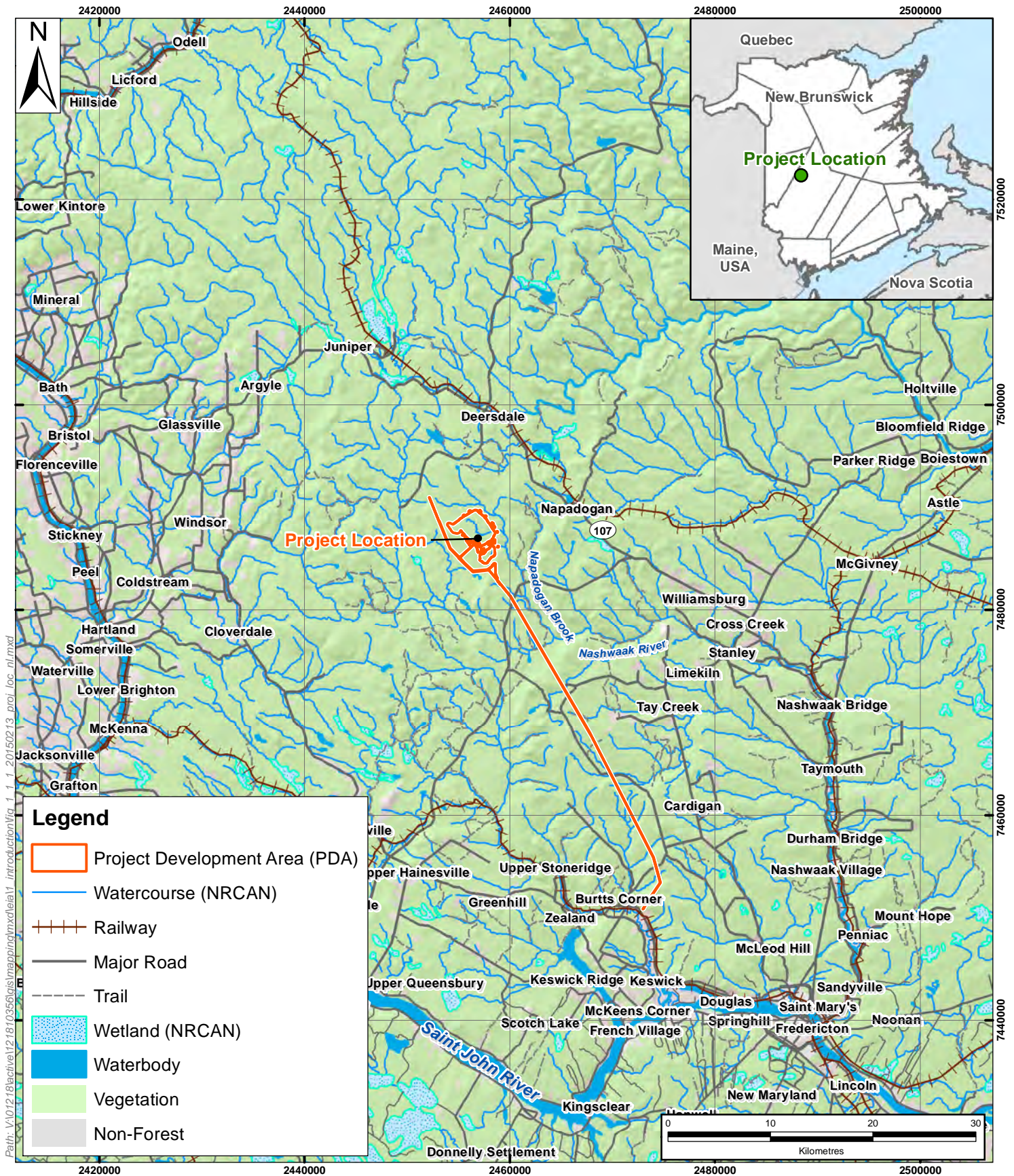
In September 2008, Geodex Minerals Ltd. (Geodex), a mineral exploration company, registered the development of the Sisson Project under the New Brunswick EIA Regulation. In October 2008, the New Brunswick Minister of Environment determined that an EIA (comprehensive review) was required. Final Guidelines for the EIA (NBENV 2009) were issued by the Minister in March 2009 after public consultation on them. Northcliff secured the mineral development rights to the Sisson ore deposit from Geodex in June 2012, and these rights were subsequently transferred to SML. The federal environmental assessment (EA) under *CEAA* was initiated by the Canadian Environmental Assessment Agency (“CEA Agency”) in April 2011, as a comprehensive study. Terms of Reference for the EIA were developed jointly by Northcliff, the CEA Agency, and the New Brunswick Department of Environment

and Local Government (NBDELG); were the subject of public and First Nations consultation over the August to October 2011 period; and were finalized in April 2012 (Stantec 2012a). The Terms of Reference define the scope of the project, factors to be considered, and scope of factors to be considered to fulfill the respective regulatory requirements for the provincial EIA and federal EA of the Project. A feasibility study and associated Technical Report (Samuel Engineering 2013), further environmental studies, an engagement program for stakeholders, the public and Aboriginal peoples, and other planning and development activities were conducted in parallel to the EIA, many of which are ongoing.

The Sisson Project Environmental Impact Assessment (EIA) Report (Stantec 2013g) was submitted to the federal and provincial governments for review in July 2013. Comments and information requests (IRs) on the July 2013 report were received from the provincial and federal governments, the public, and First Nations, and SML responded to those IRs between October 2013 and November 2014. This Final EIA Report has been prepared to meet the requirements of the provincial EIA Regulation, incorporating, where applicable and appropriate, the responses to IRs submitted by SML to governments. Thus, for the purpose of the provincial EIA process, this final version of the EIA Report supersedes the July 2013 version of this report (Stantec 2013g) submitted to both the provincial and federal governments for review. The July 2013 version remains the official version of the EIA Report for the purpose of the federal environmental assessment under *CEAA*.

The purpose of the EIA Report is to document the results of the EIA required to satisfy the requirements of the EIA Regulation and *CEAA*. It has been prepared by Stantec Consulting Ltd. ("Stantec") on behalf of SML, with contributions from other consultants and firms that carried out specialized studies aimed at further defining the Project, and its potential environmental effects and mitigation. The EIA Report describes the proposed Project and its potential environmental effects, as well as measures to avoid or minimize environmental effects, to mitigate or compensate for residual environmental effects as needed, and to manage potential environmental effects through Project construction, operation and closure. The report recommends a follow-up or monitoring program as appropriate.

SML is an informed and responsible proponent through its association with Hunter Dickinson Inc., a Vancouver-based mining company with a proven 25-year record of successful mineral developments throughout the world in a progressive and responsible way. To this end, SML is committed to life-of-Project environmental management as described in Chapter 2 of this EIA Report to avoid or minimize the adverse environmental effects, and to enhance the benefits of the Project. SML will carefully plan and manage all aspects of the Project from development to closure and beyond, and employ a comprehensive environmental management strategy to implement its "Principles of Responsible Mineral Development" (SML 2013; see Section 1.3.2). Throughout the planning, design and execution of the Project, SML will use a number of approaches and tools to avoid, minimize, and otherwise manage potentially adverse environmental effects, and to capture potential benefits, in a manner that promotes sustainable development for the people of New Brunswick and Canada.



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NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<h2 style="text-align: center;">Project Location</h2> <p style="text-align: center;">Sisson Project: Environmental Impact Assessment (EIA) Report, Napadogan, N.B.</p>		Scale: 1:500,000		Project No.: 121810356		Data Sources: SNB NRCAN, ESRI		Fig. No.: 1.1.1		
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Client: Sisson Mines Ltd.										



## 1.1 PROJECT TITLE AND PROPONENT

The Project may be cited as the “Sisson Project”. The Proponent of the Project is Sisson Mines Ltd., a body corporate governed by the laws of Canada and the Province of British Columbia. The Proponent contact information is as follows:

<b>Name of Project:</b>	Sisson Project
<b>Name of Proponent:</b>	Sisson Mines Ltd.
<b>Mailing Address of Proponent:</b>	Head Office: 15 <sup>th</sup> Floor – 1040 W. Georgia Street Vancouver, British Columbia V6E 4H8  Project Office: 47 Avonlea Court Fredericton, New Brunswick E3C 1N8
<b>Chief Executive Officer:</b>	Christopher Zahovskis, P.Eng. President, Chief Executive Officer, and Director
<b>Contact Person for the EIA:</b>	John Boyle, B.Ap.Sc., MNRM, Ph.D. Vice President, Environmental Affairs
<b>Telephone Number:</b>	Head Office: (604) 684-6365 Project Office: (506) 455-0530
<b>Fax Number:</b>	Head Office: (604) 630-0022 Project Office: (506) 455-0533
<b>Electronic Mail Address of EIA Contact Person:</b>	<a href="mailto:johnboyle@hdimining.com">johnboyle@hdimining.com</a>
<b>Websites:</b>	<a href="http://www.sissonpartnership.com">http://www.sissonpartnership.com</a> <a href="http://www.northcliffresources.com">http://www.northcliffresources.com</a>

## 1.2 PROJECT OVERVIEW

### 1.2.1 About the Sisson Deposit

The Sisson ore deposit was first discovered in the late 1950s, and has been studied extensively by various exploration and development companies since that time. It is a tungsten-molybdenum deposit comprising disseminated scheelite and molybdenite occurring in sheeted and shear-hosted quartz veins associated with Devonian-aged granitic intrusions (RPA 2012). The Sisson deposit was initially defined through exploration drilling undertaken by Kidd Creek Mines from 1979-1982. Subsequent delineation drilling carried out by Geodex from 2005-2009 outlined significant mineral resources in two main zones which are open to further expansion.

Northcliff embarked on a program comprised of drilling, engineering and environmental studies over the 2010-2012 period to advance the Sisson Project through feasibility and into environmental assessment and permitting. In addition to increasing the mineral resources in the measured category, the recent drilling has supplied metallurgical, geotechnical, and hydrogeological data to support feasibility work.

The Sisson deposit hosts a large, structurally controlled, intrusion-related tungsten-molybdenum ore body that is amenable to open pit mining. Sisson has excellent potential to be a near-term metal producer, with significant capability to meet increasing tungsten demand from North American and European markets.

A recent National Instrument (NI) 43-101 compliant technical report (“the Technical Report”; Samuel Engineering 2013) states that the Sisson deposit comprises 387 million tonnes of measured and indicated resources containing 25.6 million metric tonne units (mtu) of tungsten (as  $WO_3$ ) and 178 million pounds of molybdenum (Mo), and 187 million tonnes of inferred resources containing 9.41 mtu of  $WO_3$  and 82.6 million pounds of molybdenum.

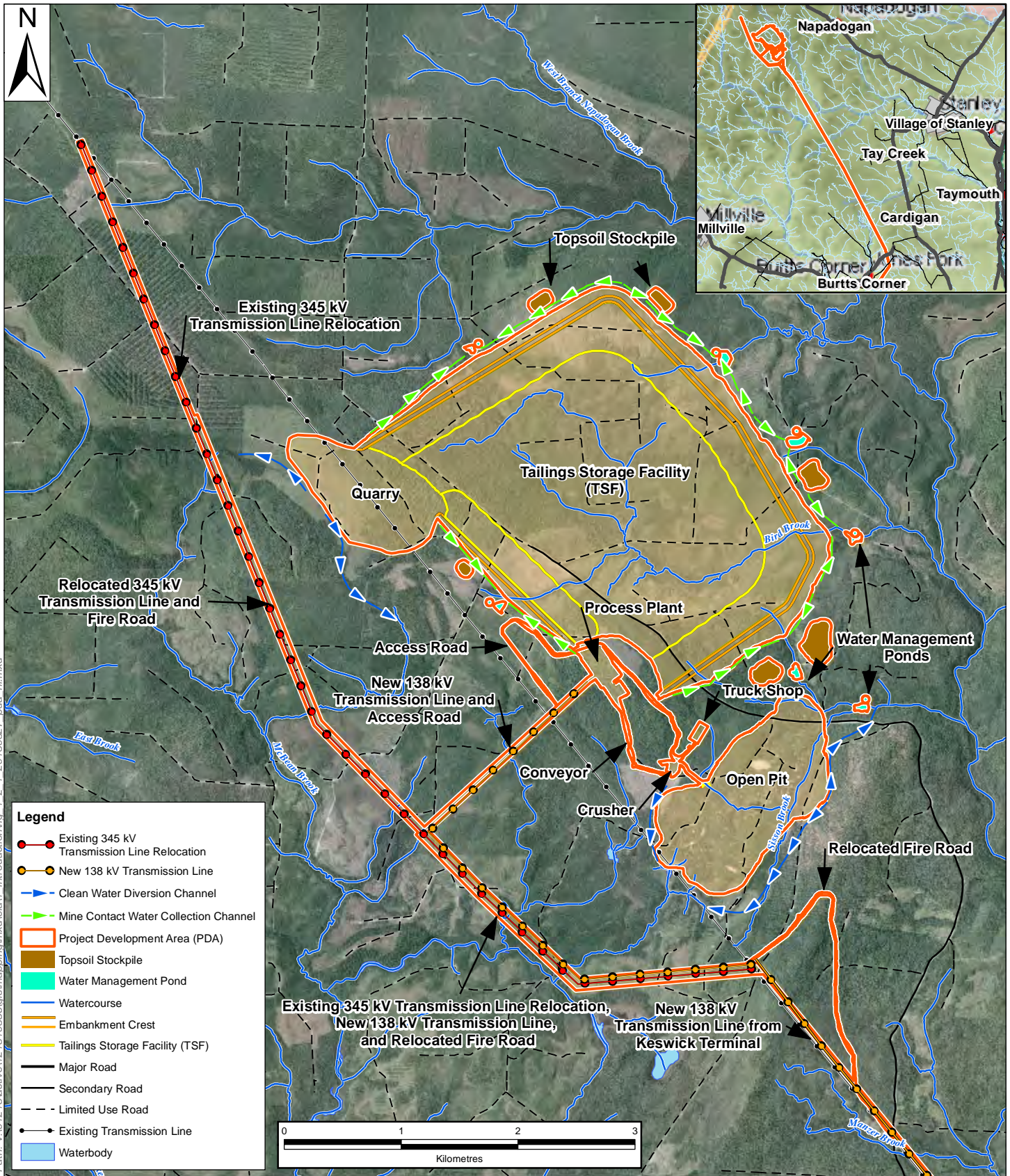
### **1.2.2 Project Summary and Location**

The Sisson Project consists of the construction and operation of an open pit, tungsten and molybdenum mine and associated facilities by SML. The Project site is on provincial Crown land at approximately N 46°22' by W 67°03', approximately 10 km southwest of the community of Napadogan, New Brunswick, and approximately 60 km directly northwest of the city of Fredericton (Figure 1.1.1).

Tungsten is a steel-grey metal that is an important alloy in tool making and construction steel as it enhances hardness, cutting efficiency, and speed with a similar hardness to diamonds. Tungsten components are used in lighting technology, electronic industry, transportation, the chemical industries, glass melting industry, medical technology, power engineering, and in jewelry.

Molybdenum is an important alloy in the manufacture of stainless steel and steel. It is also an important material for the chemical and lubricant industries. Molybdenum is used in automotive parts, construction equipment, gas transmission pipes, and turbine parts.

The Project Development Area (PDA) is shown in Figure 1.2.1. The Project will involve an open pit mine and associated ore processing, waste management, and ancillary facilities. The mine will operate for approximately 27 years. Tungsten and molybdenum containing ore will be mined from the open pit at an average rate of approximately 30,000 t/d. The ore will then be processed to concentrate on-site through a series of process steps consisting of crushing, grinding, flotation, and drying. Tungsten concentrate will be further refined on-site to produce ammonium paratungstate (APT), a higher value crystalline tungsten product used in steel making and other manufacturing industries. Waste rock from the open pit, and tailings as a by-product of the ore processing operations, will be permanently stored in a tailings storage facility (TSF, also sometimes referred to as a tailings impoundment area or TIA). The mineral products will be trucked to nearby rail facilities for their subsequent transportation to customers.



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NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.					
<b>Project Development Area (PDA)</b>		Scale: 1:45,000	Project No.: 121810356	Data Sources: SNB NRCAN, ESRI	Fig. No.: 1.2.1
Sisson Project: Environmental Impact Assessment (EIA) Report, Napadogan, N.B.		Date: (dd/mm/yyyy) 23/11/2014	Dwn. By: JAB	Appd. By: DLM	
Client: Sisson Mines Ltd.					





Organics and overburden material removed during Construction of the Project will be stockpiled on-site for later use in site reclamation activities during Project closure. Engineered diversion channels will keep clean surface runoff water away from mining, processing and waste storage areas. Precipitation falling on the Project site and dewatering from the open pit (referred to as “mine contact water”) will be collected, stored in the TSF and used in Project operations, or released to the environment following treatment as necessary. Water management ponds located around the TSF and downgradient of the Project site (Figure 1.2.1) will collect mine contact run-off water or seepage for return to the TSF to be stored and re-used. Any surplus water from the TSF will be treated, if necessary, and discharged to natural drainages. Other than groundwater wells to supply fresh water for domestic uses and other purposes (e.g., dust suppression, fire suppression, process make-up water), no sources of water beyond precipitation falling on the Project site will be required for Operation of the Project.

The open pit location is fixed based on the location of ore body; its development will intersect a portion of Sisson Brook which will be permanently lost as a consequence (Figure 1.2.1). Additionally, the construction of the TSF will involve the loss of portions of Bird and Sisson brooks, and of a small tributary to the West Branch Napadogan Brook. The configuration and location of the TSF has been the subject of design and siting considerations that have reduced the overall potential environmental consequences on streams.

A new 138 kV electrical transmission line to be built and operated by the New Brunswick Power Corporation (NB Power) will be constructed to supply up to 50 megawatts (MW) of electrical power to the Project site. The 138 kV transmission line will be constructed alongside an existing 345 kV transmission line that currently crosses the Project site (Figure 1.2.1), by widening the existing 50 m-wide transmission line corridor by a further 25 m to accommodate the new transmission line. The new transmission line will originate at the Keswick Terminal operated by NB Power, 42 km southeast of the Project location, and will terminate at the Sisson mine site. As the existing 345 kV transmission line and an existing forest resource road (*i.e.*, the Fire Road) are currently situated within or too close to Project facilities, these linear facilities will be relocated to the southwest of their current location for an estimated 12 linear km.

At the end of mining, decommissioning, reclamation and closure will occur to restore the site to near natural conditions and to meet end land uses agreed with the New Brunswick government. At closure, the water management system will be re-configured to ensure that all water discharged from the site is monitored and, as needed, treated to meet applicable water quality standards for as long as is required. The Project will generate employment and positive economic activity in the area during its lifespan. The capital cost of the Project is estimated at C\$579 million (Samuel Engineering 2013), and the projected expenditures for the entire period of operation of the Project are estimated at C\$3,730 million (EcoTec 2013). The Project will create up to 500 direct jobs during the Construction phase and up to 300 direct full-time jobs over its operating lifespan (Samuel Engineering 2013). Local contractors and Aboriginal firms will be preferred for site contract work where qualified companies and suppliers can be identified.

### 1.2.3 Project Schedule

Construction of the Project is estimated to take approximately 24 months following approval of the EIA and the receipt of required permits, approvals, and other forms of authorization. Operation of the Project will be initiated upon completion of construction activities, and will continue for an estimated 27 years, after which Decommissioning, Reclamation and Closure will be initiated. The approximate Project schedule, with estimates for 2014 and beyond, is summarized as follows:

- Complete Feasibility Study: first quarter of 2013.
- Submit EIA Report to federal and provincial governments: July 2013.
- Submit Final EIA Report to the Government of New Brunswick: November 2014.
- EIA/EA decisions received: expected by mid-2015.
- Complete initial permitting, approvals and authorizations: expected in second half of 2015.
- Conduct public and stakeholder consultation, and Aboriginal engagement: throughout the EIA process and the life of the Project.
- Construction: expected to begin in second half of 2015.
- Commissioning and Operation: commencing immediately following Construction, and continuing for approximately 27 years or until the mineral resource is depleted.

The Project schedule is subject to regulatory timelines that are not controlled by SML; therefore, the schedule outlined above is subject to change as the EIA review, approval and permitting processes unfold. The timing of Construction activities will take seasonal restrictions for environmental “windows” into account (*e.g.*, no clearing May through August during critical bird breeding seasons; no in-water work outside the June 1-September 30 window except as may be permitted by DFO). The initiation of construction also depends on financing of the construction costs and a decision by the Sisson Project Limited Partnership to proceed with the Project.

## 1.3 PROJECT APPROACH AND COMMITMENTS

SML recognizes that the Napadogan area is a rural and relatively undeveloped area of Central New Brunswick. The area has a long history of natural resource development and use, particularly in support of extensive forest resource harvesting activities which have been central to the New Brunswick economy for over a century and are dominant at the landscape level. Mining will be a new natural resource-based development in the Napadogan area, but is well-known elsewhere in the province. While the area is important for resource-based economic activities, SML recognizes that it is also important for hunting, fishing, and outdoor recreation undertaken by the people of New Brunswick, and is integral to the ecology of the Nashwaak and St. John River watersheds. It also lies within the traditional territory of the Maliseet First Nations.

As described in Chapters 2 and 3 of this EIA Report, SML is committed to meet or exceed regulatory requirements, as well as international best practice and its corporate “Principles of Responsible Mineral Development”, in the planning, design, management, Construction, Operation, and Decommissioning, Reclamation and Closure of the Project. This includes a commitment to:

- provide governance and oversight of the Project by an experienced and qualified Management team and Board of Directors, who ensure that the Project is developed responsibly for the benefit of shareholders, partners, communities and governments;
- carry out a world-class environmental impact assessment of the Project by an expert team of engineers, scientists, and other subject-matter professionals to ensure that the Project is planned and developed responsibly;
- implement Project planning, design and management strategies that avoid or mitigate potentially adverse environmental effects of the Project, and that enhance positive effects, in a manner that complies with all laws and regulations while supporting the way of life that the people of central New Brunswick know and enjoy;
- engage the public, stakeholders, and Aboriginal communities in a sustained and meaningful way so as to share information about the Project, to address issues and concerns, and to maximize local participation in, and benefits from, the Project; and
- plan and execute the Project in a manner that promotes sustainable development, applies precaution in areas of uncertainty, and enhances the benefits of the Project and of the EIA process itself for Canadians. This includes especially protecting surface water, groundwater and aquatic resources; implementing technically proven and economically feasible components and technologies; minimizing the Project footprint; and designing the Project for closure.

### 1.3.1 Project Team

Northcliff/SML assembled a world-class team of scientists, engineers, and subject-matter experts in developing the Sisson Project. The Project Team assembled to complete the planning and design of the Sisson Project is shown in Table 1.3.1.

**Table 1.3.1 Project Team – Sisson Project**

Name of Firm	Lead Office Location	Role
Stantec Consulting Ltd.	Fredericton, New Brunswick	Primary consultant for the EIA and related environmental studies.
Knight Piésold Ltd.	Vancouver, British Columbia	Geotechnical, hydrogeological, waste and water management, TSF design.
SRK Consulting	Vancouver, British Columbia	Geochemical and waste characterization, metal leaching/acid rock drainage (ML/ARD) studies.
Samuel Engineering, Inc.	Greenwood Village, Colorado	Infrastructure, civil, electrical, and mechanical engineering, and compiling the feasibility study.
Moose Mountain Technical Services	Calgary, Alberta	Mine design and production planning.
Bolu Consulting Engineering Inc.	Vancouver, British Columbia	Process design, and design of metallurgical test program.
SGS Canada Inc.	Lakefield, Ontario	Metallurgical testing.

**Table 1.3.1 Project Team – Sisson Project**

Name of Firm	Lead Office Location	Role
EcoTec Consultants	Québec City, Québec	Economic modelling of benefits to local and regional economies.
Wade Locke Economic Consulting	St. John’s, Newfoundland and Labrador	External peer review of economic modelling.
exp Services Inc.	Fredericton, New Brunswick	Road transportation study in support of the EIA.
Jacobs Minerals Canada Inc.	Toronto, Ontario	Value and basic engineering.

### 1.3.2 Principles of Responsible Mineral Development

SML is committed to working with governments, the public, stakeholders and First Nations to achieve the responsible development of the Sisson Project, and to contribute to the sustainable development of the communities in which it works. These commitments are embodied in SML’s “Principles of Responsible Mineral Development” (SML 2013) shown in Figure 1.3.1.

### 1.3.3 Project Governance and Oversight

The Sisson Project is owned by the Sisson Project Limited Partnership (SPLP), a limited partnership between Northcliff Resources Ltd. (88.5%) and Todd Corporation (11.5%). Governance and management of all aspects of the Project is the responsibility of Sisson Mines Ltd. (SML), the General Partner of the SPLP. SML is controlled by Northcliff subject to certain limits in the shareholders agreements between Northcliff and Todd. Activities carried out and managed by SML are governed by policies and procedures that parallel Northcliff’s “Corporate Governance Policies and Procedures Manual” (Northcliff 2012b) and Code of Ethics.

### 1.3.4 Public, Stakeholder, and Aboriginal Engagement

SML is committed to engaging with the public, stakeholders and Aboriginal communities in an open, transparent, and responsive manner in respect of the Sisson Project. Specifically, SML is committed to:

- listen closely to and consider the input and interests of the public, stakeholders and Aboriginal communities in the planning phase of the Project, particularly for people whose interests may be affected;
- communicate openly, and act with honesty and integrity;
- build trust, respect and constructive relationships through responsible performance from the outset and with a long-term orientation;
- share information early and often, to a level of detail and completeness that will assist all interests to prepare and to act knowledgeably;
- provide early and adequate notice of opportunities for involvement;
- provide opportunities for information exchange and mutual education about interests, objectives and values in an open, transparent, and responsive manner;



### Principles of Responsible Mineral Development

Sisson Mines Ltd. is committed to working shoulder to shoulder with stakeholders to achieve the responsible development of our projects and to contribute to the sustainable development of the communities in which we work.

All activities are guided by the following principles:

<b>Health and Safety</b>	We operate in a responsible manner so that our activities protect the health and safety of our employees and contractors, and of the communities in which we work.
<b>Stakeholder Engagement</b>	We engage with governments, communities, indigenous peoples, organizations, groups and individuals on the basis of respect, fairness, transparency, and meaningful consultation and participation.
<b>Community Development</b>	We establish productive local partnerships to contribute to achieving development goals identified by communities in which we work, to address local priorities and concerns, and to have communities derive substantive benefits from our activities.
<b>Environment and Society</b>	We apply environmental and social best management practices in the planning, design and implementation of our activities, from exploration through to closure of our mining operations. We meet or exceed regulatory requirements in the jurisdictions in which we work.
<b>Resource Use</b>	We use land, water and energy resources responsibly, strive to maintain the integrity and diversity of ecological systems, and apply integrated approaches to land use.
<b>Human Rights</b>	We respect human rights principles, as well as local cultures, customs and values, in our dealings with employees, communities and other stakeholders.
<b>Labour Conditions</b>	We provide fair treatment, non-discrimination and equal opportunity for our employees, and comply with labour and employment laws in the jurisdictions in which we work. We strive for excellence in relations between management and employees.

Sisson Mines Ltd. integrates these *Principles of Responsible Mineral Development* within our corporate management and decision-making, and we work to continually improve our performance. From project acquisitions and exploration through to mine closure, we assess the financial, social and environmental benefits and risks of our business decisions. Our goal is international best practice in all our operations, in Canada and around the world.

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Source: SML (2013)

Figure 1.3.1 SML’s Principles of Responsible Mineral Development

- satisfy all regulatory expectations and requirements for engagement and consultation; and
- positively affect the Project timeline through the development of good relationships with stakeholders.

The intent of the public, stakeholder, and Aboriginal engagement program implemented by Northcliff/SML is to contribute, through constructive dialogue, to the responsible development and implementation of the Sisson Project, meet regulatory public consultation requirements, and inform the Crown's duty to consult with Aboriginal people. Northcliff/SML provided numerous and substantive opportunities for the public, stakeholders, and Aboriginal communities to become involved in the EIA of the Project and to provide input into the scope of issues to be studied in the EIA. The means by which Northcliff/SML sought to provide opportunities for public, stakeholder and Aboriginal input into the EIA were outlined in Chapter 3 of the Terms of Reference (Stantec 2012a) and are updated and further elaborated in Chapter 4 of this EIA Report.

### 1.3.5 Sustainable Development and the Precautionary Approach

As defined in CEAA, "sustainable development" means development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. The purposes of CEAA, as outlined in Section 4 of the Act, are to:

- *... "to ensure that projects are considered in a careful and precautionary manner before federal authorities take action in connection with them, in order to ensure that such projects do not cause significant adverse environmental effects"*
- *to encourage responsible authorities to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy;"...*

Environmental assessment provides an effective means of integrating environmental factors into the planning and decision-making process in a manner that promotes sustainable development.

Principle 15 of the 1992 Rio Declaration on Environment and Development states that *"In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."* This principle encourages decision-makers to take a precautionary approach, especially where there is a large degree of uncertainty or risk, in order to ensure that appropriate measures are taken to avoid or minimize environmental risks. The Government of Canada's "Framework for the Application of Precaution in Science-based Decision Making About Risk" (Government of Canada 2003) guides federal decision-making in this regard.

The EIA of the Project, including the alternative means of carrying out the Project that were considered in its development, has contributed to sustainable development by ensuring that Project planning and design has been carried out in a manner that avoids or minimizes adverse environmental effects, enhances environmental and societal benefits wherever possible, and applies the precautionary approach to avoid or minimize the risk of serious or irreversible environmental impacts, in an inclusive and transparent framework for the people of New Brunswick and Canada.

To this end, the Project:

- has been examined, planned and designed in a careful and precautionary manner in order to ensure that its elements and activities required to accomplish its construction, operation, and ultimate decommissioning and closure does not cause significant, irreversible damage to the environment, adversely affect key environmental functions and integrity, or affect the human health of current or future generations (as evidenced by this EIA Report in its entirety);
- has been planned and designed (Chapters 2 and 3) to avoid or minimize the adverse environmental effects of the Project, and enhance its environmental and societal benefits (Chapter 8);
- has considered alternative means of carrying out the Project that are technically and economically feasible, and compared them in light of risk avoidance and adaptive management capacity (Section 3.3);
- has given priority to strategies that avoid the creation of adverse environmental effects, minimizes those environmental effects through design or the implementation of proven mitigation and best management practices (Chapters 2, 3 and 8);
- has described and justified assumptions made in assessing the environmental effects of the Project, and in the methods for minimizing and managing these effects (Chapters 7 and 8);
- has identified contingency plans to address potential accidents and malfunctions for the Project, despite the best planning and design or the implementation of mitigation to reduce residual environmental effects (Chapters 2 and 8, and Appendix D); and
- has proposed a follow-up program and associated monitoring activities, particularly in areas where the prediction of environmental effects of the Project lacked scientific certainty, or where monitoring to determine the effectiveness of mitigation is required, and to ensure its development is in compliance with federal and provincial laws and regulations (Chapter 9).

Specific examples of where Northcliff/SML has incorporated the principles of sustainable development and the precautionary approach in the planning and design of the Sisson Project include the following.

- The configuration of the open pit has been optimized to maximize the recovery of ore from the Sisson deposit while minimizing its footprint.
- The ore processing plant, TSF, and associated facilities are all sited within a single watershed, Napadogan Brook, for maximum effectiveness of responsible water management and ultimate closure of the project.
- The ore processing plant, TSF, and other major Project components are sited in very close proximity to the open pit location, thereby minimizing hauling and pumping distances for maximum energy efficiency.

- The TSF has been designed to exceed the requirements of Canadian Dam Association guidelines to ensure it will readily withstand the effects of extreme storm events and earthquakes.
- The TSF has been sited to avoid waterbodies to the extent possible, and its proposed location avoids disturbing lakes in the area, some of which support recreational fisheries. The size and configuration of the TSF have been optimized to avoid unnecessary disturbance or destruction of fish habitat as well as areas having concentrations of sites with elevated archaeological potential.
- All potentially acid generating process tailings will be stored sub-aqueously in the TSF to effectively mitigate the potential onset of acid generation.
- All waste rock (some of which is potentially acid generating) will be stored sub-aqueously in the TSF rather than in a separate waste rock storage area on the land surface. This conservative design feature avoids the need to collect and treat potentially acidic drainage that could otherwise occur from its storage, and minimizes potential environmental effects. Storing waste rock sub-aqueously in the TSF effectively mitigates acid generation from the rock. This element of the Project represents industry best practice.
- No waste rock will be used to build the TSF embankments since some is potentially acid generating. Instead, a quarry will be developed on-site to provide rock for the embankments which is not potentially acid generating.
- Ammonium paratungstate (APT) will be produced on-site as an added-value end product, thereby enhancing job creation and economic benefits for the people of New Brunswick and Canada.

While the mining of a non-renewable resource may be considered by some to be inherently unsustainable, the Sisson Project is a key element of a sustainable mining industry in New Brunswick that is, in turn, essential to sustaining the New Brunswick economy. CEAA recognizes that completing an EIA of a project like the Sisson Project contributes to achieving sustainable development and, when carried out responsibly, can contribute significantly to a sustainable economy to the benefit of the people of New Brunswick and Canada. To this end, the EIA of the Sisson Project has contributed significantly to ensuring that its development, Construction, Operation, and ultimate Decommissioning, Reclamation and Closure will not adversely affect the needs of future generations.

### **1.3.6 Benefits to Canadians**

The Terms of Reference for this EIA Report (Stantec 2012a) require that it describe “how Canadians benefit from the project planning and information gathering process undertaken by the Proponent as part of the environmental assessment.”



As a planning tool, environmental assessment is a valuable mechanism for integrating the environmental, engineering, and socioeconomic aspects of the Project, and for bringing issues and concerns raised by the public, stakeholders, and Aboriginal people into the planning, design, review, approval, and development of the Project. As a key component of Project planning and design, the EIA process has benefitted Canadians in the following important ways.

- It has highlighted opportunities for avoiding or minimizing adverse environmental effects, and for garnering beneficial effects, such that the Project as planned will not cause significant adverse environmental effects, and environmental benefits of the Project will be maximized.
- It has provided the opportunity for the principles of sustainable development, including the precautionary principle, to be incorporated into the Project design and development to meet the societal needs for tungsten and molybdenum without compromising ecosystem integrity for present or future generations.
- It has afforded substantive and meaningful opportunities for the public, stakeholders, and First Nations to become informed about the Project, to voice their interests and concerns, and to provide valuable input into the planning and design of the Project. Such engagement activities have been conducted through working groups formed with a variety of stakeholders to share information and discuss issues relevant to the Project, as well as through other meetings, open houses, newsletters, a store-front office, and other means.
- It has provided many opportunities for Aboriginal participation in the EIA to foster dialogue among First Nations, Northcliff/SML, and the provincial and federal Crowns in respect of potential benefits of the Project; to support the Crown's duty to consult with First Nations; and to provide opportunities for Aboriginal issues, concerns and interests to be heard and addressed. This dialogue has occurred directly between Northcliff/SML and First Nations leadership, between the Crown and First Nations leadership, through open houses in First Nation communities by Northcliff/SML; and importantly through a First Nations EA Working Group formed to share information about, and discuss issues relevant to, the Project.
- It has advanced scientific knowledge of Central New Brunswick ecosystems, not only in determining and documenting the components, current conditions and quality of the various ecosystems of the area, but also in demonstrating how a mine can be successfully developed in remote, relatively undeveloped areas of New Brunswick in an environmentally-appropriate way.
- It has provided opportunities for people to appreciate the economic development, employment, and other social benefits the Project can deliver to New Brunswick communities which have a long history of industrial and resource-based development, but have suffered in recent years from limited development, high unemployment, and reduced economic activity due to mill closures and other societal and economic pressures.

## 1.4 PURPOSE AND ORGANIZATION OF THE EIA REPORT

This EIA Report has been developed to meet the requirements of the Final Guidelines issued under the New Brunswick EIA Regulation and the Terms of Reference that both form the scope of the EA under *CEAA* and were written to reflect the requirements of the Final Guidelines. The EIA Report is organized in eleven chapters, as follows.

- Chapter 1 provides an introduction to the EIA Report, identifies the Proponent and provides a brief Project overview, provides context for the Project, and outlines the structure and content of the EIA Report.
- Chapter 2 describes the planning of the Project, outlines the principles and philosophies applied by the Proponent in the design, construction, and operation, and ultimate decommissioning, reclamation and closure of the Project, and identifies the environmental management initiatives and practices that will be implemented as part of the Project to minimize environmental effects.
- Chapter 3 provides a detailed Project Description of the proposed elements of the Sisson Project, and describes how the Project will be constructed, operated, and ultimately decommissioned, reclaimed and closed at the end of mine life. Alternative means of carrying out the Project that are technically and economically feasible are discussed. Emissions and wastes, transportation requirements, and employment and expenditure for the Project are described.
- Chapter 4 provides a discussion of the applicable regulatory framework, including the regulatory requirements for the EIA; the scope of the Project and the scope of the EIA; a summary of public, stakeholder, Aboriginal, and regulatory consultation and engagement efforts; and other matters relevant to the scoping of the EIA. The valued environmental components (VECs) that have been selected for the EIA are identified. Additionally, a list of other projects and activities that are considered for the assessment of cumulative environmental effects is provided.
- Chapter 5 provides a description of the methodology used to conduct this EIA to meet the requirements of the EIA Regulation and *CEAA*.
- Chapter 6 provides a summary of the existing environmental setting of the Project area, including the historical setting, ecological context, and socioeconomic context of the region.
- Chapter 7 provides a summary of the key predictive studies that were carried out to provide information or analyses to support the environmental effects assessment of the Project.
- Chapter 8 provides the assessment of potential environmental effects of the Project, including cumulative environmental effects, on various VECs of relevance and importance to this EIA, for all Project phases, as well as for accidents, malfunctions, and unplanned events.
- Chapter 9 describes the follow-up and monitoring program that will be developed in respect of the Project.

- Chapter 10 summarizes the mitigation measures proposed for the Project.
- Chapter 11 provides conclusions of the EIA.
- Chapter 12 provides the references cited or consulted in the preparation of the EIA Report.

Additional supporting information is provided in the Appendices.

#### **1.4.1 Tables of Concordance**

Tables of Concordance that list the information requirements of the Final Guidelines (NBENV 2009) and Terms of Reference (Stantec 2012a) in relation to the sections of the EIA Report in which the information is presented are provided in Appendix C.

