

# 1 INTRODUCTION

## 1.1 NAME OF THE UNDERTAKING

The name of the undertaking is “Howse Property Iron Mine – Howse Minerals Limited”.

## 1.2 PROPONENT

In order to acquire a 100% share of the Howse Property, Tata Steel Mineral Canada Ltd. (TSMC) created Howse Minerals Limited (HML), a wholly-owned subsidiary based in St. John’s, Newfoundland and Labrador. HML has acquired a 100% participating interest in the mineral licenses comprising the Howse Property and is responsible for managing and operating the Howse Property. HML was appointed the Operator and legal owner of the Howse Property and is therefore considered the proponent for this undertaking.

TSMC is a joint venture between Tata Steel Ltd. and New Millennium Iron Corp. (NML), which was established in October 2010. Tata Steel Ltd. owns 80% of the company shares, while NML owns the remaining 20%. TSMC is part of Tata Steel Group, which is a Fortune 500 company and is among the top 10 steel producers in the world. The Tata Steel Group has over 81,000 employees spread over five continents. TSMC is developing iron ore deposits in Québec and Newfoundland and Labrador, Canada. Tata Steel Ltd. is part of the Tata Group.

<b>Name of Corporate Body:</b>	Howse Minerals Ltd.
<b>Chief Executive Officer:</b>	Rajesh Sharma, CEO and Managing Director
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<b>Project Director:</b>	Loïc Didillon, director environment and permitting, Tata Steel Minerals Canada
<b>Address:</b>	1000 Sherbrooke West, Suite 1120 Montréal, Québec H3A 3G4
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**Rajesh Sharma** holds an MBA (marketing and operations) from XLRI, Jamshedpur and an engineering degree (E&C) from IIT Roorkee. He also successfully completed a scholarship program on globalization and leadership from the London School of Economics in 2002. He has over 20 years' experience in various businesses with the Tata Group. He has lived and worked in various geographies in the continents of Asia, Africa, North America and Europe.

In November 2010, he was appointed CEO and managing director of TSMC. Prior to this, Mr. Sharma was executive in charge of Southern Africa for Tata Steel, responsible for new investments and acquisitions in mining and minerals related to the steel industry.

Mr. Sharma has diverse cross-functional and cross-industry experience with the Tata Group. His experience encompasses leading large-scale start-up companies, international investments and acquisitions and heading global business units, amongst others. He is also a regular speaker at business seminars and conferences in connection with the mining industry, and has addressed national and international audiences.

**Loïc Didillon** moved to Canada from France in 2003 with a Master's degree in ecology, biology and environment. Prior to that, he worked in the environment sector in France (pulp and paper industry), Switzerland (*Université de Neuchâtel*), Guadeloupe (research hospital center), and Corsica (regional district of Ghunsani). Since moving to Canada, Mr. Didillon has worked with the St. Charles River Basin Council in the City of Québec, in the mining industry as an environmental superintendent in Val d'Or, as a biologist and environmental advisor at the Biotechnology Research Institute, as an environmental advisor at Bell Canada's head office and with SNC-Lavalin as an environmental senior officer for a project in Libya. Mr. Didillon has been working as environment and permitting senior manager at TSMC head office since August 2011.

**Michael Lewis** joined TSMC in the spring of 2014 after several years in the forestry sector. He has a Master's degree in environmental management from the University of New Brunswick and has worked for the forest management agencies of Alberta, British Columbia, and New Brunswick, as well as with private silviculture operations. Mr. Lewis is now the environmental coordinator at TSMC's direct shipping ore (DSO) site in Labrador's Menihék region.

**Coco Calderhead** has a Bachelor's degree from the University of Victoria and a Master's degree from *Université du Québec à Montréal*, both in geography. Since 1996, Ms. Calderhead has worked in British Columbia, Tanzania, Ontario and Québec at the government, educational, First Nation and business levels. She has expertise in Aboriginal labour market matters, capacity-building, project implementation and coordination, organizational policy analysis and development, and Aboriginal community relations. Since 2011, she has held the position of manager, community relations, for TSMC and HML.

**Rabi Mohanty** (M.Sc., applied geology; M.Tech., mineral resource development and management) is a geologist with around 25 years of experience in exploration, resource estimation, quality control in mines, due diligence of mineral deposits and feasibility studies of mining projects. He has also has a post-graduate diploma in geostatistics from the geosciences department, Paris School of Mines, France. He has gained experience in metallic mines and deposits, but mostly in iron ore deposits located in various parts of the globe. He has been working in Canada since 2011 as one of the key members in the Taconite feasibility study and as a leader for the Howse exploration project. He successfully fulfilled the duties of chief – geology and minerals at TSMC before moving to his present position, chief – geology and new opportunities.

**Armand MacKenzie** has been a consultant on legal issues for the Innu Nation in Québec/Labrador most of his life. He was born in Labrador, where his parents and grandparents taught him how to hunt and live

off the land. He later became interested in human rights issues and graduated from law school at the University of Ottawa.

As a lawyer, he had a private practice for fifteen years working for the Aboriginal communities, while being involved in land claims negotiations in Québec. He campaigned internationally for greater Innu self-determination, representing the Innu Council of Nitassinan at the United Nations, UNESCO, OAS and at the CBD. He argues that the Innu deserve fair compensation for being relocated off mineral-rich lands that were once their traditional hunting and gathering territory. He also participated in the drafting of the *United Nations Declaration on the Rights of Indigenous Peoples* and the *Inter-American Declaration on the Rights of Indigenous Peoples*.

More recently, with the Innu from Sept-Iles, he successfully led the negotiations of three impacts and benefits agreements and two exploration agreements and helped ITUM in partnering in two joint-ventures operating with mining companies in Québec-Labrador.

He is now with TSMC working for the CEO&MD, acting as the senior director on government and stakeholders relations.

**Paul Abongwa** (P.Geo., M.Sc., MST.) earned B.Sc. and M.Sc. degrees from the University of Yaoundé I. He later obtained a Master's degree in natural resources engineering at the department of chemical engineering, Lulea University of Technology, Sweden, with a specialization in mineral exploration. Mr. Abongwa has worked as a senior geologist and field manager and has vast knowledge of the trough, having been involved in projects throughout the Québec-Labrador Trough, from Grenville up to Ungava.

Mr. Abongwa is currently senior project geologist on the Howse Project. He previously worked as a mining and exploration geologist for more than 10 years, and in the course of his career, has worked on different types of deposits, and iron deposits in particular, in Africa, Scandinavia and Asia. As a geologist, he has been involved in project supervision, training and supervision of technical personnel. He is a member in good standing of the *Ordre des Géologues du Québec*.

**Andrew Garrity** (Eng., BSc.) is a Mining Engineer with a bachelor's degree from the University of Arizona. As a student he worked for two different Freeport-McMoRan copper mines. After receiving his degree Mr. Garrity went to work for Mintec Inc., producers of MineSight software. As a MineSight Specialist Mr. Garrity provided support and training to all types of mining operations across the globe. In 2013 Mr. Garrity came to Montreal to train the TSMC mining team to use MineSight software for their operation. In October 2014 Andrew Garrity joined the TSMC team.

**Mr Debasis Kundu** (B.Tech (Hons.) in Mining Engineering) from Indian Institute of Technology (BHU), India and M.Tech (Dist.) in Environmental Science and Engineering from Indian School of Mines, Dhanbad. He was appointed Vice President (Technical) in April, 2013.

Mr Kundu joined Tata Steel in 1989 and worked in various capacities in iron ore, manganese and dolomite mines. In 2001, he was appointed as Head (Planning), Mines Division entrusted with the responsibility of raw-material planning for the integrated steel operations in Jamshedpur, Tata Sponge and Ferro-Manganese Plant, Joda. Mr Kundu played a key role in the capacity enhancement of iron ore mines from 7.2 to 12.8 MTPA. He was also responsible for raw-material planning for the newly built 3 MTPA Steel Plant in Orissa.

In 2008-09, Mr Kundu had a brief spell in Santa Fe Mining, Chile as General Manager (Mines) responsible for the development of a green-field magnetite project.

From 2009 onwards, Mr Kundu has been involved in scanning and selecting iron ore projects in several countries around the world, which ultimately led to Tata Steel taking an Investment Decision in the Direct Shipping Ore (DSO) Project and a Feasibility Study for the Taconite projects in Northern Canada with New Millennium.

In a career spanning over 25 years in the mineral industry, Mr Kundu has made note-worthy contributions in technological aspects for mineral exploration, extraction, beneficiation and sales. In his present capacity as Vice President (Technical), Mr Kundu is responsible for long-range planning of the DSO Project, technical support for new mineral acquisition, permitting, project financing, sales and future investment avenues in taconites.

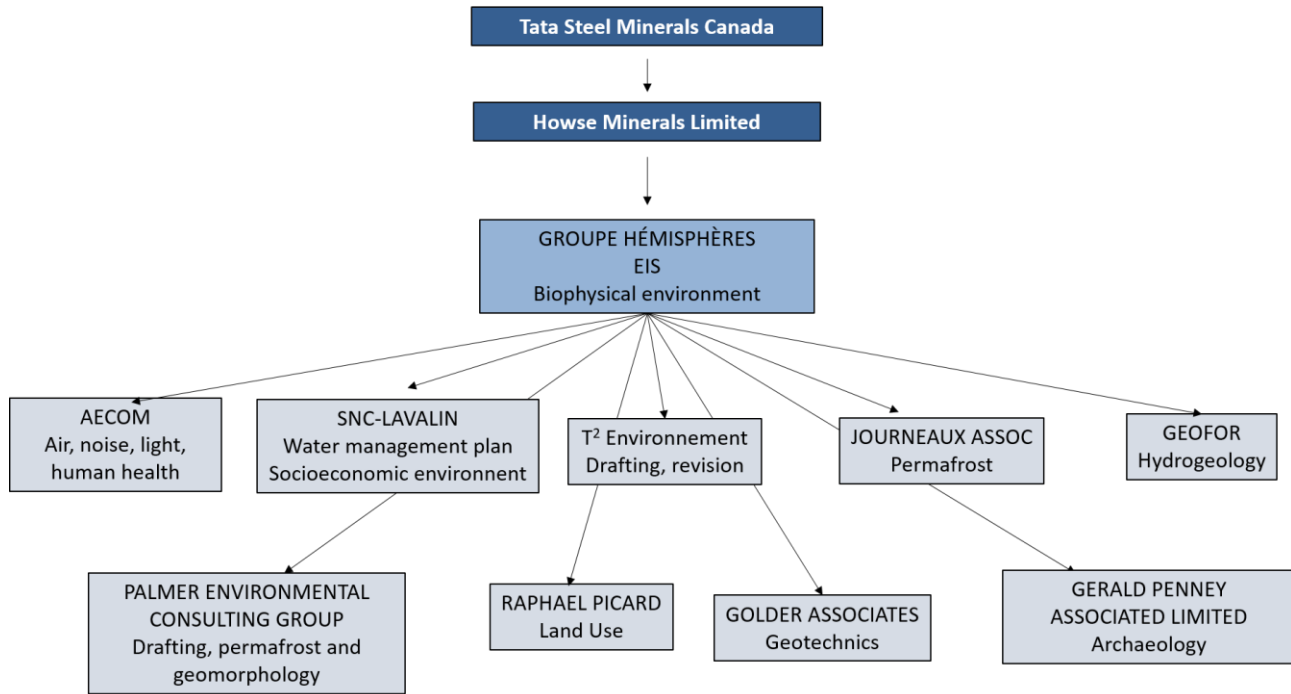
**Lisa Clancey** (P. Tech.) is a certified environmental technologist with the Association of Engineering Technician and Technologists of Newfoundland and Labrador. Ms. Clancey graduated from the Environmental Technology Program from College of the North Atlantic in 2005. Ms. Clancey is experienced in Phase I, II and III environmental site assessments for various residential, commercial, and industrial sites, as well as up-, mid- and down-stream oil and gas facilities for due diligence and real estate transactions. In addition, Ms. Clancey is experienced in conducting detailed site assessments, environmental field reports, pre-site assessments, groundwater well installation and monitoring, borehole logging and reporting, as well as the creation of Standard Operating procedures.

**Jean-Francois Dion** is an experienced environmental and geological field technician. Mr. Dion graduated from the Mining Technology program at the Cégep de Thetford in 2012. He is experienced in implementing and conducting regulatory environmental monitoring programs related to federal and provincial mining regulations as well as conducting environmental characterization sampling programs and redacting field data reports. In addition, he is experienced with wastewater treatment and has also worked on grassroots and advanced mineral exploration ventures and a wide variety of silviculture operations in Québec, Alberta and British-Columbia.

### 1.3 CONSULTANTS

The various consultants working on the EIS are presented in Figure 1-1. The consultant mandated by HML for the EIS and biophysical components of the Howse Project is Groupe Hémisphères. The resource person is Mariana Trindade and her contact information is:

<b>Name of consultant:</b>	Groupe Hémisphères
<b>Project manager:</b>	Mariana Trindade
<b>Address:</b>	1453, rue Beaubien Est, Suite 301 Montréal, Québec H2G 3C6
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**Figure 1-1 Project Flowchart**

### 1.3.1 Groupe Hémisphères

**Groupe Hémisphères** is an environmental consulting firm founded in 2004 by three experienced environmental professionals: Mr. Daniel Néron, geographer, Mr. Hugo Thibaudeau Robitaille, biologist and Mr. Christian Corbeil, senior technician and professional technologist. They opened their first office in Beaumont and a second one in Montréal in 2006. Note that the Beaumont office moved to Lévis in 2012, joining the Québec Urban Community. The company has been active in all regions of Québec, including the north, as well as in Labrador.

Groupe Hémisphères employs a multidisciplinary team of professionals that has strong knowledge of the various environmental issues related to the characterization and management of aquatic, riparian and terrestrial ecosystems, as well as environmental impact studies (EIS) and stream management. Knowing all the legal aspects related to working in these various natural environments is part of the commitment of Groupe Hémisphères, which always executes its projects in accordance with current legislation and following the best practices put forward by the government.

To meet the current needs of its clients, Groupe Hémisphères uses a georeferenced approach and delivers digital information in common or desired format. Its respect for budgets and deadlines makes Groupe Hémisphères a reliable and renowned firm. Groupe Hémisphères is well-positioned in the environmental market in Québec as a contractor, customer or partner with many large engineering firms located in Québec, such as AMEC, SNC-Lavalin Environment and AECOM. The company also has a network of professional subcontractors in certain specialties to complement its expertise when necessary. Since 2004, Groupe Hémisphères also has a supply arrangement with Public Works and Government Services Canada.

Groupe Hémisphères is managing the production of the EIS report and is involved more specifically in the terrestrial ecosystem, aquatic and hydrological studies, as well as in the description of the biological environment.

**Mariana Trindade** (PhD, Environmental studies) holds a doctoral degree in physical geography, and a diploma in Environmental Impact Assessment with a background in biology. She has 10 years of multidisciplinary environmental research experience relating the abiotic and biotic components.

Mrs Trindade has worked on studies on the effects of climate variability and change on terrestrial systems, such as caribou habitat, caribou diet, vulnerability of alpine ecosystems to climate (dendroclimatology), forest ecology (relating harvesting practices to revegetation characteristics) and disturbance studies (fire, ice and wind), and distance modelling of biological data. With a strong multidisciplinary background, she has nearly 15 years of experience with field work in remote locations across Canada.

Mrs Trindade started with Groupe Hémisphères in 2015 as a biologist and project manager and is responsible the coordination of the supplemental studies and the revisions and writing of the Final EIS.

**Julie Bastien** (M.Sc. Water) is a biologist with a Master's degree in water sciences. She has more than 10 years of professional experience in greenhouse gas, water quality and environmental evaluations. She has worked on various EIS for mining, pipeline, hydroelectric powerplant and railway projects. As a project manager, Ms. Bastien conducted and participated in the biophysical field surveys for the baseline study of a rare earths mining project near Kuujuaq, Québec. She was involved in the environmental studies related to the GENESIS project (IOCC-Rio Tinto), the Québec North Shore & Labrador (QNS&L) railway (IOCC-Rio Tinto) and the Mont-Wright iron mine (ArcelorMittal). She was part of the UNESCO/International Hydropower Association greenhouse gas working group, and as such, participated in writing the Greenhouse Gas Measurement Guidelines for Freshwater Reservoirs. She has done field surveys and presentations in South America, Africa, Oceania and Asia.

Ms. Bastien was the project manager and was responsible for the integration of the whole EIS study and the terrestrial fauna component of the project.

**Christian Corbeil** (Wild. Man. Tech.), a member of the *Ordre des Technologues professionnels du Québec*, has 25 years of experience in environmental research and investigation, as well as in the technical management and administration of projects pertaining to wastewater, soil and water characterization, ecological surveys and the rehabilitation of contaminated sites.

From 1988 to 1995, he developed his soils and water expertise while performing numerous worksite monitoring, geotechnical survey, sampling, ecological diagnosis and inventory tasks throughout Québec. Since 1995, Mr. Corbeil has supervised several soil, sediment, surface water and groundwater characterization studies. He has also monitored long-term projects for different contexts and regulations and planned many decontamination projects for sites with various problems, and has carried out preliminary tests and authorization certificate applications. His management expertise includes the restoration of sites that have been contaminated by oil, mercury or heavy metals, particularly in remote areas and on islands. He has also interpreted toxicological and ecotoxicological risk-analysis data for such projects and has participated in the federal and provincial environmental assessment processes applicable to them.

Since 2004, Mr. Corbeil has been active in the development of Groupe Hémisphères at every level, such as by setting-up wastewater management tools and developing an innovative work method for watersheds in the context of development projects. He is also actively working on promoting alternative solutions for mixed decentralized sanitation in isolated areas. Over time, Mr. Corbeil has developed a true analysis and

communication capability that enables him to contribute in a timely and efficient manner. He has also been involved in the DSO project since 2008.

Mr. Corbeil was responsible for quality control on the project and for the implementation of Groupe Hémisphères' internal system based on ISO 9001 2008 certification.

**Daniel Néron** (M.Sc. Geog.) is a physical geographer from *Université de Montréal* who has conducted various projects in environmental protection, specializing in the conservation of aquatic and wetland ecosystems. He has conducted several studies on water quality, water regimes, dam management, wetlands and flood-prone areas, legal expertise regarding high waterline delineation, restoration of degraded sites and habitat creation. He is also well-versed in problems related to fish habitat and is able to characterize spawning, rearing and feeding areas.

Mr. Néron started his career as an inspector, and then as a supervisor of special studies in the Lakes Program of the *Ministère de l'Environnement du Québec*. He worked as a hydrologist and as a geomorphologist in charge of numerous projects for Option Environnement inc. for seven years. Mr. Néron has participated in numerous environmental assessments for various levels of government, as well as for industrial clients.

With more than 20 years of experience, Mr. Néron focuses on lake and watercourse protection plans, hydrology and water quality monitoring programs, effects studies, environmental cartography and biodiversity inventories. He has expertise in geomatics and often participates in environmental mapping. He also has been involved with the water quality, aquatic and hydrology aspects of the DSO project over the past five years, such as the water budget of Timmins 1. In the last two year, he has been in charge of the hydrology component of the Taconite Labmag and Kémag studies. Recently, the modeled plume dispersion of the DSO effluent for environmental effects monitoring (EEM) under Metal Mining Effluent Regulations (MMER).

Mr. Néron was responsible for the hydrology study and climate component of the project.

**Marie-Ève Dion** (M.Sc. Env.) is a biologist with a Master's degree in environmental sciences. She has 10 years of experience in environmental management and has been part of the Groupe Hémisphères' team since May 2006 as a project manager and lead biologist of the Québec office. She is also in charge of ecosystem characterization projects and the species-at-risk survey program. She has been a member of the Association of Biologists of Québec since 2006 and of the Québec Association for Impact Assessment since 2009.

Ms. Dion has been responsible for many dozens of large-scale surveys of plants, aquatics and terrestrial communities in Québec and Labrador, as well as for various wildlife inventories. She has also completed over 40 high watermark delineation and wetland characterization projects, and carried out surveys of species at risk for the National Capital Commission (Gatineau Park), Canada Park, Longueuil and Montréal cities, as well as many projects for Public Works and Government Services Canada. As part of the development of a methodology for assessing the ecological value of wetlands, she conducted the literature review and developed the scoring system criteria.

Since 2006, Ms. Dion has been involved in biological inventories as part of several effects studies for wind farm and mining projects. She has coordinated the drafting of the technical reports and written several sections describing the biological components. She has also completed the assessment of the effects significance of biological components for seven effects studies. She has been involved with the DSO, Taconite and Howse projects over the past six years and is very familiar with the regional context.

Ms. Dion was responsible for the data analysis and effect assessment for the terrestrial ecosystem mapping and wetland components of the project.

**Simon Barrette** (M.Sc.) is a biologist who has been part of the Groupe Hémisphères team since July 2009. He has a Master's degree in biology with a specialization in ecology from *Université du Québec à Montréal*. He now has eight years of experience as a biologist, including five as a consultant. During his academic career, he participated in research projects in a variety of areas, including animal behavior, forestry, botany and conservation. Prior to joining Groupe Hémisphères, he worked in research in collaboration with several universities and Hydro-Québec and was project manager for a watershed committee.

Mr. Barrette works as a wildlife project manager with Groupe Hémisphères. He has directed several wildlife surveys, mainly concerning ichthyofauna, herpetofauna and bottom-dwelling invertebrates, limnology and terrestrial ecosystems in several regions of Québec, including the north, as well as in Labrador. He has also worked in the collection of data and drafting of environmental characterization and EIS for mining projects in northern Québec and Newfoundland and Labrador and for wind farm projects. In addition to planning and participating in fish habitat and water quality surveys, he developed and implemented the first cycle environmental effect monitoring (EEM) study design for the Elross Lake Area Iron Ore Mine (ELAIOM) project, including the biological and water quality monitoring. Mr. Barrette has been involved with the DSO Taconite and Howse projects over the past five years.

Mr. Barrette was in charge of analyzing data and drafting sections on water quality and aquatic fauna for the project.

**Samuel Denault** (M.Sc.) is a biologist/ornithologist at Groupe Hémisphères with over 15 years of experience in conducting bird surveys. He obtained his Bachelor's degree in Biology from *Université du Québec à Montréal*, and did graduate studies (M.Sc.) in natural resource sciences at McGill University. Mr. Denault has applied his extensive bird knowledge with various organizations in both the government and not-for-profit sector, including Environment Canada, *Regroupement Québec Oiseaux* and the *Observatoire d'Oiseaux de Tadoussac*. He has also participated in various environmental assessment studies in the boreal ecosystem from Québec to the Northwestern Territories. Mr. Denault has a broad understanding of avian communities breeding in eastern Canada and, as such, is one of the main editors of the Québec Breeding Bird Atlas.

Mr. Denault was responsible for the avifauna component of the project.

**Julie Tremblay** (B.Sc. biol.) is a biologist, GIS analyst and photo interpreter who has a certificate in geographic information systems. She also started post-graduate studies in geographic information systems. Ms. Tremblay thus has a strong understanding of and high level skills in mapping and spatial analysis. She masters MapInfo and ArcGIS software with the spatial analysis module, and 3D digital station for photo interpretation, among others.

Ms. Tremblay has worked for Groupe Hémisphères since 2008 and is head of the geomatics department. She has been a member of the FloraQuébec Association since 2014 and has training in vascular plants at risk.

As part of Groupe Hémisphères team, Ms. Tremblay has been responsible for geographical data management and map production for several major projects, including effects studies in northern Québec and Labrador. She has also been responsible for the ecological mapping of wetlands and terrestrial ecosystems and developed automation software algorithms to calculate the ecological value of wetlands using photo-interpretation and data collected in the field. Ms. Tremblay has participated in several flora and fauna surveys, conducted high waterline delineations and wetland characterizations and participated



in the development of several methodologies of ecological value assessment. Ms. Tremblay has been involved with the DSO, Taconite and Howse projects over the past six years.

Ms. Tremblay participated to the data analysis and effect assessment for the terrestrial ecosystem mapping and wetland components for the project.

**Élissa Dickoum** is a geomatician with a Master's degree in both geography and remote sensing and geomatics applied to the environment with five years of experience. Ms. Dickoum has in-depth knowledge in mapping and spatial analysis and is adept at using software such as Mapinfo and ArcGIS.

During her Master's studies, she completed internships as a geographer and geomatician on research issues for the biodiversity conservation of forest habitats, both in mountain ecosystems and agro-forestry. In addition, Ms. Dickoum worked for three years on the development of cartographic services and management of environmental projects involving the development of natural resources as a result of global change.

As part of Groupe Hémisphères team since May 2012, Ms. Dickoum has produced numerous cartographic outputs through various projects, consisting of characterization of ecosystems, constraints analysis and wastewater management. She has been involved with the DSO, Taconite and Howse projects since 2012.

Mrs. Dickoum was responsible for producing the maps for the project.

### 1.3.2 T2 Environnement

Founded by two passionate biologists with over 40 years of experience, T<sup>2</sup> Environnement provides customized environmental services. T<sup>2</sup> Our mission is to balance development, restoration and the conservation of natural and man-made habitats so as to reduce or eliminate the environmental effects of our private- and public-sector clients' projects in Québec and elsewhere in Canada. Environnement's priority is to help our clients to develop viable projects that maximize the positive effects on the biophysical and social environments while reducing the negative ones. Our team of senior experts has successfully completed major projects with a diversified clientele. During the last 10 years, Mr. T. Robitaille acted as a project director for the completion of large scale environmental impact studies in the field of renewable (forests and wind energy) and non-renewable resources (mining). In this role, Mr. T. Robitaille coordinated multidisciplinary teams of biologists, geologists, geographers and engineers to perform all needed biophysical inventories in remote northern areas and to produce the related technical reports. He also assessed the biophysical effects and proposed targeted mitigation measures to reduce project effects on the environment.

**Hugo Thibault Robitaille** (M.Sc. Env.) is a project manager and biologist with a Master's degree in Environmental Studies from Université du Québec à Montréal (UQÀM). He has been working as a consulting biologist and soil scientist for more than 20 years with municipalities, governments, industries and private-sector clients.

Mr. T. Robitaille has led and participated in numerous biophysical mapping studies across Canada, including for CHARS in 2014 with a multi-disciplinary terrestrial ecology team focused on documenting the characteristics of terrestrial ecosystems near Cambridge Bay and in northern mainland Nunavut. He has carried out many shoreline and sensitive ecosystem characterization and mapping projects in Québec, Labrador, Canadian Arctic, British Columbia and Asia. He recently coordinated the implementation of a comprehensive program of floristic inventory and predictive ecosystem mapping, including wetlands and sensitive ecosystems, in a subarctic area covering more than 35,000 km<sup>2</sup>. He led several major projects on flora and fauna species with status and successfully completed complex ecological restoration projects.

He also directed four major wetland and natural environment conservation plans for municipalities, facilitating the long-term protection of hundreds of km<sup>2</sup> of endangered ecosystems. Mr. Robitaille has been closely involved with the DSO, Taconite and Howse projects over the past ten years. He was in charge of the production of the biophysical components of the Elross Lake Area Iron Ore Mine (ELAION) EIS and led the Taconite EIS data collection process.

Mr. Robitaille acted as a senior advisor for the project, and assisted the project team in data and study review and report revision.

### 1.3.3 Raphaël Picard

**Raphaël Picard** has studied history (BA), anthropology (MA), public administration (graduate diploma), corporate governance and business management (MBA). He was the chief of the Pessamit Innu First Nation from 2002 to 2012. Prior to this period, he taught community intervention and management with First Nations at Université du Québec à Chicoutimi (1983-1990) and had his own consulting company on public policy analysis, government negotiations and relations, and program development (1990-2002). Since 2012, he has had his own consulting firm (Consultants Innus) which specializes in public relations, counselling for the management of First Nations, land use and the environment, as well as in business development. He has also worked for several Aboriginal and government organizations and sat on a number of boards of directors and sectoral committees.

Mr. Picard was responsible of the land use study.

### 1.3.4 SNC-Lavalin

SNC-Lavalin is one of the leading engineering and construction groups in the world and a major player in the ownership of infrastructure. With offices in over 50 countries and approximately 45,000 employees, SNC-Lavalin provides EPC and EPCM services to clients in a variety of industry sectors, including oil and gas, mining and metallurgy, environment and water, infrastructure and power. SNC-Lavalin is involved in the project with regard to the water management plan, the socioeconomic environment and the revision of specific sections of the EIS.

### Environment and Water Team

**Geneviève Dionne** is an anthropologist specializing in the integration of socioeconomic issues in EIS and stakeholder engagement. Her experience at the Food and Agriculture Organization of the United Nations led her to work with participatory development approaches (sustainable livelihood approaches) and to promote their integration into the Food and Agriculture Organization's work on sustainable development and emergency projects. She also contributed to field data collection and analysis as part of social effects studies relating to hydropower and mining projects in northern Québec. She works with Aboriginal communities and integrates socioeconomic and land-use issues into project planning processes. As an anthropologist at SNC-Lavalin, she is involved in Environmental and Social Impact Assessments and in stakeholder engagement strategies. She has worked in Sri Lanka, Guatemala, Ecuador, West Africa and Northern Québec. She speaks French, English and Spanish.

Ms. Dionne was responsible for data analysis and effect assessment for the socioeconomic, land use and Aboriginal Traditional Knowledge (ATK) components of the project.

**Christian Laliberté** is a geographer, Msc. Environment, with 15 years of experience in environmental and social studies. He coordinates environmental and social impact assessment, socioeconomic studies, resettlement action plan, environmental monitoring program and the development of geographic

information system. He coordinated socioeconomic and biophysical surveys and participated to public consultations. He acquired a diversified expertise due to his involvement in several major projects in mining, hydroelectric, industrial and transport infrastructure sectors. Mr. Laliberté has been involved in international projects in Canada, Central Asia, Haiti and several African countries. He speaks French and English. Mr. Laliberté contributed to the country food survey and the effect assessment for the socioeconomic, land use and Aboriginal Traditional Knowledge (ATK) components of the project.

M. Laliberté was responsible for data analysis and effect assessment for the socioeconomic, land use and ATK components of the project.

**Christian Fortin** (M.Sc. Biology) is a biologist with a Master's degree in animal ecology. He has 20 years of experience in the following areas: amphibian, reptile and land mammal ecology, rare species, biodiversity, impact assessments, habitat studies, wildlife surveys and management of beaver-related issues. He has worked on various EIS in hydroelectric, road, wind energy, and mining projects. He is involved in writing proposals, planning and conducting fieldwork, analyzing and writing reports and scientific papers. His previous experiences on caribou include the following projects: Taconite Project (New Millennium Iron – TATA Steel), Raglan Project (Glencore), GENESIS project (IOCC-Rio Tinto), and the extension of Route 167 North to the Otish Mountains (Transports Québec).

Mr. Fortin was a reviewer for the caribou component of the project.

#### **Sustainable Mining Development Team**

**Marie-Hélène Paquette** (Eng., M.Env.) is a civil engineer with 20 years of experience. She holds a Bachelor's degree from *Université de Sherbrooke* and completed a Master's degree in environmental management at *Université de Sherbrooke* in 2010. Ms. Paquette has been involved in several mining environment projects such as mine tailings containment and landfill site projects, including long-term planning, preparation of mine tailings OMS manuals, geotechnical and hydrological studies and preparation of drawings and specifications for various earthworks.

Ms. Paquette was responsible for the Water Management Plan for the project.

**Andrew Peach** (P.Geo., EP.) is a senior environmental scientist / fisheries biologist. He has a total of 12 years of applied consulting experience, much of which has been gained under a wide range of conditions. Mr. Peach is a registered professional geoscientist in the provinces of Newfoundland and Labrador and Nova Scotia and is a nationally certified environmental professional (fish and wildlife).

Mr. Peach has been involved in numerous environmental, geological, and engineering projects throughout Canada (Newfoundland and Labrador, Nova Scotia, and Ontario) and some within the United States and Africa. Projects have generally involved materials testing; geological, hydrogeological, and geotechnical studies; environmental site assessments (phase I and II); environmental site remediation; federal and provincial environmental assessments; environmental effects monitoring; toxicology studies; and baseline environmental studies related to hydroelectric, transportation, and mining development projects.

Mr. Peach has also worked directly within the mining industry while employed with the IOCC as a geotechnical geologist for the Carol Project in Labrador City, NL.

Mr. Peach participated to the development of the WMP for the project.

**Patrick Scholz** (Eng., M.Eng.) is a civil engineer specialized in water resources with more than 15 years of experience. Mr. Scholz has provided technical expertise for various hydrologic and hydraulic analyses, including runoff management, hydropower system evaluation, surface water management for mining sites,

and inflow forecasting. His assignments included climatic and hydrologic data collection and analyses, flood and low flow analyses, water balance modelling, hydrologic and hydraulic modelling, dam break and dynamic flood routing, river and reservoir flow routing, flood inundation mapping, and hydraulic structure design for water conveyance and storage.

Mr. Scholz participated in the development of the WMP for the project.

**Anh-Long Nguyen** (Eng., M.Sc.) is a process engineer with 15 years of experience specializing in the water treatment industry for the mining, industrial and municipal sectors. Mr. Nguyen is presently the discipline lead for water treatment in the Sustainable Mine Development group. He has acquired a solid background in the design and development of water treatment processes, including clarification, filtration and membrane systems. He has participated in all project engineering phases, including pre-feasibility studies, basic and detailed engineering, and start-up and commissioning. He has also acted as proposal manager, where he was responsible for a team of specialists (engineers, designers and estimators) for the process design, technical and commercial risk evaluation, cost estimate and proposal preparation.

With SNC-Lavalin, he has participated in the development of a mine site water management plan where he identified water sources, looked at water quality, identified streams requiring treatment, and designed water treatment processes to deal with these streams.

Mr. Nguyen participated in the development of the WMP for the project.

**Abdel Benlahcen** (Ph.D.) is a professional geologist with Master's and Ph.D. degrees in hydrogeology. He has over 12 years of experience in consulting and research. He is involved in EIS for mining projects, and in groundwater supply and source water protection projects. His experience covers several aspects of hydrogeological field investigations and project management for institutional, mining and industrial projects.

He has experience in geochemical modelling and multivariate geostatistical analysis. He supervises fieldwork for major projects, prepares terms of references for proposals, technical notes and reports. Dr. Benlahcen collaborates in projects of environmental site assessments and the characterization and remediation of contaminated sites. He has extensive knowledge of guidelines and regulations in relation to the environment and is well acquainted with the DSO environment, as he has participated in several hydrogeological studies for related sites between 2008 and 2011.

Mr. Benlahcen participated in the hydrogeology modelling for the project.

### 1.3.5 AECOM

With nearly 100,000 employees — including architects, engineers, designers, planners, scientists and management and construction services professionals — serving clients in more than 150 countries around the world following the acquisition of URS, AECOM is a premier, fully integrated infrastructure and support services firm. AECOM is involved in the EIS for the air, noise, ambient nighttime light and human health risk assessment studies.

**Denis Lalonde** (Eng.) is a project manager in the AECOM Montréal office with 25 years of experience in the environmental industry. He earned a Bachelor's degree in chemical engineering from *Université de Sherbrooke* in 1989. He is an expert in the field of air quality, including monitoring, emissions inventories, permitting, modelling, auditing and more. Over the years, he has advised several industrial clients in the mining, petroleum refining, cement, thermal power, incineration and forest products industries. He was an environmental manager with Norbord, an important wood products manufacturer with operations in the

US, Canada and the UK. His international experience has included UNIDO and a four-year posting in Vietnam for a CIDA-funded project on environmental governance strengthening.

Mr. Lalonde was director of the air, noise and light and human health risk assessment studies and corresponding EIS sections for the project.

**Alexandre Bourget** has been working at the AECOM Montréal office since 2012 as an environmental engineer, after earning his B.Eng. in biotechnology process engineering at *Université de Sherbrooke* in 2008, and completing his M.Sc. in civil engineering at Université Laval in 2011. During the last three years, he led the technical aspect of a transition project from MOBILE to MOVES for the transportation simulation system of the Québec Ministry of Transportation and participated in several air dispersion modelling projects (CALPUFF, AERMOD) for impact studies. He also participated in various risk assessment modelling projects using industry hazard analysis tools such as PHAST and ALOHA. Since 2012, Mr. Bourget has been regularly involved in air dispersion modelling studies in the environmental permitting of the DSO project.

Mr. Bourget was responsible for the air quality study for the project.

**Niloofar Sokhandan** is a meteorologist in the Industrial Environment group at the AECOM Montréal office. She earned her master's degree in Atmospheric Science and Meteorology at UQAM in Montreal Québec in 2013. As a member of the TRAQ research group at McGill University, she developed the use of the CALPUFF air model to assess the effects of transportation on public health in Montreal.

Ms. Sokhandan worked on the air quality study for the project.

**James Au** is an acoustic engineer with AECOM's acoustics, noise, and vibration group. He has been working in acoustics and noise control consulting engineering since 2008. Mr. Au's general areas of expertise include sound and vibration measurement, sound and vibration ambient monitoring, acoustic software modelling (Cadna/A and EASE), building acoustics, and mechanical noise assessment and abatement; transportation services, including road and rail noise and vibration effect, noise barrier analysis, and Ministry of Transportation Ontario highway noise assessment; and environmental services, including Ministry of Environment certificates of approval (air and noise), environmental assessments, and construction noise and vibration assessments.

Mr. Au was responsible for the noise study for the project.

**Brian Bulnes** is an acoustic engineering intern with the acoustics, noise, and vibration group. He has been working in the field of acoustics, noise, and vibration since October, 2013. He earned a Bachelor's degree in mechanical engineering in 2013 from the University of New Brunswick. Mr. Bulnes has experience in noise and vibration environmental assessments, sound measurement, sound and vibration monitoring, noise from transportation services, noise barrier analysis, acoustic software modelling (CadnaA), and construction noise and vibration assessments.

Mr. Bulnes worked on the noise study for the project.

**Rabih Alkhatib**, Ph.D., is a senior vibration engineer with the acoustics, noise, and vibration group. He has 13 years of experience in the areas of structural vibration, wind engineering, damping systems, finite element analysis, multi-body dynamics, noise, acoustics, structural health monitoring, and vibration measurements. Dr. Alkhatib has conducted numerous studies related to modelling and simulation of structural vibration induced by wind, footfall, blasting and machines. He has also designed passive and active vibration control systems and worked on projects involving environmental vibration, structure and ground borne noise.

Dr. Alkhatib was in charge of the blast vibration and overpressure modelling portions of the project's noise study.

**Martin Aubé** earned his Ph.D. degree in remote sensing from *Université de Sherbrooke*, Canada, and a Master's degree in astrophysics from Université Laval, Canada. Dr. Aubé is a teacher in the *Cégep de Sherbrooke* physics department, where he is researcher/coordinator of GRAPHYCS research group. He is an associate professor in the applied geomatics department at *Université de Sherbrooke*. Among many other affiliations, he is an associate researcher at *Centre d'applications et de recherche en télédétection* and a researcher at the *Centre de recherche en astrophysique du Québec*. Dr. Aubé was awarded the Excellence in Research award in 2014 by Québec's research council (FRQNT) and is Principal of Logis-Logique SENC.

Mr. Aubé was responsible for the ambient light study for the project.

**Mike Rankin** (M.Sc., RPBio., and CSAP Risk Specialist). Mr. Rankin has over 28 years of Canadian and international consulting and industrial chemical sector experience in human and ecological toxicology and contaminant health risk assessment and has direct relevant experience in environmental impact assessment as applied in Canada and internationally. He is a Registered Professional Biologist and a member of the BC Roster of Contaminated Sites Approved Professionals (CSAP-Risk Specialist). His practice focuses on risk management, remedial options and sustainability decisions in the context of human, terrestrial, and aquatic receptors and diverse contaminants (e.g., petroleum hydrocarbons, PAHs, metals, chlorinated dioxins/furans, chlorinated solvents). He is an experienced leader of multidisciplinary teams resolving regulatory and environmental contaminant issues including: environmental social impact assessment e.g., oil and gas sector initiatives (LNG, oilsands projects), mining, contaminated site risk assessment/management, Province of BC regulatory risk assessment guidance for petroleum hydrocarbons, instructor of environmental risk assessment, and regulatory/corporate toxicology reviews. International work experience derives from USA, Cuba, Guatemala, Thailand, Vietnam, Laos, Cambodia, Malaysia, Mongolia, Madagascar, Tanzania, Peru and Chile.

Mr. Rankin was responsible for the human health risk assessment study for the project.

**James Phibbs** (M.Sc., RPBio., PBiol.) is a biologist with AECOM in Winnipeg with more than nine years of experience investigating contaminated sites and conducting risk assessments. James has a Bachelors of Science, in Forestry focusing on logging effect on aquatic systems. James also completed a M.Sc. degree in environmental toxicology focusing on the aquatic effect of non-uranium metals in lakes down gradient of an active uranium mill in northern Canada. James has authored or co-authored five papers based on this research and presented at international conferences on aspects of toxicology and risk assessment related to metal mining in Canada.

James has experience conducting human health and ecological risk assessments in wild lands settings following both federal and provincial guidance for risk assessment. Since joining AECOM, James has focused on remote and complex contaminated sites with a specific emphasis on abandoned mine site investigation and risk assessment for government and private mining clients. Mr. Phibbs was responsible for the human health risk assessment study for the project.

Mr. Phibbs worked on the human health risk assessment study for the project.

**Mike Sanborn** (M.Sc. RPBio) is an Environmental Scientist (Level 5/Experienced) with over ten year's total experience (ten of which have been at AECOM) as an environmental consultant and risk assessment specialist. Mike manages small environmental projects, and routinely manages components of large environment investigations. Mike has extensive experience in the design, implementation, and conduct of

environmental investigations involving water quality, sediment quality, chemical tracers, contaminant fate and transport, and toxicity testing. In addition, he has extensive field experience in the sampling of marine and freshwater aquatic environments, marine and freshwater sediment, as well as extensive scientific laboratory experience relating to environmental chemistry, metals speciation, geochemistry and biological observations.

Mike has considerable experience in the conduct of human health and ecological risk assessments, particularly in support of the development or reclamation of mining projects. Mike has a good understanding of statistics which he brings to his risk assessment and site investigation work. Mike attempts to identify and provide novel scientifically defensible approaches to environmental issue where appropriate, providing added value to the project team and his clients. Since joining AECOM, Mike has been involved in the preparation of large environmental effects statements, detailed site investigations and the conduct of detailed human health and ecological risk assessments. Mike has been involved in several projects which have been met with regulatory approval under both federal and provincial jurisdictions.

Mr. Sanborn was a contributing author of the human health assessment study.

### 1.3.6 Golder Associates

Golder is an employee-owned, global organization providing consulting, design, and construction services in their specialist areas of earth, environment, and energy through technical excellence, innovative solutions and award winning client service. Golder is involved in the geotechnical study for the EIS.

**Carl Gravel** (Eng., M.Sc.A.) has a Bachelor's degree in geological engineering (2009) and a Master's degree in mineral engineering (2012), both from *École Polytechnique de Montréal*. In 2011, he joined Golder Associates Ltd. in Montréal where he is involved in mining geotechnical projects. His specializations include geotechnical site investigations, geotechnical rock mass characterization, and open pit rock mechanics studies and design.

Mr. Gravel was involved in the geotechnical field investigation for the project and was responsible for the preparation of the geotechnical study.

**Marc Rougier** (Eng., B.Sc. Hons.) is a geological engineer with more than 22 years of international experience. His fields of expertise are geotechnical engineering applied to mine projects, soil and rock slope stability, and applied geology and hydrogeology. Mr. Rougier acts as the technical lead on rock mechanics, engineering geology, hydrogeological and geotechnical design studies for open pit and underground mines, waste dumps, earth dams, quarries and tunnels, and highway, park and residential rock cuts. This includes landslide and terrain hazard assessments. Mr. Rougier also acts as overall project manager for multidisciplinary bankable feasibility studies, with emphasis on: mine geotechnics, hydrogeology, mine waste management and environmental baseline data collection, including wildlife, aquatics, geochemistry, hydrology and air.

Mr. Rougier was the technical lead for the project geotechnical study.

### 1.3.7 Geofor

**Gilles Fortin** (Eng., M.Sc.) graduated in geological engineering from *Université du Québec à Chicoutimi* in 1975 and received a Master's degree in Environment from *Université de Montréal* in 1992. He is currently president of the firm GEOFOR Environnement, which is specialized in hydrogeology. Since 2008, Mr. Fortin has been regularly involved as a hydrogeologist in the environmental permitting of the DSO project near Schefferville. He planned and managed all field campaigns aimed at determining groundwater configuration

and characteristics, as well as the anticipated effect of mining activities on groundwater. He supervised modelling of the dewatering of ore bodies, report writing and preparation of applications for certificates of authorization.

Mr. Fortin was responsible for the hydrogeology study for the project.

### **1.3.8 Gerald Penney Associates Limited**

Gerald Penney Associates is a Newfoundland-based private archaeological and heritage resource consulting company with 28 years of leadership in historic resource assessment and mitigation. The firm is the largest of its kind in eastern Canada, with a reputation for technical expertise, interpersonal skills and imaginative approaches.

Along with three archaeologists and a historian on staff, Gerald Penney Associates is associated with a number of professionally-qualified consultants and researchers. They bring multi-disciplinary ethnographic, documentary, and cartographic expertise as well as valued historical perspective to heritage investigations. They not only “cover off” regulatory compliance – the fundamentals of cultural resource management are its team members’ specialty. While the company’s professional focus is by definition reflective, its approach is forward-looking, respecting the lessons and the current value of the past.

Gerald Penney Associates was responsible for the archaeology study for the project.

**Gerald Penney** (M.A.) has an unparalleled background as a consulting archaeologist in Newfoundland and Labrador. As principal investigator, Mr. Penney, who has held more archaeological investigation permits than anybody in the Province, has built a dedicated and professional staff, emphasizing a team approach to projects that maximizes the members’ varied skills and abilities. His company has grown in step with the Province’s historic resources regulatory regime.

**Blair Temple** (M.A.), who has 17 years of experience in conducting Stage 1, 2 and 3 Historic Resources assessments, led the HRIA investigation. He specializes in historic era investigations and has been employed by Gerald Penney Associates since 2006, where his responsibilities include background research, field investigations and report writing.

**Robert Cuff** (M.A.), Gerald Penney Associates historian, has broad research interests in the social, economic, and political history of Newfoundland and Labrador. He has more than 25 years of experience in relating heritage and historical themes to the general public in a variety of media, including five years as managing editor of the *Encyclopedia of Newfoundland and Labrador*.

**Toby Simpson** (B.A.) is Gerald Penney Associates archaeological AutoCAD technician/surveyor, with 20 years of experience working on a variety of complex projects involving site consolidation and conservation for public access, in the UK and Middle East, and (since 2007) in Newfoundland and Labrador. His specialist knowledge and surveying experience assist in interpreting historic cartography and geotechnical data, and in precise recording of historic structures and archaeological features.

**Lori Temple** (B.A.), who holds a B.A. from Memorial University of Newfoundland, has been employed at The Rooms in various capacities for 15 years (mainly with the Provincial Museum of Newfoundland and Labrador). Currently Collections Manager for Archaeology and Ethnology, Provincial Museum, she catalogues and curates all artifacts for Gerald Penney Associates under contract.



**Miki Lee** (B.A.), a trained professional conservator, has been contract employed by The Rooms for the past 10 years. She has provided consultant conservation services to various archaeologists, and conducts all conservation requirements for Gerald Penney Associates.

### **1.3.9 Journeaux Assoc**

**Noel Journeaux** (Eng., M.S.C.E, F.ASCE) graduated in geological engineering from Queen’s University in 1960 and received a Master’s degree in civil engineering from Purdue University in 1962. Mr. Journeaux has civil engineering and engineering geology permits in Alberta Ontario, Québec, Newfoundland and Labrador, and Nunavut. He is also a Fellow of the American Society of Civil Engineers. Mr. Journeaux has been working in the field of geotechnical engineering for more than 45 years. He has strong experience in foundation design of several project types; namely, dams, bridges, maritime ports, excavations, tunnels and underground transport systems. Also, he is an expert in design of foundations in the warm permafrost of the west and the cold permafrost of the east Canada. Mr. Journeaux has been elected in 2015 to be a member of the technical committee of BNQ a member of the National Standards System (NSS) preparing guidelines for geotechnical investigation and foundation design in permafrost. Such experience has been gained in different sectors such as the mining, energy, transportation, construction and environment. Since 2007, Mr. Journeaux is the president of Journeaux Assoc. Division of Lab Journeaux Inc., a company that provides geotechnical laboratory testing and engineering services. Since TATA steel minerals started the construction of its production plant in Schefferville 2012, Journeaux Assoc. has been involved in the geotechnical and quality control aspect of projects involving the foundation for the dome, railway, water tank, screening structure and administration building. In 2014, Journeaux Assoc. conducted intensive geotechnical field investigation to design pit slopes in the discontinuous permafrost of different pits to be mined in the south area DSO 3 and in the north area DSO 4.

Mr. Journeaux was responsible for the evaluation of permafrost presence in Howse deposit.

## **1.4 CORPORATE POLICIES**

HML recognizes that Project operations can have a direct effect on the environment, and its primary environmental concerns are human health, environmental awareness and conservation of plants and wildlife. HML is committed to conducting its operations responsibly so as to minimize and eliminate, where possible, these effects on the environment. All employees, including contractors, follow safe and efficient practices to control environmental damage above, below, or at the surface during all operations.

TSMC has developed an Environmental Protection Plan (EPP) to attain its environmental goals (Volume 1 Appendix Ia). To effectively manage and implement the EPP, several mechanisms have been identified, including adequate communication with environmental personnel and other personnel on site, annual environmental performance reviews, environmental orientation, and regular hazard analyses and tool box meetings that incorporate environmental issues. Section 6.2.1 presents an overview of TSMC’s EPP document.

## **1.5 OVERVIEW OF THE PROJECT AND SCOPE**

HML is planning to mine the iron ore deposit at the Howse Property with the support of adjacent infrastructure. The Howse Property Project is located 25 km northwest of Schefferville, Québec, in Labrador, between Kauteitnat (also known as Irony Mountain, 840 m asl), Pinette Lake and HML’s DSO Project 1a. The center of the pit is located at 67°8’19.07”W, 54°54’31.18”N and the mineral rights of the property are registered under HML in the form of two map-staked licenses, 021314M and 021315M, which replace license

0201430M. The Howse Property is located on provincial Crown land, without any particular zoning. The Project area also lies outside areas for which there is a land use plan.

The Howse Project can be brought into production in a relatively short period of time and at a low capital cost. The Project requires few new installations and some of the required infrastructure (e.g. the railway, the road network, camp, mining equipment and explosives storage) are already in place at the nearby DSO project complex, which was recently put into operation.

A conventional in-pit drill and blast operation mining method will be used at the Howse Property. The extracted iron ore will be processed at a facility adjacent to the existing rail loop. As such, material will be hauled by truck to HML's DSO project rail loop loading area (less than 5 km from the Project) for crushing, and then shipped by train to Sept-Îles.

The construction of some new infrastructure will be required to mine the deposit at the Howse Property. The main physical works and activities involved for the Project are:

- open pit: approximately 105 ha 3D surface area and 78 ha projected surface area (footprint) with a maximum depth of 195 m. The production rate is expected to be 1,304 kt of dry ore in the first year and 3,043 kt/year in subsequent years until 2022. The maximum planned production is 9,130 kt/year (25,000 t/day), which will be reached in 2023 (see Table 1-2);
- stockpiles/dumps (overburden and topsoil): approximately 67.8 ha 3D surface area (63.5 ha projected surface area) of overburden and roughly 3.15 ha of 3D surface area (3.0 projected surface area) for topsoil; surrounded by peripheral ditches linked to a sedimentation pond;
- waste rock dumps (waste material): about 43.4 ha 3D surface area (39 ha projected area); surrounded by peripheral ditches linked to a sedimentation pond;
- a crushing and screening facility located near the rail loop at the DSO site; There will be one Primary Jaw crusher, and two secondary cone crushers. The specification sheets for the crushers are available in Volume 1 Appendix II;
- Howse haul road: an existing road from past IOCC mining activities will be upgraded (0.95 km), and 1.2 km of road will be built over a disturbed area to link the Howse Property to the existing TSMC DSO project road network;
- power generation;
- bypass road; at the request of local First Nation communities, the proponent is committed to the establishment of a bypass road at the Howse site. Alternatives to the configuration of these roads and their effects are discussed in Section 2.5.3;
- new site infrastructure: will consist of 3 trailers (washrooms, office, lunchroom) and parking spaces for the haul trucks and pickups;
- water management infrastructure: peripheral wells will be installed around the pit to lower the water table below the elevation of the mining operation. Dewatering will be carried out by means of two diesel-powered pumps and drained to a sedimentation pond, located at the north and south ends of the pit. All snowmelt and runoff water (draining all Howse Project planned physical works) will be collected with ditches and drained to sedimentation ponds before being discharged into the environment; and
- transport of ore and of solid, liquid and hazardous wastes from the Howse Property Project to the DSO Project Complex.

Apart from some dust increase due to vehicle traffic, the Howse Property Project will not add any pressure to the DSO Project plant complex activities. Previously-assessed quantities for ore processing will not be exceeded: no tailings or tailings process water will be generated by the Howse Property Project. The capacity of the worker's camp will never exceed its limit of 192 workers, and no increase in domestic waste

is therefore expected from the Howse Property Project. Domestic solid waste generated by the mine operations will be disposed at the TSMC-approved landfill site.

Some areas could not be considered for infrastructure construction due to topography and the presence of sensitive environments, i.e., the Irony Mountain area, wetlands, and Burnetta and Goodream creeks. The proposed layout was selected in order to accommodate Aboriginal rights or interests, after consultation with Aboriginal organizations and family trapline holders, to minimize the visual effects and the environmental effects on wetlands, water quality and fish habitat.

The approved facilities at TSMC's DSO project plant complex that have been recently put into operation and that HML plans to use include: a processing plant, a rail car loading system, an existing railway track from former IOCC operations, a camp to accommodate the workers, offices, a warehouse, workshops, garages, a laboratory, a landfill, and a wastewater treatment facility. All these facilities are not part of the scope of the current EIS.

## **1.6 ENVIRONMENTAL ASSESSMENT PROCESSES AND REQUIREMENTS**

In accordance with the Newfoundland and Labrador *Environmental Protection Act* (EPA), SNL 2002 and *Environmental Assessment Regulations, 2003*, "[...] anyone who plans a project that could have a significant effects on the natural, social or economic environment" is required to submit a Project Registration to the Department of Environment and Conservation for examination. The process consists of up to five steps: 1) registration and review, 2) Minister's decision and, if required, 3) preparation of guidelines for an Environmental Preview Report (EPR) or EIS, 4) proponent preparation of EPR or EIS and EPR/EIS review, and 5) Minister's decision. There are definitive timelines associated with each of the five steps.

At the federal level, the Project is a "designated project" in accordance with paragraph 16(a) of the *Regulations Designating Physical Activities* under the Canadian Environmental Assessment Act, 2012 (CEAA, 2012), which describes the following activity: "the construction, operation, decommissioning and reclamation of a new metal mine, other than a rare earth element mine or gold mine, with an ore production capacity of 3,000 t/day or more". Based on the Project Description submitted to the Canadian Environmental Assessment Agency, referred as "the Agency", the potential for the Project to cause adverse environmental effects, and comments received from the public during a 20-day comment period, the Agency decided that a complete EIS was required under CEAA (2012).

Three federal agencies are designated as "responsible authorities": the Agency, the National Energy Board (NEB) and the Canadian Nuclear Safety Commission (CNSC). In this project, the Agency is the designated responsible authority.

The federal EA process officially begins with the proponent submitting a Project Description to the Agency (or to the NEB or the CNSC, as applicable) in accordance with the Guide issued by the Agency in July 2012. The Agency then has 45 days, including a 20-day public comment period, to decide whether an EIS is required. Additionally, the Minister may refer a project to a review panel up to 60 days after the posting of the Notice of Commencement.

The process is subject to strict timelines: in the case of the Agency EIS, the Minister must render a decision within 365 days of the EA commencing (i.e. Notice of Commencement). Exceptions can be made under certain conditions: the Minister can extend these timelines by three months, and the federal cabinet can extend them further. These timelines apply solely to the functions of the Agency and the review panels, and do not factor in the time taken by the proponent to discharge its responsibilities.

A variety of forums for public participation exists for both CEAA (2012) and Newfoundland and Labrador EIS to comment on a draft EIS report and, in the case of review panels, to participate in public hearings. Public participation is achieved through the Canadian Environmental Assessment Registry website, as well as the Department of Environment and Conservation website, where key project information and documents are posted as the process unfolds.

CEAA (2012) contains specific references to the inclusion of Aboriginal peoples in the EIS process through cooperation and communication, and defines environmental effect as effects that specifically cause changes to Aboriginal health and socioeconomic conditions, physical and cultural heritage, current use of land and resources for traditional purposes, and structures, sites or items of historical, archaeological, paleontological or architectural significance. Aboriginal consultations is also required by the provincial government as per the Government of Newfoundland and Labrador (GNL)’s Aboriginal Consultation Policy on Land and Resource Development Decisions.

A regional environmental study as per the Agency’s definition of “a focused assessment of the development potential of an area, which examines the cumulative effects of the forecasted development scenarios” has not been or is not being carried out in the region where the Project will be located.

### 1.7 PROXIMITY TO OTHER PROJECTS

The Project is located in the vicinity of other DSO projects proposed by TSMC and LIM (Figure 1-2 and Table 1-1).

**Table 1-1 Other DSO Projects in the Area**

PROJECT	PROPONENT	DEPOSITS	PROVINCE	STATUS	ENVIRONMENTAL ASSESSMENT
DSO 1	TSMC	Gill	Labrador	-	n/a
DSO 2	TSMC	Star Creek 2,3 Ferriman 6 Sawmill 1 Lance Ridge 1 Fleming 6 Fleming 7X	Québec	Exploration is planned between 2014 and 2016 to validate historical records. As per historical records, the iron grade for DSO2 material is not in line with our already-established DSO grade production schedule. Therefore, all DSO2 material will be mined after the plan stabilization.  All DSO2 deposits are very small. Hence, it is not economically viable to start mining at this time. Mining of DSO 2 is not in TSMC’s current plans.	n/a
DSO 3 (Project 1a; Also known as the ELAION project)	TSMC	Timmins 1,3N,3S, 4,6, 7 Fleming 7N	Labrador	Timmins 1: past IOCC mine, now a fish habitat  Timmins 3S: past IOCC mine, not planned to be mined  Timmins 6: past IOCC mine. Timmins 6 is partially on TSMC	Provincial (NL) EIS completed

PROJECT	PROPONENT	DEPOSITS	PROVINCE	STATUS	ENVIRONMENTAL ASSESSMENT
				property and partially on LIM property  Operational: Timmins 4: 2012-2014 and 2018 (not mined in 2015 and 2016 and will probably close in 2017) Fleming7N: mined only in 2014, and 2018-2022 Timmins 7: planned for 2018-2020 Timmins 3N: This pit's schedule is dependent on the outcome of the Howse Project. Currently, it is planned for 2024-2026, which would be the earliest possible time, if Howse Property Project operations start in 2017.	
DSO 3 (Project 1b)	TSMC	Ferriman 4	Québec	Exploration done in 2008. Ferriman 4's potential is very small. Hence, its development is planned for 2028-2032	n/a
DSO 4 (Project 2a)	TSMC	Goodwood Sunny 1  Leroy	Québec (N of 55°N)	Goodwood: Construction and development planned for 2016, 2017 and 2019-2027 Sunny 1: Planned for 2029-2030 Leroy: Planned for 2027-2031	Provincial (QC) EIS completed
DSO 4 (2b)	TSMC	Kivivik 1C,2,3N,4,5	Labrador	Kivivik 1C: Started in 2015 and will be operational to 2027 Kivivik 2: Started in 2015, to 2025 3N: no current plans Kivivik 4: Planned for 2025-2028 Kivivik 5: Planned for 2020-2027	Provincial and federal EIS not required
Stage 1	LIM	James Redmond 2B & 5 Knob Lake 1	Labrador	Bankruptcy process	Provincial (NL) EIS completed
Stage 2	LIM	Houston 1 & 2	Labrador	Bankruptcy process	Provincial and federal EIS not required
Stage 2	LIM	Malcom 1	Québec	Bankruptcy process	n/a
Stage 4 & 5	LIM	Sawyer Lake Astray Lake Kivivik 1a, 1b	Labrador	Bankruptcy process	n/a

PROJECT	PROPONENT	DEPOSITS	PROVINCE	STATUS	ENVIRONMENTAL ASSESSMENT
Taconite (KéMag / LabMag)	NML (TSMC partnered with NML for the feasibility study) and other potential partners if the project goes ahead.	KéMag/ LabMag	KéMag (Québec) LabMag (Labrador)	Re-evaluation of the project. NEWTAC project is being considered	n/a

These projects are independent of each other. However, the TSMC projects listed in Table 1-1 will utilize the same TSMC rail loop loading area to ship the iron ore by train. Also, depending on the grade of the material mined from the different pits, the DSO plant complex could be used for all the DSO projects listed in Table 1-1, as long as the usage of the plant remains within the pre-approved limits. Also, if the Taconite project goes ahead, the only potential link with other projects would be the use of the road from DSO3 to DSO4. The Taconite Project is under revision and a NEWTAC project is being studied, based on market conditions.

Due to delay in construction of the access road leading to DSO 4, TSMC is currently planning on working to develop DSO 3 and Howse. Although it is possible that some of the ore from DSO 1 and DSO 2 might use the various facilities at TSMC’s DSO project, it is currently impossible to provide more details on their reliance on these facilities. It is also worth noting that it is not in TSMC’s or HML’s current plans to develop any other pits than those listed in Table 1-1.

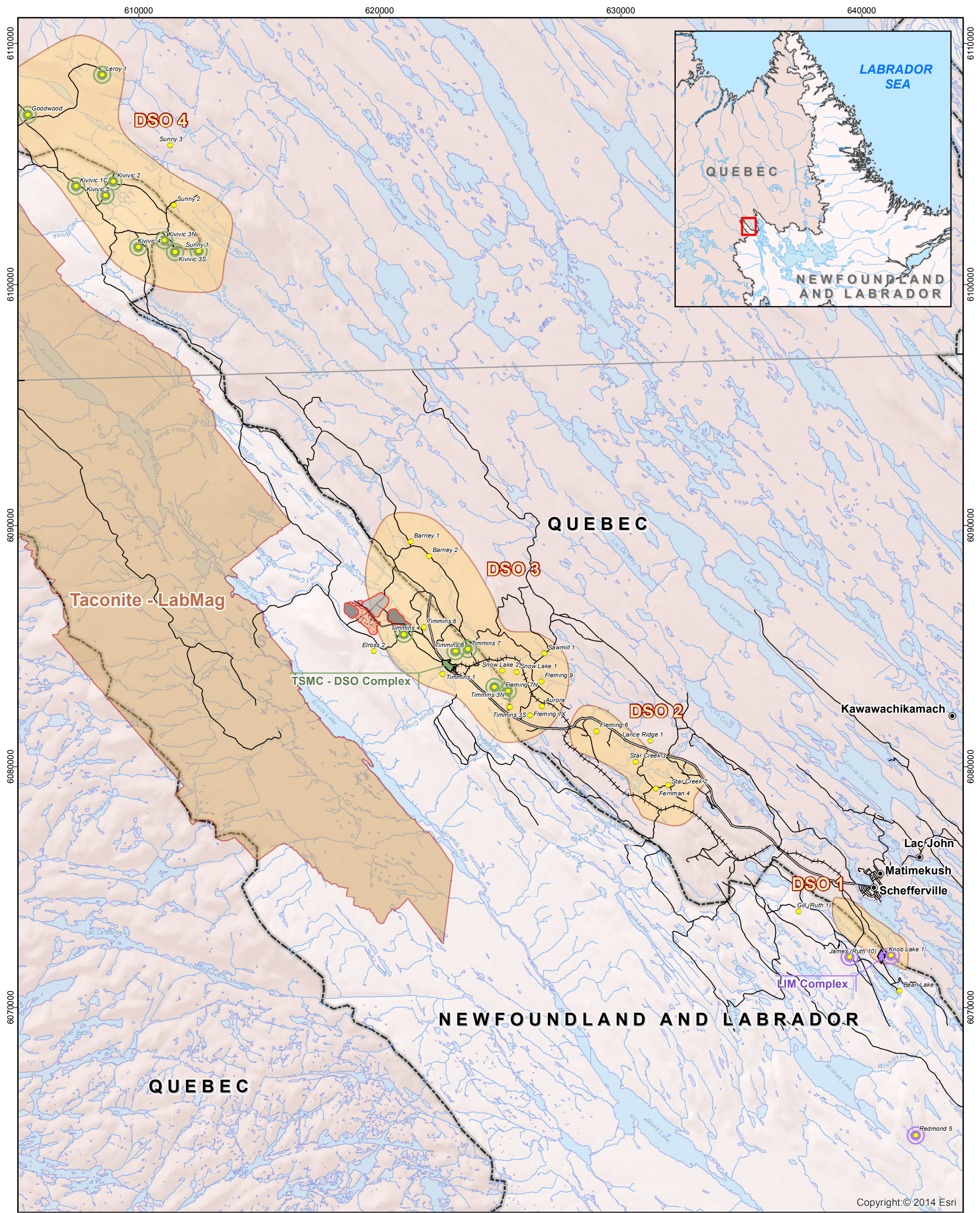
TSMC’s DSO 3 Project 1a is also known as the ELAIOM. Groupe Hémisphères, the environmental consulting firm that prepared this EIS, was also actively involved with NML and TSMC in the preparation of the Project Description, Project Registration and EIS for TSMC’s DSO 3 Project 1a (ELAIOM). Table 1-2 lists the annual production rates for the ROM ore for the Howse Property, along with TSMC’s other DSO projects.

**Table 1-2 Anticipated Production Rates for the Howse Property and TSMC's DSO Project**

PROJECT YEAR	2016 (MT)	2017 (MT)	2018 (MT)	2019 (MT)	2020 (MT)	2021 (MT)	2022 (MT)	2023 (MT)	2024 (MT)	2025 (MT)	2026 (MT)	2027 (MT)	2028 (MT)	2029 (MT)	2030 (MT)	2031 (MT)	2032 (MT)	TOTAL
Howse Property	0	0	1.3	3.0	3.0	3.0	3.0	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	5.2	46.09
DSO 3 (1a)	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.3
DSO 4 (2a)	0	0	5.5	5.5	4.7	4.5	4.5	4.7	0.5	0	0	0	0	0	0	0	0	29.9
DSO 4 (2b)	0	3.0	3.2	2.3	0.4	0	0	0	0	0	0	0	0	0	0	0	0	10.6
Total	2.6	3.0	10.0	10.8	8.1	7.5	7.5	7.7	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.6	82.3







**LEGEND**

**Infrastructure and Mining Components**

- DSO - Deposit
- LIM Actual or Planned Deposit Operation
- LIM Complex
- TSMC Actual or Planned Deposit Operation
- DSO Complex - TSMC
- DSO - Other Site
- Taconite - LabMag

**Howse Infrastructures**

- Proposed Howse Pit
- Proposed Topsoil/Overburden Stockpile
- Proposed Site Infrastructure
- Proposed Waste Dump/In-Pit Dump

**Basemap**

- Town
- Railroad
- Road
- Watercourse
- Water body
- Provincial Boundary

FILE, PROJECT, DATE, AUTHOR:  
GH-0571, PR185-19-14, 2015-10-21, edickoum

0 2 4 6 8 10  
Kilometers  
UTM 19N NAD 83

SCALE: 1:150 000

**SOURCES:**

Basemap  
Government of Canada, NTDB, 1:50,000, 1979  
SNC Lavalin, Groupe Hémisphères, Hydrology update, 2013.

Infrastructure and Mining Components  
New Millennium Capital Corp., Mining sites and roads  
Howse Minerals Limited/ MET-CHEM, Howse Deposit Design for General Layout., 2015

ENVIRONMENTAL IMPACT ASSESSMENT  
HOWSE PROPERTY PROJECT

**Location**  
Howse Minerals Limited

**Groupe Hémisphères**  
5731, rue Saint-Louis, Bureau 201, Lévis (QC) Canada, G6V 4E2  
1453, rue Beaubien est, Bureau 301, Montréal (QC) Canada, H2G 3C6

**Figure 1-2**



## 1.8 REGULATORY FRAMEWORK AND THE ROLE OF GOVERNMENT

In addition to approval under the provincial and federal EA process, the Project will also require a number of other environmental permits and authorizations from the following departments / agencies:

Government of Canada:

- Environment Canada and Climate Change
  - Canadian Wildlife Service
- Natural Resources Canada
- NAV Canada / Transport Canada
- Fisheries and Oceans Canada

Government of Newfoundland and Labrador:

- Service NL
  - Engineering and Inspections Division
  - Engineering Services Division
  - Operations Division
  - Program and Support Services Division
- Department of Natural Resources
  - Mineral Lands Division
  - Mines Branch
- Department of Environment and Conservation
  - Pollution Prevention Division
  - Water Resources Management Division

### 1.8.1 Effects on federal lands

According to the Canadian Environmental Assessment Act (2012), "federal lands" means lands that belong to Her Majesty in right of Canada, or that Her Majesty in right of Canada has the power to dispose of, and all waters on and airspace above those lands, other than lands under the administration and control of the Commissioner of Yukon, the Northwest Territories or Nunavut.

- the following lands and areas, namely,
  - the internal waters of Canada;
  - the territorial sea of Canada;
  - the exclusive economic zone of Canada; and
  - the continental shelf of Canada.
- reserves, surrendered lands and any other lands that are set apart for the use and benefit of a band and are subject to the *Indian Act*, and all waters on and airspace above those reserves or lands.

Based on this definition, the Howse Project is not on federal land. It is also important to note that the Project is not in the vicinity of commercial or navigable waters, parks or any infrastructure under the federal authority.

### 1.8.2 Components enabled by federal authorizations and permits

A list of the potential permits and authorizations required for the Project is presented in Volume 1 Appendix III. The table below provides a list of federal authorization and permits and the location, in the present text, where the potential environmental effects associated with these permits are assessed.

<b>PERMIT/AUTHORIZATION                      LEGISLATION/REGULATION                      DEPARTMENT/AGENCY</b>	<b>DESCRIPTION OF POTENTIAL ENVIRONMENTAL                      EFFECTS IN DOCUMENT</b>
Letter of Advice or Authorization for Works or Undertakings Affecting Fish Habitat <ul style="list-style-type: none"> <li>▪ <i>Fisheries Act</i></li> <li>▪ Fisheries and Oceans Canada</li> </ul>	Any activities in or near water that may support a fishery:  Sections 6.4, 7.3.10, 7.4.9, 7.5.2.2 and 8.4, as well as Volume 2, Supporting studies D
Compliance Standard / letter of acceptance <ul style="list-style-type: none"> <li>▪ <i>Fisheries Act, Section 36(3), Deleterious Substances</i></li> <li>▪ Environment Canada</li> </ul>	Any run-off from the Project site being discharged to receiving waters:  Section 6.4
Compliance Standard <ul style="list-style-type: none"> <li>▪ <i>Migratory Birds Convention Act and Regulations</i></li> <li>▪ Canadian Wildlife Service, Environment Canada</li> </ul>	Any activities which could result in the mortality of migratory birds and endangered species and any species under federal authority:  Sections 6.3, 7.4.3, 7.4.4, 7.4.7, 7.4.8, 7.4.9, 7.5.2.2, 8.4, 8.6 and 8.7
Policy <ul style="list-style-type: none"> <li>▪ Federal Policy on Wetland Conservation</li> <li>▪ Environment Canada</li> </ul>	Any disruption of wetland habitat:  Sections 7.4.1 and 8.5

### 1.8.3 Other guidelines

The following is a list of existing regulatory documents, environmental standards, guidelines or objectives used in the Howse EIS document to assess the level of the effect of the Project on a component. Details on the documents presented below can be found in the component's Effects Assessment section (Chapter 7). The documents are listed in the order in which they appear in the document.

- Canadian Dam Safety Guidelines (2007)
  - published by the Canadian Dam Association
- Environmental Guidelines for Mining Operations
  - compiled by the United Nations Department of Economic and Social Affairs (UNDESA) and the United Nations Environment Programme Industry and Environment (UNEP)
- *Newfoundland and Labrador Regulation 39/04, Schedule A – Table I: Ambient Air Quality Standards at Reference Conditions*
  - Air Pollution Control Regulation, 2004
  - Guidelines for Ambient Air Monitoring, December 16, 2010 (NL guidance document GD-PPD-065).
- Québec Clean Air Regulation

- Environment Quality Act (Chapter Q-2, ss. 31, 35, 115.27, 115.34, 124.0 and 124.1)
- Atmospheric quality standards, Sections 197 and 198 and Schedule K of the Clean Air Regulation, Q-2, r. 4.1
- Air Pollution Control Regulations, 2004
- Equipment noise data was gathered from manufacturer data, previous equipment measurements, BSI British Standards (BSI, 2008), and Roadway Construction Noise Model (RCNM) data (USDT, 2006a)
- Canadian Environmental Protection Act, 1999
  - Federal PM<sub>2.5</sub> standards published on May 25, 2013: Sections 54 and 55 of the Canadian Environmental Protection Act, 1999.
  - For other pollutants, the federal government sets national ambient air quality objectives (NAAQOs) on the basis of recommendations from the Federal-Provincial Working Group on Air Quality Objectives and Guidelines consisting of representatives from both the health and environment departments. NAAQOs are structured in three-tiered: maximum desirable levels, maximum acceptable levels and maximum tolerable levels. Maximum acceptable levels are listed in the table.
- Ontario's Ambient Air Quality Criteria
  - Standards Development Branch Ontario Ministry of The Environment, April 2012
- Government of Newfoundland and Labrador, Department of Environment and Conservation
  - Guidelines for Plume Dispersion Modelling (2012)
- Government of Québec
  - Sampling Guide for Environmental Analysis
  - Booklet 4. Sampling of Atmospheric Emissions from Stationary Sources (MDDEFP, 2006).
  - Quebec Guidelines for Stationary Noise Sources for Type I Zoning Area
  - Directive 019 Sur l'Industrie Minière, March 2012
- Ontario's Ministry of the Environment.
  - Guidelines on Information Required for Assessment of Blasting Noise and Vibration.
- International Commission on Illumination
- CCME guidelines
  - Surface Water Quality Guidelines for the Protection of Aquatic Life
- Metal Mining Effluent Regulation (MMER) guidelines
- Fisheries and Oceans Canada
  - Guidelines for the Use of Explosives in or near Canadian Fisheries Waters
- Health Canada, Toxicological Reference Values and Chemical-Specific Factors, Version 2.0

## 1.9 PROJECT SCHEDULE

The Construction phase for the Howse Property is expected to start in 2017 subject to regulatory and environmental approvals.

The duration of the Construction phase, which includes: pit development, upgrading/construction of the Howse haul road, upgrading of a bypass road, construction of two sedimentation/transfer ponds and corresponding ditches, site infrastructure pad, site clearing and construction of a crushing and screening facility, is estimated at roughly 7 to 10 months based on 12-hour shifts.

Mining activities (Operations phase) at the Howse Property are expected to be ongoing until 2032, for a total of 15 years. The mine will be operational year-round, but the ore will only be mined, crushed, screened and shipped by train from April to mid-October (or November, depending on the weather), with day and night shifts. For the remaining months, overburden stripping is planned, and crews will work on restoring the overburden and waste rock stockpiles/dump.

The Decommissioning and Reclamation phase will be ongoing during the Operations phase as a result of the Proponent's in-Pit mining technique, which will allow for progressive site restoration. The Proponent estimates that this phase will last 5 years after mine closure, and the schedule will depend on progress of mining and the closure of dumps.