



HOWSE PROPERTY PROJECT

Environmental Preview Report

Presented to the Government of Newfoundland and Labrador

Environmental Impact Statement

Presented to the Canadian Environmental Assessment Agency

HML

Howse Minerals Limited

FINAL VERSION

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- Appendix A. Golder Associés (2014) *Howse Pit Conceptual Slope Design - Interim Report*. CONFIDENTIAL. Report Number: 014-13-1221-0104-4000 RA. Submitted to Labrador Iron Mines.
- Appendix B. Geofor Environnement (2015) *Hydrogeology and MODFLOW Modelling – Howse Property*. Technical Memorandum prepared for Howse Minerals Limited, 22 p. and 6 Appendices.
- Appendix C. Raphael Picard (2014) Study on Land and Resource use by the Innu and Naskapi – Howse Property Iron Ore Project. Prepared for Howse Minerals Limited, 36 p.
- Appendix D. *Human Health Risk Assessment* and supporting documents.
- Appendix E. AECOM (2015) *Air Dispersion Modelling Reports*
- Appendix F. AECOM (2015) *DSO Howse Property Environmental Assessment – Noise and Vibration Technical Report*. Prepared for Howse Minerals Limited, 17 p. and 3 appendices.
- Appendix G. AECOM (2015) *DSO Howse Property Environmental Assessment – Ambient Light Technical Report*. Prepared for Howse Minerals Limited, 16 p. and 2 appendices.
- Appendix H. Activation Laboratories Ltd. (2014) *Acid-Base Accounting and Toxicity Characterization Leach Procedure Report*. HPP-RM-20141023. A14-08392. Prepared for Tata Steel.
- Appendix I. Groupe Hémisphères (2014) 2013-2014 Hydrological Campaign for the Howse Property. Field Report for Howse Minerals Limited, 6 p. and 2 appendices.
- Appendix J. Permafrost Condition at Howse and supporting documents
- Appendix K. Groupe Hémisphères (2014) *Terrestrial ecosystem mapping, Howse pit study area*. Technical Report submitted to Howse Minerals Limited, 45 p. and 6 appendices.
- Appendix L. Groupe Hémisphères (September 2015) *Pinette Lake Water Regime*. Technical Report submitted to Howse Minerals Limited., 13 pp. and 1 appendix
- Appendix M. Groupe Hémisphères (2014) *Aquatic Survey - Howse Pit Study Area*. Technical Report Submitted to TSMC, 35 pages and 7 appendices.

Appendix N. Groupe Hémisphères (2015) *Common Nighthawk Survey* for Howse Mining Project, Labrador, Summer 2015. Technical Report submitted to Howse Minerals Ltd., 11 pp. and 3 appendices.

Appendix O. Gerald Penney Associates Limited (2014) *Goodwood-Timmins Haul Road and Howse Property Historic Resources Impact Assessment, near Schefferville, QC*. Archaeological Investigation Permits #14.42. DRAFT Submitted to Provincial Archaeology Office and Tata Steel Minirals Canada.

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- Appendix a. AECOM (2009) 2009 Breeding Bird Monitoring Report – James, Redmond, Silver Yards, Knob Lake, Houston, Howse, and Proposed Road Crossing Areas. Prepared for Labrador Iron Mines.
- Appendix b. Groupe Hémisphères (Avril 2012) Inventaire des oiseaux nicheurs du site minier du projet KéMag. Rapport technique réalisé pour New Millennium Iron Corp., 23p. et 4 annexes.
- Appendix c. Groupe Hémisphères (May 2012) Migrating Birds Survey for the LabMag Project, Spring and Fall 2011. Technical Report submitted to New Millennium Iron Corp., 25pp. and 6 appendices.
- Appendix d. Groupe Hémisphères (August 2012) *Migrating Birds Surveys at the KéMag Project Mine Site, Spring and Fall 2011*. Technical Report submitted to New Millennium Iron Corp., 25pp. and 6 appendices.

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- Appendix b. D’Astous and Trimper (November 2009) *Spring Survey of Caribou in the Vicinity of Schefferville May 2009*. Final report prepared for New Millennium Capital Corp. and Labrador Iron Mines Limited, 17pp. and 2 appendices.
- Appendix c. Groupe Hémisphères (2009) *Inventaire 2008 et 2009 des oiseaux nicheurs du future site DSO*. Rapport technique réalisé pour New Millennium Capital Corp., 22p. et 4 annexes.
- Appendix d. Groupe Hémisphères (2009) *Reconnaissance de l’habitat du poisson le long de deux tracés hypothétiques de la route principale d’accès entre les secteurs DSO3 et DSO4, projet DSO*. Rapport technique réalisé pour New Millennium Capital Corp., 19p. et 7 annexes.
- Appendix e. Groupe Hémisphères et Groupe Synergis (Janvier 2010) *Inventaires du milieu aquatique pour le projet DSO*. Rapport technique réalisé pour le compte de New Millennium Capital Corp., 160p. et 10 annexes.
- Appendix f. D’Astous and Trimper (April 2010) *Spring Survey of Caribou in the Vicinity of Schefferville May 2009– Addendum concerning Blue 331*. Final report prepared for New Millennium Capital Corp. and Labrador Iron Mines Limited, 2pp.
- Appendix g. D’Astous and Trimper (May 2010) *Spring Survey of Caribou in the Vicinity of Schefferville April-May 2010*. Final report prepared for New Millennium Capital Corp. and Labrador Iron Mines Limited, 10pp.
- Appendix h. Groupe Hémisphères (Mai 2010) *Recherche de mesures de compensation relatives à l’habitat du poisson pour le projet DSO*. Rapport technique réalisé pour New Millennium Capital Corp., 79p et 1 annexe.
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- Appendix j. Groupe Hémisphères (Mai 2011) *Plan de mitigation pour la protection du quiscale rouilleux, Projet DSO*. Rapport technique réalisé pour New Millennium Capital Corp., 13p.
- Appendix k. Groupe Hémisphères (July 2011) *Spring Survey of Caribou in the Vicinity of the DSO3 Sector*. Final Report submitted to Tata Steel Minerals Canada Ltd., 7pp. and 1 appendix.
- Appendix l. Groupe Hémisphères (May 2012) *Spring Monitoring of Caribou in the Vicinity of the DSO3 Sector*. Technical report submitted to Tata Steel Minerals Canada Ltd., 5pp. and 2 appendices.
- Appendix m. AMEC (July 2008) *Reconnaissance of Potentially Affected Fish Habitat Western Labrador and Eastern Quebec*. Technical Report submitted to Groupe Hémisphères, 10pp. and 4 appendices.

LIST OF ABBREVIATIONS AND SYMBOLS

%	Percentage
°C	Degrees Celsius
AANDC	Aboriginal Affairs and Northern Development Canada
ABA	Acid Base Accounting
AIP	Agreement-In-Principle
ALT	Acute Lethality Test
AP	Acid Potential
ARD	Acid Rock Drainage
ASL	Above Sea Level
ASSSCN	Agence de la santé et des services sociaux de la Côte-Nord
ATK	Aboriginal Traditional Knowledge
BCWRM	Brace Centre for Water Resources Management
BP	Before Present
CAM	Conseil des Atikamekws et des Montagnais
CARMA	CircumArctic Rangifer Monitoring and Assessment Network
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Agency
CEAA (2012)	Canadian Environmental Assessment Act of 2012
CIE	Commission Internationale de l'Éclairage (International Commission on Illumination)
CLSC	Centre Local de Services Communautaires (Local Community Services Centres)
cm	Centimetre
CNA	College of the North Atlantic
CNSC	Canadian Nuclear Safety Commission
CNQA	Cree-Naskapi (of Québec) Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSSS	Centre de santé et de services sociaux
dBA	Decibel
DFO	Fisheries and Oceans Canada
DSO	Direct Shipping Ore
EC	Environment Canada
EDC	Effluent Discharge Criteria
EEM	Environmental Effects Monitoring
EIS	Environmental Impact Study
ELAION	Elross Lake Area Iron Ore Mine (DSO Project 1a)
EPA	Environmental Protection Act
EPP	Environmental Protection Plan
EPR	Environmental Preview Report

ERP	Environmental Response Plan
FDSN	Federation of Digital Seismograph Networks
FTA	Federal Transit Association
GHG	Greenhouse gases
GNL	Government of Newfoundland and Labrador
GRCH	George River Caribou Herd
ha	Hectare
H ₂ S	Hydrogen Sulfide
HEU	Habitat Equivalent Units
HML	Howse Minerals Limited
HSE	Health, Safety and Environment
HST	High Subarctic Tundra
IBA	Impact and Benefit Agreement
IDA	International Dark-Sky Association
IOCC	Iron Ore Company of Canada
ITUM	Innu Takuaikan Uashat mak Mani-Utenam
JBNQA	James Bay and Northern Québec Agreement
kg	Kilogram
km	Kilometre
km/h	Kilometre per hour
L/s/km ²	Liter per second per square kilometre
LEED	Leadership in Energy and Environmental Design
LGRHA	Labrador-Grenfell Regional Health Authority
LIL	Labrador Innu Lands
LIM	Labrador Iron Mines Ltd.
LIOP	LabMag Iron Ore Project
LISA	Labrador Innu Settlement Area
L/min	Litres per minute
LSA	Local study area
µm	Microgram or one-millionth of a gram
µm/L	Microgram per Liter
µg/m ³	Microgram per cubic metre
masl	Metres Above Sea Level
MDDEFP	Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs
mg/L	Milligrams per Litre
m	Metre
m ³	Cubic metre
m/d	Metres per day

m ² /d	Square metres per day
m ³ /d	Cubic metres per day
m/s	Metres per second
m ³ /s	Cubic metres per second
mm	Millimetre
mm/d	Millimetres per day
mm/y	Millimetres per year
MLJ	Matimekush – Lac John
MMER	Metal Mining Effluent Regulations
MN	Nuttli magnitude
MRC	Municipalité régionale de comté (Regional County Municipality)
MSF	Mid Subarctic Forest
Mt	Million tonnes
N	North
NAD	North American Datum
NEB	National Energy Board
NCC	NunatuKavut Community Council
n.a.	Not applicable
n.d.	No data
NEQA	Northeastern Québec Agreement
NHS	National Household Survey
NIMLJ	Nation Innu Matimekush – Lac John
NLBP	Newfoundland and Labrador Benefits Plan
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
NLDOT	Newfoundland and Labrador Department of Transportation
NLMB	Naskapi Local Management Board
NML	New Millennium Iron Corp.
NNK	Naskapi Nation of Kawawachikamach
NNP	Net Neutralization Potential
NO _x	Nitrogen Oxides
NP	Neutralizing Potential
NPR	Neutralization Potential Ratio
NQPA	Naskapi-Québec Partnership Agreement
NTDB	National Topographic Data Base
PFWA	Paul F. Wilkinson & Associates
QNS&L	Québec North Shore & Labrador Railway
RCNM	Roadway Construction Noise Model
RDL	Reported Detection Limit

ROM	Run-of-mine
RNC	Royal Newfoundland Constabulary
RSA	Regional Study Area
RTWQ	Real-Time Water Quality
SARA	Species at Risk Act
SFNQ	La Société Ferroviaire du Nord québécois
SO _x	Sulfur Oxide
SO ₂	Sulfur Dioxide
SQ	Sûreté du Québec
SQM	Sky Quality Metres
SS	Suspended Solids
TC	Transport Canada
TCLP	Toxicity Characteristic Leaching Procedure
TEM	Terrestrial Ecosystem Mapping
TLH	Trans Labrador Highway
TML	Transportable Moisture Limit
TSH	Tshuetin Rail Transportation Inc.
TSMC	Tata Steel Minerals Canada Ltd.
TSS	Total Suspended Solids
US	Upper Shale
UTM	Universal Transverse Mercator
VC	Valued Component
WEP	Women's Employment Plan
WMP	Water Management Plan

GLOSSARY

Benthos	An organism that lives on or in the bottom of a body of water such as a river, lake, or sea.
Biota	All of the living organisms (including animals, plants, fungi, and micro-organisms) that are found in a particular area.
Biotope	The smallest subdivision of a habitat characterized by a high degree of uniformity in its environmental conditions, and in its plant and animal life.
Chert	A hard, brittle sedimentary rock consisting of microcrystalline quartz.
Chiroptera	Bats, a highly-specialized group of insectivorous mammals and the only mammals capable of flying like birds.
Cobble	A rock fragment, rounded or abraded, that is larger than a pebble and smaller than a boulder.
Conductivity	The transfer of heat from one object to another through direct physical contact.
Decibel	A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to referenced sound pressure amplitude. The reference pressure is 20 microPascals.
Dissolved oxygen	The oxygen dissolved in water. The amount is usually expressed in parts per million.
Ecoregion	An area of the landscape with characteristic regional climate and landforms, as expressed in typical vegetation physiognomy and composition, soils and topography.
Ecotype	The most detailed ecological classification units within ecoregions, which are used to delineate and describe terrestrial landscapes or, alternatively, ecosystems in this report. Ecotypes occur in predictable landscape positions and feature characteristic landform, site and soil characteristics that can be identified through stereoscopic interpretation of aerial photographs and described in detail during site visits.
Ericaceous	Of or pertaining to a plant family that includes numerous plants, mostly from temperate climates, that normally grow in acidic soils.
Fen	A sedge-dominated, groundwater-fed type of wetland that accumulates peat, but is less acidic than a bog.
Fish habitat	Spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.
Fluvial	Of or pertaining to a river or rivers.
Freshet	A comparatively short-duration, high rate of flow of freshwater in a stream resulting from heavy rainfall or rapid snow melt.
Glaciofluvial	Pertaining to the sediments (commonly moderately- to well-sorted sand, gravel or cobbles) eroded, transported and deposited by glacial meltwater in ice-contact or proglacial environments.

Herpetofauna (Herptile)	All reptiles and amphibians (e.g., salamanders, frogs, toads, caecilians, snakes, lizards, turtles, tuataras and crocodilians).
Hibernacula	The winter quarters of a hibernating animal.
Hydrometric station	A station on a river, lake, estuary or reservoir where water quantity and quality data are collected and recorded. Such data may include stage (water surface elevation), discharge, sediment concentration, water temperature, chemical and biological properties of water, ice formations and other characteristics.
Impacts and Benefits Agreement	Most simply put, these negotiated, private agreements serve to document in a contractual form the benefits that a local community can expect from the development of a local resource in exchange for its support and cooperation. Their specific content varies, but typically they include provisions on royalties and/or profit-sharing, employment, wider economic development opportunities, and enhanced protection of environmental and socio-cultural amenities. IBAs are novel and noteworthy for a couple of reasons. First, they provide some assurances to, and tangible benefits for, local communities facing a major resource development such as a diamond mine in a way that conventional regulatory mechanisms like environmental effects assessments have never been able to provide. Second, they have largely been established without the explicit involvement of the state, the traditional sovereign authority in all matters of natural resource allocation and development.
Landform	A distinct, three-dimensional feature on the earth's surface that has originated through a particular set of erosional and/or depositional processes and thus can be recognized wherever it occurs.
Local Study Area	The area where the Howse Property Project facilities and activities will be located and in which detailed terrestrial ecosystem mapping was carried out.
Littoral	The shallower parts of a waterbody along the shore; often defined as the area where rooted aquatic macrophytes can grow.
Mesic	Of or pertaining to well-drained soils that retain some water.
Moraine	Landform deposited directly by glacial ice, typically consisting of grains ranging in size from clay to boulders.
Migratory bird	<i>A legal term in Canada</i> ; it means a migratory bird referred to in the Migratory Birds Convention, and includes the sperm, eggs, embryos, tissue cultures and parts of the bird.
Migrating bird	Bird carrying its seasonal movement from/to breeding grounds and wintering grounds.
Order	A taxonomic group between the Class and the Family.
Particulate matter	Microscopic solid and liquid particles, of various origins, that remains suspended in the air for any length of time.
Permafrost	Perennially frozen soil and/or bedrock typically found in areas with arctic or subarctic climates.
pH	A term used to describe the hydrogen-ion activity of a system; a solution of pH 0 to 7 is acid, pH 7 is neutral, pH over 7 to 14 is alkaline.

Recharge	The replenishment of water in an aquifer. Much of the natural recharge of groundwater occurs in spring and comes from the melting snowpack or from streams in mountainous regions. It can also occur during local heavy rainstorms. Groundwater often discharges into a river or lake, maintaining its flow in dry seasons.
Riparian	Pertaining to the banks of, or area immediately adjacent to, a watercourse.
Roosting site	A daytime retreat or night-time resting place for bats and birds.
Rubble	A loose mass of rough, angular rock fragments, coarser than sand.
Sediment	Bottom material in a lake or a stream that has been deposited after the formation of a lake basin or stream course. It originates from the remains of aquatic organisms, chemical precipitation of dissolved minerals and erosion of surrounding lands.
Shale	Shale is a fine-grained, clastic sedimentary rock composed of mud that is a mix of flakes of clay minerals and tiny fragments (silt-sized particles) of other minerals, especially quartz and calcite. The ratio of clay to other minerals is variable. Shale is characterized by breaks along thin laminae or parallel layering or bedding less than one centimetre in thickness, called fissility.
Sublimation	Process of change from ice (solid state) to water vapour (gaseous state).
Till	Material deposited directly by glacial ice with grains ranging in size from clay to boulders.
Total particulate matter	Any particulate with a diameter less than 100 microns.
Turbidity	A measure of suspended particulates in water.
Veneer	A thin (typically <2 m), commonly discontinuous surficial deposit overlying another material or bedrock.
Waterbody	Pertaining to watercourses, lakes, reservoirs and ponds.
Water table	The upper water level of a body of groundwater.

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