

MERC

Mineral Exploration Research Centre





A Five Year Business Plan

EXECUTIVE SUMMARY



ABOUT MERC

Established in 1997, MERC is a collaborative geoscience centre for mineral exploration research and education. It is one of six mining-related educational and research centres within the Goodman School of Mines (GSM) located at Laurentian University (LU) in Sudbury, Ontario, Canada. MERC comprises an internationally recognized group of researchers from academia, industry and government and provides the mineral exploration research focus for LU's Department of Earth Sciences. MERC's research integrates geological, geochemical and geophysical techniques to solve fundamental and applied problems related to the discovery of Precambrian ore deposits. Located in Sudbury, one of the richest mining districts in the world, and within hours of world-class greenstone gold and base metal deposits in Ontario and Quebec, MERC is uniquely positioned to undertake this research. MERC's location also provides an advantage for Precambrian Shield field training, and education.

The Business Plan reviews MERC's current operations, focussing on its achievements to date and recommends a series of steps, phased over a five year period, which will firmly place MERC on the path to increased operational capacity and long term sustainability. To achieve financial sustainability and success, MERC must be seen to demonstratively deliver value to its industry and government members and sponsors, to Laurentian University and the Goodman School of Mines, to the Department of Earth Sciences, and to students.

RESEARCH OUTLOOK

The outlook for MERC-based research over the next five years is predicted to improve gradually as metal prices slowly recover and the mining industry moves out of the current economic slowdown. If the economic turnaround is slower than anticipated, MERC's research and education initiatives would maintain the status quo or experience more modest growth. Growth will be achieved by focusing on research projects that are relevant to exploration, by increasing the number of industry relevant professional courses and workshops, by adding more corporate members, by attracting more students, and through more intensive advertising and branding efforts.

MERC's research will maintain a Precambrian ore systems focus, with emphasis on the Canadian Shield, but will also expand to include other Precambrian shields. MERC will continue its focus on improving base and precious metals exploration in greenstone terrains, with an increasing emphasis on research directed at gold exploration over the next five years.

A major challenge facing exploration in the Canadian Shield is the extensive cover by glacial drift and lacustrine clays, and younger cover rock. MERC's research and educational initiatives will address how to integrate geological, geochemical and geophysical data to explore for deposits under this cover. In tandem, MERC research will continue to span problems related to the exploration of many ore deposit types and will be conducted across Canada and globally.

Ultimately, MERC's vision is to promote a wide range of exploration focused research and educational initiatives ranging from small, one company sponsored projects and workshops to multi-year, multi-company thematic projects, developed through individual researcher initiatives and entrepreneurship, and through broader based industry/government/MERC funding initiatives.

PROPOSED NEW STRATEGIC DIRECTIONS

The Business Plan proposes six new strategic directions to guide future research, broaden organization capacity, improve overall governance and ensure that MERC remains firmly on a path of sustainability. Some of these strategies are achievable in the short term; others will need to be phased in and implemented as MERC's financial capacity enables it to do so. The first three proposed strategic directions are consistent with best practices at two leading mineral deposit research centres, the Mineral Deposits Research Unit (MDRU) at the University of British Columbia, and the Centre for Ore Deposit Research (CODES) at the University of Tasmania.

STRATEGIC DIRECTION #1

With annual operating surpluses increasing as a result of an increase in memberships and the success of revenue-generating field courses and workshops, MERC now has the financial capacity to establish an operating reserve. MERC's operating reserve ("MERC Sustainability Fund") will be equivalent to one year of operating costs to be used to offset periods of operating shortfalls due to cyclical downturns in the mineral sector.

STRATEGIC DIRECTION #2

Strengthen MERC's research and educational planning capacity by establishing an Exploration Science Advisory Council that is sensitive to industry needs. The Exploration Science Advisory Council will report to the MERC Advisory Board and is mandated to develop and make recommendations concerning MERC's strategic exploration research and educational priorities over the next five years.

STRATEGIC DIRECTION #3

To enable research capacity to increase and for MERC to grow, MERC will recruit two full time Research Associates (RAs); the first to be hired in 2016-2017. The RAs will assist with graduate student supervision, project coordination, and the design of new research projects capable of attracting higher levels of external research funding for MERC.

In addition, MERC proposes that the services of an experienced Funding Coordinator (fee for service basis) be retained to match projects with funding agencies/opportunities in order to maximize leverage of industry dollars and assist in designing successful proposals to industry and other funding bodies.

STRATEGIC DIRECTION #4

Implement a new pre-research Investigation Initiative that will explore potential research projects by providing seed funding (up to \$20,000 per year) to determine proof in principle, prior to seeking support from industry/government.

STRATEGIC DIRECTION #5

By promoting MERC's key successes to date along with the implementation of new strategic directions, MERC will establish realistic and progressive membership recruitment targets. In order to maintain the existing 1:1 leveraged funding between industry memberships and LU contributions, LU will be asked to provide additional matching funds for all new MERC memberships beginning in 2016-17, and to review its overhead policy for research centres.

STRATEGIC DIRECTION #6

Longer-term objectives for MERC include expanding its research to include exploration for base and precious metal deposits in Precambrian shields globally, establish the funding necessary to support a full-time Associate Director, and through discussions with Advisory Board members, and the Goodman School of Mines, explore new ways to promote broad interdisciplinary research on mineral exploration. Research could be focussed on improving environmental monitoring and base-line studies, and by increasing the public understanding and perception of exploration by promoting a broad dialogue on all aspects of mineral exploration, addressing both its value to society and its challenges.

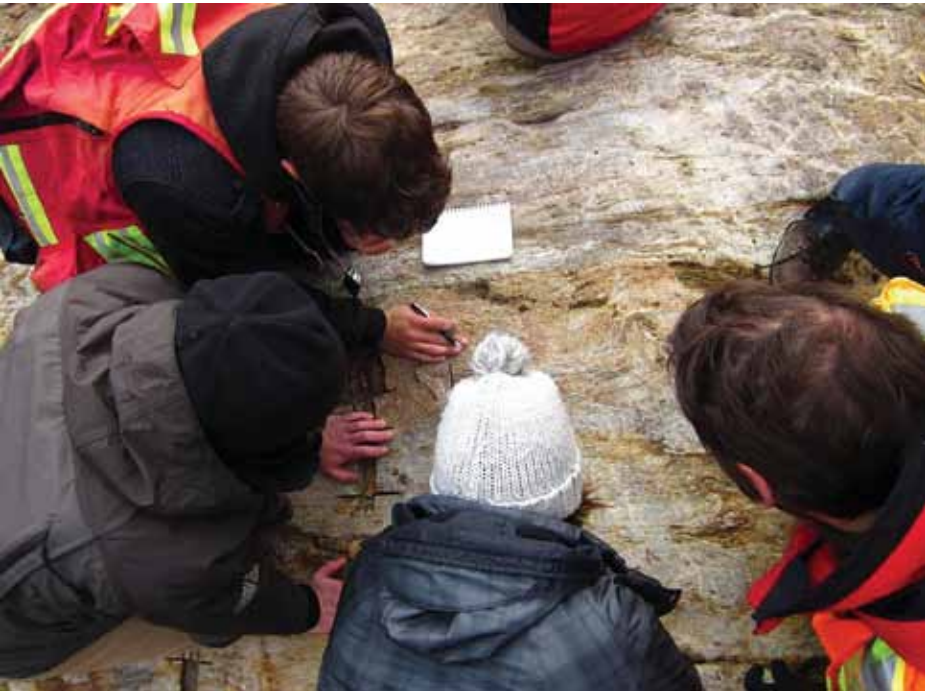
Adopting these recommended strategic directions will enable MERC's Board and management to further brand and grow the organization. These new measures will help MERC manage through economic uncertainty, increase its research capacity and output through increasing human resources, project coordination capacity and strengthened governance in research and educational priority setting.

Taken together, these new measures support the branding of MERC as an organization increasingly responsive to industry's exploration research needs and enable greater success in attracting research funding to LU. They will also position MERC as a driving research and educational force for industry and the Goodman School of Mines.



Prof. Harold L. Gibson PhD., P.Geo.
Director, Mineral Exploration Research Centre

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Mineral Exploration Research Centre

THE MERC MISSION STATEMENT

MERC conducts cutting-edge, field-based collaborative research directed at solving problems related to the exploration for Precambrian mineral deposits, educates and trains highly qualified geoscientists and professionals, and develops new exploration methodologies.

MERC will become a world class, self-sustaining geoscience centre focused on exploration research and education, and as a learning centre for methodologies in the exploration of Precambrian ore systems.

INTRODUCTION

Established in 1997, MERC is a collaborative geoscience centre for mineral exploration research and education. It is one of six mining-related educational and research centres within the Goodman School of Mines (GSM) located at Laurentian University (LU) in Sudbury, Ontario, Canada. MERC consists of an internationally recognized group of researchers from academia, industry and government, and provides the mineral exploration research focus for LU's Department of Earth Sciences (DES; Appendix 2). MERC's research integrates geological, geochemical and geophysical techniques to solve fundamental and applied problems related to the discovery of Precambrian ore deposits. Located in Sudbury, one of the richest mining districts in the world, and within hours of world-class greenstone gold and base metal deposits in Ontario and Quebec, MERC is uniquely positioned to undertake this research. MERC's location also provides an advantage for Precambrian Shield field training, and education.

MERC operations are supported through industry memberships (50%), and in-kind support from LU, research overheads, and revenues from workshops and field courses (50%). At present, MERC has over 80 faculty, research scientists and graduate students investigating mineral deposits, Precambrian geology, and exploration geophysics (methodology and targeting). A new faculty position in exploration geochemistry was filled in 2014 (Appendix 2).

MERC research projects are supported by Canadian and international mining companies, the National Science and Engineering Research Council of Canada (NSERC), the Geological Survey of Canada, the Ontario Geological Survey, and other provincial and territorial geological surveys, and agencies. The research projects range from regional to global, and address fundamental problems related to exploration, technology and methodology development that aid in exploration of Precambrian and younger terrains. In addition to its research agenda, MERC, in conjunction with the Departments of Earth Sciences at Laurentian and Ottawa Universities provides six modular courses aimed at training graduate and undergraduate students from across Canada and globally and, in collaboration with the GSM, provides short courses and workshops aimed at students and industry personnel for professional development training and upgrading.



A key measure of MERC's success to date has been its ability to attract progressively higher levels of mineral exploration research funding. Over the last ten years, MERC's annual research funding has exceeded \$1 M and in 2014 its research projects will exceed \$2M in expenditures and involve 66 graduate students. As research represents a core business of MERC, a key question is how to create momentum and ultimately maintain a stable base of research and operating funds into the foreseeable future in an era of economic and fiscal uncertainty.

The answer to this question is complex and ultimately involves a multi-faceted approach that the MERC leadership and Advisory Board has embarked upon - rethinking and refining its research priorities, advocating fair practises in the allocation of research overheads, human resource planning for new faculty and research staff, aggressive promotion (advertising and marketing) of MERC activities to attract new members, and developing new educational initiatives which address top industry priorities. All these initiatives have a key role in the growth of MERC as a vibrant and sustainable organization that increases value to its industrial and academic partners well into the future.

What does "sustainable" mean to MERC? In a business sense one might simply describe a sustainable organization as a "going concern"; one that possesses the right mix of business fundamentals to ensure steady operating growth over the foreseeable future. This business definition is applicable to MERC. *However, for MERC to achieve financial sustainability and to be successful, it must be seen to demonstratively deliver value to its industry and government members and sponsors, to Laurentian University and the Goodman School of Mines, to the Department of Earth Sciences, and to students.*

One set of fundamentals is the "products and services" – which, for MERC's purposes are: research, educational programs, and targeting methodologies. Another set of fundamentals is the active "promotion" of MERC products and services to industry, prospective students and the broader academic community within the Goodman School of Mines. Both of these fundamentals are explored and discussed in greater detail the body of this report.

This business plan focuses on a third set of fundamentals, specifically MERC's financial and organizational capacity addressing key questions including:

- What is MERC's capacity for growth?
- Does it have a plan for growth?
- Does it have the leadership to drive growth?
- What are the constraints to business growth?

This business plan helps to provide the means by which growth can be accelerated by broadening MERC's membership base through sound financial planning, developing and integrating a sharper industry focus, and determining new means to leverage industry funding.

In doing so, this plan provides guidance in maintaining and enhancing research and educational excellence, broadening MERC's profile and value to LU as a major component within the newly established Goodman School of Mines.

This plan begins with a brief description of MERC, including its current operating model, governance and financial status, followed by a discussion of MERC in the context of "best practises" from leading mineral deposit research centres - namely MDRU and CODES.

A strategic context for MERC's exploration focus over the next five years is then discussed, followed by a high level summary of issues and challenges facing MERC over the next five years.

In light of the goals (above) that MERC has established for itself and the best practises that are examined, a set of business strategies are proposed to guide future research development, broadening organizational capacity, improving overall governance and ensuring the MERC remains firmly on a path of sustainability. Some of these strategies are achievable in the short term; others will need to be implemented when MERC's financial capacity enables it to do so.

Overall, the organizational and financial strategies proposed will enable MERC's leadership to promote MERC to the global exploration community as an exploration research and education organization that is aligned with leading research centres around the world; that understands and is responsive to exploration and educational needs; and has the organizational and financial capacity to drive innovation and change. These improved business fundamentals are a keystone to MERC's success, and essential to its achievement of sustainability in the years ahead.

THE GOODMAN SCHOOL OF MINES

Established in 2013, the Goodman School of Mines (GSM) was created at Laurentian University to help Canada meet the impending employment shortfall in the mining industry. The School encompasses Department of Earth Sciences (DES) and the Bharti School of Engineering, in addition to Commerce, Indigenous Studies, Ecology, Biology and Occupational Safety and Health as they pertain to resource development.

The School's vision is to attract students and researchers from around the world who are interested in developing world-class credentials in the five key areas that define the mining cycle:

- Mineral Exploration
- Project Feasibility
- Mine Development
- Mine Closure
- Ecological Restoration

and in the three key areas in society:

- People and Community
- Environment and Ecology
- Economy

MERC is one of six mining-related research centres associated the GSM:

- Centre for Mining and Materials Research (CIMMR)
- Center for Research in Occupational Safety and Health (CROSH)
- The Cooperative Freshwater Ecology Unit (CFEU)
- The Geomechanics Research Centre (GRC)
- Mining, Innovation, Rehabilitation and Applied Research Corporation (MIRARCO)
- The Mineral Exploration Research Centre (MERC)

Allied centres under the GSM umbrella include:

- The Centre for Social Justice and Policy (CRSJP)
- The Centre for Rural and Northern Health Research (CRaNHR)
- The Institute for Northern Ontario Research and Development (INORD)

CURRENT STATUS

MERC RESEARCH AND EDUCATION INITIATIVES

In fulfilling its mandate, MERC's activities focus on exploration methodology and targeting in Precambrian ore systems and education. Its research is subdivided into seven exploration themes that integrate geological, geochemical and geophysical research:

- Mafic and ultramafic environments – Ni, Cu, PGEs
- Felsic intrusive environments – Ag, Sn, W, REEs
- Volcanic environments – Cu, Zn, Pb, Au, Ag
- Sedimentary environments – U, Cu, Zn, Pb
- Precambrian gold environments
- Geophysical mapping, detection and discovery
- Surficial studies to detect ore deposits under cover

Overall, its research team in 2014 includes 14 faculty, 26 industry and government adjunct professors, 66 graduate students including 24 PhDs and 42 MScs (Appendix 2). Research funding typically comes from industry, NSERC, NSERC - Industry Collaborative Research (CRD) Grants, and other provincial and federal government funding programs/agencies.

Through its educational initiatives MERC, in collaboration with the GSM, conducts workshops on topical issues. For example in 2014, MERC has or will be offering workshops in:

- Scientific and technical writing
- Exploration methods for gold and base metals
- First Nations concerns and exploration
- The economics of exploration in challenging times
- Advances in surficial exploration

An Abitibi-focused Greenstone Gold and Base Metal Exploration Mapping Course and an Abitibi Metallogenic Field Trip will be offered in alternate years on an annual basis. The Abitibi-based courses are directed at professionals entering the exploration industry or those who are not familiar with exploring in Precambrian shield terrains. They are designed for a capacity of 20 to 25 participants.

A new, one-day, "Sudbury Rocks" field course designed specifically to introduce Sudbury geologists to the complex rock types they will encounter during operations will be offered in 2015 and each subsequent year, as demand requires.

RESEARCH FACILITIES

Resources accessible by MERC members are extensive and are summarized in Table 3.

MERC OPERATING MODEL

Governance

MERC is one of six mining-related research centres and mining-related departments at LU, whose educational programs and initiatives form an integral part of the GSM. MERC has no separate legal status as an entity. It operates semi-autonomously (as it is affiliated with the Department of Earth Sciences), while operating under the guidance of an external Advisory Board, comprised of industry, government and academic leaders, who also hold active corporate memberships (at right). The board has defined that the MERC Director should be a full-time faculty member within DES who is actively engaged in exploration-related research and has an international reputation.

The Chair of the MERC Advisory Board is appointed by recommendation of the Advisory Board in consultation with the MERC Director. Currently the Chair is appointed for a renewable five-year term.

Operations

As the organizational chart illustrates, MERC operations are managed by a Director who is a fulltime Faculty member within DES and who devotes 20 per cent of his time to MERC under agreement with DES and the LU administration. The MERC Director provides the continuity between MERC and the Advisory Board, DES, the Faculty of Science, Engineering and Architecture, and the GSM. The MERC Director reports to the Dean of the Faculty of Science, Engineering and Architecture and works collaboratively with the DES Chairperson. The MERC Director is responsible for the long-term strategic vision and yearly plans/budgets for MERC, for collaboration with the GSM, and for communications with the LU community, industry sponsors, and Advisory Board.

The Director is compensated entirely through the University. The annual, in-kind value of the Director's salary and office/accommodation paid by the university is approximately \$37,500.

The Director is assisted by a part time, Associate Director (Adjunct Faculty member). The Associate Director's role is to manage MERC operations, including:

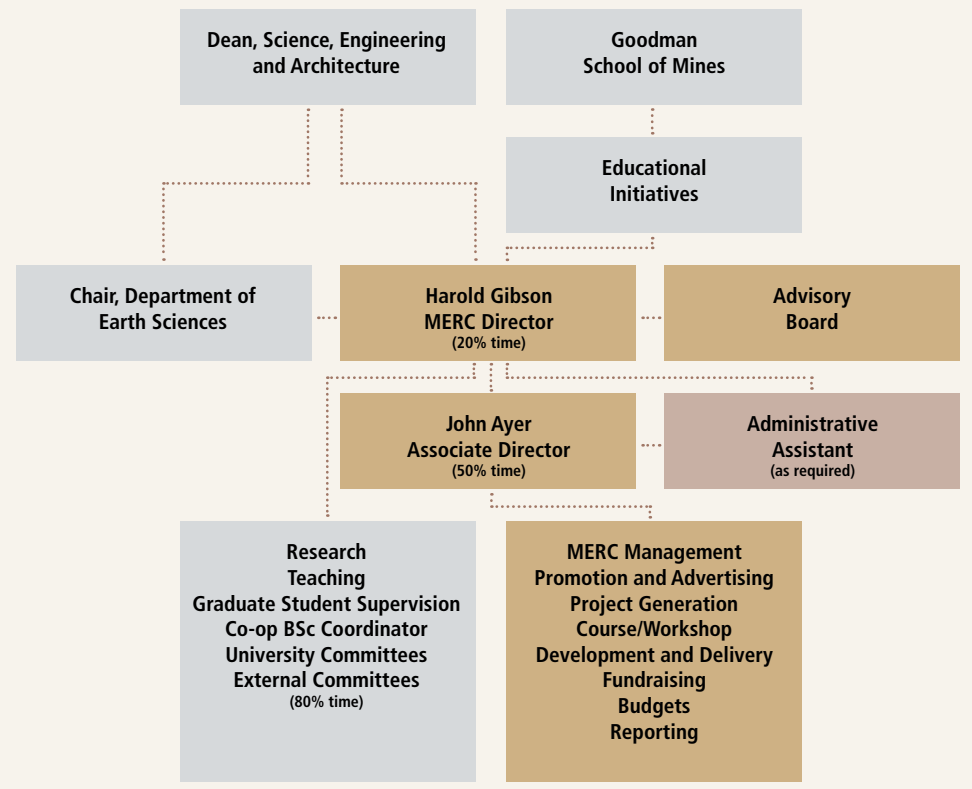
- Communications, promotion and advertising (branding)
- Research Project generation (with Director)
- Coordination of activities
- Course and workshop development and delivery
- Advertising, marketing and fund raising
- Budgeting
- Reporting

The Associate Director's workload constitutes approximately 50% of a full time equivalent position. The annual, in-kind value of the Associate-Director's office space and phone paid by the university is approximately \$2,500.

Accordingly, the part-time MERC Director and Associate Director positions are equivalent to approximately 70% of a fulltime management position. Only the Associate Director's part-time salary of approximately \$71,000 is provided directly from MERC operating funds.

Administrative support is provided by a part time Administrative Assistant/LU employee who also works for MERC on an 'as required' basis and the annual compensation of approximately \$25,000 is provided directly through MERC operating funds.

MERC ORGANIZATIONAL CHART



MERC OPERATING MODEL

Research Direction

Historically, MERC’s approach to setting research priorities is best described as researcher-led, and driven by proximity to world-class deposits of base and precious metals as well as diamonds. MERC has traditionally relied on the vision, expertise and entrepreneurship of its researchers – in collaboration with industry and government supporters – to develop research projects. Increasingly, MERC has begun to adopt a more proactive, focussed and strategic approach to priority setting as evidenced through its participation in larger industry-government sponsored research projects, as exemplified by the Discover Abitibi Initiative, Sudbury Ni-Cu-PGE research, thematic Abitibi Gold and Sudbury Footwall exploration projects (in progress), and its focus on exploration for Precambrian ore deposits.

MERC Memberships

MERC has three levels of memberships: Foundation, Tier 1 and Tier 2 as outlined in Table 1.

Currently there are 11 corporate members of MERC, including the Goodman School of Mines. (See Appendix 1 for MERC’s membership list at the time of writing).

As summarized in Table 1, benefits of membership within MERC include a position on the MERC Advisory Board, participation in decisions regarding future educational and research initiatives, reduced fees for MERC workshops and modular courses (variable percentage depending on membership level), and exclusive access to the MERC website, which contains PDF files of research papers, meeting abstracts/posters/PowerPoint presentations, and will contain final reports of past projects (when reports are outside the confidentiality period), maps, databases and student theses. In addition MERC membership provides:

- Specialized professional courses and field trips (reserved space)
- Specialized research that address members exploration challenges
- Access to state-of-the-art analytical facilities at discounted rates
- Source of, and interaction with, HQP (MERC students)
- Access to expertise in a wide range of ore deposit types

Currently one of the three Foundation Members is from industry. The remaining two are from the public sector; the Ontario Geological Survey and the LU Goodman School of Mines.

TABLE 1. MERC CORPORATE MEMBERSHIP

(Details in Appendix 1)

Membership level	FOUNDATION	TIER 1	TIER 2
Current number of memberships	3	4	4
Annual cost per membership	\$20,000	\$10,000	\$5,000
Workshop/course discount	20%	10%	5%
Guaranteed course reservation	4	2	1
Membership benefits	<p>(In addition to Tier 1/Tier 2 benefits)</p> <ul style="list-style-type: none"> • A voting position on the MERC Advisory Board • Opportunity for a visiting industry scientist • A seat on the MERC Advisory Board • Preferential access to HQP • Access to MERC research teams • Discounted access to MERC facilities • Receipt of newsletters and reports • Recognition in MERC materials • Access to restricted website 		

MERC Partnerships

MERC’s corporate members are its key strategic partners.

In addition, MERC collaborates with industry and academic partners across Canada and around the world on a project-by-project basis to undertake research initiatives. The following are some recent examples:

MERC is hosting the Canadian Mining Industry Council’s (CMIC) 5-year \$13M “Footprints” project, which is the largest mineral exploration research project and NSERC CRD project ever conducted in Canada. The research involves 42 researchers from 24 Canadian universities and 45 industry collaborators from 27 mining and exploration service companies.

MERC is conducting research directed at problems related to the exploration of a varied spectrum of ore systems. Some examples include the base metal potential of northern Canada’s Proterozoic and Paleozoic basins, the geology, geochemistry and petrogenesis of the Black Thor Intrusive complex and its chromite deposits in Ontario’s much talked about Ring of Fire, the origin of greenstone gold including the newer large tonnage, low-grade deposits (e.g. Côté Lake and Detour), and the interrelationship between magmatism, volcanology and tectonics in influencing gold enrichment in VMS deposits in Canada, Mexico and on the modern sea floor.

Financial Performance

Table 2 summarizes MERC's financial performance for the last three years.

It should be noted that MERC does not maintain cash or other asset balances separate from those of LU. MERC's finances, as noted in Table 2, reflect administrative arrangements among MERC, DES and LU, which have evolved over time, such as the in-kind contributions by LU as previously noted. Records of MERC's finances are maintained by the MERC Administrative Assistant in conjunction with LU Finance and Administration staff, and are not audited separately from LU's accounts.

Key observations on financial performance from Table 2 include:

- A substantial growth in operations has been experienced in the three year reporting period with reported revenues and expenditures increasing by two to three times, notably through a significant growth in memberships and the inception of annual, revenue-generating Abitibi field courses in 2013-14.
- Membership revenues increased from \$15,000 in 2011-12 to \$115,000 in 2013-14.
- Revenue from research overheads has declined by approximately \$7500 over the past 3 years, due in part to a change in overhead policy implemented by LU Administration resulting in proportionately less overhead funding allocated to MERC and other research centres on campus.
- The Goodman School of Mines' recent purchase of a MERC Foundation membership demonstrates further commitment to MERC.
- Operating expenditures have increased significantly due largely to the recruitment of an Associate Director in 2012-13.
- Operating surpluses have been reported in each year and have increased substantially, from \$531 in 2011-12 to over \$26,700 in 2013-14.
- Accumulated year-end surpluses have been realized in each of the past three years and are forecast to stand at an estimated \$305,000 at end of the 2013-14 operating year, which represents over two times the estimated operating expenditures for the same operating year.

It should be noted that the financial position summarized at right does not include two significant in-kind, annual, operating contributions:

- The approximate \$40,000 in-kind contribution from LU (Director's salary and office space, Associate Director's office space);
- Approximately \$20,000 in additional in-kind contribution from DES Faculty in planning and delivery of MERC educational field courses and workshops.

TABLE 2. MERC FINANCIAL POSITION 2011-12 TO 2013-14

	2011-12	2012-13	2013-14
REVENUE			
MERC Membership Fees (Industry/OGS)	15,000	40,000	95,000
MERC Membership Fees (GSM)	-	-	20,000
Research Overheads	19,085	15,963	12,148
Field Courses and Workshops	-	-	58,783
(Less) SEG Shared Revenue	-	-	(13,144)
Co-op Workshops	2,000	-	-
Balance of Start-up Funding	-	36,548	-
	36,085	92,511	172,787
EXPENDITURES			
Salaries and Benefits			
Associate Director	-	11,994	71,921
Administrative Assistant	-	-	24,539
Sub-total (Salaries)	-	11,994	96,460
Operating Expenses	19,009	20,889	6,425
Travel and Conferences	2,228	3,304	6,945
Student Travel Subsidy	6,127	6,107	1,649
Field Course Expenses	-	-	32,495
Co-op Workshop	331	-	-
Promotion	1,279	8,667	2,108
Equipment	6,500	-	-
Miscellaneous	81	-	-
	35,555	50,971	146,082
OPERATING SURPLUS for the year	530	41,540	26,705
ACCUMULATED SURPLUS beginning of the year	236,021	236,551	278,091
ACCUMULATED SURPLUS end of the year (MERC Sustainability Fund)	236,551	278,091	304,796



THE NATIONAL AND INTERNATIONAL CONTEXT FOR MINERAL EXPLORATION RESEARCH

BEST PRACTISES - COMPARATIVE REVIEW

This discussion provides a high level comparison of MERC operations, discussed in the previous section, with two of the leading global mineral deposit research centres, specifically the Mineral Deposit Search Unit (MDRU) at the University of British Columbia and the Centre for Ore Deposit Research (CODES) located at the University of Tasmania. Table 3 provides details of the comparison.

From a business planning and “best practises” perspective, key points from Table 3 include:

- The core businesses of the three centres are research and education. They have access to similar research facilities and equipment and research is undertaken by faculty, associates and graduate students.
- MDRU and CODES have significantly larger operating budgets than MERC and both have benefitted from substantial start-up funds from government (NSERC and the Australian Research Council respectively, matched in part by industry).
- MDRU and CODES both have significantly larger numbers of dedicated, full time centre staff than MERC, including full time Directors and contract Research Associates.
- There are significant differences in the number of foundation memberships between Centres (as shown in Table 4). Barrick, Anglo American and Newmont have Foundation Memberships (or equivalent) in both MDRU and CODES. Teck Resources has Foundation Memberships in MDRU, CODES and MERC.



TABLE 3. BEST PRACTISES - COMPARATIVE REVIEW OF MDRU, CODES, MERC

	MDRU	CODES	MERC		MDRU	CODES	MERC
Start-up	<ul style="list-style-type: none"> Established in 1989 with support and financial assistance from the mining industry and the Natural Sciences and Engineering Research Council of Canada (NSERC). Income from an endowment generated approximately \$100,000 per year in operational funding in 2006, 2007 and 2008. The forecast funding estimate for 2009 was \$50,000 (per MDRU annual reports published on its website). 	<ul style="list-style-type: none"> Formed in 1989 at the University of Tasmania. Federal Government-funded ARC Key Centre (1989-1996). ARC Special Research Centre (1997 to 2005). ARC Centre of Excellence (2005 to 2013). COE status triggers approximately \$3 million in annual government core funding; matched or exceeded by industry funding. Fee-for-service revenues generate another \$1 million + annually. University of Tasmania funding provides CODES with an additional \$1.5 - 2 million annually. 	<ul style="list-style-type: none"> Established in 1997 as a semi-autonomous research centre within Laurentian University's Department of Earth Sciences No financial support or endowment from LU except for office space – first director (M. Leshner) was an IRC chair and salary was paid by NSERC. 	Key Resources	<ul style="list-style-type: none"> Economic geology-related library including the geologic and mining archive for Island Copper donated by BHP Minerals. Sheahan-MDRU Library. The GIS-computer facility. Fluid inclusion laboratory. Petrographic microscope. Access to departmental facilities (SEM, Microprobe, sample preparation laboratories, etc.). 	<ul style="list-style-type: none"> Laser ablation ICP-MS lab. Axios Advanced 4.0kW X-ray fluorescence spectrometer. PicoTrace high pressure digestion system allowing for full dissolution of rock samples with resistant phases. State of the art polishing and thin-section making equipment. A wide range of analytical facilities such as electron microscopy, stable isotope ratio analysis, vibrational spectroscopy and elemental analysis. 	<ul style="list-style-type: none"> The John B. Gammon Mines Library. The isotopic geochemical laboratory (LA-ICP-MS lab). Laurentian University Central Analytical Facility. Fluid Inclusion laboratory. The Ontario Geoscience Labs. MIRACO 4-D Virtual Realty Laboratory. Access to and collaboration with mining-related expertise housed in 4 other mining related research centres and Bharti School of Mines at LU, all under the GSM umbrella.
Global Reach	<ul style="list-style-type: none"> Corporate and individual members currently include major and junior mining and exploration companies from Canada, United States, and Australia, and several associate members. Collaborative research projects with economic geology research groups in the United States and Australia, and is developing projects in Asia and Africa. 	<ul style="list-style-type: none"> 30 major industry projects. 34 countries involved. 165 research reports to industry per annum. 56 publications in journals per annum. Worldwide collaborations with 42 mining companies and 35 institutes and universities. CODES has satellite facilities, known as 'nodes' and 'international research partners', at the University of Queensland, University of Melbourne, Australian National University, CSIRO, University of British Columbia, Colorado School of Mines, Imperial College London and the Russian Academy of Sciences. 	<ul style="list-style-type: none"> 16 industry (NSERC) and government sponsored projects. Collaborative research projects across Canada and in 11 countries spanning 5 continents. 45 publications per annum. Global collaboration with 16 mining companies. 	Operating Priorities	<ul style="list-style-type: none"> Ore deposit research, geomaterials, targeting technology. Advanced education - workshops and short courses for professional development. 	<ul style="list-style-type: none"> Ore deposit research, exploration geochemistry, porphyry systems. Advanced education-modular graduate courses for Australian and international students. Workshops and short courses for professional development. 	<ul style="list-style-type: none"> Exploration research. Advanced education-modular graduate courses for Canadian and international students. Workshops and short courses for professional development.
				Management and Staff	<p>7 staff</p> <ul style="list-style-type: none"> Director GIS Specialist Project Manager Business Development Manager Event Manager Resource Centre Coordinator Finance Processing Specialist 	<p>Approximately 17 staff</p> <ul style="list-style-type: none"> Director Deputy Director Executive Assisstant Administrative Officers Communications Manager Lab Manager Lab Technician Lab Analyst Lapidary Technician Program Coordinator IT Officer Publications Rockstore Curator 	<p>3 staff (part-time)</p> <ul style="list-style-type: none"> Director Associate Director Administrative Assistant

	MDRU	CODES	MERC
Governance	<ul style="list-style-type: none"> • Research Generative Group • Board of Directors (19) 	<ul style="list-style-type: none"> • Science Planning Council • Advisory Board 	<ul style="list-style-type: none"> • Advisory Board • Dean, Faculty of Science, Engineering and Architecture
Members	<ul style="list-style-type: none"> • 12 Foundation Members (Industry) • 50 Corporate Members • 3 Individual Members • 3 Government Agencies 	<ul style="list-style-type: none"> • 12 "Industry Partners" (generally equivalent to Foundation members) 	<ul style="list-style-type: none"> • 3 Foundation Members: 1 Industry, 1 Government Ministry (MNDM), University (Goodman School of Mines) • 8 Corporate Members
Professors and Associates	<ul style="list-style-type: none"> • 27 	<ul style="list-style-type: none"> • 42 (academic research staff) 	<ul style="list-style-type: none"> • 40 (14 faculty, 26 industry, university and government adjunct professors)
Graduate Students	<ul style="list-style-type: none"> • 33 (9 PhD) 	<ul style="list-style-type: none"> • 40 (35 PhD) 	<ul style="list-style-type: none"> • 66 (24 PhD)
Operating Budget	<ul style="list-style-type: none"> • Approximately \$3M (Operations and Research) 	<ul style="list-style-type: none"> • Approximately \$12M (Operations and Research) 	<ul style="list-style-type: none"> • \$112,000 Operations • Approximately \$2M Research

TABLE 4. FOUNDATION MEMBERS - MDRU, CODES, MERC

MDRU	CODES	MERC
<ul style="list-style-type: none"> • ALS Group • Anglo American • Barrick • Eldorado Gold • Glencore* • Goldcorp • Independent Gold • Kinross • KGMH International* • Newgold • Newmont • Teck 	<ul style="list-style-type: none"> • AMIRA International • Anglo American • Anglo Gold Ashanti • Barrick • BHP Billiton • Beunaventura • Minerals and Metals Group • Newcast Mining • Newmont • Rio Tinto • St Barbara Ltd. • Teck 	<ul style="list-style-type: none"> • Teck Resources Ltd. • Ontario Geological Survey • Laurentian University Goodman School of Mines
<p>*Also have a corporate membership with MERC</p>		

- The development of international projects and collaborations have helped to grow CODES and MDRU. MERC, because of its strategic location, has focussed its research in Sudbury and in other nearby world-class mining districts (Timmins, Kirkland Lake, Noranda, Bousquet/LaRonde-Val' Dor/Hemlo). MERC's location is a significant advantage over MDRU and CODES, but in order to grow, MERC's research must expand to include other shields, and the exploration for deposits undercover.
- In terms of governance, all have an Advisory Board or Board of Directors (MDRU), however MDRU and CODES also have an additional advisory body known as a Research Generative Group (MDRU) or Science Planning Council (CODES), responsible for providing guidance in the establishment of research programs and priorities.
- The growth of MDRU and, in particular, CODES into world-class research centres has required a significant increase in their research capacity. A significant component of this increased capacity has been a steady increase in the number of research staff, referred to as research fellows or associates, who play an integral role in conducting, managing and developing research projects undertaken by the centres. They are also responsible for the co-supervision of an increasing number of graduate students and PDFs. The research fellow/associates are full-time, contract employees whose salary is derived from funds supporting the research projects that they are engaged in. (Without research associates or fellows, the number of permanent staff and available faculty would have limited the research capacity and growth of MDRU and CODES, as is the current situation that exists now at MERC.)



STRATEGIC CONTEXT FOR PRECAMBRIAN MINERAL EXPLORATION RESEARCH AND EDUCATIONAL INITIATIVES OVER THE NEXT FIVE YEARS

The outlook for MERC-based research over the next five years is predicted to improve as metal prices recover, the mining industry slowly moves out of the current economic slowdown, and as industry becomes more familiar with MERC. Growth will be achieved by focusing on research projects that are relevant to exploration, by increasing the number of industry relevant professional courses and workshops, by explaining the benefits of membership and thereby adding more corporate members, by attracting more students, and through more intensive advertising and branding efforts. If the economic turnaround is slower than anticipated, MERC will experience more modest growth or maintain the status quo. In this eventuality, MERC will focus on industry-relevant training, field trips and research projects of identified importance to exploration.

MERC's research will maintain a Precambrian ore systems focus, with emphasis on the Canadian Shield, but will also expand to include other Precambrian shields. MERC's research will continue to focus on improving base and precious metals exploration in greenstone terrains, but with an increasing emphasis on research directed at gold exploration over the next five years. A major challenge facing exploration in the Canadian Shield is the extensive cover by glacial drift and lacustrine clays, and younger cover rock. MERC 's research and educational initiatives will address how to integrate geological, geochemical and geophysical data to explore for deposits under cover. However, MERC research will continue to span problems related to the exploration of many ore deposit types and will range across Canada and globally.

MERC's vision is to promote research opportunities tailored to the skill set of the researcher(s) and to the specific needs of the industry sponsor. Projects will range from small, one company sponsored projects to multi-year, multi-company thematic projects, developed through individual researcher initiative and entrepreneurship as well as through broader based government/industry/ MERC-based funding initiatives. Priority setting will continue to be driven by collaborations with industry and government, but MERC will look to a new Exploration Science Advisory Council to provide direction and identify new/future research opportunities.

Research initiatives with government geological surveys will increase, particularly with the Ontario Geological Survey (OGS). In these collaborative projects, which are mapping based, the OGS provides field supervision and funding (student stipend for summer work, field/logistical and analytical costs), and MERC provides research supervision. The research focus for each project, deliverables and time lines are formalized through a signed OGS-MERC Collaborative Project Agreement.

Through its rebranding efforts, MERC management and the Advisory Board have noted an opportunity to develop and promote new modular courses aimed at graduate students, and a more formalized series of workshops, courses and field trips tailored for industry. MERC, through partnership and collaboration with the GSM, and with other research centres (e.g. CODES, MDRU), will increase the number and quality of academic and professional courses and workshops that will attract increasing numbers of global clientele.



CHALLENGES AND OPPORTUNITIES OVER THE NEXT FIVE YEARS

Challenges

1 Declining industry mineral exploration budgets due to the present economic slowdown, resulting in exploration and mining companies' reduced financial capacity to partner in MERC collaborative research initiatives.

- This has translated into the loss of one Foundation member, lower levels of project funding, fewer research projects, and a decrease in industry participation in workshops and courses. MERC management remains optimistic that the impact on MERC will be temporary and industry project funding will slowly increase when metal prices improve over the next five years.
- However, the current economic slowdown provides a good case for a stable base of operating funds that will allow MERC to maintain momentum during periods when industry cash flow is tight. Fortunately, as noted in Table 2, MERC is well positioned financially to offset periodic operating shortfalls.

2 Capacity and growth.

- The opportunity for MERC to take on additional research projects, workshops and field trips is severely constrained by the human resources within and available to MERC. DES faculty oversee each MERC project and they are also involved in developing and delivering MERC workshops and courses in addition to their normal teaching, administrative and research duties. Faculty workload has increased to the point where MERC activities are currently at or near maximum and a significant increase in graduate student numbers or research projects is not possible.
- In order to significantly increase the number of research projects, graduate students and PDFs, and professional courses offered, MERC proposes following a best practise from MDRU and CODES whereby:
 - The hiring of the Associate Director on a part time basis has made it possible to maintain the website, publish newsletters, meet with members and other companies and create a variety of workshops. The position requires a person with skills to connect with industry and the geoscience community and a base of regional geoscience knowledge. A fundamental requirement is that the Associate Director be able to connect with industry. Industry experience is a useful qualification. This position has the highest priority to continue. Depending on the economic climate and continued MERC growth over the next five years this position will be expanded to full time.
 - MERC has proposed the hiring of two contract Research Associates, to be paid out of projects and the MERC operational budget. The Research Associates would help generate new projects, provide oversight across a number of projects, co-supervise new graduate students and be involved in delivering workshops and courses. This will provide MERC researchers the time to design and develop new research projects in collaboration with industry counterparts. This is essential to increase research capacity

and to add value to our industry/government sponsors through focused problem-solving, relevant workshops, and more HQP; to LU and the GSM through increased revenue resulting from more graduate students, overhead and courses; to DES faculty who can devote more time on research; and to students by increasing the number of quality exploration relevant research projects. The Research Associate salaries would be in the order of \$90,000 to \$100,000 and could be phased in over three or four years.

- In addition, MERC proposes that the services of an experienced Funding Coordinator be retained (on a fee for service basis) to search out and identify funding opportunities available to new projects and to assist in designing proposals, thus maximizing the leverage of industry dollars thereby increasing project funding, and the number of graduate students. It is estimated that this would cost MERC approximately \$15,000 to \$20,000 annually.
- The financial impact of these staff positions and fee-for-service contract are discussed later in the report.

3 Changes in Laurentian University policies regarding the allocation of research overheads.

- MERC has reported a \$26,000 decline in annual revenue from research overheads. This is due to a decline in laboratory revenues following the departure of the Canada Research Chair in Precambrian Geoscience, and a reduction in the percentage of overhead awarded to research centres by LU that was implemented in 2011 (Table 5). The impact of the new overheads distribution policy translates into 43% less research overheads revenue flowing annually to MERC since 2011.
- It is worth noting that MDRU reportedly receives 100% of overheads associated with its research.

4 Relatively low corporate membership base, particularly in industry Foundation Members.

- The comparative assessment summarized in Section 3 illustrated that MERC's corporate membership base is relatively low, and that there is only one mining company among the three Foundation Members. While the existing membership is providing a stable funding base for its current level of operations, MERC's growth and capacity to take on new initiatives will be constrained if membership growth is not realized. This is particularly important for MERC, but also for MDRU and CODES, as 70% of MDRU and approximately 50% of the CODES' operating revenues are derived from memberships. Broadening MERC's corporate membership base, particularly its Foundation membership, will be important to position MERC as a leading exploration research centre accountable to, and representative of, the Precambrian-based mining industry at large.

TABLE 5. IMPACT OF CHANGES IN LU RESEARCH OVERHEADS POLICY ON MERC

	Former Overhead Distribution Policy	Current Overhead Distribution Policy	Relative Change
Central Revenues	20%	33%	
LU Research Office	5%	33%	
Dean	0%		
Academic Unit	0%		
Research Centre	60%	34	(43%)
Principle Investigator	15%		
TOTAL	100%	100%	

TABLE 6. A COMPARISON OF INDUSTRY AND UNIVERSITY CONTRIBUTIONS TO MERC OPERATIONS IN 2013-14

Industry Contributions		Non-industry Contributions	
<ul style="list-style-type: none"> Industry/OGS contribution to MERC operations through memberships 	\$95,000	<ul style="list-style-type: none"> LU contribution to MERC through GSM membership In-kind contribution (Director's salary and office space, estimate) Faculty time spent on field course planning and delivery Allocation of research overheads 	<ul style="list-style-type: none"> \$20,000 \$40,000 \$20,000 \$11,200
TOTAL	\$95,000		\$91,200

- In this regard it is worth noting the sizable number of exploration and mining companies with multiple memberships in MDRU, CODES and to a lesser extent, MERC, leading to a conclusion that there is growth potential for MERC if it promotes a research and educational agenda complementary to the research being undertaken at other centres. To maintain uniqueness and complementarity, it has been suggested by the MERC Advisory Board that MERC maintains its focus on industry driven exploration research as opposed to mineral deposit research and ore deposit research, as those fields are occupied by MDRU and CODES respectively.
- The current economic slowdown and scarce industry resources underline the need for a strong rationale and value proposition for investing in MERC research. In this regard industry has communicated its expectation of greater leverage of its funding from government and university sources. The minimum expectation is a matching of operating funds between industry and other sources, similar to the best practises in MDRU and CODES for example. Using figures from Table 2, the calculation of current industry leverage is illustrated in Table 6.

From Table 6, it can be seen that LU funding is currently close to par with industry's membership funding. However it should be pointed out that from a growth perspective, LU's funding is largely static, and will clearly not keep pace with a growth strategy founded on increasing the number of industry members and increasing overhead to MERC.

In light of industry's expectation that the university should match its operating funding, it is evident that success in attracting more industry members to MERC will require, among other things, a commitment of additional funding from the University.

Using the membership growth projections presented in Table 7, it is recommended that discussions among LU, MERC and the MERC Advisory Board be held to discuss a scenario where LU increases its in-kind funding to match all new industry funding associated with new memberships in MERC. Leveraging industry membership fees 1:1 on an on-going basis is a key element in attracting new members.

Opportunities

1 Capitalize further on MERC's successful educational initiatives.

- It has been noted that MERC is currently performing excellently with its short courses and field workshops.

MERC management have suggested that the current programming could nonetheless be strengthened by planning for additional modular courses aimed at graduate students and a more formalized series of professional workshops, courses and field trips for industry.

- To pursue opportunities and raise revenues related to MERC's educational offerings, it is suggested that MERC management organize an educational priority and planning session with its Advisory Board members to explore and potentially formalize these and other opportunities.

2 Develop a series of projects that address specific interests of members and local companies.

Examples of such projects are those related to solving problems related to the exploration for Sudbury Footwall deposits, the Black Thor chromite deposit, the Coté Lake Gold deposit, and VMS deposits within the Trans-Hudson.

3 Capitalize on MERC's stable financial footing and capacity to promote itself as a financially sustainable research centre.

- Notwithstanding the need to attract new members into the organization, Table 2 (MERC Financial Position), illustrates that accumulated year-end surpluses have been realized in each of the past three years and is forecast to stand at an estimated \$305,000 at end of the 2013-14 operating year, which is over two times the estimated operating expenditures for the same operating year.

4 Over the long term, expand MERC's capacity to become an internationally recognized leader on all aspects of mineral exploration, beyond geoscience.

- Over the long term, there is scope for MERC to take a leading role in improving the public perception of the exploration and mining industry by promoting a broad dialogue on all aspects of mineral exploration addressing both its value to society as well as its challenges. In particular, expertise within DES and LU allows future expansion into research areas such as environmental monitoring and geochemistry as applied to exploration (Appendix 2).

- Possible partnering possibilities through the Goodman School of Mines include:
 - History and geography, examining exploration linkages to human settlement patterns; how exploration and mining has evolved in different jurisdictions and led to current beneficial or negative circumstances around the world.
 - Economics, outlining the economic case for exploration and benefits to society. Explanation of market cycles and their impacts.
 - Finance (exploration's role and importance on Canada's capital markets).
 - Sociology, fostering a greater understanding about what makes a successful exploration team? Why do some have recurrent successes?
 - Environmental impact of exploration (scientific bases to support permitting, policy and legislative decisions i.e. what is the short term/long term effect of drilling in a boreal forest, as well as environmental monitoring and base-line studies).
- By promoting this type of research, MERC could broaden its reach within the academic community and strengthen its profile within LU and the GSM. For instance, an economics student studying the impact of exploration financing on spin-off jobs and regional economies could have a MERC logo on their paper, presentation, and other publications.

As noted above, this activity would need to be considered in the longer term, as at this time MERC does not have the staff or resources for these initiatives.



BUSINESS PLANNING OPTIONS

STRATEGIC DIRECTIONS

The following is a summary of strategic directions introduced in this report. The financial impact of these directions has been assessed in a financial forecast for MERC, found in Table 8.

- 1 Enact a policy establishing a MERC Sustainability Fund equivalent to approximately one year of operating costs (\$120,000 initially, increasing to match growth) to be kept in reserve and used to offset periods of operating shortfalls due to cyclical downturns in the mineral sector.
- 2 Strengthen MERC's current Governance Model and Research Planning Capacity, by establishing a new Exploration Science/ R&D Advisory Council, reporting to the MERC Advisory Board and mandated to develop and make recommendations concerning MERC's strategic research priorities over the next five years.
- 3 To increase the capacity needed for growth, recruit a Research Associate in 2017, to be paid out of projects and MERC operations. The Research Associate would help to design new projects, and to provide oversight and student supervision across a number of projects, thereby increasing MERC's research capacity, number of workshops/courses, and DES graduate student numbers
- 4 Implement a new Pre-Research Investigation Initiative to provide funds for proof-of-concept for potential, strategic research projects (maximum \$20,000/yr.).
- 5 By promoting MERC's key successes to date and the implementation of new Strategic Directions proposed above, establish realistic membership recruitment targets as proposed in Table 7.
- 6 As longer-term objectives, MERC will strive to expand its research capacity to include exploration for base and precious metal deposits in Precambrian Shields globally, to establish the funding necessary to support a full time Associate Director, and through discussions with Advisory Board members, and with the Goodman School of Mines, explore new ways to promote broader interdisciplinary research on exploration. Research could be focussed on improving environmental monitoring and base-line studies, and by increasing the public understanding and perception of exploration by promoting a broad dialogue on all aspects of exploration, addressing both its value to society and its challenges.



TABLE 7. TARGETTED GROWTH IN MERC MEMBERSHIP

	FOUNDATION	TIER 1	TIER 2	TOTAL
2014-15	3	4	4	11
2015-16	3	4	4	11
2016-17	4	4	5	13
2017-18	4	5	6	15
2018-19	4	5	7	16

Note that using these growth projections, and with the current membership fee structure, industry funding of MERC operations will exceed non-industry funding in 2016-17. In order to maintain a 1:1 leveraged funding arrangement between industry and non-industry funding sources, it is recommended that LU increase its in-kind funding to match funds for all new MERC memberships beginning in 2017-18, and to review its overhead policy for research centres.



FINANCIAL IMPLICATIONS

Table 8 provides a five-year financial forecast taking the above proposed Strategic Directions into consideration.

The following key assumptions are made in this forecast:

- A progressive membership recruitment campaign is successful in attracting five new members, including one new Foundation member over the next five years. In addition, MERC management suggests that there is a need to build more than one MERC champion within each sponsor/member company so that if an individual who supports MERC leaves, the sponsor company will still support MERC through membership.
- A full-time Research Associate is recruited in 2017-2018-at an annual cost of \$100,000. These positions require initial funding through projects and operations, but to maintain the conservative budgetary calculations in Table 8 funding has been assumed to be 100% through MERC operations initially, declining to approximately 10% within approximately 4 years, as the salary is allocated progressively to research projects. A second Research Associate would be recruited, likely post 2018-19, when MERC's financial situation allows.
- A Funding Coordinator is retained, beginning in 2014-15.
- A new Exploration Science / R&D Advisory Board with strong industry representation is established in 2014-15 at an estimated annual cost of \$6,000.
- A Research Project Initiation Initiative (proof of principle) is initiated in 2016-17 at an estimated annual cost of \$20,000.
- A MERC "Sustainability Fund" is created immediately with accumulated surpluses from MERC operations and equalling approximately one year of operating costs, to address periods of economic downturn.
- 10% of the income from MERC workshops and courses is provided to the LU Student Chapter of the Society of Economic Geologists (SEG) in support of field trips. For this remuneration the LU SEG student Chapter would provide assistance in delivering workshops and courses.

Note that a "mature state" scenario assuming the recruitment of a second Research Associate has been included on the far right column of Table 8. This column provides the long range "outlook" for MERC in terms of on-going requirement of membership revenues, LU top-up support, maintenance of the Sustainability Fund and the addition of a second full-time MERC Research Associate.

TABLE 8. A PROPOSED FIVE-YEAR FINANCIAL MODEL FOR MERC

 *Planning scenario assuming recruitment of a second full-time Research Assistant
Bold type indicates new five-year business planning initiatives

	2011-12	2012-13	2013-14	2014-15	2015-16	FIVE-YEAR PLANNING FORECAST			OUTLOOK*
						2016-17	2017-18	2018-19	
REVENUE									
MERC Membership Fees (Industry/OGS)	15,000	40,000	95,000	100,000	100,000	125,000	140,000	145,000	175,000
MERC Membership Fees (GSM)	-	-	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Research Overheads	19,085	15,963	12,148	15,000	15,000	17,000	19,000	21,000	30,000
Proposed LU Matching Funds (new industry memberships)	-	-	-	-	-	20,000	45,000	70,000	105,000
Field Courses and Workshops	-	-	58,783	55,000	55,000	55,000	55,000	60,000	60,000
(Less) SEG Shared Revenue	-	-	(13,144)	(5,500)	(5,500)	(5,500)	(5,500)	(6,000)	(6,000)
Co-op Workshops	2,000	-	-	-	-	-	-	-	-
Balance of Start-up Funding	-	36,548	-	-	-	-	-	-	-
	36,085	92,511	172,787	184,500	184,500	231,500	273,500	310,000	384,000
EXPENDITURES									
Salaries and Benefits									
Full-time Research Associates	-	-	-	-	100,000	70,000	35,000	10,000	20,000
Associate Director	-	11,994	71,921	72,000	73,000	74,000	75,000	75,000	75,000
Funding Coordinator	-	-	-	10,000	20,000	20,000	20,000	20,000	35,000
Administrative Assistant	-	-	24,539	25,000	25,500	26,000	26,500	27,000	30,000
Sub-total (Salaries)	-	11,994	96,460	107,000	218,500	190,000	156,500	132,000	160,000
Operating Expenses	19,009	20,889	6,425	1,750	1,800	1,800	1,800	1,800	1,000
Travel and Conferences	2,228	3,304	6,945	8,000	8,500	9,000	9,500	10,000	8,500
Student Travel Subsidy	6,127	6,107	1,649	2,000	2,000	2,000	2,000	2,000	2,000
Field Course Expenses	-	-	32,495	27,500	27,500	27,500	27,500	30,000	30,000
Co-op Workshop	331	-	-	-	-	-	-	-	-
Promotion	1,279	8,667	2,108	3,000	4,500	5,500	6,500	7,500	8,000
Equipment	6,500	-	-	-	-	-	-	-	-
New Initiatives									
Science Advisory Board	-	-	-	6,000	6,500	6,500	6,800	7,000	7,500
Research Project Initiation	-	-	-	-	-	20,000	20,000	20,000	25,000
Miscellaneous	81	-	-	-	-	-	-	-	-
	35,555	50,971	146,082	155,250	269,300	262,300	230,600	210,300	242,000
OPERATING SURPLUS for the year	530	41,540	26,705	29,250	(84,800)	(30,800)	42,900	99,700	142,000
ACCUMULATED SURPLUS beginning of the year	236,021	236,551	278,091	304,797	334,247	292,247	218,447	261,347	361,047
ACCUMULATED SURPLUS end of the year (MERC Sustainability Fund)	236,551	278,091	304,796	334,047	249,247	218,447	261,347	361,047	503,047

CONCLUSIONS

This Business Plan has reviewed MERC's current operation, focussing on its achievements to date and suggests a series of steps to be phased in over a five year period, which will place MERC on the path of increased operational capacity and long term sustainability, and will provide increased value to MERC's industry/government sponsors, LU and DES.

Discussions with MERC management and the insights provided to date by MERC Advisory Board members have highlighted the many financial and human resource issues that will challenge the extensive knowledge, creativity and resourcefulness demonstrated by MERC faculty and researchers to date.

To address these issues, many of the measures suggested in this Business Plan come from the best practises of the world's major mineral deposit research centers, notably MDRU and CODES. While much larger in operating capacity and having been seeded with significant start-up funding from industry and non-industry sources, there remains many similarities among the three centres in operating style, research and educational activities that provide a useful blueprint for MERC to follow.

The measures suggested in this business plan are presented over five years and are dependent on success in growing MERC's membership base, enhancing its profile within LU and the return of a more robust economic climate. This plan represents a patient and disciplined growth strategy for MERC that will need to be carefully monitored, as MERC's capacity to grow is tempered by the need to recognize and provide for the economic uncertainty that continually revisits a cyclical exploration sector.

Adopting these recommended measures offers the MERC Board and its management the opportunity to aggressively brand the organization. In conjunction to highlighting its locational and knowledge advantage to the exploration world, these new measures will help MERC manage through economic uncertainty by establishing an operating reserve; the measures increase its human resources and project coordination capacity, and strengthen governance in research and educational priority setting. Taken together, these new measures help brand MERC as increasingly responsive to industry's research needs and enable greater success in attracting research funding to LU, positioning MERC as a driving force with the Goodman School of Mines.



APPENDIX 1. MERC MEMBERS AND ADVISORY BOARD

Foundation Members

Teck Resources Ltd.
Dr. Andrew Davies, Chief Geoscientist

Ontario Geological Survey
Dr. Andrew Fyon, Director

Goodman School of Mines
Dr. Bruce Jago, Executive Director

Corporate Tier I Members

Detour Gold Corporation
Pat Donovan, Vice President, Corporate Development

Gold Fields Canada Exploration
Dr. Ross Sherlock, Exploration Manager, North America

KGHM International
John Everest, Regional Manager, Exploration, North America

Osisko Mining Corporation
Sergio Cattalani, Vice-President, Exploration

Corporate Tier II Members

Cliffs Natural Resources Inc.
Michael Orobona, Director - Geology

Glencore - Sudbury Integrated Nickel Operations
Greg Snyder, Chief Geologist - Sudbury

Northern Superior Resources
Dr. Thomas Morris, President and CEO

Wallbridge Mining Company
Alar Soever, Executive Chairman

Chair

Dr. Thomas Lane, CAMIRO

Exploration/Science Advisor

Dr. Howard Poulsen, Consultant

Ex-Officio

Harold Gibson
Director, MERC

John Ayer
Associate Director

Bruno Lafrance
Chair, Department of Earth Sciences

Yves Alarie
Director, Research, Development and Creativity, Laurentian University

Osman Abou-Radia
Dean, Faculty of Science, Engineering and Architecture, Laurentian University



APPENDIX 2. MERC AND LAURENTIAN UNIVERSITY DEPARTMENT OF EARTH SCIENCES FACULTY

Faculty

Harold L. Gibson
Professor and MERC Director, BSc Queen's, MSc PhD Carleton: Economic Geology, Volcanology

Bruce C. Jago
Executive Director, Goodman School of Mines, BSc MSc Lakehead, PhD Toronto; Economic Geology

Pedro J. Jugo
Associate Professor, BSc Central Venezuela, MSc Maryland, PhD Edmonton: Igneous Petrology

Daniel J. Kontak
Professor, BSc St. Francis Xavier, MSc Alberta, PhD Queen's: Economic Geology

Bruno Lafrance
Professor, BSc Montréal, PhD New Brunswick: Structural Geology, Economic Geology

C. Michael Leshner
Professor, BSc AM Indiana, PhD Western Australia: Economic Geology, Igneous Geochemistry

Matthew Leybourne
Associate Professor, BSc Waikato, MSc Acadia, PhD Ottawa: Geochemistry, Economic Geology

Andrew M. McDonald
Professor and DES Chair, BSc Waikato, Toronto, MSc PhD Carleton: Mineralogy

Michael Schindler
Associate Professor, BSc, MSc, PhD Frankfurt (a.M): Environmental Mineralogy, Hydrology

Graeme A. Spiers (Cross-Appointed)
Associate Professor, BSc Waikato, MSc PhD Alberta: Environmental Geochemistry

Richard S. Smith
Professor, BSc MSc Adelaide, MSc PhD Toronto: NSERC IRC in Exploration Geophysics

Phillips C. Thurston
Adjunct Professor, AB Rutgers, MSc Bryn Mawr, PhD Western: Precambrian Geology

Douglas K. Tinkham
Associate Professor, BSc Rocky Mt. College, MSc Illinois, PhD Alabama: Metamorphic Petrology

Elizabeth C. Turner
Professor, BSc Toronto, PhD Queen's: Carbonate Sedimentology, Invert. Paleontology

Clastic Sedimentologist – Position Advertised

Mineral Exploration Research Centre

Emeritus Professors

Anthony E. Beswick
Professor, BSc PhD DIC Imperial College: Igneous Petrology

Paul Copper
BA, MA Saskatchewan, PhD London, DIC: Paleobiology

Richard S. James
BSc MSc McMaster, PhD Manchester: Metamorphic Petrology

Reid R. Keays
BSc (Geol Eng) Queen's, PhD McMaster: Economic Geology, Geochemistry

Don H. Rousell
BSc PhD Manitoba, MSc British Columbia: Structural Geology

Robert E. Whitehead
BSc Mount Allison, PhD New Brunswick: Exploration Geochemistry

Adjunct Professors

Doreen Ames
Geological Survey of Canada, BSc Waterloo, MSc PhD Carleton: Economic Geology, Impact Structures

Nicolas Arndt
University of Grenoble, PhD Toronto: Igneous Petrology & Economic Geology

John A. Ayer
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Alan Bailes
Bailes Geoscience, BSc McGill, MSc PhD University of Manitoba: Precambrian Geology, Economic Geology

Peter J. Barnett
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Gary Beakhouse
Ontario Geological Survey, BSc MSc Manitoba, PhD McMaster: Precambrian Geology

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Adjunct Professors continued

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Franklin Geosciences, BSc MSc Carleton, PhD Western: Economic Geology

Alan G. Galley
Director, Canadian Mining Innovation Council, BSc PhD Carleton, MSc Western: Economic Geology

Paul J. Golightly
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George Gow
Ontario Geological Survey, BSc MSc Xinjiaan, PhD Cambridge: Sedimentology

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Mark D. Hannington
University of Ottawa, BSc Queen's, MSc PhD Toronto: Economic Geology

Charles W. Jefferson
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Alan King
Consultant, BSc Toronto, MSc Macquarie: Exploration Geophysics

Thomas E. Lane
T. Lane and Associates, BA Franklin & Marshall, MSc Dalhousie, PhD Memorial: Economic Geology

Peter C. Lightfoot
Vale, BA Oxford, MSc Toronto, PhD Open: Petrochemistry, Economic Geology

William A. Morris
McMaster University, BSc Leeds, PhD Open: Geophysic

Adjunct Professors continued

Edward F. Pattison
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Jan M. Peter
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Stephen J. Piercey
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Paula Piilonen
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Gregory M. Stott
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