

CIRAIG Newsletter

Interuniversity Reference Center for the Life Cycle Assessment,
Interpretation and Management of Products, Processes and Services

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Welcome to l'Infocycle's First Issue!

The CIRAIG is happy to present this first issue of l'Infocycle, its monthly electronic newsletter which highlights the Center's activities and events.

Aimed at a vast public of professionals including CIRAIG members, SMEs, NGOs and government agencies, l'Infocycle also gives up-to-date information on activities related to Life Cycle Assessment (LCA), Life Cycle Management (LCM), eco-design and sustainable development.

CIRAIG

The CIRAIG is a Canadian pioneer interuniversity center in the field of Life Cycle Assessment (LCA). Created in 2001 on an initiative started by the École Polytechnique, in

collaboration with the Université de Montréal and the École des Hautes Études Commerciales (HEC), the CIRAIG was set up in order to respond to requests from industry and government to develop a state-of-the-art academic expertise in sustainable development tools.

The CIRAIG gathers the strengths of Quebec and Canadian universities in the field of LCA and LCM and makes them available to companies and governments.

The Center is also an official partner of the UNEP/SETAC's (United Nations Environment Programme/Society of Environmental Toxicology and Chemistry) Life Cycle Initiative.



CIRAIG's logo

CIRAIG's logo is the schematic representation of the life cycle of a product, process or service. The logo is dynamic, with the element of the circle in motion, going through the various life cycle stages while undergoing change at each one. The colors of the logo are those of the Earth which we aim to preserve: blue, green and ochre.

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Who Are We?

The CIRAIG consists of a team of research scientists, research professionals and seasoned experts from its three founding partners; École Polytechnique, Université de Montréal and the École des Hautes Études Commerciales along with other universities. The CIRAIG also

collaborates with industrial and governmental partners as well as private research centers.

The following organizational chart presents CIRAIG's core team members which include the following people:

General Director: Pr. Réjean

Samson, eng., PhD (Chemical Engineering Department—École Polytechnique de Montréal)

Adjunct Director—Université de Montréal: Pr. Sylvain Plouffe, BDI, MScA (École de design industriel—Université de Mon-





Who Are We? (continued)

tréal)
Adjunct Director—École Polytechnique de Montréal: Pr. Louise Deschênes, PhD (Chemical Eng. Dept.)

Adjunct Director—École des Hautes Études Commerciales: Pr. Bernard Sinclair-Desgagné, PhD (Institute for Applied Economy)

Director - Partnership, financing and communications: Mr. Daniel Normandin, MSc, MBA

Technical Coordinator: Mrs. Renée Michaud, E.I.T. (Chemical Eng. Dept.—École Polytechnique de Montréal)

Analysts:
 Mr. Gontran Bage, E.I.T., PhD (Chemical Eng. Dept.—École Polytechnique de Montréal)

Mrs. Julie-Anne Chayer, E.I.T. (Chemical Eng. Dept.—École Polytechnique de Montréal)

Mr. Jean-François Ménard, E.I.T. (Chemical Eng. Dept.—École Polytechnique de Montréal)

Mrs. Laurence Toffoletto, MScA (Chemical Eng. Dept.—École Polytechnique de Montréal)

Information Scientist:
 Mrs. Sandra Estrela, BSc, (Chemical Eng. Dept.—École

Member Professors:
 Pr. Paul Stuart, eng., PhD (Chemical Eng. Dept.—École Polytechnique de Montréal)

Pr. Pierre de Coninck, PhD (École de design industriel—Université de Montréal)

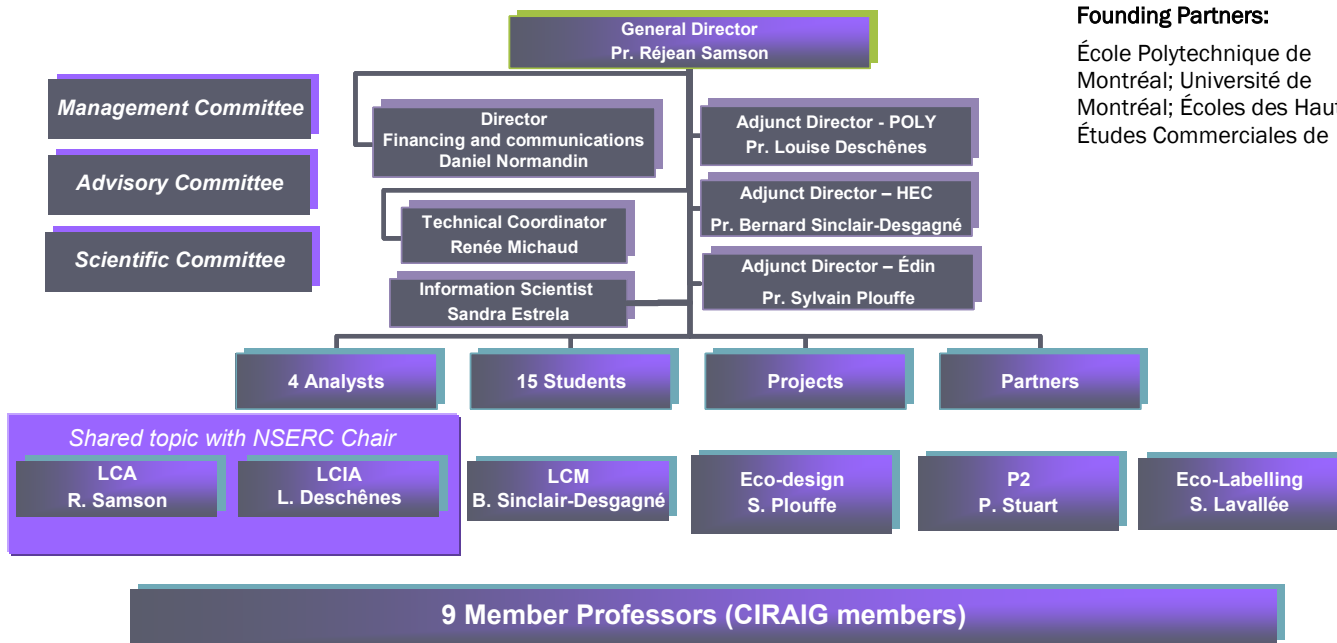
Pr. Paul Lanoie, PhD (Institute for Applied Economy—HEC Montréal)

Pr. Michel Provost, Sociologist, M.Sc., MBA (Groupe d'études et de recherche sur le management et l'écologie)—HEC Montréal)

Pr. Sophie Lavallée, LL.D (Law Faculty, Université Laval)

Founding Partners:

École Polytechnique de Montréal; Université de Montréal; Écoles des Hautes Études Commerciales de



CIRAIG's organizational chart

University Partners

École Polytechnique Fédérale de Lausanne (Switzerland); Université du Québec à Montréal (Institut des sciences de l'Environnement); Université du Québec en Abitibi-Témiscamingue (Mining Engineering Department); Université du Québec à Trois-Rivières (Pulp and Paper Research Center); Université Laval (Law Faculty).

Industrial Partners

Canadian Chemical Producers' Association; Forest Products Association of Canada; Québec Forest Industries Association; Association minière du Québec inc.; Centre Patronal de l'environnement du Québec; Canadian Petroleum Products Institute; Alcan; Bell Canada; Cambior; Canadian Pacific Railway; Hydro-Québec; Petro-Canada.

Governmental Partners

Ministère de la Science de la Recherche et de la Technologie du Québec; Ministère de l'Environnement du Québec; Minis-tère de l'industrie et du Commerce du Québec; Ministère des Affaires municipales et de la Métropole; Ministère des Relations internationales du Québec; Natural Ressources Canada.

Institutional Partners

United Nations Environment Programme (UNEP); ICI Environnement Inc.; Institute for Chemical Process and Environmental Technology (ICPET); Institute of Design Montreal.

CIRAIG's New Web Site

CIRAIG's Web site was designed by Mr. **François Boisvert** of Création et Gestion de Communication 2D + interactif and was brought online on September 2002.

Aside from information on LCA, visitors can view all services and products offered by the CIRAIG as well as projects currently underway at the Center.

The Web site also offers its members restricted access to a science watch in the LCA field

and access to a list of all available documents contained in CIRAIG's Documentation Center.

The Documentation Center includes a collection of journals, software, databases as well as a significant number of work (articles, conference proceedings, case studies, books) related to LCA.

The site also contains an up-to-date calendar of events which lists current and upcoming environmental and LCA related

events.

The site can be consulted at the following address:
<http://www.polymtl.ca/ciraig>.

Please forward any comment or question to :

Sandra Estrela, Webmaster
sandra.estrela@polymtl.ca



CIRAIG's Web Site:

<http://www.polymtl.ca/ciraig>

What is LCA Exactly?

In 1997, the International Organization for Standardization (ISO) defined Life Cycle Assessment (LCA) in the following manner:

« LCA is a method that studies the environmental aspects and potential impacts during the entire life cycle (from « cradle to grave ») of a product, from raw material extraction to its production, use and disposal ».

Thus, LCA is a tool for the

analysis of the environmental burden of products or activities at all stages in their life cycle.

LCA is a tool that permits comparative studies between products or processes having the same function. It can also be used to identify the steps in a system having the most environmental impact, to develop new products or services, to develop or guide in public policy making, to guide in the selection of raw material,

energy sources, packaging types, waste treatment options, etc.

In this sense, LCA is a decision-making tool whose goal is to contribute to the implementation of sustainable development. As such, it helps to decrease the local and global environmental impacts of products and services while maximizing the profit margin of businesses that employ it by a return cost reduction on the

*« LCA: a tool
for sustainable
development »*

LCA, a Bit of History...

The first LCA study is attributed to Coca-Cola in 1969. This type of study, named at the time Resources and Environmental Profile Assessment (REPA), dealt mainly with the use of energy which back then seemed more important than the use of raw material or environmental pollution. In the 80's, interest in LCA diminished due to technical difficulties

namely the lack of effective software. The 90's saw a renewal interest in LCA.

Three international organizations have been—and are—important players in the development and application of LCA: the SETAC (the Society of Environmental Toxicology and Chemistry), was the first international body to act as an umbrella organization for the

development of LCA, and as such has hosted a significant number of workshops which have greatly contributed to the establishment of the best available practices in LCA; ISO (the International Organization for Standardization), which produced the first complete series of LCA standards, the 14040 series and lastly; the UNEP (United

Nations Environmental Programme), responsible for numerous publications of user-friendly and easy-to-read guides to LCA along with many international workshops. The SETAC and the UNEP have recently joined forces by creating the Life Cycle Initiative which aims are to better advance LCA methodology, increase knowledge in the field and promote life cycle thinking.



Life Cycle Initiative logo

The CIRAIG on the International Scene

Many international working groups are presently working at defining and harmonizing the methodology through best available practices in order to advance LCA world-wide. To remain at the forefront of scientific expertise, many CIRAIG members have joined these working groups.

Within the UNEP/SETAC Life Cycle Initiative, Pr. **Réjean Samson** sits on the *Life Cycle Inventory* working group while

Pr. **Louise Deschênes** has joined the *Life Cycle Impact Assessment* working group. Mr. **Daniel Normandin**, for his part, sits on the *International Life Cycle Panel* (ILCP), highest authority of the UNEP/SETAC.

On the economic front, Dr **Gontran Bage** represents the CIRAIG on the Europe-SETAC *Life Cycle Costing* working group.

The next issues of L'Infocycle will include the latest

developments stemming from these working groups.

The CIRAIG has also participated in numerous international symposiums and conferences having a life cycle component.

The next section presents these events which took place in 2002.



International Conferences the CIRAIG Attended in 2002

EcoBalance V (Nov. 6–8, 2002)

Pr. **Réjean Samson**, Mr. **Daniel Normandin** and Dr **Gontran Bage** attended the Fifth International Conference on Ecobalance in Tsukuba, Japan. The CIRAIG representatives were able to interact with other leaders in the LCA field and also size up the current LCA status in Japan.

Europe SETAC (May 12–16, 2002)

Professors **Réjean Samson** and **Louise Deschênes** attended the 12th Annual Meeting of the

Europe-SETAC in Austria this past May. The meeting included many presentations as well as various workshops on LCA methodology.

UNEP's 7th High-Level Seminar on Cleaner Production (April 28-30, 2002)

Mr. **Daniel Normandin** attended this seminar presented in Prague during which took place the first meeting of the ILCP and the official launching of the UNEP/SETAC Life Cycle Initiative. The CIRAIG is an official partner of the initiative

and is co-sponsored by the Québec government.

Canadian conferences and workshops attended by the CIRAIG:

- 6e colloque de la SETAC-Chapitre St-Laurent, Qc, June 6-7, 2002.

- Colloque de l'écologie industrielle : une approche de développement durable, Orford, Canada, March 1st 2002.

- International Workshop on Life Cycle Assessment and Metals, Montreal, Canada, June 15-17, 2002.

Conferences and Posters Presented in 2002

• **Deschênes, L.** (2002). Applicabilité des méthodes d'évaluation des impacts du cycle de vie au contexte canadien. 6e colloque du SETAC – Chapitre Saint-Laurent, Quebec, Canada, June 6–7.

Lesage, P., Deschênes, L. et Samson, R. (2002). Analyse du cycle de vie de la gestion de friches industrielles urbaines.

SETAC – Chapitre Saint-Laurent, Quebec, Canada, June 6–7 (poster).

• **Samson, R.** (2002). Analyse du cycle de vie : Aspects méthodologiques et initiatives nationales et internationales. 6e colloque du SETAC – Chapitre Saint-Laurent, Quebec, Canada, June 6–7.

• **Samson, R.** (2002). Éco-parcs et symbiose industrielle : Utilisation de la méthode d'ACV pour quantifier les performances environnementales. Colloque de l'écologie industrielle : une approche de développement durable, Orford, Canada, March 1st.

• **Toffoletto, L., Deschênes, L. et Samson, R.** (2002). Analyse

environnementale du traitement en biopiles d'un sol contaminé au diesel, 6e colloque du SETAC – Chapitre Saint-Laurent, Quebec, Canada, June 6–7.

Upcoming CIRAIG Conferences in 2003

•**Daoust, C., Jolliet, O., Payet, J., Samson, R. et Deschênes, L.** (2003). Integrating Metal Bioavailability into Life Cycle Impact Assessment of Terrestrial Ecotoxicity. Second International Workshop on Bioavailability of Soil Pollutants and Risk Assessment, Ascona, Switzerland, February 2-7 (poster).

•**Daoust, C., Jolliet, O., Payet, J., Samson, R. et Deschênes, L.** (2003). Integrating Metal Bioavailability into Life Cycle Impact Assessment of Terrestrial Ecotoxicity. SETAC

Europe 13th Annual Meeting, Hamburg, Germany, April 27 – May 2 (submitted poster).

•**Gaudreault, C., Samson, R., Stuart, P.,** (2003). Survey of LCA Applications in the Pulp and Paper Industry. PAPTAC Meeting, Paper Week International 2003, Montreal, Canada, January 27-30.

•**Lesage, P., Deschênes, L. et Samson, R.** (2003). Life Cycle Assessment of Brownfield Redevelopment. SETAC Europe 13th Annual Meeting, Hamburg, Germany. April 27 – May 2

(submitted).

•**Lesage, P., Deschênes, L. et Samson, R.** (2003). Life Cycle Assessment of Brownfield Management. International Life Cycle Assessment/Life Cycle Management Conference, Seattle, September 23-25 (to be submitted).

•**Lesage, P., Deschênes, L. et Samson, R.** (2003). Life Cycle Assessment of Brownfield Redevelopment. 31st World Congress, International Association for Housing Science, June 23- 27, Montreal,

•**Samson, R., Ménard, J-F, Lesage, P, Michaud, R. et Deschênes, L.** (2003). Analyse du cycle de vie du concept bioréacteur pour le traitement des matières résiduelles. Salon des technologies environnementales des Amériques – AMÉRICA-NA 2003, Montreal, Canada, March 19-21.

•**Samson, R., Toffoletto, L. et Deschênes, L.** (2003). Analyse du cycle de vie de la réhabilitation d'un terrain par voie biologique. Salon des technologies environnementales des Amériques – AMÉRICA-NA 2003, Montreal, Canada, March 19-21.

Recently Submitted Articles

Bage, G.F., Samson, R. (Submitted in 2002). The Econo-Environmental Return (EER): A link between environmental impacts and economic aspects in a life cycle thinking perspective. *International Journal of Life Cycle Assessment*.

Toffoletto, L., Deschênes, L., et Samson, R. (Submitted in 2002). LCA of aboveground bioremediation of diesel impacted soil. *International Journal of Life Cycle Assessment*.



International Journal of LCA: number one reference in the field of LCA

LCA Training Courses Offered by the CIRAIG

For the second year in a row, an advanced two-day LCA training course was offered by Professors **Réjean Samson** and **Louise Deschênes** on November 14-15. This course was offered via the continuing education program of the École Polytechnique de Montréal.

The aim of the course was to provide thorough understanding of LCA methodology and give knowledge as how to conduct studies using LCA software tools such as GaBi.

Once again, this LCA training course was a success judging

by the number of participants and the degree of satisfaction of the attendees.

An abridged version of this training course was offered to thirty industrial participants on December 3rd, 2002.



Upcoming Courses in 2003

Canada (to be submitted).

The course entitled **Analyse environnementale du cycle de vie des produits et procédés** will be offered again in 2003 by the continuing education centre of the École Polytechnique de Montréal.

A part of this course will cover the use of different LCA software tools and databases contained in them. The participants will also be invited to conduct a short project with an LCA software program, via directed workshops.

Another course, entitled **Planification et mise en œuvre d'un programme de prévention de la pollution (P2)** will be offered in 2003 in collaboration with the Canadian Centre for Pollution Prevention (C2P2) and Environment Canada.

Professors **Réjean Samson** and **Louise Deschênes** will host these courses.

Current Major Projects

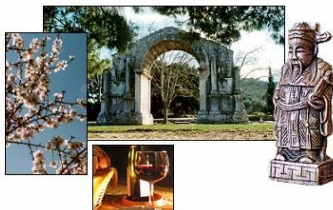
The CIRAIG and its partners are presently working on two important research projects entitled: 1) Life Cycle Environmental Assessment of Products, Process and Services: Validation of Existing Processes and Implementation in Industry, which is subsidized by the Fonds d'Action Québécois en Développement Durable (FAQDD); and 2) University Network on the Life Cycle Environmental Management of Products, Processes and Services subsidized by Valorisation Recherche Québec

(VRQ). The FAQDD project includes two objectives : a) the critical review of existing processes and the adaptation of the methodology for Quebec and b) the creation of a program for the training and promotion of the LCA tool.

The VRQ project, for its part, deals with the development of LCM tools in order to facilitate its use and implementation of sustainable development concepts by industries and governments. The two targeted sectors are pulp and paper and

Public Lectures and Conferences Presented in 2002

les **BELLES Soirées**
et matinées



Let us first mention the presentation given by professor **Sylvain Plouffe** during the general assembly of the **Centre local de développement du Bas-Richelieu**, on May 14th 2002. The presentation, entitled «*Le développement durable; contrainte ou opportunité?*», addressed the transformations taking place in the manufacturing sector in order to diminish the environmental impacts related to the

production of goods and services.

In addition, on October 16th 2002, Mr. **Daniel Normandin**, CIRAIG's director for partnership, financing and communications, presented the LCA methodology along with CIRAIG's principal activities to the **Association des industries forestières du Québec** members.

Mr. **Normandin** was also invited

to present a general public conference in the framework of **les Belles Soirées de l'Université de Montréal**. This conference which took place on November 14th 2002, was entitled «*Le cycle de vie des produits : les coûts pour l'environnement* ».

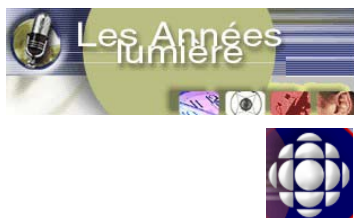
The CIRAIG in the Media

Last September, the **CIRAIG** participated in the taping of the Télé-Québec television show «**Zones Sciences**» on the life cycle of products. During the broadcast, professors **Louise Deschênes** and **Sylvain Plouffe** as well as **Mrs Renée Michaud**, CIRAIG's technical coordinator, explained the concept of a product's life cycle and its

application to environmental design. The show aired on October 21st and the **CIRAIG** possesses a copy of the interview.

Professor **Sylvain Plouffe** also gave a radio interview on Radio-Canada's show **Les Années Lumières**, which aired on December 8th, 2002. This interview, entitled «*L'éco-design*

ou la conception d'objets "écologiquement corrects" can be heard in its French version on : <http://radio-canada.ca/radio/lumiere/>.



CIRAIG'S First Graduate Student

The CIRAIG is proud to present its first graduate student, **Laurence Toffoletto** whose Master's thesis was on the life cycle assessment of a biotreatment for a diesel-contaminated soil.

In addition to this Master's in Chemical Engineering, environmental orientation, **Mrs Toffoletto** also possesses a Bachelor degree in Biomathematics from the Université de Lyon, a Master's degree in Biology of population and terrestrial ecosystems, with

a specialization in biomathematics of the same establishment, a Master's in Environmental Sciences from McGill University (1998-1999) and a DEA in water sciences with a specialization in environmental risk management from the Pharmacy Faculty of Montpellier.

She is presently pursuing her interests in environmental issues by working at the CIRAIG as a research associate.

Her article, « *LCA of Aboveground Bioremediation of Diesel Impacted Soil* » will soon be published in the *International Journal of LCA*.



Student Wanted

The CIRAIG is presently searching for a student who wishes to conduct a doctoral project (PhD) or a Master's doctorate entitled « *Ecotoxicological Impact Model Development in an LCA Perspective* ».

The main goals of the project are as follows :

- To conduct a critical review of existing contaminant fate and

exposure models in the context of toxicological risk assessment.

- To identify the required adaptations and develop an ecotoxicological impact model relevant to the LCA context.

- To compare, by case study, the results obtained from the developed model to those obtained with already existing LCA models.

The available financing for the project is 18 000\$/yr, for a maximum period of 4 years and the project starts as soon as possible.

For more information, please contact:

Pr Louise Deschênes :
514-340-5974
(louise.deschenes@polymtl.ca)

WEB site :
<http://www.polymtl.ca/ciraig>

PROJECT

« *Ecotoxicological impact model development in an LCA perspective* »

Companies Using LCA

Automobile Industry

McLaren/Hart Inc., Dow Automotive, Chrysler Corporation, PSA Peugeot-Citroën, Mercedes Benz AG, Volkswagen, Ford Motor Company, Toyota Motor Co., BMW, Fiat, General Motors, Volvo, Daimler-Chrysler, Honda

Pharmaceutical Industry

Proctor&Gamble, Johnson&Johnson, Henkel, Bristol-Myers Squibb, 3M, Novo Nordisk

Communication Industry

AT&T, Motorola, Nortel Networks, Lucent Technologies

Others

CIBA, IKEA, Airbus, BASF, Canfor, Compaq, Noranda, Shell, Battelle, Alcan, Hydro-Québec, Electrolux, Xerox, Philips Electronics, Quantum Corporation, Hewlett-Packard, Unilever, Bombardier





CIRAIG

Interuniversity Reference Center for the life cycle
Assessment, Interpretation and Management of
products, processes and services

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Find us on the Web!

<http://www.polymtl.ca/ciraig>

*Is your business prepared to meet the
Kyoto Protocol objectives?*

*Powerful tools are now available to help
businesses generate products and
services more efficiently and
economically while reducing
environmental impacts.*

Make your business benefit!

*CIRAIG- « Life Cycle Management for
Sustainable Development »*

2003 Calendar of Events

February 28: Énergie : efficacité et durabilité par l'Association de la maîtrise en environnement de l'Université de Sherbrooke (Ameus)
(Orford).

March 19, 20 and 21: L'eau, la santé et l'environnement
(Montreal).

March 19, 20 and 21: América 2003 by Réseau Environnement
(Montreal).

March 23–27: 1st International Conference on Environmental Research and Assessment
(Bucharest, Romania).

March 23–27: 5th International Conference on Environmental Future

(Zurich, Switzerland).

March 27: 19th Discussion Forum on LCA "Life Cycle Assessment of Pesticides"
(Zurich, Switzerland).

April - May: Building Sustainable Enterprises: Cross-Canada Eco-Efficiency Workshops (5 cities across Canada: Halifax, Toronto, Montreal, Vancouver and Calgary).

April 2 - 6: V International Conference on Ethics & Environmental Policy "Business Style and Stable Development"
(Kiev, Ukraine).

April 27 - May 1st: SETAC Europe 13th Annual Meeting "Understanding the Complexity of Environmental Issues: A Way

to Sustainability"
(Hamburg, Germany).

May 4 - 6: ARCSACC 2003- Assessment and Remediation of Contaminated Sites in Arctic and Cold Climates (Edmonton, Ontario).

May 4 - 7: 2003 International Pulp & Paper Environmental Conference & Exhibit (Portland, OR, USA).

May 18 - 23: Forum international écosystème et santé humaine (Montreal).

May 21 - 23: Environment & Energy Conference (Toronto).

May 25 - 28: Sudbury 2003- Mining and the Environment III
(Sudbury, Ontario).

June 4–5: The 2003 Business and Sustainability Conference
(New York, USA).

June 29–July 2nd: Second Conference of the International Society for Industrial Ecology
(Ann Arbor, Michigan, USA).

September 23 -25: InLCA/LCM-2003
(Seattle, Washington, USA).

For more detailed information on these events, please check the CIRAIG's Web site:

<http://www.polymtl.ca/ciraig>