Mount Allison University Environmental Audit 2005

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PREFACE

Mount Allison has made headway since the last campus environmental audit (2002). Large scale projects such as the Wet/Dry program were launched, and plans for the Carriage House Sustainable Residence came together, with the official opening in the Fall of 2005. A number of smaller initiatives have also led Mount A in the right direction such as a reduction in pesticide use, increase in locally produced foods in Jenning's, and energy efficient technologies installed in new buildings on campus.

Overall, the university is committed to environmental responsibility; however there remain areas for improvement. Given the state of the global environment, our actions need to be bigger and better. We continue to use large amounts of oil, water, and food that travels from as far as South America to get to our table. We use virgin paper, drive from one campus building to another when we could walk, and perhaps most concerning, is that we can graduate students who have never engaged with environmental issues even at the most basic level.

If Mount Allison is to become a sustainable campus, we need a commitment from all members of the university community, including senior administration, students, faculty and staff, which states that we will do what it takes to take care of our natural environment, including creating a culture of awareness on campus.

A vision for a sustainable Mount A is where we should start. From there the goals and recommendations laid out in this audit can serve as a guideline for initiatives over the next few years. By the time the next audit is conducted, major headway should be made.

This audit is an attempt to map our progress since 2002, and to provide the university with a clear strategy for improvements. Each chapter highlights goals and provides recommendations on how to achieve those goals as quickly, and cost effectively as possible.

In addition to this document, a "Green Action Plan" was developed for quick reference to the list of recommendations to be used by any group on campus looking to push environmental initiatives forward. Mostly, this will serve as a tool kit for the Environmental Issues Committee, who, after rewriting the environmental policy, will ensure that our campus continues to move towards being "green."

For students, a separate action plan has been drawn up that gives easy tips for sustainable living on campus. All of these documents are available on the environmental website www.mta.ca/enviro.

-August 19, 2005
Nik Basque, Jon Hudson, and Robin Hutcheon
Student Environmental Auditors

EXECUTIVE SUMMARY

This is the fourth biennial audit conducted at Mount Allison University. Each audit has highlighted our progress in reducing our ecological footprint and outlined areas for improvement, providing strategies on how to do so. This year, changes were made to the structure of the audit to better reflect the environmental situation both locally and globally. Some of the performance indicators were removed, while others were added, and the grading system was removed all together after campus feedback determined that it was not the most effective means of assessment. Overall, the university continues to make progress in most areas, but much work remains in order to achieve a Sustainable Campus at Mt.A. The following is a brief summary of each chapter.

Dining Services

Waste management at Jenning's Dining Hall is exemplary. All wet waste is pulped, and then composted off site, and food is only purchased in bulk to reduce packaging. In the Fall of 2005, students will be required to scrape their own dishes at a sorting station in hopes that less food will be wasted. Large areas for improvement include food purchasing policies and menu planning. Food needs to be procured more substantially from local sources, providing organic options when available. Menus need to focus on serving more sustainable meals (low on the food chain, in season, local and organic) as much as possible. Small steps are being taken to move in this direction.

Water Use

Overall water conservation at Mount A is mediocre. In terms of renovating, and implementing water-saving technologies in new buildings, we are doing well. But little priority is placed on retrofitting old fixtures which are costly and inefficient. Mount A should be concerned about the amount of water it uses, as it has the potential to use much less using some easy to implement strategies.

New Buildings & Renovations

Most work at Mount Allison involves renovations, as very little new construction occurs. When either new constructions or renovations happen on campus, there are efforts made (within the constraints of availability and cost) to implement green building techniques and energy efficient technologies. The university's newest building, Campbell Hall, has received CBIP certification, a commendable feat that will be formally recognized in the Fall. Due to the many ongoing energy reduction efforts, new buildings and renovations is an area that is moving forward environmentally at Mount Allison.

Energy Use

Total energy consumption at Mount Allison has risen over the years, though many efforts have been made to increase the efficiency of the HVAC systems and the buildings on campus. Increased efficiency reduces consumption, which is the overall goal of energy use. Significant effort has been made recently to implement an energy management plan for Mount Allison that will maximize our energy reduction. In 2004 an energy audit was completed by a consulting firm outlining several measures that could be taken to improve efficiency and therefore reduce consumption. A plan has been put in place to implement certain measures and it is now pending approval.

Emissions

From May 2002 to April 2005 36 882 tonnes of CO_2 equivalent emissions have been released into the atmosphere. Emissions levels are not congruent with previous audits due to inconsistency in emissions calculators used for each audit. The calculator used for this audit is the Clean Air Cool Planet CA-CP eCalculator v4.0. The task it facilitates – the collection, analysis, and presentation of data constituting an inventory of the emissions of greenhouse gases attributable to the existence and operations of an institution – provides an essential foundation for focused, effective outreach on the issue of climate change at a college or university, and the basis for institutional action to address it.

Hazardous Waste

Anything hazardous is disposed at Mount Allison according to provincial regulations. All hazardous materials are handled by trained personnel and there are significant efforts made to ensure all faculty and students understand the hazards associated with some of the materials they are working with. Most hazardous waste is generated in the Chemistry department on campus, and their Science Stores facility disposes of anything that requires regulated disposal. Hazardous wastes generated by other departments, like Facilities Management, are collected by Westmorland at least twice a year.

Solid Waste

Since the last audit the solid waste management system at Mount Allison has improved significantly. The implementation of the wet/dry system university wide eliminates the need for a separate recycling program on campus. The Westmorland-Albert Solid Waste Corporation (WASWC) has a sophisticated sorting system and recycles as much waste as possible with a landfill diversion rate of approximately 48%. In addition, WASWC processes compost on site with approximately 55% of the wet waste they receive. The main challenge to the most effective use of this system is proper sorting. In addition to responsible waste management, Mount Allison must consider its waste generation. There are a number of individual efforts made on campus to reduce waste but no waste reduction plan exists for the university. There are still a number of small steps that Mount Allison could take to further reduce waste generation, education being foremost among them.

Paper Use

Paper waste is a major challenge in a university setting and was among the most mentioned issues in all audit interviews, regardless of what the interview was about or who it was with. While paper consumption has gone down by over 2 million sheets/ year since 1998, we should continue to strive to reduce more. There are a number of steps that could be taken by faculty and staff to reduce paper consumption, such as accepting electronic assignments and double-sided hardcopy assignments and using double sided exam booklets. Students create a large portion of the paper waste through photocopying and numerous printings of assignments, or other documents, for extensive editing. In the area of paper consumption, in particular, it is up to individuals to be conscious of their consumption, and its effects, and make efforts to reduce.

Transportation

Since the previous audit the composition of the vehicle fleet has remained the same. There has been one removal and replacement of a truck. Six additional bike racks have been installed and progress continues in this area. The university should implement a commuter program to improve car-pooling and alternative transportation.

Grounds Keeping

The grounds at Mount A are a good example of how a campus can maintain its aesthetic appeal without applying harmful chemicals. Since the last audit, we have improved and continue to move in the right direction (toward a campus 100% free of all pesticides). Commendable areas include composting all yard waste, using drought resistant landscaping, and efficient watering techniques. Areas for improvement include: making the green spaces on campus more interactive for the university community to enjoy, learn from, and contribute to; planting more native species of plants and trees, and discontinuing the use of any pesticide on campus.

Spill Control

Mount Allison only has one potential environmental risk according to the Canadian Environmental Protection Act 1999. The oil bunker for the heating plant meets all legal regulations, however a containment dyke and employee training can improve the University's preparedness for the event of a leak or oil spill. Due diligence continues to be exhibited in all university operations.

Procurement

Procurement activities have improved due to higher environmental standards demanded by consumers and shareholders. Some consideration is given to environmental factors during tendering but the bearing of this factor on the final contract is negligible. Procurement tools that minimize packaging and "green" the supply chain have been recommended to the purchasing manager. The previous recommendation to develop an environmental purchasing policy has been deemed too constricting for the complexities of contract tendering in the short term. Other resources have been made available to provide alternative methods for improving the procurement process.

Academic Opportunities

Mount A is dedicated to the development of the "whole student." However, the incorporation of environmental content into academic curriculum at Mount A remains concentrated in the environmental studies and science programs, and a few other specific courses in various departments, making up a small percentage of all courses offered on campus overall. Students are able to graduate from Mount Allison without ever having engaged with environmental content, resulting in a general lack of awareness of our consumer impacts.

Stewardship

This is overall the weakest area at Mount A. Although many initiatives are taking place on campus, little has been done to unify them with a common institutional vision of environmental stewardship. Despite having a written environmental policy, it appears that little has been done to create a culture of sustainability, and to ensure that Mount A is living up to its potential. There are several ways that Mount Allison can improve, beginning with the reconstitution of the Environmental Issues Committee, updating of the Environmental Policy, and a signed declaration of environmental responsibility by Senior Administration.

DINING SERVICES

"Eat what you take for earth's sake!" -Unknown

Introduction

Wendell Berry once said that "how we eat determines how the earth is used." For students, staff and faculty at Mount Allison, there is a wide range of fruit, vegetables, sandwiches, salads and desserts available on campus. And yet, when we put food on our tray we rarely ask ourselves: Where does this food come from?

Following the Penn State Indicators Report (Penn, 2000) guidelines for a sustainable campus food system, the following indicators were chosen to measure Mount A's progress towards a sustainable food system:

1. Dining Commons Diet
2. Dining Commons Waste
3. Dining Commons Policies

Audit Evaluation

Dining Commons Diet

Indicator 1. Menu planning accommodates several different diet types.

Food Services at Mount A is currently provided by Sodexho whose goal is to promote "balance through healthy living." (Sodexho, 2004) Their aim is to provide a wide variety of foods that will satisfy the nutritional needs of students (their largest customer). Menus are planned by a large national body factoring in nutrition, regional and seasonal availability, and variety. Students are encouraged to give feedback on the menu items, make suggestions, and request specialty items (including more "sustainable food options"). Specialty diets (other than vegetarian) are accommodated on a per-student-as-needed basis.

Indicator 2. Information regarding ingredients and processing are made available to students at point of purchase.

Surrounded by all of this food, how do we make an educated decision about what to eat? Currently, information is available in regards to the nutritional content of foods, calculators are available online, and dieticians are available on campus and online as well. Jenning's has not attempted to include information on the ecological and social dimension of our food system, nor have they made information available at the point of purchase.

Dining Commons Waste

This is Dining Services strongest area. Jenning's should be commended for their continual efforts to reduce the amount of waste being sent to landfill. Jenning's follows the wet/dry program, implemented campus wide in the Fall of 2004. This program alone diverts more than 48% of all waste from landfill! Of the wet waste (which includes all food scraps), 55% is composted and used as fertilizer or landfill cover on the Westmorland Albert Solid Waste Corporation (WASWC) site.

Indicator 3. "On demand cooking" is used to prevent excess "left-overs."

Currently, this is done at Jenning's and has proven to save a large quantity of food from being thrown out.

Indicator 4. Packaging and Waste are minimized.

Jenning's follows a strict policy to purchase all food in bulk to reduce the amount of packaging being used. Exceptions include peanut butter in individually wrapped packages (for student allergies), and specialty teas. That said, student waste is still an issue at the Dining Hall. At any given meal, a quick glance at the tray trollies shows how wasteful the student body can be- trays are loaded with untouched fruit, glasses of juice, and full bowls of yoghurt. This is likely attributable to the "All You Care to Eat" program, and a general lack of student awareness about our impact.

There have been efforts to reduce non-compostable materials, such as napkins, by strategically placing them on the tables for an "as-needed" basis rather than on counters near food on a "might-need" basis. This has shown a decrease in the amount of napkins being thrown out.

DID YOU KNOW?

Jenning's has a plan to make waste more visible to students. Starting in the Fall of '05, students will be encouraged to eat only what they need, and will be responsible to scrape and sort their own dishes (following the lead of Skidmore College in New York state). This hopefully will raise student awareness about their personal food waste, thereby encouraging students to participate in the overall campus efforts and reducing waste even more.

Indicator 5. Food and Cardboard recycling programs used.

Jenning's encourages other departments to take items that would otherwise be discarded. Students take cardboard boxes, faculty and staff request containers for personal use, and a variety of departments on campus request buckets, boxes, etc for use in the classroom and for projects.

Indicator 6. China or reusable plastics are used.

China is used in the dining hall at all times, unless dishwashing equipment breaks down, in which case disposable dishware is used. Food Services only use styrofoam for outdoor functions, for bagged lunches, and in the Golden A Cafe (because of lack of a dishwasher in the case of the latter). There are plans to install a dishwasher and remove the use of disposable dishware once the café moves to the new student centre. In the meantime, this produces a significant amount of waste that cannot, in New Brunswick, be diverted from landfill.

Food Purchasing Policies

We're On the Right Track!

Mount Allison has taken the first steps toward a local food purchasing system! We buy local apples (when available), potatoes, and are looking into other local suppliers for things like grains. Let's keep this momentum going! Bates College in Maine, for example, is now a food service leader, buying mostly local and organic food. They started by composting at a local farm and buying local apples and potatoes too!

"[Mount Allison] has the potential to exert great leverage through its food purchasing decisions. Each dollar spent, in effect, is a vote for a certain way of doing things. Thus, through its food purchasing decisions, the University has the opportunity to pro-actively support a sustainable and just food system, if it so chooses" (Penn, 2000).

This is one of the weakest areas on campus, although progress is being made. Sodexho Food Services has exclusive rights to provide all food on campus. This translates to mean that campus food can only be supplied by Sodexho approved suppliers and vendors. That said, none of Sodexho's suppliers and vendors supply organic options, and few local options.

Indicator 7. Food is procured from local sources.

The few local suppliers at Jenning's include Scotsburn (dairy products), Sterling's Apples, and Just Us Fair Trade Coffee (as of Fall 2005). Jenning's is also looking into a local supplier for grains and oats (such as Speerville Mill in Speerville, NB) but no agreement has been reached. Ultimately, the food that is being served in the Dining Hall for the most part is not environmentally sound, as it travels from regions as far as California and South America. The transportation of our food requires a large consumption of fossil fuels, and increases the need for packaging, processing and refrigeration.

Indicator 8. Organic and Seasonal options are served.

In the past, no organically grown food has been served in the Dining Hall. In addition to serving Just Us (Fair Trade, Organic) Coffee beginning in the Fall of 2005, Jenning's has made a commitment to the student body to serve 1 to 2 meals per week containing organic ingredients!

Colby College in Maine is a prime example of the potential Dining Halls have to serve 90-95% sustainable foods. New Brunswick and the surrounding provinces have several sustainable farms, including farmer's cooperatives that could supply most of Mount Allison's demands[1]. Supporting sustainable agriculture whenever possible would significantly decrease Mount Allison's impact on the environment and is the area we need to improve on the most.

Indicator 9. Fish Species at Risk are not served.

Currently, Jenning's serves farmed atlantic salmon, a species which is on the "at risk" list! See box below for a list of species we should not serve, and healthy alternatives.

SUSTAINABLE SEAFOOD CHOICES
(Monterray, 2005)

Avoid serving:	***Instead Serve:***
King Crab	Halibut
Haddock (trawl caught)	Hook and Line Haddock
Salmon (farmed Atlantic)	Hook and Line Pollock
Tuna (bluefin)	Mackerel

Mount A, like most universities, aims to provide healthy food for the cheapest price. Although the issues mentioned complicate the buying process, they should be considered and there is no good reason not to. Before Jenning's staff are able to make the shift to sustainable dining at Mount A, students need to demand better (i.e., sustainable) food, and the university must change their mandate.

If Mount A makes the commitment to promoting a sustainable food system, the following should be considered "in addition to price and convenience" (Penn, 2000):

-Sustainable farming practices (See box above)
-Minimal Packaging
-Humane treatment of animals
-Labour practices
-Distance transported

www.themeatrix.com

THE FACTORY FARM

"Industrial agriculture practices are responsible for a host of environmental problems; in addition to causing massive topsoil erosion, aquifer depletion, and the reduction of genetic diversity, factory farms pollute our air, water, and soil with hazardous gasses, toxic chemicals, and harmful pathogens. Industrial farms cause ***$34.7 billion worth of environmental damage*** in the U.S. each year." (Sustainable Table, 2005) (italics mine)

Summary

Dining Services at Mount A is moving in the right direction. Steps are being taken to reduce waste and packaging and procure food from local and organic sources. The food purchasing policy is in need of improvement as it does not consider how far the food travels, how it is produced and processed (i.e., organically or not), and whether the animals and workers are treated fairly. Mount A needs to be concerned about these areas as this will determine whether or not we move toward a sustainable food system, or remain in an unsustainable one.

Goals and Recommendations

Short Term Goals:

1. Make a commitment to support a sustainable food system.

- Continue looking into local suppliers food items (such as grains and oats) and move towards local sustainable producers for produce, meat, poultry and dairy.
- Implement a policy that requires the following to be considered when purchasing food;
  -farming practices
  -labour practices
  -distance traveled
  -treatment of animals
  -packaging
- Students can conduct research of local suppliers, and pilot-test their acceptability in cooperation with Jenning's Dining Hall.
- When contracts are negotiated with an outside contractor (such as Sodexho), university administration can specify an increase in more sustainable food options, and consider the indicators above when making purchasing decisions.
- Do not to serve fish species at risk.
- Promote eating low on the food chain by increasing access to vegetarian/vegan food options, and decreasing overall amount of meat served.
- Increase amount of "sustainable meals" (meals that include at least 1 local and/or organic ingredient) by 30%.

2. Foster student awareness.

- Provide students with information about their specific food choices and their impacts.
- Make binder available with nutritional information and ingredients list available near the food stations for quick, easy reference.
- Make information on food sourcing made available to students through a visual map display.
- Encourage students to reduce their own waste through campaigns such as "lug a mug," discounting the price of coffee and tea for participants, and through the new waste sorting station (to open in the Fall of 2005).
- Increase students connection with their food through education campaigns about "where food comes from," invite farmers who provide food for Jenning's to give a presentation, for example.

3. Reduce Waste by 10%.

- Continue pulping pre and post consumer waste to be composted.
- Reduce amount of Styrofoam used at the Golden A Café and outdoor functions by purchasing a dishwasher for the café (once moves to new student center), and finding compostable/ recyclable/ reusable alternatives to Styrofoam for outdoor functions (such as Melmac plates and beverages served in cans and bottles).

Long Term Goals:

1. Have 90-95% of meals procured by local and or organic sources.

2. Eliminate all disposable dishware.

3. Compost pre- and post-consumer waste on site.

- Redesign pulping system so that all compostable materials are collected to be composted on site, and non-compostables can be removed and taken off site for sorting.

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goals	Long Term Goals
Diet				
Menu planning accommodates several diet types.	n/a	Vegetarians are accommodated in the meal rotation. Other diets are accommodated on a per student basis.	Focus on serving more "low impact" meals (low on the food chain and produced as locally and organically as possible).	Serve 90-95% food procured from local and or organic sources.
Information regarding ingredients and processing practices are made available to students.	A binder is available that lists ingredients of all dishes served in meal hall. It does not include information on processing.	The binder is still available, however not at the point of purchase. Information is accessible online as well.	Make the information binder available at the point of purchase for easy reference.	Include access to information about "sustainable eating," including where the food items come from and how they were grown.
Waste				
On-demand cooking used to reduce left-overs.	n/a	This technique is used, and has been successful in reducing large amounts of food from being thrown out.	Keep it up!	--
Packaging and waste are minimized.	Some packaging is avoided by purchasing food in bulk. Wastes are not measured.	Much packaging is avoided by buying food in bulk. Waste now is sorted through wet/dry system. All wet is composted, all dry is either recycled or reused on site, or sent to WASWC for processing.	Continue with the wet/dry program. Look into ways to compost pre- and post-consumer waste on site. This would require a reassessment of the pulping system that does not sort wet waste accurately enough.	Work with Facilities management to compost all pre-consumer and post-consumer waste on site. (This is a money saver since we pay tipping fees by metric tonne!).
Food and cardboard recycling programs used.	Food will be sent to WASWC beginning in September 2002. Cardboard continues to be recycled.	All waste is sent to WASWC which diverts all wet waste to compost heaps and recycles materials through sophisticated sorting system.	See above.	See above.
China or reusable	China is used in meal hall.	Same.	New Brunswick does not	Same.

plastics are used.	Food at the Golden A Café is served on Styrofoam and picnics/outdoor functions also use Styrofoam.		have a Styrofoam recycling system therefore it goes to the landfill. The university should look into purchasing a dishwasher for the Golden A Café. Look into encouraging students to "lug a mug" to outdoor events and eliminating non-recyclable dishware.	
Purchasing Policies				
Food is procured from local sources.	A small portion is procured from local sources.	Same.	At least 30% of food is purchased from local producers.	90-95%
Organic and seasonal options are used.	No organic options are currently available on campus; some changes in foods offered depending on the season.	JustUS Fair Trade and Organic Coffee products available campus-wide as of Fall '05, looking into Speerville Mill for local organic oats and flour, commitment to CHSRI and rest of student body to provide meals with local/organic ingredients twice a week.	At least 30% of all food on campus is organic, local, and in season (Cole, 2003).	90-95%
Fish species at risk are not served (see Box above).	n/a	Currently Mt.A serves mainly haddock, tuna, farmed atlantic salmon and occasionally crab. Farmed atlantic salmon is a species at risk.	Make a pledge to not serve endangered fish species.	--

Our Food Stream Starts Here.

Producer

Processor
Transporter
Distributor

Dining Hall

Consumer

Waste Stream a
Waste that is flushed travels through the water treatment facility and eventually ends up in the Tantramar River

Waste Stream b
Food that is thrown out is pulped and taken off site to be composted. 55% of wet waste is composted at WASWC*,the rest goes to landfill.

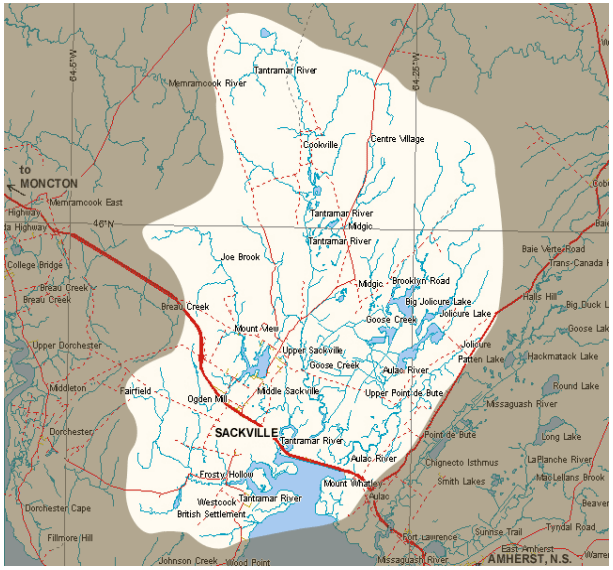
THE TYPICAL GLOBAL FOOD STREAM

WATER USE

When the well is dry we know the worth of water
-Benjamin Franklin

Introduction

Mount A is the Sackville's largest consumer of water so it is understandable that we have a large impact on the bodies of water we draw from, and discharge into, as well as the infrastructure used to treat our water.



Our water is drawn from the Tantramar River Watershed (pictured left, in white), a groundwater supply which is treated and pumped by the town of Sackville. Even though our water table is not at an immediate risk of depletion according to the Department of Water and Public Works, water conservation is still essential to preserve water quality. Since the last audit, Mount Allison's overall water use has decreased (See appendix 1). Mount Allison continues to do a great deal to decrease the amount of water used, and to protect our aquifers from waste and storm water.

The following 14 indicators illustrate our progress.

Audit Evaluation

Consumption

Indicator 1. Total Potable Water Consumption

- Overall water use has decreased slightly
- No baseline has been set for water use

Indicator 2. Storm and Grey Water reuse

- Mount A does not currently reuse either of these sources of water.

Management

Indicator 3. Leaking Fixtures

- In most cases leaking fixtures are fixed within a 24 hour period.

Indicator 4. Water metering

- All buildings are metered for potable water.
- No buildings are metered for wastewater.

Indicator 5. Pressure testing for leaks

- Mount A does not pressure test for leaks.

Indicator 6. Efficiency of fixtures

- All new fixtures installed are energy efficient ("low flow").
- There are conscious efforts to retrofit inefficient fixtures ("worst first") promptly.
- Alternatives to water consuming appliances have not been seriously considered (such as composting toilets). Waterless urinals were pilot tested, but not implemented because of a concern of "odour."

Indicator 7. Motion Detectors Installed

- As new buildings are built, and renovations are made, motion detectors are installed on sinks, toilets, and drinking fountains, however there is no plans to retrofit all bathrooms on campus with this technology.

Storm and Waste Water (Quantity)

(Sewage Lagoons, Sackville NB)

Indicator 8. Quantity of waste water produced

- Unknown.

Indicator 9. Quantity of wastewater treated

- 100% treated by the Town of Sackville.

Storm and Wastewater (Quality)

Indicator 10. Stormwater contaminant separation/collection

- Currently none of Mount A's storm water drains connect to contaminant separation/collection systems.

Projects and Education

Indicator 11. Projects are undertaken to decrease water usage

- Grounds keeping has reduced their water use significantly.
  - -Drought resistant landscaping techniques used
  - -Efficient sprinkling/irrigation technology used
- Jenning's Dining Hall has a commendable water reduction strategy.
  - -Water Recycling Systems in place
  - -Flow Control Devices used
  - -Staff Training includes water efficiency techniques
- No records of water saving measures are compiled including a list of all water saving features included in new and renovated buildings.
- No education campaigns have been conducted on campus to encourage water conservation.

Protection

Indicator 12. Ground Water Quality

Mount A's ground water source comes from the Tantramar River Watershed, of which the quality is good. The area of concern for Mount A is the King Street Parking Lot. See box below for discussion.

The King Street Remediation Project

Mount A is currently conducting a ground water clean-up Project on the King Street Parking Lot site. Formerly the site of a foundry, the ground water is contaminated with VOC's and hydrocarbons- both extremely pollutant. Without clean-up, the water will eventually make its way into the Waterfowl Park- a productive wetland site. The cleanup began in 2002 by drawing water up into a mini treatment station and cycling it back into the ground. It is expected to take another 2 years before completion.

Indicator 13. Backflow Prevention

Currently, installing backflow prevention devices is required, and Facilities Management is planning to address this area in the near future.

Disposal

Indicator 14. Waste Water Disposal

Our waste water is treated by the town of Sackville, of which the water is eventually drained into the Tantramar River. We have not looked into treating our own water with technologies such as a Living Machine (see appendix 3) that would allow for our waste stream to be much more visible, and also serve as a learning opportunity for students, staff and faculty.

Table XX: Water Use in Rest Rooms

Device	Traditional Water Use	Low-Flow Water Use
Toilet (tank)	22 Litres per flush	6 Litres/flush
Shower	22 Litres per minute	8 Litres/minute
Faucet	22 Litres per minute	8 Litres /minute

(Creighton, 1998:89)

Summary

Overall, water conservation efforts at Mount A are good. Projects have been undertaken to reduce water use on the grounds, and in the Dining Hall. However, only new buildings are equipped with low flow and/or censored fixtures which leaves several older buildings with inefficient fixtures. No education campaigns have been initiated to inform the university community about the importance of conserving water, and how to use the new technology that has been installed in certain buildings on campus. A baseline needs to be set in order to work towards the goal of decreasing our overall water consumption

Goals and Recommendations

Short Term Goals:

1. Reduce Water Consumption by 25% over the next 10 Years.

Structural:

- Continue using recycled water in dish machines in Jenning's and implementing this technique in any other applicable areas on campus.
- Continue installing flow control devices (such as used in Jenning's and Grounds).
- Continue using drought resistant landscaping.
- Continue replacing inefficient fixtures, either by adapting existing toilets for example (with toilet dams and displacement bags) or replacing the actual fixture.
- Set a baseline for water use (using this year's data) and,
- Create a computerized database, in cooperation with the town of Sackville, to record meter readings and alarm facilities management of sudden increases of flow (i.e., a break or flood).
- Look into implementing a waste water re-use system (such as a Living Machine. This could also serve as an educational opportunity for students in Biology and Environmental Science or Studies, for example).

Operational:

- Continue prompt detection and repair of leaks.

Educational:

- Use CHSRI as a *model* for efficient technologies that could potentially be implemented on campus in the future (especially low flow/pausable showerheads, low flow toilets and sink fixtures, etc).
- Spearhead education campaigns for water conservation (in the form of a "challenge," or incentive program) (As part of the campaign, those interested could tour CHSRI).
- Educate public about university's environmental efforts through news releases and "open houses" (especially in CHSRI) and increase visibility of the water system.

2. Develop Proactive Strategy to Protect Groundwater.

Long Term Goal:

1. Eliminate Waste Water at Mount A!

By following some simple guidelines and implementing some energy efficient technologies, the university will be shocked at how much water, and money, we will save! Some of the steps, many of which we have already taken, include:

- Install low flow shower heads, toilets, and faucets campus wide.
- Use water saving technologies when it comes to dish and clotheswashing.
- Install composting toilets throughout campus. This will save the unnecessary mixing of two valuable resources: pure water and human manure (See appendix 2).
- Collect rainwater from campus rooftops to be used for washing purposes (rather then drawing from the town source).
- Reuse gray-water (water that has been used for washing) instead of sending it down the drain (i.e.,) to the treatment plant.
- Use Living Machines "to process building wastewater on site…[this] offers a cost-competitive technological alternative to conventional wastewater treatment facilities with remarkable educational benefits".

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
Total Potable Water Consumption	174 Million Litres	On average 177 Million Litres (between 2002/03- 2004/05).	Establish baseline using 2005 date.	Reduce (per capita) water consumption by 25% over the next 10 years.
Storm and Grey Water reuse	n/a	Mount A does not reuse its storm or grey water.	Reuse at least 25%.	Reuse 100%
Leaking Fixtures	n/a	Most leaks are repaired within 24 hours of detection.	Keep up the good work!	--
Water Metering	n/a	All buildings on campus are metered for potable water. No buildings on campus are metered for wastewater.	50% of buildings metered.	100% of buildings metered
Pressure testing for leaks	n/a	Mount A does not pressure test for leaks.	50% of pipes tested.	100% of pipes tested
Efficiency of fixtures	Water fixtures are being replaced by more efficient models when the fixture needs replacing or when a building is renovated.	Inefficient fixtures continue to be replaced with low flow technology during renovations or new construction. New constructions such as Campbell Hall use energy efficient technologies such as Dual Flush Toilets. Alternatives to water consuming appliances have not been considered such as composting toilets.	50% of fixtures on campus should be energy efficient.	100% of fixtures on campus be equipped with energy efficient technology.
Motion Detectors Installed	n/a	With new constructions (such as Campbell) and renovations (such as the Dunn Building) motion sensors are installed in the washrooms and at drinking fountains. There is no plan to retrofit existing buildings.	Motion detectors should be installed in 50% of bathrooms and drinking fountains.	Motion detectors should be installed in 100% of bathrooms and drinking fountains.
Quantity of waste water produced	n/a	Not metered.	Meter wastewater.	Eliminate wastewater.
Quantity of wastewater treated	n/a	100%	Keep it up!	--
Stormwater	n/a	None of Mount Allison's storm water drains	At least 50%	100%

contaminant separation/collection		connect to contamination separation/collection systems.		
Projects are undertaken to decrease water usage	Projects are undertaken to reduce leaks.	Same. In addition, Grounds have made a significant reduction in their water usage (see grounds section), and Jenning's Dining Hall has water saving equipment and policy including staff training.	Implement education programs for staff and students.	--
Ground Water Quality	n/a	The King Street remediation is ongoing, started in 2003 it is expected to continue "cleaning up" the contaminated water for another two years at least.	Continue focusing on cleaning up King Street in the short term.	See prevent ground water contamination.
Backflow Prevention	n/a	When renovating laboratories, backflow prevention devices are installed, however, there are many taps that have not been fitted.	Install all labs with backflow prevention devices immediately.	--
Waste Water Disposal	n/a	Mount Allison does not treat its waste water on site and has not considered doing so.	Go beyond government regulations! Develop a proactive strategy to protect groundwater including stormwater management. Look into Living Machines as an alternative, and a learning opportunity for students, faculty and staff.	Implement one Living Machine at the Sustainable Residence.

NEW BUILDINGS & RENOVATIONS

> The good building is not one that hurts the landscape, but one which makes the landscape more beautiful than it was before the building was built.
> ~ Frank Lloyd Wright

Introduction

Buildings impact the environment significantly in a number of ways. Construction requires large amounts of energy through the production of building materials and the construction itself. As well, once buildings are up and running they require energy to run. Not only do buildings consume energy through their electrical and plumbing elements, they also require ventilation and heating. There are a number of steps that can be taken to minimize the impact of a building, generally classified as green building techniques.

The Canadian Green Building Counsel (CaGBC) defines 'green building' as "building design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:

-Sustainable site planning
-Safeguarding water and water efficiency
-Energy efficiency and renewable energy
-Conservation of materials and resources
-Indoor environmental quality"

Green building certification boards recognized by the CaGBC include LEED-Canada NC, LEED-BC and Green Globes[1]. According to an article in Facilities Manager magazine green building is not only an important environmental consideration but can also be an effective tool for improving indoor air quality, providing free publicity and recruiting[2].

While green building at Mount Allison is at the mercy of material availability and expense, the university is showing a commitment to improving the environmental impact of its buildings. Renewable energy technologies are available in New Brunswick, and materials like environmentally friendly paint are sold by most mainstream companies as they appeal to a growing niche market of sustainable living enthusiasts. The university continues to make small steps towards improving the environmental impact of their buildings by testing and using new technologies and 'greener' materials. Because of the strong feeling of support for this type of construction, it could be useful for the university to monitor advances in this market in order to be fully aware of the green building options that are available. The number of old buildings (over 40 yrs.) on campus is another challenge to implementing 'green building' at Mount Allison as they may not be suitable or adaptable to green building technologies.

Mount Allison has designed a 'Master Plan' that outlines the university's future building and renovation goals. Details about the 'Master Plan', including the guidelines used to establish it, can be found in the Facilities Management section of Mount Allison's website. The goal of the 'Master Plan' is to streamline the university's services and work on deferred maintenance to existing buildings.

The ultimate goal of the audit this area is to evaluate how 'green' new building and renovation projects are. In order to assess this, the following indicators were used.

Audit Evaluation

Indicator 1. Response time for major building maintenance and repairs is monitored and minimized.

The Facilities Condition Index (FCI) is "a comparative indicator of the relative condition of facilities" expressed as a function of deferred maintenance divided by the current replacement value[3]. The FCI of the university is between 16 and 20, an indication of the amount of deferred maintenance there is on campus. Neglected maintenance tasks generally increase energy use and potential harm to the environment. To quantitatively assess this indicator the university should ensure the FCI does not increase and set a long term rating goal.

Funding is probably the most important challenge in this area. In order to adequately maintain and especially to improve the FCI, proper funding is essential. For example, the university has received funding to update the ventilation system in the Barclay building, a project that has been on the list for at least 4 years. With the funding available, Mount Allison will be able to greatly improve the indoor air quality, as well as the energy efficiency of the building.

Indicator 2. Prior to new building or renovation projects an environmental impact analysis is completed.

New projects are assessed based on the needs of the university. For example, Palmer Hall was assessed and found to be inadequate for the needs of students (ie: there was not enough space to accommodate enough students). Rather than renovate that building, Campbell Hall was built as the more economically viable option. Normally consultations are held with focus groups and relevant departments when construction planning begins. Information sessions are held for students though these are not necessarily presented as an effort to solicit suggestions or concerns from them. The university is open to suggestions from anyone though they do need to be brought forward before decisions are made to be given consideration.

An environmental consultant was brought in to work on the Fitness Centre and Campbell Hall and will continue to be used on future projects. All new developments at Mount Allison receive an impact assessment.

Indicator 3. Building construction or renovation makes use of green building techniques.

The following efforts have been taken to minimize the environmental impact of building and renovating at Mount Allison:

- The university used an architect with a strong environmental stance to design its 'Master Plan'.
- The university used David Stewart & Associates Inc., (Energy, Environmental & Sustainable Management), as an environmental consultant on the Campbell Hall and Fitness Centre projects, and will continue to do so in future projects.
- Campbell Hall received CBIP certification and was found to have 30.4% more energy efficiency compared to a similar building[5].
- Heat retention is maximized, and therefore energy efficiency as well, with insulation and windows.
    - Campbell Hall has the best insulation on campus with R40 loose fit in the roof and R20 rigid polystyrene in the walls.
- Water consumption is reduced as much as possible in toilets and showers
    - Dual flush toilets were tested in Facilities Management in the women's washroom and were installed in Campbell Hall. Provided they are successful in terms of maintenance in Campbell they will be used in future projects as well.
    - Low-flow showers can be found in the Athletic Centre and Fitness Centre and Campbell Hall has pause-able showerheads.

- T8 and compact fluorescent bulbs are now installed everywhere on campus – incandescent bulbs can be found in some of the older buildings and not-renovated buildings on campus, but these will be replaced over time.
- Avard Dixon, the Dunn building and Campbell Hall are outfitted with 'watt stopper' sensors (further details can be found in the Energy Use Report).
- Low off-gasing carpets are used with water based adhesive. There is a limited availability of colours for adhesive free carpets making them aesthetically inappropriate.
- Non-toxic or organic paints are being looked into. The painting cycle is currently 12 years or more so paint selection may not be high on the list of priorities.
- Run-off from building construction is carefully monitored and monitoring specifications are outlined in the documentation of each project for the contractor to follow.
- Contractors are allowed to re-use materials from projects on the project they are working on, or for their own personal use.
- Construction waste is recycled by Westmorland or by Fero Waste Management in Moncton.

In general the university tries to be the most energy efficient in its buildings with the best payback. Without a proven payback period it is difficult to get funding for some of the large up-front costs of environmental materials and technologies.

Due to a lack of regional availability few green building materials are used on campus. Even when certain materials are available (like adhesive-free carpets), aesthetics are often a further barrier to their use. And, there are some other issues, including: will the material last as long as its non-environmental counterpart, how easy is it to maintain, is it locally available, and who will install it (carpets specifically)? Indoor materials are currently selected for least toxicity and ease of cleaning as custodial staff is limited. Other green practices have been subject to negative feedback from users. For example, someone removed all the low-flow shower heads that were installed in Hunton, so no more were used in any other residences. Un-insulated buildings present a problem in terms of their energy use. Several of the older satellite buildings on campus have little or no insulation. While it is very difficult to redo insulation a climate like Sackville's is not conducive to un-insulated living. There are therefore, a number of challenges associated with implementing green building techniques and energy efficiency at Mount Allison.

No buildings on campus are currently certified by any green building certification bodies but it is in serious consideration for future major building projects. The CBIP certification of Campbell Hall should be applauded and is another indication of the university's commitment to green building. Mount Allison will be receiving a plaque in recognition of this building.

Construction waste is generally recycled as outlined in the Solid Waste section.

"Minimizing" Campbell Hall:

- occupancy sensors installed
- dual flush toilets installed
- pause-able showers installed
- best insulation on campus
- CBIP certification
- involvement of an environmental consultant

Summary

Increasing efforts to improve energy efficiency have resulted in improvements in the environmental impact of new buildings and renovations at Mount Allison. While some material selection may be limited the university works with what is available within financial constraints to maintain and improve its buildings. Funding can be a major challenge to incorporating 'green building' into a campus but energy efficiency and waste reduction will result in payback periods for

the initial expenses of 'green building'. Mount Allison is making significant improvements in this area of their environmental impact.

Want to know more?

For the past several years, there has been an ongoing initiative to build a sustainable residence at Mount Allison. After years of work, the sustainable residence will become a reality in September 2005 in Carriage House. While it is not going to be a new building, as was originally proposed, nor will it be renovated immediately, it is a strong indication of the university's commitment to improving the environmental impact of its buildings. Through financial savings based on sustainable lifestyle choices, the residence is hoping to renovate Carriage House into a 'greener' building.

Goals & Recommendations:

Short Term Goal: Make buildings as efficient as possible.

- Continue to retrofit appropriate spaces with 'watt stopper' sensors. (Washrooms, hallways, etc.)
- Pilot test more environmentally friendly materials for indoor finishing, ie: organic or 'eco' paints (or no paint at all), adhesive free carpeting, etc. to ensure their viability in future university projects. (The Environmental Choice Ecologo certification provides lists of products and services that meet certain environmental criteria[6].) Include in testing education about what the university is doing and why for the entire campus, especially students.

Long Term Goal: Go green.

- Continue working towards green building certification.
- Use the influence of the university as a major consumer to promote green technologies and materials in the region by requesting their use in building contracts. Monitor advances in the green building industry to keep on top of available materials and technologies that could enhance the environmental performance of the university's buildings.
- Set a target FCI rating and integrate that with the implementation of green building techniques.

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
Response time for building maintenance and repairs is monitored and minimized.	This policy is adhered to for most repairs. Some repairs assume priority over others, bumping more unimportant repairs down the priority list.	Repairs are prioritized according to necessity. The FCI of Mount Allison is far from what it should be, an indication that a great deal of deferred maintenance remains on campus and the facility is not in great condition.	Maintain funding to stabilize current FCI rating.	Decrease FCI rating.
Prior to new building or renovation projects an environmental impact analysis is completed.	Environmental impact analysis is not carried out in all cases.	An environmental consultant was brought in for the new Athletic Centre and Campbell Hall projects. Mount Allison will continue to use his services on future projects.	All projects receive an impact assessment.	Same.
Building construction or renovation makes use of green building techniques.	While not all materials are environmentally friendly, there has been some headway made in this area.	Environmentally friendly materials continue to be pilot tested.	50% of major projects utilize green building techniques.	100% of major projects utilize green building techniques.

ENERGY USE

> I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait 'til oil and coal run out before we tackle that.
> ~ Thomas Edison

Introduction

Energy production can represent significant damage to the earth. Most energy in Canada is produced by burning fossil fuels. Fossil fuels are a non-renewable resource and we can expect to see the peak of production of our most popular fossil fuel, oil, in the next decade. Not only is limited availability an issue, the pollutants released by burning fossil fuels have significantly altered the earth's climate since the onslaught of the Industrial Revolution. Energy use strategies often focus on efficiency, which is crucial, but soon enough we will have no choice but to limit our reliance on fossil fuels and switch to renewable technologies in order to meet our energy needs.

Mount Allison has made a number of energy efficient choices in past decades, mostly based around financial savings. Since the last audit, a number of measures have been taken to improve the efficiency of energy production on campus:

- **Energy Audit**. An energy audit was done in 2004 which includes a number of steps that the university could take to improve its energy efficiency. Also included in this report are implementation plans, payback periods and funding opportunities.
- **Energy Coordinator**. This position will be filled once the job description/duties are completed and approved.
- **Boiler improvements**. Steam flow from the boilers has been measured since 2003 and a program to tune them up was implemented in 2004. As well steam pipes and traps are continuously monitored for leaks. The university has purchased and installed one set of 'soot blowers', and has plans to buy two more, which remove the soot from the boilers and increase their efficiency. Each boiler will be outfitted by June 2006.
- **Microwaves over conventional ovens**. When Campbell Hall was built, microwaves were installed on every floor rather than conventional ovens as in the other residences.

The motivation to conserve energy is an indication of Mount Allison's commitment to improving the environmental impact of the university and any energy saving measures implemented will always save money. The most important aspect of this area is education. Educating students about efficiency and alternative energy measures would not only improve their behaviour, and therefore their consumption practices, but would also enhance the university's environmental reputation through word of mouth. Improving the environmental reputation of the university will also motivate more students, who increasingly consider environmental leadership an important quality of post secondary institutions, to attend Mount Allison. Energy savings are not only important environmental concerns, they are also excellent money savers.

Major concerns associated with energy use include the rate of consumption, and the source of one's energy. The state of energy consumption and the sourcing of energy at Mount Allison were assessed using the following indicators:

Audit Evaluation

Indicator 1. Total energy consumption has decreased

Mount Allison's energy comes from two locations. Steam is produced in the central heating plant (CHP), (see appendix 4) and electricity is purchased from NB Power. The school uses four main fuel types in the CHP: No.5, Bunker A, Heavy Fuel Oil; No. 2 Light Oil; Low Sulfur Diesel; Propane.

Total energy and fuel consumption since the last audit is as follows:

Years (Jan. – Dec.)	Electricity (kWH)	Steam Flow	No. 5, heavy oil (Litres)	No 2. light oil (Litres)	Low Sulfur Diesel (Litres)	Propane (Litres)
2003	11 289 852	58 615 710	2 269 765	75 930.5	5 920.9	29 194.4
2004	11 930 961	55 587 309	2 330 916	75 569.6	7 866.5	26 076.5

(See appendix 5 for trends in electricity and fuel oil consumption since 1998.)

The following sub-indicators were used to quantitatively assess the rise or decline of the school's total energy consumption:

Sub-Indicator I. A baseline has been established as a standard against which improvement in energy consumption can be measured.

The university has yet to establish a baseline of consumption or energy use that could provide benchmarks from which goals could be set. The current practice is simply to "use what we need". In order to decrease our impact we should carefully examine our energy use and strive to need and use less.

Sub-Indicator II. Buildings are constructed or renovated incorporating energy efficient technologies.

In all cases the university strives to be the most energy efficient with the best payback. Without a proven payback period, it is difficult to justify the expense of implementing energy efficient or renewable energy technologies. Mount Allison has made significant use of energy efficient technologies, including 'Watt Stopper' sensors, dual-flush toilets, low-flow showers (where possible), day/night thermostat setback settings, and a recent move towards microwave ovens over conventional ovens, demonstrated in Mount A's newest residence, Campbell Hall.

Over the last several years the following steps, on top of those mentioned earlier, have been taken to improve energy efficiency in campus buildings:

- 'Watt Stopper' technology. Avard Dixon, the Dunn building and Campbell Hall all have sensors installed in their lighting systems that measure light and heat and operate the lights accordingly.
- Automatic temperature reductions. Thermostats have a day/night setback that automatically sets the temperature back to 18 degrees at night and can be manually reset to 21 degrees during the day.
- T8s over T12s. The university replaces all T12 fluorescent bulbs with T8s as replacements are needed.
- LED exit lighting. The majority of exit signs on campus are LED rather than incandescent.

Sub-Indicator III. Buildings not in use are closed.

Any buildings not in use during the summer months are closed. In the fall, if any buildings are not going to be used they are winterized. This includes turning off the water and setting the thermostat to a certain temperature. An alarm is installed in the form of a light attached to a thermometer that turns on if the temperature goes below a certain point. This ensures that nothing freezes in the building and it will be ready for future use.

Sub-Indicator IV. The HVAC systems are monitored and repairs are done in a timely fashion.

The HVAC systems on campus are monitored with an Energy Management Control System (EMCS). This system monitors the heating and ventilation in most buildings on campus and sounds temperature and security alarms in key areas. The EMCS serves the university's needs and has been programmed with energy efficiency in

mind. This sophisticated monitoring system allows the CHP team to respond to trouble areas quickly and efficiently, usually in the same day.

> "Humber College in Ontario has prevented 8 200 tonnes of GHG emissions and saved $2 861 000 since 1990 through energy management systems (that's about 546 tonnes and $190 733/yr.)."
> (Office of Energy Efficiency website)

Many small improvements have been made in terms of energy efficiency at Mount Allison, and the university continues to work on reducing consumption through these measures. Contrary to popular belief, computers do not use a significant amount of energy when compared to heating, air conditioning and lighting which are much bigger sources of energy consumption.

A plan has been created based on 'Energy Management Plan: A Comprehensive Study of Energy and Operational Efficiency Opportunities' prepared by Enerplan Consultants Ltd in April 2004. This report indicates a number of areas where improvements could be made, including costs and payback periods. Pending approval, Mount Allison will implement an increasing number of efficiency measures over the next few years. A series of buildings will be addressed with a mandate to improve their efficiency starting with the worst areas first. The bulk of these initial improvements will be in lighting. The goal of this plan is to reduce to the maximum amount possible total consumption. Once that is achieved the university can move towards alternative energy technologies. This will represent an important step towards reducing overall consumption, a responsible choice considering the current global situation of declining energy resources.

Indicator 2. Alternative energy sources are used.

All of the fuels used in the CHP are conventional and none are renewable.

NB Power generates power using Orimulsion®, oil, hydro, coal and nuclear energy. While only one of these, hydro, could be considered 'renewable', the company is "committed to the achievement of excellence and innovation in protecting the environment of the province" and their generating and nuclear facilities conform to ISO 14001 standards, an internationally recognized environmental regulation. NB Power is currently planning to provide 10% of its power through renewable sources. Wind Power is of particular interest with a 20 year power purchase agreement with a 20 MW wind farm at Dark Harbour off the coast of Grand Manaan.

A few years ago Mount Allison was preparing to use natural gas. While not a renewable energy source, it is cleaner burning than the No. 5 Bunker A heavy fuel oil currently being used. These efforts have been curtailed by the gas company due to the expense of extending their pipeline. Tapping into the main pipe line would cost $1 million and the company will not build any new lines until the existing ones are running at full capacity.

The wind turbine that was proposed several years ago is also no longer an option. After wind mapping was done it was decided that the Mount Allison farm is not a good location for the turbine as was originally thought. The university is interested in supporting a remote project however, that would put power back into the grid and the school would then buy 'green energy certificates' in support of renewable energy. At this time Mount Allison is relying on heavily polluting fuel sources for its energy needs and using no alternative energy sources. (See Appendix 6 for examples and benefits of alternative energy sources.)

Indicator 3. Government initiatives are monitored to ensure participation in relevant programs in the areas of pollution reduction and energy efficiency.

Government initiatives are monitored individually or departmentally. Any areas on campus that are regulated by the government are monitored closely and strictly enforced by Environment Canada.

Summary

Energy consumption at Mount Allison has increased, but energy efficiency is a high priority in the main areas of consumption on campus. Several measures have been taken over the years to improve the efficiency of heating and lighting in particular. It is also important to note that per capita consumption was not analyzed here. The proposed Energy Plan will further improve the efficiency of Mount Allison's energy consumption and should eventually lead to further investigations into alternative energy sources, including relevant funding opportunities. Overall, the university is on the right track towards improving the environmental impact of its energy use.

Want to know more?

Mount Allison is represented on the Board of Directors of ECO Energy. This is the community based group that was formed to be a watchful eye on the development of wind turbine farms in the area. They also are involved in looking at all types of renewable energy sources. The university had to pay a fee of$2000 to be a part of this group.

Research into other universities, particularly in Atlantic Canada, indicates that Mount Allison is on par with or ahead of the majority of Canadian schools in terms of energy management. Other universities in Atlantic Canada have focused their environmental efforts on recycling and energy efficiency measures similar to those found at Mount Allison (upgrading fluorescent bulbs to T8s with electronic ballasts, for example).

Goals and Recommendations:

Short-Term Goal: Improve efficiency and reduce energy consumption.

- Continue with plans to monitor oil going into the boilers.
- Continue to utilize the 'Energy Management Plan' produced by Enerplan Consultants Ltd. for energy saving measures in all areas of energy use on campus.
- Do an 'education retrofit'. Where energy retrofits have been done put up some educational material (ie: posters) describing what the technology is and why it's there. (see appendix 7 for examples).
- Set a baseline of energy consumption with 2004 data.

Long-Term Goal: An emission free university.

- Go 'carbon neutral' with 'renewable energy certificates' (RECs). This is a process endorsed by the David Suzuki Foundation whereby all carbon emissions are either eliminated or counteracted with RECs.
- Carefully and continually monitor advances in alternative energy technology, especially price reductions, so that the university knows about them and knows when they can afford them.
- Construct new buildings, or renovate old ones, assuming alternative energy sources will be used in the future to ensure that Mount Allison is ready when they are.

Benefits of solar energy:

- NB Power expects energy demand to exceed supply by 2007. (NB Power website)
- Class 43.1 allows taxpayers an accelerated write-off at up to 30% per year on equipment producing solar electricity (systems greater than 3 kW) and for active solar technologies generating thermal energy.
- Potential to have power when conventional source is out.
- Greater price stability versus fluctuating fuel prices.
- Safe, durable, reliable and long lasting.
- Low maintenance and silent operation.
- It is free and abundant.
- Job creation. "A recent study found that wind and solar power both provide about 43% more person-years of employment per dollar invested that coal-fired electricity production." (Pembina Institute, 2003) (Clean Nova Scotia website - http://www.clean.ns.ca/solar/about.html)

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
Total energy consumption has decreased.	n/a	Energy consumption has increased but a plan is in the works to maximize reductions in consumption.	10% reduction.	30% reduction.
Sub-indicator: *I. A baseline has been established as a standard against which improvement in energy consumption can be measured.*	The university now has one year's worth of data from the meters installed on individual buildings. This should be used to set a baseline as soon as possible.	No baseline has been established. However, this should be accomplished in the near future.	--	--
II. Buildings are constructed or renovated incorporating energy efficient technologies.	A number of steps have been taken to improve energy efficiency including retrofitting of fixtures, energy saving features on computers and lights, and fixing leaks in the steam lines. Newly constructed buildings on campus integrate more energy efficient technologies.	New buildings and renovations on campus use state of the art energy efficiency technologies.	--	--
III. Buildings not in use are closed.	Most buildings are used during the summer. Residence buildings are frequently used for conferences and other buildings often undergo repairs or renovation and would be in need of utilities. However, those not used are closed.	Any buildings not used during the summer are closed. Buildings not used during the winter are winterized in the fall.	--	--

IV. The HVAC systems are monitored and repairs are done in a timely fashion.	n/a	A sophisticated computer system monitors the HVAC system and repairs are usually performed the same day they are detected.	--	--
Alternative energy sources are used.	The university has begun investigating alternative energy sources including solar shingles, and a wind turbine, despite the cost difference. More research needs to be done on the feasibility of using renewable energy sources on this campus. Renewable energy technologies have not been incorporated into buildings on campus.	Investigations into alternative energy sources have so far been disappointing. The proposed wind turbine site was not appropriate, and solar panels have been found to be too expensive.	Use one alternative fuel source.	Fossil fuel free!
Government initiatives are monitored to ensure participation in relevant programs in the areas of pollution reduction and energy efficiency.	Government initiatives are monitored by staff in the Facilities Management department.	Government initiatives are monitored on an individual or departmental basis.	75% participation.	100% participation.

AIR EMISSIONS

"You cannot affirm the power plant and condemn the smokestack, or affirm the smoke and condemn the cough" ~ Wendell Berry, *The Gift of the Good Land*, 1981.

Introduction

Since the Kyoto Protocol climate change has been at the forefront of today's global issues. This trend of global warming is melting ancient glaciers and ice sheets, endangering the survival of species and ecosystems, and increasing the frequency of weather disasters like floods, droughts, heat waves, wildfires, and tornadoes. As the Canadian government strives to reduce overall emissions 20% by the year 2012 it is up to Universities and other educational institutes to set the standard, putting the same sustainable methods taught in their classrooms into practice on their own campuses.

The 2005 Environmental Audit calculated Mount Allison's air emissions using the Clean Air Cool Planet CA-CP eCalculator v4.0 (see appendix 8). The task it facilitates – the collection, analysis, and presentation of data constituting an inventory of the emissions of greenhouse gases attributable to the existence and operations of an institution – provides an essential foundation for focused, effective outreach on the issue of climate change at a college or university, and the basis for institutional action to address it. (Clean Air, Cool Planet ToolKit)

Based on the available information (many emissions inputs were not available for the auditors) Mount Allison released the equivalent of 11,634 tonnes of CO_2 effluents during this fiscal year (May 2004 – April 2005). For the past four years emission levels have remained near this figure with minor fluctuations occurring due to heating and electricity costs for the winter months. Since the last audit, a total of 36,882 tonnes of CO_2 gas has been released. To put these figures in perspective, the average Canadian is responsible for 6 tonnes of green house gas emissions each year.

Audit Evaluation

Indicator 1. Emission levels resulting from Energy and Heating

The majority of emissions released by Mount Allison come from energy and heating. Approximately 10,942 tonnes of CO_2 were emitted from May 2004 to April 2005 as a result of electricity and oil heating.

The Value of Energy Policies

Energy efficiency policies and procedures can help drive down energy costs. For example, you could set up an energy committee, include energy-reduction goals in job accountability forms, present cost-reduction progress reports in staff meetings, or regularly track utility costs through a bill-monitoring system in your accounting department. (http://oee.nrcan.gc.ca/getting-started/change)

Indicator 2. Emission levels resulting from Transportation

The University operates 13 vehicles, but only 7 vehicles have information recorded necessary to calculate the total emissions of these vehicles. The information required to calculate vehicle emissions is model and year of the vehicle, kilometers driven, and litres of gas/diesel consumed. According to the Facilities Management Vehicle Policy this information should be recorded and stored in log books. Updating vehicle logbooks and reaffirming vehicle policy procedures with the vehicle users is recommended if future vehicle emissions are to be calculated.

Commuter Emissions

Another factor of Mount Allison's GHG emissions are the commuting trends of university employees. These emissions have not been included in the GHG calculations for two reasons: (1) personal transportation of employees does not fall under the jurisdiction of the university and thus must be treated as an external source of emissions, separate from the university, (2) an accurate assessment of commuting trends is difficult to establish without consistent monitoring. How an employee travels to and from campus is a personal decision, but Mount Allison should aim to accommodate and promote methods of commuting that reflect the values and policies of the university. Recommendations on how to achieve this goal can be found in the transportation section.

Indicator 3. Emission levels resulting from Solid Waste

The total tonnage of solid waste removed from campus for the period between October 2004 and February 2005 was 86.33 tonnes. This information comes from PBS Waste Services Ltd. records which began October 2004. The total emissions from this waste were 59 tonnes of CO_2 equivalents.

Prior to this Tantramar Sanitation Service removed waste from campus. Unfortunately tonnage of waste was not recorded during this period as the University paid a flat service fee based on the average of 224 tonnes of garbage/year.

A considerable amount of CO_2 is emitted during the transportation, sorting, and disposal of waste. These factors are difficult to calculate and are thus not included in the inputs for the Cool Air – Clean Planet emissions calculator.

Indicator 4. Emission levels resulting from Fertilizer

Fertilizers used on grounds contribute to our overall emissions by slowly releasing nitrous oxide after application. The level of nitrous oxide emissions depends upon the percentage of nitrogen in the fertilizer and the amount of fertilizer used. In 2004, six different types of fertilizer which had nitrogen content were used on campus grounds. The total amount was 162 Kg with an average nitrogen percentage of 20.5%. Less than 1 tonne of emissions resulted from the use of fertilizer.

Indicator 5. Emission levels resulting from Food

Even though the amount of food consumed on campus is not a direct input into the calculator it is important to note the impact that food consumption has on our emissions. The production of food involves many factors which contribute to GHG emissions. Methane emissions from livestock, energy used to operate farms and water crops, chemical fertilizers, distribution and packaging all increase the amount of GHG's required to provide our meals.

In the Clean Air – Cool Planet calculator these factors are averaged into the campus population input because measurements of GHG's from food vary considerably depending upon personal diet, geographic location of suppliers, and chemicals used in the production of the food.

Summary

For the year 2004-2005, Mount Allison emitted 11,634 tonnes of green house gases. These gases have five main sources contributing to the total emissions of the university:

- Energy and Heating
- Transportation
- Solid Waste
- Fertilizer
- Food

Emissions are a result of activities varying from the consumption of fossil fuels for heating, electricity, and transportation, to wastes sent to the landfill, to the use of fertilizers on campus lawns. Almost all activities undertaken at Mount Allison have a direct impact upon air quality.

Goals and Recommendations

Short Term Goals:

- Continue to restrict the use of automobiles on campus.
- Create a section on air quality in the environmental policy, complete with performance indicators.
- Bike or walk whenever possible.
- Consider car pooling whenever driving is necessary.
- Reduce energy and heat consumption whenever possible. (See chapter on Energy.)

Long Term Goals:

- Endorse an emissions reduction target for Mount Allison that meets or surpasses Canada's Kyoto Protocol commitment of 6% below 1990 levels.
- Request that Sodexho purchase more food from local sources. This will reduce emissions resulting from transportation.
- Commit funds and fully support the implementation of alternative energy sources which do not create air pollution (eg: wind and solar energy) where economically feasible.

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
Emission levels resulting from Energy and Heating	n/a	Heating and electricity are the largest factors contributing to air emissions.	(refer to Energy chapter)	--
Emission levels resulting from Transportation	n/a	Emission levels were unable to be determined due to insufficient data.	Maintain vehicle log books so that future emissions can be calculated.	Move towards a zero emissions/hybrid campus fleet.
Emission levels resulting from Solid Waste	n/a	Solid waste records only began in October 2004. Before that time it was a flat service fee.	Make tonnage records easily available for future emissions calculators.	--
Emission levels resulting from Fertilizer	n/a	Fertilizer contributed less than 1 tonne of emissions this year. Continue to limit fertilizer use.	--	--
Emission levels resulting from Food	n/a	The Cool Air-Clean Planet calculator did not have an input for this factor.	Research other emission calculators that factor in food consumption.	--

HAZARDOUS WASTE

"We have found the sources of hazardous waste and they are us."

— US EPA, from "Everybody's Problem: Hazardous Waste"

Introduction

Hazardous wastes come in a variety of forms and have a variety of negative impacts on the environment. "Hazardous wastes usually have one or more of the following characteristics; they are:

- Corrosive: they eat or wear away at many materials
- Flammable: they easily ignite
- Reactive: they can cause an explosion or produce deadly vapours
- Toxic: they are poisonous to humans and animals"

Improper disposal of hazardous wastes can result in pollution of the earth's soil, water and air in the following ways:

- "Buried wastes can filter down through the soil and contaminate groundwater. Wastes can clog storm sewers and over-burden septic systems.
- Plumbing systems can be damaged by corrosive chemicals.
- Burning hazardous wastes may simply distribute them over a larger area. Pouring hazardous liquids on the ground can poison soil, plants and water."[2]

The Chemistry, Biology, Psychology and Fine Arts departments, Facilities Management and the swimming pool all produce waste that could be considered hazardous. The Chemistry department is responsible for the majority of hazardous waste on campus. Chemical waste generated in the Chemistry department is collected and disposed by *Clean Harbours*, a chemical waste disposal contractor. On campus these wastes are handled through the Science Stores facility according to provincial and federal regulations. The Biology and Psychology departments produce biological waste (like experimental rats), but the details of their disposal procedures were unavailable at this time. Other potentially hazardous wastes, like paint, adhesives and most of the photography chemicals are dealt with haphazardly and proper disposal is up to the individual. The move towards environmentally friendly cleaning products represents an improvement to the environmental impact of the university, but this needs to be formalized at the top to ensure the practice continues. While certain departments may only generate a relatively small amount of hazardous waste, it is still important to ensure that all wastes are being properly dealt with.

Any spills that may occur in the Chemistry department are handled depending on their size. Small spills are the responsibility of the spiller and are cleaned with absorbents or spill pillows, identified and put in the proper pack for disposal. There are two people in the department with spill response training who deal with any large spills. All employees are trained in WHMIS. Students are educated on proper safety and the hazards associated with work in the labs by faculty. It is hoped that through proper education and awareness students will work with and dispose of their chemicals in the proper fashion. All emergency and safety equipment is regularly tested and easily accessible for lab users. MSDSs accompany all chemicals and end-users are always given a copy. This information was readily available and clearly labeled in the labs. Eating is forbidden in labs, and there is a lunchroom available for everyone's use.

Assessing the environmental impacts of hazardous waste disposal at Mount Allison was done using the following indicators.

Audit Evaluation

Indicator 1. Chemical waste through Science Stores is minimized.

There are a number of efforts made to keep chemical waste to a minimum. Research projects in the chemistry department often use very expensive chemicals so the smallest amounts are purchased and very little gets wasted. One of the main motivations in this area is the expense of various materials. Every department tries to do as much work as they can within budget constraints, necessitating careful chemical use. Photography in the Fine Arts department is another contributor to chemical waste at Science Stores. Disposal of chemicals through the contractor can be very expensive, a good incentive to keep chemical waste in all departments to a minimum.

Sub-Indicator I. Microscale chemistry is used.

As often as possible, experiments in the chemistry department are done using microscale chemistry.

Sub-Indicator II. Natural solutions are used instead of chemicals where ever possible in chemistry.

The use of chemical solutions in chemistry is reduced through the use of natural solutions that will do the job, for example, using water from the Swan pond to test for nitrates and lead.

Indicator 2. Effective, environmentally friendly cleaning supplies are used.

Varsol was previously used as a cleaning agent in the printmaking studios in the Fine Arts department. This is no longer the case as the department has switched to non-toxic solvents for cleaning.

The custodial staff currently uses only biodegradable cleaning products.

The university uses the drain cleaner Open Flo, a sulphuric acid based cleanser[3]. This would have little or no impact on the water. As a drain cleaner the sulphuric acid would react as it's supposed to with the materials blocking the drain and would then be diluted by the larger volumes of water passing through the pipes[4].

This is an area that would benefit from formal policy to ensure that the university continues to use environmentally friendly cleaning products no matter who is in a supervisory position.

Indicator 3. All hazardous wastes are properly monitored and disposed of.

Most hazardous materials used on campus are chemicals ordered through the Science Stores facility located in the basement of the Barclay building. These are delivered to them and then transported to the end-user. Other departments order directly through financial services, rather than through Science Stores. There is currently no system that monitors all hazardous materials being used on campus or their disposal.

Chemistry department:

Any common, bulk chemicals used in the chemistry department are ordered by the Lab Administrator, Roger Smith, and professors order their own specific research materials either through financial services or through him. All purchase orders are sent to Science Stores so that they know what they are receiving. There are times when financial services can't get the PO to Science Stores before the chemical arrives resulting in some confusion. As chemicals are received in Science Stores they are stamped with proper labeling and all WHMIS regulations are followed. This system is ineffectual when an unknown chemical order arrives. There is always someone on site with training in transporting dangerous goods who receives the chemicals, and all grounds staff are also trained as they are the ones who transport the chemicals.

The previous audit mentioned an annual memorandum that is sent by Science Stores to all departments concerning proper disposal information. This is practiced, but hasn't been done in a few years.

Fine Arts:

In the Fine Arts department, photography produces the most hazardous waste. All chemicals used in the development process are dumped down the drain, except selenium toner which is sent to Science Stores for disposal.

Chemicals are stored in a secure storage area with proper labeling and dating to ensure nothing gets wasted. No silver recovery program has been established (as suggested in previous audits) as the department doesn't produce enough silver to make it worthwhile. Any other waste materials produced in the Fine Arts department are disposed of in the dry waste stream.

Science Stores waste disposal practices:

- Used bleach is collected in 20 litre pails and sent for disposal.
- Used chemicals are put in 'lab packs' (45 gallon drums) for disposal – compatible chemicals are put together into different waste streams until the packs are full. Labpacks are packed with vermiculite and Clean Harbors Environmental Services in Nova Scotia is contracted to collect them.

Facilities Management:

Pesticide containers used by the grounds grew in Facilities Management are triple rinsed and stabbed to eliminate any residual chemicals or off-gassing that may occur. Containers are then disposed of in the dry waste stream.

Swimming Pool:

There are three chemicals used in the university's pool: chlorine, myriatic acid and sodium bicarbonate. Both the chlorine and myriatic acid now come in returnable plastic pails (this has just begun for the myriatic acid). They use a maximum of about 10 litres/day of chlorine and 8 litres/day of the acid[5], at peak times. The pool never has any leftover chemicals, so their disposal is not a problem. As long as the containers are being returned properly, their disposal should not pose any problems either.

And, because sodium bicarbonate is simply baking soda, its disposal is not a hazardous waste concern. There is also some soda ash on hand at the pool, but it is rarely used.

Hazardous waste on campus consists mostly of chemicals and these are disposed off campus, through Science Stores with the Clean Harbors waste disposal company. Hazardous wastes, other than chemicals, are picked up by Westmorland at least twice a year, on special hazardous waste days. The grounds supervisor is hoping to establish a monthly pickup to minimize the need for hazardous waste storage.

Summary

Due to regulations hazardous waste on campus is generally dealt with responsibly. Hazardous materials are handled carefully with limited waste and properly trained transporters. The university would benefit from a database that monitored all hazardous materials being used and disposed of. This would ensure that proper procedures are being practiced and regulations followed.

Want to know more?

Between May 1 2003 – April 31 2005, Science Stores disposed of ~2026 kg and 600 1/4 Lt of hazardous wastes[6]. As mentioned, chemical waste disposal can be very expensive and the university is very conscious of making sure they have enough money for disposal (for example, it cost $1400 to dispose of 20 kg of cyanides).

Goals and Recommendations:

Short Term Goals:

1. Minimize hazardous waste on campus.

- Continue with microscale chemistry and efforts to utilize natural solutions for chemical analysis rather than creating chemical solutions. Using natural solutions will not only limit chemical use and therefore waste, but would also be a good tool for integrating environmental aspects into chemistry courses (for instance, comparison of soils from the King St. remediation site compared to soil on campus could demonstrate the polluting effects of the former foundry, See chapter on water use for details).
- Formalize policy surrounding cleaning products to ensure environmentally friendly practices continue.

2.Fully monitor all hazardous materials on campus.

- Create a university wide database that includes all hazardous materials used on campus.

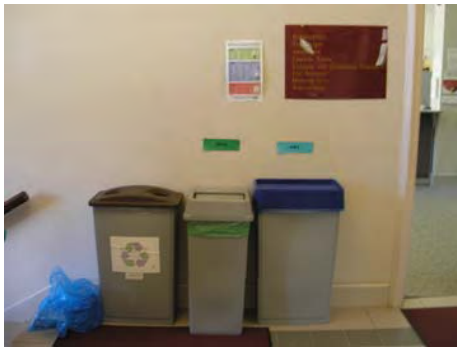
Long Term Goals: Eliminate unnecessary[7] hazardous waste disposal.

- Eliminate pesticide use and therefore eliminate the need to dispose of the pesticide containers.
- Go above and beyond regulations.

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
Chemical wastes are minimized.	n/a	Expense of chemicals and their disposal provides incentive to keep wastes minimal.	Minimize hazardous waste on campus.	Eliminate unnecessary hazardous waste disposal.
<u>*Sub-Indicator:*</u> *I. Microscale laboratories used.*	The micro-scale method is implemented in the majority of chemistry classes at Mount A.	Same.	All appropriate instances utilize mircroscale chemistry.	Same.
II. Natural solutions are used instead of chemicals where ever possible.	n/a	Natural solutions are used in certain classes.	All appropriate instances utilize natural solutions.	Same.
Effective, environmentally friendly cleaning supplies are used.	A few Environmentally friendly cleaning supplies are being purchased, but the use of these products is optional. Most products are still purchased with price foremost in mind.	Custodial staff uses only biodegradable cleaning products. Non-toxic solvents have replaced varsol for cleaning in Fine Arts. Drain cleaner presents no environmental issues.	All cleaning products are environmentally friendly.	Same.
All hazardous wastes are properly monitored and disposed of.	Hazardous Materials are monitored in a series of smaller database systems. A University-wide monitoring database has not yet been created.	There is currently no database that includes all hazardous materials used on campus. All disposal and transportation practices follow provincial and federal regulations.	Full monitoring of all hazardous materials on campus.	Go above and beyond regulations.

SOLID WASTE



"Source Reduction is to garbage what preventive medicine is to health."

~ William L. Rathje, *Atlantic Monthly*, December 1989.

Introduction

Waste generation in any area is a subject of concern to the environment. In this case, solid waste basically means anything that could end up in a landfill. Landfills impact the environment significantly by directly polluting soil, and indirectly polluting water and air. There are a number of factors involved in maintaining a landfill, or in creating a new one. Regulations are strict and space is limited. Landfills generally need to be continually treated for decades after they are closed making the logistics enormous. And of course, the NIMBY attitude (Not In My BackYard) is very prevalent in this area, making new landill space hard to find. It is therefore important to divert as much waste as possible from your landfill in order to minimize the environmental impact and to ensure we have somewhere to put our trash now, and in the future.

Most waste at Mount Allison gets sent to the Westmorland-Albert Solid Waste Corporation in Moncton in two streams: wet & dry. The wet/dry program is considered an innovative waste management system due to the low level of source sorting that is required. It is generally considered a two-stream system, but there is a third stream for 'household hazardous waste' which is not generally present in the university's waste bins. The Westmorland-Albert facility is basically a distribution centre. They collect waste from the surrounding region but only compost and landfill materials are processed on site. All recyclables are sent to other areas, local and international, for processing and redeemables are collected by redemption centers in Moncton. Currently, the facility recycles everything possible and they are constantly looking for new markets for other recyclables, like styrofoam. Westmorland diverts about 48% of waste from the landfill and composts about 55% of their wet waste. Wet and dry bags are weighed separately at the scales and Mount Allison pays $53.58/metric tonne in tipping fees[1]. The wet/dry system was implemented university wide September 2004 after two years of testing the system – Facilities Management was first in 2002, followed by Centennial and Bigelow House in 2003.

This section of the audit does not include food wastes generated by food services, hazardous waste or paper waste.

The wet/dry program

How it works: Waste is sorted into 3 streams - wet, dry and household hazardous waste. On campus, most locations only have the wet & dry streams. Wet waste consists of any compostable material and generally anything that could ruin the integrity of your recyclables (a good rule of thumb is: if you don't want to see it again, neither do the people sorting the dry waste). Dry waste includes everything else.

How it works at Mount Allison: Campus users put their waste in the appropriate bin (green for wet, blue for dry). Custodians are responsible for emptying the bins. Office bins are changed weekly and the wet bags are only removed and changed if they are dirty. Each floor in each building has centrally located, large wet and dry bins, usually in the kitchen, which are changed daily. Washroom bins are also changed daily and only contain wet waste bags. Custodians are also responsible for sorting wet and dry for conferences. Residences separate their own bottles and cans for redemption.

Benefits of using Wet/dry at Westmorland:

- Participation rate is at ~87%.
- The life span of their landfill cells has doubled since implementing wet/dry.
- A 48% rate of diversion from the landfill was reported last year.
- ~55% of all wet waste received is composted. (Currently Grade B compost is produced though they are working towards Grade A.)
- Westmorland won Silver Honours for the Canadian Environment Awards – Sustainable Living category in June 2004.
- This region is Canada's top participant in the rechargeable battery recycling program.
- There are no complaints of cross-contamination of waste and recyclables meaning their sorting procedures are comprehensive and accurate.

In order to assess solid waste on campus various interviews were conducted, including the custodial supervisor, the director of computing services, the university librarian and various department heads and faculty deans. Each interview provided insight into the generation of solid waste on Mount Allison's campus. There were some contradictory opinions surrounding student consciousness of environmental issues, including wet/dry sorting, making it difficult to accurately assess student behaviour. A waste audit conducted during the school year would provide a more accurate understanding of individual behaviour on campus, not only of students. The following indicators were used to evaluate the performance of the university's waste management:

Audit Evaluation

Indicator 1. There is an effective waste reduction program.

There is currently no waste reduction program at Mount Allison. There are efforts to reduce waste production on campus, but these are generally individual choices by supervisors or department heads and not based on the environmental policy.

Waste reduction efforts on campus:

- One book supplier for the library uses 'factory seconds' boxes for shipping. While this is a positive point the library has no control over publishers' packaging practices and would more often than not complain of damaged products over excess packaging.
- The librarian only buys environmentally friendly furniture.
- Old furniture is either re-used around campus or sold in the university sale before being thrown away.
- Custodial trash collection practices that include leaving clean bags in bins and emptying office bins weekly and central bins daily.

In terms of reducing waste and supporting environmental initiatives there is a strong feeling of individual support across campus, but there is little coordination among departments and faculties on waste management or reduction strategies.

Indicator 2. The wet/dry program is utilized effectively.

A brief audit of the garbage bins around Mount A. was conducted, Tuesday, May 31. This was not a comprehensive review of what waste is produced and was instead meant to provide a rough idea of how successfully waste is being sorted on campus.
Most Successful Sorting: Cenntenial Hall – bins visible and clearly marked wet & dry (& recycling on some floors)
Least Successful Sorting: STUD – wet & dry bins weren't always positioned together and sorting was less particular (floor sweepings were found in one dry bin though this could be attributed to the almost hidden location of the wet bin)

There is a general feeling of successful sorting into the 2 waste streams and few complaints are reported. In particular, the librarian expressed a feeling of strong student consciousness towards proper recycling and waste management, especially surrounding the start-up of

the Bean coffee shop. Complaints of improper sorting tend to stem from the residences which also produce the most waste, according to the custodians.

This is the major issue with wet/dry waste streams at Mount Allison and is generally attributable to inexperience with or ignorance about the wet/dry system. Many out-of-province students would have no experience with this type of system and could have trouble figuring out what goes in each bag, particularly when another separate recycling container is placed with the wet & dry bins. Residences produce the most waste and are the worst sorters, according to custodial staff. A workable solution to this problem hasn't been found yet, but the custodial supervisor is working on securing a representative from Westmorland who will conduct presentations on this subject in each of the residences in the coming academic year.

All wet/dry and other dumpster waste and large items from grounds waste (ie: branches) go to Westmorland. Electronic equipment is also sent to Westmorland where it is either sent to needy schools for re-use or broken down and the parts are recycled. No electronic waste ends up in the landfill.

Currently, first year students receive some education on the wet/dry system as part of their orientation and posters are put in all garbage rooms on all floors in all buildings. Unfortunately, most posters do not make it through the school year. There are no proactive efforts to remind students about wet/dry throughout the year but future residence monitor training will include wet/dry education. The information is generally available on the web though not well advertised. . It is hoped that the sustainable residence initiative will have some effect on overall student behaviour as the residents of Carriage House can set an example of conservation and sustainability for the rest of the student body.

To ensure your recyclables aren't sent to the landfill:

- Follow the guidelines illustrated on the Westmorland posters to ensure your dry bag is not contaminated with wet waste. One wet item doesn't necessarily ruin a whole dry bag, but it could ruin recyclables, like newspaper.
- Make sure any recyclables are washed, wiped or shaken clean or they will most likely end up in the landfill.

Indicator 3. Furniture is offered for sale or donation prior to disposal.

Old furniture is stored and reused by the university in various applications, or it is sold in the university sale.

Indicator 4. Construction waste is recycled and re-used whenever possible.

Construction waste is either discarded by the contractor or by the university. Contractors are always offered the option of re-using materials on the current project or on their own future projects. In the case that construction waste is disposed by the contractor, it is normally put in a dumpster and would go to Westmorland from there. Westmorland recycles construction materials and gives anything that is useable to Habitat for Humanity. In the case that the university must dispose of construction waste itself, it sends it to Fero Waste Management in Moncton where it is recycled.

Summary

In the vast majority of instances solid waste at Mount Allison is dealt with in a very responsible manner. The largest impediment to waste

management is individual behaviour which is near impossible to monitor or control. As mentioned, education is the key to making waste management as effective as possible. Mount Allison would benefit from increased awareness throughout the entire university community and a university-wide strategy to reduce overall waste as most efforts in this area are individual or departmental.

The wet/dry system represents the major improvement for Mount Allison in terms of waste management. Not only does it ensure our waste is dealt with in a responsible manner, but it has also allowed for more detailed record keeping. Starting in February 2004 the university started paying for waste per tonne. This will allow Mount Allison to better develop a waste reduction strategy based on yearly trends of waste production. This system also requires solid education for it to work properly. It is crucial for the university to increase its efforts to educate everyone on campus about the wet/dry program, and how it works, as few are being made at this point.

Goals & Recommendations:

Short Term Goal: Proper sorting in all waste bins on campus.

- Eliminate the use of all garbage bags that are not blue or green on campus as they are not sorted at Westmorland and are automatically sent to the landfill.
- It may be useful to eliminate separate beverage container and paper recycling bins from campus to eliminate confusion in wet/dry sorting, unless the university is interested in collecting them for profit.. (Obviously residences that are collecting containers for redemption would not do this.)
- Regularly remind the university community, especially students in residences about the wet/dry program via the Argosy, CMHA radio or events organized by EcoAction (for example).
- More regular reminders of wet/dry in department head or faculty meetings.
- All first year classes receive a brief wet/dry orientation from their professors.
- Integrate a monitoring routine into the weekly schedules of custodial supervisors to ensure wet/dry bins are properly placed and labeled.
- Semi-permanently paste the wet/dry sorting lists in each residence room and classroom/lecture hall.
- Educate any conference goers or other outside users about the wet/dry system.
- Give a discount in the 'Golden A' to students who bring their own reusable dishes (not just mugs).
- Include reusable mugs and grocery bags along with a frisbee in frosh kits if it is economically feasible – frosh barbeque could then be BYODishes (ie: mug & frisbee)

Long (and Short) Term Goal: Overall waste reduction.

- Develop a university-wide waste reduction strategy including reduction goals, using 2005 data as a baseline.
- Implement a battery and ink cartridge recycling program on campus.
- Dedicate one outdoor event to using re-usable dishes to test the practicality of using re-usable dishes for outdoor events on campus. (It doesn't necessarily have to be china, Sodexho might consider purchasing camping-type dishes specifically for outdoor use.)
- Work towards composting Sodexho's waste on site, rather than sending it to Westmorland.

Don't want that apple core to sit your 'wet' caddy all week?
No problem. Central wet bins in kitchens and washrooms are emptied daily. If you aren't producing a lot of wet waste and don't want it to sit in your little caddy getting moldy, just trot down to your closest central bin and dispose of it there.

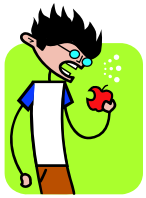
Indicator Summary

Indicator	State of Affairs in 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
There is an effective waste reduction program.	n/a	There is no waste reduction program on campus.	10% reduction.	30% reduction.
The wet/dry program is utilized effectively. *(Assessed through educational efforts.)*	In order to increase participation, participants require more information, and increased number of bins.	The wet/dry program has been implemented university wide, eliminating the need for a separate recycling program unless the university is interested in claiming redeemables for possible financial gain, something that is already in practice in the residences.	75% perfect sorting.	100% perfect sorting.
Furniture is offered for sale or donation prior to disposal.	Effort is made to make furniture available for sale or donation.	Furniture is stored and either re-used around campus when necessary or put in the university sale.	Furniture waste reduction.	Same.
Construction waste is recycled and re-used as much as possible.	n/a	Construction waste is offered to contractors for re-use. Otherwise it is recycled by Fero or Westmorland.	Construction waste reduction.	Same.

Basic Waste Flow

So, this is how it goes…

Other than paper waste, most waste found in trash bins around campus probably comes from food packaging;



For busy students, eating on the go becomes a way of life and coffee is consumed voraciously;

And, residence students make great use of the local pizza vendors, particularly during the university's annual food exchange during which each residence house has a pizza party.

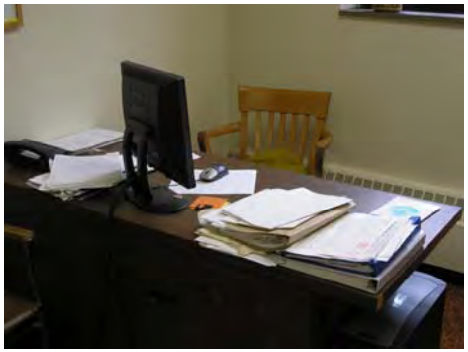
Waste is thrown out by everyone, and here on campus it should be going into the appropriate bin (wet or dry).

Custodians empty individual bins into larger green and blue bags which are then put in the dumpsters. The grounds crew collects the bags from the dumpsters and sends it to PBS Waste Services in Sackville's industrial park. They have trucks equipped for separating wet and dry. PBS transports the waste to Westmorland-Albert.

Westmorland weighs wet & dry bags separately, sending each to their respective processing plants.
Dry waste is sorted manually and either recycled or landfilled. Wet waste is sorted mechanically and either composted or landfilled.
Recyclable products are shipped to various locations/markets, locally and around the world, and compost is processed on site.

Mount Allison sent 86.33 tonnes of waste to Westmorland between October 2004 and February 2005.

PAPER CONSUMPTION



> We need to address our Nation's mounting garbage problem by generating less garbage, particularly paper waste.
> ~Wendell H. Ford

Introduction

One of the biggest issues of waste production in a university setting is paper use. Helmut Becker, Director of Computing Services reported student printing to be in excess of 500 000 pages last year in his department alone. Computing services and some department heads and faculty deans informally encourage professors to accept assignments electronically and to use WebCT, but no formal avenues exist to ensure such practices. Paper waste was a complaint in almost all interviews regardless of the subject of the interview.

As well as examining how much paper is being consumed, the university must look at what type of paper is being consumed. There are a number of options available for the recycled content of paper. What is most important to consider is how much *post-consumer* content is present in the paper. Paper companies may claim to be making recycled paper, but without significant post-consumer content there is no reduction in overall waste production, an important consideration in paper use. Ideally the university would purchase recycled paper with 100% post-consumer content.

The following indicators were used to gauge the impact of Mount Allison's paper consumption:

Audit Evaluation

Indicator 1. There is an effective program to reduce paper consumption.

There is no program to reduce paper consumption on campus. Some departments make efforts to reduce their paper consumption, but these are individually or departmentally based and there is no university-wide strategy. (See Appendix 9 for graphs of paper consumption.)

Paper reduction efforts in the library:

- Paper interlibrary loan forms will no longer be available in September 2005.
- The librarian is working towards an integrated borrowing system with all other Atlantic universities that will expand the library's collection without necessitating the purchase of more books or journals in hardcopy form.
- All books are catalogued electronically and the library is close to spending more on digital information than hardcopies (similar to UNB which already spends more on digital than on hardcopy).

The library makes no efforts to encourage students to reduce their paper waste in printing and photocopying because all copiers and printers are under the purview of Administrative Services.

Other campus efforts:

- The university will be requesting double-sided printing as the default for each department unit in the new copier contract.
- Students pay for each sheet of paper they print or copy on providing incentive to reduce the amount they print and copy.
- The university maintains a strict 'no junk mail' policy and newspaper flyers are prohibited. The mass mailing service is priced very high to discourage requests for access to the student mail system.

- Many faculty and staff make use of double sided printing and photocopying, and some departments have adjusted their default setting on their printers to do so.
- Course calendar printings have reduced from 9 000 copies per year to 5 000 copies due to increased usage of the web calendar. As well, only new students receive a copy for registration.
- The 2004/05 printings of *The Record* (campus alumni magazine) were done on 25% recycled paper with at least 10% post-consumer content.

Double-sided "printers" on campus (the people not the machines):

- Social sciences department
- Library staff
- Computing services staff
- Facilities Management staff

Indicator 2. The university purchases 100% post consumer content recycled paper.

Prior to April 29, 2005, Mount Allison used only virgin white paper. Testing was being done with 30% post-consumer content recycled paper but a new paper supplier presents financial issues as their virgin paper is significantly cheaper than their recycled. This testing of recycled paper was a positive step, but whether or not Mount Allison continues with recycled paper remains to be seen. At the time of this audit Support Services was waiting for input from all department heads regarding their preference for recycled or virgin paper before making the choice.

Summary

Though there are a number of individual efforts to reduce paper consumption on campus, there is little continuity and collaboration among them. These efforts have, however, been beneficial as paper consumption has gone down by over 2 million sheets per year since 1998. All members of the university community would still benefit from university wide policies surrounding paper use. Such policies would represent a commitment by Mount Allison as an institution to reduce, rather than just individuals at Mount Allison doing so. Consistent paper reduction would not only reduce waste, but would also cost the school less money as they would need to buy less paper.

Want to know more?

The production process of recycled paper and virgin paper are almost identical, and most recycled paper contains some virgin material so that it is strong enough. However, recycled paper production uses less water and energy, creates less air and water pollution, requires few or no trees, and provides jobs. The initial financial cost of recycled paper may seem more expensive than virgin paper but the savings to the environment reduce the overall cost in a number of ways. (See Appendix 10 for details.)

Goals and Recommendations:

Short & Long Term Goal: **Reduce paper waste through reduced paper consumption.**

- Continue defaulting all printers and photocopiers on campus to double-sided printing.
- Formalize a university-wide policy stating that professors must accept the following:
  - Double sided assignments
  - Electronic assignments
  - Double sided exams
- Encourage faculty and staff to do the following:
  - Use WebCT.
  - Re-use paper printed on one side.
  - Share documents among departments when more than one person has to read the same thing.
- Re-use old envelopes.
- Establish a paper waste reduction program.
- Encourage students to do the following:

- Re-use paper printed on one side.
- Re-use old envelopes.
- Print and copy only what you need.
- Request email assignments and WebCT use.

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
There is an effective program to reduce paper consumption.	Paper waste continues to be a major issue at Mount Allison, paper consumption has steadily risen over the past six years.	There is no paper waste reduction program.	10% reduction.	30% reduction.
The university purchases 100% post consumer content recycled paper.	Number 5 paper contains 30% post-consumer and 20% pre-consumer content. Coloured papers contain 30% post-consumer content.	Due to a supplier switch the university is waiting for input before making the decision on whether or not to buy recycled paper. Testing was done in 2004 with 30% post-consumer content recycled paper.	30% post-consumer content.	100% post-consumer content.

TRANSPORTATION

"Environmentally friendly cars will soon cease to be an option...they will become a necessity."

- Fujio Cho, President of Toyota Motors, North American International Auto Show, 2004.

Introduction

Every morning, 2058 students and 339 faculty and staff make one common, but very important, decision; "How should I get to campus?" Most of us rarely give it a second thought, but collectively, our commuting choices have a greater impact than we often realize in the course of our daily lives.

Living in Sackville, we sometimes take for granted the amenities of a rural life such as ample parking, low traffic, and higher air quality. Larger universities in major metropolis' do not share our luxuries and experience the full impact of transportation problems such as limited parking, smog, and heavy vehicle congestion. Mount Allison's size and rural setting diminishes the impact of campus-related transportation and hides some effects that would otherwise be visible within a large centre.

Whether an individual lives in Toronto, Ontario or Sackville, New Brunswick, their transportation choices contribute to the overall effects of climate change. Despite our geographic location air emissions are air emissions and the only way to reduce our impact is to change our behaviour. The aim of this chapter is to highlight options for alternative transportation and to encourage behaviour that is based on necessity rather than habit.

Since the last audit in 2002 the university vehicle fleet has remained virtually the same. There was a removal of one facilities management truck last year, replaced by another previously used 4x4 truck. The usage of the vehicles has had no significant change during the past three years either.

Commuting trends of University faculty, staff, and students have not been analyzed since the previous audit but information from interviews and visual observations indicate no change in commuting trends. A campus wide survey is planned for the fall. In previous audits surveys were performed in the summer, but findings are less accurate at this time when campus population is lower than normal.

The following indicators are used to measure transportation improvement on campus.

Audit Evaluation

Indicator #1: Bike racks are available at academic and residence buildings

The area of greatest improvement since the last audit has been the addition of several new bike racks at academic and residence buildings.

Bike racks have been installed at Jennings, Windsor, Bennett Building, Avard-Dixon, Barclay, Trueman, and Bennett House bringing the total number of bike racks from 8 to 14 since the last audit. The other bike racks are located at the library, Crabtree, Music Conservatory, Athletic Centre (2), University Centre, and Dunn (2). The additional racks not only provide more storage capacity, but also serve to improve the overall bicycle network on campus. This enables direct parking to any building with an adjacent bike rack.

The new bike racks were installed by the grounds keeping crew whenever there was new construction being done on campus buildings. Each residence also has storage rooms where students can store their bikes.

Bike Racks in 2002	Bike Racks in 2005
• Bell Library • Crabtree • Music Conservatory • Athletic Centre (2) • University Centre • Dunn Building	• Jennings • Windsor Hall • Bennet Building • University Centre • Avard-Dixon • Music Conservatory • Bell Library • Barclay Building • Dunn Building (2) • Athletic Centre (2) • Truman House • Bennet House

The number of bike racks on campus demonstrates the university's commitment to facilitate transportation. Without research, however, the extent of alternative transportation on campus is difficult to assess because there is no recent information on the subject. The fall survey will give a better indication of how additional bike racks effect commuting. Despite the lack of information, Mount Allison should strive to educate and encourage alternative transportation.

One long term method of carrying this out would be to construct a network of bike paths across campus that would be separate from pedestrian traffic. The University of Illinois' Urbana-Champaign campus has established a sophisticated network of bike lanes and bike parking facilities. The bike lanes are removed from sidewalks and roadways and are well marked. This network has reduced building costs that would otherwise have gone to accommodate vehicular access. It has also improved the aesthetics and environmental quality of the Urbana-Champaign campus.

An Environmentally Friendly Way to Travel

When traveling on business you should keep in mind that a large source of emissions is from air travel – which is also one of the fastest growing sources of global warming gases in the world. What is more, aviation fuel is not taxed and there are few restrictions on how much we can pollute.

For traveling short distances options such as trains, buses, and rentals should be selected first as they have much lower emissions than air travel.

Mount Allison does not record transportation expenses separately from other travel expenses, however, some organizations are starting to provide options for environmentally conscious travelers.

Climate Care is an organization which enables travelers to repair the damage that air travel does to the climate. Contributions from airplane users fund projects that reduce emissions by the same amount as the flight creates. The money is invested in projects such as renewable energy and reforestation which either reduce emissions at source or absorb CO2 from the atmosphere. Check it out and make your next flight an "eco-friendly" one. (www.climatecare.org)

Indicator #2: Emission levels are taken into consideration when purchasing campus vehicles

There has only been one vehicle acquisition since the last audit and while emissions levels were taken into consideration before the purchase they did not have much bearing on the decision. The heavy work requirements of the vehicle limited such options as bio-diesel and hybrid vehicles.

As green vehicle options continue to develop and increase in the automotive industry future acquisitions for the university may include low emission vehicles.

There is a bicycle at Facilities Management for employee transportation across campus which reduces the use of other vehicles for short trips. No additional bicycles have been recommended for this audit as current use does not suggest a need.

Indicator #3: Adherence to vehicle policy or effectiveness of vehicle policy

A comprehensive vehicle policy can improve efficiency and consistency, as well as reduce operating costs. The current policy is focused towards these ends, but some points in the policy have been neglected since it was first implemented. A review of the policy and re-training of employees of whom the policy directly applies to could be of great benefit for Facilities Management's operations.

The current university vehicle policy was approved in May 1998 to ensure safety and efficiency is maintained while employees operate university vehicles. The policy can be found on the Mount Allison website under the Vice-President Policies.

Elements of the policy include Responsibility, Operation, and Care and Maintenance. While overall operation and maintenance of the vehicles is satisfactory, there are some parts of the policy that are not adhered to. In particular, extended periods of idling, unnecessary vehicle use, and inconsistent vehicle log books are the major faux-pas'.

Indicator #4: Status of Mount Allison Commuter program

Information gathered from previous surveys indicates that the majority of students, and a high percentage of faculty and staff, live within a 5 kilometre radius of campus. This close proximity suggests that commuting by car to campus is only a behavioural stigma, rather than a geographic necessity.

Since Mount Allison campus is specifically focused on pedestrian and cyclist activity (vehicle access to campus buildings is strictly for university service/maintenance vehicles) it would be logical to have a commuting program that would compliment the unique design of campus. Programs such as the government of Canada's *Commuter Options: The Complete Guide for Canadian Employers* are ideal, low cost tools to implement this change.

Organizing a commuter survey during the school year has been recommended to Facilities Management in order to provide an accurate baseline for measuring commuter activity. Once a baseline has been made, goals can be set and commuting trends can be monitored for change.

> ***Commuter Options: The Complete Guide for Canadian Employers***
>
> This guide provides invaluable guidance for planning and implementing a commuter options program in any workplace. It is the most comprehensive Canadian resource of its kind.
>
> The guide presents practical, proven approaches to increasing the use of active transportation (e.g. walking and cycling), public transit, ridesharing (e.g. carpooling and vanpooling), and other alternatives to driving alone to work. It also addresses important aspects of creating a commuter options program, right from the earliest planning stages through program development, implementation and monitoring.
>
> The guide is available for download from the Transport Canada website, www.tc.gc.ca, in PDF format. You may also order a printed copy for delivery by mail.

(See appendix 11)

Summary

The university's vehicle fleet is the same composition as the previous audit. A used 4x4 truck was acquired last year to replace an older model. Usage of the vehicles has remained roughly the same for the past three years.

The vehicle policy should be reviewed by Facilities Management employees. Updating and reaffirming the policy may decrease unnecessary use, reduce idling, and encourage drivers to maintain vehicle logbooks.

The university has done a mediocre job providing car pooling options. An unutilized drive board is located in the STUD and informal car pool groups have formed in some departments. It is recommended that a comprehensive commuter program is implemented to improve employee commuting options.

Goals and Recommendations:

Short Term Goals:

- Implement a commuting program such as "The Complete Guide for Canadian Employers".
- Support, through the allocation of funds, the purchasing of zero or lower emission vehicles.
- Stage an "Alternative Transportation" day to build awareness on campus.
- When possible, arrange to use one vehicle for multiple tasks (e.g. custodial deliveries combined with carpentry deliveries).
- Plant hedges in areas where people cut corners to prevent the problem of pedestrian damage to turf and tree roots.
- Unless absolutely necessary, all members of the university community should avoid driving their vehicles onto the campus.
- The university community should be encouraged to car pool.
- For those staff, faculty and students who live 5 km or less from the university campus, cycling or walking to work or class should be a primary option.
- Because neither the grass nor the root structures of the trees on campus are strong enough to support regular pedestrian traffic, all members of the university community should try to keep to the walkways in order to preserve this vegetation.
- When on university business, travel more sustainably by taking a train or bus instead of flying or off set your emissions by donating to organisations like Climate Care.

Long Term Goals:

- Eliminate unutilized carpooling bulletin board in University Centre and replace with a modern ride-sharing program which would include the:
    - Creation of carpools and vanpools and match riders by computerization and publicity
    - Guarantee of emergency rides home to employees who share rides
    - Creation of incentives with preferential parking spaces and lower or free parking rates to those who ride-share
- Explore alternatives to current use of university vehicles.
    - Make small deliveries on foot/bicycle
    - Consider the possibility of using cleaner burning fuels (e.g. bio-diesel, propane)

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goals	Long Term Goals
Bike racks are available at academic and residence buildings.	7 bike racks located across campus.	14 bike racks located across campus. Plans for additional bike racks as future construction on campus progresses.	Continue to add bike racks to all buildings.	Develop a bike path network across campus, specific to bike use.
Emission levels are taken into consideration in the purchase of vehicles	Emission levels have been considered during vehicle purchases but price and durability are two criteria that have been limiting purchasing options, particularly with hybrid vehicles.	Emission levels were considered for the only vehicle acquisition since the 2002 audit. Due to heavy work requirements of the vehicle, no hybrid or alternative vehicle was suitable.	Continue efforts in this area.	Purchase a zero emissions vehicle.
Vehicle operators adhere to Facilities Management policy	n/a	The majority of operating procedure in the policy is followed by employees. The few problem areas can be resolved with re-training or by implementing the recommended commuter programs.	Review and revise the vehicle policy and decrease idling time from 5 minutes to 30 seconds.	--
Status of Mount Allison Commuter program	n/a	An informal drive board in the STUD was used in a minimal capacity for a brief period of time. While the board still exists in the STUD it is no longer used.	Implement a comprehensive commuter program on campus.	--

GROUNDS KEEPING

Weeds are flowers too once you get to know them! -Eeyore

Introduction

The grounds at Mount Allison are beautiful. Throughout the Spring, Summer, and Fall there are large tree canopies hanging over head forming stunning entry ways to campus, colourful flower beds adorn campus quads and walkways, and the swan pond adds a peaceful retreat for the campus community to enjoy.

The decisions that are made by Facilities Management play a significant role in the size of our campus footprint. Just a few short years ago, the entire campus was being sprayed with chemical pesticides and insecticides! Thankfully, decisions are now being made that take the environment, and our health, into consideration.

In keeping with Mount Allison's goals to have an aesthetically pleasing campus, Facilities Management are faced with many challenges on how to deal with weeds, what to plant and where, and how to use water most efficiently. The following nine indicators give us a sense of how we are doing.

Audit Evaluation

Indicator 1. Pest Management is 100% organic

Until the year 2000, Mount Allison thoroughly applied pesticides and insecticides yearly. Currently, Facilities Management no longer sprays campus as a whole, choosing to use the technique referred to as Integrated Pest Management, or IPM. (See appendix 12.) This translates to Mount A using minimal amount of pesticides, on an as needed basis, concentrated on the sport fields. When applied, a spot treatment method is used to ensure that it is only the problem area being sprayed- although the environmental impact is still a concern even if applied carefully, in small doses.

Recently grounds purchased a "Flame Thrower" to address weed problems in the paved pathways on campus. This propane run weed-wand gets rid of weeds by "exposing them to enough heat to vapourize the water in the plant cells, thereby preventing them from photosynthesizing and eventually dying off."

(http://www.yardener.com/FlamingWeedTools.html)

Indicator 2. Yard waste is composted

All of the yard waste on campus (grass clippings, for example) are either left on the site as fertilizer, or composted on site to be broken down and eventually used as soil or mulch for the flower beds.
This is a great step!

Water Conservation

Indicator 3. The landscape design incorporates native species of plants and trees.

Currently, about half of all the trees on campus are native, as well as many of the plants found in many of the flower beds. Since the last audit more native plants have been planted which has, in effect, attracted more wildlife to the area.

Indicator 4. The landscape is designed to be drought resistant.

Environmental Reasons to Plant Native Species

- increase biodiversity;
- provide habitat for a wide variety of creatures such as birds and butterflies;
- provide a home for many native plants that are becoming increasingly rare in the wild;
- conserve water;
- and eliminate the need for chemical inputs such as pesticides, herbicides and fertilizers.

http://www.goforgreen.ca/gardening/Factsheets/Fact6.htm

Since the last audit, Facilities Management has made changes to implement a more efficient watering system. The overall landscape is drought resistant-meaning it can be healthy and aesthetically pleasing with little water. Plants are strategically chosen, most of which require little water (except in the first year after planting). For plants that do need watering, techniques such as mulching or covering with compost are used to improve water retention, and "water holding grains" are used as another mechanism to hold water in the soil.

Other watering methods used include drip irrigation (used in the Campbell Quad), "rain towers" (sprinklers with timers and distance controls as well as in-ground controls). In other areas, water tanks are used for areas without outlets, and some non-timed sprinklers are also used.

The only areas that regularly need watering are the sports fields and newly planted beds of annual flowers.

Education

Indicator 5. The grounds are used for educational purposes.

There are several departments on campus that use the grounds as a space for teaching, ranging from Biology to Fine Arts. Outside of the classroom, a quick glance around will show that most students do not make use of the greenspace on campus during the warmer seasons. There are a few benches around campus to encourage the campus community to enjoy their surroundings, but few do. There are currently no educational gardens, for example, that feature native species of plants for all students to engage with, nor are there programs on campus such as "Adopt-a-Plot" (Cruickshank, 2005) that would allow the grounds to be integrated into more classrooms and student projects.

Indicator 6. Facilities Management communicates their major plans/changes to the university community and allows for questions and feedback.

Currently, no such system exists. When grounds has plans to cut down a large tree, the campus community is often not informed as to why (being diseased for example). Questions and comments are sent directly to the grounds manager who responds to most inquiries.

Winter Maintenance

Indicator 7. Salt use is reduced.

Last winter, Facilities Management purchased a new piece of salting equipment that allows for the control of amount of salt released on the ice surface. This has reduced the amount of salt used by ½!

Alternatives to salt have been looked into, and some are used in areas closest to entry ways of academic buildings, for example. However, no economically viable alternative exists at this time, according to the grounds manager.

Gas Powered Equipment

Indicator 8. Trim mowing is minimal.

Since the last audit, trim mowing has been significantly reduced. Facilities Management have been able to reduce the amount of trim mowing from 2 employees mowing all summer long, to one or two employees mowing for a day once every few weeks! Beds have been reshaped to accommodate ride on mowers, and walls have been constructed to reduce the need for weed-whacking and push mowing.

Summary

Facilities Management is contributing to decreasing our campus ecological footprint. A major move away from chemical pesticides exemplifies the changes happening in this department. Composting, conserving water, and using drought resistant landscaping are all commendable projects. Areas for improvement include encouraging the grounds to be used as educational and recreational spaces, and communicating more effectively with the campus community.

Ensure that grounds are managed sustainably

1. Plan for the future

- Set out a clear environmental vision (see the "Stewardship" section) that includes details on how the grounds should be managed sustainably taking into account diversity, conservation, and education.

2. Create "accessible" greenspaces for the university community to enjoy

- Create spaces, such as native plant gardens, butterfly gardens, medicine wheels, picnic areas, etc. that will encourage the community to use, and respect, the grounds at Mount A.

3. Ensure Landscaping is Low Input

- Continue implementing low-input species of plants and trees (especially native species)
- Look into alternatives to lawn (in certain areas, natives ground covers could replace high-input turf)

Goals and Recommendations:

Short Term Goals:

4. Improve Communication

- Improve communication with the university community, especially students about Facilities Management plans/changes and how students can get involved.

Long Term Goals:

1. Make Mount Allison 100% Pesticide Free!

- Continue to limit the use of pesticides, and look into proactive alternatives such as compost tea and worm castings

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goals	Long Term Goals
Pest Management				
Pesticides are used on campus only when required	Pesticides are currently used when pests are sited on campus. Spraying is limited to the problem area. The football fields continue to be sprayed with pesticides each year.	Until 2000 sprayed considerable amount of campus; now use a technique called Integrated Pest Management, using pesticides (as a spot application in sports fields) as a last resort.	Look into proactive alternatives to chemical pesticides such as compost tea and worm castings.	Make the campus 100% pesticide free.
Yard Waste				
Yard waste is composted and used as mulch	n/a	Yard waste (such as grass clippings) are composted on site, and used as mulch/fertilizer.	Keep it up!	--
Design				
Native species of plants are incorporated into campus landscape	n/a	Native species are widely planted on campus which is incorporated into the overall drought resistant landscaping being used. Currently, about ½ the trees on campus are native species.	Continue to plant native species of plants and trees. Consider alternatives to grass (in some areas) with a native ground cover that requires less input.	--
Drought resistant landscaping used	n/a	This technique is being used. Watering is only done on the sports fields, and on some beds when plants are newly transplanted.	Keep it up!	--
Education				
Grounds used as an educational space	n/a	Grounds continues to partner with several departments on campus (Biology, for example) to use campus grounds as a laboratory, space for art installations and performances, etc.	Make campus grounds more accessible to all students by: -Planting educational gardens (with native species, or medicinal herbs for example). -Encouraging the campus to engage with the grounds through programs such as "Adopt A Plot," or "Friends of the Garden".	--

Grounds Keeping communicates with campus community	n/a	There is no formal system to let the university community what is being planned by the grounds crew (i.e, the cutting down of a diseased tree).	Create a website, with contact information to increase accessibility to grounds plans, and to allow for questions and feedback.	--
Winter Maintenance				
Salt use is reduced	n/a	In the winter of 2004 a new salt machine was purchased that reduces the amount of salt used on campus by ½.	Look into alternatives to salt use on ice that are less harmful.	--
Gas powered equipment				
Trim Mowing is Minimal	n/a	Trim mowing has been significantly reduced.	Continue to reduce the need for trim mowing.	Eliminate trim mowing.

RISK PREVENTION

"For the first time in the history of the world, every human being is now subjected to contact with dangerous chemicals, from the moment of conception until death." ~ Rachel Carson, *Silent Spring, 1962*

Introduction

We are very fortunate to have such a beautiful campus and to be situated in such a lovely town as Sackville. With that said, it is the university's responsibility to take all precautions to protect the campus and town from any risks created as a result of university operations. Mount Allison needs to identify potential environmental risks and determine ways to handle them in the case of occurrence.

This chapter reports on the university's various environmental risks and outlines training and mechanisms that are in place to ensure continuous due diligence and compliance with government regulations. Having the proper response procedures for potential risks also reduces the university's exposure to prosecution and enhances the University's reputation as a responsible corporate citizen.

Audit Evaluation

Indicator 1. The reporting system for environmental risks.

Reporting environmental and health and safety risks is an ongoing process which requires consideration for past, current and potential impacts.

Mount Allison bases its reporting and risk assessment on two main factors: government regulations and exercising due diligence. These are the two foremost considerations when determining whether or not to perform a risk assessment. Considerations for reporting risks include:

- Identification of activities which may have potential beneficial or adverse impacts on the environment and on health and safety
- Creation of procedures for evaluating the potential impacts of new projects
- Identification of potential impacts associated with changes or modifications to university facilities
- Identification of the potential scope and severity of impact related to mechanical or other system failure and associated remedial considerations

Currently Mount Allison is adhering to, or in the process of adhering to, all regulations which apply to universities under the Canadian Environmental Protection Act (1999) (see appendix 13).

Indicator 2. Risk control procedures.

While universities are required to continually evaluate potential risks and identify new risks as they arise the list of environmental risks for a university such as Mount Allison is relatively small. There is only one major environmental risk at Mount Allison: a spill of the main heating tank. Other environmental risks include:

- Asbestos removal (see Asbestos box)
- Water contamination and backflow (See Water Chapter)
- Hazardous chemicals (See Hazardous Materials chapter)

Asbestos Removal

Mount Allison does have asbestos contained in some campus buildings. On occasions when buildings containing substantial quantities of asbestos are renovated excavation of the asbestos is conducted.

Asbestos is hazardous when airborne, thus any excavation of buried asbestos waste must be undertaken with special care. Where possible, every effort should be made to allow known deposits of asbestos waste to remain untouched.

However, in cases where it is necessary to disturb the deposits, the this procedure should be followed so that the asbestos can be removed, transported and disposed of elsewhere in a safe and proper manner.

Mount Allison does not have a spill control procedure at this time, however the university's only role to play in the event of a spill is to report it to Environment Canada. Mount Allison is not responsible for the clean up of a spill as this is the responsibility of the supplier. This minimal involvement in pollution incidents downplays the importance of internal preventive, response, and recovery procedures. In-depth procedures and training will improve employees' ability to respond to a spill.

A proper spill control procedure should be implemented for any occupancy where flammable or combustible liquids are stored, handled, processed or used and must include the following requirements:

- Ventilation
- Control of ignition source
- Spill containment and cleanup
- Personnel protective clothing and equipment
- Handling and disposal of waste
- A preventive maintenance program
- Training for staff

An effective procedure will enable employees to identify potential hazards before they arise and carry out appropriate mitigation and remedial actions.

Indicator 3. Preventative measures for potential risks.

Preventative measures are by far the most important action to take once a risk has been identified. Even the most in-depth emergency response procedures are only partially effective after an incident has occurred. Prevention is also the most cost effective method to deal with a spill.

The main preventative measure to address an oil spill is to create a dyke surrounding the heating tank to contain any leak or spill. Construction of a dyke has already been established as a future project by Facilities Management.

Other preventative measures that are already in place include safety procedures for loading fuel and an early alert system which notifies heating technicians when there is a rupture in the tank.

Indicator 4. Employee training for environmental risk incident.

The technicians who work in the heating plant have basic hazard/safety training as part of their certification. Unfortunately, this does little to prepare them for the event of an oil spill. The technicians do know who to contact in the event of a spill and the actions they can take to contain a spill are limited by their equipment and resources. However, practice drills and periodic training sessions can improve response time and reporting procedures. Competency for reporting potential environmental hazards is of the utmost importance when human health and nature are at risk. Training should take place on an annual or bi-annual basis. Specialized training and awareness programs, particularly involving new procedural legal requirements, should also be provided as required.

Dyke Specifications

Containment features such as dykes must be constructed around tank or drum storage areas in accordance with the Guidelines as listed below.

- the impoundment within the dyke system enclosing one or more tanks is calculated as the total enclosed volume minus the volume of up to the height of the dyke of all tanks other than the largest and all tank foundations;
- the impoundment within the dyke system enclosing one or more tanks has a capacity of 110 percent of the volume of the largest tank within the impoundment;
- a collection sump with a minimum capacity of 50 cubic feet should be installed within the dyke area;
- the floor of the dyke should have a minimum slope of 1 percent toward a sump to ensure that any runoff or spilled material will drain to the sump;
- all sewer connections from the dyked area should be through the dyke valve;
- the floor and walls of the dyke should be constructed if impermeable materials which are compatible with the contents of all tanks within the dyked areas;
- overhead piping should be used to fill tanks within the dyked area;
- block valves should be installed on all tanks containing flammable chemicals to prevent the draining of tanks into the dyke in the case of a fire;
- dykes should be protected from vehicular impact by means of guard posts or other protection;
- dykes containing liquids heavier than and immiscible with water (specific gravity grater than 1.0) should be equipped with overflow weirs and a sump;
- dykes containing liquids heavier than and immiscible with water should have two separate sets of pipes and valves, one set for the draining of intermittent storm runoff and tank spillage, and a second set for the discharge of overflow waterspray and fire protection system water which exceeds the volume of the dyke area;
- during normal operation, dyke valves should be locked in the closed position with designated PRS and/or other University personnel retaining keys;
- all piping and dyke valves should be protected from freezing;
- for flammable or toxic chemicals, the distance from a dyke valve to the top of the inside face of the dyke wall should be not less than 25 feet; and
- for non-flammable, non-toxic, biodegradable chemicals, the dyke valve should be located on the outside toe of the dyke;

Goals and Recommendations:

Short and Long Term Goal: To exercise due diligence in all university operations that have a potential environmental risk.

- Construct a containment dyke around the heating bunker
- Develop an emergency response training program for heating plant technicians
- Conduct a risk assessment of the entire campus

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goals	Long Term Goals
The reporting system for environmental risks.	n/a	yes	Continue to exercise due diligence in university operations.	Do a risk assessment on campus.
Risk control procedures.	n/a	no	Develop internal spill control procedures.	--
Preventative measures for potential risks.	n/a	no	Construct a containment dyke for the heating bunker.	Continue to evaluate potential risks and develop preventative measures accordingly.
Employee training for environmental risk incident.	n/a	no	Develop an emergency response training program for heating technicians.	Conduct emergency response training every two years at least.

PROCUREMENT

We could have saved the Earth but we were too damned cheap. ~Kurt Vonnegut. Jr.

Introduction

With new legislation for Kyoto and higher expectations from consumers it is inevitable that the supplier chain will need to turn over a new "green" leaf. With more accountability comes more disclosure, making it easier to source products to their corporations.

Corporations have also begun to see the benefit of greening their practices and improving the supply chain. *Purchasing professionals create contracts that include those environmental dimensions requested by consumers and shareholders and required by governments, at the same time as maintaining or even reducing costs. It shows that, both logically and strategically, they are our "environmental gatekeepers"*(Buying for the Future, 2000)

Is the purchasing process ignoring fundamental social and environmental issues? Above all, could new purchasing initiatives based on environmental principles be significantly more cost- and resource-effective for the university?

When making procurement decisions many elements need to be taken into consideration. Factors such as raw materials acquisition, production, manufacturing, packaging, distribution, operation, and disposal of the product have an impact on the environment. Benefits of choosing products that have a lesser or reduced effect on the environment include: superior risk management, eco-efficiency, stronger supplier relationships, and improvements in environmental performance.

Good examples of the benefits of "green" products are energy-efficient vehicles and renewable energy which cut greenhouse gas emissions and harmful air pollutants while lessening our dependence on imported oil.

Pollution Prevention/Environmental Impact Considerations

- Energy efficiency and conservation
- Natural resource depletion
- Forest and ecosystem protection
- Water efficiency
- Waste minimization
- Hazardous waste reduction
- Toxic material content
- Adverse effects to workers, animals, plants, air, water and soil
- Recyclable content
- Recyclability of waste resources
- Resource conservation
- Renewable material percentages
- Green house gas emissions
- Packaging
- Transportation
- Others

Audit Evaluation

Indicator #1: In the purchase of products, the following factors are taken into consideration:

a) reduced packaging;
b) environmental performance (i.e. energy saving),
c) reduced consumption;
d) construction (i.e. recycled materials rather than tropical hardwoods, PVC); and longevity.

Roughly 10% of the University budget is used for purchasing goods and this 10% consists of literally thousands of tender contracts. Many of the contracts are renewals and many of the contracts are limited to a few suppliers due to factors such as geographic location, price, warranty requirements, and the quality of the product. These complexities in the purchasing process make it difficult to place a heavy weight on environmental factors when placing a tender for a contract.

When all other factors are considered, as much consideration as possible is given to environmental issues such as reduced packaging and energy savings.

Indicator #2: Development of environmental procurement strategy:

While Mount Allison's individual purchasing power is minimal, the power of inter-university purchasing is substantial and our purchasing manager can further environmental initiatives by developing an environmental procurement strategy. An environmental procurement strategy uses procurement and operational sustainable development initiatives to reduce ecological impacts while satisfying purchasing needs. These initiatives include cross-organizational input, assessments, research, contract specification enhancements and supplier negotiations.

Resources, such as the book *Buying for the Future,* provide options to stimulate environmental initiatives throughout the supply chain. Methods and tools such as sending suppliers letters requesting ideas on how they can reduce their packaging have been very successful.

There are a myriad of methods and tools to implement an environmental procurement strategy, but this requires a considerable amount of research and organization from the purchasing manager. Each individual strategy depends on factors like provincial legislation, regional suppliers, and the purchasing power of the institution. Once these factors have been taken into consideration an appropriate strategy can be made.

Understanding the Procurement Process

- Faculty or staff wishing to buy a product with university funds submit a request form to the purchasing manager.
- Products such as lights, fuel and office supplies, are handled by standing contract agreements with a tendered company. When one of these products is ordered, the order is automatically filled by this company.
- Products bought in extremely large quantities and bulk such as computers and paper are bought through an inter-university tender. Under an inter-university contract, all universities in the Maritime region join together to purchase from one company in order to maximize their purchasing power. Contract proposals are accepted every year through a central inter-university purchasing office and the lowest suitable bidder is chosen.
- Products ordered in smaller quantities or on a sporadic basis are not covered by the standing contracts and are bought from the supplier with the lowest price. These companies are under short term contract agreements and environmental guidelines are generally not requested from them.

Indicator #3: Staff and faculty's environmental consciousness of their purchasing requests:

Each contract and purchase done by the purchasing manager originates as a request from a campus employee. In this sense the purchasing manager is a "gatekeeper" who is trying to satisfy a need within the university. Based on criteria such as price, quality, and warranty the manager makes his decision. However, the person making the request has the most influence over the product chosen.

Educating faculty and staff on the impacts of their departmental purchases will better prepare them to make smart consumer decisions. By

requesting certain standards or criteria when submitting a request it is possible to reduce a large list of available products to a short list of the most environmentally sound products.

Additional benefits of educating Mount Allison employees include energy savings, reduce waste streams, and minimal packaging.

Understanding the Procurement Process

- Mount Allison's purchasing control is reliant on its contract agreements. In these documents the desired specifications and product use is defined. There are currently few environmental specifications in contract agreements. Purchasing control is limited further by financial restraints. The monetary advantages of buying in bulk often outweigh the advantages of choosing an environmentally friendly product. Because some products are bought through a consortium there is very little purchasing control by the university.
- The money used to pay for any ordered product is deducted from the departmental budget of the staff or faculty
- Budgets are spent at the discretion of each department, therefore some departments may choose to spend money on computers or paper, while others will spend it on research.
- The university currently abides by the purchasing policy which stipulates that all contracts must be established by a contract agreement and records must be kept of all business transactions in research, travel and casual purchases.

Summary

Despite limited purchasing power, initiatives can be taken to make our supply chain more environmentally friendly. Developing an environmental procurement strategy is the initial step towards greening the supply chain. Other techniques, such as environmental purchasing policies or amending declarations such as the CERES principles, have been shown to further environmental plans, but it should be noted that some of these techniques can constrict purchasing choices rather than increase eco-friendly options.

Education on the part of the requester is just as important as the education of the purchaser as the two work hand in hand to determine appropriate criteria for a contract. Consumer consciousness programs can improve employees' knowledge of green alternatives for traditional products.

Goals and Recommendations:

Short Term Goals:

- Develop an environmental procurement strategy to "green" the supply chain
- Implement a consumer consciousness program to improve faculty and staffs' understanding of purchasing decisions

Long Term Goals:

- Sign the CERES Principles
- Establish an Environmental Purchasing Policy which stipulates that recycled, non toxic and renewable product alternatives be favoured by the purchasing department whenever the product is less than 5% more expensive than its conventional alternative.

The CERES Principles

The Coalition for Environmentally Responsible Economies (CERES) was formed in 1989 to promote responsible corporate environmental conduct. Shortly after the disaster of the Exxon *Valdez* , CERES announced the creation of the Valdez Principles. Later renamed the CERES Principles, this statement represents an environmental ethic for corporations.

The CERES Principles are offered as a comprehensive statement of environmental values for businesses within any industry sector. They are intended to help companies formalize their dedication to environmental awareness and accountability, and actively commit to an ongoing process of continuous improvement in environmental performance, dialogue, and comprehensive, systematic reporting.

The Principles encompass ten broad, aspirational standards, covering the following points:

1. Protection of the Biosphere
2. Sustainable Use of Natural Resources
3. Reduction and Disposable of Wastes
4. Energy Conservation
5. Risk Reduction
6. Safe products and services
7. Environmental Restoration
8. Informing the Public
9. Management Commitment
10. Audits and Reports

(See Appendix 14 for a more detailed copy of the CERES Principles.)

Indicator Summary

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goals	Long Term Goals
In the purchase of products, the following factors are taken into consideration: a) reduced packaging; b) environmental performance c) reduced consumption; d) construction and longevity.	Minimal consideration was given to these factors due to price, quality, warranty, and durability taking precedence.	More consideration is given to these factors, mainly as a result of consumers and shareholders demanding higher environmental standards and more accountability from suppliers.	Continue to take environmental factors into consideration on an inter-university purchasing level. Mount Allison's own purchasing benefits from our purchasing associations increasing standards.	Establish an environmental purchasing policy.
Development of environmental procurement strategy.	n/a	No environmental procurement strategy exists at this time.	Develop an environmental procurement strategy to stimulate environmental initiatives along the supply chain.	--
Staff and faculty's environmental consciousness of their purchasing requests.	n/a	No efforts have been made to improve the environmental consciousness of faculty and staff.	Implement a consumer education program to improve the purchasing decisions of university employees.	--

ACADEMIC OPPORTUNITIES

"Institutions of higher education bear a profound moral responsibility to increase the awareness, knowledge, skills and values needed to create a just and sustainable future." (Cortese: 1999)

Introduction

From the studying of on-campus tree species for biology, to analyzing the university environmental policy in geography, the Mount Allison curriculum has consistently incorporated environmental content into many of the courses they offer. In an era where climate change is considered a global emergency and Kyoto is a household term, universities are left with the onus of setting the stage for a sustainable future. While many of our graduates have contributed significantly to environmental efforts others have slipped through the cracks without ever receiving an introduction to environmental issues.

At Mount Allison University we stress the value of a "whole", liberal education but is this really the case? The question we ask in this chapter is "Do our graduates truly have a complete education if they lack the knowledge to understand the environmental consequences of their personal actions?" To answer this question the following indicators were used:

Audit Evaluation

Indicator 1. Local community resources, such as the Canadian Wildlife Services are utilized and local regional issues are integrated into course work.

Information not available at this time.

Indicator 2. The university offers programs to educate faculty on environmental issues.

- There are no programs on campus to educate faculty on environmental issues.
- There are a number of opportunities available, such as speakers, conferences, etc. that could be used to educate faculty, but there is no formal structure that requires a minimum number of hours devoted to environmental training.

Indicator 3. Faculty environmental research.

Information not available at this time.

Indicator 4. Students taking courses with substantial environmental content.

Information not available at this time.

Indicator 5. Progress of environmental curriculum.

The following improvements have been made to the environmental curriculum at Mount Allison:

- An introductory environmental studies course (ENST 1001) has been added to the Environmental Studies and Environmental Science curriculums. This is the first lower level environmental studies course created, which helps to strengthen both primarily multi-disciplinary programs.

- A new professor has been hired to coordinate the environmental science program. This new addition to the faculty is a large accomplishment (particularly for a small university) which adds new talent and leadership to the program.
- Recent faculty additions to the Social Sciences have keen environmental interests. While environmental interest was not a criteria for hiring, this increased support from faculty will help push environmental progress.
- The McCain post-doctoral grant (a floating one year doctoral position which moves from department to department) is reserved for Geography next year. Since Environmental Studies is closely linked with Geography, this will increase the human resources of the department.
- Two additional seats were created at departmental meetings for the Environmental Studies and International Relations coordinators. These programs, which involve environmental and social issues, now have more influence on departmental decisions.

The main contribution to an improved environmental curriculum has been the gradual, but significant increase in concerned faculty across campus. Over the past 5-6 years an increasing number of professors have contributed by teaching environmental courses of one kind or another in all disciplines. One very recent example is the hiring of Zoe Finkel, the new coordinator for Environmental Science.

The Environmental studies program has made the most progress since the last audit in terms of enhancing the environmental curriculum at Mount Allison. Two years ago the Environmental studies coordinator received a budget specific to his department. The coordinator has also experienced continuing growth in all classes and 2006 will see the largest number of graduating majors yet (10-12 are due to graduate with majors in Environmental Studies).

The environmental contribution of Mount Allison's curriculum is not exclusive to Environmental Studies and Science, but it is centered in these two departments. Increased support is necessary to enhance the profile and course offerings of these two departments. Faculty from all disciplines would benefit from education on incorporating environmental issues into their courses.

Summary:

Since the 2002 Audit environmental academics has lost pace in many areas of the university. This is not to say that environmental curriculums have not progressed, but they have not achieved the same level of success experienced since the first audit (1998) and have assumed a much more conventional progression process.

The progress which has taken place in the last three years is due to individual interest much more than institutional commitment. This suggests that while there are faculty and staff who support environmental progress, administrative leadership on these issues is insufficient.

Goals and Recommendations:

Short Term Goal: **Integrate more environmental content into curriculum.**

- Educate faculty in all disciplines on environmental issues so they may integrate them into their courses.
- First year courses, in particular, should be "greened" due to their high enrollment.
- The environmental audit can be used to integrate environmental issues into various courses.

Long Term Goal: **Every graduate should have a basic understanding of environmental responsibility.**

- Use university projects as an educational tool. For example, a business course could analyze the cost benefits of a waste management program.
- Every student should complete a Sustainability Literacy Survey and Sustainability Pledge.

- Include the statement "all students, upon graduating will possess the knowledge, skills, and values to work towards an environmentally sustainable future" (Blueprint for a Green Campus) in the university's mission statement.

Indicator Summary:

Indicator	State of Affairs 2002	State of Affairs 2005	Short Term Goal	Long Term Goal
Local environmental community resources, such as the Canadian Wildlife Services are utilized and local regional issues are integrated into course work.	This has not been formalized. Some independent study projects are done with the CWS. Local and regional issues are integrated depending on the professor's interest.	Unavailable.	At least 25%.	At least 50%.
Faculty are educated on environmental issues.	n/a	There are no programs to educate faculty on these issues.	At least 24 hours per year per faculty member.	At least 60 hours per year per faculty member.
Faculty environmental research.	n/a	Unavailable.		
Students taking courses with substantial environmental content.	n/a	Unavailable.	At least 30%.	100%.
Progress of environmental curriculum.	n/a	Faculty and curricular additions since 2002 have improved the progress of Mount Allison's environmental curriculum.	Continue integrating environmental content into all disciplines.	Same.

STEWARDSHIP

"No Institutions in modern society are better equipped to catalyze the necessary transition to a sustainable world than universities. They have access to the leaders of tomorrow and the leaders of today. They have buying and investment power. They are widely respected. Consequentially, what they do matters to the wider public."
- David Orr

Introduction

Stewardship is about taking care of the resources that have been entrusted to us. It is our responsibility to take care of our surrounding natural environment (air, land, water, etc) by ensuring that whatever actions we take do not disrupt natural ecosystems. When we build a new building, make food orders, landscape, and throw out waste, we must ensure that we are doing it with the lowest environmental impact as possible.

The focus of campus environmental stewardship is about creating a sustainable campus which includes everything from conserving natural resources, serving locally produced foods, and creating a culture of environmental responsibility.

Mount A has been taking steps towards campus sustainability, beginning with the written environmental policy (1999) and continuing with environmental audits every second year (1998, 2000, 2002, 2005). Each chapter of this audit highlights projects that been undertaken by the university that have placed the environment high on the priority list. We are moving in the right direction!

That said, there is more that the university can be doing to enrich the state of our campus environment. All of the projects listed in the audit are commendable initiatives, however they remain fragmented as there is no "vision" for ecological sustainability to unite them. With the reconstitution of the environmental issues committee in the Fall of 2005 environmental initiatives will be driven forward, the environmental policy will be monitored, and a "green vision" for Mt. A will be developed. The following indicators demonstrate areas important to environmental stewardship and assess how we are doing.

Audit Evaluation

Indicator 1. Executive Support

Senior Administration have shown their support by signing a declaration, such as the Talloires Declaration, of environmental responsibility.

While this audit was being conducted, Mount A pledged their support to the New England Governors and Eastern Canadian Premiers to achieve the goals outlined in the Climate Change Action Plan (see Appendix 11). This is an effective measure taken to address issues of climate change on campus, however, Mount A's Senior Administration has not signed on to a declaration committing the university to overall environmental responsibility.

Indicator 2. Environmental Policy

A written environmental policy exists to "ensure commitment to ecology survives among competing priorities, limited funds, and perpetual turn-over in campus leadership" (Keniry, 1995:190)

Mount Allison has an environmental policy, written in 1999, however it is vague and in need of updating as it does not reflect the scope of environmental concerns on campus.

Universities Committed to Environmental Stewardship
(Canadian Signatories of the Talloires Declaration)

Dalhousie University
Mount Saint Vincent University
Saint Francis Xavier University
Saint Mary's University
Saint Thomas University
University College of Cape Breton
Atlantic School of Theology
Carleton University
Concordia University
Lakehead University
McGill University
Ryerson Polytechnical Institute
York University
University of British Columbia
University of Guelph
University of Lethbridge
University of Manitoba
University of Ottawa
University of Saskatchewan
University of Victoria
University of Western Ontario
University of Windsor
Simon Fraser University

Indicator 3. Resources and Incentives

Provisions are available for establishing new programs/initiatives and/or encouraging increased participation in already existing ones.

Incentives: Currently, there are no "incentives" for people to follow the environmental policy.

People: There is no sustainability coordinator or recycling coordinator on campus. However, Facilities Management is in the process of looking at eligible candidates for the position of "energy coordinator."

Funds/grants: There are no funds or grants specifically allocated for environmental initiatives, although funding is available through programs such as Leadership Mount A.

Indicator 4. Structural Framework

The university has an environmental committee or task force to enforce the policy and to strengthen future initiatives.

During the 2004 academic year Mount Allison's Environmental Issues Committee was inactive. There are plans to reconstitute the committee in the Fall of 2005, which will be chaired by the head of Facilities Management.

Indicator 5. Sense of Place

The university strives to "instill in students and staff a deeper appreciation of the local ecology, economy, and natural history..." (Keniry, 1995:198)

Several classes on campus incorporate the local natural environment into their curriculum, however nothing exists formally that ensures that each and every member of the university engages with the local ecology, economy and history.

Indicator 6. Public Relations and Documentation.

The university documents programs and their results and publicizes them so that they may benefit others.

The university does document large programs and has made significant effort to publicize their achievements. Examples include coverage of the launch of the wet/dry waste sorting program campus wide, and the Carriage House Sustainable Residence Initiative.

Indicator 7. Leadership Development and Training

The university invests time and money to offer training programs that foster environmental sensitivity and leadership.

No programs have been offered.

Summary

Campus environmental stewardship at Mount A needs to improve. Although we have an environmental policy, it is in need of updating, and

in need of implementation. The Environmental Issues Committee needs to be reconstituted to push initiatives forward, and the university needs to make a commitment to environmental responsibility to make campus sustainability a reality.

Goals and Recommendations

Short Term Goal: Create a Green Vision for a sustainable campus

- Reconstitute the Environmental Issues Committee.
  - -Provide the committee with a clear, focused mandate
  - - Include representatives from the student body, staff, faculty, Jenning's Dining Hall, Facilities Management, and Senior Administration.
  - -Develop an "Environment Management System" including a reporting system.
  - -Officially respond to audit recommendations, particularly those to senior administration.
  - -Provide an annual progress report to university community including Senior Administration
- Update Environmental Policy.
  - -Articulate what "the environmental problem" is and what is an appropriate response and course of action.
- Develop a "Code of Environmental Stewardship".
- Include a definition of "the environment" in Mount A's Strategic Plan (Mount Allison, 2000).
- Form Partnerships.
  - -Identify, initiate, and join partnerships that are advantageous to the university and help it implement the environmental policy.
- Show Senior Administration's commitment to environmental stewardship by endorsing a declaration, such as the Talloires Declaration (or its equivalent).
- Engage students in the implementation process through curricular and co-curricular program.
  - -Implement the environmental policy into course curriculum and in independent studies where appropriate
  - -Create an Environmental position on the Student's Administrative Council (SAC).
  - -Have the SAC make a commitment to environmental stewardship on behalf of the student body.
- Hold a regional campus greening conference to achieve environmental policy goals and build contracts.
  - -Hire a coordinator to facilitate the process
  - -Develop a sophisticated indicators program to be used in future campus audits (such as the "Campus Sustainability Assessment Framework." See Cole, 2003)
- Integrate the "green vision" into the overall strategic vision of the university.

Conclusion

Based on the evaluation of each chapter's performance indicators, Mount Allison is performing on par with most other universities of its size. Areas ranging from water use, to hazardous waste, to paper consumption reveal that we do not stray from the status quo when it comes to being an environmental steward. The findings of each indicator demonstrate that as an institution we lack a clear vision for working towards making Mount Allison a sustainable campus. In several areas, commendable initiatives have been taken to reduce energy consumption, and procure food from local sources, for example. However, these initiatives remain fragmented without a comprehensive campus-wide strategy to unite them.

During the process of conducting this audit, change was already being made. In the Fall of 2005, the Environmental Issues Committee will be reconstituted, chaired by the Head of Facilities Management, and composed of members of the university community including Dining Services, Faculty, Staff, Students, and Senior Administration. This "environmental task force" will help to ensure that we stay on track with environmental initiatives, and that recommendations made in this document are implemented.

A "GREEN ACTION PLAN" document has been included in this document. It is a quick reference document to all long and short term goals listed in the audit, as well as recommendations on "how to get there." It is our sincere hope that this document be used as a guiding tool by the Environmental Issues Committee and any other group on campus wanting to push green initiatives forward.

Noteworthy initiatives/features already happening on campus include:

- The launch of the Wet/Dry Waste Sorting Program in the Fall of 2004. By participating in this program we are contributing to the diversion of 55% of waste from landfill!
- The reduction of pesticides used on campus grounds. Just a few short years ago, the entire campus was sprayed with toxic pesticides. Now, only the sports fields are "spot treated" as needed.
- Jenning's Dining Hall is making moves towards procuring food from local/organic/fair trade sources. In the Fall of 2005 Just Us Fair Trade coffee will be available campus wide, and a source is currently being confirmed for local grains.
- Our newest residence building, Campbell Hall, is 30.4% more energy efficient than an average building its size.
- The "Green House," Mount Allison's first Sustainable Residence will open in the Fall of 2005.

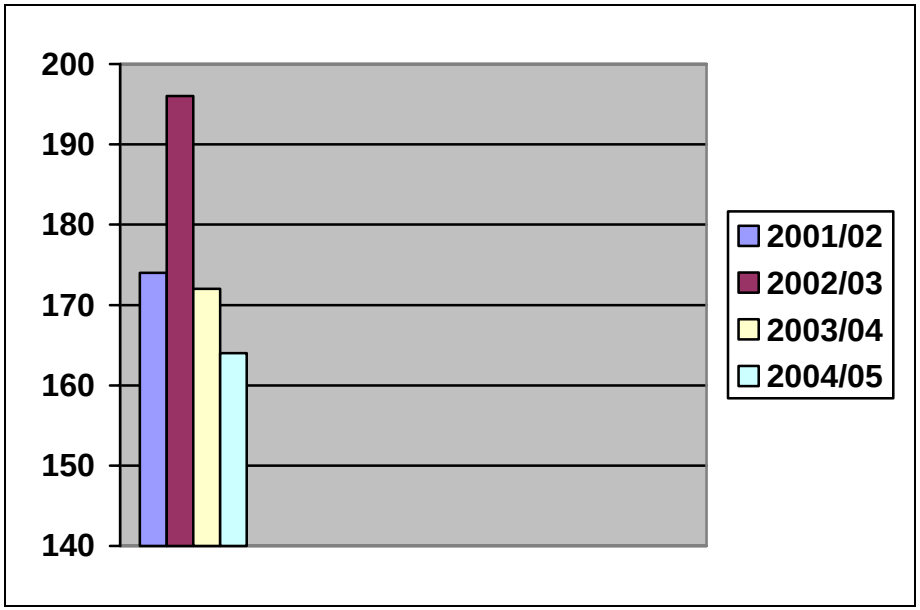
These initiatives are commendable and are an important part of moving towards campus sustainability. It is now up to Mount A to commit to environmental responsibility in all areas of campus, and ensure that every student who graduates from our university does so having engaged with environmental content in the classroom, even if at the most basic level. Having a comprehensive strategy on how to green campus will help to unify campus initiatives, and set Mount Allison apart from the rest.

Mount Allison plays an important role in decreasing the ecological footprint locally and globally. Realizing this, the university has committed to reducing our green house gas emissions as part of the New England Governors and Eastern Canadian Premiers Climate Change Action Plan- a great first step! Now it is time to keep this momentum going.

For further information on this audit, previous audits, The Green House, the Environmental Issues Committee, the Environmental Policy, and other related information refer to the Environmental Web Page: www.mta.ca/environment/.

Appendix 1

Overall Water Use (Million Litres)

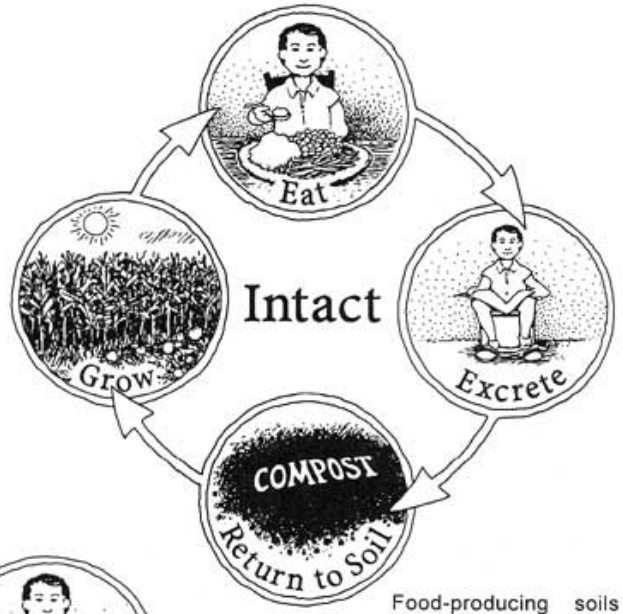


Appendix 2 2

Figure 2.4

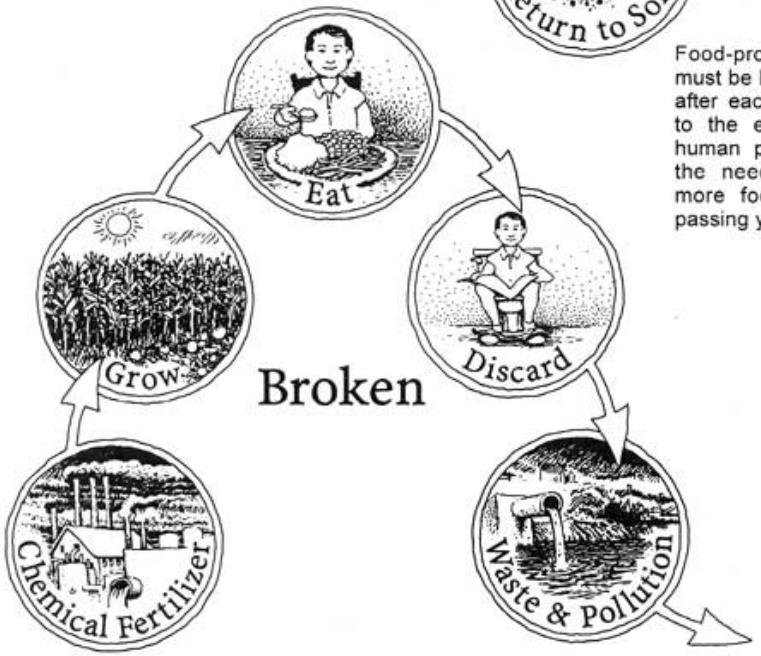
THE HUMAN NUTRIENT CYCLE *INTACT* and *BROKEN*

The Human Nutrient Cycle is an endless natural cycle. In order to keep the cycle intact, food for humans must be grown on soil that is enriched by the continuous addition of organic materials recycled by humans, such as humanure, food scraps, and agricultural residues. By respecting this cycle of nature, humans can maintain the fertility of their agricultural soils indefinitely, instead of depleting them of nutrients, as is common today.



Intact

Food-producing soils must be left more fertile after each harvest due to the ever-increasing human population and the need to produce more food with each passing year.



Broken

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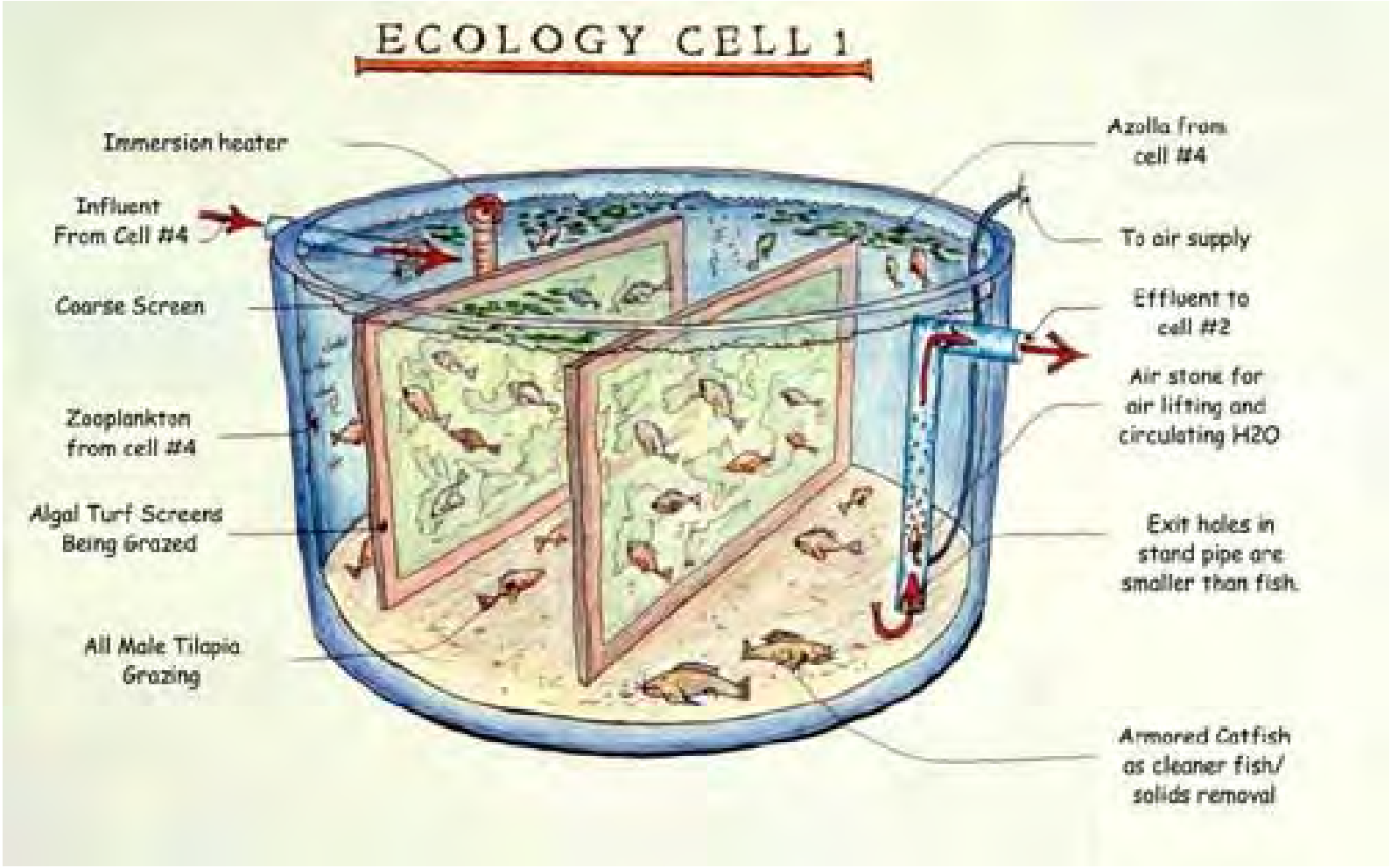
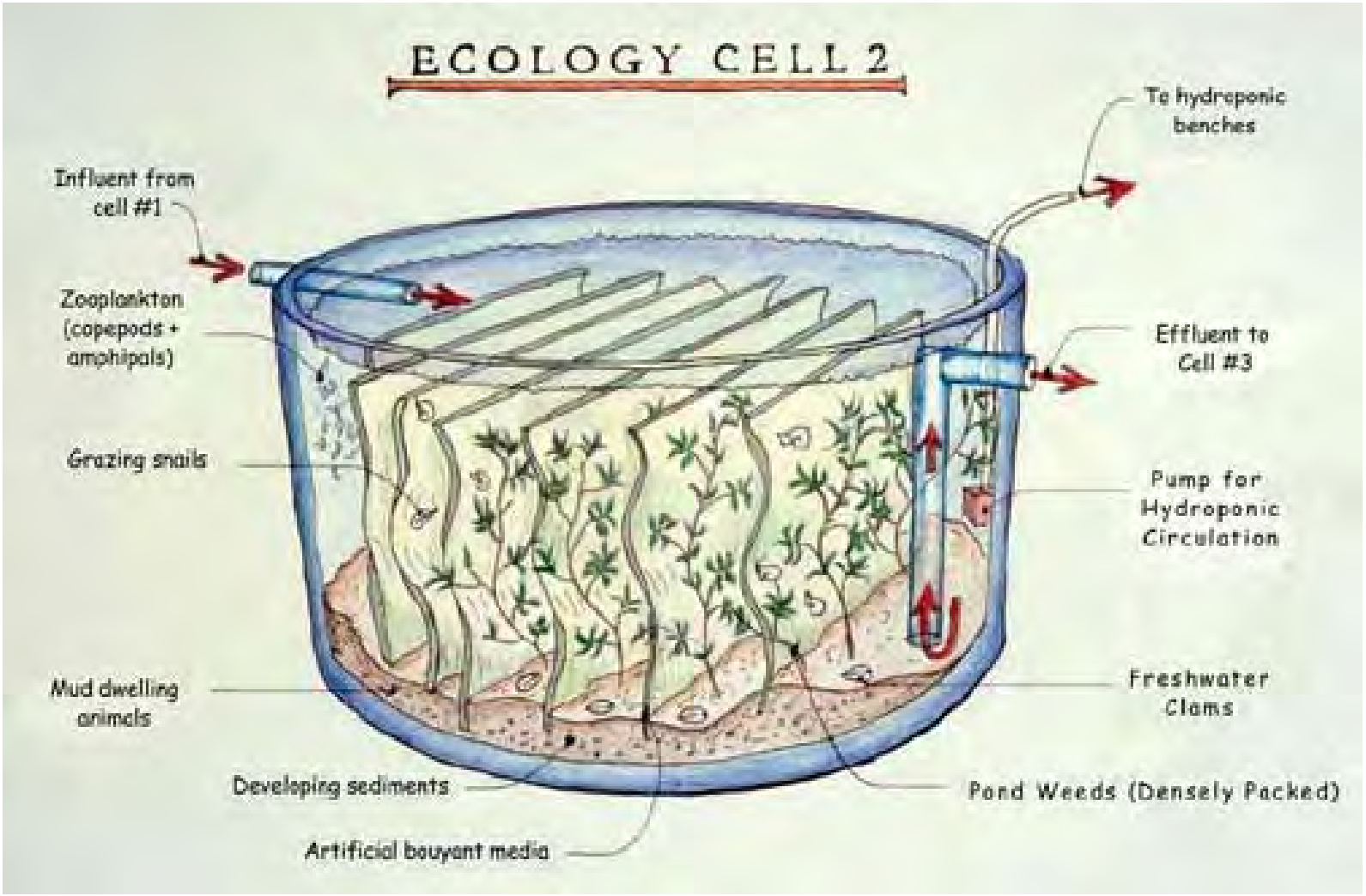
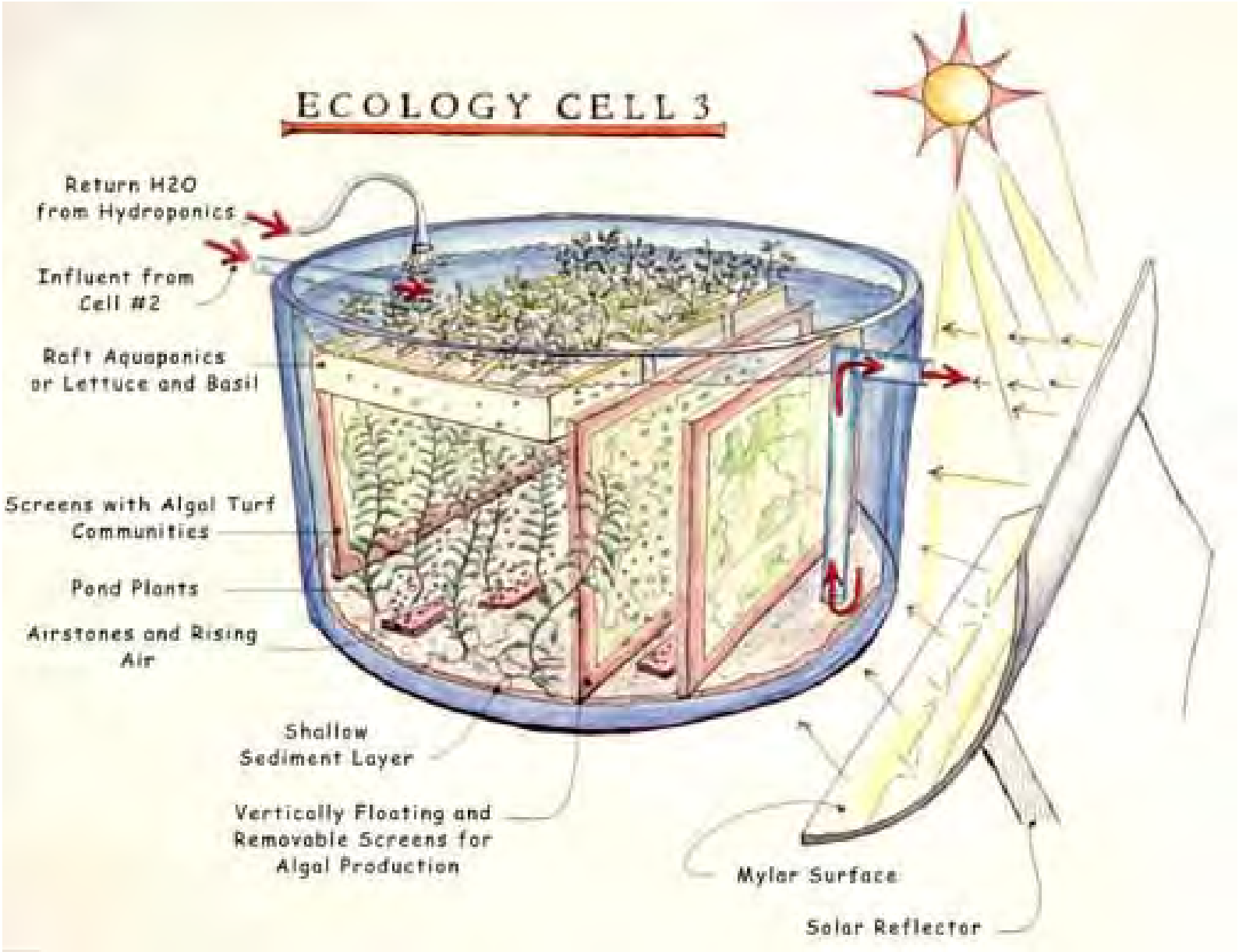
Appendix 3

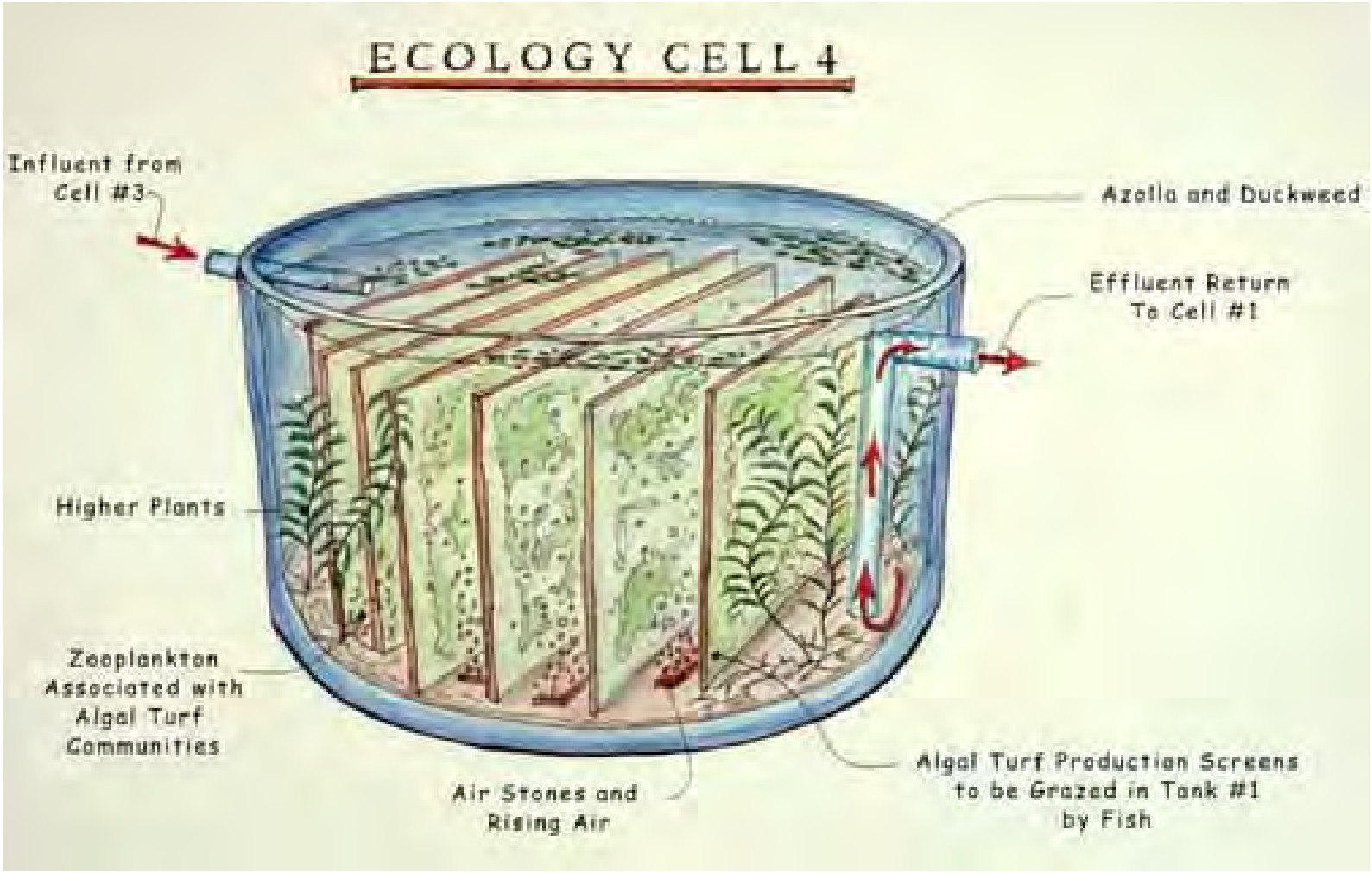
Living Machines

"A Living Machine (capital letters, it's a patented invention) is a series of tanks teeming with live plants, trees, grasses and algae, koi and goldfish, tiny freshwater shrimp, snails, and a diversity of microorganisms and bacteria. Each tank is a different mini-ecosystem designed to eat or break down waste. The process takes about four days to turn mucky water crystal clear. It is chemical-free, odor-free (with the exception perhaps of the sweet fragrance of flowers), and, compared to conventional waste treatment, it costs less financially and ecologically" (Penn State, 2000b).




ECOLOGY CELL 2
To hydroponic benches
Influent from cell #1
Zooplankton (copepods + amphipals)
Effluent to Cell #3
Grazing snails
Pump for Hydroponic Circulation
Mud dwelling animals
Freshwater Clams
Developing sediments
Pond Weeds (Densely Packed)
Artificial bouyant media


ECOLOGY CELL 3
Return H2O from Hydroponics
Influent from Cell #2
Raft Aquaponics or Lettuce and Basil
Screens with Algal Turf Communities
Pond Plants
Airstones and Rising Air
Shallow Sediment Layer
Vertically Floating and Removable Screens for Algal Production
Mylar Surface
Solar Reflector

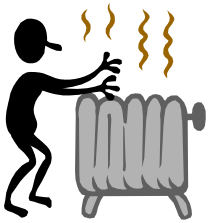

ECOLOGY CELL 4
Influent from Cell #3
Azolla and Duckweed
Effluent Return To Cell #1
Higher Plants
Zooplankton Associated with Algal Turf Communities
Air Stones and Rising Air
Algal Turf Production Screens to be Grazed in Tank #1 by Fish

How oil heats Mount Allison:

Fuel oil is burned to heat the water inside the boiler to produce steam.

The condensate is treated to remove oxygen before being returned to the boiler.

Condensate* leaves the heating implements through another system of pipes and returns to the heating plant for treatment.

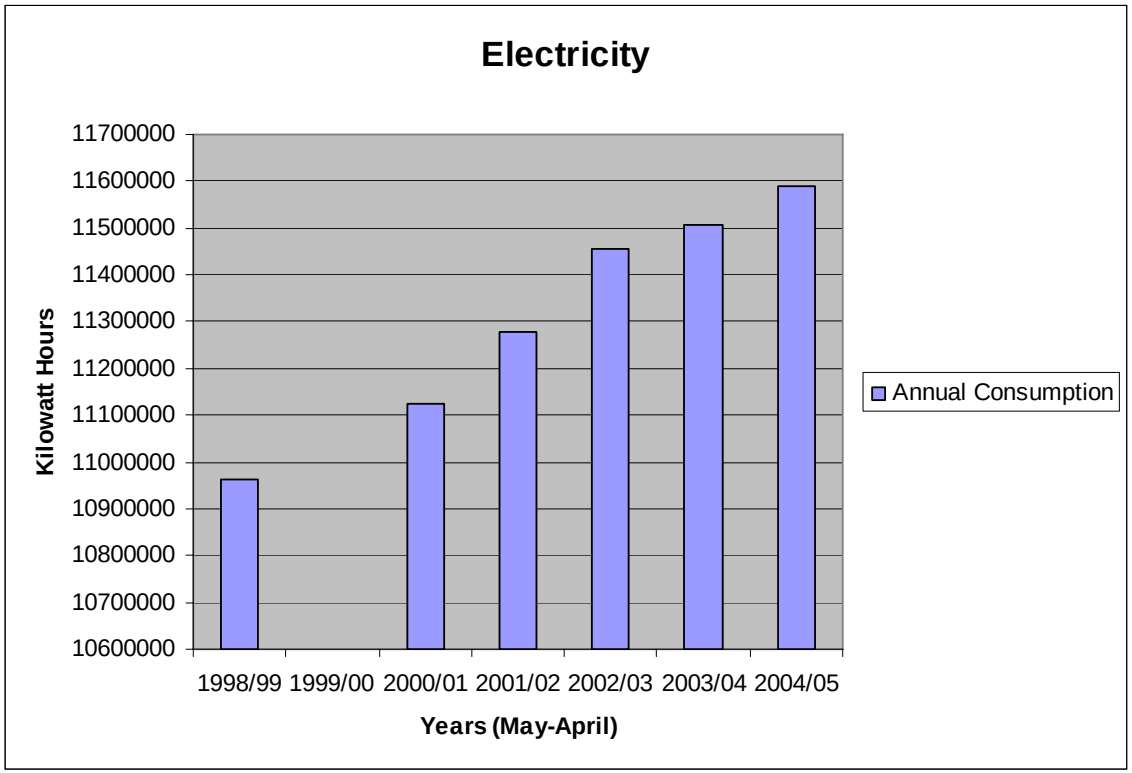


The steam travels through a system of pipes to the various heating implements around campus.

*Condensate is the water that is produced when the steam cools.

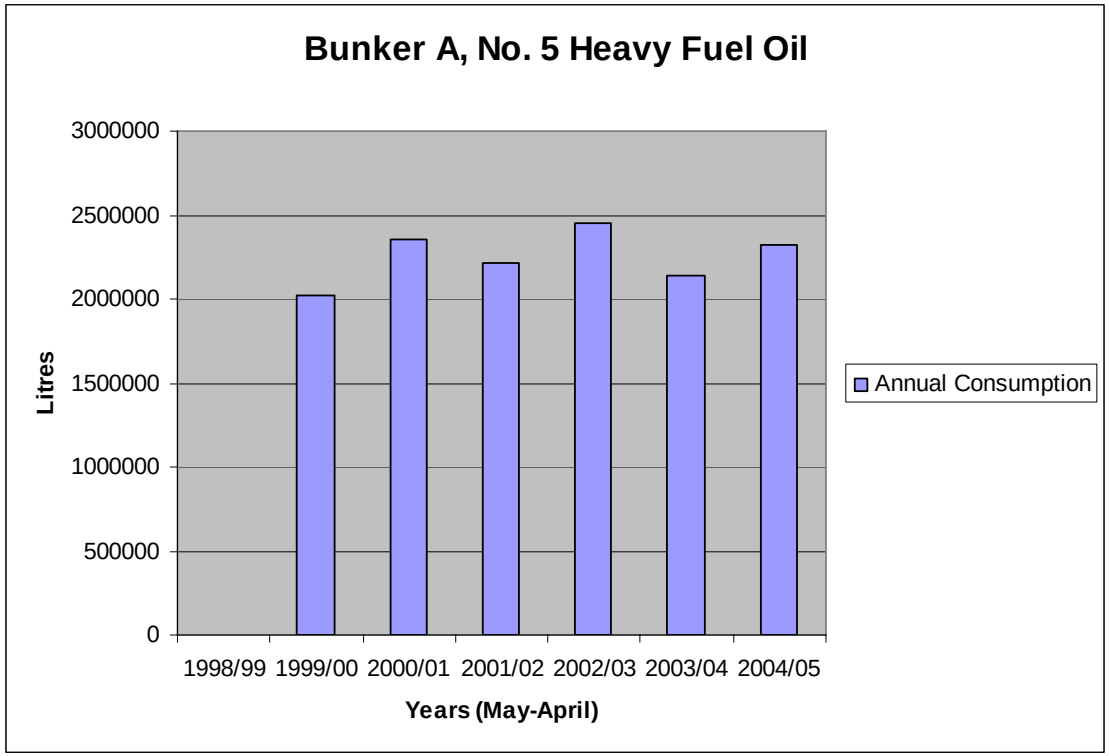
Electricity Consumption
1998 - 2004

Year (May - April)	Consumption kWH
1998/99	10961057
1999/00	
2000/01	11124448
2001/02	11276287
2002/03	11454446
2003/04	11507423
2004/05	11588029

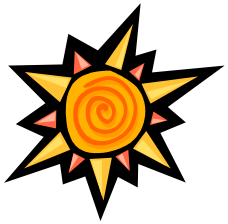


Bunker A Consumption
1998-2005

Years (May-April)	Consumption (Litres)
1998/99	
1999/00	2022800
2000/01	2351282
2001/02	2210050
2002/03	2448288
2003/04	2141430
2004/05	2324489



DID YOU KNOW?

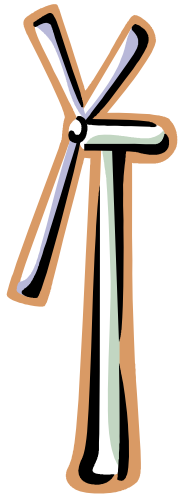


The sun produces more energy in an hour than the entire population of the Earth uses in a year!

Solar energy can be used for:
Electricity – photovoltaic solar cells can collect 15% of the energy that hits them and the technology is constantly improving
Heating – solar cells can transfer about 80% of the heat that hits them, not only providing heat, but improving the drying capacity of the surrounding air as well – who needs a clothes drier?

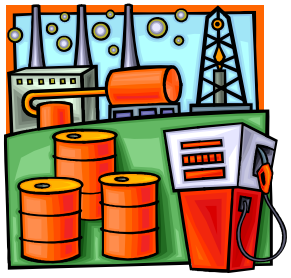
The Canadian Wind Energy Association hopes to encourage enough investment in Canada's wind energy industry to provide 5% of our electricity by 2010. In good wind areas electricity costs range from 6-12 cents/kWH and good quality wind turbines are more than 98% reliable.

Wind is the fastest growing source of electricity in the world and the global wind energy potential is roughly five times current global electricity use!



There is 50 000 times more thermal energy in the top 6 miles of the Earth's crust than in all the oil and natural gas reserves in the world combined!

According to many estimates global oil production will reach its peak before 2010. This does not mean the end of oil but the end of a cheap resource, one that industrial societies like ours depend on to maintain our industrial status. Oil prices will continue to rise unless demand is curtailed through continued use and investment in alternative energy sources, like renewables.



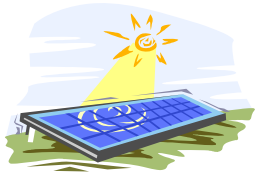
Fossil fuels are being depleted at a rate 100 000 times faster than they are being formed!

SO, WHAT CAN WE DO??

WE CAN FOLLOW THESE LEADS…..

Saskatchewan's Dancing Sky Theatre has gone solar. They've built a solar trailer with a PV system for their summer tour performances in order to avoid the necessary proximity to extension cords or generators. At the end of the tour the solar collector will be installed in the theatre to power its sound system, avoiding what would have been a $4 000 repair cost.

Nunavut Arctic College installed a photo-voltaic solar system in 1995 and it has been used successfully ever since, providing ~ 2000 +/- 200 kWh/year of power to the college. The system has been used, not only as a reliable, clean, renewable energy source, but also to educate those directly and indirectly involved with the project on the viability and benefits of solar energy.

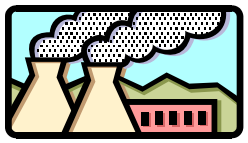


In March 2001, Dr. Larry Hughes and Dr. Tim Little of the Department of Electrical and Computer Engineering at Dalhousie University were awarded $50,000 for the Nova Scotia Wind Energy Project (NSWEP). This project, funded by the Federal Government's Climate Change Action Fund for Public Education and Outreach (PEO), is intended to raise awareness of climate change in Nova Scotia and to demonstrate how wind energy could be used to mitigate climate change.
In early 2002, TEAM awarded Dr. Hughes $200,000 for the purchase of three 20kw turbines for the second phase of NSWEP.

Projects like these represent the commitments of institutions and other organizations across the country to renewable energy over non-renewable. On top of the energy sources mentioned, renewables also include: hydro or water energy, bioenergy, tidal or wave energy, hydrogen energy. But, what about nuclear power isn't it clean and renewable? See for yourself…

NUCLEAR POWER, MYTH OR REALITY?

Myth # 1 - Nuclear power does not emit greenhouse gases.



Reality - Indirect emissions of greenhouse gases from the production of nuclear power plants, the mining & processing of uranium and the storage & transportation of radioactive waste are ~ 35 tonnes of CO_2 equivalent annually.

Myth # 2 - There is a plentiful supply of fuel for the nuclear fission process.

Reality - Uranium, like fossil fuels is a finite resource. At the current rate of usage there is an estimated 3.5 million tonnes of usable uranium reserves on the planet – enough for ~ 50 years.

Myth # 3 - Nuclear power is economically viable.

Reality - The nuclear industry has been heavily subsidized worldwide making nuclear power appear cheaper than it actually is.

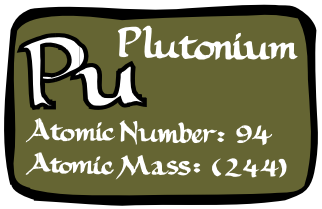
Myth # 4 - There are no viable alternative solutions.

Reality - Current global energy demand is ~0.1% of the amount of energy the sun gives us each year, and the cost of renewable energy like solar has declined dramatically in the past 10 years, while the cost of nuclear has risen.

Myth # 5 - There are no other major problems associated with nuclear power.

Reality - Major problems associated with nuclear power include: storage of radioactive waste, safety, weapons proliferation and terrorism, and health.

Myth # 6 - The fast breeder technology will eventually mature and provide unlimited resources.



Reality - The plutonium used as fuel for fast breeder reactors is among the most dangerous elements in the world, and cannot even be found in nature. Fast breeder technology has thus far proved technologically and economically unviable.

"There is certainly no way safely to dispose of nuclear waste into the environment."
A. Stanley Thompson, May 1998

Point Lepreau Nuclear Generating Station

Appendix 7

DID YOU KNOW?

This residence washroom is equipped with pause-able shower heads. This allows you to pause the flow of water while you can lather up.

Pause-able showerheads save water and energy, improving the environmental performance of Mount Allison's residences.

DID YOU KNOW?

This room uses 'Watt stoppers'. These intelligent sensors use passive infra-red and ultrasonic technology to sense occupancy through movement and heat and turn the lights on & off accordingly.

Infra-red sensor detects occupancy.

This technology saves the school electricity and money and improves our environmental performance.

Appendix 8

CLEAN AIR COOL PLANET

Campus Greenhouse Gas Emissions Inventory Toolkit
CA-CP eCalculator v4.0
Canadian Version

This *CA-CP Campus GHG Emissions Inventory Calculator* is the Canadian version of a tool that has been used at over 20 schools since 2001, mostly in the Northeastern U.S. The task it facilitates – the collection, analysis, and presentation of data constituting an inventory of the emissions of greenhouse gases attributable to the existence and operations of an institution – provides an essential foundation for focused, effective outreach on the issue of climate change at a college or university, and the basis for institutional action to address it.

There are three steps to the greenhouse gas emission inventory process:
1) Data collection;
2) Calculating greenhouse gas emissions;
3) Analyzing and summarizing the results.

The MS Excel-based Emissions Inventory Calculator, called the eCalculator is an electronic workbook that takes the energy use, agriculture, refrigerant, and solid waste data you will gather and calculates estimates of the greenhouse gas emissions for your campus associated with them. It includes the greenhouse gases specified by the Kyoto Protocol (CO2, CH4, N2O, HFC and PFC, and SF6). It will enable you to calculate emissions for the years 1990-2020 and produce charts and graphs illustrating changes and trends in the institution's emissions over time. The spreadsheets are based on the workbooks provided by the Intergovernmental Panel on Climate Change (IPCC, www.ipcc.ch) for national-level inventories. They have been adapted for use at an institution like a college or university, but follow virtually all the same protocols.

412-1 Nicholas St.
Ottawa, ON
K1N 7B7

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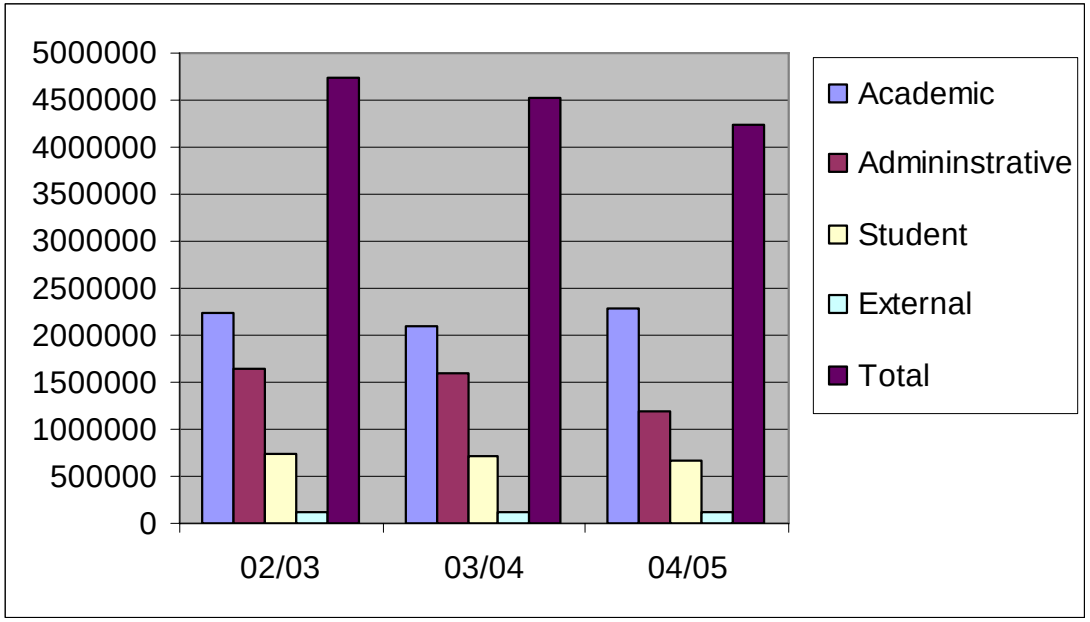
Youth arm of the Sierra Club of Canada – Branche des jeunes du Club Sierra du Canada

Paper Consumption[3]

Year	02/03	03/04	04/05
Academic	2231831	2106168	2275565
Admininstrative	1644133	1596144	1188044
Student	740309	713671	661250
External	123227	109517	116641
Total	4739500	4525500	4241500

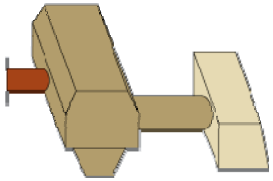


[3] Information courtesy of Judy VanRooyen

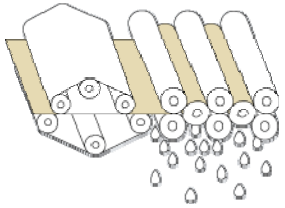
Appendix 10

1. Paper begins with wood chips. Wood chips are made of cellulose wood fibres and the binding agent lignin. Making pulp from these wood chips is the first step in paper production. Pulp is produced by mechanically or chemically reducing the wood chips into individual fibres. Bleach is also added at this stage.

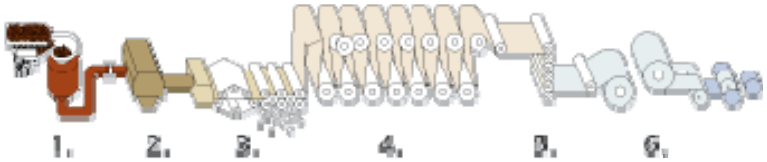
2. Pulp is mixed with other pulp and diluted to produce a mixture that is ~99% moisture. Different combinations of pulps are used to produce different types of paper.

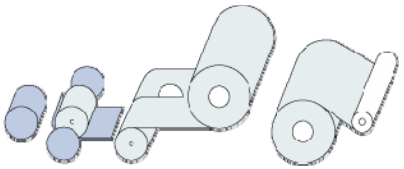


3. Next, water must be removed from the pulp mixture. A combination of gravity, vacuum and centrifugal force is used to reduce the mixture to 85% moisture. The mixture then moves on to several stages of pressing and drying.

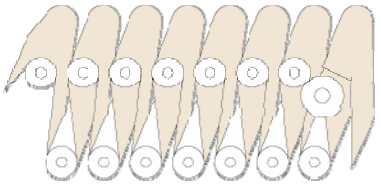


THIS IS HOW PAPER IS MADE:

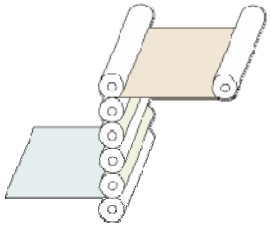




4. More water is removed by first squeezing the product out on a press. The sheet then passes over and around several steam-filled drums. This reduces the moisture to less than 10%.



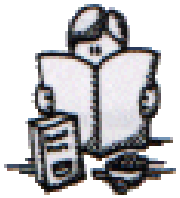
5. Next, the sheet is iron dried between steel rolls producing a smooth finish and uniform thickness according to specifications.



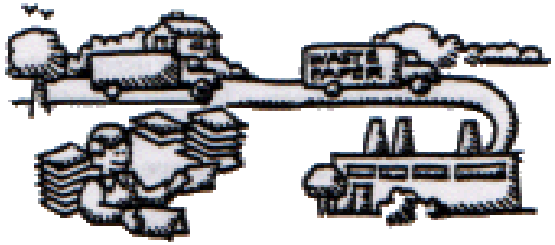
6. Finally, the finished paper is rolled tightly onto large reels as wide as a city street and weighing as much as 30 tonnes. The paper is cut to specifications, wound onto smaller rolls and enveloped in a vapour-barrier wrap for storage and shipping.

Source:
http://www.norskecanada.com/products/products_howwemakeproducts_paper.xml

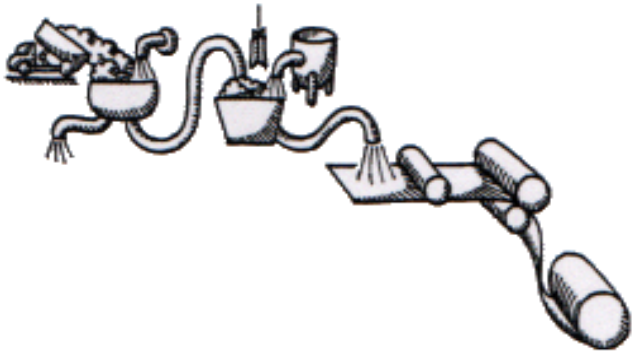
THIS IS HOW RECYCLED PAPER IS MADE:



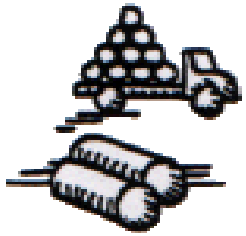
1. You use paper products and save them for recycling.
2. The paper is collected and sorted.



3. Then it is delivered to a paper mill.
4. Where it is prepared for de-inking.
5. In de-inking, paddles beat the paper to pulp and remove old ink, glue and staples.



6. A screen shakes the pulp into a flat wet mass which is moved to...
7. Heated drying rollers which squeeze water out of the pulp and dry it into new paper and cardboard.
8. The new paper and cardboard are then delivered to printers and box makers...



9. Who use it to make new products.

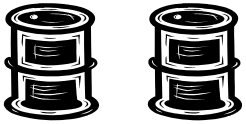
Source:
http://www.on.ec.gc.ca/community/classroom/c7-paper-e.html

AND THIS IS WHY RECYCLED PAPER IS BETTER

1 tonne of paper uses 17 35' trees or 3700 lbs of lumber.

+ 15 yrs =

Recycled paper uses 60 – 70% less energy than virgin paper;
1 tonne of recycled paper saves 4100 kW or 2 barrels of oil.



Recycled paper uses 50 – 58% less water than virgin paper,

produces 74% less air pollution,

and 35% less water pollution than virgin paper.

Appendix 11

Commuter Options: The Complete Guide for Canadian Employers

Preface

Canadians are beginning to fully understand the enormous impacts that their commuting activities have on our cities. Governments at all levels have renewed their efforts to improve the alternatives to commuting by car, and employers and employees alike are realizing that programs to encourage the use of commuter options – public transit, cycling, walking, carpooling and teleworking, among others – can be an attractive element of an employment package.

Transport Canada has assumed a "leadership by example" position in the field of commuter options by making cycling, walking, carpooling, public transit and teleworking more attractive to employees at its Ottawa headquarters. Furthermore, the department has committed to expanding its commuter options program to regional offices, and to promoting commuter options among other federal departments and private-sector employers.

Transport Canada has created *Commuter Options: The Complete Guide for Canadian Employers,* the first comprehensive and nationally relevant guide on this subject, to encourage and support the creation of commuter options programs at Canadian workplaces. This guide summarizes "best practices" for commuter options program planning and implementation at employers of all types, and provides numerous real-life examples and valuable resources. To accompany the guide, Transport Canada has also developed a one-day commuter options workshop. The guide and all training materials are freely available to Canadians on Transport Canada's website at www.tc.gc.ca.

Transport Canada invites readers to send their comments and suggestions to:

Email: environmentalaffairs@tc.gc.ca
Fax: (613) 957-4260
Mail: Transport Canada, Environmental Affairs
Place de Ville, Tower 'C'
330 Sparks Street
Ottawa, ON K1A 0N5

Appendix 12

Mount Allison's Integrated Pest Management (IPM) Procedure[4]
(as determined by ground keeping manager Andrea Ward)

STEP 1: A STANDARD is set to determine the amount of insects, diseases, and weeds which are acceptable

STEP 2: The levels are then MONITORED

STEP 3: The "CULTURAL METHOD" is used whenever possible to ensure the plants are as healthy as possible. This involves keeping a minimum of 4 inches of topsoil on the beds. Kelp, compost, and fertilizer are also used to increase the health of the plants. Water is appropriately added.

STEP 4: If, at this point, pests, weeds, or disease become an issue, MECHANICAL METHODS are used (parts of the plant are removed, wire brushes remove scale, flame thrower burns weeds, high pressure water removes insects, or insects are physically picked off plants)

STEP 5: If this doesn't work, and the problem increases to a level that was not deemed acceptable, ORGANIC means are considered first (such as insecticidal soap, and horticultural oil).

STEP 6: If that doesn't work, and the problem is considered threatening (i.e., Dutch Elm spreading from one tree to another potentially destroying several large trees), COMMERCIAL PESTICIDES are used.

[4] This applies to all areas of campus except the sports fields which receive pesticide application as needed.

Appendix 13

The following paragraph is the Emergency Reporting Section found on page 3 of Schedule A in your current Approval to Operate (I-4648):

EMERGENCY REPORTING

8. The Approval Holder, operator or any person in charge of the Facility shall **immediately** report to the New Brunswick Department of the Environment and Local Government where:

a) there has been, or is likely to be, an unauthorized release of solid, liquid or gaseous material including wastewater, petroleum or hazardous materials, to the environment;

b) there has been a violation of the *Air Quality Regulation*, the *Water Quality Regulation* or any Approval issued thereunder; or

c) a release of a contaminant or contaminants is of such magnitude or period that there is concern for the health or safety of the general public, or there could be significant harm to the environment.

During normal business hours, contact the:

Moncton Regional Office
(506) 856-2374

After hours, or when there is no answer at the Regional Office contact the:

Canadian Coast Guard
1-800-565-1633

All reports shall include:

a) a description of the source, including the name of the owner or operator;
b) the nature, extent, duration and environmental impact of the release;
c) the cause or suspected cause of the release; and
d) any remedial action taken or to be taken to prevent a recurrence of the violation.

The following paragraph is the Emergency Reporting Section that will be included in your re-issued Approval to Operate (which will be completed within the next few months):

EMERGENCY REPORTING

Immediately following the discovery of an environmental emergency, a designate representing the responsible party shall notify the Department in the following manner:

During normal business hours, telephone the applicable Department Regional Office **until personal contact is made** (i.e. no voice mail messages will be accepted) and provide as much information that is known about the environmental emergency. The telephone number for the Regional Office is provided below:

Moncton Regional Office (506) 856-2374

After hours, telephone the Canadian Coast Guard **until personal contact is made** and provide as much information that is known about the environmental emergency. The telephone number for the **Canadian Coast Guard** is **1-800-565-1633.**

Within 24-hours of the time of initial notification, a faxed copy of a **Preliminary Emergency Report** shall be filed by a designate representing the responsible party to the applicable Regional Office within the Department and the Department's Central Office using the fax numbers provided below. The Preliminary Emergency Report shall clearly communicate as much information that is available at the time about the environmental emergency.

Within five (5) days of the time of initial notification, a faxed copy of a **Detailed Emergency Report** shall be filed by a designate representing the responsible party to the applicable Regional Office within the Department and the Department's Central Office using the fax numbers provided below. The Detailed Emergency Report shall include, as minimum, the following: i) a description of the problem that occurred; ii) a description of the impact that occurred; iii) a description of what was done to minimize the impact; and iv) a description of what was done to prevent recurrence of the problem.

Moncton Regional Office (506) 856-2370

Ceres Principles

In the fall of 1989, Ceres announced the creation of the Valdez Principles (later renamed the Ceres Principles), a ten-point code of corporate environmental conduct to be publicly endorsed by companies as an environmental mission statement or ethic. Imbedded in that code of conduct was the mandate to report periodically on environmental management structures and results. In 1993, following lengthy negotiations, Sunoco became the first Fortune 500 company to endorse the Ceres Principles. Today, the tide has changed dramatically. Over 50 companies have endorsed the Ceres Principles, including 13 Fortune 500 firms. By endorsing the Ceres Principles, companies not only formalize their dedication to environmental awareness and accountability, but also actively commit to an ongoing process of continuous improvement, dialogue and comprehensive, systematic public reporting. Endorsing companies have access to the diverse array of experts in our network, from investors to policy analysts, energy experts, scientists, and others.

Protection of the Biosphere

We will reduce and make continual progress toward eliminating the release of any substance that may cause environmental damage to the air, water, or the earth or its inhabitants. We will safeguard all habitats affected by our operations and will protect open spaces and wilderness, while preserving biodiversity.

Sustainable Use of Natural Resources

We will make sustainable use of renewable natural resources, such as water, soils and forests. We will conserve non-renewable natural resources through efficient use and careful planning.

Reduction and Disposal of Wastes

We will reduce and where possible eliminate waste through source reduction and recycling. All waste will be handled and disposed of through safe and responsible methods.

Energy Conservation

We will conserve energy and improve the energy efficiency of our internal operations and of the goods and services we sell. We will make every effort to use environmentally safe and sustainable energy sources.

Risk Reduction

We will strive to minimize the environmental, health and safety risks to our employees and the communities in which we operate through safe technologies, facilities and operating procedures, and by being prepared for emergencies.

Safe Products and Services

We will reduce and where possible eliminate the use, manufacture or sale of products and services that cause environmental damage or health or safety hazards. We will inform our customers of the environmental impacts of our products or services and try to correct unsafe use.

Environmental Restoration

We will promptly and responsibly correct conditions we have caused that endanger health, safety or the environment. To the extent feasible, we will redress injuries we have caused to persons or damage we have caused to the environment and will restore the environment.

Informing the Public

We will inform in a timely manner everyone who may be affected by conditions caused by our company that might endanger health, safety or the environment. We will regularly seek advice and counsel through dialogue with persons in communities near our facilities. We will not take any action against employees for reporting dangerous incidents or conditions to management or to appropriate authorities.

Management Commitment

We will implement these Principles and sustain a process that ensures that the Board of Directors and Chief Executive Officer are fully informed about pertinent environmental issues and are fully responsible for environmental policy. In selecting our Board of Directors, we will consider demonstrated environmental commitment as a factor.

Audits and Reports

We will conduct an annual self-evaluation of our progress in implementing these Principles. We will support the timely creation of generally accepted environmental audit procedures. We will annually complete the Ceres Report, which will be made available to the public.

Disclaimer

These Principles establish an environmental ethic with criteria by which investors and others can assess the environmental performance of companies. Companies that endorse these Principles pledge to go voluntarily beyond the requirements of the law. The terms "may" and "might" in Principles one and eight are not meant to encompass every imaginable consequence, no matter how remote. Rather, these Principles obligate endorsers to behave as prudent persons who are not governed by conflicting interests and who possess a strong commitment to environmental excellence and to human health and safety. These Principles are not intended to create new legal liabilities, expand existing rights or obligations, waive legal defenses, or otherwise affect the legal position of any endorsing company, and are not intended to be used against an endorser in any legal proceeding for any purpose.

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Sierra Youth Coalition, Campus Greenhouse Gas Emissions Inventory Toolkit

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Michelle Strain. Administrative Services. Various email communications throughout the summer
Helmut Becker. Computing Services. May 30, 2005
Bruno Gnassi. Librarian. June 2, 2005

Appendix
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Persons Interviewed
Andrea Ward. Facilities Management.

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Grounds Keeping

Persons Interviewed
Andrea Ward. Facilities Management.

Adopt-A-Plot Program

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Risk Prevention

Persons Interviewed
Perry Eldridge. Facilities Management.
Mark Gland. Environment Officer. Moncton Regional Office

Canadian Environmental Protection Act
Environment Protection Review Canada, 2005. http://www.eprc-rpec.gc.ca/epic/internet/ineprc-epec.nsf/en/home

Procurement

Persons Interviewed
Dale Creelman, Purchasing Officer

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Academic Opportunities

Persons Interviewed
Robert Summerby-Murray. Social Sciences. May 20, 2005
Margaret Beattie. Sciences. May 26, 2005
Brad Walters. Environmental Studies. May 24, 2005
Michael Fox. Geography. May 17, 2005
Bruno Gnassi. Librarian. June 2, 2005

Performance Indicators
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http://www.syc-cjs.org/gitp/en/framework/structure.htm

Stewardship

Persons Interviewed
David Stewart
Dr. Michael Fox

Keniry, Julia. 1995. Ecodemia: Campus Environmental Stewardship at the Turn of the 21st Century. National Wildlife Federation: Washington.

Mount Allison University. 2000. “Mount Allison University Strategic Plan.” http://www.mta.ca/strategicplan/index.html

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University Leaders for a Sustainable Future. 2001. “The Talloires Declaration.” http://www.ulsf.org/

ENDNOTES

Dining Services

1.Currently, New Brunswick Farmers are faced with the issue of distribution. Without a central distribution system, it is difficult for farmers and institutions to form partnerships, which is a major barrier when trying to shift the food system on campus.

Water Use

1.This decrease may be attributable to lower student enrollement.
2.Facilities Management did pilot test a waterless urinal but chose not to install any on campus because of potential complaints of "odour"

New Buildings & Renovations

1. Green Globes certification is based on the Building Research Establishment Environmental Assessment Method from the UK. It also integrates the CBIP screening tool used by the Canadian government. Green Globes Design (certification for new buildings) and LEED have harmonized the majority of their certification criteria after two studies were conducted to compare and then to integrate LEED with Green Leaf, Green Globes' hard copy format. Studies were conducted for the Canadian Government. Green Globes website. http://www.greenglobes.com/design/faq.asp#link3
2. Morris, John P.. *The Hidden Economics of Campus Sustainability*. Facilities Manager. May/June 2005. Vol. 21, Number 3. http://www.appa.org/FacilitiesManager/index.cfm
3. The Facilities Condition Index: A Useful Tool for Capital Asset Planning. *The Facilities Condition Index: A Useful Tool for Capital Asset Planning*. Facilities Manager. May/June 2005. Vol. 21, Number 3. http://www.appa.org/FacilitiesManager/index.cfm
4. The new system will vent air based on all fume hoods running at full velocity, but the hoods will be running at varying velocities depending on use. Vented air will be supplemented with outside air to make up the volume. Maintaining the volume will ensure that fumes are being pushed high enough to eliminate the potential for vented air to recycle back into the air intakes. Rather than having 45 separate fans, one for each fume hood, the new system will use 3 central fans and instead operate the fume hood slats according to their individual venting needs. This will increase the efficiency of the system.
5. CBIP stands for: Commercial Building Incentive Program – a one time grant based on a minimum energy savings of 25% compared to a similar building built to meet the requirements of the Model National Energy Code for Buildings which establishes minimum building standards for energy efficiency. Office of Energy Efficiency – Natural Resources Canada. http://oee.nrcan.gc.ca/
6. Described as "North America's leading benchmark of environmentally responsible products and services", the Environmental Choice program has a mission "to encourage the supply of products and services that are more environmentally responsible and to help organizations and consumers buy "green."" Environmental Choice. http://www.environmentalchoice.com/index.cfm?fuseaction=main.DspDivision&PageID=28&fkMainPage=0

Energy Use

1. HEINBURG, Richard. Powerdown: options and actions for a post-carbon world. New Society Publishers. Gabriola, BC. 2004
2. Microwave ovens can use up to 50% less energy than a conventional oven because no energy goes into heating utensils or the oven, the door can be opened and closed with no loss of energy and no pre-heating is required. The Energuide label does not apply to microwave ovens though they do have to meet strict guidelines set by Health and Welfare Canada.
Office of Energy Efficiency – Natural Resources Canada.
http://oee.nrcan.gc.ca/publications/infosource/pub/home/Buying_and_Using_EE_Appliances_Section07.cfm)
3. T8 fluorescent tubes are currently the most energy efficient and can last up to 20 000 hours. T8s are 15-30% more energy efficient than T12 tubes and compact fluorescent lighting uses 50-70% less energy than incandescent and lasts up to 10 times as long. LEDs can last up to 25 years. Benchmarking & Best Practices Guide for College Facility Managers. Office of Energy Efficiency. Natural Resources Canada.
4. LEDs use 1 – 5 watts and can cost < $5/yr.
BC Hydro -http://www.bchydro.com/business/investigate/investigate748.html
5. Enerplan Consultants Ltd.. *Energy Management Plan: A Comprehensive Study of Energy and Operational Efficiency Opportunities*. April 30, 2004.
6. Michael Bluejay. Saving Electicity website. http://michaelbluejay.com/electricity/computers.html
7. HEINBURG, Richard.
8. Of the 15 generating stations in New Brunswick, 6 are hydro, 3 are diesel, 2 are coal, 2 are oil, 1 is Orimulsion, and 1 is nuclear. The three stations closest to Sackville use oil (Courtenay Bay), coal (Grand Lake) & diesel (Millbank).
NB Power. http://nbpower.com/
9. Ibid. *Environmental Policy*.
10.Ibid. *Annual Report 2002-03*.
11. NB Power is planning on producing 400 MW of wind energy by 2016. Ibid. *Press Release*. 29 June, 2005.
12. This information is taken from the websites of various institutions including Acadia, Dalhousie, UNB.

Hazardous Waste

1. Environment Canada website. http://www.atl.ec.gc.ca/udo/put.html
2. Ibid.
3. Open Flo is produced by Choisy, a Canadian company based in Quebec, whose Enviro-Technik policy ensures "the maximum utilization of the scientific technologies to formulate and manufacture environmentally safer products." Choisy. http://www.choisy.com/enviro_eng.html
4. Interview with Steven Duffy.
5. Myriatic acid is diluted at 3 parts water to 1 part acid. Interview with Jon Peters
6. These totals include all contaminated glassware, gloves, and other contaminated materials on top of the actual chemicals being disposed.
7. "Necessary" could be defined by whether or not there is an option that won't add to the hazardous waste stream.

Solid Waste

1. All information about WASWC was taken from a tour conducted June 1, 2005 and their 2004 Annual Report. Additional information and details about WASWC can be found at: http://www.westmorlandalbert.com/