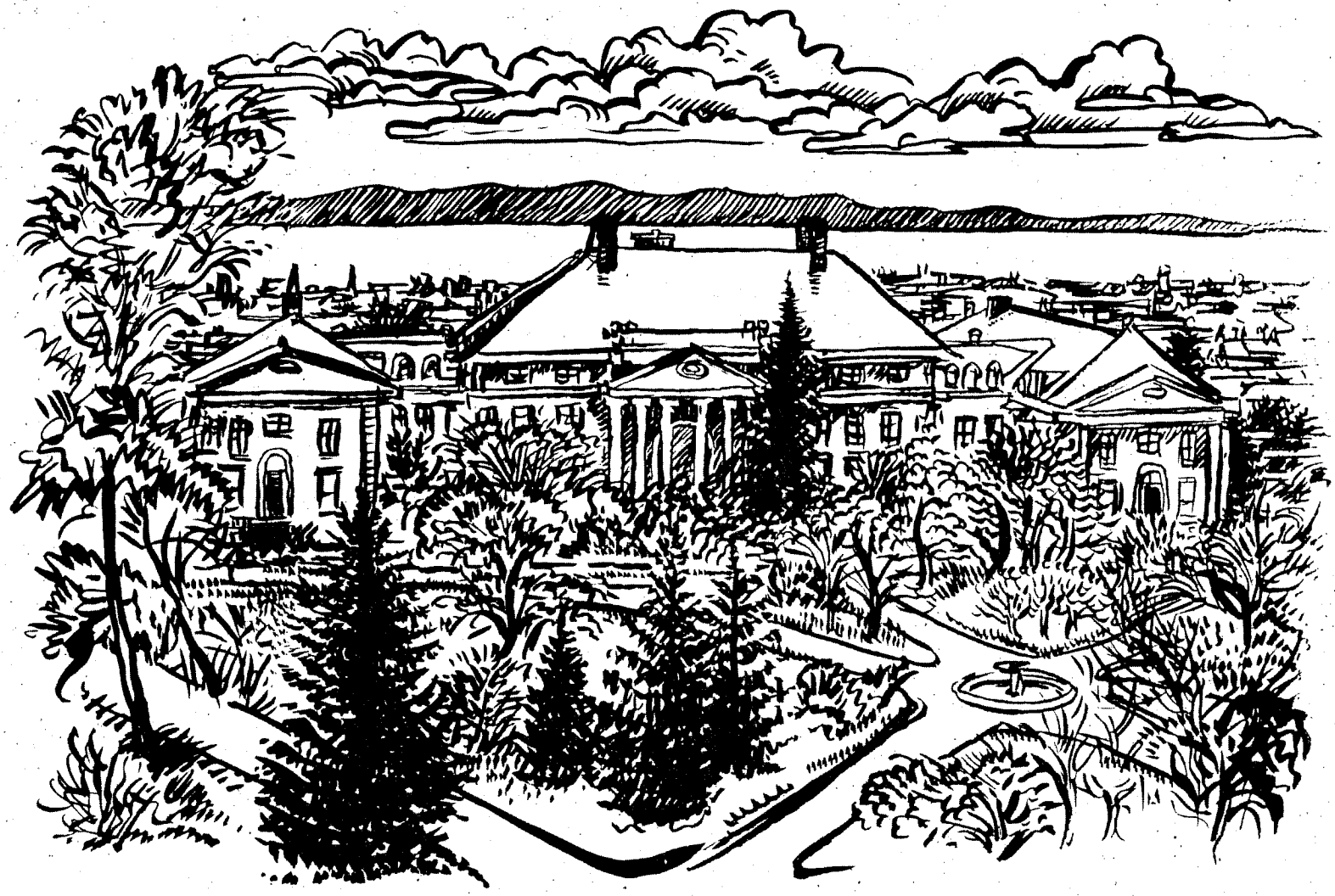
Greening UVM

Campus Environmental Report



BY THE UNIVERSITY OF VERMONT ENVIRONMENTAL COUNCIL

APRIL 1998

Wastes

People at UVM use a wide variety of materials in instruction, research, and other activities that, once used, become solid, hazardous, radioactive, or biohazardous waste. In addition to their disposal cost, many of these materials create health and safety concerns during their use, storage, and disposal. There are environmental consequences to producing, transporting, and disposing of these materials. Fossil fuels are used to transport them, and chemicals and pollutants are dispersed into the environment at each stage of a product's life.

UVM's ecological responsibilities are therefore to:

- Ensure that the ways of handling and disposing of waste are safe for human health and the environment
- Expand efforts to reuse, recycle and compost in order to reduce waste
- Reduce the toxicity of the wastes generated
- Educate faculty, staff and students about the health impacts of toxic and hazardous wastes
- Promote a culture of conservation and recycling

Solid Waste

The university campus generates more than 2,000 tons of solid waste each year, which costs $350,000 per year to collect and process for recycling, composting, or landfill disposal. UVM diverts about 45 percent of this waste from landfills through a campus-wide recycling program. This amounts to an average of 120 tons of food and beverage containers, 600 tons of paper, 70 tons of scrap metals, 65 tons of food waste, and 60 tons of scrap wood recovered for recycling.

In addition to successful "conventional" recycling, the UVM Solid Waste Office cooperates with other departments on a number of projects:

- **Food waste** (kitchen scraps and plate scrapings) is collected at five campus dining locations and delivered daily to Burlington's Intervale Composting Project, where it is turned into a nutrient-rich soil additive.
- **Foam Polystyrene** (Styrofoam) cups and plates from the Billings Student Center are returned to the vendor for recycling.
- **Used furniture and equipment** are collected and redistributed through Property Control.
- **The Student Move-Out program** collects food, small appliances, and furniture from residence halls at the end of the year and distributes them to local charities.
- **Packaging materials** accompany most shipments; the Purchasing department requests that vendors take material back. For example, furniture is usually ordered "blanket wrapped," reducing cardboard waste.
- **Junk mail:** Mail Services is working with the Solid Waste office and an Environmental Studies intern to reduce the large volumes of unwanted catalogs and solicitations students receive.

At UVM people recycle:

- office paper
- newspaper
- magazines
- cardboard
- glass bottles
- plastic bottles
- steel cans
- aluminum cans
- scrap metal
- wood and lumber
- food waste
- yard waste
- foam polystyrene
- toner cartridges
- certain chemicals

Certain facility constraints limit program options and the recycling program's efficiency. The most notable is that many university buildings lack storage or loading docks. Others have little or no space at the loading dock to facilitate recycling. The major challenge, however, is to educate the ever-changing population at UVM to use existing programs.

Hazardous Waste

Hazardous waste comes mainly from two sources at UVM: chemicals from approximately 500 labs on campus and operations that generate materials such as used oil, solvents, and batteries.

The university generates more than 100,000 pounds of hazardous waste each year. In 1997 it cost $81,000 for disposal of this waste, plus an additional disposal cost of $117,000 to clean out 11,000 pounds from the Chemistry stockroom. In order to manage this waste in a safe and cost effective manner, UVM operates the Environmental Safety Facility on Spear Street. Here, UVM's hazardous wastes are processed and repackaged for purposes of consolidation and environmentally preferred, cost effective disposal.

The amount of hazardous waste generated has increased annually by 5 to 10

percent over the past six years. The reasons for this trend are not clear, but may be partially explained by unusual projects such as large-scale excavations of defunct fuel oil lines, cleaning of chemical stockrooms, and replacing and recycling PCB-containing ballasts and mercury-containing lamps for fluorescent lights. Increased research activities and reclassification of previously nonhazardous materials may continue to increase waste volumes.

UVM staff is committed to reducing hazardous waste. Its primary means for achieving waste reduction is Chemsource, a centralized chemical distribution program. Between 30 and 40 percent of hazardous lab waste consists of unused chemicals bought in quantities larger than needed. ChemSource allows researchers to buy smaller amounts at a price about 40 percent cheaper than buying through commercial suppliers and allows people to reduce the amount of waste generated and the risks from storing larger quantities of hazardous chemicals in labs.

For the past nine years, UVM has conducted a program to exchange previously owned chemicals. This program has been moderately successful in redistributing pre-owned, unwanted chemicals among the various research laboratories on campus.

Radioactive Waste

UVM is Vermont's second largest producer of radioactive waste, which comes from medical, biomedical, biological, and animal science labs. UVM's Radiation Safety Office (RSO) manages the proper packaging, shipping, and disposal of this waste in accordance with the regulations of the Nuclear Regulatory Commission, the U.S. Department of Transportation, and the State of Vermont. Averaged over the last three years, the RSO handles about 800 cubic feet per year, of which 30 cubic feet are sent for burial, for a total cost of approximately $31,000. Radioactive waste falls into three categories:

- Long-lived waste—about 30 cubic feet per year of this waste (which has a half-life of more than 90 days) are stored on campus until it can be shipped to an approved off-campus disposal site. At the moment, it is sent to Barnwell, South Carolina for shallow land burial.
- Short-lived waste—about 375 cubic feet per year of this waste (with a half-life of less than 90 days) is allowed to decay on campus. When the waste is no longer radioactive, it is sent to a local incinerator as nonradioactive biomedical waste.
- Low-level waste—this amounts to 68 cubic feet per year, in the form of radionuclides in liquid scintillation fluid. This waste is sent to Florida for incineration.

The Radiation Safety Office is responsible for compliance with existing regulations, packaging, shipping, record keeping, training, protection procedures, and emergency preparedness. In addition, the office encourages departments to reduce waste generation or use lower-level radioactive material. For the past decade, the RSO has been billing departments for disposal of their radioactive waste to encourage reduced generation of waste.

Biohazardous Waste

The university generates between 10 and 15 tons per year of biological and biohazardous waste from teaching and research activities. Biohazardous waste consists of such materials as blood and blood products, pathological waste, cultures and stocks of infectious agents, sharps (such as discarded hypodermic needles and scalpel blades), biotechnological by-product effluents, and research animals and animal waste.

If these solids are not contaminated with hazardous materials, they can be autoclaved (high temperature disinfecting) and disposed in designated dumpsters on campus. Three to four tons per year of sterilized biohazardous waste are disposed at a solid waste landfill. Another three to four tons of biohazardous waste are shipped off campus for incineration at a permitted medical waste incinerator. Approximately eight tons per year of animal waste are incinerated at the university's animal crematorium. During the next three years, UVM will continue to assess options for disposing of biohazardous waste.

Current & Future Efforts

- ❑ Institute an office paper reduction campaign
- ❑ Increase recycling and reuse of construction, demolition, and renovation debris
- ❑ Expand efforts to educate departments about buying recycled products, choosing items that are reusable and recyclable or have less packaging
- ❑ Explore cost-effective ways to collect new recyclable materials
- ❑ Encourage departments to: buy smaller quantities of chemicals; substitute nonhazardous materials; use microscale chemistry techniques; segregate hazardous wastes from nonhazardous; better manage hazardous chemical inventories in laboratories; reduce to the extent feasible the amount of biohazardous and radioactive waste generated on campus
- ❑ Reassess methods of disposing of biohazardous waste

Environmental Health & Safety

Burlington has been rated one of the best small U.S. cities to live in, partly because of the safety of its neighborhoods and the health of its natural environment. UVM, the largest employer and the largest user of hazardous materials in the city, plays an important role in safeguarding the health and safety of the 13,000 people who learn, live, and work on campus and in surrounding communities. This requires not only minimizing pollution but actively promoting human and ecological health.

UVM's ecological responsibilities are therefore to:

- Provide working and living spaces where people can be healthy, safe, and comfortable while they conduct their daily business
- Minimize the use of hazardous materials
- Identify and minimize health and safety risks
- Educate the community about healthy lifestyles to maintain personal and community well-being

Environmental health and safety concerns include the use of hazardous chemicals in laboratories and studios, proper management of biological agents used in research and teaching, and maintaining air quality both inside and outside university buildings. As a teaching and research institution, UVM is committed to setting an example for students and the rest of the world in providing a safe and healthy environment.

Environmental Safety

UVM strives not only to comply with the many regulations governing environmental safety, but also to educate the university community about ways to reduce risks to health from materials that are not yet regulated. Department of Risk Management staff work with other departments in these areas, integrating human and environmental health concerns. In addition to providing education for general safety, such as avoiding back injuries, ensuring fire safety, or using car air bags properly, they address the following environmental areas.

Office safety: Concerns include ergonomic and radiation risks associated with sustained use of video display terminals and indoor air quality concerns (also known as "sick building syndrome").

Hazardous Materials: Safe handling of chemicals and biohazardous materials in campus laboratories and other operations requires a significant amount of central support. To reduce disposal costs and risks to health, UVM's Environmental Safety Facility staff researches less toxic alternatives to commonly used materials. For example, one program allows departments to exchange their mercury thermometers for non-mercury thermometers free of charge. To date, more than 1,000 mercury thermometers have been collected from campus labs.

Regulatory compliance: The use of hazardous materials is heavily regulated by state and federal government. UVM strives not only to comply with these regulations but also works to educate the university community about ways to reduce risks to health not yet regulated. Many of the offices described below deal with specific regulations involved in this effort. In addition, UVM is involved in a variety of cooperative efforts with the federal and state agencies to improve these regulations. For example, UVM is part of the Laboratory Consortium for Environmental Excellence, which is working with the EPA on regulations that affect laboratory work nationwide. Within the next year, UVM will become a test site for the new regulations.

Air Quality

Air quality concerns arise from a wide range of activities, from campus heating systems to chemicals used in campus operations to emissions from vehicles.

Office Health Tips

- Sit at least 24 inches from the front of a computer monitor, and at least 10 feet from the sides and back of the monitor
- Fix ergonomic problems at the computer: use a copy stand; have forearms parallel to the floor; and have wrists supported
- Ask that new furniture and rugs be unwrapped and aired out for one to two weeks in the warehouse before delivery
- Be sure that the ozone filters on the copier and laser printer are changed after every 50,000 copies

Campus programs concerned with air quality on campus include:

The **Asbestos and Lead** Management Program (ALMP) in the Department of Physical Plant inspects and tests for asbestos-containing materials, lead materials and lead-based paint prior to any construction or renovation. The program coordinates, designs and performs full-scale and small-scale abatement projects. ALMP also coordinates asbestos training, monitors UVM personnel for asbestos and lead exposures and is responsible for implementing UVM's Respiratory Protection Program. This program includes medical surveillance, training and fit-testing of faculty and staff whose work requires the use of a respirator.

Cleaning products: Physical Plant's Custodial Services and Residential Life have begun identifying, field testing, and substituting non-toxic cleaning products. They will be working with the Environmental Council and Risk Management to expand these efforts. Staff have information on all products used, in the event that a concern arises about air quality.

Emissions from buildings' heating systems and laboratories are monitored in a joint effort between Environmental Safety Facility and Physical Plant staff. The largest volume of emissions comes from the Central Heating Plant behind Royall Tyler Theater. This facility has recently been upgraded to decrease its sulfur dioxide emissions. Other stationary sources of air pollution on campus include numerous building boilers, emergency generators, above-ground and underground oil storage tanks, the Given Building, the gasoline-dispensing facility and gasoline spill remediation operation at Centennial Field, and emissions from laboratory fume hoods and vents. These are managed on a case-by-case basis.

University vehicles also contribute to campus air quality concerns. Transportation and Parking has voluntarily sought emissions testing of their buses from the state Agency of Natural Resources. Pollution levels were found to be lower than similar vehicles tested, attributable to turbocharged engines and a good maintenance program. The next step is to seek alternative fuels for the university fleet.

Pesticide Use

In the spring of 1997 Environmental Studies students presented a proposal suggesting that the Department of Physical Plant use alternatives to chemical herbicides for killing weeds, for the health of the environment as well as the people exposed to the chemicals. The City of Burlington has instituted strict regulations governing pesticide use, requiring extensive signage and documentation. As a result, Physical Plant decided to eliminate herbicides for a summer and investigate alternative approaches. After conducting several experiments, staff found that some areas could be weeded with a propane-powered flame weeder for about the same cost as using an herbicide.

Physical Plant plans to continue to experiment, with the long term goal of using an Integrated Pest Management approach.

UVM Lifetime Wellness Program

The UVM Lifetime Wellness Program assists faculty, staff and students in striving toward personal health within the larger context of work, family, and community life. The program sponsors a series of workshops on topics such as holistic health, vegetarianism, yoga and t'ai chi, and balancing work and family. A network of 52 Wellness Ambassadors across campus distributes information to departments about classes, lectures, research, and community programs.

Through sponsorship of the annual Well Department Awards, the Wellness Program also encourages UVM faculty and staff to evaluate the health of both physical and motivational aspects of the worksite environment.

Pedestrian safety

UVM makes an effort to create a safe and pleasant environment for pedestrians on the main campus through a number of efforts. In winter the grounds crews work hard to keep pathways clear and sanded, while attempting to reduce the amount of salt used. Plans to widen Main Street include a light for pedestrians to cross near Pomeroy building. Plans are also underway for a blue-light system showing location of telephones to increase safety at night.

Current & Future Efforts

- ❑ Shift to less toxic cleaning products to minimize human and environmental health risks
- ❑ Use Integrated Pest Management for landscaping to protect workers and Lake Champlain water quality
- ❑ Conduct an indoor air quality inventory
- ❑ Investigate non-toxic alternatives for furniture, carpets and paints
- ❑ Further integrate environmental safety concerns with wellness education
- ❑ Improve pedestrian safety on Main Street and University Place