

1999-2000 ENVIRONMENTAL AUDIT ENVIRONMENTAL ASSESSMENT

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## Executive Summary

The Environmental Studies Program received a grant from the Vice President for Administrative Affairs to perform an environmental assessment of the University of Oregon (UofO). The environmental assessment was performed by the students in ENVS411 during the Fall Term 1999. More specifically, the purpose of the assessment was to perform a review of the environmental assessment performed in 1995 and to determine if the recommendations of that report were implemented. In addition, the UofO has requested that we perform a review of the UofO's environmental procedures. The following procedures and programs were reviewed:

- Energy and water use
- Solid waste disposal and recycling;
- Hazardous and solid waste management;
- Pesticide and herbicide use on-campus;
- The Erb Memorial Union activities

The goals of the assessment were the following:

- gain a basic understanding of the mechanics of performing an environmental assessment in a university setting
- gain a basic understanding of the regulatory mechanisms involved
- develop interview and research skills
- develop an assessment report to submit to the UofO for their use which will include findings and recommendations for further activities

As established in the Mission Statement, “The University of Oregon strives to enrich the public that sustains it through the acceptance of the challenge of an evolving social, political and technological environment by inviting and guiding change....” In keeping with this vision and to maintain the campus effectively while also working to preserve the rights of future generations, the UofO affirms its commitment to environmental excellence and actively promotes the public’s right to a healthy, quality environment. The University of Oregon will work toward the goal of balancing fiscal and environmental responsibility in making decisions and in general University practices. The UofO acknowledges its role and responsibility to provide educational, social, and financial leadership to achieve the goals of the policy. A copy of the policy is included in Appendix A.

Based upon the assessment performed the following general recommendations were proposed:

- The 1993 assessment performed by the Community Planning Workshop recommended that the UofO develop a Comprehensive Environmental Policy. In addition, the assessment recommended that EH&S direct and manage the creation of sub-policies for each

department. At this point in time, EH&S is the only department that has created a sub-policy, Develop Campus Environmental Sub-policy Models or Program. EH&S needs to facilitate the creation of sub-policies. Some departments have argued that the sub-policy would not be an appropriate and efficient approach for their department and would like to develop other programs with the help of EH&S. The School of Music is developing a program to include speakers on environmental issues during a winter term class. AAA is currently developing an environmental sub-policy.

- Develop a program or document to outline a specialized environmental education program for faculty, staff and students that includes an introduction to environmental issues on the UofO campus.

- Publish and distribute the UofO Comprehensive Environmental Policy to the campus community, i.e., the students, faculty, and staff. After the previous assessment, a Comprehensive Environmental Policy was created. However, the document was not distributed and published. The document would make more of a difference if it was distributed as part of environmental education.

- Publish the results of environmental assessments. Create and maintain a webpage, or simply link to the EH&S home page, for posting the UofO environmental documents. This is a good way to advertise the UofO's strengths. UofO personnel are doing a good job of making the campus environmentally friendly, this information needs to be shared with the community.

- Develop and strengthen the environmental education system to include brief environmental orientation for incoming students. Outline environmental groups, programs, and concerns on campus and distribute the Comprehensive Environmental Policy and other policies such as double-sided printing and recycled paper policies, and recycling program goals.

- The audit class should be taught on a regular basis to educate the students about the activities of the UofO. In addition, these assessments give UofO personnel a chance to review their activities and implement more environmentally friendly activities that can be cost effective.

More specific findings and recommendations can be found at the end of each section of the report.

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# 1 INTRODUCTION

## 1.1 Purpose of Report

The Environmental Studies Program received a grant from the Vice President for Administrative Affairs to perform an environmental assessment of the University of Oregon (UofO). The environmental assessment was performed by the students in ENV5411 taught by Teresa Sabol Spezio, a graduate student in Environmental Studies and the class included: Elizabeth Bartleson, Tim Garland, Ross Myrmo, Leslie Perry, Kelly Riordan, Ali Rahimi, Michael Steene, Brian Ulrich, and Nicholas Walls.

More specifically, the purpose of the assessment was to perform a review of the environmental assessment performed in 1995 and to determine if the recommendations of that report were implemented. In addition, the UofO has requested that we perform a review of the UofO's environmental procedures. The following procedures and programs were reviewed:

- Energy and water use
- Solid waste disposal and recycling;
- Hazardous and solid waste management;
- Pesticide and herbicide use on-campus;
- The Erb Memorial Union activities

The goals of the assessment were the following:

- gain a basic understanding of the mechanics of performing an environmental assessment in a university setting
- gain a basic understanding of the regulatory mechanisms involved
- develop interview and research skills
- develop an assessment report to submit to the UofO for their use which will include findings and recommendations for further activities

## 1.2 UofO General History

In 1872 the Oregon Legislative Assembly passed a bill to create the University of Oregon in Eugene and the UofO first opened its doors to students in 1876. The UofO continued to grow in the early 1900's. Judge David Fenton, in 1921, gave the UofO the gift of a law library to enable the initial accreditation of the School of Law. McArthur Court was built in 1927. The UofO Museum of Art was dedicated in 1927 with Gertrude Bass Warner's donated Asian art collection. Growth then slowed until the 1960's when Autzen Stadium opened (1967). In 1969, the UofO became the only Oregon school to be inducted into the elite ranks of the Association of American Universities, the elite ranking of the top 60 public and private universities in the U.S. and Canada.

In 1986, the Earl A. Chiles Business Center was dedicated and 1989 ushered in a new four-

building science complex. The Riverfront Research Park dedicated its first building in 1992 with the renovated Knight Library being rededicated shortly thereafter (1994). Additionally, The Oregon Campaign, the state's largest-ever fund-raising drive, was launched by the UO Foundation that same year. The Campaign proved successful as it surpassed its' \$150 million goal in 1996, two years ahead of schedule. In 1997 a \$6 million renovation of Allen Hall began and the dedication of the Ed Moshofsky Sports Center (worth \$14 million) took place in 1998. The latest accomplishment of the UofO was the opening of the \$45 million Knight Law Center in 1999.

### 1.3 University of Oregon Mission

Recognizing that knowledge is the fundamental wealth of civilization, the UofO strives to enrich the public that sustains it through the following goals:

- A commitment to undergraduate education, with the goal of helping the individual learn to question critically, think logically, communicate clearly, act creatively and live ethically
  
- A commitment to graduate education to develop creators and innovators who will generate new knowledge and shape experience for the benefit of humanity
  
- A recognition that research, both basic and applied, is essential to the intellectual health of the university, as well as to the enrichment of the lives of Oregonians, by energizing the state's economic, cultural and political structure
  
- The establishment of a framework for lifelong learning that leads to productive careers and to the enduring joy of inquiry
  
- The acceptance of the challenge of an evolving social, political and technological environment by welcoming and guiding change rather the reacting to it
  
- A dedication to the principles of equality of opportunity and freedom from unfair discrimination for all members of the university community and an acceptance of the true diversity as an affirmation of individual identity within a welcoming community
  
- A commitment to international awareness and understanding, and to the development of a faculty and student body that are capable of participating effectively in a global society
  
- The conviction that freedom of thought and expression is the bedrock principle on which all university activity is based
  
- The cultivation of an attitude toward citizenship that fosters a caring, supportive atmosphere on campus and the wise exercise of civic responsibilities and individual judgment throughout life
  
- A continuing commitment to affordable public higher education

### 1.4 Primary University Officers of Administration

- Dave Frohnmayer, president
- John T. Mosley, vice president for academic affairs and provost
- Daniel A. Williams, vice president for administration
- Duncan L. McDonald, vice president for public affairs and development

For further details concerning the UofO's administrative organization, consult Figure 1.

### 1.5 Campus Description

The UofO's 280-acre campus is an arboretum of more than 2,000 varieties of trees. Campus buildings date from 1876, when Deady Hall opened, to 1999, when the Knight Law Center was completed. The Museum of Natural History is located at 15<sup>th</sup> Avenue and Columbia Street. Across campus the Museum of Art, a member of the American Association of Museums, is noted for its collections of Oriental and Northwest art. The two million volume UofO Library System, a member of the Association of Research Libraries, is an important research facility for scholars throughout the Northwest.

Campus athletic facilities include the 41,000 seat Autzen Stadium, the Casanova Athletic Center, McArthur Court, Leighton Pool, Esslinger Hall's gymnasiums and courts, the Harry Jerome Weight Center, Gerlinger Annex's gymnasiums and dance studios, Hayward Field's all-weather track, the Bowerman Family Building, and open-air and covered tennis courts.

### 1.6 University's Comprehensive Environmental Policy Statement

As established in the Mission Statement, "The University of Oregon strives to enrich the public that sustains it through the acceptance of the challenge of an evolving social, political and technological environment by inviting and guiding change...." In keeping with this vision and to maintain the campus effectively while also working to preserve the rights of future generations, the UofO affirms its commitment to environmental excellence and actively promotes the public's right to a healthy, quality environment. The University of Oregon will work toward the goal of balancing fiscal and environmental responsibility in making decisions and in general University practices. The UofO acknowledges its role and responsibility to provide educational, social, and financial leadership to achieve the goals of the policy. A copy of the policy is included in Appendix A.

### 1.7 University Assessment History

The UofO participated in several environmental and resource assessments in the early 1990's. In 1990, the Oregon Student Public Interest Research Group (OSPIRG) conducted an audit on the UofO to examine the "interrelationship and interdependence between social justice and the environment." A variety of issues related to the physical, and social environment at the UofO were considered in this audit. Limiting military research funding, eliminating the exploitation and abuse of "non-human animals" and banning additional parking structures were among the recommendations that came out of this audit. A copy of this audit is not maintained on campus and the authors of this report were unable to obtain a copy of the report.

In 1993, the Energy Department of the UofO conducted an energy assessment of the UofO. In cooperation with Eugene Water and Electric Board (EWEB), the Department assessed 25 campus buildings out of the approximate 150 total buildings on campus. The results of these assessments revealed a need for increased energy conservation measures. One recommendation of the Energy Department was that older UofO structures have double-paned windows installed in them. The cost for implementing this and the other recommendations in the report was estimated at about \$4.5 million. The UofO has begun the process of installing double panes in these recommended building's windows. A copy of the report is archived in the Energy Department.

In 1994, the National Safety Council conducted an administrative review of the UofO's Environmental Health and Safety program. The recommendations stemming from this assessment centered on the creation of an autonomous Environmental Health and Safety department, with its own director, staff and policy goals. A copy of this audit is not maintained on campus and the authors of this report were unable to obtain a copy of the report.

In August 1995, the Community Planning Workshop, commissioned by Dan Williams, conducted an environmental assessment of the UofO. The purpose of the assessment was to develop a methodology which could be used in future assessments, to identify practices or policies inhibiting environmental excellence at the UofO, and to establish base line data for energy use, waste generation and recycling at the UofO. The recommendations generated by this assessment included the development of a comprehensive environmental policy for the UofO and for each UofO department, the adoption of integrated management strategies, the development of a material tracking system and the adoption of the 1994 EH&S Third Party Assessment recommendations. A copy of the report is included in Appendix B.

## 1.8 General Recommendations

- The 1993 assessment performed by the Community Planning Workshop recommended that the UofO develop a Comprehensive Environmental Policy. In addition, the assessment recommended that EH&S direct and manage the creation of sub-policies for each department. At this point in time, EH&S is the only department that has created a sub-policy, Develop Campus Environmental Sub-policy Models or Program. EH&S needs to facilitate the creation of sub-policies. Some departments have argued that the sub-policy would not be an appropriate and efficient approach for their department and would like to develop other programs with the help of EH&S. The School of Music is developing a program to include speakers on environmental issues during a winter term class. AAA is currently developing an environmental sub-policy.
- Develop a program or document to outline a specialized environmental education program for faculty, staff and students that includes an introduction to environmental issues on the UofO campus.
- Publish and distribute the UofO Comprehensive Environmental Policy to the campus community, i.e., the students, faculty, and staff. After the previous assessment a Comprehensive Environmental Policy was created. However, the document was not distributed and published. The document would make more of a difference if it was

distributed as part of environmental education.

- Publish the results of environmental assessments. Create and maintain a webpage, or simply link to the EH&S home page, for posting the Universities environmental documents. This is a good way to advertise the UofO's strengths.
- Develop and strengthen the environmental education system to include brief environmental orientation for incoming students. Outline environmental groups, programs, and concerns on campus and distribute the Comprehensive Environmental Policy and other policies such as double-sided printing and recycled paper policies, and recycling program goals.
- The audit class should be taught on a regular basis to educate the students about the activities of the UofO. In addition, these assessments give UofO personnel a chance to review their activities and implement more environmentally friendly activities that can be cost effective.

## 2 CONSUMPTION AND USE TRENDS

### 2.1 Introduction

We analyzed consumption information looking for trends occurring at the UofO. This section will focus on four general areas. The four areas of concern for this assessment included energy consumption, recycling, hazardous waste, and water/sewer usage. This assessment of UofO consumption was made by analyzing the existing information, data, and methods used by the UofO in its consumption practices. This analysis was performed to better understand the practices used by the UofO and to see trends occurring in each of the four areas chosen and to make possible recommendations to the UofO.

We obtained information and data from interviews, telephone conversations, and e-mail with the following UofO personal and staff:

- Nick Williams, CCHM (Hazardous Waste)
- Kay Coats, Director of Environmental Health & Safety (Hazardous Waste)
- Amy Lake, Energy Specialist (Energy Consumption)
- Karen Kaplan, Recycling Program Manager (Recycling)
- Greg Haider, Maintenance Team Supervisor Zone A,
- Chuck Gammel, Garbage and Maintenance Supervisor
- Laura Ethertun, OSPIRG (Portland)
- Randy Collins, Co-Generation Engineer (Energy Consumption)

- George Hecht, Campus Operations Director
- Jerry Dominy, Service Manager, Facility Services

Information and graphs produced for this report were also from spreadsheets and packets provided by staff and personal.

## 2.2 Energy Consumption

When the UofO was founded the UofO heated the buildings, Villard and Deady, with fireplaces. As the UofO grew they changed to steam heat and using wood chips, hog fuel and natural gas were used to heat buildings. Steam distribution to the buildings originated from the area of Lawrence Hall. When the campus grew too large for the amount of steam being produced, the co-generation power plant was built across the Franklin Blvd. The plant is a co-generation facility because it creates steam and captures the energy from the steam to produce electricity with the use of turbines.

Hog fuel was used as the fuel source until the UofO converted to natural gas in 1992 for economic and environmental reasons. Hog fuel is made up of wood chips and other byproducts from the processing of timber for lumber and paper pulp. The price of hog fuel rose drastically in the early 1990s and the pollution created from the burning of hog fuel was high in particulate matter, SO<sub>x</sub>, and NO<sub>x</sub> emissions. Natural gas is burned in boilers to heat water and create steam. It is then sent through the boiler again to superheat the steam. From there it is sent through turbines where it creates electricity by converting the heat energy into electric energy. When the steam becomes saturated, it is then sent to the UofO via the tunnel system where it is used as the primary source of building heat on campus (Figure 2).

The UofO has underground storage tanks with No. 2 Fuel Oil for times of natural gas shortage. Natural gas Shortages occur during the winter months when natural gas is sent preferentially to other areas of the United States having a greater need for heating fuel during winter storms. In addition, the UofO also has unleaded gas tanks for fueling vehicles. There are a total of five USTs at the physical plant location.

The production and use of energy at the UofO involves many different activities, below are some of the activities performed during the production, distribution and use of energy at the UofO.

- The UofO can produce up to approximately 40-50% of electricity consumed on campus; the rest is purchased from EWEB at a bulk, high voltage rate, of 2.88 cents per Kilowatt-hour (KWh). In comparison, Oregon State University (OSU) pays 4.1 cents per KWh.

- Physical Plant charges 3.3 cents per kWh for the electricity they supply to other UofO Departments to cover handling and operating expenses.

- The UofO has its own sub-station, which allows it to receive electricity from EWEB at a higher voltage and at lower cost. For a diagram of the feeders and distribution of electricity throughout campus (Figures 3 and 4).

- The tunnel system under the university is primarily for the transportation of steam to

buildings for heating, but the tunnels also allow easy access to utility wires running through them.

- Natural gas purchased from Northwest Natural Gas Company since 1992. Figure 5 includes a map of gas lines.

- The Siemens system, formerly Landis & Staefa Trunkline, monitors the buildings temperature, humidity, ventilation, etc. It also corrects or adjusts itself by utilizing compressed air to open and close valves (Figure 6).

- Chillers use chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) to ‘chill’ both air and water. The half life of HCFCs is much shorter than that of CFCs

### 2.2.1 Regulatory Review

United States Environmental Protection Agency (USEPA) promulgated regulations (40 CFR 72 under Title V of the CAA which required operating permits for facilities that meet one of the following criteria:

- Any major source:
  - Any source, including an area source, subject to a standard, limitation, or other requirement under section 111 of the CAA;
  - Any source, including an area source, subject to a standard or other requirement under section 112 of the Act, except that a source is not required to obtain a permit solely because it is subject to regulations or requirements under section 112(r) of the CAA;
- Any affected source; and
- Any source in a source category designated by the Administrator pursuant to this section.

Under the Title V requirements, a facility can obtain a synthetic minor permit which allows the facility to operate below a required minimum. The UofO chose to minimize their emissions. A copy of the permit is included in Appendix C.

### 2.2.2 Findings

- In 1996, a partnership formed between the UofO, EWEB, and several local high schools to begin work on constructing a 1.8-mile bypass to the natural gas interstate pipeline. This partnership was formed in response to a large proposed increase in the price for gas transportation. The pipeline would have paid for itself in reduced transportation fees within five years. However, NW Natural Gas offered a 10-year firm delivery contract at substantially lower rates, making the proposed bypass unnecessary. They quickly filed an injunction that would prevent the coalition from building a bypass in the future.

- The Northwest has the lowest rates of electricity due to hydropower. The deregulation of the utility industry may result in electricity prices across the nation to average out which could cause

the price of electricity to increase for the UofO.

- The compressed air system has many leaks. These leaks cause a loss of energy. No survey has been performed to determine the location and number of leaks in the system.
- Most decisions are dependent on a payback period of five years or less before funding for the project will be supplied. A short payback period is difficult because electricity is inexpensive in the Northwest. With the deregulation of the utilities, proposed projects may need to be further reviewed. This payback period is not a hard and fast rule. The newly installed windows in Pacific Hall have a payback period of 141 years.
- The UofO Physical Plant has a good working relationship with EWEB. EWEB gives the UofO incentives to work on improving energy efficiency and collaborates on projects with the UO Physical Plant.
- Physical Plant has been trying to get more campus involvement in energy efficiency issues. Amy Lake (Physical Plant) and Karyn Kaplan (Recycling) have worked to create posters and stickers for placement around campus. These posters and stickers are designed to bring energy conservation to the minds of the campus community.
- Individual electricity meters for the buildings on campus have been read since the summer of 1999. Because of the large quantity of energy used by the science buildings (Klamath, Willamette, Streisinger and Huestis), there is a focus on trying to make the science buildings more energy efficient because they use a large portion of the energy on campus. See appendix D for energy assessments of campus buildings.
- Current fume hoods in science labs are inefficient and are a significant loss of energy.
- The Knight Law School, Recreation Center, and the Moshofsky Sports Center are top of the line in energy efficiency. These buildings earned the Energy Edge Award from EWEB. The Moshofsky Center's designers made the facility 25 percent more efficient than Oregon building code requires.
- The new Knight Law School has conventional electric heat instead of steam heat from the power plant. Conventional electric heat was considered more cost effective since the Knight Law School is not part of the tunnel system.
- UofO policy is to keep the buildings at 72 degrees, however it varies per building some are warmer some are colder. The goal is to make and keep people comfortable. At OSU the policy is 68 degrees during office hours and 58-62 degrees after office hours.
- A review of the energy consumption shows that the quantity of natural gas has decreased while the cost per therm has increased (Figure 7).
- The amount of electricity used has increased over the last few years, with it leveling off over the last few years, which includes the additional buildings (Figure 8).

### 2.2.3 Recommendations

- Fixing the compressed air leaks has the potential to save significant amounts of money and energy.
- Increase campus community involved energy conservation and education programs. Amy Lake and Karyn Kaplan need support to increase the awareness on campus.
- Implement and expand 1995 Energy HVAC Assessment (Appendix D)
- Expand current Physical Plant home page. The OSU home includes additional information (<http://osu.orst.edu/admin/facilities/conserves/top.html>). An expanded home page would be more effective in communicating to the UofO community.

## 2.3 Water Use

The UofO purchases water and sewer utilities from EWEB. Drinking water is supplied by EWEB from their treatment facility on the McKenzie River. Wastewater is piped to the EWEB wastewater treatment plant. Stormwater is sent directly to the Millrace or the Willamette River. EWEB charges the UofO for the stormwater sent to the Millrace and the Willamette River so that a stormwater treatment plant can be constructed with the surcharge collected.

Water is diverted from the Willamette River into the Millrace, with pumps behind the Black Angus Restaurant on Franklin Blvd., a human-made waterway flowing through Eugene. The Millrace water is used for non-contact cooling of the UofO's boilers. The UofO has the appropriate Stormwater National Pollution Discharge Elimination System Permit (NPDES) (Appendices E and F).

### 2.3.1 Regulatory Review

Under the Clean Water Act, two programs are identified that pertain to the facility: direct discharge of process water and stormwater. NPDES regulates the discharge of wastewater into waters of the United States; permits are required for these discharges. The Oregon Department of Environmental Quality (DEQ) is the permitting authority in Oregon for wastewater and stormwater discharges. Any discharges into the sanitary sewer are permitted by the City of Eugene. NPDES permits for direct wastewater and stormwater discharges into the Millrace and the Willamette River are received from the DEQ.

### 2.3.2 Findings

- Under the NPDES permit, the UofO is required to record:
  - Total gallons per day discharged into the millrace
  - Temperature readings of the Millrace, Willamette and cooling water discharge
  - pH of Millrace.

- In mid-1999, smoke tests were performed to determine whether the sewer and stormwater lines connected to the correct system. It was determined that some of the stormwater lines connected to the sewer system.
- Water use increased approximately 100,000 gallons from 1997-98 to 1998-99, while costs have leveled off (Figure 9).
- Water and sewer costs have not increase substantially over the 5-year study period (Figure 10).

### 2.3.3 Recommendations

- Reduction of summer irrigation of lawns, or a different type of irrigation. Water use jumps in June, July, and August and the sidewalks get most of the water. Investing in a more efficient type of irrigation, such as drip irrigation might have a short pay off in terms of water saved.
- Water during the night and not during the day, especially in the summer
- Assess the current chiller water use on campus. We did not have time to look at chilled water and its use in this report.

## 2.4 Solid Waste Generation

The UofO produces a variety of solid waste ranging from food scraps to construction material to office waste to “anything a person can fit in a dumpster.” The following activities are performed during the collection and disposal of non-recyclable solid waste.

- All waste is collected and sent to the LCWM site in Glenwood for processing and shipment to Short Mountain.
- The UofO has two garbage trucks; two full-time and one part-time employees operate and supervise the garbage services.
- The trucks make on average about seven trips a day to LCWM between both trucks.
- The average truck weighs 4-7 tons when full.
- Waste from the academic buildings, buildings with classrooms, is totaled and calculated into the solid waste budget and therefore are not billed separately.
- Auxiliaries, which include the Erb Memorial Union, the resident halls and off-campus housing are calculated separately and billed accordingly.

### 2.4.1 Findings

- Waste quantity has been constant for the last five years.

- Prices at LCWM rose from \$42/ton to \$46/ ton in 1998.
- The garbage service is a state institution and therefore transporting waste to a publicly owned facility, therefore it requires no licensing or permit agreements.
- The service has not received any citations from the weighmaster for over weight trucks.

#### 2.4.2 Recommendations

- Have undergraduate interns conduct garbage audits to find out what people throw away (Appendix G).

### 2.5 Hazardous Waste

At the UofO, the Department of Environmental Health & Safety (EH&S) headed by Kay Coots manages the hazardous waste generation throughout the UofO. EH&S is a division of campus operations. EH&S is also in charge of collection and proper disposal of all chemical waste produced at the UofO.

The use of hazardous chemicals and the generation of waste are performed in the following manner:

- EH&S allows the various departments and laboratory operators to purchase their chemicals and receive their chemicals independently.
- When the laboratories are ready to dispose of the chemical waste, the operator or laboratory official puts the waste into an appropriate container, provided by EH&S, and has the material picked up by EH&S.
- EH&S does a hazardous waste determination on all chemical waste they receive from the campus community. The waste is then disposed of properly with the appropriate and necessary paperwork.
- EH&S disposes of lead and cadmium contaminated debris from construction and demolition on campus. This would be partially the responsibility of the contractor, however EH&S prefers to collect and dispose of all the debris to ensure proper disposal.
- EH&S collects universal waste for recycling. They collect batteries, fluorescent tubes, and PCB containing ballasts from electrical fixtures.

- Regulated hazardous wastes are shipped via permitted hazardous waste transporters to permitted treatment, storage and/or disposal facilities.
- EH&S completes paperwork required by the Oregon Department of Environmental Quality, such as hazardous waste manifests that accompany shipments of waste to treatment facilities. EH&S keeps records of all hazardous and chemical waste generated and which department generated it.
- Some chemicals are treated on-site, such as waste photofixer from the development of photographs on campus, which is treated to remove the silver ions from solution. The waste containing the silver is picked up by BF2, a treatment facility, for beneficial silver recovery, and EH&S discharges the spent solution to the sewer system.
- EH&S conducts material handling, safety, and toxics use reduction training for members of the campus community who come in contact with dangerous chemicals.

### 2.5.1 Findings

The UofO's Toxics Use Reduction Hazardous Waste Reduction (TURHWR) Plan for 1998 listed goals, objectives and challenges to the reduction of toxic materials used and hazardous waste produced. The TURHWR Plan is a required report submitted annually to the Oregon Department of Environmental Quality. EH&S is in charge of creation, direction, and enforcement of programs listed in this plan. Appendix H includes a full copy of the 1998 TURHWR Plan.

The goals of the plan are the following:

- Reduce corrosive wastes by 2%
- Reduce lead and/or cadmium contaminated debris by 3%
- Reduce flammable liquid solvents by 5%

The objectives of the plan are the following:

- Continue small group presentations on chemical management that includes a discussion on segregating materials and neutralizing specific corrosive wastes.
- Educate project managers on the possible presence and hazards of lead based paint when building renovation projects are discussed.
- Individual operators or groups of operators will be contacted to arrange an environmental assessment of their particular area. This assessment will include suggestions for segregating and

reducing wastes.

The reduction challenges are the following:

- Lack of centralized chemical purchasing system.
- Lack of reduction incentives.

EH&S have instituted the following programs:

- EH&S has instituted a chemical exchange program. Chemicals in the stocks of individual laboratories that are unneeded are first offered to other members of the department and then they are put into a database from which any qualified faculty or staff can requisition the chemical. This program reduces the quantity of unused chemicals that are disposed of or held in stock, and the quantity of chemical brought onto campus.

- EH&S replaces chemicals with a short shelf-life or that are dangerous when kept in stock beyond their expiration date for individual laboratories or operators. This is a very new program; there is no data available on its efficacy as of yet. This program is designed to increase the safety of anyone who comes in contact with chemicals at the UofO.

- Another EH&S pilot program is central purchasing/receiving of gas cylinders. This program, if successful, will help to begin a university central purchasing and receiving of chemicals. A centralized purchasing system has the ability to reduce the quantity of chemicals brought onto campus and held in stock. See recommendations below.

#### Other Findings

- EH&S has no record of fines or inspection in the last 7 years by the Department of Environmental Quality for hazardous waste management, shipment, or storage violations. Oregon State University in Corvallis received a large fine in 1998 for the conditions of their hazardous waste storage area.

- Figure 11 shows the total generation of chemical waste on campus from scholastic year 1994-95 through 1998-99.

- Figure 12 shows the departments producing chemical waste in scholastic year 1998-99.

- Figure 13 shows departments that contribute significantly and steadily to the UofO's chemical waste generation from scholastic year 1994-95 through 1998-99.

- Table 1 shows department chemical waste generation by waste type: biohazard, bulked solid waste, chemical treatment (neutralization), free-stand, lab pack, non-regulated waste, PCB

containing debris, waste photofixer. July 1998 through June 1999.

- Table 2 shows a comparison of scholastic year 1993-94 chemical waste generation to 1998-99. The total chemical waste generated for both years is almost the same: 21,216 pounds in 1993-94 and 22,871 pounds for 1998-99. There are more departments contributing to the chemical waste production in 1998-99, this could be a result of greater awareness of the dangerous of hazardous waste entering the environment. It could also be a result of the category "other" being 24% of the total in 1993-94 and only 6% of the total in 1998-99. The totals are fairly consistent, 21,216 pounds for 1993-94 compared to 22,871 pounds for 1998-99.

- Hazardous waste handling and disposal procedures are becoming more and more well understood. A greater portion of hazardous waste is reported and properly disposed of now than even a few years ago. However, the relative cost for handling the hazardous waste generated by this campus has gone down in the past year.

- There are departmental reduction trends. Waste generated by Biology, OIMB, and the EMU Craft Center has decreased.

#### 2.5.2 Recommendations

- Develop a centralized chemical purchasing system. A centralized purchasing system would minimize the purchase of chemicals by laboratories and laboratory operators and minimize the chemical products kept in stock. This program would also allow for better tracking of chemicals as they move through the campus and better more effective contingency planning.

- Modify the current computer system for maintaining records of hazardous and chemical waste. The current computer program for tracking hazardous waste disposal is outdated and prone to error. Hire a computer science student to renovate the waste tracking system.

- Conduct EH&S supervised student laboratory safety training and material handling training. It is an integral part of a laboratory education.

#### 2.6 Recycling Program

Karyn Kaplan started the UofO Student Recycling Program in the 1980s. She worked through the UofO Survival Center with a group of ten student volunteers to raise awareness of recycling and student support of a recycling program. Through campus-wide student and support and student volunteers hours the recycling program was sanctioned and given a budget by the administration and the associated student union. A copy of the Associated Student Union sanctioning of the recycling program is included in Appendix I. In the last ten years the recovery rate, the percentage of waste that is recycled or reused, has grown to 40-45%.

One purpose of this report is to bring attention to the significant gains made by the recycling program due to the hard work of the program staff. Another purpose is to highlight problems facing the recycling program as well as the UofO campus.

We met with UofO staff working with the student recycling program to discuss the program. We were given recycling records by the recycling program staff which we then analyzed for trends. The recycling program staff also gave us documents and literature relating to the recycling program. We researched recycling programs at other colleges and universities across the nation as well as examining our recycling program. As trash piles up in landfills across the nation waste reduction methods such as recycling become increasingly important. The garbage produced by one person on campus has doubled since the start of the recycling program. The following activities occur during the collection of materials for recycling on this campus.

- The Recycling Program employs 40 students part-time, 4 full-time recycling coordinators, and one full-time program manager.

- In the almost two decades that the recycling program has existed, greater than 500 student volunteers have gained valuable work and leadership experience with the program.

- The campus recycles:

- Paper of all types.

- Cans/bottles, etc. Beverage bottles

- Reusable office supplies

- Demolition/construction debris

- Motor oil

- Yard Debris

- Post-consumer kitchen waste

- Used furniture

- Recyclables are collected from:

- Residence Halls

- Throughout campus (inside and outside of buildings)

- UofO family housing

- Fraternity and Sorority Houses

- The Reusable Office Supply Exchange (ROSE) was instituted in 1993 for reuse of office supplies. UofO staff and faculty can place their unneeded office supplies in the ROSE storeroom and take whatever they need. There is one student employed to clean the storeroom and keep records of the office supplies that move through the program. Figure 14 shows the revenue saved

by ROSE from 1994-95 through 1998-99.

### 2.6.1 Findings

- The recovery rate is approximately 42%, which meets Oregon State recycling goals. Figure 15 shows the recovery rate from 1992-99.
- Cost avoidance and revenue from paper revenue, can/bottle revenue, dump tipping fee avoidance, transportation of solid waste to dump cost avoidance, and ROSE was \$136,000 in scholastic year 1998-99.
- The UofO is such a large producer of recyclables that it is influential in creating a market for recyclables in this area. Institutions across the nation are influential in this manner.
- Figure 16 shows the tons of material recycled by general category, from scholastic year 1992 through 1999.
- Figure 17 shows tons of waste material collected versus tons of waste material recycled for 1992 through 1999.
- Figure 18 shows paper revenue versus quantity of paper recycled for 1994 through 1999.
- Table 3 shows recycling data, condensed to total paper, total cans/bottles, total other, total solid waste collected and total recycled by year. 1992 through 1999.

### 2.6.2 Recommendations

- Sell reusable UofO Recycling Program mugs in the EMU.
- Work on increasing student awareness/involvement in the programs.
- Raise awareness of problems created by landfilling large amounts of avoidable waste. Show campus community how much trash they create and where it goes, life cycle of trash.
- Recommend that Karyn and her staff document their recycling management system and create a system for spreading their knowledge around so that the recycling program doesn't leave with Karyn or her staff.

## 3 PESTICIDE AND HERBICIDE USE

### 3.1 Introduction

The UofO is located on 262 acres of land in Eugene, Oregon. The campus consists of 117 buildings that are appraised at \$416 million. The Facilities Services Department consists of facilities maintenance, campus utilities, support services, campus services and facilities improvements. The campus services department receives 15% of the total activity budget, which is then divided up between custodial services, garbage services, grounds maintenance and campus recycling. In 1996-97, the budget allocation equaled one groundskeeper for every 27.6 acres with a total of 10 groundskeepers for the UofO. In 1997 the UofO installed automatic irrigation systems at the west lawn area by education. The UofO also established a new tree maintenance program and implemented the Integrated Pest Management (IPM) System for campus buildings and tunnels.

The UofO has 4 areas that use chemicals such as pesticides. These areas include interior buildings, exterior grounds, intercollegiate athletics and greenhouses. The indoor chemical applications are performed by contracted companies of Orkin and Swansons. Certified groundskeepers apply pesticides to outside areas. The chemicals are stored in a building near the Physical Plant Building. The Intercollegiate Athletics Department also keeps chemicals in a structure outside the Moshofsky Center. Certified applicators apply pesticides and herbicides. For the greenhouses, the chemicals are kept on the greenhouse premises and are applied by the greenhouse caretaker who is a certified applicator.

### 3.2 Grounds

The following activities were performed during the assessment of the landscape and grounds facilities at the UofO:

- Review of campus services;
- Review of environmental plans and permits;
- Review of pesticide use and history for the campus;
- Review of Integrated Pest Management (IPM) Plan;
- Interview with grounds and building managers;
- Review information on past and present pesticide use at the UofO;
- Put pesticide data into a database;
- Review of compliance with environmental regulations within the facility operations. The regulations include;
- Pesticide regulations (ORS 634.006)
- Integrated Pest Management (ORS 634.122)
- Clean water act

- Toxic substances control act
- State and local regulations

We reviewed all information gathered to identify areas of potential concern and recommend activities to be performed. This information will help the UofO and all its personnel identify the hazards of the work performed.

During the fall term of 1999, we reviewed records, interviewed UofO personnel and staff and performed a walk through of the grounds. During the site visit, the following records were obtained and reviewed:

- Past and present data pertaining to pesticides purchased, used, stored and the personnel who deal with them.
- Pesticide regulations
- Integrated Pest Management manual (Appendix J)
- Budget allocation to grounds maintenance
- Review of available data from hired companies outside of the UofO
- Layout of the UofO
- Operating schedules and zones

The following are activities and duties performed by the grounds and maintenance of the UofO:

- Maintain aesthetics of the UofO
- Maintain grounds, including trees, shrubs and plants on UofO properties
- Apply pesticides and herbicides as needed on the grounds
- Apply IPM plan to work done on the grounds
- Maintain UofO buildings free of pests, within IPM parameters
- Apply insecticides as needed within the buildings when exceeding thresholds

These are the chemicals used, based on data received from UofO personnel. These chemicals include but are not limited to the following. Copies of the MSDSs are located in Appendix K.

- Tempo 20wp
- Contract
- PT-515
- Siege
- Cynoff

- Borid
- Traps
- Bait
- Tim-Bor
- Ficam dust
- Precor

During the walk through and interviews of UofO grounds, buildings and personnel, the assessment team reviewed the following regulations.

- Pesticide regulations (ORS 634.006)
- IPM (ORS 634.122)
- Clean Water Act
- Toxic Substances Control Act

### 3.2.1 Findings

- The UofO grounds personnel receive a one-day seminar followed by an exam for IPM training and licensing each year.
- Purchase and use of chemicals is documented through EH&S and also by personnel in charge of purchasing for specific departments. EH&S is in charge of purchasing of special requests by the groundskeepers and building managers.
- For the indoor chemicals, there are warning signs posted on the outside of the building and at the rooms to be sprayed. Chemicals are not sprayed unless pests exceed thresholds. If thresholds are not being exceeded then alternative methods are used. For indoor applications, there is usually an outside company contracted to do the spraying.
- Federal, State and Local laws do not currently restrict the use of any of the pesticides that are currently being used on campus. The UofO must comply with State mandated IPM. However applicators of pesticides must be licensed by the State of Oregon and must also adhere to labeling standards for stored pesticides. As a general practice, groundskeepers try to apply pesticides by 8:00 AM to avoid the possibility of exposure by students and staff, but they do not regularly post notices in treated areas.

### 3.3.3 Recommendations

- The department should consider using fewer pounds of fertilizer or alternatives, yet any reduction in the total used would be beneficial.

- Properly comply with IPM procedures according to the Universities policy.
  - Keeping complete records in a database (instead of a day planner).
  - Hire a work-study student for data management.
  - Having a database that is linked to Environmental Health and Safety as well as other departments on campus that use pesticides and make this available to the public.
- While recognizing the necessity of uniform ground cover for the athletic fields, the UofO could use less toxic methods (such as hand weeding), the following agency may be of help:

Northwest Coalition for Alternatives to Pesticides

1149 Willamette St.

Eugene, Or. 97405

(541) 344- 5044

### 3.4 Greenhouses

The objective of this section is to review the pesticide and herbicide use for the Department of Biology's greenhouses located at 1387 Franklin Blvd. Prior to the arrival of Marcia Trenary 13 years ago, many restricted use pesticides/insecticides/herbicides were used in and around the facilities. Marcia was able to eliminate their usage within the first year and does not currently use restricted use chemicals.

Marcia soon tried using biologicals, which are non-chemical alternatives, such as insects and predators of insects including whitefly parasites, spider mite predators and ladybugs. These beneficial organisms would work better on ornamentals that remain permanently in the greenhouses, but the way the facility grows plants and discards them within a few short months; it became obvious that biologicals could never establish themselves. Marcia tries to avoid using unnecessary chemicals when possible. She has numerous biology students working under her supervision at any given time.

On October 29, 1999 we visited the Biology greenhouses which are located directly north of the UofO's main campus to interview Marcia Trenary. Marcia is responsible for maintaining the greenhouses, purchasing the chemicals used, and is the primary applicator of the chemicals. She is a licensed applicator. She wears protective clothing and uses a respirator when applying the chemicals. Chemicals are only used when pests exceed threshold levels. Warnings are posted outside the greenhouse doors 48 hours in advance. Chemicals are stored in a shed outside but near the greenhouses atop pallets and gravel. Inside the new greenhouse, on the graveled ground, she uses salt crystals and/or a propane torch for weed control. Leaf mulch is also used for weed control around the greenhouses. The containers of the chemicals used are rinsed in the sink then recycled or thrown away accordingly. Marcia does not consult with EH&S about the purchase, storage, and use of any chemicals. After the site visit, we received complete pesticide application records from 1995 to October of 1999 as well as current soil tests.

In the records showed that there are two main locations where pesticides are applied:

- greenhouse #110

- greenhouse #111

For each location the following information is supplied:

- Date
- Time
- Trade Name
- Supplier
- Strength of Pesticide
- Amount of Concentration
- Equipment Used
- Specific Target Pest

The pesticide application records as well as the soil test provided an overview of chemical use at the biology greenhouses.

The following is a list of the most frequently used but not limited to chemicals in the greenhouses:

- Tilt
- Enstar
- Avid
- Resmethrin
- Malathion
- Orthene

Appendix A includes MSDSs for Avid, Resmethrin, Malathion, and Orthene.

### 3.4.1 Regulatory Review

Marcia holds a Public Pesticide Applicator License #103304 (categories of license- ornamental, insecticide and fungicide). After the interview and pesticide applications records were reviewed the following categories were reviewed to ascertain compliance with federal, state, and local regulations:

- ORS 634.006
- 603-057-0110 Pesticide Operator, Applicator, and Trainee Categories

(3) Demonstration and Research: This shall include all pesticide operator, pesticide applicators, and public applicators that use or supervise the use or supervise the use of pesticides in field research educational demonstrations. The exemption provided manufacturers under subsection

(1) of ORS 634.106 only applies to laboratory research.

### 3.4.2 Findings

- In reviewing the pesticide application records, we noticed numerous inconsistencies with the way records were kept. Often the record was not completely filled out and there is no area for amount actually applied.
- Marcia is able to apply pesticides at her own discretion, and has biology students working under her supervision.
- From 1995 to 1999 the total number of pesticide applications have declined. In 1995 there were 22 application records and so far in 1999 there have been only 10 records. This does not reflect fewer pesticides being used because we are unable to determine totals from the information Marcia supplied.
- Although, the greenhouses are not required to report to EH&S, it is recommended that the pesticide used and quantities be submitted to EH&S.

### 3.4.3 Recommendations

- Keep more complete records by filling in applicable parts as well as adding a section for total amount of pesticide used.
- Report to pesticide application information to EH&S. This is not currently part of the UofO IPM program, but all pesticide applicators should report to one department.
- Keep records in a database for easier review.
- If necessary hire a workstudy student for data management.
- Use less harmful pesticides as well as alternative. The following agency may be of aid:

Northwest Coalition for Alternatives to Pesticides

1149 Willamette St.

Eugene, Or. 97405

(541) 344-5044

## 4 ERB MEMORIAL UNION

### 4.1 History

The Donald Milton Erb Memorial Union (EMU) was built in 1950, in response to the need for a central and permanent meeting area for students of the UofO. The building was dedicated to Donald Milton Erb, the seventh president of the UofO, seven years after his death, in 1943. The

EMU's original design contained the Taylor lounge, the Fishbowl and the Post Office. This is the brick portion of the building.

Since the original design several renovations have been made to accommodate the changing student needs and growing population. In 1961, the dining room and Fountain Court were added and the Fishbowl was renovated into a modern cafeteria style. The largest renovation project began in 1970. By 1974, this project which doubled the size of the EMU was completed. The renovation added the entire east wing of the present EMU, along with the skylights and the staggered levels. The remodeling allowed room for additions such as the child care center, the craft center and numerous other organizations that represent the student body.

Recently, a renovation was done that added the new amphitheater and redesigned the Fishbowl. The main kitchen in the fishbowl had a new drainage system and dish room installed. New food businesses were brought in.

With as many as fifteen thousand students utilizing the EMU each day, it still serves its original purpose, as the main meeting area for students. Currently, the EMU contains a computing lab, the UofO radio station, The Emerald student newspaper, a pool hall, travel agency, Ticketmaster, administrative offices, a craft center, child care center, numerous student run organizations, a food court, The Buzz Coffeehouse, and comfortable study rooms. With its coming fifty-year anniversary the EMU serves as the most utilized and important facility on the Oregon campus.

## 4.2 Computing Center

Located on the bottom floor of the EMU is the Computing Center which provides UofO students access to computers, printing and internet services. With nearly 50 computers in use from 8 A.M. to 2 A.M. seven days a week, this center is widely utilized. Funds are allocated to the center by the Technical Fees assessed to students via tuition. Control of the Computing Center is held by Mary Bradley, the Microcomputer Lab Coordinator, as well as the Microcomputer Lab Manager, Doug Simpson. However, as the Computing Center is within the EMU, the EMU Board Committee also influences regulations concerning the center. This Board is comprised of students, facilities operators, and individuals pertinent to the management of the EMU.

Typical activities in the computing center include student use activities such as word processing and internet exploration. As students print material, the printers are supposed to be set to print double-sided, however, these settings are changed every time a word processing program is opened. Changes are not made to re-establish the double-sided printing option. Managers are on hand to supervise the students and to make sure that no one is abusing their privileges.

During the investigation of the Computing Center, interviews were held with Mary Bradley. Also, direct observations of activities within the center were noted. These activities were held between the weeks of October 1 through November 25, 1999.

### 4.2.1 Findings

Along with independent research, the information gathered lead to the following findings:

- Printers default settings are to print double-sided, however the option to change to single-sided printing is available and once the option is selected, it cannot be reset until the program is loaded again. This results in needless paper usage.
- The paper that is used is only thirty percent post-consumer content and a bleaching process is

used to whiten the paper.

- Paper costs for the eight month period between March and October 30th totaled \$3601.50 for 147 cartons of paper.
- Students are not directly charged for printing which does not promote responsible paper usage as it does in the Knight Library where students are charged for each printing.
- Multiple copies of the same document are needlessly printed due to the lack of printing queue systems.
- Trashcans are commonly placed next to the recycling stations therefore, recyclable paper often ends up in the trashcan needlessly.
- Aside from often-overlooked postings and personal habits, there does not exist any motivation for students to conserve paper.
- When possible, workers attempt to identify students who are abusing printing services and confront these people in order to dissuade them from their actions.
- Paper recycling bins are abundant.
- During the time that the center is closed, the computers remain on but in a suspended state.
- The management is willing to make changes in order to enhance conservation, however monetary costs keep them from implementing new systems.

#### 4.2.2 Recommendations

In order to decrease paper and energy waste, recommendations for the Computing Center are as follows:

- Set the printers and computers so that there is no option of printing single-sided.
- Use printing paper with 100% post-consumer content that is not bleached using chlorine. Costs associated with this change are about \$2.00 more per carton. This would add \$300 to the total eight-month period.
- Set an allotment for each student for the amount of free printing each term, after the student has used this allotment, charge the student for each sheet printed. This will result in large paper savings however, devices must be installed that can keep track of this allotment and be able to accept payment for further printing. A cost-benefit analysis needs to be performed in order to ascertain how long this system would take to pay for itself.
- Purchase queue devices such as those used in the Knight Library to ensure that documents are not needlessly duplicated.
- Position the trashcans away from the recycling bins and fit them with lids and information on

recyclable materials as well as providing the location of the recycling bins.

- Give greater attention to the printing habits of students and provide them with greater encouragement for conserving paper.
- Develop a Comprehensive Environmental Policy that details all the processes by which employees and students should act in order to achieve better conservation of paper and energy.
- Increase the budget for the Computing Center so that the necessary technology that is needed to achieve the preceding recommendations can be attained.
- Develop a survey for student users of the Computing Center in order to educate them about paper issues as well as to find their stances on this issue.

#### 4.3 EMU Food Services

The EMU consists of both private and UofO run restaurants. Grateful Bread and The Buzz are both UofO run food establishments that mainly consist of baked goods such as breads and pastries. These goods are baked daily in the main kitchen and then dispersed to the place of sale, including UofO operated stores around campus such as The Hearth, The Grind and various other food carts throughout campus. Off of the main kitchen are several privately owned companies including Subway, Jamba Juice and Pizza Planet, Holy Cow, Bento Brothers, Orient Express, Samurai Duck, India House, and Ritta's Burritos. These businesses rent out space in the EMU under individual contracts. One feature of the EMU Foodcourt is the marketplace, each day either Bento Brothers, Orient express, Samurai Duck, India House or Ritta's Burritos are in the Marketplace. It is a shared space in which the different restaurants occupy on a given day. The main kitchen in the EMU is open for use of the businesses and is mainly utilized for preparatory work. All of the establishments have sufficient individual kitchens to perform the majority of the work, and there is a communal walk-in refrigerator that all the businesses use.

Victoria Varble-Goss is the EMU food service manager. She is responsible for the daily operations of the EMU run food establishments and oversees the general operation of the private businesses, although the ultimate responsibility of those are left to internal management. Victoria gave us a detailed tour of the main kitchen and a brief tour of Holy Cow, Subway and the India House. The main kitchen was originally designed to run a cafeteria so there is a lot of equipment in the kitchen that is now rarely used, such as industrial size ovens, stoves, grills and food preparatory equipment. The dish room, where the dishes and equipment are cleaned, is newly remodeled with stainless steel equipment and new drainage. The kitchen has three freezer walk-ins and two refrigerator walk-ins. Three of the walk-ins are very dated with poor insulation. The actual use of the kitchen is minimal compared to its size and potential.

The pre-consumer food waste, (unused, prepared food) in the EMU are accounted for as follows:

- The Buzz sent to The Mission, a homeless shelter
- Holy Cow composted UofO Urban Farm
- Subway Garbage
- Jamba Juice & Pizza Planet Garbage

- Bento Brothers Garbage
- Orient Express Garbage
- Samurai Duck Garbage
- India House Garbage
- Ritta's Burritos Garbage

It should be noted that mainly due to economic reasons, pre-consumer food waste is kept to a minimum.

The Lane County Health Department inspects each private business. Lane County Health Department does not inspect the UofO-run establishments since they are a state-owned establishment. The last inspections and outcome were

- Holy Cow- August 3, 1999- 100%
- Subway- August 3, 1999- pass
- Jamba Juice & Pizza Planet- July 14, 1999- pass
- Bento Brothers- March 12, 1999- pass
- Orient Express- October 7, 1999- pass
- Samara Duck- September 20, 1999- 100%
- India House- September 20,1999- Pass
- Ritta's Burritos- July 14,1999- 100%

On November 9, 1999 we investigated the dumpsters outside the EMU to gain an idea of what is thrown away on a daily basis in the EMU, we investigated thirty-three bags. A sample of our findings is included in Appendix M.

#### 4.3.1 Findings

- The walk-in refrigerators and freezers in the main kitchen have poor insulation, resulting in condensation and ice on the floors and walls, and inefficient energy use.
- The walk-ins also have boxes of food on the ground that can potentially damage and contaminate the food.
- There are recycling bins in two areas of the main kitchen, but these areas are not used to the extent of other areas
- In 1996 the use of Styrofoam was banned from the EMU, this forced Jamba Juice to provide a more environmentally friendly alternative.

#### 4.3.2 Recommendations

- Repair the insulation in these walk-ins for energy and safety reasons. Possible funds may be collected from selling the unused equipment in the kitchen.
- Put boxes on shelves for health and safety reasons, the walk-ins have plenty of room for the food to be safely stored.
- Install a glow in the dark handles instead of a light to be more energy efficient.
- Place recycle bins behind point-of-sale counters, because receipts and other recyclable goods accumulate in the garbage there.
- Pre-consumer food waste can be used instead of thrown in the garbage as some businesses do. For example, Holy Cow composting, or the EMU restaurants, donating food to The Mission.
- Have the EMU use their power of contract to instill other environmentally friendly practices in all use of the food facilities in the building.
- Provide a water tank at the Food carts in order to decrease the waste of small plastic water bottles.
- Sell more reusable coffee mugs and provide a cost incentive to use them to decrease paper waste and save money.

#### 4.4 EMU Craft Center

The Craft Center is located on the bottom floor of the Erb Memorial Union, across from the office of the Women's Center. The manager is Tom Urban. The facility operates while classes are in session during the fall, winter, spring, and summer. Six different areas including photography, woodworking, sewing, ceramics, and silk-screening are available. Each is separated and located in a different area depending on the tools and space needed.

For investigation on the processes and the practices of the Craft Center our team met and interviewed Mr. Urban, the Craft Center manager. During this time he was able to give us a tour of the facilities and was very helpful in answering many of the questions.

The darkrooms included one common area containing the print and film washers. Separate rooms from the common area held the print chemicals, projectors, and other developing tools.

The woodworking is done in a separate room near the back of the facility. The door is kept closed in order to minimize sawdust in the general working area.

The sewing room is near the front of the facility with a large common table in the center. The sewing machines are on a separate table against the left-hand wall.

The Ceramics Room is located in a separate room near the back. There are a number of worktables as well as drying shelves for all the unfinished work. Baking machines are also located within the room.

The silk-screening area is in the back room under the skylight. The largest sink is in the room as well as drying lines and presses.

Included in the general practices are the Craft Center's care of solid waste, wood chips and

sawdust, hazardous waste, recycling, and energy consumption. Most of the Craft Center's solid waste is generated from the woodworking and pottery areas. The majority of the wood chips and sawdust are disposed of in the dumpster. A miscommunication has occurred between the Craft Center and Campus Recycling in regards to the wood chips recycling. Campus Recycling thought that the Craft Center was recycling the chips through the UofO's Recycling Program, while the Craft Center thought they would not recycle it due to the chance of contamination. This has led to a large amount of waste ending up in the dumpsters. Some of the "clean" sawdust is available for anyone who would like to use it for gardens etc.

The hazardous waste generated by the Craft Center includes some of the glazes used in the pottery and ceramics area, the fixer containing silver used in the photography darkrooms, and the stains used in the woodworking area. EH&S manages the hazardous waste. The silver is sent back to the supplier and is then reused.

Campus Recycling previously took care of the recycling. One year ago the service was discontinued according to Tom Urban. Campus Recycling had thought that the Craft Center was informed that the recycling area was re-located outside of the Craft Center. This miscommunication has led Tom Urban to personally handle the transport of the recycling to the UofO Recycling area using his own vehicle.

The energy consumption issue is handled with the expectation that when an area is not being used the lighting and the machines will be turned off. This does not include the ventilation system, which is constantly running during Craft Center hours.

#### 4.4.1 Findings

- One of the most apparent problems was the disorganization of darkroom chemicals. While examining a darkroom a large number of glass and plastic containers occupying floor space in the corner were not labeled or organized in any apparent way. This could result in the mishandling of a certain chemical by EH&S and other users.

- The second issue is that much of the sawdust that contributes to the waste is not recycled and instead disposed of in the dumpster. Instituting a mandatory recycling program or composting of all "clean" sawdust and wood chips easily solves this problem. Some of the material that is swept from the floor can not be used due to contamination by spilled solvents resulting in "dirty" sawdust. This must be disposed of in the dumpster because it is unsuitable to use on composting piles and gardens.

- The woodworking area operates many potentially dangerous machines and tools with an excellent safety record. For an example, not a single injury occurred until the seventh week of fall term 1999.

- The ceramic drains also seem to be a problem in that they are not the right types for the area. The floors of the ceramic room are flooded weekly for cleaning and much of the mud and clay is flushed down the drains resulting in the trap becoming clogged. This takes much effort on the part of the staff to keep the drains clear and free while cleaning the area. The correct type of grate could be removed when clogged by simply lifting it up and throwing away the collected clay. It would then be replaced until clogged again. This would alleviate workers from reaching down the drains and trying to pull out the clogged clay.

- One of the more minor problems involves the lighting. In the skylight area towards the back of the Craft Center new lighting was recently installed. This reduces the chance of injury that is caused by poor lighting. The rest of the facility is rather dimly lit and is potentially dangerous while using certain tools.

- The last major area or concern is that in certain areas of the Craft Center, students are allowed to bring in their own chemicals to use for their projects. This results in unidentifiable bottles of potentially hazardous material. Certain areas, like woodworking students must use the materials made available to them by the Craft Center. This rule needs to apply to all areas.

- In our investigation of the Craft Center we found that Tom Urban and his staff provide good services that are environmentally sound. The area is well ventilated with fans in each of the separate areas. The dark rooms each have a fan system that circulates the entire room's air three times per hour. The wood-finishing room also contains a ventilation system as well as the ceramics area. These fans are generally kept running while the Craft Center is open.

#### 4.4.2 Recommendations

- Complete organization and labeling of darkroom chemicals. This should be done immediately and all unknown chemicals dealt with accordingly. This problem will also be helped by a more rigid policy concerning chemicals that are allowed to be brought in, which is a later recommendation.

- The next is implementing a wood chip and sawdust recycling plan to help minimize waste going to the landfill. This could involve Tim King taking it to the Facility Operations compost area. It would also include a way in which collection can be stored and made available to the general public. Simple advertising may also be used in order to let the general public know that the sawdust is available for use. If excess builds up it can be transported to the urban farm composting pile.

- Installing new ceramic drains is also very important in order to facilitate easier cleaning. The new drains would consist of separate collection grates that trapped the clay materials, not allowing them to travel into the drainage pipes.

- The Craft Center has good control over some of the materials brought in, but it seems to need a consistent policy throughout the separate areas where students may only use the chemicals that the Craft Center offers to them. Tom Urban expressed his concern over the photography area chemicals that are brought in unlabeled and left. This new policy will mean that the Craft Center office will have to stock more items than it does now. It would not allow students to creatively design their own photography. The overlying benefits of knowing what exactly is being used and it ensures that hazardous chemicals are not going down the drain. The policy also prevents chemicals being left for the disposal by the UofO.

- A Comprehensive Environmental Policy (CEP) created specifically for the Craft Center would also be very beneficial. Tom Urban runs the area right now very well with regards to environmental concerns. A CEP would help to insure that existing policies would continue to be

performed. The CEP would entail the actions that are now being performed at the Craft Center.

## References

<http://www.uoregon.edu>

1998-99 University of Oregon Undergraduate and Graduate Bulletin

<http://www.eweb.org/energy/energysmart/edb/9811/moshofsky.html>