

LAB XL PROGRESS REPORT FOR 2006

UNIVERSITY OF MASSACHUSETTS BOSTON

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Introduction

This 2007 annual progress report is required by the Final Project Agreement between EPA New England, the state of Massachusetts and the University of Massachusetts Boston (UMB). As described in the previous Lab-XL Progress Report, the UMass Boston Environmental, Health and Safety (EH&S) Department has identified four key environmental indicators of its Laboratory Waste Program and established goals for those indicators. This progress report provides information and data about progress towards these goals in 2006/2007.

Laboratory Waste Generation Rates

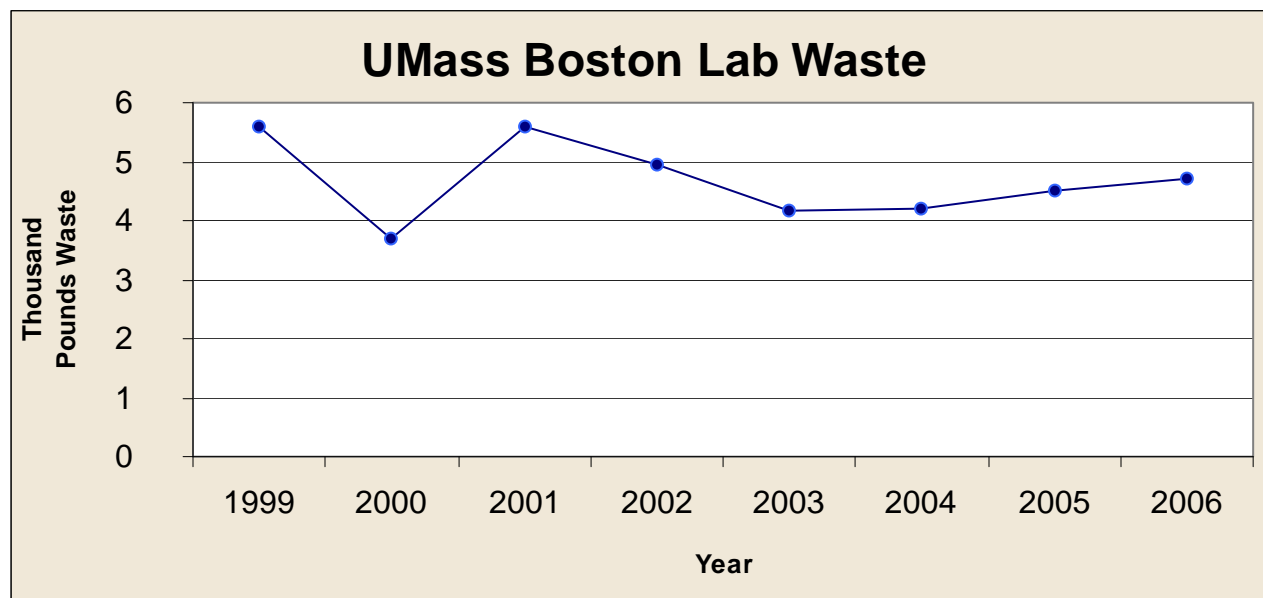
UMass Boston's goal for laboratory waste generation is to maintain an absolute waste generation rate of 5,000 pounds, which is 10% less than the baseline waste levels established in 2000 before our Project XL lab waste program began.

Results to date:

Laboratory waste data are presented in Figure 1 and Appendix 1. UMB's laboratory waste generation increased 4% from the previous year. Over the life of this project, however, we have maintained an approximate 16% reduction of hazardous waste.

Additional data regarding the amount of materials on campus will be available next year. UMB's EH&S Office was finally able to upgrade the bar-coding software in May 2007. We have begun the reinventory process and expect it to take several months. Next year, we hope to have data with regard to number of containers on campus, number disposed of and movement of materials on campus.

Figure 1. Lab Waste Generation Rates Since 1999.

**Lessons learned:**

Despite nine years of tracking hazardous waste generation at UMass Boston, it is still difficult to gain insight into any trends. While yearly totals continue to vary according to many factors, including type and amount of research, number of researchers and other factors, we have maintained for the fourth year an approximate 16% reduction from baseline in the annual generation of hazardous wastes from laboratories.

Environmental Awareness Training

UMass Boston's goal for training is to 1) maintain an accurate training database and 2) to maintain at least 75% total trained of those that require training.

Results to date:

EH&S has built an accurate training database. Each year, we send out forms to the PIs asking them to identify all laboratory personnel under their supervision that require training based on criteria for training listed in our Integrated Chemical Hygiene and Environmental Management Plan. Our criteria is: ALL laboratory faculty, staff, and graduate students must complete training in the Project XL laboratory regulations. Undergraduate students are included only if they are conducting independent study or work-study. EH&S has entered

the information into a database and is able to generate the information on a yearly basis for the PI to update. This ensures that our training records are accurate and up-to-date. The last update to the training database occurred in the Spring of 2007.

The number of laboratory workers trained in the CH/EM Program remains consistent with last three years at about 63% of the total lab population that fit our training criteria, but is still lower than the high of 89% in 2002 when we were rolling out the full XL/Lab training program. We have continued to train new staff and students at the beginning of each semester. We also make an effort to notify those who have not attended a training session that there are sessions available. As always, training also occurs on an informal basis during laboratory pickups and inspections.

Lessons learned:

As long as we are flexible and available to provide training in a variety of settings, we should continue to have a high training rate. Additionally, the use of an accurate database, based on information from the PIs, is critical to insure that we are training the correct population. We continue to find that even though current formal training numbers are lower than baseline, it is evident that informal training is highly effective based on consistent laboratory audit scores. In fact, we believe that the training of key personnel (PIs and lab supervisors) early in the project and our strong management system, with clear guidelines and standards, results in strong performance overall, even in years when fewer new individuals are trained.

Environmental Management Plan Conformance

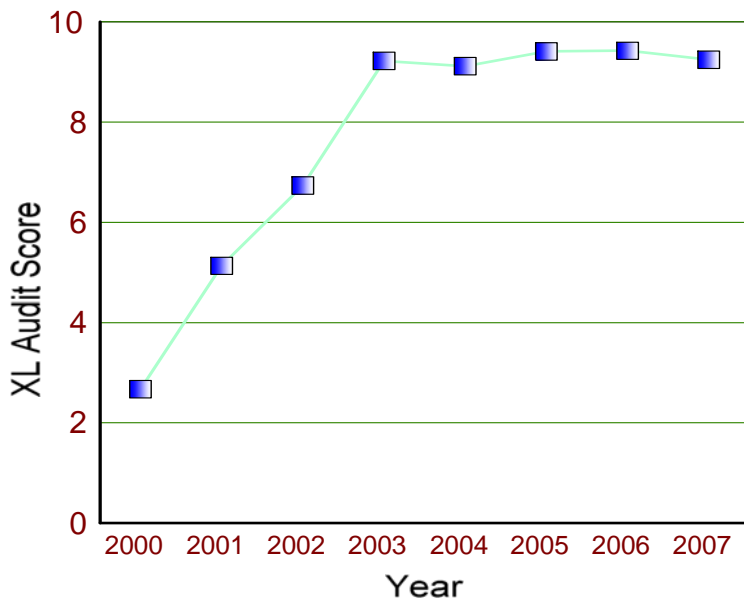
UMass Boston's goal for EMP conformance is to have more than 75% of laboratories score a grade of 9 or better.

Results to date:

UMB EH&S staff conducted annual laboratory inspections in July and August 2007 to measure conformance with the Environmental Management Plan. The results (see Figure 2) continue to show progress.

Figure 2. Average XL Audit Scores for 2000-2007.

Average XL Audit Scores 2000-2007



Again, we utilized the C2E2 “audit grading” system that converts the results of the laboratory audit checklist used by the pilot schools into “grades” on the issues most important to the Lab-XL project:

- Chemical container management
- Laboratory housekeeping
- Pollution prevention
- Laboratory self inspections
- Training and awareness

This grading system was applied to UMB laboratory inspections previously conducted in 2000, 2001, and 2002. The range of the grading system was from 0 to 11 with 11 being the highest score. In applying scores to each laboratory for the categories listed above, certain assumptions were made. Since training in the Environmental Management Plan was not initiated until 2001, each laboratory was assigned a score of ‘0’ for the ‘Training and Awareness’ category prior to 2001. In addition, the UMB pollution prevention program was not initiated until 2001, so each laboratory received a score of ‘0’ for the ‘Pollution Prevention’ category prior to 2001.

Certain assumptions were made for the 2002 scores as well. In conducting laboratory inspections, it was often impossible to ascertain whether or not everyone who works in a laboratory was trained or not, since some labs were unoccupied at the time of inspection and our training database was incomplete. EH&S personnel relied instead upon the presence of a written copy of the EMP in a laboratory to determine training status. If the EMP was present in a laboratory, it was assumed that some of its regular occupants had been trained in the new regulations, since the Plan was distributed only at training sessions. Thus, a laboratory was assigned a score of '1' for the 'Training and Awareness' category if the plan was present, and '0' if it was not. In both cases, self-inspection grades were based solely on the one page checklist that laboratories send to EH&S monthly, not on the container self-inspection checklists posted in each laboratory. In many cases, the posted checklists were filled out even if the monthly self-inspection sheets had not been sent to EH&S.

For 2003-2007 inspections, audit forms were completed during the inspection and the scores were based on actual observations for container management, housekeeping and self-inspection. For training, EH&S records were examined. All laboratories were given a score of 1 for pollution prevention, which is consistent with previous years. 2007 results are presented in Table 1 according to graded categories.

Table 1: 2007 Audit Grading Results at UMass Boston						
Score	Container Management	House-keeping	Pollution Prevention	Self inspection	Training	Total Grade
NA						
0						
1	6	23	108	39	1	
2	8	86		70	108	
3	95					
4						
5						
6						2
7						6
8						14
9						29
10						58
Total	109	109	109	109	109	109
Average Score						9.24

Lessons learned:

We continue to see good conformance with our EMP based on laboratory inspections. Average audit scores have been consistent over the last five years. Presently, 80% have scored greater than 9.

Appendix 1.

Table 2. UMass Boston Laboratory Waste Generation (in lbs)								
Waste Stream	<i>Calendar Year</i>							
	1999	2000	2001	2002	2003	2004	2005	2006
Labpack with poisons	192.83	335.57	1083.36	335.28	374.10	540.95	429.98	507.21
Labpack with corrosives	1161.46	959.94	2165.53	1497.22	919.95	1238.94	862.74	1096.55
Labpack with acutely hazardous waste	31.48	2.00	16.78	8.39	18.78	8.85	0.00	2
Labpack with misc. hazardous waste	739.57	819.62	31.00	6.00	151.96	450.00	2.00	2
Labpack with organic peroxides	19.57	0.00	8.39	0.00	0.00	3.09	0.00	0.52
Labpack with spontaneous combustible material	11.68	0.00	1.00	14.00	2.00	3.25	30.0	5.24
Labpack with pyrophorics	21.34	10.00	28.39	9.00	2.00	3.00	1.00	10.22
Labpack with flammable liquids	2470.02	1168.39	1543.44	2010.64	1750.24	1393.06	775.73	1279.11

Waste Stream	<i>Calendar Year</i>							
	1999	2000	2001	2002	2003	2004	2005	2006
Labpack with flammable solids	11.70	33.39	15.39	65.57	29.00	257.00	556.64	372
Labpack with oxidizers	148.48	121.75	225.10	303.42	52.39	153.64	238.00	277.59
Compressed gases and aerosols	264.27	20.00	156.39	15.57	40.39	62.00	9.00	44
Non-hazardous/non-regulated waste	512.07	240.00	310.00	690.00	830.00	100.00	1595.00	1104
Total	5584.47	3710.66	5584.77	4955.09	4170.81	4213.78	4500.09	4700.44
Total	5584.47	3710.66	5584.77	4955.09	4170.81	4213.78	4500.09	200.35
%Difference from previous year		-33.75	+50.51	-11.27	-15.83	+1.03	+6.79	+4.45
Total % Difference from baseline								-15.83