

Office of Risk Management Environmental Health and Safety Annual Report

Prepare. Prevent. Stay Safe





TABLE OF CONTENTS

The Environmental Health and Safety Office reduces risk to the university community through our focus on hazard management and regulatory compliance while engaging our stakeholders at every opportunity.

MESSAGE FROM THE DIRECTOR	3
DID YOU KNOW	4
WSIB AND COMPLIANCE METRICS	5
RESEARCH SAFETY	6
ASBESTOS MANAGEMENT	9
INDUSTRIAL HYGIENE	10
ERGONOMICS	11
TRAINING HIGHLIGHTS	12
STUDENT IMPACT AND EXPERIENTIAL LEARNING	13
LOOKING AHEAD	14
COMMUNITY ENGAGEMENT	15





MESSAGE FROM THE DIRECTOR



The Environmental Health and Safety (EHS) Team is pleased to present the 2022 Environmental Health and Safety Annual Report, one of three annual reports produced by the Office of Risk Management.

EHS provides expertise and develops proactive and solutions-focused programs in areas of Research Safety, Industrial Hygiene, Ergonomics, Accident and Incident Preven-

tion, Risk Assessment, Regulatory Compliance, Training, and Workplace Violence and Harassment Prevention, among others. We identify, evaluate and mitigate operational risk across the spectrum of our research, teaching and business activities, implementing innovative solutions and providing guidance in support of Carleton's academic mission.

Through ongoing collaboration and the nurturing of strong partnerships with our many stakeholders across the Carleton community, we continue to evolve best-in-class strategies and frameworks to ensure we are building a culture of an ever safer and more respectful environment for all members of the Carleton community to work, study, explore and grow.

The past two years of learning to live with COVID challenged all aspects of our community as the university continued to respond with compassion, resilience, creativity and innovation. Not only did we come together to ensure we remained safe on our campus, but we worked diligently to reassure those individuals who may have retained concerns about their safety in our ever-changing community. The EHS team, as well as the other units within the Office of Risk Management, continued to occupy a pivotal space in the university COVID response, tempering ongoing vigilance with a focus on fully returning to our on-campus activities in a different, and ever safer way.

Despite slowdowns resulting from adherence to COVID-19 restrictions, research at Carleton continued to flourish, garnering significant accolades across the country for the tremendous growth we experienced again this past year. EHS supported this growth, focusing on areas of highest hazard.

Some milestone moments from 2022 include:

 Lowest WSIB Lost Time Injuries (LTI) and No Lost Time Injuries (NLTI) rate of all the Ontario universities for 2022, as well as lowest five-year average for each.

- The 2023 WSIB premium rate is decreasing, based on 2022 performance. At 0.09, our rate will be the lowest of all of the Ontario universities This is projected to result in a savings of approx. \$150K in 2023.
- Completed a comprehensive review of the Tunnel Cart program, including the policy, strengthening the safety program, prescribing preventative maintenance, and development of specialized training.
- Enhanced ergonomic offerings, including creation of additional self-help web resources, and introduced new online ergonomic awareness training, a year in advance of the strategic plan, to support the flexible work strategy.

I am pleased to highlight some of the performance-based metrics achieved across the community in 2022.

CU 2022 Safety Metrics:

- 174 in- person ergonomic assessments, continuing the year over year increase in demand
- 1,200 faculty and staff individually contacted and provided guidance further to symptom reporting
- 250% increase in new biohazard applications reviewed and approved

With a full year as a consolidated Office of Risk Management now behind us, and a new leader at the helm, the richness gained from our varied expertise has resulted in a more cohesive, comprehensive and robust approach to assessing and addressing all levels of risk across the university.

Prepare. Prevent. Stay Safe

Nancy Delcellier, MBA, BSc, CRM, CRSP Director Environmental Health and Safety



DID YOU KNOW ?

67,553

EHS website pageviews

\$15,000

Spent on life safety alarm calibrations and repairs

Emergency spill response supplies capable of absorbing

1,363 |

Absorber

of chemicals were distributed across the faculties

122 Respiratory fi

Respiratory fit tests performed

200

Animal Use Protocols reviewed

174

Ergonomic assessments conducted



Incidents, injuries and good catches reported in CU WorkSafe

467

2022 Environmental Health and Safety Annual Report

4

HEALTH AND SAFETY EXCELLENCE

Carleton continued the excellence journey in 2022, following our successful inaugural participation in the WSIB Health and Safety Excellence program, having netted a rebate in our premiums. This year, efforts focused on health and safety program enhancements related to hazard control.

WSIB AND REGULATORY COMPLIANCE METRICS

Strong collaboration between EHS and Human Resources ensures that Carleton continues to make significant strides both in injury prevention and in managing return to work for injured workers. Data from 2022 indicates that Carleton has the lowest Lost Time Injuries (LTI) and No Lost Time Injuries (NLTI) rates of all the Ontario universities, as well as the lowest five-year average. This is reflected in our WSIB premium rate for 2023 being the lowest of all the Ontario universities at 0.09. This is expected to result in a premium savings of approximately \$150K for 2023.



Lost Time Injury (LTI) Frequency 5-YR Average

Despite our stellar injury rate, a critical injury in 2021, and another in late 2022, contributed to a significant jump in days lost. While this will not impact the 2023 rate premium, it is expected to impact 2024. No orders were issued by the Ministry of Labour, Immigration, Trades and Skills Development (MLITSD) for any of the critical injuries. There was, however, a compliance visit conducted by the MLITSD further to an anonymous complaint related to air quality and COVID safety protocols. Findings confirmed that Carleton met or exceeded all COVID health and safety recommendations.

The number of Good Catches for 2022 decreased substantially compared to the previous year. Communications in the coming year will focus on the value of Good Catch reporting and the importance of proactive measures.

	2019	2020	2021	2022	5 Year Avg	Change
# of Critical Injuries	4	0	1	3	3	\land
# of Lost Time Injuries	9	3	4	8	5.8	
Days Lost to Injuries Claims	16	8	107	108	49.4	
Average # of Lost Days/Claim	1.8	2.6	26.8	13.5	6.6	
# Of Good Catches Reported	105	91	139	92	117.6	



Health and Safety

Excellence program



As Carleton earns the reputation of Canada's fastest growing research-intensive university, the supporting role of EHS in ensuring safety in our laboratories across campus has also increased considerably.

RESEARCH SAFETY

HAZARDOUS WASTE MANAGEMENT

The safe disposal of hazardous waste continues to be crucial for research and campus operations. EHS co-ordinates with multiple stakeholders including, but not limited to, researchers in the faculties of Science and Engineering and services, such as Science Technology Centre (STC), Facilities Management and Planning (FMP), and Dining Services. This ensures that all hazardous waste generated on campus is collected and disposed of in compliance with the applicable regulations. As of Jan. 1, 2023, institutions subject to Ontario's amended Regulation 347: General – Waste Management, are required to report their activities through a new online portal overseen by the Resource Productivity and Recovery Authority (RPRA). Preparation for this transition, occupied the fourth quarter of the year.

11, 657 kg Hazardous waste safely disposed

CHEMICAL SPILL MANAGEMENT ASSESSMENT

Following the 2021 review of emergency readiness in regards to proper storage of large volumes of hazardous materials, EHS continued to focus on risk mitigation for potential chemical spills in laboratories. 65 spaces, within nine buildings, were visited and assessed. A gap was identified in chemical spill response planning as 54% of rooms were not equipped with proper spill kits nor were spill response procedures available.



Therefore, resources were developed to educate and reinforce lab safety culture across the university. A general chemical spill guideline, lab-specific standard operating procedure template, spill response plans, and a recommended spill kit inventory were devel-

oped to help plan for an appropriate response when a chemical spill occurs. Moving forward, these tools will be made available on a dedicated spill response webpage.

EMERGENCY SHOWER AND EYEWASH AUDIT

Leveraging our connections with our external suppliers, laboratory emergency showers and eyewashes across the university were audited to determine the general state of readiness. Of 166 units, **32%** did not meet the performance requirements related to water pressure as stipulated by the updated ANSI standards. This could potentially impact emergency response capabilities. EHS is working with Facilities Management and Planning to develop a plan to address these deficiencies.

CHEMICAL INVENTORY SYSTEM



By hiring summer student workers, the Environmental Health and Safety team was able to successfully reconcile Carleton's chemical inventory system. Approximately 22,000 individual chemicals were located and scanned and an additional 6,000 were removed from the inventory. This task is crucial to ensure the accuracy of the inventory system. In conjunction with this project, the students also updated laboratory signage across campus to reflect the revised pictograms of the globally harmonized system.

"EHS has had a major role in ensuring that our research meets regulatory standards and brings to the table new information on current national and international policies on biosafety. EHS is an integral part of the success that Carleton has in the growth of its research."

> Dr. William Willmore Faculty Member, Institute of Biochemistry

BIOLOGICAL SAFETY

Many regulations apply to the handling and storage of hazardous materials and EHS plays a critical role in ensuring compliance with legislation, particularly so in our research intense areas. Carleton's institutional licence issued under the Human Pathogens and Toxins Act, stipulates the safe use of biohazardous materials. In June, the Public Health Agency of Canada conducted a day-long inspection of our biosafety program in relation to our small animal containment zones. Preparations included extensive consultation with internal and external stakeholders, development of a comprehensive biosafety web page and an update of Carleton's biosafety manual. Findings from the inspection listed only minor non-compliance issues that were easily rectified. The co-operation of staff and students across the faculties on this occasion and in their daily research activities resulted in a highly successful outcome.

Over the last 3 years, there has been a 98% average increase in the number of new biohazard applications



ANIMAL RESEARCH STUDIES

EHS plays an important role in the Animal Care Committee to not only assess animal welfare, but also to ensure the safety of Carleton students and employees in the animal research laboratories. Numerous factors contribute to a higher risk of occupational exposures in animal care workers. Therefore, risk assessments were conducted for in-vivo use of biohazards in the new containment level 2 suites and for the use of various toxic chemicals handled in the chemical suite. Last year, after consultation with the vivarium-user group we standardized the risk assessment process for hazardous chemical agents. This new streamlined process will allow for better risk control and mitigation and will speed up the protocol approval process. We are planning to implement a similar process to the Field/Wildlife Research protocols.

LASER SAFETY PROGRAM

Date:	Depa	Department:			
Supervisor:	Build	Building/Room:			
Posting, Labeling and Security Measures					
	Yes	No	NA	Comments	
Are entrances properly signed?	0	0	0		
Is the room adequately secured?	0	0	0		
Is the door interlocked?	0	0	0		
Is there a laser status indicator outside the	0	0	0		
room?	0	0	0		
Laser Unit Safety Controls					
	Yes	No	NA	Comments	
Is the protective housing in place?	0	0	0		
Is there an interlock on the housing?	0	0	0		
Is there a beam shutter?	0	0	0		
Is there a key operation?	0	0	0		
Is there a laser activation indicator?	0	0	0		
Is there an emergency shutoff available?	0	0	0		
Engine	eering S	afety	Contr	rols	
-	Yes	No	NA	Comments	
Are laser optics secured?	0	0	0		
Are lasers at eye level?	0	0	0		
Is the beam enclosed?	0	0	0		
Are beam stops in place?	0	0	0		
Is the heam collected using ontics?	0	0	0		

The laser safety program has expanded to include a mandatory self-inspection procedure for laboratories with regulated laser systems. This requires researchers to complete a checklist biannually and submit for review. Deficiencies can then be identified and addressed through concerted efforts between the lab and EHS. **60%** of laser labs have successfully completed the process with the remainder expected in the first quarter of 2023.

ENGINEERED SAFETY CONTROLS



We appreciate EHS's contribution to our safety

Mark MacGuigan



Laboratory and workshop ventilation systems are critical engineering controls used to draw and exhaust hazardous vapours. To prevent occupational exposures, it is imperative that these are functioning as intended.

Over 180 fume hoods were tested on campus in 2022 and 60% were found to be deficient requiring either: recalibration of the air flow monitor; a reminder to laboratory personnel that clutter in the hood reduces its efficacy or; mechanical issues that required repair by either FMP or an external qualified service provider. All deficiencies were addressed with minimal interruption to ongoing lab work thus ensuring a safe environment for users.

Local exhaust ventilation systems within workshops were also inspected to ensure proper capture of dust, smoke, vapours and fumes generated during research or operational activities.

Eleven downdraft tables were tested for smoke capture and air velocities and were found to be within safe use parameters

SAFETY THROUGH VALIDATION



systems, downdraft tables and biological safety cabinets inspected and deficiencies addressed

Engineered life safety systems such as roof anchors, hoisting and rigging equipment, athletic training equipment, fixed access ladders, and other critical equipment used by trades and researchers must be inspected annually under the Occupational Safety and Health Administration (OHSA). EHS co-ordinates with our contracted third party service provider and oversees this annual certification process.

A total of 1,519 pieces of critical equipment were inspected with a pass rate of 95%. Deficiencies were as follows; 21 items had missing or improper labelling or documentation, 22 items were identified as a safety risk and removed from service, and 35 items required repair or replacement when practicable.

EMERGENCY RESPONSE

EHS provides support in emergency response situations. There were five instances in 2022 that required co-ordination and participation by EHS members to ensure safe and proper cleanup of hazardous materials.

- Safe cleanup of a leaking 45-gallon drum of organic waste solvent. The bulk drum was found leaking as a result of
 corrosion due to improper labelling. Internal procedures were revised to reduce potential ofrecurrence.
- Clean up in a public corridor of a spilled bottle of isoflurane, a highly volatile and toxic controlled substance. The cause of the spill was due to improper transportation procedures.
- Following the discovery of numerous unstable chemicals, EHS co-ordinated and participated in the removal and compliant disposal of hundreds of bottles of dated materials following the retirement of a long-standing faculty member.
- We provided technical expertise to assist in the safe cleanup of two instances of liquid refrigerant spills in mechanical spaces.

ASBESTOS MANAGEMENT





- Once again, asbestos removal activities were centred on building mechanical systems. An estimated 1,100 fittings/ elbows along with over 22 linear meters of ACM pipe were removed from the Steacie crawlspace while 148 fittings/ elbows were removed from Robertson Hall following a type 2 glove-bag operation.
- Following asbestos removal, all exposed piping was reinsulated with mineral based insulation and finished with a non-fabric vinyl or metal covering to prevent the growth of mould, extend the lifespan of the pipe covering and render it safer for workers.
- In addition to asbestos-containing material (ACM) removal, mould-contaminated pipe insulation was removed and replaced within Archives.
- We are currently undergoing a cyclical update of Carleton's ACM database. This will ensure workers have accurate information to avoid exposures and assist in devising a strategy for asbestos removal moving forward.

ASBESTOS BY THE NUMBERS

22+

Linear metres of ACM pipe insulation removed

1,240+

ACM elbows/ fittings removed from high use mechanical rooms and fittings and pipes re-insulated





INDUSTRIAL HYGIENE

As more people returned to campus in 2022, we saw increased demand to assess indoor air quality (IAQ) in office spaces. Indoor air quality testing can help identify potential air quality problems, and assist with determining the source of any identified issues. Our IAQ surveys include measurements for contaminants such as particulates (PM), volatile organic compounds (VOCs), carbon monoxide (CO) and physical parameters such as relative humidity, temperature, and dampness. All findings were below occupational exposure levels. (Exposure Guidelines for Residential Indoor Air Quality, Health Canada). While temperatures were within the recommended comfort range for the winter season, we did find substantially lower humidity levels than recommended. This was addressed with FMP, as dry indoor air can be linked to exacerbation of respiratory symptoms, including itchy and dry eyes, skin, and sinuses. These small adjustments increased comfort, and served to further reassure returning staff.



To ensure staff and students are not at risk of overexposure, a noise level assessment was proactively requested by the Faculty of Engineering and Design upon installation of new vacuum pump equipment. Findings from EHS spot measurements exceeded the action limit and required the implementation of hazard control measures. Recommendations included the use of earplugs when the equipment is in operation and the posting of signage at all entrances advising of the hearing protection requirements.



ERGONOMICS

We saw an increased demand for ergonomic assessments from faculty and staff. A record 174 individual (in-person) sessions were conducted across various departments. Averaging 45 minutes per assessment, this focused attention has already paid dividends, as no WSIB musculoskeletal claims were filed.

As a result of Carleton's implementation of the Flexible Work Arrangements program, ergonomic recommendations are proactive and include a focus on shared workspaces. We recognize that in order to support the hybrid work model and to meet the diverse needs of workers, our recommendations must be centred on adjustability and the ability to accommodate various body sizes and postures.

Originally planned as a priority for 2023, we are happy to announce that improvements to our ergonomics program were achieved a full year earlier than planned:

- Developed and successfully launched office ergonomics training available to all Carleton employees and students on Brightspace
- Developed and implemented a standardized pre and post assessment evaluation process
- Provided a platform for streamlined ergonomic assessment booking

In addition, we provided job specific training for FMP employees who are part of the furniture moving team. With an emphasis on proper lifting and manual material handling techniques, this training mitigated potential ergonomic injury.

In October, during Global Ergonomics Month, EHS hosted a Lunch n' Learn workshop on office ergonomics.

In 2023, we anticipate collaborating with a faculty researcher to optimize the equipment selection process and overall ergonomic workplace design.







TRAINING HIGHLIGHTS



Health and Safety training remains a critical element to ensure staff and students are aware of hazards and can safely conduct their activities, whether in an office setting, workshop, mechanical space or laboratory.

Three new training courses were developed and launched in Brightspace and promoted through Carleton's Top 5 to reach a wide audience. Infection Prevention and Control (replacing COVID-19 training), Tunnel Cart Safety, and Office Ergonomics were published in Brightspace and accompanied with their own webpage.



IN-CLASS AND VIRTUAL TRAINING PARTICIPANTS

Autoclave Safety	26
Biosafety Awareness	130
Confined Space	16
First Aid and CPR	55
Forklift	1
Grounds Crew Safety	11
Hoisting and Rigging	1
Laboratory Safety	257
Laser Safety	29
Lockout Tagout Safety	9
Radiation Safety	20
JHSC Orientation	6
Transportation of Dangerous	
Goods	10
Working at Heights	53
Workplace Inspection	6

Asbestos Awareness 10, 590 to demon-Total number of training completions

All course completions are seamlessly integrated into Banner to demonstrate and support legislative compliance, and are available to every employee through the Carleton Central portal.

EHS continues to provide training from certified third parties in areas of high hazard, particularly for the trades, to continue their unique skills development, and to ensure due diligence. This year saw the resumption of in-person training, for individuals working in a laboratory environment, while maintaining virtual offerings to enhance training options.

Together, with the faculties of Science and the Faculty of Arts and Social Sciences, we offered an inaugural Wilderness First Aid training. This two-day course prepared students to handle the unique emergencies they could encounter during field work while working in remote locations. Feedback from the session has validated the necessity for ongoing annual sessions in support of field activities.



ONGOING SUPPORT FOR COVID-19

To protect the health and safety of our community, Carleton took additional steps to keep those who were sick or were exhibiting symptoms away from campus, in an attempt to reduce overall transmission in the workplace. The Environmental Health and Safety team and two student staff continued to follow-up with all employees and affiliates who completed the COVID-19 Symptom Reporting Form through cuScreen to provide them with guidance and support. Weekly data on campus cases, as well as waste water monitoring, were provided to the Joint Health and Safety Committee (JHSC), the Return to Campus Committee and the university leadership to assist with decision-making.

- 1,200 individuals were contacted and advised on isolation timelines dependent on their particular circumstances.
- EHS continued to streamline the symptom reporting process by advising respective supervisors and managers with their employees' expected return to campus date.
- Although no longer mandatory as of May 1, 2022, 1,900 vaccine attestation forms and 1,035 employee booster dose forms submitted through cuScreen were verified to ensure document authenticity.

STUDENT IMPACT AND EXPERIENTIAL LEARNING

Building on the success of existing experiential learning activities, we seek out opportunities for student engagement and knowledge transfer.

- Completion of respiratory fit testing for student work placements in Social Work and Health Sciences, as well as all Carleton University Student Emergency Response Team (CUSERT) members
- Reviewed exercises for new undergraduate laboratories in the Faculty of Science
- Faculty of Engineering and Design Capstone projects: Introduction to real-world safety requirements
- 16 Carleton students joined the EHS team to assist with vaccine validation and other Health and Safety initiatives
- Provided work opportunities for Act to Employ students as part of the EHS summer team. Students had the opportunity to present their work to university Senior Leadership
- For the sixth consecutive year, we are pleased to have welcomed a placement student from Carleton's Health Sciences program to our team



LOOKING AHEAD

Even as we continue the implementation of EHS's four-year strategic plan, the focus for 2023 will be to return to some of our basics, as the time away from campus for faculty, staff and students has resulted in the loss of some health and safety culture foundational elements. We have been extremely successful over the past few years in ensuring a safe return to campus from a COVID perspective, but other elements have lost their priority.

Inspections to higher risk areas, such as laboratories and workshops across campus in 2022 identified a significant increase in non-compliance with basic laboratory and workshop safety procedures, which increase the risk of a significant negative event.

Many supervisors have effectively focused on managing a virtual and geographically remote workforce, but may have forgotten their critical role in ensuring a dynamic and vibrant safety culture. In 2023, there will be an opportunity to remind Leaders that a workplace, where physical safety and compliance to safety frameworks is prioritized, will result in significant benefits to efficiency, reputational enhancement, and position the university for continued success across our strategic pillars.

3 P R I O R I T I E S

THE SUPERVISOR/ MANAGER ROLE

Connect/collaborate with managers, including faculty members supervising research teams across the university, to enhance their awareness and provide them tools to effect positive change in safety culture.

WORKSHOP SAFETY PROGRAM

Develop a safety program to address the unique hazards and risks associated with workshops, engineering laboratories, studios, and related spaces. This will provide tools and resources to mitigate risks related to teaching, research and operational activities, and provide a unique opportunity for skilled learners to practice their craft safely.

BACK TO BASICS

Begin the cyclical review of selected health and safety programs, including Designated Substances and Construction Safety Management. With recent changes to select regulatory frameworks, as well as new strategies for the Planning, Design and Construction team of Facilities Management and Planning, this actively provides not only compliance validation, but allows for the implementation of best practices in these two higher risk areas.

STRATEGIC PRIORITIES 2023 AND BEYOND

	Year 3 (2023)	Year 4 (2024)		
	Develop Workshop Safety Program	Implement Workshop Safety Program		
	Develop and Implement Laboratory and Workshop Inspection Program			
	Continue to expand H&S training opportunities and develop/ introduce mandatory risk management training	Implementation of H&S training linked to job descriptions		
A A A A A A A A A A A A A A A A A A A	Cyclical review of selected H&S	Cyclical review of selected H&S		
State State State	programs and training	program and training (Year 2)		
	Health and Safety Excellence Year 3	Health and Safety Excellence Year 4		

COMMUNITY ENGAGEMENT

- Building a strong health and safety culture is crucial to Carleton's success! Our team participated in events such as Residence Move-in, Expo Carleton, and the Panda game. We also offered numerous opportunities for engagement to the campus community during the annual national Safety and Health week.
- By collaborating with the VP Students and Enrolment's initiative to install Naloxone stations, the university is well positioned to comply with the new "Naloxone in the Workplace" legislation coming into effect in June 2023.
- EHS benchmarked smudging procedures across Ontario universities, providing the Centre for Indigenous Support and Community Engagement with tools to safely enhance and expand Carleton's Smudging activities.
- Carleton University hosted the 2022 annual meeting of the Ontario Universities Biological Safety Officers. The 2-day hybrid event brought together 22 universities and affiliate institutions to discuss topics related to the safe use of biohazardous materials. Participation by the Canadian Food Inspection Agency and Environment and Climate Change Canada, expanded the outreach.

Internal

Joint Health and Safety Committee

Faculty Safety Committees (FED and Science)

Return to Campus Committee

Animal Care Committee

Biohazards Committee

Radiation Safety Committee

Emergency Management and Continuity of Operations (EMCO) Advisory Committee External

Council of Environmental Health and Safety Officers (CEHSO) Ontario University Biological Safety Officers (OUBSO) Public Service Health and Safety Association (PSHSA) Education Advisory Council

Our dynamic and highly skilled team supports the prevention of incidents and injuries on campus through a number of solution-based, customer-focused programs. We work collaboratively with faculty and staff to enable and support research and student activities. Drop in anytime!



Nancy Delcellier MBA, BSc, CRM, CRSP

Director Tina Preseau MSc Manager, Laboratory and Academic Safety Zaneta Polis HBSc, MPH Manager, EHS Tim Golding BScEE, CRSP EHS Officer Stephanie Vaithilingam, BScH EHS Officer Norm Barton Radiation Safety Officer

