1.0 INTRODUCTION

Weill Cornell Medical College (WCMC) is committed to the protection of human health and the environment. To meet these commitments, the Medical College encourages the utilization of chemical waste minimization and pollution prevention techniques. This reduces the volume and toxicity of chemical wastes generated. An added benefit is the reduction of chemical waste disposal costs.

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3.0 APPLICABILITY

The waste minimization and pollution prevention techniques identified in this program apply to all students, faculty, staff, visitors, and contractors working on behalf of WCMC who use chemicals at the Medical College.
4.0 RESPONSIBILITIES

4.1 ENVIRONMENTAL HEALTH AND SAFETY (EHS)

Environmental Health and Safety’s responsibilities include:
- Act as a resource to WCMC personnel, providing technical assistance and guidance on waste minimization.
- Review and monitor existing waste minimization practices.
- Conduct College-wide waste minimization studies to identify new waste minimization programs to be implemented.
- Provide training as requested.

4.2 PRINCIPAL INVESTIGATORS AND SUPERVISORS

Principal Investigator and Supervisor responsibilities include:
- Promote and practice waste minimization concepts.
- Establish procedures for conducting specific waste minimization activities.
- Ensure that all personnel and/or contractors adhere to the waste minimization concepts provided in this procedure and Department internal procedures.

4.3 PERSONNEL USING CHEMICALS

Personnel using chemicals must:
- Practice the waste minimization concepts detailed in this program.
- Follow internal procedures developed by their Principal Investigator (PI) and/or supervisor.

4.4 CONTRACTORS

Contractors must ensure that:
- All unopened or unused portions of chemicals brought on-site are removed by the contractor upon completion of services.
- Waste minimization techniques are used when feasible.

5.0 CHEMICAL WASTE MINIMIZATION TECHNIQUE

Chemical waste minimization and pollution prevention techniques include the following:

5.1 TRAINING

Each individual at the Medical College must choose to minimize chemical wastes for the program to work successfully. Personnel are to be trained when they are first hired, yearly thereafter, and when procedures change.

5.2 CHEMICAL REDISTRIBUTION
Unopened or unused portions of chemicals may be redistributed within the College to other users. If a chemical is needed, especially exotic, high-hazard and single-use chemicals, check with other laboratory personnel and colleagues within the Medical College for availability before ordering. EHS will occasionally offer chemicals for redistribution that were collected from laboratory close-outs.

5.3 **END OF PROCESS TREATMENT**

Write end of process treatment procedures into your standard operating procedures and use them. An example would be to conduct “in container” neutralization of an acid with a base and flush to the local sewer with excess water if in accordance with the College’s Drain and Trash Disposal of Chemicals procedure. Contact Environmental Health and Safety for additional information.

5.4 **PROCESS MODIFICATION**

To the extent that it does not compromise research, teaching, or service, laboratories are encouraged to modify experimental or standard processes to decrease the quantity of hazardous chemicals used and generated. Whenever possible, micro- and semi-micro techniques should be used to reduce the volume of waste generated.

5.5 **PRODUCT SUBSTITUTION**

Substitute non-hazardous or less toxic materials in your chemical processes and experiments. Some examples include:

- High flashpoint scintillation fluids (e.g., Ecoscint).
- Non-mercury thermometers (e.g., Enviro-Safe™).
- Detergents and enzymatic cleaners can be substituted for sulfuric acid/potassium dichromate (chromerge) cleaning solutions and ethanol/potassium hydroxide cleaning solutions.
- Avoid the use of known carcinogens, mutagens, or extremely hazardous chemicals where possible.

5.6 **RECYCLING**

The Medical College collects some precious metals and valuable chemicals for recycling by outside contractors to reduce waste disposal costs. Some departments are involved in the reclamation of precious metals and chemicals from laboratory processes. Examples include:

- Reclamation of silver from photofixing chemicals.
- Collection of mercury (e.g., thermometers and lamps) for distillation by an outside recycler.
- Collection of surplus electronics (e.g., computers) for recycling by an outside recycler.
5.7 SEGREGATION AND CHARACTERIZATION:

Do not consolidate various process/experiment wastes into the same container unless the wastes contain similar constituents or you are otherwise authorized to do so by EHS. Accurately label waste containers, including all chemical contents and approximate percentages. Segregation and characterization simplifies the waste stream, facilitating treatment and disposal.

5.8 INVENTORY CONTROL

It is important to audit chemical supplies and use inventory control measures. Purchase only the quantity of chemicals required for a specific project and do not stockpile chemicals unnecessarily. Chemicals in storage should be examined periodically for changes in the condition of the chemical, the container holding the chemical, and/or the storage area. Signs of degradation such as split caps; accretion of deposits on the bottles or on shelf surfaces in the storage area; formation of two phases or change in physical state or formation of crystalline structures within liquids should be corrected immediately or submitted for disposal through EHS. Some changes in the chemical may not be readily visible (e.g. formation of peroxides in ether). Before using or storing chemicals, become familiar with their physical and chemical hazards.

5.9 STORAGE PRACTICES

5.9.1 Chemical Segregation and Secondary Containment

Chemical containers should be stored and segregated according to their hazard (e.g., flammables, acids, bases, oxidizers, reactives, and poisons) and away from incompatible chemicals. Measures such as secondary containers to protect the stock container may be required to safely store chemicals. This will help minimize the damage and/or deterioration of chemicals in the event of spills. Information on the specific hazards is available on the chemical’s Safety Data Sheet (SDS). A listing of chemical incompatibilities is available in Section 17 of the EHS Program Manual, section 4.1 - Laboratory Chemical Hygiene Plan.

Examples include:

- No storage of chemicals, excluding standard detergents, under sinks.
- Store acids and bases in dedicated cabinets, and separate acids and bases.
- Flammables are not to be stored near ignition sources or oxidizing chemicals.

5.9.2 Chemical Labeling Practices

All containers must have an appropriate container label intact and legible at all times. Any defaced, faded or separating labels should be addressed
immediately, either by correcting the label or offering the chemical to EHS for disposal. Any unknown chemicals must be labeled as such and immediately submitted to EHS for disposal.

5.9.3 Expired Chemicals

Expiration dates must be clearly marked for chemicals that are in reactive groups or chemicals with similar functional groups which may, upon long term storage, develop hazardous characteristics (e.g., peroxide-forming chemicals). Storage of chemicals should be consistent with FDNY storage limits found in the “Laboratory Chemical Hygiene Plan.”

6.0 REFERENCES

EHS Program Manual, section 4.1 - Laboratory Chemical Hygiene Plan.