SRM UNIVERSITY – *AP*, ANDHRA PRADESH

SRMAP / Reg. Off / Policies /8/ 2024-25 **11th February 2025**

Chemical and Hazardous Waste Disposal Policy

1. Purpose

SRM University-AP (SRMAP) protects its employees from chemical hazards in its research and teaching labs. This policy explains how to safely handle hazardous chemicals throughout their lifecycle - from purchase to disposal. This includes how to handle, store, transport, process, and dispose of chemicals. The university works only with government-approved waste contractors to dispose of hazardous chemical waste. This policy follows the National Environment Policy 2006 by creating clear plans for handling hazardous waste and supporting the use of environmentally friendly technologies.

SRMAP mandates everyone - including staff, students, and visitors - must follow this policy when handling hazardous waste in the campus. All hazardous waste produced on campus must be managed according to the Hazardous Wastes (Management and Handling) Rules, 1989, which were created by the Central Pollution Control Board. These rules follow the Environment (Protection) Act, 1986, as established by India's Ministry of Environment and Forests. Anyone who creates, stores, or disposes of hazardous, radioactive, or chemical waste must legally comply with all relevant national and international environmental protection laws.

2. Definitions:

(i). Hazardous Material: Any material that presents a risk to physical or mental health upon exposure. This definition excludes radioactive materials and infectious agents, as these are covered under separate policies.

(ii). Hazardous Waste: As defined by Hazardous Wastes (Management and Handling) Amendment Rules, 2003 (effective May 20, 2003), hazardous waste includes any waste that poses danger to health or environment due to its: Physical characteristics, Chemical properties, Reactive nature, Toxic properties, Flammability, Explosive nature, Corrosive characteristics This includes all wastes listed in Schedules 1, 2, and 3 of HW (M & H) Rules, 2003.

(iii). Material Safety Data Sheet (MSDS): Technical documentation provided by product manufacturers that details: Toxicity information, Physical hazards, Safe handling procedures.

(iv). Cleaner Production: As defined by UNEP (1990), refers to the ongoing implementation of integrated environmental strategies for processes, products, and services to: Increase efficiency and Reduce risks to humans and environment.

3. Chemical Waste Disposal Committee

The Chemical Safety Committee is comprised of university faculty and staff.

S.No	Chemical Safety Committee	Designation
1	Dr Jatis Kumar Dash, Dept. of Physics	Chair
2	Dr Debajyoti Kundu, Assistant Professor, Dept. of Environmental Science and Engineering	Member
3	Dr Sudeshna Saha, Assistant Professor, Dept. of Biological Sciences	Member
4	From CLM directorate, nominated by Director CLM	Member
5	Dr Chinmoy Das, Assistant Professor, Dept. of Chemistry	Member & Convenor

The Chemical Waste Disposal Committee shall have the following responsibilities:

1. Development, review, and approval of campus policies pertaining to the purchase, use, storage, and disposal of chemicals.
2. Assessment of compliance with campus policies and recommendation of methods to enhance compliance measures.
3. Coordination with other institutional committees, including but not limited to the Biological Safety Committee, Animal Care and Use Committee, and Institutional Review Boards to ensure proper addressing of chemical safety concerns.
4. Monitoring and review of engineering controls, including chemical fume hoods and gas storage tankers.
5. Oversight of usage and disposal of extremely hazardous substances, specifically HF and perchloric acid or residues.
6. Assessment and recommendation of safety equipment including Safety Showers, Eyewashes, and Fire Extinguishers.
7. Authorization of Principal Investigators for the use of Particularly Hazardous Substances including pyrophoric, highly reactive, or flammable compounds.
8. Management and execution of all hazardous waste disposal operations.
9. Issuance of non-compliance notifications to respective department heads and Deans.
10. Escalation of continued non-compliance matters to the Dean or Vice Chancellor, as applicable.

11. Implementation of proper identification and labelling protocols for all waste containers.
12. Establishment and maintenance of periodic waste collection schedules.
13. Ensuring legal and safe disposal of hazardous waste.
14. Facilitation of proper hazardous waste disposal during laboratory decommissioning or remodelling processes, including proper identification and labelling of waste containers.
15. The following records are maintained by the Chemical Waste Disposal Committee: all permits, licenses, hazardous waste shipping documents, inspection logs, training records, and regulatory agency correspondence.

4. General Laboratory Safety and Hazardous Waste Management Policies

The Chemical Safety Committee is authorized to develop, review, and approve campus-wide policies governing chemical purchase, use, storage, and disposal. All university personnel must comply with these policies in addition to applicable government regulations. Principal Investigators may establish additional laboratory-specific policies, provided they meet or exceed existing regulations and campus policies. Prior approval from the Chemical Safety Committee is required for the use of Particularly Hazardous Substances, including pyrophoric, highly reactive, radioactive, carcinogenic, or flammable compounds.

5. Roles and Responsibilities of PIs and Laboratory Personnel

The Principal Investigator (PI), whether managing research projects or academic laboratories, holds primary responsibility for workplace safety and policy compliance within their assigned laboratory space.

(i). Laboratory Safety Requirements: When working with hazardous chemicals, the following safety protocols must be observed:

1. Laboratory coats must be worn at all times.
2. Close-toed shoes and safety glasses are mandatory when hazardous chemicals are present.
3. Eating and drinking are strictly prohibited in laboratories containing hazardous chemicals.
4. Audio headphones (over-ear and in-ear) are prohibited during chemical procedures and hazardous operations.
5. Engineering controls, personal protective equipment, and administrative controls must be properly utilized to prevent chemical exposure.
6. Laboratories must maintain good housekeeping practices.

7. All passageways, exits, utility controls, and emergency equipment must remain accessible at all times.

(ii). Hazardous Waste Management: All individuals handling chemicals at SRMAP are responsible for proper waste disposal. The waste generator must ensure that proper container labelling (including, complete description of contents, date of disposal, and material safety data sheets (MSDS).

(iii). Financial Responsibilities: While properly labelled and packaged hazardous wastes typically incur no disposal fees, charges will apply for (a) Identification of unlabelled containers, (b) Disposal of compressed gas cylinders, and (c)Disposal of atypically large quantities of hazardous waste. The waste generator bears responsibility for proper labelling, waste segregation, and coordinating disposal with the Chemical Waste Disposal Committee.

(iv) Additional roles and responsibilities of Principal Investigator (PI) and Laboratory Personnel:

The PI, whether managing research projects or academic laboratories, holds primary responsibility for workplace safety and policy compliance within their assigned laboratory space. The PI shall:

Safety Documentation and Procedures:

- Develop and implement Standard Operating Procedures (SOPs)
- Establish appropriate administrative controls within SOPs
- Maintain Safety Data Sheets and safety-related documentation
- Keep updated chemical inventories
- Document all training, exposure monitoring, approvals, and safety-related matters

Training and Supervision:

- Ensure all students, scholars, and interns understand and comply with chemical safety policies.
- Determine and provide appropriate training based on specific laboratory operations
- Verify staff knowledge of emergency procedures (fires, equipment failures, chemical exposures, spills)

Laboratory Personnel Responsibilities (all individuals working under PI supervision) must undertake safety training. Also:

- Adhere to all campus and laboratory practices, policies, and SOPs.
- Attend all required safety training sessions.
- Operate only equipment for which they have received proper training and authorization.

- Review chemical information (Safety Data Sheets, Prudent Practices, literature) prior to handling substances.
- Understand emergency procedures before working with hazardous chemicals.
- Incorporate safety considerations in all experimental planning.
- Maintain clean and organized work areas.
- Follow established laboratory protocols consistently

6. Action Plan for Hazardous Waste Management

The Institute shall store hazardous waste for a maximum of 90 days, unless extended by the State Pollution Control Board, and must maintain comprehensive records of all sales, transfers, storage, recycling, and reprocessing activities. Approved disposal methods include recycling, reuse, on-campus treatment facilities, storage facilities, or authorized incineration as per guidelines. Additionally, the Institute must maintain detailed inventories of end-of-life consumer goods, including e-waste.

The Institute maintains two types of waste accumulation areas. Satellite accumulation areas are designated for collection and temporary storage near generation points, with the Chemical Waste Disposal Committee responsible for collecting full containers and transporting them to the Central Waste Accumulation Area. This central facility serves as a secure, hazard-marked building where campus-wide waste is stored, consolidated, and packaged for disposal. The facility undergoes weekly inspections and is equipped with on-site spill kits for emergency response to accidental releases.

An Emergency Response Plan is in place to standardize the Institute's response to hazardous material incidents. This plan, which focuses on reducing risks to human health, environment, and property, requires annual updates and contains detailed emergency procedures. The Chemical Waste Disposal Committee maintains and distributes copies of this plan.

The Chemical Waste Disposal Committee provides mandatory hazardous waste training for all SRMAP faculty, staff, and students involved in waste generation. All personnel must complete annual refresher training, while Committee members involved in waste packaging and disposal must undergo additional specialized training.

7. Waste Minimization Plan

SRMAP strictly adheres to the Hazardous Waste Minimization Plan, focusing on reducing waste generation through two primary approaches. The first approach emphasizes waste avoidance and pollution prevention by implementing cleaner production methods. The second approach focuses on recovery, reuse, and recycling of materials whenever possible. Through these strategies, SRMAP demonstrates its

commitment to environmental responsibility and sustainable waste management practices.

8. Procurement responsibilities:

All persons authorized to procure resources for SRMAP employees and students shall:

1. Assess potential hazards associated with materials prior to purchase
2. Ensure supervisors inform users about:
    - Potential dangers of the materials
    - Proper handling procedures

Waste that has not been specifically listed can still be characteristically hazardous if it exhibits any one of the following characteristics:

(i). Ignitability refers to materials that pose fire hazards, including flammable liquids with flashpoint below 140°F such as alcohols, acetone, ethyl acetate, mineral spirits, and gasoline. This category also includes oxidizers (nitrates, perchlorates, bromates, permanganates, peroxides, iodates) and organic peroxides (benzoyl peroxide, cumene hydroperoxide, methyl ethyl ketone peroxide).

(ii). Corrosivity encompasses aqueous liquids with pH less than 2 or greater than 12.5, or liquids capable of corroding steel at a rate exceeding 6.35 mm (0.250 inches) per year at 55°F. This includes inorganic acids (hydrochloric acid, sulfuric acid, nitric acid, perchloric acid, phosphoric acid), organic acids (formic acid, lactic acid), and bases (hydroxide solutions, amines).

(iii). Reactivity describes materials capable of violent reactions or toxic fume generation. This category includes sulfides and cyanides, peroxide formers (ethers, potassium amide, sodium amide, vinyl acetate, tetrahydrofuran), water reactive materials (sodium, potassium, lithium, calcium carbide), multi-nitrated compounds (picric acid, nitrosoguanidine, trinitroaniline), perchlorate crystal formers (perchloric acids), and compounds that may undergo vigorous polymerization (acrylic acid, vinyl acetate, methyl acrylate).

(iv). Toxicity refers to materials that exceed regulatory limits when subjected to toxicity characteristic leaching procedure (TCLP). These include various metallic, organic, and pesticide constituents such as arsenic, barium, cadmium, chloroform, chromium, m-cresol, mercury, selenium, and silver, among others.

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