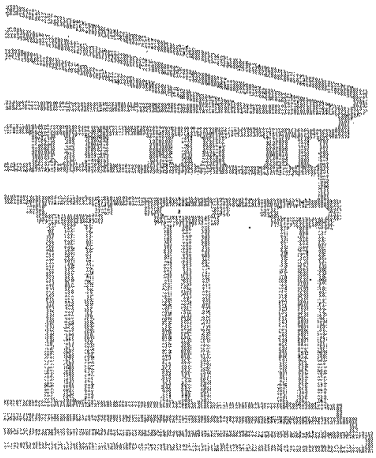

UNIVERSITY OF WESTERN CAPE (UWC)

POLICY AND PROCEDURES FOR HAZARDOUS CHEMICAL WASTE

DATE OF LAST APPROVAL: C2008/3

UNIVERSITY of the WESTERN CAPE

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CRMC Annex 2008/3/1

HAZARDOUS
CHEMICAL WASTE POLICY AND PROCEDURES {DRAFT ..... 1)

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SECTION I GENERAL INFORMATION

A. Purpose.

The purpose of the following policy and procedure is to ensure that all hazardous Chemical Waste is properly and safely managed, from point of generation, storage, and transportation, also the compliance of any legislation with regards the above. e.g National Environment Management Act.etc.

- An appropriately appointed waste collector shall collect all unwanted chemical waste.
- Chemicals that have not expired shall be reused.
- As far as reasonably practical a use of all chemicals shall be made.
- The following procedure must be followed for the disposal of unwanted chemicals.
- This policy/procedure shall not apply to bio-hazardous waste and metal waste.

B. Definitions

HCS- Hazardous Chemical Substances
SABS 0228- Code of practice for the identification and classification of dangerous substances.
SABS 0229- Code of practice for the packaging of dangerous goods for road and rail transportation in South Africa
SABS 072- Code of practice for the safe handling of pesticides
Assignment- Means a programme to determine any risk from exposure to a hazardous chemical substances associated with any hazard thereof at the work place,
OHASA- Occupation Health and Safety Act (Act 83 of 1995) identifying steps needed to be taken to remove or control such a hazard.
SAA- Satellite Accumulation Area. This is a location or room where HCS is stored.near a place of daily use. (If this is a flammable liquid the requirements of General Safety Regulation 4 of the OHASA applies.

Hazardous Chemical Waste is waste that is dangerous or capable of having a harmful effect on human health or the Environment. A discarded material will be deemed a hazardous waste if it exhibits any of the four hazardous waste characteristics listed below.

- Ignitability: - Liquids with a flash point of 35° C or below, oxidizers or is spontaneously combustible.
- Corrosive
- Reactivity:- Materials that readily explode or undergo violent reactions
- Toxicity:- Waste that leach dangerous concentrations of toxic chemicals into ground water

Listed Hazardous Chemical Waste

- Listed Hazardous Chemical Waste from non-special sources
- Listed Hazardous Chemical Waste from special sources
- Listed Hazardous Chemical Waste from chemical products
- Listed Toxic Waste from discarded commercial chemical products
- Hazardous Chemical Waste generally includes all organic solvent waste and solid residues containing these solvents, waste acids, alkalis, and other corrosive materials, some materials containing heavy metals, explosives, highly reactive materials or laboratory agents.
- Aerosol cans which are full or partially full must be disposed of as hazardous waste.

- Ignitable material is disposed of as hazardous waste.

SECTION II GENERAL LABORATORY PERSONNEL RESPONSIBILITIES

A Waste Generation

- Waste chemicals must be collected in individual leak proof, sealed containers.
- The chemicals must be collected with the container material e.g Acids·must not be placed in a metal container.
- Glass or Plastic containers may be safely used for virtually anything accept hydrofluoric acid and very strong alkalis.
- Waste chemicals must not be placed in an unwashed container, which contains any incompatible residual material from previous chemicals.
- Do not use any containers other than those provided by the waste chemical service provider or original containers.
- Broken or used hypodermic needles or syringes that contained chemicals must be disposed of with medical waste. Collect these in a separate puncture proof container that is appropriately labled.

Container Labeling

- All containers must be clearly identified and labeled with the proper chemical name (s) of the substance, trace names, acronyms, abbreviations; codes or formulars are not acceptable.
- All chemical waste which cannot be recycled, because it is either spent, past the manufacturer's expiration date or has been mixed or contaminated with other substance must be labeled with a label as supplied by the hazardous chemical service provider.
- Whenever practicable the concentration of each chemical must be identified on the label even if the container contains mixed chemicals

Unidentified Waste

Samples of unidentified waste must be taken by the Hazardous Chemical Waste Service Provider for identification, packaging, collection and disposal

Satellite Storage Areas

- Hazardous waste must be stored in the laboratories satellite storage area or at the point of generation under the control of the generator.
- Chemical waste must be segregated from general waste type e.g. flammable, poisonous, acids and alkalis and arranged so that incompatable substances will not mix. See below for the general principals for safe storage.

1. Store acids and bases separately
2. Keeps acids apart from cyanides or Sulfides
3. Acids must not be stored in steel containers.

4. Water-reactive, strong acids, organic acid anhydrides must be kept away from alkalis and water.
5. Oxidizing agents must be kept far apart from reducing agents and organic compounds.
6. Water re-active chemicals must be kept apart from water aqueous solutions.
7. Air-reactive materials must be packed in containers that are sealed off from the atmosphere.
8. Explosive materials must be handled as for instructions on material safety DATA sheets as supplied.

- Containers must be stored so that their identification is readily available.
- The National Building Regulations, Hazardous Chemical Regulations and Regulation 4 of the General Safety Regulation Use and Storage Flammable Liquids specify maximum quantities of chemicals/flammable substances that may be stored in the work-place.

Daily Laboratory Inspections

- Waste containers must be inspected daily for signs of leakage, corrosion or any other forms of deterioration.
- Visual Inspections must be conducted of all containers to ensure
    1. capped/sealed
    2. properly labeled
- Any container found leaking must have its contents transferred to a new container immediately.
- Any spillage must be cleaned up immediately.

Request for Chemical Waste Removal

- Hazardous Chemical Waste is collected by a Hazardous Chemical Waste Collection Service Provider.

Request for Collection and Disposal

1. The generator must supply the SHE department with a list of chemicals for disposal.
2. The list must contain the following
    - Name of chemical, type, class
    - How packed
    - How stored
    - Volume
    - Amount
    - Where stored, building name, department name
    - Contact person for generator

3. The SHE department will forward the list to the service provider who will in-turn submit this to land fill (Vissershok) for.

    - Packing instructions
    - Type of container to be used for disposal

Disposal Method

- When approval for disposal is authorized, the service provider will quote costing for disposal charges to the U.W.C SHE department.
- The SHE department will generate an order, supply same to the service provider and arrange for collection and disposal the SHE Department in forms the generating department of date, time and collection.
- When chemical waste has been disposed the service provider must issue a waste manifest stating the chemical waste details and that it has been disposed in an environmentally acceptable manner.

NB. No unknown chemicals will be accepted for disposal.
Waste containers must not be mixed with empty containers that will be used for disposal.
All containers must be tightly sealed to avoid any spillage during transport.

SECTION Ill ENVIRONMENTAL RESPONSIBILITIES

WASTE HANDLING & STORAGE PRIOR TO COLLECTION FOR DISPOSAL

Waste Handling and Storage

1. Before dispatching any hazardous chemical waste, the generator must ensure that ALL containers are properly sealed and labeled. Records must be kept of all hazardous chemical waste dispatched.
2. All flammable solvents must be stored in flammable store.
3. Hazardous chemical waste must be segregated according to their classification.

B. Waste Transport

1. The SHE Department will make ALL arrangements for off-site disposal
2. The service provider will comply with the requirement of SABS 0229- the Code of practice for packaging of dangerous goods for road and rail transportation in South Africa.

C. Waste Inspections [Storage areas]

1. All Satellite Accumulation Areas must be inspected at least once a week.

SECTION IV MISCELLANEOUS INFORMATION .. TREATMENT/DRAIN DISPOSAL & WASTE Waste MINIMIZATION

Treatment & drain disposal.

a. General Information.

Research and Instruction in laboratories continuously produces small amounts aqueous water, in such cases laboratory workers must decide whether to pour particular solutions down the drain or keep them for collection by the service provider.

Unwanted chemicals must be kept for collection.

Before disposing of any chemicals down the laboratory sinks consideration must be given/taken into account if the chemical won't damage the plumbing system.

Drain disposal of dilute acids and alkalis that have been neutralized by the experimental process may be discarded by drain disposal.

When disposing of hazardous chemical waste protective equipment and clothing must be worn {Gloves, apron and safety glasses.

Before pouring the solution into the drain,, turn on the tap to get a good flow of water to wash it down.

DRAIN DISPOSABLE SUBSTANCES

These substances must be diluted to a pH of 6 to 9 before it can be disposed

i.e Hydrochloric Acid
Nitric Acid
Phosphoric Acid
Surphuric Acid
Acetic Acid
Formic Acid
Sodium Hydroxide
Potassium hydroxide
Ammonium Hydroxide
Sodium Carbonate

B. WASTE CHEMICAL RE -USE

1. Unused and unopened chemical being disposed of as waste due to changes in Research or dis-Continuation of special research protocol and may be re-distributed to other laboratories that can utilized the chemical ,sharing unused and un-opened chemicals can reduce the amount of chemical waste.

C INVENTORY CONTROL

Each Laboratory must maintain an appropriate inventory of chemicals in their laboratory as a method to reduce unnecessary purchase and disposal. The following methods can reduce the amount of chemical in a laboratory and minimize waste generated from expired or unwanted excess chemicals.

- Check laboratory inventories before ordering to avoid over supply of chemicals

D MICROSCALLING

Micro scale chemistry is pollution prevention method that decreases the amount of chemical waste generated during laboratory experiments and it has the following benefits:

- Reducing chemical waste produced at the source
- Improve laboratory safety by decreasing potential exposure to chemical and reducing fire and explosion Hazards.

- Reduce laboratory costs for chemical purchase and disposal.
- Improve a·1r quality due to greatly reduced volumes and other volatile substances used.
- Decrease the amount of storage space necessary for chemicals.
- Reduce the time required to perform experiments due to short chemical reaction times.
- Encourage students to think about waste minimization
- Decrease costs for U.W.C.
- Increase environmental awareness for U.W.C.
- Rotate stock chemicals in the laboratory to ensure older chemicals are used before the newer chemicals
- Do not accept free samples from chemical suppliers unless you are certain that you will be using the material.

SUBSTITUTION

In some instances, chemicals that are more environmentally friendly may be substituted for traditionally used chemicals.

D. LEGISLATION

The following South African legislation must be taken into consideration with regards hazardous chemical substances.

[1] National Environmental Management act. [Act 107 of 1998]
[2) Occupational Health and Safety Act [Act 83 of 1995] and regulations
[3] National Environment Management Air Quality Act 2004
[4] Hazardous Substances Act [Act 15 of 1973]
[5] SABS 0229 code of practice for identification and classification of dangerous substances/

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ADDENDUM 1

SHE DO's & DON'T ABOUT SPILLAGES

1. Analyze the spill
   - Always stand upwind
   - Keep bystander away
   - Consider evacuation
   - Try to identity the quantity and the chemical by asking the relevant qualified people.
   - Analyse the risks and inform the relevant people.
   - Look at means to contain
   - If the spillage cannot be contained call for emergency assistance.

2. Select the correct P.P.E
   - Consult the M.S.D.S for the correct P.P.E. to ensure that nobody's life is endangered.
   -

3. Contain the spillage
   - Contain the spillage in the smallest area possible.

4. Stopping the flow of the product
   - If possible turn the container up-right to stop the leak.
   - Place a drip tray underneath to catch liquid spill.
   - Transfer to an undamaged container.

5. Recovering the spilt product
   - Absorb the product with chemical absorbent found in the chemical spill kit.
   - Discard absorbent into open top container.

6. Decontamination
   - Wash everything that was in contact with the spill.

7. Disposal and personal Health & Safety
   - Dispose of accumulated waste as per safe disposal method that applies to safe disposal of laboratory waste.

8. Do all relevant reports
   - A full report must be completed to educate other employees what to do for future spills, and limit the possibility of future spills.

G ADONIS
SHE OFFICER

THE FOLLOWING LEGISLATION NEED TO BE COMPLIED WITH

- NATIONAL ENVIRONMENTAL MANAGEMENT ACT.
  [ACT 107 OF 1998]

- ENVIRONMENT CONSERVATION ACT
  [ACT 73 OF 1989]

- NATIONAL WATER ACT
  [ACT 36 OF 1998]

- HAZARDOUS SUBSTANCES ACT
  [ACT 83 OF 1993]

- OCCUPATIONAL HEALTH AND SAFETY ACT.
  [ACT 83 OF 1993]

- NATIONAL ENVIRONMENTAL MANAGEMENT
  WASTE BILL
  B.B. NO. 30142 OF AUGUST, 2007

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