1. Purpose and Objectives

This procedure provides information on the generation, collection, storage and disposal of chemical waste to ensure:

- that the collection, storage and disposal of chemical waste is conducted in an environmentally sound manner;
- compliance with environmental and workplace health and safety legislative requirements in relation to the disposal of chemical wastes; and
- that risks to health, safety and the environment are minimised.

This procedure supplements the University's *Environmental Management Policy* and should be read in conjunction with the University's *Waste Management Program*.

Disposal of chemical waste must be regarded as an integral part of all research projects and teaching programs involving chemical use.

2. Definitions, Terms, Acronyms

Waste – Section 13 of the *Environmental Protection Act 1994* defines waste as any gas, liquid, solid or energy (or a combination of these) that is surplus to, or unwanted from, any industrial, commercial, domestic or other activity, whether or not it is of value.

Chemical Waste – Any waste generated from the use of chemicals in medical, dental, veterinary and laboratory procedures that has the potential to pose a chemical threat to health, safety and/or the environment, or is chemically hazardous.

Waste Generator – Any person whose act or process produces waste and who is therefore responsible for that waste.

QUU – Queensland Urban Utilities.

3. Procedure Scope/Coverage

This procedure applies to all staff and students involved in the generation of chemical waste and/or the collection, transport, storage and disposal of chemical wastes. The procedure covers:

- disposal of sewerable chemicals by way of waste sinks;
- disposal of inert solid wastes;
- collection of categorised liquid wastes;
- collection of special wastes (individually packaged); and
- collection of other specific items – oil, gas cylinders, batteries and paint.

This procedure **excludes** the following:

- clinical and related waste;
- cytotoxic drugs and related waste;
- animal waste;
- radioactive waste;
- asbestos; and
- explosives.

4. Procedure Statement

All chemical users must follow this procedure to assist in meeting individual and organisational legislative requirements and to minimise environmental and personal harm.

It is expected that all generators of chemical waste are familiar with dangerous goods classifications and categorising types of waste generated in the laboratory. This procedure also assumes knowledge about incompatible materials; the rule is the same for chemical waste as it is for chemical storage. Planning for chemical waste disposal must form part of the laboratory or work site's risk assessment.

If you require more information than what is provided in this procedure, please ask your Supervisor and/or Laboratory Manager or contact the University Chemical Store: **chemwaste@uq.edu.au**.

Regardless of campus or site, these procedures must be followed for the disposal of chemical waste. Some sites and campuses have specific work instructions which supplement this procedure. ***Please refer to the site specific work procedure for collection and delivery areas and times, and other details specific to your campus or site.***

5. Responsibilities

5.1 Waste Generators

Chemical Waste Generators include students, laboratory technicians, researchers and lecturers. It is the responsibility of chemical waste generators to observe the following:

- identify and be responsible for the appropriate disposal of chemical wastes they generate;
- segregate chemical wastes from other wastes to avoid contamination; and
- hold all necessary equipment to clean up the area in the case of accidental spillage.

5.2 Heads of Schools and Centres, and Farm Managers

Heads of Schools and Centres, and Farm Managers must:

- ensure that students and staff are aware of the operating procedure for chemical wastes as applicable;
- provide adequate environmental management training; and
- review the laboratory's waste management program as necessary.

6. Chemical Waste Avoidance and Minimisation

Chemical users should employ strategies for avoiding and minimising production of chemical waste in laboratories where practicable. Where applicable, these strategies may include the following:

- Avoid over-ordering chemicals;
- Replace hazardous compounds with less hazardous compounds;
- Minimise the quantity of hazardous materials used;

- Require staff leaving the University to clear out old chemical stocks by returning them to store or labelling them and arranging for correct disposal;
- Take periodic inventories of chemicals and investigate likely hiding places for chemicals;
- Educate staff through regular training; and
- Post clearly visible signs to guide staff in correct procedures.

7. Chemical Waste Disposal

There are limits to and specific conditions placed upon chemicals which are discharged to the sewer. In the first instance, compare your waste ingredients (and concentrations) against the categories and criteria for disposal of chemical waste to the sewer as detailed in QUU's Trade Waste Sewer Acceptance Criteria to determine if your substance is sewerable or not.

Following the procedures below will permit maximum reclamation of recyclable waste, segregation for specific treatment processes, and will comply with labelling, storage and handling requirements.

7.1 Liquid Chemical Waste

7.1.1 Sewerable Substances

Any chemicals discharged to the sewer must meet the Trade Waste Sewer Acceptance Criteria outlined in QUU's Trade Waste Environmental Management Plan. Generally, this means that:

- Waste must be miscible (soluble) with water;
- Waste **must not** be TOXIC (DG6) or hazardous to aquatic, marine and terrestrial life and environments (refer to MSDS);
- Waste **must not** be FLAMMABLE (DG3) *at the point of being sewered* (i.e. when it is put down the sink). Acceptable flammable liquids must therefore be less than 10% of their explosive concentrations (refer to MSDS) *before* being sewered; and
- Waste solutions must be within a pH range of 6 to 10.

Dilution is not an acceptable means of overcoming appropriate disposal. Always refer to the Trade Waste Sewer Acceptance Criteria for guidance.

7.1.2 Non-sewerable Substances

Waste containers appropriate to the dangerous goods grade of the substance being disposed of will be supplied on request from the University Chemical Store. See section 8.1 for how to request empty waste containers. Containers range in size from 2.5 litres to 5 litres, 15 litres will only be supplied by prior arrangement with the Chemical Store. Formatted labels are provided on containers supplied by the Chemical Store.

Waste containers should be turned over at least every 3 months to avoid instability of chemicals and container degradation. Waste generators should therefore request containers of an appropriate size based on the predicted amount of waste to be generated in a 3 month time period.

Only one 'individually generated' chemical waste is permitted in each container. DO NOT mix chemical waste from different processes, even if they are of similar properties – the waste disposal contractor will assess which wastes can be combined and will perform this task.

7.2 Solid Chemical Waste

7.2.1 Non-sewerable Substances

Waste must be sealed in an appropriate and compatible container (refer to MSDS). These can be requested from the University Chemical Store following the process outlined in section 8.1.

All containers must be labelled with a label provided by the Chemical Store. If using your own container, you must request a label from the Chemical Store waste request website: http://www.science.uq.edu.au/facilities/content/uq-science-store.

See section 8.2 for more information on labelling chemical containers.

8. Chemical Waste Containers and Chemical Waste Collection

8.1 Requests for Empty Chemical Waste Containers

Refer to the University Chemical Store website to request empty chemical waste containers and subsequent chemical waste collection: http://www.science.uq.edu.au/facilities/content/uq-science-store.

Ensure you have an up to date profile before you submit your request. Enter the waste details in the 'comments' field if you cannot select the substance from the list. Further advice on using the online Chemical Store is available via the *Guidelines for Clients* link, once you have logged in.

Empty waste containers will be delivered to designated areas for pick-up by those who have requested them. ***Refer to the relevant site specific work procedure for details on delivery areas and times specific to your campus or site.***

For queries and assistance, please email **chemwaste@uq.edu.au**.

8.2 Requirements for Waste Generators providing their own Containers

Only use containers that are compatible with the chemical waste being disposed of (refer to MSDS) and are sealed so that they will not leak during transportation (i.e. Can they be inverted without leaking?).

All containers must be labelled to ensure that the contents and source of the waste are clearly identifiable. The waste generator must ensure that the container is labelled with a Chemical Store generated label. Labels can be requested from the Chemical Store waste request website: http://www.science.uq.edu.au/facilities/content/uq-science-store.

ALWAYS attach label from the Chemical Store on the container when the waste is initially placed in the container.

Any leaking containers or containers without a Chemical Store generated label will not be collected.

Containers with a Chemical Store label, either a supplied ready-labelled waste container or a separately supplied label, will be collected as part of the regular collection schedule.

Unidentifiable chemicals will incur a surcharge for disposal. Please note that an unknown substance equals high risk, which equals high price.

8.3 Requests for Chemical Waste Collection

Waste containers should not be more than 80% full and they must be turned over regularly to maintain chemical stability and container integrity. DO NOT accumulate large quantities of chemical waste so that they become a hazard.

If you require the collection of many chemicals please contact the Chemical Store, **chemwaste@uq.edu.au**, to obtain a copy of the waste disposal spreadsheet to assist with your disposal.

Waste generators are responsible for putting chemical wastes out for collection at designated areas. ***Refer to the relevant site specific work procedure for details on collection areas and times specific to your campus or site.***

8.4 Disposal of Empty Chemical Containers

In some cases, empty original chemical containers (predominantly plastic) can be returned to the Chemical Store for reuse as waste containers. Please **DO NOT wash bottles or deface labels** as it is necessary to know what is in the bottles to prevent unwanted reactions. Any excess containers will be recycled.

In some situations it will not be possible to return chemical bottles to the Chemical Store. *Please contact the Chemical Store if you have any questions about what should be returned.*

If an individual chemical bottle CANNOT be returned to the Chemical Store for reuse AND the contents can be disposed of down the sink *safely,* then:

1. Remove the lid, rinse thoroughly and dispose of lid into a Laboratory General Waste Bin.
2. Rinse the bottle thoroughly.
3. Remove or deface the label (so that the chemical name cannot be identified).

4. ***Plastic*** – dispose of clean bottle (without lid) to Laboratory General Waste Bin.
5. ***Glass*** – dispose of clean bottle (without lid) to Laboratory Recycling Bin.

If the chemical that was in the bottle CANNOT be disposed of down the sink *safely*, then:

1. Contact the UQ ChemStore for disposal of the bottle as Hazardous Waste.

9. Disposal of Other Items – Oil, Gas Cylinders, Batteries and Paint

9.1 Oil

Used oil is a recyclable resource and should be managed carefully to protect the environment. Oil is to be treated as chemical waste.

The Chemical Store will arrange for used oil to be sent to a facility that specialises in used oil collection and reprocessing.

- Waste oil must be sealed in an appropriate and compatible container (refer to MSDS).
- The container must be labelled with a Chemical Store label, which can be requested from the waste request website: http://www.science.uq.edu.au/facilities/content/uq-science-store

To request collection:

Contact the University Chemical Store: **chemwaste@uq.edu.au**.

9.2 Gas Cylinders

- If stored, cylinders should be segregated by hazard, with different hazard classes separated.
- Gas storage areas should be secured and separated from other chemical storage areas.
- All cylinders should be at least 3 metres away from ignition sources and secured to a solid surface.
- Empty gas cylinders must be returned to the supplier.

To request collection of gas cylinders:

Contact relevant supplier (i.e. BOC Ltd, Linde Gas Pty Ltd, Air Liquide Aust Ltd).

9.3 Batteries

The University Chemical Store arranges for batteries to be sent to appropriate battery disposal facilities that recycle batteries and their components where possible.

The collection and disposal of batteries through the University Chemical Store includes the following types:

Battery Type	Common Uses
Alkaline	Cassette players, radios
Lithium	Cameras, watches, computers
Nickel cadmium batteries	Power tools, kitchen appliances
Lead-acid	Video cameras, computers, portable radios, fork lifts

To dispose of batteries, refer to the following table:

Dry batteries	Wet batteries
Ensure the batteries are not leaking, seal them in an appropriate container (generally a cardboard box will suffice), and place them in the internal mail to: University Chemical Store Cnr Glasshouse Road and Walcott St St Lucia Campus	The Chemical Store will collect wet batteries. **To request collection:** Email the University Chemical Store: **chemwaste@uq.ed.au**

Please note:

- DO NOT store large quantities of batteries – send them as soon as they go flat.

- Dry cell batteries contain an electrolyte in paste form (containing no free liquid) and are suitable for powering electronic devices. Wet cell batteries, such as a car battery, use a liquid electrolyte which is at risk of leaking if not disposed of appropriately.
- Nickel cadmium batteries (NiCads) contain cadmium, which is potentially carcinogenic and should not be placed in general waste bins.
- Using rechargeable batteries will reduce the need for battery procurement and disposal, helping to reduce the amount of environmentally harmful wastes discharged.
- For information regarding disposal of mobile phone batteries, see the University's *Recycling Operating Procedure*.

9.4 Paint

Unused paint may be allowed to dry (set hard) in the original paint container by mixing in equal parts of sand, dirt or sawdust and leaving the lid off until set. The dried, hard paint may then be disposed through the general waste stream with the lid permanently removed.

Twin pack paints and epoxys may be mixed together and allowed to cure in a similar way and discarded into the general waste stream when set hard. Caution – heat may develop with some epoxys and resins.

If this process is not possible, large quantities of paints may be processed as chemical waste in the usual manner.

10. Spills

Every School/Centre that operates with chemicals or generates chemical waste must hold the necessary equipment to carry out cleanup of spills. Each School/Centre must also have trained staff members to carry out a cleanup.

Schools/Centres are responsible for all generated wastes until the time after they are collected from the holding area. Spills of any waste must be cleaned up by the generating School/Centre. Any School/Centre that has a spill will be instructed by Security to effect cleanup. If this is not carried out, a professional contractor will be engaged and the generating area will be liable for the costs incurred.