**QUEEN’S UNIVERSITY OF BELFAST**

**SCHOOL OF BIOLOGICAL SCIENCES**

**SAFETY POLICY AND CODES OF PRACTICE**

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**School Of Biological Sciences**

**Health and Safety Policy**

As Head of the School of Biological Sciences I recognise and accept my responsibility under the Health and Safety at Work (N.I.) Order 1978 for the health, safety and welfare of staff, students and others, so far as is reasonably practicable, in all our School activities.

The Head of School and School Management Board will implement the University Health and Safety Policy to ensure the health and safety at work of all staff, students and others affected by our activities, so far as is reasonably practicable.

Our School will meet the statutory requirements for health and safety at work and will review our performance and work to enhance it in the future. The Head of School and School Management Board are committed to ensuring that the necessary resources are devoted to meeting these objectives.

All staff are required to co-operate with and to participate in the measures put in place to ensure health and safety at work. The allocation of duties for safety matters and arrangements for implementing the health and safety policy are set out in this handbook.

Professor G McMullan

Head of School of Biological Sciences



March 2017

**Health and Safety Management**

1. Responsibilities

1.1 Head of School

The Head of School has overall responsibility for health and safety within the School. She has the responsibility for ensuring that there are appropriate management systems in place to adequately address any safety risks associated with the activities of the School.

1.2 School Management

The day-to-day responsibility for health and safety is delegated to each of the School Management Board who manage the different areas within the School.

Duties include:

* Day-to-day implementation and monitoring of health and safety matters within their area of responsibility
* Establishing local arrangements and allocation of duties to staff within their area of responsibility
* Communication of the Health and Safety Policy to all staff
* Ensuring that risks from activities in areas under their control are assessed, adequately controlled and reviewed
* Taking appropriate action to correct deficiencies in the day-to-day operation of the safety management system
* Inspecting and monitoring the areas under their control to ensure the areas are maintained in a safe condition (including safe access and egress)
* Ensuring competency of staff by providing adequate information, instruction and training
* Ensuring safe use and storage of substances and articles
* Investigation of accidents / incidents and dangerous occurrences, including near misses, within their area of responsibility
* Ensuring appropriate First Aid cover at all times and ensuring that First Aiders are adequately trained
* Ensuring appropriate arrangements for fire safety, including appointment of adequately trained fire wardens
* Liaison with safety professionals and those with other expertise to improve health and safety performance, as necessary.

1.3 Health and Safety Co-ordinator

The Health and Safety Co-ordinator for the School co-ordinates the safety management systems within the School, supported by staff with specific Health and Safety roles from each location within the School. The Health and Safety Co-ordinator liaises directly with the Head of School on safety matters pertaining to the School.

1.4 Staff

Each member of staff has a personal responsibility to co-operate with any health and safety measure put in place.

All staff within the School are required to:

* take reasonable care of their own health and safety and that of others
* familiarise themselves with all relevant health and safety policies and procedures
* co-operate with management to allow compliance with statutory obligations
* use equipment properly and in accordance with training received
* ensure working areas are kept safe and tidy
* inform the area manager of any dangers or shortcomings in the health and safety arrangements
* refrain from interfering with anything provided in the interests of health, safety and welfare.

2. Staff Consultation

The Head of School and School Management Board have responsibility to ensure that there is an effective means for consultation with staff regarding health and safety at work. Health and Safety information is communicated to staff via the Health and Safety Committee, the School Board, the intranet, SharePoint, email and through staff meetings. Health and safety is a standing agenda item at School Board meetings and health and safety matters are considered at School Management Board meetings.

3. Health and Safety Committee

A Health and Safety Committee has been established to co-ordinate and promote Health and Safety within the School. The Committee meets at least twice per year, chaired by the Health and Safety Co-ordinator Manager, with senior staff and the Head of School in attendance when practicable. Each location and all categories of staff within the School are represented at the Committee.

4. Health and Safety Guidance

The University Health and Safety Policy provides detailed advice and guidance on all health and safety matters, and outlines the responsibilities and requirements for the management of health and safety across the University. This information can be accessed via the Occupational Health and Safety Service’s website.

Individual professional guidance can be obtained from staff members within the Occupational Health and Safety Service, and from the Estates Directorate for safety related matters, such as fire safety and building management.

This Health and Safety manual outlining general health and safety information is available to all staff. All staff are required to read and make themselves familiar with its contents.

5. Health and Safety Training

The Head of School and School Management Board will ensure that staff within the School are provided with suitable and sufficient training in health and safety to enable them to carry out their responsibilities. Health and safety training needs will be identified and training records will be maintained.

6. Performance Measurement

The Head of School and School Management Board will consider and review performance indicators on the health and safety performance of the School. These will include accident statistics, reports from the Annual Health and Safety Assessment and Safety audits.

7. Audit

The School will participate in the annual internal audit of health and safety and the Head of School and School Management Board will be responsible for progressing any resulting action plans and recommendations.

The School will participate in the programme of health and safety audits conducted by the Occupational Health and Safety Service. The Head of School and School Management Board will consider the findings outlined in the audit reports and ensure compliance with recommended actions.

8. Development Plan

The Head of School will ensure that a Health and Safety Development Plan is produced for the development and improvement of health and safety within the School.

March 2017

1.1 The Manual

The manual is issued for your information and guidance and you should take time to familiarise yourself with its contents. *You should not wait until you need to know something before you consult this manual*.

**HOWEVER,** it is not intended to be an exhaustive survey of Health and Safety matters; if it was you would not contemplate reading further than this!

There is now considerable literature available on most matters to do with Health and Safety on the University Safety Services website: <http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/SafetyService>

You should read this in conjunction with this manual, which has been written with the aim of;

* reminding Students (Undergraduates and Postgraduates) and Staff (Academic, Clerical and Technical) of good working practices;
* alerting all to the various potential hazards in their work environment; and
* providing general guideline information on particular aspects of Health and Safety.

1.2 School of Biological Sciences

The School comprises the offices, rooms and laboratories in the basement and on the ground, first, fifth and sixth floors of the main MBC building and the whole of the Molecular Biology wing in the MBC, rooms and laboratories occupied by IGFS in the David Keir Building and NITC and Queen’s University Marine Laboratory (QML) at Portaferry (see Appendix 1).

1.2.1 Other Responsibilities

In the event of a fire/bomb alert, certain individuals have been given ‘evacuation warden’ duties (see Section 2.3.2.3 and Appendix 3).

1.2.2 The Safety Committee and their responsibilities

The current composition of the School Safety Committee and their individual specific responsibilities are given in Appendix 2.

**School Safety Contacts:**

* H&S Co-ordinator – Dr Rosaleen Hynes [r.hynes@qub.ac.uk](mailto:r.hynes@qub.ac.uk)
* COSHH Adviser – Ms Katrina O’Connor [biolsci.safety@qub.ac.uk](mailto:biolsci.safety@qub.ac.uk)
* Radiation Protection Adviser – Dr Kostya Panov [k.panov@qub.ac.uk](mailto:k.panov@qub.ac.uk)
* Biohazards/GMO Safety Adviser – Dr Mark Robinson [mark.robinson@qub.ac.uk](mailto:mark.robinson@qub.ac.uk)
* Environmental/Fieldwork Adviser – Ms Gillian Riddell [g.riddell@qub.ac.uk](mailto:g.riddell@qub.ac.uk)
* Diving & Boating Officer & QML H&S Contact- Simon Exley [s.exley@qub.ac.uk](mailto:s.exley@qub.ac.uk)
* DKB H&S Contact – Brett Greer brett.greer@qub.ac.uk
* University Biological Safety Officer – Dr David Norwood [d.norwood@qub.ac.uk](mailto:d.norwood@qub.ac.uk)

**Risk Assessments:**

**Completed RAs to be submitted electronically to the appropriate adviser for approval**:

COSHH: – hazardous chemical substances and/or carcinogens, mutagens.

Complete either the School of Biological Sciences COSHH RA/QUB COSHH RA → COSHH Adviser – Ms Katrina O’Connor [biolsci.safety@qub.ac.uk](mailto:biolsci.safety@qub.ac.uk)

BioCOSHH – biological materials, infectious agents

Complete QUB bioCOSHH RA → Biohazards/GMO Safety Adviser - Dr Mark Robinson [mark.robinson@qub.ac.uk](mailto:mark.robinson@qub.ac.uk)

GMO – All GM work must be registered with HSE (NI) - requires initial QUB approval:

Complete appropriate [GMM RA](http://www.qub.ac.uk/schools/SchoolofBiologicalSciences/Research/EthicsSafety/Docs/Filetoupload,651121,en.doc), [GM Plant RA](http://www.qub.ac.uk/schools/SchoolofBiologicalSciences/Research/EthicsSafety/Docs/Filetoupload,651120,en.doc) or [GM Animal RA](http://www.qub.ac.uk/schools/SchoolofBiologicalSciences/Research/EthicsSafety/Docs/Filetoupload,651119,en.doc) → University Biological Safety Officer – Dr David Norwood [d.norwood@qub.ac.uk](mailto:d.norwood@qub.ac.uk)

Fieldwork:\*

Complete appropriate School of Biological Sciences Fieldwork RA (Terrestrial/River/Intertidal) → Environmental/Fieldwork Adviser - Ms Gillian Riddell [g.riddell@qub.ac.uk](mailto:g.riddell@qub.ac.uk)

Boating: \*

Complete School of Biological Sciences Boating RA → Diving & Boating Officer - Simon Exley [s.exley@qub.ac.uk](mailto:s.exley@qub.ac.uk)

Diving: Contact Simon Exley [s.exley@qub.ac.uk](mailto:s.exley@qub.ac.uk) for further guidance

\*School Health & Safety Questionnaire must also be completed

A Lone Working form should be completed if required

Section 2. Fire and Non-Fire Emergencies

2.1 Introduction

2.1.1 General

(a) Before beginning work in any Office or Laboratory for the first time, you should familiarise yourself with the nearest fire exit(s), the location of the fire alarm button and the fire blanket(s) and the type(s) and location(s) of fire extinguishers.

(b) If you discover a fire, or you are present at the initiation of a fire which looks as if it may not be easy to control, raise the alarm by breaking the glass cover of the alarm and press the button.

(c) If you discover what you think is a bomb, the evacuation procedure is different to the fire evacuation procedure, see section 2.2 below.

(d) Outside normal working hours or if you suspect that the emergencies services will not be contacted automatically ring 2222 (999 in the case of the QML at Portaferry) and state which emergency service you require and the location of the problem.

(e) Make sure that ‘smoke/fire doors’ are kept closed and that fire exits are kept clear and not blocked by furniture etc.

(f) The University is a no smoking area.

(g) **DO NOT USE LIFTS WHEN EVACUATING A BUILDING**

More specific guidance is given in the sub-sections below.

2.1.2 Undergraduate classes

It is the responsibility of each member of staff to ensure that the class(es) in their care are familiar with:

(a) emergency exits, and

(b) any relevant general or specific matters of H & S pertinent to their activities.

**This is particularly important with classes at Levels 0 and 1.**

2.2 Bomb alert and Non-Fire Emergency

There may be circumstances where it is necessary to evacuate the building for reasons other than a fire incident. Examples might be a bomb threat, gas leak or chemical spill. It is not best practice to use the fire alarm system in such circumstances. Bomb threats, gas leaks or chemical spills are situations where the source of danger is not usually immediately apparent to evacuees and the use of the fire alarm system, which involves a specific evacuation assembly area, may place them in unnecessary danger.

In circumstances of a gas leak or toxic chemical spill, it is best practice to evacuate the building by verbal instruction from personnel at the source area of the leak. If there is a bomb threat it may be possible to utilise the telephone system to contact key personnel within the building to advise them of the situation. These key personnel can then initiate evacuation of their areas by word of mouth instruction according to the best available advice from the Police Service of Northern Ireland. Members of the **Evacuation Control Team** should carry out normal procedures according to the prevailing circumstances.

2.2.1 Finding a suspected bomb

* **DO NOT TOUCH OR TAMPER WITH A SUSPECTED BOMB**;
* if it is in a room/area where others are working, evacuate the vicinity as quickly and quietly as possible;
* **DO NOT GO OUT OF YOUR WAY OR ALLOW OTHERS TO GO OUT OF THEIR WAY TO COLLECT COATS AND BAGS etc.**
* leave the danger area as quickly as possible **DO NOT** sound the (fire) alarm; as soon as you are able, report exactly what you have seen, to the duty Security Officer or Porter and keep yourself available to answer questions from the Fire and Rescue Service/bomb squad.

2.2.2 Responding to a Bomb or Non-Fire Emergency

* you will be notified by phone call or word of mouth in the event of a bomb alert to avoid the possibility of evacuation through the area around the suspect bomb;
* leave your work place as quickly and as quietly as possible via your normal escape route **unless** advised to the contrary;
* **DO NOT GO OUT OF YOUR WAY TO COLLECT COATS AND BAGS etc.**;
* if you are in the middle of an experiment, leave it in as safe a condition as possible i.e. turn off gas/electricity etc.;
* go straight to your designated assembly point to await a roll call and further instructions;
* **DO NOT REENTER THE BUILDING (even if the alarms have stopped ringing), WITHOUT PERMISSION OF EITHER THE EMERGENCY SERVICES, OR THE UNIVERSITY FIRE OFFICER OR THE AREA FIRE OFFICER;**
* Those ignoring this procedure will be reported to the School Safety Committee.

2.3 Fire

2.3.1 Fire Actions

**If you discover a fire you must:**

1. Raise the Alarm by operating the nearest safely available red break glass fire alarm call point. This will alert the rest of the occupants that there is potential danger from fire in the building and allow them to evacuate the building safely.
2. Once you have activated the fire alarm, you can consider using the Fire Extinguishers provided throughout the building. However, you should not attempt firefighting with this equipment unless you can comply with the following:
3. You are confident in the correct choice and use of the fire extinguishers provided.
4. You have a colleague with you to ensure your escape route doesn’t become smoke-logged.
5. The flames from the fire are not above head height.

Remember – “If in Doubt, - Get Out!”

1. If you are the person who discovered the fire, you must report to the Evacuation Controller at the Evacuation Control Point. This is so that you can give an eyewitness report to the Emergency Services. You may well have vital information that could affect the safety of the firefighters entering the building.
2. If your clothes are alight douse with water or lie down and roll on the floor to smother the flames; summon assistance if possible; wrap a fire blanket or coat around yourself and seek First Aid/medical assistance.

**If you hear the fire alarm sounding you must:**

1. Immediately leave the building by the nearest available safe exit to fresh air, closing but not locking doors behind you and leaving your work in as safe a condition as possible e.g. turn of gas bunsens.
2. Once outside the building, you should make your way to the assembly area nominated on the fire action posters in your area of occupation.
3. **DO NOT**:
4. Stop or return to collect personal belongings
5. Attempt to use lifts
6. Re-enter the building for any reason until authorised to do so. (N.B. The silencing of the Fire Alarm sounders does **NOT** signal that it is safe to re-enter the building. The Alarm sounders are generally silenced by the Fire Service to allow them to communicate by radio with each other. There may still be a fire in the building! Flashing beacons have been fitted at all entrances. If the beacon is flashing- do not enter the building unless you have a clear instruction to do so from Security or the Evacuation Control Team!
7. Run or push while evacuating, as this may spread panic and lead to unnecessary injuries. Provided that you react promptly to the Fire Alarm, you should be able to walk briskly out of the building without danger.

2.3.2 Evacuation

During Normal Working Hours:

The MBC operates a “Warden Sweep” evacuation system. If you are nominated as a warden you will receive appropriate training to enable you to carry out this role.

For those who are not part of the Evacuation Control team a brief description of the system is as follows:

Every Evacuation Warden is assigned a specific area of the building to “Sweep”. All the warden’s assigned areas are “dovetailed” together so that no areas overlap and no areas are missed out. On hearing the evacuation signal, the wardens will immediately start to sweep their assigned areas, ensuring that all in the area are reacting correctly to the alarm and evacuating the building promptly. Having checked their assigned area, the wardens leave the building and report to the Evacuation Officer for their area at their nominated assembly point. Generally they should be able to report that their area is clear, but occasionally they may have to report that there is a problem in their area. The Evacuation Officer notes all problems as reported and according to the urgency of each problem, reports them to the Evacuation Controller.

Within four to six minutes, the Evacuation Controller should have a clear enough idea of the state of the evacuation to provide a relevant briefing to the Officer-in-Charge of the first attendance of the Emergency Services. This should be able to include the location of the fire, the location of any persons who might be trapped in the building, and any areas that weren’t cleared by the wardens for whatever reason. This will allow the Emergency Services to plan their actions accordingly. The Emergency Services carry information cards on their vehicles detailing some of the hazards contained in the building but are always appreciative of “local knowledge”. If the incident has occurred **in your area**, please be prepared to offer information and advice through the Evacuation Controller.

It is a major help if evacuees (whose area was **not** involved) proceed to their proper assembly area and **remain** there. This leaves the entrances to the building clear for the Emergency Services.

Co-operation and patience from the Evacuees not directly involved will be greatly appreciated and will ease the burden on those who are involved. It must be understood that the Emergency Services, the Evacuation Control team and other Queen’s personnel will be working hard to deal with the emergency and return matters to normal as soon as possible. As such it may be difficult to provide timely information as to when it will be possible to re-enter the building.

## Outside Normal Working Hours

Persons remaining in the building outside normal working hours are required to react promptly to the fire alarm and evacuate **without delay** on **any and every** operation of the fire alarm sounders. They should evacuate using the shortest available safe route to the outside of the building and then make their way to the front of the building. (This includes all those who assemble elsewhere during normal working hours) Anyone who has relevant information to provide should report to the Queen’s security officers present so that they can be introduced to the Officer in Charge of the first attendance of the Emergency Services.

2.3.3 Fire Precautions

For your own safety and that of your colleagues, it is important that you follow the guidelines given below. Failure to do so could lead to death or injury of you or a colleague or a criminal conviction with a heavy fine and/or a term of imprisonment!

## Fire Equipment

It is a criminal offence to tamper or interfere with fire equipment. This means the following is illegal:

1. Wedging or propping open designated fire doors. These doors are installed in buildings to prevent the spread of smoke and flames to escape routes. If you prop open a fire door you could cause smoke-logging of an escape route which might prevent your colleagues getting out of the building safely.
2. Using fire extinguishers for anything other than fighting fires.
3. Tampering with any part of the fire alarm system.

## Escape routes

It is essential that escape routes, corridors and stairs are kept free and clear of any obstructions and free and clear of any combustible materials. This means that departments cannot allow combustible items in most corridors adjacent to their “owned areas”. Although these areas might be communal and not generally regarded as part of a department’s area of responsibility, the fact that they serve as escape routes for the department (and possibly others) means that the responsibility for keeping them clear rests with all departments that are liable to use them.

2.3.4 Evacuation Wardens and their duties

The names of the ‘Wardens’ for each Floor/Area within the School are given in Appendix 3.

**Without putting themselves at risk,** the duties of these wardens in the event of a fire/bomb alert are to:

* ensure that all personnel leave the area as quickly as possible;
* ensure that all doors and windows are shut;
* ensure that the area is safe e.g. turn off gas at central points if possible;
* assist those with a disability to the nearest ‘Safe Area’ (see section 2.3.5 below);
* report to the fire officer (outside the building, wearing a high visibility jacket) that their area is clear of personnel;
* conduct a roll-call of their area personnel at the assembly point and inform the authorities of any missing person(s) and/or of any potentially hazardous situation within their area, and
* inform personnel when they may re-enter the building.

2.3.5 Arrangements for those with disabilities

Staff and students whose mobility affects their ability to evacuate the building should have a Personal Emergency Evacuation Plan (PEEP) prepared. To arrange this staff should contact University Equal Opportunities and students should contact University Disability Services.

Evacuation of visitors with restricted mobility is the responsibility of the person they are visiting. If possible meetings should be held on the ground floor.

2.4 Training

2.4.1 General

The Head of the School through the Chairman of the School Safety Committee, is responsible for ensuring that all personnel are aware of what to do (in general terms) in the event of a bomb alert/fire alarm. However it is the responsibility of those who have been designated responsibility for specific areas/rooms (see Appendix 1), to ensure that those in their charge or those working in their area are aware of

* the emergency exits for that area (see section 2.1), and
* any fire risks etc. particular to the area.

The availability of training may be found on Queens Online. Training in fire safety and awareness is available through an interactive program on your computer and through Staff Training and Development Unit. All staff are expected to avail of this training course. Training in many other areas of safety is also available; please see the School Safety Officer for further details.

2.4.2 The Alarm System and its testing

The alarm bells will be tested regularly; in the MBC on Mondays at 10am; in the DKB on Mondays around 8am and in QML on Mondays at 10am. The alarm bell will ring for a few seconds only. If you are at work and unable to hear the alarm during testing, you must report the problem to either the University Fire Officer (Peter Sefton) or the School Safety Officer.

2.4.3 Fire Drills

There will be official fire drills, organised annually by the University Fire Officer. You should respond as if there was a real emergency. It is only by doing this that faults in the system can be identified and rectified. These exercises are conducted ultimately for your safety and should be taken seriously. Failure to do so may put your life and that of others at risk.

2.4.4 Fire Extinguishers

The following extinguishers are available:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Extinguisher type | Red cylinder with coloured band or label | Use on fires involving | | |
| Flammable liquids | Live electrical equipment | Paper, wood and textiles |
| CO2 | Black band or label | SAFE | SAFE | NOT EFFECTIVE |
| Dry Powder | Blue band or label | SAFE | SAFE | SAFE |
| Foam | Cream band or label | SAFE | NOT SAFE | SAFE |
| Water | White band or label | NOT SAFE | NOT SAFE | SAFE |

Please contact the School Safety Officer to arrange training in the use of fire extinguishers and fire blankets.

2. 5 First Aid Arrangements

2.5.1 Training of First Aiders

Staff and postgraduates are encouraged to become trained in first aid practices to ensure the School has adequate cover in the event of accidents occurring, particularly during experimental work and field work.

Two levels of training are available:

‘First Aid at Work’ which requires a 3 day training period and ‘Appointed Persons’ which requires 1 day of training. Training is generally provided by St. John Ambulance or The Red Cross.

First Aiders will provide help prior to the arrival of paramedics, if required. Following an incident they must provide the School Safety Officer with a report of actions taken.

A list of current First Aiders will be found attached to first aid boxes in laboratories and in the School office.

2.5.2 First Aid Boxes

First aid boxes are available in most laboratories and are available for use in the field. If the contents require replenishment please contact Mr. Chris Preshaw.

Section 3. Good working practices

3.1 General

3.1.1 Training and general awareness/responsibilities

3.1.1.1 Training in Health and Safety

The University provides the following methods of health and safety training:

* Attendance at training courses facilitated by Staff Training and Development Unit, e.g. Health and Safety Induction; General Risk Assessment and Manual Handling and Lifting; and
* Interactively through a new training service organised by the Safety Service, which has been embedded into Queen’s Online, to allow staff to automatically access the system when they log in. Each module takes approximately twenty minutes to complete and is followed by a short test This system allows staff to undergo training from the convenience of their desks or even from home and at a time suitable to themselves. All staff are expected to take the Fire Safety Awareness module.

3.1.1.2 Laboratories

* Before doing something for the first time:
* read carefully any relevant literature;
* ask/seek advice from those who may be familiar with the technique/apparatus and **PREPARE A RISK ASSESSMENT** for the use of this equipment;
* **PREPARE A COSHH ASSESSMENT** if using hazardous chemicals/biological agents or dangerous procedures. (see 3.1.2 and Sections 5-8);
* you should take care that your actions will not be hazardous either to yourself or to others; think before you act;
* **causing injury to, or creating a hazard for another person makes you liable for prosecution under current legislation;**
* probably you are at greatest risk when doing something either for the first time or for the umpteenth time (when your concentration is liable to wander);
* wear the appropriate safety apparel:
* approved/appropriate laboratory coat;
* face mask and/or goggles;
* gloves/safety gauntlets, etc
* DO NOT eat, drink or apply cosmetics in laboratories;
* before leaving a laboratory unattended for any length of time e.g. to go to lunch, or when leaving at the end of the day check that:
* all gas burners are off;
* electric motors are not running hot and all connections are sound;
* all electrical apparatus is switched off and unplugged if not in use overnight;
* apparatus left on/running overnight should be clearly marked as such and with a contact telephone number;
* all water supplies are turned off if not in use; the connections of any that are left on should be checked thoroughly;
* there are no open sources of flammable vapour and all bottles of flammable liquids have been returned to safety cabinets.

3.1.1.3 Field Work

* + Complete a risk assessment before starting field work;
  + Avoid lone working if at all possible; if not you must give details of field work site and an expected time of return to a responsible person, carry a mobile phone if possible;
  + Be aware of your surroundings and any changes in the weather, tides etc;
  + Wear appropriate clothing and safety equipment.

**Extensive advice on field work will be found in Section 9**

3.1.2 Safe systems of work and Risk assessment

3.1.2.1 Safe Systems of Work

There are **FIVE** steps which should be taken to create a Safe System of Work. These are:

* assessment of the task;
* identification of hazards;
* definition of safe methods;
* implementation;
* monitoring.
  + - 1. Risk assessment
* **See School Safety Contacts & Risk Assessment Procedure on page 2 of manual**

As with Safe Systems of Work the H & S Executive recommends that FIVE steps are involved in adequate Risk Assessment. These are:

1. **look for and identify the hazard(s)**
2. **decide who might be harmed and how**
3. **evaluate the risks arising from the hazard and decide whether existing precautions are adequate or if others should be introduced**
4. **record your findings on a Risk Assessment/COSHH form**

* Risk Assessment/COSHH forms are available from the safety pages of the school website or directly from **Ms Katrina O’Connor** [**biolsci.safety@qub.ac.uk**](mailto:biolsci.safety@qub.ac.uk) **(COSHH Advisor) or** [**r.hynes@qub.ac.uk**](mailto:r.hynes@qub.ac.uk) **(School Safety Officer)**
* Advice with regard to Chemical Hazards can be obtained from Ms Katrina O’Connor [**biolsci.safety@qub.ac.uk**](mailto:biolsci.safety@qub.ac.uk);
* Biohazards advice can be obtained from Dr.Mark Robinson [mark.robinson@qub.ac.uk](mailto:mark.robinson@qub.ac.uk);
* Radiation hazard advice can be obtained from Dr.K.Panov [k.panov@qub.ac.uk](mailto:k.panov@qub.ac.uk) and

Fieldwork/Environmental hazard advice can be obtained from Mrs G.Riddell [g.riddell@qub.ac.uk](mailto:g.riddell@qub.ac.uk)).

* The assessment should be signed by the relevant Safety Advisor (depending on the content) and finally by the Safety Officer for the School. The researcher, his/her supervisor and the School Safety Officer should each hold a copy of the assessment;

1. **Review the assessment from time to time and revise procedures if necessary**.

3.1.3 Disposal procedures

**Disposal of empty waste chemical bottles; glass, plastic or metal**

**Solvent Containers**

* Remove lid and place container in a fume cupboard overnight to allow the solvent to evaporate safely in a contained and controlled manner
* When solvent has fully evaporated, rinse container with water
* Deface the hazard warning symbol with a permanent marker and clearly write ‘RINSED’ in capital letters on the remainder of the label.
* Do not replace the lid of the container, this must be disposed of separately in the general waste stream.
* The empty container can be disposed of in the designated bin in the “Stables” waste disposal and recycling area between the MBC & Whitla Buildings (BLACK bins: glass; BLUE bins: plastic)
* For IGFS in the DKB: Solvent bottles (glass, plastic or metal) can be disposed of in the designated bins in the chemistry store.



**BOTTLE EMPTY & RINSED**

**ALLOWED**

**LID REMOVED**

**ALLOWED**

**HAZARD SYMBOL DEFACED**

**ALLOWED**

**Non-solvent Containers**

* Screw lid off container, ensure as much chemical as possible is decanted from the container.
* Rinse the container thoroughly with water and allow to dry.
* Deface the hazard warning symbol with a permanent marker and clearly write ‘RINSED’ in capital letters on the remainder of the label.
* Do not replace the lid of the container, this must be disposed of separately in the general waste stream.
* The empty container can be disposed of in the **large BLUE bin** labelled Empty Plastic Chemical Containers or the BLACK bins labelled Empty Glass Chemical Bottles in the “Stables” waste disposal and recycling area between the MBC & Whitla Buildings

**Sharps disposal**

Sharps for disposal include scalpels, needles, syringes etc.

Sharps should be disposed of in accordance with the Biological / Clinical Waste Disposal Procedure.

**Broken Glassware**

***Non Contaminated Broken Glassware***

Broken glassware from laboratory areas which is not contaminated can be disposed of via the general mixed waste stream. Broken glassware must be placed in either a sturdy cardboard box or a specific ‘Magpie’ box (shown left and available from the MBC stores).

The box must be labelled as ‘NON CONTAMINATED BROKEN GLASSWARE’ with a permanent marker. ‘Magpie’ boxes are pre-labelled. The box should be secured by taping its openings with heavy duty duct tape and disposed of in the general waste bins in the BLUE GENERAL WASTE bins in the “Stables” waste disposal and recycling area between the MBC & Whitla Buildings.

- For IGFS, broken glass is to be disposed of in a cardboard box labelled as ‘Broken Glass’ in the main lab (01.307).

***Contaminated Broken Glassware***

- Contaminated broken glass may be left in a fume hood until the residual solvent has evaporated before disposing of in the ‘Broken Glass’ as described above.

**Disposal of plastic pipettes in Molecular Biology labs**

Used plastic pipettes should be disposed of via autoclave stream.

**Disposal of potentially infectious material via autoclave stream**

The bags in the designated pedal bins must not be overfilled: Overfilled bags will not be collected. Remove the bag, close with rubber band and place in dustbin supplied for collection of this material. Bags with their necks tied or taped will not be handled. If the dustbin is full, the bags must be taken to the dustbin in the basement autoclave room 0B.436 and the red folder signed. Autoclave bags must never be left on the floor.

**Disposal of non-infectious/non-hazardous material via autoclave stream**

Gloves, tips, eppendorfs etc. which are not infectious, cytotoxic or harmful, should be autoclaved and then placed in a bag with a ‘MADE SAFE FOR DISPOSAL’ label attached: The bag can then be disposed of in the general waste bins. Note that personnel from labs in the MBC should leave bags for autoclaving in the bin provided in 0B. 436; autoclaving and disposal will be carried out by technical staff.

**Items for autoclave sterilisation**

Items should be labelled with name, date and room number before being left in 0B. 436 for autoclaving. Bottles of liquid with tape over the lids will not be autoclaved.

Items not collected within 3 days will be discarded.

**Chemical Waste Disposal**

***It is the responsibility of all staff/students/research workers to ensure the safe and correct disposal of all wastes produced in the course of their work.***

***Disposal directly to drain***

Certain chemical wastes may be disposed of directly to drain. The volume disposed of at any one time should not exceed 1 litre and the waste should be diluted with many volumes of water to reduce its toxicity and to prevent accumulation and concentration in sink traps and U-bends.

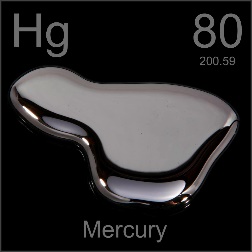
Wastes which may be disposed of to drain when in dilute form include:

* Water miscible organic substances of relatively low toxicity
  + Methanol, ethanol, glycol, glycerol and other lower alkanols
  + Formic acid, acetic acid and other lower alkanoic acids
  + Formaldehyde, acetaldehyde, acetone and other lower alkanoics
  + Dimethylformamide
  + Dimethylsulphoxide
* Aqueous solutions of relatively harmless inorganic compounds
  + Salt solutions containing the following cations and anions are considered relatively harmless: aluminium, calcium, copper, iron, lithium, magnesium, sodium, ammonium, tin, strontium, titanium, hydrogen, zinc, zirconium, borate, bromide, carbonate, chloride, hydrogen sulphite, iodide, nitrate, phosphate, sulphate, thiocyanate and hydroxide.
* Large volumes of concentrated acids or bases must be neutralised prior to disposal to drain

***Disposal through Licensed Waste Contractor***

Chemicals which cannot be disposed of in the laboratory must be clearly identified and accumulated in suitable screw top labelled containers for removal in the annual University waste chemical uplift. Items should be fully inventoried on the ‘Chemicals Disposal Inventory Form’ (<http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/GuidanceNotes/FullListofGuidanceNotes/> ) and stored in a safe manner in a secure location pending disposal by a licensed waste disposal contractor. A copy of this list must be provided to Mr Chris Preshaw.

**Mercury spillage and broken thermometers**

A kit is available to help clean up spills of mercury and collect the waste. This is stored in teaching lab 01.010. It must be returned after use and the waste created stored until the annual uplift of chemical waste in the summer.

Contact the University Occupational Health & Safety Services (OHSS) if you have a mercury spill in excess of the quantity found in a normal laboratory thermometer.

**Disposal of electrical equipment and furniture**

Notify the chief technician, Mr Chris Preshaw, and arrange for removal as instructed. Mrs Gillian Riddell must be notified of any items being discarded if they have an Inventory number attached. Equipment must not be dumped in the basement loading bay.

For IGFS, notify Mr. Brett Greer (DKB) for removal of items from the DKB or Ms. Denise Caldwell (NITC) for items to be disposed of from the NITC.

For those items with an inventory number, please inform Miss Andrea Smyth

**Recycling of paper waste**

All paper waste (including envelopes) should be placed in the Wilsons’ bags supplied by Stores. These must not be filled above the marked line or made so heavy that they cannot be lifted. They should be sealed with a tie and placed in the designated bin provided in the basement loading bay from where they will be collected each week on Wednesday. After collection by Wilsons the paper is sorted by hand; newspapers and non-confidential papers etc. are sent for recycling, confidential papers are shredded and then recycled.

**Recycling of empty cardboard boxes**

These should be flattened prior to leaving outside your lab/office for collection by the cleaning staff or disposed of directly in the GREEN bin in the “Stables” waste disposal and recycling area between the MBC & Whitla Buildings.

**Polystyrene Disposal**

Polystyrene boxes should be disposed of in the large WHITE SACKS labelled Polystyrene in the “Stables” waste disposal and recycling area between the MBC & Whitla Buildings. Only polystyrene should go in those waste sacks, remove any icepacks, dry ice etc, and remove sticky labelling if possible.  Polyurethane and Polyethylene foams are categorised as general rubbish and are not collected for recycling at present.

**Other waste for recycling**

Many bins are now available for recycling paper, tins and plastics.

3.1.4 Reporting faults

3.1.4.1 Building and Services defects

For the MBC and DKB these should be reported immediately to Mr. Chris Preshaw, MBC 01.406); Tel: Ext. 5788.

For QML these should be reported immediately to Simon Exley, Tel: 028 4272 7801.

3.1.4.2 Equipment faults

All equipment faults should be reported to Mr. Chris Preshaw, MBC 01.406; Tel.: Ext. 5788.

3.1.5 Safety audits

From time to time there will be Official and Unofficial inspections. These are mainly for your benefit and should be looked upon positively. While the latter may result in at worst a warning of bad practice and a request to put matters right, official inspections can have very serious consequences, the worst being prosecution under the appropriate legislation.

3.1.6 Manual handling of large/heavy equipment

Do not attempt to do this on your own or with colleagues, without first consulting Mr. Chris Preshaw, or if at the Marine Laboratory, Simon Exley, who will have knowledge of the whereabouts of appropriate equipment (heavy-duty trolleys, lifting gear, etc.) or whom to contact.

3.1.7 Work permits

3.1.7.1 External Contractors

Permission for external contractors to work on site should be sought from Mr. Chris Preshaw.

3.1.7.2 Students working outside normal hours

Postgraduates

Permission must be authorised by your supervisor or the Head of School. Permission for lone working forms are available from the safety section of the school website or directly from Rosaleen Hynes [r.hynes@qub.ac.uk](mailto:r.hynes@qub.ac.uk), school Safety Officer. Forms should be accompanied/evidenced by relevant Risk Assessments.

Undergraduates

Undergraduates are not permitted to work outside normal hours.

3.2 Offices

* Make sure all electrical equipment is switched off before leaving at the end of the day (computers, electric fires, etc.).
* With free standing electric fires ensure that they are:
* stable and not in a position where they can be knocked over;
* not sited between you and your exit from the room;
* not in a position where papers could fall into them thus starting a fire.
* If you spend a lot of your time at your computer, carry out a workstation risk assessment (see section 3.3) and ensure that you have the appropriate equipment i.e. adjustable chair and wrist rests, etc. If in doubt consult your line manager.
* Do not leave personal belongings and valuables in unattended and unlocked offices/rooms.
* DO NOT DO ANY alterations/repairs yourself as it may invalidate University insurance and may make you personally liable. If you require alterations/repairs to any fixtures or fittings in the MBC or DKB contact Mr. Chris Preshaw. If at the Marine Laboratory, contact Simon Exley.

3.3 Use of Computers and DSE Self-Risk Assessment

The hazards associated with Display Screen Equipment (DSE) are often underestimated, but poor ergonomic design, poor posture and insufficient rest breaks from DSE work can cause discomfort or on occasion lead to chronic disorders which can affect both home and work life.

The University recognises that the majority of staff will use DSE whilst at work and is committed to minimising the risks arising from DSE use. The University will provide suitable equipment, workstations, free eyesight tests and if required corrective glasses for DSE users.

 Information on correct DSE use is provided at Staff Induction and at the General Safety Training Courses held throughout the year for Managers, Supervisors and Clerical Staff.

An on-line training course on correct DSE use is also provided through the link below.

Completing any of these courses will enable you to carry out your own DSE Self-Assessment to identify any problems.

The University Display Screen Equipment Policy sets the standard which all Schools/Departments and users of DSE are expected to follow. The following guidance notes provide information on how the requirements of the Policy can be met.

<http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/ComputerWorkstations/>

**ALL 'USERS' ARE REQUIRED TO COMPLETE A SELF ASSESSMENT AFTER A BRIEF ONLINE TUTORIAL** – available from above link

Problems identified through DSE assessment will be referred to the School DSE Assessor, Mr. Stephen Fowler.

3.4 Laboratories, Preparation and other Special Rooms and Wash-up facilities

**The following safety regulations are displayed in all laboratories:**

* Take care that your actions are not hazardous to yourself or others.
* **ALWAYS** prepare a Risk Assessment before carrying out any procedure for the first time. Read the School Safety Manual for further advice.
* Wear the appropriate safety apparel as specified by the risk assessment.
* Disposable gloves used for work in the laboratory **MUST NOT BE WORN OUTSIDE** the immediate laboratory environment.
* Do not eat, drink or apply cosmetics in laboratories. Long hair should be tied back.
* Check correct disposal procedure before discarding used plastic ware, consumables or biological/chemical waste.
* Where appropriate, apparatus should be switched off after use.
* Report building/service defects to your supervisor or Mr. Chris Preshaw (01.406), ext 5788)
* It is a **LEGAL REQUIREMENT** to report accidents and ‘near-misses’ by completing both the Accident Book and a University Accident Report Form (both held in the school office, (01.402) in the MBC or by Simon Exley in QML or Ms Andrea Smyth in DKB/NITC).
* If the Fire Alarm sounds you should leave **IMMEDIATELY** by the nearest exit, ensuring that your work is in as safe a condition as possible. Please close doors behind you. Do not re-enter the building unless told to do so by an authorised person. **Silencing of the alarm does not necessarily indicate it is safe to return.**

COSHH assessments held in each area will give details of local working practices.

3.5 Working outside the School

3.5.1 Undergraduate Field course

Field courses may present hazards additional to those encountered in the laboratory. In order to minimise the risk, a set of rules has been drawn up. When taking part in Field Courses, students will be required to provide Health and Safety information and to sign a statement indicating that they have read, understood and agreed to abide by these rules – see Section 9.

3.5.2 Postgraduates and Staff carrying out field work

It is essential that measures are taken to ensure your safety while carrying out field work. A risk assessment must be completed prior to commencing any field work. Further information will be found in Section 9 and advice is available from the School’s Fieldwork/Environmental Adviser – Gillian Riddell [g.riddell@qub.ac.uk](mailto:g.riddell@qub.ac.uk) ,the school Safety Officer and the University Safety Services website.

3.5.3 Postgraduates and Staff working with other organisations

Occasionally it is necessary for research to be carried out outside the University premises in cooperation with other organisations. It is the responsibility of the academic supervisor to ensure that safety procedures equivalent to those in the University are in place. A questionnaire is available from the Safety Officer for this purpose. The arrangements should be discussed with the researcher involved. If, whilst carrying out the work the researcher is concerned that safety has been compromised, then the academic supervisor should be informed immediately.

3.5.4 Work Placements for undergraduates

Approved worked placements will have a health and safety checklist completed by the employer prior to the placement. Students will have undergone health and safety training within the School before the placement and on starting the placement must complete a health and safety checklist on site. Any queries regarding health and safety issues on work placements may be directed to Mrs. Julie McConkey of University Safety Services.Section 4. Accidents

4.1 General

The University’s definition of an ‘ACCIDENT, DANGEROUS OCCURRENCE AND NEAR MISS’ is an unplanned event, including physical violence, which **may or may not** result in injury or ill health to individuals, damage or loss of property, plant, materials or damage to the environment.

4.1.1 Reporting/Recording/Investigating/Action

The proper reporting of accidents, dangerous occurrences and near misses is essential. Such records provide information which can lead to improved working practices, and may be required in the event of legal or insurance proceedings. **Written reports are required whether or not personal injury or damage to property (personal, School or otherwise) has resulted.**

**Accidents should be reported to the following nominated personnel who will provide access to the Accident Book B510 and the University Accident Report Form - AC1.**

**MBC Site**: Mrs Mary Devlin [mary.devlin@qub.ac.uk](mailto:mary.devlin@qub.ac.uk) Room 01.420 - Ext. 5789

**IGFS - DKB Site**: Ms. Denise Caldwell [d.caldwell@qub.ac.uk](mailto:d.caldwell@qub.ac.uk) Room 0G.326 (32.G) - Ext. 5403

**QML Site**: Mr Simon Exley [s.exley@qub.ac.uk](mailto:s.exley@qub.ac.uk) Room 101 - OTH 02842727807

The responsibility for ensuring that an accident is reported lies with the most senior person present (and uninjured), or with the first person to arrive at the scene, if there are no uninjured witnesses. The provision of first aid, damage control and/or the summonsing of assistance, should take priority over reporting. Following an incident involving the provision of first aid, a report of actions taken must be provided to the School Safety Officer.

The incident should be investigated by the line manager/supervisor, Safety Officer, Trade Union representative or University Safety Service to establish the root cause of events which occurred and ensure remedial action is taken where necessary.

4.2 Personal injury involving chemicals

When someone has been exposed to a dangerous chemical, the proper course of action, whether injury has occurred or not, is to remove the chemical and/or prevent further exposure, due attention being paid to protecting oneself.

4.2.1 Skin contact

Remove immediately any contaminated clothing, footwear or jewellery and wash the affected area with copious amounts of water, preferably in the form of a gentle stream from a tap. Continue washing until there is reason to believe all contamination has been removed, e.g. by a test with pH paper in the event of acid or alkali splashes (saline solutions are available for irrigation (washing) in most rooms, but a stream of water is preferable if available). The possibility of wetting (soaking) uncontaminated clothing is secondary to ensuring removal of the chemical.

4.2.2 Ingestion

While in individual cases there may be specific treatments (e.g. for cyanide poisoning), a general rule would be to dilute the ingested chemical by encouraging the victim, if conscious, to drink volumes of water.

4.2.3 Inhalation

Remove the victim from the area to clean air. If the victim has stopped breathing, administer artificial respiration as soon as possible, in an uncontaminated environment. If applicable, consider if the source of contamination could be safely moved to a fume cupboard. Otherwise, attempt to isolate it by closing doors.

In all cases but particularly with ingestion and inhalation, an ambulance should be called and the victim taken to the A & E Department of the Royal Victoria Hospital as soon as is practical and as full a report as possible, of the chemicals involved, given to the hospital, to guide the staff as to suitable treatment.

4.3 **Accidents involving**:

4.3.1 Chemicals

Following an accident involving hazardous chemicals, and once any casualties have been dealt with, attention must be directed to "cleaning up" operations, to minimise any further damage by or exposure to the chemicals concerned. This cannot be effectively or safely undertaken unless the identity of the chemical(s) involved is known. No-one should introduce or work with any chemical without consideration of a suitable method of disposal and anyone involved in clean-up after an accident should take all possible steps to learn what chemicals are involved and the recommendations for their safe disposal.

Four chemical spill kits have been made available in the MBC at the Porter’s reception, the Prep Lab (01.020), Lab 0G.424 and the Fermentation Lab (0B.026). Please inform the School Safety Officer after use to enable replenishment of the kit.

A kit for the clean-up of **mercury** spillages is available in Teaching Laboratory (01.010). The waste produced must be disposed of through the annual collection of waste chemicals in the summer months.

Please also refer to **Section 5**.

4.3.2 Radioisotopes

Please see **Section 6**.

4.3.3 Biological material, Microorganisms and genetically manipulated organisms

Please see **Section 7**.

Section 5. Hazardous Substances: Codes of practice for their storage, handling and disposal.

Work in a modern biological or biochemical laboratory will often include the use of chemicals or microorganisms which carry a risk to the user, to his or her companions and to their surroundings. It should be self-evident that everyone has a moral duty towards themselves and others to eliminate or at least minimise any potential risks. This moral duty has legal backing in the form of The Health and Safety at Work (N.I.) Order of 1978 and the more recent Control of Substances Hazardous to Health Regulations (COSHH) (N.I. 2003).

In compliance with the above Health and Safety at Work Order, codes of safe practice for laboratories have been drawn up and are available in the laboratories. For work involving chemicals these are based on The Royal Society of Chemistry's Guide to Safe Practices in Chemical Laboratories and COSHH: guidance for universities, polytechnics and colleges of further and higher education. The relevant code of practice should be consulted by anyone about to commence work in any laboratory.

5.1 COSHH regulations

5.1.1 Legal requirements

COSHH regulations require that work shall not be undertaken which is liable to expose staff or students to any substance hazardous to health until a suitable and sufficient assessment has been made of the risks to health and the steps that need to be taken to meet the requirements of the regulations.

The regulations determine that a substance is hazardous to health if it is:

* Listed in Part 1 of the Approved Supply List as dangerous for supply within the meaning of the Chemicals (Hazard Information and Packaging for Supply) Regulations and for which the general indication of danger specified for the substance is very toxic, toxic, harmful, corrosive or irritant.
* A substance for which the HSE has approved a workplace exposure limit as specified in the document EH40/2005 Workplace Exposure Limits.
* A micro-organism which creates a hazard to the health of any person.
* Dust of any kind when present at a substantial concentration in air.
* A substance which creates a hazard to health which is comparable with the hazards mentioned above.

If a substance has been recently synthesised, prepared or extracted and is otherwise unlisted, the associated hazard should be estimated by comparison with known, related substances. Exposure to such substances should be controlled to as low a level as reasonably practicable.

The COSHH regulations do not apply to some substances, e.g. lead & asbestos which have their own regulations or to substances which are dangerous by virtue of physical properties, e.g. radioactive, flammable or explosive substances. However other, specific regulations may apply as will the Health and Safety at Work Order.

A distinction is to be drawn between the terms hazard and risk.

|  |  |
| --- | --- |
| **Hazard** | The hazard presented by a substance is its potential to cause harm. This is an inherent property of the substance. |
| **Risk** | The risk from a substance is the likelihood that it will harm you in the actual circumstances of use. Thus the risk depends on the hazardous properties of the substance, but also on how it is used and the steps taken to control the hazard |

5.1.2 When to complete a COSHH form and how to do it

The School of Biological Sciences requires that a COSHH Risk Assessment be carried out whenever a substance which appears in the compilations quoted in this document or which appears in the BDH, Fluka , Sigma-Aldrich or other catalogue marked with a hazard symbol and/or risk phrase is to be used (carcinogenic, mutagenic and teratogenic agents are included). ***The assessment must be carried out before work involving the agent begins.*** The COSHH Risk Assessment must be written down. COSHH forms and accompanying guidance on their completion are available from the safety pages of the school webpage or directly from **Ms Katrina O’Connor** [**biolsci.safety@qub.ac.uk**](mailto:biolsci.safety@qub.ac.uk) **(COSHH Advisor) or** [**r.hynes@qub.ac.uk**](mailto:r.hynes@qub.ac.uk) **(School Safety Officer)**. The completed form, duly signed by the relevant persons, is required as evidence that these persons have assessed the risks involved in working with this substance.

*Undergraduate Laboratories*: It is essential that the staff responsible for practical classes ensure that common hazards are clearly and prominently stated in laboratory manuals.

If a written assessment is deemed necessary, then it must be displayed on a notice board in the appropriate laboratory and the attention of students drawn to it, while the experiment is in progress. A separate assessment is also required for the preparation of the practical, carried out by the technical staff.

*Research Laboratories*: With regard to all project (Level 3) and research students, the supervisor has the responsibility of ensuring that risk assessments are completed where necessary and signed for all experiments or related groups of experiments. Students should be encouraged to carry out assessments as part of their training, but the final responsibility for content rests with the supervisor.

Guidance on completing the COSHH form is given in the following flowchart. Points to consider are

* the hazards associated with the substances being considered;
* the scale and frequency of use;
* the possibility of replacement with a less hazardous substance;
* containment measures (fume cupboards, safety cabinets, etc);
* personal protection (safety goggles, suitable gloves, etc.);
* what could happen if a spillage occurs;
* how could people be affected (ingestion, absorption, etc);
* who would be affected by the substances in use e.g. young mother or pregnant woman;
* how can excess/surplus be disposed of;
* is monitoring of the environment or individuals necessary?

A suitable and sufficient assessment must give evidence that all the questions listed on the form have been realistically considered. The assessment must be signed by the supervisor, students, the most applicable safety advisor for the hazard and finally the School Safety Officer who will check that the assessment is competent. A copy will be retained by the COSHH safety advisor. When a duly authorised copy is returned, both the supervisor and the student(s) concerned should hold copies. University or government inspectors may visit, wishing to see COSHH risk assessments for work in progress and evidence that the procedures discussed therein are being adhered to.

**Information on hazardous chemicals may be found in:-**

1. Manufacturers and Suppliers catalogues and Safety Data Sheets. These must be kept in laboratories for future reference.
2. Labels on containers of chemical substances and preparations.
3. Health and Safety Executive EH40/2005 Workplace Exposure Limits.
4. Health and Safety Commission "Approved Supply List" (7th ed. 2002) (Issued under the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002)
5. The Sigma-Aldrich Library of Material Safety Data Sheets (MSDS). These are available on line at [www.sigmaaldrich.com](http://www.Sigmaaldrich.com). Use the search box to find the chemical and click on MSDS.
6. The web site of the QUB Safety Office ([www.qub.ac.uk/so](http://www.qub.ac.uk/so)). Follow the link ‘Information’ to ‘Useful links’ and finally ‘Material Safety Data Sheets’.

Items 3 and 4 are on a CD held in the School Office (01. 402). 

5.2 Use of Hazardous Substances

5.2.1 Powder weighing cabinet

Extraction cabinets, housing a weighing balance, are situated in lab 01.429 in the Molecular Biology wing in the MBC and in the IGFS research lab in the DKB. These are recommended for the safe weighing of all hazardous powders. Their use should be advised in any risk assessment involving the use of such chemicals. They must be cleaned before and after use.

5.2.2 Carcinogens

Work with carcinogens is controlled by the Carcinogenic Substances Regulations (NI). Although there is no complete listing of compounds which should be so classified, a list of substances which are classified as carcinogenic (in various categories) will be found on the QUB Safety Services, Guidance Notes web page at: <http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/FileStore/WordDocuments/Filetoupload,369557,en.docx>

Under the Carcinogenic Substances Regulations (NI) the following substances are prohibited for use or supply: 4-aminodiphenyl; benzidine (4,4'-diaminodiphenyl); 2-naphthylamine; 4-nitrodiphenyl and their salts; and the following are controlled: o-dianisidine (4,4'-diamino-3,3'-dimethoxydiphenyl); dichlorobenzidine (4,4'-diamino-3,3'-dichlorodiphenyl); 1-naphthylamone; o-toluidine (4,4'- diamino-3,3'-dimethyldiphenyl) and their salts. Any application for exemption will be rigorously contested.

5.2.3 Toxic chemicals

Information on toxic chemicals will be found in the publications mentioned earlier in connection with COSHH regulations. Note that both acute effects (where a single exposure to the substance may cause an immediate adverse effect) and chronic effects (where an adverse effect may result from a series of low level exposures) should be taken into account.

A major consideration is that in working with any substance in the above two categories, precautions must be taken to ensure that personnel are not put at risk of inhaling, swallowing or otherwise absorbing the material.

5.2.4 Flammable chemicals/solvents

Most organic chemicals are flammable, but the greatest risk arises from the use of volatile organic solvents such as ethanol, methanol, diethyl ether and acetone (propanone) which are likely to be used in relatively large volumes. Important properties of a solvent to consider are the flash point, the temperature above which solvent vapour can burn and the ignition temperature, the temperature above which solvent vapour may be ignited by heat alone, without involvement of flame or spark. Liquids with flash points below 32°C are defined as Highly Flammable, while those with flash points above 32°C are defined as simply Flammable. Highly flammable solvents always pose a fire risk, since their vapours will always burn at normal laboratory temperatures without any further heating.

Stocks of flammable solvents in a laboratory should be kept to a minimum and should be stored in safety cabinets. Winchesters (2.5 l bottles) of solvents (and indeed other liquids) should only be transported in Winchester carriers. Under the Highly Flammable Liquids and Liquified Petroleum Gases Regulations (SI 1972 No 917), it is a requirement that the maximum stock of solvent in a laboratory is restricted to 50 l and the maximum size of bottle on a bench to 500 ml. Winchesters should be removed from safety cabinets only when needed and should be returned as soon as possible, and must not be allowed to sit on benches.

5.2.5 Biological Agents

A list of hazardous biological agents and the conditions governing their use can be found on the University Safety Services website at:

http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/GuidanceNotes/InfectiousAgentsGMOs/BiologicalMaterialsInfectiousAgentsGeneticallyModifiedOrganisms/

Advice with regard to COSHH assessments involving infectious agents and the regulations governing work with Genetically Modified Organisms can be obtained from the School Biological Safety Officer (Dr. Mark Robinson). See details in Section 7.

5.2.6 Storage

1. Legible, informative labelling of all substances is mandatory. Those purchased commercially will carry a label showing identity, quantity, some properties and some safety information. The date of receipt should be added. Any chemicals prepared in the laboratory, or aliquoted or purified from a larger container must be similarly labelled with users name (where appropriate), identity, quantity, date and at least a hazard warning.
2. Incompatibles must be stored separately, e.g. oxidising agents and flammable chemicals and also acids and bases must be stored in separate containers so that an accidental breakage or spillage cannot lead to contact, and possible reaction with a member of the other class.
3. Legislation (and prudence) requires that some classes of chemicals are held in locked cupboards and only issued on signature by an authorised member of staff. Examples are scheduled poisons, explosives and some carcinogens.
4. **All refrigerators or other storage areas should bear a list of their hazardous contents.**

5.2.7 Waste Disposal

For detailed instruction of University disposal procedures please see Appendix 5.

The primary responsibility for disposal of dangerous chemical wastes lies with the producer ***NOT*** the School Safety Officer, the University Safety Service or the School’s Technicians. The Senate has ruled as follows:

**‘Members of staff in charge of teaching or research in which dangerous chemicals are used are personally responsible for arranging the safe storage or consignment to waste of surpluses of these chemicals on completion of any course or project.’**

As for reaction products and residues arising from research, the research supervisor concerned obviously has responsibility for their safe disposal or conversion to harmless materials, and would often be the only person with the specialist knowledge required for the job. The following general suggestions for waste management are offered. Buy in as little as possible. **Do not let** your chemical waste accumulate in quantities or forms which will make treatment difficult: for instance, don’t dump filter papers, mercury, cotton wool, glass wool, or broken glass AND chemicals in the same container. Do not include with dangerous chemical wastes large quantities of harmless wastes which could alternatively go into a sink or dustbin. Clean up your glassware immediately after use, before the stoppers get stuck. Note that broken glass must be put only in bins dedicated for glass waste, when full these should be emptied into the general waste Euro bins outside.

**A flow chart giving general guidance for waste disposal follows.**

**Solid**

Bag for Radioactive  
Waste

Bunker for storage  
and collection

**Liquid**

Radioactive sink  
- Flush away

**Radioactive Waste**

**Solid**

Storage until  
collection (in sharps box if applicable)

**Liquid  
(inorganic)**

To sink\*  
-Flush away

**Liquid  
(solvents)**

Chlorinated

Dispose in labelled bottle in fume hood for removal to stores

Non-Chlorinated

Dispose in labelled bottle in fume hood for removal to stores

**Chemical Waste**

**Clinical waste  
ie blood/tissue/body fluids**

Clinical waste (Orange lidded sharps box / rigid container or green freezer bag/yellow lidded rigid container)

Clinical waste store  
(freezer or room temp)

Contaminated glassware

Virkon   
(1%/12 h)

Wash and reuse or dispose in glass bin

**Potentially Infectious material\*\***

Solids

Autoclave bag  
(or sharps box if applicable)

Autoclave

Liquids

Virkon (1%/12 h)

Flush away

**Biological Waste**

Sharps box to clinical waste store

Rest to general waste disposal

5.2.7.1 Disposal via drains

The following wastes, not exceeding 2 litres, may be put down drains **IF, AND ONLY IF**, copiously diluted with many times their volume of water:

Water-miscible (<3%) organic substances of relatively low toxicity including methanol, ethanol, glycol, glycerol and other lower alkanols; formic acid, acetic acid and other lower alkanoic acids; formaldehyde and acetaldehyde; acetone and other lower alkanones; tetrahydrofuran and the ‘glyme’ ethers; dimethylformamide; dimethysulphoxide: with the exception of chlorites, cyanides, sulphides, azides, borohydrides, and any other compounds capable of generating highly toxic or explosive gases in contact with acids, for which see Section (5.2.7.6) below. Large amounts of acid or base should be neutralised. “Chemical Safety Matters” quotes harmless cations and anions as: Al3+, Ca2+, Cu2+, Fe2+,3+, Li+, Mg2+, Na+, NH4+, Sn2+, Sr2+, Ti3+,4+, H+, Zn2+, Zr(IV); BO33-, B4O72-, Br-, CO32-, Cl-, HSO3-, I-, NO3-, PO43-, SO42-, SCN-, OH-.

5.2.7.2 Waste organic solvents

Apart from those listed under 5.2.7.1, waste organic solvents must be collected in labelled ‘waste solvents’ containers (either halogenated or non-halogenated) and disposed of by a professional waste-disposal firm. These solvents may be stored in the Waste solvent store room in the Basement until collection.

5.2.7.3 Solid water-insoluble materials

Quantities of up to 100g of inert, non-hazardous water-insoluble materials such as sundry organics, metal oxides, silicates, carbonates, sulphides, barium sulphate etc., should be securely enclosed in strong valueless containers and placed in rubbish bins for disposal to municipal dumps. This method must not be used for reactive or flammable substances which might be capable of injuring untrained persons who handle rubbish.

5.2.7.4 Mercury disposal

A kit for the clean-up of mercury spillages is available in the Teaching Laboratory 01.010. The waste produced must be disposed of through the annual collection of waste chemicals from the Basement Store in the summer months (see 5.2.7.6).

5.2.7.5 Cyanides and other ‘exceptions’

Cyanides and other ‘exceptions’ noted under (5.2.7.1) above, and other reactive inorganics and organometallics such as metal alkyls and carbonyls, and lithium aluminium hydride, require special disposal procedures which are well documented. Ask the advice of the School Safety Officer.

5.2.7.6 Other waste

Materials which cannot be disposed of safely by the user will be gathered in an annual uplift and disposed of by a professional waste-disposal firm. All items for disposal must be clearly and permanently labelled as to identity, weight of the container if it were full and user. They must be boxed and accompanied by a certificate signed by the academic supervisor. Since these collections are very expensive, responsibility must be exercised in what is left for collection. Toxic metals such as Hg2+, Cd2+ in dilute solution should be precipitated e.g. as sulphide, and filtered off. Unidentified material will not be accepted by the waste-disposal firm.

**TO SUM UP: PLEASE** design experiments to produce as little waste as possible. If you produce hazardous waste **DESTROY IT** by e.g. hypochlorite oxidation (Safety Officer will advise). Use option 5.2.7.6 as a last resort. Do not leave materials lying about unlabelled.

It is good practice to survey chemical stocks regularly to cut out obsolete items, illegibly labelled containers and any chemicals that show signs of decomposition.

**Disposal of Clinical Waste**

Clinical Waste is either heat treated or incinerated dependent on the type of waste generated. The different types of materials and the required treatment are defined below and in the attached table:

***Clinical waste is waste which has the potential to cause sharps injury, infection or offence. When packaged and disposed of appropriately there is virtually no public health significance. Clinical waste contains the following types of waste:***

***sharps; human tissue (excluding hair, teeth and nails); bulk body fluids and blood; visibly blood stained body fluids and visibly blood stained disposable material and equipment; laboratory specimens and cultures; animal tissues, carcasses or other waste arising from laboratory investigation or for medical or veterinary research.***

The operative term is **“offence”** - this should **not be infectious material**, which must be **sterilised** before disposal. Microbial and cell cultures should generally be disposed of through other waste streams after sterilisation by either autoclaving or disinfectant as appropriate. In addition to animal carcasses and body parts it may also include sharps boxes /burn bins which may contain gels contaminated with significant quantities of acrylamide or ethidium bromide (EtBr) – “Cytotoxic waste”.

**Note that micropipette tips and paper towels that may have been in contact with such gels are unlikely to be carry significant quantities of acrylamide or EtBr and should be disposed of by other waste streams as follows; Gloves, tips, eppendorfs etc. which are not infectious, cytotoxic or harmful, should be autoclaved and then placed in a bag with a ‘MADE SAFE FOR DISPOSAL’ label attached: The bag can then be disposed of in the general waste bins. Note that personnel from labs in the MBC should leave bags for autoclaving in the bin provided in 0B. 436; autoclaving and disposal will be carried out by technical staff**.

Plasticware contaminated with phenol, chloroform or formamide should also be disposed of as cytotoxic waste (purple-lidded sharps boxes or burn bins labeled HY). Waste from other harmful and corrosive but not toxic chemicals eg. Guanidine thiocyanate, should be disposed of in the yellow-lidded clinical waste bins for incineration (labeled HI).

**Please follow the instructions below and in the table for dealing with clinical waste.**

The MBC store will keep the burn bins, sharps bins and green waste bags as stock items.

**Burn bins must not be used for sharps** – they are thin gauge plastic and are not designed to contain sharps.

**Clinical Waste Colour Coding**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Container Type** | **Type of Waste** | **Suitable for** | **Treatment** | **Code** |
| th?id=H  **Burn Bin** | Infectious Clinical Waste | Infectious or potentially infectious hard clinical waste contaminated with blood / bodily fluids. **NO** free liquids. Free liquids should be sealed in a screw cap container and then placed in burn bin.  Laboratory and histology waste | Steam Sterilisation Process (alternative treatment) | **HT** |
| orangelid2  **Sharps Container** | Infectious Clinical Waste | Sharps (hypodermic needles, attached syringe bodies, etc.) which may be contaminated with potentially infectious body fluids and discharges medicinal syringes. **Non-contaminated sharps**.  Contaminated slides, stitch cutters, guide wires, trocars and razors  Blood stained or contaminated glass or any other contaminated item likely to puncture a bag | Steam Sterilisation Process (alternative treatment) | **HT** |
| 05480wiva  http://cdn6.bigcommerce.com/s-hdt6nu/products/4372/images/696/430_large__29036.1456308048.1280.1280.jpg?c=2 | Infectious Clinical Waste | Laboratory waste or anything else not suitable for heat treatment  Including waste from harmful & corrosive but NOT TOXIC chemicals eg. GUANIDINE THIOCYANATE  NO SHARPS IN BURN BINS  Waste containing Hazard group 4 pathogens or CJD  Non-autoclaved Risk group 2 and 3 laboratory cultures  Large or bulk metallic objects | Incineration Only | **HI** |
| 18808_FSL004 | Cytotoxic / Cytostatic Waste | Needles, syringes, sharp instruments, cartridges and broken glass used in the administration of cytotoxic/cytostatic and vaccine drugs  Cytotoxic sharps & ETHIDIUM BROMIDE GELS; plasticware contaminated with PHENOL, CHLOROFORM, TRIZOL or FORMAMIDE | High Temperature Incineration | **HY** |
| **Container Type** | **Type of Waste** | **Suitable for** | **Treatment** | **Code** |
| 20788_FSL392 | Cytotoxic / Cytostatic Waste | Containment of non-sharps cytotoxic/cytostatic and vaccine waste, including cover-protected sharps or sharps tips. **NO** free liquids. Free liquids should be sealed in a screw cap container and then placed in burn bin.  ETHIDIUM BROMIDE GELS  Left-over cytotoxic drug preparations | High Temperature Incineration | **HY** |
| 69395528_red-lid-60-low-res | Anatomical Waste | Infectious healthcare anatomical waste  Containment of recognisable anatomical waste or body parts | Incineration Only | **HA** |
| 69395528_red-lid-60-low-res | Anatomical Waste | Human Tissue Act (HTA) related human tissue  Human Tissue Act (HTA) related blood  Human Tissue Act (HTA) contaminated sharps (must be in a sealed orange lidded sharps bin and then placed inside red lidded burn bin and sealed) | Incineration Only | **HTA relevant material** |
|  | Animal  Anatomical Waste | Infectious veterinary anatomical waste – non recognisable animal waste or body parts | Incineration Only | **VA** |
| EPI731  **Green Freezer Bag** | Animal Anatomical Waste | Animal anatomical waste which is likely to undergo putrefaction  Recognisable animal body parts only – no tissues  Bags should be placed in the bins (WITHOUT LID) in the clinical waste room freezer and the waste log book completed. | Incineration only | **VA** |

**ALL CLINICAL WASTE BINS MUST HAVE THE FOLLOWING**:

1. Correct Lid Colour
2. Correct lettering in large letters at side of bin – should be either **HT, HI, HY or HA, HTA, VA**.ng in large letters at side of bin
3. The name of the person filling the bin
4. Location of the lab where the waste has come from ie. Building & Lab No. (eg. MBC 05.027)

Please note that from now on **the contractor WILL NOT collect waste which has been incorrectly labelled** with the wrong colour lid **or bins that have not been securely closed.**

**The clinical waste log book, kept in the clinical waste storeroom, must be completed when leaving waste: an example of the details requiring completion is shown below.**

**WASTE LOG BOOK:**

**Please enter ALL the following information including the number of containers at each volume. Each container should also be CLEARLY MARKED with waste type e.g. HT, HY etc and the Centre from which it came.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date:** | | **School/Centre:** | | **Name:** | |
|  | **HT** | **HY** | **HTA** | **HI** | **Green Bags** |
| **60L** |  |  |  |  |  |
| **30L** |  |  |  |  |
| **22L** |  |  |  |  |
| **11.5L** |  |  |  |  |
| **7L** |  |  |  |  |
| **Other………** |  |  |  |  |

5.3 Gases

5.3.1 Compressed gases

Some cylindered gases are flammable (e.g. hydrogen) and/or toxic (e.g. ammonia) and some are both, but any gas, other than oxygen, poses a hazard in that a sudden, catastrophic release could flush the oxygen out of an area, to the detriment of living creatures in that area. Gas cylinders must not be transported in passenger lifts – **please use the Goods lift only**.

It is important that cylinders are properly immobilised by a clamp (or equivalent). They must be fitted with the correct type of regulator for the gas concerned and **these must be replaced every 5 years**. Never try to force a regulator onto a cylinder. A few drops of leak detection solution around the joint provides a simple test for leaks. Cylinder valves should be shut when not in use and routinely, when a cylinder is empty. Empty cylinders should be so marked and returned to stores promptly. Any cylinder too heavy to carry by hand must be transported in a wheeled trolley. An unsupported cylinder falling over can shear off its valve and become a heavy, unguided missile.

**Hydrogen cylinders may not be brought into the building**

5.3.2 Cryogenic gases

Only liquified nitrogen (-192°C b.p.) and solid carbon dioxide (-78°C) are provided on site. These pose hazards due to extreme cold and possible displacement of oxygen.

**Insulating gloves and face protection must always be worn when handling these systems.** They must not be carried in a passenger lift as in the event of a lift failure, evaporation in a confined space could have serious consequences. Use the goods lift and do not travel with the container in the lift. No one may use cryogenic systems without instruction by an authorised user.

When liquid nitrogen is used with cold traps in a vacuum system, care must be taken not to draw air continuously through a trap at -192ºC. Under these conditions, liquid oxygen may form. This can react violently and possibly explosively, with organic matter.

5.3.3 Dry Ice packaging

Regulation of the shipment of samples on dry ice requires that the person packaging the material has been certified to do so. The School presently has two members of staff trained; Mr. John Dickson. Please discuss your requirements in advance to ensure the correct packaging is available.

Section 6. Radiation

6.1. Radioisotopes: Codes of Practice for their storage, handling and disposal.

**Designated Radioactive Laboratories**: - Rooms 01.439 and 0G.415.

6.1.1 Statutory Regulations.

### The use of radioisotopes is governed by –

### 1. The Radioactive Substance Act, 1993

The Radioactive Substance Act controls the purchase, stock storage and disposal of all radioactive materials. This control is exercised by the Department of Environment who are mainly concerned about hazards to the environment outside the university. They issue certificates of registration and authorisation for storage and disposal to every laboratory/school using radioisotopes. Copies of these must be posted on each designated laboratory notice board. Limits are set on the certificate for maximum storage of radioisotopes for each laboratory. The Radiation Protection Advisor of the University has to apply to the Department of the Environment if any change to that limit is required or a new radionuclide is to be used. The RPA has also to provide the DOE (NI) with copies of any new protocols to be used.

### 2. The Ionisation Radiation Regulations, (NI) 2001

The Ionisation Radiation Regulations are primarily concerned with the health and safety of employees of the university who use or are in contact with radioisotopes. This is mainly the responsibility of the Health and Safety Executive. They issue an approved code of practice and Inspectors ensure that all university labs comply with all relevant regulations.

### 3. University Regulations

### The Radiation Protection Advisor (RPA) is designated as the University's competent person with regard to work with Ionising Radiation.

#### He/she

* + designates areas suitable for radioactive experiments and advises on refurbishment that has to be carried out before existing non-designated laboratories can be rendered suitable for radioisotope usage.
  + keeps a record of all users of radioactivity within the university and give advice on the handling of radiochemicals.
  + receives copies of all orders for radiochemicals
* is furnished with copies of all new protocols involving work with ionising radiation before the work commences to ensure appropriate protective measures are in place.
  + approves the disposal methods used by each school. He/she reports yearly on isotopes disposed of by the university to the Department of the Environment.

4. School Regulations

Supervision within each school has been delegated by the RPA to Radiation Protection Supervisors (RPS). They are nominated and approved by each school board. They are responsible for all radioisotopes brought into each school and their safe keeping. They hold a register of all radioactive workers within that school and report all new users to the RPA. They are responsible for records of radioisotope usage and their disposal. They can recommend the de-registration of anyone not using isotopes properly and safely to the Head of that school and to the RPA.

6.1.2 Guidelines for the storage of isotopes.

**Isotopes must only be held and used in premises certified by the Department of Environment.**

Isotopes must be kept in locked cupboards, fridges or freezers in laboratories that have been designated as suitable for radioactive usage by the RPA. In addition it is advisable that these laboratories should be locked when empty. They should have a radioisotope trefoil sign on the entrance door which must be labelled with the isotopes that are stored and used in it. A record must be kept of all isotopes that have been used from stock containers and the means of disposal of it (section 6.1.6).

6.1.3 Guidelines for Ordering and Receipt of Radiochemicals.

6.1.3.1 Ordering Radiochemicals

Orders for radiochemicals must be placed with the school purchasing officer (currently Mrs. Mary Devlin). She gives the orders a special code that alerts the University purchasing office of its nature. They then inform the University Radiation Protection Advisor for record keeping purposes.

Some biochemical kits contain radiochemicals. This may not immediately be apparent from the placed order. Ensure that the school purchasing officer knows of this so that it can be dealt with in the correct way.

Radiochemicals must not be brought in from other departments of QUB or from other Universities without the express approval of the Radiation Protection Supervisor. Special legislation governs the transfer of radiochemicals between locations and it is imperative that this is obeyed. All radiochemicals within the school must be accounted for in the record-keeping system (section 6.1.6). Radiochemicals should not be sent or received by post.

6.1.3.2 Receipt of Radiochemicals

Radiochemicals are delivered to the store in the basement. The store man will phone your laboratory when it is delivered. This must be collected by a responsible person who will ensure that it is stored in the correct way. The person responsible for the work should ensure that a record is opened for it (section 6.1.6).

When opened the label on the container should be read to ensure that the correct quantity has been sent. The outside of the container should also be monitored to ensure that no leakage has occurred on transit.

6.1.4 Safety Regulations for Handling Radioisotopes during Experimental Work

6.1.4.1 General points

* All work with radionuclides must be conducted under a written protocol. The protocol provides details of the isotopes used, their activities, the work undertaken and the methods of disposal of the radioactive waste.
* Risk assessments must be carried out on all these procedures. This is to include the protective measures used (time, distance, shielding etc.) to reduce exposure to ionising radiation to as low a level as reasonably practical. It should also include emergency procedures.
* Gloves and buttoned-up lab coats must be worn. These should be removed when leaving the laboratory. Gloves should be disposed of in the radioactive bin.
* Personnel and workspaces should be monitored at frequent intervals during experimental work.
* It is a requirement that a space in the laboratory is designated and demarcated for dispensing and working with stock solutions.
* The time taken for handling radioisotopes should be reduced to the minimum. Doubling your distance from them reduces your dose level by 70%.
* Radiochemical tape should only be used for labelling, equipment and demarcating radioactive work areas, containers which have radiochemical stock solutions and for radioactively-labelled experimental products in them. All such containers should be put in a locked fridge/freezer if storage is required.

6.1.4.2. Common Isotope Characteristics and Their Safe Handling

6.1.4.2.1 Tritium (3H)

3H is a low energy beta emitter the maximum energy of which is 0.0186MeV. However, it has a relatively long half-life of 12.3 yrs. It cannot be detected by mini-monitors but contamination of work surfaces can be checked by swabbing and subjecting the swabs to liquid scintillation counting. Because tritium can be absorbed through the skin gloves should be worn at all times. The maximum range in air of this isotope is 6 mm and therefore, shielding is not required.

6.1.4.2.2 Sulphur-35 (35S); Carbon-14 (14C).

35S and 14C emit β rays with a maximum energy of 0.167 MeV and 0.156 MeV respectively. However the half-lives are very different with that of 35S being 87.4 days whilst that of 14C is much longer at 5730 years. Contamination of work surfaces by either isotope can be detected using a mini-monitor fitted with a thin end-window Geiger Muller probe. However, for small amounts swabbing may be necessary. The maximum penetration in air for beta rays from both isotopes is almost the same (approx 25 cm) thus distancing oneself from reaction vessels or stock containers is an essential feature of safety. Shielding, if used, should be made of 1 cm Perspex.

35S - Special considerations.

Radiolysis of 35S amino acids can sometimes occur during storage and use, leading to the generation of a small amount of 35 S volatile impurities. These may contaminate reaction and storage containers. It is advisable that vials containing such materials should be opened and used in fume cupboards or other ventilated enclosures. Opening when cold minimises the vapour. For tissue culture procedures, class II microbiological cabinets must be used. Work trays should be used inside cabinets. Incubators used for labelling cells must be fitted with charcoal filters and a water container should be placed at the bottom of it. All of these should be thoroughly monitored after the experiment is over.

14C - Special Considerations.

Carbon dioxide may be released during the course of some experiments. Care should be taken that this is not inhaled. If this is the case, work should be done in a radioactive fume hood. Some organic compounds can be absorbed through laboratory gloves. If this is the case reaction vessels should be held using forceps or tongs when possible.

6.1.4.2.3 Phosphorous-32 (32P).

32P emits β-rays the maximum energy of which is 1.709 MeV. It is generally (but not always) the strongest isotope used in biological/biochemical laboratories. However, it has a relatively short half-life of 14.3 days. Contamination of work surfaces should be routinely checked using a mini-monitor fitted with a type E Geiger Muller probe. Stock containers or tubes containing high levels of 32P should be held for the minimum length of time. Finger dosimeters are recommended for those dispensing from stock containers or using greater than 37 MBq (approx 1 mCi). It is wise to put reaction vessels in Perspex or lead holders. Shielding of 1 cm Perspex should be used if quantities used are less than 185 MBq (5 mCi). This effectively cuts out the beta-radiation. If quantities greater than this have to be used then lead shielding is required since absorption of beta particles by perspex can give rise to Bremstralung radiation. In these instances the use of lead impregnated rubber gloves is also recommended.

6.1.4.2.4. Iodine-125 (125I).

This isotope has a half-life of 60 days and emits primarily gamma rays the maximum energies of which are 0.035 MeV. Monitoring for contamination should be done by swabbing workbenches followed by liquid scintillation counting of swabs or using a mini-monitor fitted with a special 125-I probe. Extreme caution must be taken when using this isotope, since iodine is extremely volatile. It is essential that the thyroids of all workers should be monitored at regular intervals since iodine can be concentrated here when incorporated into thyroxine. Solutions containing iodide ions should not be frozen or made acidic since elemental iodine can be formed and with some compounds it is wise to wear two pairs of gloves to prevent penetration onto the skin. Shielding should be of leaded glass or lead.

6.1.4.3 Spillages

* When **minor spills** have occurred, ensure that no personnel walk through the spillage area. Minor spills can be mopped up using absorbent disposable paper, preferably using a remote handling device. The paper should be disposed off in the radioactive waste bin. The area should be washed with Decon until decontaminated. If the area cannot be decontaminated readily consult the Radiation Protection Supervisor for advice.
* If a **major spillage** occurs, do not panic. Immediately cordon-off the area. Do not allow staff or students people to walk through the spill. Get a colleague to notify the Radiation Protection Supervisor who will advise you on the correct way to proceed. He/she will call the University Radiation Protection Advisor. After normal working hours, ring University Security (5099) and ask them to phone the University Radiation Protection Advisor who will come in.

All personnel working in the surrounding area should be monitored for contamination. No articles of clothing, books or personal belongings should be allowed to leave the area until checked. If personnel are contaminated, all contaminated clothes will need to be removed as quickly as possible, put into a bag and shielded until it can be safely dealt with. Contaminated skin should be washed repeatedly with soap and water. During this procedure care should be taken to avoid spread of contamination to other areas. Scrubbing should also be avoided since this may break the skin.

Spillages should be mopped up with remote handling tools using absorbent paper to confine it to a limited area. If a 125I spillage occurs, the area and spill should be treated with alkaline sodium thiosulphate before decontamination can take place. Personnel suspected of being contaminated should take immediately a tablet of potassium iodide to block uptake in the thyroid. All spillages must be accounted for in the disposal records.

6.1.5 Guidelines for disposal.

6.1.5.1 Scintillation fluid.

It is strongly recommended that a biodegradable scintillation fluid is used at all times when required. This can safely be poured down a designated radioisotope sink provided that the total limits for disposal of all isotopes, as set out on the Department of Environment disposal certificates, are not exceeded for this site. If it is essential that a non-biodegradable fluid be utilised, then after use it should be poured onto absorbent materials such as wood chippings contained in polythene bags. These in turn should be placed, following sealing, into wax bags, which should be labelled with (i) School, (ii) Date, (iii) Isotope(s), (iv) Activity and (v) Solvent. Where disposable vials are used they should be inserted unopened into the absorbent material, which should be disposed of as detailed above. The labelled wax bags should be placed in the store situated in the basement of the Medical Biology Centre and recorded in the book for waste disposal.

6.1.5.2 Solutions containing radioactivity.

Aqueous solutions containing radioactivity should be poured down designated radioactive sinks provided that the site disposal certificate limits are not exceeded. (These are indicated in the registration certificates outside each radioisotope laboratory). After disposal, copious amounts of water should be flushed down the sink. Radioiodine solutions of high activity can become fixed to Vulcathene pipe work. Avoid this by flushing occasionally with "Chloros" or dispose of with cold iodide mixture (ferric iodide/molasses). Stock solutions of 32P or other short-lived isotopes may be stored, if required, to allow for decay. They should then be disposed of as described above.

6.1.5.3 Radioactive solids/biological waste.

Such material should be packed in wax lined bags. These bags should be secured and labelled with (i) school name, (ii) date, (iii) isotope(s) and activity (recorded from the Isostock records; see below). When full, the bag should be sealed and brought to the Medical Biology Centre Waste store in the basement. The key for this can be obtained from the store manager and the details of each bag deposited have to be recorded in the book kept by him.

6.1.6 Record Keeping

The radiochemical inspectorate requires that we account, in detail, for all our uses and disposals of radiochemicals. The inspectors routinely perform checks on our stocks. Thus it is essential that our record keeping is full and up-to-date. The University Safety Service has invested in a computer program that enables us to do so. This is linked to a Queen’s Server and the Radiochemical Protection Advisor has instant access to our use of radiochemical when they are recorded on the system. The computer program is called Isostock. Supervisors or the Radiation Protection Officer will provide instruction on how to use the programme. All usages and disposals must be recorded immediately. Paper records of usages and disposals must also be kept.

The Certificates of Registration etc. set out daily disposal limits for the whole MBC Site which includes WMB and Pharmacy - it is imperative that records are kept up-to-date on a daily basis on the computer so that the University can show compliance with its statutory obligations. Failure to maintain accurate and timely records can lead to enforcement action by the DOE and ultimately prohibition from working with radionuclides.

6.2 Radiation: Use of UV Transilluminators and UV lamps

UV transilluminators are often used to locate nucleic acid bands in gels. Sometimes these bands are excised for further work. These transilluminators are very high-powered devices. The occupational exposure standard over an 8hr period of 30J/m2 may be exceeded after only a very short exposure to the rays that they emit**. It is essential that eyes and skin are fully protected when examining gels and/or excising fragments.** Most transilluminators are fitted with a protective perspex lid. Cover the face of the transilluminator with this at all times when examining gels. In addition **protective visors** should be placed beside the transilluminator for complete eye protection and it is essential that they are worn, especially when bands are being excised. Also make sure that wrists are fully protected by wearing cotton gloves if necessary. Gloves and visors should also be used when using UV lamps.

Section7. Biological Material, Microorganisms and Genetically Manipulated Organisms: Codes of practice for storage, handling and disposal.

**Genetic Modification**

**QUB - Code of Practice**

**Legislation**

The Genetically Modified Organisms (Contained Use) Regulations (Northern Ireland) 2015, regulates the safe use of genetically modified organisms (GMOs) in containment. The regulations cover both the human health and environmental risks from work involving genetically modified micro-organisms which includes modified cell cultures.

Before any GM work is started in an institution the law requires the following:

1. The premises are notified to HSENI

2. The institution is registered as a GM Centre

3. A Genetic Modification Safety Committee is established

4. A Biological Safety Officer is appointed

All of the above have taken place in QUB with the Biological and Infectious Agents Advisory Committee (BIAAC) serving as the GM Safety Committee and Dr David Norwood serving as the appointed University Biological Safety Officer.

**Definition**

“Genetic Modification” in relation to an organism means the altering of the genetic material in that organism in a way that does not occur naturally by mating or natural recombination (or both) and within the terms of this definition—

(a) Genetic modification occurs at least through the use of the techniques listed in Appendix 1a.

(b) The techniques set out in Appendix 1b are not considered to result in genetic modification.

**The Principal Investigator [PI]**

The role of Principal Investigator is extremely important in ensuring GM safety. They will normally be head of a research group or in charge of a specific GM research project. Their responsibilities are to:

1. Ensure that all GM work is covered by a risk assessment that has been reviewed and approved by the BIAAC.
2. Ensure that contents of the risk assessment and control measures are brought to the attention of individuals working on the project.
3. Ensure that work is undertaken in accordance with the findings of the risk assessment.
4. Ensure that all individuals involved in GM work receive training and are competent to carry out the work and that this is recorded in a robust manner.
5. Ensure an appropriate level of supervision is maintained.
6. Ensure that risk assessments are regularly reviewed and any changes notified to the BIAAC for approval.

**School/Centre Biological Safety Officers**

Schools and Centres within the University should appoint local Biological Safety Officers to co-ordinate GM risk assessments, attend BIAAC, and assist in the annual review of GM risk assessments that are initiated by the Safety Office.

**GMO Risk Assessment**

GMO risk assessments are required to be done before any work commences for any work involving the possession or use of genetically modified organisms involved in the work. There are specific requirements in relation to factors that must be considered in GMO risk assessments, and the steps that have to be included. In summary, the required steps are:

1. hazard identification
2. estimation of the severity of the consequence
3. determination of a provisional containment class
4. environment and activity considerations
5. estimation of likelihood of harm occurring
6. review of the risk assessment to check that all hazards are properly controlled
7. assignment of the final containment and activity classification

A GM risk assessment is used to assess the potential risks to humans, animals, plants or other aspects of the environment arising from the work and determine what controls are required to protect humans and the environment.

Principal investigators are responsible for ensuring that risk assessment are carried out and the controls are fully implemented, regularly monitored and that the assessment and controls are regularly reviewed and revised where required. GM risk assessments must be carried out by competent persons and approved by the appropriate manager or principal investigator. The work must be categorised on the basis of risks taking into account the hosts, vectors, genetic materials, genetically modified organisms, the type of activity, class, containment level and all the necessary controls required to ensure that the work can be done safely while protecting people and the environment.

GM risk assessments must address all aspects of the work including routine and non-routine work and what to do in emergencies if something goes wrong. The risk assessment and control measures must be suitable and sufficient and proportionate to the risks. All workers including staff, students and visitors must be provided with adequate information, instructions, training and supervision to enable them to safely and competently perform their work.

Queen’s University uses three different risk assessment templates for work with microorganisms, animals and plants. These templates can all be downloaded from the Occupational Health and safety website.

**GMO Classification**

Genetically modified organisms are classified on the basis of the risks to human health or the environment into four activity classes (Class 1-4) according to the following:

1. Ability to cause infection.
2. Severity of the disease that may result.
3. Risk that infection will spread to the population.
4. Risk of damage to the environment or economic loss.
5. Availability of vaccines and effective treatment.

The four activity classes of genetically modified organisms and the basis of their classification are as follows.

**• Activity class 1 (Class 1)**: Unlikely to cause human disease or have any untoward environmental effects.

**• Activity class 2 (Class 2):** May cause human disease or be a hazard to employees but it is unlikely to spread to the community and there is usually effective prophylaxis or effective treatment available. Unlikely to cause significant environmental damage.

• **Activity class 3 (Class 3):** May cause severe human disease and presents a serious hazard to employees and it may present a risk of spreading to the community but there is usually effective prophylaxis or treatment available. Possibility of significant environmental damage, or economic loss if accidentally released.

**• Activity class 4 (Class 4):** May cause severe human disease and presents a serious hazard to employees and it is likely to spread to the community and there is usually no effective prophylaxis or treatment available. Likely to cause severe environmental damage or economic loss if accidentally released.

The final stage in the risk assessment process for GMMs is assignment of final containment level and activity classification. Class 2 and 3 activities are subject to notification to HSE for which a fee is payable by the School.

**Class 1 activities**: work may commence once assessment had been reviewed and approved by BIAAC.

**Class 2 activities** may commence on receipt of acknowledgment by HSENI.

**Class 3 activities** require the consent of HSENI and work may not commence until this has been received. This may take up to 45 days.

**The Biological and Infectious Agents Advisory Committee (BIAAC)**

The BIAAC meets three times a year to discuss and advise on all aspects of biological and infectious agents’ safety work throughout the university. The committee oversees the work involving genetic manipulation and ensures all such work complies with guidance from the Health and Safety Executive Advisory Committee on Genetic Manipulation. A specialist sub-group of BIAAC review systematically and in detail, every risk assessment involving genetic modification. GMO risk assessments for review by the BIAAC GMO Sub-Group are submitted through the University Biological Safety Officer.

**GMO Risk Assessment Approval Procedures**

**GMO Class I**

1. Start the authorisation process by informing your PI, Centre Director or HoS as appropriate.
2. Inform your local Biological Safety Officer and H&S Committee.
3. Complete your GMO Risk Assessment and send to the University Biological Safety Officer (Dr D. Norwood).
4. The University Biological Safety Officer sends your GMO Risk Assessment to each member of the BIAAC GM Sub–Group who comment on your risk assessment.
5. The University Biological Safety Officer contacts you regarding any improvements or not which may be necessary – and finally giving approval for the project to proceed.

**GMO Class II**

Points 1 to 5 above plus:

1. When BIAAC approval has been obtained then then the following must be submitted to the HSENI:  
    a) Activity Notification (Form CU2)   
    b) Approved Risk Assessment  
    c) Fee (£981 on Jan’17)
2. If this is the first Class 2/3 Activity Notification, activity may start when consent received (within 45 days for CLII and 90 days for CLIII). Subsequent activity may begin immediately after notification is acknowledged from HSENI for CLII and when consent is received for CLIII (within 45 days).

**GMO Risk Assessment Review**

GMO risk assessments must be reviewed at appropriate intervals or if there is material change to the work. At the very minimum GMO risk assessments should be reviewed annually. However if the work changes e.g. it expands to cover different nucleic acid inserts, uses different host vector systems or the location of the work changes, then the PI must submit an amendment to the BIAAC committee through the BSO for approval as above.

Where the only change is staff joining or leaving a project this should be notified to the BSO but approval is not required. Similarly if the PI changes but all other aspects remain the same the BSO should just be notified of the name of the new PI so records can be amended.

**HSENI further notification**

Further notification to HSENI may be required if:

* if there is any significant change to the work
* new information becomes available that effects the risk assessment
* any changes are made to the containment and control measures
* must first be approved by BIACC GM Sub–Group
* fee may be payable

**Scientific Advisory Committee on Genetic Modification (SACGM) Compendium of Guidance**

The SACGM Compendium of Guidance is the most important source of advice on genetic modification, genetically modified organisms and GM risk assessment. These guidance documents can be obtained from the HSE website. It is divided into the following parts:

• Part 1: Introduction to the legislation and general health and safety issues

• Part 2: Risk assessment of genetically modified microorganisms (other than those associated with plants)

• Part 3: Containment and control of activities involving genetically modified microorganisms

• Part 4: Genetic modification work that involves plants (including plant-associated genetically modified microorganisms)

• Part 5: Genetic modification of animals

• Part 6: Guidance on the use of genetically modified microorganisms in a clinical setting

• List of abbreviations

**Appendix 1a**

Examples of the techniques which constitute genetic modification as per the definition in the regulations are:

1. Recombinant nucleic acid techniques involving the formation of new combinations of genetic material by the insertion of nucleic acid molecules, produced by whatever means outside an organism, into any virus, bacterial plasmid or other vector system and their incorporation into a host organism in which they do not naturally occur but in which they are capable of continued propagation;
2. Techniques involving the direct introduction into an organism of heritable genetic material prepared outside the organism, including micro-injection, macro-injection and micro-encapsulation;
3. Cell fusion or hybridization techniques where live cells with new combinations of heritable genetic material are formed through the fusion of two or more cells by means of methods that do not occur naturally.

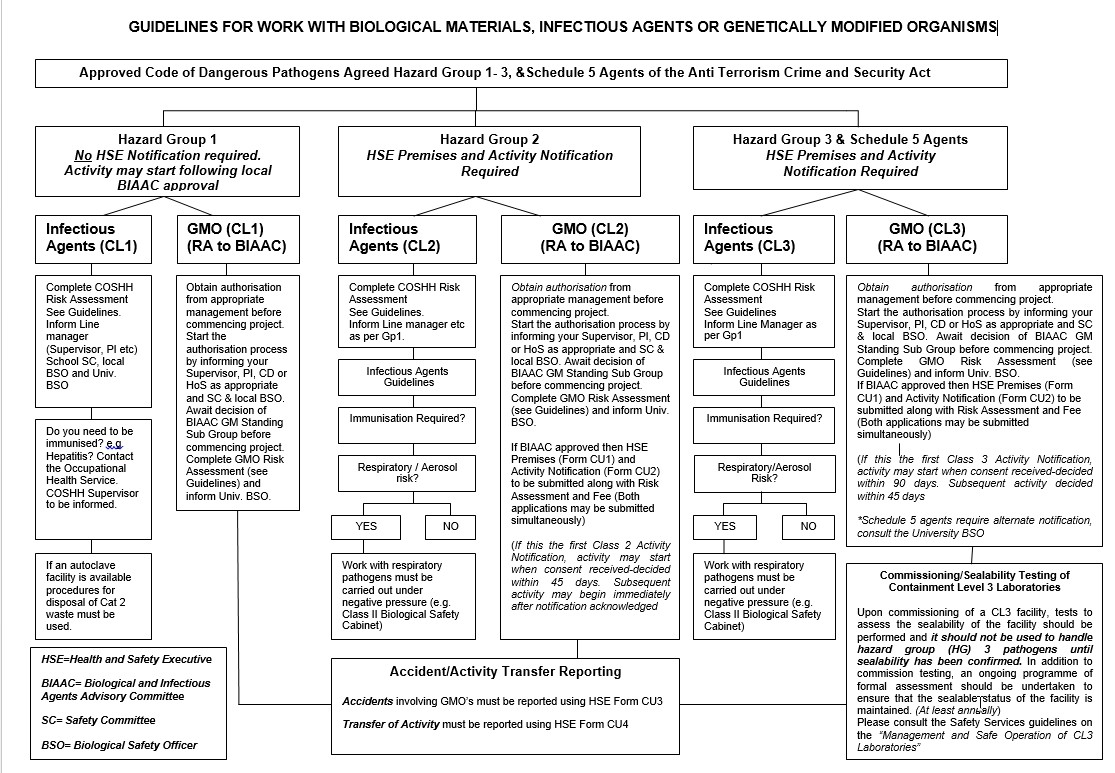
**Appendix 1b**

The following techniques are not considered to result in genetic modification provided that they do not involve the use of genetically modified organisms made by techniques other than those listed in Part III below, or the use of recombinant nucleic acid molecules, namely -

1. In vitro fertilisation
2. Natural processes including conjugation, transduction or transformation:
3. Polyploidy induction

The regulations do not apply to the following techniques providing they do not involve the use of recombinant nucleic acid molecules or GMOs other than those produced by one of the following techniques of genetic modification:

1. Mutagenesis;
2. Cell fusion of prokaryotic species which can exchange genetic material through homologous recombination;
3. Cell fusion of cells of any eukaryotic species including production of hybridomas and plant cell fusions;
4. Self-cloning where the resulting organism is unlikely to cause disease or harm to humans, animals or plants.



Appendix 2 2

Like other potentially hazardous substances biological materials are controlled by COSHH regulations. They do however merit special consideration for the following reasons:

* They may be infectious and as such can be dangerous in extremely small quantities.
* There is often a lack of awareness of the potential hazards associated with biological materials.

**If you are proposing to work with Biological Materials, Infectious Agents or Genetically Modified Organisms, then you must consult the guidance below and comply with any applicable requirements.**

* Q. What exactly are Biological Materials, Infectious Agents or Genetically Modified Organisms?

For a brief explanation of these terms click [**HERE**](http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/GuidanceNotes/InfectiousAgentsGMOs/BiologicalMaterialsInfectiousAgentsGeneticallyModifiedOrganisms/) or follow the link below;

http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/GuidanceNotes/InfectiousAgentsGMOs/BiologicalMaterialsInfectiousAgentsGeneticallyModifiedOrganisms/

**If you are proposing to work with Biological Materials, Infectious Agents or Genetically Modified Organisms you must:**

**1)** Consult your supervisor eg. Project Supervisor, Principal Investigator (PI), Centre Director (CD) or Head of School (HoS);

**2)** Determinine the ACDP Hazard Group of the material with which you intend to work; (ACDP - Advisory Committee on Dangerous Pathogens):

* Follow the link below for the Approved List of Biological Agents: <http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/FileStore/Filetoupload,369519,en.pdf>

Before starting work with any infectious agent a BioCOSHH assessment must be performed and the procedures proposed for the handling of potentially infectious material agreed. It is advised that this be done in consultation with the Biological Safety Officer. Details of the hazard group classification of organisms and the procedures for working with Group 1 and 2 agents may also be obtained from this source. The Biological Safety Officer must be informed as to the location and identity of all Group 2 agents stored in the School in order to prevent inadvertent exposure of colleagues or maintenance personnel.

Some biological materials are considered potentially hazardous as they may be a source of Group 3 or Group 4 agents. Thus all samples of human blood (or material contaminated with human blood) should be considered as possibly contaminated with hepatitis viruses or Human Immunodeficiency Virus (HIV) and handled as such (Derogated Category 2 containment for at least initial processing of samples). Caution should also be taken when working with clinical samples other than those derived from blood and a BioCOSHH assessment undertaken. This will include details of the proposed means of disposal of waste and decontamination of equipment.

Human central nervous system (CNS) tissues are considered to present a hazard of Transmissible Spongiform Encephalopathies such as Jakob Kreuzfeld Disease. The advent of BSE (Mad Cow Disease) has extended the perception of these hazards to bovine nervous tissue and lymphoid organs.

A BioCOSHH assessment should be prepared in consultation with the Biological Safety Officer before working with material of this nature.

Anti – Terrorism Crime and Security Act (2002)

This legislation requires the University to inform the Security Services before holding or working with certain agents. These, “Schedule 5 agents”, are generally Category 3 or 4 pathogens but also include toxins and DNA encoding virulence factors from the listed organisms. It is essential that you contact the Biological Safety Officer (Dr Chris Law) for further details and advice if such work is being planned.

* Click [**HERE for the Schedule 5**](http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/FileStore/WordDocuments/Filetoupload,369563,en.doc) list of agents restricted by the Anti-Terrorism, Crime and Security Act [ATCS]
* Be aware that work with any of these agents which requires importation to N.Ireland may require a licence from Government Agencies. For advice consult with University Biological Safety Officer (Dr. David Norwood)
* **POLICY, LEGISLATION AND GUIDANCE:**

Familiarise yourself with the relevant legislation and guidance which can be found at the following link;

<http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/GuidanceNotes/InfectiousAgentsGMOs/BiologicalGuidance/>

**TRANSPORT:**

If you wish to transport any Biological Materials etc. you must comply with International Shipping Regulations, click [**HERE**](http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/FileStore/WordDocuments/Filetoupload,369607,en.doc) for guidance

Section 9. Field-work, Shore-work, Use of Boats and Scientific Diving.

9.1 **Health and Safety of persons carrying out field work -** Guidance for Supervisors

All field work and associated laboratory work must be risk assessed **before work commences**.

Extensive guidance on field work risk assessment is available in the NERC and UCEA documents on safety in fieldwork (links below). In addition, a number of generic risk assessments have been produced for field work, involving various terrains, to aid the process further (available on the School’s safety webpage and sharepoint). However, it is important that generic risk assessments are tailored to the specific project.

**Lone field working should only be undertaken if unavoidable.** A “permission to work alone” form must be completed and authorised by the academic supervisor once any identified risks have been reduced to an acceptable level.

Supervisors must be informed of any medical or other issue that may impinge on the safety of individuals on fieldwork, particularly when working alone. This information should be held by the supervisor in compliance with the University's Data Protection Policy.

If any of the following health issues are indicated then it is the responsibility of the supervisor to advise persons carrying out fieldwork to contact QUB Occupational Health: Tel:  028 9097 5520; [**occhealth@qub.ac.uk**](mailto:occhealth@qub.ac.uk)

* Heart problems
* Angina
* Severe asthma
* Diabetes
* Epilepsy

QUB Occupational Health provides a wide range of services to the University for the prevention of work related injury or ill-health. Services include pre-employment health screening, statutory health surveillance and immunisations eg. Tetanus

NB. Remember that samples collected in the field maybe a source of human infection; for example rabies in association with bats, enteric viruses in association with sewage/slurry samples or cryptosporidia in association with sheep or cattle faeces. These factors should be included in your risk assessment.

In all fieldwork, a ‘reporting in’ procedure must be put in place to ensure the safe return of the researcher each day. If field work extends over a number of days or involves overnight accommodation a plan of sites to be visited each day would also be required.

**Supervisors must check if health surveillance is required** in relation to the proposed fieldwork.

**Health surveillance is required** if there is a risk of exposure to asthmagens and zoonoses, eg. working with poultry. It is also required if there is exposure to substances known to cause severe dermatitis.

* A list of asthmagens is available at <http://www.hse.gov.uk/asthma/substances.htm>.
* The asthmagens and respiratory risks in agriculture are listed at <http://www.hse.gov.uk/asthma/agriculture.htm> .
* The zoonoses related to agriculture / rural exposures are listed at <http://www.hse.gov.uk/agriculture/topics/zoonoses.htm> .

General guidance is in the health surveillance recommendations under COSHH at <http://www.hse.gov.uk/health-surveillance/resources.htm>

If the risk assessment indicates that health surveillance is required then advice on the nature of the health surveillance should be obtained from Dr D Todd, Occupational Health Physician and appended to the risk assessment.

If further guidance is required please contact Mrs Gillian Riddell [g.riddell@qub.ac.uk](mailto:g.riddell@qub.ac.uk) or Dr. Rosaleen Hynes [r.hynes@qub.ac.uk](mailto:r.hynes@qub.ac.uk)

**Forms to complete for field work:**

Field Work Risk assessment

COSHH Risk Assessment if chemicals are involved

Permission to work alone (if applicable)

Health and Safety Questionnaire

Link to NERC Safety in Field Work document

<http://www.nerc.ac.uk/about/policy/safety/procedures/guidance_fieldwork.pdf>

Link to UCEA Safety in Field Work document

<http://www.ucea.ac.uk/en/publications/index.cfm/guidance-on-health-and-safety-in-fieldwork>

**Before commencing any type of field work a risk assessment must be carried out.**

The purpose of a risk assessment is to make sure that no-one gets hurt or becomes ill as a result of your work activities.

The following 5 steps make up the risk assessment process:

* Divide your work into manageable categories; e.g. investigation on the shore; boat work;
* Look for the associated **hazards**. A hazard is anything which can cause harm, e.g.

wet/slippery rocks

deep/fast flowing water

animals and potentially infected animals (badgers: bovine TB; bats: Lyssavirus; wood mice: Hantavirus)

animal excrement

biological agents

chemicals

electricity etc;

Evaluate the **risk**. The risk is the likelihood that someone will be harmed to some extent by the hazard. Consider both the severity of the harm and the likelihood of that harm actually happening. Consider also that the persons exposed to the hazards include more than the operator, e.g. maintenance and cleaning staff, contractors, visitors and members of the public.

* Prepare a plan for **controlling** the risks. Are the risks controlled sufficiently in order to reduce the risk to an acceptable level and to comply with relevant legal requirements? If additional controls are required the following list gives the hierarchy of options available to you.

Elimination

Substitution

Enclosure

Guarding or segregation

Safe systems of work

Written procedures

Adequate supervision

Training

Information and instruction signs

Personal protective equipment – note that this last option should only be used as a temporary solution or as a last resort measure

* For each risk requiring further control, you should start at the top of the list and consider if this option provides a reasonably practicable solution. It is only if the option is not reasonably practicable, or if it alone does not reduce the risk to an acceptable level, that you should consider the next option on the list. You may need to implement more than one of the control options in order to control the risk satisfactorily. Finally decide who will take the necessary action, set a date for completion if necessary and retain a written record of the assessment.
* **Review** and revise the assessment to take account of other activities and hazards, changes in processes, new methods of work and new employees/students.

Risk assessments must be signed by the worker, academic supervisor, Fieldwork/Environmental Safety Advisor (G.Riddell [g.riddell@qub.ac.uk](mailto:g.riddell@qub.ac.uk)) and School Safety Officer (R.Hynes [r.hynes@qub.ac.uk](mailto:r.hynes@qub.ac.uk)) once approved.

9.2 Lone Working

Working alone by employees and students is to be discouraged as far as possible but it is recognised that in some situations it is not reasonably practicable to avoid it. Lone working should only be sanctioned after a thorough assessment of the risks has been carried out taking into account the nature of the work, the hostility and location of the site and the experience of the worker. A “permission to work alone” form must be completed and authorised by the academic supervisor; a Health and Safety Questionnaire must also be completed and approved and retained by the supervisor. “Permission to work alone” form and Health and Safety Questionnaire are available from the School’s safety webpage.

A safe system of work should then be devised in order, as far as is reasonably practicable, to safeguard the health and safety of the worker as required by Section 2 of the HSW Act and reduce risks from foreseeable hazards to an acceptable level.

There are specific situations in which lone working is highly inadvisable or contrary to legal requirements (e.g. work in confined spaces, fumigation, work on or near to bodies of water, or diving operations).

In many cases the lone worker will be a postgraduate or rarely final-year undergraduate undertaking project work. The worker should be involved in the risk assessment process and must be made aware that he or she is still under the supervision of the Academic Supervisor back on campus, who must take immediate responsibility for their safety.

The worker must not leave campus without informing the Supervisor (or School) of his/her destination, nature of the work (hence hazard involved) and estimated time of return. He/she must then advise the School upon return.

If the worker departs for the field directly from home, the supervisor or School must be given the relevant information by telephone and appropriate emergency plans should be in place should the lone worker fail to check in at the arranged time.

Because the lone worker may be at greater risk than a group member, it is important that an effective means of communication is established. Any safe system of work should include arrangements to determine the whereabouts of a lone worker and contingency plans in case of failure to make contact.

As well as the danger of personal injury, the possibility of exhaustion or hypothermia should be considered, although any such risk should have come to light during the risk assessment and would strongly mitigate against lone working.

Checks on lone workers must be made on a regular and planned basis. The frequency should be dependent on the nature of the activities and the perceived hazards. Checks might take the form of periodic visits by the supervisor or regular communication by telephone or radio.

9.3 Guidance for the organisation of student field courses

It is important for both staff and student health and safety that we are informed of any medical, allergy, or other issue that needs to be known about. This information will remain confidential wherever possible. Attendees should also inform us about any special dietary requirements they have.

For this reason a Health and Safety Questionnaire has been prepared following the University guidelines. Next of kin detail is also requested in the questionnaire for use in the event of student illness etc. This questionnaire should be provided to all attending the course along with any other instructions and must be returned to the School Office 2 weeks prior to the commencement of the field course (to allow time to resolve any H&S issues). The information provided will be collated by School Office staff and provided to the Field Course Coordinator and School Safety Officer who will address any problems arising. The questionnaires and related computer files will be destroyed after the field course has taken place.

**At the start of the field course safety instructions must be discussed with the students who should then be issued with written safety instructions (see below) and required to sign a statement that they understand and will abide by them. Anyone who breeches this agreement should be dismissed from the course, automatically failing the module.**

**The following must be provided to the School Safety Officer prior to the commencement of the field course:**

* List of the sites possibly being investigated during the field course. It is understood that the sites chosen depend on the conditions on the day. A member of field centre staff should be notified of field work site and expected time of return.
* List of staff and demonstrators and their mobile contact numbers.
* List of names of students attending.

This information will be provided to the University Security Manager by the Safety Officer.

All staff supervising students on field courses should have read the University guidance on field courses, available on the QUB Safety Services web site at:

<http://www.qub.ac.uk/directorates/HumanResources/OccupationalHealthandSafety/qubonly/Filetoupload,28144,en.pdf>

9.4 Code of Practice for Field Courses

Field courses may present hazards additional to those encountered in the laboratory. In order to minimise the risk the following rules have been drawn up. When taking part in Field Courses students will be required to sign a statement indicating that they have read, understood and agreed to abide by these rules.

1.Safety is of paramount importance; students should behave responsibly with respect to their own and others safety at all times.

2. Make sure that you are equipped with appropriate, all-weather clothing.

3. First Aid Kits are carried in the minibuses and are also available in the laboratories.

4. Care should be taken in the vicinity of vehicles especially when entering and leaving minibuses during field excursions.

5. While in the field, individuals should remain with their work group. Visual contact should be maintained at all times. Do not leave the course without consulting with a member of staff.

6. Follow the instructions of the group or course leader; where in doubt ask for guidance.

7. Avoid the edge of precipices; do not climb rock faces or trees. Keep to paths where possible.

8. Take particular care close to deep or fast-running water. Slippery surfaces around water are also a significant hazard.

9. Take care on bog land; avoid entering drains and areas of standing water.

10. Normal laboratory safety measures apply in the field centre; in particular care should be taken with bunsen burners and all electrical equipment, especially where water is also present. Smoking is permitted only in specified areas.

11. Alcoholic drinks and drugs are not permitted in the field centre or on field excursions.

9.5 Code of Practice for Shore-work

1. Staff or students with any medical condition or disability intending to carry out shore-work must inform their supervisor before commencing the work and provide details of any action to be taken in the event of emergency.
2. Safety is of paramount importance; all persons carrying out shore-work must behave responsibly with respect to their own safety and that of others.
3. A minimum of two people should be involved in the shore-work. Only under exceptional circumstances should single working be considered: supervisor approval must be obtained before such working commences.
4. Appropriate all-weather clothing must be worn for shore-work.
5. Portable first-aid kits are available at the Marine Laboratory and should be carried when out on the shore.
6. Care should be taken in the vicinity of vehicles, especially when entering and leaving them and also when accessing sites on foot along narrow roads. Always walk along the edge of the road and be aware of oncoming traffic.
7. Before leaving the Marine Laboratory to carry out shore-work, leave notice of your intended destination and ETA for your return with a responsible person and advise them of your return. *This is essential for any person working alone on the shore.*
8. A mobile phone should always be carried by one member of the shore-work party. For immediate assistance, dial 999 for the Coastguard.
9. When working on the shore, take particular care close to deep or fast-running water and when walking over rocky/boulder shores or on wet slippery rocks. Also take particular care regarding the tidal conditions e.g. to avoid being cut off from land.
10. Particular care should be taken when working on soft muddy shores. Do not proceed if foot sinks below ankle level in soft substrate. It is advisable to retrace your original route when leaving the shore.
11. If working in a group, do not leave the group without consulting the leader; always remain in visual contact with the group and at all times follow the instructions of the group leader.

9.6 Code of Practice for the Use of Queen’s University Boats

9.6.1 Boat usage at the University

The boating facility for the University is at the Queen’s University Marine Laboratory (QML) in Portaferry. Boat bookings, enquiries and safety information are all available upon request from the QUB Boating Officer, Simon Exley, who is also based at the QML. The following guidelines are general codes of conduct for all users of boats. More specific guidelines for the skippering of QUB boats are available from the QUB Boating Officer.

9.6.2 `The University has two small workboats:

1. “Tonicella” - a 7 m Rigid-Hulled Inflatable Boat (RHIB) used primarily as a diving boat. This RHIB is MCA coded to category 4 (can be used up to 20 miles from a safe haven during daylight hours). It is powered by twin 80 HP engines.
2. “Cumella” - a 5.7 m fiberglass hulled boat. As Cumella is not a MCA-coded boat it cannot be used outside of Inshore waters (category C and D) of the MCA water body classification. It must also be used during daylight hours. It is powered by a main 50 HP engine, with a 9 HP reserve engine.

9.6.3 Access to moored boats

The University workboats which are moored at Portaferry are accessed by a 10' dinghy. This involves wheeling/towing the dinghy from the Marine Laboratory across the public road and down the ferry slipway for launching. The boat is then launched, rowed off to a workboat and the boat driver switches boats, leaving the dinghy secured to the mooring.

1. Due care and attention must be taken when crossing the public road and while negotiating the Strangford-Portaferry ferry slipway.
2. Launching and recovery of the dinghy should normally be avoided when the ferry is at or near to the Portaferry quay.
3. Favourable sea conditions in the work area are essential for the deployment of this small vessel. An experienced boat driver should determine if the conditions are suitable.
4. Only specific members of staff are permitted to use the dinghy and permission to carry more than one person should be sought from the QUB Boating Officer (Simon Exley).

1. A competent member of staff should monitor the dinghy when in use.
2. Users must pay particular attention when entering and leaving the dinghy.
3. Transfer of heavy items of equipment via the dinghy should be avoided.
4. Life-jackets must be worn when boarding, onboard and disembarking the dinghy.
5. Use of the dinghy at a site other than the Ferry slipway must be discussed with the QUB Boating Officer

9.6.4 Use of “Tonicella” and “Cumella”

1. Boats will be prepared for launching and launched by approved or training QUB boat drivers.
2. Particular care will be taken to avoid interference with the Strangford Ferry service when launching or recovering boats from the Portaferry ferry slipway.
3. Boats may only be used with a QUB boat driver in full charge.
4. QUB boat drivers will be responsible for ensuring that all required safety gear is carried on the boat and is in working order prior to commencing a journey.
5. It is the responsibility of the QUB boat driver in charge of the boat to check the weather forecast and sea conditions before leaving the quay. It is the decision of the QUB boat driver whether the conditions are suitable for the planned boat work at hand.
6. Prior to departure, the QUB boat driver will note the relevant details on the QML fieldwork notice board so that others know their departure time, intended destination, who is on board and their estimated return time. The QUB boat driver will remove these details upon their return.
7. Particular care will be given to safety when persons are embarking/ disembarking from the boat and loading equipment.
8. All persons carried on the boat are required to wear a Maritime and Coastguard Agency (MCA) approved life-jacket at all times.
9. Persons using the boat must wear protective clothing appropriate to sea and weather conditions.
10. All persons on the boat, except the QUB boat driver, must remain seated when the boat is moving at speed.
11. A maximum of six people (including driver) can be carried on “Tonicella” and five people (including driver) can be carried on “Cumella”.
12. Work will only be carried out during the hours of daylight.
13. The boats will only operate within MCA approved coastal limits, determined by each vessels level of coding.
14. The boats will be equipped with safety equipment to required MCA standards.
15. Each boat must carry a VHF radio.
16. All sampling gear used will be commensurate with the size of the boat.
17. Particular care will be taken when deploying gear over the side that ropes will not foul the propeller.
18. A log-book of boat use will be maintained.
19. Engines will be checked and serviced regularly.

9.7 Code of Practice for Scientific Diving

The SCUBA diving facilities for the University are at the Queen’s University Marine Laboratory (QML). The University conducts SCUBA diving for scientific purposes under the HSE Approved Code of Practice (ACOPS) for Scientific and Archaeological Diving Projects. Any diving that is conducted for work or for personal gain, i.e. for a publication or report, must be conducted under this ACOP. The QUB Diving Safety Sub-Committee has developed a code of practice that conforms to this ACOP and is available upon request from the QUB Dive Officer (Simon Exley). This document is known as the QUB Diving Rules and must be adhered to while diving for work, research or personal gain at the University.**Section 10. Use of the Fermenter Facilities in the MBC.**

* 1. **Persons responsible.**

The academic staff ultimately responsible for the operation of the fermentation facility and associated down-stream centrifuge is: Dr Chris Allen (MBC room OG 416, ext 2758). In the advent of Dr Allen’s absence, other associated academic staff include; Prof Mike Larkin and Dr Leonid Kulakov.

The chief technician responsible for the area is Mr Chris Preshaw, from the School of Biological Sciences.

* 1. **Authorised personnel.**

Only fully trained personnel are permitted to operate facilities in the fermentation suite. Dr Allen will be responsible ultimately for training of such personnel, and will keep a record of these individuals. All personnel should have received and read a copy of these safety guidelines, with acknowledgement in writing to this effect to Dr Allen.

* 1. **Associated hazards.**

The area is particularly noted for specific hazards, not usually found in a microbiology laboratory setting. Due consideration should be taken of these hazards during risk assessment and COSHH evaluation. These hazards include:

10.3.1 High pressure steam.

Fermentation facilities, boiler, autoclaves, centrifuge equipment all require use of high pressure steam. This hazard is particularly noted as, if connections/equipment fail, direct release of steam into the area may result. Suitable protective clothing and sufficient care should therefore be taken at all times.

10.3.2 High temperature hazards.

During autoclaving, fermenters and other equipment may reach high/scalding temperatures.

10.3.3 Pressure vessel hazards.

Fermenters and boilers are pressure vessels. Therefore care must be taken during operation to ensure correct procedures are followed.

10.3.4 Chemical hazards.

During some experiments, chemical hazards (e.g. organic solvents) may be used in the room. COSHH procedures should be developed to ensure release of organic solvents into the room does not occur during normal operation. However, operators should be aware of risk of exposure during accidental spillage – the aim should be to ensure that there is no risk of exposure to chemical hazards during successful operation of procedures.

10.3.5 Microbial hazards.

Category I microorganisms only are cultured in the fermenters to volumes of up to 100L. Operators should be aware of containment procedures required to ensure that these organisms are not released into the environment prior to inactivation – either through autoclave or chemical sterilisation.

10.3.6 Compressed air.

Compressed air lines are used in the room, and should be treated with appropriate care. Only compressed air to 60psi is permitted.

* 1. **COSHH evaluation.**

All procedures to be performed in the facility must be subject to COSHH evaluation, in accordance with School of Biological Sciences guidelines.

* 1. **Growth of organisms – suitable cultures.**

The facility may be used for large-scale growth and downstream processing of microbial cultures; including GM strains (to category I only) and wild-type/mutant soil bacteria (to category I only). Therefore, no category II or above work is permitted:

**All GM organisms must have been subject to a full risk assessment prior to growth in the facility.**

The assessment should be scrutinised by the GM safety officer in the building, presently Dr Chris Law. Where appropriate the risk assessment should consider:

Accidental release, transportation, disposal, health hazards presented to staff and students.

* 1. **Correct operation.**

Correct equipment operation procedures must be adhered to at all times. Trained personnel will be fully instructed in these procedures. If in doubt regarding correct procedures, seek advice from Dr Allen.

* 1. **Accidental spills of microbial cultures.**

The facility has been designed, so that accidental spills of microbial cultures (up to 100L) can be contained at all times. In the event of such a spill;

1. Isolate all power sources and turn-off equipment.
2. Evacuate room.
3. Use the provided chemical sterilant to kill any spilled organisms. Sterilant (Virkon 1% wt/vol) is pre-measured in sufficient quantity to sterilise 100L of culture (1 kg). Once treated, with Virkon, contaminated area should be left for 3 hours before clean-up.
4. Follow appropriate procedures to ensure no contaminants leave the room.
5. If contamination does occur beyond the contained fermenter area:
6. Clear area of other personnel and notify the appropriate authority.

ii) Treat the contaminated region with a virkon solution (1% wt/vol).

* 1. Dispose of contaminated items (e.g. paper towels) by incineration, or by conventional means after autoclave de-contamination - provided there is no additional chemical hazard.
  2. Ensure appropriate safety items (lab coat, eye protection, gloves, foot protection) are worn during decontamination.

1. All accidents should be reported to both Dr Allen and the School Safety Officer. A standard accident report form should be completed.
   1. **Trained personnel**

Only fully trained personnel may operate equipment. Dr Allen is responsible for all training activities.

* 1. **General guidelines. Certain general rules must be adhered to during operation:**

10.9.1 Fermenters must not be left unattended during sterilisation.

During this time high pressure steam lines will be in use, high vessel pressures and high vessel temperatures will occur. Therefore, a trained individual must be in attendance at all times. Any indication of dysfunctional response of the fermenter during the sterilisation cycle will require that the individual immediately terminate the sterilisation cycle. Trained operators will be able to facilitate this process quickly *via* the fermenter control panel. If in doubt, power to the vessel should be immediately switched off – either *via* the vessel emergency off switch/button, or directly at the wall isolation switch. Vacate the room immediately until the vessel temperature is below 60oC and vessel pressure below 1 atm, and notify appropriate authority.

10.9.2 The steam centrifuge must not be left unattended during operation.

During this time high pressure steam lines will be in use, high vessel temperatures will occur, and the centrifuge may rotate at speeds of up to 50,000 rpm. Therefore, a trained individual must be in attendance at all times. Any indication of dysfunctional response of the centrifuge will require that the individual immediately terminates the operation. Trained operators will be able to facilitate this process quickly *via* the steam control valve at the back of the instrument. Alternatively, power to the boiler should be immediately switched off – either *via* the vessel emergency off switch/button, or directly at the wall isolation switch. Vacate the room immediately until the centrifuge has stopped, and notify appropriate authority.

10.9.3 Correct boiler operation procedures must be followed at all times.

Particularly, operators are reminded that correct ‘blow-down’ procedures need to be followed, as advised. Also, the boiler must not be left on over the weekend - unless it is checked at least once every 12 hours.

10.9.4 The spillage containment area drain should be closed during normal operation.

The drain leading from the room must be closed with the appropriate plate seal during all normal activities.

10.9.5 Untrained or unauthorised personnel must not be present in the facility during sterilisation of fermenters, or use of the steam centrifuge.

During these procedures, this equipment is especially hazardous as noted above.

* + 1. All staff and visitors must wear suitable protective clothing in the area at all times**.**

This includes appropriate protection to footwear, lab coats and eye protection - compliant with regulations for category I GM operation.

* + 1. All accidents and/or dysfunctional operation of facilities must be reported.

Dr Allen is the appropriate person in the first instance.

Appendix 1: Staff responsible for individual Laboratories, Offices and Other Rooms within the School.

The School comprises laboratories, offices and other rooms in the Medical Biology Centre, Lisburn Road, Belfast, David Keir Building and NITC, Stranmillis Road, Belfast and The Queen’s University Marine Laboratory, Portaferry as indicated below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Original room no.** | **New room no.** |  | **Member of staff responsible** | **Delegated responsibility** |
| **MBC Main Building** |  |  |  |  |
| **Basement** |  |  |  |  |
| B03 | 0B 044 | Workshop | S Fowler |  |
| B12 | 0B 033 | Snail lab | A Maule | P Mc Veigh |
| B12a | 0B 034 | Snail lab |  |  |
| B13 | 0B 031a | Micro lab | M Larkin |  |
| B13a | 0B 032 | Constant temp room | J Dick | G Riddell |
| B15 | 0B 028 | HPLC lab | M Larkin |  |
| none | 0B 027 | Chest Freezer room | C Preshaw |  |
| B16 | 0B 026 | Fermentation lab | M Larkin |  |
| B19 | 0B 006 | Store | C Preshaw | K O’Connor |
| B21 | 0B 005 | Store | C Preshaw | K O’Connor |
| B22 | 0B 003 | Store | C Preshaw | G.Riddell |
| B23 | 0B 004 | Store | C Preshaw | G.Riddell |
| B34 | 0B 318 | Solvent Store | C Preshaw | J.Dickson |
| B35 | 0B 317 | Gas Cylinder Store | C Preshaw | J.Dickson |
| B36 | 0B 316 | Solvent Store | C Preshaw | J.Dickson |
| B39 | 0B 313 | Radioactive Waste Store | K Panov |  |
| B40 | 0B 312 | Waste Solvent Store | C Preshaw | J.Dickson |
| B41 | 0B 311 | Clinical Waste Store | A Trudgett |  |
|  | 0B 021 | Stores | C Preshaw | J.Dickson |
|  | 0B 022 | Stores | C Preshaw | J.Dickson |
|  | 0B 401 | Observation room | H Kunc |  |
|  | 0B 402 | Observation room | H Kunc |  |
|  | 0B 404 | Plant Growth room | C Preshaw | K O’Connor |
|  | 0B 405 | Constant Temp room | F Min | G Riddell |
|  | 0B 406 | Constant Temp room | M Emmerson | G Riddell |
|  | 0B 408 | Constant Temp room | J Dick | G Riddell |
|  | 0B 409 | Observation room | H Kunc | G Riddell |
|  | 0B 434 | Kirkpatrick lab | A Mousley |  |
|  | 0B 435 | Kirkpatrick lab | A Mousley |  |
|  | 0B 436 | Sterilisation lab | C Preshaw | K O’Connor |
|  |  |  |  |  |
| **Ground Floor** |  |  |  |  |
| G06 | 0G 045 | Office PGs |  | A.Maule |
| G08 | none | Store | C Preshaw | K O’Connor |
| G09a | 0G 404a | Lab | J Hallsworth/I Grant |  |
| G09b | 0G 404b | Cat 2 lab | I Grant |  |
| G11 | none | Office |  |  |
| G12 | none | Office | Freezer Room |  |
| G13 | 0G 405 | Lab | R Holland |  |
| G13a | 0G 406 | Lab | R Holland |  |
| G14 | 0G410 | Cold room | M Larkin |  |
| G29 | 0G 209 | Office |  |  |
| G29a | 0G 210 | Office |  |  |
|  | 0G 420 | Lab | M Larkin |  |
|  | 0G 415 | Lab | M Larkin |  |
|  | 0G 414 | Lab | M Larkin |  |
|  | 0G 412 | Store | M Larkin |  |
|  | 0G 421 | Office | I Grant |  |
|  | 0G 418 | Office | A Mousley |  |
|  | 0G 417 | Office | IGFS Post Docs/Linda Stewart |  |
|  | 0G 416 | Office | C Allen |  |
|  | 0G 413b | Office | L Kulakov |  |
|  | 0G 413a | Office |  |  |
|  |  |  |  |  |
| **First Floor** |  |  |  |  |
| 103 | 01 010 | Teaching lab | K O’Connor |  |
| 103a | 01 011 | School office store |  |  |
| 104 | 01 402 | School office |  |  |
| 104a | 01 012 | School office store |  |  |
| none | 01 403 | Office |  |  |
|  | 01 404 | Office | HOS |  |
|  | 01 405 | Office | M-R Mervyn |  |
| 107 | 01 406 | Office | C Preshaw |  |
| 108 | 01 407 | Office | K King |  |
| 109 | 01 408 | Office | Meeting Room |  |
|  | 01 409 | Office | J Dalton’s Group |  |
|  |  |  |  |  |
| 111 | 01 410 | Office PG |  |  |
| 112 | 01 414 | Lab | Gibson |  |
| 112a | 01 414 | Office |  |  |
| 113 | 01 413 | Office |  |  |
| 114 | 01 416 | Office | J Nelson |  |
| 115 | 01 415a | Office | A Longo |  |
| 115 | 01 415b | Office | G Hutchinson |  |
| 115 | 01 415c | Office | J Williamson |  |
| 116 | 01 419 | Small lab |  |  |
| 117 | 01 420 | Office | M Larkin |  |
| 118 | 01 421 | Lab | J Nelson |  |
| 125 | 01 020 | Prep lab | K.O’Connor |  |
| 125a | 01 022 | Office | K.O’Connor |  |
| 125b | 01 023 | Store | K.O’Connor |  |
| 125c | 01 021 | Autoclave/wash up | K.O’Connor |  |
| 126 | 01 024 | Board room/Seminar room |  |  |
| 126a | 01 026 | Kitchen |  |  |
| 127 | 01 029 | Teaching lab | K.O’Connor |  |
| 127a | 01 031 | Small lab | K.O’Connor |  |
| 127b | 01 030 | Cold room | K.O’Connor |  |
| 128 | 01 033 | Store | K.O’Connor |  |
| 129 | 01 037 | Teaching lab | K.O’Connor |  |
|  |  |  |  |  |
| **5th Floor** |  |  |  |  |
|  | 05 012 | Write Up Room |  |  |
|  | 05 013 | Write Up Room |  |  |
|  | 05 014 | Quercus Office | E Boston |  |
|  | 05 015 | J.Provan Lab | J.Provan |  |
|  | 05 016 | J. Provan Office | J Provan |  |
|  | 05 017 | Office | J Provan |  |
|  | 05 018 | Quercus Lab | E Boston/I. Montgomery |  |
|  | 05.019 | Dark Room |  |  |
|  | 05 021 | Office | I. Montgomery |  |
|  | 05 022 | Field Course Store | G.Riddell |  |
|  | 05 024 | Cold Room | P Prodöhl |  |
|  | 05 025 | Office | H.Kunc |  |
|  | 05 026 | Office | R. Holland |  |
|  | 05 027 | FGMEL Lab | P Prodöhl |  |
|  | 05 028 | Office | P Prodöhl/R.Hynes |  |
|  | 05 029 | Office | P Prodöhl |  |
|  | 05 030 | Freezer Room | P Prodöhl |  |
|  | 05 031 | Office | J.Lennon |  |
|  | 05 032 | Office | M. Emmerson |  |
|  | 05 034 | Kitchen |  |  |
|  | 05 035 | Office | D Roberts |  |
|  | 05 036 | Office | N Reid |  |
|  | 05 037 | Office | A.Cameron |  |
|  | 05 038 | Office | J.Sigwart/R.Hynes |  |
|  | 05 039 | Office | F.de Castro/W Hunter |  |
|  | 05 041 | Office | M Emmerson |  |
|  | 05 044 | Write Up Room |  |  |
|  |  |  |  |  |
| **6th Floor** |  |  |  |  |
| 605 | 06 005 | Office PG |  |  |
| 614 | 06 014 | Invasive species | J.Dick |  |
| 615 | 06 015 | Lab | Provan/Prodöhl |  |
| 616 | 06 016 | Office PG |  |  |
| 617 | 06 017 | Office | M.Scantlebury |  |
| 619 | 06 019 | Office | T.Caruso |  |
| 620 | 06 020 | Freezer room | G Riddell |  |
| 621 | 06 021 | Lab | T.Caruso/M Scantlebury |  |
| 623 | 06 023 | Office | N.O’Connor |  |
| 626 | 06 026 | Lab | M.Scantlebury |  |
| 627 | 06 027 | Office | M.Boeri |  |
| 628 | 06 028 | Office | K Farnsworth |  |
| 630 | 06 030 | Office | J Houghton |  |
| 631 | 06 031 | Office | J Dick |  |
| 632 | 06 032 | Lab |  |  |
| 633 | 06 033 | Office | G Riddell |  |
| 634 | 06 034 | Computing lab | K Farnsworth |  |
| 635 | 06 035 | Lab |  |  |
| 637 | 06 037 | Office | P Mensink |  |
| 638 | 06 038 | Office PG |  |  |
| 639 | 06 039 | Store | J Houghton |  |
| 640 | 06 040 | Lab | T Caruso |  |
| 641 | 06 041 | Lab | H Kunc |  |
| 642 | 06 042 | Office | G Arnott |  |
|  |  |  |  |  |
| **New Wing** |  |  |  |  |
| LG80 | 0B 441 | Small lab | J Hallsworth |  |
| LG81 | 0B 442 | Lab | A Maule |  |
| LG82 | 0B 450 | Lab | A Maule |  |
| LG83 | 0B 455 | Lab | JP Quinn/J McGrath |  |
| LG84 | 0B 456 | Office | J McGrath |  |
| LG85 | 0B 454 | Office | JP Quinn |  |
| LG86 | 0B 453 | Office | J Hallsworth |  |
| LG87 | 0B 451 | Office | A Maule |  |
| LG88 | 0B 449 | Office | N Marks |  |
| LG89 | 0B 447 | Fermentation lab |  |  |
| LG90 | 0B 445 | Microscope lab |  |  |
| LG91 | 0B 443 | Cold room |  |  |
| none | 0B D06 | Gas cylinder cupboard |  |  |
|  |  |  |  |  |
| G80 | 0G 424 | Small lab |  |  |
| G81 | 0G 425 | Lab | M.Robinson/ |  |
| G82 | 0G 434 | Lab | J.Dalton |  |
| G83 | 0G 439 | Lab |  |  |
| G84 | 0G 440 | Office | M.Robinson |  |
| G85 | 0G 438 | Office |  |  |
| G86 | 0G 437 | Office | A Hyland |  |
| G87 | 0G 435 | Office | J Dalzell |  |
| G88 | 0G 433 | Microscope Room |  |  |
| G89 | 0G 430 | Tissue Culture lab |  |  |
| G89a | 0G 431 | Equipment lab | J.Dalton |  |
| G90 | 0G 428 | Dark room |  |  |
| G91 | 0G 426 | Hub room |  |  |
|  |  |  |  |  |
| 180 | 01 429 | Small lab | A.Galkin/C.Law |  |
| 181 | 01 430 | Lab | F.Liu |  |
| 182 | 01 439 | Lab | K Panov |  |
| 183 | 01 444 | Lab | A Galkin/C Law |  |
| 184 | 01 445 | Office | F.Liu |  |
| 185 | 01 443 | Office | C Law |  |
| 186 | 01 442 | Office | A Galkin |  |
| 187 | 01 440 | Office | J.Dalton |  |
| 188 | 01 438 | Office | K Panov |  |
| 189 | 01 435 | Tissue culture lab | K Panov |  |
| 189a | 01 436 | Tissue culture lab | K Panov |  |
| 190 | 01 433 | Ice Machine |  |  |
| 191 | 01 431 | Cold room | K Panov |  |
| 192 | 01 428 | Freezer room |  |  |
|  |  |  |  |  |
| **IGFS NITC** |  |  |  |  |
| **Ground Floor** | 0G.005 |  |  |  |
|  |  |  |  |  |
| **2nd Floor** | 007A | Office |  |  |
|  | 007B | Office |  |  |
|  | 008A | Office |  |  |
|  | 008B | Office |  |  |
|  | 009A | Office |  |  |
|  | 009B | Office |  |  |
|  | 010 | Bioinformatics Suite |  |  |
|  | 012 | Office | Z Takats |  |
|  | 013 | Office | Q Su (commencing May 2018) |  |
|  | 014 | Office | A Nugent |  |
|  | 015 | Office | (TBA) |  |
|  | 016 | Hub Room |  |  |
|  | 016A | Office | M.Dean |  |
|  | 016B | Office | N.O’Connell |  |
|  | 018 | Hub Room |  |  |
|  | 020 | Store Room |  |  |
|  | 021A | Office | C Elliott |  |
|  | 021B | Office | P Brereton |  |
|  | 022 | Office | 2 x Researchers (TBC) |  |
|  | 023 | Materials store |  |  |
|  | 024 | Post Doc Room | M Spence, T Benson, F Lavelle, A Meljon, M Sliwinska-Bartel |  |
|  | 025 | Office | Maeve Palmer/Mary Baxter |  |
|  | 027 | Boardroom |  |  |
|  |  |  |  |  |
| **IGFS - DKB** |  |  |  |  |
| **Ground Floor** | 0G.326 | Office | A Johnston/D Caldwell/J Del Duca |  |
|  | 0G.325 | Office | K Campbell |  |
|  |  |  |  |  |
| **1st Floor** | 01.303 | Office | C Black/J.Meneely/K.Cooper/H Montgomery |  |
|  | 01.305 | Office | T Friedel, plus TBA |  |
|  | 01.306 | Office | D.Gray/C Choi/A Gadaj |  |
|  | 01.307 | Research lab |  |  |
|  | 01.316 | Feed sample Prep Lab |  |  |
|  | 01.319 | Advanced ASSET Technology Centre (Lab) |  |  |
|  | 01.320 | Freezer Room |  |  |
|  | 01.321 | Office | O.Chevallier/P McCarron |  |
|  | 01.322 | Meeting Room |  |  |
|  | 01.324 | Proteomics/Genomics Lab |  |  |
|  | 01.325 | Molecular Lab |  |  |
|  | 01.327 | Office | E Wielogorska/K Austin/M Monteiro/M Shannon |  |
|  | 01.330 | Office | T.McGrath/B Greer/M Carey |  |
|  | 01.331 | Office | S.Haughey/P.Galvin-King |  |
|  | 01.333 | ASSET Technology Centre (Lab) |  |  |
|  |  |  |  |  |
| SARC |  |  |  |  |
| 1st floor | 01.024 | Postgraduate, Marie Curie Researchers |  |  |
|  | 01.020 | Postgraduate, Marie Curie Researchers |  |  |
|  | 01.027 | Office | C Situ |  |
|  | 01.028 | Office | L Connolly |  |
|  | 01.029 | Office | T Koidis |  |
|  | 01.030 | Office | P Williams |  |
|  | 01.031 | Office | C Cao |  |
|  |  |  |  |  |
| 8 Malone Road |  |  |  |  |
|  | 02.002 | Office | M Cantwell |  |
|  | 02.003 | Office | M Mooney |  |
|  | 02.005 | Office | B Green |  |
|  | 02.006 | Office | K Theodoridou |  |
|  |  |  |  |  |
| 10 Malone Road |  |  |  |  |
|  | 0G.003 | Office | Visiting Researchers |  |
|  | 0G.004 | Office | TBC |  |
|  | 01.008 | Office | A Eakin/R Kyle |  |
|  | 01.001 | Office | Lecturer (Education), TBA |  |
|  | 01.005 | Office | A Meharg |  |
|  | 01.004 | Bioinformatics Suite | PDRA & PhD |  |
|  | 01.003 | MFD |  |  |
|  | 02.007 | Office | C Meharg |  |
|  | 02.008 | Office | TBC |  |
|  | 02.004 | Office | TBC |  |
|  | 02.003 | Store |  |  |
|  |  |  |  |  |
| 13 Stranmillis Road |  |  |  |  |
|  | 0G.003 | Office | M Hills/A Smyth/P Millar |  |
|  | 0G.004 | Office | S Todd/J Paxton |  |
|  | 0G.005 | Kitchen |  |  |
|  | 0G.006 | Office | J Watterson |  |
|  |  |  |  |  |
|  | 01.003 | Office | U Bradley/N Donnelly |  |
|  | 01.004 | Office | N Scollan |  |
|  | 01.005 | Meeting Room |  |  |
|  |  |  |  |  |
|  | 02.003 | Office | I Marshall/C Brannigan |  |
|  | 02.004 | Office | S Durand |  |
|  | 02.005 | Meeting Room |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **QML** |  |  |  |  |
| **Basement** | 002.0B.003 | Lab bench area | S Exley |  |
| Basement | 002 0B 005 | Lab wet area | S Exley |  |
| Basement | 002 0B 006 | Tanks | S Exley |  |
| Basement | 003 0B 003 | Freezer room | S Exley |  |
| Basement | 003 0B 004 | Store | S Exley |  |
| Basement | 003 0B 005 | Store | S Exley |  |
| Basement | 003 0B 006 | Store | S Exley |  |
|  |  |  |  |  |
| G01 | 002 0G 002 | Tea Room | S Exley |  |
| G02 | 002 0G 003 | Pantry | S Exley |  |
| G03 | 002 0G 008 | Autoclave room | S Exley |  |
| G04 Minaki | 003 0G 011 | Wet lab | S Exley |  |
| G05 Minaki | 003 0G 015 | Parcel store | S Exley |  |
| G06 Minaki | 003 0G 016 | Technician’s office | B McNamara/E Gorman |  |
| G07 Minaki | 003 0G 012 | Drying room | S Exley |  |
| G08 Minaki | 003 0G 013 | Store | S Exley |  |
| G09 Minaki | 003 0G 014 | Visitors office – “Gotto Room” | S Exley |  |
| G11 | 002 0G 006 | Toilet | S Exley |  |
| G10 | 002 0G 009 | Chemicals lab | S Exley |  |
| G12 | 002 0G 005 | Front lab | S Exley |  |
| none | 002 0G 012 | Garage | S Exley |  |
| Minaki gnd fl | 003 0G 003 | Main office | B Curran |  |
| Minaki gnd fl | 003 0G 004 | Seminar room | S Exley |  |
| Minaki gnd fl | 003 0G 006 | Post room | B Curran |  |
| Minaki gnd fl | 003 0G 007 | Stationary store | B Curran |  |
| Minaki gnd fl | 003 0G 009 | Technician’s store | S Exley |  |
| Minaki gnd fl | 003 0G 010 | Technician’s office | S Exley |  |
|  |  |  |  |  |
| Minaki 1st fl | 003 01 003 | Main lab – “Flynn Lab” | S Exley |  |
| Minaki 1st fl | 003 01 005 | Director’s office | J Sigwart |  |
| 101 | 002 01 006 | Hub room | Network Services |  |
| 102 | 002 01 007 | Microscope lab | S Exley |  |
| 103 | 002 01 004 | Microscope lab | S Exley |  |
| 104 | 002 01 003 | Emeritus office | S Exley |  |
| 105 | 002 01 002 | Main lab – “Flynn Lab” | S Exley |  |
|  |  |  |  |  |
| Minaki 2nd fl | 003 02 003 | Postgrad office | S Exley |  |
| Minaki 2nd fl | 003 02 004 | IBIS office | L Ashton |  |
| Minaki 2nd fl | 003 02 007 | Postdoc office | L Kregting/N Geraldi |  |
| Minaki 2nd fl | 003 02 008 | Postgrad office | S Exley |  |
| 201 | 002 02 013 | Postdoc office | K Mooney/D Birkett |  |
| 202 | 002 02 011 | Toilet | S Exley |  |
| 203 | 002 02 009 | Toilet | S Exley |  |
| 204 | 002 02 008 | Office | M Emmerson |  |
| 205 | 002 02 007 | Visitors office | S Exley |  |
| 206 | 002 02 005 | SMRU office | A Murray |  |
| 207 | 002 02 004 | Postgrad office | S Exley |  |
| 208 | 002 02 003 | SPACE office | B Elsaesser |  |
|  |  |  |  |  |
|  |  |  |  |  |

Appendix 2: School Safety Committee

|  |  |  |  |
| --- | --- | --- | --- |
| Health & Safety Co-ordinator and Chairperson | Dr. Rosaleen.Hynes | 2055/2413 | 05.027 |
| Environmental Advisor | Mrs Gillian Riddell | 2284 | 6.33 (06 033) |
| Biohazards/GMO Advisor | Dr. Mark Robinson | 2125 | G85 (0G 438) |
| Radiation Advisor | Dr. Kostya.Panov | 2119 | 01.438 |
| COSHH Advisor | Ms Katrina O’Connor | 2277 | 118 (01 421) |
| Technical Advisor and Teaching Representative | Mr Chris.Preshaw | 5788 | 107 (01 406) |
| Representing QML | Mr Simon Exley | 028 4272 7801 | QML,Portaferry, 0G.009 |
| Representing IGFS | Dr Brett.Greer | 6613/6543 (DKB) | 01. 307 (DKB) |
| Representing Administrative Staff | Mrs Catriona Toner |  |  |
| Representing MSF | Not available |  |  |
| Representing NIPSA | Not available |  |  |
| Representing Post Grads | Not available |  |  |

Local Laboratory Safety Representatives

MBC

Ms Katrina O’Connor

Mrs Gillian Riddell

DKB/NITC

Mr Brett Greer to cover IGFS laboratories.

QML

Simon Exley to cover QML.

Appendix 3: Evacuation Wardens

**When the fire alarm sounds and without endangering yourself, the Evacuation Warden’s main role is** to ensure complete evacuation of the building during emergencies and to report to an evacuation officer in the Assembly area that the designated area is clear. If a fire is discovered during the evacuation it should be reported to a fire officer immediately.

**Medical Biology Centre;**

**Evacuation Controller: Chris Preshaw**

**Evacuation Wardens: Biological Sciences**

**Main Building:** Basement J.Dickson

First Floor A.Meredith / E.McDermott & M.Devlin

Fifth Floor R.Hynes / C.Bradley

Sixth Floor J.Dick / K.Farnsworth

**New Wing:** Lower Ground Floor J.McGrath / J.Chin

Ground Floor I.Grant /J.Dalzell

First Floor K.Panov / F.Liu

**IGFS, David Keir Building**

**EVACUATION OFFICER: Stephen Todd**

**Evacuation Wardens:**

|  |
| --- |
| TERRY McGRATH |
| SIMON HAUGHEY |
| MANUS CAREY |
| BRETT GREER |
| JULIE MENEELY |
| OLIVIER CHEVALLIER |

**IGFS, NITC**

M.Mooney

**QML, Portaferry**

**Evacuation Controller:** Emma Gorman

**Evacuation Wardens:**

|  |
| --- |
| Bernie Curran |
| Simon Exley |
| Emma Gorman |
| Louise Kregting |

*Evacuation Wardens updated March 2018*

Appendix 4: Legislative Framework

**General Matters**

The Health and Safety at Work (N.I.) Order of 1978 and the Control of Substances Hazardous to Health Regulations (COSHH) (N.I. 2003).

**Use of Radioisotopes**

The Radioactive Substance Act, 1993 and The Ionisation Radiation Regulations, 2001.

**Chemicals and Carcinogens**

Carcinogenic Substances Regulations (NI).

Highly Flammable Liquids and Liquified Petroleum Gases Regulations (SI 1972 No 917),

Health and Safety Commission "Authorised and Approved List" (3rd ed. 1990) (Issued under the Classification, Packaging and Labelling of Dangerous Substances Regulations 1984 - the "CPL" Regulations).

**Biohazards and Genetically Modified Organisms**

Advisory Committee on Dangerous Pathogens (1995) Categorisation of pathogens according to hazard and categories of containment. 3rd edition

Health and Safety Executive (1993) A guide to the Genetically Modified Organisms (contained use) Regulations. Guidance on Regulations. HMSO ISBN 011 8820494. This is explained further in **A**dvisory **C**ommittee on **G**enetic **M**anipulation (ACGM) newsletters and notes. Special notes on work with oncogenes.

Statutory Rules of Northern Ireland (1994) no. 143 Health and Safety, Genetically Modified Organisms (contained use) Regulations (Northern Ireland) HMSO.

Appendix 5: University Waste Disposal Policy; 18.02.2013

<http://www.qub.ac.uk/directorates/EstatesDirectorate/UniversitySafetyService/qubonly/QUBonlyWordDocuments/Filetoupload,777053,en.doc>

|  |  |  |  |
| --- | --- | --- | --- |
| **1.0** | **PURPOSE** | | |
|  | 1.1 | To ensure that the University remains in compliance with legal and regulatory requirements regarding the storage and disposal of waste. | |
| **2.0** | **SCOPE** | | |
|  | 2.1 | This procedure applies to staff and students in all Schools and Departments across the University. | |
|  | 2.2 | The University has a legal responsibility to ensure that any waste that is removed from University premises is stored, transported and disposed of without harming the environment. This is called our ‘Duty of Care’ and requires the University to ensure that:   * Waste is stored and transported appropriately and securely so it does not escape * Waste is transported and handled by people or businesses that are authorised to do so * Appropriate documentation is completed and retained for all waste removed from the University. | |
|  | 2.3 | Waste types covered in this procedure include:   * Non-hazardous general waste and recyclables * Waste electrical and electronic equipment * Hazardous waste * Laboratory waste. | |
|  | 2.4 | This procedure does not apply directly to the disposal of clinical waste or chemical waste. These waste streams have their own specific disposal procedures and are attached as appendices 2 & 3 for reference. | |
|  | 2.5 | This procedure does not apply to the disposal of radioactive wastes. These wastes have separate disposal procedures. Further guidance is available through the University’s Radiation Protection Adviser. | |
| **3.0** | **RESPONSIBILITY** | | |
|  | 3.1 | The Head of School/ Directorate is responsible for:   * Ensuring that all the relevant waste streams detailed in this procedure are stored and disposed of in a safe and proper manner and in accordance with the legal requirements * Ensuring that this generic procedure is adapted to detail exact disposal arrangements within their School/ Department. | |
|  | 3.2 | All Staff and Students are responsible for ensuring that they comply with this procedure. Additionally, it is the duty of all staff and students to attempt to comply with the Government's waste hierarchy, i.e.   * Reduce the amount of waste produced * Re-use the material where possible * Recycle the material where possible * Recovery of any component parts or materials * Disposal as the last resort. | |
|  | 3.3 | The Environmental Services section of the Estates Directorate is responsible for:   * Conducting periodic audits on the process of waste disposal * Ensuring that all waste contractors used by the University are suitably licensed * Ensuring that all waste streams are classified correctly * Maintaining waste records. | |
|  | 3.4 | All waste detailed in this procedure should be disposed of through the University’s appointed waste disposal contractors. These appointed contractors are deemed by the University to be ‘authorised persons’ in accordance with our Duty of Care. Departments must satisfy themselves that any other contractor engaged is similarly suitable to receive the University’s waste. | |
|  | 3.5 | The Environmental Services section of the Estates Directorate and the University Safety Service have responsibility for raising the awareness of this procedure to staff and students and completing training where necessary. | |
| **4.0** | **PROCEDURE** | | |
|  | **Non-hazardous General Waste and Recyclables** | | |
|  | 4.1 | Non-Hazardous General Waste | |
|  |  | 4.1.1 | Material that cannot be re-used or recycled, and that is not hazardous, should be deposited into general waste bins and disposed of into black bags which are collected on a daily basis by cleaning staff. |
|  |  | 4.1.2 | The black bags are taken and disposed of into external blue bins. The University’s appointed waste management contractor empties these bins. |
|  |  | 4.1.3 | On the main site, bagged waste is also collected internally and taken to the Waste Management Centre at Rugby Road and compacted, prior to disposal. |
|  |  | 4.1.4 | To request a skip for non-hazardous general waste, the School/ Directorate’s Building Liaison Officer should complete an online works request. |
|  | 4.2 | Books | |
|  |  | 4.2.1 | Books in good condition can be donated for reuse to a social enterprise called Better World Books. |
|  |  | 4.2.2 | Contact the Assistant Environmental Manager for information on books that are accepted by Better World Books. |
|  |  | 4.2.3 | Contact your School/ Directorate’s Building Liaison Officer (BLO) to place an online works request to receive boxes to pack the books. |
|  |  | 4.2.4 | Once the boxes are packed with books, uplift of boxes can be arranged via an online works request through your School/ Directorate’s Building Liaison Officer (BLO). Please detail the location and the number of boxes requiring uplifting on the request. |
|  | 4.3 | Cans | |
|  |  | 4.3.1 | Metal cans (both steel and aluminium) should be segregated from the main general waste stream and recycled in designated bins for recycling. Rinse cans out if they contain any food residues. |
|  |  | 4.3.2 | This material should be deposited in clear tied bags to allow handlers to see any contamination. |
|  |  | 4.3.3 | The bags of cans are then taken to the dedicated external storage bins by the cleaning staff. |
|  |  | 4.3.4 | The contents of the external bins (generally red) are then collected by Estates and taken to a dedicated skip at the University’s Waste Management Centre at Rugby Road for recycling. |
|  |  | 4.3.5 | When the skip is full it is collected by the University’s appointed waste contractor and sent for recycling. |
|  |  | 4.3.6 | Where facilities do not exist, waste cans are to be disposed of through the general waste bins as detailed in 4.1. |
|  |  | 4.3.7 | Additional metal can recycling bins can be ordered via an online works request through your School/ Directorate Building Liaison Officer (BLO). |
|  | 4.4 | Cardboard | |
|  |  | 4.4.1 | All cardboard waste generated should be segregated from the main general waste stream and recycled. |
|  |  | 4.4.2 | Ensure all cardboard boxes are empty of their original contents. |
|  |  | 4.4.3 | Small quantities of flat packed cardboard will be collected by the cleaning staff and recycled. |
|  |  | 4.4.4 | For non-office areas; flat pack the cardboard boxes and place them in the designated external green or white external bins which are clearly labelled for cardboard disposal. |
|  |  | 4.4.5 | For large quantities of cardboard (e.g. from deliveries), a request to collect the cardboard for recycling should be arranged via an online works request through your School/ Directorate Building Liaison Officer (BLO). |
|  |  | 4.4.6 | Waste cardboard in the green external bins is collected by Estates and taken to the Waste Management Centre at Rugby Road for baling. |
|  |  | 4.4.7 | The baled cardboard is then uplifted (usually when there are 4 bales generated) by the University’s appointed waste contractor and sent for recycling. |
|  |  | 4.4.8 | Waste cardboard in the white external bins is collected by the University’s appointed waste contractor and sent for recycling. |
|  | 4.5 | CDs, DVDs, Videos | |
|  |  | 4.5.1 | If this material contains confidential information and requires data destruction dispose of with Waste Electrical and Electronic Equipment as detailed in 4.15. |
|  |  | 4.5.2 | Non confidential media can be disposed of in the general waste bins as detailed in 4.1. |
|  | 4.6 | Furniture | |
|  |  | 4.6.1 | Redundant furniture includes desks, chairs, filing cabinets, bookcases etc. |
|  |  | 4.6.2 | Contact your School/ Directorate Building Liaison Officer (BLO) with details of the items for disposal. |
|  |  | 4.6.3 | The BLO then places an online works request for internal collection of the redundant furniture. |
|  |  | 4.6.4 | The Estates Directorate collects redundant furniture. Where practical to do so, good quality furniture is stored for reuse within the University or donated to a local charity. |
|  | 4.7 | Garden Waste | |
|  |  | 4.7.1 | Garden waste originating from the University premises is centrally collected at the University’s Waste Management Centre and collected by the University’s appointed waste contractor for composting. |
|  | 4.8 | Glass | |
|  |  | 4.8.1 | Glass bottles and jars can be recycled in the glass recycling containers at the following locations on Campus:   * PFC Café * Whitla Hall * MBC Whitla Medical |
|  |  | 4.8.2 | Mixed glass i.e. clear and coloured, are accepted together. |
|  |  | 4.8.3 | Remove any lids and rinse if there are food residues. |
|  |  | 4.8.4 | Laboratory and Pyrex glass and other non-container glass (e.g. window glass) and crockery are unable to be recycled this way and should not be placed in the glass recycling containers. |
|  |  | 4.8.5 | Disposal of glass from laboratories is detailed in sections 4.26 and 4.26. |
|  | 4.9 | Metal | |
|  |  | 4.9.1 | All scrap metal to be disposed of must be fully decontaminated prior to disposal. |
|  |  | 4.9.2 | Contact your School/Directorate Building Liaison Officer (BLO) with details of the items for disposal. |
|  |  | 4.9.3 | The BLO then places an online works request for internal collection of the scrap metal. |
|  |  | 4.9.4 | The scrap metal is collected by the Estates Directorate and taken for recycling. |
|  | 4.10 | Packaging | |
|  |  | 4.10.1 | Packaging such as plastics (excluding bottles, see section 5.12.) and polystyrene\* currently cannot be recycled.  \*Polystyrene can now be recycled at the MBC site – see section 3.1.3 “Polystyrene Disposal” of school safety manual |
|  |  | 4.10.2 | All such packaging should be taken to the respective bin areas and disposed of in the blue general waste bins provided. |
|  |  | 4.10.3 | Where the packaging is too large to be placed neatly in the bin, it should be broken down accordingly. |
|  |  | 4.10.4 | If it cannot be broken down, contact your School/ Directorate Building Liaison Officer (BLO) with details and they will place an online works request for internal collection by the Estates Directorate. |
|  |  | 4.10.5 | Packaging must not be left on the ground beside the bins. |
|  | 4.11 | Paper | |
|  |  | 4.11.1 | Office waste paper should be segregated from the main general waste stream and recycled through the confidential waste paper stream. Office paper recycling stations have white/blue coloured sacks for the disposal of waste paper. All paper disposed of in these sacks is securely destructed (shredded) and recycled. The types of waste paper which can be recycled in these sacks include:   * General office paper i.e. print outs, photocopies etc. * Envelopes (including those with windows) * Post it notes * Newspapers * Magazines/ Journals (any hard backing should be removed) * Paper already shredded. |
|  |  | 4.11.2 | Waste paper recycling sacks can be obtained by contacting the Porters’ Office. |
|  |  | 4.11.3 | Sacks should only be filled to a level where those using them can comfortably lift them. If they are too heavy, the Waste Contractor will not remove them during the collection day. |
|  |  | 4.11.4 | Sacks should not be filled above the ‘Fill line’ depicted on all bags (taking the above point into consideration). |
|  |  | 4.11.5 | Sacks should be secured using the cable ties provided.  If these are not used, the Waste Contractor will not remove them during the collection day. |
|  |  | 4.11.6 | Where a School/Department have sacks ready for collection, the School/Directorate Building Liaison Officer (BLO) should contact the Porter’s Office before lunch time on a Tuesday afternoon to be added to the collection schedule. Where Schools/ Departments will have sacks for collection every week they can be permanently added to the schedule without having to ring up each week. |
|  |  | 4.11.7 | The bagged waste paper is collected from School/ Directorate areas on a weekly basis (typically on a Wednesday morning) by the University’s approved waste management contractor for confidential shredding and reprocessing. |
|  | 4.12 | Non-Confidential Waste Paper | |
|  |  | 4.12.1 | Facilities for the recycling of non-confidential waste paper are mostly available in corridor areas and Student Computing Centres. |
|  |  | 4.12.2 | All waste paper not deemed as confidential can be disposed of in these facilities. This material should be deposited in clear tied bags to allow handlers to see any contamination. |
|  |  | 4.12.3 | The bags are replaced and the full ones taken to the dedicated storage area by the cleaning staff. The contents of the external bins are then collected and taken for recycling. |
|  | 4.13 | Plastic Bottles | |
|  |  | 4.13.1 | Plastic bottles (including plastic milk cartons) should be segregated from the main general waste stream and recycled in designated bins for recycling. Rinse cans out if they contain any food residues. |
|  |  | 4.13.2 | This material should be deposited in clear tied bags to allow handlers to see any contamination. |
|  |  | 4.13.3 | The bags of plastic bottles are then taken to the dedicated external storage bins by the cleaning staff. |
|  |  | 4.13.4 | The contents of the external bins (generally red) are then collected by Estates and taken to a dedicated skip at the University’s Waste Management Centre at Rugby Road for recycling. |
|  |  | 4.13.5 | When the skip is full it is collected by the University’s appointed waste contractor and sent for recycling. |
|  |  | 4.13.6 | Where facilities do not exist, plastic bottles should be disposed of through the general waste bins as detailed in 4.1. |
|  |  | 4.13.7 | A plastic bottle recycling bin can be ordered via an online works request through your School/Directorate Building Liaison Officer (BLO). |
|  | 4.14 | Wood (including wooden pallets) | |
|  |  | 4.14.1 | Garden waste originating from the University premises is centrally collected at the University’s Waste Management Centre and collected by the University’s appointed waste contractor for composting. |
|  |  | 4.14.2 | To request a collection of wood, the School/Directorate’s Building Liaison Officer should complete an online works request. |
|  | **Waste Electrical and Electronic Equipment Removal and Recycling** | | |
|  | 4.15 | Electrical and Electronic Equipment | |
|  |  | 4.15.1. | The disposal of electrical and electronic equipment such as; IT equipment (computers, faxes, printers etc.), small and large lab equipment and domestic goods (kettles, toasters etc.) is covered by the WEEE (Waste Electrical and Electronic Equipment) Regulations. |
|  |  | 4.15.2 | It is a legal requirement that WEEE is collected separately from other waste and must not be disposed of via the mixed general waste stream. The University’s appointed contractor is currently Asset Management Ireland Limited. |
|  |  | 4.15.3 | Contact your School/Directorate Building Liaison Officer (BLO) with details of the items. |
|  |  | 4.15.4 | The BLO then places an online works request for internal collection of the obsolete electrical goods. |
|  |  | 4.15.5 | Environmental Services coordinates request for the disposal of electrical and electronic equipment for all University Departments ensuring that the service is legally compliant and in majority of cases free of charge to Schools and Departments. |
|  |  | 4.15.6 | Hard disks will be data wiped and/or physically disabled by the University’s appointed contractor to prevent access to any remaining data. |
|  |  | 4.15.7 | Older items of equipment may contain hazardous materials e.g. older laboratory oven/ incinerator units may contain asbestos. Please ensure that such items are specifically detailed in the online works request. |
|  |  | 4.15.8 | Electrical equipment must not be left in external areas. |
|  | 4.16 | Refrigerators | |
|  |  | 4.16.1 | Redundant fridges and freezers are classified as Hazardous Waste and require collection by the University’s appointed waste management contractor, currently Asset Management Ireland Limited. |
|  |  | 4.16.2 | All redundant fridges should be emptied and cleaned. If this is not undertaken, they will not be removed. |
|  |  | 4.16.3 | Any chemical contamination should be wiped down and the contamination removed. |
|  |  | 4.16.4 | Microbiological contamination should be sterilised by appropriate chemical disinfectants such as Virkon or other methods as appropriate which will be highlighted through the risk assessment process prior to commencing experiments. |
|  |  | 4.16.5 | Contact your School/Directorate Building Liaison Officer (BLO) with details of the items. |
|  |  | 4.16.6 | The BLO then places an online works request for internal collection of the obsolete white goods. The white goods are then collected by the Estates Directorate and disposed of. |
|  |  | 4.16.7 | Refrigerating equipment must not be left in external areas. |
|  | **HAZARDOUS WASTE** | | |
|  | 4.17 | Batteries | |
|  |  | 4.17.1 | There are various different types of batteries and some contain hazardous materials. They should therefore not be disposed of in the non-hazardous general waste bins, as the University has an appointed contractor that is legally authorised to take our hazardous items. |
|  |  | 4.17.2 | Smaller ‘household’/consumer batteries such as non-chargeable (general purpose and button cells) and rechargeable (nickel cadmium, lithium ion and smaller lead acid) can be recycled in the battery recycling tubes located in the Porter’s Offices or at reception areas in the following buildings:   * Administration Building, Level 2 * Ashby Building * Institute of Clinical Science Block A, Royal Victoria Hospital * David Keir Building (Malone Road & Stranmillis Road entrances) * Elms Village * Geography * Health Sciences Building * McClay Library * McClay Building, School of Pharmacy * Medical Biological Centre (MBC) * Safety Services at 5A Lennoxvale * Students Union * Whitla Medical Building |
|  |  | 4.17.3 | Larger industrial type batteries such as lead acid car type batteries and nickel cadmium batteries used in emergency standby systems cannot be disposed of in these tubes. They should be disposed of by contacting your School/ Directorate’s Building Liaison Officer (BLO) with details of the batteries for disposal. The BLO then places an online works request for internal collection by the Estates Directorate. |
|  | 4.18 | Disposal of Nominally Empty Chemical Containers | |
|  |  | 4.18.1 | These include empty glass winchesters, plastic and aluminium chemical bottles. Adherence to this procedure will ensure this waste is classified as non-hazardous waste. |
|  |  | 4.18.2 | Solvent Containers   * Screw off the lid of the container and rinse * Ensure as much solvent as possible is decanted from the container * Place the container in a fume cupboard overnight to allow the solvent to evaporate safely in a contained and controlled manner * Deface the hazard symbol (orange and black in colour) with a permanent marker and clearly write ‘RINSED’ in capital letters on the remainder of the label * DO NOT replace the lid of the container. Dispose of the lid separately in the general waste stream * Take the empty container to the laboratory supervisor who MUST check the container prior to disposal * Once checked, the empty container can be taken to the designated disposal area. |
|  |  | 4.18.3 | Non-Solvent Containers   * Screw off the lid of the container and rinse * Ensure as much chemical as possible is decanted from the container * Rinse the container thoroughly and allow to dry * Deface the hazard symbol (orange and black in colour) with a permanent marker and clearly write ‘RINSED’ in capital letters on the white section of the label * DO NOT replace the lid of the container. Dispose of the lid separately in the general waste stream * Take the empty container to the laboratory supervisor who MUST check the container prior to disposal * Once checked, the empty container can be taken to the designated disposal area. |
|  | 4.19 | Fluorescent Tubes and Energy Efficient Light Bulbs | |
|  |  | 4.19.1 | Fluorescent tubes and spent UV, mercury and sodium lamps are classified as Hazardous Waste. They should therefore not be disposed of in the non-hazardous general waste bins. The University has an appointed contractor that is legally authorised to take our fluorescent tubes and energy efficient light bulbs for recycling. |
|  |  | 4.19.2 | Ensure that all fluorescent tubes and energy efficient bulbs are stored in their original packaging. A request to remove any tubes and bulbs for recycling should be logged via the School/Directorate Building Liaison Officer (BLO). |
|  |  | 4.19.3 | The tubes are stored in a designated container (coffin) and disposed of by the University’s appointed contractor. |
|  |  | 4.19.4 | Maintenance staff undertaking tube replacement in the University, store the resultant waste tubes in designated storage containers (coffins) at the following locations:   * Works Department, Rugby Road * David Keir Building (Boiler House) * Elms Village * Medical Biology Centre (Goods Ramp).   Once the coffin is nearing capacity, the DLO Manager is informed who advises Environmental Services that a collection and replacement is required. Environmental Services contacts the University’s appointed contractor to arrange collection. |
|  | 4.20 | Oil | |
|  |  | 4.20.1 | Waste engine and machinery oil, or waste fuel oil, produced by the University is hazardous waste. In addition, the University arranges the collection of waste vegetable oil by a specialist contractor. |
|  |  | 4.20.2 | Contact your School/Directorate Building Liaison Officer (BLO) with details of the waste oil that requires disposal. |
|  |  | 4.20.3 | The BLO then places an online works request for internal collection of the waste oil. |
|  |  | 4.20.4 | The waste oil is collected by the Estates Directorate and disposed of by the University’s appointed contractor. |
|  | 4.21 | Paints | |
|  |  | 4.21.1 | Some paints are hazardous and should therefore not be disposed of in the non-hazardous general waste bins. The University has an appointed contractor that is legally authorised to take our hazardous items. |
|  |  | 4.21.2 | A collection can be arranged via an online works request through your School/ Directorate Building Liaison Officer (BLO). |
|  | 4.22 | Toner Cartridges | |
|  |  | 4.22.1 | There are various different types of laser, inkjet and photocopier cartridges and some contain hazardous materials. These should be sent for recycling and should not be disposed of via the general waste stream. |
|  |  | 4.21.2 | Small quantities should be placed in the internal post and will be collected by the Porters for recycling. |
|  |  | 4.21.3 | For larger numbers of cartridges a collection can be arranged via an online works request through your School/Directorate Building Liaison Officer. |
|  | **LABORATORY WASTE** | | |
|  | 4.23 | Laboratory Waste | |
|  |  | 4.23.1 | Ensure the appropriate Personal Protective Equipment (PPE) is worn at all times. |
|  |  | 4.23.2 | Schools MUST NOTarrange for the collection and disposal of waste through other contractors. |
|  |  | 4.23.3 | Please refer to the separate procedures for the disposal of chemical and clinical wastes (attached as appendices 2 & 3). |
|  | 4.24 | Chemical Oxygen Demand (COD) Test Vials | |
|  |  | 4.24.1 | Place the used vial in its original packaging box. |
|  |  | 4.24.2 | Once the box is full with used vials, place the lid on the box, clearly write ‘WASTE’ in capital letters with a permanent marker on the remainder of the label. |
|  |  | 4.24.3 | Take the empty container to the laboratory supervisor who MUST check the container prior to disposal. |
|  |  | 4.24.4 | Once checked, the empty container can be taken to the designated disposal area. |
|  | 4.25 | Sharps Disposal | |
|  |  | 4.25.1 | Sharps for disposal include scalpels, needles, syringes etc. |
|  |  | 4.25.2 | Sharps in contact with clinical wastes   * These should be disposed of in accordance with section 3.5 of the Biological/ clinical waste disposal procedure attached as Appendix 3 and as directed under “Clincal Waste Disposal” in this school safety manual |
|  |  | 4.25.3 | Sharps in contact with chemicals\*   * These should be disposal of in the sharps boxes labelled as ‘Chemically contaminated sharps’ * When full, these boxes must be taken to the designated disposal area. * All hazardous sharps to be disposed of as directed under “Clincal Waste Disposal” in this school safety manual |
|  |  | 4.25.4 | Non-hazardous Sharps   * Defined as Sharps used which have not been in contact with contamination e.g. the use of scalpels for cutting plastic * These should be disposed of in sharps boxes labelled as ‘Non-contaminated sharps’ * When full, these boxes can be disposed of via the general mixed waste stream (external blue bins). |
|  | 4.26 | Non-Contaminated Broken Glassware | |
|  |  | 4.26.1 | Broken glassware from lab areas which is not contaminated can be disposed of via the general mixed waste stream (external blue bins) |
|  |  | 4.26.2 | Broken glassware must be placed in either a sturdy cardboard box or specific ‘Magpie’ box. |
|  |  | 4.26.3 | Ensure the appropriate PPE is worn at all times (safety glasses and gloves). |
|  |  | 4.26.4 | Before leaving the lab area, clearly label the cardboard box as ‘NON-CONTAMINATED BROKEN GLASSWARE’ with a permanent marker. This is not necessary when the ‘Magpie’ boxes are used as they are pre labelled. |
|  |  | 4.26.5 | When full enough to be comfortably lifted, secure the box by taping its openings with heavy duty tape and take the box to the designated blue bin area. |
|  |  | 4.26.6 | Open the lid of a blue bin with sufficient space for the box to be placed. |
|  |  | 4.26.7 | Lift the box very carefully and place it in the bin. |
|  | 4.27 | Contaminated Broken Glassware | |
|  |  | 4.27.1 | Contaminated broken glassware should be disposed of in the respective sharps boxes (dependant on type of contamination i.e. chemical/clinical) provided in the laboratory areas as detailed in section 4.4 previous. |
|  | 4.28 | Petri Dishes | |
|  |  | 4.28.1 | Used Petri dishes not containing microbiological cultures   * Place the used Petri dishes in a bag. DO NOT USE A BIOHAZARD BAG * When full, ensure the bag is securely closed and wrap the ‘STERILE’ laboratory tape around the bag at least twice * Fill in the ‘MADE SAFE FOR DISPOSAL’ label (template attached as appendix 1) and apply to the bag * Take the bag to the laboratory supervisor who MUST check and sign off prior to disposal * Once checked, the bag can be taken to the designated disposal area and disposed of in the mixed general waste stream (external blue bins). |
|  |  | 4.28.2 | Petri dishes containing microbiological cultures/genetically modified organisms (GMO’s)   * Please refer to sections 2.0 and 3.4 in the Biological/ clinical waste disposal procedure, attached as Appendix 3 for the disposal of these wastes. |
| **5.0** | **LEGAL COMPLIANCE** | | |
|  | 5.1 | Waste contractors are appointed to collect and dispose of waste and do so in accordance with legal requirements. Wastes generated on site are disposed of using licensed carriers via licensed waste transfer stations or directly to a licensed/permitted facility. | |
|  | 5.2 | Non-hazardous waste must be disposed of under completed waste transfer notes issued either for each collection or via season ticket arrangement for frequent collections, refer to procedure GEOP003, Procedure for the completion of Waste Transfer Notes. Transfer notes must be retained for a minimum of 2 years and are kept by the Environmental Manager. | |
|  | 5.3 | Hazardous waste s must be disposed of under a consignment note, refer to procedure GEOP002, Procedure for the completion of Hazardous Waste Consignment Notes. Consignment notes must be retained for a minimum of 3 years and are kept by the Environmental Manager. | |
|  | 5.4 | Waste receptacles used for the storage of waste must be kept in good condition, free from third party contamination and where possible, covered. | |
| **6.0** | **ATTACHMENTS** | | |
|  | 6.1 | Made safe for disposal’ label template Appendix A | |
|  | 6.2 | ‘Disposal of Chemicals’ procedure Appendix 2 | |
|  | 6.3 | Biological/ Clinical waste disposal procedure Appendix 3 | |

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|  | **Appendix A** Made safe for disposal template |
|  | **Queen’s University Belfast**  Laboratory waste –  **MADE SAFE FOR DISPOSAL**  Dept/Lab: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date: \_\_\_\_\_\_/\_\_\_\_\_\_/\_\_\_\_\_\_\_\_  Supervisor’s Initials: \_\_\_\_\_\_\_\_\_ Extension no.\_\_\_\_\_\_\_ |

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|  | **Appendix B** Disposal of Chemicals Procedure |
|  | Responsibility  Individuals acquiring and/or using chemical substances (whether hazardous or not) are personally responsible for the safe disposal of all wastes there from. Similarly, research supervisors are responsible for the safe disposal of chemical reaction products and other residues arising from their research. |
|  | Disposal Directly to Drain  Certain chemical wastes, specified in Appendix 2.1, may be disposed of directly to drain. The volume disposed of at any one time should not exceed 1 litre and the waste should be diluted with many volumes of water to prevent accumulation and concentration in sink traps and u-bends. |
|  | Disposal through Licensed Waste Contractor  With the exception of chemical waste that can be sent to drain, all other chemical waste must be clearly identified, accumulated in suitable screw top labelled containers, fully inventoried on the “chemicals disposal inventory form” (see Appendix 2.2), and stored in a safe manner in a secure location pending disposal by a licensed waste disposal contractor.  It must be noted that waste disposal contractors will not accept “unknown” or “non-characterised” chemical waste for disposal. The producer of such waste will be liable for the cost of chemical analysis to characterise it prior to its acceptance for disposal.  The University Safety Service arranges a University-wide lift of waste chemicals by licensed contractor on an annual basis in June. Therefore, fully completed inventory forms should be submitted to the Safety Service in a timely fashion to expedite this disposal. In extenuating circumstances (where storage space is at a premium) additional disposals may be organised on an ad hoc basis throughout the year on application to the Safety Service.  Finally, care must be exercised in the choice of storage location for chemical waste prior to its disposal. In particular, great care should be taken in the accumulation of large quantities of flammable solvents or other hazardous materials. (Further advice should be sought on a case by case basis from the Fire Officer or officers from the Safety Service) It may also be possible to arrange temporary storage of waste chemicals and to decant waste solvents into chlorinated/non-chlorinated bulk waste solvent streams by arrangement with the storekeepers at the following locations;   * Chemical Store, David Keir Building * General Store, Medical Biology Centre * General Store, CCRCB * Chemical Store, Microbiology Building, RVH Site.   Storage space at the stores is restricted and their temporary use for waste storage is by local arrangement only. |
|  | Production and Accumulation of Waste  As a general rule, the production and accumulation of chemical waste should be minimised so far as is reasonably practicable. This may be achieved by;   * Implementing a sensible purchasing policy. Chemicals should be purchased in as small a pack size as is required. * Segregating carefully chemical wastes from other harmless wastes such as cotton wool, glass wool, filter paper and glassware. * Not permitting chemical waste to accumulate in quantities or in physical forms which would make future treatment difficult. * Converting, where possible, hazardous materials into less hazardous materials prior to disposal.   Chemical waste must not be deposited with general mixed waste in “on-site” external blue bins nor deposited along with builders’ and other waste in skips which may be on site from time to time. Appendix 2.1 |
|  | Disposal of Wastes to Drain  The volume disposed of at any one time should **not exceed 1 litre** and the waste should be diluted with many volumes of water to reduce its toxicity and to prevent accumulation and concentration in sink traps and u-bends.  Wastes which may be disposed of to drain when in dilute form include:-   1. Water miscible organic substances of relatively low toxicity  * Methanol, ethanol, glycol, glycerol and other lower alkanols * Formic acid, acetic acid and other lower alkanoic acids * Formaldehyde, acetaldehyde, acetone and other lower alkanoics. * Dimethyl formamide * Dimethyl sulphoxide  1. Aqueous solutions of relatively harmless inorganic compounds.    * Salt solutions containing the following cations and anions are considered relatively harmless: aluminium, calcium, copper, iron, lithium, magnesium, sodium, ammonium, tin, strontium, titanium, hydrogen, zinc, zirconium, borate, bromide, carbonate, chloride, hydrogen sulphite, iodide, nitrate, phosphate, sulphate, thiocyanate and hydroxide.   Large volumes of concentrated acids or bases must be neutralised prior to disposal to drain.  Note: Some aqueous solutions of toxic or highly toxic substances must not be disposed of to drain. Disposal advice is provided on the material safety data sheets which accompany chemicals.  Similarly aqueous solutions of other compounds capable of generating highly toxic or explosive gases in contact with acids must not be disposed of to drain. Examples of such compounds include; chlorites, chlorates, cyanides, sulphides, azides and borohydride. Appendix 2.2 |
|  | Disposal of Waste by Licensed Waste Contractor  Waste chemicals or chemicals surplus to requirements will **NOT** be accepted back into Chemical Stores for disposal unless:  Individual items are returned in secure and appropriately sized containers.   * The containers are adequately labelled and like substances are aggregated in one container where possible. (Waste disposal is costed by container size). * All the chemicals returned are fully itemised**\*** on approved *“Chemicals Disposal Inventory”* forms. (Blanks are available on request from the Store). * The forms are completed in a legible fashion. (Ideally lists should be word-processed. An example is attached. The template may be accessed by emailing the Store). * All the items are returned in sturdy box(es), labelled with the Lab Number and Box Number i.e. LG62/Box 2 of 2 etc and with the corresponding inventories attached. * Copies of the inventories attached are supplied to the storekeeper.   **\***Full chemical names and not chemical structures must be listed. The container size (in weight or volume) must be recorded and not a guesstimate of the contents. |
|  | **Hazard ratings should be clearly indicated where appropriate as follows:**  Explosive E Corrosive C  Oxidising O Irritant XI  Extremely Flammable (Flash Point < O°C) F+ Sensitising R42 or R43  Highly Flammable (Flash Point < 20°C) F Carcinogenic Carc Cat 1, or 2 or 3  Flammable (Flash Point < 55°C) R10 Mutagenic Muta Cat 1 or 2 or 3  Very Toxic T+ Toxic for Reproduction Repr Cat 1 or 2 or 3  Toxic T Dangerous for the Environment N  Harmful Xn Hazards not known NK |
|  | **CHEMICALS DISPOSAL INVENTORY- sample form**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Lab No.** | **Name(s)of Persons Returning Chemicals** | | | **Tel No.:** | | | **LG3555** | **Sid Sulphate** | | | **9998899** | | | **Container/Box Code No.: LG3555 Box 2** | | | CHEMICAL NAME | | | QUANTITY | | **HAZARD RATINGS** | | orthophosphoric acid | | | 2.5 litres | | C | | S-2(ethylsulphinyl)00-dimethyl phosphorothioate | | | 100 grams | | T | | 2,3-dihydro-6-methyl-5-(N-phenylcarbamoyl)-1,4-oxothiine 4,4-dioxide | | | 25 grams | | Xn | | benzene | | | 100 mls | | F,T,Carc Cat 1 | |

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|  | **Appendix C** Biological/Clinical Waste Disposal |
|  | Biological/Clinical Waste Disposal Procedure |
|  | Introduction   * The following procedure must be used for the safe disposal of microbiological and tissue cultures, clinical waste (CW), cultures containing genetically modified organisms (GMO’s) and clinical sharps. A central service for the disposal of clinical waste is provided through the clinical waste stores at the Medical Biology Centre (MBC) and Centre for Cancer Research and Cell Biology (CCRCB). Material to be disposed of through this waste stream must be packaged in specific containers (see below). The Biological Safety Officer should be contacted for advice as to obtaining these containers and CW matters in general before commencing a project that will generate CW. * Separate arrangements exist for units at the Royal Victoria Hospital site (RVH). * These generic procedures should be incorporated into local standard operating procedures (SOP’s) and followed in conjunction with other regulatory procedures such as the Human Tissue Act (HTA) Guidelines. * The supervision, checking and monitoring of procedures is a local responsibility. Where necessary, individuals should be appointed as disposal officers to ensure that proper procedures are followed. |
|  | Microbiological and Tissue Cultures   * Sterilised by chemical disinfection (see below). * Appropriate chemical sterilisation may be used for Biohazard Group 1 material. If an autoclave facility is available then this should be used. For Biohazard Groups 2 and above, the procedure determined to be appropriate for the organism concerned as part of the risk assessment should be used. * Materials to be sterilised should be immersed in a sterilisation solution such as 2% Virkon®  for 10 – 12 hours. Sterilisation products from different manufacturers will vary. Always follow the manufacturers’ instructions. * Once the sterilisation process has been completed, the waste material should be bagged and sealed. Some sterilised liquid solutions may be disposed of to drain depending on the content. * Wrap the ‘STERILE’ laboratory tape around the bag at least twice. * Fill in the ‘MADE SAFE FOR DISPOSAL’ label (template attached as appendix 1) and apply to the bag. * Take the bag to the designated disposal officer who MUST check the container prior to disposal. * Once checked, the bag can be taken to the designated disposal area and disposed of in a blue bin. |
|  | Sterilised by Autoclaving   * The process of autoclaving allows materials containing microbiological cultures to be effectively sterilised to render them harmless and therefore safe for disposal through the University’s non-hazardous waste stream. Some solutions sterilised by autoclaving may be disposed of to drain depending on the content. * Once the materials have been autoclaved, wrap the ‘STERILE’ laboratory tape around the bag at least twice making sure that it covers the biohazard signage on both sides of the bag. * Place the bag into a black bag and seal. * Fill in the ‘MADE SAFE FOR DISPOSAL’ label (template attached as Appendix 1) and apply to the bag. * Take the bag to the designated disposal officer who MUST check the container prior to disposal. * Once checked, the bag can be taken to the designated disposal area and disposed of in a blue bin. |
|  | Clinical Waste   * Defined as “waste which has the potential to cause sharps injury, infection or offence” Note a separate waste disposal stream exists for non-hazardous clinical waste generated from teaching and clinical skills activities which is placed in yellow clinical waste bags and blue lidded sharps boxes and accumulated in clinical waste bins at a designated compound at the MBC. * When packaged and disposed of appropriately there is virtually no public health significance. Clinical waste contains the following types of waste:   + - sharps     - human tissue (excluding hair, teeth and nails)     - bulk body fluids and blood     - visibly blood stained body fluids and visibly blood stained disposable material and equipment including gloves and dressings     - laboratory specimens and cultures; animal tissues, carcasses or other waste arising from laboratory investigation or for medical or veterinary research * Any clinical waste which is infectious MUST be sterilized before disposal to render it non-infectious. * Cultures containing genetically modified organisms (GMOs).   + - These MUST be sterilised before disposal, either by chemical disinfection or autoclaving as appropriate     - Following sterilisation they must be disposed of as detailed in sections 2.1 and 2.2 previous in this appendix * Sharps disposal   + - Routine clinical sharps e.g. needles, butterflies etc should be placed in a suitable clinical sharps container prior to disposal     - Sharps which are contaminated with infectious material MUST be sterilised by chemical disinfection before being packaged in the relevant sharps containers (plastic ‘buckets’ with associated biohazard signage, available from Stores areas)     - These sharps containers must then be taken to the DKB stores or the MBC clinical waste store |
|  | Stores Procedures   * Details (quantity, nature and originating School, lab number and building) of all clinical waste deposited in the MBC clinical waste store MUST be recorded in the log book provided. * Clinical Waste MUST be packed into the specific containers supplied (obtainable from the MBC stores). The Biological Safety Officer must be contacted immediately should these be unavailable. * Clinical waste must be segregated, packaged and labelled according to any current instructions notified to Schools. In particular, waste under the Human Tissue Act must be segregated and labeled as per the relevant regulations. * For clinical waste which must be stored frozen, plastic bags measuring no more than approximately one cubic foot must be used which must be deposited in the plastic bins in the freezers in the MBC clinical waste store. * The University Biological Safety Officer will arrange for the uplift of clinical waste from the stores. The Biological Safety Officer must be contacted immediately should the facilities be full or there is any other problem with the procedure. |