UNIVERSITY OF TASMANIA

MICROBIOLOGY POLICY & PROCEDURES

OVERVIEW

The University of Tasmania is committed to providing a safe workplace and promoting safe microbiological work practices in laboratories and animal, plant and invertebrate containment facilities. In addition, the University must comply with legislative requirements relating to genetically modified organisms (GMOs) and importation of biological materials.

This document provides the framework for employees, students, contractors and visitors to assist the University to meet those requirements and to fulfill our stated commitment to providing a safe workplace.

The Microbiology Policy and Procedures applies to all microbiological hazards including infective biohazards and gene technology affairs.

DEFINITIONS

Accountable Person

An individual, who assumes responsibility for the health or welfare of any other person in a workplace by providing instruction, direction, assistance, advice or service, is deemed an Accountable Person in accordance with the *Workplace Health and Safety Regulations 1998*. All management and supervisory staff (which includes those with responsibility for students) are therefore considered "Accountable Persons".

Employee

For the purposes of this Policy and Procedure, employee refers to any staff member, student, contractor or visitor.

Gene Technology Regulator

The Office of Gene Technology Regulator is responsible for administering *the Gene Technology Act 1 July 2007* and the *Gene Technology Regulations 1 July 2007*. These references and all GTR forms and guidebooks are available at www.ogtr.gov.au. This is the primary reference site for GMO information and should be accessed for each proposal. OGTR forms can be amended without notice.

GMO (genetically modified organism)

(a) An organism that has been modified by gene technology; or
(b) an organism that has inherited particular traits from an organism (the initial organism), being traits that occurred in the initial organism because of gene technology; or

(c) anything declared by the *Gene Technology Regulations 1 July 2007* to be a genetically modified organism, or that belongs to a class of things declared by the Regulations to be genetically modified organisms.
(d) But does not include
(e) a human being if the human being is covered by paragraph (a) because they have undergone somatic cell gene therapy; or
(f) an organism declared by the regulations not to be a genetically modified organism, or that belongs to a class of organisms declared by the regulations not to be genetically modified organisms.

Institutional Biosafety Committee (IBC)
The University of Tasmania is an accredited organisation under the *Gene Technology Act 1 July 2007*, with a properly constituted and maintained IBC. The IBC is a sub-committee of the Occupational Health & Safety Committee (OH&S).

The University IBC is established to assist the University to meet its legislative responsibilities for dealing with GMOs and to assist the Gene Technology Regulator.

Microbiological Hazard – Risk Group
AS/NZS 2243.3 Safety in Laboratories Part 3: Microbiological aspects and containment facilities defines four classifications of microorganism by Risk Group based on information about the microorganism and the classification of laboratory facilities, equipment, and procedures required to handle the microorganism safely. These are:

- Risk Group 1 (low individual and community risk)
- Risk Group 2 (moderate individual risk, limited community risk) e.g. *Legionella* spp., *Brucella ovis*, *Candida albicans*, Orf, Human parvovirus.
- Risk group 3 (high individual risk, limited community risk) e.g. *Bacillus anthracis*, Australian bat lyssavirus, Human immunodeficiency virus
- Risk Group 4 (high individual and community risk) e.g. *Filoviridae* including Ebola and Marburg.

AS/NZS 2243.3 provides examples of microorganisms in Risk Groups 2 to 4.

Occupational Health and Safety Committee
Is a committee that reports to the Vice-Chancellor and is responsible for the development of the University's OH&S policies and procedures.

Physical Containment Classification for Microbiological Hazards
AS/NZS 2243.3 Safety in Laboratories Part 3: Microbiological aspects and containment facilities defines four physical laboratory containment levels, which correspond to the four classifications of microorganism by Risk Group.

The four physical containment levels are:

- Physical Containment level 1 (PC1) – laboratories suitable for work with microorganisms where the hazard levels are low (i.e. organisms in Risk Group 1). This level of facility with its practices and equipment is appropriate for student and undergraduate laboratories.
- Physical Containment level 2 (PC2) – typically clinical, diagnostic, industrial, teaching and other facilities where Risk Group 2 microorganisms are used

- Physical Containment level 3 (PC3) – clinical, diagnostic and other facilities where work is carried out with microorganisms where there is a serious risk of infection to humans, animals or plants i.e. Risk Group 3 organisms.
- Physical Containment level 4 (PC4) – facilities where work with dangerous microorganisms that pose a high individual risk of life threatening disease and may be readily spread to the community.

Detailed requirements relating to the laboratory facilities, personal protective clothing and equipment, work practices, containment equipment, ventilation and health monitoring for each Physical Containment level including animal, plant and invertebrate containment facilities are defined in *AS/NZS 2243.3 Safety in Laboratories Part 3: Microbiological aspects and containment facilities*.

Responsible Officer
Deans, Heads of Division, Heads of School and Administrative Sections have been designated as Responsible Officers under the *Workplace Health and Safety Act 1995.*

RESPONSIBILITIES

Accountable Persons
Ensure that relevant employees are able to work with microbiological materials including GMOs in a safe manner by following this Policy and Procedure.

The Accountable Person is responsible for ensuring that:
- Delegated safety and license responsibilities are fulfilled and that appropriate supervision is provided
- Coordinating the induction and training program related to microbiological hazards within their work area
- Appropriate records relating to microbiological hazards and GMOs are kept e.g. risk assessments, inspections, monitoring, procedures and instructions, training and induction.

Employees
Employees must participate in microbiological induction and training programs, comply with all safety instructions and report potential loss of containment/exposures to their Accountable Person as soon as practicable.

All employees whilst working with microorganisms/GMOs at the University of Tasmania, must follow the Microbiology Policy and Procedures.

Institutional Biosafety Committee (IBC)
The IBC is responsible for:
- Providing advice and information on microbiological hazards and risk to the Occupational Health and Safety Committee, Accountable Persons and employees who work with microorganisms.
- Developing policies and procedures relating to microbiological hazards that provide a framework for employees to work safely with microorganisms including GMOs and ensure these are consistent with legislative requirements.

- Investigate and evaluate any incidents involving actual or suspect exposure to hazardous microorganisms including GMOs and notify the Office of the Gene Technology Regulator and any other appropriate organisation where appropriate.
- Reviewing microbiological risk assessments.
- Evaluating and if appropriate approving applications to deal with GMOs.
- The Chair of the IBC is authorised to require a School/Section to immediately cease any activity relating to working with microorganisms including GMOs, where they believe that the activity poses an unnecessary risk to any person(s). Such circumstances would be the subject of a special meeting of the IBC and may be referred to the Office of the Gene Technology Regulator.
- Ensuring facilities and physical containment requirements are regularly inspected and reports of inspections are reviewed.
- Maintaining a record of all exempt, notifiable low risk dealings and licensed dealings with GMOs undertaken by Accountable Persons and reporting annually to the Office of the Gene Technology Regulator.
- Administering the University of Tasmania's status as an Accredited Organisation to deal with GMOs and certification of University facilities.
- Annual inspections at all sites controlled by the University of Tasmania where authorised dealings with GMOs occur or where microorganisms of Risk Group 3 or higher are used.

Occupational Health and Safety Unit
The OH&S Unit is responsible for the following activities:
- Monitoring School/Section practices involving microbiological hazards.
- Reviewing incident reports and annual reports provided by Accountable Persons and forwarding them to the IBC.
- Maintaining records associated with health surveillance.
- Providing the Secretary to the Institutional Biosafety Committee (IBC).

Responsible Officers
Must ensure that where employees are required to work with microorganisms and GMOs, that this Policy and Procedures are implemented within their area of responsibility.

Responsible Officers must ensure that all School/Section specific microbiological guidelines are forwarded to the Institutional Biosafety Committee for approval.

PROCEDURES

Application to work with Infectious Agents

An Accountable Person who intends to import, manipulate, store, grow or export any Risk Group 3 (PC 3) non-recombinant infectious agent in any laboratory or facility owned or controlled by the University, must obtain written approval from the Institutional Biosafety Committee prior to the commencement of the work.

Further information including an application form may be obtained from the Institutional Biosafety Committee (IBC). The application must include a copy of the Risk Assessment for the proposed work.

Application to Conduct Genetic Manipulation Work
Accountable Persons who are considering genetic manipulation experimentation in any laboratory or facility owned or controlled by the University, must obtain written approval from the Institutional Biosafety Committee prior to the commencement of the work. All proposals must be submitted on GTR forms available from www.ogtr.gov.au and must be accompanied by an IBC cover sheet (Attachment 1).

There are three categories of approval that may be sought by the Institutional Biosafety Committee from the Office of the Gene Technology Regulator:

a. Dealings with Exempt GMOs
A license or prior approval by the Gene Technology Regulator is not required to undertake exempt dealing with GMOs. However Accountable Persons are responsible for consulting with the Institutional Biosafety Committee to confirm that the work being undertaken with a GMO is in fact exempt. Accountable persons are required to have the IBC confirm exemption for all the different host / vector / insert combinations that they believe are exempt. A proforma is available for this purpose from www.ogtr.gov.au and the completed from should be sent to the Chair or Secretary of the IBC for approval before commencing work.

Accountable persons shall also advise the Institutional Biosafety Committee when the exempt dealings are completed or abandoned.

b. Notifiable Low Risk Dealings with GMOs (NLRD)
Accountable Persons are responsible for making application to the Institutional Biosafety Committee for all Notifiable Low Risk Dealings with GMOs.

All work of this nature shall be conducted in a laboratory or facility of Physical Containment Level PC 2 or higher, approved by the Regulator.
Transport of the GMOs must be in accordance with the requirements set out in Regulator's *Guidelines for the Transport of GMOs*.

Appropriate records must be kept in relation to this work by the Accountable Person. Accountable Persons shall also advise the Institutional Biosafety Committee when the Notifiable Low Risk Dealings are completed or abandoned.

c. GMO Licenses (DNIR and DIR)
Dealings with a GMO that are not exempt, classified as Notifiable Low Risk Dealings, or on the GMO Register, must be licensed by the Office of the Gene Technology Regulator. There are two types of licenses that may be sought:

- A license for dealings not involving intentional release of the GMO into the environment (DNIR), or
- A license for dealings involving intentional release of the GMO into the environment (DIR).

Accountable Persons proposing to undertake work that requires a license to deal with a GMO are responsible for preparing an application for consideration by the Institutional Biosafety Committee. Further information on preparing the application, completing the risk assessment and the approval process is available from the Institutional Biosafety Committee.

If the application contains confidential commercial information, application may also be made for a declaration that specified information is confidential commercial information (CCI).

Applications if approved by the Institutional Biosafety Committee will be forwarded to the Office of the Gene Technology Regulator with supporting information. If the application is granted by the Regulator, the license holder is the University and the 'license' will cover persons and classes of persons including project supervisors and principal researchers.

It should be noted that approval from the Office of the Gene Technology Regulator does not give a license holder an absolute right to undertake work with a GMO. Approvals from other Regulators may also be required.

Accountable Persons are responsible for ensuring all license conditions including GMO transport, certification of facilities, reporting, informing affected persons of license conditions, maintain records and documentation are complied with.

Accountable Persons are also responsible for ensuring the Institutional Biosafety Committee is notified when licensed dealings with a GMO are completed or abandoned.

Certification of Facilities for GMO Work
As part of the license conditions to work with a GMO, the Office of the Gene Technology Regulator will in most cases require the work to be conducted in a certified and registered facility. Facilities are certified by the Office of the Gene Technology Regulator in order to satisfy the Regulator that the requirements for physical containment are met. Certification of a facility does not automatically mean that work with GMOs can be undertaken.

Physical containment levels for microbiological work (as defined *by AS/NZS 2243.3 Safety in Laboratories Part 3: Microbiological aspects and containment facilities*) may not be the same as the requirements for physical containment specified by the Office of the Gene Technology Regulator.

Classification of Microbiological Risk Group
Accountable Persons are responsible for classifying all microorganisms handled or stored into one of the four microbiological Risk Groups.

Physical Containment for Microbiological Hazards
Employees are responsible for ensuring all work done in a laboratory or other containment facility of a specific physical containment level follows the procedures that are prescribed for that level of physical containment.

Accountable Persons are responsible for ensuring that, at all times, laboratory facilities, safety equipment, work practices, personal protective clothing and equipment, ventilation and health monitoring procedures, in use or undertaken, are at a minimum, consistent with or higher than the classified Risk Group of the microorganism(s) in use.

The AS/NZS 2243.3 states that use of risk group 2 organisms should be carried out in a PC2 facility. In this context, the PC2 facility is meant to comply with the specifications in the Australian Standard in terms of workplace environment and procedures, and does not mean that the laboratory needs be certified by an IBC as Physical Containment Level 2(PC2) which is only a requirement of the Gene Technology Regulator for GMO work. Where laboratories

are not PC2 standard the Head of School is to ensure that a risk assessment that determines that the additional risk associated with using the organisms in labs that are not PC2, is acceptable in particular instances, has been completed and filed in the School with a copy available in the respective laboratories.

Risk Assessments

Accountable Persons are responsible for ensuring that a risk assessment is conducted for all projects or activities involving microbiological procedures including infectious agents and genetic manipulation as outline in Section 17, 18 & 19 of the *Workplace Health and Safety Regulations 1998*.

Documentation relating to the risk assessment process must be maintained within the School/Section.

Assistance with risk assessments for microbiological hazards including GMOs may be obtained from the Institutional Biosafety Committee.

Health Surveillance

The risk assessment process will identify employees who will require health surveillance.

In general all employees working with human pathogens (Risk Group 3 or 4 microorganisms) should undergo an initial examination, including a baseline serum sample.

Vaccination should be offered to all employees working with agents infectious for humans where specialised medical opinion and evaluation advises it.

Accountable Persons are required to inform all female employees of the risk to the unborn child or the pregnant woman of occupational exposure to certain microorganisms (e.g. *listeria monocytogenes*, *Toxoplasma gondii*). The risk assessment must detail the precise steps required under the circumstances for protection. Medical opinion may be required.

Health surveillance will be coordinated through the OH&S Unit and paid for by the relevant School/Section. Records of health surveillance will be kept for 30 years by the OH&S Unit who will also advise employees of the results of any periodic monitoring.

Emergency Procedures

Procedures must be developed to take into account any unique aspects of teaching or research activity associated with the use of microorganisms or GMOs. Consideration must be given to both the possible health and environmental consequences of a loss of containment including clean up of the laboratory, facilities and equipment.

Accountable Persons are responsible for ensuring that local procedures are consistent with the University of Tasmania's Emergency Procedures. Further advice is available from the Institutional Biosafety Committee.

All employees must be trained in the correct emergency procedures associated with microbiological material. Accountable Persons must maintain records of all training.

Imported Biological Materials

Quarantine permission must be obtained to import biological materials. The Australian Quarantine and Inspection Service (AQIS) requires that all institutions including the University, seeking to import biological materials, obtain a permit for all *in-vitro* work, and *in-vivo* work with laboratory animals. For work involving *in-vivo* use of imported biological materials in non-laboratory animals, an additional permit is required.

Signage
Warning signs in accordance with *AS 1319 Safety signs for the occupational environment* and *AS/NZS 2243.3 Safety in Laboratories Part 3: Microbiological aspects and containment facilities*, that bear the biological hazard symbol, the personal protective equipment requirements and the level of physical containment of the facility or laboratory, must be posted near the entrance to each area involved in the handling of hazardous microorganisms.

Transport
Transportation of biological material includes movement between campuses, and between the laboratory and an off campus location including a field work site, and between (GMO) certified facilities.

Persons who wish to transport microbiological material by road, rail, air or ship or to post microbiological material must comply with:

- The International Air Transportation Association (IATA), *Dangerous Goods Regulations*
- The Australia Post, *Dangerous and Prohibited Goods Packaging Guide*
- *Australian Code for the Transport of Dangerous Goods by Road and Rail*
- Office of the Gene Technology Regulator, *Guidelines on the Transport of GMOs.*

Packaging and shipping documentation must also comply with these requirements.

A summary of biological material packaging instruction classification is provided in *AS/NZS 2243.3 Safety in Laboratories Part 3: Microbiology*. Guidelines and further advice are available from the University Microbiological Safety Officer.

Schools/Sections are required to develop and document procedures for the unpacking of infectious and other biological materials.

Under certain circumstances, the University may be required to notify the Office of the Gene Technology Regulator if transport of a GMO is required. For further information contact the IBC.

Annual Inspections
Accountable Persons are required to arrange for the IBC to undertake an annual inspection of all sites controlled by the University, where authorised dealings with GMOs occurs or where work involves microrganisms of Risk Group 3 or 4.

Accountable Persons responsible for licensed dealings with GMOs (DNIR and DIR) are also required to submit an annual report to the Institutional Biosafety Committee.

The Office of the Gene Technology Regulator may also conduct routine or unannounced inspections of facilities and other aspects of license compliance in relation to work with GMOs.

Records
Copies of all training, monitoring, School/Section specific instruction manuals must kept in the School at all times.

Waste
Laboratory waste shall be collected, segregated and clearly identified as required into the following categories:

- Non infectious waste including waste paper, plastics and paper products
- Sharps including syringes, needles, broken glass and scalpel blades
- Infectious materials including sample remains, used Petri dishes, culture bottles, disposable equipment, used gloves, biological tissue, fluids and infected animal carcasses and bedding
- Co-mingled material including infectious and radioactive waste or infectious and chemical wastes
- Radioactive infectious material.

Waste shall be treated and disposed of in accordance with regulatory requirements.

Induction and Training
All relevant employees must be appropriately inducted, according to the requirements of the Institutional Biosafety Committee, prior to undertaking any activity involving microorganisms.

Security
Access to laboratories shall be limited to laboratory personnel and persons specified by the Accountable Person.

PC3 and PC4 laboratories shall be locked when the room is unoccupied.

Procedures shall be developed to ensure no person enters a PC3 or PC4 laboratory for cleaning, servicing of equipment, repairs or other activities before relevant potentially contaminated laboratory surfaces have been disinfected and authorisation has been obtained from the Accountable Person.

Cleaning of Laboratories and other Facilities
The laboratory's physical containment shall be considered when setting out laboratory cleaning arrangements and services.

Dedicated cleaning equipment shall be provided for PC3 and PC4 laboratories. This equipment shall be stored within the containment facility.

Accountable persons are responsible for developing and implementing cleaning procedures necessary for cleaning microbiological laboratories including cleaning methods and timing of work. Only laboratory staff shall handle infectious waste.

Annual Reporting to the OGTR
The University assisted by the Institutional Biosafety Committee is required to report annually to the Office of the Gene Technology Regulator on a range of matters including:

- Membership of the Institutional Biosafety Committee

- Exempt dealings
- Notifiable low risk dealings
- License dealings with GMOs
- Certified physical containment laboratories and facilities
- Biosafety incidents.

FURTHER INFORMATION

Further information regarding the University of Tasmania's Microbiology Policy and Procedures and copies of forms and guidelines for various activities are available from the Occupational Health and Safety Unit on (03) 6226 7509.

REFERENCES

The following documents have been used in the development of the University of Tasmania's Microbiology Policy and Procedures:

- *Workplace Health and Safety Act 1995*
- *Workplace Health and Safety Regulations 1998*
- *Gene Technology Act 1 July 2007*
- *Gene Technology Regulations 1 July 2007*
- AS/NZS 2243.3-2002 Safety in Laboratories Part 3: Microbiological aspects and containment facilities
- AS 1319 Safety signs for the occupational environment
- Handbook on the Regulation of Gene Technology in Australia

Approved by the OH&S Committee
June 2002

Disclaimer

This Policy/Procedure was designed for use within the University of Tasmania. The University makes no guarantee and assumes no responsibility as to the absolute correctness for all circumstances outside the University of Tasmania environment.

Attachment 1

Secretary
Institutional Biosafety Committee
GPO Box 252-46
Hobart, Tasmania 7001 Australia
Tel: 03 62267509 Fax: 03 62267536

UNIVERSITY OF TASMANIA

INSTITUTIONAL BIOSAFETY COMMITTEE

INVESTIGATION NUMBER
TITLE of proposed investigation

Contact details for chief investigator: Name		
Phone	Fax	Email

DECLARATIONS

Statement of scientific merit

The *Head of School** is required to sign the following statement:
This proposal has been considered and is sound with regard to its merit and methodology.

(Name of Head of School) (Signature) (Date)

* In some schools the signature of the Head of Discipline may be more appropriate.

- The certification of scientific merit may not be given by an investigator on the project.

Conformity with Gene Technology Regulations (GTR available at www.ogtr.com.au)

The *chief investigator* is required to sign the following statement:
I have read and understood the Gene Technology Regulations. I accept that I, as chief investigator, am responsible for ensuring that the investigation proposed in this form is conducted fully within the Regulations and any other conditions specified by the Office of Gene Technology Regulator.

(Name of chief investigator) (Signature) (Date)

Signatures of other investigators

(Name) (Signature) (Date)

HAZARD IDENTIFICATION AND RISK CONTROL GUIDELINES Attachment 2

The information detailed below may be used in the risk assessment process. It is not an exhaustive list and may need to be customised for individual circumstances. However, it does provide an example of biological hazards and their control. It can be attached to the Risk Assessment (RA) at the attachment section on the RA. The information has been sourced from the following:

References:

www.adm.monash.edu.au/ohse/
www.acue.adelaide/edu/au/hr/policies/ohs/
www.latrobe.edu.au/ohs/
http://www.utas.edu.au/chemistry

Biological Hazards - Microbiological Exposure Hazards

Identification

Do you have any of the following hazards when working with either microrganisms (Risk Group 2, 3 or 4) or human blood and bodily fluids?

B1. Undertake procedures or activities that could result in spills or splashes of liquids containing the microrganisms or human blood and bodily fluids.

B2. Perform procedures or use equipment that produce aerosols.

B3. Use any sharps that are brought into direct contact with either microrganisms or human blood and bodily fluids?

B4. Perform procedures that could result in exposure to fungal spores or mycotoxins -i.e. anything from examining agar plates to working with composts)

Assessment

		Likelihood				
	Consequence	**L1 Highly Likely**	**L2 Likely**	**L3 Occasionally**	**L4 Unlikely**	**L5 Highly Unlikely**
Death or an infection that is likely to significantly shorten life span or lead to total incapacitation	**C1. Major**	Extreme	Extreme	Extreme	High	Medium
Severe infection or disease that has permanent health implications that significantly alter lifestyle.	**C2. Severe**	Extreme	High	High	Medium	Medium
Infection or disease that results in medical treatment but does not have permanent health implications.	**C3. Moderate**	High	High	Medium	Medium	Low
Minor infection.	**C4. Minor**	Medium	Medium	Low	Low	Low
Negligible infection.	**C5. Negligible**	Low	Low	Low	Low	Low

Controls

Risk controls are actions taken to control risks to the health and safety of staff and students. The primary duty is to eliminate any risk to health arising from the use of a microbiological hazard. Where elimination of risk is not practical, you must reduce the risk as far as practicable. **Risk control** measures for hazards associated with microbiological hazards should be considered in the following priority order:

Priority One –Elimination

Eliminating the risk by eliminating the use of the microbiological hazard that creates the risk is the most effective way of protecting the health of staff and students. When considering the possibility of eliminating a microbiological hazard you need to begin by answering questions like:

- Why is this microbiological material used?
- Why is it necessary to carry out this function?
- How could this function be achieved by doing things differently?

Examples of elimination are: Use of an avirulent mutant.

Don't use the biological hazard. Don't use the process.

Priority Two – Substitution/Reduction

Substitute the microbiological hazard for a less hazardous form. Use less of the microbiological hazard.

Examples of substitution are:

- Using a risk group 1 rather than a risk group 2 organism.
- Use screened sources of human blood rather than unscreened sources of human blood.

Find a less hazardous microorganism or find a better way to perform the process.

Priority Three – Isolation

Isolation involves separating people from the microbiological hazard by distance or barriers to prevent or reduce exposure. Barriers may take the form of a totally closed system or process, an enclosure with exhaust extraction or an isolated / restricted access room.

Keep it away from you.

Priority Four - Engineering Controls

Engineering controls are physical controls (such as equipment) that eliminate or reduce the generation of airborne biological hazards, suppress or contain the potential for airborne biological hazards or limit the area of contamination in the event of spills or leaks. Engineering controls often entail partial enclosure, exhaust ventilation or automation.

Engineer a better way.

Priority Five - Procedures and Training

Systems of work or safe work procedures can often help to reduce exposure to microbiological hazards.

Examples include:

- Performing the task out of normal hours or restricting access to a certain area.
- Reducing the duration or frequency staff or students perform a specific task.
- Good housekeeping.
- Cleaning up spills immediately

Priority Six – Personal Protective Equipment (PPE)

PPE includes overalls, aprons, footwear, gloves, safety glasses, face shields and respirators. PPE can often be used in combination with other risk controls to further reduce exposures to

microbiological hazards. However if they are used as the only control measure they should be generally regarded as a short-term solution or a last resort. Staff and students must be trained in correct fit use and maintenance of the PPE. In addition, you should make sure that the equipment is the right one for the job and readily available.

Biological Hazards – Macroscopic (Animal / Insects / Plants)

Identification

Do you have any of the following hazards when working with animals, plants or insects?

B5. Direct contact with a live animal, plant or insect that is capable of inflicting physical damage.

B6. Routine handling of large numbers of animals, plants or insects that shed allergenic material known to cause sensitisation (e.g. grasshopper colonies).

B7. Contact with an animal, plant or insect that is capable of causing poisoning or a toxic reaction.

B8 Contact with an animal, plant or insect, or parts thereof, that may harbour microrganisms that could result in zoonotic infections.

Assessment

		Likelihood				
	Consequence	**L1 Highly Likely**	**L2 Likely**	**L3 Occasionally**	**L4 Unlikely**	**L5 Highly Unlikely**
Death or an injury, infection or allergy that is likely to significantly shorten life span or lead to total incapacitation	**C1. Major**	Extreme	Extreme	Extreme	High	Medium
Severe injury, infection or allergy that permanently significantly alters lifestyle.	**C2. Severe**	Extreme	High	High	Medium	Medium
Injury or infection that results in medical treatment; Allergy that does not significantly affect lifestyle.	**C3. Moderate**	High	High	Medium	Medium	Medium
First aid treatment, minor injury, minor infection.	**C4. Minor**	High	Medium	Medium	Low	Low
Bruising or short term discomfort.	**C5. Negligible**	Medium	Medium	Low	Low	Low

Controls

Risk controls are actions taken to control risks to the health and safety of staff and students. The primary duty is to eliminate any risk to health arising during work with animals or insects. Where elimination of risk is not practical, you must reduce the risk as far as practicable. **Risk control** measures for hazards associated with working with animals or insects should be considered in the following priority order:

Priority One –Elimination

Eliminating the risk by eliminating the use of the animal or insect that creates the risk is the most effective way of protecting the health of staff and students. When considering the possibility of eliminating an animal or insect from your protocol you need to begin by answering questions like:

- Why is this biological system (e.g. animal or insect) used? (What is its purpose or function in the process?)
- Why is it necessary to carry out this function?
- How could this function be achieved by doing things differently?

Don't use the biological hazard. Don't use the process.

Priority Two – Substitution/Reduction

Substitute the animal or insect that creates the risk for a less hazardous form.

Find a less hazardous animal or insect or find a better way to perform the process.

Priority Three – Isolation

Isolation involves separating people from the animal or insect that creates the risk by distance or barriers to prevent or reduce exposure. Barriers may take the form of a totally closed system or process, an enclosure with exhaust extraction or an isolated / restricted access room.

Keep it away from you.

Priority Four - Engineering Controls

Engineering controls are physical controls (such as equipment) that eliminate or reduce the generation of airborne biological hazards, suppress or contain the potential for airborne biological hazards or control the animal that is the potential source of injury. Engineering controls often entail partial enclosure, exhaust ventilation or automation.

Engineer a better way.

e.g. Local exhaust ventilation for high exposure activities such as cage washing.

A cow crush is an example of a remote handling device to minimize the potential for physical injury.

Priority Five - Procedures and Training

Systems of work or safe work procedures can help to reduce exposure to animal or insect that creates the risk, like:

- Reducing the duration or frequency staff or students perform a specific task.
- Good housekeeping.

Priority Six – Personal Protective Equipment (PPE)

PPE includes overalls, aprons, footwear, gloves, safety glasses, face shields and respirators. PPE can often be used in combination with other risk controls to further reduce exposures to airborne allergens or to reduce the potential for direct harm due to bites, skin contact etc . However if PPE is used as the only control measure they should be generally regarded as a short-term solution or a last resort. Staff and students must be trained in correct fit use and maintenance of the PPE. In addition, you should make sure that the equipment is the right one for the job and readily available.