Moreton Bay Research Station (MBRS)
Air Quality Program

1. Scope

The Air Quality Program covers the air emissions throughout the University, including:

- Emissions from fume cupboards and scrubbers;
- CFC Management for cooling systems; and
- Emissions of an odorous nature.

This program **excludes** the following:

- Indoor air quality;
- Emissions from vehicles; and
- Air quality issues covered under the Workplace Health and Safety Act (1995).

2. Objectives

- Ensure that all relevant licences, permits and approval for air emissions are in place;
- Set procedures in line with the University of Queensland Environmental Policy in order to provide the University of Queensland's "Best Environmental Practices" for air quality and controlled substances (e.g. CFCs and Halons); and
- Determine the University of Queensland's environmental performance through air quality auditing and monitoring of emissions and comparing against current environmental legislation, guidelines and standards.

3. Procedures

3.1 Stationary Emission Sources

The Moreton Bay Research Station operates 2 fume cupboards in the laboratory area. Both units exhaust to the atmosphere via roof top stacks. Exhaust is passed through a scrubber before discharge.

3.1.1 Standards

The following lists the adopted standards to lessen the effect of the emission from the fume cupboard exhausts.

No emission levels have been regulated for the use of fume cupboards. Therefore, the standard adopted is to ensure that any emissions from fume cupboards are below accepted background concentrations. Table 1 lists these background concentrations and are adopted from the air quality guides in the *Environmental Protection (Air) Policy (1997)* or 1/30th of the TWA levels for occupational exposure from the *National Occupational Health and Safety Council*.

Table 1. Adopted Standards for Various Emissions

Parameter	Concentration mg/m3 (ppm)	Time Weighted Average	Standard Source
Acetone	39.5 (16.7)	8 hrs	NOHSC
Acetonitrile	2.2 (1.3)	8	NOHSC
Benzene	0.5 (0.1)	8	NOHSC
2-Butanone	14.8 (5)	8	NOHSC
Dichloromethane	3 (0.8)	24hrs	EPP
Ethyl Ether	40.3 (13.3)	8	NOHSC
Ethanol	62.7 (33.3)	8	NOHSC
Formaldehyde	100 (0.07)	30 mins	EPP
Hexane	58.3 (16.7)	8	NOHSC
Isobutanol	5.0 (1.6)	8	NOHSC
Methanol	8.7 (6.6)	8	NOHSC
Pentane	59 (20)	8	NOHSC
Tert-butanol	10.1 (3.3)	8	NOHSC
Triethylamine	0.4 (0.1)	8	NOHSC

3.1.2 Fume Cupboard Management

Scrubbers
Fume cupboard exhausts are scrubbed before discharge to atmosphere. Scrubbers shall be maintained in good working order and fume cupboards are not to be used if scrubbers are inoperable.

Exhaust Stack heights
All fume cupboard exhaust stacks must be a minimum of 3m above any roof penetration or access walkway (AS2243.8-2001). Optimally, all stacks should exhaust 3m above the highest access point or roofline within a 20m radius of the exhaust stack.

3.2 Refrigerants

3.2.1 Refrigerant Management

Refrigerants used on site shall be selected as to minimise potential impact on the environment (i.e. ozone depletion and greenhouse warming). CFC Refrigerants (particularly CFC-11 and CFC-12) shall not be used on site. The following measures shall be taken to address this issue:

- All new plant installed shall use at least HCFC (i.e. R22) as refrigerant. Other refrigerants with lesser ozone-depleting and/or greenhouse capacity may be substituted.
- Existing plant currently operating on CFCs shall be refitted and the refrigerant changed to meet the requirement of the above point when regassing is required.
- No plant operating on CFCs shall be 'topped up' if refrigerant losses have occurred. The plant should be regassed in line with dot points above.

When meeting the requirements of the above, or in general maintenance, no refrigerants are to be released to the atmosphere (as per *Environmental Protection Act (1994)*).

4. Odour

Odour is only likely from the site if an 'off design' event occurs. These are addressed in the contingency schedule.

5. Auditing and Monitoring

5.1 Auditing

Auditing of air emissions will be performed randomly and reactionary.

Scheduled audits are determined annually by randomly selecting a number of stationary emission sources from all University sites and campuses. The scheduled audits are listed on the auditing schedule held by the Environmental Services, Property and Facilities Division. Audits may also be undertaken on a reactionary basis in response to a complaint, issue or failure of the system.

Audits will at least be performed in accordance with the University of Queensland auditing manual. Where scrubbers and other emission control devices are fitted, audits should also determine the effectiveness of all control measures in place.

5.1.1 Air Dispersion Modelling

From the results of auditing, air dispersion modelling may be performed. Air dispersion modelling will be performed used a Guassian dispersion model. Modelling results shall indicate ground concentration at sensitive receptors.

When performing modelling, the use for the results is to be determined and the applicability of the model confirmed. Modelling should be performed in accordance with any regulations and within the limitations of the model (refer to manual).

5.2 Monitoring

Monitoring programs will be undertaken when required and are subject to the results and recommendation from air quality audit reports.

Air monitoring programs will be established at the Environmental Engineer, Property and Facilities discretion.

6. Responsibilities

Responsibilities for air emissions lie with various people in the University. Table 2 outlines these responsibilities.

Table 2. Responsibilities

Responsible Person	Duties
Users (students, researchers, staff, etc)	• Ensure awareness and understanding of the air emission control procedures. • Ensure hazardous materials are handled in the fume cupboards. • Attend environmental and occupational health and safety management training seminars.
Manager, Moreton Bay Research Station.	• Ensure that all users are aware of air management procedures, including the provision of environmental management training. • Ensure the air quality management is carried out according the management plan. • Assist in the review of the air quality management plan as required.
Property and Facilities Division	• Liaise with the Manager, Moreton Bay Research Station to ensure application of the air management plan. • Provide facilities to collect and phase out CFCs. • Ensure efficient operation of fume cupboards. • To provide technical and environmental advice on the management of air quality issues.

7. Records

All documents issued regarding air quality and emissions are to be held by the Property and Facilities Division and/or the Manager, Moreton Bay Research Station as applicable. The term documents, for the purpose of the Air Quality Program refers to:

- Operational procedures;
- Checklists;
- Reports;
- Notes/Memoranda;
- Letters; and
- Invoices.

8. Training

It is the responsibility of the Manager, Moreton Bay Research Station to ensure that their personnel are adequately trained in environmental management issues.

Refer to the "Environmental Training Program" for further information.

9. Budget

It is the responsibility of the Directors of the Property and Facilities Division and Centre for Marine Studies to allocate the necessary resources to the Air Quality Program on a yearly basis for their areas of responsibility.

10. Contacts

If further information is required regarding air quality management, please refer to Table 3:

Table 3. Enquiries at The University of Queensland.

Subject	Contact	Person	Telephone
Fume cupboards	Property and Facilities Division Works Control Centre	Customer Service Clerk	(07) 336 **52222**

11. Definitions

11.1 CFC

CFC means a chlorofluorocarbon and includes all isomers of a chlorofluorocarbon.

11.2 Sensitive Receptor

A sensitive receptor is a fixed location such as a house, building, other premises or open area where health or property is affected emissions that increase the concentration of the emitted parameter above background levels.

11.3 Time Weighted Average (TWA)

Time Weighted Average is the average concentration of a chemical observed over a period of 8 hours which represents the typical exposure over a working day.

12. References

- Environmental Protection Act 1994
- Environmental Protection Regulations 1998
- Environmental Protection (Air) Policy 1997
- Exposure Standards for Atmospheric Contaminants in the Occupational Environment 1997
- AS2243.8 - 2001 Safety in Laboratories. Part 8: Fume cupboards
- Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 and Regulation 1995
  Ozone Protection and Synthetic Greenhouse Legislation Amendment Bill 2003