University of Rochester Environmental Health & Safety
Indoor Air Quality Program
March 23, 2005

1. **Purpose:** The purpose of this program is to inform the University community about indoor air quality (IAQ).

2. **Scope:** University wide. The University recognizes the impact that indoor air quality has in the workplace. In an effort to provide the University Community with the optimum level of indoor air quality, Environmental Health and Safety has developed an indoor air quality program. Symptoms arising from poor indoor air quality often mimic those symptoms commonly associated with a cold, flu or allergies. These symptoms may include upper respiratory irritation, congestion, headaches, nausea, fatigue and itchy or watery eyes. Through our indoor air quality program of occupant interviews, building inspection and air quality testing, Environmental Health and Safety is often able to determine the cause of indoor air quality problems.

The objectives of this program include the following:
- To prevent illness and adverse health symptoms associated with poor indoor air quality
- To respond to indoor quality complaints effectively and to make recommendations for improvement;
- To maintain indoor air quality within acceptable levels according to consensus guidelines.

**References:**
(a) ASH RAE, American Society of Heating and Air Conditioning Engineers, as presented in standard 62-1989.
(b) General Duty Clause of the aSH Act of 1970, section No.5

3. **Definitions:**

*Building Material Contamination:* Building components treated with a variety of chemicals and preservatives are common sources of indoor air quality problems. Glues and adhesives from new carpet and formaldehyde from new particleboard and upholstery may off gas and become sources of contamination.

*Carbon Dioxide:* Carbon dioxide (CO₂), a major product of human respiration, is used as an indicator to evaluate the performance of ventilation systems. Ordinary outside air in urban areas normally contain about 350 to 500 parts per million (ppm). ASHRAE standard 62-1989 (Ventilation for Acceptable Indoor Air Quality) recommends that CO₂ levels be maintained below 1,000 ppm.

*Contamination From Inside the Building:* Contaminants commonly found inside the building include:
- Ozone from copiers
- Cleaning agents
- New furniture and carpets
- Sewer gas from dry traps
- Appliances not properly maintained
- Pesticides
- Cosmetics
- Humidification devices
Contamination From Outside the Building: Contamination commonly found outside of buildings include:
- Exhaust from motor vehicles
- Fumes from construction or renovation activities

Inadequate Ventilation: Inadequate ventilation occurs when an insufficient amount of fresh outside air is supplied to the interior environment.

Microbial Contamination: Microbial Contamination occurs in buildings that are susceptible to water leaks and other sources of moisture. Contaminants can also be introduced into buildings from stagnant water in HVAC air distribution systems and cooling towers. In general, prevention of microbiological contamination is accomplished by eliminating standing water and other sources of moisture (Mold and Water-Damaged Building Materials Management Policy).

Relative Humidity: Relative humidity levels can affect the release rate of many indoor contaminants, their concentrations in the air, and the potential growth of microbial organisms. Humidity can also have a direct effect on worker comfort. In ASHRAE 55-1981, a "comfort chart" shows an acceptable range of humidity to be from 20 to 60%.

Temperature: Temperature ranges of 73 degrees F to 79 degrees F during the winter months, and 69 to 75 during the summer months are recommended by ASHRAE. These guidelines are intended to achieve thermal conditions in a given environment that at least 80% of persons who occupy that environment will find it acceptable or "comfortable".


5. Responsibilities: Environmental Health and Safety investigates indoor air quality complaints and distributes written final reports to affected parties.

6. Procedures:

IAQ Investigation:

Phase I Assessment
The first step in a typical IAQ investigation is a Phase I or preliminary assessment. Phase I assessments include interviewing occupants using an employee questionnaire and occupant diary (see appendix) and performing a walk-through inspection of the building or area of complaint. The questionnaire is used to obtain information about the nature of the employee complaints and symptoms and also to determine the magnitude of the problem.

During the walk-through, building ventilation systems are evaluated and potential sources of contamination are identified. If the immediate cause or source cannot be found, a Phase II assessment is required.

Phase II Assessment
During a Phase II assessment, common indoor air quality parameters including temperature, relative humidity, and carbon dioxide levels are measured. The most commonly cited quantitative measurements of indoor air quality are provided by ASH RAЕ, American Society of Heating and Air Conditioning Engineers, as presented in standard 62-1989.
Phase III Assessment
A Phase III Assessment is performed when a definitive cause for the symptoms cannot be determined during the Phase II Assessment of the investigation. Phase III Assessments consists of extensive and more specific monitoring and sampling for chemical and/or microbial contaminants. Environmental Health and Safety often contracts Phase III Assessments to Professional Indoor Air Consultants. In our final report for a Phase III investigation, our office will typically recommend that the occupant seek the services of an occupational health physician.

7. Website Address for this Policy:
www.safety.rochester.edu/ih/iaq/iaqpolicy.html

8. Appendices:
I. Occupant Interview
II. Occupant Diary

9. Document Revision History:

<table>
<thead>
<tr>
<th>Revision Number</th>
<th>Date</th>
<th>Description of Revision</th>
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<td></td>
<td>2011</td>
<td>Reviewed - no changes</td>
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Appendix I  OCCUPANT INTERVIEW

Location:

Occupant name:

Date:

SYMPTOM PATTERNS

What kind of symptoms or discomfort are you experiencing?

Are you aware of other people with similar symptoms or concerns? Yes    No

If so, what are their names and locations?

Do you have any health conditions that make you particularly susceptible to environmental problems?

   Wear contact lenses?
   Allergies?
   Chronic respiratory problems?
   Immune system suppressed?

TIMING PATTERNS

When did your symptoms start?

Do they go away? If so, when?

Have you noticed any other events (such as weather events, temperature or humidity changes, or activities in the building) that tend to occur around the same time as your symptoms?

SPATIAL PATTERNS

Where are you when you experience symptoms or discomfort?

Where do you spend most of your time in the building/office/lab?
ADDITIONAL INFORMATION

Do you have any observation about building conditions that might need attention or might help explain your symptoms (e.g., temperature, humidity, drafts, stagnant air, odors)?

Have you sought medical attention for your symptoms?

Do you have any other comments?
Appendix II
OCCUPANT DIARY

Occupant Name:

Location:

Date:

On the form below, please record each occasion when you experience a symptom of ill health or discomfort that you think may be linked to an environmental condition in this location.

It is important that you record the time and date and your location within the building as accurately as possible, this will help to identify conditions (e.g., equipment operation) that may be associated with your problem. Also, please try to describe the severity of your symptoms (e.g., mild, severe) and the duration. Any other observations that you think may help in identifying the cause of the problem should be noted in the "comments" column. Feel free to attach additional pages or use more than one line for each event if you need more room to record your observations.

<table>
<thead>
<tr>
<th>Time / Date</th>
<th>Location</th>
<th>Symptom</th>
<th>Severity/Duration</th>
<th>Comments</th>
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