

# UNCG INDOOR AIR QUALITY INFORMATION AND ASSISTANCE

## **Purpose**

The purpose of this program is to inform the University community about indoor air quality (IAQ) and act as a first point of contact for building occupants that suspect there may be indoor air quality issues where they work.

## **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, the office of 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, the Office of 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.

## 1. DEFINITIONS:

### **Chemical Contamination**

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

### **Carbon Dioxide**

Carbon Dioxide (CO<sub>2</sub>), 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 contains about 350 to 500 parts per million (ppm) of CO<sub>2</sub>. ASHRAE standard 62-1989 (Ventilation for Acceptable Indoor Air Quality) recommends that CO<sub>2</sub> levels be maintained below 1,000 ppm.

### **Contamination From Inside the Building:**

- Ozone from copiers
- Cleaning agents
- New furniture and carpets (formaldehyde)
- Sewer gas from dry traps
- Appliances not properly maintained
- Pesticides
- Cosmetics
- Humidification devices

### **Contamination From Outside the Building:**

- 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. Typically reservoirs (water sources) need to be present to sustain mold growth in indoor environments. Eliminating the source of water and removal of contaminated building materials will correct the microbial contamination issues.

### **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%. The recommended humidity levels will vary depending on the temperature in the environment.

### **Temperature**

Office temperature ranges recommended by ASHRAE 55 "Thermal Environmental Conditions for Human Occupancy" are within the range of 67 to 82 degrees F. In keeping with the ASHRAE

standards, UNCG Facilities Operations Standards of Comfort Policy requires that thermostats will be set at 69-71 degrees F in the winter months and 74-78 degrees F in the summer months. 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. Due to the variation in metabolic rates, clothing choices and personal preference, not all building occupants will feel comfortable at all times in the temperature ranges that are specified by ASHRAE. The goal is to make a majority or as many occupants as possible comfortable and productive in the work environment.

## 2. RESPONSIBILITIES:

When deemed necessary, the Office of Safety investigates indoor air quality complaints and coordinates corrective actions with Facilities Operations.

## 3. 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 may be conducted.

### **Phase II Assessment**

During a Phase II assessment, common indoor air quality parameters including temperature, relative humidity, carbon dioxide levels and carbon monoxide levels are measured. Additional HVAC evaluations may be conducted such as air flow patterns, outside air intake measurements, and in-depth analysis of HVAC maintenance practices. The most commonly cited quantitative measurements of indoor air quality are provided by **ASHRAE, American Society of Heating and Air Conditioning Engineers**, as presented in standard 62-1989.

### **Phase III Assessment**

A Phase III Assessment is performed when evidence of potential air quality problems have been identified, but a definitive cause for the symptoms was not determined during Phase I or II Assessments. Phase III Assessments consist of more in-depth evaluation of the indoor environment, which may include sampling for chemical and/or microbial contaminants. The current consensus in the industrial hygiene and safety field is that air sampling and surface sampling in the indoor environment only has limited usefulness. The information obtained from conducting sampling for indoor air contaminants can be misleading and further complicate the indoor air quality investigation process. The Office of Safety will determine if air and surface sampling is warranted and what type will be conducted during a Phase III Assessment.

## 4. APPENDIX:

- I. Occupant Interview Form
- II. Occupant Diary

## 5. CONSENSUS STANDARDS & REFERENCES:

- (a) ASHRAE, American Society of Heating and Air Conditioning Engineers, as presented in standard 62-1989.