

## Sources outside a building

### Contaminated outdoor air

- pollen, dust, fungal spores
- industrial pollutants

### Emissions from nearby sources

- loading docks
- odors from dumpsters
- exhaust from vehicles on nearby roads, in parking lots or garages
- re-entrained (drawn back into building) exhaust from the building itself or from neighboring buildings
- unsanitary debris near the outdoor air intake

### Soil gas

- leakage from underground fuel tanks
- radon
- contaminants from previous site uses
- pesticides

### Moisture or standing water promoting excess microbial growth

- rooftops after rainfall
- crawlspaces

## Equipment

### HVAC system

- dust or dirt in ductwork or other components
- refrigerant leaks
- microbiological growth in drip pans, humidifiers, ductwork, coils
- improper use of biocides, sealants and/or cleaning compounds

### Non-HVAC equipment

- emissions from office equipment such as copiers, printers (volatile organic compounds, ozone)
- supplies (solvents, toners, ammonia)
- emissions from shops, labs, cleaning processes
- elevator motors and other mechanical systems

## Human activities

### Personal activities

- smoking
- body odor
- cooking
- cosmetic odors

### Housekeeping activities

- cleaning materials and procedures
- emissions from stored supplies or trash
- use of deodorizers and fragrances
- dust or dirt circulated by sweeping and vacuuming

### Maintenance activities

- microorganisms in mist from
- airborne dust or dirt improperly maintained cooling towers
- pesticides from pest control activities
- volatile organic compounds (VOC's)
- emissions from stored supplies from use of paint, caulk, adhesives and other products

## Building components and furnishings

### Locations that produce or collect dust or fibers

- textured surfaces such as carpeting, curtains, other textiles
- open shelving
- old or deteriorated furnishings
- materials containing damaged asbestos

### Unsanitary conditions and water damage

- microbiological growth on or in soiled or water-damaged furnishings
- microbiological growth in areas of surface condensation

- standing water from clogged or poorly designed drains
- dry traps that allow the passage of sewer gas

### Chemicals released from building components or furnishings

- volatile organic compounds
- inorganic compounds

## Other sources

### Accidental events

- spills of water or other liquids
- microbiological growth due to flooding or to leaks from roofs, piping
- fire damage (soot, PCBs from electrical equipment, odors)

### Special use areas and mixed use buildings

- smoking lounges
- laboratories
- print shops, art rooms
- exercise rooms
- beauty salons
- food preparation areas

### Redecorating/remodeling/repair activities

- dust and fibers from demolition
- emissions from new furnishings
- odors and volatile organic and inorganic compounds from paint, caulk, adhesives
- microbiologicals released from demolition or remodeling activities

**Source: U.S. EPA, *Building Air Quality – A Guide for Building Owners & Facility Managers* (December 1991)**