

Appendix A

Indoor Air Quality Concern Form

Occupant Interview

Building Name: _____ **File Number:** _____
Address: _____
Occupant Name: _____ **Work Location:** _____
Completed by: _____ **Title:** _____ **Date:** _____

Section 4 discusses collecting and interpreting information from occupants.

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 may make you particularly susceptible to environmental problems?

- | | | |
|---|---|--|
| <input type="checkbox"/> contact lenses | <input type="checkbox"/> chronic cardiovascular disease | <input type="checkbox"/> undergoing chemotherapy or radiation therapy |
| <input type="checkbox"/> allergies | <input type="checkbox"/> chronic respiratory disease | <input type="checkbox"/> immune system suppressed by disease or other causes |
| | <input type="checkbox"/> chronic neurological problems | |

TIMING PATTERNS

When did your symptoms start?

When are they generally worst?

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?

IAQ Concern

The purpose of this form is to gather information to help us resolve the indoor air quality concerns. Therefore, any information you can provide will be appreciated.

Name: _____ Position: _____ Date: _____

Approximate location on floor: _____

I. Background Information

Question	Response
How long have you been in the building?	
How long have you been in your present location in the building?	
Have you experienced any physical discomfort or symptoms relating to indoor air quality? If yes, please describe type of symptoms.	
When did symptoms start?	
What time of day or week are you experiencing symptoms?	
How long do symptoms last?	
Are symptoms experienced apart from this work location? If yes, when and where?	
Is an odor coinciding with your symptoms? If yes, describe odor.	
Have these symptoms ever been experienced at another work location? If yes, please describe.	

Additional comments: _____

Appendix B

Internal Indoor Air Quality Investigation Form

Internal Indoor Air Quality Investigation Form

I. Investigator Information

Name:	Date:	Time:
Room #/Area:	# of Students in Room/Area:	

II. Complaint Data

Name:	Date of Complaint:	Time:
Room #/Area:	Building Name:	
Health symptoms associated with complaint: _____		
Other concerns, i.e. odor, moisture, airflow, cleaning, etc.: _____		
Other comments: _____		

III. Investigation Checklist

Air Handling Unit

- Air Handling Unit On: Yes No
- Air Flowing from Vents: Yes No
- Exhaust Operational: Yes No
- Thermostat Properly Set: Yes No
- Other Problems Noted: _____ Yes No

Comments/Actions Taken

Air Filters

- Filters in Place/Functional Yes No
- Magnahelic Reading (inches H₂O): Yes No

Moisture

- Any Present Signs of Moisture: Yes No
- Any Previous Moisture Concerns: Yes No
- Any Signs of Biological Growth: Yes No
- Any Odors? Yes No

Other Sources

- Any Recent Renovation in Area: Yes No
- Is it Overly Dusty/Unclean: Yes No
- Are Chemicals Stored in Room: Yes No
- Any Pesticides Applied in Area Recently: Yes No
- Any Tunnel Systems: Yes No

IV. Test Data

AHU #:		VAV/Zone #:	
Room Temp. (°F):		Room Relative Humidity (%):	
Stat Setting (°F):			
Total Airflow in Room:			
Max.:	Max.:	Max.:	Max.:
Min.:	Min.:	Min.:	Min.:
Total Airflow in Room:		CO (ppm):	
Max.:			
Min.:			
Room CO₂ (ppm):		Design Capacity:	
Mixed Air/Supply Air CO₂ (ppm):		Balance Report:	
Return Air CO₂ (ppm):		Max.:	
Disc. Temp. (°F):		Min.:	
Conv. Temp. (°F):			
Outside Air Temp. (°F):			

V. Test Data Results

Total Airflow (CFM):	Outdoor Air CFM/Person:
Max.:	Max.:
Min.:	Min.:

VI. Immediate Corrective Action(s) Taken

<hr/> <hr/> <hr/>

VII. Additional Corrective Action(s) Required by Outside Contractors

Include P.O. #'s and date completed.

<hr/> <hr/> <hr/>

VIII. Additional Comments

<hr/> <hr/> <hr/>

Copy completed form to Building Administration & Director of Buildings and Grounds.

Appendix C

Indoor Air Quality Recorded Upgrades

Mounds View Public Schools

Indoor Air Quality Recorded Upgrades

School:	Copied To: <input type="checkbox"/> Principal/School Administrator <input type="checkbox"/> Director of Buildings & Grounds <input type="checkbox"/> Other: _____
Date:	
Completed By:	

Please check the appropriate items that have been completed or are in progress. This form must be completed annually until all items on this checklist have been implemented.

Task	Completed	Completion Date	Completed By
Installation of inspection doors on ductwork.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In Progress <input type="checkbox"/> Not Required		
Upgrade filters to higher efficiency, if achievable.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In Progress <input type="checkbox"/> Not Required		
Increase run time of HVAC system an additional two (2) hours before/after occupancy.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In Progress <input type="checkbox"/> Not Required		
Install appropriate dirt and moisture mats at entrances.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In Progress <input type="checkbox"/> Not Required		
Upgrade vacuum bags to higher efficiency.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In Progress <input type="checkbox"/> Not Required		

Appendix D

Indoor Air Quality Operation/Maintenance Checklist

Mounds View Public Schools

Indoor Air Quality Operation/Maintenance Checklist

School:	Copied To: <input type="checkbox"/> Principal/School Administrator <input type="checkbox"/> Director of Buildings & Grounds <input type="checkbox"/> Other: _____
Date:	
Completed By:	

The following tasks need to be performed on a regular basis, and recorded to ensure optimum indoor air quality. Any problems identified should be immediately relayed to the Principal/School Administrator.

Task	Condition	Condition Resolved
I. Outdoor Air Intake	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
▪ Inspect intake for blockage (unit ventilators monthly, others semi-annually)		
▪ Verify O/A damper operation (semi-annually)	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
▪ Ensure damper does not close completely (semi-annually)	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
▪ Check controls' calibration (semi-annually)	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
II. Exhaust Air	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
▪ Check exhaust operation (quarterly)		
▪ Check belt tension on all fan motors (annually)	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
III. Duct Work	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
▪ Inspect duct work (annually)		
IV. Air Handling Unit	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
▪ Inspect duct work (annually)		
▪ Heating/cooling coils inspection (annually)	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____
▪ Fan inspection (annually)	<input type="checkbox"/> O.K. <input type="checkbox"/> Requires Cleaning Comment: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No Comment: _____

Appendix E

Indoor Air Quality A Common Sense Guide to Communication

Indoor Air Quality

A Common Sense Guide to Communication



Developed by:

Institute for Environmental Assessment
9201 West Broadway, #600
Brooklyn Park, MN 55445
(763) 315-7900 ☎ (800) 233-9513



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Appendices:

- A. About the Institute for Environmental Assessment (IEA)
- B. You can Help Prevent Air Quality Problems in Your School
- C-1. Glossary of General Terms
- C-2. Common Medical Terms Associated with Indoor Air Quality
- D. U.S. Government Agencies & Professional Organizations Associated with Indoor Air Quality Issues
- E. Suggestions for Answering Common Questions

Section 1:

Indoor air quality is a critical issue for educators

Educators have long known that a school in which students and staff feel safe and comfortable is a school in which students can learn. In recent years, the public has equated safety in school largely with the absence of guns, knives and illegal drugs. But today, the public is becoming increasingly concerned about other more subtle – and perhaps more basic – factors that must be considered in order to create a safe environment for learning. The quality of air in schools is one of those factors. And, it is one that is now receiving a great deal of attention. Reports on television and in the national press have raised concerns about air quality in schools, as well as in factories and office buildings. In fact, the term “sick building” is often heard in everyday conversation.

Parents concerned about the health of their children can often become emotional – especially when they are faced with seemingly mysterious hazards posed by pollutants in indoor air. Several students with unexplained headaches, wheezing or sore throats may prompt parents and teachers to jump to the conclusion that air quality in the school must be the source of the problem. Staff members worry when a couple of their colleagues become seriously ill. They ask each other, “could it be the air in our school? After all, didn’t we read about indoor air quality problems in the paper just a few weeks ago?” Rumors and half truths spread. Before long, justified or not, the school has a major problem. It **may** have an indoor air quality problem, but it most **definitely has** a public relations problem. Unless it is handled quickly, the trust between parents and the school, between staff and the administration is damaged. Regaining that trust is very difficult, and in some cases, may seem impossible.

This is just one reason why schools need to take a proactive approach to dealing with indoor air quality issues **and** to communicating openly and honestly about them with the public.

This guide is intended to assist you in communicating about indoor air quality. It will help you learn what to communicate, when, and with whom. It will give you advice in how to communicate with the media and tips on how to communicate in a crisis. It will answer some of the most commonly answered questions about indoor air quality, and it will provide a number of background resources to help you understand indoor air quality issues so that you can respond knowledgeably to questions from staff, parents, the media and the general public.

Indoor air quality must become a priority

When looking at the issues school administrators face on a daily basis – test scores, budget shortfalls, personnel issues, curriculum challenges, and discipline problems, to name just a few – indoor air quality may seem like a low priority. Until it becomes a problem. Then it moves to the top of the priority list in a hurry.

Putting indoor air quality issues near the top of your priority list before problems develop will save a lot of time, effort and money in the long run. It may also protect the reputation of your school or your school district and maintain the positive trust relationship you have with staff and parents. You can’t put a price tag on that.

But indoor air quality is an important issue for educators to consider for other reasons.

First of all, taking indoor air quality seriously is simply the right thing to do. Health and welfare of students and staff must be your primary concern. If indoor air quality problems in your building are indeed affecting individuals, they must be identified and remedied to the extent possible. And even if there have been no complaints or suspected problems, it is wise to:

- ◆ examine a building for potential problems by conducting a baseline indoor air quality survey; and,
- ◆ develop and institute prevention strategies that may eliminate future problems.

Taking this proactive approach to indoor air quality allows you to handle small problems before they become serious and create a crisis atmosphere. It also gives your school or school district the credibility that comes from taking leadership by being on top of problems. You will gain approval of parents, staff and community by being able to demonstrate your concern for providing a safe, healthy environment when you put a proactive indoor air quality management program in place.

In short, the proactive approach will allow you to:

- ◆ prevent indoor air quality problems;
- ◆ solve minor problems before they become major problems;
- ◆ protect health of students and staff;
- ◆ save money;
- ◆ avoid litigation on the part of those who believe their health, or that of their children, was impaired by poor air quality in school; and
- ◆ avoid a public relations crisis that may cause your public to lose faith in the school or school district.

Section 2

Is indoor air quality really a concern? A brief overview of the problem

Most Americans spend nearly 90 percent of their time indoors – and during the school year, a large share of that time is spent in classrooms. While in reality students and staff spend only about one quarter to one third of a 24-hour day in the classroom, the common *perception* is that they spend “most of their day” in school. This means they spend considerable time in an environment in which there may be relatively high levels of pollutants.

Although invisible and often unnoticed, pollutant levels are generally two to five times higher indoors than outdoors. In fact, the US Environmental Protection Agency (EPA) considers indoor air pollution to be one of the top five public health risks associated with environment.

A 1995 report by US General Accounting Office estimates that approximately one in five schools in the United States has an indoor air quality problem. Schools present more air quality problems than most indoor environments for several reasons:

- ◆ Large numbers of people are concentrated in small areas for relatively long periods of time. For comparison, schools house an average of four persons more per square foot than the typical office building.
- ◆ A wide variety of activities occur in schools that contribute to air quality problems. Science, art and industrial arts classes, for example, use supplies such as paints, glues, inks, and acids that are sources of VOCs.
- ◆ Increasingly tight school budgets have resulted in cutbacks. Reduced custodial services mean buildings and heating/ ventilating/ air conditioning systems (HVAC) may not be cleaned as thoroughly as needed. Leaky roofs and other water infiltration problems create mold growth.
- ◆ Energy conservation concerns have prompted school officials to reduce ventilation and seal buildings. As a result, indoor air pollution levels increase and oxygen supplies decrease.
- ◆ Building additions and remodeling projects have created spaces that are difficult to maintain and ventilate properly.
- ◆ Cheap construction typical in the 1950’s and 60’s has resulted in a legacy of school buildings with poor ventilation systems. Many contain materials that contribute to pollution problems.

The air in the typical school includes a number of types of pollutants that can contribute to health problems. There include:

- ◆ volatile organic compounds (VOCs) which are emitted from an astonishing array of sources – everything from carpet adhesives and particleboard to felt tip markers, emissions from printers and photocopiers, cleaning supplies and even air fresheners;
- ◆ biological agents (biocontaminants) such as pollens, spores and mold, hair and skin cells, bacteria and viruses, animal dander, and dust mites;
- ◆ particulates such as asbestos, lead, man made fibers;
- ◆ ozone emissions from office machinery;
- ◆ combustion products from heating and cooking appliances and tobacco smoke; and,
- ◆ radon.

Indoor air quality problems caused by elevated levels of pollutants or inadequate ventilation systems may have consequences:

- ◆ poor learning environment;
- ◆ increased health problems such as sore throats, asthma attacks, headaches, muscle ache, and fatigue;
- ◆ increased spread of airborne infectious diseases;
- ◆ reduced staff productivity; and
- ◆ increased student and staff absenteeism.

Obviously, preventing indoor air quality problems is beneficial. Addressing problems once they have developed is essential.

Section 3

Communication—A key element in any indoor air quality plan

Once your school or school district embarks on any indoor air quality management action – whether it’s a preventive plan or an investigation of serious complaints - it is essential to include communications as a part of that plan.

Open, honest communication with all concerned individuals is always the best policy. It helps develop trust, alleviates fears and dispels rumors that may arise from lack of understanding. You might be tempted to ignore the communications, feeling that it’s too time consuming and unnecessary. You might decide to avoid the issue unless questions arise.

If so, consider this scenario:

An unfamiliar workers shows up in a school building with instruments to measure carbon dioxide and air flow. Intrigued, a student turns to his teacher and asks, “What’s going on? What are these people doing?” If the teacher has not been informed that an indoor air quality evaluation is underway, the teacher cannot answer the question, only speculate. “I don’t know. Maybe they are looking for some sort of problem,” says the teacher.

That evening, the student tells mom and dad that “some guys with strange equipment were at school looking for problems.” The parents are puzzled and curious. They question the child. “What kind of equipment? What was the person doing?” The parents may have read in the news about radon and asbestos. They may have heard about sick buildings. They leap to me conclusion that there is a problem at school. Maybe that explains the headaches their child has reported occasionally, or the coughing.

They would like to call the principal for answers, but school is closed for the day so they can’t reach him/her. Instead, they call a neighbor or a friend who has children at the school? “Do you know what’s going on at school?” they ask. They pass along their suspicious about a problem at the school. Soon rumors are everywhere. Parents start talking about their children’s illnesses. They attribute them to the air at school. Next, a parent calls a television reporter, accusing the school of a cover-up.

The principal is bombarded with questions and put on the defensive immediately – especially when a TV camera crew shows up announced. What may have started as a routine investigation has now become a major headache. Emotions are aroused. Trust between school and parents has eroded. Regaining it may be difficult.

Taking time to communicate up front will save time in the end. It will help educate parents and staff about indoor air quality in a positive way. The more they know and understand about what is happening in their school, they more they will support it.

The level of communication you undertake will vary greatly depending on your individual situation. If you are simply announcing the implementation of a new program to evaluate indoor air quality in your school, your approach can be quite general and low key. If, however, you have severe indoor air quality problems, you will need to communicate immediately, employing several strategies.

Choose a Communicator

Designate an individual to serve as the communications contact person on indoor air quality issues. If your school district employs an individual who is responsible for communications (communications coordinator/director, community relations director, public relations specialist, etc.), he or she would be the logical choice. Generally, these people have already developed relationships with the media that can be helpful in communicating and they should have a good working knowledge of the characteristics of your community and the most effective ways to communicate with them. If you have no such person, *choose an individual who has good communication skills and is trusted by staff and parents*. This person may be the superintendent or an assistant superintendent, an individual responsible for facilities, a principal or even a teacher.

Provide your communicator with the background information on indoor air quality issues and resources included in this packet. In addition, provide an overview of your school/school district's indoor air quality management plan:

- ◆ What is the purpose of your plan? Why are you doing it?
- ◆ What do you expect to learn?
- ◆ What steps will you take in evaluating air quality?
- ◆ How are evaluations/tests conducted? Are there associated hazards?
- ◆ What do you plan to do if you discover problems?
- ◆ What is the cost?
- ◆ What is the timeline?

Your air quality communicator should serve as the primary link between the media and the school/school district. This person should also be responsible for developing a communications plan to serve as part of your overall indoor air quality management plan.

In general, the principal is the most logical person to communicate directly with staff and parents in an individual school because the principal is a person they know. Your air quality communicator must work closely with principals to help them communicate most effectively with their own staff, students and parents. The communicator can help them develop appropriate key messages.

General Tips on Communicating Effectively

Effective communication is the most important step you can take in not only informing people about indoor air quality issues, but in preventing air quality concerns from become developing into a public relations problem.

Here are some general tips to help you communicate effectively.

1. **Remember, communication is a two-way process.** We often think that by telling – either in writing or verbally – we have communicated.

2. **Listening is as important as telling.** Through effective listening you can pick up a great deal of information on how your message is being received. Do people understand? Do they have concerns? Do they need more information? Are they aware of problems that you don't know about?

Hints for Effective Listening

- ◆ *Listen with all the senses.* Accurate listening focuses not just on what words a person says, or how the words were said, but also upon facial gestures, posture, use of space, touch, use of the body, and so on.
 - ◆ *Listen attentively.* Accurate listening is not an automatic process. Focusing on the present—on what is happening in the here and now—can greatly increase one's efficiency and effectiveness in interpersonal communication.
 - ◆ *Listen supportively.* The effective listener must be open to hearing what the other person means rather than focusing upon what he or she wants to hear.
 - ◆ *Check listening accuracy.* It is a good practice to check what you are hearing by discussing. This can be done by saying, "Do you mean...?" or by paraphrasing the other person, or by indicating from time to time, "I hear you saying...."
 - ◆ *Listen with empathy.* We need to feel what the speaker feels; we need to empathize with the speaker. To empathize with others is to feel with them, to see the world as they see it, to feel what they feel. Convey empathy with the speaker. This does not, of course, mean that we must agree with everything the speaker is saying.
 - ◆ *Listen with an open mind.* It is not easy to listen to arguments against some cherished belief. We need to learn to continue listening fairly even though some signal has gone up in the form of an out-of-place expression or a hostile remark. Listening often stops when such a remark is made.
 - ◆ *Listen critically.* We need to listen fairly but critically if meaningful communication is to take place. It is our responsibility to critically evaluate what we hear.
3. **Don't brush off complaints or simply label people as "complainers."** If people complain about health symptoms and suggest air quality may be the problem, listen attentively. Jot down their complaints. If you brush them off by saying, "we don't have a problem," you risk angering them and losing their trust. They will believe "the school" or "the district" doesn't care about their concerns. Follow up on their complaints; describe what you are going to do about them, or what you are doing already. Ignoring them, or ignoring the problem won't solve it. In fact, it will become worse. People may take their complaints to the superintendent or school board. They may begin talking with their colleagues and neighbors about the situation. Soon a small problem becomes a big one.
 4. **Don't become defensive.** If you become defensive, people will assume you have made a mistake or that there is a problem that you are trying to cover it up. If you have made a mistake, admit it and explain what you are doing to remedy the mistake.
 5. **Don't be evasive.** Be open and honest. If your school has an air quality problem, admit it and explain it. Then, explain how you will solve it.
 6. **Avoid technical language and jargon.** Try to explain things clearly and completely using everyday language. Don't talk down to people though, or assume they can't understand the issues. If you explain with care, you will be understood.
 7. **Don't promise something you can't deliver.** For example, don't guarantee that your building will be 100 percent problem free. It's simply not possible.

- 8. Encourage input from staff and public.** They may have valuable suggestions. If they have further concerns, you need to know about them. It is better that they share them with you, than with their neighbors.
- 9. Practice rumor control.** If you hear a rumor, replace it with fact. Encourage staff to report rumors they have heard. You might consider a regular "rumor watch" column in your staff bulletin or parent newsletter. It will be one of the most widely read items!
- 10. Inform the School Board.** School board members interact frequently with the public. They will appreciate knowing the facts about your indoor air quality plans/issues so they can effectively answer questions they may get from the public. Staff or parents may take their concerns about indoor air quality to the school board during a public meeting. If school board members are aware of the issues, they can respond appropriately. If not, they may become upset because they haven't been informed of the issues.

Section 4

Developing a communications plan

If your communications are carefully planned, you will have more success in gaining support from staff and parents if you communicate up front rather than waiting for questions to emerge. Here are some simple steps to take:

Step 1: *Identify your audiences.*

To be most effective, your message must be tailored to fit the audience. Obviously you would share more details with staff than you would with students; you would share more with high school students than with elementary students.

- ◆ school board;
- ◆ all staff;
- ◆ students;
- ◆ parents;
- ◆ media; and
- ◆ community.

Step 2: *Determine the best methods of communicating.*

Methods include:

- ◆ discussion at regular staff meetings and parent organization meetings;
- ◆ a special meeting called specifically to discuss indoor air quality concerns;
- ◆ memos to staff;
- ◆ articles in your school or school district newsletter;
- ◆ letters to parents;
- ◆ announcements over your PA system to students;
- ◆ teacher led discussions with students;
- ◆ individual phone calls to parents;
- ◆ news releases and phone calls to the media;
- ◆ press conferences; and
- ◆ cable television program.

The most effective method will vary greatly depending on your situation and the methods of communication that are generally most effective in your school/school district and community.

Example: If you are announcing plans to launch a program of routine indoor air quality evaluations, a brief story in your next newsletter to parents should meet parents' needs for communication. The principal may inform staff of plans during a routine staff meeting. At this time, staff members should also be informed about simple steps they can take to maintain good air quality in the school. The media can be informed through a routine press release.

However, if complaints brought by parents and/or staff members have prompted an investigation that has uncovered serious problems requiring that the school building be closed temporarily, prompt action must be taken. Call a meeting with staff immediately. Explain the results of the investigation, what you plan to do to correct the problems, timeline, and plans for continuing or canceling classes as the case may be. You may send a letter home with students explaining the situation and follow it up with phone calls from teachers inviting parents to a meeting to discuss issues and plans. Contact the media immediately by phone and FAX.

Step 3: *Develop a timeline for communications.*

Determine what you are going to communicate with each group at various times throughout the process. Again, this will depend greatly on your situation. If you are going to institute a proactive indoor air quality program, simply inform your various audiences at the beginning and follow up at the end of your initial investigation with a report of the results. If you are responding to serious complaints, however, you may need to report periodically throughout the investigation in order to allay fears and to reassure people that you are indeed following up on their concerns. If corrective action is necessary, you must also inform people when that will occur.

Step 4: *Determine what you want to communicate.*

Develop key messages that you believe are most important for people to understand. These messages must be clear and simple. Generally choose no more than four or five key points that are most important for people to know. Avoid jargon and a lot of technical language, but try not to "talk down" to people. Make sure that all people – principals, school board members, head custodians, all staff members, etc. – who may be asked questions about your indoor air quality issues know and understand the key messages. It is important, especially in crisis situations, for everyone to know, understand and be able to give the same answers.

Note: Frequently non-certified staff such as cooks, custodians, secretaries, paraprofessionals, etc. are overlooked when it comes to communicating information on sensitive topics. The importance of these people cannot be underestimated when it comes to informal communication. They are more likely to live in the community and talk with a lot of people in their neighborhood, at the store, at church, etc. Research shows that the general public is more likely to believe non-certified staff than administrative staff and even teachers. They feel that these people will "tell it like it really is" while administrators and teachers are more likely to cover up problems. *It is important to have them on your side!*

Staff can take an active role in helping to maintain indoor air quality – if they know how they can help. When you implement your indoor air quality plan, it would be useful to talk with staff about how they can help. Review some of the simple things they can do – like making sure that airflow from classroom ventilation systems is not obstructed by books and papers. (See Appendix B)

Sample Communications Plan

Scenario

Sunnyvale School in Anywhere, USA has been the subject of complaints by staff and parents for several months. Health complaints have included headaches, sore throats, increased need for inhalers by students who have asthma, and more frequent colds. Staff members have also complained of vague odors in the spring and inability to control room temperature satisfactorily.

The school contracted with the Institute for Environmental Assessment (IEA) in mid-spring to examine the building and make recommendations. Parents, staff and media were informed that the school was responding to the complaints and had hired experts to evaluate the school. (see Communications Plan, Part 1)

IEA found levels of mold spores to be higher than normal, indicating that mold growth was occurring inside the school. Areas of mold growth were identified: ceiling tiles had become damp as the result of a roof leak; carpeting and sheetrock in several classrooms had become damp as the result of poorly sealed windows. The leaks had been repaired as soon as they were discovered.

In addition, examination of the heating/ventilating/air conditioning (HVAC) system found that the system did not provide adequate exchange of air.

IEA recommended replacement of ceiling tiles, carpet and sheetrock where mold growth was present and improvements to the HVAC system to increase air exchange. IEA further recommended additional follow-up tests to ensure that problems had been corrected.

The school followed up on the recommendations during summer vacation. It also made arrangements with IEA for follow-up tests at various points throughout the school year.

School is now ready to open in the fall. (see communications plan, Part 2)

Communication Plan for Sunnyvale School Scenario

Part 1:

Spring - Announcement of investigation

The goal of the communication is to *acknowledge* that there have been complaints, to *reassure* people that the school will take steps to ensure a safe environment, and to *inform* them of the investigation process.

◆ Key messages to communicate:

1. The school (school district) is concerned about health and safety of students and staff. For that reason, it is responding promptly to concerns raised by parents and staff.
2. The school is responding appropriately and responsibly. It is hiring leading experts to provide a thorough investigation of the school.
3. If problems are found, they will be corrected immediately so that the school building will provide a safe environment.
4. Parent and staff concerns are important to the school. Further questions and phone calls are invited.

◆ Communication approaches for each audience:

- **Staff.** As part of the weekly staff meeting, the principal acknowledges complaints from staff and parents and announces that the school has contracted with IEA to conduct a thorough evaluation. He/she provides a timeline for the investigation and announces that results will be expected prior to the start of the next school year. He/she thanks staff members for bringing potential problems to his/her attention and informs others about the best process for providing additional input.
- **Parents.** The principal makes phone calls to parents who had raised concerns about their children's health and suggested the school building may be at fault. The principal indicates that the school has contracted with IEA to conduct a thorough evaluation. He provides a timeline for the investigation and announces that results will be expected prior to the start of the next school year. He/she thanks parents for bringing potential problems to his/her attention.

The principal includes an article in the regular school newsletter informing all parents that an indoor air quality investigation will be conducted. He/she invites parents to call if they have questions or concerns.

- **Media.** Either the communicator or the principal sends a brief news release to the media announcing that IEA has been hired to evaluate the school in response to concerns raised by parents and staff. He/she invites phone calls from reporters.

Part 2

September - Start of school year

Report of results of investigation, building improvements made, timeline for monitoring set

The goal of the communication is, again, to *inform* people of the evaluation results and building improvements, *reassure* them that the school is a safe environment, and *indicate* that monitoring will continue to make sure that the building improvements have corrected the problems.

◆ **Key messages to communicate:**

1. Once again, our greatest concern is the health and safety of students and staff in the facility.
2. The test results indicated:
 - mold growth was occurring in some areas of the school
 - HVAC system needed improvements
3. It is possible that the mold and inadequate ventilation contributed to health symptoms.
4. Corrective action has already been completed: sheetrock and ceiling tiles were replaced; more powerful fan added to HVAC system
5. Monitoring of air quality will continue to ensure that modifications have worked and contamination does not return.

◆ **Communication approaches for each audience:**

- **Parents.** The principal makes phone calls to parents who made the initial complaints. They should be informed of results and corrective action, and thanked once again for helping the school to identify and solve a problem.

Key messages should be summarized in newsletter to parents at start of school year.

- **Media.** News release outlining key messages should be sent to media.

Reporters should be invited to tour school and observe corrective work. (The goal here is not necessarily to get coverage in the media, but to convey to reporters that the school is very open about the fact that there were some problems but that they are being corrected.)

Summaries of investigation reports should be made available. (These reports are public under law).

- **Staff.** During the first regular staff meeting of the school year, staff should be informed of the results of the investigation.

Staff should receive a brief written summary of what has occurred and the district's plans related to monitoring the situation. Parents will probably ask staff questions, so they need accurate, printed information they can refer to if necessary. This should be mailed to staff prior to workshop week so they can have time to review the information prior to the meeting.

Sample articles for school newsletters on the Sunnyvale School scenario

Part 1 *Spring*

Sunnyvale School has hired experts to evaluate indoor air quality in the building.

"When some of our teachers and parents expressed concerns about symptoms such as headaches, sore throats, and more frequent problems with asthma, we decided to take a look at the situation to see if our school was contributing to these problems," said Principal Susan Smiley. "We felt we needed experts to review the situation so we have hired the Institute for Environmental Assessment to conduct tests and evaluate the school."

The Institute for Environmental Assessment (IEA) is considered the leading expert in the nation on indoor air quality concerns in school buildings.

IEA will inspect the building's structure and mechanical systems and conduct tests to determine if there are problems with air quality in the school. The evaluation will begin immediately. Results should be available in mid summer.

"If the results point to problems, we will take action to correct them as soon as possible so that we can open the school next fall with a clean bill of health," said Smiley. "I would like to thank parents and staff for bringing their concerns to my attention. By working together we are able to provide a safe atmosphere for students, staff."

If you have questions please call the principal at 222-4444.

Part 2 *"Welcome Back" fall newsletter for parents*

Steps have already been taken to improve air quality in Sunnyvale School. "We feel we can give our school an 'A' for indoor air quality," said Principal Susan Smiley.

The school hired the Institute for Environmental Assessment (IEA) to examine air quality last spring after several parents and staff members reported health symptoms that they believed were caused, at least in part, by indoor air quality problems.

The investigation found minor problems with mold growth in three classrooms. The mold resulted from a small roof leak and several window leak last springs. Although the leaks were repaired immediately, the dampness allowed mold to begin growing. During the summer, workers removed and placed the affected ceiling tiles and sheetrock. Carpet in areas affected by the leak was also disinfected.

IEA also recommended improvements in the school's ventilation system to bring in more fresh air. A new fan has already been installed to upgrade the ventilation system.

"We are pleased that IEA was able to pinpoint the problems so that the improvements could be made immediately," said Smiley.

IEA will continue to monitor air quality at Sunnyvale School throughout the year to ensure that repair and replacement efforts were effective.

If you have questions or would like a copy of the air quality report please call the principal at 222-4444.

Sample news releases for Sunnyvale School scenario

Spring

Anywhere School District #222 has hired experts on indoor air quality to evaluate air quality at Sunnyvale School in response to concerns from parents and staff.

"When some of our teachers and parents expressed concerns about symptoms such as headaches, sore throats, and more frequent problems with asthma, we decided to take a look at the situation to see if our school was contributing to these problems," said Principal Susan Smiley. "We felt we needed experts to review the situation so we have hired the Institute for Environmental Assessment to conduct tests and evaluate the school."

The Institute for Environmental Assessment (IEA) is considered the leading expert in the nation on indoor air quality concerns in school buildings.

IEA will inspect the building's structure and mechanical systems and conduct tests to determine if there are problems with air quality in the school. The evaluation will begin immediately. "If results of the investigation point to problems, we will take action to correct them as soon as possible so that we can open the school next fall with a clean bill of health," said Smiley. "We are committed to doing everything possible to ensure that Sunnyvale School provides a safe atmosphere for students, staff and the public," said Smiley

For more information, contact Principal Susan Smiley at 222-4444, or district communication specialist John Jones at 222-4111.

Fall

Results of an indoor air quality investigation at Sunnyvale School found minor problems with mold growth in three classrooms. Experts from the Institute for Environmental Assessment (IEA), which conducted the investigation, also recommended improvements in the school's ventilation system.

The school hired IEA to examine indoor air quality in the school after several parents and staff members reported health symptoms that they believed were caused, at least in part, by indoor air quality problems.

The report from IEA indicated that mold growth resulted from a small roof leak and several window leaks. Although the leaks were repaired immediately, the dampness caused small areas of mold growth in ceiling tiles and sheetrock. During the summer, workers removed and placed the affected ceiling tiles and sheetrock. Carpet in areas affected by the leak was also disinfected. In addition, a new fan was installed to upgrade the ventilation system.

"We are pleased that IEA was able to pinpoint the problems so that improvements could be made immediately," said Principal Susan Smiley. "We feel we can give our school an "A" for indoor air quality."

IEA will continue to monitor air quality at Sunnyvale School throughout the year to ensure that repair and replacement efforts were effective.

For more information, contact Principal Susan Smiley at 222-4444, or district communication specialist John Jones at 222-4111.

General Samples

Sample news release or district newsletter story

To begin proactive district-wide program

Anywhere School District #111 will begin a new indoor air quality program designed to make certain that the school district's buildings provide a safe environment for students and staff.

The program is simple. Each school in the district will be evaluated on a yearly basis for potential problems. If problems are found, they will be corrected.

"While our school district has received no complaints of indoor air quality problems, we have learned that indoor air quality problems are common in schools throughout the country. In fact, the federal government estimates that approximately one in five schools nationwide have air quality problems," said Superintendent Sam Smith.

Indoor air quality problems have been linked with health symptoms such as headaches, respiratory problems, fatigue and more. "Because air quality can have an impact on health, and therefore on learning, we believe it is important to evaluate our schools carefully. If we find conditions that contribute to indoor air quality problems, we will take steps to correct them immediately," said Superintendent Smith.

The evaluation will include a number of steps. Ventilation systems will be examined to make sure they are functioning properly and providing adequate fresh air. Visual inspections will be made to check for signs of excess moisture from leaks that could lead to growth of molds. Cleaning practices will be reviewed to ensure that cleanliness is maintained and that cleaning supplies used are safe. In addition, all staff members will receive information on simple steps they can take to help protect indoor air quality.

The initial evaluation will be conducted by school district staff within the next few months. Results of the inspection will be reported to the school board. Principals will share reports for their individual schools with parents.

"We believe this new indoor air quality program is a good investment. Not only will it protect the health of our students and staff, but it may identify potential problems that can be solve before they become serious and expensive," said Superintendent Smith.

If you have questions, please call the office of the superintendent at 222-1000.

Sample newsletter article for individual school newsletter

To begin proactive district-wide program

Sunnyvale School will take part in a district-wide indoor air quality program designed to make certain that the school provides a safe environment for students and staff. The program is simple. Each school in the district will be evaluated on a yearly basis for potential problems. If problems are found, they will be corrected.

"We have not had any complaints of indoor air quality problems at our schools, we know that indoor air quality problems are becoming common in schools around the country," said Principal Susan Smiley. "We want to make sure that the air in our school is safe."

Indoor air quality problems have been linked with health symptoms such as headaches, respiratory problems, fatigue and more.

The evaluation will include a number of steps. Ventilation systems will be examined to make sure they are functioning properly and providing adequate fresh air. Visual inspections will be made to check for signs of excess moisture from leaks that could lead to growth of molds. Cleaning practices will be reviewed to ensure that cleanliness is maintained and that cleaning supplies used are safe. In addition, all staff members will receive information on simple steps they can take to help protect indoor air quality.

The initial evaluation at Sunnyside School will be conducted over the next month by our school's custodial staff. Results will be shared with parents.

If you have questions, please call Principal Susan Smiley at 222-4444.

Communicating with staff about implementing an ongoing indoor air quality program.

- ◆ **Sample outline for discussion at a staff meeting.** Announce implementation of the indoor air quality program.
 1. Announce the plan
 - how was it developed
 - why is it being implemented
 2. Provide background information on indoor air quality
 - why is indoor air quality a common problem in schools
 - what are health implications of indoor air quality problems
 3. Discuss the evaluation
 - When will it be conducted?
 - How will it affect staff?
 - Who will be involved?
 4. Discuss their role
 - Explain the importance of each staff member taking responsibility for maintaining good indoor air quality
 - Distribute and review appendix B
 5. Discuss results
 - When will they be available?
 - If problems are discovered, how will they be corrected?

Section 5

Working with the media—surviving and thriving

Knowing how to work effectively with the media is important to educators at all times, but with issues that can become emotional, it is critical. News reporters love stories that evoke strong emotion. Imagine the “news value” in a television report on parents who believe that the schools to which they entrust their children each day are making them sick because of indoor air quality problems.

Journalists feel strongly that they have the responsibility to report on public institutions, including schools. They can be an ally in getting out important news and messages on schools; or they can be an adversary, portraying schools and school staff in a negative light. **You can have a major positive impact on the kind of reports the media presents about your school.**

If the media is to do an accurate job of reporting on any issue, they need accurate information on all sides of the issue. It’s that simple. One of your jobs is to help them get that information.

The following scenario* illustrates the value of working *with* reporters, rather than against them.

Hillview School has had a number of indoor air quality problems over the years. Though it is a relatively new building – approximately 10 years old – it has had a number of water infiltration problems that have caused growth of mold on sheetrock, carpet and ceiling tiles in some areas. These problems resulted from a leaky roof, condensation on uninsulated pipes, and unsealed windows. Some materials used in construction also emitted VOCs, such as formaldehyde, that were a concern.

A few staff and parents complained about illnesses that they believe were related to the building. At first their complaints were dismissed. When more people began complaining and the problems became more obvious, the buildings and grounds staff of the school district became involved. They identified some obvious problems and solved them. The complaints persisted, however, so the district called in indoor air quality consultants to conduct an evaluation. Test results pinpointed more problems and the school district took action to correct them.

A parent meeting was scheduled to provide information on test results and corrective work. Several very vocal parents invited a television reporter to attend the meeting that evening. They indicated in their phone conversation with the reporter that their children were sick as a result of indoor air quality problems at school. They claimed the school had done very little to take care of the problem.

The reporter called the principal the day of the meeting to get more information and some comments. The principal invited the reporter to come and visit the school. While the reporter was enroute, the principal called the district’s public relations coordinator for some help developing key messages to emphasize in his conversation with the reporter. He also identified a teacher who would be willing to talk with the reporter about some health concerns she felt were related to air quality at the school. He prepared a background information sheet for the reporter that outlined the problems identified and the actions taken to correct them, as well as costs.

When the reporter arrived, the principal took her on a tour of the school, indicating areas where there had been problems and discussing what was done to correct them. He was able to emphasize his key messages. The reporter also talked with a teacher about her concerns.

The resulting television report represented the situation accurately. Yes, the school did have some indoor air quality problems that affected some staff and students. But, they had also taken steps to locate the source of the problems and to correct them. The report emphasized the school's concern for the health and safety of students and staff. The parents' allegations that the school was doing little to solve the problem were not included in the report. The background information outlining all corrective actions made it obvious to the reporter that the school had done much work to alleviate the problem.

By working with the reporter, the principal was able to demonstrate clearly that the school was indeed concerned and was doing everything possible to eliminate indoor air quality problems.

If the principal had simply ignored the reporter's request for information, or said "no comment," the story would have been very different. The reporter would have assumed the principal had something to hide. Her report may have been very one-sided; she would probably have relied heavily on the comments of the parents who called her. She may have showed up during the school day to talk with any students or teachers who would talk with her. Or, she may have come to the meeting with a camera crew to talk with reporters. It is likely that a negative story would have resulted.

By working with the reporter, the principal was able to control the situation. He was able not only to supply accurate information, but also to choose the staff person the reporter interviewed, rather than leaving it to chance.

**The scenario is taken from an actual situation, though simplified somewhat for purposes of illustration. The name of the school has been changed.*

Key messages for reporter working on Hillview School indoor air quality scenario

(Note: These were not handed to the reporter; they were presented by the principal in an interview situation.)

1. We have taken these problems very seriously. (Very briefly describe the problems:)
 - we have had moisture problems in some areas of the school
 - we went through the building from top to bottom, pinpointing the problems and then eliminating them
 - we did extensive testing of air, carpet samples, etc.
 - we found problems with mold and bacteria
 - we made building modifications and then did extensive clean up to eliminate the problems.
2. Some parent and staff concerns remained even after the building modifications. As a result, the district contracted with the Institute for Environmental Assessment to conduct an independent review of air quality issues at Andover. A staff/parent group is providing input into the study process to make certain that all questions raised by parents and staff are addressed.
3. Tonight's public meeting will provide a mid-process update on what has occurred thus far. Test results are not yet complete. They are now being reviewed by a group of experts. The final report and recommendations will be completed in late March.
4. We are committed to doing everything possible to ensure that Hillview School provides a safe atmosphere for students, staff and the public.

Background Information on Hillview School presented to reporter for reference

Hillview School

*Summary of work completed to alleviate moisture and air quality problems
February 1997*

The large amounts of rain, high heat and humidity last summer exaggerated moisture problems that have existed at Hillview School for several years. This made it possible to pinpoint structural and mechanical problems that had not been discovered in the past.

The building was **thoroughly** inspected. Missing insulation, some missing moisture barriers, and uncaulked areas were discovered.

Here is a summary of the action we took to correct the problems:

- rerouted condensation draining from the univents
- modified the univent control system to increase the efficiency of humidity removal by 30 percent or more
- removed sheetrock in three rooms and re-sheetrocked.
- replaced carpet with floor tile in one room
- added fresh air supply and exhaust missing in one classroom
- extended roof curbs on air release vents to prevent snow entry
- reinspected every foot of heating/cooling piping in ceiling and repaired or replaced improperly installed insulation
- sprayed a “biocide” in ceiling to prevent microbial growth (guaranteed for a minimum of five years)
- cleaned and disinfected carpet using a high heat/high moisture extraction process with 1% bleach solution (representatives of the carpet firm were consulted on this procedure.)
- filled wall cavities with a foam insulation that will insulate the pipes (foam product is guaranteed safe and “environmentally friendly”)
- recaulked windows
- installed vapor barrier and replaced the wall in the classroom where it barrier was missing

In addition to the work outlined above, we conducted tests of the sheetrock, carpet, and ceiling tiles to determine if there is contamination. A fungal species that raised some concern was found in two classrooms. Further testing was done to determine if this species was present in other areas. No additional areas were found. We retested in after the carpet cleaning/disinfecting had been completed. The species was no longer present.

We will continue to monitor the building carefully.

Tips on Working with the Media

If you understand how to work with reporters and know some basic strategies, you'll be able to deliver your message more effectively and, at the same time, you'll be able to stay out of hot water. Here are some tips to help you do just that.

◆ Return calls promptly.

- Deadlines are important. Find out if the reporter has a deadline and then work to provide the information requested within the deadline.
- Make yourself available. Let the reporter know where and when can you be reached for further comments and clarifications.
- Don't avoid talking with reporters because your input is valuable. It can change the whole slant of a story, possibly neutralizing a negative report.
- If you avoid reporters they will think you are trying to hide something and will dig deeper.

◆ Everything is on the record

- Even if a reporter says you can talk "off the record," don't. If you tell a reporter something he or she feels a duty to report, it will be reported.
- If you do speak off the record, reporters can't always remember which things you said are off the record.
- If you can't answer a question, tell the reporter why. Don't just say "no comment." A no comment response leads people to believe that you have something to hide.

◆ Speak with confidence

- It's essential to look and sound as if you really know and believe what you are talking about, especially with television reporters. The overall perception that viewers have comes from your persona (55 percent) and your voice quality (38 percent). Only seven percent comes from your message. So, while it's important to speak truthfully, it's very important to sound as if you know what you are talking about!
- Be positive, not defensive.

In a TV interview:

- Look at the reporter when answering questions; turn to the camera when delivering a key point.
- Steady eyes suggest honesty; blinking, darting eyes suggest nervousness and dishonesty.
- Relax. Take a couple of deep breaths and compose yourself

◆ Prepare information

- Frequently you will be called in advance. If not, and you feel you need some time, be sure to ask about deadline and call back to the individual.
- Ask questions about what the reporter wants to know so that you know what to prepare.
- Do your homework. Get background information.
- Decide what the key points of your message are and keep bringing them back into the discussion. Choose two or three—**never** more than five.
- Present your main point first, then the supporting points.
- Be concise. Don't ramble on and on.

- Think about ways to present ideas that will be understood by the average person. Explain – don't use jargon.
- If the reporter wants to talk with an expert in a specific area, refer them to that person, help make the contact if necessary.

◆ **Expect challenges**

- Reporters may come with a hidden agenda, assumptions or misconceptions. Try to anticipate these and develop responses.
- Don't get defensive.
- Don't get angry. Count to 10 if you need to. Be patient.
- Avoid an argument.
- Don't pass the buck. Deal with it.
- Don't let the reporter put words in your mouth. Listen carefully. If you don't agree with the way the reporter paraphrases your ideas, say so.
- If you get a multi-part question, start with the part you like best. don't feel you have to remember everything.

◆ **Choose catchy quotes**

- Short phrases will be remembered and used in a story far more often than long detailed explanations.
- Try to prepare some in advance.

◆ **Tell the truth**

- If you don't, you can get in big trouble and lose credibility.
- If you don't know an answer, don't guess. Say so and offer to find the answer.
- If you accidentally say something that is incorrect and realize it later, make immediate attempts to correct the misinformation.

◆ **Be aware of laws regarding public access to documents and records.**

In general*, all data collected, created, received, maintained or disseminated by the school district, regardless of its physical form, storage media or conditions of use, is open to the public. This includes:

- written records of district school board meetings, committee/task force meetings, special ad hoc committee meetings, public hearings, etc.
- official district contracts, ordinances and resolutions.
- financial documents including budget; payable records; copies of warrants, invoices, etc.; revenue/expenditure

This means that if a reporter – or anyone else – asks for access to records or reports of indoor air quality tests, you must make them available.

*(State data practices laws vary. Check your state's law.)

A final word of caution:

Never ask reporters to show you their stories before they are printed. It implies that you don't trust them, or that you feel they aren't intelligent enough to understand the issues.

Section 6

Communicating in an emergency

Sudden Emergency

Be prepared. In the event of a sudden emergency such as a chemical spill, a chlorine leak, or sudden unexplained illness on the part of many people, you may need to evacuate the school in a hurry. There's not much time to think. Does your school have an emergency plan? Every school should. Follow the plan.

Consider the safety of the students and staff first. Once that has been addressed, think about how you can communicate most effectively. Your goal is to inform people about what is happening as quickly as possible and allay any fears they may have.

- ◆ Review the facts and decide what you need to communicate.
- ◆ Appoint one or more people to facilitate communication with reporters as well as parents. Make sure these people have all the facts.
- ◆ Develop key messages as soon as possible, keeping in mind the goal of allaying fears.

Communicating with Reporters

- ◆ Use the media to help get the word out on the situation. Television and radio are often willing to broadcast messages that inform the public about emergency situations. You can use them to your advantage. If you believe they could be helpful in informing the public, call and ask to speak to the news assignment desk. Explain the situation. Chances are they will be eager to assist.
- ◆ If you don't feel your situation merits media attention, be prepared for the media anyway. If fire or police emergency personnel were called to the school, it is very likely that reporters know about the situation since they routinely monitor police and fire calls. Television crews may be on your doorstep in just minutes.
- ◆ Greet reporters when they come and escort them to an area where you can talk with them rather than allowing them to wander around, searching for people to interview at random.
- ◆ Give reporters the facts available and let them know you will keep them brief as the situation unfolds.
- ◆ If reporters insist on getting additional comments from a staff or student, find someone who is articulate and willing to comment.

Communicating with parents

The severity of the emergency will determine to a large extent how you communicate with parents. If the situation requires that the entire student body be sent home from school, obviously parents need to know as soon as possible, especially parents of elementary students. Your school should have a plan in place for handling such emergencies.

The best way to communicate with parents is through direct phone calls. That personal approach is the best way to alleviate their fears. Unfortunately, this is very time consuming. If you have large numbers of students, it may be difficult or impossible. If this is the case, you may need to use the media for assistance in broadcasting information about the emergency.

If the emergency was cleared up fairly quickly and students were able to return to class, consider sending a letter home that afternoon with students explaining what happened. Parents appreciate learning from the school what happened, rather than reading it in the newspaper or watching it on television. Middle and high school students are less likely to actually give parents a letter from the school. In this case, make sure the students know what happened and how the issue was resolved before they leave the school. If there is time, teachers can discuss it with students. If not, at least give the details in a message over the public address system. This will help prevent a lot of rumors.

Communicating when closing a school

Closing a school temporarily – or delaying the start of school the school year – due to an indoor air quality problem obviously requires careful communication.

As soon as a decision is made, inform the parents and staff using methods that best fit the timeframe and your individual situation.

Individual letters should:

- ◆ outline the problem concisely;
- ◆ explain what will be done to solve the problem;
- ◆ explain the timeline: when will school be closed? when will it reopen?
- ◆ explain how lost instruction time will be made up, or plans for use of an alternate facility; and,
- ◆ stress that this action is being taken because your first concern is the health and safety of students and staff.

Consider holding a public meeting. This will give you an opportunity to further explain the problem and solution. It will also give people an opportunity to ask questions and to express concerns and frustrations they may have.

Appendix A

About the Institute for Environmental Assessment (IEA)

The Institute for Environmental Assessment (IEA) is committed to providing practical, cost-sensitive environmental engineering counsel for private and public organizations. Founded in 1983, it has provided environmental control services to hundreds of organizations throughout the United States.

- ◆ IEA employs a large, certified professional staff capable of addressing a wide range of indoor environmental needs.
- ◆ IEA draws upon the expertise of nationally-recognized physicians, engineers, architects, toxicologists, attorneys, industrial hygienists and epidemiologists.
- ◆ IEA has formally prepared policy and regulations for a number of public agencies in areas of environmental risk.
- ◆ IEA has served as a resource to the Environmental Protection Agency (EPA) on development of national guidelines for schools on indoor air quality issues.
- ◆ IEA has performed over 15,000 safety/environmental inspections.

Appendix B

You Can Help Prevent Air Quality Problems in Your School

Regular and thorough classroom cleaning is important in maintaining good indoor air. Unsanitary conditions attract insects, mice and other pests, leading to possible indoor air quality problems from pesticide use or pest feces. Dirt, moisture, and warmth stimulate the growth of molds and other microbiological contaminants.

◆ General Cleanliness

Teachers can play an important role in maintaining classroom cleanliness.

- Make sure that the classroom is cleaned dusted, swept, and/or vacuumed regularly.
- Make sure that trash is removed regularly.
- Clean spills promptly, especially wet spills on carpets.
- Do not keep food in classroom overnight.
- Look for signs of pests.
- Request that unit ventilators be cleaned and filters replaced if spilled liquid goes into the units.

◆ Classroom Animals

Some individuals are allergic to animal dander. If animals are kept in classroom:

- Store animal food in tightly sealed containers.
- Minimize exposure to animal allergens.
- Locate animals away from ventilation system vents to avoid circulating allergens throughout the room or building.
- Keep animals in cages as much as possible; do not let them roam freely.
- Clean cages regularly.
- Find alternatives to using animals, if possible.

◆ Drain Traps

Sewer gases can enter the classroom if water in traps is allowed to evaporate.

- Fill drain traps by pouring water down them regularly.

◆ **Excess Moisture**

Excess moisture contributes to the growth of mold and mildew that cause odors and other IAQ problems. It results from condensation on cold surfaces, leaked or spilled liquid, or excess humidity.

- Check for condensed water or "fog" on cold surfaces, such as windows, sills and frames; plumbing; indoor surfaces of exterior walls.
- Check for plumbing leaks— around and under classroom sinks and in classroom lavatories;
- Check for roof leaks on ceiling tiles or walls (discoloration may indicate periodic leaks).

◆ **Thermal Comfort**

Temperature and relative humidity can affect comfort and indoor air quality. Changing thermostat settings or opening windows in an effort to control temporary fluctuations in temperature may affect other parts of the school or add to problems.

- Discuss solutions to thermal comfort problems with the building manager/supervisor/custodian.

◆ **Ventilation System**

Ventilation systems exhaust stale indoor air outside and draw outdoor air into the building. Mechanical ventilation systems use fans to exchange air; natural ventilation systems use windows or other openings. Improperly operated or poorly maintained ventilation systems may cause indoor air quality problems. Odors may indicate a ventilation problem.

- Report odors such as chemical, mold or mildew, and vehicle exhaust smells to the appropriate persons, usually the building manager, supervisor or custodian.
- If your classroom uses mechanical ventilation, check that air is flowing into the room from air supply vents. Hold a strip of lightweight plastic or tissue paper near the air supply vents. It will flutter away from the vent if vent is working.
- Make sure that the airflow is not diverted or obstructed by books, papers, furniture, curtains, or other obstacles.
- Check that air is flowing from the room into the air return grille(s). The plastic or tissue will be pulled toward the return and stick to the face of the grille.

◆ **Allergens**

Some students are especially sensitive to allergens. Become aware of who they are and take special precautions with them:

- Consult the school health office or nurse about student allergies (privacy laws may limit the information school officials can disclose).
- Ask parents about potential animal allergies.
- Check for allergies when new students enter the class.
- Locate sensitive students away from animals and their habitats.

◆ What Special Subject Teachers Can Do

Laboratories and other special classrooms require additional inspection and preventive action.

Local exhaust fans and fume hoods can be used to prevent air pollutants and excess moisture from accumulating or spreading beyond the local area. Local exhaust fans may be used to exhaust entire rooms such as locker rooms. Fume hoods may be used for activities that generate pollutants in a local area within a room such as science experiments, painting or staining in an industrial arts room, etc.

Teachers should:

- Confirm that fume hoods and local exhaust fans function by checking for airflow when fans are on.
- Check for odors in adjacent rooms or hallways.
- Make sure that fume hoods and fans are used whenever activities that generate pollutants occur.
- Train students when and how to use the fume hoods and fans.

◆ Art

Art supplies may emit contaminants during use and storage. In addition, certain activities, such as firing ceramic kilns, may generate air contaminants or heat up the classroom, causing thermal discomfort to occupants.

Art supplies that may contribute to air quality problems include solvents; adhesives and glues; varnishes and lacquers; acids; paints; inks; powdered pigments; and clays.

Art teachers should:

- Make sure that safety precautions are followed.
- Follow good safety, handling, and storage practices.
- Keep lids on containers when not in use.
- Minimize exposure to hazardous materials.
- Isolate contaminant-producing activities or operations.
- Use moist premixed rather than powdered products.
- Follow recommended procedures for disposal of used substances.
- Substitute less hazardous or nonhazardous materials where possible.
- Read labels and identify precautions regarding fumes or other indoor air issues.
- Have appropriate procedures and supplies available for spill control.
- Label all hazardous supplies with date of receipt/preparation and pertinent precautionary information on handling.
- Choose art supplies approved as safe by the Art and Craft Materials Institute or the Center for Safety in the Arts:
 - Art and Crafts Materials Institute, 5 Beekman Street, New York NY 10038
 - Center for Safety in the Arts, 100 Boylston Street, Suite 1050, Boston, MA 0116.

◆ Science

Some supplies used as teaching aids in science laboratories may contribute to indoor air quality problems. Experiments should be conducted in well-ventilated rooms using fume hoods and local exhaust systems wherever appropriate. Safety precautions should be followed at all times.

Science supplies that may contribute to IAQ problems include solvents, flammables, biological specimens, acids and caustics.

Science teachers should:

- Learn about potentially harmful supplies.
- Read labels and identify precautions regarding fumes or other indoor air issues
- Request information and Material Safety Data Sheets from suppliers and manufacturers.
- Follow good safety, handling, and storage practices.
- Develop appropriate procedures and have-e supplies available for spill control.
- Label all chemicals accurately with date of receipt/preparation and pertinent precautionary information on handling.
- Store supplies according to manufacturers' recommendations.
- Follow recommended procedures for disposal of used substances.
- Secure compressed gas cylinders.
- Separate storage areas from main classroom area and ventilate separately.
- Minimize exposure to hazardous materials.
- Use diluted substances rather than concentrates wherever possible.
- Ensure that fume hoods capture all aerosols, gases, and vapors released within them.

◆ Industrial Technology/Vocational Education

Industrial and vocational education materials and operations can create indoor air quality problems. Activities may contribute to air quality problems include machining, grinding, painting, welding, soldering, and baking/heating. Supplies that may contribute to air quality problems are adhesives, solvents, fuels, and paints

Industrial Technology/Vocational Education teachers should:

- Learn about potentially harmful supplies.
- Read labels and identify precautions regarding fumes or other indoor air issues.
- Request information and Material Safety Data Sheets from suppliers and manufacturers.
- Follow good safety, handling, and storage practices.
- Develop appropriate procedures and have supplies available for spill control.
- Store supplies according to manufacturers' recommendations.
- Follow recommended procedures for disposal of used substances.
- Secure compressed gas cylinders.
- Separate storage areas from main classroom area and ventilate separately.
- Minimize exposure to hazardous materials.
- Use instructional techniques that require the least quantity of materials.
- Ensure that fume hoods capture all aerosols, gases, and vapors released within them.

◆ Physical Education

Locker room conditions that affect indoor air quality include standing water, high humidity, warm temperatures, and damp or dirty clothing. Some methods used to control bacteria and odors in the locker room may contribute to air quality problems if used improperly.

Physical education teachers should:

- Verify that showers and locker room areas are cleaned regularly and properly.
- Use chemical cleaners and disinfectants when students are not in the locker room.
- Run exhaust fans to remove cleaning product odors from the locker room.
- Maintain cleanliness and reduce excess moisture in the locker room.
- Remove wet towels regularly.
- Wash and dry soiled practice uniforms regularly.
- Encourage students to take soiled clothes home regularly.

Appendix C-1

Glossary of General Terms

Abatement: reduction or removal of a contaminant.

Acceptable indoor air quality: indoor air that does not contain harmful concentrations of contaminants; air with which at least 80% of building occupants do not express dissatisfaction.

Aerosol: a suspension of liquid or solid particles in air.

Air cleaner: a device that actively removes impurities from the air, including forced air filtration systems and electronic air cleaners. Air cleaners may be added to HVAC systems or stand-alone room units.

Air exchange rate: the rate of air flow moving through a space, usually expressed in terms of room volume units per unit of time such as room air changes per hour.

Air handling unit (AHU): the part of an HVAC system responsible for moving air, which may also clean, heat, or cool the air.

Air quality standard: a government-mandated regulation that specifies the maximum contaminant concentration beyond which health risks are considered to be unacceptable.

Ambient air: the air surrounding a building; outside air.

Amplification: an increase in the numbers or concentration of a microbe or its products through reproduction and growth of the microbe.

Asbestos: a class of silicate minerals composed of long, thin fibers.

ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers; the trade association that provides information and sets standards for the industry.

Backdrafting: a condition where the normal movement of combustion products from a combustion appliance up a flue is reversed so that the combustion products can enter the building.

Background concentration: the level of a contaminant present before the introduction of a new source.

Bioaerosol: an airborne microbial contaminant, such as a virus, bacteria, fungus, algae, or protozoa, or particulate material associated with one of these microorganisms.

Breathing zone: the area of a room in which occupants breathe as they stand, sit, and lie down

Building, envelope: the outer walls, windows, doors, roof, and floors of a building; the building shell.

Carbon dioxide (CO₂): an odorless, colorless gas which can at high levels (above 1.5 % or 15,000 parts per million), have physiological effects. Main indoor source is human respiration; measurements used as indicators of ventilation conditions.

Carbon monoxide (CO): an colorless, odorless gas that is the product of incomplete fuel combustion. It is a chemical asphyxiant; in the bloodstream it effectively prevents the transport of oxygen to the body's tissues. CO exposure can affect the lungs, heart, and nervous system, and can cause death. Sources include cooling and heating appliances, tobacco smoke, and entrained exhaust from parking garages and truck idling areas.

Carcinogen: an agent suspected or known to cause cancer.

Ceiling plenum: the space between the suspended and structural ceiling used as part of the air distribution system. This space usually accommodates electrical, communications, and mechanical connections as well.

Coil: a cooling or heating element, often including fins, through which treated gas or liquid is passed, exchanging thermal energy with air surrounding it for heating or cooling.

Colony forming unit (CFU): a laboratory measure of fungal concentration, indicating the quantity of viable organisms collected for a given unit sample.

Commissioning: the testing of HVAC systems prior to building occupancy to check whether the systems meet the operational needs of the building within the capabilities of the system design.

Condenser: a heat exchange device that condenses vapor by removing heat from the air.

Conditioned air: the air that has been heated, cooled, humidified, or dehumidified to maintain an interior space within the "comfort zone."

Contaminant: an unwanted constituent that may or may not be associated with adverse health or comfort effects.

Cooling capacity: the maximum rate at which cooling equipment removes heat from airflow at operating conditions.

Cooling tower: a heat transfer device, which cools warm water using outside air.

Damper: a mechanical device in HVAC systems that varies airflow through an air outlet, inlet, or duct.

Dilution: a mitigation strategy that lowers the concentration of airborne contaminants by increasing the fraction of outdoor air in the supply airstream.

Electrostatic air cleaner: a device that uses an electrical charge to trap particles traveling in the air stream.

Emission standard: a voluntary guideline or government regulation that specifies the maximum rate at which a contaminant can be released from a source.

Encapsulate: a mitigation technique that reduces or eliminates emissions from a source by sealing with an impenetrable barrier.

Endotoxin: a biological agent that is part of the outer membrane of some bacteria. Endotoxins are highly toxic, capable of causing fever, malaise, respiratory distress, even death.

Environmental tobacco smoke (ETS): the combination of sidestream and mainstream smoke that is emitted from a burning cigarette; also called second-hand smoke.

Epidemiological: dealing with the scientific study of the incidence, control, and spread of disease in a population.

Follow-up testing: the testing designed to confirm the results of the initial testing using identical testing devices and similar test conditions.

Fungi: a large group of organisms including molds, mildews, yeasts, mushrooms, rusts, and smuts. Most fungi produce spores, which are broadcast through the air so that virtually all environmental surfaces will have some fungal material. Most health effects are associated with allergic responses to antigenic material or toxic effects from mycotoxins. Fungi also generate certain volatile organic compounds.

Half-life: the amount of time it takes for half of the existing amount of a radioactive element to decay to non-radioactive products.

HEPA (high-efficiency particulate air) filter: a specialized filter capable of removing 99.97% of particulates 0.3 μ in diameter.

House dust mite: a common microscopic household arachnid, which feeds on shed skin scales, and so tends to concentrate around mattresses and furniture. Antigens present in the mite's excreta are implicated in cases of allergic asthma and allergic rhinitis.

HVAC: heating, ventilating, and air-conditioning system.

Indoor air quality (IAQ): characteristics of the indoor climate of a building, including the gaseous composition, temperature, relative humidity, and airborne contaminant levels.

Infiltration: air movement into an enclosed space through cracks and openings.

Local exhaust ventilation: an industrial ventilation system that captures and removes contaminants emitted from nearby sources before dilution into ambient workplace air can occur.

Man-made mineral fibers (MMMF): fiber insulation products including glasswool, fiberglass, rock wool, slag wools, as well as refractory ceramic fibers, which are used for fireproofing.

Mildew: a superficial covering of organic surfaces with fungi under damp conditions.

Mitigation: a procedure or strategy aimed at reducing or eliminating an indoor air problem, either through source control, ventilation control, exposure reduction, or air cleaning.

Mold: a fungal infestation that causes disintegration of a substance.

Mycotoxin: a metabolic product generated by certain fungi; includes both useful substances, such as penicillin, and harmful substances, such as aflatoxin.

NESHAP: National Emissions Standard for Hazardous Pollutants

National Ambient Air Quality Standard (NAAQS): the US outdoor air quality standard designed to protect public health. Pollutants covered by the NAAQS include ozone, sulfur dioxide, lead, nitrogen dioxide, respirable particulates, and carbon monoxide.

National Institute for Occupational Safety and Health (NIOSH): the US government agency authorized to research and develop exposure criteria for toxic substances and recommend these standards to OSHA. NIOSH is also authorized to investigate unsafe working conditions.

Natural ventilation: the supply of outdoor air through passive flow from windows, chimneys, doors, and other infiltration.

Negative ion generator: an air cleaning device that uses static charges to remove particulates from indoor air.

Nitrogen dioxide (NO₂): a pollutant associated with combustion; a deep lung irritant.

Occupational Safety and Health Administration (OSHA): the regulatory arm of the US Department of Labor, which promulgates safety and health standards, facilitates training programs, and enforces regulations on work sites. OSHA has developed permissible exposure limits for over 600 contaminants present in the industrial workplace.

Ozone (O₃): a highly reactive form of oxygen. Ozone exposure can result in mucous membrane irritation and potential pulmonary damage. Some copier machines and laser printers emit noticeable levels.

Ozone generator: an air cleaning device that produces highly reactive ozone, which reacts with volatile organic compounds to form non-hazardous products, remove particulates, and reduce the number of biocontaminants. These devices are controversial because their touted benefits may only be accomplished at ozone levels above recommended exposure levels.

Particulates: small airborne particles found in indoor environments which include fibrous materials, solid-state semi-volatile organic compounds, and biological materials.

Passive smoking: the inhalation of environmental tobacco smoke; also called involuntary smoking.

Pathogen: any microorganism or substance that causes disease.

Permeable: porous, allowing the passage of air.

Picocurie: a unit of measurement used to describe radon concentration.

Plenum: the portions of the air distribution system that makes use of the building structure, and the sheet metal that connects distribution ductwork to an air handling unit. Many buildings use the space above a dropped ceiling as a plenum.

Preventive maintenance: a program of building maintenance implemented to reduce the possibility of problems, usually through periodic inspection, cleaning, adjustment, calibration, and replacement of functioning parts of the HVAC system, as well as housekeeping practices to reduce the buildup of potential contaminants.

Radioactive decay: the disintegration of the nuclei of the atoms of radioactive (charged) elements with the concomitant release of alpha, beta, or gamma rays.

Radon: the gas emitted by the decay of radium and uranium in rock.

Relative risk: the ratio of health impact incidence among exposed individuals to incidence among unexposed individuals.

Reservoir: the environmental substrate, or source, of a particular organism. Reservoirs for indoor biocontaminants include stagnant water, moist surfaces, and dust collection sites.

Respirable suspended particulates: particulates less than 10 µm in diameter that can enter the respiratory tract.

Return air: the air removed from an occupied space and returned to the air handler to be exhausted or recirculated.

Setback: a reduction of climate control energy demand in HVAC controls when a building is unoccupied.

Sick building: a building in which the indoor air quality is considered to be unacceptable to a substantial majority of occupants.

Sick building syndrome (SBS): a phenomenon in which building occupants experience a variety of health and/or comfort effects linked to time spent in a particular building, but where no specific illness or causative agent can be identified. Symptoms in sufferers often include headaches, eye irritation, and respiratory irritation.

Source control: a preventive strategy for reducing airborne contaminant levels through removal of the material or activity generating the pollutants.

Stack effect: a condition resulting from the rise of heated air, which creates positive pressure near the top of the building and negative pressure toward the bottom. Stack effect pressures have been known to overpower mechanical ventilation systems, disrupting proper circulation and contributing to the infiltration and stagnation of pollutants.

Statistical significance: the probability that and degree to which the results of an experimental study describe an actual relationship between two factors beyond that which might be expected by pure coincidence.

Systems control: the control of indoor air pollutants through the use of mechanical means such as ventilation control or air cleaning.

Testing, adjusting, and balancing (TAB): the diagnostic and corrective procedures for HVAC controls and operating components to ensure provision of specified airflow rates and environmental conditions.

Threshold: the contaminant dose or exposure level below which there is no expected significant effect.

Threshold limit value (TLV): the American Conference of Governmental Industrial Hygienists recommended guideline for exposure limit represented in terms of exposure over a work day (8 hours) or a work week (40 hours).

Tight building syndrome (TBS): a condition in which a building is very tightly insulated against infiltration, its ventilation is reduced for energy conservation, and airborne contaminants are sufficiently elevated to cause health effects in occupants; often used synonymously with sick building syndrome (SBS).

Total volatile organic compounds (TVOCs): a measure representing the sum of all VOCs present in the air to provide an approximate indication of pollutant levels. Indoor air typically contains hundreds of different VOCs in very low concentrations, some of which can have additive effects.

Toxicant: a substance that can cause tissue damage or otherwise affect organs or systems within the body.

Tracer gas: an inert compound that is a rare constituent of indoor air which is released into building air and monitored qualitatively and/or quantitatively to characterize airflow characteristics to determine air pathways, infiltration, and ventilation efficiency measurements.

Urea formaldehyde foam insulation (UFFI): a form of insulation no longer in use because of excessive formaldehyde emissions and documented associated health impacts.

Ventilation effectiveness: a measure of the fraction or percentage of outdoor air that reaches the occupied zone of a specified area; an evaluation of air delivery to occupants, regardless of the effectiveness of contaminant removal.

Ventilation efficiency: an evaluation of the pollutant removal capacity of a ventilation system.

Ventilation standard: a specification for the minimum rate of input of outdoor air into indoor spaces

Volatile organic compound (VOC): one of a class of chemical compounds; indoor sources include tobacco smoke, building products, furnishings, cleaning materials, solvents, and office supplies. In sufficient quantities, VOCs can cause eye, nose, and throat irritations; dizziness; and headaches. Some VOCs are suspected carcinogens. Data for health effects resulting, from exposure to the characteristically low levels of VOCs in the indoor environment are scarce.

Appendix C-2

Common Medical Terms Associated with Indoor Air Quality

Allergen: a substance that can trigger an immune response, resulting in an allergic reaction; also known as antigen. Allergens include living agents – such as bacteria, fungi, amoebae, and algae—and nonliving biological products—house dust, animal dander, spores, and insect feces.

Allergic asthma: an allergic illness that can be triggered by a variety of biological agents and exacerbated by such factors as cigarette smoke, sulfur dioxide, and emotional stress. It causes bronchospasm, swelling of the bronchial mucosa, and accumulation of bronchial mucus. Symptoms include wheezing, shortness of breath, itching of the nose, and rhinorrhea.

Allergic illness: an illness caused by an allergen, usually upon second exposure. Although often associated with biological substances, allergic diseases may also be triggered by certain chemicals. Airborne exposure to allergens may occur on the skin, the nose, airways, even the lung alveoli.

Allergy: an increased reactivity to an antigen as a result of previous exposure.

Antigen: the same as allergen.

Antigenic: being able to induce an antibody response.

Asbestosis: the fibrous scarring of the lungs from inhalation of asbestos fibers.

Asthma: a disease of the pulmonary or lower respiratory system characterized by episodic bronchial constrictions that cause severe wheezing and shortness of breath.

Building related illness (BRI): a diagnosable illness with identifiable symptoms whose cause can be directly attributed to airborne pollutants within the building (e.g., Legionnaires' disease, hypersensitivity pneumonitis).

Cilia: the short hairlike structures on the surfaces of the cells lining the nose, pharynx, and trachea of the human respiratory system, which beat in waves to carry foreign particles and mucus away from the lungs.

Humidifier fever: a form of pneumonitis attributed to allergic reactions of the alveolar walls of the lungs to amoebae, bacteria, or fungi found in humidifier reservoirs, as well as air conditioners and air cooling equipment. While the disease produces flu-like effects of hypersensitivity pneumonitis (HP) within 8 hours of exposure, these symptoms resolve within 24 hours, without the long-term lung damage (pulmonary fibrosis) associated with other forms of HP.

Humidifier lung: a form of hypersensitivity pneumonitis; symptoms include fever, chills, muscle aches, cough, and dyspnea. Long-term exposure can result in permanent lung damage.

Hypersensitivity disease: a type of disease characterized by allergic responses to antigens. The only hypersensitivity diseases demonstrably due to indoor airborne exposure are hypersensitivity pneumonitis, allergic asthma, allergic rhinitis, and allergic aspergillosis. Of these, allergic asthma and allergic rhinitis occur only in genetically predisposed individuals, typically after years of exposure to low levels of antigens.

Hypersensitivity pneumonitis (HP): a rare but serious allergic disease with flu-like symptoms of chills, fever, dry cough, shortness of breath, chest tightness, and fatigue, which can result in progressive lung damage with continuous exposure to the causative agent. Sources of HP include viable and nonviable particles from bacteria, fungi, and protozoa.

Immunological: pertaining to an inherited, acquired, or induced response to an agent.

Legionnaires' disease: a severe multisystemic illness caused by *Legionella pneumophila* bacteria that can affect not only the lungs but also the gastrointestinal tract, central nervous system, and kidneys. It has a long incubation period (4-10 days), and while only 2%-3% of those infected with the bacteria contract the disease, the disease can be fatal.

Mass psychogenic illness: a condition in which numerous persons report similar physical symptoms—such as nausea, fainting, headaches, and dizziness—that are traceable to psychological factors rather than physical environmental factors.

Multiple chemical sensitivities (MCS): a medical condition affecting several organs, in which a person reports sensitivity to very low doses of a variety of chemicals after an identifiable exposure to one chemical. This condition is controversial in the medical community because its origin is not well documented or understood.

Neurotoxic: affecting the nervous system and causing such symptoms as headaches, dizziness, and nausea.

Pontiac fever: a form of legionellosis that is much milder than Legionnaires' disease. It has a short incubation period (~3 days) and attacks 90% of those infected. Reports of Pontiac fever are rare, possibly because of the similarity of the symptoms—fever, chills, headache, muscle ache—to the flu.

Pulmonary: having to do with that part of the lungs where gas exchange occurs, including the alveolar ducts and alveoli.

Sick building syndrome (SBS): a phenomenon in which building occupants experience a variety of health and/or comfort effects linked to time spent in a particular building, but where no specific illness or causative agent can be identified. Symptoms in sufferers often include headaches, eye irritation, and respiratory irritation.

Systemic effects: the physical effects that occur following absorption of a given agent into the body, manifesting at an organ or site removed from the point of contact

Appendix D

U.S. Government Agencies & Professional Organizations Associated with Indoor Air Quality Issues

Government Agencies

Consumer Product Safety Commission (CPSC)

4330 East West Highway
Bethesda, MD 20814
800-638-CPSC or 800-638-2772

The CPSC reviews complaints regarding safety of consumer products and takes action to ensure product safety.

General Services Administration (GSA)

18th and F Streets NW
Washington, DC 20585
202-502-1464

The GSA writes IAQ policy for federal buildings, provides proactive IAQ building assessments, assesses complaints, and provides remedial action.

National Institute for Occupational Safety and Health (NIOSH)

Hazard Evaluations and Technical Assistance Branch (R-9)
4676 Columbia Parkway
Cincinnati, OH 45276
Requests for information, toll-free: 800-35-NIOSH or 800-356-4674
Requests for field investigations, direct: 513-841-4382

NIOSH conducts research, recommends standards to the US Department of Labor, and conducts training on various issues including IAQ to promote safe and healthful workplaces. The institute undertakes investigations at the request of employees, employers, other federal agencies, and state and local agencies to identify and mitigate workplace problems.

Occupational Safety and Health Administration (OSHA)

Department of Labor
200 Constitution Avenue
Washington, DC 20210
202-523-5181

OSHA promulgates safety and health standards, facilitates training and consultation, and enforces regulations to ensure that workers are provided with safe and healthful working conditions.

US Department of Energy (DOE)

Office of Conservation and Renewable Energy
1000 Independence Avenue SW, CE-43
Washington, DC 20585
202-586-9455

The DOE quantifies the relationships among reduced infiltration, adequate ventilation, and acceptable IAQ.

US Environmental Protection Agency (EPA)

Indoor Air Quality Information Clearinghouse
P O Box 37133
Washington, DC 20013-7133
Toll-free: 800-438-4318
Direct: 301-585-9020
Fax: 301-588-3408

EPA conducts a nonregulatory IAQ program that emphasizes research, information dissemination, technical guidance, and training. The agency issues regulations and carries out other activities that affect IAQ under the laws for pesticides, toxic substances, and drinking water.

US Department of Health and Human Services (DHHS)

Office on Smoking and Health
National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control
1600 Clifton Road NE
Mail Stop K50
Atlanta, GA 30333
404-488-5705

The DHHS disseminates information about the health effects of passive smoking and strategies for eliminating exposure to environmental tobacco smoke.

Professional and Standard Setting Organizations

Air-Conditioning and Refrigeration Institute (ARI)

1501 Wilson Blvd., Suite 600
Arlington, VA 22209
703-524-8800

ARI represents manufacturers of air-conditioning, refrigeration, and heating products and components, provides technical assistance to government agencies, and develops and establishes equipment and application standards and certification. It has an active committee involved in IAQ issues.

American Board of Industrial Hygienists (ABIH)

4600 Jest Saginaw, Suite 101
Lansing, MI 48917-7737
517-321-2638

ABIH oversees the certification of industrial hygienists and coordinates the development and promotion of standards for professional practice. ABIH maintains a lists of certified practitioners, and is developing a list of professionals demonstrating proficiency in IAQ matters.

American Conference of Governmental Industrial Hygienists (ACGIH)

6500 Glenway Avenue, Building D-7
Cincinnati, OH 45211
513-661-7881

ACGIH is a professional society composed of individuals in government positions responsible for the practice of industrial hygiene as well as related research or educational matters. The organization is best known for publishing a regularly updated manual of threshold limit values for exposure to hazardous substances in the industrial workplace.

American Industrial Hygiene Association (AIHA)

P.O. Box 8390
345 White Pond Drive
Akron, OH 44320
216-873-2442

AIHA promotes research on all aspects of industrial hygiene. AIHA's Indoor Environmental Quality Committee has developed indoor investigation protocols, guideline thresholds for indoor environments, and informational programs and seminars for specialists.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

1971 Tullie Circle NE
Atlanta, GA 30329-2305
404-636-8400

ASHRAE sets industry standards on ventilation, thermal conditions, methods of testing ventilation devices, and commissioning of HVAC Systems.

National Conference of States on Building, Codes and Standards (NCSBCS)

505 Huntmar Park Drive, Suite 210
Herndon, VA 22070
703-437-0100

NCSBCS includes state building code officials, building material manufacturers, consumer groups, and others interested in seeking a cooperative solution to the building regulatory system. The conference assists in the development of uniform standards, and develops standards and code practices to encourage the introduction of innovative building materials.

Appendix E

Suggestions for Answering Common Questions

Is the air in this school safe?

This is perhaps the most difficult question to answer. If results of indoor air quality assessments indicate that the school is within normal ranges, you can state that the school is safe. However, you may want to qualify that with the statement that it is impossible to guarantee that no one will experience health symptoms related to air quality in the school. A very sensitive individual may react to very low levels of pollutants or something as common as odors from felt tip pens or paints used in art class.

Is this a sick building?

Sick building syndrome is a term used to describe situations in which building occupants experience acute health symptoms that seem to be related to time spent in a building, but for which no specific illness or cause can be diagnosed. **Avoid labeling** any school a "sick building." Even if experience in the building seems to fit the definition, choose instead to respond to this question by briefly stating the facts about air quality in the building and what is being done to alleviate problems.

Has air in this school made people sick?

If people have complained of health symptoms that appear related to indoor air quality, state that there have been some complaints, but that it is difficult to establish a clear link between specific symptoms and air quality in the school. Consider that, in general, a student is in school only about six to seven hours in a 24 hour period. The health symptoms may be associated with air in the school building or with some other factor. A doctor would need to determine whether or not an individual's illness can be linked to air quality in the school.

How does indoor air quality affect health?

Pollutants in the air are related to a number of health related symptoms including respiratory problems, headaches, eye irritation, asthma attacks, allergic reactions, fatigue, shortness of breath, dizziness and more. Many of these symptoms are nonspecific, however, making it difficult to link them conclusively with air quality. Headaches, for example, could be caused by a variety of condition, ranging from eye strain to tumors.

What kind of air pollutants can be found in a school?

A wide variety of pollutants can be found in schools. These include volatile organic compounds (VOCs) which are emitted from such things as carpet adhesives, particleboard shelving, felt tip markers, printers and photocopiers, cleaning supplies, the glues used in binding textbooks, and even air fresheners. Others are biological agents (biocontaminants) such as pollens, spores and mold, bacteria and viruses, animal dander, and dust mites; particulates including asbestos and lead; ozone emissions from office machinery; combustion products from heating and cooking appliances and tobacco smoke; and, radon.

Why are indoor air problems so common in schools?

Schools present more air quality problems than most indoor environments for several reasons:

- ◆ Large numbers of people are concentrated in small areas for relatively long periods of time.
- ◆ A wide variety of activities occur in schools that contribute to air quality problems. Science, art and industrial arts classes, for example, use supplies such as paints, glues, inks, and acids that are sources of VOCs.
- ◆ Tight school budgets have resulted in cutbacks in general maintenance and repairs, creating conditions in which air quality problems arise.
- ◆ Energy conservation concerns have prompted school officials to reduce ventilation and seal buildings. As a result, indoor air pollution levels increase and oxygen supplies decrease.
- ◆ Cheap construction typical in the 1950's and 60's has resulted in a large number of school buildings with inadequate ventilation systems.
- ◆ Building commonly used building materials contribute to pollution problems.

Appendix F

References

References

The following documents were utilized during the process of developing ST##P Public School's Indoor Air Quality Management Plan.

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