STAFFORD COUNTY SCHOOL BOARD

Agenda Consideration

TOPIC: Energy Resolution for Facility Construction & Major Renovation Designs

ITEM NO.: 9C

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MEETING: February 28, 2006
ACTION DATE: February 28, 2006

ACTION REQUESTED BY THE SUPERINTENDENT: That the School Board approve a resolution (attachment 1) to consider and when appropriate incorporate U.S. Green Building Council's Green Building Program (LEED), High – Performance School Building Program and EPA's Energy Star Performance goals in all facility construction and major renovation designs

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KEY POINTS:

1. In the United States, buildings account for 36% of all energy used, more than 65% of the electricity consumed, 30% of the greenhouse gas emissions, 30% of the raw materials used, 30% of waste output (130 million tons) and 12% of potable water consumed.

Over the last 10 years, advancements in building operations, materials and technology have become more available to building owners, managers, designers and builders who want to be more environmentally conscious, reduce energy cost and build "green." Through these advancements, both economic and environmental performances can be maximized.

U.S. Green Building Council's Green Building Program (attachment 2)

a. What is Green Building?

- Collection of design and construction strategies when utilized, significantly reduce or eliminate the negative environmental impacts of building, and provide healthy indoor space for the occupants.

b. What are the benefits implementing Green Building?

- More efficient and cost effective use of building resources.
- Significant energy and operational savings.
- Increased productivity and reduced absenteeism among occupants.
- Reduced storm water and air pollution impact.

c. What is the Cost and Return on Investment (ROI) of implementing Green Building?

- Recent analysis of existing Green Buildings show an upfront building cost increase from 0-5% of the total construction costs. However, these same additional costs are recouped through reduced operational costs over the life of the building.

d. How "Green" is measured?

- U.S Green Building Council (USGBC) developed LEED (Leadership in Energy and Environmental Design). LEED is the nationally accepted standard for green buildings.
- LEED allots points for: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality and Innovation and Design.
- A LEED project can strive for one of the following LEED award levels: Certified (26-32 points), Silver (33-38 points), Gold (39-51 points) or Platinum (52-69 points).

High – Performance School Buildings Program (attachment 3)

a. What are they?

- High-performance school buildings have three key characteristics: ***Healthy and Productive, Cost-effective, and Sustainable*.**
- These buildings are ***"healthy and productive"*** for students and teachers in that they provide high levels of acoustic, thermal and visual comfort, large amounts of natural daylight, superior indoor air quality, and a safe and secure environment. They are ***cost-effective*** to operate and maintain because their design employs energy analysis tools that optimize energy performance. They are ***sustainable*** because they integrate energy conservations and renewable energy strategies, high-performance mechanical and lighting systems, environmentally responsive site planning, environmentally preferable materials and products, and water-efficient design.

Environmental Protection Agency's Energy Star Program (attachment 4)

a. What is it?

- EPA's Energy Star Program calls on businesses and institutions across the country to take the right steps to identify buildings where financially prudent improvements can reduce energy use by 10% or more and to make the improvements now through proven methods such as low-cost building tune-ups, lighting upgrades, and replacement of old equipment.

b. Energy Star promotes three important actions:

- Determine how much energy buildings are using
- Establish efficiency improvement goals
- Make improvements

2. Staff plans to integrate the goals of these three (3) programs into all new facility and major renovations design efforts.

3. Implementation of these goals by definition is designed to reduce building operation cost and save/conserve energy. However, some features can and will add cost to initial construction or renovation but ultimately through life-cycle cost decrease operational cost,

enhance facility environment and reduce energy consumption

SCHOOL BOARD GOAL: #5 - Provide facilities that promote student learning and community support

#7 - Provide school environments where teachers are safe to teach and students are safe to learn.

FUNDING SOURCE: N/A

AUTHORIZATION REFERENCE: Policy 4-55 Conservation of Resources

STAFFORD COUNTY PUBLIC SCHOOLS

INDOOR AIR QUALITY MANAGEMENT PLAN

February 2006

IAQ MANANGEMENT PLAN

I. Introduction

The IAQ Management Plan provides uniform procedures and practices to be implemented consistently throughout the school district to improve and maintain good air quality. Good indoor air quality contributes to a favorable learning environment for students, productivity for teachers and staff, and a sense of comfort, health, and well-being for all school occupants. These combine to assist a school in its core mission – educating children. Through the careful and consistent implementation of this Management Plan, all school facilities will better prevent, identify, and remedy concerns about IAQ.

II. IAQ Coordinator

- Knowledgeable of and willing to learn about IAQ related issues such as building maintenance, heating, and ventilation systems, health, and safety
- Readily available to respond to IAQ related questions and concerns
- Granted access to all facilities to inspect or respond to IAQ issues
- Point of contact for district staff, students, parents, government agencies, and media on IAQ issues
- Given authority to address most IAQ issues

III. IAQ Advisory Committee

- Comprised of: IAQ Coordinator
  Supervisor of Physical Plants
  Representative from Health Advisory Committee
  Coordinator of Custodial Services
  Head Nurse
  Assistant Director of Maintenance and Operations
- Education of district staff regarding IAQ issues
- Design and approval of IAQ procedures/information for inclusion in IAQ Management Plan
- Review of all reported issues

IV. Walk-through Inspection

A walk-through inspection should be performed during normal occupancy and operational times – while classrooms are occupied and the ventilation equipment running. The inspection should cover classrooms, hallways, offices, building entrances, the roof, mechanical rooms, and air intakes. The walk-through inspector(s) should ask questions of building occupants and write comments in order to clarify the nature and history of known or potential IAQ issues. Building administrators are encouraged to perform such inspections on an ongoing basis. Additionally, inspections may be conducted by the IAQ Coordinator and or other Maintenance/Operations support staff.

Evidence of the following issues must be assessed during a walk-through inspection of a building:

- Water intrusion problems (such as discoloration/bulging/cracks in ceiling tiles; plaster, wall coverings, and carpeting)
- Ventilation failures (such as stuffiness, high level of odors, windows open, high temperatures, lack of air movement, excess dust levels, and humidity)
- Building cleanliness (such as carpets clean, dustiness, presence of past days garbage, and food/drink spills, pest management)

See Attachment #1. Walk-through Inspection Checklist.

V. Building Systems Evaluation

An evaluation of key building systems must be performed in order to assess issues not easily identifiable during the walk-through inspections. The three key building systems are classrooms, ventilation systems, and building maintenance.

See Attachment #2. Preventative Maintenance Schedule.

VI. Cleaning Standards

Regular and thorough classroom cleaning is important to ensure good indoor air quality. The custodian and teacher play a vital role in promoting and maintaining classroom cleanliness. The presence of dirt, moisture, and warmth stimulates the growth of molds and other biological contaminants. Unsanitary conditions attract insects and vermin, leading to possible indoor air quality problems from animals or insect allergens.

See Attachment #3. Cleaning Standards for Classrooms with Unit-Ventilators.
See Attachment #4. Teacher Classroom Checklist.

VII. Remediation

The purpose of mold remediation is to remove the mold to prevent significant human exposure and damage to building materials and furnishings. It is necessary to clean up mold contamination, not just to kill the mold.

Remediation guidelines are based on the size of the affected area to make it easier for remediators to select appropriate techniques. It should be noted that there is no research showing there is a specific method appropriate at a certain number of square feet. Professional judgment and an extra measure of caution will be utilized to adapt the guidelines to particular situations.

For the purpose of developing a remediation plan, the following square feet criteria, as recommended by the EPA, shall be utilized:
Small – Total surface area affected less than 10 square feet (ft^2)
Medium – Total surface area affected between 10 and 100 (ft^2)
Large – Total surface are affected greater than 100 feet (ft^2)

See Attachment #5. Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water.
See Attachment #6. Water Damage – Cleanup and Mold Prevention.

VIII. IAQ Concern Reporting Forms

This form should be used to report concerns related to indoor air quality. Indoor air quality problems include concerns with temperature control, ventilation, and air pollutants. It may be important to record specific occasions when experiencing a symptom of ill health or discomfort that may or may not be linked to an environmental condition in the building.

See Attachment #7. Indoor Air Quality Concern Form.
See Attachment #8. Occupant Diary

IX. Sampling

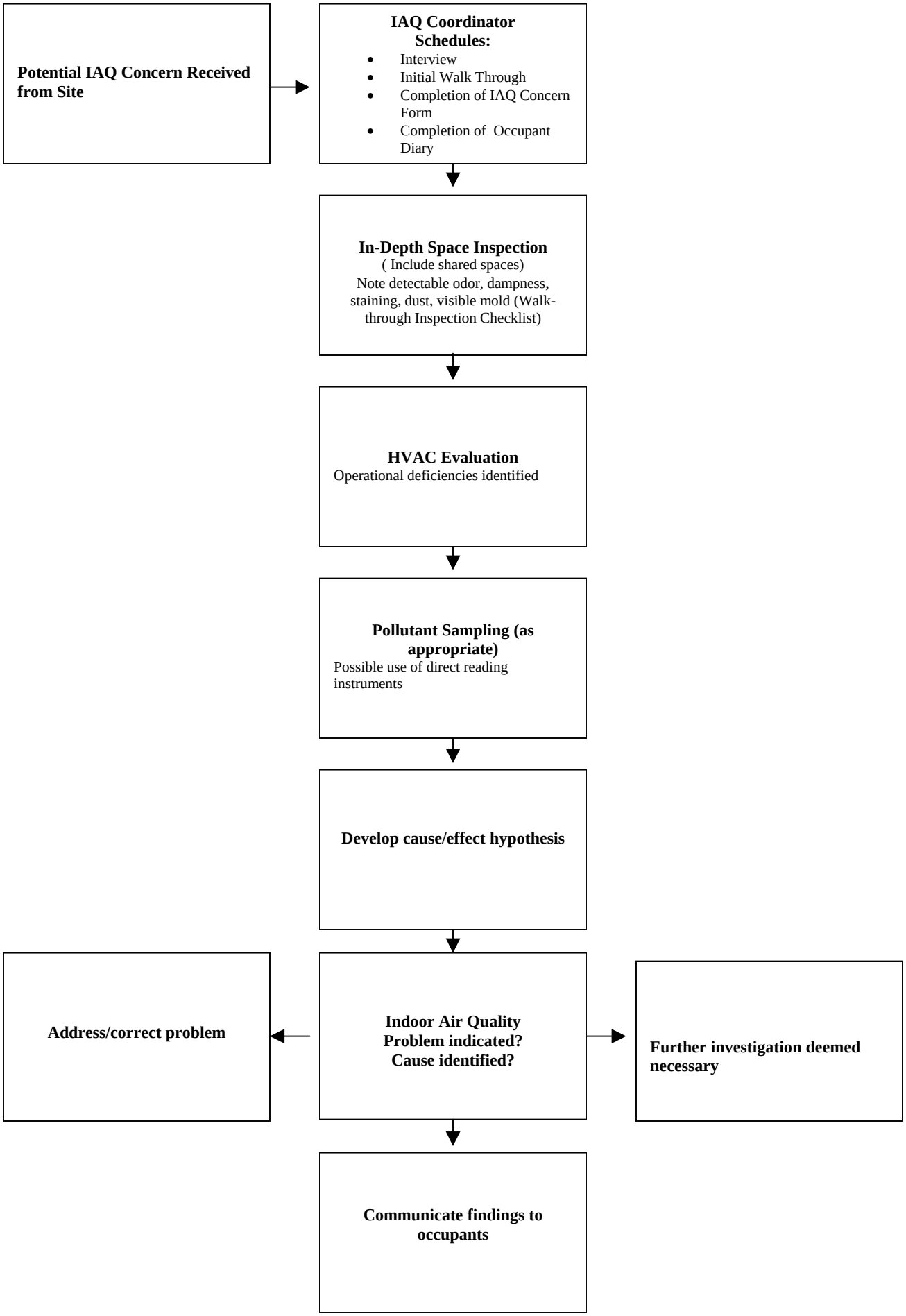
Is sampling for mold needed? In most instances, if visible mold growth is present, sampling is unnecessary. In specific instances when the source(s) of suspected mold contamination is unclear and/or health concerns are a problem, sampling may be included as a part of the site evaluation. Surface sampling may also be useful in order to determine if an area has been adequately cleaned or remediated.

The results of sampling may have limited use or application. Sampling may help locate the source of mold contamination, identify some of the mold species present, and differentiate between mold and soot or dirt.

Pre and post remediation sampling may also be useful in determining whether remediation efforts have been effective. After remediation, the types and concentrations of mold in indoor air samples should be similar to what is found in the local outdoor air. Air sampling provides information only for the moment in time in which the sampling occurred, much like a snapshot.

X. Basic Response Sequence (Page 4)

BASIC RESPONSE SEQUENCE



Attachment #1: Walk-through Inspection Checklist

Walkthrough Inspection Performed by:

_____ _____

Name Date

Room/ Space	Water Damage/ Visible Mold	Venti- lation	Unusual Odors	General Cleanliness	Dust	Animals	Humidity/ Temp.	Comments/ Recommendations

Complete this checklist in a manner that will help you document issues, and create solutions and policies that address the issues.

Attachment #2: IAQ Preventative Maintenance Schedule

	Every 3 Months	Every 6 Months	Annually	As Needed
HVAC Systems				
Filters replaced	X			
Fan/air flow direction	X			
Belt tension		X		
Drain pans intact not leaking		X		
Drain pans clean		X		
Insulation at or near unit clean no deterioration	X			
Overall cleanliness of ductwork			X	
Min. outdoor air set for 15 - 20 percent		X		
Calibration of system				X
All thermostats functional			X	
No pollution sources within 25ft of intakes		X		
Outdoor air intakes secure			X	
Rodent wire secure and in place			X	
All doors and covers secure	X			
Dampers operation properly		X		
Plenum insulation in place no deterioration		X		
No condensation leaks	X			
No HW/CW leaks	X			
Univents				
No objects on univent diffusers	X			
Filters replaced	X			
Insulation at or near unit clean no deterioration	X			
No condensation leaks	X			
No HW/CW leaks present	X			
Calibration of system				X
All thermostats functional			X	
No pollution sources within 25 ft of intakes		X		
No obstruction of air intakes		X		
Outdoor air intakes secure			X	
Rodent wire secure & in place			X	
All doors and covers secure	X			
Dampers operating properly			X	
Drain pans intact not leaking		X		
Drain pans clean		X		

Attachment #2: IAQ Preventative Maintenance Schedule (continued)

	Every 3 Months	Every 6 Months	Annually	As Needed
Cleaning Schedule				
Clean heating coils		X		
Clean cooling coils		X		
Clean drain pans		X		
Cleaning of ductwork				X
Clean condenser coils			X	
Exhaust System				
Proper exhaust		X		
Air direction correct		X		
No obstruction of exhaust		X		
Belt tension		X		
Outdoor vent cleaned				X
Exhaust system operating at corret time		X		
All doors and covers secure		X		
Roof plumbing vent stacks are un-occluded	**Monthly**			
Housekeeping				
Ceiling tile in good condition, no stains	X			
Sewage traps filled with water	**Monthly**			
All leaks reported	**Immediately**			
Spills or water intrusion reported	**Immediately**			

Attachment #3: Cleaning Standards for Classrooms with Unit – Ventilators

Carpet Cleaning:

Usage of Pro Team backpack vac with Four-Level Filtration system combines "Intercept Micro Filters, micro filters and High Filtration Media Disks that are up to 99.79% efficient in filtering particles down to a .3 micron size."

Tile Cleaning:

- Usage of Pro Team backpack vac as described above for daily maintenance.
- Scrub floors at least twice a year with Auto Scrubber and recoat. (Remove furniture from middle of floor)
- Strip and recoat floors yearly with Auto Scrubber and recoat with at least 7 coats of floor finish. (Remove all furniture)
- Run air conditioner and dehumidifiers when stripping.

General:

- Window sills wiped monthly with non-acid biological disinfectant
- Spills or leaks immediately removed from carpet or tile
- Entrance mats that account for 3 steps (minimum 1 yard)

Attachment #4: Teacher Classroom Checklist

The classroom teacher is encouraged to inspect the classroom on a daily basis and take the necessary steps to promote and maintain classroom cleanliness. Any and all concerns are to immediately be brought to the attention of the Principal and or Custodian.

General:

__ Trash removed daily

__ Food not kept in classroom overnight

__ Classroom free from clutter. No area rugs over existing carpet

__ Classroom is dusted and cleaned regularly

__ No animals at anytime (Exception: See guidelines for service pets)

__ All spills or leaks immediately removed

__ Water run in sinks at least once per week

__ Classroom toilets flushed once per week

__ Indoor surfaces of exterior walls free of condensate

__ Area around and under classroom sinks free from clutter and no apparent leaks

__ Ceiling tiles not stained or discolored

__ Temperature generally between 68 – 74 degrees F

__ Humidity is acceptable 30% - 58% relative humidity

__ Air is flowing unobstructed from air supply (No books, papers, furniture)

__ No unexplained odors (No need for scented air fresheners)

__ Chairs stored daily on top of desks

__ At end of school day, large pieces of paper, pencils, and paper clips removed from the floor

__ Furniture arranged so electrical outlets are accessible

Attachment #5: Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water*			
Material or Furnishing Affected	Cleanup Methods†	Personal Protective Equipment **	Containment ***
SMALL - Total Surface Area Affected Less Than 10 square feet (ft^2)			
Books and papers	3	Minimum N-95 respirator, gloves, and goggles	None required
Carpet and backing	1, 3		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3		
Non-porous, hard surfaces (plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3		
Wallboard (drywall and gypsum board)	3		
Wood surfaces	1, 2, 3		
MEDIUM - Total Surface Area Affected Between 10 and 100 (ft^2)			
Books and papers	3	Limited or Full Use professional judgment, consider potential for remediator exposure and size of contaminated area	Limited Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area
Carpet and backing	1,3,4		
Concrete or cinder block	1,3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1,2,3		
Non-porous, hard surfaces (plastics, metals)	1,2,3		
Upholstered furniture & drapes	1,3,4		
Wallboard (drywall and gypsum board)	3,4		
Wood surfaces	1,2,3		
LARGE - Total Surface Area Affected Greater Than 100 (ft^2) or Potential for Increased Occupant or Remediator Exposure During Remediation Estimated to be Significant			
Books and papers	3		
Carpet and backing	1,3,4		
Concrete or cinder block	1,3		

Attachment #5: Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water* (Continued)			
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1,2,3,4	Full Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area	Full Use professional judgment, consider potential for remediator exposure and size of contaminated area
Non-porous, hard surfaces (plastics, metals)	1,2,3,		
Upholstered furniture & drapes	1,2,4		
Wallboard (drywall and gypsum board)	3,4		
Wood surfaces	1,2,3,4		

†Cleanup Methods

- **Method 1:** Wet vacuum (in the case of porous materials, some mold spores/fragments will remain in the material but will not grow if the material is completely dried). Steam cleaning may be an alternative for carpets and some upholstered furniture.
- **Method 2:** Damp-wipe surfaces with plain water or with water and detergent solution (except wood —use wood floor cleaner); scrub as needed.
- **Method 3:** High-efficiency particulate air (HEPA) vacuum after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags.
- **Method 4:** Discard/remove water-damaged materials and seal in plastic bags while inside of containment, if present. Dispose of as normal waste. HEPA vacuum area after it is dried.

Select method most appropriate to situation. Since molds gradually destroy the things they grow on, if mold growth is not addressed promptly, some items may be damaged such that cleaning will not restore their original appearance. If mold growth is heavy and items are valuable or important, consult a restoration/water damage/remediation expert. Please note that these are guidelines; other cleaning methods may be preferred by some professionals.

**Personal Protective Equipment (PPE)

- Minimum: Gloves, N-95 respirator, goggles/eye protection
- Limited: Gloves, N-95 respirator or half-face respirator with HEPA filter, disposable overalls, goggles/eye protection
- Full: Gloves, disposable full body clothing, head gear, foot coverings, full-face respirator with HEPA Filter

***Containment

- Limited: Use polyethylene sheeting ceiling to floor around affected area with a slit entry and covering flap; maintain are under negative pressure with HEPA filtered fan unit. Block supply and return air vents within containment area.
- Full: Use two layers of fire-retardant polyethylene sheeting with one airlock chamber. Maintain are under negative pressure with HEPA filtered fan exhausted outside of building. Block supply and return air vents within containment area.

Attachment #6: Water Damage - Cleanup and Mold Prevention	
Guidelines for Response to Clean Water Damage within 24-48 Hours to Prevent Mold Growth*	
Water-Damaged Material	**Actions**
Books and papers	• For non-valuable items, discard books and papers. • Photocopy valuable/important items, discard originals. • Freeze (in frost-free freezer or meat locker) or freeze-dry.
Carpet and backing - dry within 24-48 hours	• Remove water with water extraction vacuum. • Reduce ambient humidity levels with dehumidifier. • Accelerate drying process with fans.
Ceiling tiles	• Discard and replace.
Cellulose insulation	• Discard and replace.
Concrete or cinder block surfaces	• Remove water with water extraction vacuum. • Accelerate drying process with dehumidifiers, fans, and/or heaters.
Fiberglass insulation	• Discard and replace.
Hard surface, porous flooring (Linoleum, ceramic tile, vinyl)	• Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary. • Check to make sure underflooring is dry; dry underflooring if necessary.
Non-porous, hard surfaces (Plastics, metals)	• Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.
Upholstered furniture	• Remove water with water extraction vacuum. • Accelerate drying process with dehumidifiers, fans, and/or heaters. • May be difficult to completely dry within 48 hours. If the piece is valuable, consult a restoration/water damage professional who specializes in furniture.
Wallboard (Drywall and gypsum board)	• May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace. • Ventilate the wall cavity, if possible.
Window drapes	• Follow laundering or cleaning instructions recommended by the manufacturer.

Attachment #6: Water Damage - Cleanup and Mold Prevention (Continued)	
Wood surfaces	• Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.) • Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry. • Wet paneling should be pried away from wall for drying.

*If mold growth has occurred or materials have been wet for more than 48 hours, consult Attachment #5 Guidelines.

Attachment #7: Indoor Air Quality Concern Form

This form can be filled out by the building occupant or by a member of the building staff.

Occupant Name: _____ __ Date: _____
Department/Location in Building: _____ Phone: _____
Completed By: _____ Title: _____ Phone: _____

This form should be used if your concern may be related to indoor air quality. Indoor air quality problems include concern with temperature control, ventilation, and air pollutants. Your observations can help to resolve the problem as quickly as possible. Please use the space below to describe the nature of the complaint and any potential causes. **(If more space is needed, please use back of form.)**

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?

__ Contact lenses __ Chronic cardiovascular disease __ Chronic neurological problems
__ Allergies __ Chronic respiratory disease __ Undergoing chemotherapy or radiation therapy
__ Immune system suppressed by disease or other causes

TIMING PATTERNS:
When did your symptoms start?

When do they generally intensify?

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?

Attachment #7: Indoor Air Quality Concern Form (Continued)

SPATIAL PATTERNS:
Where are you when you experience symptoms or discomfort?

Where do you spend most of your time in the building?

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

Have you sought medical attention for your symptoms? Findings you would feel comfortable sharing?

Do you have any other comments?

We may need to contact you to discuss your complaint. What is the best time to reach you?

So that we can respond promptly, please return this form to:_____
IAQ Coordinator

Attachment #8: Occupant Diary

Occupant Name: _____Title: _____Phone: _____

Location: _____File Number: _____

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

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

TIME/DATE	LOCATION	SYMPTOM	SEVERITY/DURATION	COMMENTS

REFERENCES

- Minnesota Department of Health, Indoor Air Quality Management Plan Development Package 2002

- EPA Indoor Air Quality, Tools for Schools 2000

- Adverse Human Health Effects Associates with Molds in the Indoor Environment, American College of Occupational and Environmental Medicine, October 27, 2002

- www.epa.gov/iaq/molds/mold_remediation.html

- nyc.gov/html/doh/html/epi/epimold.html

- www.cdc.gov/nceh/airpolution/mold