EPA Definition

“Indoor Air Quality can be defined as the temperature, humidity, ventilation, and chemical or biological contaminants of the air inside a building.”

ASHRAE Definition

Acceptable Air Quality: air in which there are no known contaminants at harmful concentrations as determined by cognizant authorities and with which a substantial majority (80% or more) of the people exposed do not express dissatisfaction.
MDH Indoor Air’s Role

- Technical support to MDE
- Individual consultation to schools
- Website
- Written guidance
- Radon testing tracking
- IAQ trainings
- Enforce smoking, radon, ice arena regulations

Agenda

- Review of Regulations
- IAQ Plan
- Radon
- Mold
- Resources

Regulations: A Quick Review
State Laws

Examples

- Notify parents & staff about pesticides (MS121A.30)
- Non-smokery (MS 121A.33)
- Limit school bus idling (MS 123B.885)
- Implement HVAC Plan (MS123B.76, 51244.76)
- Reduce toxic materials in purchasing and waste (MS 65C.079)
- Asbestos Management Plan (Part 763)
- SDS and Right to Know Information
- Follow OSHA standards—employees (MS 182)
- Lead-safe work practice for work in pre-1978 kindergartens (40 CFR Part 745)

State & Federal Laws

Examples

- Ensure safe indoor air quality (MS 144.1222)
- If radon testing done, follow state testing plan and report (MS 121B.571)
- Prohibit tobacco & e-cigarettes indoors (MS 144.411)
- Follow safe asbestos removal practices (MS 320.70)
- Reduce toxic materials in purchasing and waste (MS 65C.079)
- Asbestos Management Plan (Part 763)
- SDS and Right to Know Information
- Follow OSHA standards—employees (MS 182)
- Lead-safe work practice for work in pre-1978 kindergartens (40 CFR Part 745)
Do schools have environmental health programs?

<table>
<thead>
<tr>
<th>Program Components</th>
<th>% responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood borne Pathogens</td>
<td>78%</td>
</tr>
<tr>
<td>Chemical Safety</td>
<td>77%</td>
</tr>
<tr>
<td>IAQ</td>
<td>75%</td>
</tr>
<tr>
<td>Asbestos</td>
<td>74%</td>
</tr>
<tr>
<td>Pests</td>
<td>65%</td>
</tr>
<tr>
<td>Ventilation</td>
<td>64%</td>
</tr>
<tr>
<td>Mold</td>
<td>63%</td>
</tr>
<tr>
<td>Drinking Water</td>
<td>60%</td>
</tr>
<tr>
<td>Lead Paint</td>
<td>59%</td>
</tr>
<tr>
<td>Noise</td>
<td>57%</td>
</tr>
<tr>
<td>Outdoor Air Quality</td>
<td>56%</td>
</tr>
<tr>
<td>Food Safety</td>
<td>54%</td>
</tr>
<tr>
<td>PCBs</td>
<td>31%</td>
</tr>
<tr>
<td>Vehicle Idling</td>
<td>29%</td>
</tr>
<tr>
<td>Radon</td>
<td>17%</td>
</tr>
<tr>
<td>Green Cleaning</td>
<td>17%</td>
</tr>
<tr>
<td>UV Protection</td>
<td>10%</td>
</tr>
</tbody>
</table>

- All public school districts sent survey in 2014 (498)
  - 231 responded
- 77% (178) responded having a written environmental health and safety program

Inquiries submitted to MDH Indoor Air Unit

- Since 9/2011
- Tip of iceberg
  - Only Indoor Air (not asbestos, lead, vapor, pesticides, others)
- Half are complaint, half consultation
- Immediate/apparent problems drive complaints
Minnesota Statutes, 123B.595, Subd. 4. Facilities plans. (a)

To qualify for revenue under this section, a school district or intermediate district, not including a charter school, must have a ten-year facility plan adopted by the school board and approved by the commissioner. The plan must include provisions for implementing a health and safety program that complies with health, safety, and environmental regulations and best practices, including indoor air quality management.

Minnesota Statutes, 124E.03, Subd. 2. General federal, state and local requirements. (a)

A charter school shall meet all federal, state and local health and safety requirements applicable to school districts.

IAQ Plan

IAQ Coordinator Requirements

Appoint an IAQ Coordinator

• Based in school or spends most of his/her time
• Capable of answering parent’s basic questions
• Authorized to receive and respond to complaints
• Separate role from maintenance (health and safety oriented)
IAQ Plan
IAQ Coordinator Requirements

Capable of answering parent’s basic questions

• Where can parents go to find answers to their IAQ questions and concerns?

• Where can a parent obtain checklists or other self-help information so they can properly evaluate their child’s home or other out-of-school situation, including information provided by their child’s physician? (Parents want to do their part in working toward solutions.)

• How can a parent obtain information about school facility construction, maintenance and housekeeping practices, chemicals used, mold and HSVC-related information, chemical-producing academic subjects, pesticides and herbicides, and the like to determine the extent to which school activities contribute to a child’s symptoms?

• What can a parent do—how can a parent effect change—upon discovering questionable activities occurring within schools? Examples might be poor ventilation in the auto maintenance shop resulting in exhaust fumes or construction fumes leaking into the occupied portion of a building.

Create written IAQ Management Plan that describes policies

• ‘operational’ and implemented

• obtain school board adoption

• update yearly

• authority & responsibilities of IAQ Coordinator

Radon
Attention on Radon

Ventilation
Radon Key Facts

- A colorless, odorless gas
- From uranium in soil
- Cancer-causing
- Leading cause of lung cancer for non-smokers

Ventilation
Depressurization → soil gas entry

Radon Entry Into Schools
Radon in MN Schools vs Homes

- All MN Data (mostly homes)
  ~44% of buildings ≥ 4 pCi/L
- 2012-2019 (schools)
  - 1% of rooms ≥ 4 pCi/L
  - 13% of buildings ≥ 1 room ≥ 4 pCi/L

123B.571 RADON TESTING
Current law (could change)

Subdivision 1. Voluntary plan.

The commissioners of health and education may jointly develop a plan to encourage school districts to accurately and efficiently test for the presence of radon in public school buildings serving students in kindergarten through grade 12. To the extent possible, the commissioners shall base the plan on the standards established by the United States Environmental Protection Agency.

Subd. 2. Radon testing.

A school district may include radon testing as a part of its health and safety plan. If a school district receives authority to use health and safety revenue to conduct radon testing, the district shall conduct the testing according to the radon testing plan developed by the commissioners of health and education.

Subd. 3. Reporting.

A school district that has tested its school buildings for the presence of radon shall report the results of its tests to the Department of Health in a form and manner prescribed by the commissioner of health. A school district that has tested for the presence of radon shall also report the results of its testing at a school board meeting.

Radon Testing Plan (required)

- If short term testing is chosen, conduct testing on school days only (not holidays, vacations or weekends), between November 1 and March 31
- If long term testing is chosen, conduct testing in a manner where at least half the test duration includes days between November 1 and March 31
- Use certified radon testing devices
- Test all frequently-occupied rooms, including rooms with ground contact and rooms immediately above unoccupied spaces that are in contact with the ground, such as crawl spaces and tunnels.
Radon Testing Plan (required) cont.

- Conduct follow-up testing in all frequently-occupied rooms that have radon ≥ 4 pCi/L.
- Take corrective measures in frequently-occupied rooms that have radon ≥ 4 pCi/L following Environmental Protection Agency (EPA) guidelines described in "Reducing Radon in Schools: A Team Approach."
- Re-test after corrective measures that reduce radon levels.
- Report radon test results at a school board meeting.
- Report radon test results to the Minnesota Department of Health (MDH), using the MDH 'School Radon Testing Form' on the MDH school radon website.

Where to test

- Test all ground contact rooms
  - Includes all classrooms, offices, break rooms, laboratories, cafeterias, libraries, auditoriums, and gymnasiums
- Many schools still test a portion of rooms
- A sample of rooms will likely miss a problem room

Follow-up Testing

- Do follow-up testing in rooms at or above 4 pCi/L
  - Recommend use of continuous radon monitor
  - MDH can lend free of charge to school, management assistant, consultant
  - Levels may be high overnight, low during school hours
Ventilation
Radon Mitigation

• Balancing air flow
• Increase outdoor air supply
• Work with HVAC engineer or school/large building mitigator
  • not a home radon mitigator
• Usually don’t need to install new equipment

Radon Licensing Act

• Effective 1/1/19
• Professionals/contractors must be licensed to test or mitigate schools
• Systems are tagged so state can inspect
• School staff can test and mitigate school buildings they own or lease (without a license)

Resources

• MDH
  • Testing Plan
  • Guidance (see also AARST Radon Standard)
  • List of licensed/price
  • Planning your testing program
  • Review your reporting and advise on your testing and next steps
  • Lending CAMs
  • Presentations (per the issue)
• MN Cooperative Purchasing (Tesals/Department of Admin)
  • State Master Contract: $4.56 per test kit from Air Chek (short term)
  • Schools/districts eligible
  • www.intel-admin.state.mn.us/coop.htm
Radon Key Points

• Elevated radon can be found in schools
• Follow state testing plan
  • Important point: test all ground contact rooms
• Report ALL your results to MDH and board
• Recommend testing every 5 years
• We are available to advise, assist, train

Mold: Investigation and Remediation

Moisture
Where does the water go?
Moisture Interior

Investigate water infiltration  
Improve insulation / ventilation

Fix roof  
Plumbing problems

Moisture
Identify and Map Dampness

Infrared camera  
Boroscope  
Moisture Meter

Check inside walls

Moisture
Investigate Hidden Areas
Moisture Investigate Hidden Areas

- Remove ventilation diffuser
- Peel back carpet
- Pull away insulation
- Peel back base board

Moisture Examples of Mold Growth

- Above ceiling tile
- Above dry wall ceiling
- Behind mirror
- Behind vinyl wall covering
Moisture Examples of Mold Growth

- Wallboard, behind vinyl
- Backside of wallboard
- Wood beams
- Ceiling tile

Mold Cleanup Allowable Projects

- Engineering study
- Larger problems
  - Abatement done by trained persons
  - Containment
  - Personal protection

Containment

- 0-10 sq feet (small)
  - No containment
  - N-95, glove, goggles

- 10-100 (medium)
  - Limited or full containment
  - N-95/N-100, glove, goggles, coveralls

- 100+ or potential for increased exposure (large)
  - Full containment
  - N-100, gloves, goggles, coveralls
Personal Protective Equipment

Eye protection  Outer Clothing  Gloves  Respirator

Can you clean it?

Porous Materials:
• Insulation, drywall, upholstery, paper, carpet
• Throw away if growing visible mold

Non-Porous Materials:
• Concrete, brick, solid wood, metal, plastic
• Clean these items if in good shape

Resources
How To Develop a School Environmental Health Program

• 'Long-Term Facilities Maintenance Revenue-Guide for Allowable Expenditure' (MDE) education.state.mn.us/MDE/dse/schfin/fac/ltfm
• 'Health, Safety, and Environmental Management Program' (MDE) education.mn.gov/MDE/dse/schfin/fac/hhs/index.htm
• 'School Environmental Health Plan' (MDH): health.state.mn.us/communities/environment/schools/ehplan.html
• 'Model School Environmental Health Program' (USEPA) epa.gov/schools
• 'Healthy Sustainable Schools: Guide for Change' (MPCA) pca.state.mn.us/living-green/helping-schools-reduce-pollution

MDH School Environmental Health Web Portal

• 22 topic areas
• announcements
• sign up for announcements
• health.state.mn.us/communities/environment/schools

EPA Has Many Resources!

Tools for Schools Mobile App

SHIELDS: Technical 1 hr webinars

Energy Savings Plus Health: IAQ in Renovations
EPA School IAQ Assessment

• Free Assessment
  • HVAC
  • Moisture
  • Cleaning/maintenance
  • Pest management
  • Other source control

• For more information contact Jeanette Marrero at (312) 886-6543 or Marrero.Jeanette@epa.gov

MN Green Schools

MN GREEN SCHOOLS COALITON, created by dedicated USGBC volunteers, offers a network of support to grow greener, healthier learning spaces for all students.

Green Apple Day of Service
Strategic Planning with industry experts

Green Ribbon Award: How Green is Your School/District?

• The award highlights:
  • Reducing environmental impact and costs
  • Improving health and wellness
  • Providing effective environmental education

• Deadline: December

• MN Green Ribbon Schools website:
  • education.state.mn.us/MDE/dse/recog/grn/index.htm
Green and Healthy Schools

Questions? Suggestions?

Don't hesitate to contact me!

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