Boston Public Schools

Indoor Air Quality Management Plan

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1. Purpose

The mission of Boston Public Schools (BPS) Facilities Management is to ensure that the Boston Public Schools' buildings are welcoming, vibrant, clean, and safe. To do so, BPS Facilities Management manages, repairs, and provides maintenance and security for all 125 school buildings, 5 administrative locations, and 5 leased/closed buildings.

The health, safety, and comfort of the learning environment of students and staff are important priorities of Boston Public Schools. Indoor air quality (IAQ) is one of the key components to providing a healthy and comfortable learning environment. Indoor air pollutants may cause or contribute to short- and long-term health problems including asthma, respiratory tract infection and disease, allergic reactions, headaches, nasal congestion, eye and skin irritations, coughing, sneezing, fatigue, dizziness, and nausea. Additionally, indoor air pollutants and extremes in temperature and humidity affect students' ability to concentrate and learn.

The BPS IAQ Management Plan is designed to help monitor and improve the air quality in all BPS school buildings.

2. Plan Responsibilities

BPS IAQ Management Team: The BPS Facilities Management Environmental Division is responsible for providing the tools and resources necessary to implement the BPS IAQ Management Plan, and for ensuring that the provisions in the Plan are being followed.

The Environmental Division's responsibilities include:

- Acting as the key contact entity within the district to respond to and address IAQ concerns and issues from building occupants, management, and the public.
- Coordinating the development and implementation of the district's IAQ Management Plan, which includes conducting building walk-through inspections, conducting or coordinating the investigations of reported IAQ concerns and issues, and modifying the IAQ Management Plan to fit the specific needs and objectives of the district.
- Reviewing new BPS construction and renovation projects for IAQ concerns.
- Collaborating with other BPS departments to inform the BPS community about IAQ procedures, policies, and programs.
- Managing compliance with federal, state, and local environmental health regulations.

The BPS IAQ Management Team also includes support from the following trades and areas within Facilities Management: Energy Division, HVAC Division, Alterations & Repairs Division, and Sustainability Program.

Building Occupants: All BPS staff, students, families, and visitors' responsibilities include:

- Review all BPS IAQ Management Plan materials.
- Follow school and school district policies.
- No smoking or vaping on BPS property, per the HWD-06 BPS Tobacco and Nicotine-Free Environment Policy.
- Follow all anti-idling laws when using vehicles adjacent to BPS buildings, particularly during drop-off and pick-up of students.
- Never touch, tamper with, block, or turn off IAQ sensors or HVAC systems.
- Report IAQ concerns to the school leader or Main Office staff, who shall then be responsible for relaying the concerns to the BPS Environmental Division.
- Report repairs needed for HVAC systems, leaks, windows, and doors to your school's Main Office. School leaders, Administrative staff, or Custodians shall then report these issues to Facilities Management via the BPS Asset Essentials Work Order System.
- Report spills immediately to the Custodian.
- Do not use personal portable air-cleaning or ozone-generating devices; only the BPS-approved portable air cleaners (Medify MA-40 Air Purifier) provided by BPS Facilities Management are allowed.
- Do not use pesticides, personal cleaners (e.g. Clorox wipes or Lysol spray bottles), air fresheners, scented candles, scented personal care products, or other scented materials. These items can add irritating chemicals to the indoor air and trigger asthma, or interfere with the IAQ sensors. These products are prohibited per the FMT-11 BPS Green Cleaners Policy.
- Discard all waste and recycling into the appropriate containers, following FMT-08 BPS Recycling and Zero Waste Policy.
- Declutter your space. Clutter collects dust, an asthma trigger, harbors pests and impedes the Integrated Pest Management contractor from inspecting and treating areas, impedes Custodial cleaning of surfaces and floors, and blocks inputs and outputs on HVAC systems. Clutter can also be a fire hazard, particularly in electrical closets, where storage is prohibited. Use the BPS Declutter Guide to declutter your school.
- Do not bring animals (except service animals) into BPS buildings.
- Do not bring personal plants or flowers into BPS buildings.

3. IAQ Policy, Procedures and Plans

The BPS IAQ Management Plan is publicly available online through the BPS Healthy and Sustainable Schools website.

The BPS IAQ Management Plan applies to all school buildings (owned and leased) regularly occupied by BPS students and staff. The plan prioritizes a "layered risk reduction approach" to improve IAQ in all BPS school buildings, as advised by the U.S. Centers for Disease Control (CDC), the U.S. Environmental Protection Agency (EPA), and U.S. Department of Education (ED). The components of the BPS IAQ Management Plan's "layered risk reduction approach" include: Annual School Environmental Audits; Preventative Maintenance and Repairs of Buildings; Indoor Air Quality Monitoring and Reporting; Asbestos Hazard Emergency Response Act (AHERA) Management; Temperature Monitoring and Control; Mold and Moisture Control; Integrated Pest Management (IPM); Cleaning/Housekeeping; Chemical Management and Science Safety; Waste Management; Anti-Idling; Tobacco and Nicotine-Free Environment Policy; Lead Paint Inspections and Abatement.

3.1 Annual School Environmental Audits

Every BPS school annually receives two Environmental Audits - one conducted by the BPS Facilities Management Environmental Division (IAQ Management Team) and one conducted by the Boston Public Health Commission. The purpose of the audits is to identify new building issues that affect Environment, Health and Safety, further evaluate issues identified previously, and confirm, record, and report needed repairs. The audits evaluate issues related to: cleaning, ventilation, indoor air quality monitoring, pest infestation, water leaks/stains, visible mold, odors, chemical or hazardous materials, clutter and housekeeping, and any occupant's building concern. Results from the audits are shared with the appropriate BPS Facilities Management trades (e.g. Alterations & Repairs, Plumbing, HVAC, Energy, and Electrical) to rectify operational issues, while immediate life and safety issues (e.g. mold, asbestos, lead) are addressed by the Environmental Division. Annual audits are also sent to School Leaders and made publicly available on the BPS website.

3.2 Preventative Maintenance and Repair of Buildings

Preventive maintenance plays a major role in maintaining the quality of indoor air by ensuring that building systems are operating effectively and efficiently. The building systems, which are operated and maintained by the Facilities Management Energy and HVAC Divisions, are key components in maintaining comfortable temperatures and humidity levels in occupied spaces. Preventative maintenance involves routine inspection, adjustment, and repair of building structures and systems, including the heating, ventilation, and air conditioning system (HVAC), unit ventilators, local exhaust, and fresh air intakes.

All building repairs should be reported by the school's Main Office or Custodian to Facilities Management via the Asset Essentials Work Order System.

3.2.1 Operation, Maintenance, and Repairs of HVAC Equipment and Systems

BPS follows HVAC operations and maintenance guidance recommended by ASHRAE, as described in Standard 62.1-2022, Standard 241-2023, and Handbook - HVAC Applications; Chapter 8: Educational Facilities. Information regarding BPS operational strategies for improving IAQ and ventilation can be accessed on the BPS website. BPS Planning & Engineering Supervisors and Local 537 Union HVAC Technicians inspect BPS "Central HVAC" systems per industry standard practices, original equipment manufacturers recommendations, and as outlined in the American Society of Heating, Refrigerating, and Air Conditioning Engineers' (ASHRAE's) "Standard Practice for the Inspection and Maintenance of Commercial HVAC Systems."

Annual HVAC maintenance includes:

- January: Preparations begin for air conditioning (A/C) operations. Preventative maintenance is performed on A/C chillers, towers, pumps, air handlers, etc., including any major overhauls or repairs to this equipment.
- February: Preventative maintenance for univents and repair as needed.
- March: Follow up on boiler repairs and issues like pilot light or electronic ignition. Repair faulty controls; malfunctioning thermostats, sensors, relays, or safety switches. Repair leaks due to corrosion or pressure-related cracks in the boiler or piping. Perform repairs on Air Handling Systems; fan failures.
- April-May: A/C systems (chillers, towers, pumps) are filled and chemically treated; all chill water coils are drained, flushed repeatedly, reconnected and filled. A/C systems are then ready for start-up.
- June-August: Boiler maintenance to ensure efficient operation and reliability when heating is required. Drain all water from steam boilers and associated piping to remove sediment, scale, and sludge that accumulate over the heating season. Inspect internal component burners and combustion chambers. Check for corrosion, cracks, leaks or scaling. Remove soot and buildup from tubes. Clean and replace components, inspect burners and nozzles, replace gaskets, seals, or filters as needed. Inspect controls and sensors, test all safety devices, including low water cutoffs, pressure relief valves and temperature sensors. Ensure gauges, thermostats, and controls are calibrated and functioning properly. Flush system. Inspect gas system. Test operation.
- September: Check chilled water, condenser pumps, piping, and nozzles for the tower, make-up water floats, and tower fan operations. Check glycol readings.
- October: Preparations begin for heating operations. A/C chillers, towers and pumps are chemically treated (winterized), cleaned, and drained. Chill water coils in all air handlers are drained and filled with glycol (anti-freeze).
- November: Start the glycol process for coils in school buildings. Circulating glycol throughout the HVAC system's heating or cooling coils to prevent freezing during low temperatures.

- December: Preventative maintenance on the Air Handling Units - each mechanic will do as assigned.
- Additional Maintenance Tasks:
    - The HVAC Division monitors in real-time for proper water chemistry levels to ensure there are adequate biocides to control legionella or any other bacteria.
    - Preventative maintenance to all secondary pumps, air handlers, exhaust fans, etc. is performed throughout the year within each building during this seasonal schedule.
    - All air filters are replaced two times per year by a BPS-hired contractor, managed by BPS Facilities Management. Filter changes are scheduled using original equipment manufacturers' recommendations and industry best practices and procedures. Scheduled replacements are verified by the Planning & Engineering Supervisors and HVAC Mechanics' inspections, and adjusted if needed based on observations.

3.3 Indoor Air Quality Monitoring and Reporting

Since 2021, BPS has monitored Indoor Air Quality (IAQ) continuously across all classrooms, Main Offices, and Nurses Offices, as well as on the roofs of 119 through 4,400 sensors. Data from the sensors across the district enable BPS Facilities Management to record, monitor, and analyze real-time indoor air quality parameters so the appropriate Facilities staff can make scientific and data-driven decisions for improvements in BPS buildings, take action on elevated IAQ levels, such as identifying and remediating sources of elevated levels, educate the BPS community about indoor air quality at BPS, and propose investments in HVAC systems in BPS buildings.

IAQ Dashboard. Live (15 minute rolling average) IEQ results can be viewed publicly through the BPS IAQ Monitoring Dashboard. Please review the Dashboard User Guide to assist you with using and understanding the dashboard. To learn more about the IAQ Monitoring System, review the fact sheet.

IAQ parameters measured. Each sensor is recording the following IAQ measures:

1. Carbon Dioxide (CO2)
2. Carbon Monoxide (CO)
3. Airborne Particulates - Total (PM10)
4. Airborne Particulates - Respirable (PM2.5)
5. Temperature (T)
6. Relative Humidity (RH%)

BPS has adopted IAQ standards following federal, state, and local recommendations on indoor air quality and ventilation in schools, and BPS Facilities Management will take action based on those recommendations. Details on the BPS standards and response actions, and strategies for achieving optimal ventilation in classrooms can be reviewed in the BPS Indoor Air Quality Monitoring and Response Action Plan.

To ensure proper recording of IAQ measures and prevent damage to the sensors, please do not:

- Touch or move, breathe directly into, or apply cleaning solutions, chemicals, or any liquids to the IAQ sensor.
- Unplug / disconnect the sensor.
- Block or restrict air flow to or around the sensor.
- Use aerosols, perfumes, air fresheners, paints, personal cleaning products, or any other fragrant-like products within classrooms. Use only the approved BPS green cleaner provided by the school Custodian, per the BPS Green Cleaners Policy.

To achieve optimal Indoor Air Quality and Ventilation:

- Never block, change, or turn off HVAC systems.
- Open one operable window to 4 inches (if applicable).
- Open one corridor-facing door.
- Turn on one portable air cleaner - recommended to be kept on during school hours.
    - Portable air cleaner & filter memo
    - Portable air cleaner guidance
    - School leaders can make portable air cleaner requests through their Operational Leaders.
    - Portable air cleaner filters are changed every six months per manufacturer technical guidance.
    - In addition to filtering particles, portable air cleaners provide 1-2 additional ACH.
- Window air conditioning (AC) units are provided for additional classroom comfort and temperature control only.
    - Window AC's will not provide ventilation.
    - Window AC's should be run during occupied school hours only. Please shut off units at the end of each school day, and do not operate during winter months or days when the outdoor temperature is 68 degrees fahrenheit or cooler. These steps will help to prolong the AC's lifespan, and are critical to conserve energy.
- Fans can be used to exhaust indoor air to the outside, via an open window.
    - Fan use guidance
    - School leaders can make fan requests through their Operational Leaders.

Why opening a window and a door, and turning on the portable air cleaner are important: The U.S. Centers for Disease Control (CDC) recommends ventilation rates of five or more air changes per hour (ACH) of clean air through any combination of central HVAC systems, natural ventilation, or additional air cleaning devices. BPS district air exchange testing demonstrated that one classroom window open at 4 inches with one classroom door open provided excellent ventilation, an average of 6.5-7 ACH, in non-mechanically ventilated classrooms that rely on operable windows as their main source of ventilation. The portable air cleaner filters particles and provides an additional 1-2 ACH.

Additional information regarding BPS operational strategies for improving IAQ and ventilation can be accessed on the BPS website.

3.4 Asbestos Hazard Emergency Response Act (AHERA) Management Plan

Asbestos is a mineral fiber that can be found in some building materials. When these materials are damaged or disturbed, they release asbestos fibers into the air. Airborne asbestos fibers pose an increased health risk for mesothelioma, lung cancer, and asbestosis.

In compliance with federal law, BPS has developed and maintains an AHERA Management Plan to prevent occupational exposure to asbestos during general operation and maintenance activities. The AHERA Management Plan describes the location and condition of asbestos-containing building materials, and documents the removal and repairs. The BPS Environmental Division is responsible for updating each school's AHERA Management Plan with information collected from their periodic surveillance every 6 months, reinspections of buildings for asbestos-containing materials every 3 years, and response actions taken within the school. The AHERA Management Plan is available for review and is located in the main office of each school building.

Per law, BPS also communicates necessary AHERA Management Plan information to school staff, BPS families, and BPS contractors. BPS posts an annual Asbestos Notification Letter on the BPS website and a notice in the annual Welcome Back BPS booklet. BPS notifies all short-term temporary workers/contractors of possible asbestos building-containing materials (ACBM) in school buildings by sending them an annual notification letter and a copy of the statement of compliance. All contractors must review and sign the AHERA Management Plan before conducting any work in BPS buildings, and must submit their signed letters of compliance with their invoices.

3.5 Temperature Monitoring and Control

The temperature standard for BPS is the thermal comfort guideline of 68–78°F from the Massachusetts State Sanitary Code (Chapter 2 for Habitable Housing, 105 CMR 410.201) during the heating and cooling seasons. It should be noted that only one third of BPS buildings have central HVAC systems controlled by the BPS Building Management System, whereas two-thirds of BPS buildings are heated by steam-heat and cooled by window ACs controlled manually by school-based staff.

The BPS Energy Division will monitor school temperature readings, and respond to high and low temperatures by making adjustments to heating and cooling settings to return spaces to the 68-78°F thermal guideline (where the Energy Division has mechanical control). Response actions shall also include, but not be limited to: replacing a faulty temperature sensor, investigating the HVAC equipment (if applicable), and/or making recommendations to achieve optimal ventilation.

3.6 Mold and Moisture Control

Fungi (mold) are present everywhere and can be a cause of illness, health symptoms, and discomfort. In an indoor environment, hundreds of different kinds of mold are able to grow wherever there is moisture and an

organic substrate (food source). Indoor mold growth can be prevented or minimized by actively maintaining, inspecting, and correcting buildings for moisture problems and immediately drying and managing water damaged materials. Removing mold growth and correcting the underlying cause of water accumulation can also help reduce mold exposures. School staff should be aware that the easiest way to control microbial growth is to control moisture.

Rapid remediation of mold damaged materials and infrastructure repairs to stop the source of water should be the primary response to mold growth in buildings. The simplest, most expedient remediation that properly and safely removes mold growth from buildings should be used. Found below is the BPS Guideline for Assessment & Remediation of Indoor Mold, based on guidelines from the U.S. EPA.

3.6.1 Environmental Assessment

Following a report of mold, a visual inspection is conducted by the BPS Environmental Division to identify any possible mold problem and determine remedial strategies. The extent of any water damage and mold growth is visually assessed and the affected building materials are identified. The visual inspection includes observations of hidden areas where damages may be present, such as crawl spaces and behind wallboard. Wallpaper, baseboards, insulation, ceiling tiles, and other materials suspected of mold growth are also assessed.

3.6.2 Remediation

The goal of remediation is to remove or clean mold-damaged materials using work practices that protect occupants by controlling the dispersal of mold from the work area. Found below are the listed remediation methods designed to meet this goal, however, they are not meant to exclude other similarly effective methods.

- *Moisture Control & Building Repair*
  In all situations, the underlying moisture problem must be corrected to prevent recurring mold growth. Indoor moisture can result from numerous causes, such as: facade and roof leaks; plumbing leaks; floods; condensation; and high relative humidity.

  Relative humidity should generally be maintained at levels below 65% to inhibit mold growth. Short-term periods of higher humidity would not be expected to result in mold growth. However, condensation on cold surfaces could result in water accumulation at much lower relative humidity levels. Relative humidity should be kept low enough to prevent condensation on windows and other surfaces. BPS monitors relative humidity using the BPS IAQ Monitoring dashboard.

- *Cleaning Methods*

  Non-porous materials (e.g. metals, glass, and hard plastics) can almost always be cleaned. Semi-porous and porous structural materials, such as wood and concrete can be cleaned if they are structurally sound. Porous materials (e.g. ceiling tiles, insulation, carpeting and area rugs, and wallboards) with more than a small area of mold growth (10 square feet) will be removed and discarded. Carpeting and/or area rugs with small areas (less than 10 square feet) of mold growth or water-damage will be cleaned and sanitized by custodial staff. Wallboard will be cleaned or removed at least six inches beyond visually assessed mold growth or wet or water-damaged areas. All areas of mold growth greater than 10 square feet will be assigned to a BPS-hired non-hazardous contractor, managed by BPS Facilities Management.

  Cleaning will be done using a soap or detergent solution using the gentlest cleaning method that effectively removes the mold to limit dust generation. All materials to be reused must be dry and visibly free from mold. Consideration will also be given to cleaning surfaces and materials adjacent to areas of mold growth for settled spores and fungal fragments. A vacuum equipped with a High-Efficiency Particulate Air (HEPA) filter could also be used to clean these adjacent areas. Disinfectants are rarely needed to perform an effective remediation because removal of fungal growth remains the most effective way to prevent exposure. Disinfectant use is recommended when addressing certain specific concerns such as mold growth resulting from sewage waters.

- *Restoring Treated Spaces*

  After completing mold remediation and correcting moisture problems, building materials that were removed will be replaced and brought to an intact and finished condition. New building materials that do not promote mold growth will also be used. Antimicrobial paints are usually unnecessary after proper mold remediation. They should not be used in lieu of mold removal and proper moisture control, but may be useful in areas that are reasonably expected to be subject to moisture.

3.6.3 Environmental Sampling

Environmental sampling is not recommended by industry standards or necessary to proceed with remediation of visually identified mold growth or water damaged materials. Decisions on appropriate remediation strategies should be made on the basis of a thorough visual inspection.

For additional information on mold remediation, refer to EPA's guide, "Mold Remediation in Schools and Commercial Buildings" and EPA's website.

3.7 Integrated Pest Management (IPM) Plan

Integrated Pest Management (IPM) is a comprehensive strategy for controlling pest activity and pesticide usage in the building and surrounding landscape, which trigger health problems, such as allergies and asthma. The district's IPM Program aims to reduce the frequency and magnitude of both pest problems and pesticide use.

State laws and regulations require all school buildings and licensed daycares to register an indoor and outdoor IPM plan with the Massachusetts Department of Agricultural Resources (MDAR). The law requires the IPM plans to be updated and registered annually. The IPM Plan must be located and accessible in the Main Office of each school building. Every BPS school has an assigned Pest Control Contractor (PCC), whose contract is managed by the BPS Environmental Division. The PCC is responsible for annually updating the school's indoor and outdoor IPM plan, and this activity is checked by the Environmental Division.

3.8 Cleaning/Housekeeping

BPS Custodians follow daily school building cleaning, sanitizing, and disinfecting procedures. Cleaning and disinfecting of high-touch areas will occur multiple times a day. Bathrooms will be monitored every 2-3 hours throughout the day and will include wiping down all sink hardware, toilets, door handles, and all other surfaces. All stock items will be checked at this time. A daily cleaning checklist/log will be used by Custodians, with review and sign-off daily by the Senior Custodian, and weekly by the Area Manager. Custodial Cleaning Work Schedules are posted in the Custodian's Office and are available upon request.

Regular and thorough cleaning is an important means for the removal of air pollutant sources, however, cleaning products can also contribute to indoor air pollution. To ensure that cleaning practices remove pollutant sources while using cleaning products appropriately, cleaning guidelines have been created to minimize the negative impacts that cleaning products have on occupant health and the environment.

The FMT-11 BPS Green Cleaners Policy is in accordance with the City of Boston's executive order relative to greening city building maintenance and operations and executive order relative to climate action. This policy applies to all BPS buildings and grounds, including offices, classrooms, restrooms, cafeterias, gymnasiums, hallways, pathways, kitchenettes, stairwells, etc.

Under the green cleaning policy, BPS departments, school sites, and partner programs taking place in schools must comply with the following:

- Purchase, provide, and use only environmentally friendly cleaning products that comply with the Green Seal Environmental Standard (GS-37), including but not limited to glass, bathroom, carpet, and general purpose cleaners used for industrial and institutional purposes.
- All other, non-approved, cleaning products and air fresheners are prohibited from being used in BPS buildings and grounds by any staff, volunteer, vendor, or partner.

- Use of disinfectants for cleaning shall be limited to food service areas, the clean-up of biological and bodily wastes, and "high touch areas" (when directed). All disinfectants must be premixed, registered by the U.S. Environmental Protection Agency, and have a Hazardous Materials Identification System (HMIS) rating of 2 or less.
- Pre-approved or least toxic and asthma friendly sanitizer/disinfectants must be used in early learning centers in accordance with the National Association of Education for Young Children accreditation standards.

All schools have on hand a 2-month supply of soap, paper towels, toilet paper, etc. Requests for supplies should be directed to the school's Senior Custodian.

3.9 Chemical Management and Science Safety

BPS has developed a Science Safety Plan to promote a safer and more effective learning environment for students and a healthier workplace for teachers and other employees within science classrooms and laboratories in Boston Public Schools. The Science Safety Plan is a comprehensive effort to address chemical use, storage, and disposal procedures, as well as the prevention and/or minimization of, and response to, chemical spills and other accidents.

The district wide plan is responsive to the needs of all BPS science classes and is consistent with the requirements of the U.S. Department of Labor, Occupational Safety and Health Administration's (OSHA) 29 CFR 1910.1450 Occupational Exposures to Hazardous Chemicals in Laboratories for the protection of our students and employees, as well as guidance materials from the National Fire Protection Association (NFPA), the National Institute for Occupational Safety and Health (NIOSH), and the Boston Fire Department. The Science Safety Plan promotes a culture of safety in science and the safe operation of all science laboratories for students, faculty, and staff.

To ensure that all students and their teachers work in an environment that is safe, it is necessary to formulate standard procedures and requirements for all schools and their personnel. The Science Safety Plan will be reviewed annually and updated as necessary.

3.9.1 Responsibilities of School Leaders and Administrators:

- *Implementation and notification of safety procedures.*
  School leaders and administrators must inform students and staff in writing of safety standards, ensure science teachers review and implement the Science Safety Plan in their own classrooms, and verify that staff have instructed all students in safety procedures.

- *Completion of safety training.*
  School leaders and administrators must ensure that all staff participate in required safety training programs provided by BPS (posted on Vector when available), that all appropriate

personnel receive training in the use of portable fire extinguishers and blankets, and that all instructors working with toxic or hazardous substances receive additional training as specified in Chapter 111F of the Massachusetts General Laws. School leaders and administrators should also appoint a science safety coordinator (SSC) annually and facilitate their participation in PD/meetings. The SCC should have the opportunity and incentive to attend district training related to science safety and to conduct any necessary duties as recommended by the Science Safety Plan.

- *Maintenance of science facilities.*
  School leaders and administrators must assign science classes and laboratories only to appropriately equipped science rooms and submit a list of all science teachers and the class(es)/course(s) they teach to the BPS Science Department by October 1 each year. Throughout the year, school leaders and administrators should verify that science laboratories and classrooms have adequate lighting and proper ventilation as well as workable safety equipment. Appropriate science areas should have fire extinguishers, fire blankets, first aid kits, safety showers, emergency eyewashes, and spill kits. In order to request safety equipment or report issues with lighting and ventilation, please contact Facilities Management.

- *Posting safety notices.*
  Principals should ensure that the Hazardous Material Permit and Safety Data Sheets are available in the main office. Safety Data Sheets should also be posted in chemical storage rooms (or wherever chemicals are stored) as well as the “Right to Know” workplace notice. Building evacuation procedures should be posted in classrooms, offices, and corridors. The notices and additional guidance can be found in the Science Safety Plan.

3.9.2 Responsibilities of Teachers:

- *Implementation of the Science Safety Plan.*
  Teachers should be familiar with all Standard Operating Procedures (SOPs) for general laboratories, chemical use and storage, chemistry laboratories, biology laboratories, physics laboratories, and waste management. The school’s science safety coordinator must also attend safety training(s) (posted on Vector when available), including science safety and first aid. The SSC must also share information from any safety training(s) with the other science teachers at their school. Practicing safety procedures serves as the model for good safety conduct for students.

- *Supervision of all students in the classroom.*
  Prior to any laboratory activities, teachers should establish a Student Safety Contract (see example in Appendix A of BPS Science Safety Plan) with each student. While in the lab, teachers must require the use of appropriate personal protective equipment and ensure that students are dressed properly for the laboratory (e.g. wearing closed toe shoes, using appropriate eye

protection, etc.) in order to avoid accidents. Under no circumstances shall a teacher leave students unsupervised in a laboratory or chemical storage room.

- *Appropriate chemical storage.*
  Teachers must maintain a chemical inventory using the online ChemVentory system (contact the Science Department for access), update at least annually, and submit an electronic copy to the BPS district Science Department and Facilities Management by October 1 each year. SDSs for all chemicals should be accessible in the chemical storage room and main office. Teachers must store all chemicals in their compatible chemical families, label all chemical storage rooms/cabinets and laboratory doors with the appropriate NFPA Diamond, and keep all chemical storage rooms and/or cabinets locked at all times. All chemical and waste containers should be labeled appropriately and stored safely until they can be removed. Contact Facilities Management for removal.

- *Proper chemical use.*
  Teachers must consult with the BPS district Science and/or Facilities Management Department staff as appropriate regarding the use of Class 1A flammables, compressed gasses, donated chemicals, and the implementation of any laboratory experiment that may be more hazardous than those contained in the district-identified curriculum.

- *Maintenance of safety equipment.*
  Teachers must inspect fire extinguishers monthly and safety showers and eyewash stations weekly. They should also ensure that the first aid kit is fully stocked and in an easily accessible area. The Science Equipment Checklist can be found in Appendix J of the Science Safety Plan.

In the event of any accidents or injuries in a science area, school staff must ensure they are reported to the BPS district Science Department and Facilities Management. If the accident could potentially pose a threat to the health and safety of building occupants, teachers should follow procedures outlined in the Emergency Response section below or consult the Science Safety Plan for more information. In addition to the Science Safety Plan, BPS upholds the FMT-18 Science Safety in School Laboratories and Classrooms Policy.

3.10 Waste Management

The FMT-08 BPS Recycling and Zero Waste Policy is implemented in accordance with the City of Boston's commitment to reduce waste and sustainably manage recycling products. BPS collaborates with the Public Works Department (PWD) for pickup and disposal of single-stream recycling products (such as cardboard, glass, metals, paper, and plastic), whereas other waste products are managed directly by Facilities Management or BPS-licensed contractors. BPS is also responsible for providing recycling equipment, signage, and education services to foster cleaner and healthier school environments. Proper waste management is necessary to prevent clutter and pest activity, which can exacerbate dust accumulation, allergies, and asthma symptoms for building occupants.

School staff are responsible for decluttering their spaces regularly and are encouraged to reuse or recycle as many products as possible. Staff can use the BPS Declutter Guide and resources available on the BPS Healthy & Sustainable Schools website to assist with decluttering and recycling efforts. Upon request, BPS Academics & Professional Learning or Facilities Management provides donation services for disposal of unwanted school supplies, books, sports equipment, clothing and textiles, furniture, and electronics. Schools are also responsible for appointing a Zero Waste Champion (teacher, staff, active volunteer, or a staff-advised student team) to serve as the liaison to Facilities Management. The Zero Waste Champion will communicate requests for donation pickups, recycling equipment, or signage; attend waste management training with the Senior Custodian; and advise the school community on best recycling practices.

Each school has a designated accumulation area for universal waste and hazardous waste. Universal waste (such as lamps, batteries, and mercury-containing devices) should be appropriately labeled with the type of waste and date of generation before being placed in the accumulation area. To schedule a hazardous waste pickup, for materials such as chemicals, the Zero Waste Champion or Custodial staff should contact the BPS Environmental Division.

3.11 Anti-Idling

BPS follows an anti-idling policy of no idling of buses or other motor vehicles on school property per MGL Chapter 90, Section 16A. Delivery and bus pickup and drop-off zones have been located away from building outdoor air intakes to ensure that exhaust fumes do not enter the school buildings. BPS schools can access anti-idling curriculum and signage resources on the BPS Healthy & Sustainable Schools website.

3.12 Tobacco and Nicotine-Free Environment Policy

The HWD-06 BPS Tobacco and Nicotine-Free Environment Policy is motivated by the philosophy that every staff person, student, and visitor should have the right to breathe clean air in their school and work environment and that BPS is acutely aware of the serious health risks associated with the use of tobacco or nicotine products, both to users and non-users. The policy recognizes that the use or promotion of tobacco or nicotine products on school grounds and at off-campus school-sponsored events is detrimental to the health and safety of students, staff, and visitors. BPS acknowledges that adult staff and visitors serve as role models for students and embraces its obligation to promote positive role models in schools, and to provide an environment for learning and working that is safe, healthy, and free from unwanted smoke and tobacco or nicotine product use, including vaping, for students, staff, and visitors. Therefore, Boston Public Schools prohibits tobacco or nicotine products on school property and in all public school facilities and vehicles.

3.13 Lead Paint

Lead can be found in paint and varnishes in pre-1978 building structures. When lead is released as dust or chips, individuals are at risk of exposure via inhalation or ingestion. This can affect the nervous system, and young children under the age of six years old are particularly susceptible.

Under state and federal regulations (105 CMR 460.00 & 606 CMR 7.00) Family Child Care, Small Group & School Age, and Large Group & School Age Child Care Programs are required to submit documentation of lead paint disclosure as required by 606 CMR 7.07(15)(a)2 for licensure. This includes, but is not limited to, the licensee providing all parents with a disclosure statement regarding any known sources of lead in common and specific use areas. This is usually accomplished through a comprehensive lead inspection and a "Letter of Full Compliance" thereafter. Under 606 CMR 7.00, public school systems are excluded from this requirement as Small Group & School Age Child Care and Large Group & School Age Child Care programs are not to be included in any part of a public school system.

Despite this exemption, due to the known health effects of lead exposure, BPS has implemented the following procedure that must be followed by all BPS schools. Prior to approving any early childhood or before and after-school programs in a school building, the School Leader must complete the BPS Request for Comprehensive Lead Paint Inspection procedure to ensure critical life and safety requirements are met in accordance with Mass General Law, Chapter 111, Sections 196 and 197 and 105 CMR 460.000, Regulation for lead poisoning prevention and control. Upon the written approval from BPS Administration and the requesting Licensee for the before/after school program (Small/Large Group & School Age Child Care program), the BPS Environmental Division will schedule a MA Certified Lead Inspector to conduct a comprehensive lead inspection at the designated site specific rooms or locations (i.e. classrooms, common areas, etc.). The means and methods to conduct the inspection shall adhere in accordance with the requirements of 105 CMR 460.000.

If violations (i.e. loose/flaking lead containing paint) have been observed during the time of inspection, abatement activities will be required to correct the problems. BPS Environmental Division will schedule a MA Certified Lead Abatement Contractor to conduct abatement activities in order to correct violations in areas noted in the comprehensive lead inspection. Once the violations have been corrected, if any, BPS Environmental Division will schedule a MA Certified Lead Inspector to conduct a re-inspection of the remediated areas and issue a "Letter of Full Compliance" after verifying the completion of deleading. Per the Department of Elementary and Secondary Education (DESE) regulation 606 CMR 7.07(6), the Licensee must maintain the designated areas of the program in good repair, free of loose, chipping, flaking, or peeling paint or broken plaster for the licensing period. The Letter of Full Compliance can then be used to apply for an early childhood or before and after-school program in a school building.

4. Emergency Response

Any IAQ concerns that could potentially pose a threat to the health and safety of building occupants shall be addressed by Facilities Management immediately. Teachers, administrators, and custodial staff are encouraged to report such incidents as soon as possible. Scenarios which require prompt response actions include, but are not limited to:

4.1 Carbon Monoxide (CO)

As outlined above in the "Indoor Air Quality Monitoring and Reporting" section, the BPS Environmental Division monitors and responds to elevated IAQ measures in real-time. Because the CO standard is health-based, the response action(s) will be based on the first exceedance of an instantaneous 4 ppm measurement. Response action(s) shall include, but not be limited to, an investigation by the BPS Environmental and HVAC Divisions to identify and control the source of CO. The investigation may include monitoring real-time instantaneous CO results, monitoring trending 8-hour time-weighted average CO results, investigating HVAC equipment (e.g. boiler, radiators, etc.), and making recommendations to achieve optimal ventilation, as described in the BPS Indoor Air Quality Monitoring and Response Action Plan. Manual CO measurements may also be required to ensure the IAQ sensor(s) is within calibration. If the IAQ sensor(s) is found to be outside calibration (+/- 20%), the sensor(s) shall be recalibrated by SGS Galson and CO measurements re-verified. In the event of an emergency related to elevated carbon monoxide, the response action shall require immediate action by the school, including, but not limited to, relocation of staff and students, possible evacuation of the classroom or school, notification to the Boston Fire Department (BFD), and any action(s) required by BFD.

4.2 Combustion Odor Complaints

Building occupants who smell combustion odors and/or experience severe headaches or nausea should report the incident to the BPS Environmental Technician assigned to their school. Staff members from the BPS Environmental Division will respond to the complaint promptly and investigate any probable cause of emissions.

4.3 Chemical Spills

If a major spill occurs (cannot be cleaned-up safely by yourself), contact the Headmaster or Principal, the school's SSC, and Facilities Management. In case of a spill that is an immediate hazard, know the school's evacuation plan and be ready to carry it out if necessary. In general, if evacuation is necessary, proceed as you would in a fire drill evacuation. Send everyone to a pre-designated area and then count heads to make sure everyone is out of the building. School staff should review and familiarize themselves with the BPS Science Safety Plan for more information regarding their responsibilities in the event of an emergency.

Facilities Management and/or Science Department personnel will investigate each reported spill or other incident that occurs in a science area. Investigations will be completed within 48 hours of the incident and will include suggestions to prevent or reduce the likelihood of the incident occurring again.

All incidents that result in a response from any outside agencies such as BFD and Boston EMS or cause any injuries or illness to students or staff will be considered a "significant incident," requiring copies of the incident report be sent immediately to the BPS Chief Operating Officer, the Deputy Superintendent of Curriculum & Instruction and the Superintendent's Office. BPS Facilities Management and BPS Science Department personnel will meet with the school's headmaster and SSC or lead science teacher to review all findings, recommendations and suggestions.

For body fluid spills, please follow FMT-19 BPS Standard Operating Procedure for Cleaning and Disinfecting Body Fluid Spills.

4.4 Rapid Response & Outbreak Prevention

In the event of confirmed infectious disease cases, school staff shall follow the BPS protocol outlined in the Rapid Response & Outbreak Prevention Program. The school Nurse should continuously monitor and report illness rates to the BPS Health Services (BPSHS) department. BPSHS shall report the elevated rates to Boston Public Health Commission (BPHC). Following consultation from BPHC, Facilities Management will conduct a thorough disinfecting of all bathrooms and of all frequent contact surfaces in relevant classrooms using an approved hospital grade EPA-registered disinfectant. BPSFM will notify BPS Food and Nutritional Services (FNS) to increase their disinfecting protocol, and FNS will notify the City of Boston Inspectional Services Department (ISD) to conduct an inspection of the food service area. Confirmation of this comprehensive cleaning process will be sent to the following BPS departments: Health Services; Operations; Operational Superintendents; Facilities Management; Communications; Food and Nutritional Services; and the school principal or headmaster. These protocols are based on the recommendations of the Boston Public Health Commission and Boston Public Schools Health Services.

All other non-emergency situations are to be reported by submitting a Work Order via the Asset Essentials system, or by directly contacting the BPS Environmental Technician assigned to your school.

5. Steps for Prevention

Preventative maintenance is the most effective way to ensure that IAQ concerns do not escalate into emergencies. BPS Facilities Management is committed to sustaining healthy indoor environmental quality in all of its facilities by:

- Continuously monitoring real-time data from the IAQ sensors and responding to elevated measures.

- Completing the Annual School Environmental Audits in order to address immediate life and safety issues (e.g. mold, asbestos, lead) that have materialized since the last inspection.
- Responding in a timely manner to Work Orders related to any of the IAQ topics outlined in this plan.
- Inspecting and performing annual HVAC maintenance per industry standard practices, original equipment manufacturers recommendations, and as outlined in ASHRAE guidance.
- Supplying schools with disposable masks in sizes for students and staff.
- Providing nurses with appropriate PPE per CDC/DESE/BPHC guidance.
- Ensuring that there are abundant hand hygiene stations (e.g. sinks for handwashing) throughout school buildings with plenty of supplies on hand in all buildings.
- Regular daily cleaning by Custodial staff and disinfecting of high contact surfaces with a hospital grade EPA registered disinfectant as needed.

Facilities Management will complete an annual review of the IAQ Management Plan in order to address frequent IAQ complaints, emerging IAQ issues, ongoing research regarding indoor environmental quality, updates to building and ventilation systems, and changes to applicable district, local, state, and federal requirements. Revisions to the IAQ Management Plan will allow BPS to provide the most recent and comprehensive guidance to school occupants in order to maintain healthy and comfortable learning environments in all of its facilities.

6. Applicable District, Local, State, and Federal Requirements or Guidance

6.1 Federal Guidance

- 40 CFR Part 50 - National Ambient Air Quality Standards
- 40 CFR Part 763 Subpart E - Asbestos-Containing Materials in Schools
- OSHA 1910.1450 - Occupational exposure to hazardous chemicals in laboratories
- U.S. EPA - IAQ Tools for Schools Resources

6.2 State Requirements

- 105 CMR 410.00: Minimum standards of fitness for human habitation (State sanitary code, chapter II)
- 105 CMR 460.00: Lead poisoning prevention and control
- 606 CMR 7.00: Standards for the licensure or approval of family child care; small group and school age and large group and school age child care programs
- M.G.L Part IV, Title I, Chapter 270, Section 22: Smoking in public places
- M.G.L Part I, Title XII, Chapter 71, Section 2A: Use of tobacco products within school buildings or facilities or on school grounds
- M.G.L. Part I, Title XIV, Chapter 90, Section 16A: Stopped motor vehicles; operation of engine; time limit; penalty
- M.G.L Part I, Title XVI, Chapter 111, Section 196: Prohibited acts relating to lead-based paint, glaze or other substance; punishment; embargo of personal property
- M.G.L Part I, Title XVI, Chapter 111, Section 197: Duty of residential premises owners; interim control measures; abatement or containment of paint, plaster or other accessible structural material containing lead

6.3 District Policies

- BPS Science Safety Plan
- HWD-01 District Wellness Policy
- HWD-04 Healthy School Environment Policy
- HWD-06 Tobacco and Nicotine-Free Environment Policy
- FMT-02 Work Order Requests
- FMT-08 BPS Recycling and Zero Waste Guidelines
- FMT-10 Integrated Pest Management
- FMT-11 Green Cleaners Policy
- FMT-15 Annual School Environmental Inspection/Audit conducted by BPS and BPHC
- FMT-18 Science Safety in School Laboratories and Classrooms
- FMT-19 SOP for Cleaning and Disinfecting Body Fluid Spills

7. Recommended Resources

- ASHRAE Handbook - HVAC Applications; Chapter 8: Educational Facilities
- ANSI/ASHRAE Standard 62.1-2022, Ventilation and Acceptable Indoor Air Quality
- ANSI/ASHRAE Standard 241-2023, Control of Infectious Aerosols
- Center for Green Schools
- Operational Guidance for K-12 Schools and Early Care and Education Programs to Support Safe In-Person Learning
- Harvard T.H. Chan School of Public Health Healthy Schools Program
- Mold Remediation in Schools and Commercial Buildings Guide
- BPS Healthy School Environment Webpage

8. Acknowledgements

We'd like to thank the following individuals for their expertise and contributions to the IAQ Management Plan:

- Dr. Patricia Fabian, Boston University School of Public Health
- Hannah Carter, The Center for Green Schools at the U.S. Green Building Council
- Paul Shoemaker, Boston Public Health Commission
- Joyce Bowen, BPS Science, Technology, and Engineering Department
- Lauren Bolton, BPS Environmental Division
- Lauren Main, BPS Environmental Division
- Michael DiLorenzo, BPS Environmental Division
- Maria F. Carvalho, BPS Environmental Division
- Larry Kenney, BPS HVAC Division
- Rosangelica Rodriguez, BPS Planning, Engineering, Sustainability, & Environment
- Katherine H. Walsh, BPS Planning, Engineering, Sustainability, & Environment