

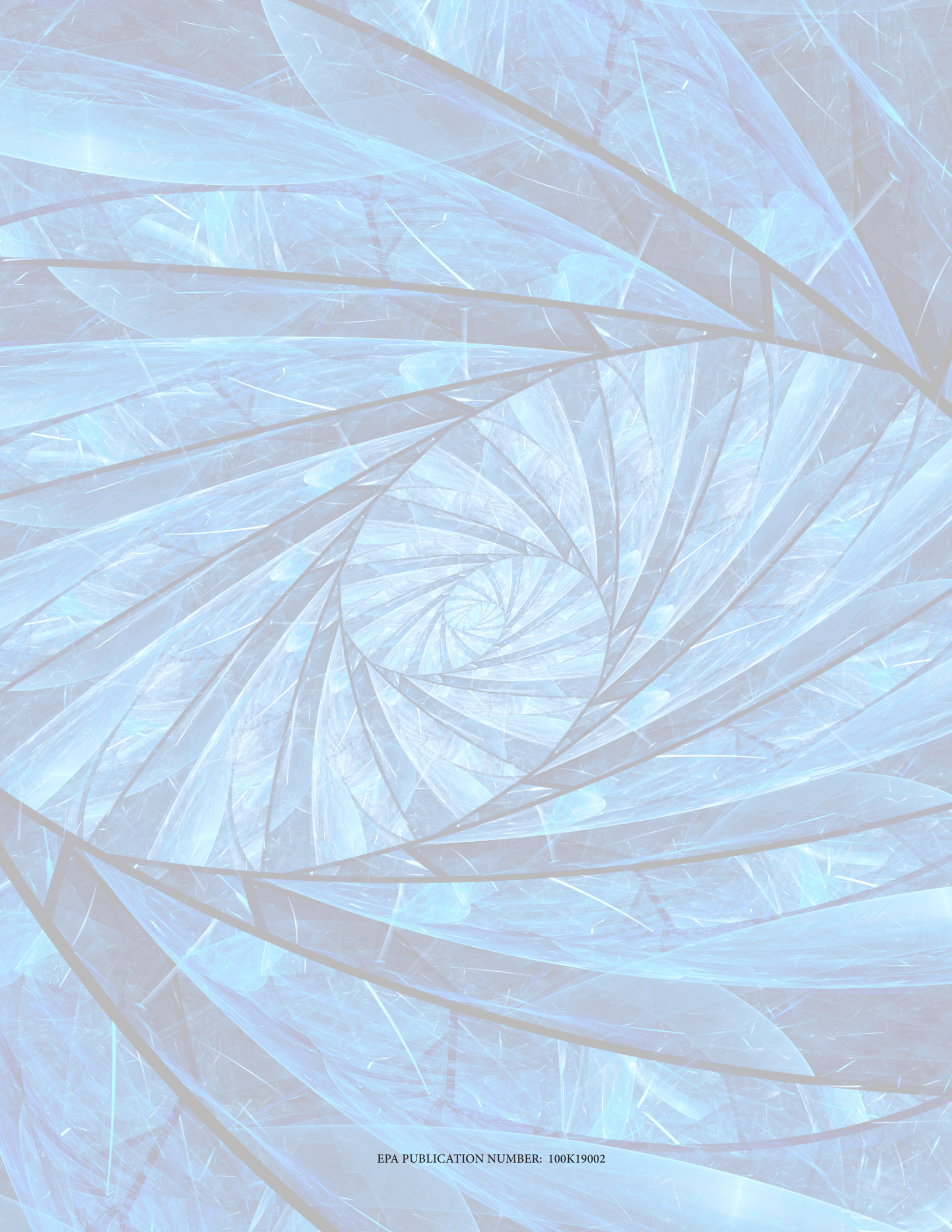


Supporting Healthy Houses of Worship

Effective, affordable measures to
protect the health of congregations and staff



OCTOBER 2019



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Healthy Environments for Worship, Learning and Service

There are thousands of places of worship in the United States. Many of these buildings were built decades or even over a century ago and—like many older buildings—may contain environmental conditions that could pose increased risks to the health of congregants and staff.

Children are particularly vulnerable to many environmental risks. Since many places of worship play important roles in children's lives—through schooling, daycare, and other services—please consider using this document to ensure that your place of worship is a healthy and safe environment for children.

This booklet is designed to identify some of the most common types of environmental health concerns found in older facilities and contains voluntary recommendations that maintenance staff may use to limit risks to congregations. It also provides one-stop access to learn some facts about these issues and existing low-cost or no-cost measures to prevent, reduce, and resolve each of the highlighted environmental issues.

By completing the voluntary Quick Assessment activity provided near the end of this brochure, places of worship can determine which areas and programs will require more detailed attention. Additionally, by implementing the highlighted waste reduction and energy and water efficiency actions, places of worship can conserve valuable, financial and natural resources.

Energy and water efficiency are powerful tools that can drastically cut short-term and long-term operating costs. At least 25% energy savings can occur by implementing little to no-cost actions and energy management practices. Places of



worship can leverage the opportunity created by utility efficiency upgrades to put in place building upgrades and practices that enhance the health and quality of the facility's environment. Some examples would include improved ventilation systems, moisture control, integrated pest management practices, and removal of PCB-containing lighting ballasts and building materials from the facilities.

Another valuable cost savings tool for places of worship is waste reduction. Reusing or recycling materials can save money in the short term and encourage environmentally conscious behavior among congregants. Simple tasks like composting food or yard waste and reusing supplies can help conserve valuable funds.

Finally, EPA administers several grant programs designed to promote healthy environments. Your place of worship or local community may be eligible for some of these grants. To learn more about grant funding opportunities, please visit <https://www.epa.gov/grants>.

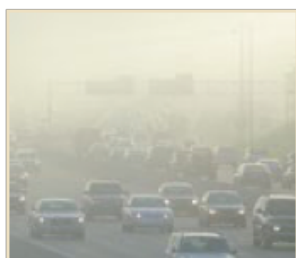
Asthma and Asthma Triggers

Asthma is a chronic disease that affects the lungs and makes it hard for people to breathe. According to the Centers for Disease Control and Prevention (CDC), more than 25 million Americans, including one out of every 10 school age children, have asthma.

Of children with asthma, those 11 years or younger are significantly more likely to have “uncontrolled” asthma, which means they face increased risk of intense asthma attacks that can be caused by environmental triggers.

Common asthma triggers include animal allergens, pest allergens, mold and moisture, smoke, dust mites, chemical odors, and outdoor air pollutants like ozone and particle pollution or diesel exhaust.

Please consider following the steps outlined on this page to reduce asthma triggers that may be present in your place of worship.



Steps to Reduce Exposures to Asthma Triggers:

1. Ensure that your place of worship is a smoke free environment.
2. Consider switching to fragrance free cleaning products. These products are less likely to have harsh chemical odors that can exacerbate asthma symptoms. A link to EPA approved “Safer Choice” cleaning products is provided at the bottom of the page.
3. Keep rooms adequately ventilated and free of clutter, dust regularly, and frequently wash items that attract dust.
4. Ensure that your place of worship has an Integrated Pest Management (IPM) program that will reduce exposures to pesticides while reducing asthma triggers. More information on IPM can be found on page 17.

Learn more at:

www.epa.gov/asthma

www.epa.gov/saferchoice/products

Buses and Vehicle Idling

Buses:

Air pollution from older diesel vehicles and buses has health implications for everyone, especially children. Children are more susceptible to air pollution because their respiratory systems are still developing and they have a faster breathing rate. In addition to producing a number of hazardous pollutants, diesel exhaust contains significant levels of particulate matter that can deposit into the lungs causing lung damage and aggravate respiratory conditions such as asthma.

Vehicle Idling:

Idling vehicles contribute to air pollution and emit air toxins, which are pollutants known or suspected to cause cancer or other serious health effects. This is yet another important issue that affects health at houses of worship when people idle their vehicles during drop-offs and pick-ups. Exhaust produced by idling vehicles can be pulled into facilities through the air intakes of the building's heating, ventilating and air conditioning (HVAC) system where it can accumulate and cause serious health issues for staff and others using the facilities.

In addition to other environmental benefits, reducing vehicle idling has several financial benefits: reduced fuel costs, energy costs and unnecessary engine wear.



Steps to Reduce Vehicle Exhaust:

1. Encourage policies to eliminate unnecessary idling.
2. Upgrade or “retrofit” buses and replace older vehicles with newer, more efficient models
3. Consider establishing anti-idling zones for all vehicles at the facilities (buses, delivery trucks and parents).
4. Locate passenger pickup and drop off areas away from the place of worship’s air intake supply and windows.

Learn more at:

www.epa.gov/cleandiesel/clean-school-bus

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas. That results from incomplete oxidation of carbon in combustion processes. Common sources of CO in buildings are improperly vented furnaces, malfunctioning gas ranges, and exhaust fumes that have been drawn back into the building. Worn or poorly maintained combustion devices (e.g., boilers, furnaces), or a flue that is improperly sized, blocked, disconnected, or leaking, can be significant sources. Auto, truck, or bus exhaust from attached garages, nearby roads, or idling vehicles in parking areas can also be sources.

Exposure to concentrated levels of CO may result in a variety of flu-like symptoms such as dizziness, fatigue, headaches, disorientation and nausea. High levels of exposure can result in loss of consciousness and death.

Combustion equipment must be maintained to assure that there are no blockages, and air and fuel mixtures must be properly adjusted to ensure more complete combustion. Vehicular use should be carefully managed adjacent to buildings. Additional ventilation can be used as a temporary measure when high levels of CO are expected for short periods of time.

Steps to Prevent Carbon Monoxide Exposures:

1. Annually inventory and inspect all gas burning appliances such as stoves, furnaces and water heaters to ensure they are properly operating and vented to the outside.
2. Install carbon monoxide alarms in the buildings near appliances that burn natural gas, oil or wood.
3. Never let buses or other vehicles idle directly outside of the place of worship or other facilities, particularly in places where air can get indoors such as air handling intakes, windows or exit doors.



Learn more at:

www.epa.gov/indoor-air-quality-iaq/carbon-monoxides-impact-indoor-air-quality

Chemical Management

Houses of worship may use a variety of chemicals for cleaning and other purposes. When they are mismanaged, chemicals can put congregations, staff and others who use the facilities at risk from spills, fires, and other accidental exposures. Common hazardous chemicals include corrosive acids, bases, oxidizers, compressed gases and flammable solvents.

Chemical accidents impact safety, can cost thousands of dollars to clean up, disrupt schedules and could even temporarily close facilities. Toxic chemicals can cause serious health effects, including cancer; brain and nervous system disorders; organ damage (e.g., liver, kidneys, and lungs); irritation of the eyes, skin nose and throat; and asthma attacks.

A proper chemical management program ensures that all facilities are free from hazards associated with mismanaged chemicals.

Chemicals may be considered mismanaged when they are:

- In poor condition or expired
- Overabundant
- Not needed or used
- Not properly labeled or unknown
- Unsecured
- Stored near food
- Stored in inappropriate, leaking, corroded or cracked containers
- Stored with incompatible chemicals
- Stored on unstable/incompatible shelves or cabinets

Responsible chemical management programs start with development and implementation of a safe chemical management plan that reduces the risk of chemical exposures and accidents. Proper chemical management includes: a strong inventory control process, assessment of chemicals for risk and benefit, prohibiting the use of unauthorized chemicals, proper hazardous chemicals cleanout and disposal, appropriate safety measures, and personal protective equipment.

Steps to Improve Chemical Management Include:

1. Conduct annual chemical inventories and prohibit any unauthorized, toxic or hazardous chemicals from being brought into the facility.
2. Store toxic or hazardous chemicals in appropriate containers, separated by hazard category in a ventilated, fire resistant, and locked area or cabinet.
3. Label containers with the name of the material and date it entered the facility, and ensure that Safety Data Sheets (SDSs) for each product are in a binder readily displayed near the chemical storage area.
4. Conduct regular cleanouts of chemicals that are unnecessary, outdated, and pose a health, safety or environmental risk.
5. Ensure proper training of staff involved with chemical management before using toxic or hazardous chemicals.
6. When possible, consider using EPA approved “Safer Choice” chemical products.

Learn more at:

www.epa.gov/environmental-topics/chemicals-and-toxics-topics

www.epa.gov/saferchoice

Drinking Water

Clean drinking water is an essential ingredient for good health and a safe building environment. The vast majority of public drinking water systems provide safe and dependable drinking water to citizens across the United States every day. To learn more about the quality of your drinking water, contact your local water system or local health department.

Older buildings may have older plumbing materials that are made of lead. Lead is a toxic metal that is harmful to human health and can be found in a variety of sources (e.g. paint, dust, water). Lead pipes are more likely to be found in older cities and buildings built before 1988.

EPA's 3Ts for Reducing Lead in Drinking Water in Schools Toolkit was developed to assist schools and places with child care facilities with lead in drinking water prevention programs. It is intended for use by building officials responsible for the maintenance and/or safety of facilities including the drinking water. The document introduces the 3Ts for reducing lead in drinking water, which includes a training, testing, and telling approach. To learn more about the 3Ts guide visit: www.epa.gov/safewater/3Ts

In addition to the 3Ts, your facility can take steps reduce exposure to lead in drinking water:

- Talk to your water system and local health department about water testing.
- Use only cold water for food and beverage preparation.
- Remove lead plumbing materials like lead service lines or drinking water coolers listed in EPA's 3Ts as containing lead lined coolers.



- Clean faucet and drinking water fountain aerators (screens) regularly.
- Make sure that if filters are used they are maintained and are certified to remove lead (or any other contaminants of concern).
- Post placards near bathroom or utility sinks with notices if the water should not be consumed. Use pictures if there are small children using bathrooms.
- Regularly flush all water outlets used for drinking or food preparation, particularly after times when water may have been sitting for a long period of time (e.g. over a long weekend or break).

Although a majority of places of worship receive their drinking water from public water supplies, others may operate their own water systems and are required to comply with of regulations under the Safe Water Drinking Act (SDWA). Make sure to check in with your state to learn more about drinking water requirements that may apply to you.

Learn more at:
www.epa.gov/safewater

Educational, Art and Craft Supplies

Common arts and crafts supplies are used in many houses of worship for youth activities, advertising events, plays and more. These supplies could include glues, cleaners, glazes, paints, solvents, and other materials. Many of these materials are formulated with hazardous ingredients that can be harmful or toxic, especially to children, when used improperly or by an inappropriate age group.

Dangerous metals such as lead, volatile organic compounds, dust and fibers are commonly found in the art materials and supplies. Ingestion and skin absorption can occur when handling these materials as well as many other hazardous products.

Simple preventive measures can greatly reduce harmful exposures. Careful purchase and selection of art materials, dedicated adult supervision, and the proper use of the product with the appropriate age group are all simple actions that should be implemented. For added security, always lock up art supplies when they are not in use. The U.S. Consumer Product Safety Commission recommends that when buying art materials, school supplies and toys you should only purchase those products that are labeled "Conforms to the American Society for Testing and Materials (ASTM) D4236 (CPSC Document #5016)" and that do not have any cautionary warnings on the label.



Steps to Reduce Exposure to Hazards Associated with Educational, Art and Craft Supplies:

1. Check whether your supplies are listed as toxic or nontoxic (should be labeled accordingly by the Art and Creative Materials Institute (ACMI)).
2. Read and follow directions on labels regarding fumes or ventilation.
3. Ensure you have read and have available the Safety Data Sheets (SDS) for all craft products being used.
4. Provide ample fresh air and ventilation.
5. Do not allow eating or drinking around hazardous chemicals.
6. Properly store and dispose of all products according to label instructions.
7. Wash hands often when using toxic or hazardous chemicals.

Learn more at:

Art and Craft Safety Guide: www.cpsc.gov/s3fs-public/pdfs/blk_media_5015.pdf

Extreme Heat Events

Extreme heat events, or heat waves, are defined by weather that is substantially hotter and/ or more humid than average for a location at that time of year. These conditions stress the body's ability to maintain an ideal internal temperature, which can lead to a range of adverse health effects. Houses of worship should consider holding events earlier in the in the summer to avoid extreme heat.

Children need to take extra precautions on days of extreme heat. Dehydration, heat stroke, and other heat illnesses may affect children more severely than the average adult because:

- Children have a smaller body mass to surface area ratio than adults, making them more vulnerable to the heat.
- Children are more likely to become dehydrated than adults because they can lose fluid more quickly.
- Children play outside more than adults, and they may be at greater risk of heat stroke and exhaustion because they may lack the judgment to limit exertion during hot weather and to rehydrate themselves.

Hot weather can also affect ozone levels and other types of air quality. The Air Quality Index (AQI) is a guide for reporting daily air quality. The EPA Flag Program uses colored flags based on the AQI to teach coaches, students and others about outdoor air quality conditions.

Facilities can raise a colored flag each day that corresponds to their local air quality forecast. To check for air quality conditions in your area, visit www.airnow.gov.



Steps to Protect Children from Extreme Heat:

1. Limit outdoor activity and organized athletic events to morning hours when possible.
2. Encourage participants to drink more fluids.
3. Advise the wearing of lightweight, light-colored, loose-fitting clothing.
4. Plant more trees and vegetation (low pollination varieties) on facility grounds.

Learn more at:

www.epa.gov/natural-disasters/extreme-heat

Indoor Air Quality/ Ventilation

Poor indoor air quality (IAQ) can impact the comfort and health of congregants and staff and increase the risk of short-term health problems.

Inadequate IAQ can result in health concerns such as fatigue, nausea, coughing, eye irritation, headaches, asthma episodes, allergic reactions, and in rare cases, life threatening conditions such as severe asthma attacks.

Many perceived IAQ problems, however, are often comfort problems, such as temperature, humidity or air movement in a space being too low or too high.

Proper ventilation with outdoor air is a key component for good indoor air quality. In many cases, indoor air may, potentially, be two to five times more polluted than outdoor air. While at times challenging due to the high occupant densities of houses of worship, it is important that building designers incorporate ventilation systems that provide adequate outdoor ventilation air complying with the American Society of Heating, Refrigerating and Air Conditioning Engineers' standard (ASHRAE) 62.1-2010 or local codes.

Factors that contribute to poor IAQ may originate from inadequate heating, ventilation and air conditioning (HVAC) design. Some may be solely in the control of facilities management, such as proper maintenance of the HVAC system and the amount of outside air being mechanically brought into the building.

The cleanliness and general housekeeping of a building is a shared responsibility and requires the cooperation of facility management as well as the staff who work in the building.

Many of the topics discussed in this booklet, such as pesticides, idling, and chemical management, are all factors that influence a facility's IAQ. The goal of an Indoor Air Quality Management Program is to prevent the occurrence of IAQ problems and to respond quickly to issues before they become serious health matters.

Steps to Improve IAQ and Ventilation:

1. Ensure the ventilation system is operating as designed.
2. Implement a proactive IAQ management program, such as the one highlighted in the link below.
3. Develop and implement a tobacco-free facility policy.
4. Establish and implement a regular schedule for maintaining unit ventilators, replacing air filters, cleaning supply air diffusers, return registers and outside air intakes, and commission the HVAC system a minimum of once every 5 years.
5. Ensure condensate pans are clean, unobstructed, and drain properly.
6. Keep unit ventilators clear of books, papers and other items that can obstruct air flow.

Learn more at:

<https://www.epa.gov/indoor-air-quality-iaq/indoor-air-quality-offices-and-other-large-buildings>
<https://www.epa.gov/indoor-air-quality-iaq/heating-ventilation-and-air-conditioning-checklist-long-form>
<https://www.epa.gov/indoor-air-quality-iaq/establishing-indoor-air-quality-programs-building-and-facility-management>

Lead

Lead is a highly toxic metal that can have adverse health effects for both children and adults. The most common source of lead is from paint in buildings built before 1978. Lead dust comes from disturbing lead paint during renovations, deteriorating lead paint, and lead-contaminated soil that gets tracked into a building.

Children under 6 years of age are at particular risk of lead poisoning because their bodies are still developing. Furthermore, they frequently place their hands, toys, and other objects that could have dust from lead paint in their mouths. Some playground equipment and toys may contain lead or lead paint. Toys can pick up lead from contaminated soil or dust. Exposure to lead can result in lower IQ scores in children and has been associated with headaches, slowed growth, hearing problems, brain damage, nervous system disorders and behavior and attention problems.

If a house of worship was built before 1978, there is a chance that it contains lead paint, and you should consider testing for lead paint by a certified inspector or risk assessor.

If you hire a contractor to test for or clean up lead in your house of worship, you should know the following Lead Renovation, Repair, and Painting Rule Requirements for Contractors:

- Renovators must provide building owners and occupants pre-renovation notification.
- Firms/contractors and staff performing renovations that disturb paint must be appropriately certified.
- Renovators must be trained and certified.



- Workers must receive on-the-job training from a certified renovator.
- Lead-safe work practices must be followed and documented.

Steps to Reduce Lead Exposures:

1. Interior painted areas—Examine walls and interior surfaces to see if the paint is cracking, chipping, or peeling, and check for areas on doors or windows where painted surfaces rub together.
2. Exterior painted areas—Check exterior paint for flaking and ensure it is not contaminating nearby soil where children may play.
3. Check large outdoor structures for peeling or flaking paint that could contaminate the soil around play areas.
4. Have staff ensure that children wash their hands thoroughly after playing outside and before eating.

Learn more at:

www.epa.gov/lead

<https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>

Find EPA Lead-Safe Certified Contractors in your area at <https://cfpub.epa.gov/flpp/pub/index.cfm?do=main.firmSearch>

Mercury

Elemental mercury is found in thermometers, barometers, switches, thermostats, and glass vials. Compact fluorescent lamps (CFLs) light bulbs also contain mercury.

Mercury spills are often caused by improper storage and mishandling of these items. These types of exposures can occur when elemental mercury is spilled or when products that contain elemental mercury break and release mercury to the air, particularly in warm or poorly-ventilated indoor spaces.

Mercury is a neurotoxic substance that can produce a wide range of health effects depending on the amount and timing of exposure. Elemental mercury primarily causes health effects when it is inhaled as a vapor and absorbed into the lungs.

Cleaning up mercury spills can be costly and cause widespread environmental contamination since it can easily be tracked through a building and to other buildings, vehicles, and personal property (e.g. clothes, bags, toys). Whenever possible, items containing elemental mercury should be replaced with alternatives, such as digital thermometers.



Steps to Prevent Mercury Exposure:

1. Conduct an inventory of all chemicals and locate all mercury equipment and compounds.
2. Contact a professional to collect and properly dispose of all mercury equipment and compounds.
3. In the event of a spill, open windows, turn down the temperature, have everyone leave the area, and contact local or state health or environmental agencies.
4. Create and distribute a mercury spill response plan.
5. Spills the size of a single thermometer or CFL can be cleaned by staff or facilities personnel after opening a window and ventilating the area.
6. Never use a vacuum cleaner to clean up mercury. The vacuum will put more mercury into the air and increase exposure.
7. Never use a broom to clean up mercury. It will break the mercury into smaller droplets, spread them, and contaminate the broom.
8. Never wash clothing or other items that have come in direct contact with mercury in a washing machine, because mercury may contaminate the machine and/or pollute the sewage system. Clothing that has come into direct contact with mercury should be discarded as directed by your local health or fire department.

Learn more at:

www.epa.gov/mercury

www.epa.gov/cfl/cleaning-broken-cfl

<https://www.epa.gov/mercury/what-do-if-mercury-thermometer-breaks>

<https://www.epa.gov/mercury/what-do-if-you-spill-more-mercury-amount-thermometer>

Mold and Moisture Control

By checking for moisture and mold on a regular basis and spending a few hundred dollars of annual preventative maintenance, facility managers could avoid the need for costly repairs, as well as the potential legal liability due to health risks. Potential health concerns are also an important reason to prevent mold growth and to clean up existing indoor mold growth.

All molds have the potential to cause health effects that may include irritation of the eyes, skin, nose, throat, and lungs of both mold allergic and non-allergic people. Molds can produce allergens that trigger allergic reactions or even asthma attacks in people allergic to mold. Others are known to produce potent toxins and/or irritants. Molds can be found almost anywhere and they can grow on virtually any organic substance, as long as moisture and oxygen are present. There are molds that can grow on wood, paper, carpet, foods and insulation.

The presence of moisture within building structures stimulates the growth of molds and other biological contaminants. The key to mold control is moisture control.

Moisture and uncontrolled humidity problems may include roof leaks, landscaping or gutters that direct water into or under the building, and unvented combustion appliances. Additionally, moist facilities provide a nurturing environment for mites, roaches and rodents which are associated with asthma and other diseases. Solve moisture and condensation problems before they become mold problems.



Steps to Prevent Mold and Control Moisture:

1. Maintain indoor humidity levels below 60%, ideally between 30% and 50% when possible.
2. Clean and dry any wet or damp spots within 48 hours.
3. Fix leaky plumbing and roof leaks in the building as soon as possible.
4. Check regularly for condensation and wet spots.
5. Address sources of moisture problems as soon as possible.
6. Scrub mold off hard surfaces with water and detergent, and dry completely.

Learn more at:

www.epa.gov/mold

<https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide>

PCBs in Caulk and Fluorescent Light Ballasts

Polychlorinated biphenyls (PCBs) are a class of organic chemicals that have been used in a variety of commercial products. Buildings built or renovated from the 1950s to the late 1970s may contain PCBs in caulking, electronics, fluorescent light ballasts, and other materials.

In 1979, EPA banned the commercial production of PCBs, citing health and environmental concerns, including but not limited to cancer, reproductive effects, and neurological effects. EPA has found PCB-containing caulk and PCB-containing light ballasts can be a significant source of PCBs in indoor air.

EPA found that old caulk used to seal gaps around windows, doors, and joints in buildings constructed between 1950 and 1979 may contain as much as 30% PCBs and can emit PCBs into the surrounding air. PCBs from caulk may also contaminate adjacent materials such as masonry or wood. EPA recommends removing PCB-containing caulk during planned renovations and repairs (e.g. when replacing windows, doors, roofs, ventilation, etc.)

PCBs are also contained within some fluorescent light ballast capacitors and potting material manufactured prior to 1979. PCB-containing fluorescent light ballasts that are currently in use should be properly removed from buildings to prevent indoor air exposure. Sudden rupture of light ballasts may pose health risks to the occupants and is difficult and costly to remediate. Removal of PCB-containing light fixtures, as part of lighting upgrades or a stand-alone project, is an

investment that pays off with long-term benefits to congregants, staff, the community, and the environment.

Conduct the following best management practices (BMPs) listed below on an ongoing basis to minimize potential exposures to PCBs:

1. Ensure that ventilation systems are operating properly and are regularly inspected and maintained according to system manufacturer instructions and guidelines or ANSI/ASHRAE/ACCA Standard 180-2012—Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems. If system cleaning is needed, follow ANSI/ACCA Standard 6 – Restoring the Cleanliness of HVAC Systems (2007).
2. Clean inside buildings frequently to reduce dust and residue.
3. Use a wet or damp cloth or mop to clean surfaces.
4. Use vacuums with high efficiency particulate air (HEPA) filters.
5. Do not sweep with dry brooms or use dry cloths for dusting.
6. Wash hands with soap and water, particularly before eating.
7. Wash children's toys.

Learn more at:

<https://www.epa.gov/pcbs>

www.epa.gov/sites/production/files/2016-03/documents/practical_actions_for_reducing_exposure_to_pcbs_in_schools_and_other_buildings.pdf

<https://www.epa.gov/pcbs/program-contacts>

Pesticides and Pest Management

It is important to keep your place of worship free of pests that cause health concerns and property damage. That said, pesticides need to be used carefully and judiciously, especially when used in sensitive areas where children are present. Children are more sensitive than adults to pesticides and can have greater exposure to pesticides from crawling, exploring, or other hand-to-mouth activities.

Adverse effects of pesticide exposure range from mild symptoms of dizziness and nausea to serious, long-term neurological, developmental and reproductive disorders.

EPA recommends that facilities use an Integrated Pest Management (IPM) approach to reduce pest and pesticide risk and exposure. Implementing IPM practices in facilities can reduce or minimize economic and health related issues caused by pests and pesticides.

All building occupants and staff play a role in ensuring that a facility's IPM program is successful. By working together, everyone can have a role in creating an ongoing safe and healthy place of worship.



Steps to Reduce Pesticide Risks and Manage Pests in your Facility:

The central features of an IPM program are the implementation of exclusion and sanitation practices that keep pests out.

Exclusion Practices:

1. Install high-density door sweeps on all doors to keep out mice, rats and roaches.
2. Block then seal open spaces around utility pipes coming into the building with copper mesh wire and sealant. Open spaces as small as 1/4 inch, or less than half the width of a dime, will allow mice and other pests into a building.
3. Install screens on all windows, particularly if they are open during warm months.

Sanitation Practices:

1. Clean and mop floors in all food service areas daily, including office spaces.
2. Use sealable containers or canisters to provide secure storage for edible food items and snacks.
3. Bag and completely close all garbage and place in dumpsters outside of the building daily.

Learn more at:

https://www.epa.gov/sites/production/files/2015-11/documents/ipm_in_buildings.pdf

Radon

Radon is a radioactive, colorless, and odorless gas that comes from the natural (radioactive) breakdown of uranium in soil, rock and water. Radon gas can enter a building through cracks and holes in the floor and become trapped in indoor air. Radon can be found in both old and new buildings and cannot be felt when inhaled into your lungs.

Prolonged exposure to radon can result in lung cancer. Higher radiation doses may result in children due to their smaller bodies and faster breathing rates compared to adults. The EPA estimates that radon is responsible for 21,000 lung cancer deaths every year making radon the second leading cause of lung cancer in the U.S., after smoking.

EPA encourages all building owners to test for radon gas. Radon test kits cost \$10-15 and can be purchased from environmental laboratories, local hardware stores and building supply companies or through the National Radon Hotline, (800) 767-7236.

If you are interested in finding a qualified company to test for radon or address high levels of radon in your place of worship, contact your state radon program for help in finding qualified professionals in your area. You can find contact information for your state radon program by going to <https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information>.



Steps to Reduce Radon Exposure:

1. Test occupied rooms for radon, following EPA and state protocols.
2. Install radon mitigation systems which, are designed to reduce and remove radon from indoor air if the rooms testing results show radon concentrations of 4 pCi/L or higher.

Learn more at:

<https://sosradon.org/>
<https://www.epa.gov/radon>

UV Radiation

While short exposure to sunlight is enjoyable and beneficial as an important source of Vitamin D, too much exposure to the sun can be dangerous. Most people are not aware that skin cancer, while largely preventable, is the most common form of cancer in the United States. In fact, 5.4 million basal and squamous cell skin cancer are diagnosed each year. Melanoma, the most deadly type of skin cancer, accounts for about 76,000 cases of skin cancer. One in five Americans will develop skin cancer in their lifetime. One American dies from skin cancer every hour.

Overexposure to ultraviolet (UV) radiation from the sun can result in painful sunburns. It can also lead to more serious health problems, including skin cancer, premature aging of the skin, cataracts and other eye damage, and immune system suppression. Because they tend to play outside more frequently for long periods of time and may not have the benefit of sunscreen or shade, children are particularly at risk. By following some simple steps, children and adults can still enjoy time in the sun and be protected from overexposure to UV radiation.

Steps to Protect Against Overexposure to UV Radiation:

1. Take steps to prevent sunburns. Sunburns significantly increase a person's lifetime risk of developing skin cancer, especially for children.
2. Wear protective clothing. A long-sleeved shirt, a wide brimmed hat, and sunglasses are strongly recommended.
3. Generously apply broad-spectrum sunscreen with a minimum Sun Protection Factor (SPF) of 30+ approximately 15 minutes prior to going outside. Sunscreen should provide protection from both ultraviolet A (UVA) and ultraviolet B (UVB) rays. Reapply every two hours, even on cloudy days, and after swimming or sweating.
4. Provide access to shade on property grounds, and remember that the sun's UV rays are strongest between 10 a.m. and 4 p.m.
5. Visit EPA's UV Index page to access real time information about the amount of UV radiation your community faces. www.epa.gov/sunsafety/uv-index-1

UV INDEX	
Exposure Category	UV Index Range
Low	2 or less
Moderate	3 to 5
High	6 to 8
Very High	8 to 10
Extreme	11+

Learn more at:

<https://www.epa.gov/sunsafety>

Energy Efficiency

Energy efficiency is an important tool for places of worship to save money and natural resources. The savings from improved energy performance can help pay for building improvements and other upgrades that enhance the facilities and experiences of the congregants.

In addition, energy and water efficiency are connected. Because electricity or natural gas is used to pump, heat, and treat water throughout a facility, every gallon of water has an energy footprint. Evaluating energy and water use together will maximize savings, especially in areas of heated water use and water-intensive HVAC and commercial kitchen equipment.



Energy Efficiency Opportunities in Houses of Worship:

Low-Cost Measures:

1. Use EPA's measurement and tracking tool, Portfolio Manager, to assess energy performance.
2. Turn off lights when not in use or when natural daylight can be used.
3. Set back the thermostat in the evening and at other times when the building is unoccupied.
4. Perform monthly maintenance of heating and cooling equipment to ensure efficient operation throughout the year.
5. Educate staff about how their behaviors affect energy use.
6. Use Energy Star's Commercial Building Design Resource, Target Finder, to set energy targets and integrate efficiency goals into the design of new properties.

Cost-Effective Investments:

1. Install energy-efficient lighting systems and controls, which will improve light quality and reduce heat gain. Installing new energy-efficient lighting systems will also serve to remove any potentially harmful PCB-containing light ballasts.
2. Upgrade and maintain heating and cooling equipment.
3. Use a performance-based contract to guarantee energy savings from upgrades.
4. Work with an energy services provider to help manage and improve energy performance.
5. Purchase energy-efficient products like ENERGY STAR qualified office equipment.
6. Install window films and add insulation or reflective roof coating.

Learn more at:

A resource and planning guide for clergy, staff, and laypersons at houses of worship who want to increase the energy and water efficiency of their facilities:

https://www.energystar.gov/buildings/tools-and-resources/energy_star_action_workbook_congregations
<https://www.energystar.gov>

Water Efficiency

Houses of Worship use water in different ways depending on the usage and occupancy patterns, the age of the building and its fixtures and equipment, and the behavior of the people in it. Reducing water use lowers the costs associated with operating and maintaining equipment, as well as the energy needed to heat, treat, store and deliver water throughout the property.

EPA's WaterSense program was created to help consumers and businesses identify ways to save water, energy and money. Houses of worship can use WaterSense tools and resources to implement water efficiency programs that include water assessments and incorporate water-efficient best practices into regular operations and maintenance and procurement policies. Reducing the costs of water and energy can make funds available for other purposes or to further mission projects. Faith leaders and youth can educate the whole community about the benefits of saving water and encourage everyone to make water-efficiency a part of their everyday life.



Water Efficiency Opportunities in Houses of Worship:

Low-Cost Measures:

1. Use EPA's measurement and tracking tool, Portfolio Manager, to track water usage over time.
2. Conduct a water assessment to find out how much water being used and where to prioritize improvements.
3. Look for leaks and unexpected water use to fix them before they add up or cause damage.
4. Optimize water use in heating and cooling equipment, and shut down or use standby mode for all continuous flow equipment between uses.
5. Educate staff about saving water and how to report leaks and problems.
6. Practice water-efficient landscaping with native and regionally-appropriate plants to minimize watering needs.

Cost-Effective Investments:

1. Retrofit and replace plumbing fixtures and irrigation controllers with WaterSense labeled models.
2. Eliminate single-pass cooling where possible, and work with vendors to optimize HVAC equipment.
3. Purchase energy-efficient products like ENERGY STAR qualified commercial kitchen equipment to save energy and water.
4. Include water efficiency requirements in contracts and service agreements with vendors to continue savings.
5. Contact water and energy utilities for rebates and giveaways of efficient products and equipment.

Learn more at:

<https://www.epa.gov/watersense>

WaterSense at Work Best Practices for Commercial and Institutional Facilities at:

<https://www.epa.gov/watersense/commercial-buildings>

Waste Reduction

Americans generate millions of tons of trash in our homes and communities. Every day, the average individual living in the United States produces nearly 4.5 pounds of trash. While many people already recycle products at home, houses of worship can also control their waste by reducing, reusing and recycling it where available. Waste prevention and reduction opportunities exist everywhere.

Products that can be reused and recycled are countless and include everything from food scraps, yard and grounds wastes, paper, clothing, school supplies, sports equipment, and electronics. Items commonly recycled, and found in virtually any house of worship, are paper, aluminum, glass, steel, cardboard, and yard waste. Food scraps or yard waste can be composted instead of being thrown out and then be used to improve the soil and support facility landscaping or gardens. Many waste reduction efforts save money, energy, and natural resources.

Houses of worship can implement waste reduction programs that can include pre-post waste reduction audits and promote programs that reduce waste. Engage youth in the program who will often educate the whole community about the benefits of waste reduction and encourage everyone to make waste reduction a part of their everyday life. Increasing the flow of reusable and recyclable materials can even generate extra funds for faith groups.

Waste reduction can be further minimized by using WasteWise, a free EPA program through which organizations can use strategies and track results to eliminate costly municipal solid waste.

On food alone, EPA estimates that more food (over 75 billion pounds) reaches landfills and combustion facilities than any other material in everyday trash, constituting 22% of discarded municipal solid waste. Too often, much of the food that is wasted is otherwise consumable and could be diverted to the hungry or those in need. EPA has several programs that houses of worship may utilize to reduce and divert food waste, both in building cafeterias and across their congregations, including the Food Recovery Challenge. The agency is also planning to relaunch the Food Stewards Program late in 2019. The Food Stewards Program supports the diversion of food specifically to those in need.

Steps to Reduce Waste:

1. Reduce waste through recycling, reusing or composting recyclable products.
2. Purchase more environmentally friendly electronic and paper products.
3. Manage obsolete electronics in an environmentally safe way.
4. Purchase less food to save money and reduce waste.



Learn more at:

www.epa.gov/smm/wastewise
www.epa.gov/sustainable-management-food

Quick Assessment

Please use this voluntary assessment to help you reduce and prevent exposures to common environmental health hazards in your building. Each topic area covered below has low or no-cost steps which can be taken to improve your congregants' environmental health. This tool also highlights energy efficiency strategies to help conserve valuable financial resources.

Asthma and Asthma Triggers

Is the building's cleaning staff encouraged to use fragrance free cleaning products and "wet" dusting techniques whenever possible?

Yes No N/A

Are rooms free of clutter? Are they dusted regularly? Are stuffed cushions pillows washed frequently?

Yes No N/A

Buses and Vehicle Idling

Have anti-idling policies been developed and implemented for buses that serve the facility?

Yes No N/A

Have anti-idling zones been established for all vehicles at the facility (school buses, delivery trucks and cars)?

Yes No N/A

Are all passenger pickup/drop off areas located away from the facilities' air intake supply, windows and exit doors?

Yes No N/A

Carbon Monoxide (CO)

Does the maintenance staff inspect and document the condition and findings for all gas burning appliances, furnaces and water heaters yearly to ensure they are properly operating?

Yes No N/A

Have CO detectors been installed in the building near appliances that burn natural gas, oil, wood or gas?

Yes No N/A

Chemical Management

Does the building conduct a yearly inventory of all chemicals present?

Yes No N/A

Does the building have a policy that prohibits any unauthorized toxic or hazardous chemicals from being brought inside?

Yes No N/A

Are all chemicals properly labeled, stored in original containers, dated as to when they entered the building, and have accompanying SDS information on site?

Yes No N/A

Are all toxic or hazardous chemicals stored in appropriate containers, separated by hazard category, in a ventilated, fire resistant, and locked area or cabinet?

Yes No N/A

Does the facility conduct cleanouts of all chemicals that are unnecessary, outdated and posing a health risk on a regular basis?

Yes No N/A

Do you ensure proper training of staff involved with chemical management?

Yes No N/A

Drinking Water

Are water faucets, fountain screens and aerators regularly cleaned and sanitized?

Yes No N/A

Do you have policies and procedures in place to prevent the disposal of hazardous substances down the toilets and/or dumping into storm drains?

Yes No N/A

Educational & Art Supplies

Do you have a policy to ensure that art materials and supplies purchased are labeled “Conforms to ASTM D4236”?

Yes No N/A

Do your policies encourage minimizing exposure to hazardous materials by substituting less- or non-hazardous materials where possible for youth activities; prohibiting food consumption around hazardous chemicals; and washing hands often?

Yes No N/A

Is the staff reminded to follow the precautionary recommendations listed on the labels?

Yes No N/A

Do your staff have updated Safety Data Sheets for all products being used?

Yes No N/A

Energy Efficiency

Are lights turned off when not in use or when natural daylight can be used?

Yes No N/A

Are thermostats set back in the evening and at other times when the building is unoccupied?

Yes No N/A

Do you track energy performance, perform monthly maintenance of heating and cooling equipment, educate congregants and staff about how their behaviors affect energy use, and use systems and controls that improve light quality, heating and cooling as part of an energy efficiency program?*

Yes No N/A

Extreme Heat Events

Do you advise congregants to wear lightweight, light-colored and loose-fitting clothing during extreme heat events?

Yes No N/A

Do you remind congregants to limit physical exertion outdoors during days with unhealthy air conditions or periods of extreme heat?

Yes No N/A

Indoor Air Quality/Ventilation

Do you currently implement a proactive IAQ management plan?

Yes No N/A

Do you have a tobacco-free building policy?

Yes No N/A

Does maintenance staff have a regular cleaning schedule for unit ventilators, supply air diffusers, return registers, outside air intakes, and commission the HVAC system a minimum of once every 5 years?

Yes No N/A

Are condensate pans clean, unobstructed, and do they drain properly?

Yes No N/A

Are unit ventilators clear of books, papers that would block or hinder air flow?

Yes No N/A

Lead

Are the walls and interior surfaces free of cracking, chipping, or peeling paint, especially around doors or windows where painted surfaces rub together?

Yes No N/A

Are exterior walls and other large structures in the building grounds free of cracking, chipping, or peeling paint?

Yes No N/A

Does the maintenance staff provide pre-renovation notification to staff and congregants prior to construction activity?

Yes No N/A

Are all demolition and renovation activities impacting lead containing paint or other building materials in the building undertaken by “certified” and properly trained contractors?*

Yes No N/A

*Assessment Activities that may require additional, cost-effective resources and methods for resolution.

Mercury

Has an inventory of all chemicals, materials and equipment containing mercury been completed?

Yes No N/A

Does the building have a mercury spill kit and spill response plan readily available on site?

Yes No N/A

Mold and Moisture Control

Is humidity in the building maintained below 60%, and ideally between 30% and 50% where possible?*

Yes No N/A

Does the maintenance staff repair all leaking plumbing and roof leaks in the building as soon as possible?*

Yes No N/A

Is the building (walls/ceilings/floors) free of wetness or condensation?

Yes No N/A

Does the maintenance staff clean and dry any wet or damp spots consistently within 48 hours?

Yes No N/A

PCBs in Caulk and Fluorescent Light Ballasts

Have you determined whether the fluorescent light ballasts contain PCBs? If so, have the lighting fixtures in the building been retrofitted to adequately remove potential PCB hazards using recommendations highlighted in <https://www.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials>?

Yes No N/A

Have you followed recommendations highlighted in <https://www.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials> for potential PCB-containing caulk?

Yes No N/A

Pesticides and Pest Management

Do all floors in food service areas and rooms where food is served get cleaned and mopped daily?

Yes No N/A

Are all food items stored securely in sealable containers or canisters?

Yes No N/A

Is all garbage bagged, completely closed, and placed in dumpsters outside the building daily?

Yes No N/A

Are there high-density door sweeps installed on all doors to keep out mice, rats and roaches?*

Yes No N/A

Are all open spaces around utility pipes coming into the building blocked with copper mesh wire or other materials and sealed to hinder entrance into the building by pests?*

Yes No N/A

Does the building have screens installed on all operable windows?*

Yes No N/A

Radon

Have all the first floor and basement rooms of the building been tested for the presence of radon with results documented and available for review?

Yes No N/A

If room radon levels exceed 4pCi/L, have you installed radon mitigation systems?*

Yes No N/A

Top 10 Ways to Make Your Building Healthier

1. **Clear the air inside.** EPA's Indoor Air Quality Tools program provides information and tips on how to help building managers prevent and solve indoor air quality problems.
2. **Clear the air outside.** You can reduce exposure to engine exhaust by eliminating unnecessary vehicle idling, installing effective emission control systems on newer vehicles, and replacing the oldest vehicles with new ones.
3. **Reduce/remove radon in buildings.** You should test the level of radon gas in your buildings. No radon level is healthy. If the test results are at or above 4pCi/L, appropriate mitigation steps should be taken to reduce the radon level.
4. **Use chemicals carefully.** Possible health, safety and environmental implications should be considered before chemicals are purchased for use. Do not allow outside, unauthorized chemicals to be brought into the building. Proper chemical use and management (storage, labeling, and disposal) is critical for reducing chemical exposures and costly accidents.
5. **Test the water.** You should test the drinking water in your building regularly.
6. **Get the lead out.** Buildings built prior to 1978 should be tested for lead paint. Renovations or repairs must be done in a way that does not create lead dust. Children should be kept away from lead hazards inside and outside of buildings.
7. **Eliminate Mercury.** Your environment should be mercury-free. Consider using digital thermometers and safer alternatives to mercury containing products.
8. **Cover up.** Encourage congregants to practice "sunsafe behavior" and especially encourage children to cover up, use SPF 30 or higher broad-spectrum sunscreen, and stay out of midday sun to avoid damaging UV rays.
9. **Use toxics with caution.** Look for alternatives to toxic pesticides and cleaning chemicals. Remove sources of lead, mercury, and PCBs from the your environment.
10. **Educate yourself.** Know which environmental health issues affect your building and how to address them.

Federal Grants and Other Financial Assistance Opportunities

Federal Programs

The federal government provides a variety of grant programs to private organizations, and places of worship may qualify for many of these grants. For more information on federal grants, as well as some specific examples of EPA grant programs, please see the following links.

Information about Federal Grants

<https://www.grants.gov>

Information about EPA Grants

<https://www.epa.gov/grants>

Brownfields Grant Program

<https://www.epa.gov/brownfields/types-brownfields-grant-funding>

Environmental Justice Programs

<https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance>

Energy Efficiency Assistance Programs

<http://www.energystar.gov/rebate-finder>

<https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/find-financing>

Air Quality Assistance Programs

<https://www.epa.gov/grants/air-grants-and-funding>

<https://www.epa.gov/cleandiesel>

State Financial Assistance Programs

Many state environmental protection and public health agencies also provide grants to private organizations to improve human and environmental health. Please see the following link to find a directory of state run environmental and public health agencies.

<https://www.epa.gov/home/health-and-environmental-agencies-us-states-and-territories>

Grants and Other Forms of Financial Assistance Provided by Private Entities

Private entities provide many forms of financial assistance to building owners and operators looking to improve energy efficiency. Please see the following link for a list of current rebate programs provided by electric utilities designed to support energy efficiency improvements.

<https://www.dsireusa.org/>

Further, there is a robust community of faith organizations involved in environmental stewardship, and some of these organizations may provide financial support in case by case situations. Please see the following link for a list of faith based environmental stewardship organizations.

<https://www.energystar.gov/buildings/owners-and-managers/congregations/external-faith-based-environmental-stewardship-organizations>

