Pollution Prevention Practices

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Overview

North Risk Partners

CERC is a certification program administered by Environmental Risk Professionals and is being offered at no additional cost to you through UCPM and North Risk Partners. Visit c-e-r-c.com to learn about the program and the steps to become certified.

Pollution Prevention Practices

UCPM

The Pollution Prevention Practices contained herein are compliments of UCPM and **North Risk Partners,** and are part of the CERC Certification program. Visit c-e-r-c.com to learn about the program and the steps to become certified. For companies with 40-hour HAZWOPER trained employees, implementation of the Pollution Prevention Practices is voluntary.

Get Certified

Environmental Risk Professionals

In addition to securing qualifying pollution coverage, you must complete the Certification Request Form online at c-e-r-c.com/getcertified. If you are unsure which of the five contracting classes applies to you, please use the General and Trade Contractors request form to get started. Your certificate and link to your custom marketing kit will be sent to you once all of the requirements have been met.

Risk Management through Pollution Prevention

Pollution Prevention Practices

Pollution Prevention Practices were developed for businesses and contractors by Environmental Risk Professionals to guide them on how to prevent the release of toxic and hazardous pollutants into the environment. Many of the same environmental controls promoted as part of a pollution prevention plan may be used by industry in Stormwater Pollution Prevention Plans, Spill Prevention Control and Countermeasure (SPCC) Plans, Occupational Safety and Health Administration (OSHA) safety programs, fire protection programs, insurance policy requirements, or Standard Operating Procedures (SOPs).

Distributing Pollution Prevention Practices internally provides an opportunity for pollution prevention, which may help minimize the risk of a spill or release of hazardous materials into the environment. Pollution Prevention Practices may also help reduce long-term costs through operational changes, reduced health and safety risks to employees, substituting for more environmentally safe products, and reduced waste generation through recycling/reuse.

Environmental Risk Professionals understand that companies may implement successful measures to reduce and control environmental releases of all types of pollutants formally as part of pollution prevention plans and informally as part of unwritten SOPs. The Pollution Prevention Practices contained herein are meant to supplement those already in place and provide additional measures for those that are not.

DISCLAIMER

Responding to Spills

Small spills can become larger incidents and become expensive to clean up when inadequately or inappropriately controlled. Spills or emergencies can happen anywhere, at any time. Spills will likely occur during loading, unloading, transporting, or storing chemicals or materials. Pre-planning and training employees on how to respond can help mitigate the environmental impacts caused by spills.

The information provided within this document is intended to provide general Pollution Prevention Practices (PPPs) for responding to spills. Please note that owners and operators of facilities that store or use petroleum products or other oils of any type (including vegetable oil, animal fat, milk, etc.) may be required by federal law to develop and implement a Spill Prevention Control and Countermeasures (SPCC) Plan to minimize the environmental impact resulting from oil or fuel releases. If you are unsure whether your facility is subject to SPCC regulation, please consult your state or local regulatory authority.

Pollution Prevention Practices for Responding to Spills at a Facility

To prevent or minimize the impact of spills, consider implementing the following:

- Designate personnel responsible for spill response and cleanup.
- Provide sufficient secondary containment at chemical and waste storage locations to prevent migration of a spill outside the area.
- Inspect chemical and waste storage and fueling locations regularly to ensure the integrity of storage units and secondary containment.
- Post spill response and notification procedures in locations readily accessible to employees.
- Train employees on spill response protocols/procedures at regular intervals.
- Use absorbent granules or pads to dry spills and berm any liquids that cannot be absorbed to prevent migration of spills.
- Cover or berm storm drain inlets to prevent the discharge of spilled materials into the storm system.
- Cover or berm floor drains and trench drains to prevent the discharge of spilled materials.
- Periodically inspect floor, storm, and trench drains for debris and clean out as necessary.
- Periodically check and restock spill response kits.
- Stage spill kits at all fueling and loading/unloading locations.
- Utilize dry cleanup methods.
- Do not wash down spills into a storm or sanitary drain.
- If fluids other than wash water and stormwater enter drains connected to the sanitary sewer, the sewer system operator may have to be notified. Check local regulations and post protocols.

Pollution Prevention Practices for Responding to Spills During Transport

- Establish notification procedures and keep them in an accessible location in all vehicles.
- Keep spill response kits on transport vehicles.
- Periodically check and restock spill response kits.
- Establish spill response protocols and keep a list of protocols in an accessible location in all vehicles.

- Train employees on accident reporting and spill response procedures at regular intervals.
- Establish an agreement with a spill response company to respond to significant spills that company personnel cannot clean up.
- Cover or berm storm drain inlets to prevent the discharge of spilled materials into the storm system.
- Utilize dry cleanup methods.
- Do not wash down spills into a storm or sanitary drain.

Spill Response Kit May Include:

- Sorbent materials such as snakes, pads, sweeps, booms, or pigs
- Drain plugs, mats, or pads
- Repair Putty
- Wooden plugs
- Personal protective equipment
- Disposal bags
- Overpack drums

Crystalline Silica

Crystalline silica is a common mineral found in many naturally occurring materials and used in many industrial products and construction sites. Respirable crystalline silica (very small particles typically at least 100 times smaller than ordinary sand found on beaches or playgrounds) is generated by high-energy operations like cutting, sawing, grinding, drilling, and crushing stone, rock, concrete, brick, block, and mortar; or when using industrial sand. There is strong scientific evidence showing that exposure to respirable crystalline silica can increase a person's risk of developing lung cancer.

Once inhaled, silica accumulates in the lungs and causes lung inflammation, which leads to scarring and the formation of nodules, called silicosis, a type of pulmonary fibrosis. Symptoms of silicosis can appear from a few weeks to many years after exposure to silica dust. Sufficient scarring decreases breathing capacity and increases susceptibility to lung

infections, such as tuberculosis. Exposure may lead to chronic obstructive pulmonary disease (COPD), lung cancer, or kidney disease. Silicosis is permanent and irreversible.

Silica Standard Overview

Employers must use engineering controls and safe work practices as the primary method to keep exposures at or below the permissible exposure limit (PEL) of 50 micrograms per cubic meter of air (µg/m3), which is averaged over an eight-hour work day. Engineering controls include using tools with integrated water delivery systems, wetting down work operations, employing shrouds and dust collection systems, or using local exhaust ventilation (such as vacuums) to keep silica-containing dust out of the air and out of workers' lungs. Work practices to control silica exposures include wetting down dust before sweeping it up or using the water flow rate recommended by the manufacturer for a tool with water controls. Respirators will be provided when engineering and work practice controls cannot maintain exposures at or below the PEL.

Pollution Prevention Practices for Crystalline Silica

The following Pollution Prevention Practices (PPPs) are recommended for activities that have the potential to create dust-containing crystalline silica:

- Develop and implement a written exposure control plan describing methods to protect workers from exposure.
- Designate a competent person to implement the written exposure control plan.
- Provide medical exams for workers who must wear a respirator for 30 or more days a year.
- Keep records of medical exams and worker exposure history to crystalline silica.
- Conduct a pre-job hazard assessment to identify and control activities that could create dust containing crystalline silica.
- Consider using a silica-free or low-silica product to eliminate or substitute for the crystalline silica product.
- Use engineering controls, including exhaust ventilation, wet cutting or wet abrasive blasting methods, dust control additives, barriers or enclosures, and automated processes.
- Restrict housekeeping practices that expose workers to silica where feasible alternatives are available.
- Hold mandatory training for workers to educate them on the hazards of crystalline silica.
- Do not eat, drink, or smoke in areas with crystalline silica.

- Post signage warning workers of the potential hazard and limit access to authorized personnel only.
- Make the use of personal protective equipment (PPE) mandatory.
- Establish a method to decontaminate workers following exposure to crystalline silica. This can be done by setting up a decontamination area with high-efficiency particulate air (HEPA) vacuum cleaners.
- Use fire-retardant disposable coveralls and gloves to prevent contamination of employees' clothes.
- For work being conducted outside, position workers upwind of silica-generating equipment.
- Periodically conduct inspections and maintenance of engineering controls and review PPPs to ensure they are working as planned.

Finally, it is important to note that these PPPs are provided to prevent employees' exposure to crystalline silica. Although developed in response to the Occupational Safety and Health Administration's (OSHA) silica standard promulgated by 29 Code of Federal Regulations (CFR) 1910.1053, their use alone will not ensure compliance with the standard. It is the user's responsibility to understand and comply with OSHA's Silica Standard.

Fugitive Dust Control

Fugitive dust refers to small particles suspended in the air. The primary pollutant related to fugitive dust is PM_{10}, which describes particulate matter (PM) of 10 micrometers or less in aerodynamic diameter. In comparison, the diameter of the average human hair is 70 micrometers, making human hair about seven times the size of PM_{10}. Where larger particles will typically settle out near their source, PM_{10} can get entrained and carried readily by the wind. PM_{10} particles can enter the lungs, damage tissue, and impair the lungs' ability to function properly. Older adults, children, and people with chronic lung diseases like asthma are especially sensitive to high dust levels.

Common sources of fugitive dust emissions may include the following:

- Equipment and vehicle movement on unpaved roads and areas
- Excavation and grading operations
- Material stockpiles
- Loading/unloading areas
- Material spills

- Material conveyance systems
- Material crushing and abrasion operations
- Exposed openings in process and storage buildings
- General work areas

Pollution Prevention Practices for Fugitive Dust Control

The following are Pollution Prevention Practices (PPPs) to prevent and control fugitive dust emissions:

- Apply water or use water droplet dust control systems. Use multiple light applications rather than a single heavy application to prevent run-off.
- As an alternative, apply a chemical dust suppressant following manufacturer recommendations. Check with your local regulatory authority and get approval to use chemical dust suppressants before implementing them for dust control.
- Another option is to enclose sources of fugitive dust emissions.
- Mulch, vegetation, and stone are options to apply to unpaved areas to reduce erosion and dust.
- Limit soil disturbance by working with soils when moist.
- Avoid dust-generating work when there are high winds.
- Reduce vehicle and equipment speeds.
- Maintain existing vegetation or plant new vegetation to limit areas of bare soil.
- Wind barriers perpendicular to prevailing winds can control air currents and prevent dust from blowing off-site.
- Regularly clean debris and dust from paved areas or roadways.
- Use track-out control systems or wheel washing at exit points to reduce dirt and dust being tracked off-site on vehicle wheels.
- When dry products (flakes) are used, spread them on the surface and mix them into the soil.
- Train facility personnel on the chosen prevention and control measures to be used on-site.
- Implement inspection and maintenance procedures and monitoring initiatives to ensure effective implementation of the prevention and control measures.

Vehicle & Equipment Washing

Vehicle and equipment washing can be done at a stationary location or by a mobile vehicle and equipment washing company. A stationary location is a permanent fixed location at a company's facility or where a vehicle is driven for washing, including commercial or industrial washing facilities. A mobile washing company is a contractor that temporarily sets up washing equipment at a vehicle owner's facility.

Regardless of whether a contractor is used or a permanent washing station is present, power washing or steam cleaning vehicles and equipment generate wastewater that may contain significant quantities of oil and grease, suspended solids, phosphates, heavy metals, and organics, as well as pollutants from detergents or the materials held in the vehicles or equipment.

These contaminants may cause surface or groundwater pollution and violate water quality standards if the wastewater is not properly managed. Many of these contaminants can be toxic and harmful to living organisms, including fish.

Pollution Prevention Practices for Vehicle & Equipment Washing

When conducting vehicle or equipment washing, consider implementing the following Pollution Prevention Practices (PPPs):

- Truck and trailer washing should be done whenever possible at a commercial wash facility. Alternatively, these vehicles can be washed at an onsite facility, such as a wash rack, designed for this purpose.
- Avoid washing vehicles near uncovered repair areas or chemical storage facilities so chemicals can be transported in wash water run-off.
- Wash bays should be covered to prevent stormwater from entering collection drains.
- Avoid storing solvents or degreasers in the wash area.
- Keep all wash areas neat and orderly.
- It is preferable to have an indoor wash area, such as a wash rack, for vehicles and equipment with wastewater draining to a sanitary sewer.
- If washing outside, all storm drains should be covered, and all wash water runoff should be drained away from shops or chemical storage areas and recovered.
- Detergents and soaps used in washing activities should be phosphate-free and able to biodegrade rapidly.
- A reduced-pressure-principle backflow-prevention assembly should be installed on the water supply to a wash rack to protect the incoming water supply from potential contamination hazards.
- All truck or equipment wash water containing soaps or other cleaning chemicals should be collected and reused, or discharged to the sanitary sewer system.
- Wash water should be treated to remove grit, oil, and grease before discharging it to the sanitary sewer.
- Check with your local regulatory authority to see if a permit is required before discharging wash water to the sanitary sewer.
- Periodic inspections and maintenance should be performed on all parts of the wash system and all discharge pretreatment systems (oil/water separators and grit/sand interceptors). Any repairs should be immediately made.
- Removal of accumulated solids from pretreatment systems should be performed regularly.
- An approved/ certified waste hauler must dispose of all chemicals and used materials.

Training

It is recommended that employee training be conducted at least annually on the vehicle-washing PPPs. Documentation of the completed training should be kept on file.

Construction Vehicle & Equipment Washing

To control dust and tracking of dirt and debris from construction sites onto roadways, a tire wash or a full equipment wash may be erected at a construction site. Dust creates particulate emissions, which are regulated as an air quality pollutant. Tracking dirt and debris onto the roadway is an issue because it can be washed into storm drains, dry wells, retention basins, etc., and end up in surface waters, impacting water quality. A contractor or mobile washing company may be responsible for washing vehicles and equipment. Alternatively, equipment may be loaded onto trucks and washed offsite at a contractor's equipment yard or a commercial facility.

Whether the location is fixed or mobile, washing, power washing, or steam cleaning vehicles and equipment generates wastewater that may contain significant quantities of oil and grease, suspended solids, phosphates, heavy metals, organics, and pollutants from detergents.

These contaminants may cause surface water or groundwater pollution, resulting in water quality standards violations if the wastewater is not properly managed. Many of these contaminants can be toxic and harmful to living organisms, including fish.

Pollution Prevention Practices for Construction Vehicle & Equipment Washing

When conducting vehicle or equipment washing, consider implementing the following Pollution Prevention Practices (PPPs):

- The washing of construction vehicles and equipment (i.e., dump truck, flat-bed supply truck, ready-mix concrete truck and chute, pick-up truck, bulldozer, grader, front-end loader, backhoe, etc.) should preferably be done on the construction site.
- Wheel or equipment washing performed at a construction site should preferably be performed on a paved area.
- A stabilized construction entrance should be constructed at the equipment wash area to reduce off-site tracking of mud, dirt, and rocks.
- Areas chosen for washing should be where there is a low volume of construction traffic.
- Highly erodible soils or frequently wet construction site areas should be avoided.
- Wash areas should be graded and bermed to collect wastewater for evaporation, off-site containment, or treatment.
- A closed-loop wash system that discharges to the public wastewater sewer system is preferable. Check with the local sanitary sewer district to determine whether a permit is required for this discharge.
- Mops, rags, or other equipment should be used to pre-clean the vehicle or equipment and remove large chunks of rock, dirt, or other debris before pressure washing or steam cleaning.
- Water use should be minimized by using high-pressure, low-volume nozzles.
- If wastewater is contained onsite, it should be directed to a lined pond.
- Storm drain inlets located within or downgradient of wash areas should be covered or protected to prevent entry of wash water.
- Avoid washing equipment near chemical or fuel storage areas.
- Avoid storing solvents or degreasers in the wash area.
- Keep all wash areas neat and orderly.
- Detergents and soaps used in washing activities should be phosphate-free and can biodegrade rapidly.

- Wash water containing cleaning chemicals, solids, or oil and grease residue may require treatment before discharge to the sewer.
- An approved/ certified waste hauler must dispose of all chemicals and used materials.

Training

It is recommended that employee training be conducted at least annually on the vehicle-washing PPPs. Documentation of the completed training should be kept on file.

Indoor Air Quality and Ventilation

Indoor air quality is impacted by various factors, including humidity, contaminants generated within the building, and contaminants drawn in from outside the building. Ventilation controls humidity and airborne contaminants within a building to provide a healthy and safe working environment. When the ventilation system in a building is inadequate, improperly designed, or malfunctions, indoor air quality can be impacted, leading to health hazards. Other sources of air quality issues may include contaminated outside air, emissions from nearby sources, vapor intrusion from soil and groundwater impacts, excessive moisture and humidity promoting microbial growth, equipment, maintenance activities, housekeeping activities, remodeling or construction activities, etc.

Also, virus transmission within a building has risen as a significant concern for indoor air quality with the advent of COVID-19.

Ventilation is used to dilute or remove contaminants from indoor air. Ventilation types include local ventilation, which addresses air flow and pollutants associated with one area of a building or piece of equipment, and dilution ventilation, which addresses the inflow and exhaust of air through a whole building and essentially dilutes the contaminants in the indoor air. Spot ventilation is used in areas of particular concern for generating moisture or air contaminants, such as an exhaust fan in a bathroom or kitchen, a hood for a laboratory, an air filtration unit, a stack, etc. In contrast, dilution ventilation controls pollutant sources that could affect an entire building. The following table from the Occupational Safety and Health Administration's Technical Manual outlines the criteria for selecting general versus local exhaust sources:

General and Local Exhaust Ventilation

General exhaust ventilation (dilution ventilation) is appropriate when:

- Emission sources contain materials of relatively low hazard. (The degree of hazard is related to toxicity, dose rate, and individual susceptibility)
- Emission sources are primarily vapors or gases or small, respirable-size aerosols (those not likely to settle)
- Emissions occur uniformly
- Emissions are widely dispersed
- Moderate climatic conditions prevail
- Heat is to be removed from the space by flushing it with outside air
- Concentrations of vapors are to be reduced in an enclosure
- Portable or mobile emission sources are to be controlled

Local exhaust ventilation is appropriate when:

- Emission sources contain materials of relatively high hazard
- Emitted materials are primarily larger-diameter particulates (likely to settle)
- Emissions vary over time
- Emission sources consist of point sources
- Employees work near the emission source
- The plant is located in a severe climate
- Minimizing air turnover is necessary

An effective building ventilation design provides outdoor air to building spaces, efficiently distributes air within building spaces, maintains temperature and humidity, and removes airborne pollutants. The following Pollution Prevention Practices apply to ventilation systems in commercial buildings.

Pollution Prevention Practices for Adequate HVAC System Performance

- Keep all HVAC equipment free of debris, obstructions, and buildup.
- Components exposed to water (such as drainage pans, coils, cooling towers, and humidifiers) must be regularly inspected and treated as needed to prevent the buildup of microbial growth.
- Examine HVAC equipment for damage and flow restrictions regularly.
- Air filter gauges should be installed to measure pressure drops across filter banks and regularly monitor them. Inspect and replace dirty air filters by comparing actual and design pressure drops.
- Ensure air filters are properly fitted and form an airtight seal.
- Inspect all equipment regularly to ensure it is in good condition and operating as designed.
- Regular system maintenance should be performed, including cleaning, servicing, adjusting and calibrating control system components, and repairing or replacing worn parts. For commercial buildings, it is recommended that the requirements of the American Society of Heating and Air-Conditioning Engineers (ASHRAE) Standard 180-2018, Standard Practice for the Inspection and Maintenance of Commercial HVAC systems, be followed.

Pollution Prevention Practices to Control Building Humidity with Ventilation Systems

- Maintain relative humidity in the building at 40-60 percent. Over 60 percent, condensation is more likely, increasing the risk of microbial growth, and below 40 percent, the air may be dry, which is believed to increase virus transmission.
- Properly vent moisture-generating appliances to the outside.
- Vent bathrooms, dryers, and other moisture-generating sources to the outside.
- Increase ventilation.
- Use exhaust fans for cooking, dishwashing, and cleaning.
- Use air conditioners and de-humidifiers.

- Design HVAC systems to keep dew points below 55 degrees Fahrenheit. Dehumidifying components and controls should be on air conditioning equipment to activate when the dew point rises above 55.

Pollution Prevention Practices to Reduce Exposure to Viruses Such as COVID-19 with Ventilation Systems

- Increase outdoor air, if possible, to help dilute contaminants. Consider opening windows or doors if it can be done safely. If not, ventilation and air conditioning systems should be evaluated to increase outdoor air input.
- If outdoor air has high particulate concentrations or is not healthy for other reasons, ensure proper filtration before opening windows or increasing outdoor air input.
- If possible, the HVAC system should at least run with maximum outside air flow two hours before and after occupied times or achieve at least three air exchanges of outside air in indoor spaces during the day.
- Evaluate air pressures within the building to ensure that movement is from clean to less clean spaces.
- An economizer controls the input of outdoor air into an HVAC system when the air temperature and humidity are within an acceptable range. For buildings without economizers, consider adding them.
- Ensure economizers are properly operating. Evaluate adjusting the economizer settings to increase outside air entering the system.
- Verify outside air dampers are fully open.
- Verify that fire protection equipment, such as fire or smoke dampers, remains in the open position during normal operations.
- Use air filters with a minimum efficiency reporting value of at least 13. If possible, use higher (MERV) filters for improved filtration. The choice of filter requires an evaluation of the capabilities of the HVAC systems already in place.
- Disable demand-control ventilation (DCV) controls that reduce air supply based on temperature or occupancy.
- Ultraviolet germicidal irradiation (UVGI) may effectively treat viruses like COVID-19. Evaluate the retrofit of existing air-supply systems to include UVGI equipment or evaluate the installation of UVGI in individual rooms or areas to disinfect air within that area.
- Provide PPE protection for building operators, maintenance technicians, and anyone else who completes inspections or comes in contact with the device or equipment.

Diesel Exhaust

Diesel engines are present in a variety of equipment and vehicles. Exhaust from diesel engines contains polluting gases and particulate matter that can harm human health. Gases in the exhaust from these engines contain volatile organic compounds and greenhouse gases. Diesel particulate matter (DPM) is less than 2.5 microns (PM2.5) and, therefore, small enough to be inhaled. DPM is typically composed of black carbon (also called soot) and organic compounds, including up to forty known carcinogens, such as polycyclic aromatic hydrocarbons, volatile aromatic hydrocarbons, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. The International Agency for Research on Cancer (a division of the World Health Organization) listed diesel exhaust as carcinogenic to humans in June 2012. Additionally, diesel exhaust contributes to the same health effects that PM2.5 causes. Studies link PM2.5 exposure to premature death in people with heart or lung disease, nonfatal heart attacks, aggravated asthma, decreased lung function, and increased respiratory issues.

Diesel exhaust emissions contribute to climate change and the production of ground-level ozone. They also reduce visibility in the atmosphere. The fine particulate matter in diesel exhaust causes acidification of water bodies, depletion of nutrients in the soil, alterations to nutrient balance in coastal waters and large river basins, damage to sensitive forests and farm crops, impacts on ecosystem diversity, and acid rain.

Funding opportunities to upgrade or replace older diesel engines with newer, cleaner technologies may be found at the federal, state, and local levels. They can take the form of grants or tax incentives.

Pollution Prevention Practices for Diesel Exhaust

The following is a list of Pollution Prevention Practices for diesel exhaust. The list is not intended to be exhaustive but can be used as a general guideline:

- Eliminate unnecessary idling.
- Define a policy and inform employees regarding idling equipment.
- Consider idling reduction technologies, such as auxiliary power units and generator sets, direct fire heaters, battery air conditioning systems, thermal storage systems, or truck stop electrification.
- Consider installing diesel particulate filters or diesel oxidation catalysts on older equipment or replace old engines or equipment with new, cleaner engines.
- Locate vehicle staging areas, generators, and other equipment away from fresh air intakes on occupied buildings, high-volume pedestrian areas, and other public spaces.
- Perform routine preventive maintenance on diesel engines.
- Expeditiously repair malfunctioning or damaged engine components.
- Accurately track equipment usage.
- Monitor fuel and oil consumption for equipment.
- Track incidents of unscheduled maintenance and identify trends.
- Perform operator training that focuses on safe and efficient equipment operation.
- Use cleaner fuels, such as ultra-low sulfur diesel, biodiesel, liquid petroleum gas, or natural gas.
- Evaluate the purchase of electric or hybrid electric equipment.
- Consider installation of aerodynamic technologies, which minimize drag and smooth out airflow, and low rolling resistance tires for tractor trailers. These reduce fuel usage and reduce emissions.
- Optimize trucking routes.