



Designation: E2365 – 21

Standard Guide for Environmental Compliance Performance Assessment¹

This standard is issued under the fixed designation E2365; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

This guide provides a framework for the development of an environmental compliance assessment program. It integrates environmental compliance, environmental risk classification and business risk management for use in decision-making. It provides a flexible, technically defensible framework to prioritize environmental compliance and associated pollution prevention, with a wide applicability to a range of facilities and environmental pathways. The facilities that may find an environmental compliance performance assessment program useful and appropriate are domestic establishments that perform work for consumers, business, government and other organizations. These include public and commercial establishments, but they generally exclude individual households. This guide may not be appropriate where a primary manufacturing facility has already implemented a site-specific environmental management system (EMS). This guide could be used as a tool in conjunction with an EMS, to evaluate compliance and pollution prevention.

1. Scope

1.1 *Overview*—This guide is an organized collection of information and series of options for industry, regulators, auditors, consultants and the public, intended to measure compliance with environmental performance standards against established benchmarks. It focuses on compliance with air, water, waste prevention, waste management, and toxic reduction standards for facilities in the United States. While the guide does not recommend a specific course of action, it establishes a tiered framework of essential components, beginning with those standards where a deviation presents the greatest potential public health, environmental, and business risks. In each identified pathway, at each tier or step of analysis, the guide outlines ways to identify compliance options and reduce pollution in iterative steps. The goal in using the guide is to lower environmental, public health and business risks from Tiers 1 and 2 to Tiers 3 and 4, by evaluating the performance standards described in this guide. While this guide provides a simplified framework of explicit steps for users, a qualified professional should conduct detailed, site-specific risk analysis. This guide may act as a starting point for organizations with limited experience in systematic environmental assessment. As facilities develop their specific plan

framework, they will find that risk is weighted by more than just a few parameters. For each facility risk is the complex interaction among location, size, history, surrounding community and ecological zones.

1.2 *Differences Among Standards*—This guide focuses on compliance with environmental performance standards in the United States. As such it includes a unique, risk-based method to analyze specific groups of legal requirements, as well as risk reduction techniques, sometimes called “pollution prevention.”

1.2.1 Use of this guide provides a system to evaluate the relative priority of compliance and pollution prevention activities. Unlike environmental management systems, it provides a framework to triage critical issues, based on consideration of actual risk of harm to public health and the environment.

1.2.2 Environmental regulatory requirements in the United States are administered primarily by the United States Environmental Protection Agency (USEPA) and the parallel State and Local Agencies with similar regulatory authority. Certain other Federal regulatory agencies and State and local counterparts may also have legal requirements relating to environmental performance standards. Examples include the Departments of Transportation (DOT) and Agriculture (USDA) and the Occupational Safety and Health Administration (OSHA). Similar to the ISO 14001:2015 standard, this guide uses the major groups of environmental regulatory standards in the United States for air and water quality, waste management, release prevention, and toxic materials use reduction, in order to organize the compliance analysis framework.

1.2.3 This guide derives general information about regulatory requirements from common elements of Federal, State and

¹ This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.05 on Environmental Risk Management.

Current edition approved June 1, 2021. Published September 2021. Originally approved in 2005. Last previous edition approved in 2014 as E2365–14. DOI: 10.1520/E2365-21.

local programs, including statutes, regulations, guidance and policies. Since agencies may have overlapping authorities and different emphasis for particular issues such as waste management, the user should consult the applicable program for detailed interpretation of specific requirements in a particular jurisdiction.

1.2.4 Pollution prevention generally refers to source reduction as a preferred option as opposed to other less preferable alternatives, such as, re-use, recycling, treatment, or disposal/release. ISO 14001:2015 Clause 8.1 requires that “consistent with a life cycle perspective”, the organization shall take a number of actions as a part of operational controls and planning activities including establishing controls, determining its environmental requirements for procurement, communicating its relevant environmental requirements as well as considering the need to provide information about potential significant environmental impacts, inter alia. Further, ISO 14001:2015 Clause 9.1.2 explicitly requires that “...organization shall establish, implement, and maintain the process(es) needed to evaluate fulfillment of its compliance obligations...” This guide compliments and supports actions required under ISO 14001:2015 by establishing a well-documented process for environmental compliance performance assessment.

1.2.5 Pollution prevention is a specific term used in United States environmental compliance management programs. The term usually refers to source reduction actions. Unlike the term “prevention of pollution,” which is used in certain international environmental management standards, pollution prevention does not generally include end-of-pipe or top-of-stack control actions.

1.3 *Limitations of this Guide*—Given the variability of the different types of facilities that may wish to use this guide, and the existence of State and Local regulations that may impose requirements greater than those required by USEPA, it is not possible to address all the relevant standards that might apply to a particular facility. This guide uses generalized language and examples to guide the user. If it is not clear to the user how to apply standards to their specific circumstances, it is recommended that users seek assistance from qualified professionals. An Environmental Regulatory Compliance Audit, such as Practice [E2107](#), may assist a facility with areas of non-compliance and potential liabilities. This can be a starting point for development of facility specific environmental compliance management programs.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

[E1526 Practice for Evaluating the Performance of Release Detection Systems for Underground Storage Tank Systems \(Withdrawn 2002\)](#)³

[E1609 Guide for Development and Implementation of a Pollution Prevention Program \(Withdrawn 2010\)](#)³

[E1990 Guide for Performing Evaluations of Underground Storage Tank Systems for Operational Conformance with 40 CFR, Part 280 Regulations](#)

[E2107 Practice for Environmental Regulatory Compliance Audits](#)

[E2681 Guide for Environmental Management of Underground Storage Tank Systems Storing Regulated Substances](#)

[F1127 Guide for Containment of Hazardous Material Spills by Emergency Response Personnel](#)

2.2 *International Standard:*

[ISO 14001:2015 Environmental Management Systems—Specification with Guidance for Use](#)⁴

3. Terminology

3.1 *Definitions:*

3.1.1 *accumulation, v*—short term containment of a hazardous waste in the control of the person who generated such waste in a manner which does not constitute disposal, which is in containers at or near the point of generation in the process, and which otherwise complies with Federal Regulations.

3.1.2 *air, n*—the natural, gaseous environmental medium contained in the troposphere that is shared in common and used for several purposes including breathing, cooling, combustion and as a sink for pollutants. The quality of this pathway is regulated through restrictions on emissions, controls and monitoring. Many programs require best or maximum available control technologies to restrict air emissions.

3.1.3 *approval, n*—any required license, permit, certificate, formal determination, registration, plan review, variance, exemption or other authorization. Regulatory agencies typically require such authorization to address releases, discharges, or disposal of material and certain business practices and activities.

3.1.4 *beneficial uses of water, n*—extraction or in place use of water for domestic purposes (for example, drinking, bathing, boating or fishing), or commercial, agricultural, or industrial purposes which will not harm public health or the environment.

3.1.5 *best management practices (BMPs), n*—schedules of activities, prohibitions of practices, maintenance procedures, and other management practices that prevent or reduce the pollution of water. They include treatment goals, operating procedures, and practices to control plant site runoff, spillage, or leaks, of sludge, waste disposal, or drainage from raw material storage.

3.1.6 *CARB, n*—the California Air Resources Board is an organization that creates some state air quality standards, such

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

as those which regulate petroleum storage tanks. These standards may or may not legally apply, depending upon the jurisdiction. The standards are useful in addressing many pollution prevention issues, especially in motor vehicle fuel dispensing.

3.1.7 *cargo tank motor vehicle, n*—as used in this standard, a truck that carries gasoline or other volatile hydrocarbon fuels in bulk, for delivery to dispensing stations.

3.1.8 *compliance assessment, n*—an evaluation of environmental regulatory requirements. The evaluation identifies and classifies requirements applicable to the individual facility, group of facilities or industry sector.

3.1.9 *criteria air pollutants, n*—a group of very common air pollutants regulated by EPA on the basis of criteria (information on health or environmental effects of pollution, or both). Criteria air pollutants are widely distributed all over the country. The six current criteria pollutants are Sulfur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Ozone (O₃), Carbon Monoxide (CO), Particulate Matter (PM₁₀) and Lead (Pb).

3.1.10 *entity, n*—a facility with regulatory requirements or potential requirements. The facility has a specific geographic location and owners and operators who may be public or private.

3.1.11 *environmental compliance benchmarks, n*—industry specific performance standards, which measure attainment of pollution control and prevention requirements.

3.1.12 *environmental management system (EMS), n*—an Environmental Management System (EMS) is a framework that helps a company achieve its environmental goals through consistent control of its operations. The assumption is that this increased control will improve the environmental performance of the company.

3.1.13 *environmental performance standards, n*—regulatory requirements, which, if violated, may result in enforcement by a regulatory agency.

3.1.14 *facility, n*—a location or building where regulated activity occurs.

3.1.15 *hazardous air pollutants (HAPs), n*—EPA definition of certain chemical emissions regulated by the Federal Government.

3.1.16 *hazardous substance, n*—any material in whatever form which because of its quantity, concentration, or physical, chemical, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare or to the environment when improperly stored, treated, transported, disposed of, used or otherwise managed. Note that this term is further defined as a hazardous substance pursuant to CERCLA (42 USC §9601(14)), as interpreted by EPA regulations and the courts, and does not include petroleum.

3.1.17 *hazardous waste, n*—any discarded material, not exempted under Federal Regulations, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause or significantly contribute to an increase in serious irreversible or incapacitating reversible

illness or pose a substantial present or potential hazard to human health, safety, welfare or the environment when improperly treated, stored, transported, used, disposed of or otherwise managed. This definition varies from one jurisdiction to another and may or may not include waste petroleum.

3.1.18 *high priority violation, n*—contravention of a regulatory limitation, which, by its nature, concentration, extent or duration, warrants formal enforcement.

3.1.19 *media, n*—environmental pathways or locations through which pollution can travel or accumulate, or both. For example, air, water, or soil.

3.1.20 *pollution prevention “P2”, n*—the act of reducing or eliminating the use, release, or generation of a pollutant or potential pollutant through source reduction, recycling, reuse, reclamation, or modification of operating practices. It should be noted that ASTM’s definition of “pollution prevention,” as contained in Guide E1609, is different from the definition used by the Environmental Protection Agency. See, for example, 58 Fed. Reg. 6478 (Jan 29, 1993, Council on Environmental Quality), and 58 Fed. Reg.41,981 (Aug. 6, 1993, Executive Order).

3.1.21 *release prevention, n*—activities that reduce the risk of human and environmental exposure to petroleum or hazardous substances. In the United States, underground storage tank (UST) and toxic materials use reduction regulations are examples of such requirements.

3.1.22 *reportable quantity releases, n*—the concentration or amount of oil or hazardous materials, in or released to soil, groundwater, air or surface water which requires notification to the local, state or federal authority.

3.1.23 *self-certification, n*—a program designed for facilities to comply with a set of environmental performance standards in lieu of permitting or other direct approval. Certification is reviewed and can be renewed annually based on the results of reports from and multimedia inspections of the facility

3.1.24 *service facilities*—domestic establishments that perform work for consumers, businesses, governments, and other organizations. These include public and commercial establishments doing business, but excluding manufacturing and individual households.

3.1.25 *significant noncompliance, n*—contravention of a regulatory limitation on facility operations, which, by its nature, concentration, extent or duration, warrants enforcement.

3.1.26 *small business, n*—the federal government defines small businesses as facilities that have less than 100 full time equivalent employees. Some states define small businesses as facilities that have less than 10 full-time equivalent employees.

3.1.27 *storage, n*—the containment of hazardous waste for a temporary period in a manner which does not constitute disposal, at the end of which period, the hazardous waste will be used, treated, disposed of, transported or stored elsewhere.

3.1.28 *toxic air contaminants, n*—EPA has defined hazardous air pollutants (see 3.1.15) as chemicals that can cause

serious health or environmental hazards. Various state programs may also define this term. The user should consult the local air pollution control agency for a specific definition of this term.

3.1.29 *Tier 1 performance standards, n*—the first step of analysis identifies standards that prevent or require a response to those imminent hazards which would likely cause actual harm to human health or the environment. Failure to meet these standards carries the highest liability for both harm to third parties, as well as government fines and penalties.

3.1.30 *Tier 2 performance standards, n*—the second step identifies significant, high priority requirements, approval for releases, emissions, discharges or potential releases to the environment. A facility should evaluate these benchmarks immediately after Tier 1, since they manage potential risk to human health and the environment. These requirements, if not met, are considered serious violations of environmental standards.

3.1.31 *Tier 3 performance standards, n*—operation, maintenance, repair and monitoring of controls on emissions, discharges, releases or prevention devices are some standards in step three. Regular checking and adjustment of air and water pollution control devices, management of hazardous waste storage areas and similar activities are the third set of benchmarks evaluated by the facility. These requirements, if not met, are considered serious because repeat violations of environmental regulations for pollution control systems could result in actual or increased releases to the environment.

3.1.32 *Tier 4 performance standards, n*—the final step to complete the analysis includes record keeping or other requirements that demonstrate the performance of controls on emissions, discharges, releases, and prevention devices. Retention and review of pollution management records may also help the facility analyze its opportunities for pollution prevention, a reduction or elimination of regulatory requirements and a reduction in costs to the facility.

3.1.33 *waste*—discarded solid or liquid materials (other than materials applied to a beneficial use that does not constitute sham recycling) that may require management controls consistent with federal, state or local regulations.

3.1.33.1 *Discussion*—Solid and hazardous waste require controls on handling, transport, storage treatment and disposal.

3.1.33.2 *Discussion*—Materials slated for recycling may be subject to state or local regulation. The user should verify rules that apply under solid waste, air and water regulations.

3.1.34 *water, n*—an environmental medium regulated through restrictions on drinking supplies, withdrawals for other purposes, waste discharges and alteration of wetlands.

3.1.35 *waters of the United States, n*—waters as defined by the United States Environmental Protection Agency (USEPA) in its rules at 40 CFR 122.2 and as construed by the Federal Judiciary.

4. Significance and Use

4.1 This guide may be used for environmental compliance performance assessment in the United States in a wide variety

of applications and is not particularly limited to one type of user. The following groups of users may find the guide particularly helpful:

- 4.1.1 Small businesses or enterprises;
- 4.1.2 Service industries;
- 4.1.3 Federal, state or local facilities and regulators, including departments of health and fire departments;
- 4.1.4 Financial and insurance institutions;
- 4.1.5 Waste managers, including liquid and solid waste haulers, treatment, recycling, disposal and transfer;
- 4.1.6 Consultants, auditors, inspectors and compliance assistance personnel;
- 4.1.7 Educational facilities;
- 4.1.8 Property, buildings and grounds management, including landscaping;
- 4.1.9 Non-regulatory government agencies, such as the military; and
- 4.1.10 Specific industrial sectors such as dry cleaners, printers, photo processors, laboratories, health care, and vehicle fueling, maintenance and delivery.

4.2 This guide is intended as a first step in crafting simplified management goals for assessing compliance with a wide variety of multimedia environmental performance standards. The framework describes a process by which the user may categorize current waste management, air quality, water, and release prevention practices in order to manage the risks associated with noncompliance. The technique classifies common environmental performance standards into tiers based on relative risks to human health, the environment and business operations. The tier classifications found in this guide reflect the general requirements of State, Federal and local compliance and enforcement programs. These authorities generally classify groups of similar environmental performance standards according to the significance of any noncompliance within each group of standards.

NOTE 1—Users in the United States are encouraged to review the EPA's Audit Policy Program: Frequently Asked Questions (2021)⁵ for additional guidance on the Agency's expectations of compliance performance assessments.

4.3 The guide helps the user to realize the benefits of environmental compliance. These benefits may include but not be limited to:

- 4.3.1 Ability to set priorities for environmental management activities;
- 4.3.2 Marketing environmental awareness and sensitivity;
- 4.3.3 Assessing compliance with permits and other requirements;
- 4.3.4 Risk management, underwriting; loss control and history; premiums and claims;
- 4.3.5 Liability assessment and qualifications for loans;
- 4.3.6 Standardization, consistency and certification of facility specific evaluations;
- 4.3.7 Educating employees, clients and customers;
- 4.3.8 Generating multi media and cross medium information;

⁵ <https://www.epa.gov/compliance/epas-auditpolicy>

- 4.3.9 Evaluating vendors; and
- 4.3.10 Reducing costs and preventing pollution.

4.4 Users may consider various benefits of environmental compliance performance assessment.

4.4.1 This guide is a basic primer on environmental compliance and may serve to introduce the subject for organizations unfamiliar with requirements.

4.4.2 Many government enforcement agencies, fiduciaries and business organizations publish environmental compliance records over the internet. The public will soon have the systematic ability to access environmental compliance information on individual businesses. Therefore, businesses need guidance on how to assess the nature and potential risks of environmental non-compliance, and a programmatic approach for reducing or eliminating those risks through pollution prevention and other proactive management systems.

4.4.3 Reduced operation and maintenance costs and paperwork may be realized through a tiered evaluation of environmental compliance and pollution prevention opportunities.

4.4.4 Compliance may be streamlined and simplified so that all levels in an organization may participate in environmental management.

4.4.5 Some enterprises may be more competitive in the marketplace with improved environmental compliance programs.

4.4.5.1 The State of Minnesota allows small firms with an environmental management system to operate under a flexible air permit.

4.4.5.2 Firms in Indiana with an Environmental Management System are eligible to participate in the state's Environmental Stewardship Program which provides regulatory flexibility.

4.4.5.3 Firms operating in Wisconsin that develop and implement an environmental management system may be eligible to apply to the Department of Natural Resources Green Tier program. Green Tier can offer eligible companies flexibility in state issued permits and compliance methods.

4.4.5.4 International firms and organizations may have significant competitive advantages through implementation of an environmental management system that conforms to ISO 14001:2015.

4.4.6 Setting priorities can allow planning and evaluation of new environmental requirements.

4.5 This guide establishes a framework of common, environmental risk management requirements in the United States and will allow the user to evaluate the potential level of risk from non-compliance. Compliance requirements would then be evaluated for pollution prevention opportunities in order to continually reduce the risks from non-compliance.

4.6 Noncompliance with Tier 1 Environmental Performance Standards represents the highest risk because Tier 1 Standards prevent, mitigate or respond to imminent hazards for human health or the environment. Tier 2 Standards address areas of significant risk, where noncompliance could result in penalties, primarily for failure to obtain required approval for releases or modifications to the environment. Tier 3 Standards require operation and maintenance of approved controls on releases or

modifications to the environment, where repeat noncompliance could represent a risk. Tier 4 Standards represent the lowest direct risk from noncompliance; however, they are still important for documenting environmental management, the details of the compliance record, environmental compliance costs and pollution prevention measurements.

5. Tiered Approach to Compliance Measurement

5.1 The essential principles of this guide are:

- 5.1.1 Environmental assessment by objective;
- 5.1.2 Compliance with requirements;
- 5.1.3 Pollution prevention;
- 5.1.4 First steps in environmental stewardship; and
- 5.1.5 Priority planning.

5.1.6 Over the years, environmental agencies have grouped statutory and regulatory requirements into classes. Both statutory and policy principles identify performance standards for environmental protection in classes.

5.1.6.1 Tier 1 Standards generally govern the prevention and response to direct, actual pollutant releases and modifications to the environment.

5.1.6.2 Tier 2 Standards ensure the appropriate approvals are in place for existing releases of pollutants to the environment or for modifications that require controls. Significant releases or modifications above approved levels are included in Tier 2 Standards.

5.1.6.3 Tier 3 Standards encompass the operation, maintenance and monitoring of source control systems and reporting for environmental pollutants or environmental modifications. Releases or modifications above approved levels, but which are of low concentration and duration, may be grouped in Tier 3, for corrective action in operation and maintenance.

5.1.6.4 Tier 4 standards document pollution control management and management of environmental records.

NOTE 2—Recordkeeping violations are the most frequently cited violation by federal, state, and local regulatory agencies.

5.2 Facilities should focus on environmental performance standards in a systematic way. The guiding principle for most compliance programs is pollution prevention. By evaluating and implementing pollution prevention steps for each class of standards, facilities will reduce both costs and impacts on the environment. Tier 1 and 2 standards generally show the greatest pollution prevention opportunities. In many cases, pollution prevention may reduce or eliminate the risks and economic and environmental impacts addressed by the environmental performance standards described as follows.

5.3 The tiered compliance and pollution prevention analysis is shown in Fig. 1. This is an iterative process that first identifies the highest priority environmental performance standards in all media. Next, the user evaluates Tier 1 standards for pollution prevention opportunities to eliminate or reduce the risk of non-compliance. The user evaluates all standards in this iterative fashion until all requirements are addressed at all tiers of analysis.

5.4 Tier 1 Standards generally require the following:

- 5.4.1 Prevent direct release of pollutants to the environment and prevent harm to public health;

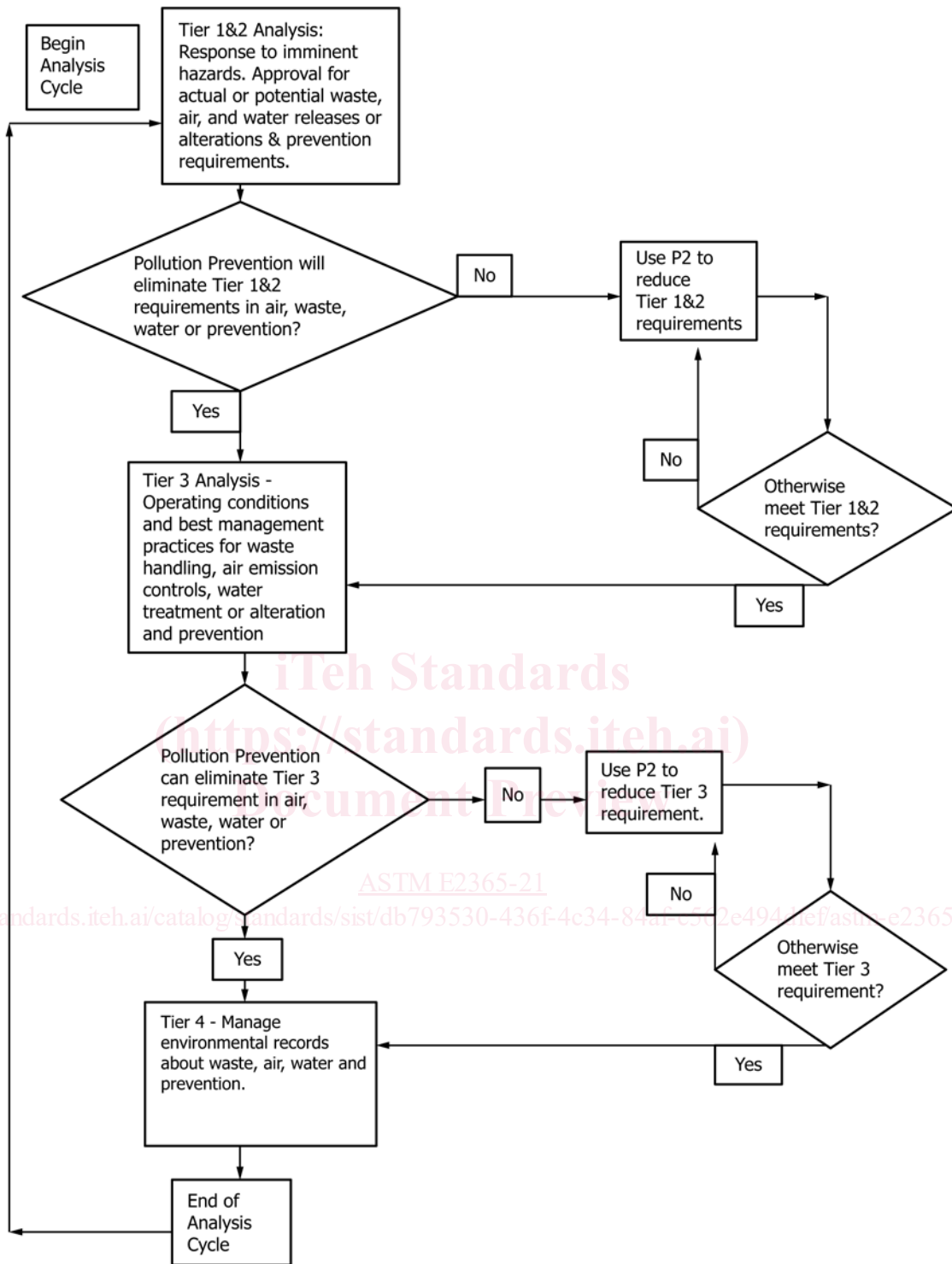


FIG. 1 Sample Flow Chart for Compliance Analysis

5.4.2 Respond promptly to actual risks from releases or modifications to the environment; and

5.4.3 Promptly report all accidental, unpermitted releases and discharges of hazardous waste and materials.

5.5 Tier 1 Standards highlight methods by which actual or potential releases, emissions, or discharges of chemicals can be prevented or which require a response. Table 1 classifies

standards according to the environmental concern: air quality; wastewater; waste; and release prevention. Tier 1 Standards are designed to help a facility manage the actual or potential threat a release may pose to human or environmental health. Due to this risk management and minimization aspect of the standards, they should be the first standards evaluated and complied with by a particular facility. Compliance with these standards not

TABLE 1 Sample Classification of Performance Standards

Medium or Program	Tier 1 Preventing and responding to actual releases, emissions, discharges or alterations to the environment	Tier 2 Required permits and approvals for releases or alterations to the environment	Tier 3 Operating conditions and best management practices	Tier 4 Managing environmental records
Waste	Reporting and response to a hazardous waste or material release.	Obtaining required approval for release or disposal of material into the environment. Required approval for treatment, storage, management, transport, receipt or delivery of wastes. Meeting conditions and limits of required approvals.	Identify, label and mark wastes. Waste sampling and analysis. Maintain storage areas and vehicles. Complete waste manifests in accordance with Federal hazardous materials transportation regulations.	Technical completeness and retention of records. Written documentation of required notifications. Timely reporting. Financial audits.
Air	Reporting and response to excess air emissions.	Approval for emissions, detection and conditions within limits of approval. Approved installation of emission monitoring devices.	Inspections and reports of pollution control equipment, report compliance status. Emission testing and monitoring. Report excess emissions.	Record keeping, manuals and test result retention. Document management. Timely reporting of emissions.
Water	Reporting and response to an actual unpermitted release or water supply contamination incident, including notification to the public.	Required approval for water resource activity such as a discharge, filling, drinking water analysis or withdrawal. Maintaining conditions within approved limits. Reporting discharge above approved limits. Approval for public, community or industrial water supplies.	Water quality discharge reports. Recording conditions on wetlands work. Treatment plant operator licensing. Correct sampling and monitoring procedures. Routine water quality reports. Pretreatment preventative maintenance.	Registering wetlands work. Retaining monitoring results for discharges and water supply.
Prevention	Root cause analysis following an actual release. Design with safety systems to detect deviations and initiate safe shut down to prevent release. Design with adequate system capacity to manage a range of operations. Use less toxic materials with reduced consequence(s) if released. Use inherently safer design process such as process safety management	Required approval for storage of petroleum or hazardous materials. Installation of secondary containment and alarm systems for air and hazardous materials storage. Disclosure of hazardous materials. Approvals for vapor recovery and drainage systems. Obtain approvals prior to initiating installation, construction, and operations. Manage construction performance to design. Perform system testing and startup evaluations. Renew permits prior to expiration	Measures to reduce potential for harm or risk. Toxic use reduction and documentation. Maintenance of vapor recovery and drainage systems. Tank maintenance. Operate within design and permit limits. Calibrate measurement systems. Understand consequences of deviation from design and permit limits. Schedule and conduct preventive maintenance. Maintain critical spare parts on-hand. Manage design or operating changes and re-permit as needed. Contingency planning and drills	Toxic use reduction cost and alternatives analysis. Records on installation and maintenance of vapor recovery, drainage and tank systems. Integrated contingency plan address hazard evaluations and accident prevention and response. Permit applications and permits issued. Documented feasibility evaluations for toxics use reduction. Inspection, maintenance and monitoring records. Reports submitted to regulatory agencies

<https://standards.iteh.ai/catalog/standards/sist/db793530-43>

<https://standards.iteh.ai/catalog/standards/sist/db793530-43/astm-e2365-21>

only mitigates risk, but also facilitates compliance with standards in subsequent tiers of analysis. Noncompliance with these standards is considered a serious violation and may be grounds for higher-level enforcement. Prompt action to comply with Tier 1 Standards can minimize high costs and subsequent liability.

5.5.1 Air Quality Tier 1 Standards—Air Quality Tier 1 Standards are designed to control the emission of criteria air pollutants, HAPs and emissions of other regulated substances into the air. For example, standards may regulate emission of volatile organic compounds, oxides of nitrogen and benzene. These standards require prompt response, including reporting and public notification, for unauthorized discharge of air contaminants that could pose a potential public health risk. In some cases Tier 1 standards require emergency planning and evaluation of potential off-site consequences for extremely hazardous substances.

5.5.2 Water Quality Tier 1 Standards—Industrial Wastewater Tier 1 standards are designed to prevent pollutants in

wastewater from entering surface or groundwater at concentrations that exceed applicable water quality standards, are likely to cause acute aquatic toxicity or which impair beneficial uses. For example, permits and standards may regulate discharge of total dissolved solids, metals, flammable and corrosive liquids, or water above a certain temperature or volume. Prompt response to unauthorized discharge of wastewater into surface or groundwater, or slug discharges to municipal sewers, that could pose a potential threat to public health or the environment and public notification are considered “front line” requirements. Other regulations cover the withdrawal volume and quality of irrigation or drinking water.

5.5.3 Solid and Hazardous Waste Tier 1 Standards—Solid and Hazardous Waste Tier 1 Standards are designed to prevent wastes from contaminating environmental media, and include release prevention criteria. Generally, unpermitted releases of hazardous substances, in amounts equal to or greater than the reportable quantity, require prompt notification to government agencies. Most jurisdictions also require Tier 1 release

prevention, including containment for underground and above-ground storage tanks holding petroleum products and hazardous substances (see Guide E2681). Tier 1 standards require prompt response to actual releases of petroleum and hazardous substances in order to minimize environmental and public health impacts by implementation of contingency plans, commitment of resources and implementation of emergency response operations.

5.6 Tier 2 standards specify the approval required for certain types of releases or modifications to the environment.

5.6.1 Obtain required approvals for releases, discharges, emissions or disposal of material into the environment, or modification of the environment.

5.6.2 Meet technical standards or limitations that are conditions of a required approval.

5.6.3 Prevent unauthorized emissions or discharges.

5.6.4 Obtain permits, licenses or approvals required for engaging in a regulated business or activity.

5.6.5 Maintain necessary structural, engineering, operational and management controls to prevent, mitigate and respond to releases of petroleum products and hazardous substances.

5.7 Tier 2 Standards:

5.7.1 *Air Quality Tier 2 Standards*—Equipment that emits air contaminants generally requires a permit prior to operating. For example, permits for combustion equipment may specify nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO) and particulate matter (PM₁₀) emission limits. Some regulatory agencies may waive certain permitting requirements if the facility purchases equipment that the manufacturer has certified will meet certain emission limits, and this equipment is listed on a regulatory agency pre-certification list. For facilities using VOCs, the standards may specify the VOC content of manufacturing materials, storage of VOC-containing materials in closed containers, recovery of VOC emissions and control of leaks from process equipment using VOC-containing materials. Standards may also describe emission control equipment that should be in place to limit emissions to allowable levels. Methods for controlling fugitive dust may be specified for construction sites. Filing of a Risk Management Plan may be required for storage of extremely hazardous substances above threshold quantities (that is, ammonia, chlorine) pursuant to Federal Clean Air Act or equivalent state regulation requirements.

5.7.2 *Water Quality Tier 2 Standards*—Facilities should obtain the appropriate permits prior to discharge of wastewater to the environment. For example, discharge to a Publicly Owned Treatment Works (POTW) generally requires an Industrial Wastewater Permit. Discharge to waters of the United States generally requires a National Pollution Discharge Elimination System (NPDES) permit. A permit may also be required for discharge of wastewater to land. Discharge limits of certain key surface and groundwater pollutants are specified by the standards. Additionally, general and specific prohibitions are outlined. If wastewater is stored onsite prior to offsite disposal, wastewater should be stored in aboveground storage tanks or Department of Transportation (DOT) approved containers that are in good condition in a secure location. Withdrawal of water

for drinking or irrigation generally requires a permit from the appropriate regulatory agency.

5.7.3 Hazardous and Solid Waste Tier 2 Standards:

5.7.3.1 Facilities may be required to obtain both State and USEPA generator ID numbers if they generate hazardous waste. These ID numbers are site specific and correspond to a generating status of the facility.

5.7.3.2 Depending upon the jurisdiction, hazardous waste generators are generally classified into the following three groups, depending on the quantity of hazardous waste generated: conditionally exempt small quantity generators (CESQG), small quantity generators (SQG) and large quantity generators (LQG). If the facility generates more waste than specified by their status, they are required to meet additional requirements and may be required to notify the appropriate regulatory agency.

5.7.3.3 Generators shall properly classify and segregate hazardous waste from non-hazardous waste to minimize the quantity of hazardous waste generated. Certain incompatible hazardous substances shall also be segregated to avoid possible reaction.

5.7.3.4 Wastes shall be kept in containers that are in good physical condition and are constructed of material appropriate for the waste being stored.

5.7.3.5 Most jurisdictions have some Tier 2 requirements for managing solid waste.

5.7.3.6 Filing plans with the Local Emergency Planning Committee is generally required for the storage of hazardous substances above certain threshold quantities, including contingency plans for responses to releases, pursuant to SARA Title III or equivalent state regulations.

5.7.3.7 Although licenses or permits are generally required for storage, transfer, treatment or disposal of hazardous waste, generators are generally authorized to accumulate hazardous waste for a limited time, below specified volumes and at specified locations without a specific permit. For example, 90 days is the usual time limitation for generator storage of hazardous waste without a specific license.

5.7.3.8 Standards may also apply for the proper management of universal or special wastes such as used oil and oil filters, asbestos-containing material, fluorescent lights, etc.

5.8 Tier 3 Performance Standards are concerned with the operation and maintenance of pollution control and monitoring equipment and the management of hazardous or other waste accumulation areas. They usually require notification of excess emissions or discharges over permitted amounts, except for those instances where immediate reporting is required (Tier 1 Standards). Tier 3 Standards also set timelines for monitoring and testing of equipment, accumulation areas, and potential physical points of release. These standards ensure that approved release control strategies, outlined in Tier 2, do not fail and that programmatic environmental protection goals are met. Accordingly, Tier 3 Standards are an important step towards compliance. Noncompliance with these standards may be serious because they often make up the bulk of repeat violations of a facility. Repeat violations could potentially lead to actual or increased releases to the environment. Tier 3 Standards generally require the following:

5.8.1 Compliance with operating conditions or prescribed best management practices to prevent actual or potential harm to public health, safety, or the environment, as required by statute, regulation, license, permit or other approval.

5.8.2 Reporting of releases, disposal or discharges of pollutants to the environment not otherwise required to be immediately reported, when required by statute, regulation, or license. Reportable quantity releases are addressed in Tier 1 Standards.

5.8.3 Maintain requirements, such as monitoring systems, designed to detect potential threats to public health, safety, welfare and the environment.

5.8.4 Meet essential statutory or regulatory program goals, such as toxic materials use reduction.

5.9 Tier 3 Standards:

5.9.1 *Air Quality Tier 3 Standards*—Air Quality Tier 3 Standards address monitoring of potential physical points of release. Examples include periodically testing the performance of vapor control systems, periodic stack testing of combustion equipment and implementation of Leak Detection and Repair Plans. Periodic stack testing is generally conducted by a third party source testing company, and may be witnessed by a regulatory agency representative. If periodic leak detection monitoring is required for manufacturing equipment, these inspections should be conducted with the proper equipment as prescribed by regulatory agency and industry standards. If leaks are detected, repair is generally required within 24 h discovery of the leak. If this is not possible, repairs should be made within the timeframes specified by the regulations or a variance should be sought. Regulations typically allow repair of certain leaks associated with critical process equipment to be delayed until the next turnaround. These types of exceptions are generally covered in the Leak Detection and Repair plan. Good maintenance practices are also suggested to minimize the occurrence of leaks associated with standard equipment use.

5.9.2 *Water Tier 3 Standards*—Wastewater Tier 3 standards address requirements for wastewater tanks, discharges, pollution control equipment, and certain kinds of monitoring equipment for secondary standards not directly related to protecting public health. Examples would be routine monitoring of wastewater discharged to POTWs or NPDES discharge monitoring to confirm compliance with permit limits. Some reporting standards for water supplies may be included in this group. Regular monitoring of drinking water supplies is usually required for certain primary quality indicators, and time intervals required for testing may be specified.

5.9.3 Hazardous Waste Tier 3 Standards address the maintenance of waste storage and accumulation areas and the facility's emergency preparedness.

5.9.3.1 Accumulation areas shall be clearly marked, shall be in or near the area where the waste is generated and shall have no more than 55 gal of waste.

5.9.3.2 Storage areas shall be secure, labeled, have sign and floor markers, be separated from other areas of activity, and have clearly defined emergency numbers and procedures. Containers shall be labeled and storage of any waste must be less than 90 days unless the facility has a specific license or

permit authorizing longer storage, or the facility is conditionally exempt because it is a very small quantity generator.

5.9.3.3 Containers in hazardous waste storage areas shall be inspected weekly using the inspection requirements found in Federal hazardous waste regulations. Containers that hold hazardous waste shall be compliant with Federal hazardous material transportation requirements. The containers shall be labeled with the words "hazardous waste," the contents of the container, the hazard(s) associated with the waste, and the accumulation start date. Containers shall be kept sealed and under the control of the operator unless waste is being added or removed. Once the container(s) is/are ready for shipment, the appropriate Uniform Waste Manifest shall be signed by the generator. The material shall then be shipped by a licensed waste transporter to a facility permitted to accept that waste stream.

5.9.3.4 Facilities shall also have an Emergency Contingency Plan. This plan should include training for employees in the handling of waste and spill response. One employee should be designated as an emergency coordinator. Communication should also be established between the facility and local emergency agencies.

5.9.3.5 Tanks and piping shall be located in a secure area. If underground or aboveground storage tanks are used for storage of petroleum products or hazardous substances, they shall be in good physical condition and constructed of material appropriate for the material being stored. Underground tanks and piping shall not be placed below the water table, and shall have secondary containment or leak detection systems, or both, as specified by regulations or permit conditions, or both.

5.10 Tier 4 Standards address documentation and reporting of operational information (except for releases, disposal or discharges—see previous tiers), including keeping timely and accurate records. These records help Local, State and Federal agencies ensure that facilities are acting in compliance with their certifications or permits. Analysis of records may also help a facility pinpoint opportunities for waste and cost reduction as well as pollution prevention. Facilities should maintain operating manuals and design specifications of both their manufacturing and pollution control equipment. This ensures that the facility is knowledgeable in the proper operation and repair of their equipment. Most records should be kept on the facility's premises for a minimum of three years and many programs recommend record retention for longer periods for inspection and auditing purposes.

5.10.1 *Air Quality Tier 4 Standards*—Tier 4 Standards address record keeping required by air quality regulations or permit conditions. One example would be maintaining tank throughput records and vapor pressure measurements for aboveground storage tanks holding liquids containing volatile organic compounds. Another example would be maintaining component leak detection and repair logs.

5.10.2 *Water Quality Tier 4 Standards*—Tier 4 Standards address recording required by wastewater discharge permits. Examples could include keeping monitoring equipment maintenance and calibration logs and logs associated with underground storage tank (UST) leak detection systems. Secondary drinking water standards may require monitoring for certain

non-health related parameters for aesthetics such as odor or color. Drinking water withdrawal sources should be documented by keeping records about volume, operations, water quality and service information.

5.10.3 *Solid and Hazardous Waste Tier 4 Standards* address record keeping required by waste management regulations. Examples could include maintaining purchase records and Material Safety Data Sheets (MSDSs) to corroborate generator status and records of manifests for the offsite transport of hazardous and solid waste to document that the generator properly disposed of such waste.

5.11 *Prevention Performance Standards:*

5.11.1 Some facilities may go through one additional step towards the development of an environmental compliance management system by looking at “prevention” requirements. Prevention requirements are typically phrased as vapor

recovery, drainage, storage tank and toxic use reduction requirements and may be mandatory in some jurisdictions.

5.11.2 Vehicle fueling and maintenance facilities in the United States, for example, are subject to requirements that are designed to prevent leakage of petroleum products from underground storage tanks (USTs) and piping. The user should consult the following standards for more information: Practice **E1526**, and Guide **E1990**. **Appendix X3** gives some example prevention requirements for vehicle fueling and maintenance facilities.

5.11.3 Facilities that are required to report under such requirements may find it helpful to organize their preventative actions and reporting requirements into a systematic tool such as an environmental management system. By conducting this additional prevention analysis, facilities can incorporate a more rigorous system of pollution prevention into their environmental compliance program beyond what is suggested in this guide.

APPENDIXES

(Nonmandatory Information)

X1. EXAMPLE INTERNET RESOURCES FOR ENVIRONMENTAL COMPLIANCE AND POLLUTION PREVENTION

X1.1 *Caveat:*

X1.1.1 The internet web citations below are current as of November 1, 2005. They are considered examples only and the user should consult the most recent information available about a particular standard or program. This is a limited list of sites that may provide the user with a starting point for planning Environmental Management Systems and other compliance and pollution prevention activities.

X1.2 *Environmental Management System Resources:*

X1.2.1 American Chemistry Council Responsible Care; <https://responsiblecare.americanchemistry.com/>

X1.2.2 Commission for Environmental Cooperation; <http://www.cec.org>.

X1.2.3 European Commission Eco-Management https://ec.europa.eu/environment/emas/index_en.htm&AuditScheme

X1.2.4 The Global Development Research Center; <https://www.gdrc.org>

X1.2.5 Minnesota Pollution Control Agency; <https://www.pca.state.mn.us/quick-links/environmental-management-systems>

X1.2.6 National Institute Health; <https://nems.nih.gov/environmental-programs/Pages/Environmental-Programs.aspx> (NIH EMS)

X1.2.7 U.S. Army Environmental Command; <https://aec.army.mil/index.php/support/EMS>

X1.2.8 US Bureau of Safety and Environmental Enforcement <https://www.bsee.gov/resources-and-tools/safety-and-environmental-management-systems>

X1.2.9 U.S. Environmental Protection Agency; www.epa.gov > *ems*

X1.2.10 U.S. Geological Survey, *Handbook Environmental Management System*, 515-4-H 2018

X1.3 *Government Recognition Programs for Environmental Performance:*

X1.3.1 National Pollution Prevention Roundtable. Most Valuable Pollution Prevention Awards <https://p2.org/MVP2-Awards>

X1.3.2 Ohio Encouraging Environmental Excellence <http://www.epa.state.oh.us/ocapp/ohioe3.aspx#112302643-introduction>

X1.3.3 Texas Environmental Excellence Awards; <http://www.teea.org/>

X1.3.4 U.S. Department of Energy <https://www.energy.gov/management/spd/us-department-energy-sustainability-awards>

X1.4 *Compliance and Assistance:*

X1.4.1 California Department of Toxic Substances Control, Regulatory Assistance Office <https://dtsc.ca.gov/regulatory-assistance-office/>

X1.4.2 Environmental Compliance Assistance Platform; <https://www.envcap.org/>

X1.4.3 Maryland Department of the Environment. ISO 14001 Environmental Management System Implementation Assistance. https://mde.maryland.gov/programs/BUSINESSINFOCENTER/GreeningYourBusinessFacility/Pages/iso_14001_em_s.aspx

X1.4.4 Wisconsin Department of Natural Resources Green Tier Program; <https://dnr.wi.gov/topic/GreenTier>

X1.5 *Pollution Prevention Resources:*

X1.5.1 KPPC — Kentucky Pollution Prevention Center, J.B. Speed School of Engineering, University of Louisville; <http://kppc.org/esrc/>

X1.5.2 Massachusetts Department of Environmental Protection <https://www.mass.gov/guides/the-massachusetts-clean-auto-repair-masscar-guide>

X1.5.3 Pacific Northwest Pollution Prevention Resource Center (PPRC); <https://pprc.org/>

X1.5.4 University of Illinois Pollution Prevention (P2) home; <https://guides.library.illinois.edu/friendly.php?s=p2>

X1.5.5 U.S. EPA Pollution Prevention; <https://www.epa.gov/p2/grant-programs-pollution-prevention#sra>

X1.5.6 Western Sustainability and Pollution Prevention Network (WSPPN); <https://wsppn.org/>

X2. SAMPLE ENVIRONMENTAL COMPLIANCE BENCHMARKS FOR RETAIL SERVICE FACILITIES SUCH AS DRY CLEANERS, PHOTOPROCESSORS OR PRINTERS

INTRODUCTION

This Appendix provides detailed tables of performance standards for certain specific activities. These are examples that apply directly to development of an assessment plan for the activities, but they may also illustrate to the user how to build performance tables for other types of facilities. The tables proceed from the most important standards in Tier 1 for air, water and waste, through the final planning steps in Tier 4 for the three media.

X2.1 Tier 1 performance standards for businesses such as dry cleaners, photoprocessors or printers, prevent or manage actual releases of chemicals. Examples include perchloroethylene (PERC) or other volatile organic compounds (VOCs), such as adhesives and cleanup solutions, or processing materials, such as silver waste solutions, that could be released to the air, water or ground as waste. These multimedia environmental standards are usually grouped under air, industrial wastewater and waste management in most Federal and State regulatory programs. The user should consult the appro-

priate experts to determine specific requirements for a facility, and should be aware that the performance standards listed in this appendix are only examples. Since Tier 1 performance standards manage actual or potential risk to human health and the environment from releases, they should be the first benchmarks evaluated by the facility. These performance standards, if not met, are considered the most serious among violations of environmental regulatory standards.

X2.1.1 *Air Quality Tier 1 Example Performance Standards:*

Type of Performance Standard	Description	P2
Use carbon adsorber	Prevent air-PERC gas-vapor streams from bypass of carbon adsorber to the atmosphere.	Minimize volumes of PERC stored or managed on sites and explore less volatile and toxic cleaning substitutes.
Notify of and respond to unexpected emissions	Accidents, spills, failure of emission equipment or other events that release significant air pollutants require notification to local, state and appropriate Federal agencies.	Minimize storage of VOCs at the facility. Conduct drills for all staff to administer emergency response procedures, to minimize the release if an accident does occur.
Secure Storage of Cleanup Solution	Cleanup solution shall be stored in accordance with applicable storage requirements.	Use application devices that minimize over-spray and use sparingly.
Secure Storage of PERC and Wastes	Store PERC and other solvents in accordance with applicable storage requirements.	Use appropriate engineering controls to dispense material and to transfer waste to storage containers. Eliminate disposal or outdoor un-containerized storage of solvent filters.

X2.1.2 Tier 1 Example Performance Standards for Industrial Wastewater:

Type of Performance Standard	Description	P2
General Prohibitions	No facility can allow the discharge of substances, materials or wastewaters to a POTW that would harm the sewer, treatment process, and equipment or endanger life, unless otherwise authorized by permit.	Post warning signs near sinks to remind employees not to dispose of chemicals down the drain. Eliminate any discharge of non-sanitary wastewater to the sewer or the environment.
Specific Prohibitions	Facility must prevent the discharge of pollutants into a POTW that: (1) Pose a fire or explosion hazard. (2) Cause corrosion (for example, maintain acid-base levels at 5.5 < pH < 9.5). (3) Cause obstruction to flow into the POTW. (4) Are discharged at a flow rate/concentration that would interfere with the POTW. (5) Would inhibit biological activity due to heat (temp at POTW should not exceed 104 °F).	Post warning signs near sinks to remind employees not to dispose of chemicals down the drain. Prevent discharge of any wastes with a pH of < 5.5 or > 9.5.
Silver Discharge	Facilities without an agency approved permit shall not discharge wastewater that has silver concentrations that exceed regulatory standards.	Facilities should comply with the most stringent silver concentration limit, whether it is a state or POTW imposed standard.
Wastewater Discharge	Facilities without an agency-approved permit shall not discharge wastewater into a sewer system or POTW unless it has been treated to recover the silver.	Recovery systems include: (1) Cartridge series. (2) Electrolytic plus cartridge. (3) Small scale precipitation.

X2.1.3 Tier 1 Example Performance Standards for Waste Management:

Type of Performance Standard	Description	P2
Report and respond to releases	Establish contingency procedures for responsible persons to notify all proper agencies in the event of a spill.	Conduct contingency plan training and emergency response drills for all staff to minimize damage in the event of a spill. An EMS is a good management tool to prevent the threat of release to the environment.
Emergency Response/ Preparedness	Notify the appropriate agency in the event of a spill or leak that exceeds state or local discharge notification requirements.	Notify environmental agency within 2 h of release. Follow up with a written report within 60 days. Conduct contingency plan training and emergency response drills for all staff to minimize damage in the event of a spill. An EMS is a good management tool to prevent the threat of a release to the environment.
Emergency Response/ Preparedness	In the case of a spill, conduct immediate containment and clean up contaminated materials, following facility contingency plan. Significant spills require notification of the National Response Center.	Employees should be trained in the proper use of spill kits, absorbents, and proper disposal of absorbed waste. Key staff should be trained in emergency response and be familiar with containment procedures such as Guide F1127.
Emergency Response/ Preparedness	In the case of a fire notify appropriately trained emergency response personnel. Follow all posted firefighting procedures until emergency response personnel arrive.	Employees should be trained in the proper use of fire extinguishers, including the PASS acronym.
Ignitable Wastes	Ignitable wastes shall be stored to prevent accidental ignition. Such wastes shall be kept away from: (1) Open Flame. (2) Smoking. (3) Cutting and welding. (4) Hot Surfaces. (5) Frictional Heat. (6) Static, electrical or mechanical sparks. (7) Spontaneous ignition. (8) Radiant Heat.	Smoking should be avoided in all areas where wastes are accumulated as well as areas where ignitable materials are used in production. "No Smoking" signs should be conspicuously placed in areas where there is actual or potential hazard from ignition.