

IV. POLLUTION PREVENTION OPPORTUNITIES

The best way to reduce pollution is to prevent it in the first place. Some companies have creatively implemented pollution prevention techniques that improve efficiency and increase profits while at the same time minimizing environmental impacts. This can be done in many ways such as reducing material inputs, re-engineering processes to reuse by-products, improving management practices, and employing substitution of toxic chemicals. Some smaller facilities are able to actually get below regulatory thresholds just by reducing pollutant releases through aggressive pollution prevention policies.

The Pollution Prevention Act of 1990 established a national policy of managing waste through source reduction, which means preventing the generation of waste. The Pollution Prevention Act also established as national policy a hierarchy of waste management options for situations in which source reduction cannot be implemented feasibly. In the waste management hierarchy, if source reduction is not feasible the next alternative is recycling of wastes, followed by energy recovery, and waste treatment as a last alternative.

To encourage these approaches, this section provides both general and company-specific descriptions of some pollution prevention advances that have been implemented within the water transportation industry. While the list is not exhaustive, it does provide core information that can be used as the starting point for facilities interested in beginning their own pollution prevention projects. This section provides summary information from activities that may be, or are being implemented by this sector. When possible, information is provided that gives the context in which the technique can be used effectively. Please note that the activities described in this section do not necessarily apply to all facilities that fall within this sector. Facility-specific conditions must be carefully considered when pollution prevention options are evaluated, and the full impacts of the change must examine how each option affects air, land and water pollutant releases.

IV.A. Water Transportation

Pollution prevention activities in the water transportation industry can be focused on three major areas: vessel maintenance, fueling, and discharges from on-board tanks. Fugitive dust emissions that occur as a result of cargo loading activities can also be reduced through pollution prevention techniques. These three areas are addressed in the following sections.

IV.A.1. Vessel Maintenance

Vessel maintenance is one of the water transportation sector's greatest environmental concerns. The major waste streams are chemical paint stripping wastes, abrasive blast and surface preparation wastes, painting and painting equipment cleaning wastes, solvent wastes, and engine overhauling and repair wastes. The wastes produced from these operations may take a liquid, gaseous, or solid form. Source reduction is the best pollution prevention approach for reducing the amount of wastes produced. Source reduction can be achieved through material substitution, process or equipment modification, recycling, or better operating practices.

Chemical Stripping Wastes

Chemical stripping wastes consist primarily of the stripping agent and paint sludges. Methylene chloride is the most commonly used paint stripping agent, although the industry increasingly is using less toxic agents such as dibasic esters, semi-aqueous terpene-based products, aqueous solutions of caustic soda, and detergent-based strippers that are currently available on the market. Although waste strippers other than methylene chloride are still hazardous, they are relatively less toxic and easier to treat on site.

Storing and reusing or recycling used strippers also are effective waste minimization techniques. Solvent strippers, particularly stripping baths can generally be reused several times before their effectiveness is diminished. Both spent caustic and organic stripping solutions can be treated to remove contaminants. Segregating the spent stripping wastes from other waste streams will help facilitate cost-efficient reuse and recycling of contaminated strippers.

Abrasive Blasting and Surface Preparation Wastes

Abrasive blasting is being used as an alternative for chemical paint stripping. Although blasting does not require disposal of chemical strippers, it does create a large amount of water runoff and air pollution, and the presence of paint chips containing hazardous metals and organometallic biocides can make abrasive blasting wastes potentially hazardous. Research and testing are underway on a number of innovative alternative paint removal and surface preparation techniques including: plastic media blasting, steel shot slingers, water jet stripping, thermal stripping, dry ice pellets, laser paint stripping, and cryogenic stripping. However, an alternative as economically viable and easy as chemical paint stripping has not been found.

- Plastic media blasting has had mixed results. The same types and quantities of solid wastes are generated as with grit blasting, but the plastic media tend to be more easily recyclable through the use of pneumatic media classifiers that are part of the stripping equipment. The abrasion eventually turns the plastic media to dust, making the waste paint the main waste to be disposed of. However, it will not work on epoxy or urethane paints, and the blasting equipment is more expensive and requires more highly trained operators.
- Cavitating water jet stripping systems remove most paints, separates the paint chips from the water, and treats the water to eliminate dissolved toxic materials. Although relatively little hazardous waste is generated by this process, it is not as efficient as conventional grit blasting, and the equipment has higher capital and operating costs.
- The thermal stripping process softens the paint so it can be peeled relatively easily. Although it generates only one waste stream (waste paint), it is more labor-intensive than other stripping methods, and can only be used on non heat-sensitive surfaces.
- Carbon dioxide pellets can be used as a blast medium leaving only paint chips that can be swept up and placed in containers for disposal (the dry ice evaporates). However, the cost of the dry ice, storage, and handling equipment can be substantial.
- A pulsed carbon dioxide laser controlled by an industrial robot to remove paint produces no residue. However, the method is complex, capital intensive, and requires highly skilled operators.
- Cryogenic stripping using liquid nitrogen baths followed by gentle abrasion or plastic shot blasting is useful for small parts or objects, but requires special equipment for handling the liquid nitrogen.
- The most promising technique to prepare the ship for painting is the use of steel shot slingers. The steel shot slingers produce fewer air emissions because the process lowers the amount of blasting required for a finished hull.

Painting and Painting Equipment Cleanup Wastes

Methods for minimizing paint and painting equipment cleanup wastes include tight inventory control, material substitution, and minimizing fugitive oversprays. Tight inventory control techniques such as monitoring employee operations or limiting access to raw materials storage areas force

employees to stretch the use of the raw materials. Use of less toxic cuprous oxide or copper flake types of antifouling paints, and non-toxic water-based paints for parts of the vessel not immersed in water can reduce the amount of hazardous paint waste as well as painting equipment cleanup waste (i.e., solvent wastes). Also, use of powder coatings based on finely pulverized plastics that are baked on at 400° F has been tried as a substitute for paint for some industrial applications.

Minimizing overspray has benefits in terms of both inventory control and elimination of surface water runoff. For inventory control, overspray in non-marine industries can be minimized by using air-assisted, airless, high volume, low pressure turbine, air atomized electrostatic, and airless electrostatic application techniques. In the marine industry, such techniques for overspray control may not be compatible, and their applications need to be evaluated. However, overspray in the marine industry can be minimized by maintaining a fixed distance from the surface while triggering the paint gun, and releasing the trigger when the gun is not aimed at the target. Overspray control for minimizing runoff can be achieved by using plastic sheeting under and around the vessel being painted, or using a paint booth for smaller parts.

Solvent Wastes

To minimize solvent waste generation, the best techniques are good housekeeping, reuse and recycling. Good housekeeping practices, including storage area leak control and containment, improvements in drum location, and product transfer leak collection, can provide very effective source reduction. Solvents can be reused until their effectiveness is compromised, and then they can be recovered and recycled. Processes for recycling thinners and solvents are well established and widely used in many industrial sectors. Waste segregation (i.e., placing different wastes into different containers) is critical to the success of both reuse and recycling programs. In addition, minimizing the use of raw or recycled solvents by materials substitution (such as using water-based paints whenever possible) will greatly reduce the volume of waste generated.

Machine Shop Wastes

The major hazardous wastes from metal machining are waste cutting oils, spent machine coolant, and degreasing solvents. However, scrap metal also can be a component of hazardous waste produced at a machine shop. Material substitution and recycling are the two best means to reduce the volume of these wastes.

The preferred method of reducing the amount of waste cutting oils and degreasing solvents is to substitute water-soluble cutting oils. Recycling of waste cutting oils also is possible, if non-water-soluble oils must be used. Machine coolant can be recycled, and a number of proprietary systems are available to recycle the coolant. Coolant recycling is most easily implemented when a standardized type of coolant is used throughout the shop. Reuse and recycling of solvents also is easily achieved, as mentioned above. Most shops collect scrap metals from machining operations and sell these to metal recyclers. Metal chips which have been removed from the coolant by filtration should be drained and included in the scrap metal collection. Wastes should be carefully segregated to facilitate reuse and recycling.

Engine Repair and Specialty Shop Wastes

Typical wastes from engine repair shops include solvents, waste turbine oils, and batteries. Of these, solvents are generally the only wastes suitable for recovery and recycling on site. However, lightly used waste turbine oil can be reused in some instances, or recycled. Some states operate portions of their motor fleet on this oil, and there are a number of recycling operations equipped to re-refine contaminated oil. In addition, there are several waste exchanges that use the oil as feedstock for other processes. Careful waste handling must be employed to facilitate this type of reuse or recycling.

Used Oil. Most water transportation maintenance facilities recycle or reclaim used oil. Recycling used oil requires equipment like a drip table with a used oil collection bucket to collect oil dripping off parts. Some facilities use absorbent materials (e.g., pigmat) to catch drips or spills during activities where oil drips may occur. Recycling used oil by sending it to a commercial recycling facility saves money and protects the environment. To encourage recycling, the publication "How To Set Up A Local Program To Recycle Used Oil" is available at no cost from the RCRA/Superfund Hotline at 1-800-424-9346 or 1-703-412-9810.

Spent petroleum-based fluids and solids should be sent to a recycling center whenever possible. Solvents that are hazardous waste must not be mixed with used oil, or, under RCRA regulations, the entire mixture may be considered hazardous waste. Non-listed hazardous wastes can be mixed with waste oil, and as long as the resulting mixture is not hazardous, can be handled as waste oil. All used drip pans and containers should be properly labeled.

Batteries. Facilities have many battery disposal options: recycling onsite, recycling through a supplier, or direct disposal. Facilities should explore

all options to find one that is right for the facility. Many waste batteries must be handled as hazardous waste. Lead acid batteries are not considered hazardous waste as long as they are recycled. In general, recycling batteries may reduce the amount of hazardous waste stored at a facility, and thus the facility's responsibilities under RCRA. The following best management practices are recommended when sorting used batteries:

- Palletize and label them by battery type (e.g., lead, acid, nickel, and cadmium)
- Protect them from the weather with an acid-proof tarp, roof, or other means
- Store them on an open rack or in a water tight secondary containment unit to prevent leaks
- Inspect them for cracks and leaks as they come into the facility. If a battery is dropped, treat it as if it is cracked. Acid residue from cracked or leaking batteries is likely to be hazardous waste under RCRA because it is likely to demonstrate the characteristic of corrosivity, and may contain lead and other metals.
- Avoid skin contact with leaking or damaged batteries
- Neutralize acid spills, such as with baking soda, and dispose of the resulting waste as hazardous if it still exhibits a characteristic of a hazardous waste.

Equipment Maintenance Fluids. Equipment and motors require regular changing of fluid, including oil, coolant, and others. To minimize releases to the environment, these fluids should be drained and replaced in areas where there are no connections to storm drains or municipal sewers. Minor spills should be cleaned prior to reaching drains. Used fluid should be collected and stored in separate containers. Fluids can often be recycled. For example, brake fluid, transmission gear, and gear oil are recyclable. Some liquids are able to be legally mixed with used motor oil which, in turn, can be reclaimed.

During the process of engine and parts cleaning, spills of fluids are likely to occur. The "dry shop" principle encourages spills to be cleaned immediately, without waiting for the spilled fluids to evaporate into the air, be transmitted to land, or to contaminate other surfaces. The following techniques help prevent spills from happening:

- Collect leaking or dripping fluids in designated drip pans or containers. Keep all fluids separated so they may be properly recycled.
- Keep a designated drip pan under the vehicle while unclipping hoses, unscrewing filters, or removing other parts. The drip pan prevents splattering of fluids and keeps chemicals from penetrating the shop floor or outside area where the maintenance is occurring.
- Immediately transfer used fluids to proper containers. Never leave drip pans or other open containers unattended.

Radiator fluids are often acceptable to antifreeze recyclers. This include fluids used to flush out radiators during cleaning. Reusing the flushing fluid minimizes waste discharges. Check ahead of time with a licensed recycler to see what types of coolants can be accepted for recycling. If a licensed recycler does not accept some spent flushing fluids, consider changing to another brand of fluid that can be recycled.

If the maintenance facility services air conditioners, special equipment must be used to collect the freon or other refrigerant because it is not permissible to vent the refrigerant to the atmosphere. Reusing the refrigerant on site is less costly than the only other legal alternative, sending the refrigerant to an off site recycler.

IV.A.2. Fueling

Pollution prevention opportunities for marine facility refueling operations primarily focus on the prevention of fuel spillage and the associated air, water, and hazardous waste pollution. Using color-coded dyes to identify fuel grades is a common used technique to prevent the mixtures of fuel and to find fuel leaks easily. One technique to prevent fuel spills is to install spill and overflow protection. All leaking pipe joints, nozzle connections, and any damage to the fueling hose (e.g., kinks, crushing, breaks in the carcass, bulges, blistering, soft spots at the coupling, deep cracks or cuts, spots wet with fuel, or excessive wear) should be reported immediately to reduce the amount of pollution to the environment. Using dry cleanup methods for the fuel area will prevent increased water-related pollution.

Pollution prevention techniques for refueling include the following:

- ✓ Inspect fueling equipment daily to ensure that all components are in satisfactory condition.

- ✓ Employ proper grounding and bonding techniques for a safe fueling operation.
- ✓ If refueling occurs at night, make sure it is carried out in well lighted area.
- ✓ Do not refuel a vehicle during maintenance as it might provide a source of ignition to fuel vapors.
- ✓ While refueling, check for leaks and make certain that the fueling operator has a clear view of control panel.
- ✓ Never leave nozzle unattended during fueling or wedge or tie nozzle trigger in the open position.
- ✓ Discourage topping off of fuel tanks.

Self-locking fueling nozzles minimize the risk of both fuel spillage and air pollution by ensuring a secure seal between the fuel source and tank.

There are two ways to reduce emissions from vehicles; use battery-operated vehicles or switch to alternative fuels. Natural gas vehicles, for example, are a viable alternative to gasoline- and diesel-powered transportation. Almost any gasoline-powered vehicle can be converted to run on natural gas by installing a natural gas fuel system and storage tanks without removing any existing equipment. Diesel conversions are somewhat more complicated because they also involve reducing compression and adding a sparked-ignition system. Other fuels suitable for vehicles include methanol, ethanol, and propane. Some of the momentum to switch to alternative fuels such as natural gas is coming from legislation. Over the past few years, Congress has passed even stricter clean air laws, as well as incentives to encourage the use of alternative fuels. Federal (and in some areas State) tax deductions for Alternative Fuel Vehicles (AFVs) and related refueling equipment are available. The maximum tax deductions range from \$2,000 to \$50,000 for each AFV and up to \$100,000 on refueling stations.

IV.A.3. On-Board Tank Discharges

Sewage, domestic wastewater, bilge, oil tanker ballast and vessel cleaning wastes may be retained, in various concentrations, in on-board tanks until the vessel returns to port, or they may be discharged to the water body the vessel is operating in. If the wastes are discharged at the port or

maintenance yard, the yard or port is the generator of record, and there is little the yard can do to reduce their generation.

With respect to sewage, progress is being made toward increasing discharge and treatment onshore and reducing the volume of sewage wastes carried by vessels. The common solution is to equip the vessels with larger holding tanks and limit the amount of flushing water required. Flushing water adds significantly to the amount of sewage; therefore, limiting its need will lower the quantity of sewage on board vessels. Increasing the size of tanks will help increase the number of onshore discharges.

The deliberate discharge of oily wastes from vessels via bilge pumping, deballasting, and tank washing operations is believed to add more oil to the seas than does the more spectacular, but less frequent, accident-related discharge. Most pollution control techniques for these types of discharges have been aimed at minimization of oily waste discharge. Segregated ballast tanks also will prevent release of oil and associated contaminants into the water.

IV.B. Cargo Handling Operations

Cargo handling operations do generate wastes and hazardous air emissions. Dry bulk-transfer operations generally have dust control problems because dust is generated each time the cargo is transferred. Liquid bulk-transfer operations can be a source of hydrocarbon emissions that are readily converted into photochemical smog by ultraviolet radiation from the sun.

Pneumatic conveyors and slurry pipelines have been used to reduce the amount of dust emissions. Additional steps to control air emissions include enclosing the conveyor transfer points in buildings, using steam or spray as a sealant over the open end of the hopper, placing the loading chute as close as possible to the cargo pile in the hold, and installing telescoping chutes which eliminate the need for slingers.

V. SUMMARY OF APPLICABLE FEDERAL STATUTES AND REGULATIONS

This section discusses the Federal regulations that may apply to this sector. The purpose of this section is to highlight and briefly describe the applicable Federal requirements, and to provide citations for more detailed information. The three following sections are included:

- Section V.A. contains a general overview of major statutes
- Section V.B. contains a list of regulations specific to this industry
- Section V.C. contains a list of pending and proposed regulations

The descriptions within Section VI are intended solely for general information. Depending upon the nature or scope of the activities at a particular facility, these summaries may or may not necessarily describe all applicable environmental requirements. Moreover, they do not constitute formal interpretations or clarifications of the statutes and regulations. For further information, readers should consult the Code of Federal Regulations and other state or local regulatory agencies. EPA Hotline contacts are also provided for each major statute.

V.A. General Description of Major Statutes

V.A.1. Resource Conservation and Recovery Act

The Resource Conservation And Recovery Act (RCRA) of 1976 which amended the Solid Waste Disposal Act, addresses solid (Subtitle D) and hazardous (Subtitle C) waste management activities. The Hazardous and Solid Waste Amendments (HSWA) of 1984 strengthened RCRA's waste management provisions and added Subtitle I, which governs underground storage tanks (USTs).

Regulations promulgated pursuant to Subtitle C of RCRA (40 CFR Parts 260-299) establish a "cradle-to-grave" system governing hazardous waste from the point of generation to disposal. RCRA hazardous wastes include the specific materials listed in the regulations (commercial chemical products, designated with the code "P" or "U"; hazardous wastes from specific industries/sources, designated with the code "K"; or hazardous wastes from non-specific sources, designated with the code "F") or materials which exhibit a hazardous waste characteristic (ignitability, corrosivity, reactivity, or toxicity and designated with the code "D").

Regulated entities that generate hazardous waste are subject to waste accumulation, manifesting, and record keeping standards. Facilities generally must obtain a permit either from EPA or from a State agency which EPA has authorized to implement the permitting program if they

store hazardous wastes for more than 90 days before treatment or disposal. Facilities may treat hazardous wastes stored in less-than-ninety-day tanks or containers without a permit. Subtitle C permits contain general facility standards such as contingency plans, emergency procedures, record keeping and reporting requirements, financial assurance mechanisms, and unit-specific standards. RCRA also contains provisions (40 CFR Part 264 Subpart S and §264.101) for conducting corrective actions which govern the cleanup of releases of hazardous waste or constituents from solid waste management units at RCRA treatment, storage, and disposal facilities.

Although RCRA is a Federal statute, many States implement the RCRA program. Currently, EPA has delegated its authority to implement various provisions of RCRA to 47 of the 50 States and two U.S. territories. Delegation has not been given to Alaska, Hawaii, or Iowa.

Most RCRA requirements are not industry specific but apply to any company that generates, transports, treats, stores, or disposes of hazardous waste. Here are some important RCRA regulatory requirements:

- Identification of Solid and Hazardous Wastes (40 CFR Part 261) lays out the procedure every generator must follow to determine whether the material in question is considered a hazardous waste, solid waste, or is exempted from regulation.
- Standards for Generators of Hazardous Waste (40 CFR Part 262) establishes the responsibilities of hazardous waste generators including obtaining an EPA ID number, preparing a manifest, ensuring proper packaging and labeling, meeting standards for waste accumulation units, and recordkeeping and reporting requirements. Providing they meet additional requirements described in 40 CFR 262.34, generators may accumulate hazardous waste for up to 90 days (or 180 or 270 days depending on the amount of waste generated and the distance the waste will be transported).
- Land Disposal Restrictions (LDRs) (40 CFR Part 268) are regulations prohibiting the disposal of hazardous waste on land without prior treatment. Under the LDRs program, materials must meet LDR treatment standards prior to placement in a RCRA land disposal unit (landfill, land treatment unit, waste pile, or surface impoundment). Generators of waste subject to the LDRs must provide notification of such to the designated TSD facility to ensure proper treatment prior to disposal.

- Used Oil Management Standards (40 CFR Part 279) impose management requirements affecting the storage, transportation, burning, processing, and re-refining of the used oil. For parties that merely generate used oil, regulations establish storage standards. For a party considered a used oil processor, re-refiner, burner, or marketer (one who generates and sells off-specification used oil directly to a used oil burner), additional tracking and paperwork requirements must be satisfied.
- RCRA contains unit-specific standards for all units used to store, treat, or dispose of hazardous waste, including Tanks and Containers. Tanks and containers used to store hazardous waste with a high volatile organic concentration must meet emission standards under RCRA. Regulations (40 CFR Part 264-265, Subpart CC) require generators to test the waste to determine the concentration of the waste, to satisfy tank and container emissions standards, and to inspect and monitor regulated units. These regulations apply to all facilities that store such waste, including large quantity generators accumulating waste prior to shipment off-site.
- Underground Storage Tanks (USTs) containing petroleum and hazardous substances are regulated under Subtitle I of RCRA. Subtitle I regulations (40 CFR Part 280) contain tank design and release detection requirements, as well as financial responsibility and corrective action standards for USTs. The UST program also includes upgrade requirements for existing tanks that must be met by December 22, 1998.
- Boilers and Industrial Furnaces (BIFs) that use or burn fuel containing hazardous waste must comply with design and operating standards. BIF regulations (40 CFR Part 266, Subpart H) address unit design, provide performance standards, require emissions monitoring, and restrict the type of waste that may be burned.

EPA's RCRA, Superfund and EPCRA Hotline, at (800) 424-9346, responds to questions and distributes guidance regarding all RCRA regulations. The RCRA Hotline operates weekdays from 9:00 a.m. to 6:00 p.m., ET, excluding Federal holidays.

V.A.2. Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a 1980 law known commonly as Superfund, authorizes EPA to respond to releases, or threatened releases, of hazardous substances that may endanger public health, welfare, or the environment. CERCLA also enables EPA to force parties responsible for environmental contamination to clean it up or to reimburse the Superfund for response costs (including remediation costs) incurred by EPA. The Superfund Amendments and Reauthorization Act (SARA) of 1986 revised various sections of CERCLA, extended the taxing authority for the Superfund, and created a free-standing law, SARA Title III, also known as the Emergency Planning and Community Right-to-Know Act (EPCRA).

The CERCLA hazardous substance release reporting regulations (40 CFR Part 302) direct the person in charge of a facility to report to the National Response Center (NRC) any environmental release of a hazardous substance which equals or exceeds a reportable quantity. Reportable quantities are listed in 40 CFR §302.4. A release report may trigger a response by EPA, or by one or more Federal or State emergency response authorities.

EPA implements hazardous substance responses according to procedures outlined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300). The NCP includes provisions for permanent cleanups, known as remedial actions, and other cleanups referred to as removals. EPA generally takes remedial actions only at sites on the National Priorities List (NPL), which currently includes approximately 1300 sites. Both EPA and states can act at sites; however, EPA provides responsible parties the opportunity to conduct removal and remedial actions and encourages community involvement throughout the Superfund response process.

EPA's RCRA, Superfund and EPCRA Hotline, at (800) 424-9346, answers questions and references guidance pertaining to the Superfund program. The CERCLA Hotline operates weekdays from 9:00 a.m. to 6:00 p.m., ET, excluding Federal holidays.

V.A.3. Emergency Planning And Community Right-To-Know Act

The Superfund Amendments and Reauthorization Act (SARA) of 1986 created the Emergency Planning and Community Right-to-Know Act (EPCRA, also known as SARA Title III), a statute designed to improve community access to information about chemical hazards and to facilitate the development of chemical emergency response plans by State and local governments. EPCRA required the establishment of State emergency response commissions (SERCs), responsible for coordinating certain

emergency response activities and for appointing local emergency planning committees (LEPCs).

EPCRA and the EPCRA regulations (40 CFR Parts 350-372) establish four types of reporting obligations for facilities which store or manage specified chemicals:

- EPCRA §302 requires facilities to notify the SERC and LEPC of the presence of any extremely hazardous substance (the list of such substances is in 40 CFR Part 355, Appendices A and B) if it has such substance in excess of the substance's threshold planning quantity, and directs the facility to appoint an emergency response coordinator.
- EPCRA §304 requires the facility to notify the SERC and the LEPC in the event of a release equaling or exceeding the reportable quantity of a CERCLA hazardous substance or an EPCRA extremely hazardous substance.
- EPCRA §311 and §312 require a facility at which a hazardous chemical, as defined by the Occupational Safety and Health Act, is present in an amount exceeding a specified threshold to submit to the SERC, LEPC and local fire department material safety data sheets (MSDSs) or lists of MSDS's and hazardous chemical inventory forms (also known as Tier I and II forms). This information helps the local government respond in the event of a spill or release of the chemical.
- EPCRA §313 requires manufacturing facilities included in SIC codes 20 through 39, which have ten or more employees, and which manufacture, process, or use specified chemicals in amounts greater than threshold quantities, to submit an annual toxic chemical release report. This report, known commonly as the Form R, covers releases and transfers of toxic chemicals to various facilities and environmental media, and allows EPA to compile the national Toxic Release Inventory (TRI) database.

All information submitted pursuant to EPCRA regulations is publicly accessible, unless protected by a trade secret claim.

EPA's RCRA, Superfund and EPCRA Hotline, at (800) 424-9346, answers questions and distributes guidance regarding the emergency planning and community right-to-know regulations. The EPCRA Hotline operates weekdays from 9:00 a.m. to 6:00 p.m., ET, excluding Federal holidays.

V.A.4. Clean Water Act

The primary objective of the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), is to restore and maintain the chemical, physical, and biological integrity of the nation's surface waters. Pollutants regulated under the CWA include "priority" pollutants, including various toxic pollutants; "conventional" pollutants, such as biochemical oxygen demand (BOD), total suspended solids (TSS), fecal coliform, oil and grease, and pH; and "non-conventional" pollutants, including any pollutant not identified as either conventional or priority.

The CWA regulates both direct and indirect discharges. The National Pollutant Discharge Elimination System (NPDES) program (CWA §502) controls direct discharges into navigable waters. Direct discharges or "point source" discharges are from sources such as pipes and sewers. NPDES permits, issued by either EPA or an authorized State (EPA has authorized 42 States to administer the NPDES program), contain industry-specific, technology-based and/or water quality-based limits, and establish pollutant monitoring requirements. A facility that intends to discharge into the nation's waters must obtain a permit prior to initiating its discharge. A permit applicant must provide quantitative analytical data identifying the types of pollutants present in the facility's effluent. The permit will then set the conditions and effluent limitations on the facility discharges.

A NPDES permit may also include discharge limits based on Federal or State water quality criteria or standards, that were designed to protect designated uses of surface waters, such as supporting aquatic life or recreation. These standards, unlike the technological standards, generally do not take into account technological feasibility or costs. Water quality criteria and standards vary from State to State, and site to site, depending on the use classification of the receiving body of water. Most States follow EPA guidelines which propose aquatic life and human health criteria for many of the 126 priority pollutants.

Storm Water Discharges

In 1987 the CWA was amended to require EPA to establish a program to address storm water discharges. In response, EPA promulgated the NPDES storm water permit application regulations. These regulations require that facilities with the following storm water discharges apply for an NPDES permit: (1) a discharge associated with industrial activity; (2) a discharge from a large or medium municipal storm sewer system; or (3) a discharge which EPA or the State determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

The term "storm water discharge associated with industrial activity" means a storm water discharge from one of 11 categories of industrial activity defined at 40 CFR 122.26. Six of the categories are defined by SIC codes while the other five are identified through narrative descriptions of the regulated industrial activity. If the primary SIC code of the facility is one of those identified in the regulations, the facility is subject to the storm water permit application requirements. If any activity at a facility is covered by one of the five narrative categories, storm water discharges from those areas where the activities occur are subject to storm water discharge permit application requirements.

Those facilities/activities that are subject to storm water discharge permit application requirements are identified below. To determine whether a particular facility falls within one of these categories, consult the regulation.

Category I: Facilities subject to storm water effluent guidelines, new source performance standards, or toxic pollutant effluent standards.

Category ii: Facilities classified as SIC 24-lumber and wood products (except wood kitchen cabinets); SIC 26-paper and allied products (except paperboard containers and products); SIC 28-chemicals and allied products (except drugs and paints); SIC 291-petroleum refining; and SIC 311-leather tanning and finishing; SIC 32 (except 323) - stone, clay, glass, and concrete; SIC 33 - primary metals; SIC 3441 - fabricated structural metal; and SIC 373 - ship and boat building and repairing.

Category iii: Facilities classified as SIC 10-metal mining; SIC 12-coal mining; SIC 13-oil and gas extraction; and SIC 14-nonmetallic mineral mining.

Category iv: Hazardous waste treatment, storage, or disposal facilities.

Category v: Landfills, land application sites, and open dumps that receive or have received industrial wastes.

Category vi: Facilities classified as SIC 5015-used motor vehicle parts; and SIC 5093-automotive scrap and waste material recycling facilities.

Category vii: Steam electric power generating facilities.

Category viii: Facilities classified as SIC 40-railroad transportation; SIC 41-local passenger transportation; SIC 42-trucking and warehousing (except public warehousing and storage); SIC 43-U.S. Postal Service; SIC

44-water transportation; SIC 45-transportation by air; and SIC 5171-petroleum bulk storage stations and terminals.

Category ix: Sewage treatment works.

Category x: Construction activities except operations that result in the disturbance of less than five acres of total land area.

Category xi: Facilities classified as SIC 20-food and kindred products; SIC 21-tobacco products; SIC 22-textile mill products; SIC 23-apparel related products; SIC 2434-wood kitchen cabinets manufacturing; SIC 25-furniture and fixtures; SIC 265-paperboard containers and boxes; SIC 267-converted paper and paperboard products; SIC 27-printing, publishing, and allied industries; SIC 283-drugs; SIC 285-paints, varnishes, lacquer, enamels, and allied products; SIC 30-rubber and plastics; SIC 31-leather and leather products (except leather and tanning and finishing); SIC 323-glass products; SIC 34-fabricated metal products (except fabricated structural metal); SIC 35-industrial and commercial machinery and computer equipment; SIC 36-electronic and other electrical equipment and components; SIC 37-transportation equipment (except ship and boat building and repairing); SIC 38-measuring, analyzing, and controlling instruments; SIC 39-miscellaneous manufacturing industries; and SIC 4221-4225-public warehousing and storage.

Pretreatment Program

Another type of discharge that is regulated by the CWA is one that goes to a publicly-owned treatment works (POTWs). The national pretreatment program (CWA §307(b)) controls the indirect discharge of pollutants to POTWs by "industrial users." Facilities regulated under §307(b) must meet certain pretreatment standards. The goal of the pretreatment program is to protect municipal wastewater treatment plants from damage that may occur when hazardous, toxic, or other wastes are discharged into a sewer system and to protect the quality of sludge generated by these plants. Discharges to a POTW are regulated primarily by the POTW itself, rather than the State or EPA.

EPA has developed technology-based standards for industrial users of POTWs. Different standards apply to existing and new sources within each category. "Categorical" pretreatment standards applicable to an industry on a nationwide basis are developed by EPA. In addition, another kind of pretreatment standard, "local limits," are developed by the POTW in order to assist the POTW in achieving the effluent limitations in its NPDES permit.

Regardless of whether a State is authorized to implement either the NPDES or the pretreatment program, if it develops its own program, it may enforce requirements more stringent than Federal standards.

Spill Prevention, Control and Countermeasure Plans

The 1990 Oil Pollution Act requires that facilities that could reasonably be expected to discharge oil in harmful quantities prepare and implement more rigorous Spill Prevention Control and Countermeasure (SPCC) Plan required under the CWA (40 CFR §112.7). There are also criminal and civil penalties for deliberate or negligent spills of oil. Regulations covering response to oil discharges and contingency plans (40 CFR Part 300), and Facility Response Plans to oil discharges (40 CFR §112.20) and for PCB transformers and PCB-containing items were revised and finalized in 1995.

EPA's Office of Water, at (202) 260-5700, will direct callers with questions about the CWA to the appropriate EPA office. EPA also maintains a bibliographic database of Office of Water publications which can be accessed through the Ground Water and Drinking Water resource center, at (202) 260-7786.

V.A.5. Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) mandates that EPA establish regulations to protect human health from contaminants in drinking water. The law authorizes EPA to develop national drinking water standards and to create a joint Federal-State system to ensure compliance with these standards. The SDWA also directs EPA to protect underground sources of drinking water through the control of underground injection of liquid wastes.

EPA has developed primary and secondary drinking water standards under its SDWA authority. EPA and authorized States enforce the primary drinking water standards, which are, contaminant-specific concentration limits that apply to certain public drinking water supplies. Primary drinking water standards consist of maximum contaminant level goals (MCLGs), which are non-enforceable health-based goals, and maximum contaminant levels (MCLs), which are enforceable limits set as close to MCLGs as possible, considering cost and feasibility of attainment.

The SDWA Underground Injection Control (UIC) program (40 CFR Parts 144-148) is a permit program which protects underground sources of drinking water by regulating five classes of injection wells. UIC permits include design, operating, inspection, and monitoring requirements. Wells

used to inject hazardous wastes must also comply with RCRA corrective action standards in order to be granted a RCRA permit, and must meet applicable RCRA land disposal restrictions standards. The UIC permit program is primarily State-enforced, since EPA has authorized all but a few States to administer the program.

The SDWA also provides for a Federally-implemented Sole Source Aquifer program, which prohibits Federal funds from being expended on projects that may contaminate the sole or principal source of drinking water for a given area, and for a State-implemented Wellhead Protection program, designed to protect drinking water wells and drinking water recharge areas.

EPA's Safe Drinking Water Hotline, at (800) 426-4791, answers questions and distributes guidance pertaining to SDWA standards. The Hotline operates from 9:00 a.m. through 5:30 p.m., ET, excluding Federal holidays.

V.A.6. Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) granted EPA authority to create a regulatory framework to collect data on chemicals in order to evaluate, assess, mitigate, and control risks which may be posed by their manufacture, processing, and use. TSCA provides a variety of control methods to prevent chemicals from posing unreasonable risk.

TSCA standards may apply at any point during a chemical's life cycle. Under TSCA §5, EPA has established an inventory of chemical substances. If a chemical is not already on the inventory, and has not been excluded by TSCA, a premanufacture notice (PMN) must be submitted to EPA prior to manufacture or import. The PMN must identify the chemical and provide available information on health and environmental effects. If available data are not sufficient to evaluate the chemicals effects, EPA can impose restrictions pending the development of information on its health and environmental effects. EPA can also restrict significant new uses of chemicals based upon factors such as the projected volume and use of the chemical.

Under TSCA §6, EPA can ban the manufacture or distribution in commerce, limit the use, require labeling, or place other restrictions on chemicals that pose unreasonable risks. Among the chemicals EPA regulates under §6 authority are asbestos, chlorofluorocarbons (CFCs), and polychlorinated biphenyls (PCBs).

EPA's TSCA Assistance Information Service, at (202) 554-1404, answers questions and distributes guidance pertaining to Toxic Substances Control Act standards. The Service operates from 8:30 a.m. through 4:30 p.m., ET, excluding Federal holidays.

V.A.7. Clean Air Act

The Clean Air Act (CAA) and its amendments, including the Clean Air Act Amendments (CAAA) of 1990, are designed to "protect and enhance the nation's air resources so as to promote the public health and welfare and the productive capacity of the population." The CAA consists of six sections, known as Titles, which direct EPA to establish national standards for ambient air quality and for EPA and the States to implement, maintain, and enforce these standards through a variety of mechanisms. Under the CAAA, many facilities will be required to obtain permits for the first time. State and local governments oversee, manage, and enforce many of the requirements of the CAAA. CAA regulations appear at 40 CFR Parts 50-99.

Pursuant to Title I of the CAA, EPA has established national ambient air quality standards (NAAQSs) to limit levels of "criteria pollutants," including carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, volatile organic compounds (VOCs), and sulfur dioxide. Geographic areas that meet NAAQSs for a given pollutant are classified as attainment areas; those that do not meet NAAQSs are classified as non-attainment areas. Under section 110 of the CAA, each State must develop a State Implementation Plan (SIP) to identify sources of air pollution and to determine what reductions are required to meet Federal air quality standards. Revised NAAQSs for particulates and ozone were proposed in 1996 and may go into effect as early as late 1997.

Title I also authorizes EPA to establish New Source Performance Standards (NSPSs), which are nationally uniform emission standards for new stationary sources falling within particular industrial categories. NSPSs are based on the pollution control technology available to that category of industrial source.

Under Title I, EPA establishes and enforces National Emission Standards for Hazardous Air Pollutants (NESHAPs), nationally uniform standards oriented towards controlling particular hazardous air pollutants (HAPs). Title I, section 112(c) of the CAA further directed EPA to develop a list of sources that emit any of 189 HAPs, and to develop regulations for these categories of sources. To date EPA has listed 174 categories and developed a schedule for the establishment of emission standards. The emission standards will be developed for both new and existing sources

based on "maximum achievable control technology" (MACT). The MACT is defined as the control technology achieving the maximum degree of reduction in the emission of the HAPs, taking into account cost and other factors.

Title II of the CAA pertains to mobile sources, such as cars, trucks, buses, and planes. Reformulated gasoline, automobile pollution control devices, and vapor recovery nozzles on gas pumps are a few of the mechanisms EPA uses to regulate mobile air emission sources.

Title IV of the CAA establishes a sulfur dioxide nitrous oxide emissions program designed to reduce the formation of acid rain. Reduction of sulfur dioxide releases will be obtained by granting to certain sources limited emissions allowances, which, beginning in 1995, will be set below previous levels of sulfur dioxide releases.

Title V of the CAA of 1990 created a permit program for all "major sources" (and certain other sources) regulated under the CAA. One purpose of the operating permit is to include in a single document all air emissions requirements that apply to a given facility. States are developing the permit programs in accordance with guidance and regulations from EPA. Once a State program is approved by EPA, permits will be issued and monitored by that State.

Title VI of the CAA is intended to protect stratospheric ozone by phasing out the manufacture of ozone-depleting chemicals and restrict their use and distribution. Production of Class I substances, including 15 kinds of chlorofluorocarbons (CFCs) and chloroform, were phased out (except for essential uses) in 1996.

EPA's Control Technology Center, at (919) 541-0800, provides general assistance and information on CAA standards. The Stratospheric Ozone Information Hotline, at (800) 296-1996, provides general information about regulations promulgated under Title VI of the CAA, and EPA's EPCRA Hotline, at (800) 535-0202, answers questions about accidental release prevention under CAA §112(r). In addition, the Clean Air Technology Center's website includes recent CAA rules, EPA guidance documents, and updates of EPA activities (www.epa.gov/ttn then select Directory and then CATC).

V.B. Water Transportation Industry Specific Requirements

The water transportation industry is regulated by several different Federal, State, and local agencies. As noted earlier, several government entities regulate specific transportation sectors. The water transportation industry

is primarily regulated by the U.S. Coast Guard and EPA. In addition, there are several international treaties and conventions that also impose regulations on the water transportation sector.

Currently, the Coast Guard regulates all sea-going vessels and ensures they comply with U.S. law, as well as international treaties and conventions. The primary regulatory framework for vessels is contained in the MARPOL Convention. MARPOL is an international agreement designed to address the problem of marine pollution from vessels. It consists of five annexes, each of which addresses a different type of marine pollution:

- Annex I - This annex forbids the discharge at sea of oil in certain “special areas” and limits other discharges to 1/30,000 of the cargo. Discharge from machinery spaces (e.g., bilge water) must occur more than 12 miles from land and the oil content must be less than 100 ppm. In addition, Annex I requires that all parties to the convention ensure that adequate facilities are provided for the reception of residues and oily mixtures at marine facilities.
- Annex II - This annex contains regulations for discharges of noxious liquid substances (i.e., bulk liquid chemicals). To date, more than 250 substances have been evaluated and regulated. Such substances can only be discharged to reception facilities, unless certain requirements are met.
- Annex III - This annex requires the issuing of detailed standards on packaging, marking, labeling, documentation, stowage, quantity limitations, exceptions, and notifications for preventing or minimizing pollution by harmful substances.
- Annex IV - Annex IV states that vessels are not permitted to discharge sewage within 4 miles of the nearest land, unless they have an approved treatment plant. Between 4 and 12 miles from land, sewage must be comminuted and disinfected before discharge.
- Annex V - This annex establishes specific minimum distances for the disposal of garbage at sea. The most important component of this annex is the complete prohibition on the disposal of plastics into the sea.

These annexes are mandatory and all signatory nations, including the United States, are subject to them. The Coast Guard has published regulations imposing requirements implementing these annexes at 33 CFR Part 151.

While the Coast Guard basically regulates vessels and sea-related activities, EPA has responsibility for regulating the marine facilities. EPA has traditionally relied on delegation to States to meet environmental standards, in many cases without regard to the methods used to achieve certain performance standards. This has resulted in States with more stringent air, water, and hazardous waste requirements than the Federal minimum requirements. This document does not attempt to discuss State standards, but rather highlights relevant Federal laws and proposals that affect the water transportation industry.

It is important to remember there is no one specific definition or design for a marine facility. Each consists of various operations and will be subject to regulation based on those operations. The following discussion focuses on some of the regulatory programs that may be applicable to a marine facility.

V.B.1. Ocean Dumping Act

The basic purpose of the Ocean Dumping Act is to regulate intentional ocean disposal of materials. The act consists of the first two titles of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA). The act basically prohibits all ocean dumping, except that allowed by permits, in any ocean waters under U.S. jurisdiction, by any U.S. vessel, or by any vessel sailing from a U.S. port. The dumping of certain materials is exclusively banned, including radiological, chemical, and biological warfare agents, any high-level radioactive waste, medical wastes, sewage sludge, and industrial waste. Permits for dumping other materials may be obtained from EPA if EPA determines there is no unreasonable danger to human health or the environment.

Four federal agencies have authority under the Ocean Dumping Act: EPA, Corps of Engineers, NOAA, and the Coast Guard. EPA has primary authority for regulating ocean disposal of all substances except dredged spoils, which are under the authority of the Corps of Engineers.

Currently, all ocean disposal of wastes must occur at a site at least 106 miles offshore. Recently, the act was amended giving the states authority to adopt dumping standards that are more stringent than federal requirements and to require that permits conform with long-term management plans for designated dumpsites to ensure permitted activities are consistent with expected uses of the site. Permits issued under the Ocean Dumping Act specify:

- Type of material to be dumped
- Amount to be transported for dumping

- Location of the dumpsite
- Length of time the permit is valid
- Any special provisions for surveillance.

The act requires EPA to make binding the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters. This convention, which is signed by 80 countries, prohibits the dumping of mercury, cadmium, and other substances, such as DDT and PCBs, solid wastes and persistent plastics, oil, high-level radioactive wastes, and chemical and biological warfare agents. The convention also requires special permits for other heavy metals, cyanides and fluorides, and medium- and low-level radioactive wastes.

V.B.2. Clean Water Act

NPDES Requirements. Wastewater from marine facilities discharging to surface waters is regulated under the Federal Water Pollution Control Act (FWPCA). National Pollutant Discharge Elimination System (NPDES) permits must be obtained to discharge wastewater into navigable waters. In some cases, the individual facilities within a larger structure (e.g., within a port or under a port authority) may not have individual NPDES permits, but may discharge to a larger, portwide system that has a permit. As mandated by Section 304(m) of CWA, EPA develops effluent limitation guidelines for certain industrial wastewater discharges from operations. At this time, there are no specific effluent limitation guidelines established for marine operations, although other wastewater discharge restrictions may apply. For example, EPA is in the process of establishing effluent limitation guidelines for the transportation equipment cleaning sector, which will include operations such as ship painting or cleaning. The guidelines are scheduled to be proposed in 1996 and promulgated in 1998. (Contact: Gina Matthews or Jan Goodwin, Office of Water, 202-260-6036 and 202-260-7152, respectively).

Storm Water Requirements. As discussed under the general description of the Clean Water Act, EPA published storm water regulations on November 16, 1990, which require certain dischargers of storm water to waters of the U.S. to apply for NPDES permits. According to the final rule, facilities with a “storm water discharge associated with industrial activities” are required to apply for a storm water permit. The rule states that transportation facilities classified in SIC 44 that have vehicle maintenance shops or equipment cleaning operations are considered to have a storm water discharge associated with industrial activity. However, only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication) and equipment cleaning operations, or which are otherwise

identified under paragraphs (b)(14)(I)-(xi) of Section 122.26 are considered to be associated with industrial activity.

Facilities covered by this rule must submit one of the following permit applications:

- Individual permit application
- Group permit application. A group permit application can be filed by facilities with like operations and discharges.
- Notice of Intent for general permit coverage.

Storm water discharges associated with industrial activity that reach waters of the U.S. through municipal separate storm sewer systems are also required to obtain NPDES storm water permit coverage. Discharges of storm water to a combined sewer system or to a POTW are excluded.

SPCC. The CWA requires facilities to develop Spill Prevention, Control, and Countermeasure (SPCC) plans for petroleum products, such as oil or any substance that cause a sheen on water, if they are stored in large quantities at a particular site. The SPCC program requires reporting spills to navigable waters and the development of contingency plans that must be kept onsite. SPCC plans document the location of storage vessels, types of containment, dangers associated with a major release of material from the tanks, types of emergency equipment available at each site, and procedures for notifying the appropriate regulatory and emergency agencies. No SPCC plan is considered complete until it has been reviewed and certified by a Registered Professional Engineer.

V.B.3. Resource Conservation and Recovery Act

Water transportation facilities generate a variety of RCRA-regulated wastes in the course of normal operations and utilize underground storage tanks for fuel storage. Vessel refurbishing and maintenance operations generate hazardous wastes such as spent solvents and caustics, and paints and paint sludges. Additional common materials from marine facilities that may be hazardous include:

- Rechargeable nickel-cadmium batteries and lead-acid motor vehicle batteries
- Vehicle maintenance fluids
- Used oil

- Fluorescent light bulbs
- Scraps of metals (cadmium, chromium, lead, mercury, selenium, and silver) and materials containing these metals (e.g., high-grade stainless steel or paint waste)
- Waste solvents
- Near-empty paint cans and spray cans
- Paint stripping residue.

Note that petroleum products and petroleum-containing wastes (e.g., waste oil, contaminated fuel, or fuel spill clean-up wastes) are specifically exempted from RCRA regulations, unless they exhibit any of the hazardous waste characteristics. Many water transportation facilities qualify as hazardous waste generators under RCRA law. Under RCRA, it is the facility's responsibility to determine whether a waste is hazardous.

A full list of EPA hazardous wastes can be found at 40 CFR §162.31 - §162.33. RCRA listed wastes are subject to the hazardous waste regulations of 40 CFR Parts 124, 261 through 266, 270, 271, and 302.

Whether or not RCRA regulations apply to on-board vessel wastes has been a question debated among EPA, the Coast Guard, and industry for several years. Currently, on-board oily wastes, such as bilge water, and used oil are exempt from RCRA Subtitle C regulation, and vessels are not considered hazardous waste generators. The generators of this waste are considered to be those facilities that remove the wastes from the ships and manage it onshore.

V.B.4. Oil Pollution Act

The 1990 Oil Pollution Act (OPA) establishes strict, joint and several liability against facilities that discharge oil or which pose a substantial threat of discharging oil to navigable waterways. OPA imposes contingency planning and readiness requirements on certain facilities defined to include motor vehicles. These requirements affect water transportation establishments. Regulations covering response to oil discharges and contingency plans (40 CFR Part 300), and facility response plans to oil discharges (40 CFR Part 112) were revised and finalized in 1994.

V.B.5. Emergency Planning and Community Right-to-Know Act

CERCLA/EPCRA (SARA Title III) Reporting. CERCLA Section 103(a) requires any person in charge of a vessel or facility to immediately notify the National Response Center of a release of a hazardous substance if, in a 24-hour period, the release is of a quantity equal to or greater than the quantity specified in 30 CFR § 302.

Federally Permitted Release Exemption. CERCLA Section 103(a) exempts those persons in charge of vessels or facilities from reporting releases that are federally permitted.

Emergency Planning. Under EPCRA, marine facilities must notify authorities if they have onsite at any time a listed hazardous substance in an amount over the substance's threshold planning quantity.

Emergency Notification. Marine facilities must also notify authorities of leaks, spills, or other releases to the environment of certain hazardous substances above a designated "reportable quantity." These substances include extremely hazardous substances, as well as CERCLA hazardous substances. Many materials commonly used in the water transportation industry fall into this category of CERCLA hazardous substances, including solvents, ethylene glycol, methanol, methylene chloride, and 1,1,1-trichloroethane.

V.B.6. Clean Air Act

Air Quality Standards - Ozone Non-Attainment Areas. The most important pollutant affected by air quality standards is ozone. Most States regulate "major sources" of air emissions. A major source emits or has the potential to emit more than 100 tons per year of any pollutant or 10 tons per year of any hazardous pollutant. Large vessel maintenance facilities performing painting or using large amounts of solvents may exceed these limits. Emission rates are dependent on the types of chemicals and methods used and the types of air emission control equipment used. Some regulations apply to substances (e.g., solvent degreasers) regardless of the size of the source. These regulations are designed to reduce emissions from solvent evaporation.

Marine facilities located in ozone non-attainment areas may be subject to restrictions applicable to motor vehicles. These restrictions may affect the type and use of vehicles.

NESHAPs. National emission standards for hazardous air pollutants (NESHAP) attempt to control several hundred compounds, the most

notable being asbestos. All marine facilities must comply with the NESHAP requirements for asbestos when demolishing, or significantly remodeling, a building or vessel containing asbestos. Asbestos is commonly found in ceiling tile, floor tile, boiler room insulation, and sprayed-on insulation installed more than 20 years ago.

Final Rule for Marine Tank Vessel Loading Operations (40 CFR 63, Subpart Y). Under the authority of the Clean Air Act Amendments of 1990, EPA issued a final rule to reduce emissions of air toxics and volatile organic compounds that result from marine tank vessel loading operations. Under the rule, terminals with an annual marine bulk loading throughput greater than or equal to 10 million barrels per year of gasoline or 200 million barrels of crude oil are required to control emissions of VOCs and HAP resulting from the loading of gasoline or crude oil. These facilities are required to apply reasonably available control technology (RACT).

Facilities that are not subject to RACT but have annual HAP emissions exceeding 10 tons or more or 25 tons or more of aggregate HAP are required to control emissions of HAP. These facilities are subject to the national emission standard for hazardous air pollutants (NESHAP) and are required to apply maximum achievable control technology (MACT) (i.e., 95 percent emission limit).

Facilities controlling loading emissions under RACT or MACT using a combustion device are required to operate the device at 98 percent efficiency. Facilities controlling loading emissions under RACT using a recovery device are required to operate the device at 95 percent efficiency or, for gasoline vapors, reduce the control device outlet concentration to 1,000 parts per million or less. Vessels loading at an affected facility must pass one or two vapor tightness tests or be loaded at less than atmospheric pressure.

Specific monitoring, recordkeeping, and reporting requirements are also required under the regulations

New Source Performance Standards (NSPS). Some facilities subject to NSPS may be found at marine facilities, including industrial and utility boilers, vehicle maintenance facilities, and fuel storage and delivery facilities.

State Implementation Plans (SIPs). SIPs regulate stationary sources, such as buildings and other permanent installations, and mobile sources, such as automobiles. Typical marine facilities and activities that may be subject to stationary source regulations include heating and refrigeration plants; fueling systems; fuel storage facilities; maintenance facilities; roadways,

garages, and parking lots; landside development; building demolition; building construction; and capacity enhancing projects. SIPs may also control mobile sources such as fleet vehicles and other vehicles using the marine facility. Marine facilities handle significant traffic and are oftentimes parking areas for other vehicles. SIPs may have to limit motor vehicle emissions through “transportation control measures” (TCMs). TCMs are designed to reduce congestion and the number of vehicle miles traveled in a region. TCMs that affect marine facilities include improved public transit, measures to encourage uses of buses and other high occupancy vehicles, mandatory trip-reduction, and traffic flow improvements.

Ozone-Depleting Substances. The amended CAA is phasing out the production and restricting the use and distribution of ozone-depleting chemicals. EPA has established requirements for servicing and disposal of air conditioning and refrigeration equipment containing regulated ozone-depleting refrigerants. Certified, self-contained recovery equipment must be available during refrigeration equipment servicing. Additional recordkeeping and reporting requirements apply for appliance owners/operators and technicians. Facilities with refrigeration equipment containing ozone-depleting chemicals must comply with the provisions in 40 CFR Part 82.

V.B.7. Federal Insecticide, Fungicide, and Rodenticide Act

FIFRA regulations are applicable to water transportation facilities and operations where herbicides are used to control weeds and brush, insecticides are used to control insect populations, or when other pesticides are used for pest control in buildings. If using such pesticides, marine facility operators should ensure compliance with the label instructions. Certification is required for application of restricted use herbicides.

V.B.8. Hazardous Materials Transportation Act

The transport of hazardous materials is regulated by the DOT under the Hazardous Materials Transportation Act (HMTA). Materials covered by the Act include all RCRA listed wastes and some additional materials deemed by DOT to be dangerous to transport. The HMTA regulations (49 CFR Parts 174-177, and §§171.15 and 171.16) cover packaging, labeling, shipping papers, emergency planning, incident notifications, and liability insurance. Because there is some overlap between the DOT regulation under HMTA and EPA regulations under RCRA, DOT personnel have been active on the committee formed to look at manifesting of tank residues under RCRA.

V.B.9. Coastal Zone Management Act

The Coastal Zone Management Act of 1972 (CZMA) established a program for States and Territories to voluntarily develop comprehensive programs to protect and manage coastal resources (including the Great Lakes). There are 29 federally approved State and Territorial programs. Despite institutional differences, each program must protect and manage important coastal resources, including wetlands, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitats. Resource management and protection are accomplished in a number of ways through State laws, regulations, permits, and local plans and zoning ordinances.

While water quality protection is integral to the management of many of these coastal resources, it was not specifically cited as a purpose or policy of the original statute. The Coastal Zone Act Reauthorization Amendments of 1990 specifically charged State coastal programs, as well as State nonpoint source programs, with addressing nonpoint source pollution affecting coastal water quality.

V.B.10. OSHA Safety Rules

Worker safety is regulated by the Occupational Safety and Health Administration (OSHA) (29 CFR §1910.1028) at truck, rail and marine facilities. Safety rules specific to the management of hazardous materials deal with occupational exposure limits, personal protective equipment, materials handling procedures, safety training requirements, and confined space entry procedures.

V.C. Pending and Proposed Regulatory Requirements

V.C.1. Intermodal Surface Transportation Efficiency Act of 1991

The Clinton Administration recently submitted a proposal to reauthorize this act. Under the proposal, state and metropolitan transportation planning would consider the economic viability of the state or metropolitan area. It also addresses how to enhance the integration and connectivity of transportation across and between modes for people and freight. The proposal also provides that state transportation plans be developed in consultation with freight shippers as well as other interested parties.

V.C.2. Clean Water Act

Storm Water. EPA's five-year old baseline general permit for industrial storm water dischargers is set to expire on September 30, 1997, and may not be renewed. A case is being made to allow the baseline permit to expire and cover existing permittees under a modified Multi-Sector General Permit. EPA suggests that industries covered by the baseline permit should explore their options. Most State five-year industrial permits will expire along with the EPA Baseline General Permit on September 30, 1997. Most permits contain a provision stating that the expired permit remains effective and enforceable until replaced. However, the permits also contain a provision requiring permittees to submit a new Notice of Intent (NOI) prior to permit expiration to remain covered. Once a marine terminal is without a permit, it generally cannot reapply for coverage under the expired permit. Contact the permitting authority for more information.

Storm Water Phase II. The Phase II storm water permitting program is currently being developed by EPA and is intended to regulate many of the discharges not covered under the Phase I program. Such discharges include:

- Construction activities between 1 and 5 acres (unless it is part of a larger plan of development or sale)
- Discharges composed entirely of storm water.

Although the Phase II regulations have not yet been finalized, there is a requirement that dischargers covered under this phase must apply for permits within 6 years of the date (October 1, 1994) the Phase II regulations were intended to be finalized. The 6-year requirement still remains in effect. EPA also prioritized the discharges to determine a tiered approach to the Phase II permitting process. The following requirements currently apply to the Phase II program:

- Discharges identified by the permitting authority as contributing to a water quality impairment or are a significant contributor of pollutants will be notified of their requirement to apply for an NPDES storm water permit under Phase II
- The notified dischargers have 180 days to apply, unless a later date is approved
- Those dischargers not notified, but who fall under the requirements of the finalized regulations, must apply before October 1, 2000.

Effluent Limitation Guidelines. Presently, there are no effluent limitation guidelines specific to the water transportation industry. Effluent guidelines are currently being developed for the industry (tank interior cleaning only) by the Office of Water (Contact: Gina Matthews or Jan Goodwin, Office of Water, 202-260-6036 and 202-260-7152, respectively). These guidelines will apply to facilities that clean the interiors of tank trucks, rail tank cars, intermodal tank containers, intermediate bulk containers, ocean/sea tankers, and tank barges. EPA is under a court-ordered deadline to propose and promulgate wastewater effluent guidelines for the industry by the end of 1996 and 1998, respectively.

Regulating Discharges of Vessel Sewage. Section 312 of the Clean Water Act entitled Marine Sanitation Devices was established in the Federal Water Pollution Control Act of 1972 to regulate discharges of vessel sewage. A technical amendment to clarify the regulations implementing Section 312 is being developed by the Office of Water (Contact: Deb Lebow, Office of Water, (202) 260-6419). This amendment is expected to be promulgated in September 1997. This proposed regulatory amendment to 40 CFR Part 140.4(b) would clarify the information required in a State application requesting EPA to designate State-specified surface water as a drinking water intake zone, thereby making it unlawful for vessels to discharge sewage within that zone. This amendment would provide guidance to EPA Regions and States on the specific information necessary for the designation of a drinking water intake zone.

Shore Protection Act, Section 4103(b) Regulations. This rule will implement the Shore Protection Act (SPA) and is designed to prevent the deposit of municipal and commercial waste into U.S. Coastal Waters. This rule establishes minimum waste handling practices for vessels and waste handling facilities involved in the transport of municipal or commercial wastes in the coastal waters of the U.S. Certain vessels or facilities may be required to develop an operation and maintenance manual that identifies procedures to prevent, report, and clean up deposits of waste into coastal waters. (Contact: Deb Lebow, Office of Water, (202) 260-6419).

VI. COMPLIANCE AND ENFORCEMENT HISTORY

VI.A. Background

Until recently, EPA has focused much of its attention on measuring compliance with specific environmental statutes. This approach allows the Agency to track compliance with the Clean Air Act, the Resource Conservation and Recovery Act, the Clean Water Act, and other environmental statutes. Within the last several years, the Agency has begun to supplement single-media compliance indicators with facility-specific, multimedia indicators of compliance. In doing so, EPA is in a better position to track compliance with all statutes at the facility level, and within specific industrial sectors.

A major step in building the capacity to compile multimedia data for industrial sectors was the creation of EPA's Integrated Data for Enforcement Analysis (IDEA) system. IDEA has the capacity to "read into" the Agency's single-media databases, extract compliance records, and match the records to individual facilities. The IDEA system can match Air, Water, Waste, Toxics/Pesticides/EPCRA, TRI, and Enforcement Docket records for a given facility, and generate a list of historical permit, inspection, and enforcement activity. IDEA also has the capability to analyze data by geographic area and corporate holder. As the capacity to generate multimedia compliance data improves, EPA will make available more in-depth compliance and enforcement information. Additionally, sector-specific measures of success for compliance assistance efforts are under development.

VI.A.1. Compliance and Enforcement Profile Description

Using inspection, violation and enforcement data from the IDEA system, this section provides information regarding the historical compliance and enforcement activity of this sector. In order to mirror the facility universe reported in the Toxic Chemical Profile, the data reported within this section consists of records only from the TRI reporting universe. With this decision, the selection criteria are consistent across sectors with certain exceptions. For the sectors that do not normally report to the TRI program, data have been provided from EPA's Facility Indexing System (FINDS) which tracks facilities in all media databases. Please note, in this section, EPA does not attempt to define the actual number of facilities that fall within each sector. Instead, the section portrays the records of a subset of facilities within the sector that are well defined within EPA databases.

As a check on the relative size of the full sector universe, most notebooks contain an estimated number of facilities within the sector according to the

Bureau of Census (See Section II). With sectors dominated by small businesses, such as metal finishers and printers, the reporting universe within the EPA databases may be small in comparison to Census data. However, the group selected for inclusion in this data analysis section should be consistent with this sector's general make-up.

Following this introduction is a list defining each data column presented within this section. These values represent a retrospective summary of inspections and enforcement actions, and reflect solely EPA, State, and local compliance assurance activities that have been entered into EPA databases. To identify any changes in trends, the EPA ran two data queries, one for the past five calendar years (April 1, 1992 to March 31, 1997) and the other for the most recent twelve-month period (April 1, 1996 to March 31, 1997). The five-year analysis gives an average level of activity for that period for comparison to the more recent activity.

Because most inspections focus on single-media requirements, the data queries presented in this section are taken from single media databases. These databases do not provide data on whether inspections are state/local or EPA-led. However, the table breaking down the universe of violations does give the reader a crude measurement of the EPA's and states' efforts within each media program. The presented data illustrate the variations across EPA regions for certain sectors.¹ This variation may be attributable to state/local data entry variations, specific geographic concentrations, proximity to population centers, sensitive ecosystems, highly toxic chemicals used in production, or historical noncompliance. Hence, the exhibited data do not rank regional performance or necessarily reflect which regions may have the most compliance problems.

VI.A.2. Compliance and Enforcement Data Definitions

General Definitions

Facility Indexing System (FINDS) -- this system assigns a common facility number to EPA single-media permit records. The FINDS identification number allows EPA to compile and review all permit, compliance, enforcement and pollutant release data for any given regulated facility.

¹ EPA Regions include the following states: I (CT, MA, ME, RI, NH, VT); II (NJ, NY, PR, VI); III (DC, DE, MD, PA, VA, WV); IV (AL, FL, GA, KY, MS, NC, SC, TN); V (IL, IN, MI, MN, OH, WI); VI (AR, LA, NM, OK, TX); VII (IA, KS, MO, NE); VIII (CO, MT, ND, SD, UT, WY); IX (AZ, CA, HI, NV, Pacific Trust Territories); X (AK, ID, OR, WA).

Integrated Data for Enforcement Analysis (IDEA) -- is a data integration system that can retrieve information from the major EPA program office databases. IDEA uses the FINDS identification number to link separate data records from EPA's databases. This allows retrieval of records from across media or statutes for any given facility, thus creating a "master list" of records for that facility. Some of the data systems accessible through IDEA are: AIRS (Air Facility Indexing and Retrieval System, Office of Air and Radiation), PCS (Permit Compliance System, Office of Water), RCRIS (Resource Conservation and Recovery Information System, Office of Solid Waste), NCDB (National Compliance Data Base, Office of Prevention, Pesticides, and Toxic Substances), CERCLIS (Comprehensive Environmental and Liability Information System, Superfund), and TRIS (Toxic Release Inventory System). IDEA also contains information from outside sources such as Dun and Bradstreet and the Occupational Safety and Health Administration (OSHA). Most data queries displayed in notebook sections IV and VII were conducted using IDEA.

Data Table Column Heading Definitions

Facilities in Search -- are based on the universe of TRI reporters within the listed SIC code range. For industries not covered under TRI reporting requirements (metal mining, nonmetallic mineral mining, electric power generation, ground transportation, water transportation, and dry cleaning), or industries in which only a very small fraction of facilities report to TRI (e.g., printing), the notebook uses the FINDS universe for executing data queries. The SIC code range selected for each search is defined by each notebook's selected SIC code coverage described in Section II.

Facilities Inspected -- indicates the level of EPA and state agency inspections for the facilities in this data search. These values show what percentage of the facility universe is inspected in a one-year or five-year period.

Number of Inspections -- measures the total number of inspections conducted in this sector. An inspection event is counted each time it is entered into a single media database.

Average Time Between Inspections -- provides an average length of time, expressed in months, between compliance inspections at a facility within the defined universe.

Facilities with One or More Enforcement Actions -- expresses the number of facilities that were the subject of at least one enforcement action within the defined time period. This category is broken down further into

federal and state actions. Data are obtained for administrative, civil/judicial, and criminal enforcement actions. Administrative actions include Notices of Violation (NOVs). A facility with multiple enforcement actions is only counted once in this column, e.g., a facility with 3 enforcement actions counts as 1 facility.

Total Enforcement Actions -- describes the total number of enforcement actions identified for an industrial sector across all environmental statutes. A facility with multiple enforcement actions is counted multiple times, e.g., a facility with 3 enforcement actions counts as 3.

State Lead Actions -- shows what percentage of the total enforcement actions are taken by state and local environmental agencies. Varying levels of use by states of EPA data systems may limit the volume of actions recorded as state enforcement activity. Some states extensively report enforcement activities into EPA data systems, while other states may use their own data systems.

Federal Lead Actions -- shows what percentage of the total enforcement actions are taken by the United States Environmental Protection Agency. This value includes referrals from state agencies. Many of these actions result from coordinated or joint state/federal efforts.

Enforcement to Inspection Rate -- is a ratio of enforcement actions to inspections, and is presented for comparative purposes only. This ratio is a rough indicator of the relationship between inspections and enforcement. It relates the number of enforcement actions and the number of inspections that occurred within the one-year or five-year period. This ratio includes the inspections and enforcement actions reported under the Clean Water Act (CWA), the Clean Air Act (CAA) and the Resource Conservation and Recovery Act (RCRA). Inspections and actions from the TSCA/FIFRA/EPCRA database are not factored into this ratio because most of the actions taken under these programs are not the result of facility inspections. Also, this ratio does not account for enforcement actions arising from non-inspection compliance monitoring activities (e.g., self-reported water discharges) that can result in enforcement action within the CAA, CWA, and RCRA.

Facilities with One or More Violations Identified -- indicates the percentage of inspected facilities having a violation identified in one of the following data categories: In Violation or Significant Violation Status (CAA); Reportable Noncompliance, Current Year Noncompliance, Significant Noncompliance (CWA); Noncompliance and Significant Noncompliance (FIFRA, TSCA, and EPCRA); Unresolved Violation and Unresolved High Priority Violation (RCRA). The values presented for this

column reflect the extent of noncompliance within the measured time frame, but do not distinguish between the severity of the noncompliance. Violation status may be a precursor to an enforcement action, but does not necessarily indicate that an enforcement action will occur.

Media Breakdown of Enforcement Actions and Inspections -- four columns identify the proportion of total inspections and enforcement actions within EPA Air, Water, Waste, and TSCA/FIFRA/EPCRA databases. Each column is a percentage of either the "Total Inspections," or the "Total Actions" column.

VI.B. Water Transportation Industry Compliance History

This section examines the historical enforcement and compliance data on the water transportation sector. As noted earlier, these data were obtained from EPA's IDEA system. The exhibits within this section provide both a 5-year and a 1-year review of the data from the sector and also provide data from other sectors for comparison purposes. It should be noted that the data are accessed in the IDEA database system through SIC codes. Therefore, these numbers represent the combined total for all the SIC codes presented in Section II of this notebook.

Exhibit 10 provides an overview of the reported compliance and enforcement data for the water transportation sector over the past 5 years (March 7, 1992 - March 6, 1997) by EPA region. As shown, there were 514 facilities identified through IDEA with water transportation SIC codes. Of these, 37 percent (192) were inspected in the last 5 years. Other points of interest include:

- Over the 5 years, 816 inspections were conducted at those 192 facilities. On average, each facility was inspected about 4 times over the course of the 5 years. Approximately 60 percent of these inspections were led by the states.
- The 816 inspections resulted in 36 facilities having enforcement actions taken against them. At those 36 facilities, there were a total of 70 enforcement actions, meaning each facility averaged nearly 2 enforcement actions over the past 5 years.

Exhibit 10. Five-Year Enforcement and Compliance Summary for the Water Transportation Industry

A	B	C	D	E	F	G	H	I	J
Region	Facilities in Search	Facilities Inspected	Number of Inspections	Average Months Between Inspections	Facilities with 1 or More Enforcement Actions	Total Enforcement Actions	Percent State Lead Actions	Percent Federal Lead Actions	Enforcement to Inspection Rate
I	26	2	8	195	1	1	100%	0%	0.13
II	51	12	201	15	5	20	45%	55%	0.10
III	54	12	61	53	1	1	100%	0%	0.02
IV	77	47	167	28	6	9	100%	0%	0.05
V	51	35	153	20	2	4	75%	25%	0.03
VI	94	34	118	48	14	22	73%	27%	0.19
VII	15	10	24	38	1	1	0%	100%	0.04
VIII	3	2	2	90	0	0	0%	0%	--
IX	9	6	22	25	0	0	0%	0%	--
X	134	32	60	134	6	12	33%	67%	0.20
TOTAL	514	192	816	38	36	70	61%	39%	0.09

- The average enforcement-to-inspection rate is 0.09. This average rate means that for every 10 inspections conducted, there is approximately 1 resulting enforcement action taken. Across the regions, this rate ranged from 0.02 to 0.2.

VI.B.1. Comparison of Enforcement Activity Between Selected Industries

Exhibits 11 and 12 provide both the 5-year and 1-year enforcement and compliance data for all the industries covered by the sector notebooks. These data allow the reader to compare the enforcement and compliance history of the sectors and identify trends across sectors and over the past 5 years. Overall, the water transportation sector had the sixth (out of 29) fewest number of facilities inspected (192), compared to all the other sectors over the past 5 years. It also had the fewest number of inspections (816) over that same period. Other points of interest from the 5-year comparison include:

- This sector was third lowest among all sectors regarding facilities with 1 or more enforcement actions. The lowest was shipbuilding and repair.
- The total number of enforcement actions was the third lowest among all sectors, following shipbuilding and repair and dry cleaning.
- The enforcement-to-inspection rate over the past 5 years is 0.09; the average for all sectors for the same period is 0.08.

In Exhibit 12, when compared to all sectors over the last year, the water transportation sector had the third fewest number of facilities inspected (84) and the fewest number of inspections (141). The enforcement-to-inspection rate was 0.08; the average for all sectors was 0.06.

Exhibits 13 and 14 provide a more in-depth comparison between the water transportation sector and others by organizing inspection and enforcement data by environmental statute. Exhibit 13 provides inspection and enforcement data from the past 5 years, while Exhibit 14 provides data for the past year only.

As shown, over the past 5 years, inspections and enforcement actions have been divided fairly equally among the CAA, CWA, and RCRA. The numbers from the 1-year summary are consistent with those from the 5-year summary. It should be noted that although no inspections were conducted under the FIFRA/TSCA/EPCRA/Other category, it did account for 9 percent of all enforcement actions.

Exhibit 11. Five-Year Enforcement and Compliance Summary for Selected Industries

A	B	C	D	E	F	G	H	I	J
Industry Sector	Facilities in Search	Facilities Inspected	Number of Inspections	Average Months Between Inspections	Facilities with 1 or More Enforcement Actions	Total Enforcement Actions	Percent State Lead Actions	Percent Federal Lead Actions	Enforcement to Inspection Rate
Metal Mining	1,232	378	1,600	46	63	111	53%	47%	0.07
Coal Mining	3,256	741	3,748	52	88	132	89%	11%	0.04
Oil and Gas Extraction	4,676	1,902	6,071	46	149	309	79%	21%	0.05
Non-Metallic Mineral Mining	5,256	2,803	12,826	25	385	622	77%	23%	0.05
Textiles	355	267	1,465	15	53	83	90%	10%	0.06
Lumber and Wood	712	473	2,767	15	134	265	70%	30%	0.10
Furniture	499	386	2,379	13	65	91	81%	19%	0.04
Pulp and Paper	484	430	4,630	6	150	478	80%	20%	0.10
Printing	5,862	2,092	7,691	46	238	428	88%	12%	0.06
Inorganic Chemicals	441	286	3,087	9	89	235	74%	26%	0.08
Resins and Manmade Fibers	329	263	2,430	8	93	219	76%	24%	0.09
Pharmaceuticals	164	129	1,201	8	35	122	80%	20%	0.10
Organic Chemicals	425	355	4,294	6	153	468	65%	35%	0.11
Agricultural Chemicals	263	164	1,293	12	47	102	74%	26%	0.08
Petroleum Refining	156	148	3,081	3	124	763	68%	32%	0.25
Rubber and Plastic	1,818	981	4,383	25	178	276	82%	18%	0.06
Stone, Clay, Glass and Concrete	615	388	3,474	11	97	277	75%	25%	0.08
Iron and Steel	349	275	4,476	5	121	305	71%	29%	0.07
Metal Castings	669	424	2,535	16	113	191	71%	29%	0.08
Nonferrous Metals	203	161	1,640	7	68	174	78%	22%	0.11
Fabricated Metal Products	2,906	1,858	7,914	22	365	600	75%	25%	0.08
Electronics	1,250	863	4,500	17	150	251	80%	20%	0.06
Automobile Assembly	1,260	927	5,912	13	253	413	82%	18%	0.07
Shipbuilding and Repair	44	37	872	3	21	38	84%	16%	0.04
Ground Transportation	7,786	3,263	12,904	36	375	774	84%	16%	0.06
Water Transportation	514	192	816	38	36	70	61%	39%	0.09
Air Transportation	444	231	973	27	48	97	88%	12%	0.10
Fossil Fuel Electric Power	3,270	2,166	14,210	14	403	789	76%	24%	0.06
Dry Cleaning	6,063	2,360	3,813	95	55	66	95%	5%	0.02

Exhibit 12. One-Year Enforcement and Compliance Summary for Selected Industries

A Industry Sector	B Facilities in Search	C Facilities Inspected	D Number of Inspections	E Facilities with 1 or More Violations		F Facilities with 1 or more Enforcement Actions		G Total Enforcement Actions	H Enforcement to Inspection Rate
				Number	Percent*	Number	Percent*		
Metal Mining	1,232	142	211	102	0.48	9	4%	10	0.05
Coal Mining	3,256	362	765	90	12%	20	3%	22	0.03
Oil and Gas Extraction	4,676	874	1,173	127	11%	26	2%	34	0.03
Non-Metallic Mineral Mining	5,256	1,481	2,451	384	16%	73	3%	91	0.04
Textiles	355	172	295	96	33%	10	3%	12	0.04
Lumber and Wood	712	279	507	192	38%	44	9%	52	0.10
Furniture	499	254	459	136	30%	9	2%	11	0.02
Pulp and Paper	484	317	788	248	31%	43	5%	74	0.09
Printing	5,862	892	1,363	577	42%	28	2%	53	0.04
Inorganic Chemicals	441	200	548	155	28%	19	3%	31	0.06
Resins and Manmade Fibers	329	173	419	152	36%	26	6%	36	0.09
Pharmaceuticals	164	80	209	84	40%	8	4%	14	0.07
Organic Chemicals	425	259	837	243	29%	42	5%	56	0.07
Agricultural Chemicals	263	105	206	102	50%	5	2%	11	0.05
Petroleum Refining	156	132	565	129	23%	58	10%	132	0.23
Rubber and Plastic	1,818	466	791	389	49%	33	4%	41	0.05
Stone, Clay, Glass and Concrete	615	255	678	151	22%	19	3%	27	0.04
Iron and Steel	349	197	866	174	20%	22	3%	34	0.04
Metal Castings	669	234	433	240	55%	24	6%	26	0.06
Nonferrous Metals	203	108	310	98	32%	17	5%	28	0.09
Fabricated Metal	2,906	849	1,377	796	58%	63	5%	83	0.06
Electronics	1,250	420	780	402	52%	27	3%	43	0.06
Automobile Assembly	1,260	507	1,058	431	41%	35	3%	47	0.04
Shipbuilding and Repair	44	22	172	20	12%	3	2%	4	0.02
Ground Transportation	7,786	1,585	2,499	681	27%	85	3%	103	0.04
Water Transportation	514	84	141	53	38%	10	7%	11	0.08
Air Transportation	444	96	151	69	46%	8	5%	12	0.08
Fossil Fuel Electric Power	3,270	1,318	2,430	804	33%	100	4%	135	0.06
Dry Cleaning	6,063	1,234	1,436	314	22%	12	1%	16	0.01

Exhibit 13. Five-Year Inspection and Enforcement Summary by Statute for Selected Industries

Industry Sector	Facilities Inspected	Total Inspections	Total Enforcement Actions	Clean Air Act		Clean Water Act		RCRA		FIFRA/TSCA/EPCRA/Other	
				% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions
Metal Mining	378	1,600	111	39%	19%	52%	52%	8%	8%	1%	17%
Coal Mining	741	3,748	132	57%	64%	38%	28%	4%	4%	1%	1%
Oil and Gas Extraction	1,902	6,071	309	75%	65%	16%	14%	8%	8%	0%	3%
Non-Metallic Mineral Mining	2,803	12,826	622	83%	81%	14%	13%	3%	3%	0%	3%
Textiles	267	1,465	83	58%	54%	22%	25%	18%	14%	2%	6%
Lumber and Wood	473	2,767	265	49%	47%	6%	6%	44%	31%	1%	16%
Furniture	386	2,379	91	62%	42%	3%	0%	34%	43%	1%	14%
Pulp and Paper	430	4,630	478	51%	59%	32%	28%	15%	10%	2%	4%
Printing	2,092	7,691	428	60%	64%	5%	3%	35%	29%	1%	4%
Inorganic Chemicals	286	3,087	235	38%	44%	27%	21%	34%	30%	1%	5%
Resins and Manmade Fibers	263	2,430	219	35%	43%	23%	28%	38%	23%	4%	6%
Pharmaceuticals	129	1,201	122	35%	49%	15%	25%	45%	20%	5%	5%
Organic Chemicals	355	4,294	468	37%	42%	16%	25%	44%	28%	4%	6%
Agricultural Chemicals	164	1,293	102	43%	39%	24%	20%	28%	30%	5%	11%
Petroleum Refining	148	3,081	763	42%	59%	20%	13%	36%	21%	2%	7%
Rubber and Plastic	981	4,383	276	51%	44%	12%	11%	35%	34%	2%	11%
Stone, Clay, Glass and Concrete	388	3,474	277	56%	57%	13%	9%	31%	30%	1%	4%
Iron and Steel	275	4,476	305	45%	35%	26%	26%	28%	31%	1%	8%
Metal Castings	424	2,535	191	55%	44%	11%	10%	32%	31%	2%	14%
Nonferrous Metals	161	1,640	174	48%	43%	18%	17%	33%	31%	1%	10%
Fabricated Metal	1,858	7,914	600	40%	33%	12%	11%	45%	43%	2%	13%
Electronics	863	4,500	251	38%	32%	13%	11%	47%	50%	2%	7%
Automobile Assembly	927	5,912	413	47%	39%	8%	9%	43%	43%	2%	9%
Shipbuilding and Repair	37	872	38	78%	29%	9%	26%	12%	39%	1%	5%
Ground Transportation	3,263	12,904	774	59%	41%	12%	11%	29%	45%	1%	3%
Water Transportation	192	816	70	39%	29%	23%	34%	37%	33%	1%	4%
Air Transportation	231	973	97	25%	32%	27%	20%	48%	48%	0%	0%
Fossil Fuel Electric Power	2,166	14,210	789	57%	59%	32%	26%	11%	10%	1%	5%
Dry Cleaning	2,360	3,813	66	56%	23%	3%	6%	41%	71%	0%	0%

Exhibit 14. One-Year Inspection and Enforcement Summary by Statute for Selected Industries

Industry Sector	Facilities Inspected	Total Inspections	Total Enforcement Actions	Clean Air Act		Clean Water Act		RCRA		FIFRA/TSCA/EPCRA/Other	
				% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions
Metal Mining	142	211	10	52%	0%	40%	40%	8%	30%	0%	30%
Coal Mining	362	765	22	56%	82%	40%	14%	4%	5%	0%	0%
Oil and Gas Extraction	874	1,173	34	82%	68%	10%	9%	9%	24%	0%	0%
Non-Metallic Mineral Mining	1,481	2,451	91	87%	89%	10%	9%	3%	2%	0%	0%
Textiles	172	295	12	66%	75%	17%	17%	17%	8%	0%	0%
Lumber and Wood	279	507	52	51%	30%	6%	5%	44%	25%	0%	40%
Furniture	254	459	11	66%	45%	2%	0%	32%	45%	0%	9%
Pulp and Paper	317	788	74	54%	73%	32%	19%	14%	7%	0%	1%
Printing	892	1,363	53	63%	77%	4%	0%	33%	23%	0%	0%
Inorganic Chemicals	200	548	31	35%	59%	26%	9%	39%	25%	0%	6%
Resins and Manmade Fibers	173	419	36	38%	51%	24%	38%	38%	5%	0%	5%
Pharmaceuticals	80	209	14	43%	71%	11%	14%	45%	14%	0%	0%
Organic Chemicals	259	837	56	40%	54%	13%	13%	47%	34%	0%	0%
Agricultural Chemicals	105	206	11	48%	55%	22%	0%	30%	36%	0%	9%
Petroleum Refining	132	565	132	49%	67%	17%	8%	34%	15%	0%	10%
Rubber and Plastic	466	791	41	55%	64%	10%	13%	35%	23%	0%	0%
Stone, Clay, Glass and Concrete	255	678	27	62%	63%	10%	7%	28%	30%	0%	0%
Iron and Steel	197	866	34	52%	47%	23%	29%	26%	24%	0%	0%
Metal Castings	234	433	26	60%	58%	10%	8%	30%	35%	0%	0%
Nonferrous Metals	108	310	28	44%	43%	15%	20%	41%	30%	0%	7%
Fabricated Metal	849	1,377	83	46%	41%	11%	2%	43%	57%	0%	0%
Electronics	420	780	43	44%	37%	14%	5%	43%	53%	0%	5%
Automobile Assembly	507	1,058	47	53%	47%	7%	6%	41%	47%	0%	0%
Shipbuilding and Repair	22	172	4	83%	0%	6%	50%	12%	50%	0%	0%
Ground Transportation	1,585	2,499	103	64%	46%	11%	10%	26%	44%	0%	1%
Water Transportation	84	141	11	38%	9%	24%	36%	38%	45%	0%	9%
Air Transportation	96	151	12	28%	33%	15%	42%	57%	25%	0%	0%
Fossil Fuel/Electric Power	1,318	2,430	135	59%	73%	32%	21%	9%	5%	0%	0%
Dry Cleaning	1,234	1,436	16	69%	56%	1%	6%	30%	38%	0%	0%