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September 1995

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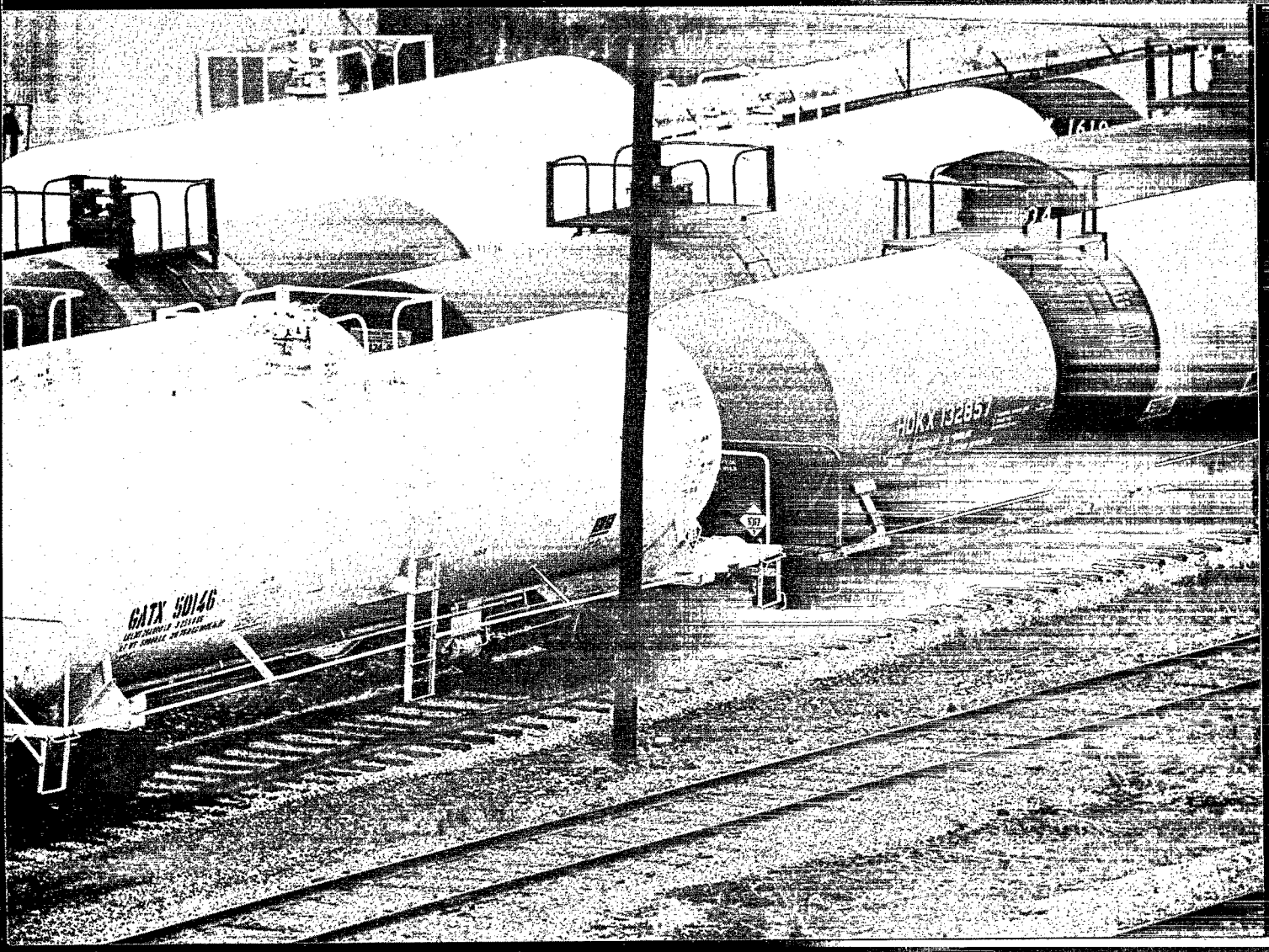
Profile Of The Transportation Equipment Cleaning Industry



EPA Office Of Compliance Sector Notebook Project

SECTOR
EPA
NOTEBOOKS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE ADMINISTRATOR

Message from the Administrator

Over the past 25 years, our nation has made tremendous progress in protecting public health and our environment while promoting economic prosperity. Businesses as large as iron and steel plants and businesses as small as the dry cleaner on the corner have worked with EPA to find ways to operate cleaner, cheaper, and smarter. As a result, we no longer have rivers catching on fire. Our skies are clearer. American environmental technology and expertise are in demand throughout the world.

The Clinton Administration recognizes that to continue this progress, we must move beyond the pollutant-by-pollutant approaches of the past to comprehensive, facility-wide approaches for the future. Industry by industry and community by community, we must build a new generation of environmental protection.

Within the past two years, the Environmental Protection Agency undertook its Sector Notebook Project to compile, for a number of key industries, information about environmental problems and solutions, case studies and tips about complying with regulations. We called on industry leaders, state regulators, and EPA staff with many years of experience in these industries and with their unique environmental issues. Together with notebooks for 17 other industries, the notebook you hold in your hand is the result.

These notebooks will help business managers to better understand their regulatory requirements, learn more about how others in their industry have undertaken regulatory compliance and the innovative methods some have found to prevent pollution in the first instance. These notebooks will give useful information to state regulatory agencies moving toward industry-based programs. Across EPA we will use this manual to better integrate our programs and improve our compliance assistance efforts.

I encourage you to use this notebook to evaluate and improve the way that together we achieve our important environmental protection goals. I am confident that these notebooks will help us to move forward in ensuring that -- in industry after industry, community after community -- environmental protection and economic prosperity go hand in hand.

Carol M. Browner

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EPA Office of Compliance Sector Notebook Project

Profile of the Transportation Equipment Cleaning Industry

September 1995

Office of Compliance
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
401 M St., SW (MC 2221-A)
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This report is one in a series of volumes published by the U.S. Environmental Protection Agency (EPA) to provide information of general interest regarding environmental issues associated with specific industrial sectors. The documents were developed under contract by Abt Associates (Cambridge, MA), and Booz-Allen & Hamilton, Inc. (McLean, VA). This publication may be **purchased** from the Superintendent of Documents, U.S. Government Printing Office. A listing of available Sector Notebooks and document numbers are included on the following page.

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Complimentary volumes are available to certain groups or subscribers, such as public and academic libraries, Federal, State, local, and foreign governments, and the media. For further information, and for answers to questions pertaining to these documents, please refer to the contact names and numbers provided within this volume.

Electronic versions of all Sector Notebooks are available on the EPA Enviroene Bulletin Board and via the internet on the Enviroene World Wide Web. Downloading procedures are described in Appendix A of this document.

Cover photograph by Steve Delaney, EPA.

September 1995

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EPA/310-R-95-008.	Metal Mining Industry	Keith Brown	564-7124
EPA/310-R-95-009.	Motor Vehicle Assembly Industry	Suzanne Childress	564-7018
EPA/310-R-95-010.	Nonferrous Metals Industry	Jane Engert	564-5021
EPA/310-R-95-011.	Non-Fuel, Non-Metal Mining Ind.	Keith Brown	564-7124
EPA/310-R-95-012.	Organic Chemical Industry	Walter DeRieux	564-7067
EPA/310-R-95-013.	Petroleum Refining Industry	Tom Ripp	564-7003
EPA/310-R-95-014.	Printing Industry	Ginger Gotliffe	564-7072
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EPA/310-R-95-016.	Rubber and Plastic Industry	Maria Malave	564-7027
EPA/310-R-95-017.	Stone, Clay, Glass and Concrete Ind.	Scott Throwe	564-7013
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* A Federal Facilities Profile is under development and will be completed later in 1995. (Contact: Sarah Walsh, 202-260-6118)

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List of Acronyms

AFS -	AIRS Facility Subsystem (CAA database)
AIRS -	Aerometric Information Retrieval System (CAA database)
BIFs -	Boilers and Industrial Furnaces (RCRA)
BOD -	Biochemical Oxygen Demand
CAA -	Clean Air Act
CAAA -	Clean Air Act Amendments of 1990
CERCLA -	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS -	CERCLA Information System
CFCs -	Chlorofluorocarbons
CO -	Carbon Monoxide
COD -	Chemical Oxygen Demand
CSI -	Common Sense Initiative
CWA -	Clean Water Act
D&B -	Dun and Bradstreet Marketing Index
ELP -	Environmental Leadership Program
EPA -	United States Environmental Protection Agency
EPCRA -	Emergency Planning and Community Right-to-Know Act
FIFRA -	Federal Insecticide, Fungicide, and Rodenticide Act
FINDS -	Facility Indexing System
HAPs -	Hazardous Air Pollutants (CAA)
HSDB -	Hazardous Substances Data Bank
IDEA -	Integrated Data for Enforcement Analysis
LDR -	Land Disposal Restrictions (RCRA)
LEPCs -	Local Emergency Planning Committees
MACT -	Maximum Achievable Control Technology (CAA)
MCLGs -	Maximum Contaminant Level Goals
MCLs -	Maximum Contaminant Levels
MEK -	Methyl Ethyl Ketone
MSDSs -	Material Safety Data Sheets
NAAQS -	National Ambient Air Quality Standards (CAA)
NAFTA -	North American Free Trade Agreement
NCDB -	National Compliance Database (for TSCA, FIFRA, EPCRA)
NCP -	National Oil and Hazardous Substances Pollution Contingency Plan
NEIC -	National Enforcement Investigation Center
NESHAP -	National Emission Standards for Hazardous Air Pollutants
NO_2 -	Nitrogen Dioxide
NOV -	Notice of Violation

NO_X -	Nitrogen Oxide
NPDES -	National Pollution Discharge Elimination System (CWA)
NPL -	National Priorities List
NRC -	National Response Center
NSPS -	New Source Performance Standards (CAA)
OAR -	Office of Air and Radiation
OECA -	Office of Enforcement and Compliance Assurance
OPA -	Oil Pollution Act
OPPTS -	Office of Prevention, Pesticides, and Toxic Substances
OSHA -	Occupational Safety and Health Administration
OSW -	Office of Solid Waste
OSWER -	Office of Solid Waste and Emergency Response
OW -	Office of Water
P2 -	Pollution Prevention
PCS -	Permit Compliance System (CWA Database)
POTW -	Publicly Owned Treatments Works
RCRA -	Resource Conservation and Recovery Act
RCRIS -	RCRA Information System
SARA -	Superfund Amendments and Reauthorization Act
SDWA -	Safe Drinking Water Act
SEPs -	Supplementary Environmental Projects
SERCs -	State Emergency Response Commissions
SIC -	Standard Industrial Classification
SO_2 -	Sulfur Dioxide
SO_x -	Sulfur Oxides
TOC -	Total Organic Carbon
TRI -	Toxic Release Inventory
TRIS -	Toxic Release Inventory System
TCRIS -	Toxic Chemical Release Inventory System
TECI -	Transportation Equipment Cleaning Industry
TSCA -	Toxic Substances Control Act
TSS -	Total Suspended Solids
UIC -	Underground Injection Control (SDWA)
UST -	Underground Storage Tanks (RCRA)
VOCs -	Volatile Organic Compounds

I. INTRODUCTION TO THE SECTOR NOTEBOOK PROJECT

I.A. Summary of the Sector Notebook Project

Environmental policies based upon comprehensive analysis of air, water and land pollution (such as economic sector, and community-based approaches) are becoming an important supplement to traditional single-media approaches to environmental protection. Environmental regulatory agencies are beginning to embrace comprehensive, multi-statute solutions to facility permitting, compliance assurance, education/outreach, research, and regulatory development issues. The central concepts driving the new policy direction are that pollutant releases to each environmental medium (air, water and land) affect each other, and that environmental strategies must actively identify and address these inter-relationships by designing policies for the "whole" facility. One way to achieve a whole facility focus is to design environmental policies for similar industrial facilities. By doing so, environmental concerns that are common to the manufacturing of similar products can be addressed in a comprehensive manner. The desire to move forward with this "sector-based" approach within the EPA Office of Compliance led to the creation of this document.

The Sector Notebook Project was initiated by the Office of Compliance to provide its staff and managers with summary information for eighteen specific industrial sectors. As other EPA offices, states, the regulated community, and the public became interested in this project, the Office of Compliance expanded the scope of the original project. The ability to design comprehensive, common sense environmental protection measures for specific industries is dependent on knowledge of several inter-related topics. For the purposes of this project, the key elements chosen for inclusion are: general industry information (economic and geographic); a description of industrial processes; pollution outputs; pollution prevention opportunities; Federal statutory and regulatory framework; compliance history; and a description of partnerships that have been formed between regulatory agencies, the regulated community and the public.

For any given industry, each topic listed above could alone be the subject of a lengthy volume. However, in order to produce a manageable document, this project focuses on providing summary information for each topic. This format provides the reader with a synopsis of each issue, and references where more in-depth information is desired. Text within each profile was researched from a variety of sources, and was usually condensed from more detailed sources pertaining to specific topics. This approach allows for a wide coverage of activities that can be further explored based upon the references listed at the end of this profile. As a check on the information included, each notebook went through an external document review process.

The Office of Compliance appreciates the efforts of all those that participated in this process and enabled us to develop more complete, accurate and up-to-date summaries. Many of those who reviewed this notebook are listed as contacts in Section IX and may be sources of additional information. The individuals and groups on this list do not necessarily concur with all statements within this notebook.

I.B. Additional Information

Providing Comments

The Office of Compliance plans to periodically review and update notebooks and will make these updates available both in hard copy and electronically. If you have any comments on the existing notebook, or if you would like to provide additional information, please send a hard copy and computer disk to the EPA Office of Compliance, Sector Notebook Project, 401 M St., SW (2223-A), Washington, DC 20460. Comments can also be uploaded to the Enviroene Bulletin Board or the Enviroene World Wide Web for general access to all users of the system. Follow instructions in Appendix A for accessing these data systems. Once you have logged in, procedures for uploading text are available from the on-line Enviroene Help System.

Adapting Notebooks to Particular Needs

The scope of the existing notebooks reflect an approximation of the relative national occurrence of facility types that occur within each sector. In many instances, industries within specific geographic regions or states may have unique characteristics that are not fully captured in these profiles. For this reason, the Office of Compliance encourages state and local environmental agencies and other groups to supplement or re-package the information included in this notebook to include more specific industrial and regulatory information that may be available. Additionally, interested states may want to supplement the "Summary of Applicable Federal Statutes and Regulations" section with state and local requirements. Compliance or technical assistance providers may also want to develop the "Pollution Prevention" section in more detail. Please contact the appropriate specialist listed on the opening page of this notebook if your office is interested in assisting us in the further development of the information or policies addressed within this volume.

If you are interested in assisting in the development of new notebooks for sectors not covered in the original eighteen, please contact the Office of Compliance at 202-564-2395.

II. INTRODUCTION TO THE TRANSPORTATION EQUIPMENT CLEANING INDUSTRY

This section provides background information on the size, geographic distribution, employment, production, sales, and economic condition of the transportation equipment cleaning industry. The type of facilities described within most of the notebooks are also described in terms of their Standard Industrial Classification (SIC) codes. The transportation equipment cleaning sector, however, is not classified under the SIC system and therefore, does not have a designated SIC code number.

The Office of Water (OW) currently has the most extensive amount of data on tank interior cleaning. OW has done over 35 site visits and has performed wastewater sampling at 18 TEC facilities. The site visit reports are available and sampling data are available for all but four facilities. OW has also administered a screener questionnaire (3,240 potential TEC facilities) and a detailed questionnaire to the industry. The detailed questionnaire was mailed in April 1995 to 275 facilities. At the time that this document went to print, results were being received and entered into a database for analysis by EPA. Information is being collected on the following: TEC operations, cargos cleaned out of the tanks and containers, cleaning solutions used, types and sizes of tanks and containers cleaned, wastewater treatment technologies employed by the facility, wastewater sampling data, pollution prevention activities, water conservation activities, air emissions data and air emissions controls, solid waste and heels generation and disposal, and revenues, assets, liabilities, operating and maintenance costs, and employees. All of the data from these two questionnaires will be used to develop survey weights from which to determine the total population characteristics for tank cleaning facilities in the U.S.

II.A. Introduction, Background, and Scope of the Notebook

Because there are no SIC codes that apply only to transportation equipment cleaning, the use of SIC codes to identify the characteristics of these facilities is not possible. A large number of industries with many different SIC codes carry out transportation equipment cleaning activities. For example, transportation equipment cleaning facilities can be located within the petroleum refining industry (SIC 2911) and the marine cargo handling sector of the transportation industry (SIC 4491). Although facilities within both industries clean transportation equipment, the petroleum refining industry predominantly refines crude oil to petroleum products and the marine cargo handling industry by SIC code predominantly loads and unloads cargo from ships and barges. Furthermore, trade associations are also unable to adequately characterize the industry. Facilities providing transportation equipment cleaning services usually provide numerous other services all of which are of concern to the trade associations, and those associations that

represent transportation equipment cleaners do not exclusively represent these facilities.

II.B. Characterization of the Transportation Equipment Cleaning Industry

II.B.1. Product Characterization

The transportation industry moves people and materials between predetermined points using four principal transportation modes: truck, train, vessel, and airplane. Almost all materials and goods in the U.S. are distributed by one of these four modes. Pipelines for crude oil and refined petroleum products are one significant exception. Delivery to pipelines and local distribution from pipelines, however, is by truck, train or vessel. The majority of domestic cargo is bulk freight transported in tank trucks, rail tank cars, and ocean/sea tankers. It is estimated that over 700 different commodities are transported in this manner throughout the U.S., including: petroleum products, coal, organic chemicals, inorganic chemicals, compressed gases, fertilizers, pesticides, food products, paints, inks, glues, and soaps. The transportation equipment cleaning industry (TECI) is a service industry for the cleaning of the interiors of trucks, rail cars, and barges, intermodal tank containers, and intermediate tank containers, and the exterior of aircraft. An important segment of this industry, in terms of wastes generated, deals with the cleaning of tank interiors. In the past, the deicing of aircraft and runways has also been regarded by EPA as part of the transportation equipment cleaning industry. It is important to note that the industry as it is described above, and throughout this notebook, is not meant to reflect the industry as it is defined in a transportation equipment cleaning rule being developed by the Office of Water.

Most truck, barge and ship tanks are in dedicated service (i.e., carries one commodity only), however, a significant number are non-dedicated and must be cleaned after every trip to prevent contamination of materials from one cargo to the next. A recent incident underscoring the importance of proper tank cleaning resulted in over 400 cases of salmonella poisoning. Tank trucks carrying raw eggs were not adequately cleaned before carrying ice cream mix which was subsequently made into ice cream without additional pasteurization. Truck, barge and ship tanks also must be cleaned prior to inspections and repairs. Almost all rail tank cars are in dedicated service and, therefore, are only cleaned prior to inspection, repairs and refurbishing. Rail car refurbishing operations, in part, involve the disassembly and cleaning of parts using a number of different cleaning methods prior to reassembly. Aircraft exteriors are cleaned for a variety of reasons including: aesthetics; as part of a routine inspection and maintenance program; and to facilitate repairs. Aircraft deicing is conducted to remove ice from aircraft wings and other areas that may adversely affect the operation of the aircraft.

intermodal tank containers and intermediate bulk containers (IBCs) or "totes" are transportable containers that can be transferred between trucks, barges, ships and rail cars. They are used to transport liquid, solid or gaseous materials. Intermodal tank containers typically hold between 6,000 - 9,000 gallons and are considerably larger than IBCs which are typically between 500 and 800 gallons.

Between 1973 and 1974 a study was conducted by EPA's Industrial Environmental Research Laboratory assessing the environmental impact of air emissions and water pollutants from cleaning rail tank cars, tank trucks, and drums. This initial study found air emissions and wastewater discharges from these operations to be relatively low. Therefore, no regulations were proposed for tank and drum cleaning facilities at that time. A preliminary study conducted in 1985 by EPA's Office of Water examined the wastewater generated by the transportation equipment cleaning industry (which did not include aircraft deicing) to determine whether regulations should be developed for the industry pursuant to the Clean Water Act. As a result of the study, EPA decided to develop effluent guidelines (wastewater regulations) for the TECI. As part of the consent decree with NRDC in January 1992, EPA is under a court-ordered deadline, however, to propose and promulgate effluent guidelines for the industry's wastewater (including aircraft deicing) by the end of 1996 and 1998, respectively. The Office of Water is currently collecting more extensive and up-to-date industry data, through mandatory surveys (CWA §308), site visits to facilities, and sampling, which will be used as a basis for developing the effluent limitations guidelines. Effluent limitation guidelines for aircraft cleaning and deicing will be developed separately, after additional studies specific to aircraft deicing can be conducted.

For the development of the TECI effluent guidelines, in 1993, EPA Office of Water administered about 3,240 screener questionnaires to potential tank interior cleaning facilities. The results of this screener questionnaire and the development of the survey weights will be used to estimate the number and types of facilities in the scope of the industry. From the screener questionnaire, approximately 740 TECI facilities were identified. Some preliminary results, before the development of the survey weights, are presented below. It is important to note that this data may change significantly depending on the survey weights used. In addition to the screener questionnaire, EPA has sent out approximately 300 detailed questionnaires to obtain information relating to transportation equipment cleaning activities, wastewater treatment technology efficiencies, wastewater treatment technology costs, and various financial and economic data.

Based on the 1993 screener questionnaire, EPA estimates that about 2,729 facilities providing tank interior cleaning services will be affected by the

wastewater effluent guidelines. Transportation equipment cleaning facilities are often part of much larger manufacturing, maintenance, depot, or terminal facilities. For this reason economic and pollutant release data specific to transportation equipment cleaning operations is not readily available.

II.B.2. Industry Size and Geographic Distribution

Based on the results of 3,240 EPA screener questionnaires sent out to potential transportation tank interior cleaning facilities, initial estimates of the total number of facilities actually conducting tank interior cleaning activities is approximately 2,729 (before scale-up analysis based on survey weights) (Exhibit 1). The number of aircraft exterior cleaning and/or deicing facilities has not yet been determined. Aircraft cleaning and deicing facilities are expected to approximate the number of commercial airports in the U.S. because almost all airports conduct cleaning and/or deicing activities.

Exhibit 1: Number and Size of Facilities with Tank Cleaning Services

Type of Tank	Number of Facilities
Truck, Land[1]	1,841
Rail, Intermodal Tank Carrier, Intermediate Bulk Container	809
Barge	49
Land-Water[2]	16
Tanker, Water[3]	14
Combination Facilities	162
Total	2,891

Source: Based on U.S. EPA Office of Water, Engineering Analysis Division, screener questionnaire data before scale-up, 1994.

[1] Land facilities are those that clean any combination of the following equipment: tank trucks, rail tank cars, intermediate bulk containers, intermodal tank containers.
[2] Land-water facilities are those that clean a combination of the following types of equipment with no one type of equipment predominating: tank trucks, rail tank cars, intermediate bulk containers, intermodal tank carriers, tank barges, and ocean sea tankers.
[3] Water facilities are those that perform cleaning of both tank barges and ocean/sea tankers with neither type of equipment predominating.

The characteristics of transportation equipment cleaning facilities differ significantly among the various modes of transportation and the forms of ownership. There are four types of facility ownership: independent owner/operators, carriers, builders/leasers, and shippers.

Independent Owner/Operators

Independent owner/operators make up about 33 percent of transportation equipment cleaning (not including aircraft cleaning/deicing) facilities. Independent owner/operators are typically "for-hire" facilities which provide services to any users for a fee. Such facilities are found in all modes of transportation, however, they are most common in the trucking sector of the industry and least common in the aircraft cleaning and deicing sector. Independently owned and operated facilities are much more likely to be dedicated to only tank cleaning than carrier, shipper, and builder/leaser owned facilities which usually provide other services (i.e., depots, repairs, maintenance, fuel, etc.) to their users.

Carrier Owned Facilities

Carrier facilities make up about 27 percent of transportation equipment cleaning facilities. Such facilities are owned and operated by transporting companies and provide services to their own vehicles. Carrier operated facilities are usually located at shipping and receiving terminals and provide maintenance and repair services as well as tank cleaning. Many carrier facilities also operate as "for-hire" facilities to outside transporters. Carrier owned facilities are found in all transportation modes and are the most common form of ownership for rail tank car and tank truck cleaning facilities. In the aircraft sector, cleaning and deicing is almost exclusively carried out by the carrier companies.

Shipper Owned Facilities

Shipper facilities make up about 20 percent of transportation equipment cleaning facilities and are owned by large manufacturing companies (i.e., petroleum and chemical companies) that ship their own or other companies' products and clean and repair their own equipment. Shipper operated facilities are typically located at the manufacturer's shipping and receiving terminals. The facilities provide maintenance and repair services as well as tank cleaning. Some shipper facilities also operate as "for-hire" facilities to outside transporters. Shipper owned facilities are found in the rail, and barges sectors, however, they are most common in the trucking sector.

Builder/Leaser Owned Facilities

Builder/leaser facilities are owned by those transportation equipment manufacturers (i.e., rail car manufacturers and leasers, barge manufacturers and leasers, etc.) and leasing companies that also provide repairs and cleaning services for the equipment that they sell or lease. Such facilities make up about six percent of transportation equipment cleaning facilities. Some builder/leaser facilities also operate as "for-hire" facilities to outside transporters. Equipment cleaning services provided by builders/leasers are usually part of an inspection, maintenance and repair facility. Builder/leaser tank cleaning facilities are found in the barges and trucks sectors, however, they are most common in the rail transport sector. Another 14 percent of transportation equipment cleaning facilities are combinations of two or more of the four types ownership described above.

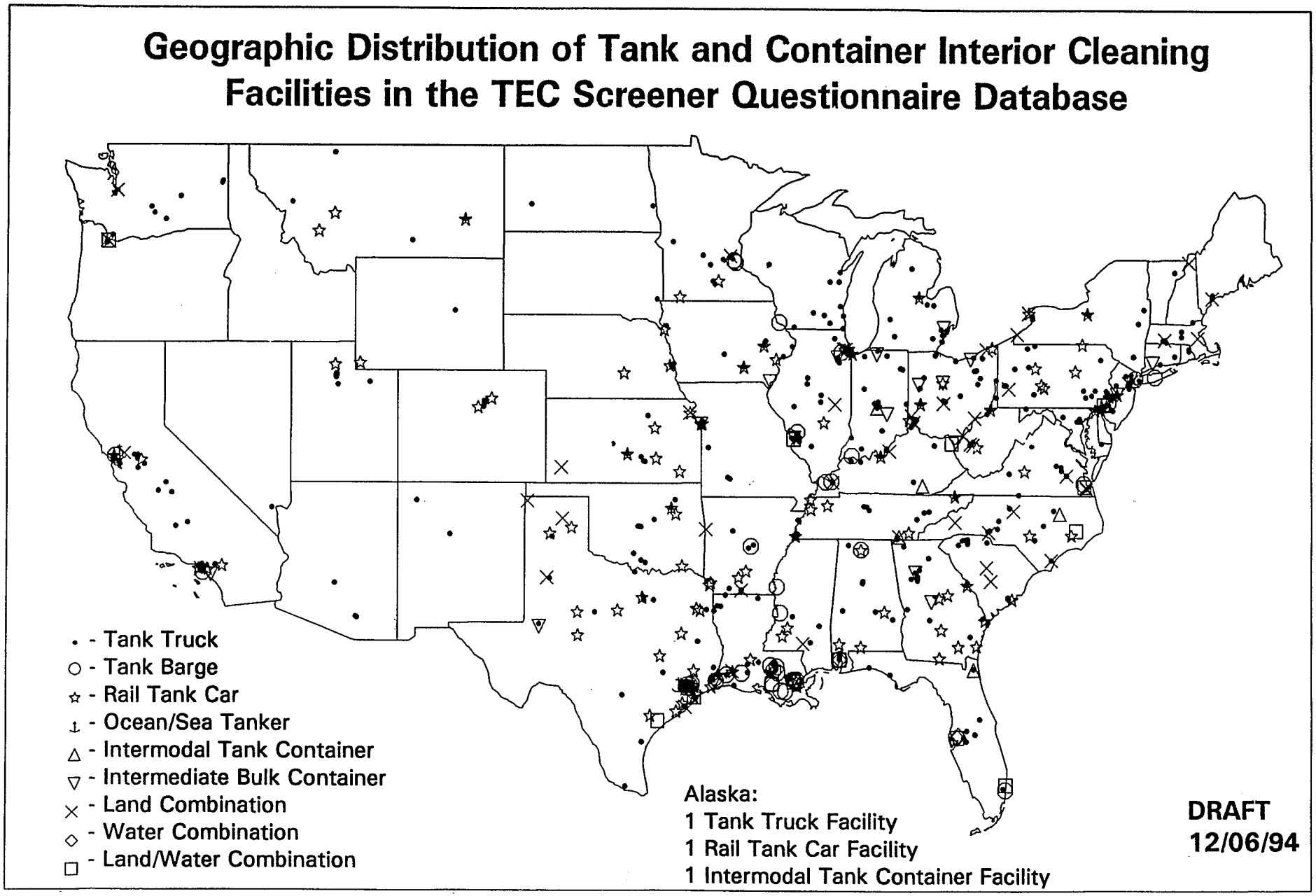
The distribution of transportation equipment cleaning facilities across the U.S. varies depending on the mode of transportation. Tank truck cleaning facilities are concentrated in five major petrochemical and manufacturing regions, and population centers of the U.S.: 1) California; 2) the Texas-Louisiana Gulf coast; 3) the Mississippi, Missouri, and Ohio Rivers; 4) Southern Lake Michigan, Lake Erie, and Lake Huron; and 5) eastern Pennsylvania and New Jersey. Rail tank cleaning facilities are located primarily in the industrialized central, south central and eastern regions of the U.S. Tank barge cleaners are located predominantly along the Gulf Coast and along the Mississippi River and its tributaries (Exhibit 2). Aircraft cleaning and deicing operations are carried out at most airports and, therefore, follow population distributions closely with deicing facilities more common and used more frequently in the northern regions (Exhibit 2).

Exhibit 2. Primary Location of Facilities Cleaning Tanks and Deicing Aircraft

Tank Type	Primary Areas of Operation
Tank Truck	California; Texas-Louisiana Gulf coast; Mississippi, Missouri, and Ohio Rivers; Southern Lake Michigan, Lake Erie, and Lake Huron; eastern Pennsylvania and New Jersey
Rail Tank Car	Industrialized central, south central and eastern regions
Barge/Tanker	Gulf Coast and along the Mississippi River and its tributaries
Aircraft Cleaning/Deicing	Follows population distributions with deicing facilities more common in the northern regions

Source: U.S. EPA Office of Water, Engineering Analysis Division, 1994.

Exhibit 3: Geographic Distribution of Tank and Interior Cleaning Facilities in the TEC Screener Questionnaire Database



II.B.3 Economic Trends

The economic health of the transportation equipment cleaning industry is highly dependent on the health of the industries it serves. The railroads, trucking, and water transportation sectors are expected to have modest growth in the next few years as the economy continues to grow. The North American Free Trade Agreement (NAFTA) is also expected to have a positive impact on the industry by increasing international freight traffic, especially between the U.S. and Mexico.

III. INDUSTRIAL PROCESS DESCRIPTION

This section describes the major industrial processes within the transportation equipment cleaning industry, including the materials and equipment used, and the processes employed. The section is designed for those interested in gaining a general understanding of the industry, and for those interested in the inter-relationship between the industrial process and the topics described in subsequent sections of this profile -- pollutant outputs, pollution prevention opportunities, and Federal regulations. This section does not attempt to replicate published engineering information that is available for this industry. Refer to Section IX for a list of reference documents that are available.

This section specifically contains a description of commonly used production processes, associated raw materials, the byproducts produced or released, and the materials either recycled or transferred off-site. This discussion, coupled with schematic drawings of the identified processes, provide a concise description of where wastes may be produced in the process. This section also describes the potential fate (via air, water, and soil pathways) of these waste products.

III.A. Industrial Processes in the Transportation Equipment Cleaning Industry

Tank trucks, rail tank cars, barges, tankers, IBCs, and intermodal tank containers all differ significantly in volume (Exhibit 4). In addition, the configuration, mean distances traveled, and types of materials transported vary among the various container types. Therefore, the volumes of water used, the types of wastes generated, and the cleaning time can vary widely depending on the mode of transport. The basic steps of the tank cleaning process, however, do not vary substantially regardless of the transportation mode or type of container. The process used can differ significantly depending on the residues to be cleaned and the extent to which a tank needs to be cleaned prior to reuse. Exterior cleaning of rail cars and aircraft cleaning and deicing differ considerably from tank cleaning in both method and wastes generated and are described separately below. Pollutant outputs from each of the processes is described in Section III.C.

Exhibit 4: Tank Volumes Vary Significantly	
Type of Tank	**Typical Volume in Gallons**
Tank Truck	3,500-8,000
Rail Tank Car	20,000-30,000
Barge	420,000-1,470,000
Ocean/Sea Tanker	3-147 million
Intermodal Tank Container	2,500-10,000
Intermediate Bulk Container	500-800
Source: American Waterways Operators Fact Sheet, 1994, and U.S. EPA Office of Water, Engineering Analysis Division.	

III.A.1. Tank Interior Cleaning

Most tank cleaning facilities will handle all types of tank residues. Some facilities, however, will not accept certain residues (i.e., highly odorous residues or materials not compatible with the on-site wastewater treatment system), and others will only accept certain types of tank residues (i.e., petroleum products or food grade products). Regardless of the type of tank or last cargo transported, the following tank cleaning procedures are typically carried out at tank cleaning facilities.

- shipping papers are checked to identify the cargo last carried;
- next cargo is determined, if possible;
- residual cargo heel is removed and segregated for off-site disposal;
- tank is rinsed;
- tank is washed;
- tank is rinsed; and
- tank is dried.

Identification of the last cargo carried is necessary to determine the appropriate level of health protection for those employees cleaning the tank and to determine the appropriate cleaning method and materials. In addition, it is important to understand the characteristics of the wastewater that will be generated in order to determine the appropriate treatment or disposal method.

Determination of the next cargo to be transported is useful for deciding the level of cleaning that is needed. Certain cargos, such as foods and highly pure chemicals, will require a much cleaner container than most cargos.

Before beginning the rinsing and washing of the tank, any residual cargo, or heel, must be removed and segregated. Heels can be removed using the vehicle's own cargo transfer piping, pumps supplied by the cleaning facility, or manually. Heel volumes vary significantly between modes of transport (Exhibit 5). In barges and ships, volumes can be relatively large and their removal, called "stripping," is often carried out using a built-in vessel stripping system. Stripping of heels from barges and ships can be facilitated by pumping ballast water into some of the tank compartments to tilt the vessel.

Washing, rinsing and drying methods vary depending on the facility's equipment, the last cargo carried, and the next cargo to be carried. Some cargos may require only a water rinse, and other cargoes may require a series of washing and rinsing cycles using different wash solutions. Washing solution may consist of: detergent solution, caustic solution, organic solvents, or steam. Tanks can be rinsed with hot or cold water, and drying can be passive or with forced air.

Washing is performed either manually with hand held sprayers, or automatically with high pressure spinner nozzles or "butterworths." Any wash solution can be used with either method, however, worker safety is a concern when manually spraying solvent and caustic wash solutions. High pressure spinner nozzles are inserted through the main tank hatch, and wash solution and rinse water is automatically sprayed onto the tank surface at 100-600 psi while rotating around vertical and horizontal axes. Some facilities have the capability to recycle washing solutions within a closed system and periodically change to fresh wash solution. Wastewater is then either treated in the facility wastewater treatment system, discharged to a publicly-owned treatment works (POTW) via a sewer system, discharged directly to surface waters, or piped to an underground injection well. Hazardous wastewater is disposed of off-site or treated separately on-site.

III.A.2 Rail Car Refurbishing and Maintenance

The processes used to clean rail car (tank and freight) interiors and exteriors prior to repairs and refurbishing, and to clean certain parts during repairs and refurbishing, are significantly different from those used to clean tank interiors. At a typical rail car refurbishing or maintenance facility, the initial cleaning of the cars involves two steps: a mechanical cleaning and water wash. Both steps remove dirt and other residues prior to removal of the damaged parts and systems to be replaced. Mechanical cleaning consists of

the physical shaking and vibrating of the rail cars to loosen dirt and debris. Dirt and debris may fall through a steel grate in the floor and are intermittently collected for disposal. The wash step consists of a high pressure water cleaning, collection of wastewater, and treatment at an on-site wastewater treatment facility. Refurbishing operations usually start with paint removal using a steel grit blast system or other methods. The paint chips and grit are typically collected through a steel grate in the floor and the mixture is conveyed to a cyclone and filter system for separation of reusable grit and paint. Next, the cars are disassembled and wheel sets and air brakes are rebuilt. Axles from wheel sets that can be reused are first washed in a caustic solution to remove grease and dirt. External debris is removed from the air brakes using a grit or bead blast system or other methods. The brakes are then disassembled and cleaned with solvents or caustic solutions. Finally, the cars are reassembled and repainted using spray guns. Maintenance and repair operations consist of disassembly, cleaning, and repair; or the disassembly and replacement, of damaged parts. Parts cleaning may include the removal of paints, cleaning with solvents or caustics, and repainting.

III.A.3. Aircraft Cleaning and Deicing

Aircraft cleaning is carried out using hand held spray nozzles, hoses and brushes. Exterior cleaning typically consists of washing with detergent solutions and a water rinse. For large aircraft, wet cleaning is usually limited to wheel wells and landing gear and is conducted to facilitate inspections. It is more economical to dry polish aircraft fuselages rather than wash them with water and cleaning solutions. Aircraft deicing is carried out at the gate area and occasionally additional deicer is applied just prior to take-off while the aircraft is on the runway. Airport runways and gate areas are also sprayed with deicer to prevent the build-up of ice and snow. Deicers are usually one, or a mixture of two or more, of: ethylene glycol, urea, potassium acetate, and sand (for runway deicing only). Some airports are using or planning remote deicing areas away from the gate areas. Remote deicing areas facilitate collection to deicing fluids for reuse, recycling, and treatment. Deicing is almost exclusively performed using hand held nozzles and hoses. However, automatic deicer spray machines, called "deicing gantries," have been developed in recent years. Deicing gantries are large structures holding numerous spray nozzles which pass over the aircraft spraying deicer. The deicing gantries are computer controlled and, depending on the type of aircraft, spray specific amounts of deicer over particular areas with very little wasted material.

III.B. Raw Material Inputs and Pollution Outputs

III.B.1. Tank Cleaning

The primary pollutant output of tank cleaning operations is wastewater contaminated with tank residues and cleaning solutions. More specifically, outputs include: spent cleaning fluids, fugitive volatile organic compound (VOC) emissions, water treatment system sludges, and tank residues. The quantities of these outputs will vary widely from facility to facility depending on the mode of transport, types of cargoes, and cleaning methods. For example, an independent owner/operator tank truck cleaning facility serving a large number of different users will generate a much greater volume of wastewater containing many more different contaminants, than a shipper operated facility serving fewer trucks all carrying the same cargo.

Tank Heels

Tank heels volumes vary substantially depending on the size and configuration of the tank, and on the nature of the last cargo carried (Exhibit 5). Disposal and treatment of tank heels can pose a problem for tank cleaning facilities. Tank heels of hazardous waste greater than 0.3 percent by weight of the tank capacity continue to be regulated by RCRA after the discharge of the waste at a TSDF. Under these regulations, the use of solvents (including water) could be viewed as treatment, and therefore, may not be allowed to remove these heels. Under such conditions, the only means available to remove the heels may be manually (e.g., scooping, shoveling, scraping) A facility's wastewater treatment system may be adversely affected by, and may not adequately treat, a slug of concentrated tank residue. In addition, the heel material may be inconsistent with the facility's wastewater discharge permit. Water soluble heels that are compatible with the facility's treatment system and the conditions of its wastewater discharge permit are sometimes combined with other wastewaters for treatment and disposal. Incompatible heels are typically segregated and, depending on the volumes generated at the facility and the value of product, the heel can be either sold back to a reclaimer or shipped off-site for disposal. The resale of tank heels is more common at facilities that generate large volumes of a small number of products, as is often the case at tank barge cleaning facilities. Heels that are comprised of detergents, solvents, acids, or alkalis can be stored on-site and used as a tank cleaning fluid or to neutralize other tank heels.

Exhibit 5: Tank Heel and Wastewater Volumes		
Type of Tank	Typical Heel Volume (gallons/tank)	Estimated Average Wastewater Generated (gallons/tank)
Tank Truck	5-10	500-1,000
Rail Tank Car	10-30	3,000-5,000
Tank Barge	5-500	10,000-12,000

Source: EPA Office of Water and *Preliminary Data Summary for the Transportation Equipment Cleaning Industry*, U.S. EPA, 1989 and EPA Office of Water, Engineering Analysis Division, 1995.

Wastewater

The primary source of wastewater from equipment cleaning facilities is from the cleaning of tank interiors. Relatively small amounts of wastewater are generated from exterior washing of vehicles. Wastewater volumes and characteristics vary depending on the last cargo transported, the cleaning solution used, the tank size, and the presence of caked, solidified, or crystallized residues. The volumes of wastewater generated per tank cleaning will vary substantially depending on the cleaning solution, the residues present and the degree of cleanliness needed. For example, the cleaning of a tank coated with a viscous, water insoluble residue will require more washing and rinsing time than a tank that last carried a water soluble material. In addition, washing with a detergent solution will, in general, generate more wastewater than a steam wash (Exhibit 5).

Washing and rinsing wastewater compatible with facility treatment systems or discharge permits is pumped or drained from the tank or recycling system to wastewater storage tanks. Cleaning solutions that are not compatible with the treatment systems or discharge permits, such as solvent washing solutions, are stored in drums for off-site disposal.

Information on the types and extent of wastewater treatment at transportation equipment cleaning facilities is limited. EPA's Office of Water has information on wastewater treatment at 700 facilities. Each wastewater treatment plant is designed for certain types of wastewater and to meet the requirements of a downstream treatment works and/or a National Pollutant Discharge Elimination System (NPDES) permit. Approximately 90 percent of transportation equipment cleaning facilities discharge wastewater to POTWs or combined treatment works (privately owned by multiple facilities) after some amount of treatment. Some facilities discharge directly to surface

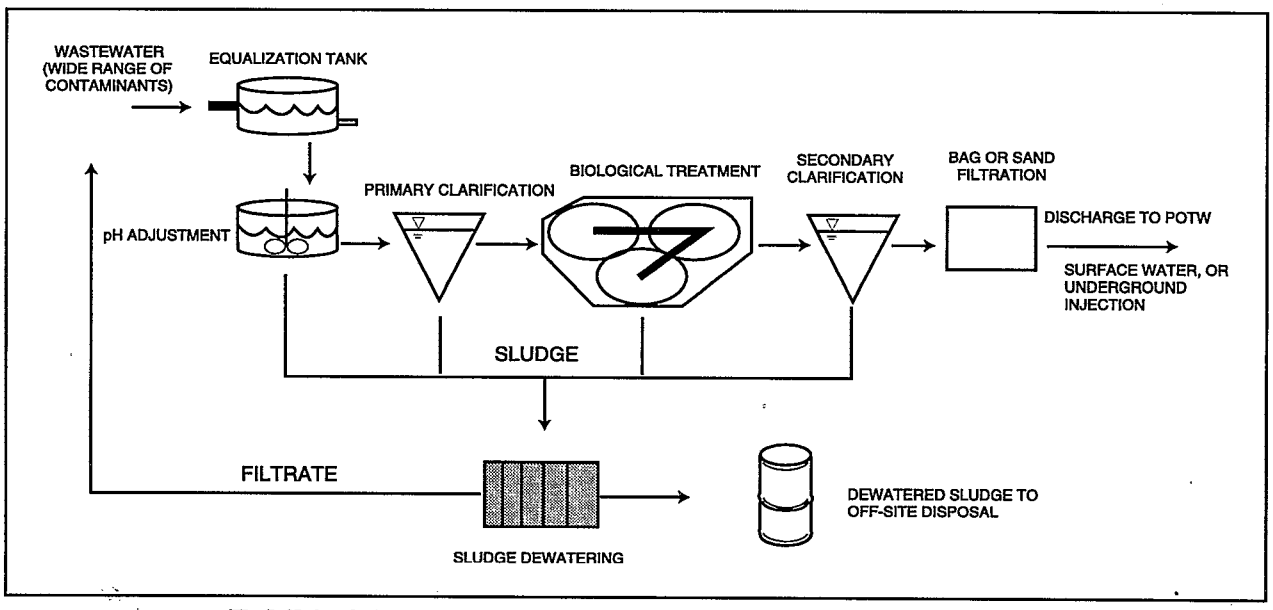


Exhibit 6: Typical Wastewater Treatment System Treating A Wide Range of Contaminants

waters under NPDES permits or to underground injection wells under Safe Drinking Water Act Permits. Wastewater treatment, therefore, ranges from no treatment to a simple settling tank for removal of suspended solids and oil and grease, to elaborate treatment systems to remove biological oxygen demand, and metals. Most facilities rely on physical-chemical treatment methods rather than biological treatment, however, biological treatment methods are becoming more and more common. Wastewater treatment systems that treat a wide range of contaminants will, in general, be more complex. A typical system could consist of pH adjustment, an equalization or aerated equalization tank, primary clarification, activated sludge, secondary clarification, and bag or sand filtration. Sludges are dewatered and shipped off-site for disposal (Exhibit 6). Typical wastewater treatment for facilities that primarily treat oily wastes may consist of a holding or equalization tank, gravitational oil water separation, bag or sand filtration, and coalescing filtration. Sludges are then removed from the equalization tank, oil-water separator, and bag or sand filters; and disposed of off-site (Exhibit 7). To reduce the volume of hazardous waste generated, some facilities dewater sludges in a sludge press prior to disposal off-site. The water generated is typically recycled back to the equalization tank. In addition, some facilities with very stringent local limits have such advanced treatment as carbon absorption with steam or air stripping for removal of organic chemicals.

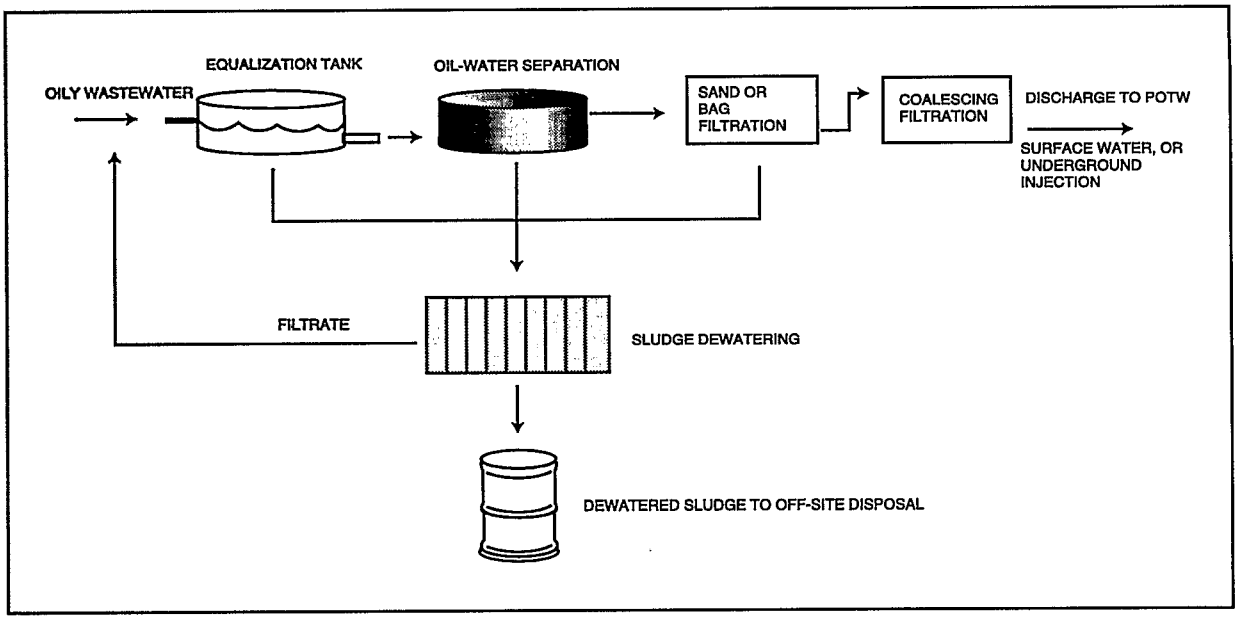


Exhibit 7: Typical Oily Wastewater Treatment System

Air Emissions

Air emissions from transportation equipment cleaning facilities arise from fugitive emissions through tank hatches of VOCs from the tank heels and residues, from solvent cleaning solutions, and from wastewater treatment facility tanks. Closed, recycled washing systems for tank trucks, tank cars, and barges, have very low air emissions. Emissions of VOCs are higher in the case of manual cleaning methods. The specific VOCs emitted will depend on the cargo last carried and the cleaning solution used. A source assessment study for rail tank car, tank truck and drum cleaning conducted in 1973 and 1974 by the U.S. EPA Industrial Environmental Research Laboratory found that air emissions from rail car and tank truck cleaning are relatively low.

Residual Waste

Residual wastes are generated as sludges from residues removed from the inside of tanks and from wastewater treatment systems. Sludges are typically drummed and shipped off-site as hazardous wastes. Sludge from a primary clarifier at a truck tank cleaning facility was analyzed for the 1989 preliminary study of transportation equipment cleaning facilities. The sludge was found to be RCRA hazardous due to high concentrations of organic compounds and metals.

III.B.2. Rail Car Refurbishing and Maintenance

Pollutant outputs from the rail car refurbishing and maintenance sector are generally in the form of wastewater from preliminary cleaning of interiors and exteriors and hazardous wastes generated from painting, paint removal, and cleaning of parts. Typical hazardous wastes generated include: spent solvents and solvent sludges from solvent cleaning operations; spent caustics and caustic sludges from caustic washing operations; paint chips; and paint sludges (Exhibit 8). VOC air emissions are also generated during the use of solvents and paints. Wastewater from preliminary cleaning of the rail cars and spent caustic solution is treated in an on-site wastewater treatment system and then discharged to a POTW. Hazardous wastes are typically drummed and shipped off-site as RCRA hazardous waste. Spent solvents, however, can be sent off-site for reclaiming.

Exhibit 8: Hazardous Wastes from Rail Car Refurbishing and Maintenance Operations

Typical Process/ Operation	Typical Materials Used	Types of Waste Generated
Oil and grease removal	Degreasers, carburetor cleaners, engine cleaners, varsol, solvents, acids/alkalies	ignitable wastes, spent solvents, combustible solids, waste acid/alkaline solutions
Engine, parts and equipment cleaning	Degreasers, carburetor cleaners, engine cleaners, solvents, acids/alkalies, cleaning fluids	ignitable wastes, spent solvents, combustible solids, waste acid/alkaline solutions
Rust removal	naval jelly, strong acids, strong alkalies	waste acids, waste alkalies
Paint preparation	paint thinners, enamel reducers, white spirits	spent solvents, ignitable wastes, ignitable paint wastes, paint wastes with heavy metals
Painting	enamels, lacquers, epoxys, alkyds, acrylics, primers	ignitable paint wastes, spent solvents, paint wastes with heavy metals, ignitable wastes
Spray booth, spray guns, and brush cleaning	paint thinners, enamel reducers, solvents, white spirits	ignitable paint wastes, heavy metal paint wastes, spent solvents
Paint removal	solvents, paint thinners, enamel reducers, white spirits	ignitable paint wastes, heavy metal paint wastes, spent solvents

Source: U.S. EPA Office of Solid Waste, 1993.

III.B.3. Aircraft Cleaning and Deicing

The primary pollutant output from aircraft cleaning and deicing is wastewater from the cleaning of aircraft exteriors and spent deicer from deicing operations. Wastewater from cleaning operations usually drains to catch basins and is mixed with other airport wastewater and treated in an on-site treatment facility. Water use in cleaning is estimated to be approximately 2,000 gallons per aircraft. Analysis of wash water from one cleaning operation showed only a few organic pollutants at relatively low levels and high concentrations of metals. The source of the metals was thought to be from the many special alloys used in aircraft manufacturing.

Deicing operations generate waste deicer fluids that drain from the aircraft surfaces or from the runway surfaces to storm drains. The deicing fluids are often mixed with storm water runoff and then either treated in the facility wastewater treatment system or discharged directly to surface waters (Exhibit 9). Deicing fluid can also be released directly to the environment through runoff to surface waters or infiltration to groundwater. Some airports have constructed deicing fluid collection systems which segregate used deicer from other wastewater for reuse, recycling, on-site treatment or disposal off-site.

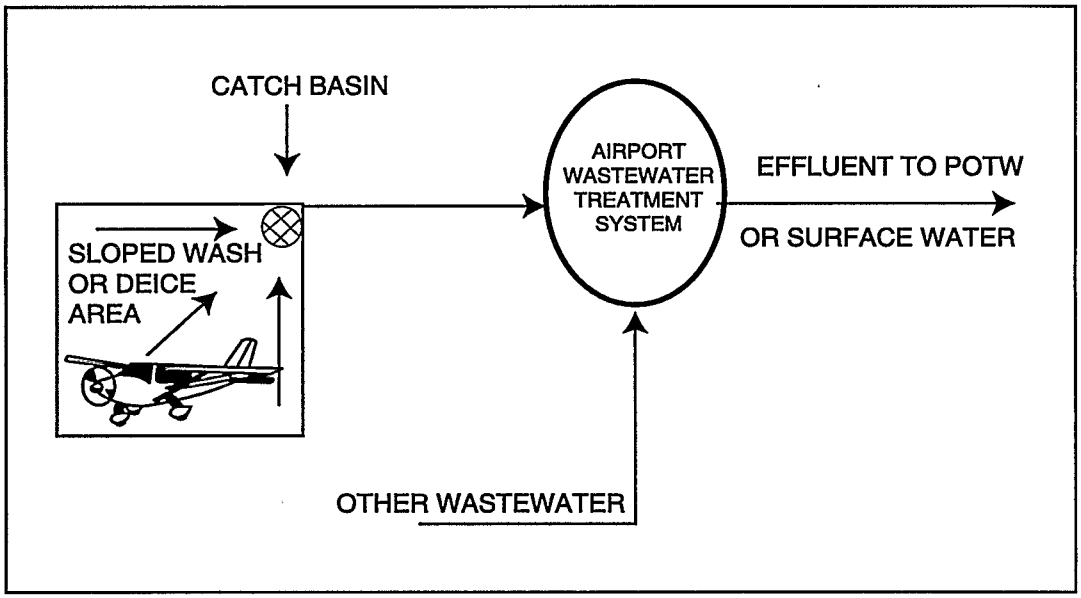


Exhibit 9: Aircraft Cleaning and/or Deicing Wastewater Treatment

IV. CHEMICAL RELEASE AND TRANSFER PROFILE

This section is designed to provide background information on the pollutant releases that are reported by this industry. The best source of comparative pollutant release information is the Toxic Release Inventory System (TRI). Pursuant to the Emergency Planning and Community Right-to-Know Act, TRI includes self-reported facility release and transfer data for over 600 toxic chemicals. Facilities within SIC Codes 20 through 39 (manufacturing industries) that have more than ten employees, and that are above weight-based reporting thresholds are required to report TRI on-site releases and off-site transfers. The transportation equipment cleaning industry, therefore, is not required to report to TRI and no TRI data for the industry is presented in this sector notebook.

Although this sector notebook does not present historical information regarding TRI chemical releases over time, please note that in general, toxic chemical releases have been declining. In fact, according to the 1993 Toxic Release Inventory Data Book, reported releases dropped by 43 percent between 1988 and 1993. Although on-site releases have decreased, the total amount of reported toxic waste has not declined because the amount of toxic chemicals transferred off-site has increased. Transfers have increased from 3.7 billion pounds in 1991 to 4.7 billion pounds in 1993. Better management practices have led to increases in off-site transfers of toxic chemicals for recycling. More detailed information can be obtained from EPA's annual Toxics Release Inventory Public Data Release book (which is available through the EPCRA Hotline at 800-535-0202), or directly from the Toxic Release Inventory System database (for user support call 202-260-1531).

IV.A. EPA Toxic Release Inventory for the Transportation Equipment Cleaning Industry

Information on the amounts and types of toxic chemicals released and transferred from facilities conducting transportation equipment cleaning operations is extremely limited. Transportation equipment cleaning facilities are not required to report to the Toxic Release Inventory (TRI) under Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313. Although many large manufacturing facilities (which do report to the TRI) carry out transportation equipment cleaning activities, it is impossible to determine from TRI data what portions of releases and transfers are generated from transportation equipment cleaning. Of the two previous EPA studies identified, both examined a small number of facilities, making any extrapolation of toxic chemical releases to the industry as a whole extremely inaccurate. In addition, data from the EPA Source Assessment Study of 1978 covered only a portion of the industry (tank car and truck tank cleaning) as it is now regarded, and the EPA Preliminary Data Summary of 1989 examined only wastewater discharges. Information on the total releases and

transfers from aircraft deicing and rail car refurbishing is especially limited due to the lack of previous studies.

IV.B. Summary of Selected Chemicals Released

The top toxic chemical releases from transportation equipment cleaning facilities could not be characterized due to the limited availability of pollutant release data for the industry.

IV.C. Other Data Sources

The primary source of toxic chemicals released and transferred from the transportation equipment cleaning industry are dissolved or suspended in wastewater generated during cleaning of tank interiors. The contaminant loading of tank cleaning wastewater can vary from a few different toxic chemicals to a mixture of many toxic chemicals depending upon what liquid is used to clean the tank and the cargo last carried. The EPA preliminary study of transportation equipment cleaning facilities performed in 1985 and 1986, analyzed wastewater samples from eight truck tank, rail tank, tank barge and aircraft cleaning facilities. A total of 111 organic priority pollutants and all 13 priority pollutant metals were detected. In addition to priority CWA pollutants, the raw wastewaters were found to contain high levels of oil and grease, suspended solids, and chemical oxygen demand (COD). The study concluded that the tank barge cleaning sector was the largest contributor of toxic chemicals followed by the tank truck cleaning sector and then the rail tank car cleaning sector.

Based on data in the 1985 and 1986 EPA study, the Agency estimated that 22 million pounds of priority pollutants are released or transferred from the transportation equipment cleaning industry per year in the form of wastewater. The EPA Source Assessment Study of 1978 estimated total VOC emissions from tank car and rail car cleaning (barges not included) was 1.25 million pounds per year. Ignoring the contribution of VOC emissions that arise from cleaning tank barges, which make up a relatively small portion of the total toxic chemicals generated by the industry, and ignoring any changes in VOC emissions since 1978, the total amount of toxic chemicals released or transferred from tank truck, rail tank car, and tank barge cleaning can be estimated at about 23 million pounds per year. In comparison, the iron and steel industry, and the pulp and paper industry released and transferred approximately 469 million, and 249 million pounds of TRI toxic chemicals in 1992, respectively.

V. POLLUTION PREVENTION OPPORTUNITIES

The best way to reduce pollution is to prevent it in the first place. Industries have creatively implemented pollution prevention techniques that improve efficiency and increase profits while at the same time minimize 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 substitute toxic chemicals. Some smaller facilities are able to actually get below regulatory thresholds just by reducing pollutant releases through aggressive pollution prevention policies.

In order to encourage these approaches, this section provides both general and company-specific descriptions of some pollution prevention advances that have been implemented within the transportation equipment cleaning 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. When possible, this section provides information from real activities that can, or are being implemented by this sector -- including a discussion of associated costs, time frames, and expected rates of return. 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 effectively used. 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.

Pollution prevention opportunities for the transportation equipment cleaning industry are primarily aimed at reducing the release of pollutants through reducing the amounts of wastewater generated, recycling/reusing cleaning solution and heels, and effectively removing heels from tanks. However, these efforts also often reduce the amounts of hazardous wastes and air emissions generated. Because TECI is a service industry, and facilities receive what the customers send, source reduction is limited. Pollution prevention data is being collected in the Office of Water's detailed questionnaire for the TECI rule development. Brief descriptions of some of the more widespread pollution prevention opportunities for the industry are provided below. Because the basic steps of the tank cleaning process do not differ substantially between tank trucks, rail tank cars, barges, IBCs and intermodal bulk carriers, the pollution prevention opportunities for these different transportation modes are interchangeable. Pollution prevention techniques for exterior rail car cleaning and refurbishing and aircraft deicing differ considerably from tank cleaning and are described separately.

Tank Cleaning Facilities

Pollution prevention opportunities for tank cleaning operations are primarily directed at reducing wastewater contaminated with tank residues and cleaning solutions. Data are not available on the extent to which pollution prevention techniques are being implemented in these operations however, it is likely that pollution prevention opportunities currently being carried out are driven by the costs to treat or dispose of contaminated wastewater and the costs of cleaning solutions. Because many tank cleaning operations are small businesses, or are small segments of medium to large businesses, many of the acceptable pollution prevention opportunities for the industry will be somewhat limited to the less costly options, such as minor process modifications, operational changes and wastes recycling. In the future, pollution prevention may be driven by the upcoming wastewater effluent guidelines if provisions for pollution prevention control technologies or practices are included.

Closed loop washing and rinsing systems. Recycling of wash and rinse water within a closed loop system can substantially reduce the volumes of wastewater generated, fugitive emissions and water use. Such systems can reduce wastewater generation by using the same washing or rinsing solution many times before it is finally discharged to the treatment system or POTW. In addition, contaminated solutions used in a wash or rinse step of one tank can later be reused in a wash or rinse step of another tank which does not require a clean solution. (e.g., the final rinse solution of one tank can be used as the initial rinse of the next tank). Through the elimination of open tank washing and continuous discharging to storage tanks and wastewater treatment systems, the potential for fugitive emissions of volatile contaminants is lowered. Closed loop systems have the potential to reduce a facility's operating costs through reduced wastewater treatment costs, reduced cleaning solution use, and reduced water use. Capital costs, potential savings, and pollutant reductions are all site specific.

Rinse and wash solution reuse. Improved management of wash and rinse solutions can reduce wastewater generation with little or no equipment or process modifications. Washing and rinsing solutions can be stored temporarily onsite to be used later in a wash or rinse step that does not require fresh solution, such as the first wash or rinse step of a highly contaminated tank. In addition, tank heels of caustics, detergents or solvents can be stored for later use as cleaning solutions for other tanks. Some cost savings could be realized through reduced wastewater treatment costs and reduced cleaning solution costs. Capital costs may arise from increasing storage capacity.

Improved heel removal. The effectiveness of the tank heel removal step has significant impacts on the volumes and degree of contamination of wastewater generated in later steps. The removal of tank heels can be enhanced through a number of techniques, including: pumping ballast water into some tank barge compartments to tilt the vessel to facilitate residual removal, using suction or vacuum pumps, and using squeegees to remove residual from tank walls. Depending on the volumes of tank heels generated and the value of the product, it may be possible to store tank heels and, after sufficient volume has been collected, sell the product to a reclaimer or back to the manufacturer. Tank heels consisting of caustics, detergents, and solvents can be used as cleaning fluids, and acids and alkali solutions can be used to neutralize other tank heels or wastewater prior to further treatment.

Segregation of waste streams. Wastewater segregation can be an effective pollution prevention opportunity that often does not require significant process or equipment modifications. Many wastewater streams can be more effectively and economically treated if they are segregated from other streams which do not require the same degree of treatment. Highly contaminated wastewater streams, oily wastewater streams and wastewater streams containing contaminants requiring a specific treatment method (e.g., metals removal) can be segregated to reduce the volumes of wastewater receiving certain treatment steps. Wastewater treatment can also be improved by adding stages to existing wastewater treatment systems. Additional stages, such as, biological treatment, chemical precipitation, filtration, ion exchange and sludge dewatering improve system effectiveness and treatment costs through reduced sludge generation, recovery of metals for resale, and replacement of more costly treatment stages.

Rail Car Refurbishing and Maintenance

An EPA Risk Reduction Engineering Laboratory waste minimization project examined pollution prevention options for a typical rail car refurbishing and maintenance operation. The project identified a number of pollution prevention opportunities that would reduce the volume of spent solvents, spent caustics, paint chips and paint sludges shipped off-site. Some pollution prevention options that could be transferred to most facilities include: using electrostatic spray paint systems to reduce over spray losses; using ultrasonic part wash systems to reduce the need for caustic and solvent cleaners; and reclaiming and reusing spent solvents. Capital costs are site specific. Cost savings could be realized through reduced hazardous waste disposal costs and reduced materials use.

Aircraft Deicing

Pollution prevention opportunities for aircraft deicing operations primarily focus on the collection of deicing fluid to prevent direct discharges to surrounding surface water and groundwater along with facility storm water. The most widespread collection method involves the collection of deicer through separate drainage areas around aircraft deicing operations which minimize the mixing of storm water and deicing fluid. The collection systems can either be located at the gate area or at a remote deicing area. Deicer fluid on runway and gate area surfaces can also be collected using vacuum sweeping machines, sponge rollers, and pumps. Other pollution prevention opportunities include the use of alternative, less polluting deicers, and the use of deicing gantries which carefully control the quantity of deicer fluid used.

VI. 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 VI.A contains a general overview of major statutes
- Section VI.B contains a list of regulations specific to this industry
- Section VI.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.

VI.A. General Description of Major Statutes

Resource Conservation and Recovery Act (RCRA)

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 (ignitibility, 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 that treat, store, or dispose of hazardous waste must obtain a permit, either from EPA or from a State agency which EPA has authorized to implement the permitting program. 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 §264.10) for conducting corrective actions which govern the cleanup of releases of hazardous waste or constituents from solid waste management units at RCRA-regulated 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 46 of the 50 States.

Most RCRA requirements are not industry specific but apply to any company that 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 should follow to determine whether the material created 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 ID number, preparing a manifest, ensuring proper packaging and labeling, meeting standards for waste accumulation units, and record keeping and reporting requirements. Generators can accumulate hazardous waste for up to 90 days (or 180 days depending on the amount of waste generated) without obtaining a permit.

- **Land Disposal Restrictions** (LDRs) are regulations prohibiting the disposal of hazardous waste on land without prior treatment. Under the LDRs (40 CFR 268), materials must meet land disposal restriction (LDR) treatment standards prior to placement in a RCRA land disposal unit (landfill, land treatment unit, waste pile, or surface impoundment). Wastes subject to the LDRs include solvents, electroplating wastes, heavy metals, and acids. 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** storage and disposal regulations (40 CFR Part 279) do not define **Used Oil Management Standards** 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 marketer (one who generates and sells

off-specification used oil directly to a used oil burner), additional tracking and paperwork requirements must be satisfied.

- **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 who store such waste, including generators operating under the 90-day accumulation rule. (Note: implementation of this rule is expected in December of 1995 and changes are likely.)

- **Underground Storage Tanks** (USTs) containing petroleum and hazardous substance 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 establishes increasingly stringent standards, including upgrade requirements for existing tanks, that must be met by 1998.

- **Boilers and Industrial Furnaces** (BIFs) that use or burn fuel containing hazardous waste must comply with strict 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/UST Hotline, at (800) 424-9346, responds to questions and distributes guidance regarding all RCRA regulations. The RCRA Hotline operates weekdays from 8:30 a.m. to 7:30 p.m., ET, excluding Federal holidays.

Comprehensive Environmental Response, Compensation, And Liability Act (CERCLA)

CERCLA, a 1980 law commonly known 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 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 exceeds a reportable quantity. Reportable quantities are defined and 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 other 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/UST Hotline, at (800) 424-9346, answers questions and references guidance pertaining to the Superfund program. The CERCLA Hotline operates weekdays from 8:30 a.m. to 7:30 p.m., ET, excluding Federal holidays.

Emergency Planning And Community Right-To-Know Act (EPCRA)

The Superfund Amendments and Reauthorization Act (SARA) of 1986 created 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 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, commonly known 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 EPCRA Hotline, at (800) 535-0202, answers questions and distributes guidance regarding the emergency planning and community right-to-know regulations. The EPCRA Hotline operates weekdays from 8:30 a.m. to 7:30 p.m., ET, excluding Federal holidays.

Clean Water Act (CWA)

The primary objective of the Federal Water Pollution Control Act, commonly referred to as The 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 §402) 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 presently authorized forty States to administer the NPDES program), contain industry-specific, technology-based and/or water quality-based limits, and establish pollutant monitoring reporting requirements. A facility that intends to discharge into the nation's waters must obtain a permit prior to initiating a 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 forth the conditions and effluent limitations under which a facility may make a discharge.

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, the regulation should be consulted.

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.

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 toxicity characteristics 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 general pretreatment standards and technology-based standards for industrial users of POTWs in many industrial categories. Different standards may 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.

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.

Safe Drinking Water Act (SDWA)

The 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.

Toxic Substances Control Act (TSCA)

The 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.

Clean Air Act (CAA)

The 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, 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 §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.

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 but allow the affected industries the flexibility to devise a cost-effective means of reducing emissions.

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 III of the CAAA 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 establishes a sulfur dioxide 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 CAAA 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 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), will be phased out entirely by the year 2000, while certain hydrochlorofluorocarbons (HCFCs) will be phased out by 2030.

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 Technology Transfer Network Bulletin Board System (modem access (919) 541-5742) includes recent CAA rules, EPA guidance documents, and updates of EPA activities.

VI.B. Industry Specific Requirements

Clean Water Act

Wastewater from transportation equipment cleaning 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. As mandated by section 304(m) of CWA, EPA is developing effluent limitations guidelines for wastewater discharge from transportation equipment cleaning facilities. 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). In addition, the recent storm water rules require facilities that discharge storm water to apply for a storm water NPDES permit. Existing NPDES permits for transportation equipment cleaning facilities discharging wastewater are likely to already cover the collection, treatment and discharge of storm water. However, some additional treatment and monitoring of storm water flows may be required when NPDES permits are renewed.

Resource Conservation and Recovery Act

Several types of wastes generated from transportation equipment cleaning facilities are shipped off-site as hazardous under RCRA. The largest quantities of RCRA hazardous wastes are sludges generated during wastewater treatment. These wastes are typically either landfilled, incinerated, or otherwise treated or disposed. In addition, rail car refurbishing and maintenance operation generate hazardous wastes as wastewater treatment system sludges, paint removal, painting, and from cleaning parts with solvents and caustics. RCRA listed wastes are subject to the hazardous waste regulations of 40 CFR Parts 124, 261 through 266, 270, 271, and 302.

RCRA hazardous waste regulations defining an "empty" tank (40 CFR §261.7) are particularly relevant to the transportation equipment cleaning industry and the handling of tank heels. Tanks containing heels of RCRA regulated residues above the RCRA-empty limits are technically defined as a hazardous waste. Under RCRA rules, the waste must, therefore, be accompanied by a RCRA manifest and the facility itself must be permitted as a RCRA Treatment, Storage, or Disposal Facilities (TSDF). In practice,

tank heels typically do not have RCRA manifests, and tank cleaning facilities are rarely RCRA permitted. A committee of EPA, Department of Transportation (DOT), and industry trade groups that was formed to increase the uniformity of RCRA permits, also looked at the issue of how to manifest tank residues that are above the RCRA limits. The committee agreed on a number of options that require RCRA manifests for tank heels in quantities above the RCRA-empty limits. The EPA Office of Solid Waste is currently charged with making a final decision on this issue. (Contact: Ann Codrington 202-260-4777)

Comprehensive Environmental Response, Compensation and Liability Act

A number of wastes generated from the transportation equipment cleaning refining process contain CERCLA hazardous substances. Therefore, past spills and on-site releases of such substances may require remedial clean-up actions under Superfund.

Hazardous Materials Transportation Act (HMTA)

The transport of hazardous materials is regulated by the DOT under the Hazardous Materials Transportation Act. Materials covered by the Act include all RCRA listed wastes and some additional materials deemed by DOT to be dangerous to transport. Therefore, the transport, handling and unloading of tank heels could be covered by the HMTA regulations. The HMTA regulations (49 CFR Parts 174-177, and §§171.15, 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.

1990 Oil Pollution Act

The 1990 Oil Pollution Act affects those barge and ship tank cleaning facilities that clean vessels carrying oil. The Act establishes strict, joint and several liability against facilities that discharge oil or which pose a substantial threat of discharging oil to navigable waterways. Standards have been set for tank equipment, spill prevention control plans, and vessels. Some specific requirements include double hulls, drug and alcohol abuse policies, and on-board manning and vessels personnel policies. 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 Part 112) were revised and finalized in 1994.

OSHA and Coast Guard Safety Rules

Worker safety is regulated by the Occupational Safety and Health Administration (OSHA) (29 CFR §1910.1028) at truck, rail and airport facilities and the Coast Guard (33 USCA 1221-1232, 2718) at tank barge 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.

VI.C. Pending and Proposed Regulatory Requirements

Clean Water Act

Presently, there are no effluent limitations guidelines specific to the transportation equipment cleaning 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). EPA is under a court-ordered deadline to propose and promulgate wastewater effluent guidelines for the industry (including aircraft deicing) by the end of 1996 and 1998, respectively. The Office of Water is currently collecting more extensive and up-to-date industry data through questionnaires, site visits to facilities, and sampling which will be used as a basis for developing the effluent limitations guidelines.

Effluent limitation guidelines for aircraft cleaning and deicing are expected to be studied and developed separately from those for tank cleaning facilities. Recently issued Federal Aviation Administration guidelines on aircraft deicing, and the recent EPA storm water rules, are likely to have significant effects on airport deicing operations. The EPA Office of Water will study the effects of these regulations before initiating its own deicing rule making. In addition, the EPA Office of Water will also work with the Department of Defense to study deicing operations at military installations. Depending on the results of this study, guidelines specific to deicing at military installations may be developed.

Resource Conservation and Recovery Act (RCRA)

A committee made up of representatives from EPA, DOT and industry trade groups that met to increase uniformity in RCRA manifests also examined the manifesting of tank heels that are above RCRA-empty limits. Presently, DOT regulates tank heels under the Hazardous Material Transportation Act (49 USCA 1801-1819), and EPA regulates the tank heels under RCRA (40 CFR Parts 262-265). The committee agreed on a number of options for

manifesting of tank residues in quantities above RCRA-empty limits. EPA will issue a proposed rule on manifesting requirements based on the committee recommendations in 1995. (Ann Codrington 202-260-4777)

Sanitary Food Transportation Act (SFTA)

The Sanitary Food Transportation Act was enacted in 1990 and is implemented by the DOT. The Act aims to prevent contamination of food products from shipping containers previously used to transport toxic materials. DOT is currently developing regulations that will likely effect carriers as well as the tank cleaning industry. (Contact: Joseph Delevanko, U.S. DOT, (202) 366-4484)

VII. COMPLIANCE AND ENFORCEMENT HISTORY

To date, 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.

VII.A. Transportation Equipment Cleaning Industry Compliance History

An enforcement and compliance matrix based on information from the IDEA (Integrated Data for Enforcement Analysis) database is not available for the transportation equipment cleaning industry. Information from the IDEA system is sorted by industry using SIC codes. Because their are no SIC codes that apply solely to transportation equipment cleaning, compliance and enforcement information specific to the industry cannot be obtained from the IDEA system.

VII.B. Review of Major Legal Actions

This section provides summary information about major cases that have affected this sector, and a list of Supplementary Environmental Projects (SEPs). SEPs are compliance agreements that reduce a facility's stipulated penalty in return for an environmental project that exceeds the value of the reduction. Often, these projects fund pollution prevention activities that can significantly reduce the future pollutant loadings of a facility.

VII.B.1. Review of Major Cases

Historically, OECA's Office of Enforcement Capacity and Outreach does not regularly compile information related to major cases and pending litigation within an industry sector. The staff are willing to pass along such information to Agency staff as requests are made. In addition, summaries of completed enforcement actions are published each fiscal year in the *Enforcement Accomplishments Report*. To date these summaries are not organized by industry sector. (Contact: Office of Enforcement Capacity and Outreach, 202-260-4140)

VII.B.2. Supplementary Environmental Projects

Supplemental environmental projects (SEPs) are an enforcement option that requires the non-compliant facility to complete specific projects. Regional summaries of SEPs undertaken in the 1993 and 1994 federal fiscal years were reviewed. No SEPs were identified that involved transportation equipment cleaning facilities during this period. However, an injunctive relief action was identified which was carried out following a violation of the CWA at the Union Tank Car Co. in Louisiana. The specifics of the violation were not provided by the reporting Region. The company was fined $350,000 and was required to construct a pipeline from the facility to the local POTW to stop the unpermitted discharge of wastewater from the facility's rail car cleaning operations. It was also required that the pipeline be constructed to allow local residents to tie-in the system. No reduction in the initial cash penalty was granted for the implementation of the project.

VIII. COMPLIANCE ASSURANCE ACTIVITIES AND INITIATIVES

This section highlights the activities undertaken by this industry sector and public agencies to voluntarily improve the sector's environmental performance. These activities include those independently initiated by industrial trade associations. In this section, the notebook also contains a listing and description of national and regional trade associations.

VIII.A. Sector-related Environmental Programs and Activities

Environmental compliance assurance activities by both government and industry have been extremely limited for the transportation equipment cleaning industry. In part, this is due to the lack of environmental regulations specific to the industry at this time. While most facilities must obtain and meet the requirements of NPDES permits for wastewater and storm water discharge, and must comply with RCRA hazardous waste requirements, the wastes generated and the methods of handling and disposing of these wastes are not unique to the industry. Compliance assurance activities specific to the cleaning of transportation equipment, therefore, may not be an industry priority. Another possible factor limiting industry specific compliance assurance activities is that many transportation equipment cleaning facilities are a relatively small part of larger manufacturing, maintenance, repair, and depot/terminal facilities. The primary focus of industry and government compliance assurance activities would naturally focus on the various other environmental regulations that cover these facilities.

EPA activities to date have primarily been aimed at assessing the environmental effects and collecting data for the purpose of developing regulations for controlling pollutant discharges in wastewater. As a result, compliance assistance activities specific to the transportation equipment cleaning industry have been limited.

Waste Minimization Assessment for a Manufacturer of Rebuilt Railway Cars and Components

The U.S. EPA funded a pilot project to assess small- and medium-size manufacturers who want to minimize their generation of hazardous waste but lack the expertise to do so. Waste Minimization Assessment Centers (WMACs) were established at selected universities and procedures were adapted from the EPA *Waste Minimization Opportunity Assessment Manual*. The WMAC team at the University of Tennessee inspected a plant that rebuilds approximately 2,000 railway cars each year and that refurbishes wheel assemblies and air brake systems. The team issued a report and made a number of recommendations for minimizing wastes.

VIII.B. EPA Voluntary Programs

33/50 Program

The "33/50 Program" is EPA's voluntary program to reduce toxic chemical releases of eighteen chemicals from manufacturing facilities. Participating companies pledge to reduce their toxic chemical releases and transfers by 33 percent as of 1992 and by 50 percent as of 1995. Certificates of Appreciation have been given out to participants meeting their 1992 goals. The list of chemicals includes seventeen high-use chemicals reported in the Toxics Release Inventory. (Contact: Mike Burns 202-260-6394 or the 33/50 Program 202-260-6907)

Environmental Leadership Program

The Environmental Leadership Program (ELP) is a national initiative piloted by EPA and state agencies in which facilities have volunteered to demonstrate innovative approaches to environmental management and compliance. EPA has selected 12 pilot projects at industrial facilities and federal installations which will demonstrate the principles of the ELP program. These principles include: environmental management systems, multimedia compliance assurance, third-party verification of compliance, public measures of accountability, community involvement, and mentoring programs. In return for participating, pilot participants receive public recognition and are given a period of time to correct any violations discovered during these experimental projects. Forty proposals were received from companies, trade associations, and federal facilities representing many manufacturing and service sectors. (Contact: Tai-ming Chang, ELP Director, 202-564-5081 or Robert Fentress 202-564-7023)

Project XL

Project XL was initiated in March 1995 as a part of President Clinton's *Reinventing Environmental Regulation* initiative. The projects seek to achieve cost effective environmental benefits by allowing participants to replace or modify existing regulatory requirements on the condition that they produce greater environmental benefits. EPA and program participants will negotiate and sign a Final Project Agreement, detailing specifc objectives that the regulated entity shall satisfy. In exchange, EPA will allow the participant a certain degree of regulatory flexibility and may seek changes in underlying regulations or statutes. Participants are encouraged to seek stakeholder support from local governments, businesses, and environmental groups. EPA hopes to implement fifty pilot projects in four categories including facilities, sectors, communities, and government agencies regulated by EPA. Applications will be accepted on a rolling basis and projects will

move to implementation within six months of their selection. For additional information regarding XL Projects, including application procedures and criteria, see the May 23, 1995 Federal Register Notice, or contact Jon Kessler at EPA's Office of Policy Analysis (202) 260-4034.

Green Lights Program

EPA's Green Lights program was initiated in 1991 and has the goal of preventing pollution by encouraging U.S. institutions to use energy-efficient lighting technologies. The program has over 1,500 participants which include major corporations; small and medium sized businesses; federal, state and local governments; non-profit groups; schools; universities; and health care facilities. Each participant is required to survey their facilities and upgrade lighting wherever it is profitable. EPA provides technical assistance to the participants through a decision support software package, workshops and manuals, and a financing registry. EPA's Office of Air and Radiation is responsible for operating the Green Lights Program. (Contact: Maria Tikoff at 202-233-9178 or the Green Light/Energy Star Hotline at 202-775-6650)

WasteWi$e Program

The WasteWi$e Program was started in 1994 by EPA's Office of Solid Waste and Emergency Response. The program is aimed at reducing municipal solid wastes by promoting waste minimization, recycling collection, and the manufacturing and purchase of recycled products. As of 1994, the program had about 300 companies as members, including a number of major corporations. Members agree to identify and implement actions to reduce their solid wastes and must provide EPA with their waste reduction goals along with yearly progress reports. EPA, in turn, provides technical assistance to member companies and allows the use of the WasteWi$e logo for promotional purposes. (Contact: Lynda Wynn 202-260-0700 or the WasteWi$e Hotline at 800-372-9473)

Climate Wise Recognition Program

The Climate Change Action Plan was initiated in response to the U.S. commitment to reduce greenhouse gas emissions in accordance with the Climate Change Convention of the 1990 Earth Summit. As part of the Climate Change Action Plan, the Climate Wise Recognition Program is a partnership initiative run jointly by EPA and the Department of Energy. The program is designed to reduce greenhouse gas emissions by encouraging reductions across all sectors of the economy, encouraging participation in the full range of Climate Change Action Plan initiatives, and fostering innovation. Participants in the program are required to identify and commit

to actions that reduce greenhouse gas emissions. The program, in turn, gives organizations early recognition for their reduction commitments; provides technical assistance through consulting services, workshops, and guides; and provides access to the program's centralized information system. At EPA, the program is operated by the Air and Energy Policy Division within the Office of Policy Planning and Evaluation. (Contact: Pamela Herman 202-260-4407)

NICE^3

The U.S. Department of Energy and EPA's Office of Pollution Prevention are jointly administering a grant program called The National Industrial Competitiveness through Energy, Environment, and Economics (NICE^3). By providing grants of up to 50 percent of the total project cost, the program encourages industry to reduce industrial waste at its source and become more energy-efficient and cost-competitive through waste minimization efforts. Grants are used by industry to design, test, demonstrate, and assess the feasibility of new processes and/or equipment with the potential to reduce pollution and increase energy efficiency. The program is open to all industries; however, priority is given to proposals from participants in the pulp and paper, chemicals, primary metals, and petroleum and coal products sectors. (Contact: DOE's Golden Field Office, 303-275-4729)

VIII.C. Trade Association/Industry Sponsored Activity

Industry compliance assurance activities have primarily been aimed at the transportation safety requirements of the Department of Transportation, the Occupational Safety and Health Administration, and the U.S. Coast Guard. However, the trade associations anticipate providing increased environmental compliance assistance activities with the development of the wastewater Effluent Guidelines.

VIII.C.1. Environmental Programs

Industry Working Group on Deicing

A deicing working group formed by the American Association of Airport Executives and the Airports Association Council International studied the use of deicing chemicals on aircraft and the feasibility of deicing facilities away from airport gates and to provide information to both industry members and the federal government on ways in which deicing operations can be improved upon. As part of their investigation, the working group sent out surveys to the major airports to determine which deicing procedures and chemicals are being used by the industry. Some of the survey questions related to environmental effects of deicing and recovery, reuse, and recycling

of waste deicer. The results of the survey indicated that a number of air carriers are using alternative chemicals, and have constructed remote deicing facilities with deicer recovery systems. (Contact: David Jeffrey, American Association of Airport Executives, 703-824-0500 ext.136)

Global Environmental Management Initiative

The Global Environmental Management Initiative (GEMI) is made up of a group of leading companies dedicated to fostering environmental excellence by business. GEMI promotes a worldwide business ethic for environmental management and sustainable development to improve the environmental performance of business through example and leadership. In 1994, GEMI's membership consisted of about 30 major corporations.

National Pollution Prevention Roundtable

The National Pollution Prevention Roundtable published *The Pollution Prevention Yellow Pages* in September 1994. It is a compilation of information collected from mail and telephone surveys of state and local government pollution prevention programs. (Contact: Natalie Roy 202-543-7272). State programs listing themselves as having expertise in pollution prevention related to transportation equipment cleaning were not identified in *The Pollution Prevention Yellow Pages;* however, areas of expertise are listed as SIC categories which do not include a specific category for transportation equipment cleaning.

Chemical Manufacturers Association

The **Chemical Manufacturer's Association** funds research on issues of interest to their members particularly in support of their positions on proposed or possible legislation. They recently funded a study to characterize the environmental fate of organochlorine compounds.

Responsible Care® Program

The **Responsible Care® Initiative** of the Chemical Manufacturer's Association requires all members and partners to continuously improve their health, safety, and environmental performance in a manner that is responsive to the public. Launched in 1988, the Responsible Care® concepts are now being applied in 36 countries around the world. Responsible Care® is a comprehensive, performance-oriented initiative composed of ten progressive Guiding Principles and six board Codes of Management Practices. These Management Practices cover all aspects of the chemical industry's operations, from research to manufacturing, distribution, transportation, sales and marketing, and to downstream users of chemical products. Through

Responsible Care®, CMA members and partners gain insight from the public through, among other means, a national Public Advisory Panel and over 250 local Community Advisory Panels. This, coupled with the fact that participation in Responsible Care® is an obligation of membership with the Chemical Manufacturer's Association, make this performance improvement initiative unique. The Synthetic Organic Chemical Manufacturer's Association whose membership consists of smaller batch and custom chemical manufacturers with typically fewer than 50 employees and less than $50 million in annual sales, encourages its members to achieve continuous performance improvement in their health, safety, and environmental programs through implementation of the chemical industry's Responsible Care® initiative. SOCMA is a partner in Responsible Care®.

ISO 9000

ISO 9000 is a series of international total quality management guidelines. After a successful independent audit of their management plans, firms are qualified to be ISO 9000 registered. In June of 1993, the International Standards Organization created a technical committee to begin work on new standards for environmental management systems. The new standards are called ISO 14000 and are expected to be issued in 1996.

VIII.C.2. Summary of Trade Associations

Truck Transport

National Tank Truck Carriers
2200 Mill Rd.
Alexandria, VA 22314
Phone: (703) 838-1960
Fax: (703) 684-5753

Members: 260
Staff: 7
Budget: $1,000,000
Contact: John Conely

The National Tank Truck Association (NTTC), founded in 1945, represents for hire tank truck carriers of liquid and dry-bulk commodities, chemicals, food processing commodities, and petroleum and related products. The NTTC provides its members with periodic bulletins on the latest changes in federal, state and local regulations, as well as political and market issues. In addition, the NTTC conducts research and sponsors annual training schools. NTTC publications include the annual *Cargo Tank Hazardous Materials Regulations*, a monthly *Newsletter*, an annual *Hazardous Commodity Handbook*, and an annual *National Tank Truck Directory*, in addition to pamphlets and books. The NTTC holds a general conference each May, a Cargo Tank Maintenance Seminar each October, and special seminars on timely topics. A committee has been formed that will deal specifically with tank cleaning issues.

American Trucking Associations
2200 Mill Rd.
Alexandria, VA 22314
Phone: (703) 838-1844
Fax: (703) 684-5720

Members: 4100
Staff: 300
Budget: $35,000,000
Contact: Allen Schaeffer

The American Trucking Associations (ATA), founded in 1933, represents motor carriers, suppliers, state trucking associations, and national conferences of trucking companies. The ATA works to influence the decisions of federal, state, and local government bodies to promote increased efficiency, productivity, and competitiveness in the trucking industries. ATA promotes highway and driver safety, supports highway research projects, and studies technical and regulatory problems of the trucking industry. In addition, the association provides its members with a guide to federal and state regulations and offers comprehensive accounting service for all size carriers. An information center containing numerous ATA and other publications is available to members and others.

Rail Transport

Railway Progress Institute
700 N. Fairfax Street
Alexandria, VA 22314
Phone: (703) 836-2332
Fax: (703) 548-0058

Members: 150
Staff: 7
Contact: Robert Mathews

Founded in 1908, the Railway Progress Institute (RPI) is comprised of railway and rapid transit rail equipment and supply companies. The RPI promotes the interests of its membership and, the American railroad system in general, before federal agencies and Congress. The RPI publishes an annual report and the bimonthly *Railway Progress News*, a newsletter reporting industry events.

Association of American Railroads
Library Room 5800
50 F Street, NW
Washington, D.C. 20001
Phone: (202) 639-2280
Fax: (202) 639-2986

Members: 110
Staff: 745
Contact: Robert Fronczak

The Association of American Railroads functions as the coordinating and research agency of the American railway industry. Membership is comprised of the larger, Class I railroads. Focus areas include: railroad operation and maintenance, statistics, medical problems, cooperative advertising and public relations, rates, communication, safety, and testing of railroad equipment. The AAR was founded in 1934 and maintains a library of current and historical volumes and periodicals. The AAR also operates an on-line database of all rail cars, trailers, and containers used in North America called Universal Machine Language Equipment Register. Publications include the quarterly *Official Railway Equipment Register*, the biweekly *Rail News Update*, and the periodically published *Railroad Facts*. The AAR also publishes studies, statistical reports, and general information publications. Because the membership consists of the railroads and not the rail carriers, the environmental focus is primarily aimed at the effects of the railroad ties and contaminated soils on the environment. Tank car and equipment cleaning is of a lessor concern to the membership.

Ship and Barge Transport

American Waterways Operators
1600 Wilson Blvd.
Suite 1000
Arlington, VA 22209
Phone: (703) 841-9300
Fax: (703) 841-0389

Members: 305
Staff: 25
Budget: $2,000,000
Contact: Robert O'Niell

Founded in 1944, the American Waterways Operators (AWO) consists of towboat, tugboat, and barge operators, as well as the shipyards that build and repair those vessels. The AWO represents the industry before government bodies. Committees include Inland Dry Sector, Inland Liquid Sector, Coastal Sector, and Harbor Services Sector. In addition, the American Waterways Shipyard Conference (AWSC) was organized within AWO to represent U.S. Second Tier (small and medium sized) commercial shipyards. Tank barge cleaning issues are handled by the AWSC. The association provides technical assistance in the form of publications and seminars. Most assistance activities are aimed at improving safety in the industry. The

AWSC worked with the U.S. Coast Guard to publish *Safety Guidelines for Tank Vessel Cleaning Facilities*, which will be used by the industry and as a guide manual for inspectors. Other publications include an annual report, a biweekly *AWO Letter*, *Action Bulletin* and *Information Bulletin,* and an annual membership directory.

Inland Rivers, Ports and Terminals, Inc.
204 E. High Street
Jefferson City, MO 65101
Phone: (314) 634-2028
Fax: (314) 634-2028

Members: 165
Contact: Kathy Pabst

Founded in 1974, the Inland Rivers, Ports and Terminals, Inc. (IRPT) is a non-profit corporation representing port and terminal owners/operators, port authorities, towing companies, and other river related businesses. The IRPT promotes the growth of inland rivers, ports and terminals commerce through the exchange of information and coordinated action among its members. Activities include the review of impending regulations, dissemination of interpretations of regulations, and periodic meetings which include presentations on issues effecting the industry. Publications include a weekly *News Bulletin*; an annual membership directory; and *Waterways and Transportation Review*, an open forum for articles pertaining to research, opinions, operations, policies, strategies, and methodologies relating to the waterways industry. IRPT assistance to members has not focused on environmental issues, however, more environmental compliance assistance is expected to be provided as it becomes more of a concern to the membership.

Air Transport

American Association of Airport Executives
4212 King Street
Alexandria, VA 22302
Phone: (703) 824-0500
Fax: (703) 820-1395

Members: 4,000
Staff: 25
Budget: $4,100,000
Contact: David Jeffrey

The American Association of Airport Executives (AAAE) is comprised of airport management personnel and representatives of companies serving the civil airport industry. The AAAE sponsors educational seminars, conducts examinations and maintains a speakers' bureau. Assistance in complying with environmental regulations is provided in the form of regulation interpretations, training seminars, and manuals. Environmental compliance assistance as focused on the storm water rules and has not yet been specific

to aircraft cleaning and deicing operations. Publications are the bimonthly *Airport Executive Magazine* and the *Airport Report Newsletter*. Separate yearly conferences are on national airports, legislative issues (semiannual), international facilities, and general annual issues.

Airports Association Council International
1220 19th Street
NW, Suite 200
Washington, D.C. 20036
Phone: (202) 293-8500
Fax: (202) 331-1362

Members: 235
Staff: 20
Contact: Bonnie Wilson

The Airports Association Council International (AACI) is comprised of operators of public airport facilities. The group also includes government bodies that own and operate major airports. The association provides compliance assistance to members through seminars, meetings, conferences, regulation interpretations, and manuals. One day conferences are frequently held on environmental management and auditing techniques. The association's environmental compliance assistance activities have not yet included aircraft cleaning and deicing, but assistance is expected to be offered if rules are put in place. Committees include planning and environmental, safety and security, and U.S. government affairs. Publications are the weekly *Airport Highlights*, the annual *Worldwide Airport Traffic Report*, and the *Airport Environmental Management Handbook*. The AACI holds an annual meeting in September or October.

National Air Transport Association
4226 King Street
Alexandria, VA 22302
Phone: (703) 845-9000
Fax: (703) 845-8176

Members: 1,945
Staff: 20
Contact: Andrew Cebula

The National Air Transport Association (NATA) represents the interests of aviation services companies such as fixed-base operators and on-demand air taxis. NATA provides compliance assistance to members in the form of guidelines, explanations of regulations, and seminars. Most of NATA's work relates to Federal Aviation Administration regulations, however, environmental services are also provided. Environmental aspects of deicing and aircraft cleaning are not a major focus, because the membership does not include the carrier companies, however, some fixed-based operators carry out deicing operations. Publications include an annual membership directory, an annual report, and the monthly *ATAnews*.

Air Transport Association of America
1709 New York Ave., NW
Washington, D.C. 20006
Phone: (202) 626-4000

Members: 22
Staff: 125
Contact: Donald Minnis

The ATA is comprised of airlines engaged in transporting persons, goods, or mail by aircraft. Departments include government affairs, industry services, and technical services. Publishes annual *Air Transport* as well as fact sheets, press releases, studies, speeches, and references pertaining to air transport. The ATA holds quarterly meetings.

General Transport

Independent Liquid Terminals Association
1133 15th St., NW, Suite 650
Washington, D.C. 20005
Phone: (202) 659-2301
Fax: (202) 466-4166

Members: 82
Staff: 7
Budget: $600,000
Contact: John Prokop

Independent terminal companies that handle, transfer, and store bulk liquid commodities on a "for hire" basis are members of the Independent Liquid Terminals Association (ILTA). Member operations include deep water and barge terminals for the storage of chemicals, petroleum, fertilizers, and basic bulk liquid food products such as animal fats and vegetable oils, molasses, and spirits. The ILTA advises members on pending regulation and legislation, promotes the exchange of information among members, and investigates opportunities for increased safety and efficiency in handling increasing varieties of liquid products. The ILTA has task forces on Environment, Safety, and Training. Publications include an annual *Directory of Bulk Liquid Terminals and Storage Facilities* and a weekly *ILTA Newsletter* addressing federal and state legislation and regulation. The ILTA has an annual conference/trade show.

Association of Waste Hazardous
Materials Transporters
2200 Mill Rd.
Alexandria, VA 22314
Phone: (703) 838-1703
Fax: (703) 549-9570

Members: 65
Staff: 2
Contact: Cynthia Hilton

The Association of Waste Hazardous Materials Transporters (AWHMT) is affiliated with the American Trucking Association. It represents companies that transport waste hazardous materials including, PCBs, radiation, and hazardous and industrial wastes, by truck and rail. The Association is a not-for-profit organization that promotes practices and performance standards that minimize risks to the environment, public health and safety; develops educational programs to expand public awareness about the industry; and contributes to the development of effective laws and regulations governing the industry. AWHMT publishes an annual directory of transporters and meets three times per year.

IX. CONTACTS/ACKNOWLEDGMENTS/RESOURCE MATERIALS/BIBLIOGRAPHY

For further information on selected topics within the transportation equipment cleaning industry a list of contacts and publications are provided below:

Contacts[a]

Name	Organization	Telephone	Subject
Virginia Lathrop	EPA/OECA	(202) 564-7057	Regulatory requirements and compliance assistance
Gina Matthews	EPA/OW	(202) 260-6036	TECI industry size, distribution, economics, pollutant releases, effluent guidelines, and waste water treatment operations
Ann Codrington	EPA/OSWER	(202) 260-4777	Regulatory requirements (RCRA)
Joseph Delevanko	DOT	(202) 366-4484	Regulatory requirements (SFTA)
John Dickinson	EPA Region IV	(404) 347-7603	Inspector experienced in inspections of rail tank car cleaning facilities
Cynthia Hutchinson	EPA Region VII	(913) 551-7478	Experience in inspections of rail tank car cleaning facilities

OECA: Office of Enforcement and Compliance Assistance
OW: Office of Water
OSWER: Office of Solid Waste and Emergency Response
DOT: Department of Transportation
CWA: Clean Water Act
RCRA: Resource Conservation and Recovery Act

General Industry Profile

1993 Screener Questionnaire of the Transportation Equipment Cleaning Effluent Guidelines, U.S. EPA Office of Water, Engineering and Analysis Division, Washington, D.C., 1994.

Preliminary Data Summary for the Transportation Equipment Cleaning Industry, U.S. EPA, Office of Water Regulations and Standards, September 1989.

Source Assessment: Rail Tank Car, Tank Truck, and Drum Cleaning, State-of-the-Art, Monsanto Research Corp, Dayton, Ohio, prepared for the U.S. EPA Industrial Environmental Research Laboratory, Cincinnati, Ohio, April, 1978.

[a] Many of the contacts listed above have provided valuable background information and comments during the development of this document. EPA appreciates this support and acknowledges that the individuals listed do not necessarily endorse all statements made within this notebook.

Waste Minimization Assessment for a Manufacturer of Rebuilt Railway Cars and Components, F. William Kirsch and Gwen P. Looby, University City Science Center, Philadelphia, PA and U.S. EPA Risk Reduction Engineering Laboratory, Cincinnati, Ohio, July, 1991. EPA/600/M-91/017.

Process Descriptions and Chemical Use Profiles

Report of the American Association of Airport Executives - AD HOC Working Group on Deicing, American Association of Airport Executives, Alexandria, Virginia, 1993. (Contact: David Jeffrey, American Association of Airport Executives, 703-824-0500 ext.136)

Safety Guidelines for Tank Vessel Cleaning Facilities, first edition, American Waterways Shipyard Conference, Arlington, Virginia, June, 1992. (Contact: Robert O'Neill, American Waterways Shipyard Operators, 703-841-9300)

Regulatory Profile

Sustainable Environmental Law, Environmental Law Institute, West Publishing Co., St. Paul, Minn., 1993.

APPENDIX A - INSTRUCTIONS FOR DOWNLOADING NOTEBOOKS

Electronic Access to the Sector Notebooks via the Enviroene World Wide Web (E$WWW) and the Enviro$en$e Bulletin Board System (E$BBS)

The Sector Notebooks are available through two electronic systems, the Enviroene Bulletin Board System (via modem connection), and the Enviroene World Wide Web (via Internet). The Enviroene Communications Network is a **free, public,** interagency-supported system operated by EPA's Office of Enforcement and Compliance Assurance and the Office of Research and Development. The Network allows regulators, the regulated community, technical experts, and the general public to share information regarding: pollution prevention and innovative technology; environmental enforcement and compliance assistance; laws, executive orders, regulations and policies; points of contact for services and equipment; and other related topics. The Network welcomes receipt of environmental messages, information and data from any public or private person or organization. This document first provides summary information on E$WWW access, then provides information on downloading protocols from within the E$BBS.

A. ACCESS THROUGH ENVIROENE WORLD WIDE WEB

To access the Sector Notebooks through the Enviroene World Wide Web, set your World Wide Web Browser to the following address:

WWW/INTERNET ADDRESS: http://wastenot.inel.gov/envirosense/

HOTLINE NUMBER FOR E$WWW ONLY: 208-526-6956

EPA E$WWW MANAGER: Myles Morse, 202-260-3161

From the Enviroene home page, click on "Compliance and Enforcement" to obtain instructions on how to access the Sector Notebooks and how to provide comments. Names, e-mail addresses, and telephone numbers will also be provided should you require assistance. The same documents listed below under the E$BBS instructions are available on the E$WWW.

B. ACCESS THROUGH THE ENVIROENE BULLETIN BOARD SYSTEM - Instructions for Connecting, Registering and Downloading Notebooks

E$BBS MODEM CONNECTION NUMBER: 703-908-2092

HOTLINE FOR E$BBS ONLY: 703-908-2007

MANAGER: BBS Platform: Louis Paley, 202-260-4640

The following instructions are condensed from longer documents that provide information on the full features of the Enviroene Bulletin Board. Further documentation is available on-line in the files that are listed at the end of this Appendix.

STEP 1. ESTABLISHING MODEM SETTINGS

Connecting to the ENVIROENE BBS is done using a modem and communications software. The modem can be either an internal or external model connected directly to your computer or part of a modem pool that is accessible through your Local Area Network (LAN) system. The communications software (e.g., CrossTalk, ProComm, QModem, Microphone, etc.) is what allows you to access and control your modem. Your software needs to be set to the values noted below (many of these settings are the standard defaults used):

- **Telephone number - 703-908-2092** (Tip: Be sure you have entered the appropriate dialing prefix; e.g., 9 for an outside line, 1 for long distance...)

- **Baud rate - up to 14,400 BPS** is supported (always select the highest speed which YOUR modem will support).

- **Terminal Emulation - BBS, ANSI, VT-100, VT-102 etc.** (Tips: Do not use TTY. After you log in, if you see screen characters appear on the lines where you need to enter information, chances are that you need to properly set your terminal emulation. The emulation can normally be reset before or during communication with Enviroene).

- **Data Bits - 8 (Eight).**

- **Stop Bits - 1 (One).**

- **Parity - None.**

- **Transfer Protocols - ZModem, YModem, XModem, HS/Link, BiModem, ASCII** (text files only). If your communications software supports ZModem, this will increase upload/download efficiency. You must select the same protocol that BOTH your communications software and the BBS support so that they can "talk the same language" when sending and receiving files.

- **Error correction/data compression protocols - v.32, v.42,** and other older, hardware-dependent ones are supported.

Refer to your communications software manual on how to set and save the communication parameters noted above (these will generally be the default). Also check to make sure you know where the communications software will send the files you download. Due to document sizes it is best not to download Sector Notebooks to floppy disks.

STEP 2. CONNECTING AND REGISTERING

- Connect to E$BBS via a modem, using communications software set to the above settings by dialing:

  (703) 908-2092

  NOTE: EPA Employees can access E$ directly via LAN from the Agency Lan Services Menu or Icon and then follow the instructions below. The end of this document lists additional resources for accessing E$BBS through the LAN.

- Once you are in the BBS, hit the ENTER/RETURN key twice (2) to accept the default values for the screen.

- on successive pages, type your first name and hit ENTER/RETURN; type your last name and hit ENTER/RETURN; and type your password **(if you have NOT registered yet, make one up, and remember it for subsequent logons to E$)** and hit ENTER/RETURN; and

- Register (first time only) and immediately receive access to the BBS for 120 minutes per day;

  - Type responses to the Registration questions, and hit ENTER/RETURN to begin using ENVIROENE. (Tip: the last registration question is Country? _____)

  - You may need to hit ENTER/RETURN several times to move past System News and Alert messages.

STEP 3. DOWNLOADING SECTOR NOTEBOOKS

The files that appear on the following table can be downloaded from E$. Most files cannot be viewed on-screen within the E$BBS. As indicated on the following table, each document appears in several formats – WordPerfect 5.1 (PC), WordPerfect 6.1 (PC), Microsoft Word 5.1a (Mac) or WordPerfect 2.0 (Mac). Please note that the quality of formatting and graphics is highest in the file version in which the notebook was originally created. The high quality versions are underlined on the following list of filenames.

Information on Macintosh/Microsoft Word Files

Available Macintosh files are not compressed. The files are easily identified by the seventh and eighth position in the filename - which is "MA." The extension They can be directly downloaded and read using Microsoft Word 5.1a, or within other word processing software that supports conversion of Microsoft Word 5.1a documents. Conversion to other programs may alter formatting and graphics quality.

Information on PC/WordPerfect Files

The WordPerfect files are all compressed ("zipped" files ending with the .ZIP extension) files that need to be decompressed ("unzipped") after they are downloaded. The notebooks that are available in WP 5.1 and WP 6.0 are zipped together (this is why the filenames on the following table are the same). When these files are downloaded and "unzipped," you will have a version with the extension ".WP5" and one with ".WP6".

Available Notebooks, Filenames and File Formats

Profile of the.....Industry	PC WP 5.1	PC WP 6.1	Macintosh Word 5.1a/WP2.0
Dry Cleaning	DRYCLNSN.ZIP	DRYCLNSN.ZIP	DRYCLNMA.WP2
Electronics and Computer	ELECMPSN.ZIP		ELECMPMA.WD5
Wood Furniture and Fixtures	WDFURNSN.ZIP		WDFURNMA.WD5
Inorganic Chemical	INRGCHSN.ZIP	INRGCHSN.ZIP	INRGCHMA.WP2
Iron and Steel	IRONSTSN.ZIP	IRONSTSN.ZIP	IRONSTMA.WP2
Lumber and Wood Products	LMBRWDSN.ZIP		LMBRWDMA.WD5
Fabricated Metal Products	FABMETSN.ZIP		FABMETMA.WD5
Metal Mining	METMINSN.ZIP		METMINMA.WD5
Motor Vehicle Assembly	MOTVEHSN.ZIP		MOTVEHMA.WD5
Nonferrous Metals	NFMETLSN.ZIP		NFMETLMA.WD5
Non-Fuel, Non-Metal Mining	NOMTMISN.ZIP		NOMTMIMA.WD5
Organic Chemical	ORGCHMSN.ZIP	ORGCHMSN.ZIP	ORGCHMMA.WP2
Petroleum Refining	PETREFSN.ZIP	PETREFSN.ZIP	PETREFMA.WP2
Printing	PRINTGSN.ZIP	PRINTGSN.ZIP	PRINTGMA.WP2
Pulp and Paper	PULPPASN.ZIP	PULPPASN.ZIP	PULPPAMA.WP2
Rubber and Plastic	RUBPLASN.ZIP		RUBPLAMA.WD5
Stone, Clay, Glass and Concrete	STCLGLSN.ZIP		STCLGLMA.WD5
Transportation Equipment Cleaning	TRNSEQSN.ZIP	TRNSEQSN.ZIP	TRNSEQMA.WP2

Note: Underlined files contain the highest quality format/graphics

STEP 3 CONTINUED - PROCEDURES FOR DOWNLOADING

- From the E$ Main Menu, select "D" to Download then hit ENTER/RETURN.
- Type in the Sector Notebook filename from above that you would like to select for downloading and hit ENTER/RETURN.
- The system will ask you to select a file transfer protocol. Select the file transfer protocol that matches what you have selected within your PC communications software (ZModem is recommended) and hit ENTER/RETURN. (Tip: ZModem users may also be allowed to enter more than one filename to download more than one document at a time. Simply continue to enter a new filename each time a new filename prompt appears on the screen. This option is disabled for other users.)
- At this point, you may
  - begin downloading by hitting ENTER/RETURN. This should begin the download if you are using the ZModem transfer protocol. If you don't see information on the screen showing the progress of the download, follow the next step.
- If the download does not begin after following the last step, you need to tell your communications software to start receiving the file. To do this, look for a "RECEIVE" icon or command on your communications software menu and activate it. This tells your software to begin the download.

- When the download is completed, a message will appear on the screen to confirm transmission.

- The downloaded file will appear in the folder or directory that you defined in your communications software.

- Repeat the above procedure to download other notebooks.

- Macintosh users can logoff using the [G]oodbye command from the main menu

- **THE FOLLOWING STEP MUST BE TAKEN BY ALL USERS THAT HAVE DOWNLOADED ZIPPED FILES (files with a ".ZIP" filename extension) FROM E$. MACINTOSH USERS CAN SKIP THIS STEP.**

  - **In order to read the zipped file(s) you have downloaded, you must download the decompression software required to "unzip" your files.** To download the decompression software, follow the same download instructions given above. Type in the filename "PKZ204G.EXE" and hit ENTER/RETURN. You only need to download this file to your hard drive once.

- Logoff using the [G]oodbye command from the main menu.

- To end the phone connection, the user should use the "hang up" or "terminate call" option provided with your communications software.

STEP 4 DECOMPRESSING ".ZIP'D" DOWNLOADED FILES (PC Only - Macintosh files do not need to be decompressed)

After you have downloaded a compressed (".ZIP") file to your PC, you must decompress it to its original format and size by using the "PKUnzip" file which you downloaded at the beginning of Step 3. The file which you downloaded; "PKZ204G.EXE", contains PKZip.EXE and PKUnzip.EXE files. PKUNZIP will decompress the file, returning it to its original size and format as if it had never been compressed or transmitted over the BBS. To use the PK commands (pkunzip.exe & pkzip.exe), you must be at the DOS prompt (third-party software interfaces exist for Windows). For details on how to use either command, simply type the command at the DOS prompt (without any parameters, i.e., just type "PKUNZIP") and hit ENTER/RETURN. Since parameters are required for the PKs to work they will automatically go into help mode and give you a brief explanation of how they work. If a user needs more direction, there is full documentation included in the PKZ204G.EXE in the "Hints" file.

To decompress any file, use PKUNZIP.EXE by taking the following steps:

- Go to the DOS C: prompt and type PKUNZIP.EXE; then,

- Type "PKUNZIP [Filename]" (e.g., the filename and the path of the compressed file you wish to decompress).

  NOTE: after the paired files are unzipped, two files will exist, one with the extension ".WP5" and one with the extension ".WP6.

C. COMMENTING OR PROVIDING ADDITIONAL INFORMATION ON THE SECTOR NOTEBOOKS VIA E$BBS

Comments on the Sector Notebooks, or supplemental documents of interest can be uploaded to the Enviroene BBS. Follow upload instructions that appear on the screen, or look at the instructions for compressing and uploading documents. The instructional documents are listed below under Section D of this Appendix. All documents that you upload will be publicly accessible, and should contain a short abstract (less than 50 words) that describes the document. It is recommended that this abstract contain the words "Sector Notebook Comments," the title of the Notebook that the comments are directed toward, and the words "SIC <<Insert applicable 2-digit SIC code>>".

> **NOTE:** To help the system operator know what you've uploaded and where it should be put within the BBS, it is helpful to send a message to the system operator. Before logging out of E$, you will be given the option to comment to the system operator (Sysop). Please indicate what files you have sent, and that the comments or supplemental documents should be placed in Directory 51 - "Sector Compliance Information and Notebooks." Messages can also be sent to the Sysop from the main menu using the Message option.

D. ADDITIONAL RESOURCE DOCUMENTS AVAILABLE ON E$BBS

The following files can be viewed from the "Bulletins" section of E$BBS main menu. To receive these documents electronically, the files can be downloaded (and viewed) from Directory #160 (utilities). If you would like to download these files, follow the same procedures that are outlined (Section C). The directions for direct dial modem users are different than the directions for EPA LAN users. How you have accessed the E$BBS determines which of the paired files below that you should follow.

Entered E$ via Modem	Entered E$ EPA LAN	Description of File
CONREGWP.TXT	CNREGLAN.TXT	How to Connect and Register on the E$BBS via Modem
FINDVIEW.TXT	FNDVWLAN.TXT	Finding and Viewing Files from E$BBS via Modem
CONVCOMP.TXT	CVCMPLAN.TXT	Converting, Compressing & Uncompressing Files via Modem
DNLDTXWP.TXT	DNLTXLAN.TXT	Flagging and Downloading "Uncompressed" Files from E$BBS
DNLDZPWP.TXT	DNZPLAN.TXT	Flagging and Downloading "Compressed" Files from E$BBS
UPLOADWP.TXT	UPLDLAN.TXT	Directions for Uploading Files via Modem to the E$BBS
SNHOWTO.TXT	SNHOWLAN.TXT	Contains this document "Appendix A - Downloading Instructions"

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