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Foreword

Numerous activities take place at salvage yards every day from reusing parts to storage, recycling of material, metal fabricating, equipment maintenance and much more. The State of Delaware, Department of Natural Resources and Environmental Control (DNREC), Hazardous Waste Management Branch (HWMB) recognizes the importance of these operations and the valuable service they provide to their communities. However, salvage operations also produce or generate waste that requires disposal. This manual was produced to provide guidance for handling or recycling waste fluids, scrap metal, machinery, equipment, and vehicles.

DNREC would like to thank the following organizations for the information they provided:

Delaware Auto and Truck Recyclers Assoc.

James Environmental Management, Inc.

Minnesota Pollution Control Agency

North Carolina Pollution Prevention Program

And the following State of Delaware, Department of Natural Resources and Environmental Control Divisions and Programs:

Division of Air and Waste Management

Division of Water Resources

Business and Permitting Services, Pollution Prevention Program

As well as the many individuals who attended our seminars and provided comments on the manual.

Our goal is to provide the resources that operators need in order to stop pollution and protect the environment from hazardous constituent releases to air, soil, and water. This document was written strictly for guidance and may not include sections specific for your facility. If you have regulatory questions concerning the handling of solid and hazardous waste, please contact the Solid and Hazardous Waste Management Branch at (302) 739-3689.



CHAPTER ONE

Operation Guidelines

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Material Receipt and Inspection

As an owner or operator of a salvage operation, you will want to provide protection for your facility from spills and releases of hazardous constituents. Protection can be accomplished by performing an inspection of the material being brought on to your site. Proper handling ensures that you have taken every possible measure to identify and consider the method necessary to recycle or properly dispose of the material for a final product. If the material contains hazardous waste, you should not accept it if you are unable or unfamiliar with how to dispose of the hazardous waste properly. A generated waste or a product destined for disposal is a hazardous waste if it exhibits one of these characteristics: ignitability, reactivity, corrosivity, or toxicity. For example, do not accept old underground storage tanks for scrap unless they have been certified as non-explosive and the sludge and fuels have been removed. Fuel and organic sludge may be considered hazardous wastes because they represent an ignitable hazard. You should consider every possible material in your operation and ways to prevent it from having a negative impact on the environment. You should ensure hazardous materials are handled properly in accordance with the *Delaware Regulations Governing Hazardous Waste*. Once you have taken the material on-site, the responsibility for the material shifts from the supplier to the operator. You, the operator, will also want to keep records on the supplier of the material. Table 1 -- Summary of Potential Environmental Concerns provides an overview of how different materials found in your operations may adversely effect the environment.

As an operator, you will want to inspect all arriving material, equipment, or vehicles for leaking fluids and then stabilize the leaks until further handling can take place. You will need to determine the type and quantities of wastes encountered and determine the proper disposal method. Table 2 -- Storage Methods for Common Hazardous Wastes consists of a list of materials, proper characterization, and disposal methods. After the wastes are determined, you will need to decide if your facility can handle the wastes and still profit from the materials that will be resold. If unsure of the category or disposal method for a particular waste, you may wish to contact the material supplier or DNREC's Hazardous Waste Helpline at (302) 739-3689.

Note: Hazardous materials are contained in refrigeration type appliances including air conditioners, refrigerators, and freezers.

Handling

A. Draining, Dismantling and Storage Practices for Equipment

Waste-fluid spills are most likely to occur while you are dismantling, draining, or storing equipment and vehicles. Proper dismantling, draining and storage procedures help prevent pollution, such as fluids seeping into soils, ground water, surface water and/or air-conditioning refrigerant escaping into the air. To avoid spills you should consider implementing the following:

1. Dismantle equipment or material on a curbed, coated or lined, concrete surface with spill controls, such as drip pans and absorbent materials. Concrete is porous and should be sealed

with an epoxy coating or oil resistant lining. See Appendix memorandum by EPA “Concrete Liners for Hazardous Waste Tank Systems.”

2. Drain fluids and store in properly labeled storage containers immediately after draining. If draining is done outdoors, make sure the area is covered to prevent rainwater from collecting and surface water run-off from occurring.
3. Store wastes in a closed container until the wastes can be recycled, reclaimed, or disposed of properly.

Note: Dielectric oils may contain Polychlorinated Biphenyl compounds (PCB's) and are dually regulated. The operator must contact the HWMB at (302) 739-3689 and EPA Region III at (215) 814-2132.

Additional Information can be found in the Appendix. See the following documents:

Pollution Prevention Guide for Metal Fabricators
Delaware Hazardous Waste Regulations and You

B. Draining, Dismantling and Storage Practices for Vehicles

Draining and Dismantling of vehicles involves many different types and quantities of waste fluids that have the potential to impact the environment if not managed appropriately. This section discusses step by step management practices for Fuel Tanks, Radiators and Heater Cores, Engines and Transmissions.

1. Dismantle vehicles, parts and cores on a curbed, coated or lined, concrete surface with spill controls, such as drip pans and absorbent materials. Concrete is porous and should be sealed with an epoxy coating or oil resistant lining. See Appendix memorandum by EPA “Concrete Liners for Hazardous Waste Tank Systems.”
2. Drain fluids and place in properly labeled storage containers immediately after draining. If draining is done outdoors, make sure the area is covered to prevent rainwater from collecting and surface water run-off from occurring.
3. Recycle, reuse, or dispose of fluids in an appropriate manner. See **Table 2 – Storage Methods for Common Hazardous Waste.**
4. Remove fuel tank as soon as possible after vehicles enter the facility. See Section on **Fuel Tank Removal**, page 6.
5. Remove battery. Recycle battery at an appropriate facility. See **Lead – Acid Batteries** in Chapter 2.
6. Deploy Airbags if they are not going to be removed to be resold. See **Airbag Disposal** in Chapter 2 and Appendix Article on **Disposal of Airbags in Scrap Vehicles.**
7. Drain Antifreeze from Radiators or Heater Cores. See Section on **Radiator and Heater Core Removal**, page 6.
8. Remove Refrigerant CFC's. This procedure must be completed by certified personnel. See Table 2 and Appendix for EPA article on **Recovering Refrigerants at Salvage yards.**
9. Drain engine oil. See Section on **Engine Removal**, page 7.
10. Drain Transmission Fluid. See Section on **Transmission Removal**, page 7.

11. Store Engines, Transmissions and other parts in an area where spills and polluted run-off can be easily controlled, such as in a covered container or on a covered and curbed, coated or lined, concrete surface with spill controls, including drip-pans and absorbents.
12. Any secondary spill containment area must be large enough to contain the maximum volume of fluid that could be spilled from the largest storage container in the containment area. If draining and dismantling is done outdoors, the work area should be covered to keep rainwater from collecting and to prevent contaminated runoff from rain and melting snow.

Figure 1. Vehicle fluids draining into tanks in an area with curbed concrete surface for secondary containment

FUEL TANK REMOVAL

1. Drain and remove fuel tanks as soon as possible. Use one of the following draining methods:
 - Remove tank from vehicle and pump or pour fuel into storage tank or container;
 - Use an air-driven pump to remove and drain fuel into a storage container; or
 - Remove plug where sensor and gas line enter the tank and drain the fuel in a storage container.
2. Follow these safety precautions:
 - Do not store** undrained fuel tanks because they are a fire/explosion hazard.
 - Do not use electric pumps** to remove fuel. Sparks may ignite fuel vapors.
 - Do not crush** vehicles unless the fuel tank has been removed.
 - Do not mix** waste fuel or usable fuel with other waste fluids.

3. Clearly label all fuel storage containers. For example, if the fuel is contaminated or mixed with hazardous waste, label the fuel as “Hazardous Waste - Fuel.” If fuel is usable, label container as “Usable Fuel or Good Fuel.” See Chapter 2 - Fuels.
4. Empty tanks should be stored outdoors and in such a way that the tank can ventilate and not accumulate precipitation.

RADIATOR AND HEATER CORE REMOVAL

1. Drain antifreeze from radiators and heater cores as soon as possible after vehicles enter the facility. Place drip pans under radiators and heater cores while draining.
2. Cut hoses with a side cutter. Plug the ends of all hoses.
3. Store antifreeze in a labeled container for recycling or disposal. Test results have shown that used antifreeze often contains lead, benzene, and other contaminants at levels that make it hazardous. See Chapter 2 – Antifreeze, page 13.
4. Remove drained radiators and heater cores on a curbed coated or lined, concrete surface with spill controls, including drip pans and absorbents. If draining outdoors, make sure the area is covered to keep rainwater from collecting and prevent contaminated run-off from rain and melting snow.
5. Store radiators and heater cores in a leak-proof container or on a covered and curbed, coated or lined, concrete surface with spill controls, including drip pans and absorbents.
6. Recycle used radiators and heater cores regularly.

Figure 2. Storage for cores and other parts with curbed concrete surface for secondary containment

ENGINE REMOVAL

1. Drain engine oil. It should be drained to prevent oil from leaking out of vents and plugs during storage. See Chapter 2 – **Used Oils**, page 22.
2. Leave dipsticks in engine and tighten all bolts and plugs to prevent leaking of any fluid left in the engine.
3. Store engines and other parts in an area where spills and polluted run-off can be easily controlled, such as in a covered container or on a covered and curbed, coated or lined concrete surface with spill controls, including drip-pans and absorbents.

TRANSMISSION REMOVAL

Transmission fluid is difficult to remove and spills are a very common problem. Up to eight quarts of fluid can be drained from a car's transmission. Extra care should be taken to properly drain transmissions so that spills do not occur.

1. Drain transmissions before crushing vehicles. This should be done on a curbed, coated or lined concrete surface with spill controls, including drip pans and absorbents. If the draining area is outdoors, it should be covered to prevent rainwater from collecting and to prevent contaminated run-off from polluting rain and melting snow. Drain transmissions on a draining rack, over a drip pan, or use a funnel to drain fluids directly into a storage container. Drain transmissions before crushing vehicles.
2. Drain transmissions by either removing the transmission drain plug or if necessary by drilling a hole in the pan. Replace the pan after draining and seal holes. Self-drilling or self-tapping screws work well for drilling drain holes because they can be used to easily re-plug holes. Sealing holes stops leaking of fluids that may be left after draining.
3. Leave dipsticks in transmissions and tighten all bolts on the oil pan to prevent leaking of any fluid left in the transmission.
4. Leave drive-shaft yokes on transmissions to prevent leaks.
5. Waste transmission fluid can be considered used oil and may be stored with other used oils in accordance with the used oil regulations. See Chapter 2 – **Used Oil**, page 22.
6. Removing all of the fluid from transmissions is very difficult. For this reason, it is important to store drained transmissions in a leak-proof storage container. Also, transmissions can be stored on a covered and curbed, coated or lined concrete surface to capture leaks, as well as to prevent run-off from rainwater and melting snow.
7. Remove and drain torque converters when removing transmissions. Torque converters are difficult to drain because of their round shape. They should be tipped at different angles to remove as much fluid as possible. Plug torque converters to prevent leaks.
8. Seal all fluid lines after draining so they do not leak. Metal lines can be crimped or bent; rubber hoses can be plugged with clamps, balls, or golf tees.

Note: Drain differential fluid on all rear-wheel and four wheel drive vehicles. There are approximately one to two quarts of differential fluid that should be stored and recycled with used oils.

C. Vehicle Crushing

After all the fluids have been removed, the vehicle should be crushed on a coated or lined concrete pad or surface with spill controls including drip pans and absorbents. Any liquid wastes that drain from crushing onto the pad should be drained into a sump or oil/water separator and the material managed with the used oils. You will want to ensure that the contract crushers you hire clean the crusher regularly by wiping off accumulated oil and grease and removing dirt and debris from the crushing area. This prevents pollution run-off caused by rain or melting snow. See Figure 3 for an example of good management practices for a crusher.

Figure 3. Good Management Practice for Crusher

D. Washing of Vehicles, Equipment, or Material

If your facility washes cars, truck engines, etc., outdoors, you will need to obtain a permit from the Division of Water Resources for discharges to ground water and surface water. The State of Delaware, DNREC, Surface Water Discharge Section can be reached in Dover by calling (302) 739-5731.

E. Parts Cleaning

Parts cleaning can involve several different processes. Cleaning should begin by manually scraping the parts which can then be treated with chemical or physical processes for reconditioning. Cleaning processes may include Solvent-based parts washers, Caustic Cleaning Solution Dip Tanks, Pressure Washing, Sand Blasting and others. Some processes produce wastes that if not managed properly can potentially threaten ground water and surface water as well as present a hazard for employees. If your facility generates Parts Cleaning waste which are not being serviced by a Delaware Hazardous Waste Transporter, please contact the State of Delaware, DNREC, Solid and Hazardous Waste Management Branch at (302) 739-3689 to discuss methods to handle these wastes effectively and efficiently. Table 3 - **Recyclers and**

Equipment Resource List, page 27, provides information on some contractors which recycle and clean parts washers.

Additional Information may be found in the Appendix. See the following documents:

A Pollution Prevention Guide For Automotive Repair Shops

Recovering Refrigerant at Salvage Yards and Other Motor Vehicle Disposal Facilities

Managing Automotive Maintenance and Repair Waste

Delaware Hazardous Waste Regulations and You

Table 1. Summary of Potential Environmental Concerns^[1-12]

ISSUE	SOURCE	CONCERN
pH	Exposure of materials during maintenance, storage or handling. Acids/Alkaline washes may cause extreme pH in storm water runoff.	<ul style="list-style-type: none"> ● Can increase toxicity due to chemical imbalance of surface waters
Total Suspended Solids / Sediments	Parking lots, work areas, erosion	<ul style="list-style-type: none"> ● Can kill finfish/shellfish through abrasive injury or clogging of gills and respiratory passages ● May contain mobile toxic substance ● Can cause visible cloudiness in surface water ● Screens out light and contributes to lack of oxygen ● Smothering of bottom habitat / Silts can restrict organism movement
Toxic Organics	Solvents, cleaners, pesticides	<ul style="list-style-type: none"> ● Potential lethal and/or contribution to long term toxicity in surface water and/or in bottom sediments
Oil & Grease Petroleum Hydrocarbons	Drips off mechanical equipment can contaminate storm water runoff Refueling activities	<ul style="list-style-type: none"> ● Toxic to aquatic organisms ^[1] ● Adds toxicity to stream bottom sediments
Metals	Present in fuels, used motor oil, used transmission fluid, brake pad wear, used coolant Removal of rust, scale and polishing Particles created during moving, shredding, crushing or grinding	<ul style="list-style-type: none"> ● Potential lethal and/or contribution to toxicity in surface water and/or stream bottom sediments

Glycols	Antifreeze	● Potential oxygen demand on surface water and/or toxicity in surface water and/or stream bottom sediments
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Table 2. Storage Methods for Common Hazardous Wastes.

Material	Type Of Waste	Type of Storage	Additional Information
Antifreeze	Poisonous	Approved DOT Container	Reclaim and Reuse. See Appendix on Antifreeze Recycling.
Airbags (Sodium Azide)	Potential hazard until removed or deployed	Store removed airbags indoors. Deployed airbags can be crushed with vehicle.	See Appendix for Disposal of Air Bags in Scrap Vehicles
Lead - Acid Batteries	Hazardous	Store in appropriate container	Recycle at appropriate Treatment, Storage and Disposal Facility
Brake Fluid	Used Oil ¹	Approved DOT Container	Recycle with Used Oils. See list of used oil transporters on Table 3 and in Appendix.
Fuel	Hazardous ²	Approved DOT Container	Reuse at Facility or dispose of appropriately. See list of Hazardous Waste Transporters on Table 3 and in Appendix.
Hydraulic Oil/ Fluid	Used Oil ¹	Approved DOT Container	Recycle with Used Oils. See list of used oil transporters on Table 3 and in Appendix.
Motor Oil	Used Oil ¹	Approved DOT Container	Recycle with Used Oil. See list of used oil transporters on Table 3 and in Appendix.
Refrigerant	Regulated Waste	Requires special equipment and certified technician. DOT or UL approved Tank	See Appendix for EPA Article on Recovering Refrigerant at Salvage Yards
Solvents	Hazardous	Approved DOT Container	Recycle and reuse. See Table 3 for recyclers.
Transmission Fluid	Used Oil ¹	Approved DOT Container	Recycle with Used Oils. See list of used oil transporters on Table 2 and in Appendix.
Window Cleaner	NonHazardous	Approved DOT Container	Recycle and reuse

¹Oil based materials can be combined with used motor oils and then considered nonhazardous, if materials will be sent to recyclers.

² Fuel destined for disposal is often considered a hazardous waste. If fuel is recycled at a processor/re-refiner, the fuel may be managed similar to used oil.

References For Table 1. – Summary on Potential Environmental Concerns

- [1] USA Environmental Protection Agency, 1978. Guidance Development Document - Effluent Limitations Guidelines & New Source Performance Standards for Concrete Products Point Source Category. Washington, D.C.
- [2] Delaware Department of Natural Resources and Environmental Control (DE DNREC), 1989. DE Erosion and Sediment Control Handbook, Division of Soil and Water Conservation, Dover, DE.
- [3] US Environmental Protection Agency, 1994. National Water Quality Inventory - 1992 Report to Congress. Office of Water, Washington, D.C. (March).
- [4] Schueler, R. Thomas, 1987. Controlling Urban Runoff: A Practical Manual For Planning and Designing Urban BMPs. Department of Environmental Programs, Metropolitan Washington Council of Governments, Washington, D.C.
- [5] Terrene Institute, 1994. Fundamentals of Urban Runoff Management: Technical and Institutional Issues. , Washington, D.C.
- [6] U.S. Environmental Protection Agency, 1990. Motor Freight Terminals/Railroad Transportation (Industry Overview). RCRA/Superfund Programs, Washington, D.C.
- [7] Maryland Department of the Environment, 1992. Individual NPDES Permit for D.J. Joseph Co. Baltimore, Maryland.
- [8] Cardwell, Rick. D. 1982. Water Quality Biological Implications in Pacific Northwest Marinas. Boating and Moorage in the '80's. A Washington Sea Grant Publication, University of Washington, Seattle. pp. 96 -106. {referenced in: Economic Analysis of Coastal Nonpoint Source Controls: Marinas (draft report), U.S. Environmental Protection Agency, Non Point Source Control Branch, Washington, DC 1992. }
- [9] USEPA, 1990. Motor Freight Terminals/Railroad Transportation. United States Environmental Protection Agency, Resource Conservation and Recovery Act (RCRA) Section, Washington, DC.
- [10] U.S. Environmental Protection Agency, 1984. Composition and Management of Used Oil Generated in the United States, Environmental Protection Agency Office of Solid Waste and Emergency Response, Washington, DC.
- [11] Livingston,E. and McCarron,E. , (undated). Stormwater Management: A Guide for Floridians. Florida Department of Environmental Regulation, Stormwater/Nonpoint Source Management, Tallahassee, Florida.

- [12] Horner,R., Skupien,J., Livingston,E. and Shaver,E., 1994. Fundamentals of Urban Runoff Management: Technical and Institutional Issues. Terpine Institute, Washington, D.C.