

Pesticide End-Users/Application Services

Industry Overview

Not all pesticide use generates hazardous waste. If, however, you dispose of pesticides or pesticide containers, clean pesticide application equipment, or contaminate soils with pesticides, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste. Farmers using pesticides are exempt from most RCRA provisions, including preparation of a Manifest, provided that pesticide containers are triple rinsed and the rinse solution is either used or disposed of on their own farms in accordance with the pesticide label instructions.

Several industries are included in the *pesticide end-users/application services* category:

- Agricultural pesticide application services
- Lawn, garden, and tree services
- Disinfecting and structural pest control services
- Arboreta, botanical, and zoological gardens and forestry operations
- Public golf courses and other facilities regularly using pesticides.

Hazardous Wastes Generated by Pesticide End-Users and Applications

Many pesticides are commonly used in applications ranging from protection of food and structures to pest and disease control in home gardens. Pesticides can be harmful if not mixed and disposed of in accordance with EPA-approved pesticide label instructions. Several types of wastes from pesticide end-users and applicators are common:

Rinsewater - Solutions used to rinse application equipment and product containers

Empty Containers - Containers that retain pesticide residues (unless triple rinsed)

Unused Pesticides - Unusable or unidentifiable material

Contaminated Soil - Soil or other material contaminated from spills.

Some very dilute rinsewater or soils contaminated with very low pesticide concentrations might not be hazardous, but should be treated as hazardous waste unless known to be nonhazardous from label information, chemical analysis, or another reliable

source. Pesticide containers that are triple rinsed are not hazardous waste, although the rinse solution might be hazardous. Some pesticide formulations contain solvents or other material that make the pesticide solution an ignitable or toxic hazardous waste.

Table 1 summarizes possible waste types from pesticide application. If you generate more than 100 kilograms (220 pounds or about half of a 55-gallon drum) of hazardous waste per month, you must complete a Uniform Hazardous Waste Manifest when shipping your wastes. The Manifest requires the DOT (Department of Transportation) description of the waste including shipping name, hazard class, and UN/NA ID number. This information can be found in Table 2 for some wastes associated with pesticide use.

To assess whether RCRA requirements are applicable, the entire weight of each waste (e.g., the weight of any contaminated soil), not just the weight of the pesticide, is considered. Regardless of the quantity generated, pesticide waste should be disposed of according to EPA-approved pesticide container label instructions. Table 1 and Table 2 are not comprehensive lists. If you suspect that you generate a hazardous waste that is not listed, contact your state hazardous waste management agency or EPA Regional office for assistance.

Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

Table 1
Typical Pesticide End Users/Application Services Operations:
Materials Used and Hazardous Wastes that Might be Generated

Process/ Operation	Materials Used	Typical Material Ingredient	General Types of Waste Generated
Pesticide Application	Pesticides, solvents	Arsenic, carbamates, mercury, nicotine, nitrophenols, strychnine, triazine, thallium sulfate, phenoxy, organochlorides, others (see Table 2)	Used/unused pesticides Solvent wastes Ignitable wastes Contaminated soil (from spills)
Cleanup	Rinses, solvents, rags	Alcohols, toluene, benzene, xylene, solvent mixtures	Contaminated rinsewater Empty containers Solvent wastes

Table 2
Pesticide End-Users/Application Services Formulators Waste Descriptions¹

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
PESTICIDES CONTAINING ARSENIC*				
Arsenic pentoxide	Arsenic Acid Anhydride, Arsenic (v) Oxide	Waste Arsenic Pentoxide, Solid	Poison B	UN1559
Arsenic trioxide	Arsenic Sesquioxide, Arsenic (III) Oxide, Arsenous Acid (anhydride), White Arsenic	Waste Arsenic Trioxide, Solid	Poison B	UN1561
Cacodylic acid	Hydroxydimethylarsine Oxide, Dimethylarsinic Acid, Phytar	Waste Arsenical Pesticide, Solid, NOS ² Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid ³	UN2759 UN2759 UN2760
Monosodium methanearsonate	MSMA, Ansar 170 H.C. and 529 H.C., Arsanote Liquid, Bueno 6, Daconate 6, Dal-E-Rad, Herb-All, Merge 823, Mesamate, Monate, Tans-Vert, Weed-E-Rad, Weed-Hoe	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
Disodium monomethanearsonate	DSMA, Ansar 8100, Arrhenal, Arsinyll, Dinat, Di-Tac, DMA, Methar 30, Sodar, Versar DSMA-LQ, Weed-E-Rad 360	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760
PESTICIDES CONTAINING CARBAMATES				
Temik	Aldicarb, OMS 771, UC 21149	Waste Carbamate Pesticide, Solid, NOS Waste Carbamate Pesticide, Liquid, NOS Waste Carbamate Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2757 UN2757 UN2758
PESTICIDES CONTAINING MERCURY*				
2-Methoxyethylmercuric chloride	MEMC, Agallol, Cekusil Universal-C, Ceresan-Universal-Nassbeize, Emisan 6	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778
Phenylmercuric acetate	PMA, PMAS, Agrosan, Cekusil, Celmer, Gallotox, Hong Nien, Liquiphene, Mersolite, Pamisan, Phix, Seedtox, Shimmer-ex. Tag HL 331	Waste Mercury Based Pesticide, Solid, NOS Waste Mercury Based Pesticide, Liquid, NOS Waste Mercury Based Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2777 UN2777 UN2778
PESTICIDES CONTAINING NICOTINE				
Nicotine	Black Leaf 40	Waste Poison B, Solid, NOS Waste Poison B, Liquid, NOS Waste Flammable Liquid, Poisonous, NOS	Poison B Poison B Flammable Liquid	UN2811 UN2810 UN1992
PESTICIDES CONTAINING SUBSTITUTED NITROPHENOLS				
Dinitroresol	DNC, DNOC, Chemsect, Detal, Elgetol 30, Nitador, Selinin, Sinox, Trifocide, Trifrina	Waste Substituted Nitrophenol Pesticide, Solid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2779 UN2779 UN2780

Table 2 (continued)
Pesticide End-Users/Application Services Formulators Waste Descriptions¹

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
OTHER PESTICIDES				
Thiram	TMTD, AAtack, Arasan, Aules, Evershield T Seed Protectant, Fermide 850, Fernasan, Flo Pro T Seed Protectant, Hexathir, Mercuram, Nomersan, Pomarsolforte, Polyram-Ultra, Spotrete-F, Tetrapom, Thimer, Thioknock, Thiotex, Thiramad, Thirasan, Thiuramin, Tirampa, Trametan, Tripomol, Thylate, Tuads, Vancide TM	Waste Thiram Waste Flammable Liquid, Poisonous, NOS	ORM-A Flammable Liquid	NA2771 UN1992
Warfarin	Co-Rax, Cov-R-Tox, Kypfarin, Liqua-Tox, RAX, Rodex, Rodex Blox, Tox-Hid	Hazardous Waste, Solid NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Pentachlorophenol*	PCP, Penta, Penchlorol, Pentacon, Penwar, Sinituho, Santophen	Waste Pentachlorophenol Waste Flammable Liquid Waste Combustible Liquid	ORM-E Flammable Liquid Combustible Liquid	NA2020 UN1993 NA1993
Pentachloronitrobenzene	PCNB, Avicol, Botrilex, Brassicol, Earthcide, Folosan, Kobu, Pentagen, Saniclor 30, Terraclor, Tilcarex, Tritisan	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Hexachlorobenzene*	Perchlorobenzene, Anticarie, Ceku C.B., HCB, No Bunt	Hazardous Waste, Solid NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
1,2-Dibromo 3-chloropropane	DBCP, Nemaforme, Nemanox, Nemaset, Nematocide	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
IGNITABLE AND/OR TOXIC SOLVENTS USED IN PESTICIDES				
Methyl Alcohol	Methanol	Waste Methyl Alcohol	Flammable Liquid	UN1230
Ethyl Alcohol	Ethanol, Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1170
Isopropyl Alcohol	Isopropanol	Waste Isopropanol	Flammable Liquid	UN1219
Toluene	Methyl benzene, Toluol	Waste Toluene, (toluol)	Flammable Liquid	UN1294
Xylene	Dimethylbenzene, Xylol	Waste Xylene (xylol)	Flammable Liquid	UN1307
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Benzene*	Benzol	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Tetrachloroethylene*	Perc, Perclene, Tetralex, Nema, Tetracap, Persec, Antisal 1, Perawin, Didakene	Waste Tetrachloroethylene	ORM-A	UN1897
Solvent Mixtures		Waste Combustible Liquid, NOS (flash point between 100°F and 200°F) Waste Flammable Liquid, NOS (flash point less than 100°F)	Combustible Liquid Flammable Liquid	NA1993 UN1993

Table 2 (continued)
Pesticide End-Users/Application Services Formulators Waste Descriptions¹

Pesticides and Herbicides/Repellent Services Formulation Trade Descriptions				UN/NA ID Number
Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	
Silvex*	2,4,5-Fenoprop, AquaVex, Double Strength, Fruitone T, Kuron, Kurosai, Silvi-Rhap, Weed-B-Gone	Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid	ORM-A	NA2765
		Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid Ester	ORM-E	NA2765
		Waste Phenoxy Pesticide, Liquid, NOS	Flammable Liquid	UN2766
ORGANOCHLORINE PESTICIDES				
Aldrin	HHDN, Aldrex 30, Aldrite, Aldrosol, Altos, Drinox, Octalene, Seedrin Liquid	Waste Aldrin	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with more than 65% Aldrin)	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with 65% or less Aldrin)	ORM-A	NA2761
		Waste Aldrin Mixture, Liquid (with more than 60% Aldrin)	Poison B	NA2762
		Waste Aldrin Mixture, Liquid (with 60% or less Aldrin)	ORM-A	NA2762
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Chlordane*	Belt, Chlordan, ChlorKil, Chlortox, Corodane, Gold Crest C-100, Kypchlor, Vesicol 1068, Topiclor 20, Nitan, Octachlor, Octa-Klor, Orhto-Klor, Synklor, Termi-Ded	Waste Chlordane, Liquid	Flammable Liquid	NA2762
		Waste Chlordane, Liquid	Combustible Liquid ⁴	NA2762
DDT	Dedelo, Didimic, Digmar, Genitox, Gyron, Hildit, Kopsol, Neocid, Pentachlorin, Rukseam, Zerdane	Waste DDT	ORM-A	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Dichloropropene	1,3-Dichloropropene, Telone II Soil Fumigant	Waste Dichloropropene	Flammable Liquid	UN2047
Dieldrin	Dieldrex, Dieldrite, Octalox, Panoram D-31	Waste Dieldrin	ORM-A	NA2761
		Waste Organochloride Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Endrin*	Endrex, Hexadrin	Waste Endrin	Poison B	NA2761
		Waste Endrin Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Endosulfan	Beosit, Chlorthiepin, Crisulfan, Cyclodan, Endocel, EnSure, FMC 5462, Hildan, Hoe 2671, Malix, Thifor, Thimul, Thiodan, Thiofor, Thionex, Thiovel	Waste Endosulfan	Poison B	NA2761
		Waste Endosulfan Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Heptachlor*	Gold Crest H-60, Drinox H-34, Heptamul, Heptox	Waste Heptachlor	ORM-E	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Kepone	Chlordecone, GC 1189	Waste Kepone	ORM-E	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Lindane*	Exgama, Forlin, Gallogama, Gamaphex, Gammex, Inexit, Isotox, Lindafor, Lindagam, Lindagrain, Lindagranox, Lindalo, Lindamul, Lindapoudre, Lindaterra, Novigam, Silvanol	Waste Lindane	ORM-A	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Methoxychlor	Flo Pro MeSeed Protectant, Marlate	Waste Methoxychlor	ORM-E	NA2761
		Waste Organochlorine Pesticide, Solid, NOS	Poison B	UN2701
		Waste Organochlorine Pesticide, Liquid, NOS	Poison B	UN2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Propylene Dichloride	1,2-Dichloropropane	Waste Propylene Dichloride	Flammable Liquid	UN1279
Toxaphene*	Attac 4-2, 4-4, 6, 6-3, 8, Camphochlor, Motox, Phenacide, Phenatox, Strobane T-90, Toxakil, Toxon 63	Waste Toxaphene	ORM-A	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762

Table 2 (continued)
Pesticide End-Users/Application Services Formulators Waste Descriptions¹

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Dinoseb	DNBP, Basanite, Caldon, Chemox General, Chemox PE, Dinitro, Dinitro General, Dynamite, Elgetol 318, Gebutox, Hel-Fire, Nitropone C, Premerge 3, Sinox General, Subitex, Vertac General Weed Killer, Vertac Selective Weed Killer	Waste Substituted Nitrophenol Pesticide, Solid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Flammable Liquid	UN2780
ORGANOPHOSPHATE PESTICIDES				
Dimethoate	AC-12880, Bi 58 EC, Cekuthoate, Cygon, Daphene, De-Fend, Demos-L40, Devigon, Dimet, Dimethogen, Perfekthion, Rebelate, Rogodial, Rogor, Roxion, Trimetion	Waste Organophosphorus Pesticide, Solid, NOS Waste Organophosphorus Pesticide, Liquid, NOS Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2783 UN2783 UN2784
Disulfoton	BAY 19639 and S276, Dithiodemeton, Dithiosystox, Di-Syston, Ethylthiodemeton, Frumin AL, M-74, Solvirex, Thiodemeton	Waste Disulfoton Waste Disulfoton Mixture, Dry Waste Disulfoton Mixture, Liquid Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 UN2784
Famphur	Bash, Bo-Ana, Dovip, Famfos, Warbex	Waste Organophosphorus Pesticide, Solid, NOS Waste Organophosphorus Pesticide, Liquid, NOS Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2783 UN2783 UN2784
Methyl Parathion	Cekumethion, E-601, Devithion, Folidol M, Fosferno M50, Gearphos, Metacide, Metaphos, Nitrox 80, Parataf, Paratox, Partron M, Penncap-M, Wofatox	Waste Methyl Parathion, Liquid Waste Methyl Parathion Mixture, Dry Waste Methyl Parathion Mixture, Liquid (containing 25% or less methyl parathion) Waste Methyl Parathion Mixture, Liquid (containing more than 25% methyl parathion) Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 NA2783 UN2784
Parathion	AC-3422, Alkron, Alleron, Aphamite, Bladan, Corothion, E-605, ENT 15108, Ethyl Parathion, Etilon, Folidol E-605, Fosterno 50, Niran, Orthophos, Panthion, Paramar, Paraphos, Parathene, Parawet, Phoskil, Rhodiattox, Soprathion, Station, Thiophos	Waste Parathion, Liquid Waste Parathion Mixture, Dry Waste Parathion Mixture, Liquid Waste Organophosphorus Pesticide, Liquid, NOS	Poison B Poison B Poison B Flammable Liquid	NA2783 NA2783 NA2783 UN2784
STRYCHNINE PESTICIDES				
Strychnine	Strychnine Salts	Waste Strychnine, Solid Waste Strychnine Salt, Solid	Poison B Poison B	UN1692 UN1692
THALLIUM SULFATE PESTICIDES				
Thallium Sulfate	Thalious Sulfate, Rattox, Zelio	Waste Thallium Sulfate, Solid Waste Flammable Liquid, Poisonous, NOS	Poison B Flammable Liquid	NA1707 UN1992
TRIAZINE PESTICIDES				
Amitrole	Amerol, Amino Triazol Weedkiller 90, Amizol, AT-90, AT Liquid, Azolan, Azole, Cytrol, Diurol, Farmco, Herbizole, Simazol, Weedazol, Weedazol TL	Waste Triazine Pesticide, Solid, NOS Waste Triazine Pesticide, Liquid, NOS Waste Triazine Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2763 UN2763 UN2764
PHENOXY PESTICIDES				
2,4-D*	Amoxone, Brush Killer, Brush Rhap, Chloroxone, Crop Rider, D50, DMA 4, Dacamine, Ded-Weed, Desormone, Dinoxol, Emulsamine BK and E3, Envert DT and 171, Hedonal, Miracle, Pennamine D, Rhodia, Salvo, Super D-Weedone, Verton, Visko-Rhap, Weed Tox, Wee-B-Gone, Weed-Rhap, Weedar, Weedone, Weedrol	Waste 2,4-Dichlorophenoxyacetic Acid Waste 2,4-Dichlorophenoxyacetic Ester Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid	NA2765 NA2765 UN2766
2,4,5-T	Brush-Rhap, Dacamine, Ded-Weedon, Esteron, Farmco Fence Rider, Forron, Inverton 245, Line Rider, Super D Weedone, Tormona, Transamine, U 46, Veon 245, Weedar, Weedone	Waste 2,4,5-Trichlorophenoxyacetic Acid Waste 2,4,5-Trichlorophenoxyacetic Acid (amine, ester, or salt) Waste Phenoxy Pesticide, Liquid, NOS	ORM-A ORM-E Flammable Liquid	NA2765 NA2765 UN2766

Table 2 (continued)
Pesticide End-Users/Application Services Formulators Waste Descriptions¹

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
OTHER WASTES				
Ignitable Wastes, NOS		Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
		Waste Combustible Liquid, NOS	Combustible Solid	NA1993
Hazardous Waste		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 NOS—Not otherwise specified.

3 A flammable liquid has a flash point below 100°F.

4 A combustible liquid has a flash point between 100°F and 200°F.