RCRA

Resource Conservation and Recovery Act

CONTINUING EDUCATION UNIT COURSE

Technical Learning College

Important Information about this Manual

This manual has been prepared to assist employees in the general awareness of dealing with the often-complex procedures and requirements for safely handling hazardous and toxic materials.

The scope of the problem of dealing with pollution is quite large, requiring a major effort to bring it under control. Employee health and safety, as well as that of the public, depend upon careful application of safe procedures and proper disposal methods. The manner in which we deal with pollution will affect the earth and its inhabitants for many generations to come.

This manual will cover general laws, regulations, required procedures and accepted policies relating to pollution control and waste disposal. It should be noted, however, that the regulation of pollution and hazardous materials is an ongoing process and subject to change over time. For this reason, a list of resources is provided to assist in obtaining the most up-to-date information on various subjects.

This manual is not a guidance document for employees who are involved with pollution control. It is not designed to meet the requirements of the United States Environmental Protection Agency (**EPA**), the Department of Labor-Occupational Safety and Health Administration (**OSHA**) or your state environmental or health departments.

This course manual will provide general guidance and could be used as a preliminary basis for developing general pollution prevention plans. This document is not a detailed industrial hygiene textbook or a comprehensive source book on occupational safety and health.

Technical Learning College, or Technical Learning Consultants, Inc. makes no warranty, guarantee or representation as to the absolute correctness or appropriateness of the information in this manual and assumes no responsibility in connection with the implementation of this information.

It cannot be assumed that this manual contains all measures and concepts required for specific conditions or circumstances. This document should be used for educational purposes only and is not considered a legal document.

Individuals who are responsible for the health and safety of the public or workers at hazardous waste sites should obtain and comply with the most recent federal, state, and local regulations relevant to these sites and are urged to consult with OSHA, the EPA and other appropriate federal, state and local agencies.

Course Description

Resource Conservation and Recovery Act (RCRA)

This CEU course will cover the fundamentals and basic requirements of Environmental Protection Agency, Resource Conservation and Recovery Act (**RCRA**), EPCRA and other waste disposal rules and regulations. This course is general in nature and not state specific but will contain different state and city waste reduction policies and ideas. You will not need any other materials for this course.

Audience - First Responders, HAZWOPER Refreshers, Waste Recovery**,** Water Distribution, Well Drillers, Pump Installers, Water Treatment Operators, and Wastewater Operators. The target audience for this course is the person interested in working in a water treatment/wastewater treatment or distribution facility, wishing to maintain CEUs for certification license, wanting to learn how to do the job safely and effectively, and/or to meet education needs for promotion.

Final Examination for Credit

Opportunity to pass the final comprehensive examination is limited to three attempts per course enrollment.

Course Procedures for Registration and Support

All of Technical Learning College's correspondence courses have complete registration and support services offered. Delivery of services will include, e-mail, web site, telephone, fax and mail support. TLC will attempt immediate and prompt service.

When a student registers for a distance or correspondence course, he/she is assigned a start date and an end date. It is the student's responsibility to note dates for assignments and keep up with the course work.

If a student falls behind, he/she must contact TLC and request an end date extension in order to complete the course. It is the prerogative of TLC to decide whether to grant the request. You may be required to pay $25.00. All students will be tracked by their social security number or a unique number will be assigned to the student.

Instructions for Written Assignments

The RCRA Awareness CEU training course will be a True/False type of an exam. TLC will require that the Answer Key is filled-out and preferably e-mailed or faxed to TLC.

Feedback Mechanism (examination procedures)

Each student will receive a feedback form as part of their study packet. You will find this form in the rear of the course or lesson.

Security and Integrity

All students are required to do their own work. All lesson sheets and final exams are not returned to the student to discourage sharing of answers. Any fraud or deceit and the student will forfeit all fees and the appropriate agency will be notified.

Required Texts
The RCRA Awareness course does not require any additional course materials. The course is complete.

Recordkeeping and Reporting Practices
TLC will keep all student records for a minimum of seven years. It is the student's responsibility to give the completion certificate to the appropriate agencies.

ADA Compliance
TLC will make reasonable accommodations for persons with documented disabilities. Students should notify TLC and their instructors of any special needs.

Course content may vary from this outline to meet the needs of this particular group.

Educational Mission

The educational mission of TLC is:

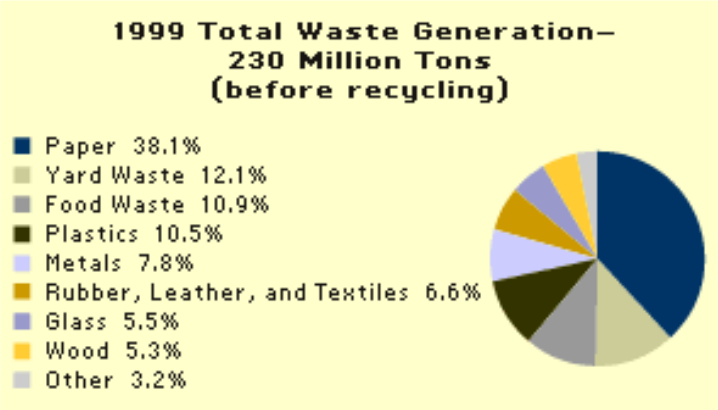
To provide TLC students with comprehensive and ongoing training in the theory and skills needed for the environmental and employment education field,

To provide TLC students with opportunities to apply and understand the theory and skills needed for a successful career,

To provide opportunities for TLC students to learn and practice environmental educational skills with members of the community for the purpose of sharing diverse perspectives and experience,

To provide a forum in which students can exchange experiences and ideas related to environmental and employment education,

To provide a forum for the collection and dissemination of current information related to employment education, and to maintain an environment that nurtures academic and personal growth.



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We teach this course in both a conventional classroom setting and in a distance-based CEU training course.

Common RCRA Acronyms

A&I: Alternative and Innovative (Wastewater Treatment System)
AA: Accountable Area; Adverse Action; Advices of Allowance; Assistant Administrator; Associate Administrator; Atomic Absorption
AAEE: American Academy of Environmental Engineers
AANWR: Alaskan Arctic National Wildlife Refuge
AAP: Asbestos Action Program
AAPCO: American Association of Pesticide Control Officials
AARC: Alliance for Acid Rain Control
ABEL: EPA's computer model for analyzing a violator's ability to pay a civil penalty.
ABES: Alliance for Balanced Environmental Solutions
AC: Actual Commitment. Advisory Circular
A&C: Abatement and Control
ACA: American Conservation Association
ACBM: Asbestos-Containing Building Material
ACE: Alliance for Clean Energy
ACE: Any Credible Evidence
ACEEE: American Council for an Energy Efficient Economy
ACFM: Actual Cubic Feet Per Minute
ACL: Alternate Concentration Limit. Analytical Chemistry Laboratory
ACM: Asbestos-Containing Material
ACP: Agriculture Control Program (Water Quality Management); ACP: Air Carcinogen Policy
ACQUIRE: Aquatic Information Retrieval
ACQR: Air Quality Control Region
ACS: American Chemical Society
ACT: Action
ACTS: Asbestos Contractor Tracking System
ACWA: American Clean Water Association
ACWM: Asbestos-Containing Waste Material
ADABA: Acceptable Data Base
ADB: Applications Data Base
ADI: Acceptable Daily Intake
ADP: AHERA Designated Person; Automated Data Processing
ADQ: Audits of Data Quality
ADR: Alternate Dispute Resolution
ADSS: Air Data Screening System
ADT: Average Daily Traffic
AEA: Atomic Energy Act
AEC: Associate Enforcement Counsels
AEE: Alliance for Environmental Education
AEERL: Air and Energy Engineering Research Laboratory
AEM: Acoustic Emission Monitoring
AERE: Association of Environmental and Resource Economists
AES: Auger Electron Spectrometry
AFA: American Forestry Association
AFCA: Area Fuel Consumption Allocation
AFCEE: Air Force Center for Environmental Excellence
AFS: AIRS Facility Subsystem
AFUG: AIRS Facility Users Group
AH: Allowance Holders
AHERA: Asbestos Hazard Emergency Response Act
AHU: Air Handling Unit
AI: Active Ingredient
AIC: Active to Inert Conversion
AICUZ: Air Installation Compatible Use Zones
AID: Agency for International Development
AIHC: American Industrial Health Council
AIP: Auto Ignition Point
AIRMON: Atmospheric Integrated Research Monitoring Network
AIRS: Aerometric Information Retrieval System
AL: Acceptable Level
ALA: Delta-Aminolevulinic Acid
ALA-O: Delta-Aminolevulinic Acid Dehydrates
ALAPO: Association of Local Air Pollution Control Officers
ALARA: As Low As Reasonably Achievable
ALC: Application Limiting Constituent
ALJ: Administrative Law Judge
ALMS: Atomic Line Molecular Spectroscopy
ALR: Action Leakage Rate
AMBIENS: Atmospheric Mass Balance of Industrially Emitted and Natural Sulfur
AMOS: Air Management Oversight System
AMPS: Automatic Mapping and Planning System
AMSA: Association of Metropolitan Sewer Agencies
ANC: Acid Neutralizing Capacity
ANPR: Advance Notice of Proposed Rulemaking
ANRHRD: Air, Noise, & Radiation Health Research Division/ORD
ANSS: American Nature Study Society
AOAC: Association of Official Analytical Chemists
AOC: Abnormal Operating Conditions
AOD: Argon-Oxygen Decarbonization
AOML: Atlantic Oceanographic and Meteorological Laboratory
AP: Accounting Point
APA: Administrative Procedures Act
APCA: Air Pollution Control Association
APCD: Air Pollution Control District
APDS: Automated Procurement Documentation System
APHA: American Public Health Association
APRAC: Urban Diffusion Model for Carbon Monoxide from Motor Vehicle Traffic
APTI: Air Pollution Training Institute
APWA: American Public Works Association
AQ-7: Non-reactive Pollutant Modelling
AQCCT: Air-Quality Criteria and Control Techniques
AQCP: Air Quality Control Program
AQCR: Air-Quality Control Region
AQD: Air-Quality Digest
AQDHS: Air-Quality Data Handling System
AQDM: Air-Quality Display Model
AQMA: Air-Quality Maintenance Area
AQMD: Air Quality Management District
AQMP: Air-Quality Maintenance Plan; Air-Quality Management Plan

AQSM: Air-Quality Simulation Model
AQTAD: Air-Quality Technical Assistance Demonstration
AR: Administrative Record
A&R: Air and Radiation
ARA: Assistant Regional Administrator; Associate Regional Administrator
ARAC: Acid Rain Advisory Committee
ARAR: Applicable or Relevant and Appropriate Standards, Limitations, Criteria, and Requirements
ARB: Air Resources Board
ARC: Agency Ranking Committee
ARCC: American Rivers Conservation Council
ARCS: Alternative Remedial Contract Strategy
ARG: American Resources Group
ARIP: Accidental Release Information Program
ARL: Air Resources Laboratory
ARM: Air Resources Management
ARNEWS: Acid Rain National Early Warning Systems
ARO: Alternate Regulatory Option
ARRP: Acid Rain Research Program
ARRPA: Air Resources Regional Pollution Assessment Model
ARS: Agricultural Research Service
ARZ: Auto Restricted Zone
AS: Area Source
ASC: Area Source Category
ASDWA: Association of State Drinking Water Administrators
ASHAA: Asbestos in Schools Hazard Abatement Act
ASHRAE: American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASIWCPA: Association of State and Interstate Water Pollution Control Administrators
ASMDHS: Airshed Model Data Handling System
ASRL: Atmospheric Sciences Research Laboratory
AST: Advanced Secondary (Wastewater) Treatment
ASTHO: Association of State and Territorial Health Officers
ASTM: American Society for Testing and Materials
ASTSWMO: Association of State and Territorial Solid Waste Management Officials
AT: Advanced Treatment. Alpha Track Detection
ATERIS: Air Toxics Exposure and Risk Information System
ATS: Action Tracking System; Allowance Tracking System
ATSDR: Agency for Toxic Substances and Disease Registry
ATTF: Air Toxics Task Force
AUSM: Advanced Utility Simulation Model
A/WPR: Air/Water Pollution Report
AWRA: American Water Resources Association
AWT: Advanced Wastewater Treatment
AWWA: American Water Works Association
AWWARF: American Water Works Association Research Foundation.
BAA: Board of Assistance Appeals
BAC: Bioremediation Action Committee; Biotechnology Advisory Committee
BACM: Best Available Control Measures
BACT: Best Available Control Technology
BADT: Best Available Demonstrated Technology
BAF: Bioaccumulation Factor
BaP: Benzo(a)Pyrene
BAP: Benefits Analysis Program
BART: Best Available Retrofit Technology
BASIS: Battelle's Automated Search Information System
BAT: Best Available Technology
BATEA: Best Available Treatment Economically Achievable
BCT: Best Control Technology
BCPCT: Best Conventional Pollutant Control Technology
BDAT: Best Demonstrated Achievable Technology
BDCT: Best Demonstrated Control Technology
BDT: Best Demonstrated Technology
BEJ: Best Engineering Judgement. Best Expert Judgment
BF: Bonafide Notice of Intent to Manufacture or Import (IMD/OTS)
BID: Background Information Document. Buoyancy Induced Dispersion
BIOPLUME: Model to Predict the Maximum Extent of Existing Plumes
BMP: Best Management Practice(s)
BMR: Baseline Monitoring Report
BO: Budget Obligations
BOA: Basic Ordering Agreement (Contracts)
BOD: Biochemical Oxygen Demand. Biological Oxygen Demand
BOF: Basic Oxygen Furnace
BOP: Basic Oxygen Process
BOPF: Basic Oxygen Process Furnace
BOYS: Beginning of Year Significant Non-Compliers
BP: Boiling Point
BPJ: Best Professional Judgment
BPT: Best Practicable Technology. Pest Practicable Treatment
BPWTT: Best Practical Wastewater Treatment Technology
BRI: Building-Related Illness
BRS: Bibliographic Retrieval Service
BSI: British Standards Institute
BSO: Benzene Soluble Organics
BTZ: Below the Treatment Zone
BUN: Blood Urea Nitrogen
CA: Citizen Act. Competition Advocate. Cooperative Agreements. Corrective Action
CAA: Clean Air Act; Compliance Assurance Agreement
CAAA: Clean Air Act Amendments
CAER: Community Awareness and Emergency Response
CAFE: Corporate Average Fuel Economy
CAFO: Concentrated Animal Feedlot; Consent Agreement/Final Order
CAG: Carcinogenic Assessment Group

CAIR: Comprehensive Assessment of Information Rule
CALINE: California Line Source Model
CAM: Compliance Assurance Monitoring rule; Compliance Assurance Monitoring
CAMP: Continuous Air Monitoring Program
CAN: Common Account Number
CAO: Corrective Action Order
CAP: Corrective Action Plan. Cost Allocation Procedure. Criteria Air Pollutant
>CAPMoN: Canadian Air and Precipitation Monitoring Network
CAR: Corrective Action Report
CAS: Center for Automotive Safety; Chemical Abstract Service
CASAC: Clean Air Scientific Advisory Committee
CASLP: Conference on Alternative State and Local Practices
CASTNet: Clean Air Status and Trends Network
CATS: Corrective Action Tracking System
CAU: Carbon Adsorption Unit; Command Arithmetic Unit
CB: Continuous Bubbler
CBA: Chesapeake Bay Agreement. Cost Benefit Analysis
CBD: Central Business District
CBEP: Community Based Environmental Project
CBI: Compliance Biomonitoring Inspection; Confidential Business Information
CBOD: Carbonaceous Biochemical Oxygen Demand
CBP: Chesapeake Bay Program; County Business Patterns
CCA: Competition in Contracting Act
CCAA: Canadian Clean Air Act
CCAP: Center for Clean Air Policy; Climate Change Action Plan
CCEA: Conventional Combustion Environmental Assessment
CCHW: Citizens Clearinghouse for Hazardous Wastes
CCID: Confidential Chemicals Identification System
CCMS/NATO: Committee on Challenges of a Modern Society/North Atlantic Treaty Organization
CCP: Composite Correction Plan
CC/RTS: Chemical Collection/ Request Tracking System
CCTP: Clean Coal Technology Program
CD: Climatological Data
CDB: Consolidated Data Base
CDBA: Central Data Base Administrator
CDBG: Community Development Block Grant
CDD: Chlorinated dibenzo-p-dioxin
CDF: Chlorinated dibenzofuran
CDHS: Comprehensive Data Handling System
CDI: Case Development Inspection
CDM: Climatological Dispersion Model; Comprehensive Data Management
CDMQC: Climatological Dispersion Model with Calibration and Source Contribution
CDNS: Climatological Data National Summary
CDP: Census Designated Places
CDS: Compliance Data System
CE: Categorical Exclusion. Conditionally Exempt Generator
CEA: Cooperative Enforcement Agreement; Cost and Economic Assessment
CEAT: Contractor Evidence Audit Team
CEARC: Canadian Environmental Assessment Research Council
CEB: Chemical Element Balance
CEC: Commission for Environmental Cooperation
CECATS: CSB Existing Chemicals Assessment Tracking System
CEE: Center for Environmental Education
CEEM: Center for Energy and Environmental Management
CEI: Compliance Evaluation Inspection
CELRF: Canadian Environmental Law Research Foundation
CEM: Continuous Emission Monitoring
CEMS: Continuous Emission Monitoring System
CEPA: Canadian Environmental Protection Act
CEPP: Chemical Emergency Preparedness Plan
CEQ: Council on Environmental Quality
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act (1980)
CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
CERT: Certificate of Eligibility
CESQG: Conditionally Exempt Small Quantity Generator
CEST: Community Environmental Service Teams
CF: Conservation Foundation
CFC: Chlorofluorocarbons
CFM: Chlorofluoromethanes
CFR: Code of Federal Regulations
CHABA: Committee on Hearing and Bio-Acoustics
CHAMP: Community Health Air Monitoring Program
CHEMNET: Chemical Industry Emergency Mutual Aid Network
CHESS: Community Health and Environmental Surveillance System
CHIP: Chemical Hazard Information Profiles
CI: Compression Ignition. Confidence Interval
CIAQ: Council on Indoor Air Quality
CIBL: Convective Internal Boundary Layer
CICA: Competition in Contracting Act
CICIS: Chemicals in Commerce Information System
CIDRS: Cascade Impactor Data Reduction System
CIMI: Committee on Integrity and Management Improvement
CIS: Chemical Information System. Contracts Information System
CKD: Cement Kiln Dust
CKRC: Cement Kiln Recycling Coalition
CLC: Capacity Limiting Constituents
CLEANS: Clinical Laboratory for Evaluation and Assessment of Toxic Substances
CLEVER: Clinical Laboratory for Evaluation and Validation of Epidemiologic Research
CLF: Conservation Law Foundation
CLI: Consumer Labelling Initiative

CLIPS: Chemical List Index and Processing System
CLP: Contract Laboratory Program
CM: Corrective Measure
CMA: Chemical Manufacturers Association
CMB: Chemical Mass Balance
CME: Comprehensive Monitoring Evaluation
CMEL: Comprehensive Monitoring Evaluation Log
CMEP: Critical Mass Energy Project
CNG: Compressed Natural Gas
COCO: Contractor-Owned/ Contractor-Operated
COD: Chemical Oxygen Demand
COH: Coefficient Of Haze
CPDA: Chemical Producers and Distributor Association
CPF: Carcinogenic Potency Factor
CPO: Certified Project Officer
CQA: Construction Quality Assurance
CR: Continuous Radon Monitoring
CROP: Consolidated Rules of Practice
CRP: Child-Resistant Packaging; Conservation Reserve Program
CRR: Center for Renewable Resources
CRSTER: Single Source Dispersion Model
CSCT: Committee for Site Characterization
CSGWPP: Comprehensive State Ground Water Protection Program
CSI: Common Sense Initiative; Compliance Sampling Inspection
CSIN: Chemical Substances Information Network
CSMA: Chemical Specialties Manufacturers Association
CSO: Combined Sewer Overflow
CSPA: Council of State Planning Agencies
CSRL: Center for the Study of Responsive Law
CTARC: Chemical Testing and Assessment Research Commission
CTG: Control Techniques Guidelines
CTSA: Cleaner Technologies Substitutess Assessment
CV: Chemical Vocabulary
CVS: Constant Volume Sampler
CW: Continuous working-level monitoring
CWA: Clean Water Act (aka FWPCA)
CWAP: Clean Water Action Project
CWTC: Chemical Waste Transportation Council
CZMA: Coastal Zone Management Act
CZARA: Coastal Zone Management Act Reauthorization Amendments
DAPSS: Document and Personnel Security System (IMD)
DBP: Disinfection By-Product
DCI: Data Call-In
DCO: Delayed Compliance Order
DCO: Document Control Officer
DDT: DichloroDiphenylTrichloroethane
DERs: Data Evaluation Records
DES: Diethylstilbesterol
DfE: Design for the Environment
DI: Diagnostic Inspection
DMR: Discharge Monitoring Report
DNA: Deoxyribonucleic acid
DNAPL: Dense Non-Aqueous Phase Liquid
DO: Dissolved Oxygen
DOW: Defenders Of Wildlife
DPA: Deepwater Ports Act
DPD: Method of Measuring Chlorine Residual in Water
DQO: Data Quality Objective
DRE: Destruction and Removal Efficiency
DRES: Dietary Risk Evaluation System
DRMS: Defense Reutilization and Marketing Service
DRR: Data Review Record
DS: Dichotomous Sampler
DSAP: Data Self Auditing Program
DSCF: Dry Standard Cubic Feet
DSCM: Dry Standard Cubic Meter
DSS: Decision Support System; Domestic Sewage Study
DT: Detectors (radon) damaged or lost; Detention Time
DU: Decision Unit. Ducks Unlimited; Dobson Unit
DUC: Decision Unit Coordinator
DWEL: Drinking Water Equivalent Level
DWS: Drinking Water Standard
DWSRF: Drinking Water State Revolving Fund
EA: Endangerment Assessment; Enforcement Agreement; Environmental Action; Environmental Assessment;. Environmental Audit
EAF: Electric Arc Furnaces
EAG: Exposure Assessment Group
EAP: Environmental Action Plan
EAR: Environmental Auditing Roundtable
EASI: Environmental Alliance for Senior Involvement
EB: Emissions Balancing
EC: Emulsifiable Concentrate; Environment Canada; Effective Concentration
ECA: Economic Community for Africa
ECAP: Employee Counseling and Assistance Program
ECD: Electron Capture Detector
ECHH: Electro-Catalytic Hyper-Heaters
ECL: Environmental Chemical Laboratory
ECOS: Environmental Council of the States
ECR: Enforcement Case Review
ECRA: Economic Cleanup Responsibility Act
ED: Effective Dose
EDA: Emergency Declaration Area
EDB: Ethylene Dibromide
EDC: Ethylene Dichloride
EDD: Enforcement Decision Document
EDF: Environmental Defense Fund
EDRS: Enforcement Document Retrieval System
EDS: Electronic Data System; Energy Data System
EDTA: Ethylene Diamine Triacetic Acid
EDX: Electronic Data Exchange
EDZ: Emission Density Zoning
EEA: Energy and Environmental Analysis
EECs: Estimated Environmental Concentrations
EER: Excess Emission Report
EERL: Eastern Environmental Radiation Laboratory
EERU: Environmental Emergency Response Unit
EESI: Environment and Energy Study Institute

EESL: Environmental Ecological and Support Laboratory
EETFC: Environmental Effects, Transport, and Fate Committee
EF: Emission Factor
EFO: Equivalent Field Office
EFTC: European Fluorocarbon Technical Committee
EGR: Exhaust Gas Recirculation
EH: Redox Potential
EHC: Environmental Health Committee
EHS: Extremely Hazardous Substance
EI: Emissions Inventory
EIA: Environmental Impact Assessment. Economic Impact Assessment
EIL: Environmental Impairment Liability
EIR: Endangerment Information Report; Environmental Impact Report
EIS: Environmental Impact Statement; Environmental Inventory System
EIS/AS: Emissions Inventory System/Area Source
EIS/PS: Emissions Inventory System/Point Source
EKMA: Empirical Kinetic Modeling Approach
EL: Exposure Level
ELI: Environmental Law Institute
ELR: Environmental Law Reporter
EM: Electromagnetic Conductivity
EMAP: Environmental Mapping and Assessment Program
EMAS: Enforcement Management and Accountability System
EMR: Environmental Management Report
EMS: Enforcement Management System
EMSL: Environmental Monitoring Support Systems Laboratory
EMTS: Environmental Monitoring Testing Site; Exposure Monitoring Test Site
EnPA: Environmental Performance Agreement
EO: Ethylene Oxide
EOC: Emergency Operating Center
EOF: Emergency Operations Facility (RTP)
EOP: End Of Pipe
EOT: Emergency Operations Team
EP: Earth Protectors; Environmental Profile; End-use Product; Experimental Product; Extraction Procedure
EPAA: Environmental Programs Assistance Act
EPAAR: EPA Acquisition Regulations
EPCA: Energy Policy and Conservation Act
EPACT: Environmental Policy Act
EPACASR: EPA Chemical Activities Status Report
EPCRA: Emergency Planning and Community Right to Know Act
EPD: Emergency Planning District
EPI: Environmental Policy Institute
EPIC: Environmental Photographic Interpretation Center
EPNL: Effective Perceived Noise Level
EPRI: Electric Power Research Institute
EPTC: Extraction Procedure Toxicity Characteristic
EQIP: Environmental Quality Incentives Program
ER: Ecosystem Restoration; Electrical Resistivity
ERA: Economic Regulatory Agency
ERAMS: Environmental Radiation Ambient Monitoring System
ERC: Emergency Response Commission. Emissions Reduction Credit, Environmental Research Center
ERCS: Emergency Response Cleanup Services
ERDA: Energy Research and Development Administration
ERD&DAA: Environmental Research, Development and Demonstration Authorization Act
ERL: Environmental Research Laboratory
ERNS: Emergency Response Notification System
ERP: Enforcement Response Policy
ERT: Emergency Response Team
ERTAQ: ERT Air Quality Model
ES: Enforcement Strategy
ESA: Endangered Species Act. Environmentally Sensitive Area
ESC: Endangered Species Committee
ESCA: Electron Spectroscopy for Chemical Analysis
ESCAP: Economic and Social Commission for Asia and the Pacific
ESECA: Energy Supply and Environmental Coordination Act
ESH: Environmental Safety and Health
ESP: Electrostatic Precipitators
ET: Emissions Trading
ETI: Environmental Technology Initiative
ETP: Emissions Trading Policy
ETS: Emissions Tracking System; Environmental Tobacco Smoke
ETV: Environmental Technology Verification Program
EUP: End-Use Product; Experimental Use Permit
EWCC: Environmental Workforce Coordinating Committee
EXAMS: Exposure Analysis Modeling System
ExEx: Expected Exceedance
FACA: Federal Advisory Committee Act
FAN: Fixed Account Number
FATES: FIFRA and TSCA Enforcement System
FBC: Fluidized Bed Combustion
FCC: Fluid Catalytic Converter
FCCC: Framework Convention on Climate Change
FCCU: Fluid Catalytic Cracking Unit
FCO: Federal Coordinating Officer (in disaster areas); Forms Control Officer
FDF: Fundamentally Different Factors
FDL: Final Determination Letter
FDO: Fee Determination Official
FE: Fugitive Emissions
FEDS: Federal Energy Data System
FEFx: Forced Expiratory Flow
FEIS: Fugitive Emissions Information System
FEL: Frank Effect Level
FEPCA: Federal Environmental Pesticide Control Act; enacted as amendments to FIFRA.
FERC: Federal Energy Regulatory Commission
FES: Factor Evaluation System
FEV: Forced Expiratory Volume
FEV1: Forced Expiratory Volume--one second; Front End Volatility Index

FF: Federal Facilities
FFAR: Fuel and Fuel Additive Registration
FFDCA: Federal Food, Drug, and Cosmetic Act
FFF: Firm Financial Facility
FFFSG: Fossil-Fuel-Fired Steam Generator
FFIS: Federal Facilities Information System
FFP: Firm Fixed Price
FGD: Flue-Gas Desulfurization
FID: Flame Ionization Detector
FIFRA: Federal Insecticide, Fungicide, and Rodenticide Act
FIM: Friable Insulation Material
FINDS: Facility Index System
FIP: Final Implementation Plan
FIPS: Federal Information Procedures System
FIT: Field Investigation Team
FLETC: Federal Law Enforcement Training Center
FLM: Federal Land Manager
FLP: Flash Point
FLPMA: Federal Land Policy and Management Act
FMAP: Financial Management Assistance Project
F/M: Food to Microorganism Ratio
FML: Flexible Membrane Liner
FMP: Facility Management Plan
FMP: Financial Management Plan
FMS: Financial Management System
FMVCP: Federal Motor Vehicle Control Program
FOE: Friends Of the Earth
FOIA: Freedom Of Information Act
FOISD: Fiber Optic Isolated Spherical Dipole Antenna
FONSI: Finding Of No Significant Impact
FORAST: Forest Response to Anthropogenic Stress
FP: Fine Particulate
FPA: Federal Pesticide Act
FPAS: Foreign Purchase Acknowledgement Statements
FPD: Flame Photometric Detector
FPEIS: Fine Particulate Emissions Information System
FPM: Federal Personnel Manual
FPPA: Federal Pollution Prevention Act
FPR: Federal Procurement Regulation
FPRS: Federal Program Resources Statement; Formal Planning and Supporting System
FQPA: Food Quality Protection Act
FR: Federal Register. Final Rulemaking
FRA: Federal Register Act
FREDS: Flexible Regional Emissions Data System
FRES: Forest Range Environmental Study
FRM: Federal Reference Methods
FRN: Federal Register Notice. Final Rulemaking Notice
FRS: Formal Reporting System
FS: Feasibility Study
FSA: Food Security Act
FSS: Facility Status Sheet; Federal Supply Schedule
FTP: Federal Test Procedure (for motor vehicles)
FTS: File Transfer Service
FTTS: FIFRA/TSCA Tracking System
FUA: Fuel Use Act
FURS: Federal Underground Injection Control Reporting System
FVMP: Federal Visibility Monitoring Program
FWCA: Fish and Wildlife Coordination Act
FWPCA: Federal Water Pollution and Control Act (aka CWA). Federal Water Pollution and Control Administration
GAAP: Generally Accepted Accounting Principles
GAC: Granular Activated Carbon
GACT: Granular Activated Carbon Treatment
GAW: Global Atmospheric Watch
GCC: Global Climate Convention
GC/MS: Gas Chromatograph/ Mass Spectograph
GCVTC: Grand Canyon Visibility Transport Commission
GCWR: Gross Combination Weight Rating
GDE: Generic Data Exemption
GEI: Geographic Enforcement Initiative
GEMI: Global Environmental Management Initiative
GEMS: Global Environmental Monitoring System; Graphical Exposure Modeling System
GEP: Good Engineering Practice
GFF: Glass Fiber Filter
GFO: Grant Funding Order
GFP: Government-Furnished Property
GICS: Grant Information and Control System
GIS: Geographic Information Systems; Global Indexing System
GLC: Gas Liquid Chromatography
GLERL: Great Lakes Environmental Research Laboratory
GLNPO: Great Lakes National Program Office
GLP: Good Laboratory Practices
GLWQA: Great Lakes Water Quality Agreement
GMCC: Global Monitoring for Climatic Change
G/MI: Grams per mile
GOCO: Government-Owned/ Contractor-Operated
GOGO: Government-Owned/ Government-Operated
GOP: General Operating Procedures
GOPO: Government-Owned/ Privately-Operated
GPAD: Gallons-per-acre per-day
GPG: Grams-per-Gallon
GPR: Ground-Penetrating Radar
GPS: Groundwater Protection Strategy
GR: Grab Radon Sampling
GRAS: Generally Recognized as Safe
GRCDA: Government Refuse Collection and Disposal Association
GRGL: Groundwater Residue Guidance Level
GT: Gas Turbine
GTN: Global Trend Network
GTR: Government Transportation Request
GVP: Gasoline Vapor Pressure
GVW: Gross Vehicle Weight
GVWR: Gross Vehicle Weight Rating
GW: Grab Working-Level Sampling. Groundwater
GWDR: Ground Water Disinfection Rule
GWM: Groundwater Monitoring

GWP: Global Warming Potential
GWPC: Ground Water Protection Council
GWPS: Groundwater Protection Standard; Groundwater Protection Strategy
HA: Health Advisory
HAD: Health Assessment Document
HAP: Hazardous Air Pollutant
HAPEMS: Hazardous Air Pollutant Enforcement Management System
HAPPS: Hazardous Air Pollutant Prioritization System
HATREMS: Hazardous and Trace Emissions System
HAZMAT: Hazardous Materials
HAZOP: Hazard and Operability Study
HBFC: Hydrobromofluorocarbon
HC: Hazardous Constituents; Hydrocarbon
HCCPD: Hexachlorocyclo-pentadiene
HCFC: Hydrochlorofluorocarbon
HCP: Hypothermal Coal Process
HDD: Heavy-Duty Diesel
HDDT: Heavy-duty Diesel Truck
HDDV: Heavy-Duty Diesel Vehicle
HDE: Heavy-Duty Engine
HDG: Heavy-Duty Gasoline-Powered Vehicle
HDGT: Heavy-Duty Gasoline Truck
HDGV: Heavy-Duty Gasoline Vehicle
HDPE: High Density Polyethylene
HDT: Highest Dose Tested in a study. Heavy-Duty Truck
HDV: Heavy-Duty Vehicle
HEAL: Human Exposure Assessment Location
HECC: House Energy and Commerce Committee
HEI: Health Effects Institute
HEM: Human Exposure Modeling
HEPA: High-Efficiency Particulate Air
HEPA: Highly Efficient Particulate Air Filter
HERS: Hyperion Energy Recovery System
HFC: Hydrofluorocarbon
HHDDV: Heavy Heavy-Duty Diesel Vehicle
HHE: Human Health and the Environment
HHV: Higher Heating Value
HI: Hazard Index
HI-VOL: High-Volume Sampler
HIWAY: A Line Source Model for Gaseous Pollutants
HLRW: High Level Radioactive Waste
HMIS: Hazardous Materials Information System
HMS: Highway Mobile Source
HMTA: Hazardous Materials Transportation Act
HMTR: Hazardous Materials Transportation Regulations
HOC: Halogenated Organic Carbons
HON: Hazardous Organic NESHAP
HOV: High-Occupancy Vehicle
HP: Horse Power
HPLC: High-Performance Liquid Chromatography
HPMS: Highway Performance Monitoring System
HPV: High Priority Violator
HQCDO: Headquarters Case Development Officer
HRS: Hazardous Ranking System
HRUP: High-Risk Urban Problem
HSDB: Hazardous Substance Data Base
HSL: Hazardous Substance List
HSWA: Hazardous and Solid Waste Amendments
HT: Hypothermally Treated
HTP: High Temperature and Pressure
HVAC: Heating, Ventilation, and Air-Conditioning system
HVIO: High Volume Industrial Organics
HW: Hazardous Waste
HWDMS: Hazardous Waste Data Management System
HWGTF: Hazardous Waste Groundwater Task Force; Hazardous Waste Groundwater Test Facility
HWIR: Hazardous Waste Identification Rule
HWLT: Hazardous Waste Land Treatment
HWM: Hazardous Waste Management
HWRTF: Hazardous Waste Restrictions Task Force
HWTC: Hazardous Waste Treatment Council
I/A: Innovative/Alternative
IA: Interagency Agreement
IAAC: Interagency Assessment Advisory Committee
IADN: Integrated Atmospheric Deposition Network
IAG: Interagency Agreement
IAP: Incentive Awards Program. Indoor Air Pollution
IAQ: Indoor Air Quality
IARC: International Agency for Research on Cancer
IATDB: Interim Air Toxics Data Base
IBSIN: Innovations in Building Sustainable Industries
IBT: Industrial Biotest Laboratory
IC: Internal Combustion
ICAIR: Interdisciplinary Planning and Information Research
ICAP: Inductively Coupled Argon Plasma
ICB: Information Collection Budget
ICBN: International Commission on the Biological Effects of Noise
ICCP: International Climate Change Partnership
ICE: Industrial Combustion Emissions Model. Internal Combustion Engine
ICP: Inductively Coupled Plasma
ICR: Information Collection Request
ICRE: Ignitability, Corrosivity, Reactivity, Extraction
ICRP: International Commission on Radiological Protection
ICRU: International Commission of Radiological Units and Measurements
ICS: Incident Command System. Institute for Chemical Studies; Intermittent Control Strategies.; Intermittent Control System
ICWM: Institute for Chemical Waste Management
IDLH: Immediately Dangerous to Life and Health
IEB: International Environment Bureau
IEMP: Integrated Environmental Management Project
IES: Institute for Environmental Studies
IFB: Invitation for Bid
IFCAM: Industrial Fuel Choice Analysis Model
IFCS: International Forum on Chemical Safety
IFIS: Industry File Information System
IFMS: Integrated Financial Management System
IFPP: Industrial Fugitive Process Particulate
IGCC: Integrated Gasification Combined Cycle
IGCI: Industrial Gas Cleaning Institute

IIS: Inflationary Impact Statement
IINERT: In-Place Inactivation and Natural Restoration Technologies
IJC: International Joint Commission (on Great Lakes)
I/M: Inspection/Maintenance
IMM: Intersection Midblock Model
IMPACT: Integrated Model of Plumes and Atmosphere in Complex Terrain
IMPROVE: Interagency Monitoring of Protected Visual Environment
INPUFF: Gaussian Puff Dispersion Model
INT: Intermittent
IOB: Iron Ore Beneficiation
IOU: Input/Output Unit
IPCS: International Program on Chemical Safety
IP: Inhalable Particles
IPM: Inhalable Particulate Matter. Integrated Pest Management
IPP: Implementation Planning Program. Integrated Plotting Package; Inter-media Priority Pollutant (document); Independent Power Producer
IPCC: Intergovernmental Panel on Climate Change
IPM: Integrated Pest Management
IRG: Interagency Review Group
IRLG: Interagency Regulatory Liaison Group (Composed of EPA, CPSC, FDA, and OSHA)
IRIS: Instructional Resources Information System. Integrated Risk Information System
IRM: Intermediate Remedial Measures
IRMC: Inter-Regulatory Risk Management Council
IRP: Installation Restoration Program
IRPTC: International Register of Potentially Toxic Chemicals
IRR: Institute of Resource Recovery
IRS: International Referral Systems
IS: Interim Status
ISAM: Indexed Sequential File Access Method
ISC: Industrial Source Complex
ISCL: Interim Status Compliance Letter
ISCLT: Industrial Source Complex Long Term Model
ISCST: Industrial Source Complex Short Term Model
ISD: Interim Status Document
ISE: Ion-specific electrode
ISMAP: Indirect Source Model for Air Pollution
ISO: International Organization for Standardization
ISPF: (IBM) Interactive System Productivity Facility
ISS: Interim Status Standards
ITC:Innovative Technology Council
ITC: Interagency Testing Committee
ITRC: Interstate Technology Regulatory Coordination
ITRD: Innovative Treatment Remediation Demonstration
IUP: Intended Use Plan
IUR: Inventory Update Rule
IWC: In-Stream Waste Concentration
IWS: Ionizing Wet Scrubber
JAPCA: Journal of Air Pollution Control Association
JCL: Job Control Language
JEC: Joint Economic Committee
JECFA: Joint Expert Committee of Food Additives
JEIOG: Joint Emissions Inventory Oversight Group
JLC: Justification for Limited Competition
JMPR: Joint Meeting on Pesticide Residues
JNCP: Justification for Non-Competitive Procurement
JOFOC: Justification for Other Than Full and Open Competition
JPA: Joint Permitting Agreement
JSD: Jackson Structured Design
JSP: Jackson Structured Programming
JTU: Jackson Turbidity Unit
LAA: Lead Agency Attorney
LADD: Lifetime Average Daily Dose; Lowest Acceptable Daily Dose
LAER: Lowest Achievable Emission Rate
LAI: Laboratory Audit Inspection
LAMP: Lake Acidification Mitigation Project
LC: Lethal Concentration. Liquid Chromatography
LCA: Life Cycle Assessment
LCD: Local Climatological Data
LCL: Lower Control Limit
LCM: Life Cycle Management
LCRS: Leachate Collection and Removal System
LD: Land Disposal. Light Duty
LD L0: The lowest dosage of a toxic substance that kills test organisms.
LDC: London Dumping Convention
LDCRS: Leachate Detection, Collection, and Removal System
LDD: Light-Duty Diesel
LDDT: Light-Duty Diesel Truck
LDDV: Light-Duty Diesel Vehicle
LDGT: Light-Duty Gasoline Truck
LDIP: Laboratory Data Integrity Program
LDR: Land Disposal Restrictions
LDRTF: Land Disposal Restrictions Task Force
LDS: Leak Detection System
LDT: Lowest Dose Tested. Light-Duty Truck
LDV: Light-Duty Vehicle
LEL: Lowest Effect Level. Lower Explosive Limit
LEP: Laboratory Evaluation Program
LEPC: Local Emergency Planning Committee
LERC: Local Emergency Response Committee
LEV: Low Emissions Vehicle
LFG: Landfill Gas
LFL: Lower Flammability Limit
LGR: Local Governments Reimbursement Program
LHDDV: Light Heavy-Duty Diesel Vehicle
LI: Langelier Index
LIDAR: Light Detection and Ranging
LIMB: Limestone-Injection Multi-Stage Burner
LLRW: Low Level Radioactive Waste
LMFBR: Liquid Metal Fast Breeder Reactor
LMOP: Landfill Methane Outreach Program
LNAPL: Light Non-Aqueous Phase Liquid
LOAEL: Lowest-Observed-Adverse-Effect-Level
LOD: Limit of Detection
LQER: Lesser Quantity Emission Rates

LQG: Large Quantity Generator
LRTAP: Long Range Transboundary Air Pollution
LUIS: Label Use Information System
MAC: Mobile Air Conditioner
MAPSIM: Mesoscale Air Pollution Simulation Model
MATC: Maximum Acceptable Toxic Concentration
MBAS: Methylene-Blue-Active Substances
MCL: Maximum Contaminant Level
MCLG: Maximum Contaminant Level Goal
MCS: Multiple Chemical Sensitivity
MDL: Method Detection Limit
MEC: Model Energy Code
MEI: Maximally (or most) Exposed Individual
MEP: Multiple Extraction Procedure
MHDDV: Medium Heavy-Duty Diesel Vehicle
MOBILE5A: Mobile Source Emission Factor Model
MOE: Margin Of Exposure
MOS: Margin of Safety
MP: Manufacturing-use Product; Melting Point
MPCA: Microbial Pest Control Agent
MPI: Maximum Permitted Intake
MPN: Maximum Possible Number
MPWC: Multiprocess Wet Cleaning
MRF: Materials Recovery Facility
MRID: Master Record Identification number
MRL: Maximum-Residue Limit (Pesticide Tolerance)
MSW: Municipal Solid Waste
MTD: Maximum Tolerated Dose
MUP: Manufacturing-Use Product
MUTA: Mutagenicity
MWC: Machine Wet Cleaning
NAA: Nonattainment Area
NAAEC: North American Agreement on Environmental Cooperation
NAAQS: National Ambient Air Quality Standards
NACA: National Agricultural Chemicals Association
NACEPT: National Advisory Council for Environmental Policy and Technology
NADP/NTN: National Atmospheric Deposition Program/National Trends Network
NAMS: National Air Monitoring Stations
NAPAP: National Acid Precipitation Assessment Program
NAPL: Non-Aqueous Phase Liquid
NAPS: National Air Pollution Surveillance
NARA: National Agrichemical Retailers Association
NARSTO: North American Research Strategy for Tropospheric Ozone
NAS: National Academy of Sciences
NASDA: National Association of State Departments of Agriculture
NCAMP: National Coalition Against the Misuse of Pesticides
NCEPI: National Center for Environmental Publications and Information
NCWS: Non-Community Water System
NEDS: National Emissions Data System
NEPI: National Environmental Policy Institute
NEPPS: National Environmental Performance Partnership System
NESHAP: National Emission Standard for Hazardous Air Pollutants
NIEHS: National Institute for Environmental Health Sciences
NETA: National Environmental Training Association
NFRAP: No Further Remedial Action Planned
NICT: National Incident Coordination Team
NIOSH: National Institute of Occupational Safety and Health
NIPDWR: National Interim Primary Drinking Water Regulations
NISAC: National Industrial Security Advisory Committee
NMHC: Nonmethane Hydrocarbons
NMOC: Non-Methane Organic Component
NMVOC: Non-methane Volatile Organic Chemicals
NO: Nitric Oxide
NOA: Notice of Arrival
NOAA: National Oceanographic and Atmospheric Agency
NOAC: Nature of Action Code
NOAEL: No Observable Adverse Effect Level
NOEL: No Observable Effect Level
NOIC: Notice of Intent to Cancel
NOIS: Notice of Intent to Suspend
N2O: Nitrous Oxide
NOx: Nitrogen Oxides
NORM: Naturally Occurring Radioactive Material
NPCA: National Pest Control Association>
NPDES: National Pollutant Discharge Elimination System
NPHAP: National Pesticide Hazard Assessment Program
NPIRS: National Pesticide Information Retrieval System
NPTN: National Pesticide Telecommunications Network
NRD: Natural Resource Damage
NRDC: Natural Resources Defense Council
NSDWR: National Secondary Drinking Water Regulations
NSEC: National System for Emergency Coordination
NSEP: National System for Emergency Preparedness
NSPS: New Source Performance Standards
NSR: New Source Review
NTI: National Toxics Inventory
NTIS: National Technical Information Service
NTNCWS: Non-Transient Non-Community Water System
NTP: National Toxicology Program
NTU: Nephlometric Turbidity Unit
O3: Ozone
OCD: Offshore and Coastal Dispersion
ODP: Ozone-Depleting Potential
ODS: Ozone-Depleting Substances
OECD: Organization for Economic Cooperation and Development
OF: Optional Form
OLTS: On Line Tracking System
O&M: Operations and Maintenance

ORM: Other Regulated Material
ORP: Oxidation-Reduction Potential
OTAG: Ozone Transport Assessment Group
OTC: Ozone Transport Commission
OTR: Ozone Transport Region
P2: Pollution Prevention
PAG: Pesticide Assignment Guidelines
PAH: Polynuclear Aromatic Hydrocarbons
PAI: Performance Audit Inspection (CWA); Pure Active Ingredient compound
PAM: Pesticide Analytical Manual
PAMS: Photochemical Assessment Monitoring Stations
PAT: Permit Assistance Team (RCRA)
PATS: Pesticide Action Tracking System; Pesticides Analytical Transport Solution
Pb: Lead
PBA: Preliminary Benefit Analysis (BEAD)
PCA: Principle Component Analysis
PCB: Polychlorinated Biphenyl
PCE: Perchloroethylene
PCM: Phase Contrast Microscopy
PCN: Policy Criteria Notice
PCO: Pest Control Operator
PCSD: President's Council on Sustainable Development
PDCI: Product Data Call-In
PFC: Perfluorated Carbon
PFCRA: Program Fraud Civil Remedies Act
PHC: Principal Hazardous Constituent
PHI: Pre-Harvest Interval
PHSA: Public Health Service Act
PI: Preliminary Injunction. Program Information
PIC: Products of Incomplete Combustion
PIGS: Pesticides in Groundwater Strategy
PIMS: Pesticide Incident Monitoring System
PIN: Pesticide Information Network
PIN: Procurement Information Notice
PIP: Public Involvement Program
PIPQUIC: Program Integration Project Queries Used in Interactive Command
PIRG: Public Interest Research Group
PIRT: Pretreatment Implementation Review Task Force
PIT: Permit Improvement Team
PITS: Project Information Tracking System
PLIRRA: Pollution Liability Insurance and Risk Retention Act
PLM: Polarized Light Microscopy
PLUVUE: Plume Visibility Model
PM: Particulate Matter
PMAS: Photochemical Assessment Monitoring Stations
PM2.5: Particulate Matter Smaller than 2.5 Micrometers in Diameter
PM10: Particulate Matter (nominally 10m and less)
PM15: Particulate Matter (nominally 15m and less)
PMEL: Pacific Marine Environmental Laboratory
PMN: Premanufacture Notification
PMNF: Premanufacture Notification Form
PMR: Pollutant Mass Rate
PMR: Proportionate Mortality Ratio
PMRS: Performance Management and Recognition System
PMS: Program Management System
PNA: Polynuclear Aromatic Hydrocarbons
PO: Project Officer
POC: Point Of Compliance
POE: Point Of Exposure
POGO: Privately-Owned/ Government-Operated
POHC: Principal Organic Hazardous Constituent
POI: Point Of Interception
POLREP: Pollution Report
POM: Particulate Organic Matter. Polycyclic Organic Matter
POP: Persistent Organic Pollutant
POR: Program of Requirements
POTW: Publicly Owned Treatment Works
POV: Privately Owned Vehicle
PP: Program Planning
PPA: Planned Program Accomplishment
PPB: Parts Per Billion
PPE: Personal Protective Equipment
PPG: Performance Partnership Grant
PPIC: Pesticide Programs Information Center
PPIS: Pesticide Product Information System; Pollution Prevention Incentives for States
PPMAP: Power Planning Modeling Application Procedure
PPM/PPB: Parts per million/ parts per billion
PPSP: Power Plant Siting Program
PPT: Parts Per Trillion
PPTH: Parts Per Thousand
PQUA: Preliminary Quantitative Usage Analysis
PR: Pesticide Regulation Notice; Preliminary Review
PRA: Paperwork Reduction Act; Planned Regulatory Action
PRATS: Pesticides Regulatory Action Tracking System
PRC: Planning Research Corporation
PRI: Periodic Reinvestigation
PRM: Prevention Reference Manuals
PRN: Pesticide Registration Notice
PRP: Potentially Responsible Party
PRZM: Pesticide Root Zone Model
PS: Point Source
PSAM: Point Source Ambient Monitoring
PSC: Program Site Coordinator
PSD: Prevention of Significant Deterioration
PSES: Pretreatment Standards for Existing Sources
PSI: Pollutant Standards Index; Pounds Per Square Inch; Pressure Per Square Inch
PSIG: Pressure Per Square Inch Gauge
PSM: Point Source Monitoring
PSNS: Pretreatment Standards for New Sources
PSU: Primary Sampling Unit
PTDIS: Single Stack Meteorological Model in EPA UNAMAP Series
PTE: Potential to Emit
PTFE: Polytetrafluoroethylene (Teflon)
PTMAX: Single Stack Meteorological Model in EPA UNAMAP series
PTPLU: Point Source Gaussian Diffusion Model
PUC: Public Utility Commission

PV: Project Verification
PVC: Polyvinyl Chloride
PWB: Printed Wiring Board
PWS: Public Water Supply/ System
PWSS: Public Water Supply System
QAC: Quality Assurance Coordinator
QA/QC: Quality Assistance/ Quality Control
QAMIS: Quality Assurance Management and Information System
QAO: Quality Assurance Officer
QAPP: Quality Assurance Program (or Project) Plan
QAT: Quality Action Team
QBTU: Quadrillion British Thermal Units
QC: Quality Control
QCA: Quiet Communities Act
QCI: Quality Control Index
QCP: Quiet Community Program
QL: Quantification Limit
QNCR: Quarterly Noncompliance Report
QUA: Qualitative Use Assessment
QUIPE: Quarterly Update for Inspector in Pesticide Enforcement
RA: Reasonable Alternative; Regulatory Alternatives; Regulatory Analysis; Remedial Action; Resource Allocation; Risk Analysis; Risk Assessment
RAATS: RCRA Administrate Action Tracking System
RAC: Radiation Advisory Committee. Raw Agricultural Commodity; Regional Asbestos Coordinator. Response Action Coordinator
RACM: Reasonably Available Control Measures
RACT: Reasonably Available Control Technology
RAD: Radiation Adsorbed Dose (unit of measurement of radiation absorbed by humans)
RADM: Random Walk Advection and Dispersion Model; Regional Acid Deposition Model
RAM: Urban Air Quality Model for Point and Area Source in EPA UNAMAP Series
RAMP: Rural Abandoned Mine Program
RAMS: Regional Air Monitoring System
RAP: Radon Action Program; Registration Assessment Panel; Remedial Accomplishment Plan; Response Action Plan
RAPS: Regional Air Pollution Study
RARG: Regulatory Analysis Review Group
RAS: Routine Analytical Service
RAT: Relative Accuracy Test
RB: Request for Bid
RBAC: Re-use Business Assistance Center
RBC: Red Blood Cell
RC: Responsibility Center
RCC: Radiation Coordinating Council
RCDO: Regional Case Development Officer
RCO: Regional Compliance Officer
RCP: Research Centers Program
RCRA: Resource Conservation and Recovery Act
RCRIS: Resource Conservation and Recovery Information System
RD/RA: Remedial Design/ Remedial Action
R&D: Research and Development
RD&D: Research, Development and Demonstration
RDF: Refuse-Derived Fuel
RDNA: Recombinant DNA
RDU: Regional Decision Units
RDV: Reference Dose Values
RE: Reasonable Efforts; Reportable Event
REAP: Regional Enforcement Activities Plan
REE: Rare Earth Elements
REEP: Review of Environmental Effects of Pollutants
RECLAIM: Regional Clean Air Initiatives Marker
RED: Reregistration Eligibility Decision Document
REDA: Recycling Economic Development Advocate
ReFIT: Reinvention for Innovative Technologies
REI: Restricted Entry Interval
REM: (Roentgen Equivalent Man)
REM/FIT: Remedial/Field Investigation Team
REMS: RCRA Enforcement Management System
REP: Reasonable Efforts Program
REPS: Regional Emissions Projection System
RESOLVE: Center for Environmental Conflict Resolution
RF: Response Factor
RFA: Regulatory Flexibility Act
RFB: Request for Bid
RfC: Reference Concentration
RFD: Reference Dose Values
RFI: Remedial Field Investigation
RFP: Reasonable Further Programs. Request for Proposal
RHRS: Revised Hazard Ranking System
RI: Reconnaissance Inspection
RI: Remedial Investigation
RIA: Regulatory Impact Analysis; Regulatory Impact Assessment
RIC: Radon Information Center
RICC: Retirement Information and Counseling Center
RICO: Racketeer Influenced and Corrupt Organizations Act
RI/FS: Remedial Information/ Feasibility Study
RIM: Regulatory Interpretation Memorandum
RIN: Regulatory Identifier Number
RIP: RCRA Implementation Plan
RISC: Regulatory Information Service Center
RJE: Remote Job Entry
RLL: Rapid and Large Leakage (Rate)
RMCL: Recommended Maximum Contaminant Level (this phrase being discontinued in favor of MCLG)
RMDHS: Regional Model Data Handling System
RMIS: Resources Management Information System
RNA: Ribonucleic Acid
ROADCHEM: Roadway Version that Includes Chemical Reactions of BI, NO2, and O3
ROADWAY: A Model to Predict Pollutant Concentrations Near a Roadway
ROC: Record Of Communication
RODS: Records Of Decision System
ROG: Reactive Organic Gases
ROLLBACK: A Proportional Reduction Model
ROM: Regional Oxidant Model
ROMCOE: Rocky Mountain Center on Environment
ROP: Rate of Progress; Regional Oversight Policy
ROPA: Record Of Procurement Action

ROSA: Regional Ozone Study Area
RP: Radon Progeny Integrated Sampling. Respirable Particulates. Responsible Party
RPAR: Rebuttable Presumption Against Registration
RPM: Reactive Plume Model. Remedial Project Manager
RQ: Reportable Quantities
RRC: Regional Response Center
RRT: Regional Response Team; Requisite Remedial Technology
RS: Registration Standard
RSCC: Regional Sample Control Center
RSD: Risk-Specific Dose
RSE: Removal Site Evaluation
RTCM: Reasonable Transportation Control Measure
RTDF: Remediation Technologies Development Forum
RTDM: Rough Terrain Diffusion Model
RTECS: Registry of Toxic Effects of Chemical Substances
RTM: Regional Transport Model
RTP: Research Triangle Park
RUP: Restricted Use Pesticide
RVP: Reid Vapor Pressure
RWC: Residential Wood Combustion
S&A: Sampling and Analysis. Surveillance and Analysis
SAB: Science Advisory Board
SAC: Suspended and Cancelled Pesticides
SAEWG: Standing Air Emissions Work Group
SAIC: Special-Agents-In-Charge
SAIP: Systems Acquisition and Implementation Program
SAMI: Southern Appalachian Mountains Initiative
SAMWG: Standing Air Monitoring Work Group
SANE: Sulfur and Nitrogen Emissions
SANSS: Structure and Nomenclature Search System
SAP: Scientific Advisory Panel
SAR: Start Action Request. Structural Activity Relationship (of a qualitative assessment)
SARA: Superfund Amendments and Reauthorization Act of 1986
SAROAD: Storage and Retrieval Of Aerometric Data
SAS: Special Analytical Service. Statistical Analysis System
SASS: Source Assessment Sampling System
SAV: Submerged Aquatic Vegetation
SBC: Single Breath Cannister
SC: Sierra Club
SCAP: Superfund Consolidated Accomplishments Plan
SCBA: Self-Contained Breathing Apparatus
SCC: Source Classification Code
SCD/SWDC: Soil or Soil and Water Conservation District
SCFM: Standard Cubic Feet Per Minute
SCLDF: Sierra Club Legal Defense Fund
SCR: Selective Catalytic Reduction
SCRAM: State Consolidated RCRA Authorization Manual
SCRC: Superfund Community Relations Coordinator
SCS: Supplementary Control Strategy/System
SCSA: Soil Conservation Society of America
SCSP: Storm and Combined Sewer Program
SCW: Supercritical Water Oxidation
SDC: Systems Decision Plan
SDWA: Safe Drinking Water Act
SDWIS: Safe Drinking Water Information System
SBS: Sick Building Syndrome
SEA: State Enforcement Agreement
SEA: State/EPA Agreement
SEAM: Surface, Environment, and Mining
SEAS: Strategic Environmental Assessment System
SEDS: State Energy Data System
SEGIP: State Environmental Goals and Improvement Project
SEIA: Socioeconomic Impact Analysis
SEM: Standard Error of the Means
SEP: Standard Evaluation Procedures
SEP: Supplementary Environmental Project
SEPWC: Senate Environment and Public Works Committee
SERC: State Emergency Planning Commission
SES: Secondary Emissions Standard
SETAC: Society for Environmental Toxicology and Chemistry
SETS: Site Enforcement Tracking System
SF: Standard Form. Superfund
SFA: Spectral Flame Analyzers
SFDS: Sanitary Facility Data System
SFFAS: Superfund Financial Assessment System
SFIREG: State FIFRA Issues Research and Evaluation Group
SFS: State Funding Study
SHORTZ: Short Term Terrain Model
SHWL: Seasonal High Water Level
SI: International System of Units. Site Inspection. Surveillance Index. Spark Ignition
SIC: Standard Industrial Classification
SICEA: Steel Industry Compliance Extension Act
SIMS: Secondary Ion-Mass Spectrometry
SIP: State Implementation Plan
SITE: Superfund Innovative Technology Evaluation
SLAMS: State/Local Air Monitoring Station
SLN: Special Local Need
SLSM: Simple Line Source Model
SMART: Simple Maintenance of ARTS
SMCL: Secondary Maximum Contaminant Level
SMCRA: Surface Mining Control and Reclamation Act
SME: Subject Matter Expert
SMO: Sample Management Office
SMOA: Superfund Memorandum of Agreement
SMP: State Management Plan
SMR: Standardized Mortality Ratio
SMSA: Standard Metropolitan Statistical Area
SNA: System Network Architecture
SNAAQS: Secondary National Ambient Air Quality Standards
SNAP: Significant New Alternatives Project; Significant Noncompliance Action Program

SNARL: Suggested No Adverse Response Level
SNC: Significant Noncompliers
SNUR: Significant New Use Rule
SO: Sulfur Dioxide
SOC: Synthetic Organic Chemicals
SOCMI: Synthetic Organic Chemicals Manufacturing Industry
SOFC: Solid Oxide Fuel Cell
SOTDAT: Source Test Data
SOW: Scope Of Work
SPAR: Status of Permit Application Report
SPCC: Spill Prevention, Containment, and Countermeasure
SPE: Secondary Particulate Emissions
SPF: Structured Programming Facility
SPI: Strategic Planning Initiative
SPLMD: Soil-pore Liquid Monitoring Device
SPMS: Strategic Planning and Management System; Special Purpose Monitoring Stations
SPOC: Single Point Of Contact
SPS: State Permit System
SPSS: Statistical Package for the Social Sciences
SPUR: Software Package for Unique Reports
SQBE: Small Quantity Burner Exemption
SQG: Small Quantity Generator
SR: Special Review
SRAP: Superfund Remedial Accomplishment Plan
SRC: Solvent-Refined Coal
SRF: State Revolving Fund
SRM: Standard Reference Method
SRP: Special Review Procedure
SRR: Second Round Review. Submission Review Record
SRTS: Service Request Tracking System
SS: Settleable Solids. Superfund Surcharge. Suspended Solids
SSA: Sole Source Aquifer
SSAC: Soil Site Assimilated Capacity
SSC: State Superfund Contracts
SSD: Standards Support Document
SSEIS: Standard Support and Environmental Impact Statement;. Stationary Source Emissions and Inventory System.
SSI: Size Selective Inlet
SSMS: Spark Source Mass Spectrometry
SSO: Sanitary Sewer Overflow; Source Selection Official
SSRP: Source Reduction Review Project
SSTS: Section Seven Tracking System
SSURO: Stop Sale, Use and Removal Order
STALAPCO: State and Local Air-Pollution Control Officials
STAPPA: State and Territorial Air Pollution
STAR: Stability Wind Rose. State Acid Rain Projects
STARS: Strategic Targeted Activities for Results System
STEL: Short Term Exposure Limit
STEM: Scanning Transmission-Electron Microscope
STN: Scientific and Technical Information Network
STORET: Storage and Retrieval of Water-Related Data
STP: Sewage Treatment Plant. Standard Temperature and Pressure
STTF: Small Town Task Force (EPA)
SUP: Standard Unit of Processing
SURE: Sulfate Regional Experiment Program
SV: Sampling Visit; Significant Violator
SW: Slow Wave
SWAP: Source Water Assessment Program
SWARF: Waste from Metal Grinding Process
SWC: Settlement With Conditions
SWDA: Solid Waste Disposal Act
SWIE: Southern Waste Information Exchange
SWMU: Solid Waste Management Unit
SWPA: Source Water Protection Area
SWQPPP: Source Water Quality Protection Partnership Petitions
SWTR: Surface Water Treatment Rule
SYSOP: Systems Operator
TAD: Technical Assistance Document
TAG: Technical Assistance Grant
TALMS: Tunable Atomic Line Molecular Spectroscopy
TAMS: Toxic Air Monitoring System
TAMTAC: Toxic Air Monitoring System Advisory Committee
TAP: Technical Assistance Program
TAPDS: Toxic Air Pollutant Data System
TAS: Tolerance Assessment System
TBT: Tributyltin
TC: Target Concentration. Technical Center. Toxicity Characteristics. Toxic Concentration:
TCDD: Dioxin (Tetrachlorodibenzo-p-dioxin)
TCDF: Tetrachlorodi-benzofurans
TCE: Trichloroethylene
TCF: Total Chlorine Free
TCLP: Total Concentrate Leachate Procedure. Toxicity Characteristic Leachate Procedure
TCM: Transportation Control Measure
TCP: Transportation Control Plan; Trichloropropane;
TCRI: Toxic Chemical Release Inventory
TD: Toxic Dose
TDS: Total Dissolved Solids
TEAM: Total Exposure Assessment Model
TEC: Technical Evaluation Committee
TED: Turtle Excluder Devices
TEG: Tetraethylene Glycol
TEGD: Technical Enforcement Guidance Document
TEL: Tetraethyl Lead
TEM: Texas Episodic Model
TEP: Typical End-use Product. Technical Evaluation Panel
TERA: TSCA Environmental Release Application
TES: Technical Enforcement Support
TEXIN: Texas Intersection Air Quality Model
TGO: Total Gross Output
TGAI: Technical Grade of the Active Ingredient
TGP: Technical Grade Product
THC: Total Hydrocarbons
THM: Trihalomethane
TI: Temporary Intermittent
TI: Therapeutic Index

TIBL: Thermal Internal Boundary Layer
TIC: Technical Information Coordinator. Tentatively Identified Compounds
TIM: Technical Information Manager
TIP: Technical Information Package
TIP: Transportation Improvement Program
TIS: Tolerance Index System
TISE: Take It Somewhere Else
TITC: Toxic Substance Control Act Interagency Testing Committee
TLV: Threshold Limit Value
TLV-C: TLV-Ceiling
TLV-STEL: TLV-Short Term Exposure Limit
TLV-TWA: TLV-Time Weighted Average
TMDL: Total Maximum Daily Limit; Total Maximum Daily Load
TMRC: Theoretical Maximum Residue Contribution
TNCWS: Transient Non-Community Water System
TNT: Trinitrotoluene
TO: Task Order
TOA: Trace Organic Analysis
TOC: Total Organic Carbon/ Compound
TOX: Tetradichloroxylene
TP: Technical Product; Total Particulates
TPC: Testing Priorities Committee
TPI: Technical Proposal Instructions
TPQ: Threshold Planning Quantity
TPSIS: Transportation Planning Support Information System
TPTH: Triphenyltinhydroxide
TPY: Tons Per Year
TQM: Total Quality Management
T-R: Transformer-Rectifier
TRC: Technical Review Committee
TRD: Technical Review Document
TRI: Toxic Release Inventory
TRIP: Toxic Release Inventory Program
TRIS: Toxic Chemical Release Inventory System
TRLN: Triangle Research Library Network
TRO: Temporary Restraining Order
TSA: Technical Systems Audit
TSCA: Toxic Substances Control Act
TSCATS: TSCA Test Submissions Database
TSCC: Toxic Substances Coordinating Committee
TSD: Technical Support Document
TSDF: Treatment, Storage, and Disposal Facility
TSDG: Toxic Substances Dialogue Group
TSI: Thermal System Insulation
TSM: Transportation System Management
TSO: Time Sharing Option
TSP: Total Suspended Particulates
TSS: Total Suspended (non-filterable) Solids
TTFA: Target Transformation Factor Analysis
TTHM: Total Trihalomethane
TTN: Technology Transfer Network
TTO: Total Toxic Organics
TTY: Teletypewriter
TVA: Tennessee Valley Authority
TVOC: Total Volatile Organic Compounds
TWA: Time Weighted Average
TWS: Transient Water System
TZ: Treatment Zone
UAC: User Advisory Committee
UAM: Urban Airshed Model
UAO: Unilateral Administrative Order
UAPSP: Utility Acid Precipitation Study Program
UAQI: Uniform Air Quality Index
UARG: Utility Air Regulatory Group
UCC: Ultra Clean Coal
UCCI: Urea-Formaldehyde Foam Insulation
UCL: Upper Control Limit
UDMH: Unsymmetrical Dimethyl Hydrazine
UEL: Upper Explosive Limit
UF: Uncertainty Factor
UFL: Upper Flammability Limit
ug/m3: Micrograms Per Cubic Meter
UIC: Underground Injection Control
ULEV: Ultra Low Emission Vehicles
UMTRCA: Uranium Mill Tailings Radiation Control Act
UNAMAP: Users' Network for Applied Modeling of Air Pollution
UNECE: United Nations Economic Commission for Europe
UNEP: United Nations Environment Program
USC: Unified Soil Classification
USDA: United States Department of Agriculture
USDW: Underground Sources of Drinking Water
USFS: United States Forest Service
UST: Underground Storage Tank
UTM: Universal Transverse Mercator
UTP: Urban Transportation Planning
UV: Ultraviolet
UVA, UVB, UVC: Ultraviolet Radiation Bands
UZM: Unsaturated Zone Monitoring
VALLEY: Meteorological Model to Calculate Concentrations on Elevated Terrain
VCM: Vinyl Chloride Monomer
VCP: Voluntary Cleanup Program
VE: Visual Emissions
VEO: Visible Emission Observation
VHS: Vertical and Horizontal Spread Model
VHT: Vehicle-Hours of Travel
VISTTA: Visibility Impairment from Sulfur Transformation and Transport in the Atmosphere
VKT: Vehicle Kilometers Traveled
VMT: Vehicle Miles Traveled
VOC: Volatile Organic Compounds
VOS: Vehicle Operating Survey
VOST: Volatile Organic Sampling Train
VP: Vapor Pressure
VSD: Virtually Safe Dose
VSI: Visual Site Inspection
VSS: Volatile Suspended Solids
WA: Work Assignment
WADTF: Western Atmospheric Deposition Task Force
WAP: Waste Analysis Plan
WAVE: Water Alliances for Environmental Efficiency
WB: Wet Bulb
WCED: World Commission on Environment and Development
WDROP: Distribution Register of Organic Pollutants in Water

WENDB: Water Enforcement National Data Base
WERL: Water Engineering Research Laboratory
WET: Whole Effluent Toxicity test
WHO: World Health Organization
WHP: Wellhead Protection Program
WHPA: Wellhead Protection Area
WHWT: Water and Hazardous Waste Team
WICEM: World Industry Conference on Environmental Management
WL: Warning Letter; Working Level (radon measurement)
WLA/TMDL: Wasteload Allocation/Total Maximum Daily Load
WLM: Working Level Months
WMO: World Meteorological Organization
WP: Wettable Powder
WPCF: Water Pollution Control Federation
WQS: Water Quality Standard

WRC: Water Resources Council
WRDA: Water Resources Development Act
WRI: World Resources Institute
WS: Work Status
WSF: Water Soluble Fraction
WSRA: Wild and Scenic Rivers Act
WSTB: Water Sciences and Technology Board
WSTP: Wastewater Sewage Treatment Plant
WWEMA: Waste and Wastewater Equipment Manufacturers Association
WWF: World Wildlife Fund
WWTP: Wastewater Treatment Plant
WWTU: Wastewater Treatment Unit
ZEV: Zero Emissions Vehicle
ZHE: Zero Headspace Extractor
ZOI: Zone Of Incorporation
ZRL: Zero Risk Level

RCRA OVERVIEW

The Resource Conservation and Recovery Act (**RCRA**), an amendment to the Solid Waste Disposal Act, was enacted in 1976 to address the huge volumes of municipal and industrial solid waste generated nationwide.

Once, the amount of waste produced in the United States was small and its impact on the environment was viewed as relatively minor. Times have changed. With the industrial revolution in the late 1800s, the country began to experience unparalleled growth. New products were developed, and the consumer was offered an ever-expanding array of material goods.

SECTION I
INTRODUCTION TO THE RESOURCE CONSERVATION AND RECOVERY ACT

This growth continued through the early 20th Century and accelerated after World War II when the nation's industrial base, strengthened by war, turned its energy toward domestic production. The results of growth, however, were not all positive.

While the country produced more goods and prospered economically, it also generated more waste, both hazardous and nonhazardous. For example, at the end of World War II, U.S. industry was generating roughly 500,000 metric tons of hazardous waste per year.

This amount continued to increase over the next 50 years. A national survey conducted by the EPA in 1996 estimated that 279 million metric tons of hazardous waste was generated nationwide in 1995, more than a 500-fold increase.

This phenomenal growth in waste production was not mirrored by advancements in the field of waste management. Much of the waste produced entered the environment, where it often posed a serious threat to ecological systems and public health.

In the mid-1970s, it became clear to Congress and the American people that action had to be taken to ensure that wastes were managed properly. This realization began the process that resulted in the passage of the RCRA.

The goals set by the RCRA are:

- To protect human health and the environment from the hazards posed by waste disposal
- To conserve energy and natural resources through waste recycling and recovery
- To reduce or eliminate, as expeditiously as possible, the amount of waste generated, including hazardous waste
- To ensure that wastes are managed in a manner that is protective of human health and the environment.

To achieve these goals, the RCRA established three distinct yet interrelated programs (see Figure I-1).

RCRA Subtitle D, the solid waste program, encourages states to develop comprehensive plans to manage nonhazardous industrial solid waste and municipal solid waste, sets criteria for municipal solid waste landfills (**MSWLFs**) and other solid waste disposal facilities, and prohibits the open dumping of solid waste.

RCRA Subtitle C, the hazardous waste program, establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal — in effect, from cradle to grave.

RCRA Subtitle I, the underground storage tank (**UST**) program, regulates underground tanks storing hazardous substances and petroleum products.

Although the RCRA creates the framework for the proper management of hazardous and nonhazardous solid waste, it does not address the problems of hazardous waste found at inactive or abandoned sites or those resulting from spills that require emergency response.

These problems are addressed by a different act, the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA**), commonly called Superfund, which was enacted in 1980.

This section provides an overview of the RCRA, including the Act, regulations, guidance, and policy. In addition, this section discusses the three major programs that comprise the RCRA and the interrelationships between them.

Finally, this section details where the RCRA is today, introduces who is involved in the RCRA, and outlines the remainder of this Course.

OUTLINE OF THE COURSE

The remainder of this manual details the three RCRA programs briefly discussed in the introduction.

The manual also describes two other components of the RCRA: the federal procurement and medical waste tracking programs.

In addition, the manual discusses the interrelationships between the RCRA's Subtitle C program and other environmental statutes, as well as RCRA's public participation provisions. To supplement this technical description of the RCRA regulatory program, the manual also contains appendices that present important RCRA forms and paperwork requirements, a glossary (for the reader 's convenience, the terms that appear in this glossary have been bolded throughout the text),a list of acronyms and abbreviations, an OSW organization chart, useful environmental contacts, and a keyword index.

RCRA: What it is…

Although RCRA is the acronym for the Resource Conservation and Recovery Act, it is often used interchangeably to refer to the law, the regulations, and EPA policy and guidance. To avoid confusion in this manual, the term "***the Act*** "refers to the public law and statutory requirements passed by Congress.

The term "***regulations***" is used interchangeably with standards or regulatory requirements, and means the rules developed by the EPA to implement the statute.

The Act

The Act provides, in broad terms, general guidelines for the waste management program envisioned by Congress (e.g., the EPA is directed to develop and promulgate criteria for identifying hazardous waste).

The Act also provides the EPA Administrator (or his or her representative) with the necessary authority to develop these broad standards into specific requirements for the regulated community.

What we commonly know as the RCRA, or the Act, is actually a combination of the first federal solid waste statutes and all subsequent amendments (see Figure I-2). In 1965, Congress enacted the Solid Waste Disposal Act, the first statute that specifically focused on improving solid waste disposal methods.

The Solid Waste Disposal Act established economic

Figure I-1: RCRA's Three Interrelated Programs

SUBTITLE D
Solid Waste Program
SUBTITLE C
Hazardous Waste Program
SUBTITLE I
Underground Storage Tank Program

The Act
The law that describes the kind of waste management program that Congress wants to establish. The Act also provides the Administrator of the EPA (or his or her designee) with the authority to implement the program, including implementing incentives for states to develop planning, training, research, and demonstration projects for the management of solid waste. The Act was amended in 1976 by the RCRA, which substantially remodeled the nation's solid waste management system and laid out the basic framework of the current hazardous waste management program.

The Act, which has been amended several times since 1976, continues to evolve as Congress alters it to reflect changing waste management needs. The Act was amended significantly on November 8,1984, by the Hazardous and Solid Waste Amendments (**HSWA**), which expanded the scope and requirements of the RCRA.

The HSWA was created largely in response to citizen concerns that existing methods of hazardous waste disposal, particularly land disposal, were not safe. Because of their significance and differences in their implementation, the HSWA provisions are emphasized throughout this manual.

Congress also revised the RCRA in 1992 by passing the Federal Facility Compliance Act, which strengthened the authority to enforce the RCRA at federal facilities. In addition, the Land Disposal Program Flexibility Act of 1996 amended the RCRA to provide regulatory flexibility for the land disposal of certain wastes.

Today, the Act consists of 10 subtitles (see Figure I-3).Subtitles A, B, E, F, G, H, and J outline general provisions; authorities of the Administrator; duties of the Secretary of Commerce; federal responsibilities; miscellaneous provisions; research, development, demonstration, and information requirements; and medical waste tracking. Other subtitles lay out the framework for the three major programs that comprise RCRA Subtitle C (the hazardous waste management program), Subtitle D (the solid waste program), and Subtitle I (the UST program).

The text of the Act can be found at www.epa.gov/epahome/laws.htm.

Regulations
The Act includes a Congressional mandate directing the EPA to develop a comprehensive set of regulations.

Regulations, or **rulemakings**, are issued by an agency, such as the EPA, that translates the general mandate of a statute into a set of requirements for the Agency and the regulated community.

Regulations are developed by the EPA in an open and public manner according to an established process. When a regulation is formally proposed, it is published in an official government document called the ***Federal Register*** to notify the public of the EPA's intent to create new regulations or modify existing ones.

The EPA provides the public, which includes the potentially regulated community, with an opportunity to submit comments.

Figure I-2:The Evolution of Significant RCRA Legislation
SOLID WASTE DISPOSAL ACT OF 1965

RESOURCE CONSERVATION AND RECOVERY ACT OF 1976

HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

FEDERAL FACILITIES COMPLIANCE ACT OF 1992

LAND DISPOSAL PROGRAM FLEXIBILITY ACT OF 1996

Figure I-3:Outline of the Act
Subtitle Provisions

A General Provisions

B Office of Solid Waste;
Authorities of the Administrator and Interagency Coordinating Committee
Hazardous Waste Management

D State or Regional Solid Waste Plans

E Duties of the Secretary of Commerce in Resource and Recovery

F Federal Responsibilities

G Miscellaneous Provisions

H Research, Development, Demonstration, and Information

I Regulation of Underground Storage Tanks

J Standards for the Tracking and Management of Medical Waste proposed rule based on both an internal review process and public comments.

The final regulation is published, or promulgated, in the *Federal Register*. Included with the regulation is discussion of the Agency's rationale for the regulatory approach, known as preamble language. Final regulations are compiled annually and incorporated in the Code of Federal Regulations (**CFR**) according to a highly structured format based on the topic of the regulation.

This latter process is called **codification**, and each CFR title corresponds to a different regulatory authority. For example, the EPA's regulations are in Title 40 of the CFR. The codified RCRA regulations can be found in Title 40 of the CFR, Parts 240-282.These regulations are often cited as 40 CFR, with the part listed afterward (e.g.,40 CFR Part 264),or the part and section (e.g.,40 CFR §264.10).

Although this relationship between an Act and the regulations is the norm, the relationship between the HSWA and its regulations differs slightly. Congress, through the HSWA, not only provided the EPA with a general mandate to promulgate regulations, but also placed explicit instructions in the Statute to develop certain regulations. Many of these requirements are so specific that the EPA incorporated them directly into the regulations.

Hammer Provisions

The HSWA is all the more significant because of the ambitious schedules that Congress established for implementation of the Act's provisions. Another unique aspect of the HSWA is that it established **hammer provisions**, or statutory requirements that would go into effect automatically (with the force of regulations) if the EPA failed to issue regulations by certain dates.

The interpretation of statutory language does not end with the codification of regulations. The EPA further clarifies the requirements of the Act and its regulations through guidance documents and policy.

The RCRA regulations can be found at hww.epa.gov/docs/epacfr40/chapt-I.info/subch-I.htm.

Guidance and Policy

Guidance documents are issued by the EPA primarily to provide direction for implementing and complying with regulations. They are essentially "***how to***" documents. For example, the regulations in 40 CFR Part 270 detail what is required in a permit application for a hazardous waste management facility, while the guidance for this Part suggests how to evaluate a permit application to ensure that all information has been included.

Guidance documents also elaborate on the Agency's interpretation of the requirements of the Act.

Policy statements, on the other hand, specify operating procedures that should generally be followed. They are mechanisms used by the EPA program offices to outline the manner in which the RCRA program is implemented. For example, the EPA's Office of Solid Waste (**OSW**) may issue a policy outlining what actions should generally be taken to achieve the RCRA corrective action cleanup goals. In many cases, policy statements are addressed to the staff working on implementation, but they may also be addressed to the regulated community.

REGULATIONS
Legal mechanisms that establish standards or impose requirements as mandated by the Act. RCRA regulations are promulgated by the EPA, published in the *Federal Register*, and codified in the Code of Federal Regulations.

GUIDANCE =*How To*
Documents developed and issued by the EPA to provide instructions on how to implement the requirements of either the Act or regulations.

POLICY =*Should Do*
Statements developed by the EPA, outlining a position on a topic or giving instructions on how a procedure should be conducted.

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RCRA: HOW IT WORKS

The three programs established under the RCRA — solid waste, hazardous waste, and USTs — are described in detail in the following chapters. To provide an overall perspective of how thee RCRA works, each of these programs and their interrelationships are briefly summarized here. In this manual, the Subtitle D (solid waste) program is discussed before the Subtitle C (hazardous waste) program. Although this is alphabetically out of order, the structure is designed for better understanding by the reader.

Subtitle D — Solid Waste
RCRA Subtitle D focuses on state and local governments as the primary planning, regulating, and implementing entities for the management of nonhazardous solid waste, such as household garbage and nonhazardous industrial solid waste.

The EPA provides these state and local agencies with information, guidance, policy and regulations through workshops and publications to help states and the regulated community make better decisions in dealing with waste issues, to reap the environmental and economic

benefits of source reduction and recycling of solid wastes, and to require upgrading or closure of all environmentally unsound disposal units.

In order to promote the use of safer units for solid waste disposal, the EPA developed federal criteria for the proper design and operation of MSWLFs and other solid waste disposal facilities. Many states have adopted these criteria into their state solid waste programs.

Subtitle C — Hazardous Waste
RCRA Subtitle C establishes a federal program to manage hazardous wastes from **cradle to grave** .

The objective of the Subtitle C program is to ensure that hazardous waste is handled in a manner that protects human health and the environment. To this end, there are Subtitle C regulations for the generation, transportation, and treatment, storage, or disposal of hazardous wastes.

In practical terms, this means regulating a large number of hazardous waste handlers. As of 1999, the EPA had on record 1,575 treatment, storage, and disposal facilities (**TSDFs**); 17,000 transporters; and about 20,000 large quantity generators (**LQGs**).

The Subtitle C program has resulted in perhaps the most comprehensive regulations the EPA has ever developed. The regulations first identify the criteria to determine which solid wastes are hazardous, and then establish various requirements for the three categories of hazardous waste handlers: generators, transporters, and TSDFs.

In addition, the Subtitle C regulations set technical standards for the design and safe operation of TSDFs. These standards are designed to minimize the release of hazardous waste into the environment. Furthermore, the regulations for TSDFs serve as the basis for developing and issuing the permits required by the Act for each facility. Permits are essential to making the Subtitle C regulatory program work, since it is through the permitting process that the EPA or a state applies the technical standards to TSDFs.

One of the primary differences between Subtitle C and Subtitle D is the type of waste each regulates.

Subtitle C regulates only hazardous waste, a subset of solid waste, whereas Subtitle D primarily manages nonhazardous solid waste.

Subtitle I — Underground Storage Tanks
RCRA Subtitle I regulates underground storage tanks (**USTs**) that contain petroleum or hazardous substances (as defined under **CERCLA**). A major objective of Subtitle I is to prevent and clean up releases from tanks.

Under Subtitle I, the EPA has developed performance standards for new tanks, upgrading requirements for existing tanks, and regulations to prevent, detect, and clean up releases at all UST sites.

State UST programs may be approved to operate in lieu of the federal program.

WHO IS INVOLVED IN RCRA?

The RCRA program involves many people and organizations, all with varying roles. Congress and the President set overall national direction for the RCRA program through amendments to the Act.

The EPA, through its Office of Solid Waste and Emergency Response (**OSWER**), translates this direction into operating programs by developing regulations, guidance, and policy.

Site-specific implementation of the RCRA program is the responsibility of the EPA Regions and states. All three RCRA programs — hazardous waste, solid waste, and USTs — have mechanisms through which states can exercise key program responsibilities.

Initial federal responsibilities vary among the different programs.

Under Subtitle D, the EPA established minimum criteria for MSWLFs and required each state to gain approval for their MSWLF permitting program through an approval process that ensures that the state's program meets minimum federal criteria.

Most of the Subtitle D solid waste program is overseen by the states and compliance is assured through state-issued permits. State involvement in the Subtitle C program is similar to involvement in the Subtitle D program. Under Subtitle C, in the authorization process, the EPA reviews a state's hazardous waste program and, if it is at least as stringent as the federal program, grants the state authority to implement its own program in lieu of the federal program.

These states are known as authorized states.

Under Subtitle I, the EPA also allows state UST programs to operate in lieu of the federal program provided that a state's regulatory provisions are at least as stringent as the federal provisions.

The **regulated community** that must understand and comply with the RCRA and its regulations is a large, diverse group. It includes not only facilities typically thought of as hazardous waste generators, such as industrial manufacturers, but also government agencies and small businesses, such as a local dry cleaner generating small amounts of hazardous solvents, or a gas station with underground petroleum tanks.

Lastly, the general public plays a key role in the RCRA by providing input and comments during almost every stage of the program's development and implementation, through rulemaking participation and comments on TSDF permits.

RCRA TODAY

When the RCRA was first enacted in 1976, the EPA was faced with a huge implementation task. The bulk of the activity during the first few years focused on developing basic regulations for the management of both hazardous and nonhazardous solid waste in order to provide adequate protection of human health and the environment. Although most of these elementary standards are now in place, the RCRA program has not remained stagnant.

The EPA continues to measure and analyze the program's results to help identify ways to make the RCRA program more efficient and achieve better, more cost-effective protection of public health and the environment.

Waste Minimization

The EPA has devoted much of its efforts in the past to the treatment and cleanup of pollutants after they are generated. In fact, great strides have been made in environmental protection over the past 20 years.

The EPA realizes, however, that there are environmental and economic incentives to reducing or eliminating waste before it is even generated. Consequently, both the RCRA solid and hazardous waste programs have adopted waste minimization elements. The EPA uses the term **waste minimization** to mean the reduction, to the extent feasible, of solid and hazardous waste.

Both programs emphasize source reduction (reducing waste at its source, before it is even generated) and environmentally sound recycling.

In the text of the HSWA, Congress specifically declared that the reduction or elimination of hazardous waste generation at the source should be a priority of the RCRA hazardous waste program. To encourage hazardous waste minimization nationwide, the EPA developed the Waste Minimization National Plan.

This initiative promotes a long-term national effort to minimize the generation of hazardous chemicals in wastes. The goals of the National Plan include:

- ✓ Reducing the presence of the most persistent, bioaccumulative, and toxic (**PBT**) chemicals in hazardous wastes by 50% by the year 2005
- ✓ Emphasizing source reduction and environmental source recycling over treatment and disposal
- ✓ Preventing transfers of chemical releases from one medium (air, water, land) to another.

The EPA has also developed strategies and priorities for encouraging source reduction and recycling of nonhazardous solid waste streams regulated by RCRA Subtitle D. The EPA envisions a flexible integrated waste management hierarchy where source reduction, recycling, waste combustion, and landfilling all play a part in the successful management of solid waste at the local level.

Source reduction and recycling are preferred approaches and are at the top of the management hierarchy. Waste combustion and landfilling are less emphasized. In addition, to expand the use of recovered materials, the EPA has developed the procurement program, which establishes guidelines recommending that federal agencies purchase products containing recycled materials.

Streamlining RCRA Regulation

The EPA is currently identifying options to reinvent the RCRA program by streamlining compliance requirements. The EPA's reinvention philosophy includes providing flexibility in how results are achieved, sharing information and decision-making with all stakeholders, creating incentives for compliance with environmental requirements, lessening the burden of complying with environmental requirements, and seeking a better interface with other environmental regulations.

The EPA is also placing an increasing emphasis on making the RCRA hazardous waste program more risk-based and results-based (i.e., ensuring that the regulations correspond to the level of risk posed by the hazardous waste being regulated and that technicalities will not interfere with the ultimate goals for a site). This approach is particularly valuable for the cleanup of contaminated sites.

Excessive Regulation

Placing excessive regulation on sites whose contamination poses low risks to human health and the environment may create disincentives for cleanup. Focusing regulations on risk and results would allow states greater flexibility in determining the appropriate way to clean up sites contaminated with relatively small quantities of hazardous waste.

Subtitle C Federal/State Partnership

The RCRA, like most federal environmental legislation, encourages states to develop their own hazardous waste programs as an alternative to direct implementation of the federal program.

At the inception of the RCRA, Congress envisioned that a successful national program would be put in place through joint action of the federal and state governments —the EPA would set national goals and standards based on the Agency's technical expertise, and the states would be responsible for implementing those policies.

Because the EPA's hazardous waste regulations are developed in stages, over time, the Agency has a phased approach to approving state programs. Each state must either adopt the new regulations or upgrade those elements of its program that do not meet federal standards. The authorization process is often long and cumbersome.

The EPA has developed streamlined procedures for these state revisions to make the process quicker and more efficient. These procedures help reduce the amount of resources needed for preparing and processing authorization applications and speed up state implementation of additional parts of the RCRA program.

DEFINITION OF SOLID WASTE

*RCRA defines the term **solid waste** as:*

- **Garbage (e.g., milk cartons and coffee grounds)**
- **Refuse (e.g., metal scrap, wall board, and empty containers)**
- **Sludges from waste treatment plants, water supply treatment plants, or pollution control facilities (e.g., scrubber slags)**
- **Nonhazardous industrial wastes (e.g., manufacturing process wastewaters and nonwastewater sludges and solids)**
- **Other discarded materials, including solid, semisolid, liquid, or contained gaseous materials resulting from industrial, commercial, mining, agricultural, and community activities (e.g., boiler slags).**

WASTE MINIMIZATION

Waste minimization is the reduction, to the extent feasible, of hazardous waste generated prior to any treatment, storage, or disposal of the waste.

Why Pollution Prevention?

Since the early 1970's, environmental protection programs in the U.S. have been directed primarily at *controlling,* not *preventing,* pollution. Pollution control programs, in general, have consisted of discharge, storage, and treatment standards, information reporting, regulations, and economic incentives. Overall, these programs have been effective, but environmental protection challenges still remain.

Pollution prevention evolved from a 1976 United Nations conference, called *Principles and Creation of Non-Waste Technology and Cleaner Production*, in response to the energy crisis begun three years earlier. How much energy could be saved, the conference asked, by reducing waste?

This conference represented a formal recognition of the limitations of end-of-pipe approaches to environmental problem solving. It became apparent that environmental protection challenges require a different approach. This approach to environmental protection involves continuing pollution control programs while at the same time developing and implementing broad-based pollution prevention programs.

Pollution Prevention Act of 1990

The Congress finds that: (1) The United States of America annually produces millions of tons of pollution and spends tens of billions of dollars per year controlling this pollution. (2) There are significant opportunities for industry to reduce or prevent pollution at the source through cost-effective changes in production, operation, and raw materials use. Such changes offer industry substantial savings in reduced raw material, pollution control, and liability costs as well as help protect the environment and reduce risks to worker health and safety. (3) The opportunities for source reduction are often not realized because existing regulations, and the industrial resources they require for compliance, focus upon treatment and disposal, rather than source reduction; existing regulations do not emphasize multi-media management of pollution; and businesses need information and technical assistance to overcome institutional barriers to the adoption of source reduction practices. (4) Source reduction is fundamentally different and more desirable than waste management and pollution control. The Environmental Protection Agency needs to address the historical lack of attention to source reduction. (5) As a first step in preventing pollution through source reduction, the Environmental Protection Agency must establish a source reduction program that collects and disseminates information, provides financial assistance to States, and implements the other activities provided for in this Act.

Demonstrating Results

As important it is for the EPA to develop protective environmental goals, it is as important to determine if these goals are actually being achieved. Recognizing this, Congress enacted the Government Performance and Results Act (**GPRA**) of 1993 to provide for the establishment of strategic planning and performance measurements throughout the federal government.

The intent of the GPRA is to improve public confidence in federal agencies by holding agencies accountable for achieving program results.

The EPA adopted the GPRA framework by developing an Agency-wide strategic plan that encompasses all EPA offices and program areas.

The strategic plan contains several goals specific to the RCRA, such as preventing pollution, reducing risk to humans and the environment, better waste management, and restoration of contaminated waste sites. As part of the requirements of the GPRA, the EPA has also developed specific, quantifiable objectives for each of these goals. Progress toward these target objectives are measured and evaluated annually. This framework ensures that the EPA can evaluate the success of its different programs and can demonstrate tangible results to the general public.

SUMMARY

The RCRA was passed in 1976, as an amendment to the Solid Waste Disposal Act of 1965, to ensure that solid wastes are managed in an environmentally sound manner.

The broad goals set by the RCRA are:

- ✓ To protect human health and the environment from the hazards posed by waste disposal
- ✓ To conserve energy and natural resources through waste recycling and recovery
- ✓ To reduce or eliminate, as expeditiously as possible, the amount of waste generated,
- ✓ including hazardous waste
- ✓ To ensure that wastes are managed in a manner that is protective of human health and the environment.

To achieve the goals, three distinct yet interrelated programs exist under the RCRA:

Subtitle D –The solid waste program promotes and encourages the environmentally sound management of solid waste. It includes minimum federal technical standards and guidelines for state solid waste plans.

Subtitle C –The hazardous waste program establishes a management system that regulates hazardous waste from the time it is generated until its ultimate disposal, in effect, from cradle to grave.

Subtitle I –The UST program regulates underground tanks that contain petroleum or hazardous substances (as defined under **CERCLA**).

There are several components of the RCRA:

Act –The law that describes the kind of waste management program that Congress wants to establish. The Act also provides the Administrator of the EPA (or his or her designee) with the authority to implement the Act.

Regulations –The legal mechanism that establishes standards or imposes requirements as mandated by the Act. RCRA regulations are promulgated by the EPA, published in the *Federal Register* ,and codified in the CFR.

Guidance – Documents developed and issued by the EPA to provide instructions on how to implement requirements of either the Act or regulations.

Policy – Statements developed by the EPA outlining a position on a topic or giving instructions on how a procedure should be conducted.

The RCRA continues to change with amendments to the Statute. The HSWA, in particular, significantly expanded both the scope and detailed requirements of the Act, especially in the context of the land disposal of hazardous wastes. Congress, the EPA, states, regulated entities, and the general public are involved in developing and implementing the RCRA program.

SECTION II
MANAGING SOLID WASTE – RCRA SUBTITLE D
WHAT IS A SOLID WASTE?

- ✓ Garbage.
- ✓ Refuse.
- ✓ Sludges from waste treatment plants, water supply treatment plants, or pollution control facilities.
- ✓ Nonhazardous industrial wastes.
- ✓ Other discarded materials, including solid, semisolid, liquid, or contained gaseous materials resulting from industrial, commercial, mining, agricultural, and community activities.

RCRA Subtitle D encourages environmentally sound solid waste management practices that maximize the reuse of recoverable material and foster resource recovery.

Solid waste is predominately regulated by state and local governments. The EPA has, however, promulgated some regulations pertaining to solid waste, predominately addressing how disposal facilities should be designed and operated. The EPA's primary role in solid waste management includes setting national goals, providing leadership and technical assistance, and developing guidance and educational materials. The Agency has played a major role in this program by developing tools and information through policy and guidance to empower local governments, business, industry, federal agencies, and individuals to make better decisions in dealing with solid waste issues.

The Agency's involvement is intended to create incentives to motivate behavioral change in reference to solid waste management through a nonregulatory approach.

This section presents an outline of the Subtitle D program. In doing so, it defines the terms solid waste and municipal solid waste, and it describes the role the EPA plays in assisting waste officials in dealing with solid waste management problems. The section will provide an overview of the criteria that the EPA has developed for solid waste landfills, and will introduce some Agency initiatives designed to promote proper and efficient solid waste management.

DEFINITION OF SOLID WASTE

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- **Sludges from waste treatment plants, water supply treatment plants, or pollution control facilities (e.g., scrubber slags)**
- **Nonhazardous industrial wastes (e.g., manufacturing process wastewaters and nonwastewater sludges and solids)**
- **Other discarded materials, including solid, semisolid, liquid, or contained gaseous materials resulting from industrial, commercial, mining, agricultural, and community activities (e.g., boiler slags).**

The term ***solid waste*** is very broad, including not only the traditional nonhazardous solid wastes, such as municipal garbage, but also some hazardous wastes. Hazardous waste, a subset of solid waste, is regulated under RCRA Subtitle C. (Hazardous waste is fully discussed in Section III.)

RCRA Subtitle D addresses solid wastes, including those hazardous wastes that are excluded from the Subtitle C regulations (e.g., household hazardous waste), and hazardous waste generated by conditionally exempt small quantity generators (**CESQGs**).

The definition of solid waste is not limited to wastes that are physically solid. As noted above, many solid wastes are liquid, while others are semisolid or gaseous.

MUNICIPAL SOLID WASTE

Municipal solid waste is a subset of solid waste and is defined as durable goods (e.g., appliances, tires, batteries),nondurable goods (e.g., newspapers, books, magazines),containers and packaging, food wastes, yard trimmings, and miscellaneous organic wastes from residential, commercial, and industrial non-process sources (see Figure II-1).

Figure II-I: Products Generated in MSW by Weight,2000 (total weight -232 million tons)

Food waste 11.2%
26 million tons

Yard Trimmings 12 %
28 million tons

Containers and packaging
32.2%
75 million tons

Nondurable goods 27.5%
64 million tons

Durable goods 15.7%
36.3 million tons

Other 1.5%
3.5 million tons

MSW

Municipal solid waste generation has grown steadily over the past 35 years from 88 million tons per year (2.7 pounds per person per day) in 1960, to 232 million tons per year (4.5 pounds per person per day) in 2000.

While generation of waste has grown steadily, recycling has also greatly increased. In 1960, only about 7 percent of municipal solid waste was recycled. By 2000, this figure had increased to 30 percent.

To address the increasing volumes of municipal solid waste that are generated on a daily basis, the EPA recommends using an integrated, hierarchical approach to waste management with four components: ***source reduction, recycling, combustion, and landfilling***.

The hierarchy favors source reduction to reduce both the volume and toxicity of waste and to increase the useful life of manufactured products. Next preferred is recycling, including composting of yard and food wastes, because it diverts waste from combustion facilities and landfills and has positive impacts on both the environment and the economy. The goal of the EPA's approach is to use a combination of all these methods to safely and effectively manage municipal solid waste.

The EPA recommends that communities tailor systems from the four components to meet their individual needs, looking first to source reduction, and second to recycling as preferences to combustion and landfilling (see Figure II-2).

Reduce

Source reduction, often called waste prevention, means consuming and throwing away less. Source reduction includes purchasing durable, long-lasting goods and seeking products and packaging that are as free of toxics as possible. It can be as complex as redesigning a product to use less raw material in production, have a longer life, or be used again after its original use is completed. Because source reduction actually prevents the generation of waste in the first place, it is the most preferable method of waste management and goes a long way toward protecting the environment.

Solid Waste Hierarchy

The EPA has ranked the most environmentally sound strategies for MSW. Source reduction (including reuse) is the most preferred method, followed by recycling and composting, and, lastly, disposal in combustion facilities and landfills.

Currently, in the United States, 28 percent is recovered and recycled or composted, 15 percent is burned at combustion facilities, and the remaining 57 percent is disposed of in landfills.

Pay-As-You-Throw Programs

In communities with pay-as-you-throw programs (also known as unit pricing or variable-rate pricing), residents are charged for the collection of municipal solid waste—ordinary household trash—based on the amount they throw away. This creates a direct economic incentive to recycle more and to generate less waste.

Traditionally, residents pay for waste collection through property taxes or a fixed fee, regardless of how much—or how little—trash they generate. Pay-as-you-throw (**PAYT**) breaks with tradition by treating trash services just like electricity, gas, and other utilities. Households pay a variable rate depending on the amount of service they use.

Most communities with PAYT charge residents a fee for each bag or can of waste they generate. In a small number of communities, residents are billed based on the weight of their trash. Either way, these programs are simple and fair. The less individuals' throw away, the less they pay.

The EPA supports this new approach to solid waste management because it encompasses three interrelated components that are key to successful community programs:

Environmental sustainability. Communities with programs in place have reported significant increases in recycling and reductions in waste, due primarily to the waste reduction incentive created by PAYT. Less waste and more recycling mean that fewer natural resources need to be extracted. In addition, greenhouse gas emissions associated with the manufacture, distribution, use, and subsequent disposal of products are reduced as a result of the increased recycling and waste reduction PAYT encourages.

In this way, PAYT helps slow the buildup of greenhouse gases in the Earth's atmosphere which leads to global climate change. For more information on the link between solid waste and global climate change, go to the EPA's "Climate Change and Waste" Web site.

Economic sustainability. PAYT is an effective tool for communities struggling to cope with soaring municipal solid waste management expenses. Well-designed programs generate the revenues communities need to cover their solid waste costs, including the costs of such complementary programs as recycling and composting. Residents benefit, too, because they have the opportunity to take control of their trash bills.

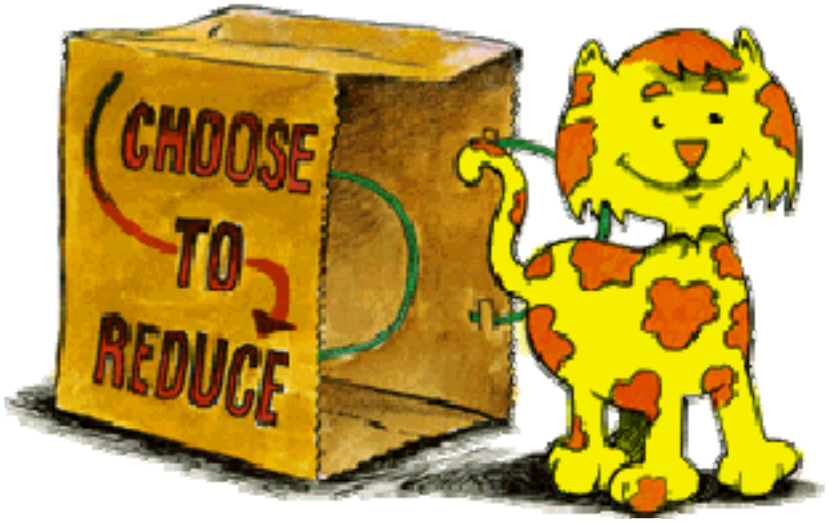
Equity. One of the most important advantages of a variable-rate program may be its inherent fairness. When the cost of managing trash is hidden in taxes or charged at a flat rate, residents who recycle and prevent waste subsidize their neighbors' wastefulness. Under PAYT, residents pay only for what they throw away.

The EPA believes that the most successful programs bring these components together through a process of careful consideration and planning. This Web site was developed as part of the EPA's ongoing efforts to provide information and tools to local officials, residents, and others interested in PAYT.

Source Reduction (Waste Prevention)

Source reduction can be a successful method of reducing waste generation. Practices such as grass-cycling, backyard composting, two-sided copying of paper, and transport packaging reduction by industry have yielded substantial benefits through source reduction.

Source reduction has many environmental benefits. It prevents emissions of many greenhouse gases, reduces pollutants, saves energy, conserves resources, and reduces the need for new landfills and combustors.



Combustion/Incineration

In incinerators of conventional design, refuse is burned on moving grates in refractory-lined chambers; combustible gases and the solids they carry are burned in secondary chambers. Combustion is 85 to 90 percent complete for the combustible materials.

In addition to heat, the products of incineration include the normal primary products of combustion—carbon dioxide and water—as well as oxides of sulfur and nitrogen and other gaseous pollutants; nongaseous products are fly ash and unburned solid residue. Emissions of fly ash and other particles are often controlled by wet scrubbers, electrostatic precipitators, and bag filters.

Burning MSW can generate energy while reducing the amount of waste by up to 90 percent in volume and 75 percent in weight.

EPA's Office of Air and Radiation is primarily responsible for regulating combustors because air emissions from combustion pose the greatest environmental concern.

In 1999, in the United States, there were 102 combustors with energy recovery with the capacity to burn up to 96,000 tons of MSW per day.

Resource Recovery

Numerous thermal processes, now in various stages of development, recover energy in one form or another from solid waste.

These systems fall into two groups: combustion processes and pyrolysis processes. A number of companies burn in-plant wastes in conventional incinerators to produce steam.

A few municipalities produce steam in incinerators in which the walls of the combustion chamber are lined with boiler tubes; the water circulated through the tubes absorbs heat generated in the combustion chamber and produces steam.

Pyrolysis, also called destructive distillation, is the process of chemically decomposing solid wastes by heat in an oxygen-reduced atmosphere.

This results in a gas stream containing primarily hydrogen, methane, carbon monoxide, carbon dioxide, and various other gases and inert ash, depending on the organic characteristics of the material being pyrolyzed.

Landfills

A sanitary landfill is the cheapest satisfactory means of disposal, but only if suitable land is within economic range of the source of the wastes; typically, collection and transportation account for 75 percent of the total cost of solid waste management.

In a modern landfill, refuse is spread in thin layers, each of which is compacted by a bulldozer before the next is spread. When about 3 m (about 10 ft) of refuse has been laid down, it is covered by a thin layer of clean earth, which also is compacted. Pollution of surface and groundwater is minimized by lining and contouring the fill, compacting and planting the cover, selecting proper soil, diverting upland drainage, and placing wastes in sites not subject to flooding or high groundwater levels.

Gases are generated in landfills through anaerobic decomposition of organic solid waste. If a significant amount of methane is present, it may be explosive; proper venting eliminates this problem.

RCRA
Under the Resource Conservation and Recovery Act (**RCRA**), state, tribal, and local governments primarily regulate landfills that accept MSW. The EPA, however, has established national standards these landfills must meet in order to stay open.

Municipal landfills can, however, accept household hazardous waste.

The number of landfills in the United States is steadily decreasing—from 8,000 in 1988 to 2,300 in 1999. The capacity, however, has remained relatively constant. New landfills are much larger than in the past.

Hazardous Wastes
Hazardous wastes have been defined by the federal Environmental Protection Agency as wastes that pose a potential hazard to humans or other living organisms for one or more of the following reasons:
(1) Such wastes are non-degradable or persistent in nature;
(2) their effects can be magnified by organisms in the environment;
(3) they can be lethal; or
(4) they may cause detrimental cumulative effects. General categories of hazardous wastes include toxic chemicals and flammable, radioactive, or biological substances. These wastes can be in the form of sludge, liquid, or gas, and solid.

Problems
Radioactive substances are hazardous because prolonged exposure to ionizing radiation often results in damage to living organisms), and the substances may persist over long periods of time. Management of radioactive and other hazardous wastes is subject to federal and state regulation, but no satisfactory method has yet been demonstrated for disposing permanently of radioactive wastes.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) was enacted by Congress in 1976 and amended in 1984. The act's primary goal is to protect human health and the environment from the potential hazards of waste disposal. In addition, RCRA calls for conservation of energy and natural resources, reduction in waste generated, and environmentally sound waste management practices.

Hurricane Debris

Hurricanes generate high-velocity winds, cause oceans to surge well above high tide levels, and create waves in inland waters. Hurricanes leave behind debris made up of construction materials, damaged buildings, sediments, green waste, and personal property. Hurricane debris obstructs roads and disables electrical power and communication systems over wide areas.

Most of the damage and resulting debris is in the area where the hurricane first hits land; however, the destruction also can extend many miles inland. For example, in 1989, Hurricane Hugo made landfall at Charleston, South Carolina, and continued inland, causing great damage as it cut across the state and into North Carolina. The hurricane generated 400,000 tons of green waste in Mecklenburg County, North Carolina, 200 miles from Charleston. This amount of green waste would have taken up two years of landfill capacity, while only two and a half years of capacity was available in the local landfill. The county considered burning the green waste, but rejected the idea to protect the county's air quality. Instead, all the debris was ground up into mulch and given away to local citizens and businesses for use.

Earthquake Debris

Earthquakes generate shock waves and displace the ground along fault lines. These seismic forces can bring down buildings and bridges in a localized area and damage buildings and other structures in a far wider area. Secondary damage from fires, explosions, and localized flooding from broken water pipes can increase the amount of debris. Earthquake debris includes building materials, personal property, and sediment from landslides.

It may be hard to believe, but as of 1/20/2002, Los Angeles is still collecting and managing debris from the Northridge earthquake that hit the city in January 1994. The amount of debris reached 3 million tons at the end of July 1995.Three months into the debris removal process, city officials decided to attempt to recycle as much of the debris as possible to conserve the remaining landfill capacity. Most of the waste was construction and demolition (**C&D**) debris, which could be processed by local recycling businesses.

City officials worked with the Federal Emergency Management Agency (**FEMA**) and local businesses to expand the existing recycling capacity and approve permits, thereby enhancing the ability of these businesses to meet the city's waste management needs. The city developed contracts with existing businesses, provided them with clean source-separated materials, and piloted a project to recycle mixed debris. After one year, the city had created more than 10,000 tons of new, privately operated daily processing capacity for mixed and source-separated debris.

Tornado debris

Damage from tornadoes is caused by high-velocity rotating winds. The severity of the damage depends on the size of the tornado funnel and the length of time the funnel touches the ground. Damage is generally confined to a narrow path extending up to half a mile wide and from a hundred yards to several miles long. Tornado debris includes damaged and destroyed structures, green waste, and personal property.

The City of Sandusky, Ohio, did not have a plan for managing disaster debris when a tornado hit in July 1992. Cleanup took about two and a half months and involved approximately 600 tons of waste, most of which was green waste. City officials found that the two greatest obstacles to managing the debris were communicating instructions to residents and sorting the green waste to maximize chipping and mulching efficiency.

Flood debris
Debris from floods is caused by structural inundation and high-velocity water flow. As soon as flood waters recede, people begin to dispose of flood-damaged household items. Mud, sediment, sandbags, and other reinforcing materials also add to the volume of debris needing management, as do materials from demolished and dismantled houses.

After the Midwest flood in the summer of 1993, officials in Lincoln County, Missouri, handled the flood debris through drop-off centers as well as county collection. The debris included appliances, wood, shingles, insulation, tires, materials containing asbestos, and household hazardous waste. To comply with state solid waste regulations and county recycling goals, county staff and contractors segregated the debris by waste type.

Scrap dealers picked up the appliances, and individuals salvaged the wood. Tires were cut in half for disposal in approved landfills or ground for roadside use. After the flood, the state of Missouri temporarily set aside its recycling policy, which prohibited landfilling of compostable materials, so that communities could landfill leaves and yard waste. A hazardous waste contractor collected and disposed of household hazardous waste.

Fire debris
While fires leave less debris than other types of disasters, they still generate much waste. For example, demolished houses contribute noncombustible debris. Burned out cars and other metal objects, as well as ash and charred wood waste, also must be managed. In addition, large-scale loss of plants serving as ground cover can lead to mud slides, adding debris to the waste stream.

In Malibu, California, one of the communities hit hardest in 1993 by coastal fires, 268 houses were destroyed; most of them burned to their foundations. Malibu removed fallen trees as well as dead trees that might have fallen on roads or homes, and chipped the trees for mulch. The city left other dead trees standing to help prevent erosion.

The city gave property owners six weeks to remove their own debris, then began removing the remaining household debris. In clearing the fire debris from about 175 properties, the city collected the same amount of solid waste normally collected in an entire year. The city recycled some concrete and asphalt and lifted daily landfill limits to accommodate the rest of the debris.

Carpet
Along with the many benefits of carpet come a number of environmental considerations--including issues of material use, production wastes, indoor air quality, and ultimately, carpet disposal. The disposal issues surrounding used carpet are of concern because of carpet's relatively significant contribution to the nation's waste stream and the inherent difficulties with its recycling.

Approximately 4 billion pounds of carpet are discarded every year in the United States, accounting for 1.1% of all municipal solid waste by weight, or about 2% by volume. The bulky nature of carpet and the variety of materials used in its manufacture often create handling, collection, and recycling problems for local and state governments.

The carpet industry has been increasingly involved in developing solutions to these issues; however, much work remains to be done. Though still in their infancy, the leasing, refurbishing, and recycling programs now being offered to commercial buyers of modular carpet have begun to lead the way toward genuine product stewardship for carpet.

Understanding Carpet
Carpet is a composite product made from face fibers that are bonded to primary and secondary backing material, usually with an adhesive. Manufacturers make carpet from different face fibers, which makes carpet recycling programs more challenging, as most carpet recyclers only accept carpet made from a particular type of face fiber. The most common face fibers (and their respective percentage of the carpet market) are: nylon (57%), polypropylene "***Olefin***" (36%), polyester "**PET**" (7%), and wool (.4%).

Residential carpet comes in broad rolls and is typically placed over separate padding, whereas commercial carpet often integrates padding into its backing and comes in rolls or square tiles. While used pad is often recycled, most residential and commercial carpet is currently landfilled. Because of its oversized and bulky nature, carpet is rarely used for waste-to-energy incineration, despite its high BTU value. Other management options are becoming available, however, particularly on the commercial side.

Reuse/Refurbishment
Due to the durable nature of carpet, direct reuse represents a good option. Carpet is often replaced long before it has become unusable. Good quality used carpet can be sold or donated to charities or building material reuse centers. Some carpet may also be refurbished by taking it back for cleaning, retexturing, and dyeing. The use of leasing programs for carpet, as opposed to the transfer of ownership through direct sale, would increase the reconditioning and reuse of carpet, but leasing is still extremely uncommon.

Recycling(carpet)
Some carpet recycling initiatives are underway. However, there are a number of barriers to effective recycling of carpet.

The infrastructure for collection and processing of discarded carpet, especially from residential sources, is not well established, though it is growing. In addition, carpet manufacturers and recyclers have been concentrated in the southeastern United States, resulting in logistical issues for carpet recycling in other parts of the country. Inadequate markets for some resins, such as nylon 6,6, are a concern as well.

Building Products
Manufacturers, retailers, and consumers of building products are beginning to explore different ways of reducing the environmental footprint of these products. A broad range of products fall into this category.

In the United States, some retailers of wood and wood products are looking at ways to promote wood reuse and recycling, along with the use of wood fiber substitutes. Other groups are working together to develop standards for recycled plastic lumber.

In Canada, the governments of Quebec and British Columbia have launched take-back schemes for used paints.

The building products industry will likely be a fertile area for future product stewardship initiatives.

Freon and Ozone Depleting Chemical Disposal

One of the single largest uses of chlorofluorocarbons (**CFCs**) in the United States is as a refrigerant in air conditioners, refrigerators and freezers. These CFCs are more commonly known as Freon. If improperly handled during the servicing of air conditioners, refrigerators and freezers Freon will be released into the atmosphere. Effective July 1, 1992, new federal laws made it illegal to knowingly release refrigerants such as Freon into the atmosphere during the repair, servicing, maintenance, or disposal of refrigeration and air conditioning equipment.

The refrigerant must be recovered by a qualified technician.

Do

- ☑ Recycle waste Freon on the premises using EPA-certified recycling or recovery equipment.
- ☑ Keep records of the dates and quantities of Freon recovered and recycled.
- ☑ Manage filters from Freon recovery equipment as hazardous waste.

Don't

- ☒ Don't evaporate or vent Freon to the atmosphere. This is illegal!

- Freon and ozone depleting chemicals (ODC) must be reclaimed and recycled.
- Failure to do so is a violation of federal law, state law, and university policy.
- Several landfills have personnel that are trained, equipped, and certified for handling these chemicals.

Empty Drum of CFC 11

ODC: Chloroform and Carbon Tetrachloride

Example of a compressor unit from a refrigeration unit. The Freon will be reclaimed before this unit is recycled for scrap metal.

The Freon from these refrigerators was reclaimed and recycled. The metal will also be recycled.

Vehicles

With an estimated 700 million cars, trucks, and other vehicles on the road worldwide, the impact of these products on the environment cannot be underestimated. And it is not just exhaust emissions that are cause for concern. Vehicles require a lot of energy and materials to make, consume a lot of energy when used, and present unique waste disposal challenges at end-of-life. Indeed, with roughly 10.5 million vehicles reaching the end of their useful lives each year in the United States alone, what to do with all the non-readily reusable or recyclable "stuff" that makes up a car or truck is a huge challenge in and of itself. From cradle to grave, the collective toll from vehicles on our natural world is perhaps more than that of any other consumer product today.

The good news is that steps are being taken to lessen the impact of vehicles on the environment. Some of the advances seen thus far, aside from improved fuel efficiency and the emergence of electric and hybrid automobiles, stem from vehicle recycling, cleaner manufacturing processes, better design for servicing (e.g., less frequent oil changes) and re-manufacturing of parts (e.g., oil caps).

In fact, the automobile industry estimates that in the United States, 75 percent of a vehicle's weight is now being recycled (the percentage is far less by volume).

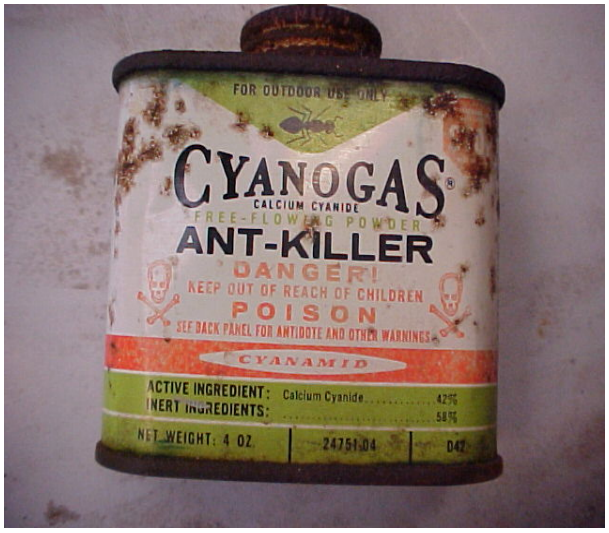
Much of the reclaimed materials end up in new vehicles. The parts most commonly recycled are ferrous and non-ferrous metal components-the chassis, engine block, radiator, etc. Components that are rarely recycled include the mixed plastics, fibers, and foam (collectively referred to as "***fluff***"), potentially hazardous materials like oils and anti-freeze and non-hazardous materials such as tires. But industry is now starting to focus on these areas as well.

The European Union has passed laws to hold producers responsible for their cars' post-life through mandatory take-back and recycling programs. No other countries are known to have producer responsibility legislation related to vehicles.

Several countries and political subdivisions (e.g., provinces, states, etc.), however, are considering establishing end-of-life vehicle stewardship programs. Whereas most vehicle lifecycle analyses focus on auto emissions and fuel efficiency, this section will concentrate on the materials aspect of cars and trucks.

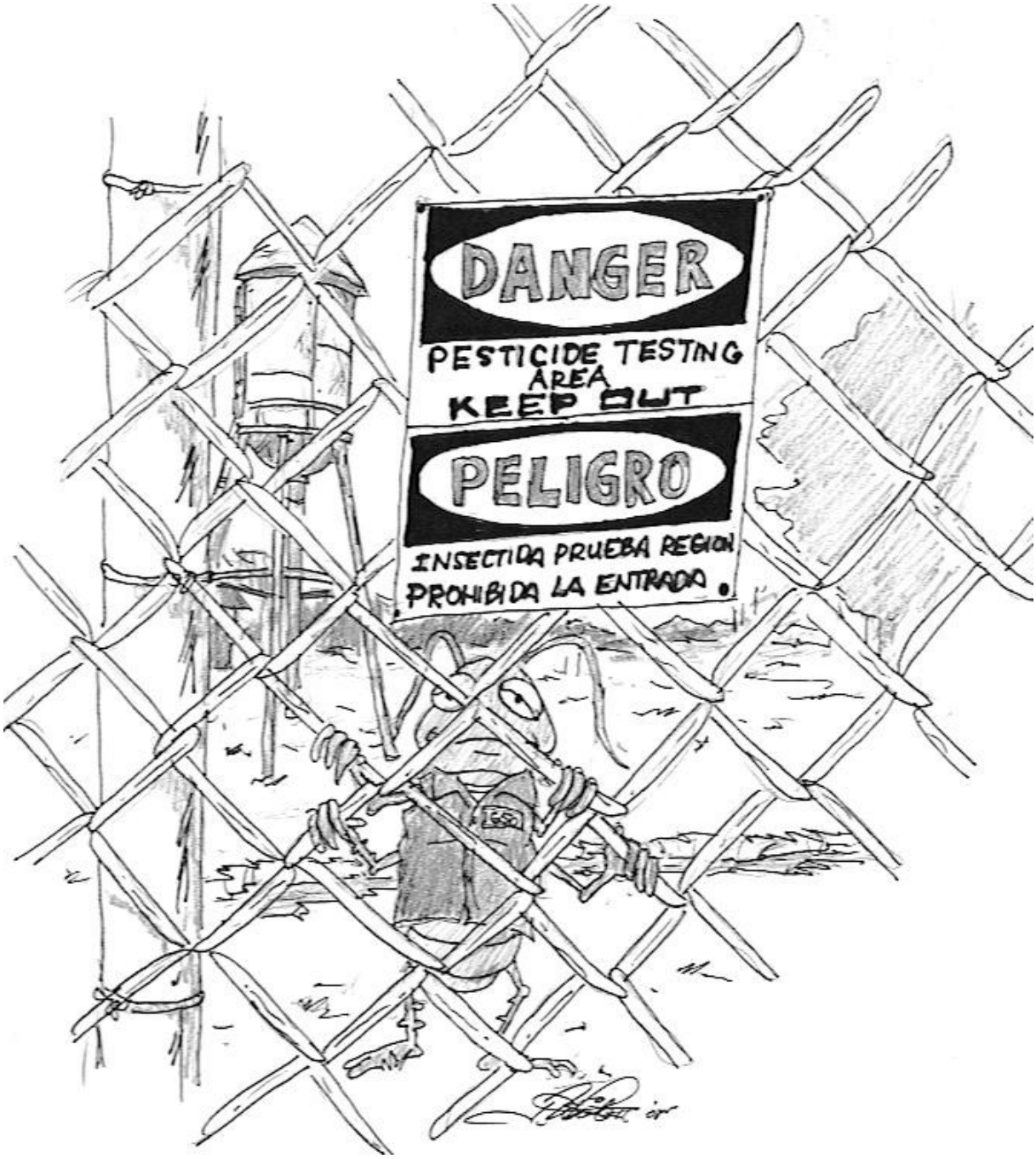
Federal Insecticide, Fungicide, and Rodenticide Act

7 U.S.C. s/s 136 et seq. (1972)



The primary focus of the FIFRA was to provide federal control of pesticide distribution, sale, and use. The EPA was given authority under the FIFRA not only to study the consequences of pesticide usage but also to require users (farmers, utility companies, and others) to register when purchasing pesticides.

Through later amendments to the law, users also must take exams for certification as applicators of pesticides. All pesticides used in the U.S. must be registered (licensed) by the EPA. Registration assures that pesticides will be properly labeled and that if in accordance with specifications, will not cause unreasonable harm to the environment.



Toxicity

When hazardous waste is disposed of in a land disposal unit, toxic compounds or elements can leach into underground drinking water supplies and expose users of the water to hazardous chemicals and constituents. The EPA developed the **toxicity characteristic (TC)** to identify wastes likely to leach dangerous concentrations of toxic chemicals into ground water.

In order to predict whether any particular waste is likely to leach chemicals into ground water at dangerous levels, the EPA designed a lab procedure to replicate the leaching process and other conditions that occur when wastes are buried in a typical municipal landfill. This lab procedure is known as the **Toxicity Characteristic Leaching Procedure (TCLP)**.

Source Reduction

Rather than managing waste after it is generated, **source reduction** is designed to change the way products are made and used in order to minimize waste generation. Source reduction, also called waste prevention, is defined as the design, manufacture, and use of products in a way that reduces the quantity and toxicity of waste produced when the products reach the end of their useful lives.

The ultimate goal of source reduction is to decrease the amount and the toxicity of waste generated. Businesses, households, and state and local governments can all play an active role in source reduction. Businesses can manufacture products with packaging that is reduced in both volume and toxicity. They can also reduce waste by altering their business practices (e.g., reusing packaging for shipping, making double-sided copies, maintaining equipment to extend its useful life, using reusable envelopes).

Community residents can help reduce waste by leaving grass clippings on the lawn or composting them with other yard waste in their backyards, instead of bagging such materials for eventual disposal. Consumers play a crucial role in an effective source reduction program by purchasing products having reduced packaging or that contain reduced amounts of toxic constituents.

This purchasing subsequently increases the demand for products with these attributes. State and local governments include source reduction in their long-term planning for solid waste management in order to ensure its effectiveness.

Recycling

Municipal solid waste **recycling** refers to the separation and collection of wastes, their subsequent transformation or remanufacture into usable or marketable products or materials, and the purchase

Figure II-2:The Solid Waste Management Hierarchy

1. **Recycling**
2. **Source**
3. **Reduction**
4. **Combustion**
5. **Landfilling**

INTEGRATED SOLID WASTE MANAGEMENT SYSTEM

Source reduction, landfilling, recycling, and combustion are all pieces of the solid waste management puzzle. Source reduction and recycling are preferred elements of the system.

In 2000, of products made from recyclable materials, 30 percent (70 million tons) of the municipal solid waste generated in the United States was recycled (see Figure II-3). Solid waste recycling:

- ✓ **Preserves raw materials and natural resources**
- ✓ **Reduces the amount of waste that requires disposal**
- ✓ **Reduces energy use and associated pollution**
- ✓ **Provides business and job opportunities**
- ✓ **Reduces greenhouse gas emissions**
- ✓ **Reduces pollution associated with use of virgin materials.**

Communities can offer a wide range of recycling programs to their residents, such as drop-off centers, curbside collection, and centralized composting of yard and food wastes.

Composting processes are designed to optimize the natural decomposition or decay of organic matter, such as leaves and food. Compost, the end product of composting, is a humus-like material that can be added to soils to increase soil fertility, aeration, and nutrient retention.

Composting can serve as a key component of municipal solid waste recycling activities, considering that food and yard wastes accounted for 23 percent of the total amount of municipal solid waste generated in 2000.

Some communities are implementing large-scale composting programs in an effort to conserve landfill capacity. The key to a successful recycling program is to ensure that the recovered material is actually reprocessed or remanufactured, and that the products are bought and used by consumers.

Recycling programs will become more effective as markets increase for products made from recycled material.

The federal government has developed several initiatives in order to bolster the use of recycled products. The federal procurement guidelines, authorized by RCRA Subtitle F, are designed to bolster the market for products manufactured from recycled materials. The procurement program uses government purchasing to spur recycling and markets for recovered materials. (This program is fully discussed in Section V.)

Combustion

For centuries, burning has been a popular method of reducing the volume of solid waste.

Before the Clean Air Act (**CAA**) of 1970 essentially banned it, the burning of waste was rampant and uncontrolled. While uncontrolled burning of solid waste can be detrimental to health and the environment, confined and controlled burning, known as **combustion**, can not only decrease the volume of solid waste destined for landfills, but can also recover energy from the waste-burning process.

Modern waste-to-energy facilities use energy recovered from the burning of solid waste to produce steam and electricity. In 2000,combustion facilities handled 15 percent (34 million tons) of the municipal solid waste generated (see Figure II-3).

Used in conjunction with source reduction and recycling, combustion can recover resources and materials and greatly reduce the volume of wastes entering landfills.

Landfilling

Despite the effectiveness of source reduction, recycling, and combustion, there will always be waste that cannot be diverted from landfills. In fact, landfilling of solid waste still remains the most widely used waste management method.

Figure II-3:Management of MSW in the U.S.,2000(total weight =232 million tons)

Land disposal	**55%**	**128 million tons**
Recycling (including composting)	**30%**	**70 million tons**
Combustion	**15%**	**34 million tons**

Americans landfilled approximately 55 percent (128 million tons)of municipal solid waste in 2000 (see Figure II-3). Many communities are having difficulties siting new landfills, largely as a result of increased citizen and local government concerns about the potential risks and aesthetics associated with having a landfill in their neighborhoods.

To reduce risks to health and the environment, the EPA developed minimum criteria that solid waste landfills must meet in order to alleviate some of the concern raised over landfill sitting and health concerns.

CRITERIA FOR SOLID WASTE DISPOSAL FACILITIES

One of the initial focuses of the Solid Waste Disposal Act (***as amended by RCRA***) was to require the EPA to study the risks associated with solid waste disposal and to develop management standards and criteria for solid waste disposal units (including landfills) in order to protect human health and the environment. This study resulted in the development of criteria for classifying solid waste disposal facilities and practices.

Criteria for Classification of Solid Waste Disposal Facilities and Practices

On September 13,1979, the EPA promulgated criteria to designate conditions under which solid waste disposal facilities and practices would not pose adverse effects to human health and the environment (Part 257 Subpart A). Facilities failing to satisfy the criteria were considered **open dumps** requiring attention by state solid waste programs.

As a result, open dumps had to either be closed or upgraded to meet the criteria for sanitary landfills.

States were also required to incorporate provisions into their solid waste programs to prohibit the establishment of new open dumps.

Technical Criteria for Solid Waste Disposal Facilities

The Part 257, Subpart A regulatory criteria used to classify solid waste disposal facilities and practices consist of general environmental performance standards. The criteria contain provisions designed to ensure that wastes disposed of in solid waste disposal units will not threaten endangered species, surface water, ground water, or flood plains.

Further, owners and operators of disposal units are required to implement public health and safety precautions such as disease vector (e.g., rodents, flies, mosquitoes) controls to prevent the spread of disease and restrictions on the open burning of solid waste.

In addition, facilities are required to install safety measures to control explosive gases generated by the decomposition of waste, minimize the number of birds attracted to the waste disposed of in the unit, and restrict public access to the facility.

The criteria also restrict the land spreading of wastes with high levels of cadmium and polychlorinated biphenyls (**PCBs**) in order to adequately protect ground water from these dangerous contaminants.

WHAT IS AN OPEN DUMP?

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D criteria. Using the Part 257, Subpart A criteria as a benchmark, each state evaluated the solid waste disposal facilities within its borders to determine which facilities were open dumps that needed to be closed or upgraded.

For each open dump, the state completed an Open Dump Inventory Report form that was sent to the Bureau of the Census. At the end of fiscal years 1981 through 1985, the Bureau compiled all of the report forms and sent them to the EPA, where they were summarized and published annually. These criteria serve as minimum technical standards for solid waste disposal facilities. As a result, facilities must meet the Part 257 standards to ensure that ongoing waste management operations adequately protect human health and the environment.

If they fail to do so, the facility is classified as an open dump and must upgrade its operations or close. States have the option of developing standards more stringent than the Part 257, Subpart A criteria.

Technical Criteria for Municipal Solid Waste Landfills
Protection of human health and the environment from the risks posed by solid waste disposal facilities was an ongoing concern of Congress after the RCRA was passed in 1976.

As a result, the HSWA required the EPA to report on the adequacy of existing solid waste disposal facility criteria and gather detailed data on the characteristics and quantities of nonhazardous solid wastes.

Report to Congress on Solid Waste Disposal
In October 1988, the EPA submitted a Report to Congress indicating that the United States was generating an increasing amount of municipal solid waste. The Report revealed that approximately 160 million tons of municipal solid waste was generated each year,131 million tons of which were landfilled in just over 6,500 MSWLFs.

The EPA also reported that although these landfills used a wide variety of environmental controls, they may pose significant threats to ground water and surface water resources.

For instance, rain water percolating through the landfills can dissolve harmful constituents in the waste and can eventually seep into the ground, potentially contaminating ground water.

In addition, improperly maintained landfills can pose other health risks due to airborne contaminants, or the threat of fire or explosion.

To address these environmental and health concerns, and to standardize the technical requirements for these landfills, the EPA promulgated revised minimum federal criteria in Part 258 for MSWLFs on October 9,1991.The criteria were designed to ensure that MSWLFs receiving solid waste would be protective of human health and the environment.

All landfills that were not MSWLFs remained subject to the Part 257,Subpart A criteria.

Criteria for Municipal Solid Waste Landfills

A **municipal solid waste landfill** is defined as a discrete area of land or excavation that receives household waste. A MSWLF may also receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, CESQG waste, and industrial nonhazardous solid waste. In 2000, there were approximately 2,000 MSWLFs in the United States.

The revised criteria address seven major aspects of MSWLFs (see Figure II-4):

- ✓ **Location**
- ✓ **Operation**
- ✓ **Design**
- ✓ **Ground water monitoring**
- ✓ **Corrective action**
- ✓ **Closure and post-closure**
- ✓ **Financial assurance (i.e., responsibility).**

Operating Criteria

The first set of criteria restrict where a MSWLF may be located. New landfills must meet minimum standards for placement in or near flood plains, wetlands, fault areas, seismic impact zones, and other unstable areas. Because some bird species are attracted to landfills, the criteria also restrict the placement of landfills near airports to reduce the bird hazards (i.e., collisions between birds and aircraft that may cause damage to the aircraft or injury to the passengers).

The operating criteria establish daily operating standards for running and maintaining a landfill. The standards dictate sound management practices that ensure protection of human health and the environment. The provisions require covering the landfill daily, controlling disease vectors, and controlling explosive gases. They also prohibit the open burning of solid waste and require the owner and operator of the landfill to control unauthorized access to the unit.

The design criteria require each new landfill to have a liner consisting of a flexible membrane and a minimum of two feet of compacted soil, as well as a leachate collection system.

Leachate is formed when rain water filters through wastes placed in a landfill. When this liquid comes in contact with buried wastes, it leaches, or draws out, chemicals or constituents from those wastes. States with approved MSWLF permit programs can allow the use of an alternative liner design that controls ground water contamination. The liner and collection system prevent the potentially harmful leachate from contaminating the soil and ground water below the landfill.

In order to ensure that the liner and leachate collection system are working properly and that the landfill is not contaminating surrounding ground water resources, MSWLF owners and operators must also establish a ground water monitoring program.

Through a series of monitoring wells, the facility owner and operator is alerted if the landfill is leaking and causing contamination. If contamination is detected, the owner and operator of the landfill must perform **corrective action** (i.e., clean up the contamination caused by the landfill).

When landfills reach their capacity and can no longer accept additional waste, the criteria stipulate procedures for properly closing the facility to ensure that the landfill does not present any danger to human health and the environment in the future.

The **closure** activities at the end of a facility's use are often expensive and the owner/operator must have the ability to pay for them. As a result, the criteria require each owner/operator to prove that they have the financial resources to perform these closure and **post-closure** activities, as well as any necessary corrective action.

Most of the solid waste program is overseen by the states, and compliance is assured through state-issued permits.

Each state is to obtain EPA approval for their MSWLF permitting program. This approval process assesses whether a state's program is sufficient to ensure each landfill's compliance with the criteria. In addition to the minimum federal criteria, states may impose requirements that are more stringent than the federal requirements.

Conditionally Exempt Small Quantity Generator Waste Disposal Facilities
Businesses that produce small amounts of hazardous waste, known as **conditionally exempt small quantity generators, need** not manage their hazardous waste under the Subtitle C program. This means that CESQG waste can be disposed of in solid waste landfills.

However, the HSWA required the EPA to establish standards to ensure that CESQG waste disposal in solid waste disposal units did not pose threats to human health and the environment.

As a result, on July 1, 1996, the EPA revised the Part 257, Subpart B criteria to contain standards for non-municipal, nonhazardous waste disposal units that receive CESQG hazardous waste. These revisions addressed location restrictions, requirements for monitoring for ground water contamination and corrective action provisions to clean up any contamination. (CESQGs are fully discussed in Section III, Chapter 3.)

Bioreactor Landfills

A bioreactor landfill operates to rapidly transform and degrade organic waste. The increase in waste degradation and stabilization is accomplished through the addition of liquid and air to enhance microbial processes.

This bioreactor concept differs from the traditional "***dry tomb*** " municipal landfill approach thus, decomposition and biological stabilization of the waste in a bioreactor landfill can occur in a much shorter time frame than occurs in a traditional landfill providing a potential decrease in long-term environmental risks and landfill operating and post-closure costs.

The EPA is currently collecting information on the advantages and disadvantages of bioreactor landfills through case studies of existing landfills and additional data so that the EPA can identify specific bioreactor standards or recommend operating parameters.

Additional information about bioreactor landfills can be found at www.epa.gov/epaoswer/non-hw/ muncpl/landfill/bioreactors.htm.

ASSISTANCE TO NATIVE AMERICAN TRIBES

The EPA developed a municipal solid waste strategy to assist Native American tribes in the establishment of healthy, environmentally protective, integrated solid waste management practices on tribal lands.

The strategy is based on input from tribal focus groups convened by the National Tribal Environmental Council and discussions with tribal organizations, EPA Regional Indian Program coordinators, other EPA offices, and other federal agencies with trust responsibilities on Native American lands.

The strategy emphasizes building tribal municipal solid waste management capacity, developing tribal organizational infrastructure, and building partnerships among tribes, states, and local governments.

Direct EPA support of these goals includes technical assistance, grant funding, education and outreach.

Solid waste managers on Native American lands face unique challenges. To address issues such as jurisdiction, funding, and staffing, EPA offers several resource guides featuring in-depth information specific to Native American lands. The Agency recognizes that every solid waste management program needs funding to survive and that, in an era of tightening budgets, it may be difficult to find necessary resources.

One of the EPA's ongoing priorities is to make current information available to help tribes locate the funding they need to develop and implement safe and effective solid waste programs.

One such initiative is the Tribal Waste Journal. The journal contains in-depth information on a variety of solid and hazardous waste topics including interviews with representatives from Native American Tribes and Alaskan Native Villages. Each issue focuses on a single topic and presents ideas, approaches, and activities that other Native American Tribes and Alaskan Native Villages have successfully employed.

Additionally, the EPA has initiated the Tribal Open Dump Cleanup Project to assist tribes with closure or upgrade of open dump sites. The project is part of a Tribal Solid Waste Interagency Workgroup, which is working to coordinate federal assistance for tribal solid waste management programs. The cleanup project's specific goals include assisting tribes with 1) completing and implementing comprehensive, integrated waste management plans; 2) developing realistic solid waste management alternatives; 3) closing or upgrading existing open dumps; and 4) developing post-closure programs.

Outreach and education materials are two other tools the EPA provides to tribes to support environmentally sound integrated solid waste management practices.

The Agency's outreach support helps tribes connect and learn from each other's experiences. Educational resources help tribal leadership (as well as the general tribal community) understand the importance of good municipal solid waste management.

Better understanding ensures that tribal municipal solid waste programs are assigned a high priority and facilitates the communities' adoption of new and improved waste disposal practices.

SOLID WASTE MANAGEMENT INITIATIVES

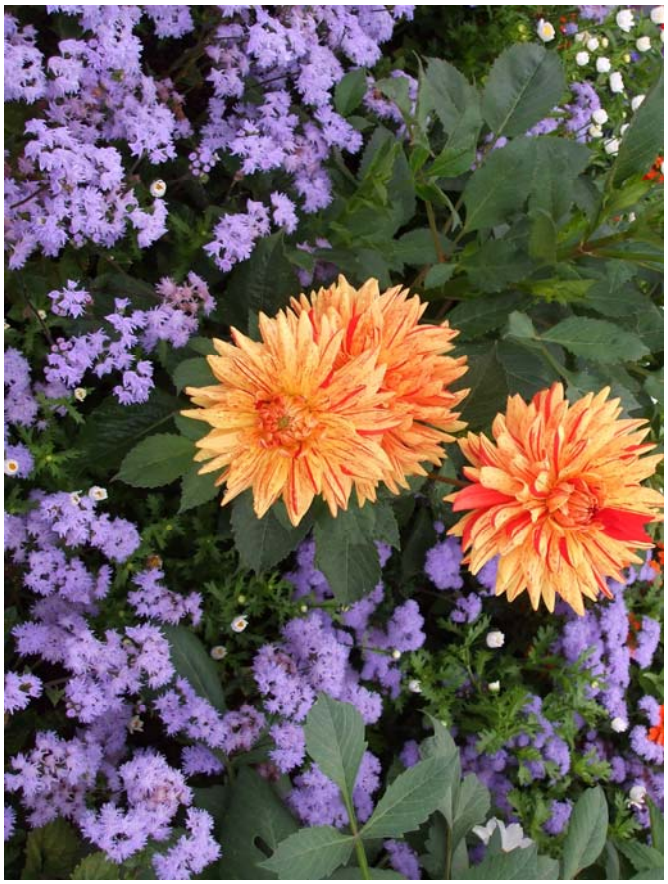
With the bulk of the RCRA Subtitle D program already in place, the EPA launched several new initiatives to further the development of the solid waste management program. These initiatives promote proper waste management, and encourage source reduction by both industry and the public.

WasteWise

Many companies, institutions, and governments have demonstrated that they can save money by reducing waste and recycling material that would otherwise be disposed.

The WasteWise program is designed to assist companies, states, local governments, Native American tribes, and other institutions in developing cost-effective practices to reduce municipal solid waste. These partners set and achieve certain goals within three areas: waste prevention, recycling collection, and buying or manufacturing recycled products.

Participation offers the partners several advantages. The EPA provides technical assistance, publications, and program updates. Successful waste reduction efforts are highlighted in EPA documents, magazines, and trade publications. Participating organizations can also use the WasteWise logo to promote their participation.



These benefits, along with the direct financial savings that result from waste prevention and recycling activities, are helping to improve waste management and resource efficiency. In 1999, partners eliminated over 9 million tons of materials through waste prevention, continuing the upward trend in waste reduction.

Partners also recycled over 8.4 million tons in 1999, avoiding approximately $300 million in disposal costs. Since the program 'inception in 1994, partners have reduced nearly 32 million tons of waste.

Additional information on the WasteWise program is found at www.epa.gov/wastewise.

Jobs Through Recycling Program

To support recycling markets, the EPA launched the Jobs Through Recycling program in 1994. The goal of the program is to foster markets for recycled goods by promoting and assisting the development of businesses using recovered materials, creating new recycling jobs, and spurring innovative technologies.

Under the program, the EPA awards over $1 million each year in grants to states and tribes.

Jobs Through Recycling funds programs that help develop or retain intermediate processing and end-use manufacturing capacity for recyclables and reusable materials.

Jobs Through Recycling supports the development and strengthening of state, multi-state, and tribal market development and economic development programs. The activities funded thus far include the creation of Recycling Economic Development Advocates (**REDAs**), Recycling and Reuse Business Assistance Centers (**RBACs**),and commodity-specific demonstration projects. REDAs are staff in state or tribal economic development agencies who pursue recycling business growth, whereas RBACs are state full-service centers providing business, technical, and financing assistance to businesses using recovered materials.

Jobs Through Recycling bolsters the job market by actively promoting the recycling industry.

Recycling is estimated to create nearly five times as many jobs as landfilling. One 1994 study reported that 103,000 jobs, or 2.7 percent of all manufacturing jobs in the Northeast region of the United States, are attributed to recycling.

In addition, the jobs created by recycling businesses draw from the full spectrum of the labor market (ranging from low-and semi-skilled jobs to highly skilled jobs). Materials sorters, dispatchers, truck drivers, brokers, sales representatives, process engineers, and chemists are just some of the jobs needed in the recycling industry.

Since Jobs Through Recycling's inception in 1994, $8 million in funding has been awarded to numerous states, tribes, and multistate organizations.

This funding has helped create more than 8,500 jobs, generate $640.5 million in capital investment, create 15.3 million tons of landfill capacity, and utilize 13.9 million tons of recovered materials.

One job has been created for every $1,040 of Jobs Through Recycling grant money invested. Additional information about Jobs through Recycling is available at www.epa.gov/jtr.

Unit Pricing

Some communities are using economic incentives to encourage the public to reduce solid waste sent to landfills. One of the most successful economic incentive programs used to achieve source reduction and recycling is variable rate refuse collection, or unit pricing.

Unit pricing programs, sometimes referred to as pay-as-you-throw systems, have one primary goal: customers who dispose of more waste pay more for the collection and disposal service. There are a few different types of unit pricing systems. Most require residents to pay a per-bag fee for refuse collection, and require the purchase of a special bag or tag to place on bags or cans.

Other systems allow customers to choose between different size containers, and charge more for collection of larger containers. The EPA 's role in the further development of unit pricing systems has been to study effective systems in use and to disseminate documentation to inform other communities about the environmental and economic benefits that unit pricing may have for their community. The number of communities using unit pricing grew to more than 4,033 in 1999 and the population served has more than tripled since 1990 to over 35 million today.

Additional information about unit pricing or pay-as-you-throw programs is available at www.epa.gov/payt.

Full Cost Accounting for Municipal Solid Waste

Full cost accounting is an additional financial management tool that communities can use to improve solid waste management. Full cost accounting is an accounting approach that helps local governments identify all direct and indirect costs, as well as the past and future costs, of a MSW management program. Full cost accounting helps solid waste managers account for all monetary costs of resources used or committed, thereby providing the complete picture of solid waste management costs on an ongoing basis.

Full cost accounting can help managers identify high-cost activities and operations and seek ways to make them more cost- effective.

The EPA is continually studying these and other programs in order to assist communities in deciding whether one of these programs is right for them. In addition to these initiatives, EPA has published numerous guidance documents designed to educate both industry and the public on the benefits of source reduction, to guide communities in developing recycling programs, and to educate students on the benefits and elements of source reduction and recycling.

Additional information about full cost accounting can be found at www.epa.gov/fullcost.

Extended Product Responsibility

Extended product responsibility, also known as product stewardship, is a product-centered approach to environmental protection. This approach recognizes that lasting and substantial environmental improvements in product systems can only occur with the combined expertise, ingenuity, cooperation, and commitment of each individual involved in the product chain, from suppliers, designers, manufacturers, and distributors, to retailers, customers, recyclers, remanufacturers, and disposers.

Product manufacturers have the greatest ability, and therefore must take on new responsibilities to reduce the environmental impacts of their products.

Reducing use of toxic substances and designing for reuse and recyclability are just a few ways for companies to rethink their products in order to provide more value at less environmental impact.

Additional information about extended product responsibility is available at www.epa.gov/epaoswer/non-hw/reduce/epr/index.htm.

Green Building
Buildings that are designed, constructed, operated, and ultimately removed in such a way as to minimize their environmental impacts are referred to as "***green*** " buildings.

Green buildings are characterized by improved energy and water efficiency, use of renewable sources of energy, improved indoor air quality, and efficient use of building materials.

The EPA supports projects to reduce, reuse, and recycle waste generated from building construction, renovation, deconstruction, and demolition. Construction and demolition wastes commonly include building materials, and products such as concrete, asphalt, wood, glass, brick, metal, insulation, and furniture.

From incorporating used or environmentally friendly materials into a building's construction or renovation to disassembling structures for the reuse and recycling of their components, each phase of a building 's life cycle offers opportunities to reduce waste.

Additional information about green buildings is available at www.epa.gov/greenbuilding.

Industrial Ecology

The study of material and energy flows and their transformations into products, byproducts, and waste throughout industrial and ecological systems is the primary concept of industrial ecology. This initiative urges industry to seek opportunities for the continual reuse and recycling of materials through a system in which processes are designed to consume only available waste streams and to produce only usable waste.

Wastes from producers and consumers become input for other producers and consumers, and resources are cycled through the system to sustain future generations.

Individual processes and products become part of an interconnected industrial system in which new products or processes evolve out of or consume available waste streams, water, and energy; in turn, processes are developed to produce usable resources.

Solid Waste Summary

Subtitle D addresses primarily nonhazardous solid waste. The term solid waste includes garbage, refuse, sludges, nonhazardous industrial wastes, and other discarded materials. Solid waste also includes hazardous wastes that are excluded from Subtitle C regulation (e.g., household hazardous waste).

Municipal solid waste, a subset of solid waste, is waste generated by businesses and households. The EPA recommends an integrated, hierarchical approach to managing municipal solid waste that includes, in descending order of preference:

1. **Source reduction**
2. **Recycling**
3. **Combustion**
4. **Landfilling.**

As part of Subtitle D, the EPA has developed detailed technical criteria for solid waste disposal facilities, including specific criteria for MSWLFs.

These criteria include specific provisions for MSWLF:

- ✓ **Location**
- ✓ **Operation**
- ✓ **Design**
- ✓ **Ground water monitoring**
- ✓ **Corrective action**
- ✓ **Closure and post-closure**
- ✓ **Financial assurance (i.e., responsibility).**

The EPA has helped develop and implement new initiatives and programs that aid businesses, states, local governments and Native American tribes in implementing effective solid waste management programs. Focusing particularly on the environmental and economic benefits of source reduction and recycling, the EPA fosters integrated solid waste management in communities and businesses.

These initiatives include:

- ➢ **WasteWi$e**
- ➢ **Jobs Through Recycling program**
- ➢ **Unit pricing**
- ➢ **Full cost accounting**
- ➢ **Extended product responsibility**
- ➢ **Green buildings**
- ➢ **Industrial ecology.**

ADDITIONAL RESOURCES

Additional information about municipal solid waste management can be found at **www.epa.gov/msw.**

SECTION III
RCRA SUBTITLE C – MANAGING HAZARDOUS WASTE

OVERVIEW

The improper management of hazardous waste poses a serious threat to the health of American citizens and their environment. When the EPA began developing the hazardous waste management regulations in the late 1970s, the Agency estimated that only 10 percent of all hazardous waste was managed in an environmentally sound manner.

Some threats posed by the mismanagement of hazardous waste are obvious. Reports of chemical accidents or spills of hazardous waste that close highways, or illegal midnight dumping that contaminates property are familiar. Yet, even when hazardous waste is managed or disposed of in a careful manner, it may still pose a serious threat to human health and the environment.

For example, toxic hazardous wastes can leak from a poorly constructed or improperly maintained hazardous waste landfill. Such waste contamination can severely, and sometimes irreversibly, pollute ground water, the primary source of drinking water for half the nation.

Ground water pollution is not the only problem posed by hazardous waste mismanagement. The improper disposal of hazardous waste has polluted streams, rivers, lakes, and other surface waters, killing aquatic life, destroying wildlife, and stripping areas of vegetation. In other cases, careless waste disposal has been linked to respiratory illnesses, skin diseases (including skin cancer),and elevated levels of toxic materials in the blood and tissue of humans and domestic livestock.

In still other cases, the mismanagement of hazardous waste has resulted in fires, explosions, or the generation of toxic gases that have killed or seriously injured workers and firefighters.

Since 1980, under RCRA Subtitle C, the EPA has developed a comprehensive program to ensure that hazardous waste is managed safely: from the moment it is generated; while it is transported, treated, or stored; until the moment it is finally disposed (see Figure III-1).

This Cradle-to-Grave Management System Establishes Requirements for Each of the Following:

- ✓ **Hazardous Waste Identification** —To facilitate the proper identification and classification of hazardous waste, the RCRA begins with hazardous waste identification procedures.
- ✓ **Hazardous Waste Recycling and Universal Wastes** —To provide for the safe recycling of hazardous wastes, and facilitate the management of commonly recycled materials, the RCRA includes provisions for hazardous waste recycling and universal wastes.
- ✓ **Hazardous Waste Generators** —To ensure proper and safe waste management, the RCRA regulations provide management standards for those facilities that produce hazardous waste, and provide reduced regulations for facilities that produce less waste.
- ✓ **Hazardous Waste Transporters** —To govern the transport of hazardous waste between management facilities, the RCRA regulates hazardous waste transporters.
- ✓ **Treatment, Storage, and Disposal Facilities —**To fully protect human health and the environment from hazardous waste treatment, storage, and disposal, the TSDF requirements establish generic facility management standards, specific provisions governing hazardous waste management units, and additional precautions designed to protect soil, ground water, and air resources.
- ✓ **Land Disposal Restrictions** (**LDR**)— To reduce the hazards posed by permanently land disposed waste, this program requires effective and expeditious hazardous waste treatment.
- ✓ **Combustion** —To minimize the hazards posed by the burning of hazardous waste, the RCRA imposes strict standards on units conducting such combustion.
- ✓ **Permitting** —To ensure that only facilities meeting the TSDF standards are treating, storing, and disposing of hazardous waste, and to provide each TSDF facility with a record of the specific requirements applicable to each part of its operation, the RCRA requires owners and operators of these facilities to obtain a permit.
- ✓ **Corrective Action** —Since hazardous waste management may result in spills or releases into the environment, the corrective action program is designed to guide he cleanup of any contaminated air, ground water, or soil resulting from such management.
- ✓ **Enforcement** —To ensure that RCRA-regulated facilities, from generators to TSDFs, comply with these regulations, the RCRA provides the EPA with the authority to enforce provisions of the Act.
- ✓ **State Authorization** —To empower states and make enforcement more efficient, the RCRA also allows the EPA to authorize state governments to administer various parts of the RCRA program.

Each of these aspects of the RCRA Subtitle C program is carefully detailed in separate chapters in this section.

CHAPTER 1

HAZARDOUS WASTE IDENTIFICATION

OVERVIEW

What is hazardous waste?
Simply defined, **hazardous waste** is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment.

Unfortunately, in order to develop a regulatory framework capable of ensuring adequate protection, this simple narrative definition is not enough.

Determining what is hazardous waste is paramount, because only those wastes that have specific attributes are subject to Subtitle C regulation.

Making this determination is a complex task which is a central component of the hazardous waste management regulations. Hazardous waste is generated from many sources, ranging from industrial manufacturing process wastes, to batteries, to fluorescent light bulbs.

Hazardous waste may come in many forms, including liquids, solids, gases, and sludges. To cover this wide range, the EPA has developed a system to identify specific substances known to be hazardous and provide objective criteria for including other materials in this universe.

The regulations contain guidelines for determining what exactly is waste (called a solid waste) and what is excluded from the hazardous waste regulations, even though it otherwise is a solid and hazardous waste. Finally, to promote recycling and the reduction of the amount of waste entering the RCRA system, the EPA provides exemptions for certain wastes when they are recycled in certain ways.

This chapter introduces the hazardous waste identification process, describes how to determine if a waste is a solid waste, and provides the regulatory definition for hazardous waste. It also discusses those wastes specifically excluded from Subtitle C regulation, and those wastes exempted when recycled.

HAZARDOUS WASTE IDENTIFICATION PROCESS

Proper hazardous waste identification is essential to the success of the RCRA program. This identification process can be a very complex task.

Therefore, it is best to approach the issue by asking a series of questions in a step-wise manner (see Figure III-2).If facility owners and operators answer the following questions, they can determine if they are producing a hazardous waste:

1.Is the material in question a solid waste?

2.Is the material excluded from the definition of solid waste or hazardous waste?

3.Is the waste a listed or characteristic hazardous waste?

4.Is the waste delisted?

This chapter will examine these key questions.

IS THE MATERIAL A SOLID WASTE?

The Subtitle C program uses the term solid waste to denote something that is a waste. In order for a material to be classified as a hazardous waste, it must first be a solid waste. Therefore, the first step in the hazardous waste identification process is determining if a material is a solid waste.

The statutory definition points out that whether a material is a solid waste is not based on the physical form of the material (i.e., whether or not it is a solid as opposed to a liquid or gas),but rather that the material is a waste. The regulations further define **solid waste** as any material that is discarded by being either abandoned, inherently waste-like, a certain military munition, or recycled.

Abandoned —The term **abandoned** simply means thrown away. .A material is abandoned if it is disposed of, burned, or incinerated.

Inherently Waste-Like — Some materials pose such a threat to human health and the environment that they are always considered solid wastes; these materials are considered to be **inherently waste-like**. Examples of inherently waste-like materials include certain dioxin-containing wastes.

Military Munition —**Military munitions** are all ammunition products and components produced for or used by the U.S. Department of Defense (**DOD**) or U.S. Armed Services for national defense and security. Unused or defective munitions are solid wastes when abandoned (i.e., disposed of, burned, incinerated) or treated prior to disposal; rendered non-recyclable or non-useable through deterioration; or declared a waste by an authorized military official. Used (i.e., fired or detonated) munitions may also be solid wastes if collected for storage, recycling, treatment, or disposal.

Recycled —A material is **recycled** if it is used or reused (e.g., as an ingredient in a process), reclaimed, or used in certain ways (used in a manner constituting disposal, burned for energy recovery, or accumulated speculatively). (Recycled materials are fully discussed in Section III, Chapter 2.)

Recycled Materials

Materials that are recycled are a special subset of the solid waste universe. When recycled, some materials are not solid wastes, and therefore, not hazardous wastes, while others are solid and hazardous waste, but are subject to less-stringent regulatory controls. The level of regulation that applies to recycled materials depends on the material and the type of recycling (see FigureIII-4).

Because some types of recycling pose threats to human health and the environment, the RCRA does not exempt all recycled materials from the definition of solid waste. As a result, the manner in which a material is recycled will determine whether or not the material is a solid waste, and therefore potentially regulated as a hazardous waste. In order to encourage waste recycling, The RCRA exempts three types of wastes from the definition of solid waste:

- **Wastes Used as an Ingredient** — If a material is directly used as an ingredient in a production process without first being reclaimed, then that material is not a solid waste.

- **Wastes Used as a Product Substitute** — If a material is directly used as an effective substitute for a commercial product (without first being reclaimed), it is exempt from the definition of solid waste.

- **Wastes Returned to the Production Process** —When a material is returned directly to the production process (without first being reclaimed) for use as a feedstock or raw material, it is not a solid waste. Conversely, materials are solid wastes, and are not exempt, if they are recycled in certain ways. If these materials are used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; accumulated speculatively; or are dioxin-containing wastes considered inherently waste-like; then they are defined as solid wastes.

Used in a Manner Constituting Disposal —**Use constituting disposal** is the direct placement of wastes or products containing wastes (e.g., asphalt with petroleum-refining wastes as an ingredient) on the land.

Burned for Energy Recovery, **Used to Produce a Fuel or Contained in Fuels** — Burning hazardous waste for fuel (e.g., **burning for energy recovery**) and using wastes to produce fuels are regulated activities. Conversely, commercial products intended to be burned as fuels are not considered solid wastes. For example, off-specification jet fuel (e.g., a fuel with minor chemical impurities) is not a solid waste when it is burned for energy recovery, because it is itself a fuel.

Accumulated Speculatively — In order to encourage recycling of wastes as well as ensure that materials are actually recycled, and not simply stored to avoid regulation, EPA established a provision to encourage facilities to recycle sufficient amounts in a timely manner.

This provision designates as solid wastes those materials that are **accumulated speculatively.** A material is accumulated speculatively (e.g., stored in lieu of expeditious recycling) if it has no viable market or if the person accumulating the material cannot demonstrate that at least 75 percent of the material is recycled in a calendar year, commencing on January 1.

Dioxin-Containing Wastes Considered Inherently Waste-Like — Dioxin-containing wastes are considered inherently waste-like because they pose significant threats to human health and the environment if released or mismanaged. As a result, the RCRA does not exempt such wastes from the definition of solid waste even if they are recycled through direct use or reuse without prior reclamation. This is to ensure that such wastes are subject to the most protective regulatory controls.

Secondary Materials

Not all materials can be directly used or reused without reclamation. A material is **reclaimed** if it is processed to recover a usable product (e.g., smelting a waste to recover valuable metal constituents), or if it is regenerated through processing to remove contaminants in a way that restores them to their useable condition (e.g., distilling dirty spent solvents to produce clean solvents).

If **secondary materials** are reclaimed before use, their regulatory status depends on the type of material. For this solid waste determination process, the EPA groups all materials into five categories. These secondary materials consist of spent materials, sludges, by-products, commercial chemical products (**CCPs**), and scrap metal.

Spent materials are materials that have been used and can no longer serve the purpose for which they were produced without processing. For example, a solvent used to degrease metal parts will eventually become contaminated such that it cannot be used as a solvent until it is regenerated. If a spent material must be reclaimed, it is a solid waste and is subject to hazardous waste regulation.

Spent materials are also regulated as solid wastes when used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively (see FigureIII-6).

Sludges are any solid, semisolid, or liquid wastes generated from a wastewater treatment plant, water supply treatment plant, or air pollution control device (e.g., filters, baghouse dust). Sludges from specific industrial processes or sources (known as listed sludges) are solid wastes when reclaimed; used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively. On the other hand, characteristic sludges (which are sludges that exhibit certain physical or chemical properties) are not solid wastes when reclaimed, unless they are used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively (see Figure III-6). (Listings and characteristics are fully discussed later in this chapter).

By-products are materials that are not one of the intended products of a production process. An example is the sediment remaining at the bottom of a distillation column.

By-product is a catch-all term and includes most wastes that are not spent materials or sludges. Listed by-products are solid wastes when reclaimed; used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively.

On the other hand, characteristic by-products are not solid wastes when reclaimed, unless they are used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively

Commercial chemical products are unused or off-specification chemicals (e.g., chemicals that have exceeded their shelf life),spill or container residues, and other unused manufactured products that are not typically considered chemicals. CCPs are not solid wastes when reclaimed, unless they are used in a manner constituting disposal; or burned for energy recovery, used to produce a fuel, or contained in fuels (see Figure III-6).

Scrap metal is worn or extra bits and pieces of metal parts, such as scrap piping and wire, or worn metal items, such as scrap automobile parts and radiators. If scrap metal is reclaimed, it is a solid waste and is subject to hazardous waste regulation (see also Section III,Chapter 2).

Scrap metal is also regulated as a solid waste when used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively. This does not apply to processed scrap metal which is excluded from hazardous waste generation entirely (as discussed later in this chapter).

Sham Recycling

For all recycling activities, the above rules are based on the premise that legitimate reclamation or reuse is taking place. The EPA rewards facilities that are recycling some wastes by exempting them from regulation, or by subjecting them to lesser regulation.

Some facilities, however, may claim that they are recycling a material in order to avoid being subject to RCRA regulation, when in fact the activity is not legitimate recycling.

The EPA has established guidelines for what constitutes legitimate recycling and has described activities it considers to be illegitimate or **sham recycling** .

Considerations in making this determination include whether the secondary material is effective for the claimed use, if the secondary material is used in excess of the amount necessary, and whether or not the facility has maintained records of the recycling transactions.

IS THE WASTE EXCLUDED?

Not all RCRA solid wastes qualify as hazardous wastes. Other factors must be considered before deciding whether a solid waste should be regulated as a hazardous waste. Regulation of certain wastes may be impractical or otherwise undesirable, regardless of the hazards that the waste might pose.

For instance, household waste can contain dangerous chemicals, such as solvents and pesticides, but subjecting households to the strict RCRA waste management regulations would create a number of practical problems.

As a result, Congress and the EPA exempted or excluded certain wastes, such as household wastes, from the hazardous waste definition and regulations. Determining whether or not a waste is excluded or exempted from hazardous waste regulation is the second step in the RCRA hazardous waste identification process.

There are five categories of exclusions:

- ✓ **Exclusions from the definition of solid waste**
- ✓ **Exclusions from the definition of hazardous waste**
- ✓ **Exclusions for waste generated in raw material, product storage, or manufacturing units**
- ✓ **Exclusions for laboratory samples and waste treatability studies**
- ✓ **Exclusions for dredged material regulated under the Marine Protection Research and Sanctuaries**

SHAM RECYCLING

Sham recycling may include situations when a secondary material is:

- ✓ Ineffective or only marginally effective for the claimed use (e.g., using certain heavy metal sludges in concrete when such sludges do not contribute any significant element to the concrete ’s properties)

- ✓ Used in excess of the amount necessary (e.g., using materials containing chlorine as an ingredient in a process requiring chlorine, but in excess of the required chlorine levels)

- ✓ Handled in a manner inconsistent with its use as a raw material or commercial product substitute (e.g., storing materials in a leaking surface impoundment as compared to a tank in good condition that is intended for storing raw materials).

Solid Waste Exclusions

A material cannot be a hazardous waste if it does not meet the definition of a solid waste. Thus, wastes that are excluded from the definition of solid waste are not subject to RCRA Subtitle C hazardous waste regulation. There are 19 exclusions from the definition of solid waste.

Domestic Sewage and Mixtures of Domestic Sewage

Domestic sewage, or sanitary waste, comes from households, office buildings, factories, and any other place where people live and work. These wastes are carried by sewer to a municipal wastewater treatment plant (called a **publicly owned treatment works** (**POTW**)).
The treatment of these wastes is regulated under the Clean Water Act (**CWA**).

Mixtures of sanitary wastes and other wastes (including hazardous industrial wastes) that pass through a sewer system to a POTW are also excluded from Subtitle C regulation once they enter the sewer. In certain circumstances, this exclusion may be applied to domestic sewage and mixtures of domestic sewage that pass through a federally owned treatment works (**FOTW**).

Industrial Wastewater Discharges (Point Source Discharges)

Another exclusion from RCRA designed to avoid overlap with CWA regulations applies to **point source discharges**. Point source discharges are discharges of pollutants (e.g., from a pipe, sewer, or pond)directly into a lake, river, stream, or other water body.

CWA regulates such discharges under the National Pollutant Discharge Elimination System (**NPDES**) permitting program. Under this exclusion from the definition of solid waste, wastewaters that are subject to CWA regulations are exempt from Subtitle C regulation at the point of discharge. Any hazardous waste generation, treatment, or storage prior to the discharge is subject to RCRA regulation.

Many industrial facilities that treat wastewater on site utilize this point source discharge exclusion.

Irrigation Return Flows

When farmers irrigate agricultural land, water not absorbed into the ground can flow into reservoirs for reuse. This return flow often picks up pesticide or fertilizer constituents, potentially rendering it hazardous. Because this water may be reused on the fields, it is excluded from the definition of solid waste.

Radioactive Waste

Radioactive waste is regulated by either the Nuclear Regulatory Commission or the U.S. Department of Energy (**DOE**) under the Atomic Energy Act (**AEA**). To avoid duplicative regulation under the RCRA and the AEA, the RCRA excludes certain radioactive materials from the definition of solid waste.

However, the RCRA excludes only the radioactive components of the waste. If a radioactive waste is mixed with a hazardous waste, the resultant mixture is regulated by both the AEA and the RCRA as a **mixed waste**.

Similarly, if a facility generates a hazardous waste that is also radioactive, the material is a mixed waste and is subject to regulation under both the RCRA and the AEA (the regulatory status of mixed waste is fully discussed later in this chapter).

In-Situ Mining Waste
In-situ (in-place) mining of certain minerals may involve the application of solvent solutions directly to a mineral deposit in the ground. The solvent passes through the ground, collecting the mineral as it moves. The mineral and solvent mixtures are then collected in underground wells where the solution is removed. Such solvent-contaminated earth, or any non-recovered solvent, is excluded from the definition of solid waste when left in place.

Pulping Liquors
Pulping liquor, also called black liquor, is a corrosive material used to dissolve wood chips for manufacturing of paper and other materials. To promote waste minimization and recycling, the EPA excluded pulping liquors from the definition of solid waste if they are reclaimed in a recovery furnace and then reused in the pulping process. If the liquors are recycled in another way, or are accumulated speculatively, they are not excluded.

Spent Sulfuric Acid
Spent sulfuric acid may be recycled to produce virgin sulfuric acid. To promote waste reduction and recycling, such recycled spent sulfuric acid is excluded from the definition of solid waste, unless the facility accumulates the material speculatively.

Closed-Loop Recycling
To further promote waste reduction and recycling, spent materials that are reclaimed and returned to the original process in an enclosed system of pipes and tanks are excluded from the definition of solid waste, provided that:

- ✓ Only tank storage is involved, and the entire process, through reclamation, is closed to the air (i.e., enclosed)
- ✓ Reclamation does not involve controlled flame combustion, such as that which occurs in boilers, industrial furnaces, or incinerators
- ✓ Waste materials are never accumulated in tanks for more than 12 months without being reclaimed
- ✓ Reclaimed materials are not used to produce a fuel, or used to produce products that are used in a manner constituting disposal.

An example of such a closed-loop system might include a closed solvent recovery system in which the dirty solvents are piped from the degreasing unit to a solvent still where the solvent is cleaned, and then piped back to the degreasing unit.

Spent Wood Preservatives
Many wood preserving plants recycle their wastewaters and spent wood preserving solutions.

These materials are collected on drip pads and sumps, and are in many cases returned directly to the beginning of the wood preserving process where they are reused in the same manner. While the process resembles a closed-loop recycling process, the closed-loop recycling exclusion does not apply because drip pads are open to the air.

Consistent with their objective to encourage recycling hazardous waste, the EPA developed two specific exclusions for spent wood preserving solutions and wastewaters containing spent preservatives, provided that the materials have been reclaimed and are reused for their original purpose.

In addition, wood preserving solutions and wastewaters are excluded from the definition of solid waste prior to reclamation. To use this exclusion, a facility is required to reuse the materials for their intended purpose and manage them in a way that prevents releases to the environment.

Coke By-Product Wastes
Coke, used in the production of iron, is made by heating coal in high temperature ovens.

Throughout the production process many by-products are created. The refinement of these coke by-products generates several listed and characteristic wastestreams.

However, to promote recycling of these wastes, the EPA provided an exclusion from the definition of solid waste for certain coke by-product wastes that are recycled into new products.

Splash Condenser Dross Residue
The treatment of steel production pollution control sludge generates a zinc-laden residue, called a dross.

This material, generated from a splash condenser in a high temperature metal recovery process, is known as a splash condenser dross residue. Because this material contains 50 to 60 percent zinc, it is often reclaimed, reused, or processed as a valuable recyclable material. Since facilities commonly handle this material as a valuable commodity by managing it in a way that is protective of human health and the environment, the EPA excluded this residue from the definition of solid waste.

Hazardous Oil-bearing Secondary Materials and Recovered Oil from Petroleum Refining Operations
Petroleum refining facilities sometimes recover oil from oily wastewaters and reuse this oil in the refining process. In order to encourage waste minimization and recycling, EPA excluded such recovered oil from the definition of solid waste when it is returned to the refinery.

Oil-bearing hazardous wastes which are recycled back into the petroleum refining process are also excluded. In 2002, the EPA proposed to conditionally exclude oil-bearing secondary materials that are processed in a gasification system to produce synthesis gas fuel and other non-fuel chemical by-products.

Condensates from Kraft Mill Steam Strippers
The Kraft process, the most commonly used pulping process today, utilizes various chemicals to break down wood into pulp. This process generates overhead gases that are condensed and often recycled as fuel. To encourage the recycling of these condensates, the EPA excluded them from the definition of solid waste provided the condensate is combusted at the mill that generated it.

Comparable Fuels
In order to promote the recycling of materials with high fuel values, certain materials that are burned as fuels are excluded from the definition of solid waste, provided that they meet certain specifications (i.e., are of a certain degree of purity).

This is to ensure that the material does not exceed certain levels of toxic constituents and physical properties that might impede burning. Materials that meet this specification are considered comparable to pure or virgin fuels.

Reactivity

The **reactivity characteristic** identifies wastes that readily explode or undergo violent reactions or react to release toxic gases or fumes.

Common examples are discarded munitions or explosives. In many cases, there is no reliable test method to evaluate a waste's potential to explode, react violently, or release toxic gas under common handling conditions.

Therefore, the EPA uses narrative criteria to define most reactive wastes and requires waste generators to use their best judgment in applying the narrative definitions to determine if a waste is sufficiently reactive to be regulated. This is possible because reactive hazardous wastes are relatively uncommon and the dangers that they pose are believed to be well known to the waste handlers who deal with them.

Processed Scrap Metal

Scrap metal includes, but is not limited to, pipes, containers, equipment, wire, and other metal items that are no longer of use. To facilitate recycling, scrap metal that has been processed to make it easier to handle or transport and is sent for metals recovery is excluded from the definition of solid waste. Unprocessed scrap metal is still eligible for an exemption from hazardous waste regulation when recycled (as discussed in Section III, Chapter 2).

Shredded Circuit Boards

Circuit boards are metal boards that hold computer chips, thermostats, batteries, and other electronic components.

Circuit boards can be found in computers, televisions, radios, and other electronic equipment. When this equipment is thrown away, these boards can be removed and recycled. Whole circuit boards meet the definition of scrap metal, and are therefore exempt from hazardous waste regulation when recycled (as discussed in Section III,Chapter 2).

On the other hand, some recycling processes involve shredding the board. Such shredded boards do not meet the exclusion for recycled scrap metal.

In order to facilitate the recycling of such materials, the EPA excluded recycled shredded circuit boards from the definition of solid waste, provided that they are stored in containers sufficient to prevent release to the environment, and are free of potentially dangerous components, such as mercury switches, mercury relays, nickel-cadmium batteries, and lithium batteries.

Mineral Processing Spent Materials

Mineral processing generates spent materials that may exhibit hazardous waste characteristics.

Common industry practice is to recycle these mineral processing wastes back into the processing operations to recover mineral values. The EPA created a conditional exclusion from the definition of solid waste for these spent materials when recycled in the mineral processing industry, provided the materials are stored in certain types of units and are not accumulated speculatively.

Petrochemical Recovered Oil

Organic chemical manufacturing facilities sometimes recover oil from their organic chemical industry operations. The EPA excluded petrochemical recovered oil from the definition of solid waste when the facility inserts the material into the petroleum refining process of an associated or adjacent petroleum refinery.

Only petrochemical recovered oil that is hazardous because it exhibits the characteristic of ignitability or exhibits the toxicity characteristic for benzene (or both) is eligible for the exclusion.

Spent Caustic Solutions from Petroleum Refining

Petrochemical refineries use caustics to remove acidic compounds like mercaptans from liquid petroleum streams to reduce produce odor and corrosivity as well as to meet product sulfur specifications. Spent liquid treating caustics from petroleum refineries are excluded from the definition of solid waste if they are used as a feedstock in the manufacture of napthenic and cresylic acid products.

The EPA believes that spent caustic, when used in this manner, is a valuable commercial feedstock in the production of these particular products, and is therefore eligible for an exclusion.

Glass Frit and Fluoride-rich Baghouse Dust Generated by the Vitrification of K088
In July 2000, the EPA proposed that glass frit and fluoride-rich baghouse dust generated by the vitrification of K088 be classified as products and excluded from the definition of solid waste.

Glass frit is usable as a commercial chemical product and fluoride-rich baghouse dust can be recycled back into the aluminum reduction pots as electrolyte or sold as a product for other industrial uses such as steel making.

Zinc Fertilizers Made from Recycled Hazardous Secondary Materials
The EPA promulgated a conditional exclusion from the definition of solid waste for hazardous secondary materials that are recycled to make zinc fertilizers or zinc fertilizer ingredients. Zinc, an important micronutrient for plants and animals, can be removed from zinc-rich manufacturing residue and used to produce zinc micronutrient fertilizer.

A second conditional exclusion applies to the zinc fertilizer products made from these secondary materials.

Hazardous Waste Exemptions

The EPA also exempts certain solid wastes from the definition of hazardous waste. If a material meets an exemption from the definition of hazardous waste, it cannot be a hazardous waste, even if the material technically meets a listing or exhibits a characteristic.

There are 17 exemptions from the definition of hazardous waste.

Household Hazardous Waste
Households often generate solid wastes that could technically be hazardous wastes (e.g., old solvents, paints, pesticides, fertilizer, poisons).

However, it would be impossible to regulate every house in the United States that occasionally threw away a can of paint thinner or a bottle of rat poison.

Therefore, the EPA developed the household waste exemption. Under this exemption, wastes generated by normal household activities (e.g., routine house and yard maintenance) are exempt from the definition of hazardous waste. The EPA has expanded the exemption to include household-like areas, such as bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas.

While household hazardous waste is exempt from Subtitle C, it is regulated under Subtitle D as a solid waste (as discussed in Section II).

Agricultural Waste

To prevent overregulation of farms and promote waste recycling, solid wastes generated by crop or animal farming are excluded from the definition of hazardous waste provided that the wastes are returned to the ground as fertilizers or soil conditioners. Examples of such wastes are crop residues and manures.

Mining Overburden

After an area of a surface mine has been depleted, it is common practice to return to the mine the earth and rocks (overburden) that were removed to gain access to ore deposits.

When the material is returned to the mine site, it is not a hazardous waste under the RCRA.

Bevill and Bentsen Wastes

In the Solid Waste Disposal Act Amendments of 1980, Congress amended the RCRA by exempting oil, gas, and geothermal exploration, development, and production wastes (**Bentsen wastes**); fossil fuel combustion wastes; mining and mineral processing wastes; and cement kiln dust wastes (**Bevill wastes**) from the definition of hazardous waste pending further study by the EPA.

These wastes were temporarily exempted because they were produced in very large volumes, were thought to pose less of a hazard than other wastes, and were generally not amenable to the management practices required under the RCRA.

The following paragraphs describe these exemptions in detail.

Fossil Fuel Combustion Waste

In order to accommodate effective study, fossil fuel combustion wastes were divided into two categories, large-volume coal-fired utility wastes and remaining wastes.

After studying these wastes, in 1993, the EPA decided to permanently exempt large- volume coal-fired utility wastes, including fly ash, bottom ash, boiler slag, and flue gas emission control waste from the definition of hazardous waste.

Further study by the EPA, in 2000, indicated that all remaining fossil fuel combustion wastes need not be regulated under RCRA Subtitle C. However, the EPA determined that national non-hazardous waste regulations under RCRA Subtitle D are appropriate for coal combustion wastes disposed in surface impoundments and landfills and used as minefill. These regulations are expected to be proposed in March of 2003.

Oil, Gas, and Geothermal Wastes

Certain wastes from the exploration and production of oil, gas, and geothermal energy are excluded from the definition of hazardous waste.

These wastes include those that have been brought to the surface during oil and gas exploration and production operations, and other wastes that have come into contact with the oil and gas production stream (e.g., during removal of waters injected into the drill well to cool the drill bit).

Mining and Mineral Processing Wastes

Certain wastes from the mining, refining, and processing of ores and minerals are excluded from the definition of hazardous waste.

Cement Kiln Dust
Cement kiln dust is a fine-grained solid by-product generated during the cement manufacturing process and captured in a facility's air pollution control system. After study, the EPA decided to develop specific regulatory provisions for cement kiln dust.

Until the EPA promulgates these new regulatory controls, however, cement kiln dust will generally remain exempt from the definition of hazardous waste.

Trivalent Chromium Wastes
The element chromium exists in two forms, hexavalent and trivalent. The EPA determined that while hexavalent chromium poses enough of a threat to merit regulation as a characteristic hazardous waste, trivalent chromium does not.

Therefore, to prevent unnecessary regulation, the EPA excluded from the definition of hazardous waste, trivalent chromium-bearing hazardous wastes from certain leather tanning, shoe manufacturing, and leather manufacturing industries.

Arsenically Treated Wood
Discarded arsenically treated wood or wood products that are hazardous only because they exhibit certain toxic characteristics (e.g., contain harmful concentrations of metal or pesticide constituents), are excluded from the definition of hazardous waste. Once such treated wood is used, it may be disposed of by the user (commercial or residential) without being subject to hazardous waste regulation.

This exclusion is based on the fact that the use of such wood products on the land is similar to the common disposal method, which is landfilling. This exclusion applies only to end-users and not to manufacturers.

Petroleum-Contaminated Media and Debris from Underground Storage Tanks
USTs are used to store petroleum (e.g., oil) and hazardous substances (e.g., ammonia). When these tanks leak, the UST program under RCRA Subtitle I provides requirements for cleaning up such spills (the regulatory requirements for USTs are fully discussed in Section IV).

To facilitate the corrective action process under the UST regulations, contaminated media (soils and ground water) and debris (tanks and equipment) at sites undergoing UST cleanup that are hazardous only because they exhibit certain toxic characteristics (e.g., contain a harmful concentrations of leachable organic constituents) are excluded from the definition of hazardous waste.

Spent Chlorofluorocarbon Refrigerants
Chlorofluorocarbons (**CFCs**) released to the atmosphere damage the stratospheric ozone layer.

To promote recycling and discourage the practice of venting used CFCs to the atmosphere as a means of avoiding Subtitle C regulation, the EPA excluded recycled CFCs from the definition of hazardous waste since the refrigerants are generally reclaimed for reuse.

Used Oil Filters

In order to promote the recycling and recovery of metals and other products from used oil filters, the EPA exempted used oil filters that have been properly drained to remove the used oil.

Used Oil Distillation Bottoms

When used oil is recycled, residues (called **distillation bottoms**) form at the bottom of the recycling unit. To promote used oil recycling and the beneficial reuse of waste materials, the EPA excluded these residues from the definition of hazardous waste when the bottoms are used as ingredients in asphalt paving and roofing materials.

Landfill Leachate or Gas Condensate Derived from K169,K171,and K172 Listings

Landfill leachate and landfill gas condensate derived from previously disposed wastes that now meet the listing description of one or more of the petroleum refinery listed wastes K169,K170,K171, and K172,would be regulated as a listed hazardous waste.

However, the EPA temporarily deferred such landfill leachate and gas condensate from the definition of hazardous waste provided their discharge is regulated under the Clean Water Act (**CWA**).

The exclusion will remain effective while the EPA studies how the landfill leachate and landfill gas condensate are currently managed, and the effect of future CWA effluent limitation guidelines for landfill wastewaters.

Project XL Pilot Project Exclusions

The EPA has provided two facilities with site-specific hazardous waste exclusions pursuant to the Project XL pilot program. The waste generated from the copper metalization process at the IBM Vermont XL project is excluded from the F006 listing.

By-products resulting from the production of automobile air bag gas generants at the Autoliv ASP Inc. XL project in Utah are exempt from regulation as D003 hazardous waste. In addition to these finalized exclusions, in July of 2001, the EPA proposed a site-specific exclusion for mixed wastes generated at the Ortho-McNeil Pharmaceutical, Inc. facility in Spring House, Pennsylvania, under the Project XL program.

Raw Material, Product Storage, and Process Unit Waste Exclusions

Hazardous wastes generated in raw material, product storage, or process (e.g., manufacturing) units are exempt from Subtitle C hazardous waste regulation while the waste remains in such units.

These units include tanks, pipelines, vehicles, and vessels used either in the manufacturing process or for storing raw materials or products, but specifically do not include surface impoundments. Once the waste is removed from the unit, or when a unit temporarily or permanently ceases operation for 90 days, the waste is considered generated and is subject to regulation.

Sample and Treatability Study Exclusions

Hazardous waste samples are small, discrete amounts of hazardous waste that are essential to ensure accurate characterization and proper hazardous waste treatment. In order to facilitate the analysis of these materials, The RCRA exempts characterization samples and treatability study samples from Subtitle C hazardous waste regulation.

Waste Characterization Samples

Samples sent to a lab to determine whether or not a waste is hazardous are exempt from regulation.

Such samples (typically less than one gallon of waste) are excluded from Subtitle C regulation, provided that these samples are collected and shipped for the sole purpose of determining hazardous waste characteristics or composition.

Storage, transportation, and testing of the sample are excluded from RCRA regulation even when the lab testing is complete, provided the sample is returned to the generator, and other specific provisions are met. When shipping the sample to or from the laboratory, the sample collector must comply with certain labeling requirements, as well as any applicable U.S. Postal Service (**USPS**) or U.S. Department of Transportation (**DOT**) shipping requirements.

Treatability Study Samples

To determine if a particular treatment method will be effective on a given waste or what types of wastes remain after the treatment is complete, facilities send samples of waste to a lab for testing.

The EPA conditionally exempts those who generate or collect samples for the sole purpose of conducting treatability studies from the hazardous waste regulations, provided that certain requirements, including packaging, labeling, and recordkeeping provisions, are met.

In addition, under specific conditions, laboratories conducting such treatability studies may also be exempt from Subtitle C regulation.

Dredge Materials Exclusions

Dredge materials subject to the permitting requirements of 404 of the Federal Water Pollution Control Act of Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 are not considered hazardous wastes.

IS THE WASTE A LISTED HAZARDOUS WASTE?

After a facility determines that its waste is a solid waste and is not either excluded from the definitions of solid or hazardous waste or exempt from Subtitle C hazardous waste regulation, the owner and operator must determine if the waste is a hazardous waste.

The first step in this process is determining if the waste is a listed hazardous waste.
The hazardous waste listings consist of four lists:
•The F list • The P list
•The K list • The U list..

Listed wastes are wastes from generic industrial processes, wastes from certain sectors of industry, and unused pure chemical products and formulations. Because these wastes are dangerous enough to warrant full Subtitle C regulation based on their origin, any waste fitting a narrative listing description is considered a listed hazardous waste.

Listing Criteria
Before developing each hazardous waste listing, the EPA thoroughly studies a particular wastestream and the threats that it can pose to human health and the environment. If the waste poses sufficient threat, the EPA includes a precise description of that waste on one of four hazardous waste lists within the regulations.

In order to determine whether a waste should be listed in the first place, the Agency developed a set of criteria to use as a guide and a consistent frame of reference when considering listing a wastestream.

These criteria were developed by the EPA to use in evaluating whether a waste warranted being listed as a hazardous waste. These listing criteria cannot be use by waste handlers for waste identification purposes. Waste handlers must instead consult the actual listings to determine if their waste is regulated as a listed hazardous waste.

There are three different criteria the EPA uses to decide whether or not to list a waste as hazardous.

The three criteria are:

1. The waste typically contains toxic chemicals at levels that could pose a threat to human health and the environment if improperly managed. Such wastes are known as toxic listed wastes.

2. The waste contains such dangerous chemicals that it could pose a threat to human health and the environment even when properly managed. These wastes are fatal to humans and animals even in low doses. Such wastes are known as acute hazardous wastes.

3. The waste typically exhibits one of the four characteristics of hazardous waste: ignitability, corrosivity, reactivity, and toxicity.

In addition, the EPA may list a waste as hazardous, if it has cause to believe that, for some other reason, the waste typically fits within the statutory definition of hazardous waste developed by Congress.

Hazardous Waste Listings
The EPA has applied the listing criteria to hundreds of specific industrial wastestreams.

DEFINITION OF HAZARDOUS WASTE
In RCRA §1004(5),Congress defined hazardous waste as a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:
(a)Cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
(b)Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Based on this broad definition, Congress instructed the EPA to develop more specific criteria for defining solid and hazardous waste.

Congress believed that the EPA should define hazardous waste using two different mechanisms: by listing certain specific solid wastes as hazardous (i.e., wastes from certain industrial processes or sources), and by identifying characteristics (i.e., physical or chemical properties) which, when exhibited by a solid waste, make it hazardous.

Taking Congress' lead, the EPA proceeded to develop an elaborate definition of hazardous waste that included both of these mechanisms. are grouped into the four lists located at 40 CFR Part 261, Subpart D. Listed wastes are organized as follows:

The F list —The F list includes wastes from certain common industrial and manufacturing processes. Because the processes generating these wastes can occur in different sectors of industry, the F list wastes are known as wastes from nonspecific sources. The F list is codified in the regulations at 40 CFR §261.31.

The K list —The K list includes wastes from specific industries. As a result, K list wastes are known as wastes from specific sources. The K list is found at 40 CFR §261.32.

The P list and the U list —These two lists include pure or commercial grade formulations of specific unused chemicals. Chemicals are included on the P list if they are acutely toxic. A chemical is acutely toxic if it is fatal to humans in low doses, if scientific studies have shown that it has lethal effects on experimental organisms, or if it causes serious irreversible or incapacitating illness.

The U list is generally comprised of chemicals that are toxic, but also includes chemicals that display other characteristics, such as ignitability or reactivity.

Both the P list and U list are codified at 40 CFR §261.33.

Each list includes anywhere from 30 to a few hundred listed hazardous wastestreams.

All of the wastes on these lists are assigned an identification number (i.e., a waste code) consisting of the letter associated with the list (i.e., F, K, P, or U) followed by three numbers.

For example, wastes on the F list may be assigned a waste code ranging from F001 to

F039,while wastes on the K list may be assigned a waste code ranging from K001 to K178.These waste codes are an important part of the RCRA regulatory system since waste code assignment has important implications for the future management standards that will apply to the waste.

The F List: Wastes From Nonspecific Sources
The F list designates hazardous wastes from common industrial and manufacturing processes.

The F list wastes can be divided into seven groups, depending on the type of manufacturing or industrial operation that creates them:

- Spent solvent wastes (waste codes F001 throughF005)
- Electroplating and other metal finishing wastes (F006 through F012 and F019)
- Dioxin-bearing wastes (F020 through F023 and F026 through F028)
- Chlorinated aliphatic hydrocarbons production wastes (F024 and F025)
- Wood preserving wastes (F032,F034,and F035)
- Petroleum refinery wastewater treatment sludges (F037 and F038)
- Multisource leachate (F039).

Spent Solvent Wastes
The spent solvent waste listings (F001 through F005) apply to wastestreams that are generated from the use of certain common organic solvents.

Solvents are commonly used in various industries, such as mechanical repair, dry cleaning, and electronics manufacturing, for degreasing and cleaning in addition to other functions. While solvents are chemicals with many uses, these listings only apply to solvents that are used as solvents for their solvent properties (e.g., to solubilize, dissolve, or mobilize other constituents) and are spent (e.g., cannot be used further without reprocessing).

In addition, these listings only apply to solvents that contain one or more of the specific organic solvent constituents found in the F001-F005 narrative descriptions. Lastly, these listings only cover solvents that were above a certain concentration before use.

HAZARD CODES
To indicate its reason for listing a waste, the EPA assigns a hazard code to each waste listed on the F, K, P, and U lists. The last four hazard codes in the table below apply to wastes that have been listed because they typically exhibit one of the four regulatory characteristics of hazardous waste. The first two hazard codes apply to listed wastes whose constituents pose additional threats to human health and the environment.

The hazard codes indicating the basis for listing a waste are:
Toxic Waste (**T**)
Acute Hazardous Waste (**H**)
Ignitable Waste (**I**)
Corrosive Waste (**C**)
Reactive Waste (**R**)
Toxicity Characteristic Waste (**E**)*

The hazard codes assigned to listed wastes affect the regulations that apply to handling the waste. For instance, acute hazardous wastes accompanied by the hazard code (H) are subject to stricter management standards than most other wastes.

**Currently, there are no hazardous wastes listed solely for exhibiting the toxicity characteristic.*

Electroplating and Other Metal Finishing Wastes
The electroplating and other metal finishing waste listings (F006 through F012 and F019) apply to wastestreams that are commonly produced during electroplating and other metal finishing operations.

Diverse industries use electroplating and other methods to change the surface of metal objects in order to enhance the appearance of the objects, make them more resistant to corrosion, or impart some other desirable property to them. Industries involved in plating and metal finishing range from jewelry manufacture to automobile production.

Dioxin-Bearing Wastes
The dioxin-bearing waste listings (F020 through F023 and F026 through F028) describe a number of wastestreams that the EPA believes are likely to contain dioxins, which are allegedly among the most dangerous known chemical compounds.

The dioxin listings apply primarily to manufacturing process wastes from the production of specific pesticides or specific chemicals used in the production of pesticides. With the exception of F028,all of the dioxin-bearing wastes are considered acutely hazardous wastes and are designated with the hazard code (**H**). These wastes are therefore subject to stricter management standards than other hazardous wastes.

Chlorinated Aliphatic Hydrocarbon Production Wastes
The chlorinated aliphatic hydrocarbons production wastes (F024 and F025) list certain wastestreams produced by the manufacture of chlorinated aliphatic hydrocarbons.

Chlorinated aliphatic hydrocarbons are used in the manufacture of certain pesticides and fire retardants. Many other wastestreams from the manufacture of organic chemicals are found within the K list, including two waste codes for chlorinated aliphatic wastes, K174 and K175.

Wood Preserving Wastes
The wood preserving waste listings (F032, F034, and F035) apply to certain wastes from wood preserving operations. Most wood used for construction or other non-fuel applications is chemically treated to slow the deterioration caused by decay and insects.

For example, telephone poles, railroad cross ties, and other wood products are treated to withstand the rigors of outdoor use.

Wood preservation typically involves coating lumber with pentachlorophenol, creosote, or preservatives containing arsenic or chromium. The wood preserving process creates wastestreams containing these chemicals, such as excess preservative solution that drips from wood products after treatment. Waste from wood preservation using pentachlorophenol is F032, waste from use of creosote is F034, and waste from treating wood with arsenic or chromium is F035.

These listings (as well as some K list waste listings) also apply to a variety of other residues from wood preserving.

Petroleum Refinery Wastewater Treatment Sludges
The petroleum refinery wastewater treatment sludge listings (F037 and F038) apply to specific wastestreams from petroleum refineries. The petroleum refining process typically creates large quantities of contaminated wastewater. Before this wastewater can be discharged to a river or sewer, it must be treated to remove oil, solid material, and chemical pollutants.

To remove most of this oily waste from the wastewater, refineries typically use two methods. In the first step, gravity separates the pollutants from the wastewater. The solids and heavier pollutants sink to the bottom of a tank, forming a sludge, while the lighter materials (called **float**) float to the surface of the wastewater, where they can be skimmed off.

This sludge is F037.The second step uses physical (stirring or agitating) and chemical means to separate remaining pollutants from the wastewater into sludge and float. This sludge and float are F038. The K list also includes wastes codes for certain petroleum wastestreams generated by the petroleum refining industry. These waste codes are K048 through K052 and K169 through K172.

Multisource Leachate
The F039 listing applies to multi-source leachate, the liquid material that accumulates at the bottom of a hazardous waste landfill. The leachate that percolates through landfills, particularly hazardous waste landfills, usually contains high concentrations of chemicals, and is often collected to minimize the potential for it to enter and contaminate the soil or ground water below the unit.

The K List: Wastes From Specific Sources
The K list designates hazardous wastes from specific sectors of industry and manufacturing. Like F list wastes, K list wastes are manufacturing process wastes.

To determine whether a waste qualifies as K-listed, a facility must first determine whether the waste fits within one of the 13 different industrial or manufacturing categories on the list.

Second, a facility must determine if this waste matches one of the detailed K list waste descriptions in 40 CFR §261.32.The 13 industries that generate K list wastes are:

- ✓ **Wood preservation**
- ✓ **Organic chemicals manufacturing**
- ✓ **Pesticides manufacturing**
- ✓ **Petroleum refining**
- ✓ **Veterinary pharmaceuticals manufacturing**
- ✓ **Inorganic pigment manufacturing**
- ✓ **Inorganic chemicals manufacturing**
- ✓ **Explosives manufacturing**
- ✓ **Iron and steel production**
- ✓ **Primary aluminum production**
- ✓ **Secondary lead processing**
- ✓ **Ink formulation**
- ✓ **Coking (processing of coal to produce coke, a material used in iron and steel production).**

Previously, the K list also included waste codes for 17 different industries. However, due to various court actions taken, the EPA withdrew the K waste codes applicable to wastestreams in the primary copper, primary lead, primary zinc, and ferroalloys industries.

The P and U Lists: Discarded Commercial Chemical Products
The P and U lists designate as hazardous waste pure and commercial grade formulations of certain unused chemicals that are being disposed. Unused chemicals may become wastes for a number of reasons. For example, some unused chemicals are spilled by accident. Others are intentionally discarded because they are off-specification and cannot serve the purpose for which they were originally produced.

For a waste to qualify as P-or U-listed, the waste must meet the following three criteria:

- ✓ The waste must contain one of the chemicals listed on the P or U list
- ✓ The chemical in the waste must be unused
- ✓ The chemical in the waste must be in the form of a **commercial chemical product** (**CCP**).

For purposes of the P and U lists, a CCP is defined as a chemical that is one of the following:

- ✓ 100 percent pure
- ✓ Technical (e.g., commercial) grade
- ✓ The sole active ingredient in a chemical formulation.

While 100 percent pure means that the chemical is the only chemical constituent in the product, **technical grade** means that the formulation is not 100 percent pure, but is of a grade of purity that is either marketed or recognized in general usage by the chemical industry.

Sole active ingredient means that the chemical is the only ingredient serving the function of the formulation. For instance, a pesticide made for killing insects may contain a poison such as heptachlor, as well as various solvent ingredients which act as carriers or lend other desirable properties to the poison.

Although all of these chemicals may be capable of killing insects, only the heptachlor serves the primary purpose of the insecticide product. The other chemicals involved are present for other reasons, not because they are poisonous. Therefore, heptachlor is the sole active ingredient in such a formulation, even though it may be present in low concentrations.

Wastes Listed Solely for Exhibiting the Characteristic of Ignitability, Corrosivity, and/or Reactivity
Hazardous wastes listed solely for exhibiting the characteristic of ignitability, corrosivity, and/or reactivity are not regulated the same way that other listed hazardous wastes are regulated under the RCRA.

When a waste meets a listing description for one of the 29 wastes listed solely for exhibiting the characteristic of ignitability, corrosivity, and/or reactivity, the waste is not hazardous if it does not exhibit that characteristic at the point of generation.

For example, F003 is listed for the characteristic of ignitability. If a waste is generated and meets the listing description for F003 but does not exhibit the characteristic of ignitability, it is not regulated as a hazardous waste.

Delistings

The RCRA regulations provide a form of relief for listed wastes with low concentrations of hazardous constituents. Through a site-specific process known as **delisting**, a waste handler can submit a petition to an EPA Region or state demonstrating that even though a particular wastestream generated at its facility is a listed hazardous waste, it does not pose sufficient hazard to merit RCRA regulation.

For example, a waste generated at a specific facility may meet a listing description even though the process uses different raw materials than the EPA assumed were used when listing the waste, thus the waste may not contain the contaminants for which it was listed. Similarly, after treatment of a listed waste, the residue may no longer pose a threat to human health and the environment.

Specifically, the petition must demonstrate that the waste does not:

- ✓ Meet the criteria for which it was listed
- ✓ Exhibit any hazardous waste characteristics (as discussed later in this chapter)
- ✓ Pose a threat to human health and the environment by being hazardous for any other reason (e.g., does not contain additional constituents that could pose a threat).

If the EPA Region or state grants a delisting petition, the particular wastestream at that facility will not be regulated as a listed hazardous waste.

IS THE WASTE A CHARACTERISTIC HAZARDOUS WASTE?

After a facility determines its waste is a solid waste and is not excluded from the definitions of solid or hazardous waste, it must determine if the waste is a hazardous waste.

This entails determining if the waste is listed, and also if the waste is characteristic. Even if a waste is a listed hazardous waste, the facility must then determine if the waste exhibits a characteristic by testing or applying knowledge of the waste.

Characteristic wastes are wastes that exhibit measurable properties which indicate that a waste poses enough of a threat to deserve regulation as hazardous waste. The EPA tried to identify characteristics which, when present in a waste, can cause death or illness in humans or lead to ecological damage.

The characteristics are an essential supplement to the hazardous waste listings.

For example, some wastes may not meet any listing description because they do not originate from specific industrial or process sources, but the waste may still pose threats to human health and the environment.

As a result, a facility is also required to determine whether such a waste possesses a hazardous property (i.e., exhibits a hazardous waste characteristic).

The characteristics are applied to any RCRA solid waste from any industry.

Even if a waste does meet a hazardous waste listing description, the facility must still determine if the waste exhibits a characteristic. If such listed wastes do exhibit a characteristic, the waste poses an additional hazard to human health and the environment, and may necessitate additional regulatory precautions.

For example, wastes that are both listed and characteristic may have more extensive LDR requirements, than those that are only listed (the LDR program is fully discussed in Section III, Chapter 6).

The EPA decided that the characteristics of hazardous waste should be detectable by using a standardized test method or by applying general knowledge of the waste 's properties.

Given these criteria, the EPA established four hazardous waste characteristics:

- **Ignitability**
- **Reactivity**
- **Corrosivity**
- **Toxicity**

Ignitability

The **ignitability characteristic** identifies wastes that can readily catch fire and sustain combustion.

Many paints, cleaners, and other industrial wastes pose such a hazard. Liquid and nonliquid wastes are treated differently by the ignitability characteristic.

Most ignitable wastes are liquid in physical form. The EPA selected a flash point test as the method for determining whether a liquid waste is combustible enough to deserve regulation as hazardous.

The flash point test determines the lowest temperature at which the fumes above a waste will ignite when exposed to flame.

Many wastes in solid or nonliquid physical form (e.g., wood, paper) can also readily catch fire and sustain combustion, but the EPA did not intend to regulate most of these nonliquid materials as ignitable wastes.

A nonliquid waste is considered ignitable if it can spontaneously catch fire or catch fire through friction or absorption of moisture under normal handling conditions and can burn so vigorously that it creates a hazard.

Certain compressed gases are also classified as ignitable.

Finally, substances meeting the Department of Transportation's definition of oxidizer are classified as ignitable wastes. Ignitable wastes carry the waste code D001 and are among the most common hazardous wastes. The regulations describing the characteristic of ignitability are codified at 40 CFR §261.21.

Corrosivity

The **corrosivity characteristic** identifies wastes that are acidic or alkaline (basic). Such wastes can readily corrode or dissolve flesh, metal, or other materials.

They are also among the most common hazardous wastes.

An example is waste sulfuric acid from automotive batteries.

The EPA uses two criteria to identify liquid and aqueous corrosive hazardous wastes.

The first is a pH test. Aqueous wastes with a pH greater than or equal to 12.5 or less than or equal to 2 are corrosive. A liquid waste may also be corrosive if it has the ability to corrode steel under specific conditions.

Physically solid, non-aqueous wastes are not evaluated for corrosivity. Corrosive wastes carry the waste code D002.

The regulations describing the corrosivity characteristic are found at 40 CFR §261.22.
The ignitability characteristic identifies wastes that can readily catch fire and sustain combustion.

The corrosivity characteristic identifies wastes that are acidic or alkaline (basic) and can readily corrode or dissolve flesh, metal, or other materials. III-23

Reactivity

The **reactivity characteristic** identifies wastes that readily explode or undergo violent reactions or react to release toxic gases or fumes.

Common examples are discarded munitions or explosives. In many cases, there is no reliable test method to evaluate a waste 's potential to explode, react violently, or release toxic gas under common handling conditions.

Therefore, the EPA uses narrative criteria to define most reactive wastes and requires waste generators to use their best judgment in applying the narrative definitions to determine if a waste is sufficiently reactive to be regulated. This is possible because reactive hazardous wastes are relatively uncommon and the dangers that they pose are believed to be well known to the waste handlers who deal with them.

A waste is reactive if it meets any of the following criteria:

- ✓ It can explode or violently react when exposed to water or under normal handling conditions
- ✓ It can create toxic fumes or gases when exposed to water or under normal handling conditions
- ✓ It meets the criteria for classification as an explosive under DOT rules
- ✓ It generates toxic levels of sulfide or cyanide gas when exposed to a pH range of 2 through 12.5.

Wastes exhibiting the characteristic of reactivity are assigned the waste code D003.The reactivity characteristic is described in the regulations at 40 CFR §261.23.

Toxicity
When hazardous waste is disposed of in a land disposal unit, toxic compounds or elements can leach into underground drinking water supplies and expose users of the water to hazardous chemicals and constituents. The EPA developed the **toxicity characteristic (TC)** to identify wastes likely to leach dangerous concentrations of toxic chemicals into ground water.

In order to predict whether any particular waste is likely to leach chemicals into ground water at dangerous levels, the EPA designed a lab procedure to replicate the leaching process and other conditions that occur when wastes are buried in a typical municipal landfill. This lab procedure is known as the **Toxicity Characteristic Leaching Procedure (TCLP)**.

The TCLP requires a facility to create a liquid leachate from its hazardous waste samples. This leachate would be similar to the leachate generated by a landfill containing a mixture of household and industrial wastes. Once this leachate is created via the TCLP, the waste handler must determine whether it contains any of 40 different toxic chemicals in amounts above the specified regulatory levels.

These regulatory levels are based on ground water modeling studies and toxicity data that calculate the limit above which these common toxic compounds and elements will threaten human health and the environment by contaminating drinking water.

If the leachate sample contains a concentration above the regulatory limit for one of the specified chemicals, the waste exhibits the toxicity characteristic and carries the waste code associated with that compound or element. The TCLP may not be used however, for determining whether remediation waste from manufactured gas plants (**MGP**) is hazardous under the RCRA.

The reactivity characteristic identifies wastes that readily explode or undergo violent reactions.

Therefore, MGP remediation wastes are exempt from TC regulation. The regulations describing the toxicity characteristic are codified at 40 CFR §261.24, and the TC regulatory levels appear in Table 2 of that same section.

SPECIAL REGULATORY CONVENTIONS
Once a facility generates a hazardous waste, the waste may become mixed with other wastes, be treated and produce residues, or even be spilled.

The RCRA provides special regulatory provisions to address the regulatory status of hazardous wastes in these situations.

Mixture Rule
The **mixture rule** is intended to ensure that mixtures of listed wastes with nonhazardous solid wastes are regulated in a manner that minimizes threats to human health and the environment.

Listed Wastes

The mixture rule regulates a combination of any amount of a nonhazardous solid waste and any amount of a listed hazardous waste as a listed hazardous waste. Even if a small vial of listed waste is mixed with a large quantity of nonhazardous waste, the resulting mixture bears the same waste code and regulatory status as the original listed component of the mixture, unless the generator obtains a delisting.

This is intended to prevent a facility from mixing a listed waste with a nonhazardous waste in order to escape having to manage the waste as hazardous.

Characteristic Wastes

The mixture rule applies differently to listed and characteristic wastes. A mixture involving characteristic wastes is hazardous only if the mixture itself exhibits a characteristic.

Characteristic wastes are hazardous because they possess one of four unique and measurable properties. Once a characteristic waste no longer exhibits one of these four dangerous properties, it no longer deserves regulation as hazardous.

Thus, a characteristic waste can be made nonhazardous by treating it to remove its hazardous property; however the EPA places certain restrictions on the manner in which a waste can be treated.

Wastes Listed Solely for Exhibiting the Characteristic of Ignitability, Corrosivity, and/or Reactivity

All wastes listed solely for exhibiting the characteristic of ignitability, corrosivity and/or reactivity characteristic are not regulated as hazardous wastes once they no longer exhibit a characteristic. If a hazardous waste listed only for a characteristic is mixed with a solid waste, the original listing does not carry through to the resulting mixture if that mixture does not exhibit any hazardous waste characteristics.

For example, the EPA listed the F003 spent solvents as hazardous because these wastes typically display the ignitability characteristic. If F003 waste is treated by mixing it with another waste, and the resulting mixture does not exhibit a characteristic, the F003 listing no longer applies.

Exemptions

There are several exemptions from the mixture rule. One exemption applies to certain listed hazardous wastes that are discharged to wastewater treatment facilities in very small or **de minimis** amounts.

Many industrial facilities produce large quantities of nonhazardous wastewaters as their primary wastestreams. These wastewaters are typically discharged to a water body or local sewer system after being treated to remove pollutants, as required by the CWA. At many of these large facilities, on-site cleaning, chemical spills, or laboratory operations create relatively small amounts of hazardous waste.

For example, a textile plant producing large quantities of nonhazardous wastewater can generate a secondary wastestream of listed spent solvents from cleaning equipment.

Routing such secondary hazardous wastestreams to the facility's wastewater treatment system is a practical way of treating and disposing of these wastes.
This management option triggers the mixture rule, since even a very small amount of a listed wastestream combined with very large volumes of nonhazardous wastewater causes the entire mixture to be listed. The EPA provided an exemption from the mixture rule for situations where listed hazardous wastes are routed to large-volume wastewater treatment systems.

Other exemptions apply to mixtures of listed and characteristic wastes with mining and mineral processing that are exempt from the definition of hazardous waste under the Bevill exemption.

Wastes that are hazardous via the mixture rule can also exit Subtitle C regulation through the delisting process.

DETERMINING BOTH LISTINGS AND CHARACTERISTICS
A facility must determine both listings and characteristics. Even if a waste is a listed hazardous waste, the facility must then still determine if the waste exhibits a characteristic because waste generators are required to fully characterize their listings.

While some wastes may not meet any listing description because they do not originate from specific industrial or process sources, the waste may still pose threats to human health and the environment. As a result, a facility is also required to determine whether such a waste possesses a hazardous property (i.e., exhibits a hazardous waste characteristic).

Derived-From Rule
Hazardous waste treatment, storage, and disposal processes often generate residues that may contain high concentrations of hazardous constituents. In order to adequately protect human health and the environment from the threats posed by these potentially harmful wastes, the **derived-from rule** governs the regulatory status of such listed waste residues.

Figure III-9:The Derived-From Rule
Listed Hazardous Waste

- ✓ Any residue from the treatment, storage, or disposal or a listed waste...
- ✓ ...is still a hazardous waste...
- ✓ ...unless the residue is derived-from a hazardous waste that is listed solely for exhibiting the characteristic of ignitability, corrosivity, and/or reactivity and does not exhibit a characteristic of hazardous waste

or

...unless the waste is recycled to make new products or processed to recover usable materials with economic value (provided that product is not used in a manner constituting disposal or burned for energy recovery)

Listed Wastes
Residues produced from the treatment of listed hazardous wastes may pose a significant threat to human health and the environment. If not captured by the waste's listing description, such waste could escape regulation. To close this potential regulatory gap, the EPA created the derived-from rule which states that any material derived from a listed hazardous waste is also a listed hazardous waste (see FigureIII-9).

For example, ash created by burning a hazardous waste is considered derived-from that hazardous waste. Thus, such ash bears the same waste code and regulatory status as the original listed waste, regardless of the ash's actual properties.

This principle applies regardless of the actual health threat posed by the waste residue or the residue's chemical composition.

Characteristic Wastes
Treatment residues and materials derived from characteristic wastes are hazardous only if they themselves exhibit a characteristic.

Wastes Listed Solely for Exhibiting the Characteristic of Ignitability, Corrosivity, and/or Reactivity
If a waste derived from the treatment, storage, or disposal of a hazardous waste listed for the characteristics of ignitability, corrosivity, and/or reactivity, no longer exhibits one of those characteristics, it is not a hazardous waste.

For example, if a sludge is generated from the treatment of F003, and that sludge does not exhibit the characteristic of ignitability, corrosivity, or reactivity, the F003 listing will not apply to the sludge.

Exemptions
There are several regulatory exemptions from the derived-from rule. The first exemption applies to products reclaimed from hazardous wastes. Many listed hazardous wastes can be recycled to make new products or processed to recover usable materials with economic value.

Such products derived-from recycled hazardous wastes are no longer solid wastes, provided that they are not used in a manner constituting disposal or burned for energy recovery (see Figure III-9).

The other exemptions from the derived-from rule apply to residues from specific treatment operations. Wastes that are hazardous via the derived-from rule can also exit Subtitle C regulation through the delisting process.

Contained-In Policy
Sometimes listed and characteristic wastes are spilled onto soil or contaminate equipment, buildings, or other structures. The mixture and derived-from rules do not apply to such contaminated soil and materials because these materials are not actually wastes.

Soil is considered **environmental media** (e.g., soil, ground water, sediment), while the equipment, buildings, and structures are considered debris (e.g., a broad category of larger manufactured and naturally occurring objects that are commonly discarded).

Examples of debris include:

- Dismantled construction materials, such as used bricks, wood beams, and chunks of concrete
- Decommissioned industrial equipment, such as pipes, pumps, and dismantled tanks
- Other discarded manufactured objects, such as personal protective equipment (e.g., gloves, coveralls, eyewear)
- Large, naturally occurring objects, such as tree trunks and boulders.

Environmental media and debris are contaminated with hazardous waste in a number of ways. Environmental media become contaminated through accidental spills of hazardous waste or spills of product chemicals which, when spilled, become hazardous wastes.
Debris can also be contaminated through spills. Most debris in the form of industrial equipment and personal protective gear becomes contaminated with waste or product chemicals during normal industrial operations.

In order to address such contaminated media and debris, the EPA created the **contained-in policy** to determine when contaminated media and debris must be managed as RCRA hazardous wastes. Environmental media are not, in and of themselves, waste, but are regulated as hazardous waste when they contain (*are contaminated by*) an RCRA listed hazardous waste or exhibit a characteristic.

In these cases, the media and debris must be managed as if they were hazardous waste.

The EPA considers contaminated media or debris to no longer contain hazardous waste when it no longer exhibits a characteristic of hazardous waste. This applies when the hazardous waste contained within the media or debris is either a characteristic waste or a waste listed solely for a characteristic.

Otherwise, when dealing with listed waste contamination, the EPA or states can determine that media and debris no longer contain hazardous waste by determining that the media or debris no longer poses a sufficient health threat to deserve RCRA regulation.

Once this contained-out determination is made, the media and debris are generally no longer regulated under RCRA Subtitle C.

However, under certain circumstances, the RCRA LDR requirements might continue to apply.

MIXED WASTE
The RCRA specifically exempts certain radioactive mixed materials from the definition of solid waste.

However, some radioactive material may be mixed with hazardous wastes that are regulated under the RCRA. In addition, a facility may generate a hazardous waste that is also radioactive. Because the material in both of these situations contains both radioactive material and RCRA hazardous waste, it is referred to as mixed waste under RCRA.

The RCRA and the AEA regulate these mixed wastes jointly. The AEA regulates the RCRA-exempt radioactive portion and the RCRA regulates the hazardous waste portion. Mixed waste generators include DOE, power plants, labs, hospitals, and universities using radioactive materials. The EPA has provided increased flexibility to generators and facilities that manage low-level mixed waste (**LLMW**) and technologically enhanced naturally occurring and/or accelerator-produced radioactive material (**NARM**) containing hazardous waste.

The Agency is exempting LLMW from some RCRA storage and treatment regulations, and LLMW or eligible NARM from RCRA hazardous waste transportation and disposal regulations. These wastes are exempt from RCRA Subtitle C requirements, including permitting, provided they meet specific conditions. The exempt wastes must then be managed as radioactive waste according to the Nuclear Regulatory Commission (**NRC**) regulations.

SUMMARY

In order to determine if a facility is subject to RCRA Subtitle C, the owner and operator must determine if they have a hazardous waste.

This determination must be made by using the following methodology:

- ✓ **Is the material a solid waste?**
- ✓ **Is the waste excluded?**
- ✓ **Is the waste a listed hazardous waste?**
- ✓ **Is the waste a characteristic waste?**
- ✓ **A waste must first be a solid waste before it can be a hazardous waste.**

A solid waste is a waste that is abandoned, inherently waste-like, a military munition, or recycled. On the other hand, if a material is directly reused without prior reclamation by being either used as an ingredient, used as a product substitute, or returned to the production process, then the material is not regulated as a waste at all.

If such reused materials, however, are used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; accumulated speculatively; or dioxin-containing wastes considered inherently waste like; then they are regulated as solid wastes.

If a recycled material needs reclamation prior to direct use or reuse, its regulatory status is determined by the type of material that it is:

- Spent materials are regulated as solid wastes when reclaimed; used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively.

- Listed sludges are solid wastes when reclaimed; used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively.

- Characteristic sludges are not solid wastes when reclaimed, unless they are used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively.

- Listed by-products are solid wastes when reclaimed; used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively.

- Characteristic by-products are not solid wastes when reclaimed, unless they are used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively.

- CCPs are not solid wastes when reclaimed, unless they are used in a manner constituting disposal; or burned for energy recovery, used to produce a fuel, or contained in fuels.
- Scrap metal is a solid waste when reclaimed; used in a manner constituting disposal; burned for energy recovery, used to produce a fuel, or contained in fuels; or accumulated speculatively.

Regardless of the type of recycling that takes place, it must be legitimate and not sham recycling.

Some kinds of materials are excluded from the Subtitle C hazardous waste regulations. There are five categories of exclusions:

- ✓ Exclusions from the definition of solid waste
- ✓ Exemptions from the definition of hazardous waste
- ✓ Exclusions for waste generated in raw material, product storage, or manufacturing units
- ✓ Exclusions for laboratory samples and waste treatability studies
- ✓ Exclusion for dredged material.

If the waste fits one of these categories, it is not regulated as an RCRA hazardous waste and the hazardous waste requirements do not apply.

If the waste is a solid waste and is not excluded, a facility must determine if it is a listed hazardous waste. The F, K, P, and U lists provide narrative descriptions of wastes from specific industrial processes and sources.

Wastes meeting any of these descriptions are listed hazardous wastes. However, through the delisting process, facilities can demonstrate that their wastes does not pose sufficient hazard to warrant Subtitle C regulation as a listed hazardous waste.

Wastes may also be hazardous if they exhibit a characteristic. Even if a facility's waste is listed, the owner and operator must still determine if it exhibits a characteristic.

The four characteristics are:

- ✓ **Ignitability**
- ✓ **Corrosivity**
- ✓ **Reactivity**
- ✓ **Toxicity.**
- ✓

There are special regulatory conventions or provisions that apply to hazardous waste mixtures; treatment, storage, and disposal residues; and contaminated media and debris.

These provisions are known as the mixture rule, the derived-from rule, and the contained-in policy.

The RCRA and the AEA jointly regulate mixed waste, or waste that is radioactive, and listed or characteristic. The EPA provided a conditional exemption for low-level mixed waste (**LLMW**) storage, treatment, transportation, and disposal of mixed wastes.

RCRA Glossary

The terms below are defined as they pertain to the Resource Conservation and Recovery Act.

Abandoned For purposes of defining a material as a solid waste under RCRA Subtitle C, a material that is disposed of, burned, or incinerated.

Accumulated Speculatively Storage of a material in lieu of expeditious recycling. Materials are usually accumulated speculatively if the waste being stored has no viable market or if a facility cannot demonstrate that at least 75 percent of the material has been recycled in a calendar year.

Acknowledgment of Consent Notice sent by the EPA to an exporter of hazardous waste, indicating that the importing country has agreed to accept such waste.

Action Levels For purposes of Subtitle C corrective action, risk-based concentrations of hazardous constituents in ground water, soil, or sediment that may trigger further investigation into possible contamination at a particular site.

Administrative Action Enforcement action taken by the EPA or a state under its own authority, without involving a judicial court process.

Administrative Procedures Act The Act that establishes rulemaking procedures as well as site-specific licensing procedures, access to agency information, and procedures and standards for judicial review of agency actions. All environmental rulemakings proposed and finalized by EPA include public participation throughout the process.

Aggregation Points Centers that accept used oil only from places owned by the same owner and operator as the aggregation point, or from do-it- yourselfers.

Alternative Concentration Limits For purposes of TSDF ground water monitoring, hazardous constituent limits established by the EPA Regional Administrator that are allowed to be present in ground water.

Annual Aggregate For purposes of UST financial responsibility, the total amount of UST financial responsibility coverage required to cover all leaks that might occur in one year.

Applicable or Relevant and Appropriate Requirements Standards, criteria, or limitations under federal or more stringent state environmental laws, including the RCRA, that may be required during a Superfund remedial action, unless site-specific waivers are obtained.

Authorized State A state that has been delegated the authority by the EPA to implement and enforce its own regulations for hazardous waste management under RCRA. The state program must be at least as stringent as the federal standards.

Automatic Tank Gauging A release detection method for USTs that uses a probe in the tank that is wired to a monitor to provide information on product level and temperature.

Basel Convention The international treaty that establishes standards for global trade of hazardous waste, municipal waste, and municipal incinerator ash. Because the United States is not a party to the convention, U.S. businesses can only export waste to those countries with which the U.S. government has negotiated a separate waste trade agreement.

Bentsen Wastes Geothermal exploration, development, and production waste exempt from RCRA Subtitle C regulation.

Best Demonstrated Available Technology The technology that best minimizes the mobility or toxicity (or both) of the hazardous constituents for a particular waste.

Bevill Wastes Fossil fuel combustion wastes, mining and mineral processing wastes, and cement kiln dust wastes exempt from RCRA Subtitle C regulation.

Biennial Report A report submitted by hazardous waste LQGs and TSDFs to enable the EPA and the states to track the quantities of hazardous waste generated and the movements of those hazardous wastes.

Boiler An enclosed device that uses controlled flame combustion to recover and deliver energy in the form of steam, heated fluid, or heated gases.

Bottom Ash Ash that collects at the bottom of a combustion chamber.

Burners Handlers who burn used oil for energy recovery in boilers, industrial furnaces, or hazardous waste incinerators.

Burning for Energy Recovery Burning hazardous waste for its heating value as a fuel, and using wastes to produce fuels or as ingredients in fuels.

By-Products Materials that are not one of the intended products of a production process and includes most wastes that are not spent materials or sludges.

California List Interim LDR treatment standards that ensured adequate protection of human health and the environment during the time the EPA was promulgating final LDR treatment standards.

Capacity Assurance Plan A written statement which ensures that a state has hazardous waste treatment and disposal capacity. This capacity must be for facilities that are in compliance with RCRA Subtitle C requirements and must be adequate to manage hazardous wastes projected to be generated within the state over 20 years.

Cathode Ray Tubes Vacuum tubes made primarily of glass, which constitute the video display component of televisions and computer monitors. These tubes are generally hazardous for lead.

Cathodic Protection A form of corrosion protection for USTs that uses sacrificial anodes or a direct current source to protect steel by halting the naturally occurring electrochemical process that causes corrosion.

Cement Kiln Type of industrial furnace that receives hazardous waste to burn as fuel to run its cement process. Cement is produced by heating mixtures of limestone and other minerals or additives at high temperatures in a rotary kiln, followed by cooling, grinding, and finish mixing.

Change in Service Using a formerly regulated UST system to store a nonregulated substance.

Characteristic Waste Waste that is considered hazardous under RCRA because it exhibits any of four different properties: ignitability, corrosivity, reactivity, and toxicity.

Civil Action A formal lawsuit, filed in court, against a person who has either failed to comply with a statutory or regulatory requirement or an administrative order, or against a person who has contributed to a release of hazardous waste or hazardous constituents.

Clean Air Act The Act that regulates air emissions from area, stationary, and mobile sources. The CAA limits the emission of pollutants into the atmosphere in order to protect human health and the environment from the effects of airborne pollution.

Clean Closure The process of completely removing all waste that was treated, stored, or disposed in a hazardous waste unit.

Clean Water Act The Act that sets the basic structure for regulating discharges of pollutants to surface waters of the United States. The CWA imposes contaminant limitations or guidelines for all discharges of wastewater into the nation's waterways.

Closure The procedure that a solid or hazardous waste management facility undergoes to cease operations and ensure protection of human health and the environment in the future.

Codification The process by which final regulations are incorporated into the CFR, which is published annually.

Collection Centers Centers that accept used oil from multiple sources, including both businesses and private citizens.

Combustion The controlled burning in an enclosed area as a means of treating or disposing of hazardous waste.

Commercial Chemical Products Unused or off-specification chemicals, spill or container residues, and other unused manufactured products that are not typically considered chemicals. For the purposes of hazardous waste listings, CCPs include only unused, pure chemical products and formulations.

Compliance Monitoring For purposes of RCRA TSDF ground water monitoring, a program that seeks to ensure that the amount of hazardous waste that has leaked into the uppermost aquifer does not exceed acceptable levels.

Composting Processes designed to optimize the natural decomposition or decay of organic matter, such as leaves and food. The end product of composting is a humus-like material that can be added to soils to increase soil fertility, aeration, and nutrient retention.

Comprehensive Environmental Response, Compensation, and Liability Act The Act that authorizes the EPA to clean up uncontrolled or abandoned hazardous waste sites and respond to accidents, spills and other emergency releases of hazardous substances. CERCLA provides the EPA with enforcement authority to ensure that responsible parties pay the cleanup costs of remediating a site contaminated with hazardous substances.

Comprehensive Environmental Response, Compensation, and Liability Information System A computerized database used to track hazardous substance sites.

Comprehensive Performance Testing The initial and periodic evaluation procedure for demonstrating compliance with the national emission standards for hazardous air pollutants and establishes revised operating limits for hazardous waste combustors.

Comprehensive Procurement Guidelines A list, updated every two years, which designates items with recycled content that procuring agencies should aim to purchase. This list currently contains 54 items within 8 product categories.

Concentration Limits For purposes of TSDF ground water monitoring, the maximum levels of hazardous constituents allowed to be present in the ground water.

Conditionally Exempt Small Quantity Generators Facilities that produce less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste, per calendar month. A CESQG may only accumulate less than 1,000 kg of hazardous waste, 1 kg of acutely hazardous waste, or 100 kg of spill residue from acutely hazardous waste at any one time.

Construction Quality Assurance A program required by the EPA to ensure that a landfill, surface impoundment, or waste pile meets all of the technological requirements.

Contained-In Policy An EPA policy that determines the health threats posed by contaminated environmental media and debris, and whether such materials must be managed as RCRA hazardous wastes.

Containers Portable devices, in which a material is stored, transported, treated, or otherwise handled.

Containment Building A completely enclosed structure used to store or treat noncontainerized waste.

Continuous Emission Monitoring Systems A system that directly and continuously measures one or more pollutants exiting a combustion unit.

Continuous Monitoring Systems A device which continuously samples the regulated parameter without interruption, evaluates the detector response at least once every 15 seconds, and computes and records the average value at least every 60 seconds.

Cooperative Agreement An agreement between a state and the EPA which ensures that the state will spend money from the LUST Trust Fund for its intended purpose.

Corporate Guarantee The demonstration that a corporate grandparent, corporate parent, or sibling corporation can meet financial assurance requirements on behalf of a TSDF owner and operator, or the financial responsibility requirements on behalf of a UST owner and operator. Firms with a "***substantial business relationship***" with a UST owner and operator can also make this demonstration.

Corrective Action An EPA program to address the investigation and cleanup of contamination from solid waste facilities, hazardous waste facilities, and USTs.

Corrective Action Management Unit A physical, geographical area designated by the EPA or states for managing remediation wastes during corrective action.

Corrosivity Characteristic The characteristic which identifies wastes that are acidic or alkaline (basic) and can readily corrode or dissolve flesh, metal, or other materials.

Counting Totaling the hazardous wastes at a given facility for a particular month in order to determine hazardous waste generator status.

Covered States States that participated in the EPA's medical waste tracking program from June 22, 1989 to June 22, 1991, which included Connecticut, New Jersey, New York, Rhode Island, and the Commonwealth of Puerto Rico.

Cradle to Grave The time period referring to the initial generation of hazardous waste to its ultimate disposal.

Criminal Action Enforcement action reserved for the most serious violations, which can result in fines or imprisonment.

De minimis Very small amounts of hazardous waste that are discharged to wastewater treatment facilities and thus, are exempt from the mixture rule. De minimis also refers to small concentrations of regulated substances in a UST.

Debris A broad category of large manufactured and naturally occurring objects that are commonly discarded (e.g., construction materials, decommissioned industrial equipment, discarded manufactured objects, tree trunks, boulders).

Delisting A site-specific petition process whereby a handler can demonstrate to the EPA that a particular wastestream generated at its facility that meets a listing description does not pose sufficient hazard to warrant RCRA regulation. Owners and operators can also use the delisting process for wastes that are hazardous under the mixture and derived-from rules that pose minimal hazard to human health and the environment.

Derived-From Rule A rule that regulates residues from the treatment of listed hazardous wastes.

Designated Facility A hazardous waste treatment, storage, or disposal facility which has received an RCRA permit (or interim status), or is a recycling facility regulated under 40 CFR Section 261.2(c)(2) or Subpart F of Section 266, and has been designated on the manifest by the generator.

Destination Facilities Facilities that treat, dispose of, or recycle a particular category of universal waste.

Destruction and Removal Efficiency Standard which verifies that a combustion unit is destroying the organic components found in hazardous waste.

Detection Monitoring For purposes of RCRA TSDF ground water monitoring, the first step of monitoring at land disposal units, where the owner/operator monitors for indication of a leak from the unit, looking for potential changes in the ground water quality from normal (background) levels.

Dilution Prohibition The LDR requirement that prohibits the addition of soil or water to waste in order to reduce the concentrations of hazardous constituents instead of treatment by the appropriate LDR treatment standards.

Direct Discharges Discharges from point sources into surface water pursuant to a CWA NPDES permit.

Disposal The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid or hazardous waste on or in the land or water.

Disposal Prohibition The LDR requirement that prohibits the land disposal of hazardous waste that has not been adequately treated to reduce the threat posed by such waste.

Distillation Bottoms Residues that form at the bottom of a distillation unit.

Do-it-Yourselfers Individuals who generate used oil through the maintenance of their own personal vehicles and equipment and are not considered used oil generators.

Drip Pads Engineering structures consisting of a curbed, free-draining base, constructed of non-earthen materials, and designed to convey wood preservative chemical drippage from treated wood, precipitation, and surface water run-on to an associated collection system at wood preserving plants.

Elementary Neutralization Units Containers, tanks, tank systems, transportation vehicles, or vessels which neutralize wastes that are hazardous only for exhibiting the characteristic of corrosivity.

Emergency Planning and Community Right-to- Know Act The Act designed to help communities prepare to respond in the event of a chemical emergency and to increase the public's knowledge of the presence and threat of hazardous chemicals.

Environmental Justice The fair distribution of environmental risks across socioeconomic and racial groups.

Environmental Media Materials such as soil, surface water, ground water, and sediment.

EPA Identification Number A unique number assigned by the EPA to each hazardous waste generator, transporter, or treatment, storage, and disposal facility.

Episodic Generation The situation in which a generator's status changes from one month to the next, as determined by the amount of waste generated in a particular month. If a generator's status does in fact change, the generator is required to comply with the respective regulatory requirements for that class of generators for the waste generated in that particular month.

Equipment Each valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange or other connector, and any other control devices or systems.

Exception Report A report, submitted by LQGs and SQGs, detailing efforts to locate wastes when a signed copy of the manifest has not been received.

Existing USTs USTs that were in service, or for which installation had commenced on or before December 22, 1988.

Extended Product Responsibility An approach to environmental protection that strives to reduce the environmental impacts of products.

Federal Insecticide, Fungicide, and Rodenticide Act The Act that provides procedures for the registration of pesticide products to control their introduction into the marketplace.

Federal Procurement Program A program that sets minimum recycled content standards for certain designated items and requires procuring agencies to purchase those items composed of the highest percentage of recovered materials practicable.

Final Authorization Authorization by the EPA that indicates that a state's program is equivalent to, or no less stringent than, as well as consistent with, federal hazardous waste regulations.

Financial Assurance Under RCRA Subtitle C, the requirements designed to ensure that TSDF owners and operators will have the financial resources to pay for closure, post-closure, and liability costs. Under RCRA Subtitle D, the requirements designed to ensure that MSWLF owners and operators will have the financial resources to pay for closure, post-closure, and corrective action costs.

Financial Test A test of self-insurance which demonstrates that an owner/operator has sufficient financial strength to satisfy TSDF financial assurance or UST financial responsibility requirements.

Float The lighter materials present in petroleum refinery wastewater. As components of oily waste, float rises to the surface in the first step of wastewater treatment.

Fly Ash Particles of ash, such as particulate matter which may also have metals attached them, that are carried up the stack of a combustion unit with gases during combustion.

Formal Action An enforcement action, frequently in the form of an administrative order, that is taken when a serious violation is detected, or when the owner/operator does not respond to an informal administrative action.

Freedom of Information Act The Act that grants private parties the right to obtain information in the government's possession. FOIA requires each federal agency to establish procedures for handling requests regarding government statutes, regulations, standards, permit conditions, requirements, orders, and policies.

Full Cost Accounting An accounting approach that helps local governments identify all direct and indirect costs, as well as the past and future costs, of a municipal solid waste management program.

Generator Any person whose act first creates or produces a hazardous waste, used oil, or medical waste, or first brings such materials into RCRA regulation.

Green Buildings Buildings that are designed, constructed, operated, and ultimately removed in such a way as to minimize their environmental impact.

Ground Water Monitoring Sampling and analysis of ground water for the purpose of detecting the release of contamination from a solid or hazardous waste land-based unit. Ground water monitoring is also a method of UST release detection which senses the presence of liquid product floating in ground water.

Hammer Provisions Requirements written directly into the RCRA by Congress, as in the case of the Hazardous and Solid Waste Amendments of 1984, that would automatically become regulations if the EPA failed to issue its own regulations by certain dates.

Hazard Communication Standard The OSHA standard that provides workers with access to information about the hazards and identities of the chemicals they are exposed to while working, as well as the measures they can take to protect themselves.

Hazard Ranking System A model devised under CERCLA that determines the relative risk to public health and the environment posed by hazardous substances in ground water, surface water, air, and soil. Only those sites with a score of 28.5 (on a scale of 0 to 100) are eligible for placement on the NPL.

Hazardous Constituents For purposes of RCRA TSDF ground water monitoring, those constituents that have been detected in the uppermost aquifer and are reasonably expected to be in or derived from the waste contained in the unit.

Hazardous Substance A comprehensive designation under CERCLA for RCRA hazardous wastes as well as other toxic pollutants regulated by CAA, CWA, and TSCA. EPA has the authority under CERCLA to designate any additional element, compound, mixture, or solution as a hazardous substance. The definition of hazardous substance specifically excludes petroleum and natural gas.

Hazardous Waste A waste with properties that make it dangerous, or capable of having a harmful effect on human health and the environment. Under the RCRA program, hazardous wastes are specifically defined as wastes that meet a particular listing description or that exhibit a characteristic of hazardous waste.

Hazardous Waste Operations and Emergency Response Worker Protection Standard The OSHA standard that protects the health and safety of workers engaged in operations at hazardous waste sites, hazardous waste treatment facilities, and emergency response locations.

Ignitability characteristic The characteristic which identifies wastes that can readily catch fire and sustain combustion.

Incinerator An enclosed device that uses controlled flame combustion and does not meet the criteria for classification as a boiler, industrial furnace, sludge dryer (a unit that dehydrates hazardous sludge),or carbon regeneration unit (a unit that regenerates spent activated carbon).Incinerators also include infrared incinerators (units that use electric heat followed by a controlled flame afterburner)and plasma arc incinerators (units that use electrical discharge followed by a controlled flame afterburner).

Incorporation by Reference This occurs when the regulatory language in a state's regulation actually cite, or refer to, the federal regulations.

Indirect Discharges Wastewater that is first sent to a POTW, and then after treatment by the POTW, discharged pursuant to a NPDES permit.

Industrial Ecology The study of material and energy flows and their transformations into products, byproducts, and wastes throughout industrial and ecological systems.

Industrial Furnace An enclosed unit that is an integral part of a manufacturing process and uses thermal treatment to recover materials or energy from hazardous waste.

Informal Administrative Action Any communication from the EPA or a state agency that notifies the handler of a problem.

Inherently Waste-Like For purposes of defining a material as a solid waste under RCRA Subtitle C, a material, such as dioxin-containing wastes, that is always considered a solid waste because of its intrinsic threat to human health and the environment.

Insurance A policy to cover the TSDF financial assurance or UST financial responsibility requirements.

Interim Authorization A temporary mechanism that is intended to promote continued state participation in hazardous waste management while encouraging states to develop programs that are fully equivalent to the federal program and will qualify for final authorization.

Interim Measures Under RCRA Subtitle C corrective action, short-term actions to control ongoing risks while site characterization is underway or before a final remedy is selected.

Interim Status Facilities TSDFs that were already in operation when the RCRA standards were established and that are operating under less stringent standards until they receive a permit.

Interstitial Monitoring UST release detection method that involves the use of secondary containment, such as a barrier, outer wall, vault, or liner around the UST or piping to prevent leaking product from escaping into the environment. If product escapes from the inner tank or piping, it will then be directed towards an interstitial monitor located between the walls.

Inventory Control A UST release detection method that involves taking measurements of tank contents, recording the amount of product pumped each operating day, and reconciling this data at least once a month to determine if a tank is leaking.

Jobs through Recycling A program the EPA launched in 1994 to support recycling markets. The goal of the program is to foster markets for recycled goods by promoting and assisting the development of businesses using recovered materials, creating new recycling jobs, and spurring innovative technologies.

Lab Packs Drums filled with many small containers packed in nonbiodegradable absorbent materials.

Land Disposal For purposes of RCRA Subtitle C regulation, placement in or on the land, except in a corrective action unit of hazardous waste, and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault, or bunker intended for disposal purposes.

Land Treatment Units Also known as land farms, land treatment units involve the application of hazardous waste on the soil surface, or the incorporation of waste into the upper layers of the soil in order to degrade, transform, or immobilize hazardous constituents present in hazardous waste.

Landfill For purposes of RCRA Subtitle C, a disposal unit where nonliquid hazardous waste is placed in or on the land.

Large Quantity Generators Facilities that generate more than 1,000 kg of hazardous waste per calendar month, or more than 1 kg of acutely hazardous waste per calendar month.

Large Quantity Handlers of Universal Waste
Handlers that accumulate a total of 5000 kg or more of universal waste at any one time.

Leachate Any liquid, including any suspended components in the liquid, that has percolated through or drained from waste.

Leaking Underground Storage Tank Trust Fund A fund created by SARA that provides money for overseeing corrective action taken by a responsible party, and provides money for cleanups at UST sites where the owner and operator is unknown, unwilling, or unable to respond.

Letter of Credit A credit document issued to an owner and operator to cover TSDF financial assurance or UST financial responsibility requirements.

Liabilities Damages that may result from an unexpected release of contaminants into the environment.

Lightweight Aggregate Kiln Type of industrial furnace that produces lightweight aggregate and burns liquid hazardous waste as fuel to run its process. Lightweight aggregate refers to a wide variety of raw materials (such as clay, shale, or slate) which, after thermal processing, can be combined with cement to form concrete products. Lightweight aggregate is produced either for structural or thermal insulation purposes.

Listed Wastes Wastes that are considered hazardous under the RCRA because they meet specific listing descriptions.

Manifest Paperwork that accompanies hazardous waste from the point of generation to the point of ultimate treatment, storage, or disposal. Each party involved in the waste's management retains a copy of the RCRA manifest, which contains specific information about the waste.

Manual Tank Gauging A method of UST leak detection that requires keeping the tank undisturbed for at least 36 hours per week, during which time the contents of the tank are measured to determine if the tank is leaking.

Marine Protection, Research, and Sanctuaries Act This Act requires a permit for any material that is transported from a U.S. port or by a U.S. vessel for disposition at sea.

Marketers Used oil handlers who either 1) direct shipments of used oil to be burned as fuel in regulated devices, or 2) claim that used oil to be burned for energy recovery is on-specification.

Maximum Achievable Control Technology Process Technology-based concentration limits developed under CAA to limit emissions of individual constituents from hazardous waste combustion units.

Maximum Contaminant Levels For purposes of RCRA ground water monitoring, contaminant-specific levels borrowed from SDWA that are the maximum levels of hazardous waste or hazardous constituents allowed to be present in the groundwater.

Medical Waste Culture and stocks of infectious agents, human pathological wastes, human blood and blood products, used sharps, certain animal wastes, certain isolation wastes, and unused sharps.

Memorandum of Agreement An agreement between a state's director and its EPA Regional Administrator outlining the nature of the responsibilities to enforce a regulatory program and defining the level of coordination and oversight between the EPA and the state agency.

Military Munitions For purposes of defining a material as a solid waste under RCRA Subtitle C, ammunition products and components produced for or used by the military for national defense and security.

Miscellaneous Units Hazardous waste treatment, storage, or disposal units regulated under RCRA that do not meet any of the other definitions of regulated units.

Mixed Waste Radioactive waste that is also a hazardous waste under the RCRA. Such wastes are jointly regulated by the RCRA and the Atomic Energy Act.

Mixture Rule A rule that is intended to ensure the regulation of mixtures of listed wastes with nonhazardous solid wastes.

Municipal Solid Waste Durable goods (e.g., appliances, tires, batteries), nondurable goods (e.g., newspapers, books, magazines), containers and packaging, food wastes, yard trimmings, and miscellaneous or anic wastes from residential, commercial, and industrial nonprocess sources.

Municipal Solid Waste Landfill A discrete area of land or excavation that receives municipal solid waste.

National Ambient Air Quality Standards Regulations promulgated by the EPA under the Clean Air Act for six criteria pollutants — sulfur dioxide,, particulate matter, nitrogen dioxide, carbon monoxide, ozone, and lead — in order to protect the public from toxic emissions to the atmosphere.

National Corrective Action Prioritization System A resource management tool by which the EPA sets priorities for the Subtitle C corrective action program.

National Emission Standards for Hazardous Air Pollutants Standards set by the EPA under the Clean Air Act to control emissions from specific industrial sources.

National Oil and Hazardous Substances Pollution Contingency Plan The NCP contains the regulations that implement the CERCLA response process. The NCP also provides information about the roles and responsibilities of the EPA, other federal agencies, states, and private parties regarding releases of hazardous substances.

National Priorities List The EPA's priority hazardous substance sites for cleanup. The EPA only funds remedial actions at hazardous waste sites on the NPL.

New USTs USTs that are installed, or for which installation has commenced, after December 22, 1988. New USTs must be installed in compliance with all of the applicable technical standards.

Nonsudden Accidental Occurrences For purposes of TSDF financial assurance, events that take place over time and involve continuous or repeated exposure to hazardous waste.

Notice of Deficiency A notice requiring that a TSDF permit applicant supply more information for a complete permit application.

Notice of Intent to Deny A notice issued by a permitting agency which tells a TSDF permit applicant that the application does not demonstrate compliance with the RCRA standards.

Notice of Noncompliance An informal letter to a handler written as part of an informal administrative action.

Notice of Violation An informal letter to a handler written as part of an informal administrative action.

Occupational Safety and Health Act The Act that is designed to save lives, prevent injuries, and protect the health of employees in the workplace. OSHA accomplishes these goals through several regulatory requirements including the HCS and HAZWOPER standards.

OECD Council Decision A multilateral agreement by the Organization for Economic Cooperation and Development that establishes procedural and substantive controls for the import and export of recyclables between member nations. Because the United States is a member of the OECD, U.S. businesses can trade recyclables with other member nations.

Off-Specification Used Oil Used oil that is tested and does not meet given parameters for arsenic, cadmium, chromium, flash point, lead, and total halogens.

Omnibus Provision The authority which allows the EPA to add conditions to a TSDF permit that are not specifically addressed by the RCRA regulations.

On-Specification Used Oil Used oil that meets all the given parameters for arsenic, cadmium, chromium, flash point, lead, and total halogens.

Open Dumps Solid waste disposal facilities that fail to comply with the Subtitle D criteria.

Operating Requirements Parameters established by a facility and written into a permit that will ensure a combustion unit meets numerical performance standards.

Operation and Maintenance The operation and maintenance phase of the CERCLA response process. Operation and maintenance may include activities such as ground water pump and treat, and cap maintenance. The EPA conducts review of operation and maintenance activities to ensure that the remedy selected is still protective of human health and the environment.

Overfiling When a state fails to enforce its hazardous waste program properly, the EPA can overfile, or enforce a provision for which a particular state has authorization.

Particulate Matter Small dust-like particles emitted from hazardous waste combustion units.

Payment Bond For purposes of TSDF financial assurance, a type of surety bond that will fund a standby trust fund in the amount equal to the value of the bond.

Per Occurrence For purposes of UST financial responsibility, the amount of money that must be available to pay for the costs from one leak.

Performance Bond For purposes of TSDF financial assurance, a type of surety bond that guarantees that an owner and operator will comply with their closure, post-closure, and liability requirements.

Performance Standards The numerical pollutant emission limits for hazardous waste combustion units developed by the EPA.

Permanent Closure Closure of a UST that involves a number of steps designed to ensure that the tank will pose no threat to human health or the environment after it is closed.

Permit-as-a-Shield The provision which ensures that TSDF permittees will not be enforced against for violating new requirements that were not established in the original permit.

Permit-by-Rule A special form of an RCRA permit that is sometimes granted to facilities with permits for activities under other environmental laws.

Permitted Facilities Facilities that have obtained a TSDF permit from the EPA or the state agency to engage in the treatment, storage, or disposal of hazardous waste.

Point of Compliance For purposes of RCRA TSDF ground water monitoring, the vertical point where a TSDF owner and operator must monitor the uppermost aquifer to determine if the leak exceeds the ground water protection standard.

Point Source Discharges Discharges of treated wastewater directly into a lake, river, stream, or other water body. Point source discharges are regulated under the CWA.

Pollutants or Contaminants Any element, substance, compound, or mixture that, after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, will or may reasonably be anticipated to cause illness, death, or deformation in any organism. The definition of pollutant or contaminant specifically excludes petroleum and natural gas.

Post-Closure Period after closure during which owners and operators of solid or hazardous waste disposal units conduct monitoring and maintenance activities in order to preserve the integrity of the disposal system.

Potentially Responsible Party The person or persons who may be held liable for hazardous substance contamination under CERCLA. PRPs may include the owners and operators, generators, transporters, and disposers of the hazardous substances.

Precious Metals Reclamation The recycling and recovery of precious metals (i.e., gold, silver, platinum, palladium, iridium, osmium rhodium, and ruthenium) from hazardous waste.

Preliminary Assessment A review of all readily available site information such as maps, deeds, and other records to determine if further CERCLA response action is necessary. During the PA, the EPA tries to determine what type of substances may have been released and the potential impacts to human health and the environment.

Principal Organic Hazardous Constituents Selected or anic constituents, which are high in concentration and difficult to burn, that are monitored to ensure a hazardous waste combustion unit's destruction and removal efficiency.

Process Vent Any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank associated with hazardous waste distillation, fractionation, thin-film evaporation solvent extraction, or air or steam stripping operations.

Processors and Rerefiners Facilities that process used oil so that it can be burned for energy recovery or reused.

Procuring Agency Agencies that purchase $10,000 worth or more of an item designated under the federal procurement program during the course of a fiscal year. Procuring agencies include: federal government departments or agencies; state government agencies that use appropriated federal funds for procurement of a designated item; local government agencies that use appropriated federal funds for procurement of a designated item, and government contractors that work on a project funded by appropriated federal funds with respect to work performed under the contract.

Publicly Owned Treatment Works A municipal wastewater treatment plant that receives domestic sewage from households, office buildings, factories, and other places where people live and work. Treatment at a POTW is regulated by the CWA.

RCRAInfo A database that tracks RCRA Subtitle C facility-specific data (i.e., events and activities related to hazardous waste generators, transporters, and TSDFs), and hazardous waste activity reports, known as biennial reports, that are submitted by LQGs and TSDFs.

Reactivity Characteristic The characteristic which identifies wastes that readily explode or undergo violent reactions.

Rebuttable Presumption For purposes of the RCRA, an objective test that focuses on the halogen level in used oil to determine whether the used oil has been mixed with a listed hazardous waste.

Reclaimed For purposes of defining a material as a solid waste under RCRA Subtitle C, a material is reclaimed if it is processed to recover a usable product, or regenerated by processing it in a way that restores it to usable condition.

Record of Decision A remedial action plan document that describes the remedy selected for a Superfund site.

Recovered Materials Advisory Notice A notice that provides suggested recycled content levels and other purchasing information for each item designated in the CPG. Procuring agencies can use these levels as guidelines, but are encouraged to exceed the EPA's recommendations.

Recovered Materials Content Levels The minimum amount of recovered material that designated items under the federal procurement program should contain.

Recycled For purposes of defining a material as a solid waste under RCRA Subtitle C, a material is recycled if it is used or reused, or reclaimed.

Recycling The separation and collection of wastes, their subsequent transformation or remanufacture into usable or marketable products or materials, and the purchase of products made from recyclable materials.

Recycling Presumption The assumption that all used oil that is generated will be recycled.

Regulated Community The group of organizations, people, industries, businesses, and agencies that, because they perform certain activities, fall under the purview of the RCRA.

Regulated Substance For purposes of UST regulation, any hazardous substance defined under CERCLA §101(14) and petroleum.

Regulations Rules issued by an agency, such as the EPA, that translate the general mandate of a statute into a set of requirements that the regulated community and the agency must work within.

Remedial Action Longer-term CERCLA response actions that ultimately represent the final remedy for a site and generally are more expensive and of a longer duration than removals.

Remedial Action Plans Special form of RCRA permit that a facility may obtain to treat, store, or dispose of hazardous remediation waste at a remediation waste management site.

Remedial Design/Remedial Action Remedial design is a phase in the CERCLA response process in which technical drawings are developed for the chosen remedy, costs for implementing the remedy are estimated, and roles and responsibilities of the EPA, states and contractors are determined. During there medial action phase, the remedy is implemented generally by a contractor, with oversight and inspection conducted by the EPA or the state (or both).

Remedial Investigation/Feasibility Study A remedial investigation is a phase in the CERCLA response process that entails an in-depth examination of the nature and extent of contamination at a site and the associated risks to human health and the environment. The feasibility study entails an analysis of remedial action alternatives comparing the advantages and disadvantages of each.

Remediation Waste All solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris that are managed for implementing cleanup.

Removal Action Short-term cleanup action taken under CERCLA that usually addresses problems only at the surface of a site. A removal is conducted in response to an emergency, and generally is limited to 12 months duration or $2 million in expenditures.

Risk Retention Groups For purposes of UST financial responsibility, entities formed by businesses or individuals with similar risks to provide insurance coverage for those risks.

Risk-Based Decision-Making A process that uses risk and exposure assessment concepts to help UST implementing agencies establish enforcement priorities.

Rulemakings Rules issued by an agency, such as the EPA, that translate the general mandate of a statute into a set of requirements that the regulated community and the agency must work within.

Safe Drinking Water Act The Act designed to protect the nation's drinking water supply by establishing national drinking water standards (MCLs or specific treatment techniques), and by regulating UIC wells.

Scrap Metal Worn or extra bits and pieces of metal parts, such as scrap piping and wire, or worn metal items, such as scrap automobiles and radiators.

Secondary Materials The five categories of solid wastes regulated under Subtitle C, which include: spent materials, by-products, sludges, commercial chemical products, and scrap metal.

Sham Recycling Illegitimate activities executed under the guise of recycling in order to be exempt from or subject to lesser regulation.

Site Inspection An in-depth assessment of on-site conditions, conducted as part of the CERCLA response process, to rank the site's hazard potential by determining the site's hazard ranking system score. Activities to assess the site may include sampling, field reconnaissance, and examination of site records (e.g., topographical maps, logs).

Sludges Any solid, semisolid, or liquid wastes generated from a wastewater treatment plant, water supply treatment plant, or air pollution control device.

Small Quantity Generators Facilities that generate between 100 kg and 1,000 kg of hazardous waste per calendar month.

Small Quantity Handlers of Universal Waste Handlers that do not accumulate 5000 kg of all universal waste categories combined at their location at any one time.

Sole Active Ingredient For purposes of determining if a waste is P or U listed, the only chemical ingredient serving the function of a commercial product formulation.

Solid Waste Any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from industrial, commercial, mining, and agricultural operations and from community activities.

For the purposes of hazardous waste regulation, a solid waste is a material that is discarded by being either abandoned, inherently waste-like, a certain waste military munition, or recycled.

Solid Waste Management Units For purposes of Subtitle C corrective action, discernible units where solid or hazardous wastes have been placed at any time, or any area where solid wastes have been routinely and systematically released.

Source Reduction Maximizing or reducing the use of natural resources at the beginning of an industrial process, thereby eliminating the amount of waste produced by the process. Source reduction is EPA's preferred method of waste management.

Spent Materials Materials that have been used and can no longer serve the purpose for which they were produced without processing.

Spill Prevention Control and Countermeasures Regulations establishing spill prevention procedures and equipment requirements for nontransportation-related facilities with certain aboveground or underground storage capacities that could reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines.

Staging Pile An accumulation of solid, non-flowing remediation waste that is not a containment building and that is used only during remedial operations for temporary storage at a facility.

State Assurance Funds For purposes of UST financial responsibility, state funds that are used to help pay for cleanup and third-party liability costs resulting from leaking USTs.

State Authorization Tracking System A tool used by the EPA to chart those states that have been authorized to implement the RCRA hazardous waste program.

Statistical Inventory Reconciliation A UST release detection method that involves using sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data in order to determine if a tank is leaking.

Storage Holding hazardous waste for a temporary period, after which the hazardous waste is treated, disposed of, or stored elsewhere.

Storage Prohibition LDR provision that prevents the indefinite storage of untreated hazardous waste for reasons other than the accumulation of quantities necessary for effective treatment or disposal.

Sudden Accidental Occurrences For purposes of TSDF financial assurance, events that are not continuous or repeated.

Superfund The common name for CERCLA. Superfund refers to the entire CERCLA program as well as the trust fund established to fund cleanup of contaminated sites where potentially responsible parties cannot be identified, or are unwilling or unable to pay.

Superfund Amendments and Reauthorization Act SARA, enacted in 1986, reauthorized and amended CERCLA to include additional enforcement authorities, technical requirements, community involvement requirements, and various clarifications. SARA Title III authorized EPCRA.

Supplemental Environmental Projects Environmentally beneficial projects which a defendant or respondent agrees to undertake in the settlement of a civil or administrative enforcement action, but which the defendant is not otherwise legally required to perform.
Surety Bond A guarantee which certifies that a surety company will cover TSDF financial assurance or UST financial responsibility requirements on behalf of the owner and operator.

Surface Impoundment A natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials that is used to treat, store, or dispose of hazardous waste.

Tank Tightness Testing A variety of UST release detection methods used to determine if a tank is leaking; most of these methods involve monitoring changes in product level or volume in a tank over a period of several hours.

Tanks Stationary devices used to store or treat hazardous waste.

Technical Grade For purposes of determining if a waste is P or U listed, a commercial chemical product that is not 100 percent pure, but is of a grade of purity that is either marketed or recognized in general usage by the chemical industry.

Temporary Closure A method by which an UST owner and operator can close a tank temporarily and bring it back into service at a later date. The owner and operator must continue to operate and maintain the corrosion protection system and the leak detection system if any product remains in the tank.

Temporary Units Containers or tanks that are designed to manage remediation wastes during corrective action at permitted or interim status facilities.

Thermal Treatment The treatment of hazardous waste in a device that uses elevated temperatures as the primary means to change the chemical, physical, or biological character or composition of the waste.

Totally Enclosed Treatment Units Units that are designed and constructed to practically eliminate the potential for hazardous wastes to escape into the environment during treatment.

Toxic Substances Control Act The Act that controls the manufacture and sale of certain chemical substances.

Toxicity Characteristic The characteristic which identifies wastes that are likely to leach dangerous concentrations of toxic chemicals into ground water.

Toxicity Characteristic Leaching Procedure A lab procedure designed to predict whether a particular waste is likely to leach chemicals into ground water at dangerous levels.

Transfer Facilities Any transportation-related facility such as loading docks, parking areas, storage areas, or other similar areas where shipments of hazardous waste, used oil, or universal waste are held temporarily during the normal course of transportation.

Transporter Any person engaged in the off-site transportation of hazardous waste, used oil, universal waste, or medical waste.

Treatment Any method, technique, or process designed to physically, chemically, or biologically change the nature of a hazardous waste.

Treatment Standards LDR criteria that hazardous waste must meet before it is disposed.
Treatment, Storage, and Disposal Facilities Facilities engaged in the treatment, storage, or disposal of hazardous waste. These facilities are the last link in the cradle-to-grave hazardous waste management system.

Trial Burn Burn conducted to test the performance of a hazardous waste combustion unit over a range of conditions.

Trust Fund A financial mechanism by which a facility can set aside money in order to cover the TSDF financial assurance or UST financial responsibility requirements.

Underground Injection Control Well Units into which hazardous waste is permanently disposed of by injection 1/4 mile below an aquifer with an underground source of drinking water (as defined under SDWA).

Underground Storage Tanks A tank and any underground piping connected to the tank that is used to contain an accumulation of regulated substances and that has at least 10 percent of its combined volume underground.

Underlying Hazardous Constituents Constituents that must be treated in order to meet contaminant-specific levels for purposes of the LDR program.

Unit Pricing An economic incentive program used to achieve source reduction and recycling, also called variable rate refuse collection, where customers who dispose of more waste pay more for the collection and disposal services.

Universal Treatment Standards Contaminant-specific hazardous waste LDR treatment levels.

Universal Wastes Commonly recycled wastes with special management provisions intended to facilitate recycling. There are four categories of universal wastes: hazardous waste batteries, hazardous waste pesticides that have been recalled or collected in waste pesticide collection programs, hazardous waste lamps, and hazardous waste thermostats.

Upgrading Retrofitting existing USTs to come into compliance with the UST regulations. The upgrading period expires on December 22,1998.

Use Constituting Disposal The direct placement of wastes or waste-derived products (e.g., asphalt with petroleum refining wastes as an ingredient) on the land.

Used Oil Any oil that has been refined from crude or synthetic oil that has been used and, as a result of such use, is contaminated by physical or chemical impurities.

USTfield Abandoned or underutilized industrial and commercial properties where redevelopment is complicated by real or perceived environmental petroleum contamination from federally-regulated USTs.

Vapor Monitoring A UST release detection method in which the equipment measures product fumes in the soil around the UST to check for leaks.

Violation The act or an instance of breaking or disregarding the law.

Waste Analysis Plan A plan that outlines the procedures necessary to ensure proper treatment, storage, or disposal of hazardous waste.

Waste Minimization The reduction, to the extent feasible, in the amount of hazardous waste generated prior to any treatment, storage, or disposal of the waste. Because waste minimization efforts eliminate waste before it is generated, disposal costs may be reduced, and the impact on the environment may be lessened.

Waste Pile An open pile used for treating or storing nonliquid hazardous waste.

Wastewater Treatment Units Tanks or tank systems that treat hazardous wastewaters and discharge them pursuant to CWA.

WasteWi$e A program designed to assist companies, states, local governments, Native American tribes, and other institutions in developing cost-effective practices to reduce solid waste.

Zero Discharges Wastewater that is not directly or indirectly discharged to a navigable water (e.g., wastewater that is land disposed through spray irrigation) under the CWA. Zero discharge facilities are subject to federal or state regulatory limitations that are as strict as those that apply to direct and indirect dischargers under the CWA.

Land Disposal Restrictions LDR Glossary

Area of Contamination (AOC) Policy: The EPA interprets the RCRA to allow certain discrete areas of generally dispersed contamination to be considered RCRA units. Therefore consolidation of material within an AOC and treatment of material, in situ, within an AOC does ***NOT CREATE A POINT OF HAZARDOUS WASTE GENERATION FOR PURPOSES OF RCRA.***

Best Demonstrated Available Technology (BDAT): The treatment technology that best minimizes the mobility or toxicity (or both) of the hazardous constituents for a particular waste.

Characteristic Waste: Waste that is considered hazardous under the RCRA because it exhibits any four different properties: ignitability, corrosivity, reactivity, and toxicity.

Contained-in Determination for Soil: Granted by the EPA or an authorized state that certifies that soil is no longer considered a hazardous waste. You can apply for a contained-in determination if soil should not be managed as a hazardous waste because:
(1) the soil does not exhibit a characteristic of hazardous waste when generated, or
(2) the soil contaminated with a listed hazardous waste has concentrations of hazardous constituents that are below health-based levels.

Contained-in Policy: The "***contained-in***" policy dates back to a 1986 memorandum which states that although groundwater is not a solid waste, it can be considered a hazardous waste if it "***contains***" a hazardous waste. This policy was then applied to soil and debris.

Debris: Any solid material exceeding a 60 mm particle size that is intended for disposal and that is a manufactured object, or plant or animal matter, or natural geologic material.

Decharacterize: Treat a characteristic waste so that it no longer exhibits a characteristic property. For characteristic wastes treated in Clean Water Act and Safe Drinking water Act systems, decharacterize means dilution.

Determination of Equivalent Treatment (DET): A type of variance from the treatment standards in 40 CFR 268.40; applicable when a technology is specified as the treatment standard. Allows an alternative technology to be used in lieu of the specified technology, if the petitioner can demonstrate that the alternative technology can achieve a measure of performance equivalent to that of the specified technology.

Generator: Any person whose act first creates or produces hazardous waste.

Hazardous and Solid Waste Amendments (HSWA): Amendments to the RCRA, enacted in 1984.

Listed Waste: Wastes that are considered hazardous under the RCRA because they meet specific listing descriptions.

Mixed Waste: Radioactive waste that is also a hazardous waste under the RCRA. Such wastes are jointly regulated by the RCRA and the Atomic Energy Act.

Non-Analyzable Constituents: Constituents that lack appropriate test methods or chemical standards and therefore cannot be properly measured to determine compliance with LDR concentration-based standards in 268.40 and 268.48.
Nonwastewater (NWW): Wastes that do not meet the criteria for wastewaters defined below.

Point of generation (POG) of a Hazardous Waste: The point at which a waste is first determined to be hazardous. For listed wastes, this is the point at which the waste first meets the listing description, and for characteristic wastes, it is the point the waste first exhibits the characteristic.

Prohibited Wastes: Wastes that have to meet their treatment standards before land disposal.

Restricted Wastes: Wastes that have LDR treatment standards, but can be land disposed without treatment because of an exemption (e.g., a capacity variance).

Soil: Unconsolidated earth material composing the superficial geologic strata (material overlying bedrock) consisting of clay, silt, sand or gravel size particles as classified by the U.S. Soil Conservation Service, or a mixture of such materials with liquids, sludges or solids which is inseparable by simple mechanical removal processes and is made up primarily of soil by volume based on visual inspection.

Subtitle C Landfill: A landfill that accepts hazardous waste (including treated hazardous waste).

Subtitle D Landfill: A landfill that accepts nonhazardous waste.

Total Waste Analysis: Analytic test method used to measure compliance with most of the organic treatment standards. Carbon disulfide, cyclohexanone, and methanol treatment standards are measured using toxicity characteristic leaching procedure.

Toxicity Characteristic Leaching Procedure (TCLP): Analytic test method used to measure compliance with the metal treatment standards.

Transfer Facilities: Any transportation-related facility such as loading docks, parking areas, storage areas, or other similar areas where shipments of hazardous waste are temporarily held during the normal course of transportation.

Transporter: Any person engaged in the off-site transportation of hazardous waste by air, rail, highway, or water.

Treatability Group: A grouping of hazardous wastes that can be treated to similar concentrations using identical technologies.

Treatment, Storage, Disposal Facilities: Facilities engaged in the treatment, storage, or disposal of hazardous waste.

Underlying Hazardous Constituent (UHC): Any constituent listed in 40 CFR 268.48, "***Table UTS - Universal Treatment Standards***", except fluoride, selenium, sulfide, vanadium, and zinc, which can reasonably be expected to be present at the point of generation of the hazardous waste, at a concentration above the constituent-specific universal treatment standard.

Universal Treatment Standards (UTS): These are the constituent-specific treatment standards found in §268.48.

Use Constituting Disposal: The direct placement of recycled materials, that is wastes or waste derived-products, on the land. Note: remediation activities involving replacement of treated soils onto the land is not a type of use constituting disposal, in part, because it is a supervised remediation instead of an unsupervised recycling activity.

Waste Analysis Plan (WAP): A plan that outlines the procedures necessary to ensure proper treatment, storage, or disposal of hazardous waste.

Wastewater (WW): Wastes that contain less than 1% by weight total organic carbon (**TOC**) and less than 1% by weight total suspended solids (**TSS**).

Pesticide Fumigation and proper disposal of spent pesticide containers.

Environmental Contacts EPA Services Information

Center for Environmental Research and Information (CERI),
Office of Research and Development (ORD).....(513)569-7562
www.epa.gov/ORD/publications

Clean Air Technology Center .....(919)541-0800
www.epa.gov/ttn/catc

Environmental Appeals Board (EAB).....(201)501-7060
www.epa.gov/eab

Environmental Justice Hotline .....(800)962-6215
www.epa.gov/compliance/environmentaljustice/index.html

Environmental Recycling Hotline/Earth 's 911.....(800)253-2687
www.earth911.org

Human Resources.....(202)564-4606
www.epa.gov/epahrist

Indoor Air Quality Clearinghouse .....(800)438-4318
www.epa.gov/iaq

Information Resource Center (IRC).....(202)260-5922
www.epa.gov/natlibra/hqirc

Methods Information Communication Exchange
(MICE or Test Methods Hotline).....(703)676-4690
www.epa.gov/epaoswer/hazwaste/test/mice.htm

National Lead Information Center .....(800)424-5323
www.epa.gov/lead/nlic.htm

National Radon Hotline .....(800)767-7236
www.epa.gov/iaq/radon/

National Service Center for Environmental Publications.....(800)490-9198
www.epa.gov/ncepihom/G-2

National Pesticides Information Center;
Federal Insecticide, Fungicide, and Rodenticide Act .....(800)858-7378
npic.orst.edu/

Office of Atmospheric Programs .....(202)564-9140
www.epa.gov/ozone

Office of Congressional &Intergovernmental Relations .....(202)564-5200
www.epa.gov/ocir

Pay-As-You-Throw Helpline .....(888)372-7298
www.epa.gov/payt

RCRA, Superfund & EPCRA Call Center .....(800)424-9346
www.epa.gov/epaoswer/hotline

Safe Drinking Water Hotline .....(800)426-4791
www.epa.gov/safewater

Toxic Substances Control Act Hotline .....(202)554-1404

WasteWise .....(800)372-9473
www.epa.gov/wastewise

Wetlands Protection Hotline .....(800)832-7828
www.epa.gov/owow/wetlands/wetline.html

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EPA DOCKETS

Office of Air and Radiation .....(202)566-1742

Office of Enforcement and Compliance Assurance .....(202)566-1514

Office of Solid Waste and Emergency Response
RCRA/UST .....(202)566-0270

Superfund/Oil .....(202)566-0276

Office of Environmental Information (Toxics Release Inventory).....(202)566-1752

Office of Pollution, Prevention, and Toxics .....(202)566-0280

Office of Water .....(202)566-2426

FEDERAL GOVERNMENT INFORMATION SERVICES

Agency for Toxic Substances and Disease Registry TSDR).....(888)422-8737
www.atsdr.cdc.gov/

Council for Environmental Quality; National Environmental Policy Act .....(202)395-5750
www.whitehouse.gov/ceq

Federal Consumer Information Center .....(800)333-4636
www.pueblo.gsa.gov

Federal Information Center .....(800)688-9889
www.info.gov

Government Printing Office.....(202)512-1800
www.access.gpo.gov

Hazardous Materials Information Center .....(800)467-4922
hazmat.dot.gov

National Technical Information Service .....(800)553-6847
www.ntis.gov

National Institute for Occupational Safety and Health (NIOSH).....(800)356-4647
www.cdc.gov/niosh

National Response Center .....(800)424-8802
www.nrc.uscg.mil

Nuclear Regulatory Commission .....(301)415-8200
www.nrc.gov

Occupational Safety and Health Administration (OSHA)
Compliance Guidance Group .....(301)515-6796

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