



PROTECTING COMMUNITIES • RESTORING LAND • CONSERVING RESOURCES

RCRA'S CRITICAL MISSION & THE PATH FORWARD



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Executive Summary

The Resource Conservation and Recovery Act (RCRA) program implemented by the EPA and its partner states, tribes and local governments, protects our communities and the environment from the threats of solid and hazardous waste, cleans up land and water, conserves resources, and empowers citizens by delivering information and opportunities that enable communities to participate in decision-making processes. Since it was enacted by Congress in 1976, the RCRA program has achieved remarkable improvements in the protection of human health and the environment as a result of more effective management of hazardous and solid wastes. RCRA has also facilitated commerce by providing manufacturers with the framework to safely treat, store and recycle or dispose of byproducts and/or waste. Large and small businesses have responded by investing capital, hiring top talent and building and developing the nation's materials handling and waste management infrastructure to be among the best in the world. In keeping pace with the constantly evolving U.S. economy, the RCRA program has remained a dynamic and nimble program that continues to evolve to tackle new and emerging challenges in waste generation and management.

While the RCRA waste management and cleanup program has established a solid foundation for protecting the nation's health and the environment, its mission continues to evolve to meet waste management and cleanup challenges and leverage opportunities to integrate resource conservation into economic productivity. This document describes the role the RCRA program continues to play in protecting communities, restoring land and conserving resources across the nation.

RCRA's Continuing Challenges. At its core, RCRA is about protecting communities and resource conservation. To achieve this goal, EPA develops regulations, guidance and policies that ensure the safe management and cleanup of solid and hazardous waste, and programs that encourage source reduction and beneficial reuse. This type of work remains critical to our environmental and economic future: there are wastes from new products and chemicals; emerging waste management technologies; unpredictable and unusual waste streams from an increasing number of natural and man-made disasters; and possible long-term legacy issues even when sites are "cleaned-up." Natural resources are increasingly valuable; consumers expect a shift towards the use of less toxic, more environmentally-friendly materials in manufacturing and production operations; and manufacturers/producers need the flexibility to develop efficient, innovative and sustainable materials management solutions. EPA and the states have been integrating more-holistic resource and material management concepts within the permitting, cleanup and recycling aspects of the RCRA program. Addressing the full life cycle of materials, from raw material to final disposition, has become a critical focus of today's RCRA program. For these reasons, the RCRA program remains vital to our society.

RCRA establishes three distinct base programs: the hazardous waste program that establishes a system for controlling hazardous waste from "cradle to grave" including cleanup (Subtitle C); the solid waste program that encourages states to develop infrastructure to manage nonhazardous industrial solid and municipal solid waste (Subtitle D); and the underground storage tank (UST) program.*

*This document does not discuss the UST program.

Vision for the Program. A strong RCRA program is essential to prevent the problems and emergencies that have the potential to affect all of us: acute problems from waste spills and contamination of air and water from improperly managed or abandoned wastes. A strong RCRA program is also critical to realize the enormous economic potential including job creation associated with resource conservation, materials recovery and recycling. By properly and efficiently managing wastes, preventing contamination and conserving resources, a

strong RCRA program protects people and resources, saves taxpayer money otherwise spent on cleanups, facilitates commerce, and provides for a strong economy.

The vision for the RCRA program is to continue to safeguard communities and the environment; mitigate and clean up contamination; champion sustainable, lifecycle waste and material management approaches; and promote economic development (including job creation) and community well-being. RCRA's vision is to fully embrace technological advances that will facilitate commerce and enhance stakeholders' participation in the decisions affecting their communities.

Looking Ahead. To maintain and enhance benefits already achieved, the EPA and the states need to continue developing and implementing safeguards, cleaning up contamination and facilitating long-term stewardship. Through investment in the future, the RCRA program can support the new solid and hazardous waste management challenges that emerge from a dynamic economy; ensure safe, sustainable materials management; and demonstrate that the EPA and its partners are working collaboratively and efficiently to predict, adapt to, and implement programs that are timely, relevant, smart and effective.

RCRA IN A SNAPSHOT

Every day, the RCRA program is...



Protecting Communities and the Environment

The EPA sets comprehensive protective national standards for managing solid and hazardous waste. In partnership with the states, it ensures facilities that manage these wastes have the necessary controls to safeguard communities and the environment, while facilitating commerce by supporting an effective waste management infrastructure.



Cleaning up Land and Water

In partnership with the states, the EPA is cleaning up contaminated sites while keeping industries in business, preserving jobs and saving taxpayers' money. The EPA is controlling and eliminating contamination at sites using short-term stabilization measures and long-term, cleanup remedies to return land and water to productive uses to support economic development and recreational uses.



Conserving Resources

The EPA and the states advance sustainable materials management in the marketplace by working to promote use and reuse across the life cycle of materials thereby reducing the need for waste disposal capacity and minimizing the need to obtain new mineral resources.



Partnering and Innovating

The EPA forms partnerships, uses innovative business models, electronic information systems and timely communication tools to enhance the effectiveness of the RCRA program and empower citizens to actively engage in environmental decisions that affect their daily lives, improve the health of their communities and work towards a sustainable future.

INTRODUCTION: TODAY, TOMORROW AND BEYOND

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to effectively manage hazardous and solid wastes and thereby protect human health and the environment. Since being enacted, EPA and the states have effectively collaborated to adapt the program and address changes in waste generation and management practices. While the RCRA waste management, cleanup and resource conservation programs have established a solid foundation for protecting the nation's health and the environment, their mission is far from complete. The EPA and its partner states, tribes and local governments face new challenges in protecting communities and the environment, cleaning up land and water, conserving resources, and innovating to be more effective. This document describes the RCRA program, its essential mission, challenges, and path forward.

The Need for RCRA

Natural resources are critical to creating and sustaining vibrant communities and ecosystems. Prior to the passage of RCRA in 1976, severe environmental problems that compromised our natural resources resulted from the mismanagement of solid and hazardous waste across the United States. Flammable and toxic chemicals were placed in unlined lagoons and released to groundwater and waterways; hazardous wastes were haphazardly stockpiled in drums used to fill valleys; midnight dumping rendered waterways lifeless; housing developments were placed on uncontrolled dump sites; and trash was burned in the open, contaminating water, land and air. In 1965, more than four million chemicals were being produced in the U.S., and synthetic chemical manufacturing was on the rise. Manufacturing these chemicals created some toxic byproducts that needed to be disposed of, and that disposal went largely unregulated. With the passage of RCRA, waste management in the U.S. was fundamentally changed.

"EPA's ...Office of Resource Conservation and Recovery has led a shift in thinking throughout key industries, sector by sector, about how products are manufactured, what materials they use, and where those materials end up at the end of a product's lifecycle."

40 Years: EPA 40th Anniversary – 10 Ways EPA Has Strengthened America; prepared by the Aspen Institute Energy and Environment Program (11/2010)

The RCRA Base Program is Still Needed

- The presence of uncontrolled hazardous constituents in soil and sediments can cause human health concerns, threaten healthy ecosystems, and inhibit economic opportunities on and adjacent to contaminated areas.
- Waste on the land can also migrate to the air, groundwater and surface water, contaminating drinking water supplies.
- Many wastes handled under the RCRA program come from water and air pollution controls. Without RCRA's sound practices for their disposal or use, the removed contaminants would simply return to air and water.

Adapted from OSWER Fiscal Year 2012 Accomplishments Report, "Protecting Communities and Restoring Land"

Laying the Foundation

In 1976, Congress passed RCRA to address the increasing problems the nation faced from its growing volume of municipal and industrial waste. RCRA set national goals for:

- Protecting human health and the environment from the potential hazards of waste disposal;
- Conserving energy and natural resources;
- Reducing the amount of waste generated;
- Ensuring the wastes are managed in an environmentally-sound manner.

“The Congress hereby declares it to be the national policy of the United States that, wherever feasible, the generation of hazardous waste is to be reduced or eliminated as expeditiously as possible. Waste that is nevertheless generated should be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment.”

RCRA § 1003 (b) National Policy

The RCRA program is a joint federal and state enterprise intended to address the goals of the RCRA statute. The federal program provides basic requirements that states then implement. Currently, 50 states and territories have been granted authority to implement the RCRA’s base, or initial, program. The RCRA base program is subdivided into Subtitle C and D programs. The hazardous waste program, under RCRA Subtitle C, establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal — in effect, from “cradle to grave.” The solid waste program, under RCRA Subtitle D, encourages states to develop comprehensive plans to manage nonhazardous industrial solid waste and municipal solid waste, sets criteria for municipal solid waste landfills and other solid waste disposal facilities, and prohibits the open dumping of solid waste.

Many states are also authorized to implement additional parts of the RCRA program that the EPA has since promulgated, such as Corrective Action. The RCRA Corrective Action program is a result of the 1984 Hazardous and Solid Waste Amendments (HSWA) passed by Congress. These amendments require the cleanup of contamination from improper waste management practices.

RCRA’s Transformational Results

In the nearly 35 years since RCRA was enacted, the base RCRA program has produced transformational results for the nation,¹ including:

- ✓ Developing a comprehensive system and federal/state infrastructure to manage hazardous waste from “cradle-to-grave;”
- ✓ Establishing the framework for states to implement effective municipal solid waste (MSW) and non-hazardous secondary materials management programs;
- ✓ Preventing contamination from adversely impacting our communities and resulting in future Superfund sites by promulgating comprehensive hazardous waste regulations that include requirements to incorporate robust technical standards into waste management systems;
- ✓ Restoring 18 million acres of contaminated lands, nearly equal to the size of South Carolina, and making them ready for productive reuse through the RCRA Corrective Action program;

¹ For a more robust discussion of the RCRA program’s accomplishments, see section *RCRA Close-Up: Existing Programs and Challenges*

- ✓ Placing the costs of cleaning up contamination on facilities that pollute rather than taxpayers;
- ✓ Ensuring the accountability of all parties regulated under RCRA and an effective and level playing-field through enforcement and compliance mechanisms;²
- ✓ Creating partnership and award programs to incentivize companies to modify manufacturing practices to generate less waste and reuse materials safely;
- ✓ Enhancing perceptions of wastes as valuable commodities that can be part of new products, thereby conserving natural resources, saving energy, and reducing greenhouse gas emissions, through its sustainable materials management efforts;
- ✓ Bolstering the nation's recycling infrastructure and increasing the municipal solid waste (MSW) recycling rate from less than 7 percent to almost 35 percent by providing information and systems that help states set recycling goals, raising awareness, and promoting the business case for waste reduction;
- ✓ Incorporating environmental justice into the program;
- ✓ Improving public transparency and, through the use of technology, sharing expertise and information on waste operations and contaminated lands to help communities make sound decisions on waste and cleanup activities; and
- ✓ Helping build capacity in states and tribes by providing grant funding and technical support.

RCRA Program by the Numbers:

- Managing 2.5 billion tons of solid, industrial, and hazardous waste resulting from the manufacturing and use of goods throughout the economy each year
- Overseeing 6,600 facilities, with over 20,000 process units, in the full permitting universe (as reported in the 2018 strategic plan)^a
- Overseeing between approximately 350,000 and 550,000 facilities that generate hazardous waste^b
- Working to address more than 3,700 existing contaminated facilities needing cleanup and reviewing as many as 2,000 possible additional facilities^c
- Providing grant funding to help states implement authorized hazardous waste programs (\$97.3 million in FY 2013)
- Providing incentives and opportunities to reduce or avoid greenhouse gas emissions through materials and land management practices; it has been estimated that approximately 42% of GHG emissions are attributable to materials management activities; approximately 16% are related to land management choices.^d

^a Includes the facilities that need an operating permit, post-closure permit or closure in addition to the ones that have completed their obligations

^b Uncertainty is associated with estimating the number of conditionally exempt small quantity generators based on state data

^c U.S. EPA, RCRA Corrective Action: Case Studies Report, April 2013, EPA 530-R-13-002

^d USEPA, Opportunities to Reduce or Avoid Greenhouse Gas Emissions through Materials and Land Management Practices, September 2009

² This document does not focus on compliance monitoring and enforcement activities. However, those activities are important to ensure that those who do subscribe and invest in operating under the RCRA framework are not out-competed in the market place by those who do not. EPA and the states conduct approximately 18,000 inspections each year at regulated facilities, following up with an appropriate enforcement response to correct and deter violations whenever significant non-compliance is identified. As a result, the RCRA program coordinates closely with EPA and state inspectors and enforcement personnel.

RCRA's Continuing Challenges

At its core, RCRA is about protecting communities and promoting resource conservation, as evidenced by substantial reductions in the amount of hazardous waste generated across the nation and shifts toward use of less-toxic, more environmentally friendly materials in manufacturing and production operations. Since it was enacted, the program has evolved in response to changes in waste generation and management aspects that could not have been foreseen when the program was first put in place. The RCRA program is needed to address continuing challenges: large amounts of waste; highly toxic waste; new wastes from novel developments in manufacturing products and chemicals; wastes from increasingly efficient air and water pollution control devices; unpredictable and unique waste streams resulting from an increased number of natural and other catastrophes; population growth that places larger demands on our natural resources and produces more and new waste; contaminated lands that still require cleanup in order to be safe for reuse; and long-term stewardship of facilities that closed with waste in place. Proper management of wastes is critical to preventing exposures and potentially adverse impacts on human health and the environment. The EPA has sought to advance the development of regulatory approaches that encourage economic productivity while achieving environmental results.

Protecting communities and facilitating commerce. Some of the key challenges come from wastes that are produced in large amounts, are highly toxic, or are produced in many dispersed locations, often by small entities. For example, mining wastes are produced in high volumes; some spent solvents, certain pesticides and some wood-preserving chemicals can be highly toxic; and used oil, fluorescent light bulbs and other mercury-containing building equipment such as older thermostats can be found in many dispersed locations. For some of these wastes for which regulations have already been developed, the EPA and the states still face ongoing challenges involving implementation and management aspects. New and more advanced management technologies and improved methods and options for recycling or reusing wastes and materials are proliferating. As science and knowledge advance and technologies emerge, RCRA's scope is evolving to address new waste streams (e.g., nanomaterials), evaluate technologies and management practices, adjust monitoring and cleanup requirements, and renew facility operating permits to accommodate new developments.

Conserving resources and contributing to economic growth. RCRA's mission to conserve resources is another critical component of the RCRA program, especially given the pressures of population growth and greater demand on natural resources. As the world population continues to grow (to over 9 billion by 2050), and material

Encouraging Economic Productivity:

Under the Definition of Solid Waste rulemaking, the EPA has proposed a re-manufacturing exclusion for higher value solvents being sent to re-manufacturing into similar high-value products. This exclusion, which was developed in conjunction with the EPA's Green Engineering Program, can help foster manufacturing innovation, save money, and realize significant energy savings and green-house gas reductions by extending the product life of these solvents to more than a single use.

<http://www.epa.gov/oppt/greenengineering/pubs/industry.html>



and natural resource use continues to increase,³ the demand for additional goods and services stresses available resources. The RCRA program's pressing role is to lead towards a change in the relationship between material consumption and economic growth by promoting more productive and sustainable ways to extract, use, and manage materials. The EPA and the states are striving to achieve an integrated and intelligent use of materials that maximizes their value, prevents upstream pollution, and conserves resources.

Responding to business needs. Businesses and industry seek to effectively manage their waste while meeting the demand for goods and services and remaining economically viable and competitive. It is critical for the EPA and the states to work with these stakeholders to facilitate commerce by supporting an effective waste management infrastructure while advancing efficient and sound resource conservation for the future.

Vision for the Program

RCRA is the fundamental program for the protection, resource conservation, waste management, and the cleanup of our land and natural resources. A strong RCRA enterprise is critical to the prevention of emergencies, such as hazardous waste spills and contamination of surface and drinking water with solid and hazardous wastes.

Meeting the challenges. The passage of RCRA provided the EPA with the framework to work hand-in-hand with its partner states, tribes, and local governments to address existing problems and prevent them in the future. The RCRA program not only protects and cleans up land, but handles and safely manages the additional, and often more concentrated, pollutants captured by pollution control devices (e.g., precipitators and settling ponds) that programs such as the Clean Air Act (CAA) and Clean Water Act (CWA) remove from the air and water.

Although the RCRA program has been very successful in addressing the immediate human health and environmental concerns that prompted passage of RCRA in 1976, the EPA and its partner states, tribes, and local governments maintain a critical and active role. *The vision for the RCRA program is to continue to safeguard communities and the environment; mitigate and clean up contamination; champion sustainable lifecycle waste and material management approaches; and promote economic development (including job creation) and community well-being. RCRA's vision is to fully embrace technological advances that will facilitate commerce and enhance stakeholders' participation in the decisions affecting their communities.*

Supporting a dynamic and sustainable economy. The RCRA program is designed and implemented to anticipate a need for aggressive, nationwide resource conservation that minimizes waste generation and disposal by "encouraging process substitution, materials recovery, properly conducted recycling and reuse, and treatment." [RCRA § 1003 (a)]. Accordingly, the RCRA program continues to expand beyond "waste management" to "sustainable materials management." Doing so will support a dynamic and sustainable economy through improved materials use.



³ The 2012 Living Planet Report estimated that human consumption of natural resources has increased to 150 percent of global capacity. World Wildlife Fund (WWF) International, Gland, Switzerland.

Looking Ahead

The RCRA program will remain a vital component of our nation's framework for the protection of human health and the environment. To accomplish this goal, the RCRA program will continue evolving to balance waste and materials management with our nation's current and anticipated materials and resource consumption habits. The EPA and its state partners:

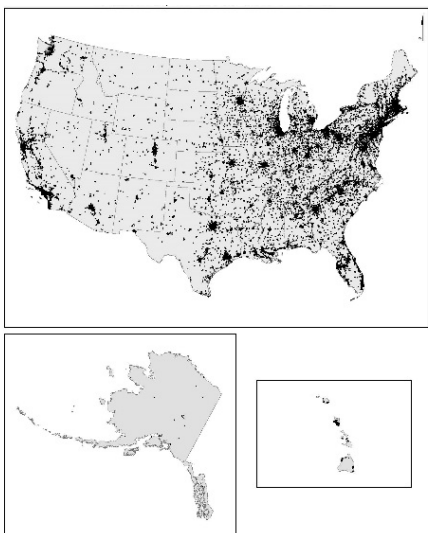
- Are committed to providing ongoing leadership in applying rigorous scientific principles and risk assessment techniques, and fostering innovation so as to support a dynamic and sustainable economy;
- Need to continue overseeing cleanup, overcoming challenges at the most highly contaminated and technically challenging sites, and ensuring long-term stewardship; and
- Need to keep providing information, convening stakeholders, and challenging manufacturers to lower life cycle impacts and advance sustainable materials management.

To find new ideas and reach better, more sustainable solutions, RCRA professionals need to keep enhancing collaboration; strengthening partnerships; leveraging technologies, resources and skills; and making science and information accessible to build capacity in American communities.

RCRA CLOSE-UP: EXISTING PROGRAMS AND CHALLENGES

Protecting Communities and the Environment

The EPA and the states develop and implement a regulatory framework to prevent exposures to contaminants from municipal solid waste and hazardous wastes, and are working to solve the most significant problems, as well as to address new areas of concern. The universe of hazardous waste is large and diverse. Not only does it include typical “heavy” industry that we think of as hazardous waste producers, but also government facilities, local small businesses, hospitals, universities, and many other entities. Elements of the RCRA program are operating in nearly every community across the country.



Locations of LQGs, SQGs and TSDFs:

- Large quantity generators (LQGs): ~14,300
- Small quantity generators (SQGs): 46,000 – 60,000
- Conditionally exempt SQGs (CESQGs): 300,000 – 470,000 (not pictured)
- Treatment, Storage, and disposal facilities (TSDFs): ~900
- **80% of all U.S. citizens live within 3 miles** of a RCRA-regulated hazardous waste generator or TSDF; 50% live within a 1 mile radius.
- Roughly **60,000 such facilities** exist in the U.S., generating and managing **30 to 40 million tons of HW annually**.
- RCRA standards are critical in protecting EJ communities.
- Communities near these facilities have greater proportions of minority and economically-disadvantaged residents relative to the U.S. average.

Hazardous Waste Management

EPA’s cradle-to-grave hazardous waste management system under RCRA’s Subtitle C program is a comprehensive system of regulations that ensures proper management of hazardous wastes and protects soil, ground water, surface waters, air, wildlife and vegetation, as well as human health, from the threats of exposure to hazardous constituents. These are perhaps one of the most comprehensive regulations the EPA has ever developed. The cradle-to-grave hazardous waste management regulations affect waste generators, as well as transporters and recycling, treatment, storage, and disposal facilities (TSDFs). The RCRA program tracks hazardous waste from facilities across the nation and protects communities by ensuring that it is managed properly.

Waste generators are the first link in the cradle-to-grave hazardous waste management regulatory system which ensures that hazardous waste ends up in controlled and permitted facilities and not dispersed throughout communities and the environment. All businesses must determine if their waste is hazardous at the point of generation and must oversee the ultimate fate of the waste. The RCRA regulations also require permittees – facilities that treat, store, or dispose of hazardous waste to certify at least annually that there is a program in place to reduce the volume and toxicity of hazardous waste generated. In 2011 alone, approximately, 16,500 large

quantity generators (LQGs) generated over 34 million tons of RCRA hazardous waste.⁴ During 2011, approximately, 1,400 waste management facilities treated or disposed of 39 million tons of RCRA hazardous wastes on site.

Due to the proliferation of new hazardous wastes and their generators, in addition to tracking and overseeing the management of known hazardous waste, the EPA's and the states' Hazardous Waste Management program will need to encompass identifying new hazardous wastes, developing new waste management regulations and standards where necessary, and providing new or enhanced technical assistance.

RCRA Permitting

Permits are essential to making the Subtitle C regulatory program work, since it is through the permitting process that the EPA or the states apply standards to TSDFs. With permits and other enforceable waste management controls, RCRA actively protects the health of communities near hazardous waste management facilities, including the estimated 20 million people living within a mile of these facilities.⁵ For example, RCRA requirements for landfills to install liners and leachate collection systems prevent hazardous contaminants from migrating into soil as well as surface water and groundwater, which are sources of drinking water. Furthermore, by containing leaks and spills, RCRA permit controls safeguard families and their homes from possible hazardous vapor intrusions. Permits also protect air resources by regulating incinerators, including new and existing Boilers and Commercial and Industrial furnaces that combust hazardous waste, and by ensuring that volatile waste is properly contained and managed.

The RCRA hazardous waste permitting program:

- Reassesses land disposal permits every five years
- Renews all permits at least every ten years
- Modifies permits to address changes in operations
- Monitors performance to ensure that permits continue to protect people and ecosystems from harmful exposures to hazardous pollutants

Since the program has been implemented, permits and other enforceable controls have been put in place to prevent dangerous releases at over 20,000 units.⁶ About 9,000 of those units continue to require some level of oversight.⁷ The EPA and the states regularly issue RCRA permits and, modify and update the active permits that have been issued for the hazardous waste units (such as incinerators and landfills) at facilities that treat, store, or dispose of hazardous waste. These RCRA permits establish the waste management activities a facility can conduct as well as the conditions under which it can conduct them.

⁴ 2011 National Hazardous Waste Biennial Report; <http://www.epa.gov/epawaste/inforesources/data/br11/national11.pdf>. Of the 16,447 facilities, only 14,262 are LQGs as defined by federal regulations; the rest qualify as LQGs according to other, lower, state-defined thresholds.

⁵ Estimate drawn from an analysis that merged facility size and location information from RCRAInfo with population data, at the block and block group levels, from the U.S. Census Bureau's 2000 Census. The demographics were captured around the total number of facilities that have approved controls in place (e.g., permits and institutional controls) that result in the protection of this population (20 million people).

⁶ The criteria for "approved controls in place to prevent release" was applied to all units that have been entered into RCRAInfo. The criteria is listed at <http://www.epa.gov/osw/hazard/tsd/permit/apprcntr.htm>.

⁷ The oversight total (9,000 units) is from the RCRAInfo in the "full oversight Workload for permitting (Operating and Post-closure) and Closure Report" as of 3-12-14.

With facilities constantly changing, it is critical that states and EPA maintain sufficient expertise and resources to process permits in a timely manner and allow businesses, especially those in the manufacturing sector, the opportunity to adjust to variable markets. Although the vast majority of hazardous waste management facilities have permits in place, there is a continuing challenge to keep pace with technology in a way that encourages safe and innovative waste management. Permit modifications present an opportunity to do this.

The challenge for the future is to improve efficiency, develop better permit status tracking, enhance compliance reporting, reduce paper burden, increase data accuracy, and grow the technical assistance and accessibility of the permitting processes.

Management of Unique Waste Streams

Unique waste streams, some of which can pose significant risks, need to be managed under RCRA. Some waste streams are unique because of the high volumes involved (e.g., construction and demolition debris) or the rapid growth of an industry (e.g., consumer electronics). Other waste streams emerge as industries advance technologies (e.g., nanotechnology) and develop new products and chemicals. Improved and more efficient air and water pollution control technologies are removing greater amounts of new and more concentrated pollutants and creating unique waste streams. Finally, some wastes are high-risk wastes likely to cause explosions, spills, and chemical accidents. RCRA standards, when properly implemented, have proven to be highly effective in preventing these and other hazards associated with acute-risk wastes. In doing so, the RCRA program saves lives and property.

What RCRA Has Done in the Past:

A fundamental hallmark of the RCRA program has been its responsiveness to emerging and unique waste streams. Protectiveness has been maintained and resource conservation and recovery have been promoted through the development of appropriately-tailored regulations, guidances and policies. The addressed wastes have included:

- Scrap Metal;
- Used Oil;
- Lead Acid Batteries;
- Circuit Boards and Cathode Ray Tubes;
- Fluorescent Light Bulbs;
- Academic Laboratory Wastes;
- Disposable and recyclable spent solvent containing wipes; and
- Chat – a residual of lead mining.

The risks from new technologies, manufacturing and energy production processes, new electronic devices and, chemicals are not yet well known. There are 2,600 new chemicals developed every year.^e The EPA and the states will need to keep up with the industry and develop protective approaches to safely manage additional pollutants, including the often more concentrated pollutants, being removed from our air and water.

^e <http://www.cas.org/content/regulated-chemicals>; Accessed: May 23, 2013

Long-term Stewardship

Wastes that are generated and cannot be reused or recycled must be permanently disposed. Permanent waste disposal creates a perpetual obligation, known as long-term stewardship. The substantial and unending obligations associated with long-term stewardship make a compelling case for resource conservation and recovery. In cases of disposal, the protective management under long-term stewardship is necessary to ensure that communities and the environment are not exposed to hazards through leaks or other releases from waste management units. The EPA, states, tribes, and local governments implement and maintain physical and legal controls and establish continuing accountability mechanisms.

To protect public health and the environment, facilities that manage waste conduct closure activities such as deconstruction of tanks and final capping of landfills. Once closure is complete, post-closure requirements are triggered for land disposal units that leave waste in place, i.e., landfills, land treatment units, surface impoundments. Post-closure is the beginning of long-term stewardship. Post-closure requirements are particularly relevant because they specify performance monitoring standards such as standards for groundwater monitoring system design.

There are a variety of public and private stakeholders involved in selecting, implementing, monitoring, and enforcing long-term stewardship activities at a site. To be effective, involved parties need to coordinate and adapt to changing site and site management conditions. Appropriate financial and legal mechanisms are necessary to ensure continued performance through changing stakeholders and site conditions over time.

The EPA will continue to develop long-term stewardship guidance, as well as to review its decision documents, agreements, and other tools, as appropriate, and ensure site-specific long-term stewardship roles and responsibilities are clearly delineated.

The RCRA program needs to be able to substantiate and remain current with the financial status of facilities so that adequate resources will be available should cleanup be necessary.

Strategic Planning and Disaster Response

As part of its responsibilities under RCRA, the EPA provides national leadership, strategic planning, preparedness, and expert technical support on waste management and disposal issues resulting from natural and manmade disasters. It conducts technical reviews of waste management issues within national and regional emergency response (ER) plans. The EPA participates in waste management planning and preparedness activities and emphasizes that recycling or reuse of disaster debris is a critical element of planning and preparedness activities. During disasters and other incidents, the EPA also provides waste management expertise that includes facilitating beneficial use/recycling where appropriate. This experience has included real time support during responses to the World Trade Center, the Anthrax letters, Hurricane Katrina, Deepwater Horizon, Fukushima Nuclear Power Plant incident, Super Storm Sandy, as well as numerous floods and tornadoes around the country.

Extreme weather events, such as tornadoes and hurricanes, are increasing in number and severity, creating huge amounts of waste that must be managed properly.^f Manmade catastrophic events such as chemical accidents and homeland security considerations also require planning, preparation and response.

The EPA needs to continue developing additional waste management guidance and tools that are so important to have readily available when working through the recovery from natural and manmade disasters. Importantly, each incident is unique and usually results in the need for incident-specific technical assistance.

^f Technical Support Document for the Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, December 7, 2009, U.S. EPA.

Cleaning Up Land and Water

RCRA Corrective Action program

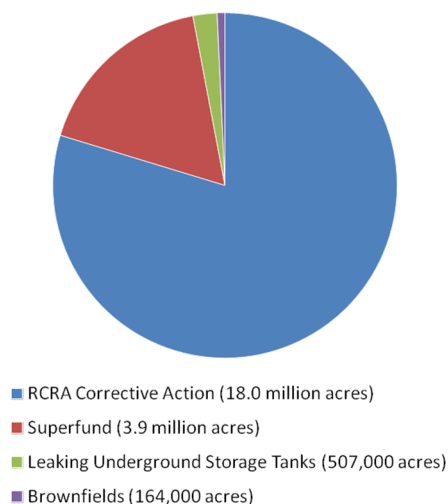
Today there are many federal and state cleanup programs that focus on a particular niche of the overall cleanup needs of the nation. One of the largest and most expansive in terms of facility numbers and size is the RCRA Corrective Action program. Under the RCRA Corrective Action program, facilities managing hazardous wastes are required to clean up releases of hazardous constituents and address those releases at the owner's expense. The Corrective Action program makes sure that facilities permitted to manage "newly generated" hazardous waste also address all of their "old waste" cleanup obligations. This framework mitigates public health threats and environmental damage; prevents future Superfund sites; and avoids the expenditure of taxpayer dollars.

EPA, the states, and the owners and operators of sites take two important steps in implementing the RCRA Corrective Action program. First, they implement interim stabilization measures to control short- and long-term exposures as quickly as possible. Second, they develop long-term remedies, ensuring that engineering and institutional controls (such as land use restrictions) are put in place and maintained over time to protect the integrity of those remedies. The EPA and the states take these steps using permits, orders, and other approaches.

Corrective Action cleanup has a proven record of helping revitalize communities and spurring economic development by enabling reuse of land for housing, industrial or commercial projects. Ridding neighborhoods of abandoned and blighted properties can reduce crime and bolster community pride and well-being, address environmental justice issues, as well as create new opportunities for commerce, employment, and property tax revenue.

Up to 6,000 facilities need to be cleaned up under the RCRA Corrective Action program. The EPA and the states are focusing their Corrective Action resources on 3,779 priority hazardous waste facilities. These facilities, some of which are large and complex,

Acres Addressed by EPA's Clean Up Programs



Cleanup at the Volunteer Army Ammunition Plant:

A RCRA Corrective Action cleanup of this site in Chattanooga, TN, resulted in 2,800 acres of parkland and 3,000 acres of commercial/industrial reuse (Volkswagen USA, Amazon, and Gestamp Corporation), creating 13,000 jobs from these new businesses.

U.S. EPA, RCRA Corrective Action: Case Studies Report
April 2013; EPA 530-R-13-002.

<http://www.epa.gov/wastes/hazard/correctiveaction/pdfs/rcracorrective.pdf>

Amazon's Distribution Center to be Located on a Former Corrective Action Site in Baltimore:

A southeast Baltimore, MD property, the home of a RCRA corrective action facility – a former GM assembly plant that closed in 2005, eliminating 1,000 jobs – will soon host a 1 million square foot Amazon.com distribution center. Amazon has announced it plans to open the fulfillment center in 2014, to hire locally and to employ over 1,000 people.

http://articles.baltimoresun.com/2013-10-22/news/bs-md-ci-amazon-warehouse-20131022_1_distribution-center-fulfillment-center-new-warehouse

include some of the most highly contaminated and technically challenging sites the EPA and states confront in any of their cleanup programs. Preventing exposures (e.g., ensuring that people are not exposed to unacceptable levels of contaminants in soils or contaminated groundwater) is a top priority.

To date, the program has controlled human exposures at 85 percent of RCRA Corrective Action priority sites, about 3,200 of them, and protected Americans from potential groundwater exposures at 76 percent of RCRA Corrective Action priority sites, about 2,900 of them. However, permanent solutions to achieve groundwater cleanup standards may still be required.

In 2011, the Government Accountability Office (GAO) provided the EPA with a report on the state of the RCRA Corrective Action program, detailing the need to maintain a successful Corrective Action program.⁹ The EPA and its state partners have established an aspirational goal to have largely completed the construction of final remedies by the year 2020 at 3,779 priority facilities. In addition, the current 2020 goal for remedy construction is only an interim step in reaching the ultimate goal of completing cleanup, which is defined as having met all the cleanup performance standards for the facility and set in place necessary long-term engineering and institutional controls. This work can take years or even decades to finish. There are formidable challenges to achieving this goal given the size and complexity of the remaining sites, the long-term stewardship needed and the financial constraints for both government agencies and involved industries.

⁹ Hazardous Waste: Early Goals Have Been Met in EPA's Corrective Action program, but Resource and Technical Challenges Will Constrain Future Progress, GAO-11-514 July, 2011.

PCB Cross-Program Leveraging

Individual programs under RCRA have built a wealth of knowledge on an array of waste and material management issues. Due to the expertise in issuing permits and cleaning up wastes, the RCRA program now encompasses the disposal and cleanup provisions of the PCB program. Under the RCRA program, the EPA issues PCB disposal approvals and oversees PCB cleanups, functions that are not delegable to the states under the Toxic Substances Control Act. EPA, therefore, plays a unique and critical role in managing the nation's legacy of PCB waste which is only now emerging as a much larger universe than anticipated.

Conserving Resources

Sustainable Materials Management

When the RCRA program was first established, priority was placed on ensuring that wastes were managed and disposed of safely. While this remains a key priority, our society has made dramatic shifts in how we deal with waste. The business case for waste reduction is strong, and stakeholders have made significant progress in source reduction and recycling or reuse of many materials. The recycling rate has increased—from less than ten percent of municipal solid waste generated in 1980 to almost 35

The overall outcome from a sustainable approach to materials management:

- Reductions in the volume and toxicity of materials at all phases of the life cycle, across every sector of the economy
- Improvements in manufacturing supply chain efficiencies, resulting in increased competitiveness for American businesses
- Incorporation of sustainable materials management within the regulated community that levels the playing field by reducing energy and materials use, as well as improving environmental results

percent in 2011.⁸ Nationally, we recycled and composted almost 87 million tons of municipal solid waste. This provides an annual benefit of more than 183 million metric tons of carbon dioxide equivalent emissions reduced, comparable to eliminating annual GHG emissions from over 34 million passenger vehicles. Nevertheless, although great strides have been taken and measurable results achieved, RCRA's conservation mandate has not been fully realized.

The EPA and the states are expanding the resource conservation aspect of the RCRA program toward "sustainable materials management" (SMM), an approach that considers the entire lifecycle of materials and casts a far broader net than traditional waste and chemicals management approaches. SMM can transform production processes, minimizing the amount of materials involved and the associated environmental impacts. Today, the EPA is convening stakeholders that work across the lifecycle of a product or material, providing transparent information and data-driven tools, and highlighting the market challenges that are the barriers to a national cradle-to-cradle materials management system.

SMM validates comprehensive "upstream" and "downstream" material management efforts, and the EPA encourages source reduction, as well as safe reuse and recycling of all wastes and secondary materials when adequate safeguards are in place. For example, since source reduction and safe reuse and recycling of secondary materials conserve vital resources, when adequate safeguards are in place, the EPA provides the flexibility to allow hazardous wastes to be managed like commodities. Common examples of source reduction practices in the U.S. have included early retirement of equipment such as mercury-containing devices, e.g., switches and thermostats; reformulation or redesign of products, e.g., new poly-vinyl chloride (PVC) compounds without the use of lead; use of less toxic feedstocks, such as lead-free solder in manufacturing; and improvement of work practices, such as the reorganizing of paint batches to reduce cleaning operations.⁹ Other examples of safe reuse and recycling efforts include recovering large quantities of solvents for

Electronics

The rapid growth in electronics use in the United States is challenging the RCRA program to think creatively to encourage the public to make responsible electronics purchasing and disposal decisions. The EPA has made the responsible management of used electronics a high priority for both regulatory and voluntary actions. Donating or recycling used electronics is an important way to conserve resources, protect national security, and minimize environmental harms that result from upstream activities involved in the extraction of metals and manufacture of materials used in electronic products.

Certification of Electronics Recyclers

Since the release of the National Strategy for Electronics Stewardship in 2011, and efforts such as EPA's SMM Electronics Challenge, there has been a 324% increase in the number of electronics recyclers certified to R2 or e-Stewards in the United States.

The EPA supports safe electronics recycling practices and will continue to push for their continuous improvement. The EPA encourages all electronics recyclers to become certified to an accredited third-party standard. Currently, two such standards exist in the United States: the Responsible Recycling Practices (R2) and the e-Stewards® standard for responsible recycling. Both standards maximize reuse and recycling, minimize exposure to human health or the environment, ensure safe management of materials by downstream handlers, and require destruction of all data on used electronics.

⁸ U.S. EPA, Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2011.

<http://www.epa.gov/wastes/nonhaz/municipal/msw99.htm>

⁹ <http://www.epa.gov/osw/hazard/wastemin/minimize/faqs.htm>

reuse or military de-manufacturing operations recovering valuable, economic quantities of many metals (copper, brass, aluminum and steel), fiberglass, plastics and other materials.¹⁰

SMM is an integral part of a national resource policy that contributes to economic growth. Advancing SMM practices brings many economic benefits:

- ✓ *A sustainable future creates considerable potential business opportunities.* There is currently an unprecedented growth in the market for environmentally-preferable products and materials. This growth will potentially create a significant number of jobs in industries such as renewable energy and material recovery and in less obvious fields such as teaching positions to train employees for newly-created roles resulting from the emerging green economy.



- ✓ *The business case for waste reduction is strong.* For example, researchers estimate that if half of core recyclables and food scraps that are currently in the waste streams of just California, Oregon and Washington were recycled, it would result in almost \$1.6 billion in additional salaries and wages, \$818 million in additional goods and services produced, and \$309 million in additional sales across the three states.¹¹ These gains would translate into additional revenue for state and local governments as well, through income, property, and sales taxes.

Regulatory Framework. EPA's current regulatory system does not use a holistic approach, but rather looks only at a single source or a single environmental medium and attempts to fix "end-of-pipe" emissions. That system has and will continue to prevent or alleviate some important environmental impacts. However, it will also miss some impacts and/or inadvertently shift them from one medium to another.^h Going forward, EPA needs to integrate the separate environmental programs to systematically address material movement through our environment.

Significant Commodities. To achieve shared SMM goals, EPA has been convening dialogues with SMM stakeholders and establishing challenges to specific sectors, e.g., Electronics, Food, and Federal Green challenge. However, there are other significant commodities that could achieve sustainable management. (EPA's *Sustainable Materials Management: The Road Ahead* report rank orders the major materials, products, and services in the U.S. economy according to their environmental impacts.)^h EPA has a continuing role in challenging sector manufacturers, service providers, and consumers to apply innovation and reduce life cycle impacts.ⁱ

^h<http://www.epa.gov/smm/pdf/vision2.pdf>

ⁱGuidance on Life-Cycle Thinking and its Role in Environmental Decision Making. Sustainable Materials Management Coalition, March, 2014, http://www.michaeldbaker.com/MDB_WP_live_site/wp-content/uploads/2014/03/Guidance-on-Life-Cycle-Thinking-031014.pdf

¹⁰ <http://www.epa.gov/solidwaste/hazard/recycling/index.htm>

¹¹ "Reducing Greenhouse Gas Emissions through Recycling and Composting, A Report by the Materials Management Workgroup of the West Coast Climate and Materials Management Forum, U.S. EPA, May 2011

Beneficial Use of Industrial Materials. Industrial secondary materials (e.g., coal combustion residuals, foundry sand, and construction and demolition (C&D) materials) account for nearly 90% of all wastes generated in the United States each year. C&D activities in the U.S. account for more than 60% of the U.S. annual material consumption, excluding energy and food.^j Industrial materials present substantial opportunities to advance SMM. Building an understanding of the value of these materials and how to use them in an environmentally sound manner is critical to reducing and changing materials use. EPA needs to develop tools and a framework for beneficial use of industrial byproducts, as well as engage with stakeholders, to advance SMM through “on-the-ground” practices.

^j<http://www.epa.gov/greenhomes/SmarterMaterialChoices.htm>

Providing Information and Data. The MSW Characterization report provides the most recent available data on annual U.S. waste generation, recycling, and disposal of MSW, as well as the benefits of recycling MSW. By continuing to provide annual facts and figures, the EPA helps stakeholders understand national material generation and management trends, and influences waste generation and sustainable material management policies. Going forward, the report patrons, including local and state governments, industry and researchers, are looking to EPA to include estimates of source reduction and reuse sectors, as well as amounts of construction and demolition plus industrial materials generated and managed.

Partnering and Innovating

The RCRA program has a number of projects that increase its productivity and efficiency and enable it to disseminate information, as well as leverage resources and skills through partnerships and stakeholder participation and collaboration.

Program Efficiency

The RCRA program has been a leader in promoting program efficiency. For instance, in the 1990s, the Corrective Action program reforms had a fundamental impact on improving the pace and outcomes of RCRA cleanups. Also, in an effort to increase efficiency and improve compliance with EPA’s hazardous waste generator regulations, the EPA developed and provided generators with guidances, checklists, and reference tools and made them available on the EPA website. Other efforts aiming to increase efficiency include the permit-standardization rule-making to improve and streamline permitting processes for eligible hazardous waste facilities; Hazardous Waste Reports (Biennial Reports) to enable efficient analysis of trends in the generation of hazardous waste from LOGs, as well as waste management practices from TSDFs; and most recently, the EPA is looking to various efforts that leverage technology, as well as Lean methods, to bring further efficiency to the RCRA program.

Standardized Permits. Under the current individual permit process, hazardous waste TSDFs are required to submit a detailed, site-specific application. The review of this data contributes to a time-intensive process. The EPA issued the Standardized Permit Rule that simplifies administrative procedures and permit renewal and modification processes for eligible hazardous waste facilities. The standardized permit now includes two parts: a uniform portion and, when necessary, a supplemental portion. The new streamlined system reduces paperwork and saves the EPA, states, and facilities time and money.

EPA needs to identify other types of facilities that could be eligible for some other type of a standard permit to reduce review time and increase efficiency. EPA needs to evaluate and mainstream innovations such as this and other similar pilot programs or efforts. “Decision-making processes must be streamlined to increase efficiency and reduce costs while retaining or enhancing environmental benefits.”^k

^k<http://www2.epa.gov/aboutepa/epas-themes-meeting-challenge-ahead>

Lean. The Lean business model refers to a collection of principles and methods that focus on the identification and elimination of non-value added activities within a process. For example, the Lean process improvement system has recently been piloted in some areas of the U.S. to improve the efficiency of the RCRA Corrective Action Cleanup Program. The specific process selected within the Corrective Action program was the RCRA Facility Investigation (RFI), which surveys the nature and extent of contamination at highly complicated RCRA facilities. It was discovered that by removing various redundant steps within the RFI process and frontloading goals and expectations between regulators and facilities through a “Corrective Action Framework” (CAF), significant time savings projected at up to 73% could potentially be achieved. A number of facilities have been selected throughout the U.S. and are hard at work implementing CAF in order to pilot this approach.

Moving forward, the EPA would like to apply the lessons learned and roll-out the Lean effort nationally across the RCRA Corrective Action Cleanup Program. The EPA will keep evaluating the incorporation of the Lean concept to the RFI process and determine if other areas of its Corrective Action program would benefit in terms of effectiveness and efficiency.

Test Methods. Under the RCRA program, the EPA employs analytical chemistry and characteristic testing methodologies, environmental sampling and monitoring, and quality assurance. SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, is a dynamic guidance document that helps the regulated and regulatory communities respond to RCRA-related sampling and analysis requirements. This document sets forth methods that are used far beyond the RCRA program – for example, the SW-846 methods are used throughout all the EPA, state waste management, and cleanup programs, as well as internationally. SW-846 is improved on an ongoing basis, and its revisions include introducing new methods as well as procedural efficiencies.

Methods Development and Approval Process

The EPA assists developers in designing proof of concept studies; hosts forums to facilitate the interchange of ideas between the user and developer communities to stimulate development of new measurement techniques; and assists developers in designing evaluation studies prior to submitting an application for new method approval.

New challenges facing this fundamental part of the base program include technological innovations in instrumentation and techniques, employing a “greener” approach to sampling and analysis, emerging technologies that call for the development of new test methods such as hydrofracking, and leveraging expertise across other EPA offices that use SW-846 routinely to keep moving forward. In meeting those challenges, the RCRA program recently has successfully revised and added a total of 23 methods to the SW-846 methods compendium and has made available new methods, such as Toxaphene in fish, In-Vitro Bioaccessibility Assay for Lead in Soil, and four LEAF procedures that are designed to be used as part of environmental leaching assessment.

E-Manifest. The RCRA program requires hazardous waste be tracked from the time it leaves the facility where it was generated, until it reaches the final waste management facility that will store, treat, or dispose of the hazardous waste. The manifest allows the waste generator to verify that its hazardous waste has been properly delivered and that no hazardous waste has been lost or unaccounted for in the process. In partnership with the states and waste industry stakeholders, the EPA has begun an effort to transition from the current paper-based hazardous waste manifest to a more modern and efficient electronic manifest system in accordance with the Hazardous Waste Electronic Manifest Establishment Act of October 5, 2012. A national electronic manifest system aims to facilitate the electronic transmission of the uniform manifest form and make the manifest much more cost-effective and convenient for industry. Electronic manifests would allow waste handlers to achieve more timely and accurate tracking of hazardous waste shipments; the EPA and states could maintain more effective oversight of hazardous waste shipments; and mandatory reporting obligations could be met more efficiently, saving industry and the states tens of millions of dollars annually.

E-Manifest: RCRA's Flagship of our E-Enterprise Efforts:

Economic benefits:

- Reduce annual burden of 300,000 to 700,000 hours to industry
- Save over \$75 million annually for users
- Is deficit neutral to the EPA as user fees will recoup system development and long-term O & M costs

Non-economic benefits:

- More timely and accurate waste shipment tracking services
- Increased transparency and empowerment of communities by providing more accurate information about completed waste shipments and management trends
- Enhanced inspection/enforcement capabilities for regulators
- One stop reporting of manifest data to the EPA and states

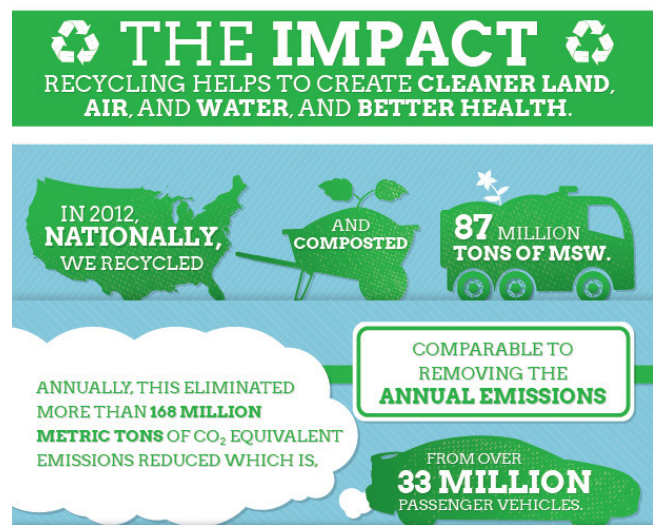
Outdated technology hampers oversight of waste and materials management and is more expensive for regulated industries. Many key RCRA programs require paper submissions instead of adopting more efficient electronic systems. Advances in the electronic storage and transmission of information could benefit those other RCRA programs. The RCRA program can evaluate which other waste and material management operations carry the potential for efficiency gains through technological advances.

Communicating in Today's World

RCRAInfo. The EPA has created RCRAInfo to track activities related to the management of hazardous waste under Subtitle C of RCRA. RCRAInfo is essential to the measurement-based management of the RCRA program. This tracking system holds both the EPA and the states accountable for their responsibilities under RCRA. The public has access to this data via EPA's Envirofacts system that allows interested community members to track hazardous waste facilities. The data helps communities make informed decisions regarding these facilities. Both EPA regions and delegated states use RCRAInfo on a day-to-day basis to track their permitting, corrective action, and compliance and enforcement activities. RCRAInfo allows for direct data entry by the states, uploads from state data systems, downloads to state data systems, and provides a multitude of Web services for the public to develop regional and/or state applications.

Social Media. Each and every day, the EPA works to provide American families with the information they need to understand and minimize adverse health impacts. In addition to communicating through traditional means, the RCRA program is taking full advantage of widespread Internet access to share knowledge and data pertaining to governmental, industrial, and manufacturing waste and materials management activities that affect businesses, families, and communities across the nation.

Besides promoting public transparency, effective communication drives changes in social behavior. One way the EPA communicates and influences behavior is through the use of social media. Social media technologies let people create and share content in innovative and interesting ways. Social media presents an exciting possibility for government agencies to communicate and collaborate with the public and greatly increase the potential for everyone to gain a better understanding of environmental conditions and solutions. For example, an important component of the RCRA program is communicating the message to use materials more wisely. The RCRA program reaches out to communities, industry, and the public to encourage stakeholders to think outside the box, to embrace the new paradigm of using wastes as materials, and to be innovative in how they use, reuse, and recycle materials.



The RCRA program needs to continue working with its co-regulators, as well as the regulated community and general public, to build new tools and strategies that enhance coordination, establish joint priorities, manage resources effectively, and share information. Without endorsing any particular social media or technique, the RCRA program will observe requirements related to federal activities such as transparency, public process, and privacy, and continue to share new insights, ideas, and solutions. The RCRA program will continue to provide “user-friendly” information, including tools that everyone can use to retrieve hazardous and solid waste data in an informative, easy-to-understand format.

Enhancing Stakeholder Engagement and Strengthening Partnerships

Through the RCRA program, the EPA and the states promote an open, fair, and inclusive decision-making process. This leads to better information exchange and collaboration among stakeholders, more informed decisions, and improved facility environmental performance. Public participation is a key component of the RCRA program and is an integral part of the hazardous waste permitting process. The RCRA regulations require public involvement from the earliest stages of the permitting process continuing throughout the facility’s lifetime. By promoting inclusive decision-making, the RCRA program facilitates partnerships with the goal of creating safer and healthier communities.



Communities. An area of focus for the RCRA program is engagement with local communities and stakeholders to help them meaningfully participate in government decisions regarding land cleanup, emergency preparedness and response, and the management of hazardous substances and wastes. Expanding the conversation with disadvantaged communities, understanding their needs, concerns, and expectations, and listening to their feedback, leads to better, more sustainable decisions and is an important part of RCRA's mission. RCRA regulations provide for public participation in permitting decisions for all hazardous waste management facilities. Since spills from a treatment and storage facilities can affect large areas, public involvement can be particularly helpful, especially to address concerns regarding potential off-site contamination and remedy selection.

Pueblo Chemical Depot, Pueblo, CO – RCRA Corrective Action and Permitting

The U.S. Army Pueblo Chemical Depot (PCD) located near Pueblo, CO, is one of five remaining Army installations in the United States that currently store or are in the process of destroying a stockpile of chemical weapons. Neutralization followed by biotreatment was selected in partnership with the community in 2002 to destroy the Pueblo chemical weapons stockpile.

PCD and the Pueblo Chemical Agent-Destruction Pilot Plant work closely with the Colorado Chemical Demilitarization Citizens' Advisory Commission, which serves as a forum for exchanging information about the project, offers opportunities for the public to get involved, and represents community and state interests to the Army and Department of Defense.

Tribal Partnerships. The RCRA program works in partnership with tribes to support the development and implementation of sustainable tribal solid waste programs. The EPA assists tribes with the development of Integrated Waste Management Plans (IWMPs), and the assessment of open dumps. The RCRA program also provides grants to tribes to support their hazardous waste management programs and address numerous issues, including household hazardous waste collection and tribal education activities. As detailed in "The Environmental Protection Agency-Wide Plan to Provide Solid Waste Management Capacity Assistance to Tribes," the EPA will continue to develop and facilitate a peer match program, as well as provide training support and technical assistance to tribes. The RCRA program also coordinates with the National and Regional Tribal Operations Committees on priorities and program direction.

International Collaboration. The EPA collaborates with other countries and benefits from expertise unique to other countries and international organizations while, in turn, sharing expertise unique to the EPA. The Agency continues to increase the environmental protectiveness of waste exports and imports while allowing for international trade in hazardous recyclables. This not only decreases disposal overall but improves economic opportunities for American recycling companies. In an increasingly interconnected, global economy, with environmental issues that are also truly global, the RCRA program is active in the international arena with other countries on both resource conservation and waste management issues.

As hazardous waste management and cleanup work continues into the future, EPA commits to early and meaningful community engagement in the decision-making process and, on individual sites, listening to affected communities and employing the tools that work best in specific situations.

The EPA strives to enhance collaboration nationally and internationally working towards success in addressing global waste and material management issues.

RCRA in International Treaties and Agreements

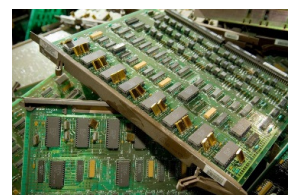
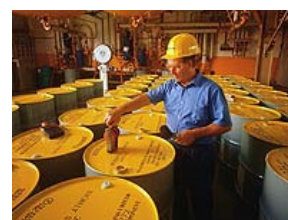
The RCRA Program plays a critical role in the negotiation and implementation of treaties and other international agreements that address significant waste management issues and often deal with emerging issues such as:

- **The Minamata Convention** that reduces global mercury releases mercury releases;
- **Organization for Economic Cooperation and Development (OECD) agreement** that
 - Supports the Basel Convention, and
 - Addresses emerging issues such as international sustainable materials management by providing a forum for governments to exchange information on policies, practices, or programs;
- **Hong Kong Convention** that ensures safe ship recycling;
- **The NAFTA environmental side accord** that
 - Develops a system for the electronic exchange of information among the U.S., Canada, and Mexico, and
 - Addresses many environmental issues such as promoting the environmentally sound management of spent lead acid batteries;
- **US-Mexico Border agreement** that
 - Reduces Mexican and U.S. scrap tire piles, and
 - Deals with the hazardous waste aspects of the Persistent Organic Pollutants Convention; and
- **The Basel Convention** that controls international shipments of hazardous waste.

PATH FORWARD

Under the RCRA statute, the EPA and its partner states, tribes, and local governments have developed and put in place comprehensive programs to safely manage nonhazardous industrial and municipal solid waste and hazardous waste from “cradle to grave.” Consequently, protection of human health and the environment has improved. Nevertheless, there are still challenges for the RCRA program that are critical to implementing the law – remaining cleanup and new disposal sites, new waste streams from recently-developed products and chemicals, and more waste and increased demands on our natural resources due to population increase and economic growth are just a few. The program’s professionals have the experience and expertise to meet these challenges. The EPA needs to maintain resources to support the high level of protection, resource conservation, and innovation that the law demands and the public expects. With a dynamic and nimble framework in place, RCRA professionals at the EPA and within the states can keep working collaboratively to predict, adapt to, and implement programs that are timely, relevant, smart and effective.

- The EPA and its state partners are committed to providing ongoing leadership in applying rigorous scientific principles and risk assessment techniques and fostering innovation so American industries can be competitive in the global economy while fully maintaining protectiveness. The RCRA program needs to keep supporting the development of new manufacturing technologies and waste management methods, revisit regulatory frameworks, and make modifications that allow businesses, especially those in the manufacturing sector, to operate in accordance with the protection of human health and the environment.
- The RCRA program has a proven record of preventing exposures to hazardous waste contamination and returning land and water to productive uses. Accordingly, the EPA and the states strive to create new opportunities for commerce, employment, and property redevelopment that bolsters communities, by preventing exposures to hazardous wastes and returning land and water to productive use. RCRA professionals need to continue overseeing cleanups, overcoming challenges at the most highly contaminated and technically challenging sites, and ensuring long-term stewardship.
- By expanding beyond “waste management” to “sustainable materials management,” the EPA and the states are implementing the RCRA statute’s imperative to encourage process substitution, materials and energy recovery, as well as properly conducted recycling, reuse, and treatment. RCRA professionals need to convene stakeholders and challenge manufacturers to apply innovation and advance sustainable materials management.
- RCRA professionals are committed to continuing the program’s legacy of innovation and creativity. To find new ideas and reach better, more sustainable solutions, RCRA professionals need to keep enhancing collaboration; strengthening partnerships; leveraging technologies, resources and skills; and making science and information accessible to build capacity in American communities.



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