Division of Waste Management

Annual Report

Fiscal Year 2016

Commonwealth of Kentucky
Department for Environmental Protection
Division of Waste Management
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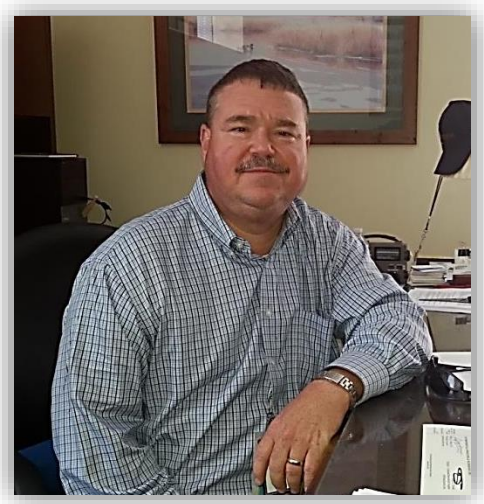
waste.ky.gov

Cover Photograph
Hydraulic Fracturing Operations
Lawrence County, KY
Courtesy of Marvin Combs

Message from the Director



As the director for the Division of Waste Management, I am committed to serving the commonwealth and working toward the mission of this agency. Our primary mission is protecting human health and the environment. I admire the division staff as their continued hard work and commitment further preserves and improves our environment.

It is my pleasure to submit the eleventh edition of our annual report for fiscal year 2016. Now residing at the new 300 Sower Boulevard address, the division is able to collaborate in a centralized location with other divisions within the cabinet. Collaboration within our cabinet and outside of our cabinet has been a key element to success this year. Currently, representatives from the Energy and Environment Cabinet, Cabinet for Health and Family Services, environmental groups, oil and gas transporters and producers, owners and operators of waste disposal facilities, along with others are convening as the Oil and Gas Workgroup to develop a review process, recommendations, and propose amendments to existing statutes and regulations as directed by House Bill 563 from this past legislative session.

I am pleased to report the success of many our programs this year. The Brownfield's Redevelopment Program, under KRS 224.1-415 is a continued success redeveloping hundreds of properties and improving thousands of acres of land across the commonwealth. After the success of the rubberized asphalt pilot project last year, and the abundance of qualified applicants, the division expanded the number of grants that were awarded for the new rubber-modified asphalt chip seal grant. Additionally, division staff has been busy developing a state Coal Combustion Residual (CCR) regulatory program in light of the new federal CCR rule, which became effective in October of 2015. The division is also amending the Hazardous Waste Branch regulations to reduce and eliminate inconsistencies between the state and federal rules regarding the Resource Conservation and Recovery Act. Lastly, the division continues to make significant progress in the cleanup of leaking underground petroleum storage tanks. These and the many other division accomplishments are discussed in this annual report.

Anthony R. Hatton, P.G., Director
Kentucky Division of Waste Management

TABLE OF CONTENTS

Highlight Stories

SELECTED FIGURES

EXECUTIVE SUMMARY

The Kentucky Division of Waste Management (DWM) is the second largest division, with 236 staff positions, in the Department for Environmental Protection with seven branches:

- ***Field Operations***
- ***Hazardous Waste***
- ***Program Planning and Administration***
- ***Recycling and Local Assistance***
- ***Solid Waste***
- ***Superfund***
- ***Underground Storage Tank***

2015 calendar year and 2016 state fiscal year selected achievements and challenges:

- ***Brownfield Redevelopment Program, KRS 224.1-415***:

  The program has achieved early success. In FY16, the division reviewed 40 brownfield sites and issued 41 Notice of Eligibility letters and 35 Notification of Concurrence letters to applicants who have entered the program. There were two sites pending review at the end of the fiscal year.

- ***Crumb rubber grants awarded***:

  In FY16 a total of 19 grants totaling $249,256 were awarded for the application of landscaping mulch derived from recycled Kentucky tires. This is more than double the amount awarded the previous year.

- ***State Government Office Paper Recycling Program thrives*:**

  This program serves more than 115 agencies in Frankfort. Office paper, computer paper, newsprint, and cardboard are collected, sorted, shredded, baled and sold to a paper mill, allowing this program to operate primarily on its own receipts. State employees recycled 1262 tons of waste paper in 2015, approximately 232 pounds per state employee. Confidential document destruction is provided at no charge, adding to the economic benefit of this program.

- ***Household municipal solid waste (MSW) collection***:

  Participation in household MSW collection has remained steady since legislation in 2002 began requiring waste haulers and recycling haulers to register and report to each county in which they provide service. The 2015 statewide household participation rate for MSW collection was 85.3 percent.

- ***Illegal open dumpsites***:

  More than 25,800 illegal open dumpsites have been cleaned up since 1993. In 2015, counties cleaned 102 illegal open dumps at a cost of $761,347. The average cost to clean up each dumpsite was $7,524.

- ***Litter along public roads***:

  The Kentucky Pride Fund, Eastern Kentucky PRIDE, Bluegrass Greensource, Kentucky Transportation Cabinet, Adopt-A-Highway, and cities and counties across the commonwealth contributed to the cleanup of 10,303,820 pounds of litter at a cost of $8.1 million during 2015. The average cost of litter picked up in 2015 was 79 cents per pound.

- ***Maxey Flats Project Final Capping***:

  The construction contractor for building the final cap, The Walker Group (TWG) from Mt. Sterling, KY, was selected in September 2014. United States Environmental Protection Agency approved the final cap design in October 2014. TWG began final cap construction in January of 2015. By May 2015, wooded areas were cleared and a haul road and drainage features constructed. A total of 421,255 cubic yards of leveling fill and 75,500 cubic yards of protective cover soil were placed. Seventy-six percent of the landfill area has been covered with geosynthetic clay liner and high density polyethylene, final completion is projected by December 2016.

- ***Methamphetamine Lab Cleanup Program***:

  Through the division's Superfund Branch, 94 contaminated residences were reported as having suspected methamphetamine contamination and 49 residences were decontaminated through the Methamphetamine Lab Cleanup Program in FY16.

- ***Recycling***:

  Kentuckians recycled 2,656,517 tons of common household recyclables (aluminum, cardboard, steel, plastic, newspaper, glass, and paper) for a recycling rate of 36.6 percent in 2015. Kentuckians recycled a total of 3,357,008 tons of municipal solid waste in 2015 including sludge, concrete, compost and asphalt.

- ***Underground Storage Tank (UST) Program Success***:

  The UST program emphasizes immediate and effective remediation. The number of open UST sites continues to drop. The total number of UST cleanups remaining has decreased substantially over the last few years, from 757 in FY15 to 675 in FY16. There were 303 No Further Action letters issued.

- ***Waste Tire Program***:

  In FY 2016, waste tire collection events (formerly referred to as "tire amnesties") were conducted in 35 counties in the Lincoln Trail, Lake Cumberland and Bluegrass Area Development Districts (ADDs). The equivalents of 711,057 waste tires were recovered through FY 2016 collection events at a cost of $1,123,470.

INTRODUCTION

The Division of Waste Management (DWM) is one of six divisions of the Department for Environmental Protection in the Energy and Environment Cabinet. The departmental strategic operational plan for state fiscal year 2016 describes the mission of the agency:

Preserve and restore Kentucky's land through the development and implementation of fair, equitable and effective waste management programs.

To accomplish this mission, the department has developed a set of objectives to be implemented by each division; the objectives, tactics, and measures germane to DWM are:

Objective 1 - Ensure programs adhere to federal and state statutory and regulatory requirements.

Tactic 1.1: Review and revise administrative regulations, and propose legislative amendments to comply with federal regulatory requirements.

Measures:

- Number of legislative proposals drafted in the current fiscal year.
- Number of regulatory packages developed, promulgated and finalized in the current fiscal year.

Tactic 1.2: Provide resources and oversight to the regulated community to achieve compliance with federal and state regulations.

Measures:

- Number of underground storage tank owners/operators that completed the Kentucky Tank Operator Online Learning System (KY TOOLS) training.
- Percentage of underground storage tank owner/operators in compliance with the requirement to have Designated Compliance Managers.
- Number and percentage of solid waste sites submitting the Environmental Remediation Fee in accordance with KRS 224.43-500.
- The percentage of authorized hazardous waste facilities in compliance.
- The percentage of registered underground storage tanks in compliance.

- Number of facility inspections completed by staff to ensure regulatory compliance.

Tactic 1.3: Review and revise quality assurance documents annually and update as necessary.

Measures:

- Number of Standard Operating Procedures and guidance documents developed or revised in the current fiscal year.
- Number of Quality Assurance Project Plans developed or revised in the current fiscal year.

Tactic 1.4: Ensure waste management programs are fiscally and administratively viable.

Measures:

- The division staffing levels as compared to cap and budgeted amounts.
- The Number of grant programs administered and completed.

Objective 2 - Ensure permits are protective of human health and Kentucky's land resources.

Tactic 2.1: Issue appropriate, lawful permits in a timely manner.

Measures:

- Number of hazardous waste permit applications received.
- Number of hazardous waste permits pending review.
- Percentage of hazardous waste permit reviews completed within regulatory timeframes.
- Number of solid and special waste permit applications received.
- Number of solid and special waste permits pending review.
- Percentage of solid and special waste permit reviews completed within regulatory timeframes.
- Number of training classes completed by DWM staff.

Tactic 2.2: Reduce, eliminate, and maintain zero permits and permit activity backlogs.

Measures:

- Number of hazardous waste permits pending review outside regulatory timeframes.

- Percentages of hazardous waste permit reviews completed outside regulatory timeframes.
- Number of solid and special waste permits pending review outside regulatory timeframes.
- Percentages of solid and special waste permit reviews completed outside regulatory timeframes.

Objective 3 - Ensure remedial investigation, restoration, and management in place decisions are site specific, risk based, and environmental performance standards prone.

Tactic 3.1: Restore sites or manage contamination at sites with known or suspected releases to soil or groundwater.

Measures:

- The number of sites with known or suspected releases with potential human exposures where no further action is required or otherwise controlled because of implementing a management in place technique:
- Number of underground storage tank cleanups conducted that resulted in a no further action being issued and number remaining.
- Number of hazardous waste program corrective actions completed and number remaining.
- Number of EPA indicators corrective action measures achieved.
- Number of historic landfills remediated and number remaining.
- Number of solid and special waste facilities in groundwater assessment.
- Number of illegal open dumps remediated under the Kentucky PRIDE Program and number remaining.
- Number of tire dumps remediated under the Waste Tire Trust Fund and number remaining.
- Number of PRP-Lead State Superfund sites characterized and number remediated.
- Number of State-Lead sites remediated utilizing the Hazardous Waste Management Fund.
- Number of sites with a release of petroleum or a petroleum product remediated from a source other than a petroleum storage tank and number awaiting review.
- Number of methamphetamine-contaminated properties reported and number decontaminated.
- Number of emergency or incident responses made and number of cases closed.

Tactic 3.2: Plan, design and execute Final Closure Period activities at Maxey Flats while maintaining regulatory compliance.

Measures:

- Substantial completion of final cap construction by October 2016.
- Complete Institutional Control Period Work Plan by April 2016.

Objective 4 - Support and encourage economic redevelopment of property with real or perceived contamination.

Tactic 4.1: Provide oversight to the investigation, remediation, management, or redevelopment of properties with real or perceived contamination.

Measures:

- Number of cleanups conducted under state oversight via the Voluntary Environmental Remediation Program (see also DCA Brownfields measure).
- Number of brownfield sites assessed under the Targeted Brownfield Assessment Program and number awaiting review.
- Number of brownfield sites reviewed under KRS 224.01-415, number of eligibility letters issued, and number of concurrence letters issued.

Objective 5 - Minimize waste generation and disposal.

Tactic 5.1: Assure proper management and disposal of waste.

Measures:

- The compliance rates for authorized solid waste management facilities.
- The amounts, by weight, of litter, open dump waste, and household hazardous waste collected by counties through the Kentucky Pride program.

Objective 6 - Encourage beneficial reuse and recycling.

Tactic 6.1: Encourage reduced waste generation and disposal by promoting beneficial reuse, recycling, waste minimization, and pollution prevention.

Measures:

- Tonnage of municipal solid waste recycled or reused, by type.
- Tonnage of material recycled through the State Government Recycling Program.
- Tonnage of solid or special waste used as Alternate Daily Cover (ADC).
- Percentage of solid or special waste used as Alternate Daily Cover (ADC).
- Number of waste tires used in tire-derived fuel projects, crumb rubber grants and other beneficial reuse purposes as a percentage of number of tires generated.
- Number of solid waste beneficial reuse determinations.
- Number of registered special waste beneficial reuse sites.
- Number of land farming and composting facilities.
- Number of recycling grants and total amount of funding administered.

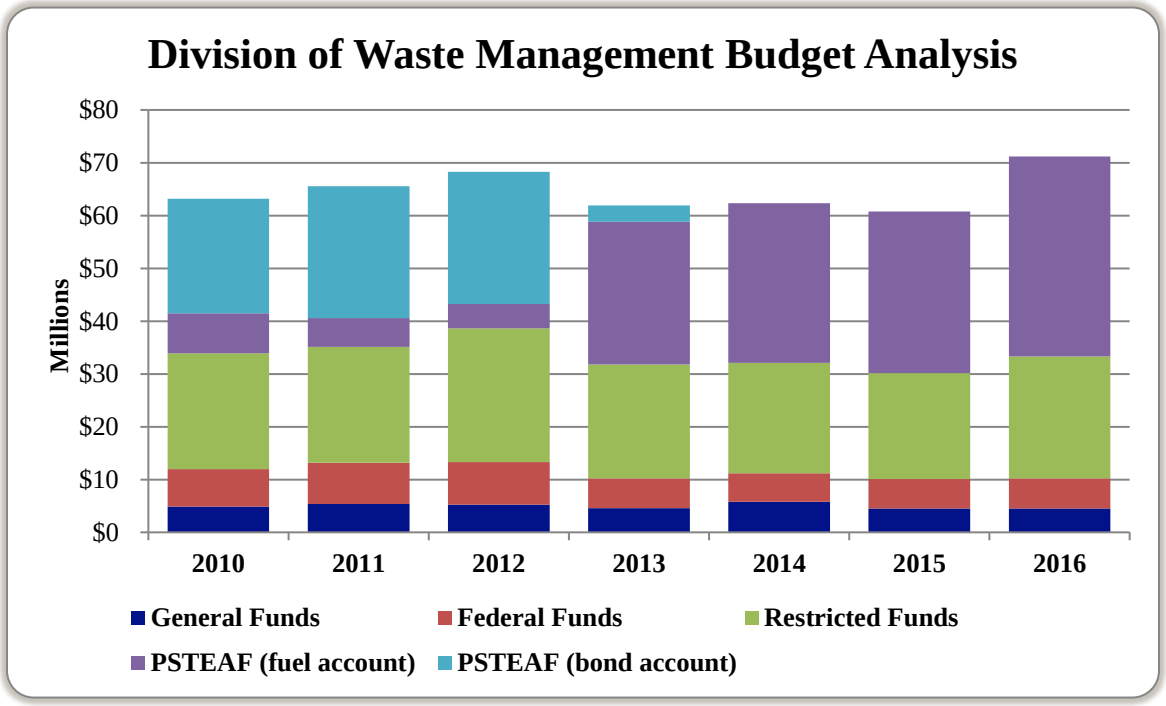
PROGRAM PLANNING & ADMINISTRATION

The mission of the Program Planning and Administration Branch (PPA) is to promote sound waste management programs by providing administrative and operational support to all branches in the division through efficient and effective financial administration, personnel management, and regulatory development.

Budget

The budget for DWM is very complex; covering a host of programs and activities, as well as, partially funding work charged by the Division of Enforcement and the Environmental Response Team. The division is financially supported by general funds, federal grants and restricted funds, including fees collected for permits and registration activities, the Petroleum Storage Tank Environmental Assurance Fund (PSTEAF), the waste tire fee, the environmental remediation fee, and an annual appropriation from the road fund. The division must utilize available funding sources in the most resourceful and equitable manner possible, while striving to achieve the cabinet's environmental goals and division priorities.

Figure 1



The DWM had the budget to employ 236 full-time permanent employees in 2016. The number of employees the division could fiscally maintain has decreased nearly 14 percent since 2010. This

reduction in personnel continues to challenge the division programs to operate more efficiently and identify program priorities.

Figure 2

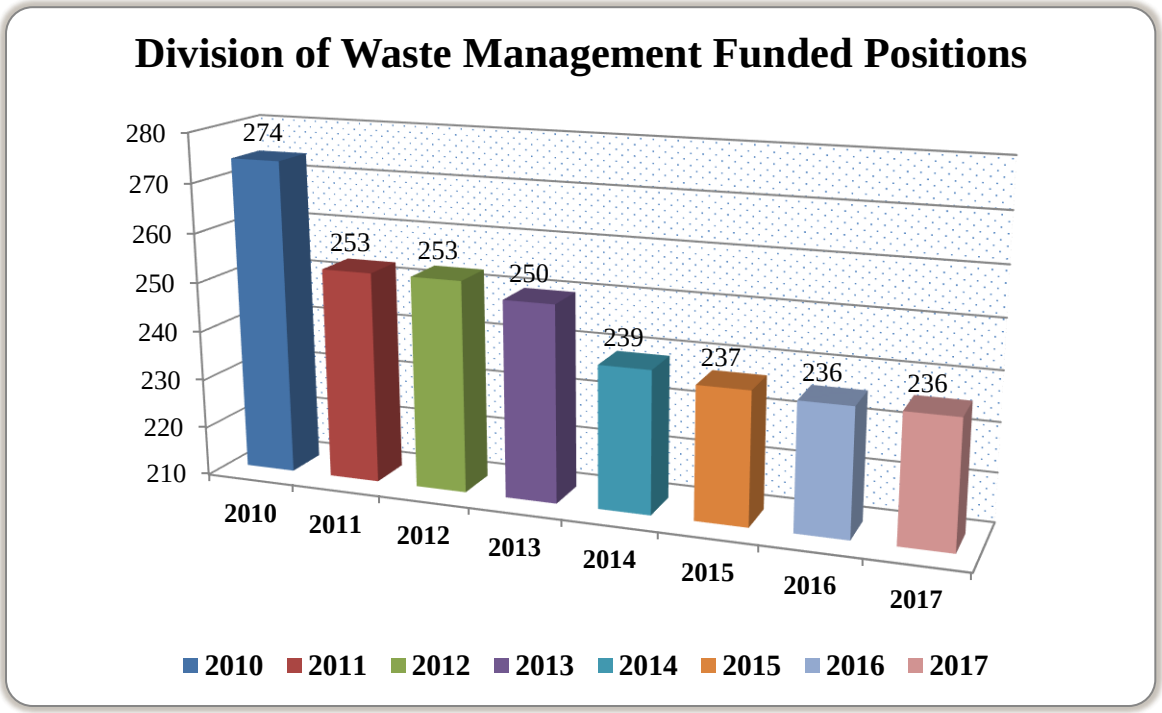
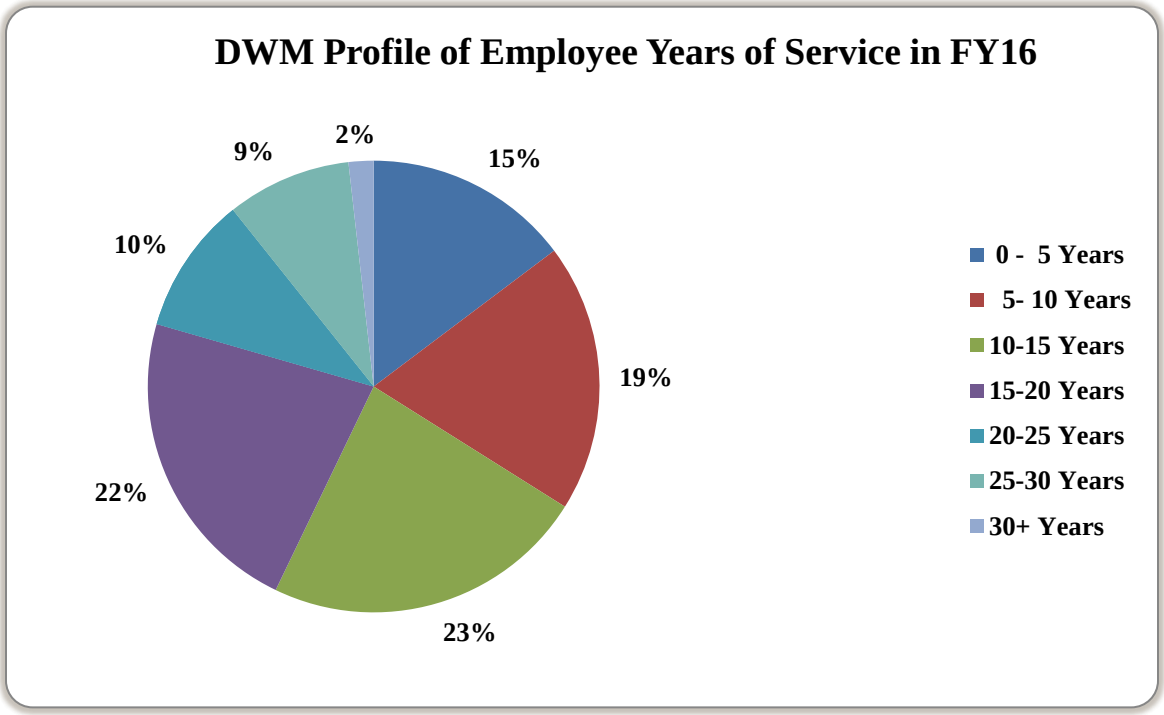


Figure 3



Project Administration Section

The Project Administration Section performs the division's procurement, contract administration and grant management. This section also handles the division's accounts payable functions and payment processing for major fee-supported programs.

This section typically manages a number of personal service contracts and memoranda of agreements with other government entities each year. In FY16, the division issued a request for proposals (RFP) and awarded a new personal service contract to engineer George Gilbert as a consultant assisting the division's Waste Tire Program with the on-going development of pilot rubber-modified asphalt projects. Also new in FY16, the division entered into a memorandum of agreement contracting Western Kentucky University to perform geophysical services related to site assessment and characterization of Superfund, Underground Storage Tank, and Solid Waste sites.

Many of the division's programs are completely supported by federal funds, while others are only partially or not supported by federal funds at all. Currently, DWM receives funding from a total of 13 federal grants. This financial support includes:

- The Assembled Chemical Weapons Alternative (ACWA) Grant from the U.S. Department of Defense (DoD) provides financial support for the division's efforts to ensure the compliance of storage regulations; review, amend and approve permit applications; keeping stakeholders and the community informed of activities; and to ensure compliance during construction and operation of the Bluegrass Chemical Agent-Destruction Pilot Plant (BGCAPP) and the Explosive Destruction Technology (EDT) processes.

- The Agreement in Principle (AIP) with the U.S. Department of Energy (DOE) funding allows DWM to conduct independent and impartial assessments of potential environmental impacts of DOE activities at the Paducah Gaseous Diffusion Plant (PDGP). Through the support of the agreement, DWM is able to manage independent environmental monitoring and research. The funds also allow DWM to enhance communications with concerned citizens.

- Under Section 128(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the U.S. Environmental Protection Agency (EPA) provides financial support to the Brownfield Redevelopment Program to address the assessment, cleanup, and redevelopment of brownfield sites and other sites with actual or perceived contamination.

- Financial assistance from the EPA's Core Program Cooperative Agreement (Core) helps the division's Superfund Program carry out its activities and responsibilities under CERCLA. Furthermore, the Core grant supports DWM in identifying, investigating and addressing environmentally contaminated sites under CERCLA.

- The Department of Defense and State Memorandum of Agreement (DSMOA) provides funding to improve communication, coordination, and cooperation between DOD and DWM in providing protection of human health and the environment on DOD installations in Kentucky. The DSMOA program ensures environmental restoration at DOD installations occur in compliance with applicable state and federal law.

- The Federal Facilities Agreement (FFA), a three-party agreement between DOE, EPA, and Kentucky, was developed to ensure compliance with and avoid duplication between the corrective action provisions of the Resource Conservation and Recovery Act (RCRA) permitting program and the corrective action requirements under CERCLA at the PGDP site. The FFA outlines regulatory structure and guides interactions between the three parties.

- The Five-Year Review Cooperative Agreement (FYR) provides funding from the EPA to the Superfund Program to perform five-year reviews of remedial action at National Priority List Sites (NPLs) in Kentucky. The purpose of a five-year review is to determine whether a site's ongoing or completed remedial actions will remain protective of human health and the environment.

- The Leaking Underground Storage Tank (LUST) Cleanup Cooperative Agreement with the EPA provides financial assistance to the Underground Storage Tank (UST) program with funding to oversee the cleanup of leaking underground storage tanks by responsible parties and to ensure the cleanup at sites where an owner or operator is unwilling or unable to take necessary corrective action.

- The LUST Prevention Assistance Agreement with the EPA provides financial support for the development, implementation, and maintenance of the UST program and the promotion of the detection, prevention, and enforcement of leaky USTs in Kentucky.

- With financial support from the Preliminary Assessment/Site Investigation Cooperative Agreement (PASI), the Superfund Program assists the EPA with the evaluation of sites with known or suspected releases of hazardous substances, pollutants, or contaminants. Under PASI, DWM assists the EPA through all aspects of the site assessment process and helps identify candidate sites for the NPL list, consisting of CERCLA sites that represent the most significant risk to human health and the environment.

- The Resource Conservation and Recovery Grant (RCRA) provides the division's Hazardous Waste Management Program with the financial support necessary to implement RCRA permitting, corrective action, closure, compliance and enforcement in accordance with the EPA's performance expectations.

- The Support Agency Cooperative Agreement (SACA) provides additional financial support to the Superfund Program to perform five-year reviews of remedial action at National Priority List Sites (NPLs) in Kentucky.

- The EPA's Substances Control Act (TSCA) Compliance Monitoring Cooperative Agreement provides financial support to the division to implement the polychlorinated biphenyls (PCBs) compliance monitoring program. The agreement allows the Field Operation Branch to perform PCB inspections, generate inspection reports, and track facility information in the PCB Transformer Registration Database.

Personnel and Administrative Support Section

The Personnel and Administrative Support Section performs support-related duties for PPA and DWM. These duties include the coordination and procurement of goods and services on state contracts such as office supplies, equipment, furniture, uniforms, and boots for DWM's Central Office. This section provides support in identifying facility needs for division personnel including workspace logistics and new phone installation.

In addition, this section is tasked with the coordination of employee training and development along with in-state and out-of-state travel logistics and reimbursement. In FY16, division personnel completed approximately 5,050 trainings and career development opportunities. This large increase, over last year, was largely a result of the implementation of new departmental safety and supervisory training requirements.

In FY16, DWM began full implementation of the Kentucky Enterprise Learning Management System (KELMS). This new statewide system allows the division to customize learning plans, track employee progress toward certification plans and programs, participate in eLearning delivery with automatic transcript reconciliation, and self-registration for agency instructor-led training. As part of the new department training requirements, DWM employees were enrolled in various curricula in KELMS based upon their job function. The curricula consist of a series of required online-training modules and instructor-led courses. All DWM employees were required to complete the DEP safety training curriculum while field and technical personnel were also required to complete an additional training curriculum. Expanding on cabinet requirements, the division also began to implement departmental training requirements for managers and supervisors.

This section also works closely with the Environmental Response Team (ERT) processing invoices and payments related to emergency responses and cleanups. In FY16, 44 new ERT contracts were awarded to vendors, 26 of which were done so under an emergency declaration. Moreover, this section provides support in pursuing the recovery of response costs when a viable responsible party is available. For FY16, DWM was able to recover a total of $144,014 in emergency response costs. These funds were deposited back into the Hazardous Waste Management Fund, to be utilized again for the remediation of environmental contaminations throughout Kentucky.

Program Development Section

The Program Development Section performs a variety of functions related to the division's future such as managing planning initiatives and development of regulations along with coordinating review of proposed bills during the legislative session.

Regulation Development:

The division is currently drafting two regulatory packages to incorporate federal rulemakings. The Hazardous Waste Program's administrative regulations are incorporating several federal rulings including the change to the definition of solid waste. These changes will then be incorporated into a new authorization package for EPA submittal and approval. Regulations are also being developed for the Solid Waste Program to permit coal combustion residual facilities that are generating electricity in response to the federal ruling on April 17, 2015.

Amendments to administrative regulations currently in progress within the division include revisions to the Recycling and Local Assistance Program (RLA) and the Underground Storage Tank (UST) Program. RLA amendments include the revisions to several forms to streamline the reporting process. UST amendments include additional requirements related to delivery prohibition in an effort to increase compliance.

Legislation:

During 2016 Legislative Session there were amendments for KRS Chapter 224 Environmental Protection.

KRS 224.50-130 directs the Energy and Environment Cabinet to reclassify any residues of the demilitarization process (secondary wastes) to ensure proper management and disposal consistent with the toxicity and hazard potential of those residual waste streams. Before, these secondary wastes carried the same waste codes. 401 KAR 31:040 was amended to address House Bill 106 of the General Assembly, which provided for the destruction of chemical munitions at Bluegrass Army Depot. This administrative regulation also reclassified aluminum processing wastewater from the automotive industry as a nonacute hazardous waste under specific circumstances, including that the waste shall not be placed on the land. This statute became effective April 6, 2016.

The new tire fee established in KRS 224.50-868 was extended as a part of the budget bill until June 30, 2018, to provide funding for waste tire amnesties, crumb rubber grants, tire-derived fuel projects, grants to counties for tire recycling and disposal, and to administer the waste tire and solid waste programs. The previous deadline was June 30, 2016.

KRS 224.60-130 requires the cabinet to make reimbursements of corrective action projects performed under the petroleum storage tank account shall be carried out on or before July 15, 2024. The previous deadline was July of 2019.

KRS 224.60-142 extended the deadline for the owners of any petroleum storage tanks to register for participation in the fund, submit affidavits and file applications for their tanks in the Petroleum Storage Tank Environmental Assurance fund July 15, 2021. The previous deadline was July of 2019.

KRS 224.60-145 extended the small operator assistance account and small operator tank removal account programs July 15, 2021. The previous deadline was July of 2016. Also, "sunsetting of account claims activity" was added to the title of the statute.

Reports:

Two legislative reports were prepared in FY16. The Hazardous Waste Management Fund Report provided information related to the commonwealth's Hazardous Waste Management Fund (HWMF) including information related to the expenditures and revenues of the HWMF for fiscal years 2015 and 2016. The Waste Tire Trust Fund Report discussed the expenditures and revenues, effectiveness in developing markets and the fee in funding the cabinet's implementation of the waste tire program and recommendations for improvement for Kentucky's Waste Tire Program.

Additional reports prepared included the division's Strategic Operational Plan and mid-year status updates of planning initiatives for 2016, and DWM's portion of the Quality Assurance Annual Report.

BRANCH HIGHLIGHT

New 300 Building at Sower Boulevard

By John Maddy

On June 19, 2015, former Secretary Leonard Peters officially announced the Energy and Environment Cabinet (EEC) had been selected as the primary occupants of a new facility being constructed at 300 Sower Boulevard, located on the south side of Frankfort, with a completion date of June 30, 2016. The announcement was significant as it would be the first time all Frankfort EEC agencies would be located in one building.

By August 2015, cabinet and department committees were established to plan and facilitate the eventual move to the Sower location deemed the 300 Building. The committees met on a routine basis to discuss issues, make necessary assignments, and recommend policy decisions to the Cabinet Secretary related to the new facility and move. As the Department for Environmental Protection (DEP) had accumulated files, supplies, furniture and personal items over the years at the Fair Oaks campus, it was obvious that cleaning efforts would be necessary in order to ready the agency for the move. As a result, DEP had to accelerate its ongoing Paper Elimination Project, with staff putting in extra hours to ensure paper files were accurately scanned and archived into the TEMPO enterprise system. Several cleanup days were also held during the spring and fall seasons to downsize the amount of agency files and equipment.

The primary construction of the new facility would be completed ahead of schedule. This allowed EEC agencies to begin moving in on June 1, 2016, a full month before originally planned. Over a series of four weeks, agencies transferred personnel, files and equipment from various EEC facilities within Frankfort and Franklin County. In most cases, EEC personnel experienced less than a 24-hour downtime as they were relocated, minimizing any interruption to business operations. The Kentucky Education and Workforce Development Cabinet and the Kentucky Department of Education have joined EEC in the new office building.

The new building, a five-story, 371,160 square foot structure, was constructed to house 1,457 employees. In February of 2015, the Finance and Administration Cabinet signed a design-build-finance-operation agreement with CRM/Wilburn LLC, a building management company based in Lexington. As a public-private partnership, also referred to as a P3, the state would lease the building for the next 35 years before taking ownership under the agreement.

As a LEED (Leadership in Energy and Environmental Design) certified facility, the building was designed to have a 19 to 26 percent reduction in utility expenditures compared to existing offices. A large number of energy efficiency and sustainability items were installed, including natural day lighting, LED fixtures, high-efficiency mechanical equipment and low-flow plumbing. The building also included a one-mile walking trail around the building, wildlife habitat areas with native grass and plant landscaping, a fleet parking lot and five inclement weather shelters to provide protection for employees. Still to come, the building will include a food service area with a capacity for up to 200 employees, a snack bar and an on-site employee health clinic. In addition to the several amenities scheduled to be completed in the coming months, a 4,000 square foot building that will house fleet management offices and equipment storage will be constructed.

New State Office Building at 300 Sower Blvd., Frankfort, Kentucky
EEC Photo

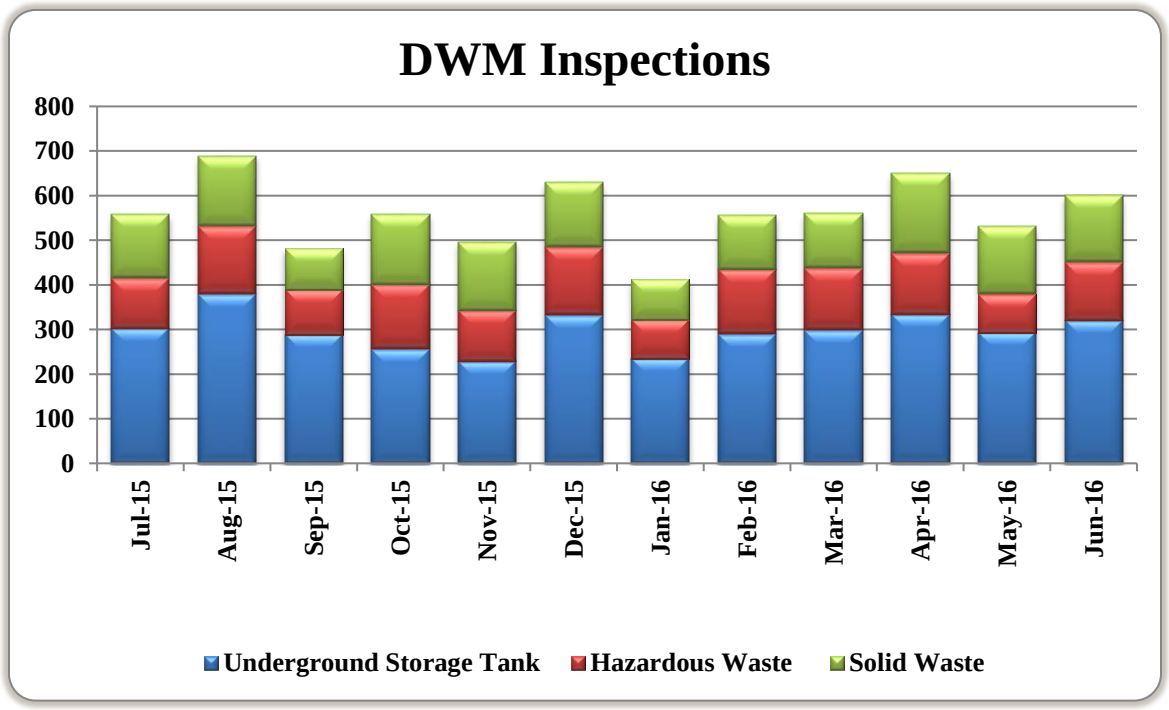
FIELD OPERATIONS

The mission of the Field Operations Branch is to identify and abate imminent threats to human health and the environment through fair and equitable inspections, technical assistance and education.

This branch performs inspections at sites managing solid waste, hazardous waste, underground storage tanks (USTs) and polychlorinated biphenyls (PCBs). The primary duty of a regional inspector is to inspect for the compliance of regulated facilities.

This branch includes a central office and ten waste management regional offices located throughout Kentucky. Regional personnel are familiar with the local waste management issues and can respond to questions and concerns.

Figure 4



During FY16, the Field Operations Branch conducted a total of 6,722 UST, solid waste, and hazardous waste inspections. There was a two percent decrease over FY15 (Figure 4).

This branch conducted 3,558 UST inspections, fifty-three percent of the overall totals this fiscal year. This was one percent higher than the previous fiscal year. The compliance rate for UST inspections increased one percent over the previous year, to 52%. The increase in compliance

rates can be attributed, in part, to awareness of the new regulations which incorporated provisions of the Energy Policy Act of 2005. There was a nine percent decrease of UST Notices of Violations in FY16 compared to FY15.

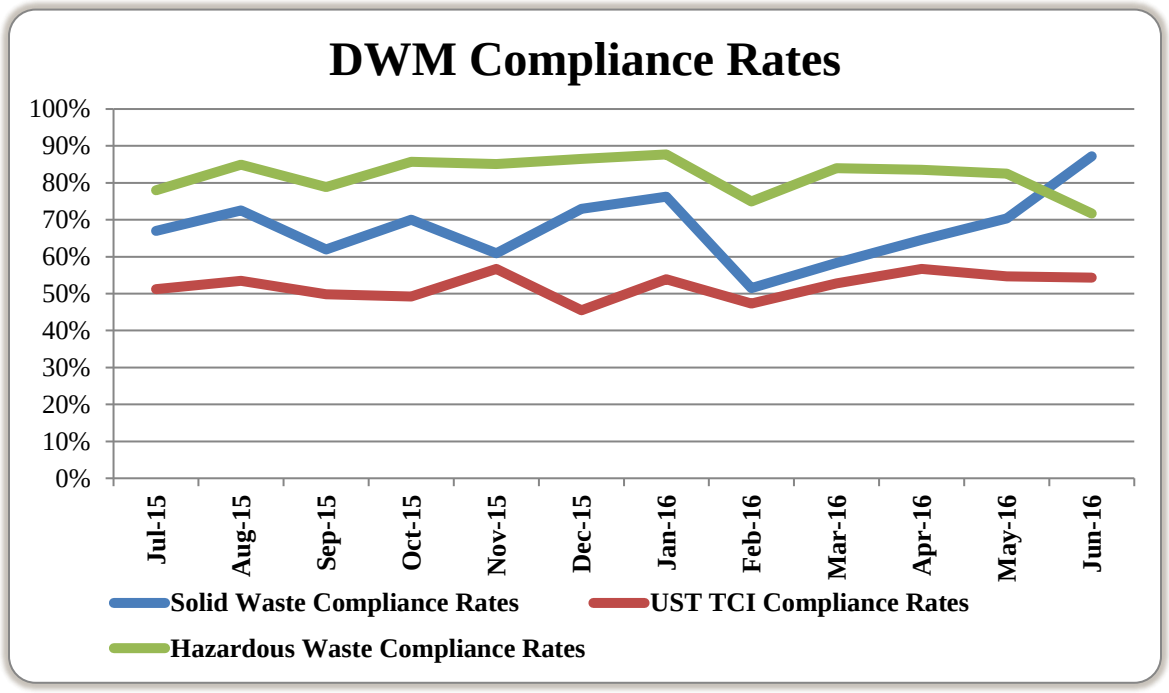
There were 1,644 solid waste inspections conducted. The compliance rate for solid waste facilities was 68%, remaining the same as the previous fiscal year.

This branch conducted 1,524 hazardous waste inspections during FY16, a six percent decrease from the previous year. This decrease was due, in part; to reduced inspections for conditionally exempt small quantity generators. These generators are typically in compliance with fewer requirements and are not required to be inspected by DWM's grant. The compliance rate remained at the previous year's rate, 82%.

There were 2,009 complaint investigations conducted; an eight percent decrease from fiscal year 2015.

Overall, there were a total of 8,731 inspections and investigations conducted, an eight percent decrease from the previous year.

Figure 5



Note: *"Compliance Rate" means the percent of total inspections when an inspector recorded no violation had occurred. This does not include investigations triggered by citizen complaints. "UST TCI" means a technical compliance inspection for a site's USTs.*

Emergency Response

KRS 224.1-400 establishes the cabinet as the lead agency for hazardous substance, pollutant or contaminant emergency spill response. The Department for Environmental Protection maintains a roster of field personnel who serve as part of the Environmental Response Team (ERT). They are the first to respond to environmental emergencies. In FY16, the ERT Team had 12,943 incidents, 531 emergency responses and closed 525 cases.

ERT is part of the Kentucky Natural Disaster Plan, which was formed after the severe tornados of 1974. They respond to natural disasters such as floods, tornados and other severe weather, earthquakes, forest fires, landslides and water shortages. During natural disasters, ERT helps ensure the stability of hazardous materials and works to limit environmental damage.

BRANCH HIGHLIGHT

Inspection Schedule for River Cities Disposal

By Brian Osterman

An Agreed Order of Judgment was entered by Boyd Circuit Court between the Citizens of Boyd County Environmental Coalition, Inc. and River Cities Disposal, LLC, and the Energy and Environmental Protection Cabinet (EEC) on November 24, 2015. One of the provisions was for the cabinet to provide the equivalent of one full-time Department of Environmental Protection staff member to monitor conditions at River Cities Disposal's facility at Big Run Landfill until completion of the final cap. The location and acreage was also stipulated in the agreement.

Big Run Landfill, Installation of Final Cap, South Slope, Units 1 & 2, Phase 2
Photo by DWM's Morehead Regional Field Office

The Division of Waste Management's (DWM) Morehead Regional Field Office was tasked with preparing an inspection rotation schedule; Monday through Friday and also including Saturdays, until September 1st, 2016, per the agreed order.

Big Run Landfill is scheduled to complete final construction of the cap by September 1st as ordered. The Morehead Regional Field office personnel have conducted 71 inspections resulting in 443 hours worked to ensure compliance with the Agreed Order. Thirteen of the inspections were held on Saturday. This branch's employees voluntarily worked several Saturdays at the landfill, cooperating as a team for maximum effectiveness. DWM was required to provide staff onsite during the construction phase of the final cap. Twenty-five acres were being closed and rail waste was no longer being accepted. Big Run Landfill is on schedule to complete the final construction phase of the cap by September 1st per the agreed order.

HAZARDOUS WASTE

The Hazardous Waste Branch oversees the management of hazardous waste from generation to disposal. This involves the promotion of hazardous waste minimization, hazardous waste management, and remediation of hazardous waste releases. These activities are accomplished through permitting, corrective action (cleanup), registration and reporting requirements.

Hazardous Waste Corrective Actions

The Corrective Action Section completed several significant activities of interest during the 2016 fiscal year are described below. It is noteworthy that, through many years of work, all state-lead sites have now attained the "Human Exposures Controlled" and "Groundwater Releases Controlled" Environmental Indicators (EI) designation; two measures of progress tracked by the U.S. Environmental Protection Agency (EPA) and Congress. This section has continued to meet or exceed U.S. EPA progress goals for EI's determinations, groundwater monitoring system inspections, renewal and issuance of post-closure permits, and the review of work plans and reports.

Environmental Indicators Determinations Completed:

In FY 2016, sixteen EIs were completed. A "Human Exposures Controlled" and a "Groundwater Releases Controlled" determination were completed for the Federal Mogul facility. There was a "Remedy Selected" accomplishment for the former Rohm and Haas site. Two "Remedy Constructed" determinations were completed for: Dyno Nobel and Huntington Alloys. Determinations were made documenting "Corrective Action Performance Standards Attained" or "Corrective Action Terminated" for eleven facilities.

Groundwater Monitoring System Evaluations Conducted:

Six groundwater monitoring system evaluations were conducted during FY 2016. Operations and Maintenance (OAMs) inspections were conducted at these sites: Ashland Route 3, Ashland Viney Branch, Dow Corning, Hallmack and Luvata Franklin. A Groundwater Monitoring Evaluation was conducted at Fort Knox. No major problems were discovered with any of the monitoring programs inspected.

Post-Closure Permits Renewed/Issued/Tentatively Terminate:

The post-closure permit for the Luvata facility was renewed during FY 2016. The former Collis facility's post-closure permit was officially terminated.

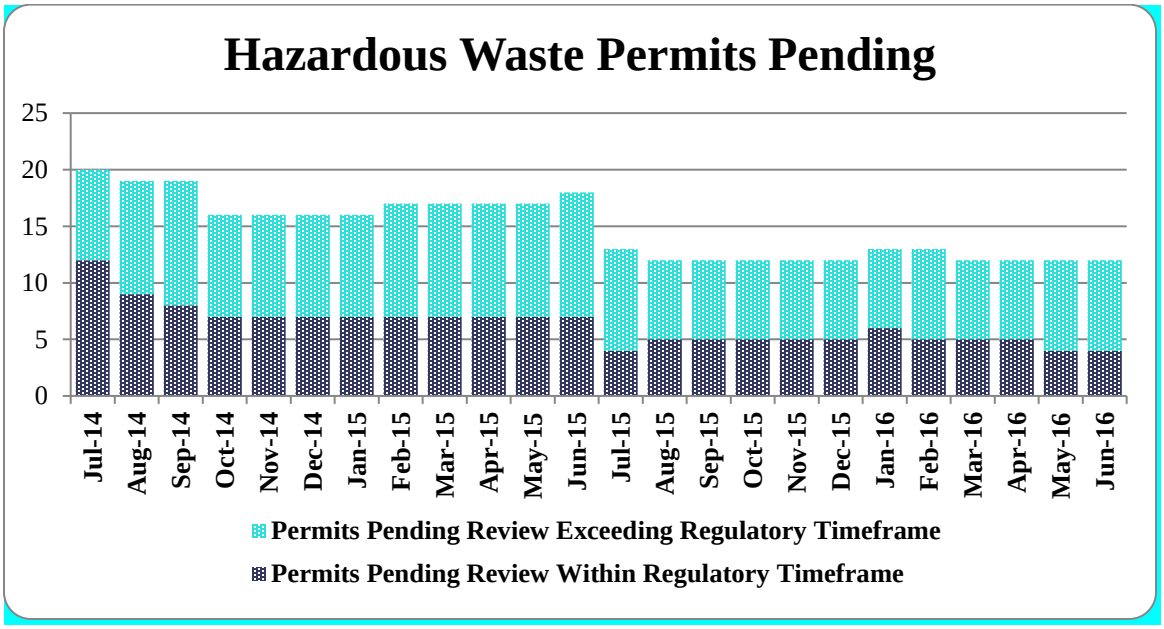
Investigation and Remediation Work Plans and Reports Found Deficient or Approved:

During FY 2016, forty-five investigations and remediation work plans, reports and associated documentation submittals were acted on. Nine Approvals or Notices of Technical Inadequacies were completed for Corrective Measures Study/Corrective Measures Implementation Plans. Three Interim Measures Work Plans were approved. The relatively high number of CMS/CMI activities is indicative of the maturation of the program with more facilities reaching the remediation phase, as many investigations are complete or near completion. Significant progress in the planning, physical or legal phases of the remedial process was made at the Philips Lighting, Lexmark, Arkema, Continental Refining, Federal Mogul, Rail Services, and Rohm and Haas sites.

Hazardous Waste Permitting

The total number of pending permit applications remained steady. At the end of FY16, four hazardous waste permits were pending review within the regulatory timeframe. Eight hazardous waste permits were pending review that had exceeded the regulatory timeframe. Permits or modifications were issued to the Paducah Gaseous Diffusion Plant, Luvata Franklin, The Blue Grass Army Depot, and PMC Organometallix in FY16.

Figure 6



BRANCH HIGHLIGHT

Hazardous Waste Regulation Changes

By Dale Burton, P.G.

On March 25, 2016, House Bill 106, which proposed changes to KRS 224.50-130, was passed by the Kentucky General Assembly. The bill was signed into law by Governor Matthew G. Bevin on April 6. This bill included an emergency provision, and thus became effective upon the governor's signature.

KRS 224.50-130 is a Kentucky statute, originally approved in 1988, that specifies requirements related to the storage and treatment of nerve and blister agents at the Blue Grass Army Depot in Richmond. The 2016 changes to the statute consisted of two main parts:

1) The Energy and Environment Cabinet is directed to reclassify secondary wastes, created by the destruction of the chemical weapons, to ensure proper management and disposal of those waste streams. All of these secondary wastes will have already met strict treatment standards to destroy the chemical agents. Previously, the secondary wastes would have carried the same waste codes as the agent-filled weapons themselves, and could have led to confusion in the event of an emergency response incident.

2) The destruction facility, which consists of the Blue Grass Chemical Agent Disposal Pilot Plant (BGCAPP) and the Explosive Destruction Technology (EDT) operation, is required to provide assurance of chemical agent destruction and removal efficiency (DRE) of 99.9999% ("six nines"). Previously, the requirement was to meet "six nines" destruction efficiency (DE). The technical change from DE to DRE is consistent with the approach used at other stockpile destruction facilities, and will allow the facility to include removal of agent using carbon filtration as part of the efficiency measurement. The older DE standard would have been virtually impossible to measure accurately due to the extremely low levels of agent involved.

Both changes necessitated revising the associated regulations. Change number one resulted in the cabinet's promulgation of an emergency regulation, 401 KAR 31:040E, which was signed by Governor Bevin on April 24, 2016, and immediately became effective. The regulation specifies 16 new secondary waste codes which result from the destruction of the chemical weapons.

Change number two affected 401 KAR 34:350, which is scheduled to be revised later this year as part of a larger regulation update package. However, these changes can be implemented in the

meantime as a statute takes precedence over a regulation, and the corresponding regulation only requires a technical change.

The changes to 401 KAR 31:040 also included two unrelated updates that were needed to keep Kentucky's Hazardous Waste Program equivalent to the federal Resource Conservation and Recovery Act (RCRA):

1) Hazardous waste listing F019 was updated to match the federal regulation, which exempted wastewater treatment sludges from zinc phosphating when used in motor vehicle manufacturing.

2) The regulation excluding comparable/syngas fuels from the Hazardous Waste Program was deleted because the U.S. Environmental Protection Agency removed the rule due to an order issued by the D.C. Court of Appeals on June 27, 2014.

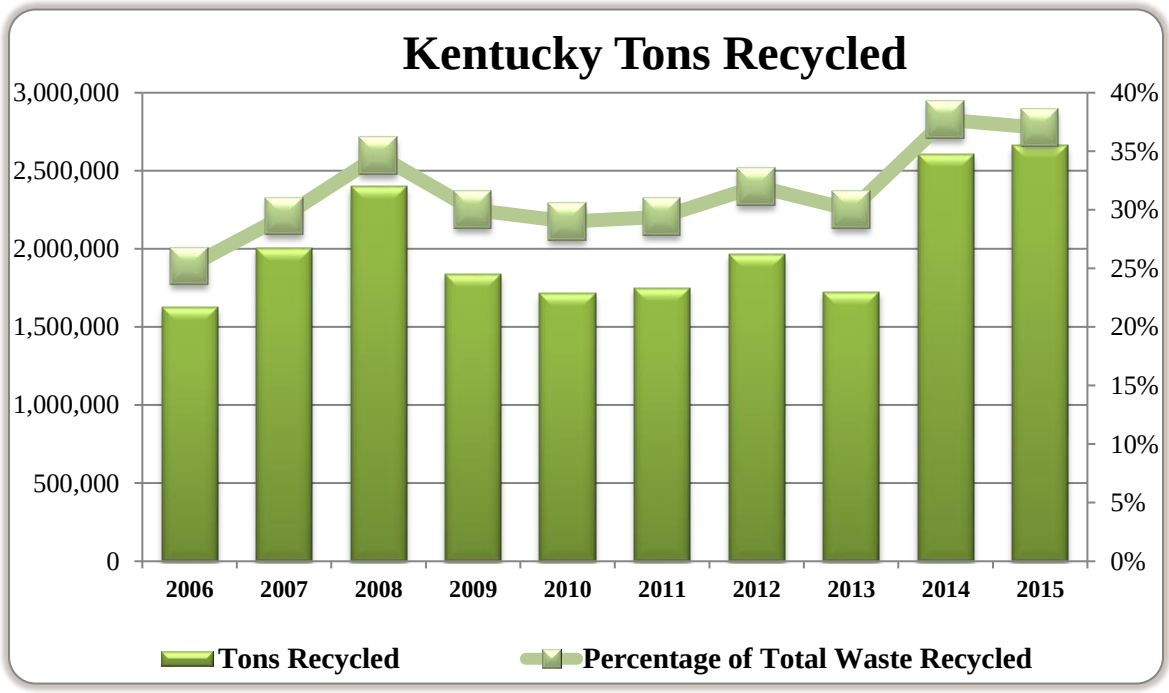
In summary, the statutory changes will streamline the management of secondary wastes, and will allow more accurate calculation of the chemical agent destruction and removal efficiency. Neither change will affect the safety or protectiveness of the mission to destroy the chemical weapons.

RECYCLING & LOCAL ASSISTANCE

The Recycling and Local Assistance Branch provides technical and financial assistance and training to public and private entities on solid waste and recycling, while promoting individual responsibility and accountability for proper solid waste management.

In accordance with KRS 224.43-315, recyclers are required to report annually to their county the amount of municipal solid waste collected for recycling by volume, weight, or number of items, and the type of items recycled. Data received for the 2015 report year showed a statewide recycling rate of 36.6 percent, which is a small decrease from 37.7 percent in 2014. This fluctuation may be due to market forces (low commodity prices) or simply reflect minor inconsistencies in data collection and reporting methodologies from year to year. This branch relies on individual counties and recycling operations to report accurate data. A strong effort is made to confirm and cross check these numbers, however, it is not always possible to ensure that entities are generating their data consistently and uniformly.

Figure 7



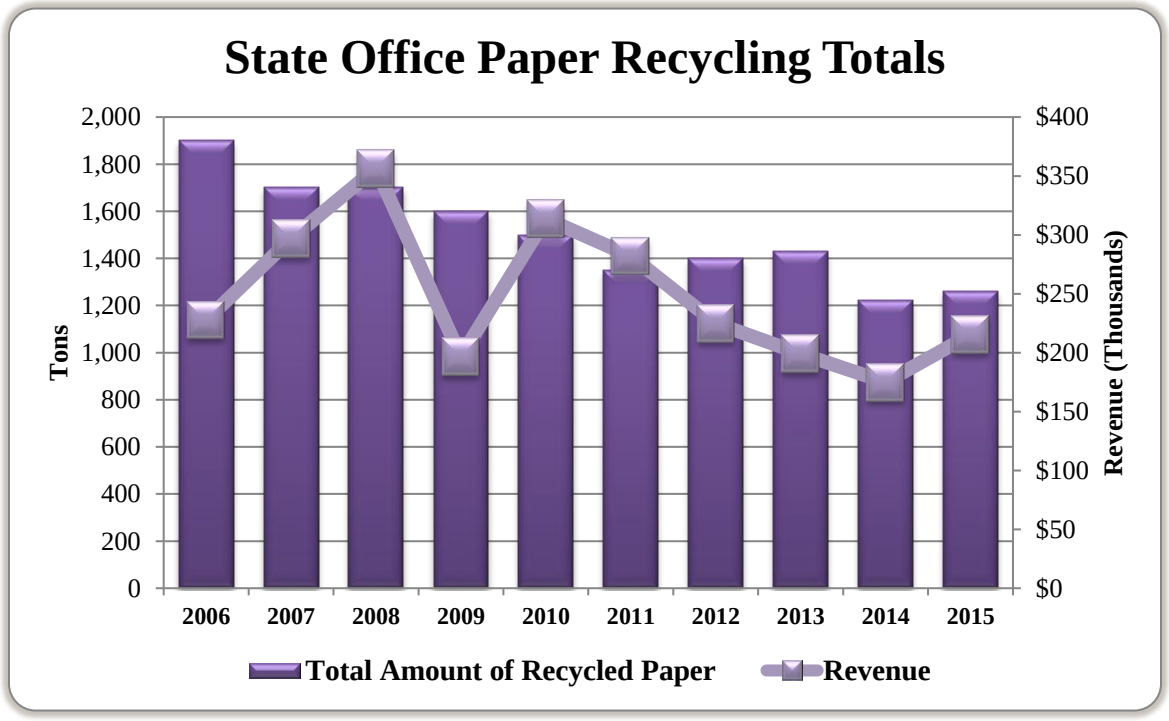
While recycling of metals and paper has grown significantly, statewide data shows a large drop in total glass, plastics and electronic scrap recycling since 2014. Specific recyclable commodity markets are discussed below.

The State Office Paper Recycling Program

The Government Recycling Section continues to operate the State Office Paper Recycling Program, serving more than 115 agencies in Frankfort. This program continues to be self-supporting; funding nine full-time and two temporary employee positions.

The program offers free pickup and document destruction of governmental office paper. Their location on Northgate Drive in Frankfort offers a secure environment to ensure proper processing of confidential documents. Office paper represents 80 percent of the waste stream in the office environment. Since 2006, state employees recycled more than 15,062 tons of waste paper, generating approximately $2.5 million in revenue. In 2015, state employees recycled 1,262 tons of waste paper, an average of approximately 232 pounds per state employee. It is notable that this section saw a significant increase in revenue in 2015. This is likely due to improved sorting techniques that resulted in a higher market value for the processed paper.

Figure 8

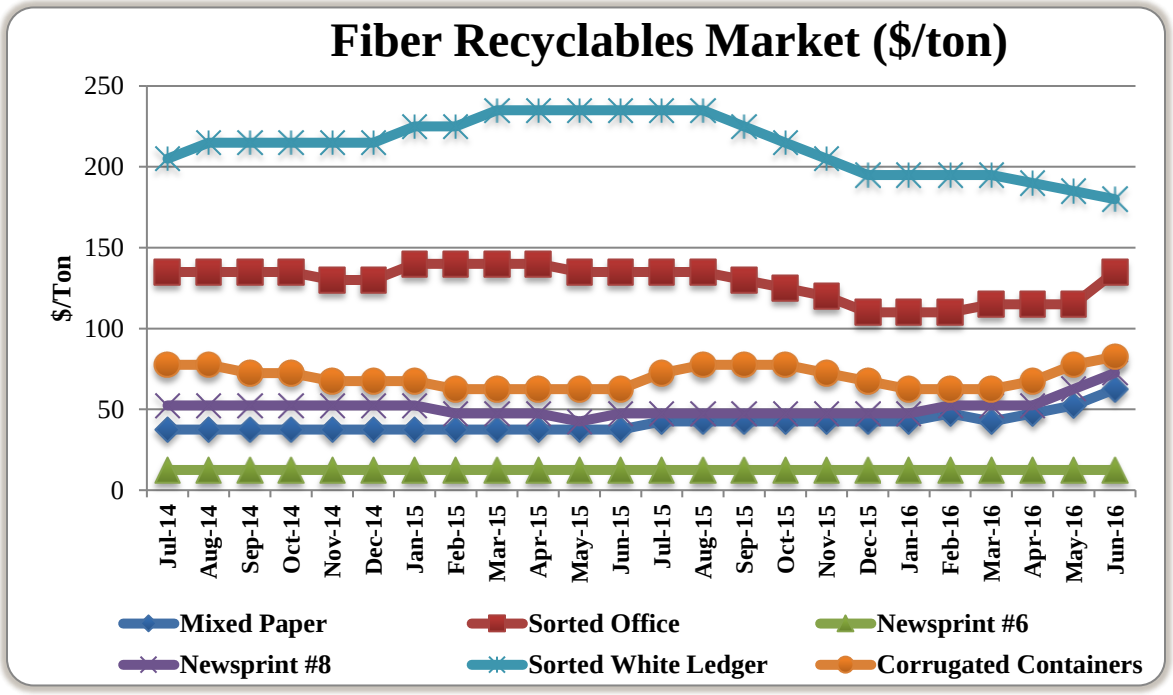


The Marketplace

Through publication of *The Marketplace* newsletter, the division reports on the prevailing prices paid for aggregate recyclable materials. The charts in figures nine through twelve demonstrate the trends for various commodities.

The MARKETPLACE For Recycling Commodities

Figure 9



Notes:

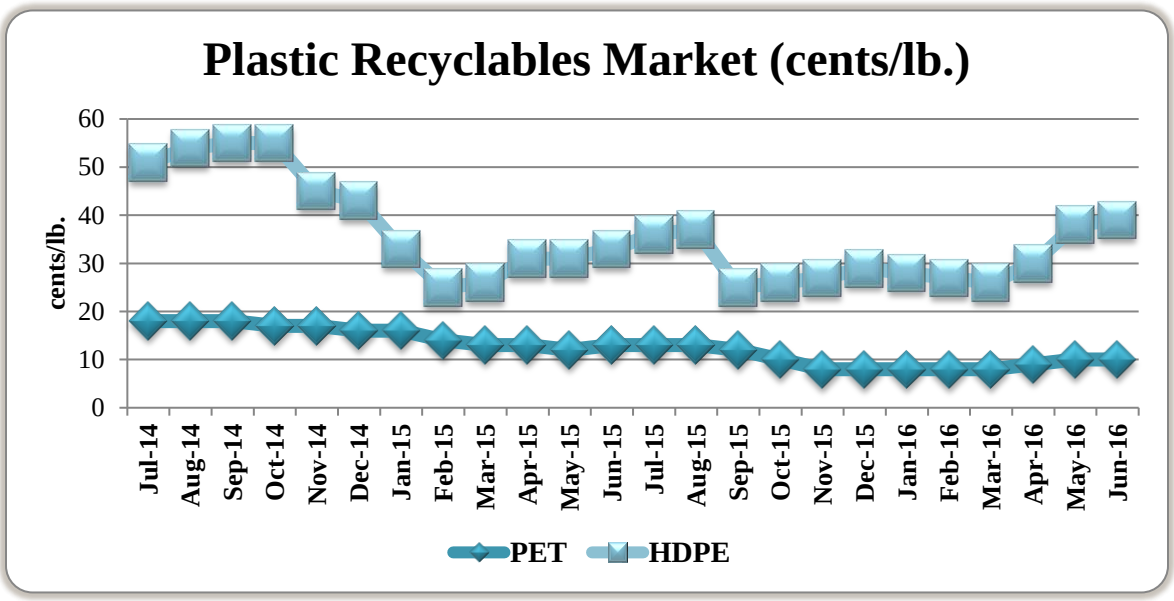
"Corrugated Containers" (OCC) means, typically, brown cardboard boxes.
"Mixed Paper" means a lower grade of material that includes slick advertising inserts, junk mail, paperboard containers and other types of paper mixed together.
"Newsprint #6" (ONP) means baled newspaper that typically has more advertising slicks, paper and plastic bags, magazines, and types of paper other than newsprint.
"Newsprint #8" (ONP) means baled sorted newspaper, with no sun exposure, with the typical amount of slick advertising inserts, as would be delivered to a home or at a newsstand.
"Sorted Office" (SOP) means an assortment of white, colored and coated, ground wood-free copier and printer paper.
"Sorted White Ledger" (SWL) means white paper.

Recycled paper will continue to be critical to the shipping industry (cardboard containers), some media (news, magazines, junk mail and bills), commerce/business, and tissue/toweling. All of the producers of these items are heavily invested in using recycled content and must have reliable volumes of quality fiber to support their production. There is no alternative in the foreseeable future. The available tonnage of recyclable paper/paperboard will continue to dwindle, but demand is expected to stay consistent, leading to increasing prices for recovered paper.

Bulk grades such as Mixed Paper, ONP, and OCC are actively, if slowly, moving upward. Slow growth is good and drastic declines are not likely. SOP and SWL are stagnant but on the verge of coming back to previous levels.

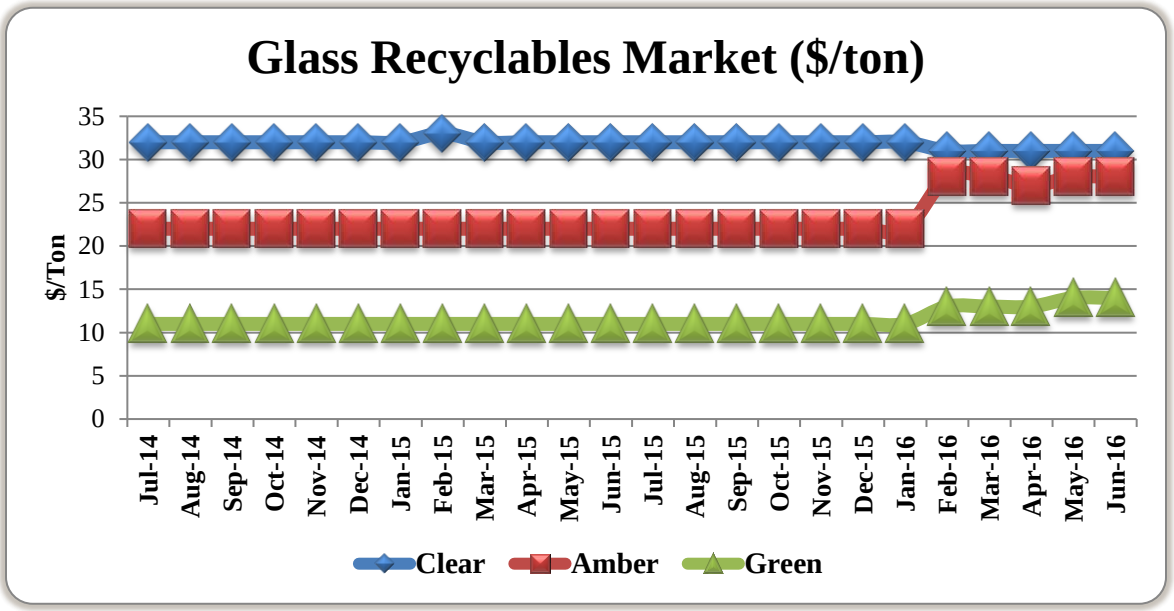
National and international overcapacity of processed commodities and the strength of the U.S. dollar against foreign currencies are affecting the recycled fiber market.

Figure 10



The depressed price of natural gas/petroleum has kept pricing for recycled resins down, but export movement has increased substantially, particularly to China, so increased pricing is anticipated to follow in the future.

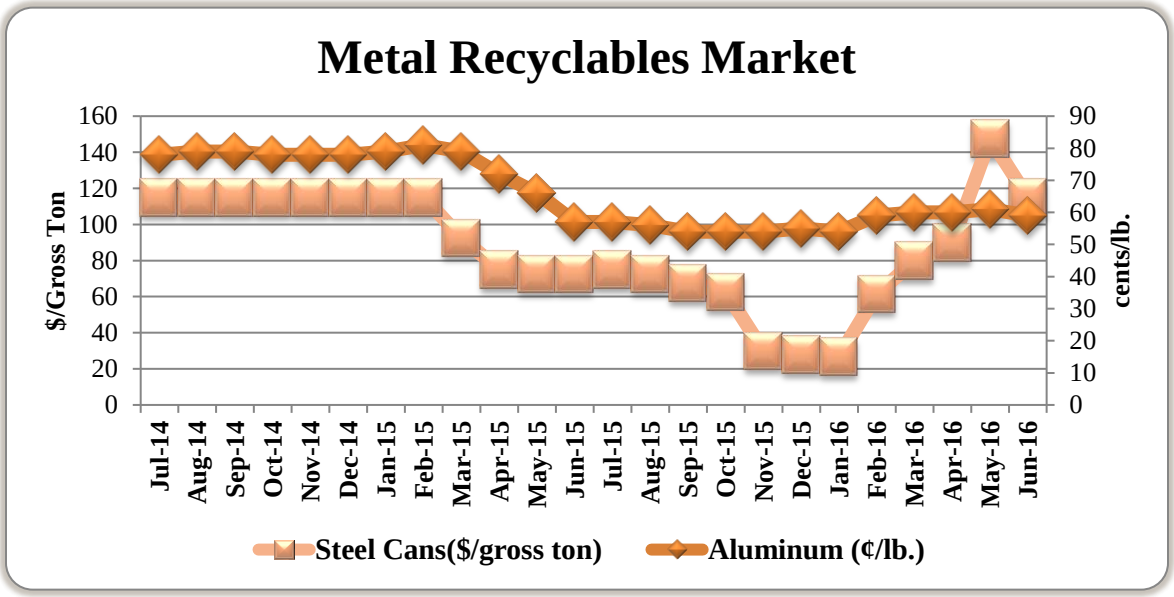
Figure 11



Residential glass recycling remains problematic due to single stream/curbside collection results in cross contamination of materials (co-mingled colors and glass with paper mixed in) which greatly diminishes its market value. Glass prices are "break-even" at best. Many recycling operations find the best uses are in local projects such as roadbed amendment, landscaping

mulch or decorative art projects. It is difficult to avoid taking glass in community recycling programs, and minimizing the handling cost of this material is often the best option.

Figure 12



Both ferrous and non-ferrous metals are in weak demand. Ferrous value increased to $50/metric ton in April 2016 and there is hope this represents the start of a consistent upward climb in the industry.

Scrap steel (including white goods, i.e., appliances), steel cans, aluminum and copper bearing scrap will continue to be in demand, especially as the global economy continues to improve. Most of these items require little or no processing which makes them valuable additions to a community recycling program.

Waste Tire Trust Fund

The Waste Tire Trust Fund (WTTF) was reauthorized by the General Assembly in their 2016 session and will remain effective until June 30, 2018. A one dollar fee on the sale of all new motor vehicle tires sold in Kentucky provides WTTF funding. This fund is used to conduct waste tire collection events, provide annual funding directly to counties for waste tire management, award crumb rubber

Tires Used at Former Race Track as Barrier, Gallatin County
Photo by Chris Craig

grants, facilitate market development for the use of waste tires, and clean up waste tires at mismanaged sites. In 2011, House Bill 433 established a Waste Tire Working Group to advise the cabinet on administering and implementing alternative methods for controlling waste tires, develop a formula to apportion money in the WTTF and prepare an annual report for the General Assembly. Beginning in 2011, the cabinet offered a $3,000 annual grant available to counties for recycling or disposal of waste tires; which has increased and is now $4,000.

Crumb Rubber Grants:

From 2004 to 2016, the cabinet awarded 441 grants totaling more than $7.78 million to local governments, schools, daycares, churches and other entities for the use of crumb rubber made from recycled tires. It can be used for athletic fields, playgrounds, walking trails, landscaping and gym floors, etc. Nineteen grants were awarded for a total of $249,526, primarily for landscaping applications, in FY16.

Henderson County Crumb Rubber Mulch Project
Photos provided by Henderson County

Pursuant to KRS 224.50-855, The Waste Tire Working Group (WTWG) is a committee appointed by the governor to discuss and research topics in waste tire management and make recommendations to the cabinet for proposed changes to applicable statutes and regulations in an effort to improve Kentucky's programs. The WTWG consists of the director or their designee, and the manager of DWM's Recycling and Local Assistance Branch, Gary Logsdon. Members appointed include Harlan Hatter, representative of the Kentucky Department of Agriculture; Kelly Bowlin, Boone County Solid Waste Coordinator and Scott Tussey, Madison County Solid Waste Coordinator, Mayor Martin Voiers of Flemingsburg, and Joe Durkin, a representative of retail tire sales in private industry. Judge Jim Townsend resigned and will be replaced with a county judge/executive. Their meetings are open to the public.

Rubber Modified Asphalt:

In the spring of 2016, the Recycling and Local Assistance Branch launched the Rubber-Modified Asphalt Chip Seal Grant program. The grant was open to counties for the application of chip seal on county roads utilizing rubber-modified asphalt (RMA). Chip seal is a process that combines one or more layers of asphalt with one or more layers of aggregate used to extend the life of an existing road surface. In June 2016, DWM announced that up to $500,000 would be awarded for RMA chip seal projects in the counties of Fleming, Hart, Metcalfe, Trigg, Webster, and Whitley.

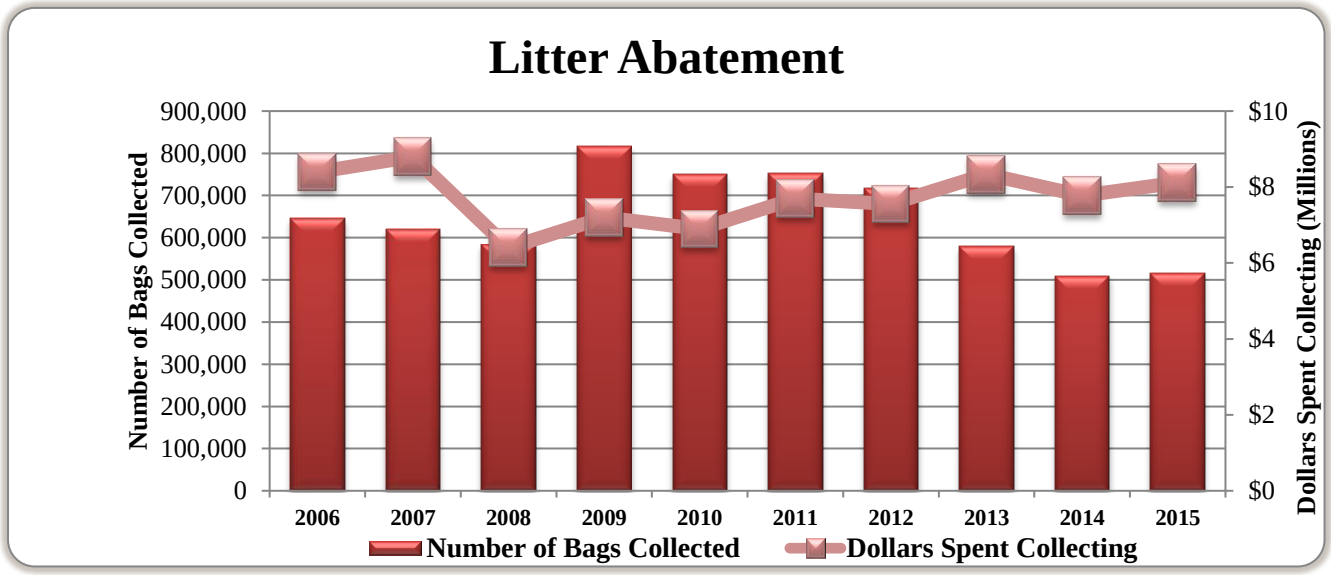
Kentucky Pride Fund

The Kentucky Pride Fund (KPF) is supported by an environmental remediation fee of $1.75 per ton of waste disposed in Kentucky landfills. This money is used for closure of historical landfills, recycling grants, household hazardous waste management grants, and remediation of illegal open dumps. Additionally, the fund receives $5 million annually from the Transportation Cabinet specifically for distribution to counties and incorporated cities for litter abatement activities.

Litter Abatement:

DWM began tracking the cost of litter activities and the amount of litter collected in 2001. State litter abatement grant funding through the KPF began in FY2002. In 2015, counties removed 515,191 bags of litter (10,303,820 pounds) from 170,478 miles of Kentucky roadways. Litter collection costs totaled $8.1 million, an average cost of 79 cents per pound. Litter collection is costly, at $1,576 per ton, when compared to the average landfill disposal rate of $39.05 per ton. The most common items found on roadways are plastic bottles and food containers.

Figure 13



Note: The amount of litter collected on public roads may not include litter collected by state road crews as part of the Department of Transportation's efforts to maintain state roads.

There is a significant variation of dollars spent per number of bags collected over the last ten years (Figure 13). Collection and recordkeeping procedures may not be uniform among the counties and expenses, such as education and outreach that do not contribute to the number of bags collected, can vary considerably from year to year.

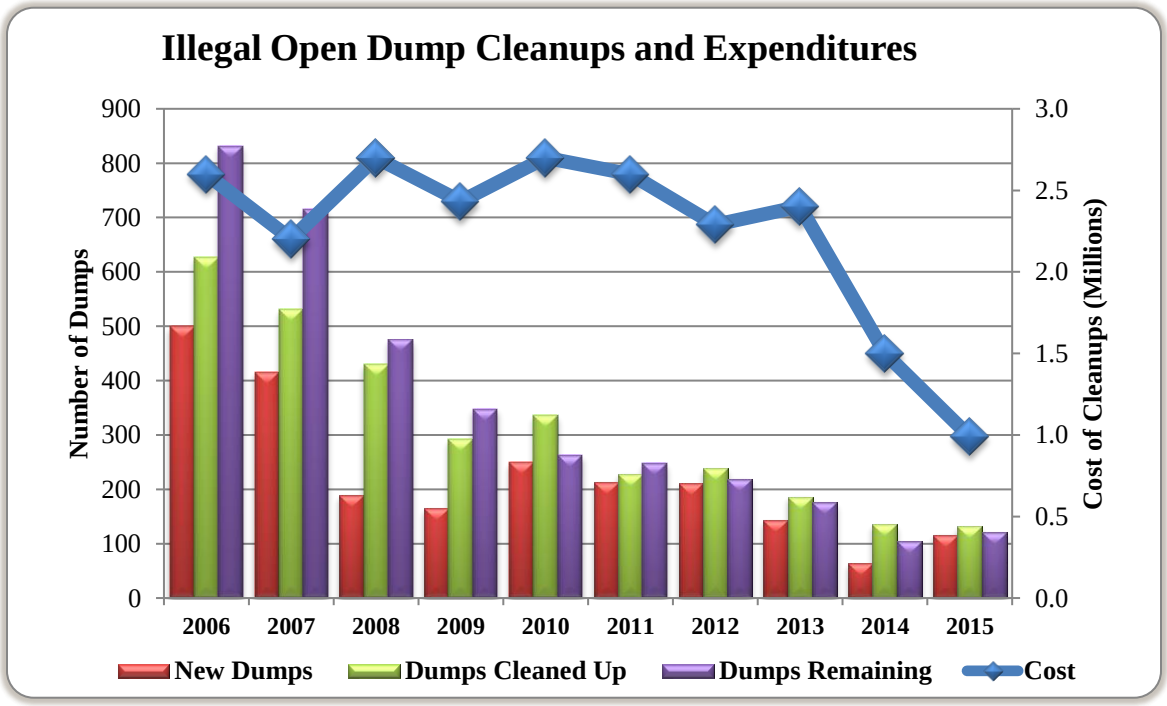
***Recycling and Household Hazardous Waste*:**

In 2006, the KPF Fund was amended to provide grants for the development and expansion of recycling programs and household hazardous waste (HHW) management. In FY16, 71 entities were awarded grants for over $3.3 million. Forty-six recycling grants were awarded to cities, counties, and universities. These grants help fund the establishment or expansion of recycling operations. The goal of the Recycling Grant Program is to build recycling infrastructure, often in areas where few of these opportunities for citizens exist, with an emphasis on regional cooperative efforts.

Twenty-five counties were awarded HHW grants. In FY16, over 366,000 tons of HHW was collected by counties through the HHW Grant Program. Materials collected included electronic scrap, pesticides, solvents, mercury and other potentially hazardous products from residences.

One pilot composting grant was also awarded in FY 2016, and more composting projects may possibly be funded in the future. The cities or counties receiving the grant award are required to provide a 25 percent local match, in the form of cash or "in-kind" personnel, educational activities/materials or advertising to promote the program.

Figure 14



Cleanup of Illegal Open Dumps:

Financial assistance through the Kentucky Pride Fund Illegal Open Dump Grant Program has provided counties the incentive and necessary resources to identify and rid their communities of old dumpsites. Since the current format of this program was developed in 2006, more than $16.9 million has funded the cleanup of 1,805 dumpsites. In 2015, counties cleaned 102 illegal open dumps at a cost of $761,347, collecting 3,713 tons of waste. The twelfth round of grants was awarded in January 2016 for the remediation of 139 dumpsites at a projected cost of $1.75 million. There were 121 known dumpsites remaining at the end of 2015.

Figure l4 shows all documented dump cleanups, including many sites cleaned with funding sources other than the Illegal Open Dump Grant. Overall, more than 25,800 illegal open dumpsites have been cleaned at a cost of $77.9 million dollars since 1993.

E-Scrap Recycling

The challenging issue of properly managing waste computer and electronic parts and equipment (e-scrap) continues to be emphasized throughout the state. Over 50 counties reportedly offer some type of e-scrap collection, whether year-round drop-off programs or periodic events. Nearly 2,300 tons of e-scrap was reported to have been collected in 2015. This is significantly less than the nearly 3,000 tons in 2014, possibly due to issues with the statewide e-scrap collection contract.

Since 2009, the state has had an e-scrap contract awarded by the Finance and Administration Cabinet. This "all-agency" contract allowed the executive, judicial, and legislative branches of government, school districts, universities, and any other public not-for-profit organizations convenient access to e-scrap recycling. The contract provided for statewide pickup and recycling services and was unique in that the vendor would typically pay the generator a small reimbursement for the items collected. From January 2009 to September 2015 over 7,937 tons of e-scrap was collected and refurbished or recycled in an environmentally sound and data-secure manner. Payments to generators netted over $494,000 during that period.

However, in late 2015 the statewide e-scrap contractor, Global Environmental Services, was found to be in violation of several environmental regulations and their contract voided. This was the second vendor to go out of business while holding the statewide contract. While management and internal issues likely played a significant role in both instances, it became clear that the e-scrap management industry as a whole was struggling. DWM is exploring different models for another statewide e-scrap contract that offers value and convenience to generators while also attractive to potential vendors.

DWM also promotes proper management of e-scrap through their HHW Grant Program. Since 2006, the Kentucky Pride Fund has provided grants awards for the management of HHW, a category that includes e-scrap and mercury.

BRANCH HIGHLIGHT

Rubber-Modified Asphalt Chip Seal Pavement Grant

By Christopher "Kitt" Tuttle

One of the many duties of the Recycling and Local Assistance Branch (RLA) of the Division of Waste Management (DWM) is to aid in the development of markets for recycled tires. A recently successful example is the rubber mulch industry, which became firmly established in Kentucky over the past 12 years with the aid of state grants for the application of rubber mulch manufactured by Kentucky processors using Kentucky waste tires.

RLA set forth to increase its portfolio of grants to expand markets for waste tires after the success of the rubber mulch grants. After extensive research, the next endeavor would be to test the efficacy of adding ground rubber from waste tires to asphalt for roadway applications. Rubber-modified asphalt (RMA) is utilized in the same manner as conventional asphalt, except it has been amended with processed tire rubber. The rubber that is added to the asphalt is very finely ground (typically 30-mesh), which gives the rubber a similar appearance to coffee grounds.

Application of Conventional-Asphalt Chip Seal in Whitley County, 2016
Photo by Christopher "Kitt" Tuttle

As of 2016, 25 states in the U.S. have performed road projects utilizing RMA. While it was originally implemented due to its superior durability, it was also discovered that it served as a sound dampener as well. States as far south as Florida and Texas, and as far north as Alaska have utilized RMA on their roads. While it is used across the country, many states have performed their own research on specifications since climate, elevation, geology, and building materials can affect asphalt performance. Since 2005, RMA has been the end-use of one to two percent of all waste tires that go to market in the U.S. (Rubber Manufacturers Association Annual Report 2013).

In September of 2013, RLA and Kentucky's Transportation Cabinet (KYTC) performed a pilot project using RMA in Campbell County. The project involved paving one lane of Kentucky Route 8 (KY-8) with RMA, and the adjacent lane with conventional asphalt. KYTC funded the project, with DWM providing additional funding to cover the difference in cost of the RMA from the conventional asphalt. Multiple quality control and comparison tests have been performed and the study is on-going. Preliminarily, the RMA section of the road was found to be less permeable than the conventional asphalt. Lowered permeability is a key benefit, as this prevents water intrusion which leads to pothole formation.

After the successes of the KY-8 pavement project, RLA determined that a grant program for the application of chip seal with RMA would be beneficial to Kentucky counties and also serve as a research project in a little used application of RMA. Chip seal is a process that combines one or more layers of asphalt with one or more layers of aggregate and is applied to an existing road surface. It is routinely used to extend pavement life, typically on lower traffic roads.

After several months researching RMA and the chip seal process, the grant application was finalized. The state would provide funding for a section of county road to be chip sealed utilizing RMA, while the grantees would fund the chip seal of an equal distance of road with conventional asphalt to provide a proper comparison for study. Metrics for judging the applications included the county's prior experience with chip seal, availability of a road suitable for a pilot project and condition of the proposed road. Additionally, due to Kentucky having varied geology and topography across its landscape, at least one project would be selected from each of the north, south, east and west regions of the state.

DWM received 13 grant applications from all over the Commonwealth. After review of the applications, representatives from DWM visited all of these counties to meet with project coordinators and tour the proposed roads. Originally, only four grants were planned to be awarded; due to the abundance of qualified applicants the number of awards was expanded to six.

In June 2016, DWM announced that up to $500,000 dollars would be awarded to the grantees in these counties: Fleming, Hart, Metcalfe, Trigg, Webster and Whitley. The grantees immediately began their bid processes to find RMA contractors for their respective projects. In accordance with the grant agreement, the projects must be completed by the December 31, 2016, deadline. Most recipients are expected to be completed by September and October.

This grant not only promotes recycling of waste tires, but also provides funding for counties to make improvements for distressed roadways. It is anticipated that this grant will grow in popularity, dependent on available funding, and there are plans to expand the program to include more grantees in the future.

SOLID WASTE

The mission of the Solid Waste Branch is to ensure Kentucky's waste is managed properly. This is accomplished by implementing a comprehensive program for solid and special waste disposal facilities. This branch reviews permit applications, issues permits, and monitors construction and operational activities at solid and special waste facilities.

The Solid Waste Branch is responsible for reviewing technical applications and reports for all types of landfills, including residential garbage, construction debris, industrial waste, and coal ash, in addition to land application and composting facilities. Of these waste streams, they may be grouped into solid waste or special waste. Solid waste may be household, commercial, or industrial solid waste. Municipal solid waste is household and commercial solid waste. Special waste is specifically defined by KRS 224.50-760. The most commonly managed special wastes in Kentucky are wastewater treatment and water treatment sludges and utility-generated coal ash.

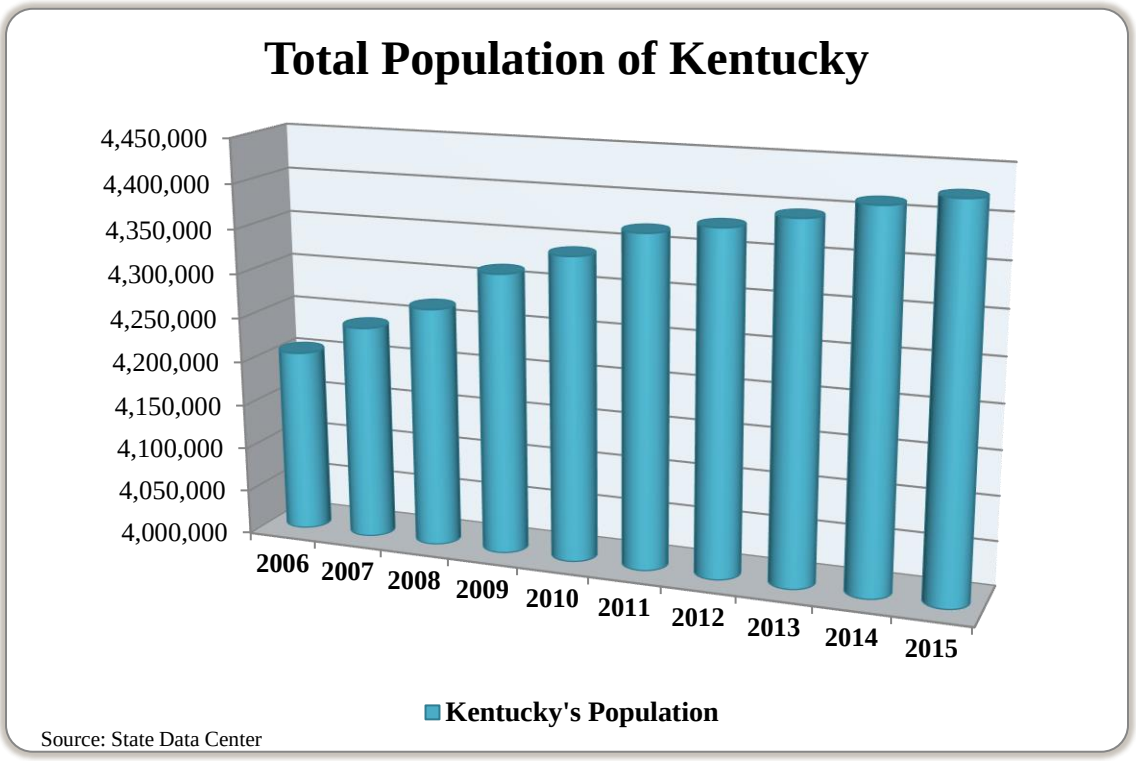
This branch issues or denies construction and operation permits based on information provided by the applicant and verified by its own personnel. This branch is also responsible for the registration of solid waste permit-by-rule facilities and closure of abandoned historic landfills.

As the total population in Kentucky has increased, so has waste generation (Figures 15 and 16). In 2015, Kentucky's population reached 4,425,092. It is imperative for residents to have easily assessable collection services, disposal facilities, and recycling facilities.

It is encouraging that Kentucky's recycling rate is increasing as well. Kentucky's recycling rate in Figure 18 also shows a small decrease, from 37.7 percent in 2014 to 36.6 percent in 2015.

In 2015, Kentucky experienced a 6.7 percent increase in Kentucky municipal solid waste (MSW) disposed of in Kentucky landfills and an 11.3 percent decrease in the amount of out-of-state MSW disposed of in Kentucky landfills. Kentucky disposed of 4,519,264 tons of MSW in 2015, an increase of 204,452 tons from 2014.

Figure 15



Source: State Data Center

Figure 16

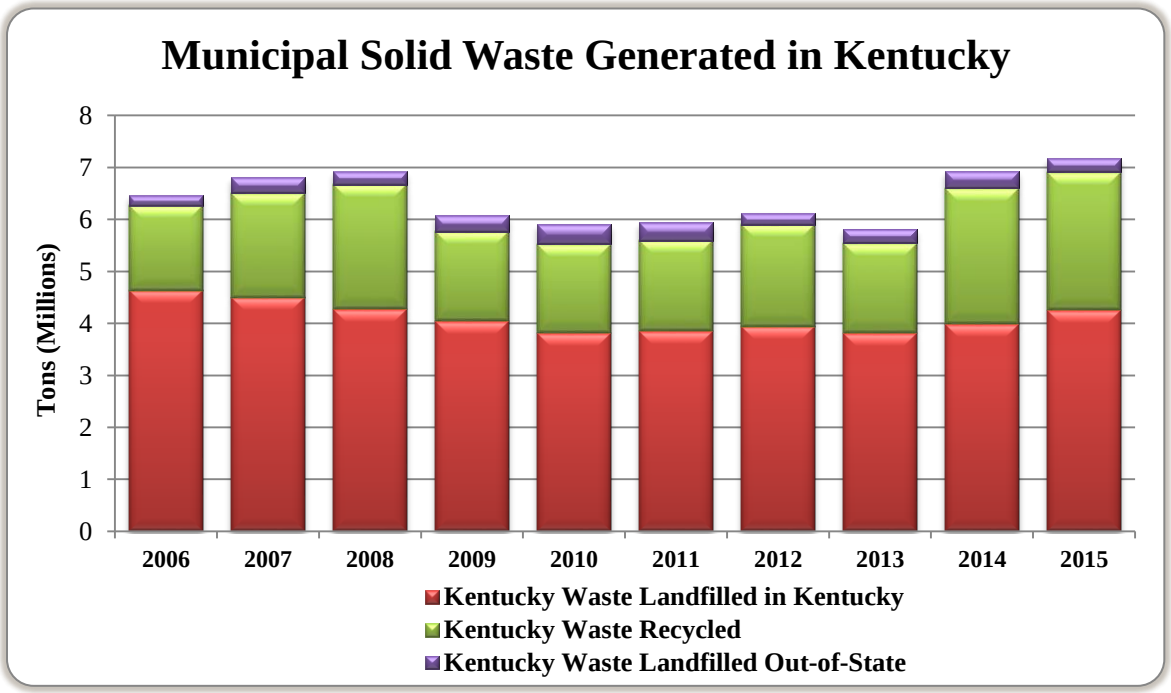
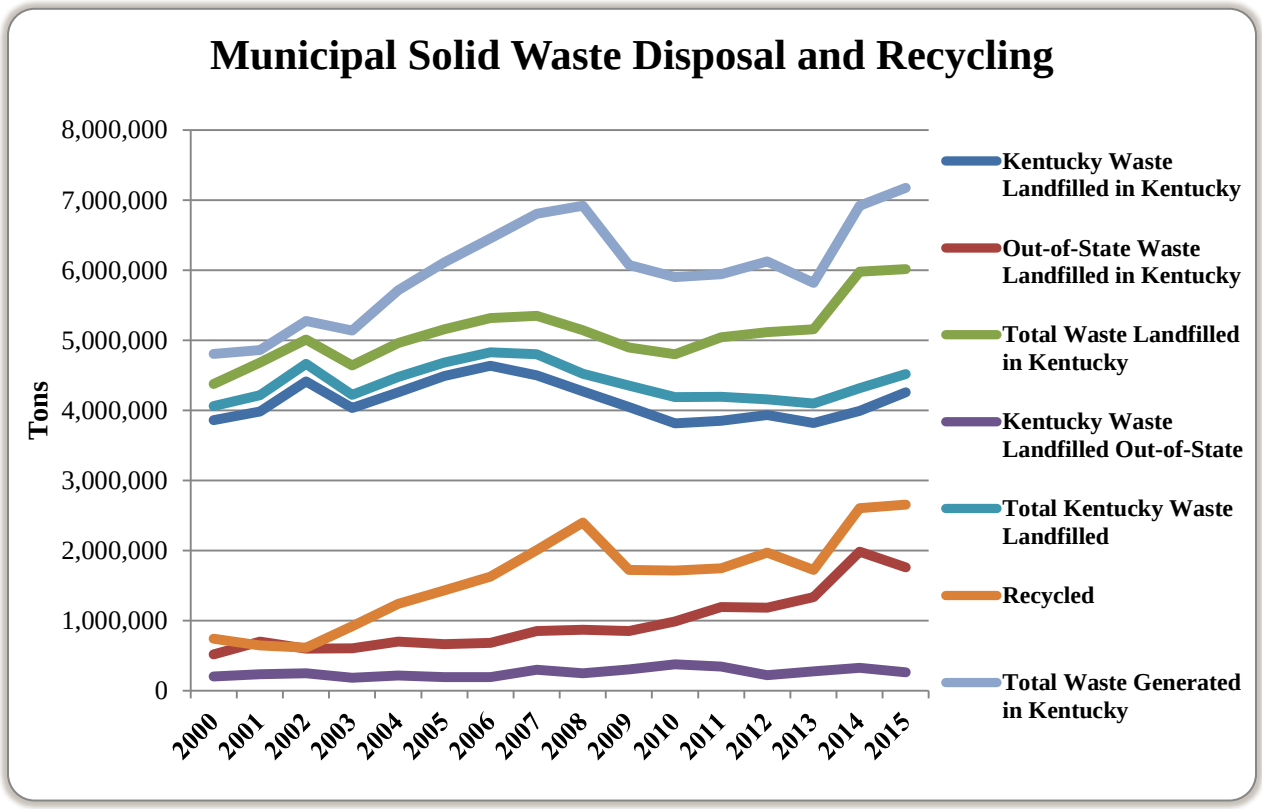
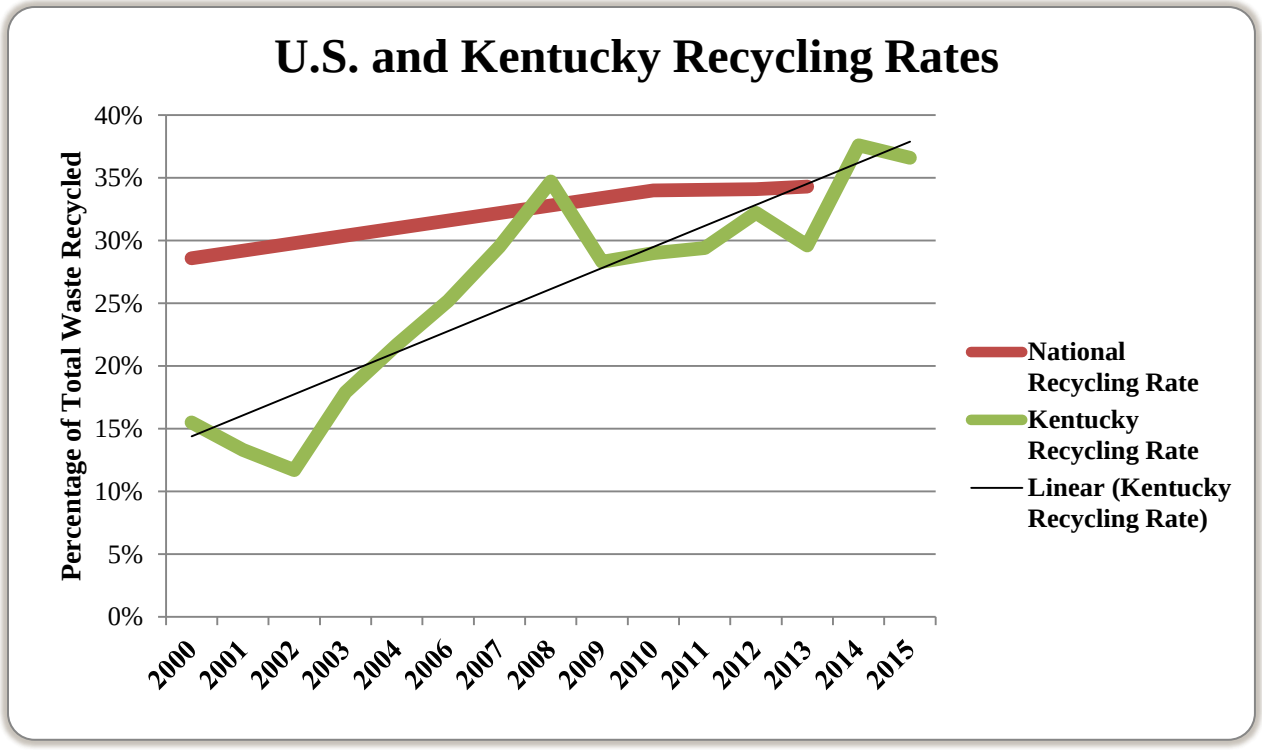


Figure 17



A small increase in the total tonnage of waste generated in Kentucky in 2015 is shown.

Figure 18



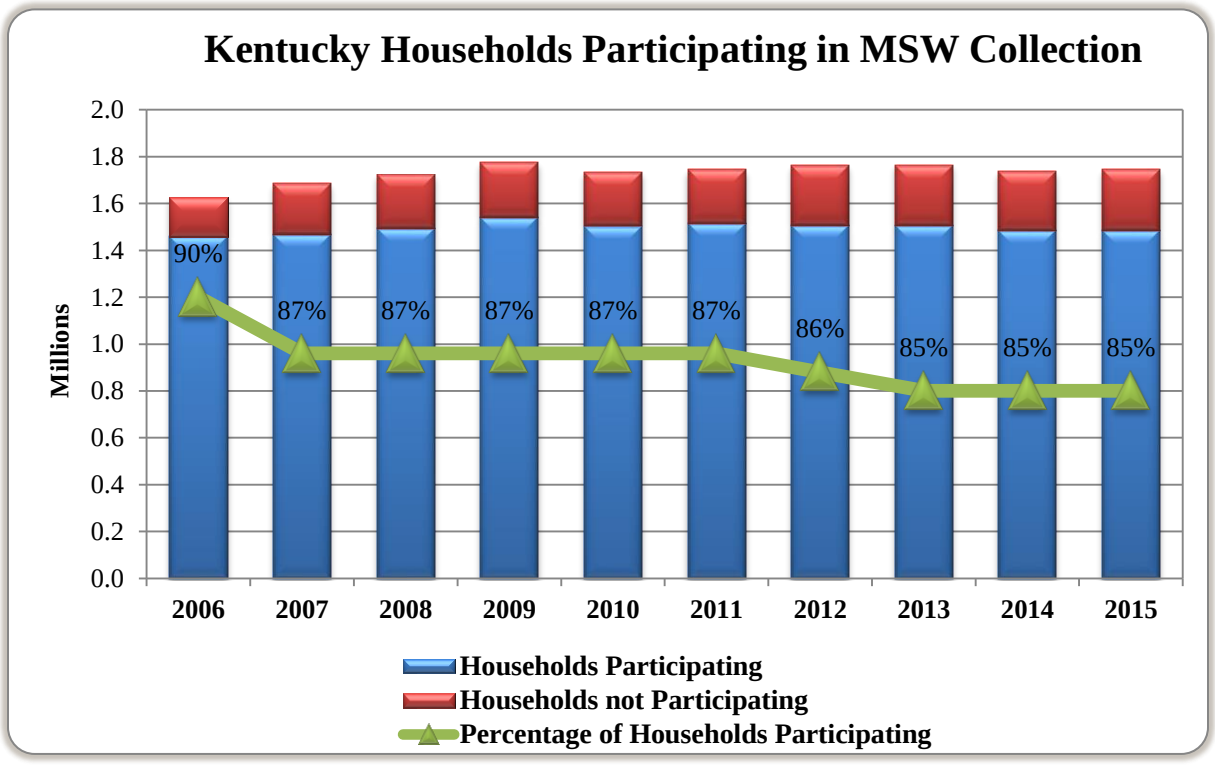
All of the counties in Kentucky offer a system of universal waste collection through a combination of curbside collection, drop-off collection centers and transfer stations.

"Universal collection" is defined by KRS 224.1-010(45) as:

> *"… a municipal solid waste collection system which is established by ordinance and approved by the cabinet and requires access for each household or solid waste generator in a county. A commercial or industrial entity which transports or contracts for the transport of the municipal solid waste it generates or which operates a solid waste management facility for its exclusive use may be excluded from participation."*

In accordance with KRS 224.43-315, waste haulers are required to report annually the number of households serviced and the monthly cost of service. The reported participation rate in approved MSW collection systems has remained steady since 2006 with an average of 86 percent.

Figure 19



In 2015, Kentucky counties reported that 1,485,016 households were participating in approved MSW collection services. The average reported household participation rate for MSW collection systems in 2015 was 85.2 percent. Approximately 14.8 percent of households (251,561) were not accounted for by current tracking methods. Self-haul to transfer stations and convenience centers are often not tracked. Multi-unit apartments comprise of approximately 17.7 percent Kentucky households. Most of these are serviced by dumpsters via commercial accounts and consequently do not show up as individual house counts. As a result of these tracking limitations, actual

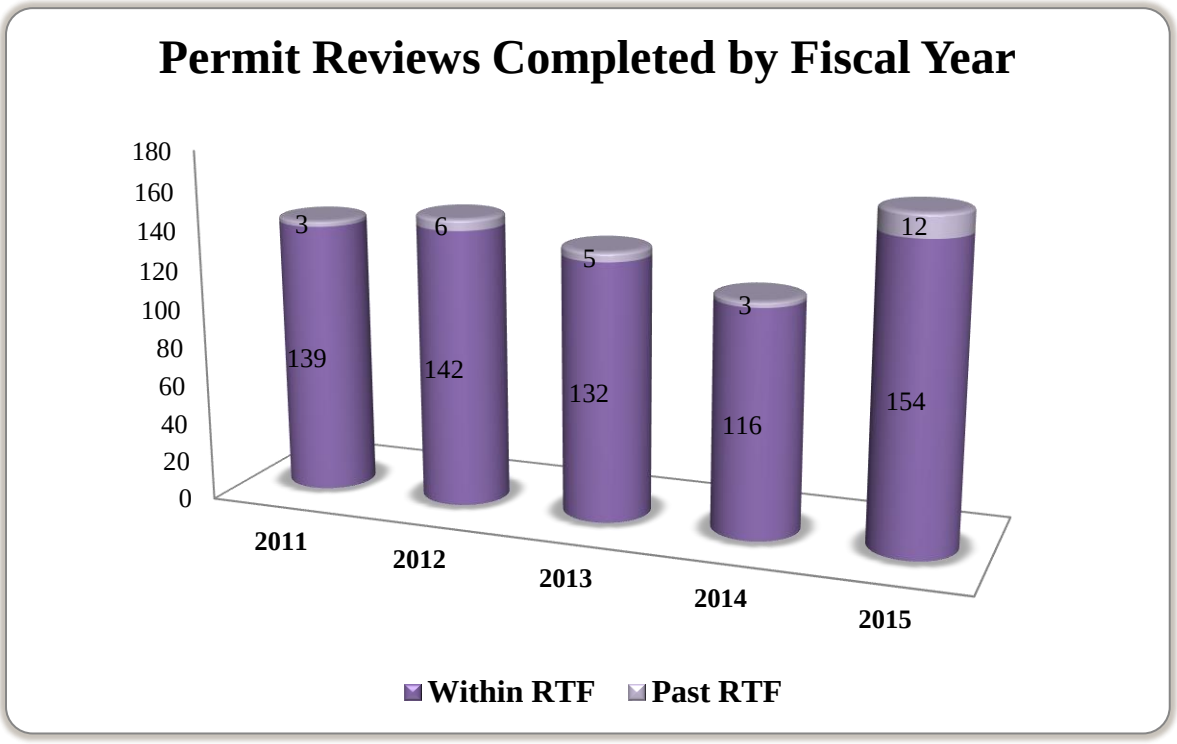
participation rates could be five to ten percentage points higher than what was reflected by county reporting. The average cost per month for household curbside MSW collection was $15.99 in 2015, a dollar higher than 2014.

Solid Waste Permitting

The Solid Waste Branch continues to issue the majority of permits within regulatory timeframes. This includes permits for new landfills, permit modifications for existing landfills, and permits for various other facilities, including land application and composting facilities.

There were 57 solid waste permits pending at the end of FY16, with 48 within and nine exceeding regulatory timeframes. In FY16 of the 140 solid waste permit reviews completed, 128 (91 percent) were within the regulatory timeframe. Additionally, branch personnel reviewed documentation for and approved the closure of 26 solid waste facilities. For the past five years, this branch has completed no less than 90% of permit application reviews within the time frame designated by regulation (RTF).

Figure 20



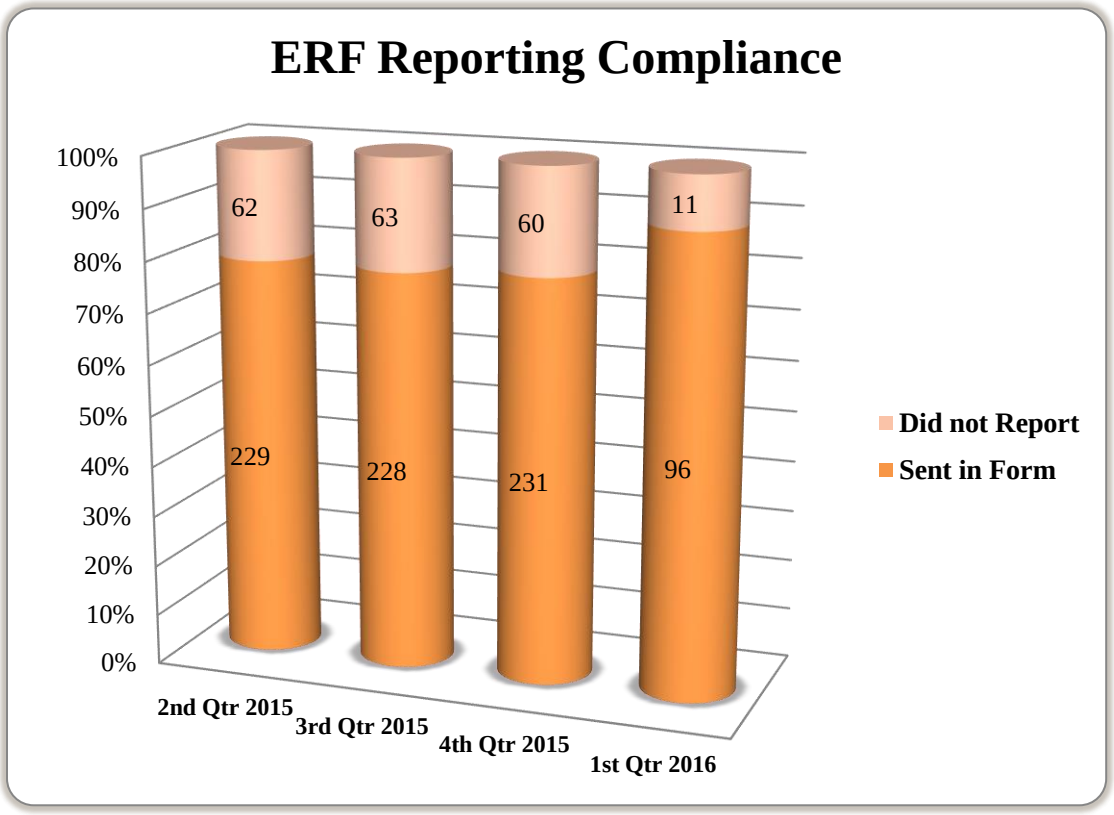
This branch permits a variety of facilities that divert waste from disposal and reuse it in ways that preserve natural resources and prevent pollution. The facilities include locations where solid and special wastes are beneficially reused, landfarm facilities where solid and special wastes are used to promote soil structure and fertility, and composting facilities where organic materials are turned into compost and distributed for use.

There are 41 active landfarm facilities, 33 active compost facilities, and 80 sites where special wastes are being beneficially reused. Sites where solid waste are beneficially reused are designated permit-by-rule, which means that the operator may begin beneficial reuse activities without having obtained written authorization from the cabinet, as long as the operation meets regulatory requirements. Some operators choose to get written authorization from the cabinet, and in FY2015, five facilities for beneficial reuse of solid waste were approved.

Environmental Remediation Fee

The environmental remediation fee (ERF) was established by Kentucky Revised Statute 224.43-500. This statute requires all generators of waste in Kentucky to pay $1.75 per ton of waste disposed in a municipal solid waste disposal facility and this fee is collected by municipal solid waste facilities or transfer stations. This fee is deposited into the Kentucky Pride Fund and used to fund grants for the cleanup of illegal open dumps, recycling, and household hazardous waste management. The ERF form which accompanies the fee compliance is shown in Figure 21.

Figure 21



Groundwater Monitoring

Groundwater assessment requires the owner or operator of a facility to determine the existence, extent, and depth of groundwater degradation, and the rate and direction of migration of contaminants in the groundwater. Groundwater assessment is triggered if the analysis of

groundwater at the facility shows one or more parameters exceeding the maximum contaminant levels (MCL) specified by regulation, or an increase over the naturally occurring background levels of parameters lacking promulgated MCLs. Of the 78 facilities currently required to monitor groundwater, 15 are in groundwater assessment (19%).

Corrective action requires the owner or operator of a facility to abate groundwater contamination and prevent further groundwater contamination from the facility, and restore or replace public or private water supplies affected by contamination from the special waste facility. Groundwater corrective action is currently being carried out by 13 facilities (17%).

Historical Landfills

A total of 90 historic landfills have been closed through construction and remediation projects or by a no further action determination due to intensive site studies. Total costs associated with the closure projects exceed $54 million, excluding branch personnel's direct and indirect expenses.

Phase I of the Butler County landfill has completed construction and is within the warranty period. Costs are estimated to be approximately $2.7 million.

Three historical landfill closure projects are in the design phase and will be scheduled for construction once the design has been completed. Construction and engineering oversight costs are estimated to be approximately $6 million.

- Bullitt County Landfill
- Johnson County Landfill
- Trigg County Landfill

Four historic landfill projects are in the site characterization phase at an estimated cost of $400,000.

- Harlan Drum Site
- Henderson Drum Site
- McCracken County Landfill
- Mercer County Landfill

Four historic landfill closure projects are in the process of being awarded through the Division of Engineering and Contract Administration of the Finance and Administration Cabinet. These projects consist of site characterizations and designs. The site characterization and design costs are estimated to be approximately $1.1 million.

- Butler County Landfill (Phase II)
- City of Covington Landfill
- Foothills Landfill
- Goodridge Avenue Landfill

Initial characterization of 288 landfills has been completed. The landfills are being prioritized based on the perceived threat to human health and the environment. The approximate cost for the initial site characterization of these sites is $3.9 million. There are 531 historical landfills remaining to be closed.

BRANCH HIGHLIGHT

Naturally Occurring Radioactive Materials

By Robin Green

Hydraulic Fracturing Operation in Lawrence County, KY
Photo courtesy of Marvin Combs

In January of 2016, the Energy and Environment Cabinet (EEC) became aware that shipments of technologically enhanced naturally occurring radioactive materials (TENORM) were being received by landfills in the state. During the 2016 Regular Session, the Kentucky House passed an act related to naturally occurring radioactive materials (NORM) and their management. House Bill 563 created a new statute, KRS 211.893, which became effective April 13, 2016. The statute identifies the various state agencies with regulatory authority over the management of NORM and their specific responsibilities. The EEC and the Cabinet for Health and Family Services are specifically directed in the statute to review and revise their existing regulations to ensure the proper management of oil and gas wastes containing NORM. They were additionally charged with making recommendations for any other statutes that should be amended in order to *"facilitate management of oil and gas production wastes in a manner commensurate with the risks that those wastes may pose to the public health and the environment"*.

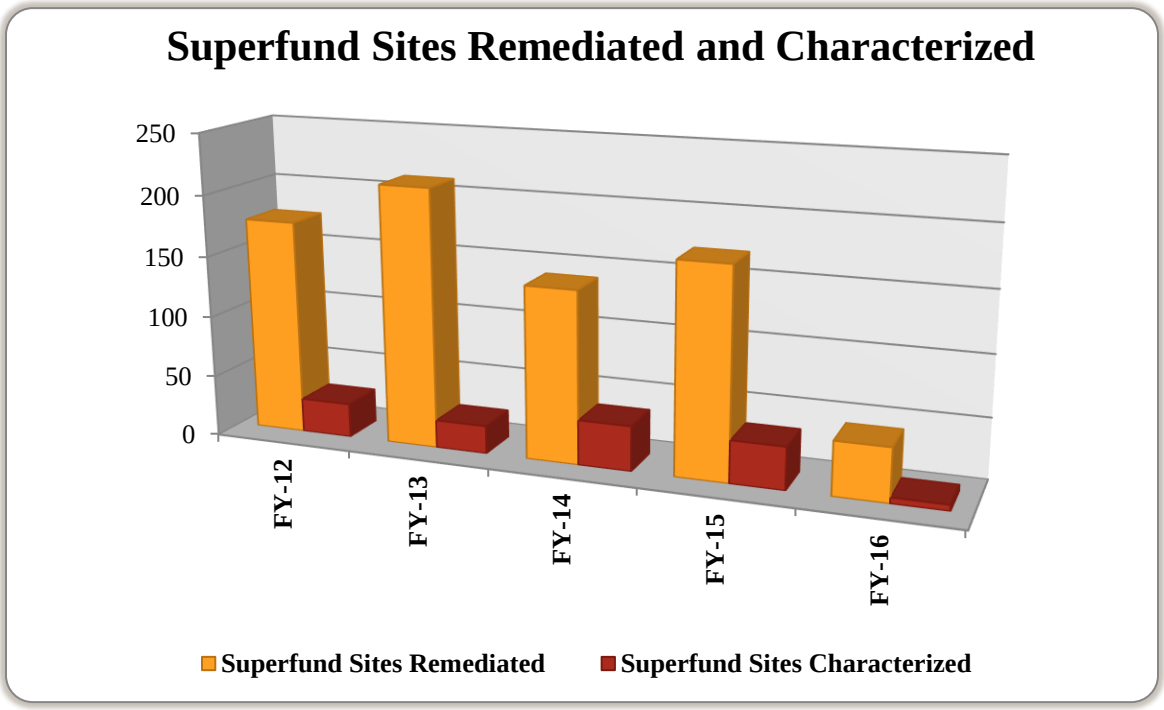
As encouraged by the statute, the cabinets have sought input from a variety of groups including those that produce and transport oil and gas wastes, environmental groups, owners and operators of waste disposal facilities, other state bodies, and the public at large. The EEC reconvened the Oil and Gas Workgroup with these groups to facilitate the review process, draft recommendations, and propose amendments to regulations and statutes.

SUPERFUND

The Superfund Branch seeks to ensure that contaminated sites are evaluated and cleaned up in a timely manner to reduce risks to human health and the environment. In most cases this means overseeing companies or individuals who have taken responsibility for cleaning up contamination found on their property. In cases where a responsible party cannot be found or is unable to act, the Superfund Branch may take a direct role in cleaning up a site. The program handles oversight of cleanup of hazardous substance releases and non-UST petroleum releases across the commonwealth.

The Superfund Branch must maintain a list of sites where waste is managed on-site through some form of engineering control, such as a cap or structure, or institutional control, such as an environmental covenant or deed restriction. There are currently 197 sites where waste is managed on-site. These sites require some form of reporting such as an annual report or five year review as established by statute. For sites that are being managed by using institutional and/or engineering controls, the obligations to continue to manage the releases are indefinite. Therefore, the numbers of total managed sites in Superfund will continue to increase as new sites are approved for closure under this option. The only way a site can be removed from the managed site list is if additional cleanup is performed to restore the site to safely allow for unrestricted residential use.

Figure 22



In FY16, the Superfund Branch remediated 44 sites and characterized five sites. There were 101 new sites registered. Three state-lead sites were remediated utilizing the Hazardous Waste Management Fund and three sites are in the process. There were no cleanups conducted under state oversight via the Voluntary Environmental Remediation Program.

There were also 31 sites with a release of petroleum or a petroleum product remediated from a source other than a petroleum storage tank, with 114 pending review.

Brownfields

Brownfields are abandoned, idled, or underutilized industrial and commercial facilities/sites where expansion or redevelopment is complicated by real or perceived environmental contamination. They can be in urban, suburban, or rural areas. The Brownfield redevelopment is a joint effort between the Division of Waste Management and the Division of Compliance Assistance.

- *Five Targeted Brownfields Assessments were conducted, and four are awaiting review. Multiple other sites have been reviewed and technical assistance was provided for recipients of various USEPA 128(a) Brownfields Grants.*

- *Forty brownfield sites were reviewed under KRS 224.1-415, 41 Notice of Eligibility letters issued, 35 Notification of Concurrence letters issued and two sites are pending review at the end of the fiscal year.*

Methamphetamine Lab Cleanup

In cases where homes are contaminated with meth waste, the Kentucky Division of Waste Management works in conjunction with law enforcement and health departments to remediate structures through the division's Methamphetamine Lab Cleanup Program. Because meth waste is so toxic, especially to small children, and absorbs into home surfaces and structures, it must be remediated by certified contractors. In FY16, 94 contaminated residences were reported and 49 residences were decontaminated through the Methamphetamine Lab Cleanup Program.

Future of the Hazardous Waste Management Fund

The Hazardous Waste Management Fund (HWMF) was created to provide the Energy and Environment Cabinet with the funds necessary to protect the health of the citizens and natural resources of the commonwealth from threats associated with releases of hazardous substances, pollutants and contaminants. The cabinet uses this fund to provide technical reviews, oversight of responsible party driven, and state-lead investigation and remediation projects. The HWMF is the Commonwealth's sole source financial support for contaminated sites where there is either no known responsible or financially solvent party available to take action. The HWMF finances regulatory oversight, emergency responses, state-lead and time-critical remediation projects at sites across Kentucky. These projects range from large industrial sites and persistent dry cleaner's plumes to small projects such as roadside drums, orphan wastes and transformers.

Presently there are no other available funding sources to conduct emergency response, state-lead cleanup actions, or regulatory oversight.

As a result of decreases to the HWMF through exemptions, decreases to general and federal funds available to the cabinet since 2008, increased costs to cleanup, and increasing number of non-viable and financially insolvent responsible parties from which to recover cost, this fund cannot credibly address the existing and projected superfund backlog, let alone sustain sufficient funding to mount large scale emergency remedial projects that arise unpredictably year to year.

The perceived "typical" and historical superfund sites are: large industrial complex sites, large caches of illegally buried drums by large companies, or otherwise highly visible and news making sites (e.g. "Love Canal", "Maxey Flats" and "Valley of the Drums"). Such sites usually either have potential responsible parties (PRPs) with large sustainable financial resources or federal funding through the NPL program to address the problem. While these types of sites still exist they no longer reflect the greater more ubiquitous threat to human health and the environment in the commonwealth. The more common type of sites that are entering into superfund are smaller sites that have geological, technical or chemical/contaminant characteristics that are complex and financially difficult to address. There is general agreement among practicing remediation professionals in government and private industry that this substantial population of sites (which are being recognized across the U.S.) are unlikely to achieve restoration within the next **50 to 100** years. By far, it is the smaller entity sites which pose the greatest and increasing threat to human health and the environment, and mainly comprise the growing number of sites to the state Superfund Program.

The concern over the impact of these sites is increased because smaller contaminated properties are generally collocated where we live, eat and play; in commercial urban, suburban and rural settings throughout our state. Such sites do not have the usual control or restricted access common to larger industrial sites. Because of the small lot-size of these sites, many times contamination extends off-site under neighboring properties, including residential homes, schools, recreational areas and other locations that a person would generally not expect to be an environmental problem. Furthermore, many of the small sites from which hazardous substances have been released, such as dry cleaners, are small "mom and pop" businesses. Most dry cleaning operators do not have adequate assets or insurance to pay for the cleanup costs, which easily could exceed the equity in the entire retail center.

Most hazardous substances and contaminants released into the environment have scientifically-proven persistence as a risk to human health and the environment for 50 to 100 plus years and in many cases (such as metals) exist forever. Large multi-national S & P Fortune 500 companies have upper life spans of 40 to 50 years[1], while most U.S. S & P Fortune 500 companies have upper life spans of only 15 years[2]. These represent the most financially solvent types of companies and their lifespans, which greatly outlive most local or regionally owned companies,

[1] Crainer, Stuart. "The Living Company by Arie de Geus". *Third Quarter 1998, Issue 12*. Strategy+Business. http://www.strategy-business.com/article/18728?gko=8c8f1

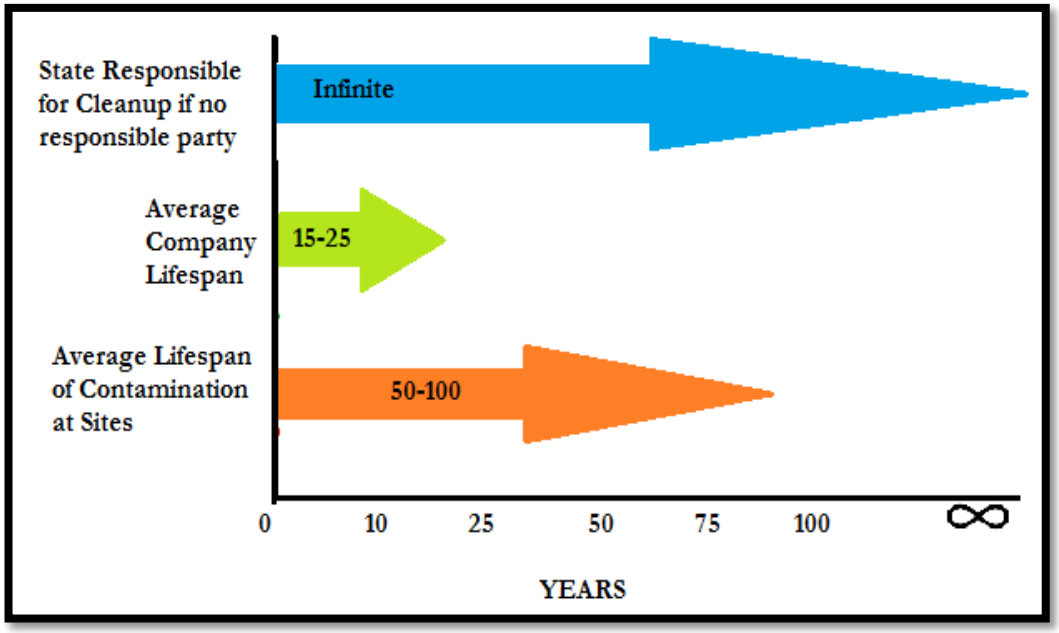
[2] Gittleson, Kim. (2012). "Can a Company Live Forever". *BBC News, New York - Business*. http://www.bbc.com/news/business-16611040. (accessed May 2016)

like dry cleaners, that release hazardous substances into the environment (i.e. a "best case scenario" analogy). With most contaminants lasting 100 or more years, the "best" of businesses averaging 15 years of financial solvency and most "mom and pop" dry cleaners are already financially insolvent as responsible parties. The state increasingly becomes the "steward" of these issues, in addition to annual cleanup issues that are a result of a modern society using hazardous substances as part of its product fabrication. This issue increasingly taxes the state's resources, both in personnel and funding, well beyond the point of being able to realistically address this increasing environmental problem.

The responsible party financial solvency or company longevity for most of these existing and potential Superfund sites is dubious. The state Superfund program and HWMF is the only remaining entity with any charge, authority and sufficient longevity to maintain protection of human health and the environment[3]. Due to their number, difficulty, and lack of financial resources, these sites place the greatest increasing burden on the HWMF. State cleanup responsibility outlives company responsibility by 400 percent (Figure 23).

Figure 23

State Cleanup Responsibility Outlives Company Responsibility by 400%



Kentucky's Superfund Program currently has a total of 588 active superfund sites which may all become state-lead. There are an additional 269 to 384 "impending" dry cleaners' sites that could

[3] KRS 224.10-100 Powers and duties of cabinet.

also become state-lead[4]; totaling 680 to 972 potential state-lead sites which may not have a viable or financially solvent responsible party.

Many variables affect cost to complete cleanups, which further depend on site-specific characteristics such as amount and location of spill, geology and general location. Site cost ranges from $10,000 to greater than several million dollars. Historic Kentucky superfund cost demonstrates and supports this estimate as well. Studies including: Federal Department of Defense, EPA, and national dry cleaner insurers' estimates, and Kentucky's historic database from 1993 to 2013 indicate a trending range from $200,000 to over $700,000 per site. Using an average from these studies, an estimated cost per site can be made for the total active superfund sites and impending dry cleaner sites. An estimated average cost for the 680 to 972 active superfund and impending dry cleaner sites ranges from $390,662,864 to $558,089,806.

Similar to cost, numerous variables control the time to complete a site's cleanup. Programmatic assessment of how long it would take to decrease the Superfund backlog and expected backlog of sites can be made based on current funding levels, number of known sites and ranges of costs-to-complete. After the annual fiscal year fixed costs are subtracted from the HWMF, approximately $323,883 of funding per year is available to apply toward state-lead capital projects. This does not include cost recovery which is unpredictable and generally decreasing over time. Based on present funding levels, an estimate of time to complete the cleanup of the known sites ranges from 1,206 to 1,723 years.

Another growing impact on the HWMF is the cost imposed on the agency for long-term management sites. At many sites the responsible party has opted to not remediate the contaminated site. This option is available under existing statues and regulations when full restoration is technically impracticable. Under these conditions the responsible party may choose to manage the site under "Managed Closure". What this entails is that no further active remedial efforts are necessary if the property remains under a certain land use controls and/or controlled with engineered measures (e.g. a cap). Additionally, managed sites require an environmental covenant to be placed on the property. This is necessary to avoid the same circumstances that necessitated the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) enacted by Congress in 1980. These sites are required to be managed, monitored, inspected and reviewed by the agency virtually in perpetuity. While the specific cost burden to state regulatory agencies varies from state to state, an average of the imposed cost burden based on several states' input of $1,000 per site per year has been estimated (Association of State and Territorial Solid Waste Management Officials, ASTSWMO, 2012)[5]. Presently the Superfund branch manages a growing number of 220 sites under Option B "Management in Place". Based on the interstate cost per site per year estimate the imposed cost burden to the division to manage these sites is currently $220,000 *per year*.

Additional cost burdens on the HWMF that are less predictable and intermittent in nature, but due to their large capital costs have extended fiscal repercussions on the fund, are larger

[4] Gary Keyes, "Cleaning Up After Dry Cleaners," CIRE Magazine, CCIM Institute, http://www.ccim.com/cire-magazine/articles/cleaning-after-dry-cleaners (accessed 23 Jun. 2014).

[5] Interstate Technology Regulatory Council, "Long-Term Contaminant Management Using Institutional Controls", Draft Guidance Document, June 2016.

emergency and time-critical contamination removals. At most of these sites a responsible party does not exist or they cease to be financially solvent through bankruptcy proceedings. In the past three-year period, three projects alone have cost and are costing the agency approximately $1.6 million, $800 thousand and $172 thousand dollars, respectively. Presently, there are other known similar large standing projects, in which there is no viable or financially solvent responsible party. These sites will require state-lead action that will cost the agency a preliminary estimate of $3.9 to $7.7 million dollars. The cost of these projects alone would burden the present HWMF annual fiscal projected project funding for the next 10 to 20 years without any other projects.

The state of the HWMF in light of the reality of the volume, number, type and cost of sites contaminated by hazardous substances, pollutants and contaminants has a direct negative impact burden on the cabinet's mandated omnibus to protect human health and the environment. The cabinet is continually formulating very limited options to best address the situation under the circumstances. However, increasing greater efficiency and resourcefulness can only offer so much before the continued decrease in available funding combined with the continued influx of contaminated properties and hazardous substance releases reach diminishing returns and make acquiring more funding and financial resources currently, if not immediately, crucial.

Maxey Flats Project

The Maxey Flats Project (MFP), formerly known as the Maxey Flats Nuclear Disposal Site, is a 55-acre commercial disposal facility for radioactive waste that operated from 1962-1977. During its operations, solid and liquid nuclear waste was buried in unlined earthen trenches. Upon the discovery of nuclear materials in off-site groundwater, the facility was closed to alleviate the environmental threat and protect human health. In 1978, the Commonwealth of Kentucky purchased the facility to ensure immediate closure and proper remediation. The MFP was placed on the National Priorities List (NPL) by USEPA in 1986.

After many years of monitoring and maintenance activities by DWM Maxey Flats employees, and several phases of remedial work conducted under the oversight of USEPA, the Maxey Flats Project, located in Fleming County, was placed into the Final Closure Period in November, 2012. The final closure plan includes installation of a permanent vegetative cap over the disposal area, installation of permanent surface water control features and installation of surface monuments to identify concerns and location of buried waste.

Following an extensive planning, remedial design and contractor selection process, construction of the permanent vegetative cap began in mid-January of 2015. Workers began by clearing a portion of the southern hillside and built a haul road to enable soils to be transported from state-owned borrow areas in the southern valleys to the landfill cap. Surface water management features were also constructed from January through May 2015.

MFP Before Final Closure Activities
Photo bv Thomas Stewart

Significant progress has been made on final closure activities during FY 2016 including the following highlights:

- In June, 2015 contractors began hauling and placing leveling fill (soil) over the existing flexible membrane liner (FML) to achieve proper slope and grade conditions, and installing geosynthetic liner systems as part of the final cap.

Aerial View of MFP Final Cap Construction Looking Northeast on June 30, 2015
Photo by Scott Wilburn

Aerial View of MFP Cap Construction Looking South on September 9, 2015
Photo by Scott Wilburn

Aerial View of MFP Cap Construction Looking Northeast on October 22, 2015
Photo by Scott Wilburn

- Contractors continued making steady progress on the cap construction through December 18, 2015 when work was shut down for the winter. In December, the progress of remediation was estimated at 54% complete. Nearly 400,000 cubic yards of leveling fill was hauled and placed as part of the cap at this point. Approximately 20 acres of Geosynthetic Clay Liner (GCL) and High Density Polyethylene (HDPE) geomembrane liner had been deployed. Storm water and perimeter drainage work and inspections of Best Management Practices (BMP) storm water control measures continued through the winter.

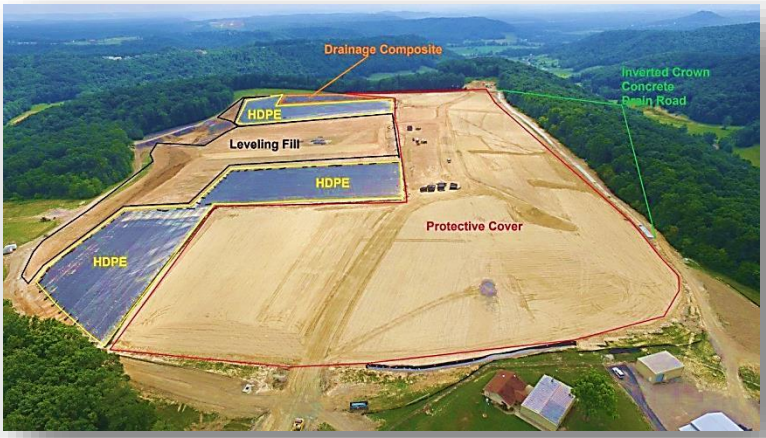
- Some slumping of soils in the southern soil borrow areas was observed over the winter and spring months. These areas were evaluated and repairs were made. These areas are continuing to be monitored and actions will be taken to mitigate any effects as necessary.

- Contractors resumed construction activities in March, 2016. A wet spring and summer caused some delays in being able to complete work on the cap.

- As of the end of June, 2016, a total of 421,255 cubic yards of leveling fill had been hauled and placed for the cap and an estimated 75,500 cubic yards of protective cover soil had been placed. Approximately 42 acres of the 55 total acres of landfill area have been covered with GCL and HDPE.

- Final completion of the construction of the final cap is projected for December 20, 2016. After the work is certified to be complete, the MFP will enter into an Institutional Control Period of 100 years which will include continued monitoring, maintenance and facility control.

- Plans are also being developed by the division to look at the most effective use and long-term stewardship of the property at Maxey Flats, which includes over 1,000 acres of woodlands, valleys and streams. The focus will be on uses which maintain the site but also encourage sustainability and provide environmental educational opportunities for the surrounding community and Commonwealth.



Aerial View of MFP Cap Construction Looking South in June 2016
Photo by Scott Wilburn

BRANCH HIGHLIGHT

State Lead Superfund Emergency Remedial Action - Arsenic Tank Sites

By Cliff Hall, P.G., Section Supervisor

Late in the summer of 2014 the Kentucky Division of Waste Management (DWM) received a rural residential complaint for investigation. The complainant, the resident and landowner at the time, indicated that from December of 2008 until November of 2013 they had lived on a 10-acre farm lot located at a property near Hartford, Kentucky, in Ohio County. This site later came to be known as the Wiley Property Site. The then resident land owner detailed that prior to their ownership of the property there was a pole barn located on it that was used to store unknown materials for use or disposal around the 1950s. This old pole barn, at some point, burned to the ground leaving a 30 foot diameter area with a white powdery substance over the surface with little to no vegetation growing around the area.

DWM conducted initial reconnaissance with several investigative follow-up activities on the property. Subsequent sampling of the white powdery substance and surface soils were conducted. Laboratory analysis of these samples indicated levels of arsenic up to 525,000 parts per million (ppm), essentially 50% arsenic and the species of arsenic was later determined to be arsenic trioxide.

As a result of the preliminary investigation of the Wiley Property Site, DWM contacted the United States Environmental Protection Agency (US EPA) to request that the site be evaluated for a Time Critical Removal Action under their authority. The US EPA concurred and began their investigatory activities for potential cleanup actions. Samples later collected from this site by the US EPA some 1,400+ feet along the downgradient from the affected area had concentrations from of arsenic ranging from 100,000s ppm near the source zone to 1,000s of ppm at the downgradient most points at the confluence of “No Name Creek”. Typical background levels for arsenic in Kentucky soils ranges from 5 to 60 ppm, depending on soil types and geology of the area, with residential risk screening levels at 0.68 ppm.

After the initial field reconnaissance and investigations at the Wiley Property Site the same property owner revealed they also were aware of two large tanks along Shinkle Chapel Road at an adjacent property, the Polluck Property, with similar looking material found on the Wiley Property. DWM followed up with further field reconnaissance. Seasonal thinning of vegetation allowed DWM to find two illegally disposed of historic tanks of unknown age (estimated around the 1950s to 1960s). These tanks were initially inspected and contained what was suspected at the time as the same arsenic material found on the Wiley property. The tank material was subsequently analyzed for constituents and characterized for disposal.

Analytical results indeed revealed that it was the same arsenic material and waste characterization results for the arsenic exceeded the hazardous waste threshold by approximately 40 times the regulatory limit. No actual quantification of the percent arsenic was determined, but it was assumed to contain roughly 50 percent arsenic similar to the Wiley property source area. The two identified abandoned tanks were visually inspected and were identified to be of similar design as tanks typically used for pressure treating lumber with chromated copper arsenate (CCA). However, laboratory analysis did not indicate the presence of chromium or copper at either site. This became the second arsenic property site known as the Polluck Property Site adjacent to the Wiley Property Site.

Forensic evidence, corroborating information, and timelines reasonably draw the inference that the arsenic-containing wastes found on both properties are from the same source material and unknown responsible party(s), and this material and the tanks were emplaced sometime in the 1950s to 1960s.

Two exhaustive searches for potential responsible party(s) (PRP) were conducted both by the US EPA and DWM to no avail. No visible, viable or reliable evidence was able to link the source of the material or tanks to any existing or historic PRP.

Upon receiving the TCLP results from the tanks, DWM procured an environmental contractor under its small purchase authority to remove and dispose of the two tanks, their contents and immediate surface soils in contact with the tanks in early spring 2015. The two tanks were emptied and cleaned of visible scale before being scrapped, and loaded on a transport vehicle for recycling at Edwards Recycling in Caneyville, KY.

In late spring 2015, Superfund employees conducted additional reconnaissance and characterization work extending from the area of the tanks draining into an ephemeral drainage ditch some 1,300+ feet downgradient at the confluence of the No Name Creek. This location is upgradient of the Wiley property confluence of the same. Field and analytical results indicated runoff of arsenic had migrated over the decade’s downgradient from the former tank location at very high levels.

Based on the field reconnaissance and the analytical data gathered, DWM procured an environmental contractor to perform a full scope investigation and characterization of the Polluck Property Site including the former tank area, the 1,300+ foot ephemeral drainage feature, and the lower confluence of the drainage feature with Little No Creek, as well as, two adjacent residential properties located along this lower confluence. This work was necessary to assess the

potential full scope of remedial and removal activities necessary to protect human health and the environment. Analytical data collected from this effort indicated that surface soil arsenic levels above Kentucky background and residential risk screening levels existed over the full length of the ephemeral drainage feature, and decreased, as expected, in the downgradient direction from the tank source area ranging from tens of thousands parts per million to few hundred parts per million at the lower reach.

During the characterization phase of work a total of four downgradient private properties impacted by the Polluck Property Site tanks were identified. The properties identified are the:

(1) Downgradient Polluck Property wooded/farmland ephemeral drainage;
(2) Felty Property wooded/farmland ephemeral drainage;
(3) Jones Residential ephemeral drainage and immediate adjacent property; and
(4) Kibbons Residential Property ephemeral drainage.

Based on the information gathered during the field reconnaissance, investigation and characterization of the full reach of the arsenic impacts in surface soils located at two residential areas; the presence of higher risk groups such as children, arsenic as a continual source from the upgradient properties, risk levels above the residential land use, the species of arsenic being the more toxic species of arsenic trioxide (AsO3), and the lack of a viable responsible party; DWM deemed it necessary and essential to protect human health and the environment by conducting cleanup and remedial measures at all four locations, including further work at the original source zone of the tanks, as timely as possible.

Therefore, in accordance with its statutory authority stipulated in KRS 224.46 580(3), DWM requested that the cabinet secretary approve the declaration of an environmental emergency so the Superfund Branch could immediately retain an environmental contractor to plan and implement immediate cleanup actions and to expedite the efforts to further limit existing or potential human health or environmental impacts. Based on the need to protect human health and the environment and information and data gathered to date, the request was deemed necessary and approved by EEC Cabinet Secretary, Charles G. Snavely, on March 24, 2016.

The emergency declaration was implemented with the subsequent procurement of environmental contractors. Due to rain events, initial excavation ground work began in the early summer of 2016, and is on-going. More than 4,102 tons of non-hazardous arsenic impacted soil material has been excavated and disposed, approximately 90 tons hazardous waste as arsenic has been excavated and staged in roll-offs for transport and treatment options at the hazardous waste landfill in Emelle, Alabama. The initial excavation of the source area generated significantly more non-hazardous waste than anticipated; however, generation amounts have been more in line with estimations along the ditch. Non-hazardous waste arsenic impacted soils are being transported to Republic's Ohio County Landfill. This is approximately 80% of the entire estimated remedial project. The project is within the anticipated design scope of work and budget and expected to finish in August 2016.

UNDERGROUND STORAGE TANKS

The mission of the Underground Storage Tank Branch is to provide for the prevention, abatement and control of contaminants in regulated underground storage tanks (UST), contaminants that may threaten human health, safety and the environment. This branch regulates the registration, compliance, closure, inspections and corrective actions of UST systems. Through cleanup, former UST sites become assets to their communities. Vacant UST properties in cities and towns are often on busy street corners and main roadways, making them potential opportunities for economic and community development, and neighborhood revitalization.

Dental Office, Dr. Scott Bridges in Reidland, KY, 2016
Former Texaco Station, Photo by UST Branch

Two sections in the UST Branch are responsible for cleaning up UST sites: the Additional Evaluation and Corrective Action. There is no functional difference between these two sections. The name, Additional Evaluation, is a relic. This section will be renamed the Corrective Action II section when a formal reorganization occurs. Both sections review and process closure assessment reports, site characterizations and site remedies; also, phase II reports upon request. In FY16, these sections reviewed 174 closure applications; 26 site checks and phase II reports; issued 993 directives for site investigation/corrective action activities, and issued 303 No Further Actions (NFA) letters. This work was performed by this section's 14 geologists and scientists.

While the number of NFAs (303 this fiscal year) has been decreasing in the past few years, these totals are drawn from a smaller total number of ongoing cleanups. Forty-five percent of the cleanup workload received NFAs in FY16. Only the sites that received a NFA in a given year are included. The spike of NFA letters issued in FY08 was due, in part, to regulatory changes in the FY07 account (Figure 24).

As a direct result of changes in the regulatory process in 2006 and 2011, the total number of UST cleanups remaining has decreased substantially. At the end of FY16, there were 675 UST cleanups requiring further work before they receive NFA letters (Figure 25).

Figure 24

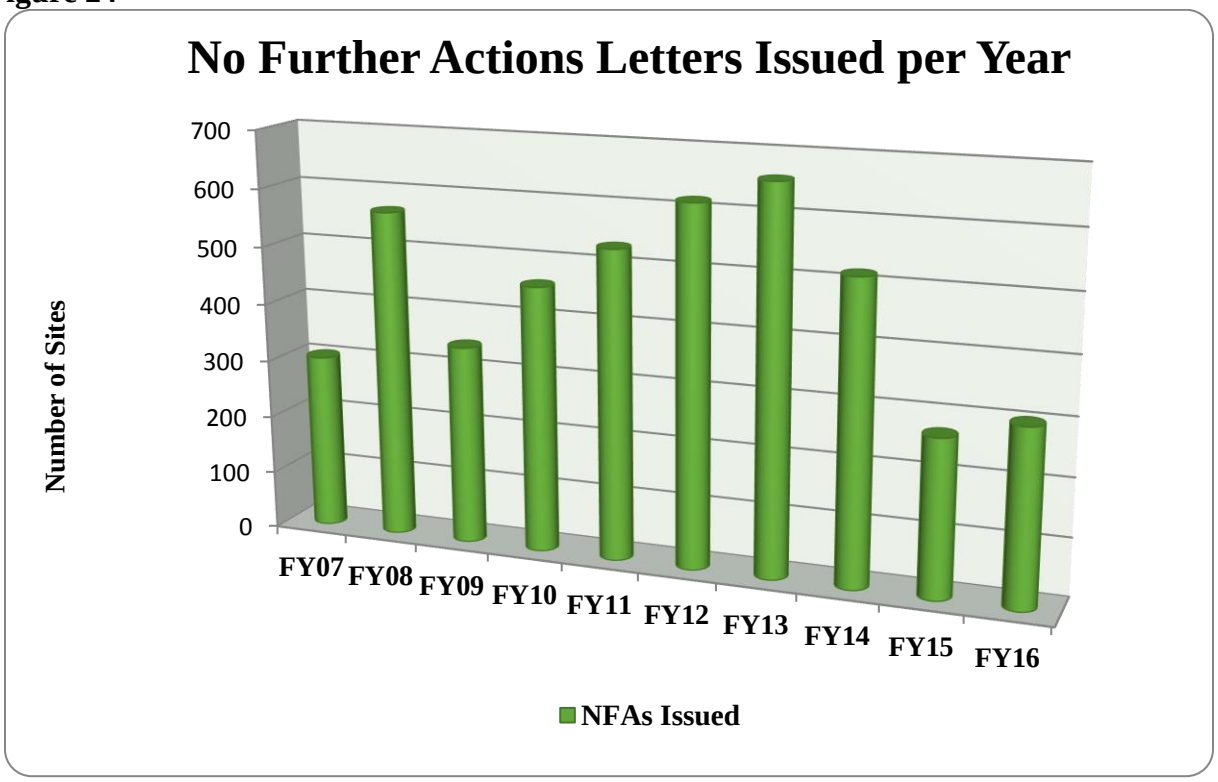
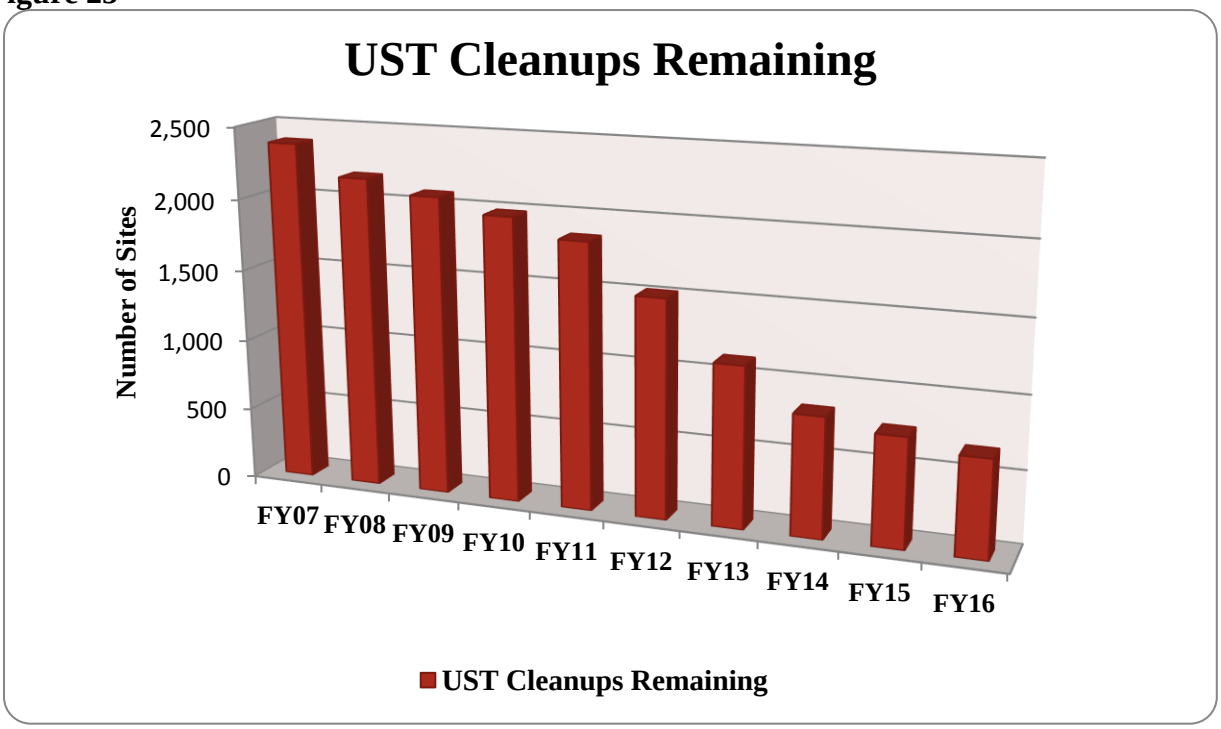


Figure 25



Kentucky is fortunate to have a funding mechanism that provides recurring financial assistance to eligible UST owners and operators for cleanup costs and, in certain cases, the removal of old UST systems. This facilitates removal and cleanups that may not otherwise take place as it helps, in many cases, UST owners who are not able to self-fund the cost. This is provided from the PSTEAF that is funded by the petroleum environmental assurance fee, $0.014 assessed on each gallon of gasoline and special fuels received in Kentucky.

While these charts reveal the clear success of the changes in the UST cleanup program and regulatory process, USTs and piping will continue to leak. Kentucky has over 800 facilities with UST systems that are in excess of 25 years old, while the expected lifespan of a system is 30 years. New UST releases will occur and the need for a cleanup program will continue. The number of new cases added to the cleanup list the past ten years averaged 245 UST sites per year, although there were only 200 sites in FY16.

UST QUARTERLY

The Underground Storage Tank Branch publishes and maintains the *UST Quarterly* and the UST Branch website. These are focused on aiding UST owners, operators, contractors and companies with timely information regarding the regulatory aspects of owning and managing USTs and the cleanup of UST-related contamination. http://waste.ky.gov/ust/USTQuarterly/Pages/default.aspx

Kentucky TOOLS

Kentucky Underground Storage Tank Operator Online Learning System (KY TOOLS) has been operational since it began May of 2013. Since that time, approximately 2,849 of Kentucky's 3,311 active facilities have successfully designated a compliance manager and completed online training in order to satisfy state and federally mandated training requirements for UST personnel. Successful completion of the training is required annually. Per federal law, states are to ensure that UST operators are trained according to state-specific requirements.

BRANCH HIGHLIGHT

Optimizing Approaches and Moving Forward

By Edward J. Winner, Ph.D.

Over the past year, the Underground Storage Tank (UST) Branch has continued to improve and refine its approach to (UST) site restoration, processing and controlling Petroleum Storage Tank Environmental Assurance Fund (PSTEAF) expenditures. The PSTEAF expenditures are stable, and compliance rates are improving. This branch also provides assistance to Kentucky's UST owners and operators. Maintaining an emphasis upon these core duties of the program has continued to pay dividends. The number of UST sites being actively managed is around 700.

Environmental restoration of UST sites continues to progress. Both the state's project managers and the UST contractors continue to develop their skills and add to their experience in the use of new tools and technologies. UST contractors, primarily Kentucky companies, who thoroughly participate in use of new technologies, will gain skills and experience that will keep them competitive nationwide. While this is not the intent of the UST program, it is an added bonus.

Multiple remedial strategies are used to address contaminated UST sites located throughout Kentucky. For sites unencumbered by shallow utilities, where soil contamination is relatively shallow, a typical remedial approach might involve digging out the contaminated soil. In deeper or generally more challenging environments substances meant to trap, degrade or destroy contamination may be injected into the soil. Depending upon the unique characteristics of the site, this approach may include injection of oxidants, biological amendments or adsorptive media (i.e., activated carbon) into the subsurface. In cases where petroleum is present in an undissolved form, pumping the petroleum from the ground may be attempted. Some sites may require a combination of these methods to successfully remove or treat the contamination.

Even with the numerous tools currently available to characterize and remediate contaminated UST sites the work ahead will be challenging. Many of the more easily remediated sites have been cleaned-up. The remaining sites may progress somewhat slower than desired for a few possible reasons. These include sites being located in more geologically complex areas, having larger releases, or having uncooperative owners. Nevertheless, it is believed that continued reliance on a strategy of aggressive source characterization, early remedy implementation, and employing a combination of treatment approaches will help to expedite UST cleanups statewide.

The administrative section invoices for tank fees, collects tank fees, and registers tanks. In 2016, there were 1,867 invoices for tank fees, totaling $297,270.00, were mailed. Ninety-one percent (91%) of the total invoiced was collected. A total of 754 new and amended registrations were processed.

PSTEAF is meeting current needs of the cleanup program. Over obligations are being held to a manageable level, claims are paid in a timely manner, and applications are processed without

delay. DWM is fully committed to moving work forward and properly accounting for the dollars spent.

The Claims and Payments section, which manages the PSTEAF, obligated $15,926,841.37 for small owner tank removal account (SOTRA) and Financial Responsibility Account (FRA) and the Petroleum Storage Tank Account (PSTA) corrective actions. Claims are reviewed and approved within an average of 10 days upon report approval. Reimbursements totaled $15,553,420.64 from all PSTEAF accounts.

The efforts of the Claims and Payments Section personnel helped design and test a new database that was successfully launched in June 2016. Three databases were consolidated into one system which will increase overall efficiency. This system tracks dollars obligated to UST work and claims for payment as a result of work completed.

Compliance personnel have been focused on building relations with the regulated community while continuing to support the field inspectors with data input into TEMPO enterprise system. They continue to assist Designated Compliance Managers with Kentucky Underground Storage Tank Operator Online Learning System (KY TOOLS), the online compliance training program.

Presently, 88% of Kentucky's UST facilities have a single individual responsible for compliance that has taken the KY TOOLS online training. The Compliance Section is continuing to seek additional ways to be of greater service to the regulated community by coordinating compliance awards, the TEC Award, with the Kentucky Petroleum Marketers Association and participating in Fuel Schools to educate the UST community on UST regulations. This branch is looking forward to participating in compliance inspections with the field inspectors and gaining additional hands-on training with UST equipment.

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Secretary Charles G. Snavely
Deputy Secretary R. Bruce Scott, P.E.

Kentucky Department for Environmental Protection
Commissioner Aaron Keatley

Kentucky Division of Waste Management
Director Anthony R. Hatton, P.G.
Assistant Director Jon Maybriar

This annual report is intended to provide a concise set of facts and measurements to support environmental decision-making. We welcome your questions and comments to the contacts below.

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Report an Environmental Emergency, 24-hours, to Environmental Response Team
502-564-2380 or 800-928-2380