Division of Waste Management
Fiscal Year 2022 Annual Report

TEAM KENTUCKY
ENERGY AND ENVIRONMENT CABINET

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EXECUTIVE SUMMARY

Dear Reader,

On behalf of the Division of Waste Management, I am pleased to present the 17th edition of our annual report. This report highlights division activities and accomplishments for the 2022 Fiscal Year (July 1, 2021, through June 30, 2022). Thank you for taking time to read this report of the important achievements the staff have accomplished during this period.

This year on December 12, Kentucky residents endured a vicious tornado that traveled through western and central Kentucky. DWM personnel responded quickly to the aftermath to provide assistance to the damaged counties and help begin the cleanup of massive tons of debris left behind. Staff from the Emergency Response Branch and Field Office Branch began surveying areas and, with the use of drone technology, mapping locations where the largest quantities of rubble had been deposited by the storm. This information was helpful in determining the location of landfills, staging areas, and burn sites that might be used for cleanup. The next step for the on-site crews was to locate and remove hazardous materials such as transformers, drums, and other items that had been scattered, and to cleanup spills that were impacting waterways or causing potential threats to human health and the environment. At the central office, staff from all branches were busy responding to questions from citizens, government agencies, and regulated entities. The Hazardous Waste Branch began contacting manufacturing facilities and providing guidance for regulatory compliance; the Solid Waste Branch issued emergency permits for the newly located construction/demolition debris landfills; the Underground Storage Tank Branch worked with local gas stations that were damaged or without electricity; the Superfund Branch provided assistance identifying areas of potential releases; the Recycling and Local Assistance Branch handled questions and assisted county officials with reporting requirements; and the Program Planning and Administration Branch ensured those in the field had the necessary supplies. Within two months, the division had issued permits for 17 construction demolition/debris landfills, approved 48 staging areas for waste consolidation, and field-approved 45 brush burning areas in a 20-county span. While the response activities were challenging, the commitment of the scientists, specialists, geologists, engineers, and administrative staff never stopped.

In addition to storm response, staff were busy conducting their normal activities and meeting the needs of daily work demands. My favorite highlight story in this year's report is the Field Operations Branch innovative way to train new employees. Maintaining training requirements for employees and keeping current with ever changing technologies can quickly get behind without proper schedules and plans. The branch, consisting of over 70 employees, implemented an approach that has been successful in other situations. They began a mentoring program and staff are excelling with the new teaching technique.

Lastly, I want to mention a term that has become a major talking point in the waste and recycling industries. Many think of environmental justice (often referred to as EJ) as preventing pollution in disadvantaged neighborhoods, when in reality EJ is multifaceted and includes concepts of social equity, circular economy, economic benefit, and sustainable material management. There is a temptation to jump in but where do we start? There is not an easy path to begin or accomplish EJ and perhaps the best way to start is to bring together the voices of our communities. Then we listen. And we listen again.

Tammi Hudson, Director.
Kentucky Division of Waste Management

PERSONNEL AND FUNDING

PERSONNEL SUPPORT

The division provides support to its personnel by identifying needs and providing tools for staff to accomplish their jobs. Some examples are evaluating workspace requirements, coordinating employee training and development, organizing in-state and out-of-state travel logistics, and procuring goods and services such as uniforms, office supplies, equipment, and furniture.

PERSONNEL

The division's FY22 budget supported the employment of 228 full-time positions and nine Federally Funded-Time Limited (FFTL) positions, a decrease of 10 full-time positions from the previous fiscal year (Figure 1). However, the average number of filled full-time positions within the division in FY22 was 208 and seven FFTL. The reductions in personnel positions from the previous fiscal year can be contributed to the challenge of retaining existing employees and hiring new employees due to lower salaries than private sector. The Division continues to also face the awareness of Tier 1 employees approaching retirement age which can affect the program priorities and efficiencies (Figure 2). The profile of Division employment shows that 24% of employees are eligible for retirement within the next 5 years. To address the ongoing personnel concerns, the cabinet initiated an employee recruitment and retention initiative. To assist in retaining existing staff and attracting new employees, salaries were adjusted for professional level staff. The Cabinet has also become more active in recruiting new talent by attending job fairs, offering internships, offering reimbursement for continuing education, and paying for professional licensures.

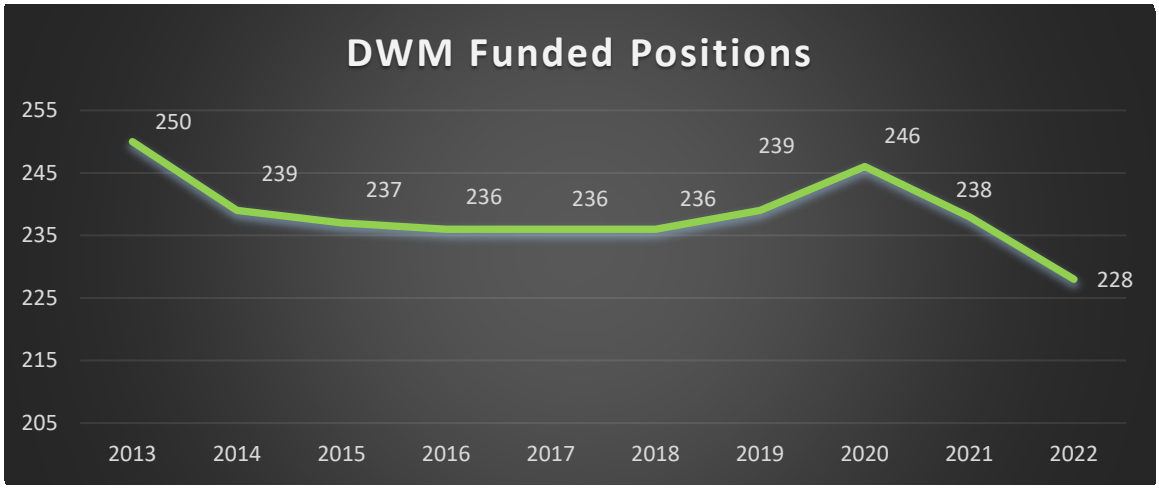

Figure 1 Division of Waste Management Funded Positions

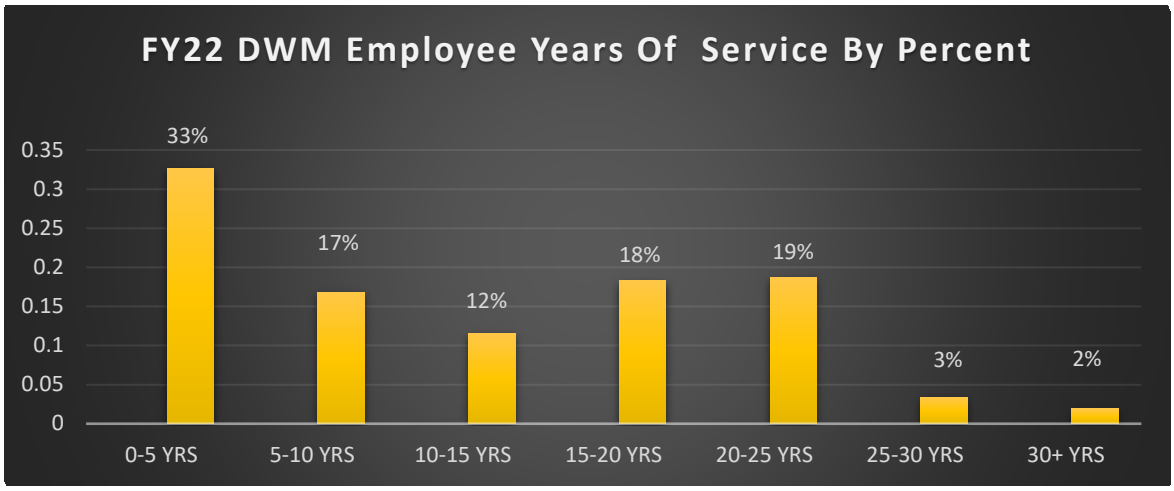

Figure 2 Employee Years of Service by Percent

BUDGET

The budget for the division encompasses numerous programs and activities. The division is financially supported by general funds, federal grants, and restricted-agency funds (Figure 3). Restricted-agency funds are received from various organizations, individuals, non-governmental agencies, and other governmental agencies. DWM restricted-agency fund receipts include: fees collected for permits and registration activities; Petroleum Storage Tank Environmental Assurance Fund fuel receipts; waste tire fee receipts; Environmental Remediation Fees; assessment and application fees; paper recycling receipts; tank registration fees; interest income; and a transfer to the Kentucky Pride Fund from Kentucky Transportation Cabinet's Highway Construction Contingency Fund.

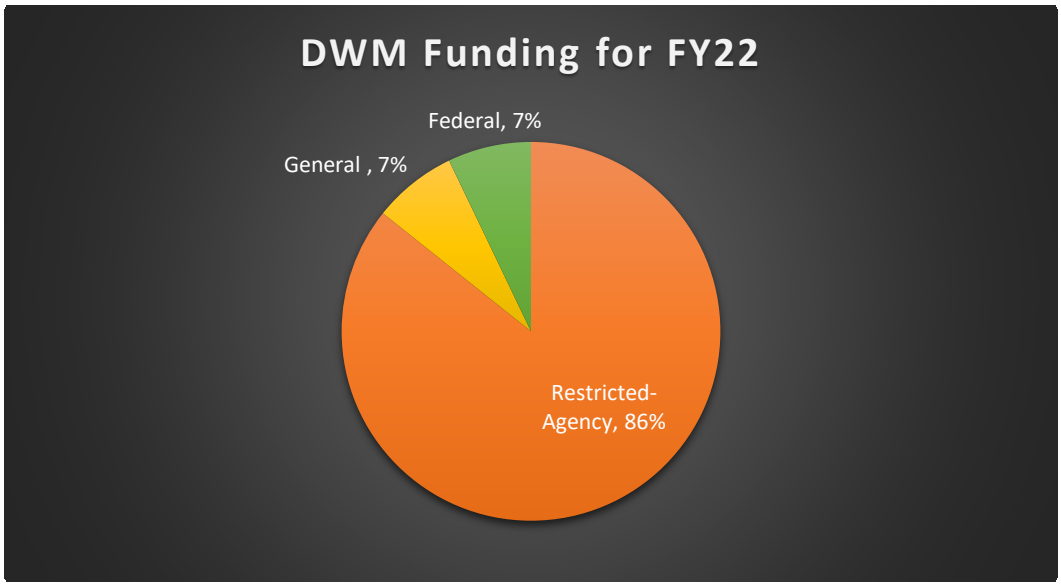

Figure 3 Division of Waste Management Funding Sources

FEDERAL FUNDS

Currently, the DWM receives funding from a total of 15 federal grants and cooperative agreements. Federal funds make up approximately 7% of DWM's total funding. The financial grant and cooperative agreement support programs include:

- The Chemical Demilitarization ACWA Cooperative Agreement with the U.S. Department of Defense provides financial support for the division's efforts at the Bluegrass Chemical Agent-Destruction Pilot Plant and the Explosive Destruction Technology facility.
- The Agreement in Principle with the U.S. Department of Energy allows the division to conduct independent and impartial assessments of ongoing remediation activities at the Paducah Gaseous Diffusion Plant.
- The B.F. Goodrich Facility Agreement outlines the technical work to be performed at its Calvert City, Kentucky facility and provides funds for field oversight support, meetings, and travel cost.
- The Core Program Cooperative Agreement funds are used for identifying, investigating, and addressing environmentally contaminated sites in accordance with the division's Superfund Program as established by the Comprehensive Environmental Response, Compensation and Liability Act of 1980.
- The US Department of Defense (DoD) and State Memorandum of Agreement provides funding to ensure environmental restoration at DoD installations occurs consistently with state and federal law, and to improve coordinated initiatives between DoD and the division.
- The Federal Facilities Agreement is a three-way agreement between US Department of Energy, the EPA, and Kentucky that outlines regulatory structure and directs work at the Paducah Gaseous Diffusion Plant site. The agreement ensures compliance with, but avoids duplication of work between, the corrective action provisions of the Resource Conservation and Recovery Act permitting program and the Comprehensive Environmental Response, Compensation and Liability Act.
- The Five-Year Review Cooperative Agreement provides funding from the EPA to the Superfund Program to perform five-year reviews of remedial action at National Priority List sites in Kentucky. The purpose of a five-year review is to determine whether sites' ongoing or completed remedial actions will remain protective of human health and the environment.
- The Support Agency Cooperative Agreement provides additional financial support to the Superfund Program to perform five-year reviews of remedial action at CERCLA National Priority List sites in Kentucky.
- Performance Partnership Grants (PPG) are the cornerstone of the National Environmental Performance Partnership System – EPA's strategy to strengthen partnerships and build a results-based management system. PPGs can reduce administrative transaction costs, provide the flexibility to direct resources toward the highest priority environmental problems, and support cross-media approaches and initiatives.
    i. Resource Conservation and Recovery Act (RCRA) grant 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. .
    ii. Superfund Brownfields Cooperative Agreement provides financial support to the Brownfield Redevelopment Program to conduct assessment, direct cleanup, and guide redevelopment of brownfield sites.

iii. Toxic Substances Control Act Compliance Monitoring Cooperative Agreement provides financial support to the division to implement the compliance-monitoring program for polychlorinated biphenyls (PCBs) and track facility information in the PCB Transformer Registration Database.

- The Leaking Underground Storage Tank Prevention Assistance Agreement with the EPA provides financial support for the development, implementation, and maintenance of the Underground Storage Tank (UST) program. The program's purpose is to identify leaking USTs in Kentucky, bring all USTs into compliance with release detection and release prevention requirements, and minimize future releases.
- The Leaking Underground Storage Tank Cleanup Cooperative Agreement with the EPA provides financial assistance to oversee remediation and cleanup of leaking USTs by responsible parties and to ensure the cleanup at sites where an owner is unable to take necessary corrective action.
- The Preliminary Assessment/Site Investigation Cooperative Agreement provides funds to assist the EPA identify candidate sites for the National Priority List – waste sites that represent the most significant risk to human health and the environment due to releases of hazardous substances, pollutants, or contaminants. The division characterizes sites, plans remedial actions, and implements cleanup of identified waste sites.
- The Brownfields Assessment and Cleanup Grant provides funding from the EPA to communities that wish to address brownfield properties in order to protect and/or improve water resources. This grant is used to target rural areas impacted by coal mining, but it may also be used to assess approved sites throughout the commonwealth.

REGULATIONS

The Program Development staff perform a variety of functions, such as management of planning initiatives, development of regulations, coordination of the review of proposed bills during the legislative session, and preparation of division's reports.

LEGISLATION:

During the 2022 Legislative Session, staff completed 20 bill reviews, which involved evaluating and commenting on how the proposed bills might affect the DWM at structural or fiscal level.

ADMINISTRATIVE REGULATIONS:

The regulation 401 KAR 39:060 establishes the general requirements for hazardous waste management systems. It was amended to revise and add additional waste codes for the treatment and disposal of nerve agent munitions. This administrative regulation was filed with LRC and became effective October 5, 2021. All administrative regulations related to DWM are listed on the Legislative Research Commission website at https://apps.legislature.ky.gov/law/kar/TITLE401.HTM.

REPORTS:

The Waste Tire Trust Fund (WTTF) CY2021 Annual Report was submitted in January 2022, as mandated by KRS 224.50-872. This report provides information relevant to Kentucky's waste tire program – specifically expenditures, revenues, and effectiveness in developing markets. The report is available for review by accessing the Division website, at https://eec.ky.gov/Environmental-Protection/Waste/Pages/division-reports.aspx/.

During FY22, staff prepared the Division's Strategic Operational Plan and mid-year status updates of planning initiatives for CY2021. Staff also reported in EPA's FY22 Grant Workplan Priorities and Commitments, and Mid-Year Update Reports to meet requirements for federal grants.

COMPLIANCE AND INSPECTIONS

DWM performs inspections at sites managing solid waste, hazardous waste, Underground Storage Tanks (USTs), and polychlorinated biphenyls (PCBs). The primary duty of the Field Operations Branch (FOB) is to inspect regulated facilities for compliance with applicable regulations. The Field Offices include the Frankfort central office, Richmond satellite office, and 10 regional offices located throughout Kentucky. The regional staff are familiar with the local waste management issues and respond to questions and concerns of citizens and public officials.

During FY22, the FOB regional staff conducted 5,781 total inspections of UST, solid waste, and hazardous waste facilities. This was an increase of 2.5% compared to inspections completed in FY21. This is attributed to the COVID restrictions being lifted and more inspector positions being backfilled.

	Inspections FY22	Inspections FY21	Compliance Rate FY22	Compliance Rate FY 21
UNDERGROUND STORAGE TANKS	2854	3037	57%	57%
HAZARDOUS WASTE	1148	1089	83%	80%
SOLID WASTE	1752	1510	68%	68%

Table 1 Summary of Inspections

Although FOB was understaffed in many field offices, staff worked across regions to satisfy federal grant commitments. New safety measures were implemented to reduce work related injuries and neighboring offices assisted to meet all grant commitments. Despite UST inspections falling by 15%, overall annual and three-year grant commitments were met or exceeded. Compliance rates remain steady from 2021. Below is a breakout of the inspections for FY22. FOB staff also completed more than 1734 investigations resulting from citizens' complaints in addition to the mandated compliance inspections.

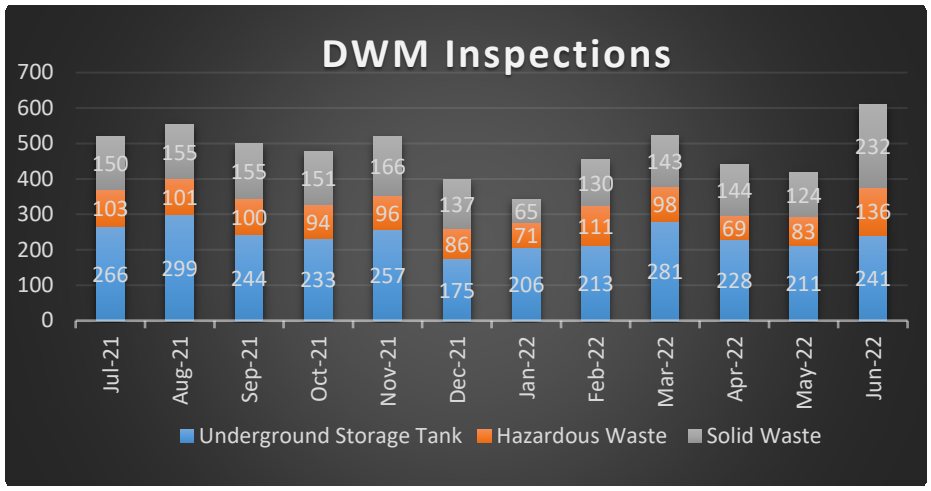

Figure 4 Division of Waste Management Inspections

- The total number of UST inspections fell approximately 15% in FY22. UST compliance rates (percent of total complaints, excluding those driven by citizen complaints, for which no violation is noted) stayed in the mid to upper 50th percentile but trended upward towards the end of the year. Overall, the average compliance rate remained at 56%.
- Hazardous waste inspections increased 5% from the previous year. The increase in inspections is attributed to new inspectors becoming more familiar with the program and being able to conduct inspections with limited oversight. The compliance rates for hazardous waste facilities averaged 78%, decreasing 2% from FY21.
- Solid waste inspections increased by 14% over FY21. This increase could be attributed to increased inspections during the December 2021 tornado outbreaks that impacted large areas of the state. The average compliance rates for solid waste facilities increased to 77%, up from 68% in FY21 and could be attributed to more frequent inspections as more inspectors are being hired and required inspections are being met.

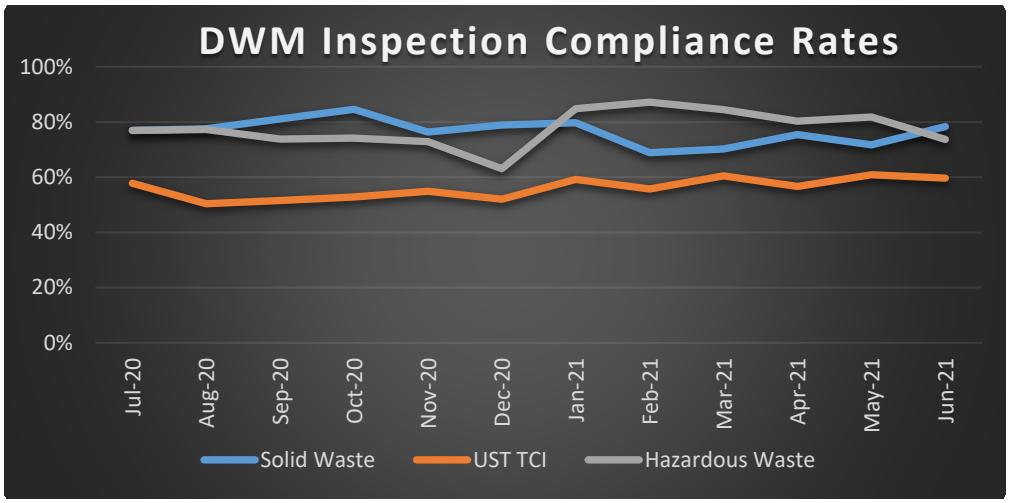

Figure 5 Division of Waste Management Inspection Compliance Rates

FIELD OPERATIONS BRANCH HIGHLIGHT

MENTORING AS A TOOL FOR TRAINING

The Division of Waste Management's Field Office Branch staff has been dealing with high rates of turnover for many years due to retirements as well as private sector competition. As knowledgeable staff retire and are replaced by recent college graduates, training new inspectors has been challenging and time consuming for current staff. With annually shrinking budgets and inflation, as well as travel restrictions during the peak of the COVID pandemic, FOB has looked at unconventional methods to train staff to perform job duties.

One of these unconventional methods that was envisioned and instituted by FOB was a mentoring program. Veteran inspectors that showed interest in training new inspectors in the Division's values and goals were paired up with new inspectors. The new and upcoming inspectors learned regulations and practical skills from their highly experienced mentors. This gave the new employees hands-on experience that cannot be gained or developed by reading policy and regulations. FOB also revamped all standard operating procedures to ensure they were current with regulations and easier to read and understand. With the mentoring program in place, FOB staff are able to train new staff while conducting inspections to meet EPA grant requirements. Staff that are chosen to mentor are those that appreciate sharing their knowledge and enjoy being part of a larger endeavor to maintain consistency across the state.

Photo 1 Solid Waste Inspectors conducting landfill inspection
Photo 2 UST Inspectors checking for leak in sump

PERMITS AND REGISTRATIONS

Staff in the Hazardous Waste Branch and Solid Waste Branch are responsible for reviewing and processing permit applications, registrations, technical reports, groundwater data, and fees for various types of waste management and disposal facilities. The regulatory requirements for each type of facility vary depending on the waste. The administrative and technical requirements can be found in the Kentucky Revised Statues Chapter 224 and Kentucky Administrative Regulations Title 401. Waste programs are divided into several broad categories, including:

- The hazardous waste program includes facilities that generate hazardous waste, those that treat, store and/or dispose of hazardous waste, as well as facilities with environmental contamination from past

mismanagement of hazardous waste. Hazardous waste is a subset of solid waste that is defined as being harmful to the environment and/or human health.

- The solid waste program includes facilities that manage and/or accept for disposal household, commercial, and industrial waste.
- The special waste program is a subset of solid waste that is specifically defined by KRS 224.50-760, and examples include wastewater and water treatment sludge, coal combustion residuals, or coal combustion by-products.

Construction and operation permits are issued based on data and information provided by the applicant and verified by DWM personnel.

HAZARDOUS WASTE FACILITIES AND METRICS

There are 12 hazardous waste treatment, storage, and disposal facilities (TSDF) permitted in Kentucky (Blue Grass Army Depot and Paducah Gaseous Diffusion Plant being 2 of the 12 permitted sites), and more than 1,800 generators of hazardous waste and over 200 transporters of hazardous waste.

The Hazardous Waste Branch, Administrative Support Section staff completed 1,872 hazardous waste generator registration reviews for facilities in all 120 Kentucky counties. These reviews include confirming the type of facility by utilizing the NAICs or SIC codes, and assessing the types of hazardous waste each facility generates as well as the types of hazardous waste transported in or through Kentucky.

In addition to facilitating generator registrations, modifications and inactivation of EPA ID numbers, the section reviewed 720 Large and Small Quantity Generator Annual Reports, addendums, and annual assessments, and 344 financial assurance reviews. Based on the annual assessment reviews, the Hazardous Waste Branch invoiced large and small quantity hazardous waste generators $1,074,406.81 in FY22 to fund the Hazardous Waste Management Fund for state lead cleanup sites.

PERMITS REVIEWED/RENEWED/ISSUED:

The Hazardous Waste Branch manages permits under the hazardous waste provisions of the Resource Conservation and Recovery Act (RCRA) for 30 individual facilities across the state. Twelve of these facilities are engaged in active treatment, storage, and/or disposal operations (“operating facilities”). Sixteen facilities are permitted for post-closure care operations and corrective action from prior life as operating facilities, and the remaining two have permits which cover only remaining corrective action. Five of the current twelve operating facilities also have requirements for post-closure or corrective action in addition to the requirements governing their hazardous waste management operations.

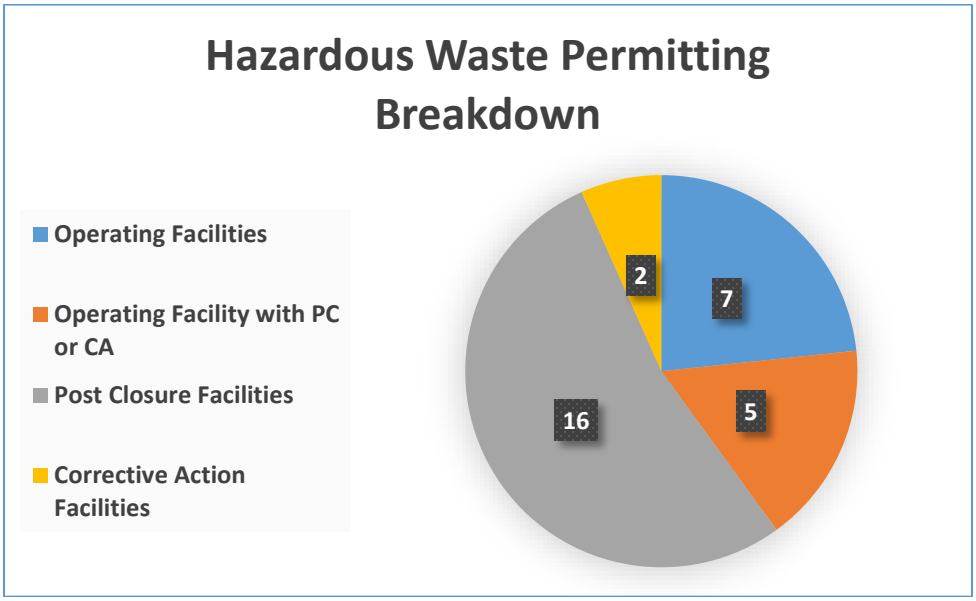

Figure 6 Hazardous Waste Permitting Breakdown

In FY22 the Permit Review and Corrective Action Section (PRCA) made 15 RCRA permitting program determinations including final permits, permit modifications, and notices of deficiency. Five of these projects were major permit renewals (a multi-year process) taken through final review and issuance. The five major permit renewals accomplished in FY22 are:

Hazardous Waste Permit Renewals	
Facility	Date of Issuance
Fort Knox	8/24/2021
Arkema	9/15/2021
Dunaway Timber	10/13/2021
Lexmark	2/13/2022
Safety Kleen Smithfield	3/25/2022

Table 2 Hazardous Waste Permit Renewals

CORRECTIVE ACTION PROGRESS

Cleanup under RCRA is tracked by the US EPA using certain Environmental Indicators (EIs), which are measures developed by the EPA to track states' remediation achievements. The most significant indicators include "Remedy Constructed", "Performance Standards Attained" and "Ready for Anticipated Use." The ultimate goal for EIs is "Corrective Action Process Terminated" which is fully accomplished when a facility has met all obligations under the Corrective Action regulation. For federal funding, the division makes a commitment to a number of EIs each year based on where various facilities are in the corrective action process. The remaining RCRA Corrective Action facilities that continue to need remediation efforts consist of sites with complex geography and contamination that will require ongoing work for many years. The

division typically commits to accomplishing two to three EIs per year and in the FFY21 the grant commitment of three EIs (two "Ready for Anticipated Use" and one "Performance Standard Attained"). Two of those accomplishments (Corning and Custom Resins each received a "Ready for Anticipated Use") were completed in FY22.

Additional significant Corrective Action work was conducted by the PRCA Section on the following projects:

- Chemours Site Wide Groundwater Monitoring Plan - Approval
- Thomas Industries Contained In Determination and associated investigations - Approval
- PMC Organometallix AOC S Wastewater Release Work Plan - Approval
- Continental Refining SWMU 4 and 5 Corrective Measures Progress Report - Reviewed, comments issued
- Lexmark Outfall #2 Corrective Measures Modification request for treatment system upgrades - Approval
- Naval Ordnance Waste Management Plan - Approval
- Naval Ordnance Vapor Intrusion Assessment Report - Approval
- Koppers Soil-Gas Sampling Report and request for no further sampling - Approval pending future groundwater sampling
- Kelley Technical Coatings CMS Work Plan - Reviewed, deficiencies determined and in review with facility
- Lexington Blue Grass Army Depot 5 Year Report on Long Term Monitoring - Reviewed, comments issued
- Fort Knox Oil Water Separator 017BE Final Closure Report - Approval
- SRG Global Soil Sampling Plan - Approval
- Fort Campbell Baseline Site Investigation for AOCs - Approval
- Fort Knox RCRA Facility Investigation Work Plan for FTKX-045 "Camp Knox Dump Site" - Approval
- SRG Global Storm Water Sampling Plan - Approval
- Fort Knox Oil Water Separator 017AF Final Closure Report - Approval
- PMC Organometallix Thermolite Area Investigation Work Plan - Approval

INSPECTIONS AND GROUNDWATER MONITORING COMPLETED:

Sites with a landfill or impoundment that was closed-in-place (post-closure sites), or which has contaminated soil or groundwater, are required to perform certain groundwater monitoring activities on a regular basis. Each facility with a groundwater monitoring program is inspected by Permit Review and Corrective Action Section staff at least every three years. During FY22, the branch conducted 13 Operations and Maintenance Inspections for groundwater monitoring programs which includes split-sampling of groundwater samples with the regulated facilities as well as inspection of physical condition and practices as the facility as it relates to corrective action.

- ARCO
- BASF
- Continental Refining
- Dow Corning

- Kidde Fenwal
- Lexmark
- Naval Ordnance
- PMC Organometallix
- Polyone/Goodrich
- Rohm and Haas
- Safety Kleen (Henry County)
- Wald
- YKK

BLUEGRASS ARMY DEPOT (BGAD):

Photo 3 BGCAPP Aerial View

The U.S. Army's Blue Grass Army Depot in Richmond, Kentucky has stored 523 tons of chemical agent in rockets and projectiles. The chemical agent consists of GB (sarin) and VX nerve agents, and H mustard (blister agent). A large industrial plant, called the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) was constructed on the BGAD facility to destroy the chemical weapons.

It is the responsibility of DWM to ensure that all regulatory and safety requirements are met under BGAD's hazardous waste permit. Approximately 50% of the entire BGAD stockpile has been destroyed as of mid-August, 2022. Weapons destructions operations began in 2019 and to-date all VX projectiles, VX rockets, GB projectiles, and H-mustard projectiles have been destroyed. The facility began destroying the last stockpiled item, GB Rockets, on July 7, 2022, and this campaign is expected to continue until the end of 2023. Two Static Detonation Chambers are expected to begin operations in fall of 2022 and spring of 2023 to destroy drained rocket warheads, overpacked leaker rockets, and problematic full M55 rockets that are not amenable to reverse disassembly. Destruction of drained containerized warheads and rocket motors is expected to continue through CY2024.

The destruction processes are complex and utilize many steps that are first-of-a-kind or have not been used on a large scale previously. Therefore, the detail of arising issues continue to be worked out during systemization and these changes require a large number of permit modifications. During FY22, the division issued 72 permit modifications to the facility, including three Class 3 modifications undergoing full public participation periods. Due to the complexity and short deadlines within the project, working together as a

team with the Army and contractors has been critical to success. The Army is obligated under treaty and funding deadlines to complete destruction of all chemical weapons by the end of CY2023.

Photo 4 BGCAPP Destruction Process

PADUCAH GASEOUS DIFFUSION PLANT:

The C-400 cleaning building at the U.S DOE Paducah Gaseous Diffusion Plant is the primary source of two 4-mile long Trichloroethene (TCE) groundwater contaminant plumes – commonly identified as the Northeast and Northwest Plumes. The groundwater plumes are the largest known sources of off-site contamination associated with the site and are therefore the primary risk to human health and the environment. In order to clean up contamination associated with the C-400 area, a comprehensive CERCLA remedial investigation was conducted to define the nature and extent of contamination. The investigation results will be summarized and cleanup options will be evaluated in a remedial investigation feasibility study. The study is due to regulators on October 7, 2022.

HAZARDOUS WASTE HIGHLIGHT

REGULATORY RELIEF AFTER NATURAL DISASTERS

After the major tornado event in western Kentucky in December 2021, the Hazardous Waste Branch worked with facilities in the affected areas to lessen the paperwork requirements for those who generate hazardous waste and meeting the required reporting periods. The Hazardous Waste Branch issued a blanket notification for any episodic generation of hazardous waste, thus allowing hundreds of very small quantity and small quantity hazardous waste generators in the affected areas to remain at their previous generator status and not incur the more stringent requirements for generation of additional hazardous waste. The Hazardous Waste Branch stands ready to assist regulated facilities that are affected by any future natural disasters.

SOLID WASTE DISPOSAL FACILITIES AND METRICS

Solid waste includes household, commercial, and industrial waste. Construction and operation permits are issued based on information provided by the applicant and verified by Solid Waste Branch staff. Regulatory Time Frame (RTF) is the allowed amount of time that the division is given to complete permit actions. The specific RTFs can be found in the regulations for both solid and hazardous waste permits. In FY21, the solid waste staff approved 139 permitting actions, and 129 (93%) were within the RTF.

- Over the past five years, staff have completed an average of 94% of permit application review approvals within the RTF.
- At the end of FY21 there were 66 pending actions and of those, 11 exceeded the RTF.

In addition, staff issued 15 denials for solid waste permitting activities, 12 withdrawal final actions, and 17 approvals for the closure and termination of solid waste permitted activities. Staff also coordinated the issuance of 26 public notices and conducted 1 public hearing.

Solid Waste landfills submit waste quantity reports to the division on a quarterly basis. The table below summarizes the tonnage of waste received by Kentucky's landfills and provides a breakdown of waste origin. This table does not represent the tonnage of waste generated in Kentucky and sent to another state for disposal.

Quarter and Year	Tons of Waste Received for Disposal	Tons of Waste Received from Out of State for Disposal	% of Out of State Waste	Tons of Waste Received for Alternate Daily Cover
3Q 2021	1,562,367.46	265,346.90	17%	82,984.22
4Q 2021	1,656,595.48	276,043.70	16.7%	81471.98
1Q 2022	1,663,451.22	247,445.20	14.9%	81,942.11
2Q 2022	1,517,090.66	205,914.10	13.6%	103,031.58

Table 3 Summary of Waste Quantity Reports

The last column in the table above represents additional tonnage of waste received by contained landfills and used for alternate daily cover (ADC) which reduces disposal tonnage. The staff reviews ADC applications on a case-by-case basis, and wastes are evaluated as acceptable for use as daily cover in lieu of or in addition to soil cover.

The Solid Waste staff oversee the permitting activities of 167 landfill disposal facilities of various types with active permits. Staff also issues permits to facilities that divert waste from disposal and reuse it in ways that preserve natural resources and prevent pollution. These facilities include locations where wastes are beneficially reused: landfarms use waste to promote soil structure and fertility; and composting and sludge giveaway operations distribute processed waste for use. There are 91 special waste beneficial reuse facilities and at least 38 solid waste facilities authorized for beneficial reuse. There are 31 sites with active compost permits, 25 sites with active landfarm permits, and 35 sites with active sludge giveaway permits.

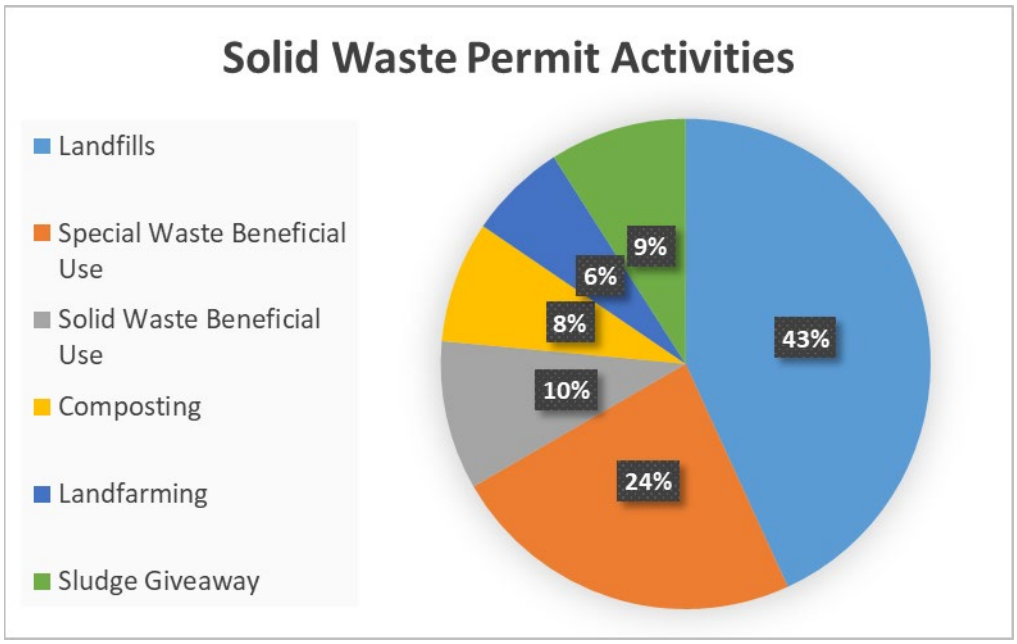

Figure 6 Solid Waste Permit Activities by Type

ENVIRONMENTAL REMEDIATION FEE AND OTHER FEES:

The Environmental Remediation Fee (ERF) was established by KRS 224.43-500 and requires generators of waste in Kentucky to pay $1.75 per ton of solid waste that is disposed in a municipal solid waste landfill. The ERFs are deposited into the Kentucky PRIDE Fund and used to support grants for the cleanup of illegal open dumps, recycling, and household hazardous waste management.

ENVIRONMENTAL REMEDIATION FEES COLLECTED			
2021 3rd Quarter	2021 4th Quarter	2022 1st Quarter	2022 2nd Quarter
$2,734,143.05	$2,899,042.09	$2,911,039.64	$2,654,908.65

Table 4 Environmental Remediation Fees

Some ERF funds are also used to characterize, remediate, and close old historic residential landfills that were never properly closed (see Historic Landfill Sites Section). Compliance rates for submission of the ERF continue to be high.

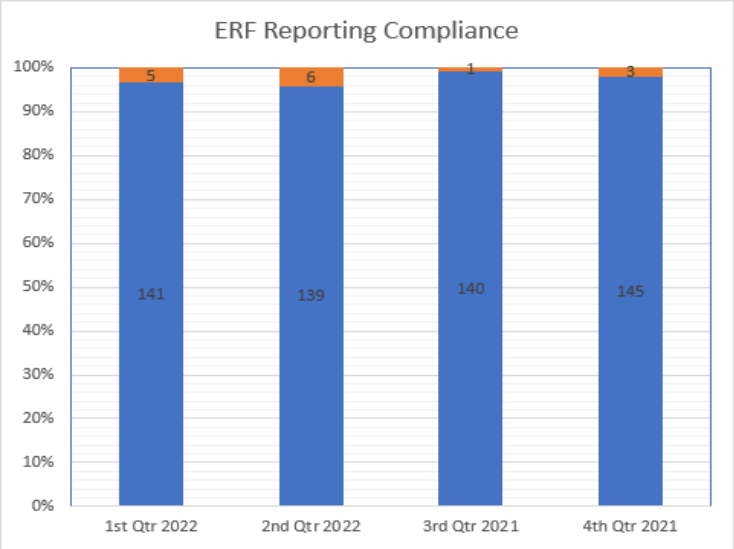

Figure 7 Environmental Remediation Fee Reporting Compliance

In addition to the ERF, solid waste branch program facilities paid $683,050.00 in FY22. Of that, $134,300.00 was collected for 46 solid waste and special waste permitting actions, and $548,750.00 was paid for the annual recurring fee for Coal Combustion Residual facilities and solid waste facilities. Compliance for payment is 100% for both types of non-ERF fees.

HISTORIC LANDFILL SITES:

A total of 99 historic landfills have been closed through construction and remediation projects or by no further action due to intensive site studies, and 522 historic landfills remain to be closed. Total costs associated with the closure projects exceed $74 million, excluding branch personnel direct and indirect expenses. To qualify for remediation under the Historic Landfill program, the landfill stopped accepting waste prior to July 1, 1992. Funding for historic landfill closure is from the Kentucky PRIDE account.

GROUNDWATER MONITORING AT SOLID WASTE FACILITIES:

Groundwater assessment requires the owner or operator of a facility to determine the existence, extent, and depth of groundwater degradation, as well as the rate and direction of migration of contaminants in the groundwater. Of the 77 facilities required to monitor groundwater, 19 are in groundwater assessment (25%).

Corrective action requires the owner or operator of a facility to abate groundwater contamination, 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 six facilities (8%).

SOLID WASTE HIGHLIGHT

2021 WESTERN KENTUCKY TORNADO STORM EVENT

The catastrophic tornadoes of December 10th and 11th 2021 that occurred in the western part of the state produced an extraordinary volume of waste. When these wide-ranging events happen, they can quickly overwhelm the capacity of an area to manage the waste efficiently and safely. In such cases, emergency permits can be requested for the storage and disposal of storm debris. After the tornadoes cleared the area,

staff from the Division of Waste Management reviewed requests from local governments and private property owners to store and dispose of storm debris. The first step was the mobilization of staff from DWM central and field offices to visit the proposed storage and/or disposal sites and assure that the proposed sites were acceptable for waste management. After individual site inspections, the field office staff gave verbal approval so that waste removal could begin as soon as possible. Overall, seventeen (17) sites were approved for waste disposal and issued emergency permits. The permits for these types of sites are required by regulation to be limited in term to a period of 90 days. However, due to the high volume of waste to be sorted, moved, and disposed, the process of clean-up continued throughout the spring and summer and the Division extended several of the permits to deal with the ongoing clean-up process. Clean-up efforts are still ongoing as of fall 2022.

RECYCLING AND WASTE MINIMIZATION

In accordance with KRS 224.43-315, Kentucky recyclers are required to report annually to their counties the amount of municipal solid waste collected for recycling by volume, weight, or number of items, and the type of items recycled. DWM staff rely on individual counties and recycling operations to report accurate data. A strong effort to confirm and cross check these numbers ensures that entities are generally consistent and provide uniform data. An effort is also made to interpret the raw data in a way that allows useful comparison to recycling rates calculated by other states and by the EPA. FY21 was 26 percent, a slight decrease from the 2020 rate of 26.9 percent.

Local recycling programs have continued to face many challenges over the past year due to highly fluctuating commodity market conditions, ongoing impacts from the pandemic on the labor force and high fuel costs which have forced some recycling operations to scale back or discontinue services. One potential source of hope is the infusion of new federal funding to help support our nation's struggling waste management systems. The new federal Bipartisan Infrastructure Law will provide an historic and unprecedented investment in our country's waste management and recycling infrastructure through a new source of EPA funding that is intended to improve and support the development and expansion of local waste management and recycling programs as well as provide increased health and safety for our communities. The new Solid Waste Infrastructure for Recycling (SWIFR) grant program will provide $275 million, $55 million per year from Fiscal Years 2022 to 2026, to help state and local governments make improvements to their recycling programs and material management systems.

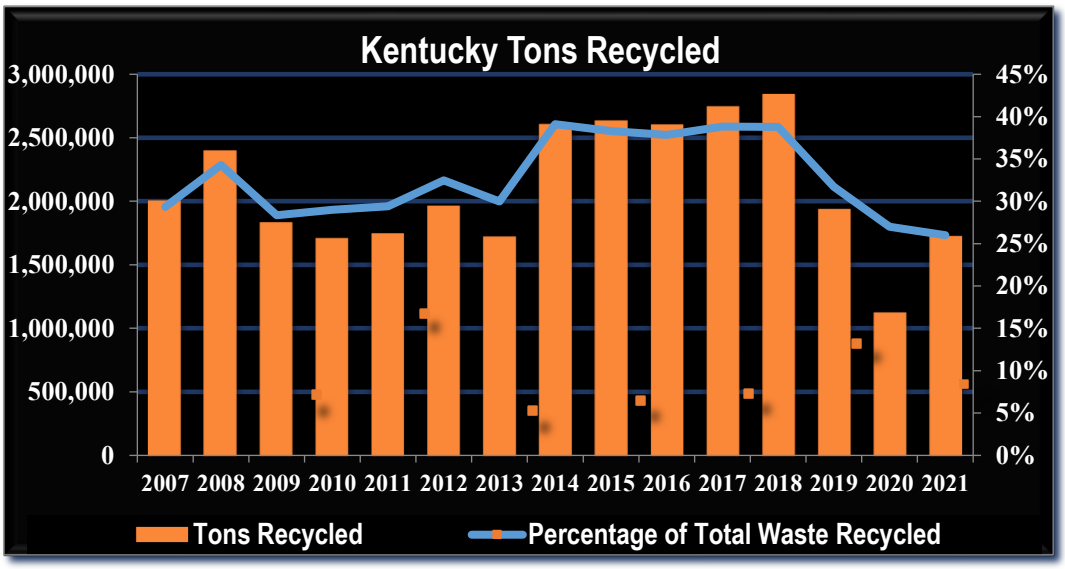

Figure 8 Kentucky Tons Recycled

MARKET CONDITIONS

The pandemic continued to leave its influence on recycling markets. People shopped from home, office materials dipped in use and then rebounded as remote working diminished. Overseas conflicts affected fuel prices, shipping schedules, and production of materials which lowered demand for packaging materials. These changes have resulted in instabilities of recyclable material values.

- Fiber commodity values have somewhat sustained their recovery values. Cardboard prices maintained a fairly even value, and sorted and mixed paper increased throughout the year.
- Prices for most plastic grades increased sharply with the onset of the pandemic in 2020, but have decreased at an equally rapid pace through 2022. Increased global petroleum priced generally increases demand and prices for recycled plastic, so it is possible that plastic prices may see an uptick in the near future.
- Steel cans remain stagnant in value while aluminum cans experienced a rise and then a return to lower values.
- Residential glass has remained unchanged for over 18 months. Single stream and curbside glass collection can result in cross contamination which decreases market potentials.
- Most ferrous and non-ferrous metals showed a steady decrease through 2019 before leveling off, but compared to many other commodities still have decent markets.
- Copper bearing scrap continued to be in demand, and is dependent on economic conditions. Most of these items require little or no processing, which makes them valuable additions to a community recycling program.
- White goods prices tend to have very little volatility.

GRANTS AND FUNDING

WASTE TIRE TRUST FUND:

The Waste Tire Trust Fund (WTTF) is generated through a fee on all new motor vehicle tires sold in Kentucky. It is used to conduct waste tire collection events, provide annual funding directly to counties for waste tire management, award crumb rubber and rubber-modified asphalt grants, facilitate market development for the use of waste tires, and to clean up waste tires at mismanaged sites. In the 2018 session of the General Assembly, the previous $1 per tire fee was increased to $2 per tire. However, some of this increased revenue may be diverted from the WTTF for other state budgetary needs going forward. The Division offers a $4,000 annual grant available to counties for recycling or disposal of waste tires.

WASTE TIRE COLLECTION EVENTS (FORMERLY KNOWN AS "TIRE AMNESTIES"):

During the fall of 2021 and spring of 2022, waste tire collection events were conducted in the counties comprising the Bluegrass, Lake Cumberland and Lincoln Trail Area Development Districts (ADDs).
The equivalent of 779,031 waste tires were recovered through the FY22 collection events at a cost of $1,768,790.

CRUMB RUBBER/TIRE DERIVED PRODUCTS GRANT:

In 2022, the Division awarded 14 grants totaling $452,500 for the application of crumb rubber used for landscaping or other tire-derived products, and poured-in-place rubberized pavement projects (used for walking trails and playgrounds). Picnic tables and benches made from recycled tires were popular requests in the 2022 grant applications. This grant does not fund crumb rubber applied to athletic fields, or loose shredded playground mulch. From 2004 to 2022, the Division has awarded 543 grants totaling over $10.4 million to local governments, schools, daycares, churches, and other entities for projects that utilize products made from recycled tires.

WASTE TIRE WORKING GROUP:

In 2011, House Bill 433 established the Waste Tire Working Group (WTWG). The WTWG is a committee appointed by the governor in accordance with KRS 224.50-855 to discuss and research topics in waste tire management, and make recommendations to the cabinet in efforts to improve Kentucky's programs. The committee is tasked with meeting twice per year with all meetings open to the public. The WTWG consists of two ex-officio members and six appointed members. Current members of the WTWG:

- Director of the Division or designee: Donald "Donny" Atha (ex-officio)
- Manager of RLA Branch: Darin Steen (ex-officio)
- KY Department of Agriculture representative: Harlan Hatter
- Solid Waste Coordinators (2): Sherri McDaniel (Woodford Co) and Brian Miles (Grant Co)
- Mayor: Tracy Neice (Hyden)
- County Judge/Executive: Pending
- Retail tire sales in private industry representative: Pending

RUBBER MODIFIED ASPHALT:

In the spring of 2016, the Division launched the Rubber-Modified Asphalt (RMA) Grant program. This grant funds the paving of approximately one mile of a county road with RMA, with the county then required to pave the same area of a similar road with standard asphalt, and to monitor both sections for a five-year period. The Division awarded four RMA grants in FY22 totaling $443,363. RMA is slowly becoming more common across the U.S., and has been found in many applications to improve durability and performance of pavement

at a competitive price. There are several different methods for incorporating recycled tire rubber into pavement and the grant is open to two different types of paving: chip seal (a process that combines one or more layers of asphalt with one or more layers of aggregate), and thin overlay (approximately 1.5 inch asphalt layer installed over existing asphalt pavement).

KENTUCKY PRIDE FUND

The Kentucky Pride Fund 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 historic landfills, recycling grants, household hazardous waste management grants, and remediation of illegal open dumps. Additionally, this fund receives $5 million annually from the Kentucky Transportation Cabinet, specifically for distribution to counties and incorporated cities (who have a solid waste ordinance or a solid waste contract with a hauler) for litter abatement activities.

LITTER ABATEMENT:

Since 2001, the Division has been tracking the cost of litter activities and the amount of litter collected. Litter abatement grant funding through the Kentucky Pride Fund was initiated in FY02.

In 2021 (the most recently available data), counties removed 614,674 bags of litter (an estimated 12,293,480 pounds) from 146,900 miles of Kentucky roadways at a total cost of $7.09 million. Counties report on all litter abatement activities, including activities conducted outside of the grant program. This data may not include litter collected by state road crews as part of the Transportation Cabinet's efforts to maintain state roads.

Litter collection is expensive, therefore, counties are encouraged to utilize some of their grant funding for education and outreach activities to help prevent littering. The most common items found on roadways are plastic bottles and food containers.

There has been a substantial variation of dollars spent per number of bags collected over the past 10 years. Possible reasons for this variation are that collection and record keeping procedures might not be consistent among the counties, and that expenses such as education and outreach, which do not contribute to the number of bags collected, can vary considerably from year to year.

ILLEGAL OPEN DUMPSITES:

In 2021 (the most recently available data), counties cleaned 67 illegal open dumps at a cost of approximately $542,326.86, and collected 5,771 tons of waste. The eighteenth round of grants was awarded in February 2022 for the remediation of 80 dumpsites at a projected cost of $994,923. Since the Division's Open Grant program was updated in 2006, over 2,405 illegal open dumpsites have been addressed at a cost of $24.2 million.

RECYCLING, COMPOSTING, AND HOUSEHOLD HAZARDOUS WASTE GRANTS:

The Kentucky Pride Fund provides funds for grants for the development and expansion of recycling programs and household hazardous waste (HHW) management. In recent years, this program has begun to provide grant funding for composting operations as well. The recycling and composting grants help fund infrastructure to promote a regional approach to decrease the amount of waste going to Kentucky landfills. The HHW grants fund county collection events that encourage proper management of such wastes as electronic scrap, pesticides, solvents, mercury, and other potentially hazardous products from residences.

During FY22, 75 entities were awarded grants totaling just under $4.8 million. A total of 34 recycling grants and 12 composting grants were awarded to cities, counties, and universities. HHW grants were awarded to 29 counties in Kentucky, resulting the collection of almost 400 tons of material. Recipients of these grants are required to provide a 25% local match in the form of cash or "in-kind" personnel, educational activities/materials, or advertising to promote the program.

STATE OFFICE PAPER RECYCLING

The State Office Paper Recycling Program serves more than 115 agencies in Frankfort. 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 approximately 70% of the waste stream in the office environment. Since 2006, state employees have recycled more than 25,559 tons of waste paper, generating approximately $4.05 million in revenue.

In 2021 (the most recently available data), state employees recycled 791.74 tons of waste paper, generating more than $94,000 in revenue. A decrease in tonnage and revenue in 2021 may reflect typical fluctuations in commodity prices over time, global developments such as China's increasingly restrictive import policies, and market disruptions caused by COVID-19. Also, the most recently re-bid contract to purchase paper generated by the program includes lower rates that some previous contracts, decreasing overall revenue. However, the Government Recycling Section is able to generate high quality, desirable bales through an emphasis on proper sorting and processing, so even in poor market conditions this material is in demand.

Photo 5 Large Paper Shredder & Baler at Paper Recycling Warehouse in Frankfort

ELECTRONIC SCRAP RECYCLING

Proper management of waste computer and electronic parts and equipment (e-scrap) continues to be a challenge throughout the state. Many counties offer some type of e-scrap collection, year-round drop-off programs, or periodic events.

The division holds a contract with Powerhouse Recycling who successfully collected and processed 202 tons of e-scrap in 2020 (the most recently available data). To date, the primary users of the contract have been state agencies and county school districts and Boards of Education. However, county governments have been encouraged to take advantage of this opportunity to properly manage their e-scrap. E-scrap generators continue to be reimbursed for certain items which should make this an attractive option for county governments. County governments reported 1,010 tons of e-scrap collected in 2021 which includes material collected under the contract and outside the contract. The Division also promotes proper management of e-scrap through the Household Hazardous Waste (HHW) Grant Program provided by the Kentucky PRIDE Fund.

THE MARKETPLACE

The Marketplace newsletter, reintroduced by the division in the fall of 2020 as a quarterly release continues to be distributed to over 200 municipalities, stakeholders and other related entities. Recycling articles of interest as well as relevant legislative or policy changing actions are featured in the newsletter. Commodity values continue each quarter for the previous six month period.

RECYCLING AND LOCAL ASSISTANCE HIGHLIGHT

LOCAL ASSISTANCE, PLANNING, AND ENVIRONMENTAL JUSTICE

At the core of the division's mission of providing planning and technical assistance to local governments is the Plan-IT Program developed by the Recycling and Local Assistance Branch, Local Assistance Section (LAS). This program began in 2020 and has been pivotal in fulfilling the requirement to coordinate the development, planning, implementation, and evaluation of Area Solid Waste Management Plans and activities pursuant to Kentucky Revised Statute 224.

The Plan-IT Program includes several objectives to be implemented by local governments related to solid waste management, with a primary focus being on the siting of facilities. The purpose of facility siting is to locate and establish solid waste management facilities while ensuring local approval. The siting process is a complex, multi-dimensional process that involves environmental, economic, and social issues. It requires local officials to be knowledgeable, flexible, and able to maintain a dialogue with the public at every stage of development. This program assists local officials in the process of determining need, locating, and managing all types of solid waste facilities by offering a comprehensive set of resource materials, workshops, trainings, and site visits that develop effective strategies and positive outcomes.

The LAS staff commits to a thorough process that walks state officials through every step of facility siting. The initial steps include an educational component that details waste management regulations and statutes, along with waste related topics. Trainings and workshops are then offered to work individually with counties to determine capacity need, location, and environmental consequences. Once a plan is initially developed, the program then includes an intensive public notification process. After consideration and response to public questions and comments, the local officials can then make the best decisions for their Solid Waste Management Area.

LAS has claimed several successful siting outcomes since developing these resources and strategies. Local officials in many counties, including Bourbon, Marshall, and Pendleton have expressed their appreciation of the program. In response to numerous requests from local officials, LAS is currently developing more workshops and guidance documents related to implementing a good solid waste management plan.

REMEDIATION AND ECONOMIC DEVELOPMENT

The Superfund staff ensure that contaminated sites are evaluated and remediated in a timely manner in order to reduce risks to human health and the environment. This may be accomplished by working with companies or individuals who take responsibility for contamination on their property. In other instances, the staff may

take a direct role in cleaning up a site. This program handles oversight of cleanup of hazardous substances, pollutants, and contaminant releases and petroleum releases that are not from an underground storage tank.

Traditionally, Superfund sites were assessed and characterized with the expectation that a person would incidentally ingest soil or drink water from a contaminated groundwater source. Now equal attention is given to the future receptor that may develop and occupy a property. In addition to soil and water impacted media, air vapors with the potential to migrate into dwellings are also considered. Chemicals with high vapor pressures can affect occupants of dwellings that have been constructed over and adjacent to prior chemical releases. When reviewing redevelopment plans and due to potential background effects, the vapor exposure pathway is assessed if future property use includes occupancy in a building.

There are currently 301 managed Superfund sites. Management is an accepted closure plan using on-site engineered controls such as a cap or structure, and/or institutional controls such as an environmental covenant or deed restriction. These sites require inspections and an annual report or five-year review as established by statute. The obligations to continue management of controls to remediate the releases are indefinite. Therefore, the number of total managed sites in Superfund will continue to increase as new sites are approved for closure. A site can be removed from the managed site list if additional cleanup is performed to restore the site to safely allow for unrestricted residential use of the land.

In FY22, staff issued a total of 63 closures, but there remains 315 sites without an approved closure plan and 40 new sites added during the year.

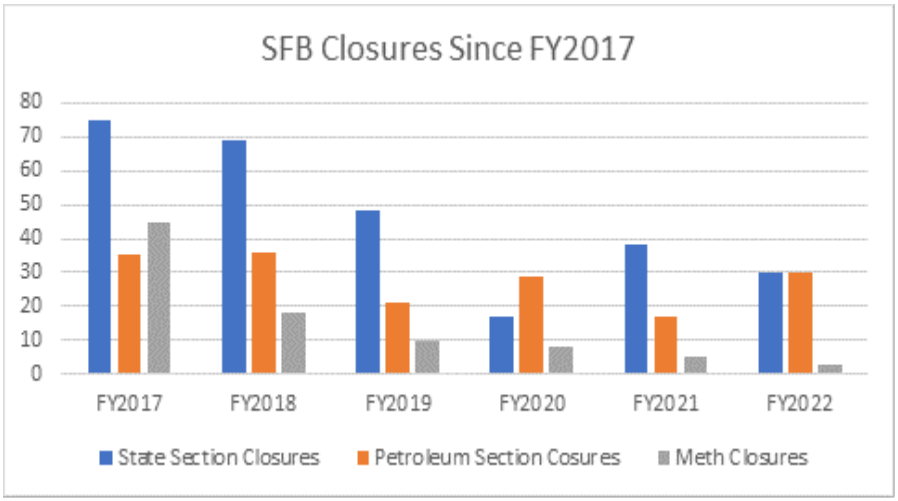

Figure 9 Superfund Program Closures

PETROLEUM

Cleanup of petroleum releases from a source other than a petroleum storage tank provides an ever-increasing number of superfund sites. In FY22, 20 new petroleum sites entered the staff's workflow, and 30 sites were closed: 12 new sites and 18 historical sites. The current active site load is 56 petroleum sites.

METHAMPHETAMINE LAB CLEANUP

DWM staff work in conjunction with law enforcement and health departments to remediate structures and homes contaminated with illicit meth waste through the division's Methamphetamine Lab Cleanup Program. Due to meth waste being toxic, especially to small children, and its ability to absorb into home surfaces and structures, methamphetamine must be remediated by certified contractors. Since this program began in 2007, there have been 2,170 reported meth properties and 799 have been remediated. In FY22, there were not any contaminated residences reported, but three additional properties were cleaned.

FEDERAL PROJECTS

The Superfund staff oversee federal projects that include CERCLA (aka Superfund) sites on the National Priorities List (NPL). Staff conducted work under federal cooperative agreements such as pre-remedial site assessments including EPA's Hazard Ranking System evaluation, NPL sites' Five-Year Reviews, and NPL operation and maintenance activities.

Under CERCLA, a total of 20 sites in Kentucky were placed on the NPL many years ago. As part of ensuring long-term protectiveness, three NPL sites received the most attention over the past year: Brantley Landfill, Caldwell Lace Leather, and Lee's Lane Landfill. The Brantley Landfill site is in the final stage of deletion from the NPL. Environmental sampling is ongoing at the Caldwell Lace Leather site to determine if it is eligible for deletion from the NPL. The Lee's Lane Landfill site's gas collection system removal is projected to be completed within a few months. The proposed removal activities require formal concurrence with the Division in coordination with EPA.

Additionally, staff conducted one Pre-CERCLA Screening and four Pre-CERCLA Screening/Preliminary Assessments. These five sites are Rank 1 – KDEP Superfund Site Ranking Initiative sites that focus on former RCRA permitted facilities. Staff also conducted one Five-Year Review for the Ft. Hartford NPL site, and are in the process of conducting three NPL sites' Five-Year Reviews (Brantley Landfill, A.L. Taylor, and Tri-City Landfill). All of these sites required in-depth research and reporting as part of EPA cooperative agreement obligations.

STATE PROJECTS

Kentucky Superfund statutes require persons or parties responsible for contaminating land or groundwater to investigate the extent and remediate or manage the contamination according to regulatory guidance. Sites requiring action to address contamination that are not associated with a financially viable responsible party are eligible to become state-lead sites. State Section staff allocate resources to collect environmental samples from soil and groundwater and to develop a strategy to remediate and/or manage the contaminants to restrict harmful exposure. The State Section provides oversight and guidance for these sites and their environmental activities.

There are over 223 state Superfund sites, and DWM staff oversee all non-federal superfund projects in Kentucky. These projects include ensuring regulatory compliance and guidance of responsible party lead investigations, remediation, and management. In FY22, the State Section oversaw the closure of 33 sites. Of these sites, 30 received clean, unrestricted closures and 3 received managed closures. There were 30 state-lead sites in progress during the FY22. Three of these sites were clean closed through state-lead

cleanup actions. The state section also manages 3 sites on behalf of non-viable responsible parties. All other sites not specifically mentioned are still in investigation or remedial planning.

RISK ASSESSMENT

The Superfund Branch Risk Assessment Section currently consists of two staff members responsible for all risk related reviews or inquiries originating from either within the Branch or from within other branches of the Division of Waste Management. Risk Assessment Section staff also provide risk assessment related trainings, perform and oversee audits of brownfield and managed sites, and oversee operation and maintenance of closed state lead sites. During FY22, section staff performed 12 document reviews. Sites for which documentation was reviewed included the Blue Grass Army Depot (BGAD), the Paducah Gaseous Diffusion Plant (PGDP) and Kentucky Utility's EW Brown Station. The section also participated is numerous conference calls with BGAD and PGPD project personnel.

The Risk Assessment Section has played a significant role in the ongoing evaluation and remediation of the Southern Wood Treatment facility, an arsenic contaminated site located in Mount Sterling, Kentucky. During FY22, the section performed a screening level risk assessment of this site using existing site data. Multiple areas at the site were evaluated to determine whether additional soil excavation might be needed in those areas. The section also assisted with gathering and evaluating background soil data and established a site-specific background threshold level for arsenic in soil for use during an upcoming removal action. This project is ongoing and will likely require additional input from section staff in the future.

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. There are two types of Brownfield programs implemented by the Department.

The first program is the Targeted Brownfield Assessment where the Division of Waste Management (DWM) and the Compliance Assistance Branch (CAB) of the Division of Enforcement work jointly to provide grant assistance and environmental assessment for redevelopment of properties for non-profit entities. Both CAB and DWM staff are trained to conduct environmental assessments known as Phase I assessments. These assessments are provided without charge to the non-profit entities. DEP staff can also provide further assistance by either preforming or contracting Phase II work, which relies on verification sampling of environmental media. During FY22, Petroleum and State Section staff conducted three "in-house" Phase II Targeted Brownfield Assessments. By performing this work using DWM professional staff and equipment, the savings for redevelopers are estimated to be $24,000 dollars.

The second program is for Brownfield Redevelopment. This allows prospective purchasers of property to utilize and redevelop property that is environmentally impacted or perceived to be impacted, and not be held liable for cleanup of the property as an owner of an existing release. The redevelopment program requires the purchaser to certify that it has never been affiliated with prior property owners or caused or exacerbated releases on the property. Staff work with a redeveloper to create a property management plan for a productive safe reuse of the brownfield is finalized, and the participating entity is not held responsible for prior releases while the plan is followed.

In FY22, three Targeted Brownfields Phase II Assessments were conducted. Multiple other sites have been reviewed and technical assistance was provided for recipients of various EPA 128(a) Brownfields Grants. Additionally 51 Brownfield sites were reviewed in accordance with KRS 224.1-415, 31 Notice of Eligibility letters issued, 55 Notification of Concurrence letters issued, and four sites were pending review at the end of FY22.

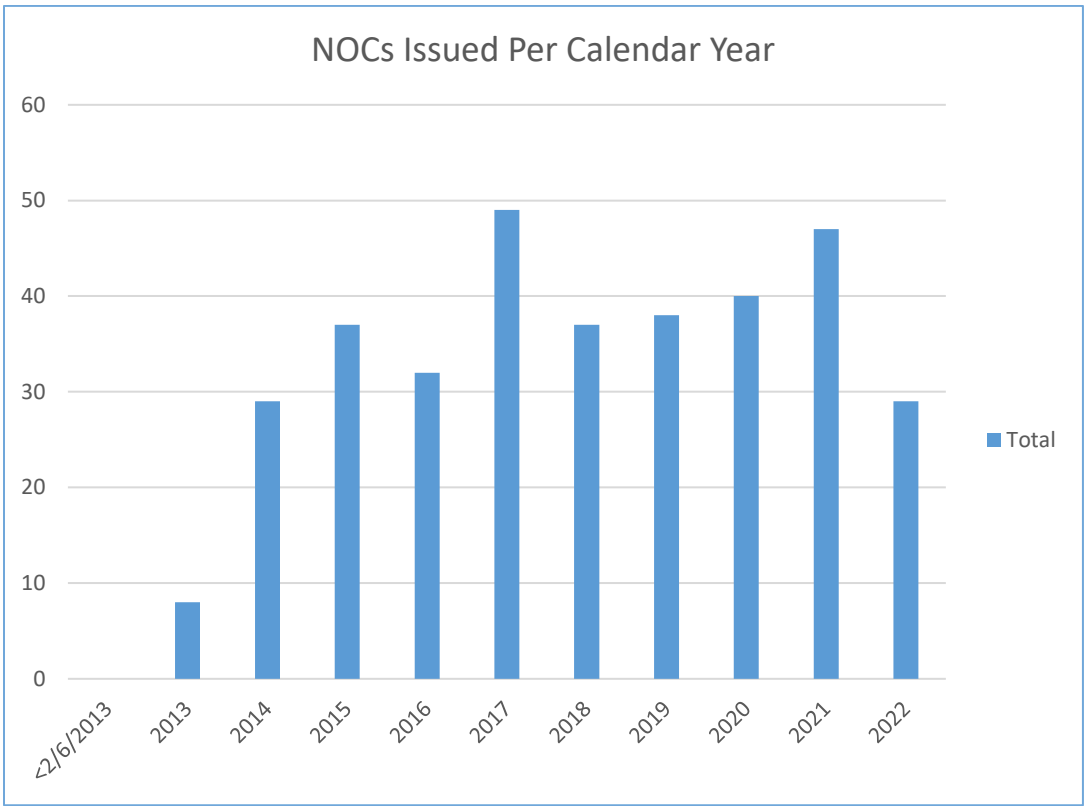

Figure 10 Brownfield Redevelopment Program

BROWNFIELD REDEVELOPMENT PROFILES

The Future Corbin Farmer's Market Pavilion is planned for construction on a city owned lot adjacent to Sanders Park in Downtown Corbin. Based on the Phase I Targeted Brownfield Assessment (TBA) completed by the Kentucky Brownfield Program, a Phase II TBA was carried out to verify the presence or absence of possible contaminants of concern associated with a possible historical automotive business. Utilizing state owned equipment, the Superfund Branch collected samples of the soils across the property and was able to clear the property of environmental concerns. Currently, the city has submitted the grant proposals and environmental reports to the United States Department of Agriculture and hopes to move forward with construction this fall.

Photo 6 Current Conditions, Future Corbin Farmer's Market

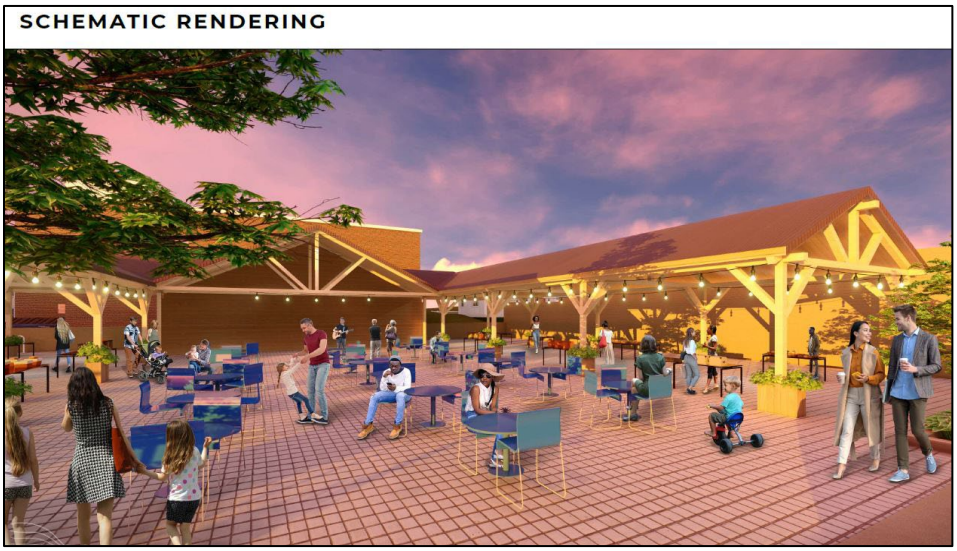

Photo 7 Planned Corbin Farmer's Market Pavilion

Louisville Baxter Apartments, LLC

Located just east of downtown, Louisville's Phoenix Hill neighborhood was once a thriving part of Kentucky's largest city. According to HistoricLouisville.com, German immigrants originally settled in this area early in the city's history. Impressive homes and commercial developments populated areas along East Broadway, which bordered the neighborhood to the south. Following World War II, much of the area was demolished and much of the neighborhood's residential housing capacity was lost. Businesses that served to draw people to the neighborhood such as the Phoenix Hill Tavern, a popular nightclub located at the neighborhood's extreme southeast corner, closed in 2015. Over the years, the site had been home to multiple businesses including retail petroleum stations and an auto repair shop. An environmental investigation of the site in 2016 concluded that the compounds 1,4-dioxane and naphthalene, both potentially carcinogenic, were present in the area and caused a significant deterrent to development of the neighborhood's southeastern corner.

In August of 2016, Louisville Baxter Apartments, LLC, a prospective site developer for housing units, applied for entry into the Kentucky Brownfields Redevelopment Program. Kentucky approved the application in 2017 with certain stipulations. One stipulation was that potentially contaminated soil would remain covered with a foot of uncontaminated soil. Another was that apartment units would not be constructed above areas of the site that might present a vapor intrusion concern. To help facilitate meeting the requirements of the agreement, existing structures were demolished, exposing areas of contamination that could be removed and then well capped with soil. To comply with the second stipulation, the developer planned the construction in such a way as to avoid placing apartment units directly above areas presenting a potential vapor intrusion risk. Construction of a new $50 million dollar apartment and retail complex was completed in 2019.

The Baxter – a 260 unit residential and retail complex – has provided additional residential housing in an area that lacked this resource. In addition to the new living space provided, the first floor of the development offers 31,500 square feet of new retail space, including restaurants and shops.

Photo 8 From Baxter Avenue Looking at First Floor Restaurant
Photo 9 Courtyard within Baxter Apartments

The Former Derby Tank Car site in Ekron has been purchased by Meade County Government. The county hopes to attract industrial businesses due to the available rail access, and the 45 acre property may be considered for long term county needs such as a county garage or animal control shelter. In the 2000s, the Superfund Branch conducted State Lead remedial activities at the site, which led to capping over 8 acres with a soil cap and the issuance of a managed closure. In cooperation with Meade County and the Kentucky Brownfield Program, Superfund personnel carried out further assessment on the eastern wooded area of the site and identified some additional environmental issues. Superfund is currently assisting Meade County in developing a plan to address those issues and move forward with redevelopment.

Photo 10 Former Darby Tank Car Site, Capped Area

Family Dollar Store (Erlanger)

Prior to entering the Kentucky Brownfields Redevelopment Program (KBRP) in 2015, the property located at the corner of Dixie Highway and McAlpin Avenue in Covington, Kentucky was unused. Two structures that had once served as retail filling stations and then later as auto repair shops lay dormant, as did the used car lot situated between them. The site had petroleum contaminated soils and groundwater, and samples collected from onsite soils indicated the presence of elevated petroleum vapors in structures in the northeast corner of the site. With the exception of a residential area located to the northwest, most of the area surrounding the property was heavily commercialized

After having sought liability protection through KBRP, Family Dollar Stores purchased the property in 2015. The land was then cleared of existing structures and a new Family Dollar store was constructed. In order to protect employees working in the store, the new building was located away from the road and intersection where contamination had been previously identified. The store's parking lot was used to cover these areas of the site thereby preventing potential human exposure to contaminated soils or vapors.

Although its opening was initially delayed due to the pandemic, the store is now operational and serving the nearby community. At the time of a recent audit, several customers were milling about the store, which sells an assortment of groceries and other staple products at reasonable prices. The mission of the KBRP is to

help to promote redevelopment and beneficial reuse of underused properties that are contaminated or potentially contaminated by hazardous substances and to do so in a manner that is protective of human health and the environment. This project is a prime example of how the program continues to fulfill this mission.

Photo 11 Family Dollar Store off Dixie Highway

MAXEY FLATS PROJECT

The Maxey Flats Disposal Site (MFDS) is a NPL site that was originally established in 1962 as the Nation's first low-level radioactive waste disposal operation. Presently the site is comprised of the original 280-acre operation and 662 acres of surrounding land was purchased during remediation for a buffer zone to restrict land development and further protect the public. Many current operations are conducted within a 60-acre perimeter fence that encompasses the waste disposal area, office complex, site laboratories, and maintenance facilities. The 55-acre waste disposal area is covered by a highly protective, technologically enhanced vegetative cap.

From 1963 to 1977, the Commonwealth of Kentucky, under authorities granted by the U.S. government, licensed a private commercial operator to dispose of low-level radioactive waste. Some of the primary producers of this waste were hospitals, universities, the US Department of Defense, and the US Department of Energy. An estimated 4.7 million cubic feet of waste material was buried in shallow, unlined trenches during commercial operation. This waste material included approximately 242,000 kilograms of source material (uranium and thorium or ores containing them), 2.4 million curies of byproduct materials, and 431 kilograms of special nuclear material (plutonium and enriched uranium). Since commercial operations were discontinued in 1977, the Commonwealth has owned and maintained the MFDS through multiple phases of closure and remediation. The Commonwealth will maintain control of the site in perpetuity. For a full summary of the site history, see here:
https://eec.ky.gov/Environmental-Protection/Waste/superfund/maxey-flats-project/Pages/MaxeyFlatsSection.aspx

Photo 12 Maxey Flats, Post-Capping

Since completion of the Final Cap in 2017, there have been no performance concerns with the vegetative cap and its components. The vegetative cover increases in density each year, erosion in the adjacent drains is stable as it relates to storm water management from the cap, and seepage contamination levels remain below conservative screening levels. Additionally, the MFDS laboratory operations are being adapted to accommodate new sampling and analysis procedures for gross alpha and gross beta detection to ensure effective contamination mobility monitoring. Tritium, the current indicator isotope, naturally decays over a relatively brief period (4,500-day half-life) and will progressively become a less representative indicator through the 100 year span of the Institutional Control Period.

The remediation at the MFDS was implemented under the guidance of the USEPA Region IV headquartered in Atlanta, Georgia, and in accordance with the 1996 Consent Decree. Environmental monitoring and site maintenance is the responsibility of the Commonwealth and is overseen by the Division of Waste Management. In FY20, the MFDS received permission from EPA to implement the Sampling, Analysis and Data Evaluation Plan and the O&M Inspection Program from the Institutional Control Work Plan. Approval of the full Work Plan is pending EPA review.

The remediation at the MFDS was implemented under the guidance of the US EPA Region IV, headquartered in Atlanta, Georgia and as defined in the 1996 Consent Decree. The US EPA is conducting the fifth MFDS Five Year Review that will be completed in FY22. Upon release, the Review will be available on the USEPA and KY Division of Waste Managements' web pages. Day-to-day operations at MFDS are the responsibility of the Commonwealth, which is directed by DWM. Current operations include environmental monitoring, radiological compliance, and site maintenance.

EMERGING CONTAMINANTS PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Per- and polyfluoroalkyl substances (PFAS) are a group of over 5,000 man-made, fluorinated chemicals that, because of their unique chemical characteristics, are used in a large number of consumer products and industrial applications. The widespread use of PFAS in many consumer, commercial and industrial products over the last seventy (70) years and recent concerns about the health effects of PFAS create challenges for

federal and state agencies to address these emerging contaminants. The PFAS compounds are ubiquitous and persistent in the environment and do not break down easily or within measurable timeframes. This group of chemicals are found at varying levels in air, soil, streams, groundwater, drinking water, various impacted crops, fish and domestic and wild animal food sources throughout the United States and the Commonwealth of Kentucky.

Currently, PFAS are not regulated by EPA under the Clean Air Act (CAA), Clean Water Act (CWA), or Resource Conservation and Recovery Act (RCRA) or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). However, to reduce the potential impacts on human health and the environment, the United States Environmental Protection Agency (U.S. EPA) launched the PFOA Stewardship Program in 2006 and worked with eight chemical companies to reduce and eliminate the use and emissions of PFOA and PFOS. Furthermore, concerning the increasing concern and urgency of PFAS impacts the U.S. EPA issued its PFAS "Strategic Road Map Action Plan 2021 – 2024". The U.S. EPA PFAS Strategic Road Map outlines EPA's priorities in aggressively addressing PFAS nationwide. The plan outlines five (5) major areas and goals EPA will actively address and implement over the next four (4) years:

- Move aggressively to promulgate enforceable drinking water standards for PFAS, in particular for PFOA, PFOS, HFPO-DA (Gen-X), and PFBS.
- Designating PFOA, PFOS, HFPO-DA (Gen-X), and PFBS as hazardous substances under CERCLA.
- Designating PFOA, PFOS, HFPO-DA (Gen-X), and PFBS as hazardous waste under RCRA.
- Developing effluent limitations for certain industry categories.
- Finalizing toxicity assessment for HFPO-DA (Gen-X).

Finally in indicating the level of concern, urgency and regulatory intent for PFAS, the U.S. EPA recently upgraded its Health Advisories (HA) for PFAS and PFOS from Seventy (70) parts per trillion (ppt) to 0.004 ppt (4 parts per quadrillion) for PFOA and 0.02 ppt for PFOS, and added HFPO-DA (Gen-X) and PFBS HAs at 10 ppt and 2,000 ppt respectively.

STATUS OF SUPERFUND, HAZARDOUS WASTE MANAGEMENT FUND, AND COMMONWEALTH OF KENTUCKY'S LIABILITY

As mentioned in past annual reports, the DWM will incur more environmental liability as the lifetime of the superfund projects exceed that of the responsible parties. The responsibility for long-term actions, such as operations and maintenance (O&M) of a managed remedy or continuation of closure activities, will eventually become DWM's. A site can be closed only after the remedy has achieved the acceptable *de minimis* concentrations, which often results in long-term management, maintenance, and operations.

The state's sole source of funding for long-term O&M or expired Record of Decisions (ROD) for National Priority List (NPL) sites is the Hazardous Waste Management Fund (HWMF). The HWMF finances work including regulatory oversight of responsible party remediation efforts, emergency response actions, contracts for state-lead investigations, and time-critical remediation at sites across the commonwealth. These projects include large industrial sites, persistent dry cleaners' impacted groundwater plumes, and small projects such as roadside drums, orphan wastes, and transformer releases

The HWMF was created to provide the division with the necessary funds to implement its critical task to protect the health of the citizens and natural resources of the commonwealth from threats associated with releases of hazardous substances, pollutants, and contaminants. Presently, the available HWMF balance to perform state lead work is estimated to be $450,000 per year. Recent emergency cleanup actions have exceeded this amount. Funding levels will challenge the DWM to meet initial remedial costs at sites in which responsible parties no longer exist, long term O&M is required, and other state long-term actions are needed.

UNDERGROUND STORAGE TANKS

Photo 13 Underground Storage Tank Installation

The Underground Storage Tank (UST) Branch is divided into four (4) areas along broad functional lines: administrative, prevention and operational compliance, corrective action, and a fund to assist with the costs for corrective action.

The Administrative staff manages UST system registration and notification requirements, and the invoicing and collection of annual registration fees for regulated UST systems in the Commonwealth. Annual fees are assessed for each UST that contained product after July 1, 1990. A $30 annual fee is assessed for every UST in the ground beginning on July 1 of each year. In 2022, a total of 472 new and amended registrations were received and processed. Invoices were mailed resulting in the collection of $262,050.00 in annual fees.

The Compliance staff provides outreach and educational services to UST system owners and operators to assist in the prevention of a release and maximize the rate of compliance. The section focuses on building

relations with the regulated community and providing support to field inspectors. In 2022, more than 4,100 compliance tests were received and reviewed to ensure tank owners and operators maintain compliance.

Compliance staff also manage the Kentucky Underground Storage Tank Operator Online Learning System (KY TOOLS), Kentucky's free online operator training course that has been utilized since May of 2013 to assist tank owners in complying with the annual operator training requirement. The KY TOOLS program was nonoperational for over a year while being upgraded to a supported web-based platform while also incorporating new lessons as a result of the amendments of Kentucky's UST Regulation in April of 2019 (401 KAR Chapter 42). As of March of 2022, the KY TOOLS program is operational and open for use. Currently, 1,336 operators have successfully completed Kentucky's online operator training. 692 of these operators represent the 2,647 UST facilities that have a trained operator. That is 88.6% of Kentucky's UST facilities having at least one (1) employee who is responsible for compliance that has completed the KY TOOLS online training.

The Corrective Action staff is responsible for cleaning up releases from UST systems. They plan and manage site characterization and remediation, direct fieldwork, review technical reports, and provide regulatory guidance to owners, operators, and contractors. In addition, they provide recommendations for no further action when deemed appropriate for sites that have had a confirmed release. The Corrective Action staff work closely with the Claims and Payment Section to establish the reimbursable amounts related to corrective action activities.

In FY22, the Corrective Action staff reviewed 96 closure assessments, and 14 site checks and phase II reports; issued 601 directives for site investigation/corrective action activities; and issued 98 No Further Actions (NFA) letters.

Overall, while the number of NFAs has been decreasing in the past few years, these totals are drawn from a smaller total number of ongoing cleanups. The surge of NFA letters issued in FY08 and FY13 were due, in part, to regulatory changes in FY07 and FY12. The slight increases in FY16, FY17, FY20, are associated with database cleanup efforts for pre-2006 closures.

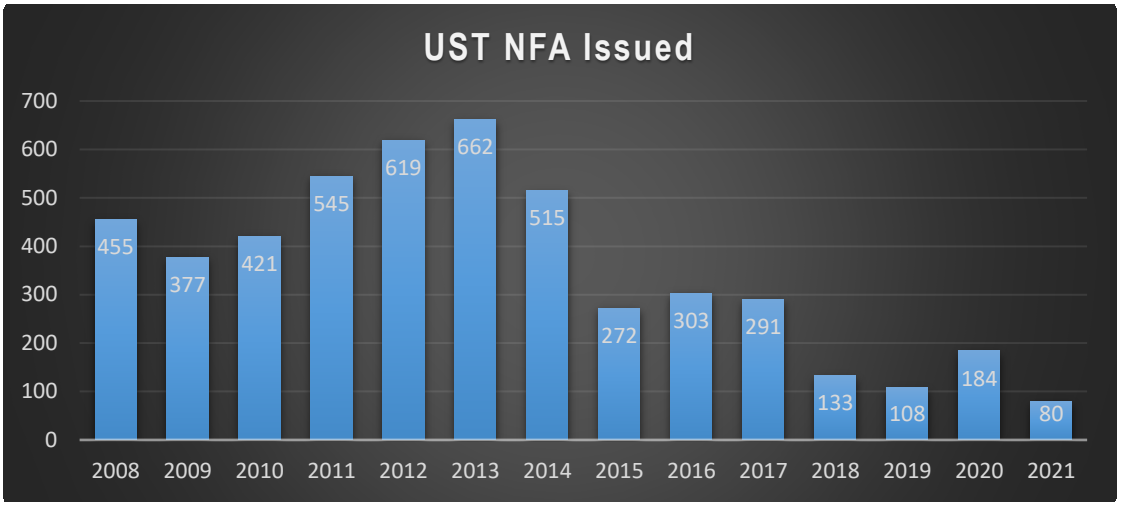

Figure 11 Underground Storage Tank No Further Action Letters Issued

As a direct result of changes in the regulatory process in 2006 and 2011, the total number of UST cleanups remaining has decreased substantially. There were 510 UST cleanups requiring additional work at the close of FY22.

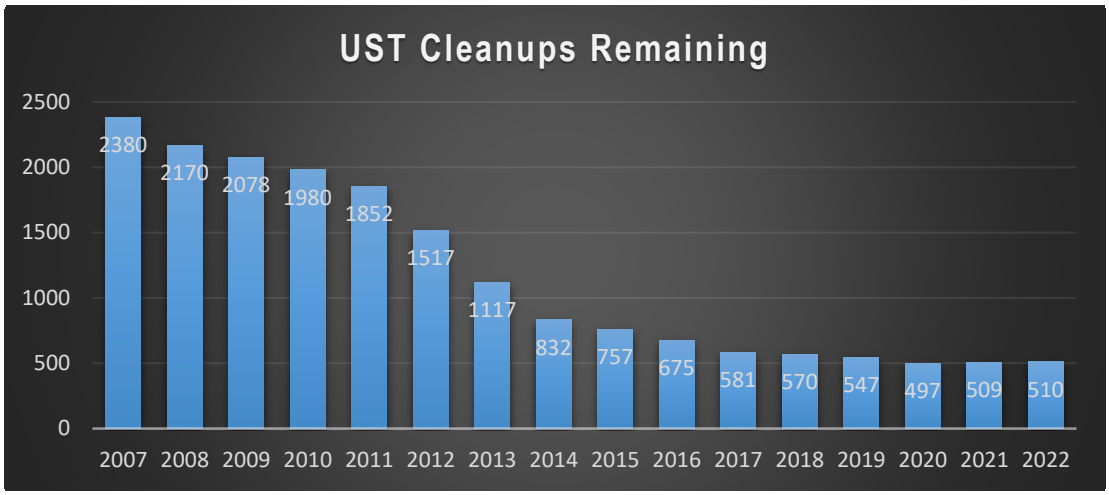

Figure 12 Underground Storage Tank Cleanups Remaining

The Claims and Payment staff manages the Petroleum Storage Tank Environmental Assurance Fund (PSTEAF). This staff approve applications, issue obligations for corrective action, and process payments for reimbursement and third-party claims. Kentucky's UST Program requires that eligible companies or partnerships, and laboratories be certified through the UST Branch in order to have a contract or perform laboratory analysis for the tank owner or operator (applicant).

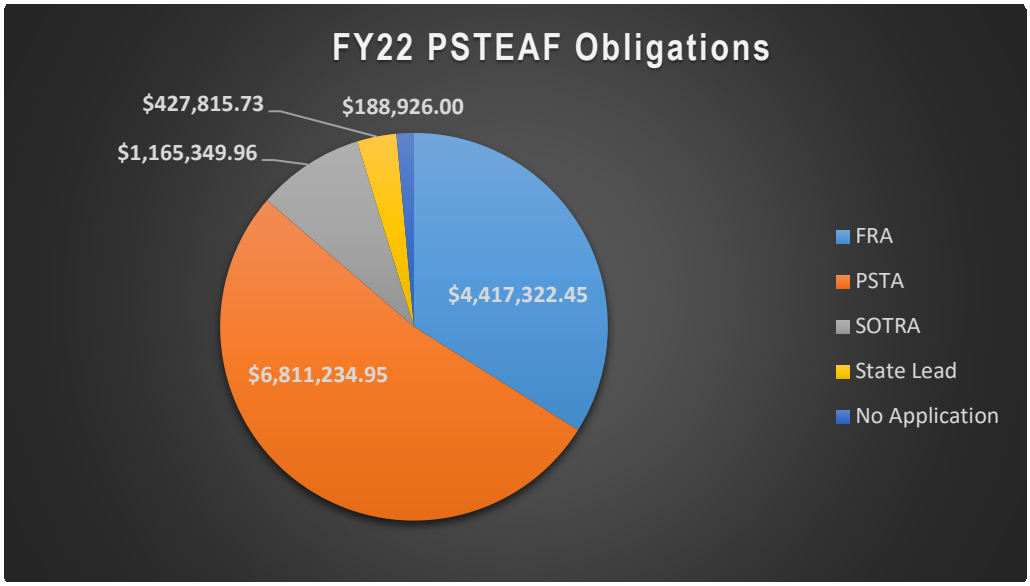

Figure 13 Petroleum Storage Tank Environmental Assurance Fund Obligations

In FY22, the Claims and Payment staff obligated a total of $13,010,649.09 for Small Owner Tank Removal Account (SOTRA), Financial Responsibility Account (FRA), Petroleum Storage Tank Account (PSTA), State Lead projects, and sites without a current application. Claim reimbursements for completed work totaled $9,936,197.61 from all accounts. Claims were reviewed and approved within an average of twenty-one (21) days upon report approval.

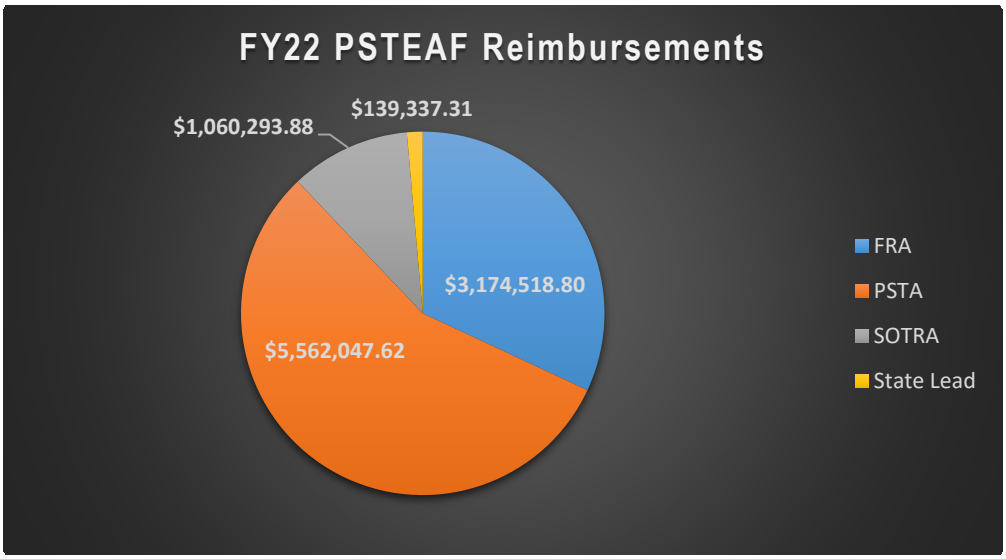

Figure 14 Petroleum Storage Tank Environmental Assurance Fund Reimbursements

UNDERGOUND STORAGE TANK HIGHLIGHT

PERSISTENCE PAYS

It is human nature to have the tendency to focus on the larger, more obvious issues while the small ones are often forgotten. Over the last 13 years, while continuing to emphasize release prevention and remediation of areas affected from petroleum releases, the UST Branch has gradually worked toward closing out a subset of historical UST sites that are no longer in operation and provide closure to property owners.

In 2009, the UST Branch received stimulus grant funding from the American Recovery and Reinvestment Act (ARRA) to perform oversight management of regulated underground storage tanks. A portion of that grant funding was utilized to perform reviews of historical records from sites with tanks coded in the branch database as having an unconfirmed tank removal (TUR tank status). These are sites that have old records indicating tanks had been permanently closed, but where required closure documentation was never submitted.

The project consisted of combing historical files of 817 UST facilities listed with a TUR tank status. File reviews began in December 2009. At the end of the grant period in 2012, the UST Branch staff had performed 711 unconfirmed tank closure reviews with approximately 500 confirmed tank closures. However, 150 sites remained under a TUR status.

Beginning in 2014, the UST Branch was awarded supplemental EPA funding under the Leaky Underground Storage Tank (LUST) Trust Fund grant for four consecutive years, to continue the TUR initiative by performing assessments for the remaining sites with TUR tanks. Contractors conducted a assessments of the remaining TUR sites. When the project concluded in 2018, over 100 additional tank closures were completed leaving just over 30 sites still under a TUR tank status, primarily due to inability to gain access to these sites.

In 2021, the TUR project was revived under another LUST Trust Fund grant. This time the project focused on gaining access to the remaining 30 plus properties with a TUR tank status in order to perform a proper closure assessment. To date, 20 sites have been recommended for closure, leaving just a handful of remaining sites with TUR tanks.

Over the last 13 years, the TUR project has allowed the UST Branch to issue close over 650 UST sites, offering much needed closure for property owners that purchased properties where the permanent tank closure had not been assessed. UST Branch has demonstrated through years of dedication and persistence, they will continue our mission to protect human health and the environment that no matter how big or how small, as they are all big in the end.

EMERGENCY RESPONSE

The Team has six dedicated staff to operate and coordinate the activities of the Emergency Response Team (ERT). The tasks include:

- Responding to environmental emergencies
- Staffing the State Emergency Operations Center during activations
- Coordinating with federal and local government partners in development of response plans and exercises
- Overseeing the many training needs and requirements and making sure they are met
- Conducting time critical removal projects
- Assisting the Department as needed with other projects
- Purchasing, maintaining, and calibrating all equipment
- Reviewing and revising ERT procedures and plans

The ERT is comprised of other personnel from the Division of Waste Management (DWM), Division of Water (DOW), and Division for Air Quality (DAQ). The ERT's main responsibility is to respond immediately to any and all emergency events that threaten the public health or the environment.

RESPONSES

The ERT conducted 478 emergency responses for the fiscal year. The responses included, but were not limited to, emergency responses to rail car derailments and locomotive fuel spills, on-road chemical tanker incidents, underground storage tank petroleum releases, facility fires and spills, oil and gas production incidents and natural disasters.

On December 10-11, 2021 a severe winter storm event impacted the Commonwealth with multiple tornados touching down resulting in devastation to numerous counties and municipalities from the western edge to the

central region of the state. Sixteen (16) counties were originally encompassed in the Presidential Emergency Declaration for this event and an additional seven (7) counties were later included in the declaration. The ERT assisted the State Emergency Operations Center by providing dedicated staffing of emergency support functions for hazardous materials and water treatment and coordinated assessment of regulated facilities and release response efforts for the impacted areas of the Commonwealth.

A total of 27 ERT personnel from across the state provided support for emergency response activities associated with this natural disaster, including: staffing of the State Emergency Operations Center; collection and in-field analysis of drinking water samples using a mobile GC/MS; mobilization of an emergency environmental clean-up contractor to perform containment of spills and collection of orphaned hazardous material containers; oversight of containment and clean-up actions for spills originating from impacted facilities, transportation incidents involving rail cars and tractor trailers, and transformer spills; and assisted in development and implementation of debris removal and disposal strategies. Photos 14 and 15 depict the type of incidents requiring response actions originating from the tornado event.

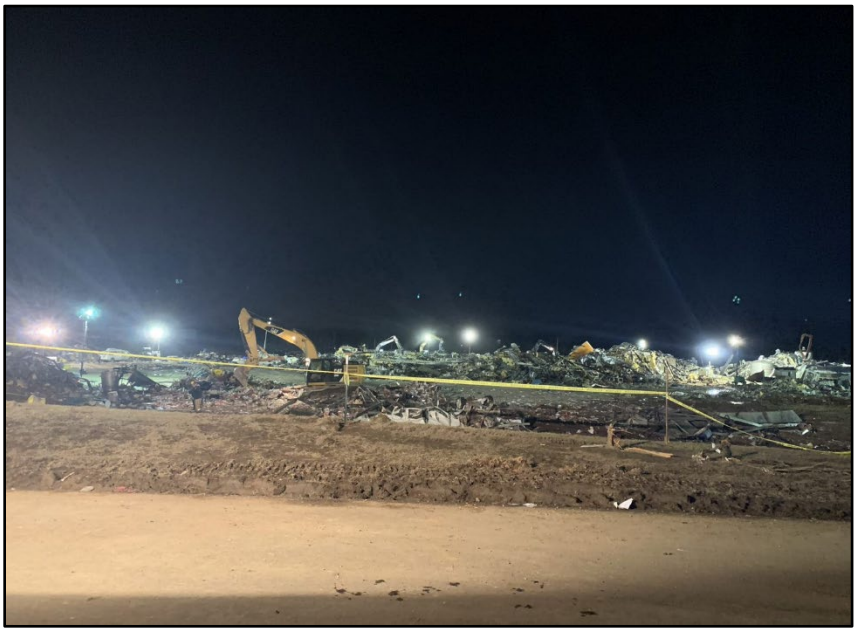

Photo 14 West KY Tornado - Mayfield Consumer Products Candle Factory

Photo 15 West KY Tornado - CSX Train Derailment

TRAINING

On-Scene responders and coordinators are required to complete training courses regarding many different safety, environmental, emergency response and incident command topics. Many of these training courses also include hands-on technical training and practice exercises, such as the oil spill response training conducted by the United States Coast Guard in Louisville, Jefferson County. ERT also developed and utilizes a 6 part series of training modules that incorporates both virtual and in-person training designed for new On-Scene responders.

Photo 16 Monthly O&M and Training on Emergency Monitoring Equipment

EQUIPMENT

Keeping supplies and equipment fully stocked and operational for emergency response is a huge undertaking. Many supplies for response actions must be immediately available and will be utilized completely during a large emergency such as containment boom and absorbent materials. These must be replaced as soon as possible to prepare for the next emergency.

Equipment must also be maintained, calibrated, and exercised so that it is ready to be used at a moment's notice. While the pandemic impacted the Team's procedures for maintaining equipment, a rotation of smaller number of staff was developed to provide for the continued maintenance of the equipment while allowing staff to retain familiarity with the equipment. The Team has taken possession of remote water quality and petroleum monitoring buoy system to allow for real time assessment of petroleum plume migration along a flowing waterway and obtained custody of an additional mobile GC/MS unit on loan from the Jefferson County Fire Department. Hazardous material monitoring and assessment equipment is now staged in two locations, Frankfort and Owensboro, providing an increased efficiency for both equipment deployment and performance of monthly maintenance and training.

Other assets, such as watercraft, trailers, generators, high volume water pumps and UTVs also must be regularly maintained and repairs performed to ensure the equipment is fully operational and ready for deployment when mobilization for an emergency incident is required.

Photo 17 Maintenance of Solar and Propane Support Trailer

DRONE USAGE

The ERT has access to multiple drones outfitted in unique ways. Camera drones give personnel the ability to see events occurring in potentially dangerous locations in real time without putting people in harm's way. They also give incident coordinators a "big picture" view of the event area to allow for better decision making. The camera drones can also record video and photos for later analysis.

The hazardous air pollutant monitoring drone carries a hazardous air pollutant sampling pump into contaminated air. The results can be analyzed within minutes to identify the contaminants and their concentrations. This information allows for informed decisions to be made to keep the public and first responders safe. The water sampling drone carries bailers to remotely collect water samples from locations where people cannot safely, or timely, access. Multiple samples can be quickly collected from remote or unsafe locations without putting people in hazardous conditions.

Photo 18 EEC Drones Displayed for Demonstration

DRONE SPECS AND CAPABILITIES:

Drones used by DWM include the DJI Mavic Pro 2. It has a five-mile travel range and can reach a speed of up to 45 mph. The DJI Matrice 300 RTK can travel 9.3 miles and reach a speed of 51 mph. The DJI Phantom 4 RTK Multispectral drone has a six-sensor camera that captures images that are used to evaluate soil moisture, plant health and growth of Harmful Algal Blooms (HABs).

MULTIPLE RESPONSE TYPES

The ERT responds to many types of emergencies. In each case, the Team must determine the best way to handle each situation to protect human health and to mitigate impacts to the environment. These emergencies may be caused by severe weather, such as ice storms, tornados and flood events, or can be a result of manmade origin, such as commercial chemical transportation incidents, industrial facility fires or spills, and oil and gas production incidents.

An example of such an emergency occurred in January 2021 when a crude oil and natural gas well exploded in Clinton County releasing hydrogen sulfide gas in close proximity to residential structures. ERT staff conducted area monitoring to ensure conditions were safe during fire extinguishment and well capping activities and for re-occupancy. ERT staff coordinated with local and state partners to provide oversight during the emergency containment, extinguishment and subsequent capping of the oil and gas production well.

Photo 19 Albany Crude Oil Well Explosion

ACKNOWLEDGMENTS

Commonwealth of Kentucky
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Secretary Rebecca Goodman

Kentucky Department for Environmental Protection
Commissioner Anthony R. Hatton, P.G.
Deputy Commissioner Amanda Lefevre

Kentucky Division of Waste Management
Director Tammi Hudson, P.E.
Assistant Director Gary Logsdon

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:

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We acknowledge the contributions of management and personnel of the Division of Waste Management.