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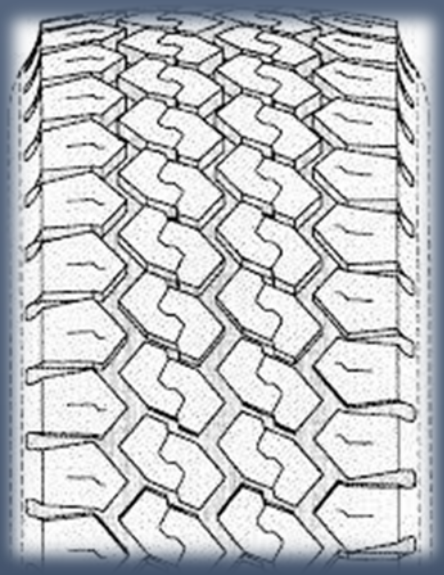

Waste Tire Program Annual Report

REPORT TO THE GENERAL ASSEMBLY

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Commonwealth of Kentucky
Energy and Environment Cabinet
Department for Environmental Protection
Division of Waste Management
Waste.ky.gov

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ENERGY AND ENVIRONMENT CABINET MANDATE

This report has been prepared as required by KRS 224.50-872. The purpose of this report is to provide information relevant to the commonwealth's waste tire program. Specifically, it includes information pertinent to expenditures and revenues, effectiveness in developing markets, benefits of the fee in funding the Energy and Environment Cabinet's (EEC) implementation of the waste tire program, and recommendations for improvement.

> *KRS 224.50-872 states, "The cabinet shall report to the General Assembly no later than January 15 each year on the effectiveness of the waste tire program in developing markets for waste tires, the amount of revenue generated and the effectiveness of the fee established in KRS 224.50-868 in funding the cabinet's implementation of the waste tire program, to include any waste tire amnesty program established by the cabinet as provided for in KRS 224.50-880(1)(b), whether the fee should be extended, comparative data on the number of waste tires generated each year, the number disposed of, the number of orphan tire piles, and the cost of tire disposal by counties in the Commonwealth".*

HISTORY & PURPOSE OF THE FUND

In 1990, the General Assembly passed House Bill 32 creating the waste tire control program and establishing the Waste Tire Trust Fund (WTTF) to eliminate existing and prevent future waste tire piles. The original program imposed a $1.00 fee on retailers of new motor vehicle tires sold in Kentucky, created requirements for tire accumulation and storage, and resulted in the removal of many tires from the environment. However, hundreds of thousands of tires continued to be stockpiled in anticipation that waste tire markets would develop in the future. In 1994, the General Assembly extended the program an additional four years and added a prohibition on open burning of waste tires.

In 1998, the General Assembly repealed the then-existing waste tire control program and created a brand new program with a new approach. The revised statute retained the $1.00 fee collected on new motor vehicle tires, the Waste Tire Trust Fund, and registration requirements for accumulators of waste tires. New additions to the waste tire management program included financial assurance requirements for accumulators, processors, and transporters of waste tires, grants for projects that manage waste tires, and reporting requirements for the Energy and Environment Cabinet regarding the effectiveness of the program. The fee is collected from consumers by retailers and paid monthly to the Department of Revenue (DOR). The cabinet uses the fee to implement the waste tire program, including the waste tire amnesties, remediation, and to fund grants that manage and develop markets for waste tires. The program

has been successively extended by the General Assembly in 2002, 2006, 2010, 2012, 2014, and 2016. It is set to expire on June 30, 2018.

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

Governor Matthew Bevin appointed Shane Gabbard to the WTWG on August 10, 2017, serving a term that expires August 1, 2018. Mr. Gabbard, of Annville, is Jackson County's Judge/Executive and represents Kentucky county judge/executives. Boone County Solid Waste Coordinator Kelly Bowlin resigned from the WTWG in 2017; her replacement is anticipated to be appointed in early 2018. Current members are:

Director, DWM or designee: .....Byron Bland (ex-officio)
Manager, DWM RLA Branch or designee: .....Gary Logsdon (ex-officio)
Kentucky Department of Agriculture representative:.....Harlan Hatter
Kentucky Solid Waste Coordinator representative:.....Scott Tussey (Madison Co.)
Kentucky Solid Waste Coordinator representative:.....Vacant
Mayor:.....Martin Voiers (Flemingsburg)
County Judge/Executive: .....Shane Gabbard (Jackson Co.)
Private retail tire sales representative: .....Joe Durkin

The cabinet conducted a WTWG business meeting September 12, 2017. Topics included updates on the 2017 Rubber Modified Asphalt Grants, the Kentucky Waste Tire Program, sustainable porous paving solutions, and the waste tire manifest system. The next meeting for the WTWG is scheduled for February 2018.

REVENUE

Kentuckians buy approximately 3,700,000 new replacement tires each year. Subtracting about 6.8 percent for internet sales, the commonwealth could be collecting about $3.4 million per year.[1] Kentucky is receiving an average of $2.65 million per year, or approximately 75 percent of the money that could be collected from the new motor vehicle tire fee. Figure 1 depicts tire fee receipts, as well as the other revenue in the WTTF for the last five years.

A number of possible explanations exist to explain why all of the fees are not being collected, including:

- *Not all retailers collect and remit the proper amount of tire fees;*

[1] U.S. Census Bureau News, November, 22, 2013, www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf

- *Fees are not paid by some trucking companies when large quantities of tires are purchased through fleet sales from wholesale companies;*
- *Department of Revenue (DOR) is paid a flat annual fee of $50,000. Insufficient resources and a lack of incentive to monitor non-paying entities could be reduced by paying DOR a percentage of collections, reflective of several states with similar programs; and*
- *The tire fee may be collected with other taxes and fees. Some fees may be inadvertently misallocated to the wrong fund's ledger. This has occurred in at least one other state and was detected when their collection mechanism changed.*

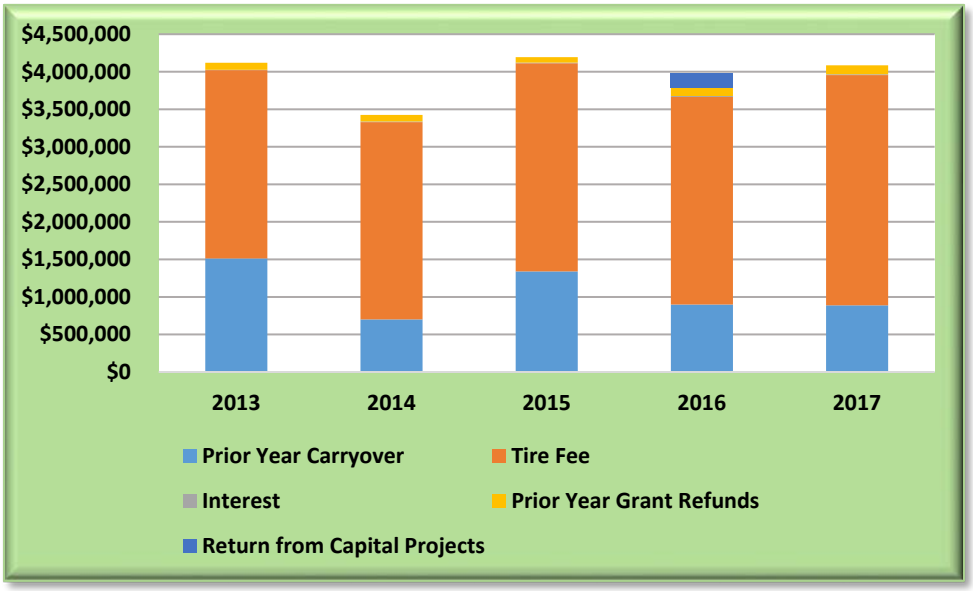

Figure 1: Waste Tire Trust Fund Revenues

EXPENDITURES

A waste tire is most commonly measured in 20-pound units or Passenger Tire Equivalents (PTEs), which is the approximate average weight of a passenger automotive tire. A light truck tire weighs approximately 30 pounds, or 1.5 PTEs, while a medium truck tire, such as a tractor-trailer tire weighs roughly 110 pounds, and is 5.5 times heavier than an automotive tire, or 5.5 PTEs. Conversion of tire units into a uniform weight basis (100 PTE = 1 ton) allows comparison of waste tire generation to markets that are tracked in tons.

During 2017, the cabinet expended waste tire funds to conduct waste tire collection events, provided funding directly to counties for the removal of waste tires, and to remediate "off-site" tire piles. Collection events held by the cabinet recycled 635,114 PTEs and cost $1,050,937. Grants awarded by the cabinet to Kentucky counties primarily funded $378,604.89 for disposal and recycling of 293,788 PTEs. In addition, the cabinet spent $108,337.63 to clean

up 50,670 PTEs collected from orphan tire piles. Overall, state and county government efforts represented the cleanup of 979,572 PTEs during 2017. Kentuckians generated 5.1 million PTEs of waste tires in calendar year 2016, thus the state and counties handled 16.6 percent of the PTEs sent to market. The private sector handled the remaining 83.4 percent of waste tires.

One of the biggest potential costs the cabinet faces is the cleanup of facilities after tire fires at sites where the responsible parties are unable to remediate the sites themselves. The burning of tires results in a release of hazardous substances into the environment and cleaning a post-fire site is much more costly than removing the same volume of tires at a typical dump site.

Regular compliance inspections of permitted waste tire accumulators minimize the risk of such fires. However, these are not predictable, planned events and in some cases can cut into the funding earmarked for grants, market development, and cleanup of additional sites.

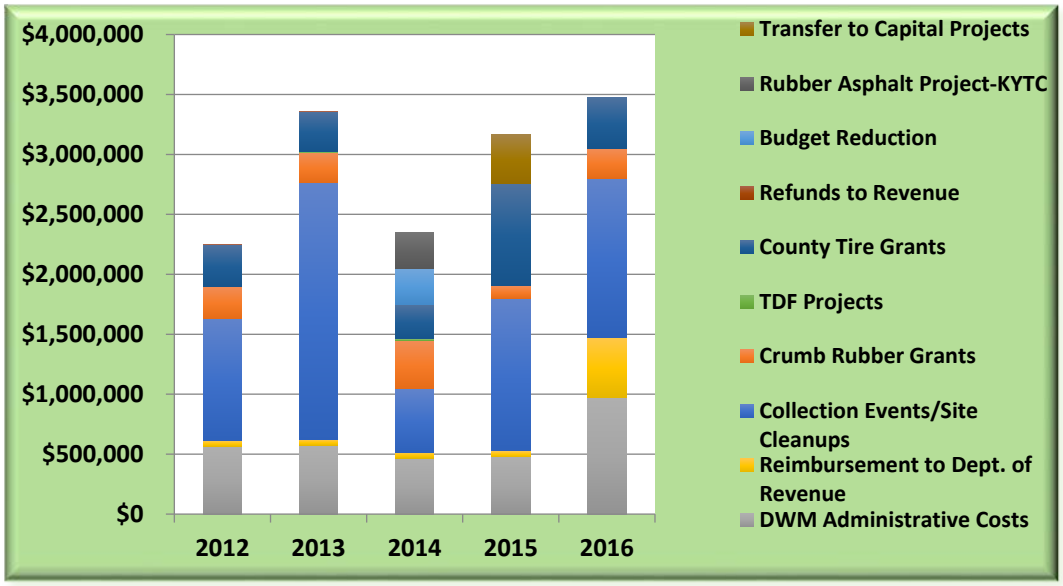

Figure 2: Waste Tire Trust Fund Expenditures

COUNTY GRANTS

Waste Tire Trust Fund receipts are used to fund several programs that assist in the management of waste tires. The programs include Waste Tire Collection Events, Direct Grants to counties, Crumb Rubber Grants, Rubber Modified Asphalt Grants, and "off-site" tire cleanups.

The Waste Tire Collection Event (WTCE) program, formerly referred to as "tire amnesty", was established in 1998 as part of the Energy and Environment Cabinet's ongoing effort to rid Kentucky's landscape of waste tires. WTCEs are conducted for each county on a 3 year cycle. Counties provide a suitable location and manpower, and the cabinet contracts for the removal and

delivery of the recovered tires to a processor where they are recycled to become products such as tire-derived fuel or crumb rubber. During a waste tire collection event, individuals have a 3 day window to drop off their unwanted tires at a specific location within their county at no cost.

Counties are also provided an annual Direct Grant to manage waste tires. The grant pays for transportation and recycling/disposal, and the county designs a program for collection or drop-off of tires that suits their needs. The cabinet increased the annual direct tire grant amount to counties from $3,000 to $4,000 per year in 2015. See Appendix A for details on the most recent cycle of Direct Tire Grants.

Photo 1: Crumb rubber landscaping, City of Vanceburg Lewis County. Photo by Lisa Evans

The Crumb Rubber Grant funds the purchase of tire derived materials or products for landscaping projects, walking trails, horse trailer or stall mats, tree wells or other products utilizing recycled Kentucky tires. See Appendix B for details on the most recent cycle of Crumb Rubber Grants.
A Rubber Modified Asphalt Grant is also funded by the Waste Tire Trust Fund. This grant pays for the installation of rubber modified asphalt with counties funding the installation of a corresponding area of standard asphalt on a similar road. The performance of the standard and rubber modified paving is monitored and compared over a five year period. The purpose of this grant is to encourage recycling of Kentucky tires, demonstrate the benefits of rubber modified asphalt, collect performance data for the different types of asphalt, and create opportunities for professionals in the industry to network.

In addition to the structured grants and programs above, the cabinet also funds the cleanup of illegal tire dumps (sometimes referred to as "off-sites") in certain cases where the responsible party is either unknown or incapable of paying for cleanup.

WASTE TIRE MANAGEMENT PROGRAM

Since 1998, the waste tire program has funded the removal and disposal of approximately $27.2 million PTEs at a cumulative cost of $25.9 million. These tires were collected from all 120 Kentucky counties.

Photo 2: Tires at recycling plant in Boyd Co.
Photo by John W. Brown

During the spring of 2017, the cabinet conducted Waste Tire Collection Events in the Gateway, Cumberland Valley, Big Sandy and Kentucky River Area Development Districts (ADD). These events garnered 350,083 PTEs at a cost of $553,131 or $1.58 per PTE. During the fall months, the cabinet conducted collection events in the Northern Kentucky, KIPDA and Purchase ADDs netting 285,031 PTEs at a cost of $497,806, or $1.75 per PTE. For all of 2017, Waste Tire Collection Events netted a total of 635,114 PTEs at a total cost of $1,050,937. Waste Tire Collection Events scheduled for 2017 include Pennyrile, Barren River, Green River and Bluegrass ADDs.

The cabinet awarded $436,000 to 109 counties in 2017 Direct Tire Grants. Of the money the cabinet awarded, the counties spent $341,813.39 to dispose or recycle 293,788 PTEs. In addition,

counties spent $36,791.50 of their own money toward waste tire remediation. Counties returned $94,186.61 of unspent state grant funds. This totals $472,791.50 of both state and county funding for an average cost of $1.61 per PTE.

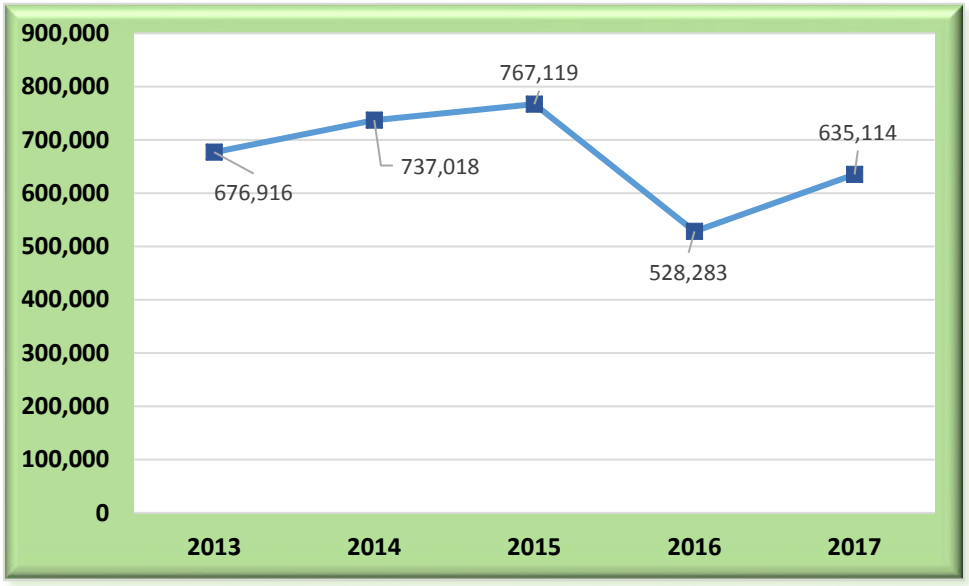

Figure 3: Waste Tires Collected Event Totals (PTE)

MARKET DEVELOPMENT

The WTTF helps support the continued removal of waste tires from the environment to prevent fires and reduce breeding grounds for mosquitoes. The cabinet has removed waste tires from the environment, funded crumb rubber grant projects, and assisted in developing markets for waste tires. The U.S. Tire Manufacturers Association has placed emphasis on the importance of waste tire cleanups in relation to threats borne by mosquitoes carrying the Zika virus. Waste tires are a haven due to their ability to retain heat, collect water and provide safety for mosquito nests from predators.[2]

The statewide recycling rate for tires was 84.1 percent for 2017 compared to 89.2 percent for 2016. This figure is comparable to the 87.9 percent in the U.S. for 2015[3], the latest available national data. The commonwealth has increased its recycling rate in the short-term by working to increase the in-state Tire Derived Fuel (TDF) market, but this market is being negatively impacted in Kentucky and nationally by decreased solid fuel usage in general, increased competition from low cost natural gas, international manufacturing competition, and environmental regulations unfavorable to coal and other solid fuels like TDF. It is appropriate for

[2] *Recycling Today*, October 3, 2016, Recycling Today Staff. http://www.recyclingtoday.com/article/rubber-manufacturers-tire-piles-declined/
[3] 2015 US Scrap Tire Management Summary, Rubber Manufacturers Association, August 2016

the cabinet to consider efforts to increase the reuse percentage in the future through the diversification of markets. Although TDF is expected to remain the largest end use of waste tires for the foreseeable future, ground tire rubber is considered a higher-end market than TDF, as the properties of the original tire are carried forward to the new product rather than using the one-time energy value of the waste tire as TDF. Additional market development efforts for civil engineering application for tire-derived aggregate (TDA) in highway, landfill, foundation backfill, and other similar projects would enhance market diversification and counterbalance possible additional future declines in TDF markets.

Photo 3: Tire shredding, recycling center, Boyd County
Photo by John W. Brown

TDF applications include use in boilers at paper mills, cement kilns, and utilities that use whole or processed tires as a supplemental energy resource, displacing a small percentage of coal usage. These facilities operate in full compliance with all applicable federal, state, and local environmental regulations. The largest ground rubber applications include playground safety cushioning, colored landscape mulch, and athletic fields.

The cabinet conducted several steps to gather information about the commonwealth's waste tire recycling markets. Since the processors and landfill owners have no knowledge of open tire dumps, the cabinet did not include the number of waste tires at open dumps in the recycling report. Since the cabinet gives $4,000 grants to counties to assist in remediating tire piles, and the counties expend some additional funds cleaning up tire dumps; the percentage for tires remaining in dumps in Kentucky may be lower.

Steps EEC performed to obtain information for this report included:

- Obtaining recycling market information from each major in-state processor;
- Compiling total tonnage of disposal of waste tires and processing wastes from each landfill;
- Separating tires collected in Kentucky from those collected out-of-state based on processor records and knowledge;
- Identifying and contacting out-of-state processors believed to collect tires from Kentucky and/or supplying TDF to end users in Kentucky;
- Contacting users of the tire products to verify receipt of processed tires and landfill owners to verify disposal amounts.

Comparing Kentucky to national markets shows:

- TDF is the largest Kentucky market at 38 percent, slightly below the national average of 48.6 percent[4] The TDF market in Kentucky decreased by almost 25 percent in 2017 due to the closure of a paper mill and operating disruptions at two power producers and a cement plant using TDF.
- Approximately 21 percent more (31.1 percent in Kentucky versus 25.8 percent nationally) for ground rubber applications including landscape mulch, playground cushioning, synthetic turf infill, and ground rubber;
- Reduction of use by civil engineering applications;
- Stable volume in reselling used tires;
- Limited exporting to other countries; and
- Increase in landfill disposal of tires generated in Kentucky due primarily to decreased regional and in-state TDF consumption.

[4] Rubber Manufacturers Association, 2013

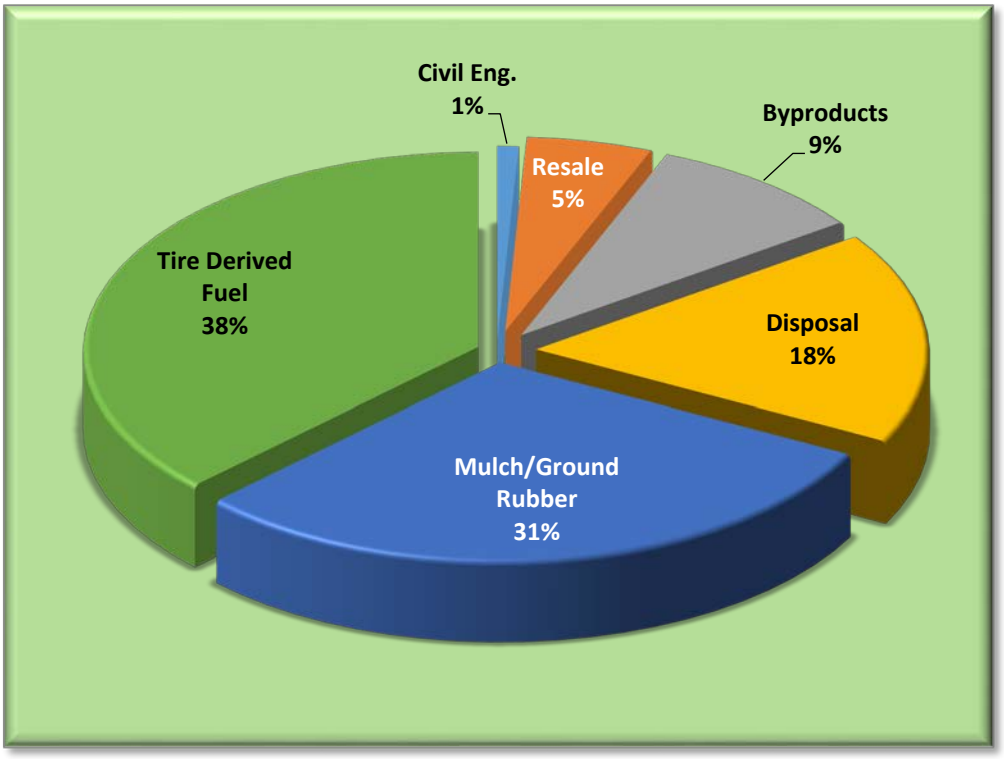

Figure 4: 2017 Kentucky Waste Tire Markets

Kentucky has gone from no in-state markets in 2000 to a point where potentially all TDF produced in Kentucky could be consumed in constructive applications. The cabinet has been involved in several initiatives to encourage growth in the TDF market, providing both grant funding and technical assistance. There have been several success stories in this field:

- In 2001, Kentucky spent $454,276 on capital equipment to assist Owensboro Municipal Utility (OMU) in using TDF. Although the contract expired in 2004, OMU has continued to use TDF. Its consumption in 2016 to 2017 was limited by power generation equipment outages and competitive power generation from natural gas, and future sporadic operation may prevent TDF use. Their boiler using TDF is scheduled for permanent shut down in 2019 due to major scheduled expense and poor economics. In 2001, TDF production in Kentucky was about 1.1 million tires, all shipped out of state because there were no in-state users. In 2016, TDF users in Kentucky consumed 3.0 million PTEs, almost 2.3 million of which were produced by in-state and out-of-state producers from tires generated in Kentucky. Some TDF still crosses into and out of Kentucky based on regional markets and transportation logistics.
- Kosmos Cement, a partnership between CEMEX and Lone Star Cement, began using whole tires as TDF in 2010 and has added the use of TDF (tire chip form) to become one of the two largest in-state users. The company uses a unique tire machine, similar to a baseball or softball pitching machine, to toss whole tires into the center of the kiln for

a more efficient burning. The reinforcing wire in the tire is incorporated into the clinker. Compliance air emission testing revealed no significant change in emissions from using waste tires and coal as opposed to only coal. In fact, Nitrogen Oxide emissions, a major greenhouse gas, were reduced by 37 percent when using TDF with coal.[5] Kosmos increasing use of tire chips in addition to whole tires may further increase its capacity for recovering the energy from tires, so additional growth is possible, but is dependent on competitive economics. An automated whole tire feeding system could improve economics and allow increased whole tire usage.

- Another progressive company using TDF is East Kentucky Power Cooperative (EKPC). The cabinet submitted a letter in support of EKPC's petition to the Public Service Commission (PSC) during 2012 to use the Fuel Adjustment Clause for TDF which was subsequently granted during 2013. Use of the provision allows for quicker recovery of TDF cost from the electrical customer and makes the use of alternative fuels more economical. EKPC has become one of the largest TDF users and could potentially use up to 4 million PTEs per year to provide 2 to 4 percent of its energy requirements. The operating rates for this efficient, environmentally sound fluidized bed boiler are being negatively impacted by low-cost natural gas boilers.

The use of TDF helps further the use of coal as it makes the fossil fuel more environmentally friendly. According to the United States Environmental Protection Agency (EPA), greenhouse gas (GHG) emissions can be reduced as a co-benefit of the use of secondary materials. Specifically, TDF combustion results in slightly lower GHG emissions per BTU than coal, and when considering emissions related to extraction and processing of coal, this difference becomes even more significant. Similarly, TDF combustions generates a slightly lower volume of particulate matter per BTU compared to coal. [6] Therefore, the use of TDF to reduce certain pollutants may make the long-term use of coal more viable.

Also, substituting TDF for coal would avoid an estimated 0.246 lbs/million BTU of particulate matter associated with the extraction and processing of the coal. Multiplying the 2016 use of 38,340 tons TDF with coal in Kentucky by these factors shows a savings of almost 13,000 tons carbon dioxide (CO_2) and 147 tons of particulate matter not emitted each year. The use of TDF to reduce certain pollutants makes the long-term use of coal more viable.

The ground rubber market has remained steady over time. Since 2004, the commonwealth has awarded 409 grants totaling over $7.7 million, primarily to schools and municipalities, for crumb rubber uses. The most common uses were crumb rubber spread on athletic fields to increase turf life and on playgrounds to reduce injuries. In October 2014, NBC News presented a story about possible health threats associated with the use of crumb rubber on athletic fields, and later presented a similar story on concerns with the use of crumb rubber mulch on playgrounds. A

[5] *Cement Kiln Burns Scrap Tires*, The Courier-Journal, November 26, 2012.

[6] 76FR15494, 40 C.F.R. Part 241, EPA, Identification of Non-Hazardous Secondary Materials that Are Solid Waste, Final Rule, March 21, 2011, *Federal Register*

premise of these studies is that exposure to crumb rubber and playground mulch may result in exposure that could result in adverse health effects. In light of these concerns, and out of an abundance of caution, the cabinet did not provide crumb rubber grants for playgrounds and athletic fields as part of its grant portfolio in 2015, 2016, and 2017.

At this time, there is no documented and peer reviewed evidence that substantiates these concerns. Existing studies conducted by industry and third parties have indicated that exposure to recycled waste tires under these scenarios does not result in adverse health effects. Crumb rubber grants were still made available to counties for landscaping and other applications, as noted by Photo 4. The suspension of crumb rubber grants for playgrounds and athletic fields has significantly affected rubber production for these uses in the state, but there has been an overall increased in shredded and ground tire production.

Photo 4: Crumb rubber mulch, Veterans Memorial Park, City of Vanceburg Lewis County. Photo by Lisa Evans.

Manufacturing of ground rubber and mulch from Kentucky tires increased from near zero in 1998 to 842,500 PTEs in 2017. Liberty Tire in Union County manufactures a large quantity of colored mulch for outlets such as Lowes, Home Depot and Wal-Mart. Dalton Tire Recycling in Boyd County produces ground rubber for playgrounds and horse arenas. Porter Tire in Carter County started producing crumb rubber and rubber mulch in 2013.

Another market for ground rubber, and one that has grown in significance in other states in recent years, is rubber modified asphalt. The cabinet is looking for ways to help this market grow in Kentucky. In May of 2016, the Division of Waste Management implemented its first ever

Rubber Modified Asphalt Grant program. The cabinet used Waste Tire Trust Fund monies to provide grants to counties for applying chip seal to county roads utilizing asphalt that has been amended with recycled tire rubber. The grant funded the application of approximately two lane miles of rubber modified chip seal, with the grantees required to fund an identical amount of standard chip seal. The projects will be monitored for five years to assess the performance of rubber modified versus standard chip seal. Five counties received approximately $350,000 in grant funds in 2016.

In May of 2017 the Rubber Modified Asphalt Grant program was expanded to offer an asphalt thin overlay option to counties, which proved to be much more popular than the chip seal option. The asphalt thin overlay product incorporates dissolved tire rubber into the liquid asphalt and is installed like regular asphalt over an existing paved road as a preventative maintenance measure. The 2017 grant was revised to fund total paved area instead of lane miles, this change permitted the application of 24,000 square yards of chip seal or 12,000 square yards of rubber modified asphalt, and the grantee had to match the same using a traditional non-rubberized asphalt. As with the 2016 chip seal grant, this is part of a five-year project to assess the performance of rubber modified thin overlay. Five counties received $465,753.00 in grant funding for the 2017 year. The grant is expected to continue in 2018 and possibly expand to include additional pavement processes, contingent on sufficient funding. *Appendix C* includes grant recipient information.

Photo 5: Rubber modified asphalt paving, Green County.
Photo by B.J. Bland

Market diversity is a critical component of successful waste tire management programs. Kentucky has developed diverse product markets, producing TDF and ground rubber products representing over 68 percent of Kentucky's waste tire generation. However, developing civil engineering markets for shredded tires would further enhance the diversity of Kentucky's markets and provide constructive applications for shredded tires that are currently landfilled. Additionally, when considering possible new areas for growth in waste tire markets, it should be noted that in 2015, Kentucky ranked third in the U.S. for car and truck production.[7] The commonwealth could consider assisting the three major automotive manufacturers in Kentucky in using waste tire ground rubber in molded automotive parts to broaden this important potential application.

Photo 6: Rubber modified asphalt paving, Marion County.
Photo by B.J. Bland

MARKET DYNAMICS

Due to the volatile nature of the scrap tire market, it is not uncommon for tire processors to quickly accumulate more tires than they can reasonably manage during busy times, processing equipment outages or changes in product markets. When shredded tires are improperly stored, specifically in large, deep compacted piles, there is the possibility of auto-ignition. When a large

[7] *Auto Jobs & Economics*, Auto Alliance, www.autoalliance.org/auto-jobs-and-economics/state-facts

pile of whole or shredded tire material catches fire it is extremely hard to extinguish. Permitted tire processors are required to have a bond equal to $1.00 per on-site PTE, with a minimum of $10,000. One common problem with this system is that facilities often bond for the minimum amount, and then accumulate well over 10,000 tires, putting themselves in a situation where the bond is not nearly adequate in the event a cleanup is required. In addition to stronger enforcement of the bonding requirement, some solutions to be considered in funding remediation of tire fires include a statutory increase in the amount of the bond required. The bond amount in KRS 224.50-862 could be increased from $1.00 per tire to $1.50 to cover all cleanup costs. Or, as done in several other states, the legislature could consider requiring an actual cost estimate for closure to determine the amount of financial assurance requirement.

One potential problem for tire processors is the maturation of national TDF markets, reflecting a general downturn in the U.S. manufacturing and reduction in coal usage. Unlike many states Kentucky's TDF market remains fairly healthy and has potential for continuing to be a major use of waste tires in Kentucky. However, use of all solid fuels, including coal and TDF is expected to decline in the foreseeable future, so continuing efforts to further diversify markets are critical to maintain a high rate of constructive utilization of waste tire resources.

Photo 7: Conveyor at tire recycling center, Boyd County
Photo by John W. Brown

Major TDF markets in Kentucky include:

- East Kentucky Power Cooperative (EKPC), Maysville:

  → EEC submitted a letter to PSC in support of EKPC use of a fuel adjustment clause

for possible TDF use;

→ EKPC could use over 4 M PTEs per year based on projections; and

→ Ways to increase supply to EKPC from local processors will be explored.

- Kosmos Cement (CEMEX-Lone Star Cement partnership) Louisville:

  → CEMEX utilizes whole-tire PTEs and has added a shredded tire supply line that has significantly increased this number. Exploring methods to increase usage is appropriate.

- Owensboro Municipal Utility

  → Due to restrictions in the equipment on-site, and scheduled closure of the boiler using TDF, OMU's future usage will be limited.

FUTURE OF THE FUND

The waste tire program exemplifies the cabinet's mission of protecting human health and the environment by encouraging waste reduction, reuse, and recycling. The WTTF supports statewide waste tire collection events on a three-year rotation, remediates large tire piles, provides direct grants to counties, and develops markets for TDF and ground rubber. If the waste tire fee is not extended, program funds will not be available to Kentucky businesses involved in tire processing, and remediation would be negatively affected.

Photo 8: Tire crumbs on scales at recycling center, Boyd County
Photo by John W. Brown

A total of 35 states have a mandated tire fee[8]. The median fee is $1.00 per new tire sold. The highest fee is $2.50 in Alaska, Illinois, New York, and Oklahoma, while the lowest fee is $0.25 in Indiana and Kansas. Waste tire funds discontinued in other states resulted in illegal waste tire dumps reappearing. These states were faced again with a recurrence of the original emergency situation which necessitated the fee, including remediation of large tire piles and fires. Legislators and governors were asked to remedy a problem that was previously solved.
Examples of problems encountered by states that discontinued their waste tire fee include[9]:

- Minnesota: An increase in waste tire tipping fees and an increase in monofilling (landfilling of tires in a disposal cell and a loss to the recycling market), and an initial increase in low value marginal civil engineering projects that were more like landfilling than constructive use of Tire Derived Aggregate's (TDA) technical and economic advantages. TDA applications have since broadened into good applications in Minnesota, providing an important market;
- Wisconsin: Product markets crashed without the state subsidy;
- Texas: $9.5 million in general funds to clean up two waste tire piles and buy TDF metering (feed) systems for industry. They saw an increase in land reclamation using waste tires in conjunction with soil to fill excavated sites, and still have major legacy stockpiles;
- Missouri: No fee for two years during which the state saw an increase in fires. The legislature reinstated the fee for five years in 2009 with subsequent renewal; and
- Recycling rates decreased by over 25 percent, on average, in seven states after discontinuance of the fee, and over 40 percent in some states.

In addition to the repercussions discussed above, the following impacts could happen in Kentucky as a result of the fee expiring:

- Counties would not receive the $4,000 annual grant to clean up abandoned waste tires;
- Rural areas would be impacted by abandoned waste tires on farms and roadsides;
- Counties might be unable to rely on the commonwealth for tire pile remediation; and
- Market development would likely cease.

The waste tire program faces many challenges, most of which are common to programs throughout the country. It is likely that some retailers collect disposal fees and then stockpile waste tires until

[8] *State Scrap Tire Legislation Summary*, Rubber Manufacturers Association, 2015, www.rrma.org/download/scrap-tires/state_&federal_reports/legislation_chart_2015.pdf
[9] *Waste Tire Management Program Closure-Precedents/Experience in Other States*, Terry Gray, TAG Resource Recovery, Inc., Houston, TX 2011

a waste tire collection event was conducted in their area, or otherwise mismanage their waste tires. Individuals have chosen to retain their waste tires to avoid additional fees charged by tire retailers for waste tire disposal, taking these tires out of the recycling stream. Some of these tires may later be mismanaged, burdening counties with continued waste tire management issues.

It has been reported that some tire retailers charge a higher fee of $3.00-3.50 to discourage individuals from leaving waste tires with the retailer, instead of the average $1.50-2.00 tire disposal/recycling fee. As an alternative, this situation could be improved by requiring the disposal price to be included in the sale price or list the actual state-wide average disposal rate on a notice and let the free market handle the situation.

Many tires collected by registered waste tire transporters are still being legally disposed of in landfills rather than being recycled. It is less capital intensive to cut or shred and landfill a tire than to install equipment required to produce a recyclable product. Some states have fixed this problem by banning all tire material, including cut or shredded tires, from landfills, except for pre-approved constructive civil engineering applications within landfills.

Based on national averages, it is estimated that Kentuckians buy 530,000 used tires each year.[10] A recent tire industry survey showed that 88 percent of all tire repairs are performed incorrectly.[11] In light of this, consideration could be given to whether re-use of tires should be promoted or discouraged.

Coverage of all areas of the state by reputable tire processing facilities is necessary for the free market to work. Long transportation distances translate into higher costs that keep tire recycling from being economically feasible.

The reporting requirement in KRS 224.50-872 could be more efficient if the requirement was for a report every two fiscal years. This would align the reporting schedule with the state budget cycle.

KRS 224.50-868(3) gives the DOR the authority to collect the waste tire fee. The statute requires up to $50,000 per year be transferred to DOR for collection of the fee. This neither provides enough money (approximately $75,000 is needed to employ one person per year) or incentive for DOR to enforce the collection. States that have specified a percentage to be awarded to the collection agency have a higher collection rate.

In conclusion, the cabinet strongly recommends that the General Assembly extend the waste tire fee and continue the waste tire program.

[10] *Used Tires Businesses Balloon*, Feb. 2011, Mike Breslin, www.americanrecycler.com/0211/814used.shtml

[11] *RMA: 88% of Tire Repairs Done Incorrectly*, 2008, www.tirebusiness.comm/article/20080228/NEWS/302289997?template=printart

CREDITS & ACKNOWLEDGEMENTS

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Energy and Environment Cabinet
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Deputy Secretary R. Bruce Scott, P.E.

Department for Environmental Protection
Commissioner Aaron Keatley
Deputy Commissioner Anthony R. Hatton, P.G.

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

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The Kentucky Division of Waste Management does not discriminate on the basis of race, color, religion, sex, national origin, sexual orientation or gender identity, ancestry, age, disability or veteran status. The division provides, on request, reasonable accommodations necessary to afford an individual with a disability an equal opportunity to participate in all services, programs, and activities. Contact the division to request materials in an alternate format.

January 2018

APPENDICES

Appendix A: FY 2016 Waste Tire Grant Awards

County	Awarded	Funds Used	Funds Returned	Number of PTE's
Adair Co.	$ 4,000.00	$ 1,934.60	$ 2,065.40	$ 1,138
Allen Co.	$ 4,000.00	$ 5,751.40	$ -	$ 2,778
Anderson Co.	$ 4,000.00	$ 4,023.25	$ -	$ 1,899
Ballard Co.	$ 4,000.00	$ 5,615.45	$ -	$ 4,883
Barren Co.	$ 4,000.00	$ 998.60	$ 3,001.40	$ 191
Bath Co.	$ 4,000.00	$ 4,812.75	$ -	$ 3,801
Bell Co.	$ 4,000.00	$ -	$ 4,000.00	$ -
Boone Co.	$ 4,000.00	$ 4,200.00	$ -	$ 4,500
Boyd Co.	$ 4,000.00	$ 4,152.00	$ -	$ 1,396
Boyle Co.	$ 4,000.00	$ 4,849.00	$ -	$ 2,150
Bracken Co.	$ 4,000.00	$ 1,832.26	$ 2,167.74	$ 495
Breathitt Co.	$ 4,000.00	$ 862.00	$ 3,138.00	$ 78
Breckinridge Co.	$ 4,000.00	$ 1,272.00	$ 2,728.00	$ 282
Bullitt Co.	$ 4,000.00	$ 1,469.00	$ 2,531.00	$ 719
Butler Co.	$ 4,000.00	$ 3,990.60	$ -	$ 3,219
Caldwell Co	$ 4,000.00	$ 4,000.00	$ -	$ 3,000
Calloway Co.	$ 4,000.00	$ 2,954.00	$ 1,046.00	$ 1,060
Campbell Co.	$ 4,000.00	$ 8,168.26	$ -	$ 7,212
Carroll Co.	$ 4,000.00	$ 4,371.75	$ -	$ 1,677
Carter Co.	$ 4,000.00	$ -	$ 4,000.00	$ -
$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00
Christian Co.	$ 4,000.00	$ 7,300.00	$ -	$ 7,000
Clark Co.	$ 4,000.00	$ 5,162.50	$ -	$ 3,255
Clay Co.	$ 4,000.00	$ 4,010.00	$ -	$ 2,352
Clinton Co.	$ 4,000.00	$ 927.35	$ 3,072.65	$ 208
Crittenden Co.	$ 4,000.00	$ 4,000.00	$ -	$ 5,200
Cumberland Co.	$ 4,000.00	$ 4,500.00	$ -	$ 3,900
Daviess Co.	$ 4,000.00	$ 4,339.00	$ -	$ 4,339
Edmonson Co.	$ 4,000.00	$ 3,953.75	$ 46.25	$ 2,138
Elliott Co.	$ 4,000.00	$ 2,104.25	$1,895.75	$ 1,155
Estill Co.	$ 4,000.00	$ 4,108.75	$ -	$ 1,646
Fayette Co.	$ 4,000.00	$ 4,000.00	$ -	$ 2,286

County	Awarded	Funds Used	Funds Returned	Number of PTE's
Fleming Co.	$ 4,000.00	$ 736.76	$3,263.24	$ 211
Floyd Co.	$ 4,000.00	$ 4,000.08	$ -	$ 1,600
Franklin Co.	$ 4,000.00	$ 2,050.00	$1,950.00	$ 1,250
Fulton Co.	$ 4,000.00	$ -	$4,000.00	$ -
Gallatin Co.	$ 4,000.00	$ 3,975.44	$ -	$ 1,461
Garrard-Lincoln	$ 8,000.00	$ 4,831.11	$ 3,168.89	$ 1,535
Grant Co.	$ 4,000.00	$ 4,534.56	$3,168.89	$ 9,207
Graves Co.	$ 4,000.00	$ 4,150.00	$3,168.89	$ -
Grayson Co.	$ 4,000.00	$ 4,010.75	$ -	$ 723
Green Co.	$ 4,000.00	$ 2,258.00	$ 1,742.00	$ 500
Greenup Co.	$ 4,000.00	$ 4,022.00	$ -	$ 3,748
Hancock Co.	$ 4,000.00	$ 4,008.30	$ -	$ 4,004
Hardin Co.	$ 4,000.00	$ 4,000.00	$ -	$ 483
Harlan Co.	$ 4,000.00	$ 8,700.00	$ -	$ 5,550
Hart Co.	$ 4,000.00	$ 5,014.00	$ -	$ 1,579
Henderson Co.	$ 4,000.00	$ 4,800.00	$ -	$ 600
Hickman Co.	$ 4,000.00	$ 4,500.00	$ -	$ 3,900
Hopkins Co.	$ 4,000.00	$ 4,510.40	$ -	$ 5,805
Jackson Co.	$ 4,000.00	$ 4,011.50	$ -	$ 1,889
Jessamine Co.	$ 4,000.00	$ 10,760.00	$ -	$ 2,820
Johnson Co.	$ 4,000.00	$ 4,071.00	$ -	$ 1,357
Kenton Co.	$ 4,000.00	$ 6,600.00	$ -	$ 3,000
Knott Co.	$ 4,000.00	$ 3,605.86	$ 394.14	$ 1,876
Knox Co.	$ 4,000.00	$ 4,064.00	$ -	$ 1,763
LaRue Co.	$ 4,000.00	$ 4,699.30	$ -	$ 2,200
Laurel Co.	$ 4,000.00	$ 4,474.50	$ -	$ 1,593
Lawrence Co.	$ 4,000.00	$ 4,234.00	$ -	$ 2,104
Lee Co.	$ 4,000.00	$ 4,151.40	$ -	$ 2,441
Leslie Co.	$ 4,000.00	$ 4,000.00	$ -	$ 504
Letcher Co.	$ 4,000.00	$ -	$ 4,000.00	$ -
Lewis Co.	$ 4,000.00	$ 2,365.13	$ 1,634.87	$ 703
Livingston Co.	$ 4,000.00	$ 3,206.00	$ 794.00	$ 506
Logan Co.	$ 4,000.00	$ 4,272.00	$ -	$ 1,803
Lyon Co.	$ 4,000.00	$ 4,016.35	$ -	$ 1,700
Madison Co.	$ 4,000.00	$ 4,341.75	$ -	$ 1,989
Magoffin Co.	$ 4,000.00	$ 4,000.00	$ -	$ 3,800

County	Awarded	Funds Used	Funds Returned	Number of PTE's
Marion Co.	$ 4,000.00	$ 1,557.25	$ 2,442.75	$ 365
Marshall Co.	$ 4,000.00	$ 4,000.00	$ -	$ 3,786
Mason Co.	$ 4,000.00	$ 6,521.15	$ -	$ 6,320
McCracken Co.	$ 4,000.00	$ 12,000.00	$ -	$ 8,010
McLean Co.	$ 4,000.00	$ 15,750.00	$ -	$ 10,800
Meade Co.	$ 4,000.00	$ 13,674.00	$ -	$ 3,838
Menifee Co.	$ 4,000.00	$ 4,040.70	$ -	$ 2,451
Metcalfe Co.	$ 4,000.00	$ 1,790.00	$ 2,210.00	$ 623
Monroe Co.	$ 4,000.00	$ 4,073.25	$ -	$ 1,821
Montgomery Co.	$ 4,000.00	$ 1,536.00	$ 2,464.00	$ 384
Morgan Co.	$ 4,000.00	$ 3,384.25	$ 615.75	$ 1,741
Nelson Co.	$ 4,000.00	$ 14,800.00	$ -	$ 14,551
Ohio Co.	$ 4,000.00	$ 5,952.90	$ -	$ 3,580
Oldham Co.	$ 4,000.00	$ 1,466.00	$ 2,534.00	$ 739
Owen Co.	$ 4,000.00	$ 2,964.50	$ 1,035.50	$ 1,441
Owsley Co.	$ 4,000.00	$ -	$ 4,000.00	$ -
Pendleton Co.	$ 4,000.00	$ 2,691.25	$ 1,308.75	2,049
Perry Co.	$ 4,000.00	$ 7,560.00	$ -	$ -
Pike Co.	$ 4,000.00	$ 34,000.00	$ -	$ 27,200
Powell Co.	$ 4,000.00	$ 4,732.00	$ -	$ 2,198
Pulaski Co.	$ 4,000.00	$ 4,333.30	$ -	$ 2,549
Robertson Co.	$ 4,000.00	$ -	$ 4,000.00	$ -
Rockcastle Co.	$ 4,000.00	$ 4,027.50	$ -	$ 2,094
Rowan Co.	$ 4,000.00	$ 275.00	$ 3,725.00	$ 166
Russell Co.	$ 4,000.00	$ 2,289.90	$ 1,710.10	$ 1,347
Scott Co.	$ 4,000.00	$ 4,058.85	$ -	$ 800
Shelby Co.	$ 4,000.00	$ 5,000.00	$ -	$ 4,000
Simpson Co.	$ 4,000.00	$ 701.05	$ 3,298.95	$ 216
Spencer Co.	$ 4,000.00	$ 4,894.50	$ -	$ 1,494
Taylor Co.	$ 4,000.00	$ 4,484.10	$ -	$ 2,814
Todd Co.	$ 4,000.00	$ 4,029.00	$ -	$ 3,929
Trigg Co.	$ 4,000.00	$ 5,508.70	$ -	$ 14,400
Trimble Co.	$ 4,000.00	$ 5,434.33	$ -	$ 801
Union Co.	$ 4,000.00	$ 7,000.00	$ -	$ 5,950
Washington Co.	$ 4,000.00	$ 4,552.50	$ -	$ 1,502
Wayne Co.	$ 4,000.00	$ 135.30	$ 3,864.70	$ 82
Webster Co.	$ 4,000.00	$ 4,358.71	$ -	$ 5,140

County	Awarded	Funds Used	Funds Returned	Number of PTE's
Wolfe Co.	$ 4,000.00	$ 4,022.50	$ -	$ 2,366
Woodford Co.	$ 4,000.00	$ 4,248.30	$ -	$ 2,499
--	**$ 436,000.00**	**$ 472,791.50**	**$ 94,186.61**	**$ 293,788**

Appendix B: FY 2017 Crumb Rubber Grant Awards

COUNTY	APPLICANT	LOCATION	PROJECT	AWARD
Allen	Project C.A.M.P., Inc. dba The Center for Courageous Kids	Project C.A.M.P. Inc, dba The Center for Courageous Kids	Landscaping; walking, trail & access paths; improve soil erosion areas	$26,672
Boone	City of Florence	Stringtown Park Enhancement Project	Refurbish crumb rubber around exercise-fitness	$6,386
Boyd	Boyd County Fiscal Court	Armco Park Hiking Trails	Walking/Hiking Trail	$54,168
Breathitt	Breathitt County Fiscal Court	Breathitt County Elk View Station	Landscaping around entrance to the station	$8,769
Henderson	Henderson County Fiscal Court	Sandy Lee Watkins Park	Landscaping around 15 new signs at park	$2,369
Lawrence	City of Louisa	Lockview Park/Pool Complex	Landscaping	$1,352
Lewis	City of Vanceburg	City of Vanceburg	Walking Trail	$2,554
Lyon	Lyon County Fiscal Court	Lyon County Courthouse & Lee S. Jones Park	Tree Rings – 80 at Lee S. Jones Park and 5 at Lyon County Courthouse	$2,380
Mason	City of Maysville	Various Locations around the city -- Kenton Commonwealth Center, Health Department, Third Street, Bridge, Probation & Parole and Lime street	Landscaping	$11,381
Pike	Pike Co Fiscal Court	73 County Buildings and Sites	Landscaping	$45,991
Rowan	Morehead State University	Morehead State University's Carbon Pocket Park	Walkway to Outdoor Classroom	$19,112
Trigg	Trigg Co Fiscal Court	Trigg County Senior Citizens Center	Landscaping	$5,824
Wolfe	Wolfe County Fiscal Court	B Stone Park	Walking Trail	$23,165
			GRAND TOTAL	**$210,123**

Appendix C: FY 2017 Rubber Modified Asphalt Awards

COUNTY	APPLICANT	LOCATION/ROAD	SURFACE TYPE	AWARD
CY2016 Grant Cycle				
Fleming	Fleming Co. Fiscal Court	Markwell Road	Chip Seal	$94,973.10
Hart	Hart Co. Fiscal Court	Mr. Vernon Road & Rocky Hill Road	Chip Seal	$66,628.50
Metcalfe	Metcalfe Co. Fiscal Court	Granville Sexton Road	Chip Seal	$63,108.00
Trigg	Trigg Co. Fiscal Court	Tyler, Ppool, Paradise & Buffalo Roads	Chip Seal	$88,765.35
Whitley	Whitley Co. Fiscal Court	Tiny Branch Road	Chip Seal	$87,726.40
COUNTY	**APPLICANT**	**LOCATION/ROAD**	**SURFACE TYPE**	**AWARD**
CY2017 Grant Cycle				
Marion	Marion Co. Fiscal Court	Riley Gravel Switch Road	Thin Overlay	$98,463.00
Green	Green Co. Fiscal Court	South End Road	Thin Overlay	$84,460.00
Jefferson	Louisville Metro Government	Lake Forest Parkway	Thin Overlay	Est. $73,400.00
Hancock	Hancock Co. Fiscal Court	Vastwood Park	Thin Overlay	Est. $78,100.00
Webster	Webster Co. Fiscal Court	Sebree Slaughter & Watkins Sebree Roads	Thin Overlay	Est. $99,000.00

Photo 9: Tire recycling center, tire crumbs, Boyd County
Photo by John W. Brown

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