



Colorado Department  
of Public Health  
and Environment

# Status of Waste Tire Recycling in Colorado

2012 Annual Report to the Transportation  
Legislation Review Committee



# Executive Summary

Calendar year 2012 marks the ninth year the Colorado Department of Public Health and Environment (the department) has compiled data related to the number of waste tires collected at waste tire processing, collection and storage facilities and by waste tire haulers and end users in Colorado and the status of Colorado's Waste Tire Program. Waste tire processing facilities continue to process tires into different tire-derived products that are used as tire-derived fuel, as alternative daily cover at solid waste landfills and as fencing and windbreaks, among others. Tires stored in monofills will be reused at a later date for various tire-derived products, including tire-derived fuel. The second largest monofill has obtained the necessary permits to process tire shreds, or tire chips, for use as fuel to power a cement kiln. Additionally, the Colorado Waste Tire Program passed two sets of updated regulations in 2012 regarding waste tire management and implementation of the waste tire

processor and end user reimbursement fund.

This 2012 calendar year annual report on waste tire recycling in Colorado is being transmitted to the Transportation Legislation Review Committee as required by House Bill 04-1428 and section 25-17-202.7, C.R.S. The statute requires the department to issue a report to the Transportation Legislation Review Committee on or before July 1st each year that includes the total number of waste tires recycled in the state. This information is submitted to the department pursuant to the Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Sections 10.3.6, 10.5.7, 10.6.7 and 10.7.7).

The department gathers this information through annual reporting from waste tire processing, collection and storage facilities and waste tire haulers and end users. The department continued outreach efforts to educate waste tire operators regarding their compliance and reporting responsibilities.



## Colorado Department of Public Health and Environment Hazardous Materials and Waste Management Division Solid Waste and Materials Management Program

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## 2012-2013 Waste Tire Advisory Committee Member Representatives

- James (Jim) Reid (Local Fire Authorities and Committee Chairman)
- Christopher (Chris) Houtchens (Waste Tire Haulers and Committee Vice-Chairman)\*
- Joel Bolduc (Waste Tire End Users)
- Cyrus (Rusty) Hardy (Law Enforcement)
- Larry Hudson (Tire Manufacturers)
- Charles Johnson (Colorado Department of Public Health and Environment)
- Trent Peterson (Waste Tire Monofills)
- Richard (Rick) Welle (Waste Tire Processors)
- Michael (Scott) Skorka (Tire Retailers)

\*Resigned from Committee effective 6/6/2013

*Cover Photos (clockwise from top-right):*

*Soccer/baseball field made from waste tires installed as a base layer, playground made from waste tires installed as a base layer, tire baler in the process of baling waste tires, tire shreds used as alternative daily cover, illegal pile of waste tires, new and resale salvage tires*

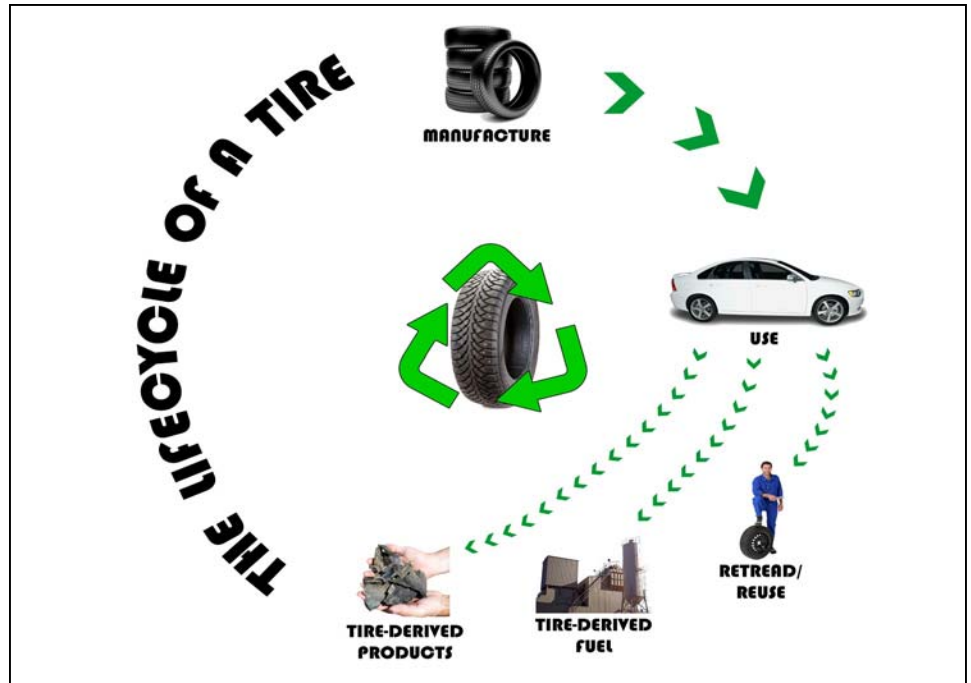
# Waste Tire Update

Data submitted to the department by waste tire facilities (waste tire processing, end using and collection facilities and waste tire monofills) and waste tire haulers indicates there were 5,117,019 waste tires generated in the state of Colorado during calendar year 2012. Considering Colorado's latest census population estimate of 5,187,582 people, this rate of waste tires generated is slightly less than the accepted nationwide industry standard that predicts a waste tire generation rate of one waste tire/person/year.

A total of 230,270 of the 5,117,019 waste tires generated in Colorado in 2012 were hauled to a recycling facility in Utah for processing and 3,524 waste tires were transported to a waste tire monofill in Kansas and a landfill in New Mexico that accepts waste tires. Conversely, 432,933 waste tires were shipped to Colorado waste tire facilities from out-of-state sources.

Colorado waste tire processors and a Utah-based waste tire processing facility that processed Colorado-generated tires recycled a total of 5,687,804 waste tires in 2012. This corresponds to a 111 percent recycling rate, with all of the tires generated in 2012 by Colorado sources being recycled. This figure is consistent with the 100 percent recycling rate of Colorado generated waste tires achieved in 2011.

A 111 percent recycling rate indicates that processing facilities in Colorado and a surrounding state processed a number of tires equivalent to the number of waste tires generated in Colorado. These processors also had the capacity to recycle 103 percent of



*The lifecycle of a tire from the point of manufacturing, use and reuse/recycling*

the total number of tires generated in Colorado plus those sent to Colorado from states to the east and northeast (5,549,952 total tires).

Figure 1 (Page 6) provides an annual comparison of Colorado's waste tire recycling rates for the last nine years. The waste tire recycling rates remained relatively consistent each year until 2009 when the recycling rate moved up sharply to levels above 90 percent. This increase can be attributed to more accurate data collection methods, identification of an out-of-state recycler of Colorado tires and an increase of tires used as tire-derived fuel and alternate daily cover.

Figure 2 (Page 6) captures the top 10 end use markets for waste tires recycled during calendar year 2012. Of the 10 end use markets identified, the top five included the processing of waste tires to be used as: 1).

tire-derived fuel by cement kilns; 2). tire shreds as alternative daily cover at solid waste landfills; 3). resale of salvage tires for reuse or retreading; 4). tire bales as fencing and windbreaks; 5). waste tires processed into crumb rubber for use in roadways and molded rubber products.

Figure 3 (Page 6) reflects the number of waste tires in storage at registered waste tire facilities statewide at the end of calendar year 2012. The on-site waste inventory decreased by 462,294 tires during the year. As of 2012, 60,400,487 waste tires were stored in tire monofills while 645,872 waste tires were stored temporarily at waste tire processing and collection facilities.

In general, in 2012 a majority of waste tire processing and collection facilities decreased their storage inventory by

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# Waste Tire Update

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increasing waste tire processing rates or shipping tires offsite for processing into tire-derived product. Figure 4 (Page 6) illustrates the amount of waste tires recycled. In 2011, 5,097,944 tires went to end use markets. In 2012, that figure grew to 5,687,804, a 10 percent increase in the number of tires going to end use markets. The number of tires going to end use markets increased by 6.8 percent in 2010 and by 12 percent in 2011. This increase represents a continuing trend of more waste tires going to end use markets within and

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*'In 2012, the number of waste tires going to end use markets grew to 5,687,804, a 10 percent increase over 2011.'*

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outside of Colorado.

By contrast, Figure 5 (Page 6) describes a further decline in the number of waste tires added to waste storage inventories in 2012. During 2009, 572,121 waste tires entered the waste tire storage

inventory. There was an increase to 604,151 tires in 2010, with a decline in 2011 with only 69,452 tires entering storage inventories. The department observed a steep decline in 2012 with no additional waste tires entering waste tire storage inventories due to the removal of waste tires from one monofill and temporary storage at processing and collection facilities and tires processed into tire-derived product for end use.

## Regulatory Authority and Program Elements

The department's Solid Waste and Materials Management Program, located within the Hazardous Materials and Waste Management Division, and the Division of Environmental Health and Sustainability are responsible for overseeing the Waste Tire Program.

The Solid Waste and Materials Management Program is responsible for ensuring compliance with laws and regulations pertaining to waste tire management and administers the waste tire fire prevention and law enforcement grant funds. The Division of Environmental Health and Sustainability Waste Tire Program provides funding for the reuse or recycling of waste tires generated in Colorado through the processor and end user, recycling incentives,

illegal waste tire cleanup and waste tire market development grant funds.

The Waste Tire Program receives no monies from Colorado's General Fund and is 100 percent fee supported. Senate Bill 09-289 changed how the Colorado Department of Revenue collects the \$1.50 tire fee to support the Waste Tire Program, shifting collection to each new tire sold in Colorado rather than collecting the fee at the disposal point.

House Bill 10-1018 allocated funding from the \$1.50 fee to cover program staff and administrative costs and appropriated a percentage of the fee to cover the five department-administered grant funds:

- Processor and End User Fund: Funding for waste tire processors and end

users to encourage the use of waste tires.

- Waste Tire Cleanup Fund: Provides grants to counties and municipalities for the removal of illegally disposed waste tires.
- Waste Tire Market Development Fund: To develop markets for waste tires.
- Waste Tire Fire Prevention Fund: Provides grants to fire agencies to purchase tire fire equipment and supplies and fund training.
- Law Enforcement Grant: Grants to law enforcement, fire agencies and local health departments for waste tire enforcement/oversight.

# Waste Tire Grants

## Waste Tire Cleanup Fund

The Waste Tire Cleanup Fund provides funding for the cleanup of illegal or abandoned waste tire sites and offers incentives to use waste tires in public projects. Funds are split two-thirds for cleanup and one-third for incentives.

Counties and municipalities may apply for funding year round. The department works with counties and municipalities to ensure the site fits the definition of “illegal” or “abandoned” waste tires.

Thirteen waste tire cleanups in four counties and one municipality were completed in 2012. The total cost was \$424,974 with a total of 197,129 illegal or abandoned waste tires removed (see chart below). Cleanup project costs can vary among sites depending on where the cleanup site is located, the site’s topography and if tires are above ground or buried.

Grantee Name	Funds Spent for Cleanup	Tires Removed
City of Pueblo	\$76,680	20,000
Douglas County	\$8,510	839
Otero County	\$205,061	117,000
Fremont County (5 grants, 4 sites)	\$30,973	10,670
El Paso County (5 grants, 3 sites)	\$103,750	48,620
Total:	\$424,974	197,129

## Processor & End User Fund

Funds for the use of waste tire-derived products are available to both processors and end users. Monthly reimbursements are based on approved tons and available funding.

For 2012, \$3,801,053 was reimbursed for 38,142 processed approved tons and 47,892 end used approved tons.

The passage of House Bill 12-1034 in May 2012 changed the eligibility requirements for processors and end users. Processors are now eligible for reimbursements when the processed waste tires are made into a tire-derived product and the processor has end used the tire-derived product themselves or the tire-derived product has been sold for an end use and moved off-site. An end user is now defined as a person who uses a tire-derived product for a commercial or industrial purpose.

*‘Thirteen waste tire cleanups in four counties and one municipality were completed in 2012. The total cost was \$424,974 with a total of 197,129 illegal or abandoned waste tires removed.’*

## Recycling Incentives

The Waste Tire Cleanup Fund also incentivizes the use of Colorado waste tires in public projects to promote tire-derived products around the state. Projects include playground surfacing, athletic fields and infill for existing recycled turf surfaces.

During 2012, eight recycling incentive grants in seven counties were completed. The total amount awarded was \$330,994, using 44,788 waste tires (see chart below).

Organization	Funds Spent on Project	Tires Used (approx.)
Jefferson County Public Schools	\$50,000	4,320
Elbert County School District C-2	\$8,100	864
South Suburban Park and Recreation District	\$49,280	13,689
Town of Calhan	\$50,000	5,511
Phillips County	\$44,400	3,022
Frontier Charter Academy	\$42,884	4,622
Academy School District 20	\$36,330	4,031
City of Evans	\$50,000	8,729
Total:	\$330,994	44,788

# By the Numbers: Overview of Colorado's Waste Tire Activity

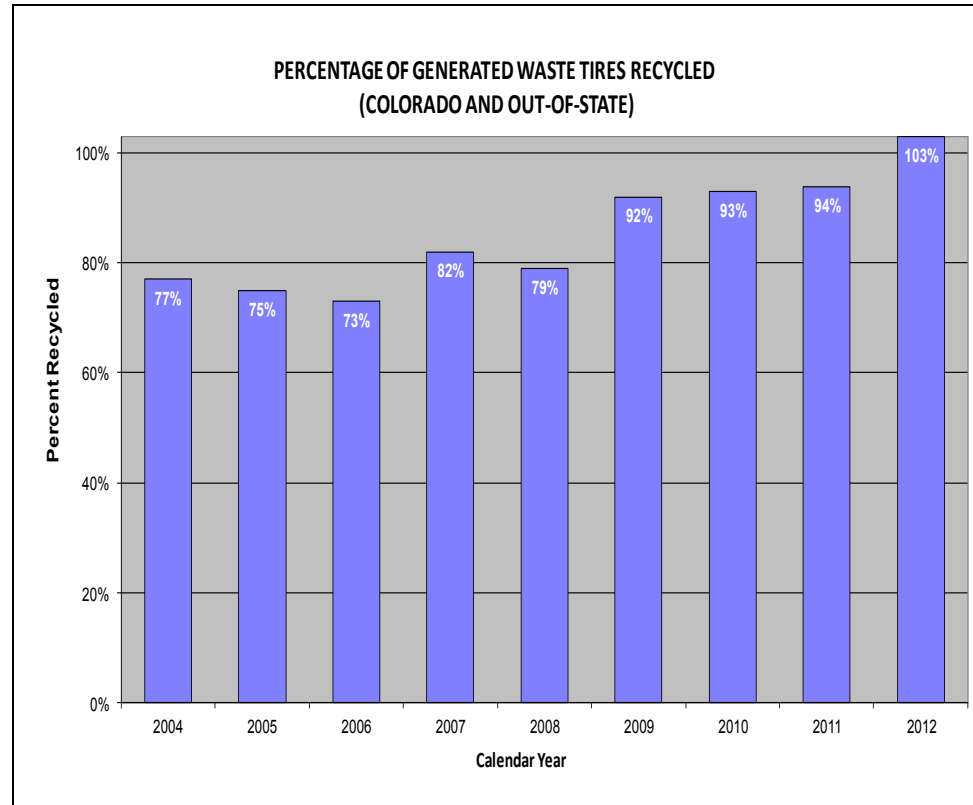


Figure 1



Figure 2

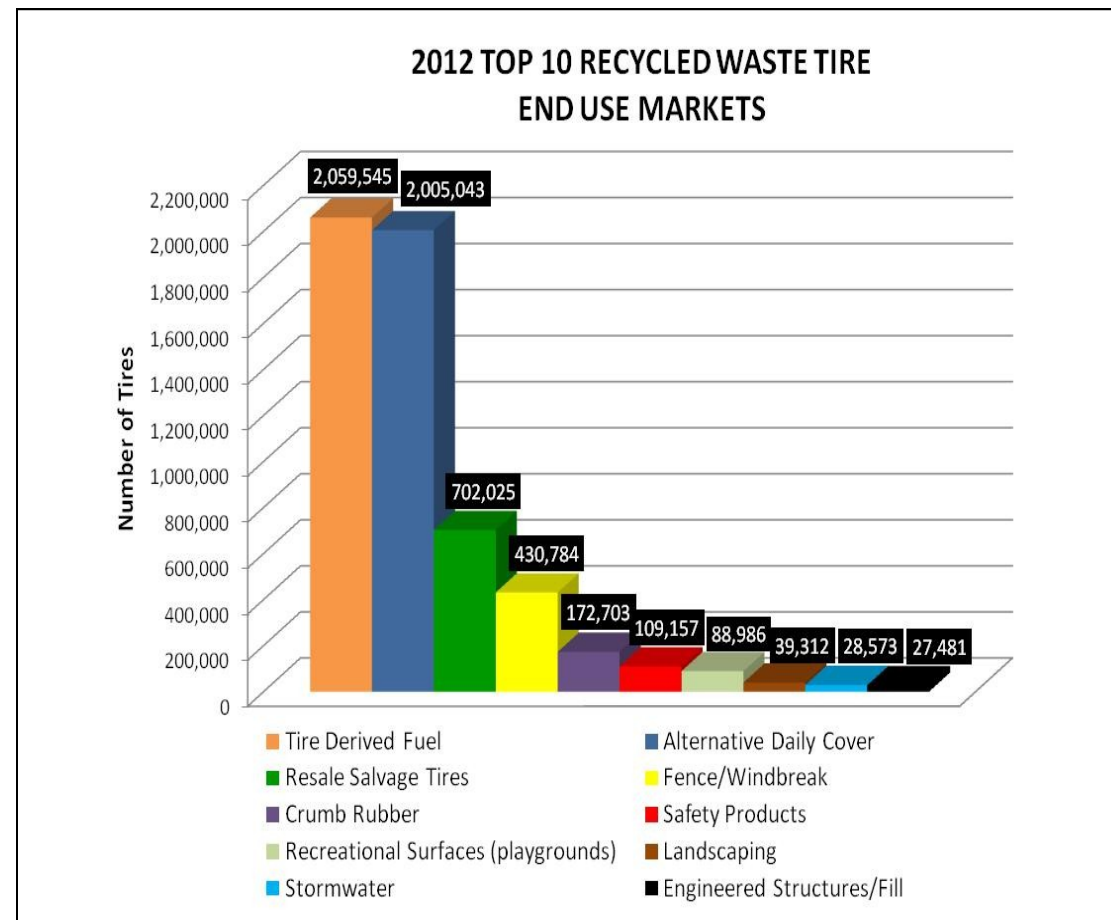


Figure 3

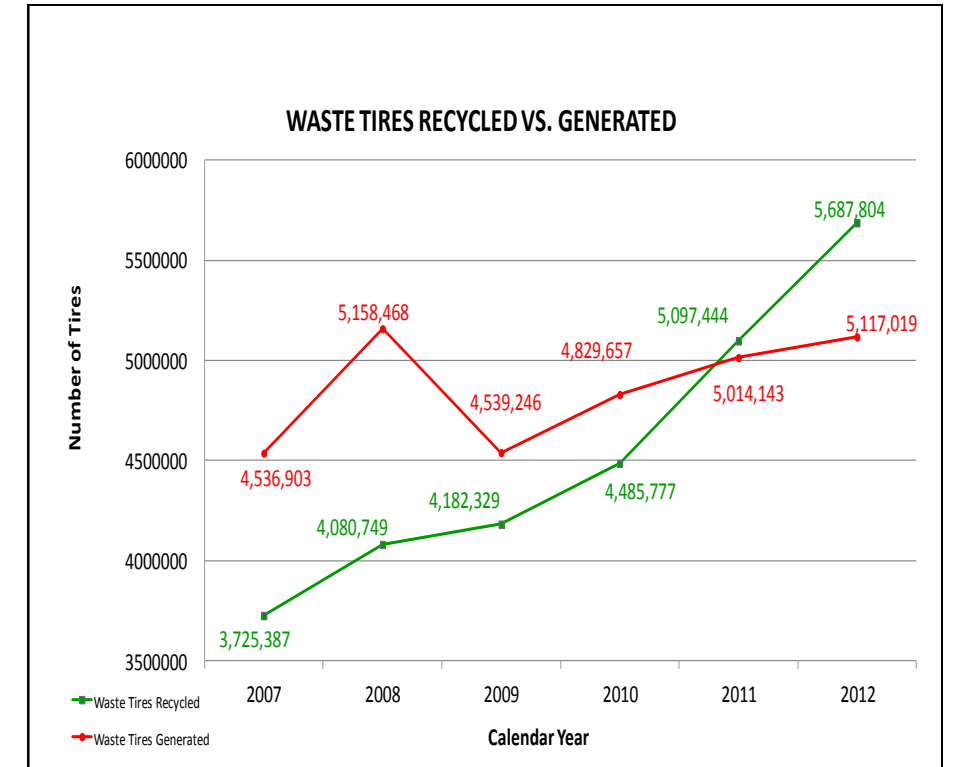


Figure 4

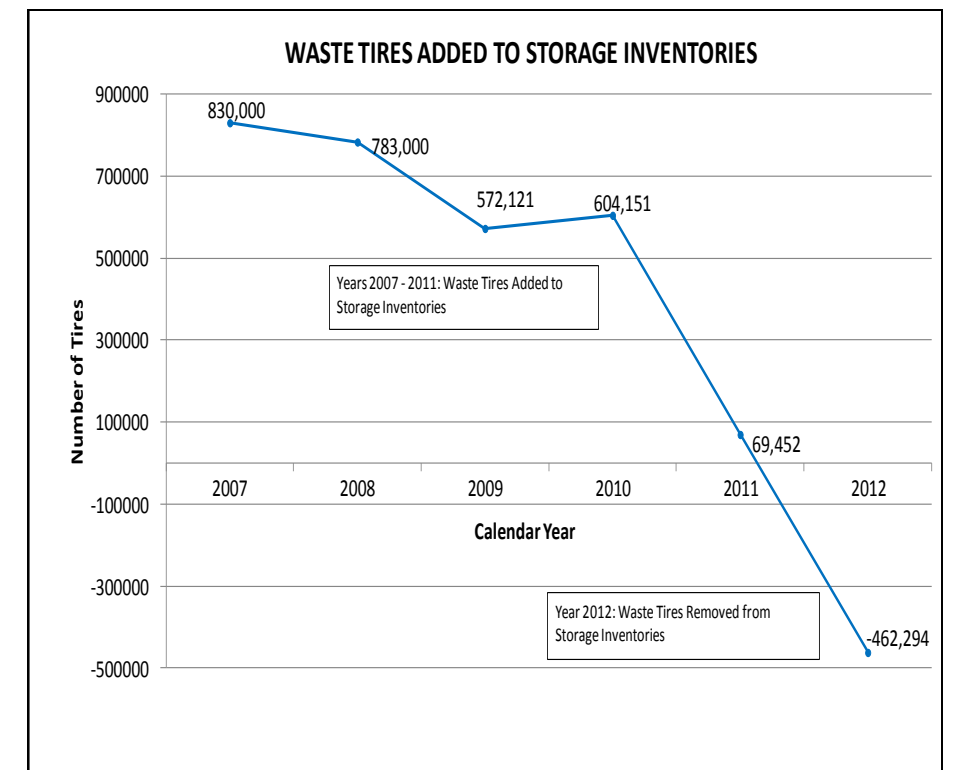


Figure 5

# Waste Tire Grants

## Market Development Fund

The Market Development Fund is to assist in developing markets for tire-derived products from waste tires.

The department awarded \$195,358 to Tetra Tech EM Inc. to develop a waste tire market development plan for the State of Colorado. Upon request of the Waste Tire Advisory Committee, the plan will have specific recommendations to meet the goal of recycling 100% of all newly generated waste tires and to reduce and eventually eliminate waste tires currently being stockpiled. The plan will be a roadmap for the department and the Waste Tire Advisory Committee to move the waste tire program forward with meeting these goals. The final plan was completed in May 2013. The plan includes recommendations regarding regulatory development modifications, waste tire stockpiles, market development, and lays out steps leading to the beneficial use of all waste tires produced and stored in the state of Colorado. The Colorado Waste Tire Market Development Plan is available on the Waste Tires website: [www.colorado.gov/cdphe/wastetires](http://www.colorado.gov/cdphe/wastetires).

The department awarded \$24,640 to the South I-25 Urban Corridor Transportation Management Association for a demonstration project of tire-derived landscape mulch at two intersections along Highway I-25 to determine the feasibility of using this material in place of traditional landscape material.



*Tire-derived mulch used as landscaping material at a metro Denver interstate interchange*

## Waste Tire Fire Prevention & Law Enforcement Grant Funds

The Waste Tire Fire Prevention Fund (Tire Fire Fund) assists fire departments, fire districts and other first responder fire entities with the purchase of equipment and supplies for the use at waste tire fires in Colorado. The Tire Fire Fund provides funding for the purchase of equipment and supplies for the prevention, preparation, response to and/or handling of waste tire fires. Eligible organizations include county, municipal, state and volunteer fire departments, fire districts and first responder fire entities.

Calendar year 2012 was the initial year of awarding Tire Fire Funds. The department and Waste Tire Advisory Committee (the committee) decided to award funds to fire agencies with waste tire monofills in their fire response area. The department reached out to these fire agencies and awarded a total of \$304,857 to seven agencies (see chart below) for purchase of fire equipment. An open competitive grant application process was developed for fiscal year 2013. The application process was successful as out of the eleven applications received, the department and committee members awarded grants totaling \$290,000 to eight applicants.

The Law Enforcement Grant Fund is available to the Colorado State Patrol, county sheriffs, police and fire departments and local health departments to assist with funding for waste tire activities. The department initiated an application process in calendar year 2012 but did not receive any applicants. The department continues to reach out to eligible agencies to apply to this Fund.

Grantee Name	Funds Spent on Equipment	Equipment Purchased
El Paso County Sheriff's Office	\$47,058	Air monitor
Fort Lupton FD	\$33,000	SCBA
Greeley Office of Emergency Management	\$47,058	Air monitor
Hanover FD	\$60,244	Ground monitor and SCBA
Hudson FPD	\$38,000	SCBA
Platteville-Gilcrest FPD	\$39,749	SCBA
Southeast Weld FPD	\$39,748	SCBA
Total:	\$304,857	

# Waste Tire Legislation

Two bills were passed during the 2005 legislative session that directly affected the management of waste tires in Colorado. The Waste Motor Vehicle Tire Hauler Act (HB 05-1126) required the registration of commercial transporters of waste motor vehicle tires. The intent of this legislation was to ensure transportation and delivery of waste tires to proper storage and recycling facilities and to minimize illegal tire dumping.

Senate Bill (05-141) regulated the disposal of residentially generated waste tires. Effective July 1, 2007, this bill limited the disposal of residentially generated tires in landfills.

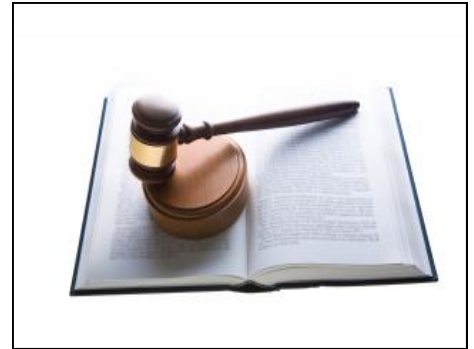
SB 09-289 was passed during the 2009 legislative session. Among other things this bill reallocated collection of the tire fee to the point of sale at tire retailers instead of the point of disposal, thereby improving collection of the funds. This bill also required facilities to use only commercial tire haulers registered with the state to transport waste tires, required the state to develop a plan for the elimination of tire monofills within 10 years and required the department to implement an outreach and education program for facilities handling tires. The combined result of this bill was to ensure waste tires were commercially transported to appropriate facilities and that more of these tires were ultimately recycled.

House Bill 10-1018 provided a cradle-to-grave or cradle-to-cradle regulatory approach for waste tires. This bill specified new registration, decal and manifest requirements for waste tire haulers and waste tire facilities. The bill also required

waste tire monofills to submit an inventory reduction plan to the department as a part of the facility Certificate of Designation. HB 10-1018 placed administrative authority for the waste tire funds with the department and allocated resources for new personnel to manage the fund and provide program enforcement.

House Bill 10-1018 transferred oversight of the Processor and End User Partial Reimbursement (Processor and End User), Illegal Waste Tire Cleanup and Recycling Incentive Funds from the Department of Local Affairs to the department's Division of Environmental Health and Sustainability. HB 10-1018 also created three new funds: the Waste Tire Market Development, Waste Tire Fire Prevention and Law Enforcement Funds, which are also administered by the department.

New regulations went into effect April 1, 2011, implementing the requirements of HB 10-1018 by setting up a cradle-to-grave or cradle-to-cradle management construct for waste tires to ensure that all newly generated waste tires are accounted for and properly recycled or dispositioned. The regulations set out the requirements for each type of facility or entity within the waste tire lifecycle — tire retailers and wholesalers that generated waste tires as they replace old tires with new tires on vehicles; waste tire haulers and waste tire collection facilities that manage waste tires in transit; waste tire processors and end users that either manufacture waste tires



into new products or turn waste tires into useable feedstocks; and waste tire monofills that store waste tires for extended periods. Regulations governing the Processor and End User Fund also went into effect on July 1, 2011.

House Bill 12-1034 was passed during the 2012 legislative session. This bill revised the definition of end user and modified the requirements of the Processor and End User Fund by requiring a processor of waste tires to end use the tire-derived product or process waste tires into tire-derived product for end use and move the tire-derived product off-site. The Processor and End User Fund section was also amended to require the department to identify other markets in Colorado that are able to eliminate illegal tire dumping and recycle or reuse waste tires in newer technologies.

New Processor and End User Fund and Waste Tire Facilities and Waste Tire Hauler regulations went into effect December 30, 2012 to implement the requirements of HB 12-1034. The new regulations modified who is eligible to receive a reimbursement from the Fund, clarified exemption language, removed waste tire hauler inconsistencies and standardized annual reporting dates.



# Trends and Accomplishments

Calendar 2012 was another busy year for the Waste Tire Program. Hazardous Materials and Waste Management Division and Division of Environmental Health and Sustainability Waste Tire Program staff were involved in the revisions of two sets of regulations regarding waste tire management and implementation of the waste tire processor and end user reimbursement fund. The Solid and Hazardous Waste Commission passed updated regulations resulting from the passage of HB 12-1034, for Waste Tire Facilities and Waste Tire Haulers and administration of the Waste Tire Processors and End User Reimbursement Program on November 20, 2012. The department actively engaged waste tire stakeholders during the development of both regulations. Stakeholders included representatives from the Waste Tire Advisory Committee, waste tire haulers, waste tire processors, waste tire end users, waste tire monofills, landfill operators and local government officials.

In November 2012, the department initiated a stakeholder group to focus on the beneficial use of waste tires related to agricultural activities. This stakeholder group continued in 2013 to work on developing guidance that explains the requirements and flexibilities in existing statues and regulations. Best management practices will also be developed using the new solid waste beneficial use process.

Waste Tire Program staff engaged in various efforts to inform the waste tire community of the regulations and the Waste Tire Program, including conducting compliance assistance outreach visits and inspections at waste tire facilities and waste tire hauler facilities. Waste tires outreach efforts also included staff presenting at the Northeast Solid Waste Operators biannual meeting, the Colorado Association of Code Enforcement Officer quarterly training session and the Colorado Rocky Mountain Chapter of the Solid Waste Association of North America Annual Conference. Staff also exhibited the Waste Tire Grant Program at the Colorado Counties Incorporated Winter Conference and provided conference attendees with jar openers made from recycled tires that were custom printed with the department's logo and the url for waste tire website.

The department continued to process waste tire registration applications and issue waste tire certificate of registrations. In 2012, the department issued over 450 new or updated waste tire certificate of registrations to registrants. Additionally, the



department developed a waste tire hauler renewal form and corresponding renewal instructions. This registration packet was mailed to all registered waste tire haulers. The department had a waste tire hauler renewal rate of 100% for the renewal cycle and issued new waste tire hauler vehicle registration decals. 2012 registration numbers were (see graph above):

- Waste tire generators (tire retailer, wholesaler or fleet service facility): 1,628
- Waste tire haulers: 75
- Waste tire collection facilities: 19
- Waste tire processors: 17
- Waste tire end users: 14
- Waste tire monofills: 3

## Waste Tire Resources on the Web

### Waste Tires Home Page:

[www.colorado.gov/cdphe/wastetires](http://www.colorado.gov/cdphe/wastetires)

### Solid Waste and Waste Tires Regulations

[www.colorado.gov/cs/Satellite/CDPHE-Main/CBON/1251607568997](http://www.colorado.gov/cs/Satellite/CDPHE-Main/CBON/1251607568997)

### Waste Tires Forms:

[www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251616360987](http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251616360987)

# Waste Tires and Public Health

In 1987 a facility known as “Tire Mountain, Inc.” located in Hudson, CO, burst into flames. Lightning caused many of the tires to burn for days which released a billowing black smoke that could be seen for miles.

Arson and wildfires that engulf illegally dumped tires can create additional ignition sources for tire fires in Colorado. Controlled burns that get away can also start tire fires.

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*‘Dr. Urbina suggests that anyone can prevent the impact of tires on the environment and the public’s health by recycling tires properly.’*

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Tire fires often become major hazardous incidents that affect human health and the environment. In some cases, entire communities are evacuated and it is often recommended that these incidents involve active participation from federal, state and local response agencies 24-hours a day for several months. These fires can also pollute the soil, water and air.

Oil that discharges into the ground and surface water is a significant environmental pollutant which is also highly flammable. The average passenger car tire is estimated to produce over two gallons of oil when burned (Source: Rubber Manufacturers Association, April 2003).

Tire fires also produce air pollution. According to the US Environmental Protection Agency, air emissions from tire fires may include toxic air pollutants which are known or suspected to cause cancer and other serious health effects.



*Tire fire that occurred Spring 2013 in Northeast Colorado from a controlled burn that spread to an adjacent tire and haystack pile*

Due to the potential size, environmental impact, duration and cost of a major fire, prevention of tires fires is paramount. “In addition to the potential damage related to tire fires impacting the quality of air, land and water, there are significant risks related to public health,” said Dr. Chris Urbina, department director. Disease carrying and nuisance pests present a second concern to human health and the environment. Stockpiled or illegally disposed tires provide shelter and a breeding ground for snakes, rodents and other vermin. The curved shape of a tire allows rainwater to collect and creates an ideal habitat for mosquitoes. Mosquitoes can breed in the stagnant water that collects inside tires.

Several varieties of mosquitoes can carry deadly diseases, including encephalitis and dengue fever. West Nile virus, which recently emerged in the US, is a mosquito-borne virus that causes viral fever syndrome and encephalitis. In 2012, Colorado there were 131 verified human West Nile virus infection cases. Five (5) of these cases resulted in death.

Short of removing tire piles, mosquito control and eradication programs are difficult and costly. Dr. Urbina suggests that anyone can prevent the impact of tires on the environment and the public’s health by recycling tires properly.

# Waste Tire Facts and Facility Information

## Waste Tire Statistics

In 2012, using waste tires as tire-derived fuel replaced the use of 50,080 tons of coal, or enough energy to power 6,596 homes for one year, and avoided greenhouse gas emissions by recycling 43,980 tons of waste instead of sending it to the landfill.<sup>1</sup>



Using waste tires as tire-derived fuel produces the same amount of energy as oil and 25% more energy than coal.<sup>2</sup>



Nationally, the top three waste tire end use markets are tire-derived fuels, conversion into ground rubber that is recycled into products or rubber-modified asphalt and used tires for reuse or retreading.<sup>3</sup>



<sup>1</sup>United States EPA "Greenhouse Gas Equivalencies Calculator" updated April 2013

<sup>2</sup>United States EPA "Tire-Derived Fuel" updated November 2012

<sup>3</sup>Rubber Manufacturing Association "U.S. Scrap Tire Market 2009 Summary" 2011

