

# Hazardous Materials and Waste Management Division

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Annual Report  
July 1, 2015 to June 30, 2017



**COLORADO**

**Hazardous Materials  
& Waste Management Division**

Department of Public Health & Environment



Pueblo Chemical Agent-Destruction Pilot Plant

**Division Mission:**  
*To improve the quality of the environment and public health for the citizens of Colorado by continuously improving our efforts to ensure proper management of hazardous materials and waste.*

## A Message from Gary Baughman

Director, Hazardous Materials and Waste Management Division



Hazardous Materials and Waste Management Division (HMWMD) staff work each day to further the mission of ensuring proper management of hazardous materials and waste so Coloradans can enjoy a safe environment and superior public health. This year’s report covers the past two years and summarizes the progress the division has made. The report also provides data and highlights from the Solid Waste and Materials Management Program, Radiation Control Program, Remediation Program and Hazardous Waste Program.

*Cover photos include landfills, the Argo Mine in Idaho Springs, buffalo at the Rocky Mountain Arsenal, a mammography machine, a geiger counter checking for radioactive material, as well as examples of solid waste and hazardous materials.*

**Paint Stewardship Program:** On July 1, 2015, the Colorado Paint Stewardship Program began managing unwanted paint in the state, in accordance with the Architectural Paint Stewardship Act.

In the first year and a half, the non-profit organization running the program established more than 155 convenient sites for consumers to drop off unused latex and oil-based paint and has managed over 900,000 gallons of paint. This new program has also hosted paint collection events and reuses or recycles over 80 percent of the latex paint collected. The program increases consumer opportunities to properly manage leftover paint.

**Bonita Peak Mining District Superfund Site:** On Aug. 5, 2015, EPA’s Superfund Removal Program accidentally triggered a blowout at the Gold King Mine in San Juan County. The resulting slug of metals-contaminated water stained the Animas River for miles downstream, and though subsequent studies concluded that there was minimal long-term environmental impact, the incident highlighted the need to remedy the environmental effects of historic mining operations.

The Bonita Peak Mining District site was added

to the National Priorities List of Superfund sites on Sept. 9, 2016. The site comprises 48 historic mines or mining-related sources where ongoing releases of metal-laden water and sediments are occurring within the Mineral Creek, Cement Creek and Upper Animas River drainages in San Juan County. Mining began in the area in the 1860s and both large- and small-scale mining operations continued into the 1990s, with the last mine ceasing production in 1991. The site includes 35 mines, seven tunnels, four tailings impoundments and two study areas where additional information is needed to evaluate environmental concerns. A remedial investigation to determine the nature and extent of contamination is under way.

**Small Landfill Initiative:** Representatives from the Solid Waste and Materials Management Program focused on small landfills in 2017, meeting with county commissioners and town representatives in areas with landfills accepting less than 20 tons of waste per day. The program inspected the landfills and informed officials of regulatory and technical requirements for operating a landfill. In the 2017 Colorado legislative session the program was granted more than \$1.3 million



from the Colorado General Fund to help small landfills meet requirements. The division will put considerable effort into this project for the next several years.

**Radon-Resistant Building Codes Adopted:** Jefferson County, Boulder, Pagosa Springs and Snowmass Village all adopted radon-resistant new construction guidelines over the last two years. The revised codes call for all new homes to include passive radon mitigation systems, aiming to reduce the 500 deaths per year due to radon in Colorado. Radon kills more people in our state than carbon monoxide, drowning, fires and driving while intoxicated combined. State

*Thirty cities and counties in Colorado now have radon-resistant building codes.*

Indoor Radon Grants, from our Radon Program to local governments, allowed for the education of code and building officials who then supported the adoption of these new guidelines. There are now 30 cities and counties in Colorado with radon-resistant building codes.

**Emerging Contaminants:** A U.S. Environmental Protection Agency (EPA) drinking water sampling program designed to monitor emerging contaminants found unregulated industrial chemicals called perfluorinated compounds (PFCs) in public water sources southeast of Colorado Springs, including the water systems for Security, Widefield and Fountain. Some studies suggest a link between PFCs and low birth weight, as well as possible links with kidney and testicular cancers.

In May 2016, EPA lowered its health advisory levels for certain PFCs in drinking water to 70 parts per trillion. The Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division, in cooperation with the El Paso County Health Department, U.S. Air Force, EPA Region 8 and the affected water districts, worked to ensure that residents had access to water that met the voluntary EPA guidelines.

HMWMD's Federal Facilities Remediation and Restoration Unit launched an investigation to identify potential sources, convincing the Air Force to accelerate a planned site inspection (SI) at Peterson Air Force Base in El Paso County. PFCs historically have been used in firefighting foam at military installations. Site inspection fieldwork was completed in November 2016 and the report is expected to be released in July 2017. Pending the results, the Air Force plans an expanded SI in fall 2017 and a follow-on remedial investigation during FY2019.

**Regulatory Innovation:** In July 2015, Black Range Minerals asked the Radiation Program to make a determination about how ablation mining technology (AMT) proposed for use at the company's Sunday Mine

Complex in San Miguel County would be regulated under the Colorado Rules and Regulations Pertaining to Radiation Control. Because the proposal represented the first commercial-scale AMT operation in the United States, Colorado's regulatory determination would set a national precedent. AMT disassociates uranium from the sand grains in ore-bearing sandstone, resulting in a slurry that is shipped to a conventional mill for further processing. AMT could result in far less material being shipped to a mill than is typical, which may make uranium mining more economical.

Following an intensive technical and regulatory review, public stakeholder process and NRC consultation, the Radiation Program determined in December 2016 that AMT, as proposed for the Sunday Mine, requires a CDPHE-issued milling license. The determination requires companies wishing to use AMT to complete a rigorous approval process, including extensive public participation. However, because AMT's wastes appear to pose significantly less radiological and hazardous risk than typical uranium mill tailings, the department determined that alternative disposal methods may be appropriate.

**Central City/Clear Creek Superfund Site:** The new Argo Tunnel Flow Control Bulkhead was completed in August 2015. A pipe runs through the concrete plug so water treatment plant operators can regulate the flow and control water levels inside the mine pool. The bulkhead will prevent future surge events from impacting the main stem of Clear Creek and will control flow volume to the Argo Tunnel Water Treatment Facility, resulting in reduced costs.

The North Clear Creek Water Treatment Plant should be up and running later this year. The last major remedy component of the Operable Unit 4 Record of Decision, the new plant treats contaminated water from the Gregory Incline, the National Tunnel and Gregory Gulch, conveyed to the plant via a pipeline

*In the 2017 legislative session, the division received \$1.3 million to assist small, rural landfills with landfill regulations.*

constructed in May 2012. The lime-based high-density sludge plant is designed to treat anticipated flows ranging from 200 gallons per minute to 600 gallons per minute. The new plant will greatly improve water quality in the North Fork of Clear Creek, where elevated metals concentrations pose a risk to aquatic life.

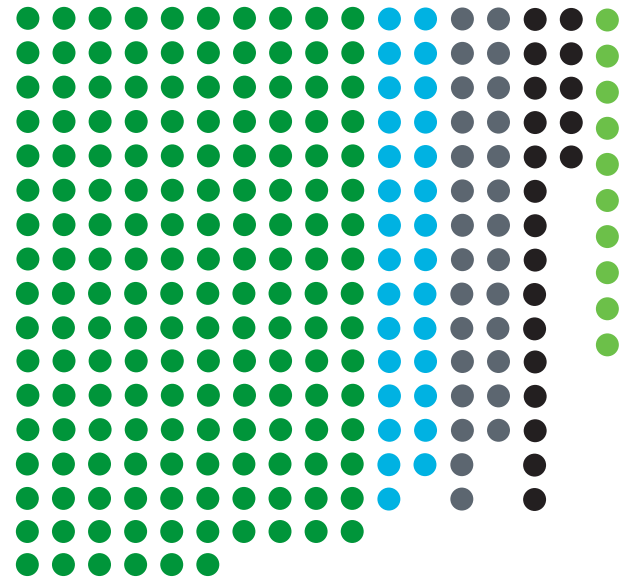
**Waste Tire Removal:** The Waste Tire Program created an innovative partnership this year with the Animas Mosquito Control District, funding a project that removed nearly 3,700 tires. The removal reduces the mosquito control district's workload as they no longer

*continued on page 12*

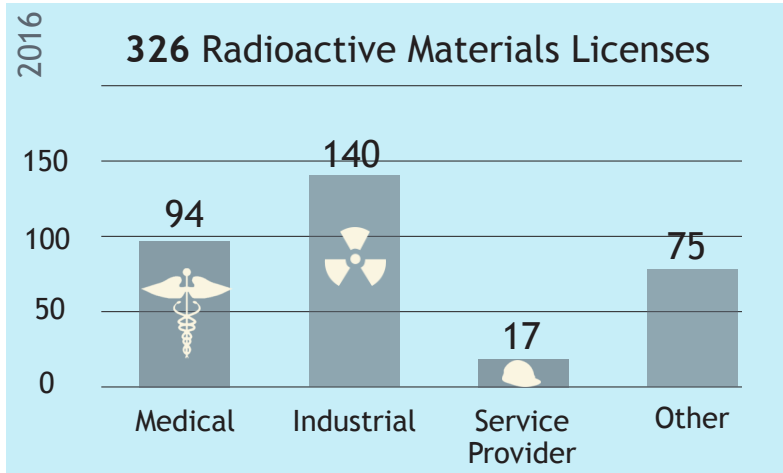
# RADIATION PROGRAM

The Radiation Program regulates the possession, use, management and disposal of radioactive materials and regulates radiation-producing machinery, such as X-ray machines. The program also works with local agencies to provide information regarding radon levels in homes and other buildings. The following information is from 2015 and 2016.

## 253 License Actions

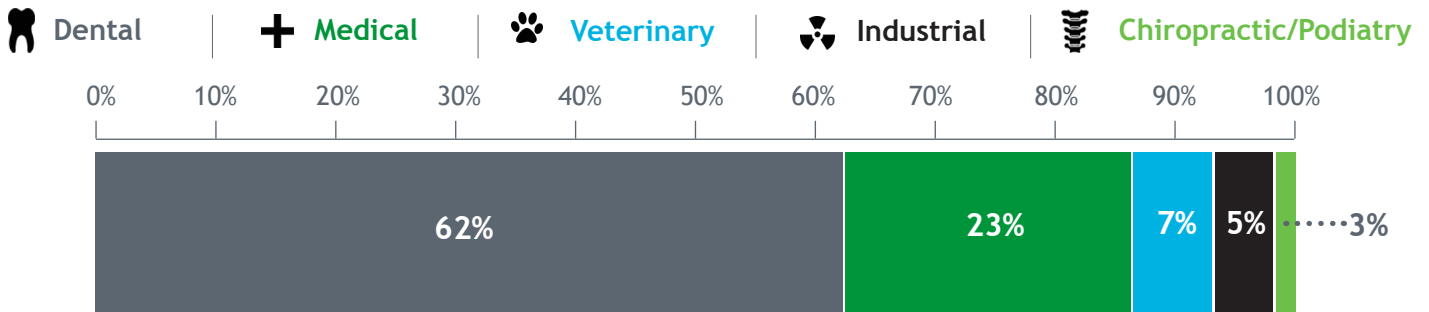


166 Amendments  
29 Renewals  
28 Document Reviews  
20 Terminations  
10 New

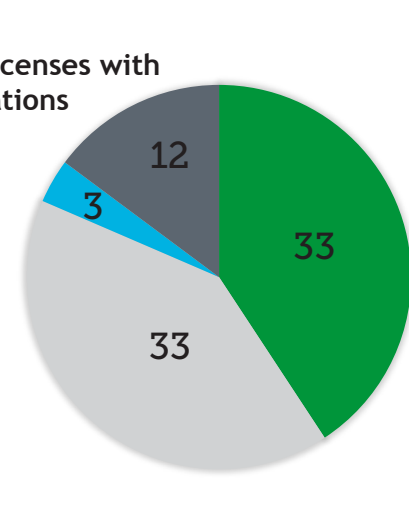
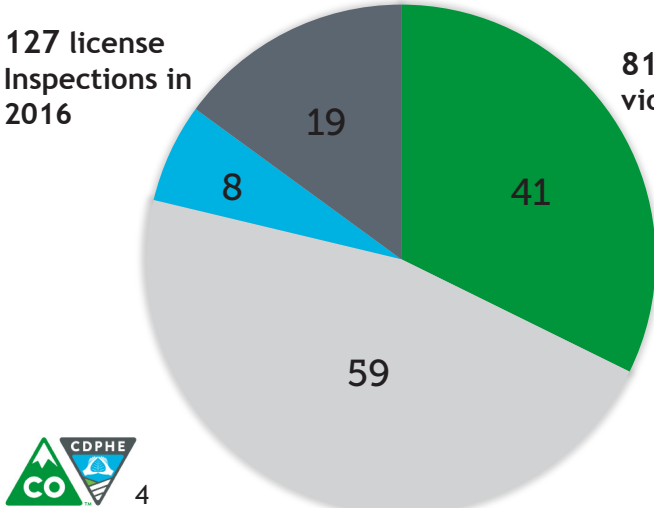


## Radiation-producing machines:

Approximately 16,000 radiation-producing machines are registered with the department.



## License Inspections



■ Service Provider    ■ Other  
37.5% had violations    63% had violations  
■ Medical    ■ Industrial  
80% had violations    56% had violations

Note: These figures represent both minor and major violations. Most violations are minor.

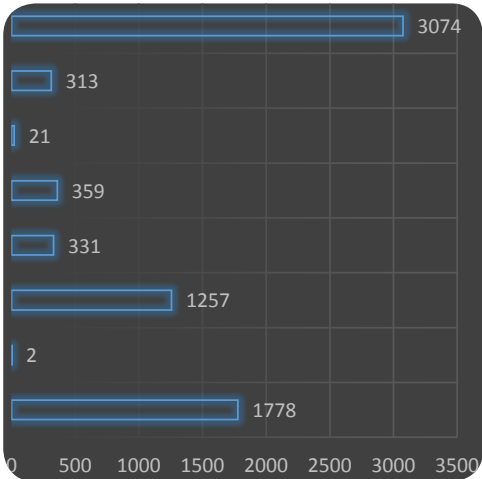
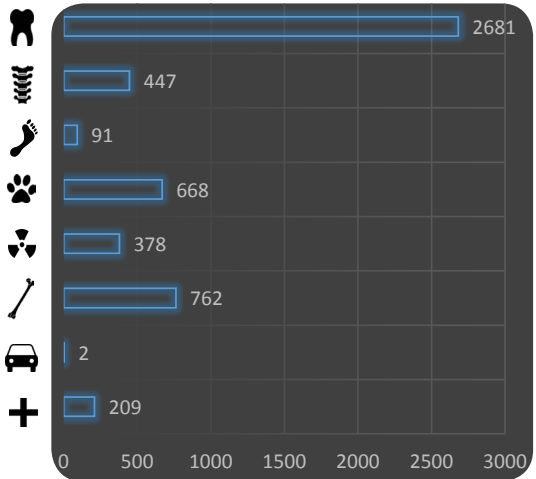
# X-Ray Program

**5238** facilities are registered by the X-Ray Program

**7174** inspections were performed in 2016

Number of registered facilities

Inspections by facility type



**276**

new X-ray facilities were added in 2016



**15,918**

machines are registered in Colorado

- Dental
- Chiropractic
- Podiatry
- Veterinary
- Orthopedics & private medical clinics
- Industrial
- Mobile medical services
- Hospitals and hospital clinics

# Radon Program



Granted approximately:

**\$136,000** (2015) | **\$210,000** (2016)  
to 22 recipients | to 24 recipients



**8,300** (2015) | **7,300** (2016)  
homes | homes  
received radon mitigation.

**5,000** (2015) | **7,000** (2016)  
free radon test kits distributed to Colorado citizens.

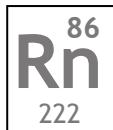


15 builders built approximately:

**1,600** (2015) | **1,050** (2016)  
homes, schools and other buildings with radon-resistant features.



**26,000** (2015) | **27,000** (2016)  
homes, schools and other buildings tested.



## Low income radon mitigation assistance

In the 2016 legislative session Colorado approved \$100,000 to help over 100 low-income families per year receive free mitigation assistance.



## Daycare testing

As of summer 2016, Colorado now requires all daycare facilities to test for radon.



## Radon and new construction codes

In the past two years Jefferson County and the cities of Boulder, Pagosa Springs and Snowmass Village have passed radon-resistant new-construction building codes. Thirty cities and counties across the state have now adopted similar codes.

# SOLID WASTE AND MATERIALS MANAGEMENT PROGRAM

The Permitting Unit reviews all permit applications for solid waste sites to determine if the proposed facility is protective of human health and the environment and works with local governing bodies to permit solid waste facilities. The Compliance Assurance Unit conducts compliance inspections – site visits and document reviews – at facilities that manage, treat, recycle, reuse and/or dispose of solid wastes. This unit also investigates complaints alleging mismanagement of solid waste and oversees cleanup of asbestos-contaminated soil. The Materials Management Group oversees recycling and beneficial reuse of waste materials. The unit also implements the waste tire/waste grease management and recycling programs.



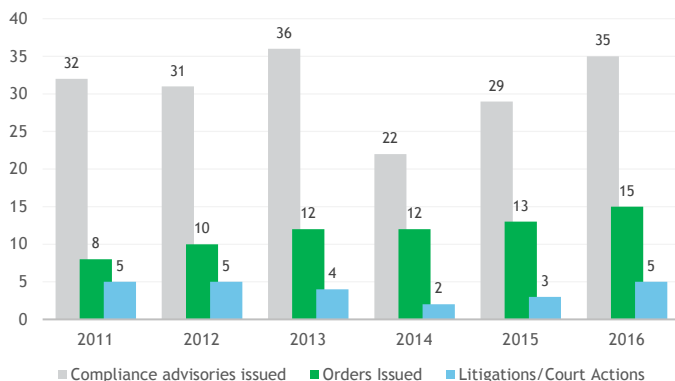
## 2017 Legislative Session

HB 17-001 included more than \$1.3 million in general funds to assist small landfills with ground water monitoring. This will be combined with \$250,000 of division money for a \$1.6 million program.



The compost regulations were amended in 2016 to reduce the regulatory requirements for yard waste composting, small-scale food waste composting and community garden composting.

## Enforcement Actions



The number of compliance orders issued has risen steadily in recent years. The number of cases that require legal action have remained low, although these cases are time-consuming and expensive.

## Permitting

**525** Projects were submitted to the Solid Waste Permitting Unit in 2016. Of these:

**14** were large, complex projects

**232** were moderately-sized projects

**279** were minor projects

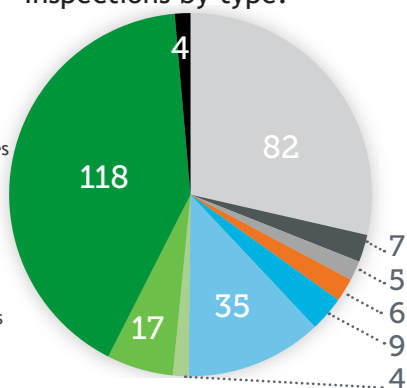
**7** new Certificate of Designation applications were received

## Inspections:



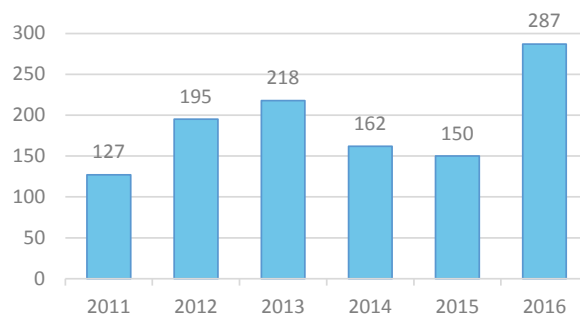
Inspections by type:

- Landfills
- Composting Facilities
- Medical Waste Facilities
- Waste Impoundments
- Recycling Facilities
- Complaints
- Beneficial Use Sites
- Other
- Waste Tire Facilities
- Waste Grease Facilities



Inspections nearly doubled in the last year.

Total number of inspections



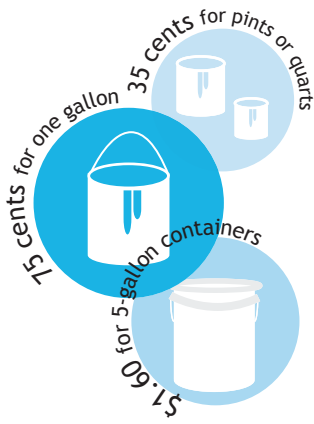
**36%** of inspections include compliance assistance

In 2016, each inspector averaged

**41** inspections



## Paint Stewardship Program



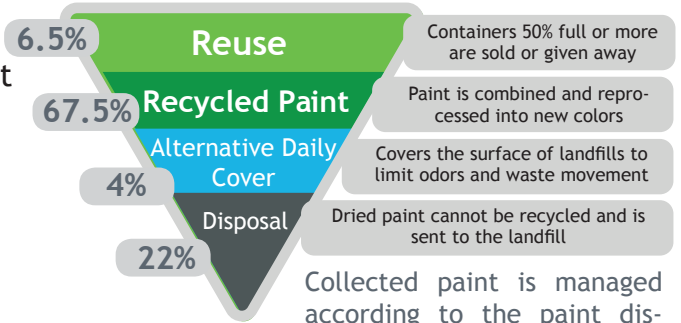
**20,142,818**  
gallons of  
paint  
purchased

**189,337**  
gallons of  
oil-based paint  
processed

**712,974**  
gallons of  
latex paint  
processed

The Paint Stewardship Program began July 1, 2015 to manage unwanted paint in Colorado. For more information on the program, please see page two.

### Paint disposal hierarchy



Collected paint is managed according to the paint disposal hierarchy. Most paint is recycled into new types and colors.

## Waste Tire Program

Every year the Waste Tire Program manages millions of waste tires, which are both fire hazards and prime mosquito breeding grounds, by conducting enforcement and promoting recycling of waste tires into different tire-derived products.

**\$356,441**

in grants awarded for illegal waste tire removal projects around the state

**118,029**

Total waste tires cleared from illegal tire sites



**870**

waste tire inspections by local health agencies in partnership with the division

**12,685,144**

waste tires were recycled or salvaged in 2016, a 78 percent increase from 2015

**1.32**

waste tires were generated per person in Colorado in 2016



## Recycling, Composting and Beneficial Use



The unit reviewed 17 new beneficial use proposals and monitored 17 approved facilities. 130,000 tons of solid waste were diverted from disposal through this program through uses such as land application.



270,831 tons of cardboard were recycled in Colorado in 2016. This was a 120 percent increase from 2015, which saw 28,073 more tons of cardboard recycled than in 2014.



1,860,499 tons of waste were diverted through recycling. This was only 19.2 percent of the waste created, however, so more can be done. The program is looking to set state-wide recycling goals in the coming year to try to increase the diversion rate.

### Fast facts



Composted food and yard waste increased 11 percent by weight in 2016 compared to 2015.



The equivalent of 1.8 million barrels of oil and 9,666 railcars of coal was conserved through recycling and composting this year.



1,802,794 million metric tons of carbon dioxide emissions were prevented, saving the equivalent emissions from over 379,535 cars.



The energy savings from waste diversion was equivalent to the energy used in 93,437 homes in one year.

# REMEDIATION PROGRAM

The Remediation Program performs preliminary assessments and site investigations of potentially contaminated sites to determine whether they should be included on the National Priorities List for Superfund designation. The program also oversees remediation activities at Superfund and federal sites, encourages the voluntary remediation and redevelopment of historically contaminated sites and assures cleanup of sites contaminated by uranium mill tailings.

## Voluntary Cleanup Program

The Voluntary Cleanup Program aims to facilitate the redevelopment and transfer of contaminated properties.

In 2016:

356 acres  
were cleaned up through the program

74 applications for voluntary cleanup projects

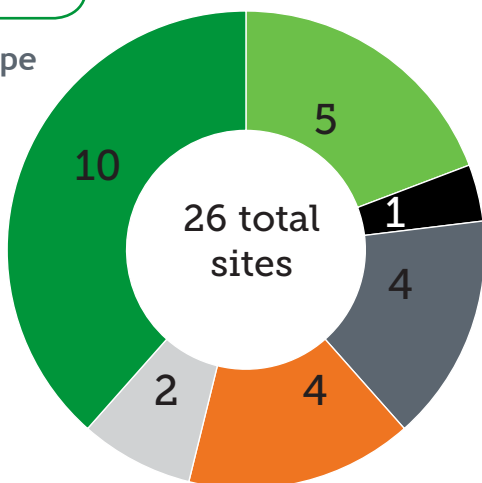
3114 houses and condos were built

4362 jobs were created

## Superfund Program

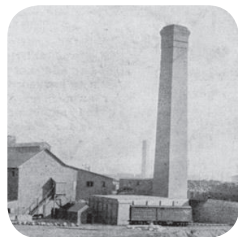
Superfund sites by type

- Industrial
- Wood Treatment
- Smelters
- Radiation
- Landfills
- Metals Mining



At metals mining sites, contamination from prior decades or centuries continues to harm the environment.

**1** new site, Bonita Peak Mining District, was added to the National Priorities List in 2016. Bonita Peak was the site of the 2015 Gold Mine Spill near Silverton, but the area had been heavily contaminated by mining waste for decades.



### Colorado Smelter

The Superfund remedial investigation/feasibility study process began for the Colorado Smelter site in Pueblo in December 2015. As of June 2016, sampling efforts included 300 homes for metals in outdoor soil and 102 of those same homes for metals in indoor dust.



### North Clear Creek Water Treatment Plant

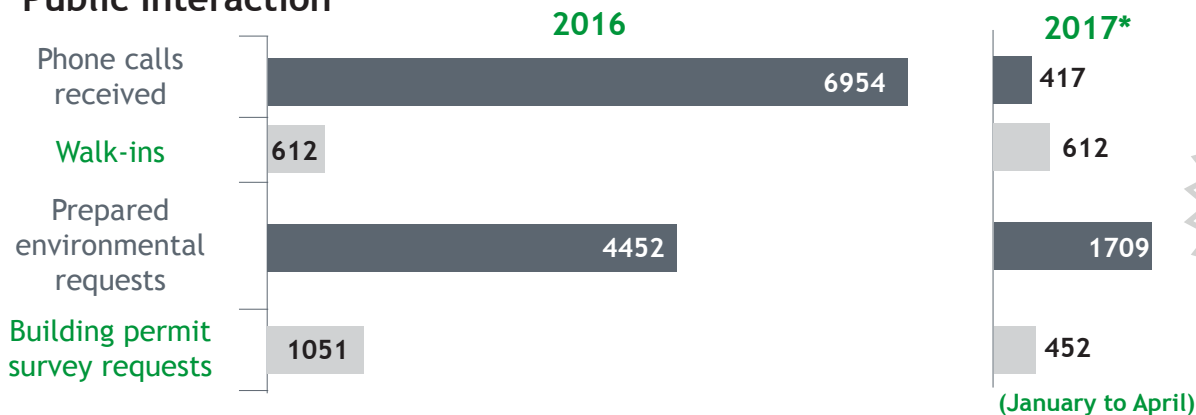
The North Clear Creek Water Treatment Plant was completed in 2017. The plant uses a high density sludge process to treat up to 600 gallons of mining-impacted water per minute. The plant treats contaminated water from the Gregory Incline, the National Tunnel and Gregory Gulch, conveyed to the plant via pipeline.



## UMTRA Program

The UMTRA program provides guidance and outlines resources for building contractors, private citizens, utility companies and local governments when faced with newly discovered radioactive uranium mill tailings.

### Public Interaction



Tailings were found on the property in **19%** of physical inspections

## Federal Facilities

The Federal Facilities Program oversees the remediation and redevelopment of formerly used defense sites.



At the Rocky Mountain Arsenal, the bison herd exceeds its carrying capacity. The U.S. Fish and Wildlife Service has requested a scientific investigation of the bison herd to understand whether the restriction on the human consumption of game meat can be lifted.

The program oversees remediation at Colorado facilities including:

- Titan Missile Complexes
- Schriever Air Force Base
- Rocky Mountain Arsenal
- Pueblo Chemical Depot
- Pueblo Army Air Field
- Air Force Plant PJKS
- Peterson Air Force Base
- Former Lowry Bombing & Gunnery Range
- Lowry Air Force Base
- Idler Range
- Fort Logan
- Fort Carson
- Delta Range
- Craig National Guard Training Site
- Cheyenne Mountain
- Camp Hale
- Camp George West Artillery Range
- Buckley Annex
- Buckley Air Force Base
- Atlas Missile Sites
- U.S. Air Force Academy

## Brownfields Program

The Brownfields Program provides property owners with resources to facilitate cleanups at contaminated properties that would otherwise hinder economic development. CDPHE conducted six new targeted brownfields assessments since 2015.



### EPA Grants

Two sites were recipients of federal cleanup grants totaling \$406k. An additional site was awarded an area-wide planning assessment grant for \$200k.



### Cleanup Grants

Five projects were approved for cleanup sites for a total of \$520,000. Three additional sites were tentatively approved for an additional \$695,000.

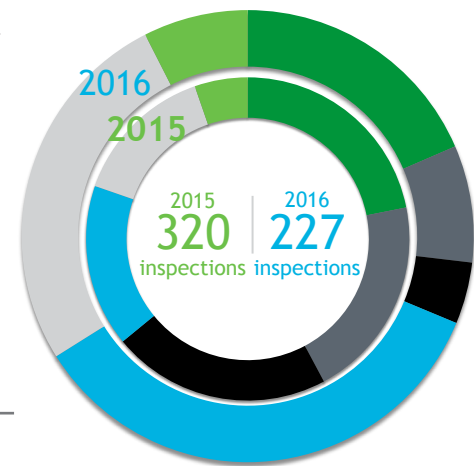


### Cleanup Loans

Three sites received support from the revolving loan fund, totaling \$2.724 million, and another three sites have approved loan commitments totaling an additional \$2.779 million.

# HAZARDOUS WASTE PROGRAM

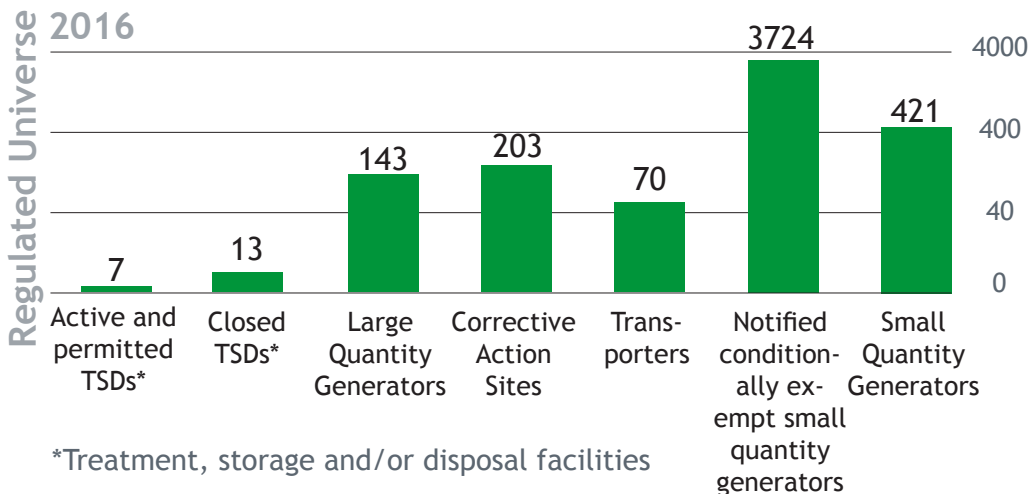
Colorado's Hazardous Waste Program is responsible for ensuring compliance with laws and regulations pertaining to the management of hazardous waste. Primary elements of the program include compliance assistance, compliance monitoring and enforcement, corrective action, permitting, and information management. The corrective action staff oversees the remediation and cleanup of over 400 individual facilities ranging in size from large facilities such as Fort Carson and Lockheed-Martin, to very small facilities like neighborhood dry cleaners and plating shops.



## Inspections

- Small Quantity Generators (SQGs)
- Conditionally Exempt SQGs
- Compliance Assistance Inspections
- Citizen Complaint Follow-ups
- Large Quantity Generators (LQGs)
- Treat, Store or Dispose Facilities

*Note: Two seasoned inspectors were promoted to other divisions in the department, accounting for the decrease in inspections as new employees were not hired to fill those positions.*



## Fast facts



**Inspector efficiency**

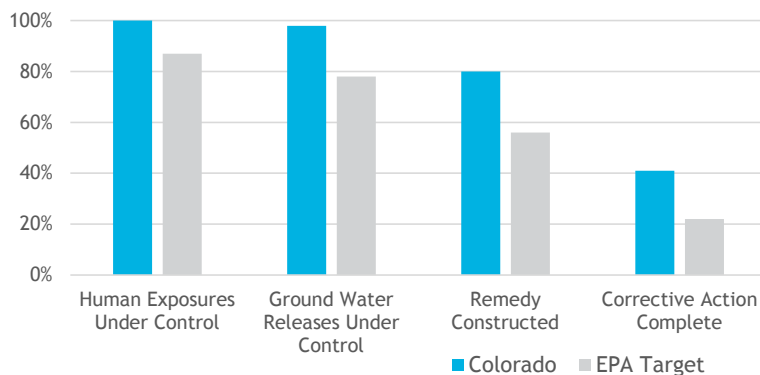
The average number of inspections per full-time employee in 2015 was 20.3, up from 17.6 in 2013 and 17.8 in 2014.



**Compliance assistance**

15 percent of staff time was spent on compliance assistance in FY2016, surpassing the 10 percent standard in SB 00-177.

The division surpasses EPA goals at all high-priority facilities for the four indicators EPA measures:



## Pueblo Chemical Depot

**94** igloos hold **780,000** waste chemical weapons. The igloos are regulated by the Hazardous Waste Program under a compliance order and must be emptied and closed by the United States Army no later than

**2021.**

In 2015 the pilot phase for the Explosive Destruction System at the Pueblo Chemical Depot treated and destroyed:

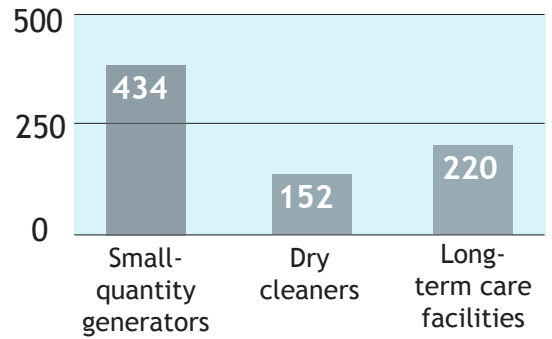
- 11** bottles of waste mustard agent
- 560** over-packed waste chemical weapons:
  - **196** 155mm projectiles
  - **265** 105mm projectiles
  - **88** 4.2 inch mortars

## Self-certification

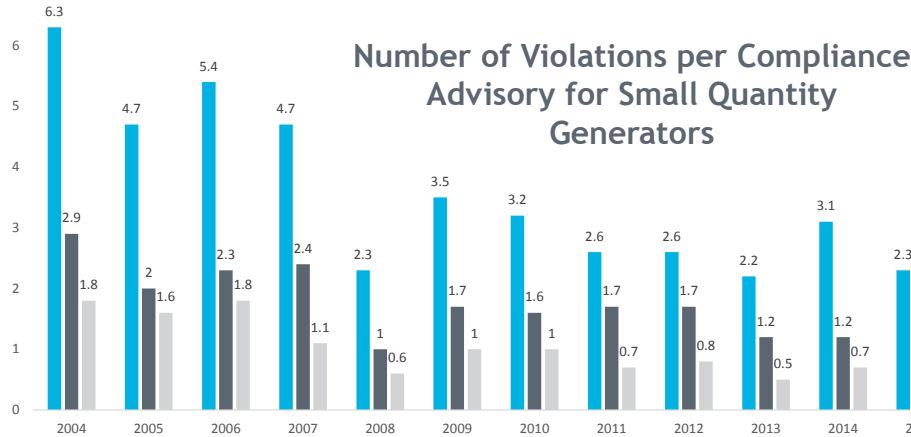
2016 was the 10th year of the mandatory SQG self-certification program, the ninth year of the mandatory dry cleaner self-certification program and the fourth year of the long-term care facility certification program.

Each year the division performs a statistically significant number of random follow-up inspections of the self-certified facilities to ensure data accuracy and to learn what regulations continue to be misunderstood or wrongly implemented.

## Facilities asked to self-certify in 2016



## Small Quantity Generators (SQG)



After the creation of the self-certification program, the number of violations per Compliance Advisory decreased overall. Both the total number of violations and the number of serious violations, such as environmental threat violations or worker/public threat violations, have decreased over the past decade.

■ Total Violations per Compliance Advisory  
 ■ Environmental Threat Violations per Compliance Advisory  
 ■ Worker/Public Threat Violations per Compliance Advisory

## Permitting

**7** There currently are seven active treatment, storage or disposal facilities (TSDs) with operating permits from the Hazardous Waste Program.

**15** Another 15 sites require a post-closure permit or equivalent enforceable document.

**1** The only unpermitted unit is at the Pueblo Chemical Depot.

## Customer Assistance

The technical assistance phone line and live training sessions are two ways staff support the regulated community.

FY2015

FY2016

Returned **1782** calls



**1521** calls

255 emails



364 emails

Offered **8** compliance assistance trainings...



**15** trainings...

...reaching **500** people



...reached **837** people

### Pharmaceutical waste



The program regulates pharmaceutical wastes to keep unusable medications out of the water supply and groundwater.

Trainings for health care professionals on proper waste management are offered across the Front Range each year.

### School Chemicals



The hazardous waste permitting unit helps characterize leftover or unidentified chemicals and advises on proper disposal as a free service to schools across the state.



continued from page 3:

need to spray the tires each year to control mosquito breeding grounds. A \$13,000 grant from the program funded this cleanup. Grants totaling \$356,441 were given out for waste tire removal projects around the state, clearing nearly 118,030 illegal waste tires.

**UMTRA Realtor Education:** The Uranium Mill Tailings Program (UMTRA) has trained nearly 400 realtors on the Western Slope in two years on the health risks associated with uranium mill tailings and the free property testing available from the division. Realtor requests for information on properties have increased substantially since these trainings began. The division also advises homeowners on mitigation and removal strategies for the tailings, which contain radioactive decay products, including radium. As the radium decays it creates radon gas, which is the leading cause of lung cancer in non-smokers. Uranium mill tailings were historically used in the construction of many homes and buildings on the Western Slope.

**Microfiche Digitization:** The UMTRA program has worked for the last five years to digitize over one million images from more than 40 years of records from the Grand Junction Remedial Action Program and the UMTRA program from the 1970s. If a property had an extensive clean-up, it is possible 400 images could come from just one location. Previously, the thousands of environmental reports requested for properties required pulling individual images up on microfiche and scanning them to complete every report – now the program can create reports for the public more quickly. The program still finds uranium mill tailings on nearly 20 percent of properties physically inspected each year.

**Emergency Detonation Permits:** The Hazardous Waste Permitting Unit issued 21 emergency detonation permits between July 1, 2015 and May 15, 2017. These permits are expedited and take between one day and one week. The division has prioritized emergency permit outreach this year, educating hundreds of law enforcement officials. The unit permits detonations to

ensure hazardous chemicals are not dispersed during detonation. Most detonations are done by bomb squads or police departments, but private companies hauling chemicals and the state transportation department also detonate or incinerate chemicals on occasion. Other government agencies, such as police departments, are not charged for the permit.

**Suncor Compliance Order:** In 2015 a joint effort between the Hazardous Materials and Waste Management Division, the Water Quality Control Division and the Air Pollution Control Division finalized a compliance order on consent with Suncor for regulatory violations associated with the 2011 discharge of hydrocarbon to Sand Creek and impacts to ground water both on and off the facility. Under the agreement, Suncor must pay \$500,000 in penalties and will conduct a review of its above- and below-ground piping to repair sections that may cause leaks similar to the one in 2011.

**Division Conferences and Education:** The division co-sponsored the 2016 Colorado Brownfields Conference with the Colorado Environmental Management Society and Community Builders, focusing on the many aspects of redevelopment in Colorado. The Waste Tire Program has also hosted two successful conferences during the past two summers. The Waste Tire Conference continues to put into action the aggressive market development program targeted at broadening and upgrading waste tire product markets.

Division staff also offer a myriad of trainings each year, ranging from proper pharmaceutical waste disposal classes to teacher enhancement programs on radiation, radioactivity and radon. The division also offers Hazardous Waste Operations and Emergency Response trainings for staff, first responders and the public. In 2017, students from the Dwight D. Eisenhower School for National Security – part of the National Defense University in Washington D.C. – visited the department to learn about the lasting environmental impacts of mineral mining.



**COLORADO**  
Hazardous Materials  
& Waste Management Division  
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