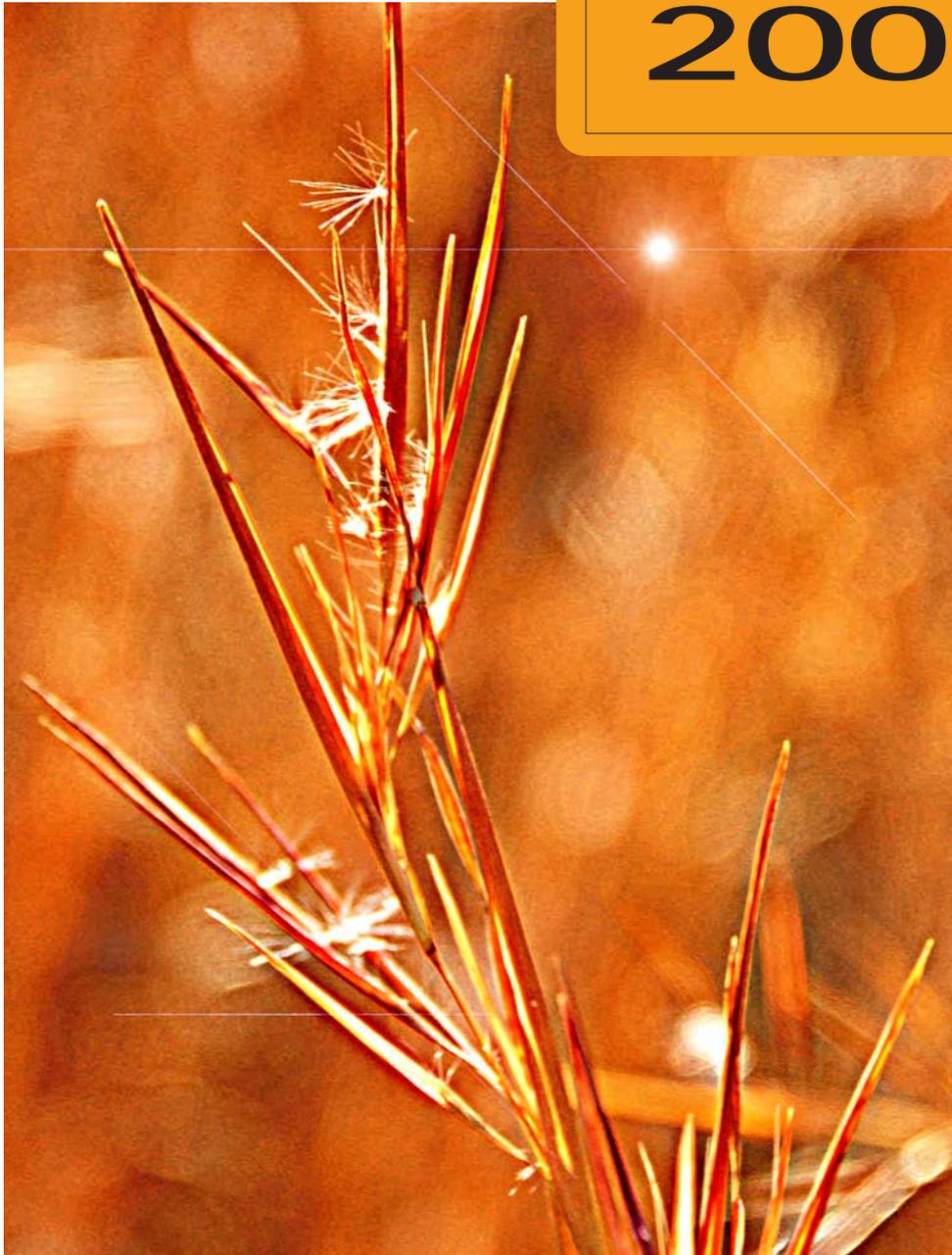


Land Report

2008





*Towers at the Okmulgee Refinery
before cleanup.*



Oklahoma Department of Environmental Quality

Land Report

2008

January - December 2008

A status report describing DEQ progress in cleaning up contaminated properties

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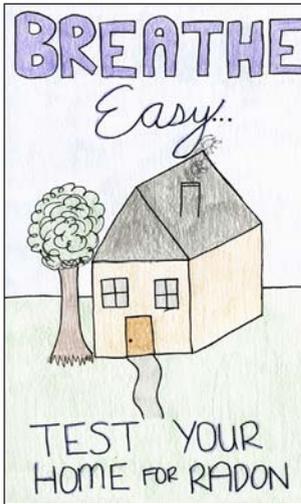
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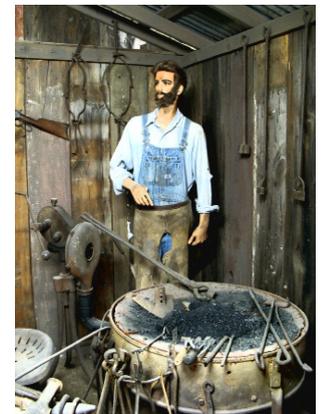
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Pond at the abandoned Empire Refinery site in Cushing.



Protecting Oklahoma’s environment is the cornerstone of the Oklahoma Department of Environmental Quality’s mission. The Land Protection Division strives to make practical decisions to carry out its mission. We have a renewed focus on pollution prevention and beneficial reuse in all our programs.

As an agency DEQ promotes pollution prevention and reuse efforts, and I am particularly proud that the Land Protection Division’s programs have embraced this concept and are getting results. For example, you will read in this report about the Site Cleanup Assistance Program, a relatively new program, which cleans up armories so communities can reuse those facilities. During the past year, Land Protection Division staff also played a part in organizing recycling efforts in the community – at events and schools.

In our cleanup programs, the ultimate goal is to return formerly used properties to productive and beneficial reuse. This rehabilitation of idle property helps put property back on the tax rolls and helps preserve green space by recycling formerly used properties. The Brownfields Program, in particular, is focused on reuse or “recycling” of properties. Our cleanup programs have targeted cleanup of all the abandoned refinery sites that we can identify. Recent progress at the Imperial and former UNOCAL refinery sites near Ardmore are helping address historical contamination and groom those properties for future use.

Land Protection Division programs include Solid Waste, Hazardous Waste, Pollution Prevention, Underground Injection Control, Superfund, Brownfields, Voluntary Cleanup, Radiation Management, Recycling, Environmental Education, Land Restoration and the Site Cleanup Assistance Program.

This report illustrates some of these vital programs. For information on any programs in the Land Protection Division, visit our Web site at www.deq.state.ok.us/LPDnew/ or contact us at (405) 702-5100.

Sincerely,

Scott Thompson

Oklahoma Brownfields Grant Recipients Awarded \$3.5 Million

Several Oklahoma entities are focusing on environmental improvements made possible by \$3.5 million in grant money. The 2008 Brownfields grant recipients competed with businesses and non-profit organizations across the United States for the funding. A ceremony was held April 7, 2008 to acknowledge their achievements.

“Environmental issues now have a much higher profile when we conduct daily business, whether it be cleanups, getting new equipment, or working to restore a property. These federal funds are very valued and prized, and we try to use them the best way we can for the community,” said Oklahoma City Mayor Mick Cornett.

Love Link Ministries is an Oklahoma ministry focused on assisting the poor and homeless. The ministry received \$37,130 to abate asbestos in one of its buildings, then demolish the building, and eventually create a parking lot for a new training facility.

The Latino Community Development Agency is using the \$200,000 it received to abate asbestos, lead based paint, and mold in a building soon to be a community action center.

The Absentee Shawnee Tribe of Oklahoma was awarded approximately \$400,000. The funds will go toward a cleanup project to ensure its tribal environmental headquarters is free of environmental hazards. The tribe will use \$200,000 to continue a Brownfields job training program to teach people to perform environmental work geared toward property cleanups.



The Cherokee Nation is refurbishing a courthouse on Cherokee land built in the 1800s. The \$104,000 in grant money will be used to remove lead paint inside the historic building. The structure is the oldest courthouse in Oklahoma.

Oklahoma City was awarded \$200,000 for community wide hazardous substance removal. Oklahoma City also received \$2 million for revolving loan grant funds. This money will be used in an effort to conduct cleanup activities at sites contaminated with hazardous substances.

“The money awarded by EPA will go a long way in making Oklahoma a cleaner, safer, more productive state. What were once unusable, unsafe buildings and properties will now be used for the good of the community, and that is what the Brownfields Program is really all about,” said Dr. Rita Kottke, DEQ’s Brownfields program manager.



Targeted Site Assessments



Targeted Brownfields Site Assessments

The Land Protection Division provides assistance to local governments and non-profit organizations that wish to acquire property that could have historic contamination. As part of the Targeted Brownfields Site Assessments, agency staff perform these studies at no cost to the participant. The assessments determine if contamination is likely to be found at a site where redevelopment is planned.



DEQ Environmental Specialists sampling for contamination.

Environmental Emergencies Prompt DEQ Response

In Oklahoma, emergency response may conjure up images of tornado aftermath, flooding debris, or other weather-related disasters. While DEQ is sometimes involved in that type of emergency response, the agency also addresses many unique environmental emergencies like a recent incident in Hugo.

An old rat poison facility there had been closed for nearly two decades. The property was not fenced. The building was open, and children played there. Inside the facility were two and a

half drums of white arsenic, posing a significant risk. White arsenic is the active ingredient in rat poison, and it is highly toxic.

A resident contacted DEQ's Environmental Complaints and Local Services Division. An environmental specialist responded to the facility and immediately secured the building. The Land Protection Division provided additional assistance by disposing of the chemical and collecting soil samples. LPD is evaluating the need for additional actions at the site.



Drums and bags of white arsenic found in the dilapidated building above.



DEQ Responds to Significant Threat in Downtown Durant

DEQ requested EPA assistance in handling a significant emergency in downtown Durant. In late 2007, Earth Biofuels, a biodiesel plant, shut down leaving dangerous chemicals, such as methanol, sodium methoxide, and biodiesel on site. Some of the chemicals can spontaneously combust.

“The facility had no fire suppression, and it was in the middle of a residential area,” said Dr. Rita Kottke, DEQ environmental programs manager.

Flammable products and chemicals were piped

throughout the facility. To add to the urgency of this situation, the site was not secure. EPA visited the site and required the company to install a fire suppression system and remove the chemicals immediately.

“This situation had the potential to be catastrophic. Fortunately, that didn’t happen,” Kottke said.

At this time, the future of the plant is unknown, but the immediate threat posed by it has been addressed.



The shut-down Earth Biofuels facility in Durant.



DEQ Responds to Mercury Spills

Through the eyes of a child, mercury can look fascinating. Some adults may also find mercury interesting. It can be found in things like thermometers and barometers. Once mercury is spilled, over time it can seep into just about anything in a house - the carpet, wood, cement, some appliances, clothing, and plumbing. Mercury contamination is easily spread; cleanup and disposal is very difficult.

DEQ was involved in four mercury-related cleanups in 2008. In Snyder, Oklahoma, children playing with the chemical spilled it onto bleachers at the high school football field. Following the initial spill, mercury was traced to three residential homes and the high school band room. The homes had to be cleaned up. Contamination in the band room was so bad some items had to be disposed. The rest of the band room was cleaned.

Mercury contamination filled a home in Colbert, Oklahoma. A couple was trying to extract gold from electronic equipment using an old mining technique.

That technique was once used by miners but was banned because it was so dangerous. The man involved in this incident died as the result of mercury poisoning.

A family in Carmen, Oklahoma, discovered mercury in a shed, picked it up, and spilled it. In this case, because the family immediately called DEQ to find out how to properly dispose of the mercury, the exposure was very limited and serious harm was avoided.

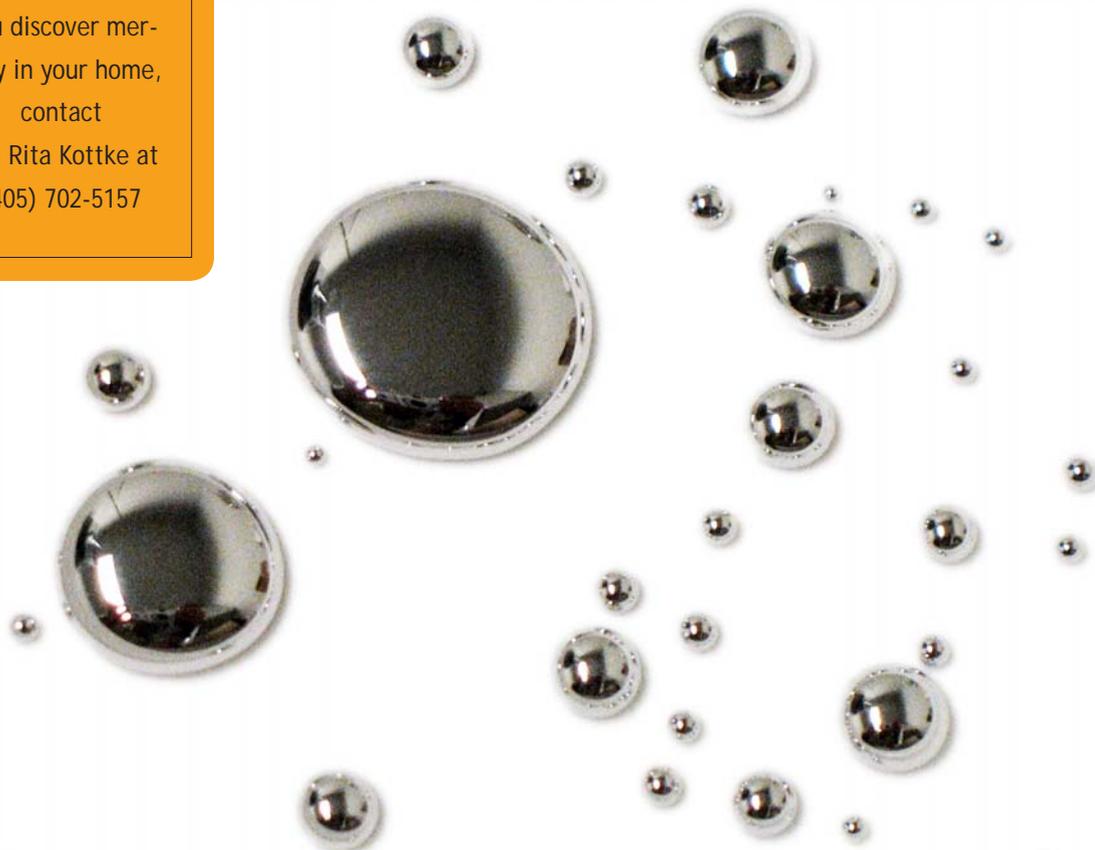
Heirs cleaning up a Bethany home spilled a vial of mercury on the carpet. To prevent contamination throughout the house, a portion of the carpet had to be removed.

In all four cases, DEQ coordinated with EPA to properly dispose of the mercury. Exposure to high levels of mercury can cause serious health effects.

"If anyone finds or spills mercury, DEQ encourages them to call us right away. It is important to handle it properly and dispose of it properly," said Dr. Rita Kottke, DEQ mercury coordinator.

More information on mercury can be found at www.deq.state.ok.us/factsheets/land/mercexpo.pdf.

Mercury poisoning can cause serious health effects. If you discover mercury in your home, contact Dr. Rita Kottke at (405) 702-5157



Reuse and Redevelopment: the Focus of DEQ's Voluntary Cleanup Program

Through the Voluntary Cleanup Program, companies or individuals can remediate a property with DEQ oversight. That property can then be reused or redeveloped. An example of this is the Habitat for Humanity property in Ardmore. Environmental releases from storage tanks at a former crude oil tank farm, previously owned by Union Oil Company of California (UNOCAL), caused some soils in the area to contain elevated levels of pollutants.

Chevron Corporation acquired UNOCAL and is currently working with DEQ to address environmental impacts to the property. A material similar to asphalt road base was found in some

areas. Soils contaminated with this material were removed. More than 300 samples were taken after this step to find out if any impacts remained.

"There are a few small areas that need further analysis to determine if additional soil removal is necessary," said Kendel Posey, DEQ site project manager. Chevron and DEQ have held public meetings and will continue to hold them periodically until work is completed.

Site-specific cleanup levels will be developed based on information from the environmental investigation for the remaining contaminants. Once the soil is cleaned up to these levels, the property can be cleared for reuse.



Areas being cleaned up by the Chevron Corporation at a site in east Ardmore.

Okmulgee Refinery Cleanup Creates Partnership and Progress

Eleven years ago, ConocoPhillips embarked on a journey to clean up an abandoned refinery in Okmulgee. With oversight provided by DEQ, ConocoPhillips demolished the old refinery, treated the soil, and constructed a 25-acre repository for waste containment. ConocoPhillips partnered with DEQ to ensure that proper ground water monitoring is performed and that maintenance is conducted on the repository. Ground water cleanup is slated to begin soon.

The Okmulgee Area Development Corporation (OADC) created a marketing plan to generate interest in the property and let people know it was ready for development. The north side of the land is now available for commercial and industrial use. A three-acre parcel has already been sold to a development company with plans to build a hotel.

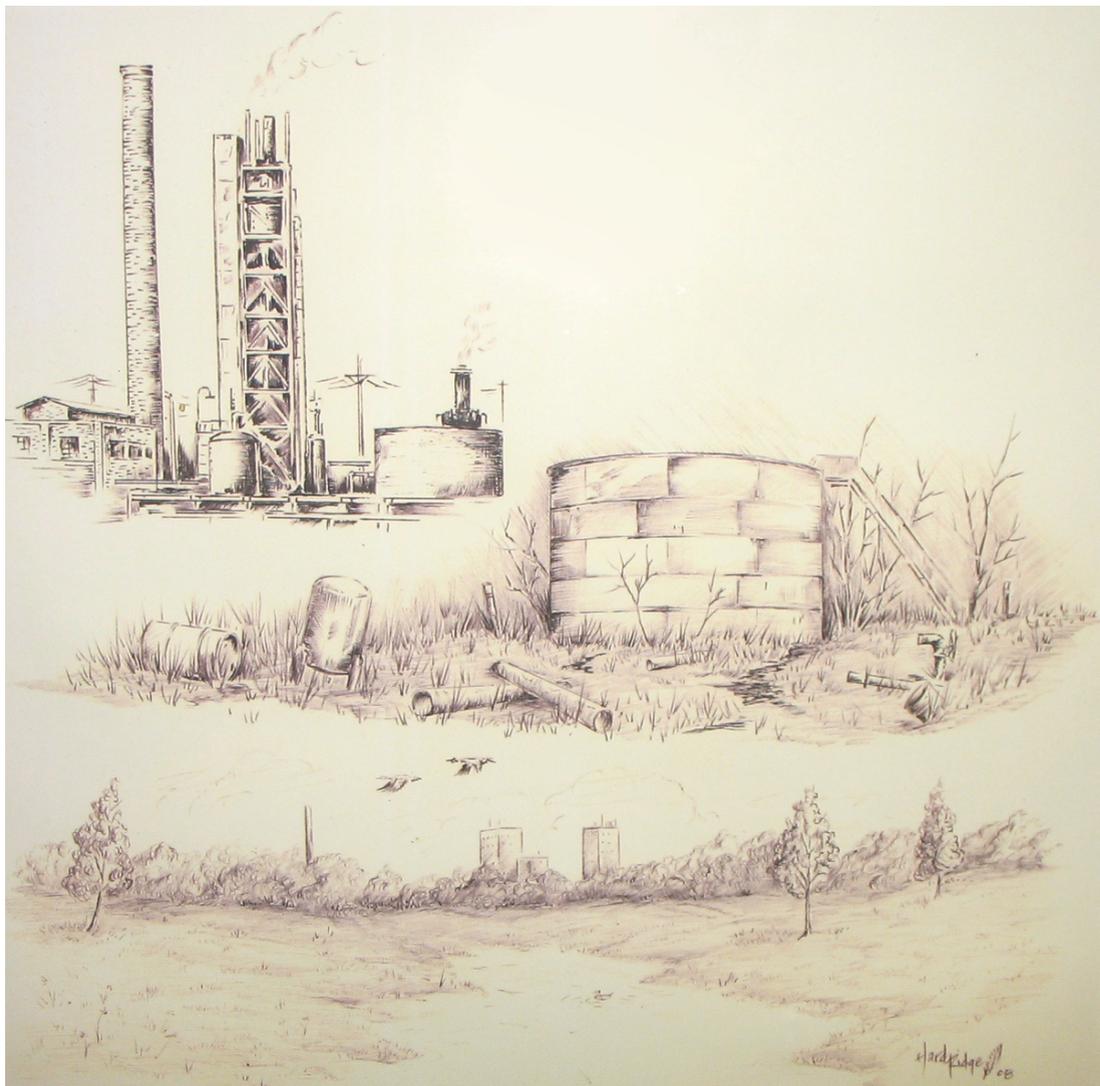
“We couldn’t be happier with the way this land is being developed for reuse. Where we once had an undeveloped, virtual

wasteland of unusable property, we now have a great resource for Okmulgee offering the potential for substantial new investments and job creation,” said John Robertson, OADC director.

In an effort to continue the positive progress at the old refinery location, ConocoPhillips, DEQ, and OADC are working together on a long-term stewardship plan.

“This project is such a wonderful opportunity to work with OADC and ConocoPhillips for the betterment of the community,” said Angela Hughes, environmental programs manager for DEQ. “I am excited to see the positive opportunities for economic development in Okmulgee in the coming years.”

Original art commissioned by ConocoPhillips to recognize the cleanup accomplished at the Phillips Refinery in Okmulgee.



Former Kerr McGee Refinery Being Remediated and Reused

Cushing is known for once being a center of extensive petroleum production and refining. Today, related activities continue at the former Kerr McGee refinery located about two miles north of town. Cleanup of this site is ia being cleaned up under DEQ's Voluntary Cleanup Program.

Kerr McGee operated the refinery until 1972 and also operated a thorium processing plant on the site until 1966. Through the years, cleanup has included excavation of large acid sludge pits and addressing radiation under Nuclear Regulatory Commission supervision. Two landfills were constructed on the property to contain

treated acid sludge. The radiation waste was shipped offsite to an out-of-state facility licensed to manage this type of waste.

The cleanup allowed Tronox (formerly Kerr McGee) to sell about half of the former refinery to SemCrude for use as a crude storage tank farm. SemCrude operates crude oil storage and transmission lines and plans to expand the storage capacity on this site. Tronox retains ownership of the other half of the former refinery site.

"The above-ground petroleum storage tanks are an appropriate reuse of an old refinery," said Amy Brittain, DEQ project manager. "It is rewarding to see redevelopment of a once contaminated property for many reasons - it preserves greenspace; it puts idle land back into productive use; and it benefits the local economy by providing jobs."

There is still contamination in areas including in the ground water, which is being addressed with a system that recovers the water, routes it to a wastewater treatment area and then discharges it under the authority of a DEQ permit. While SemCrude has operations on portions of the property, cleanup is the responsibility of Tronox.

"The two largest of three cleanup projects are complete," said Jeff Lux, Tronox senior project manager. "Tronox continues to manage the site to ensure there is no impact to human health or the environment."

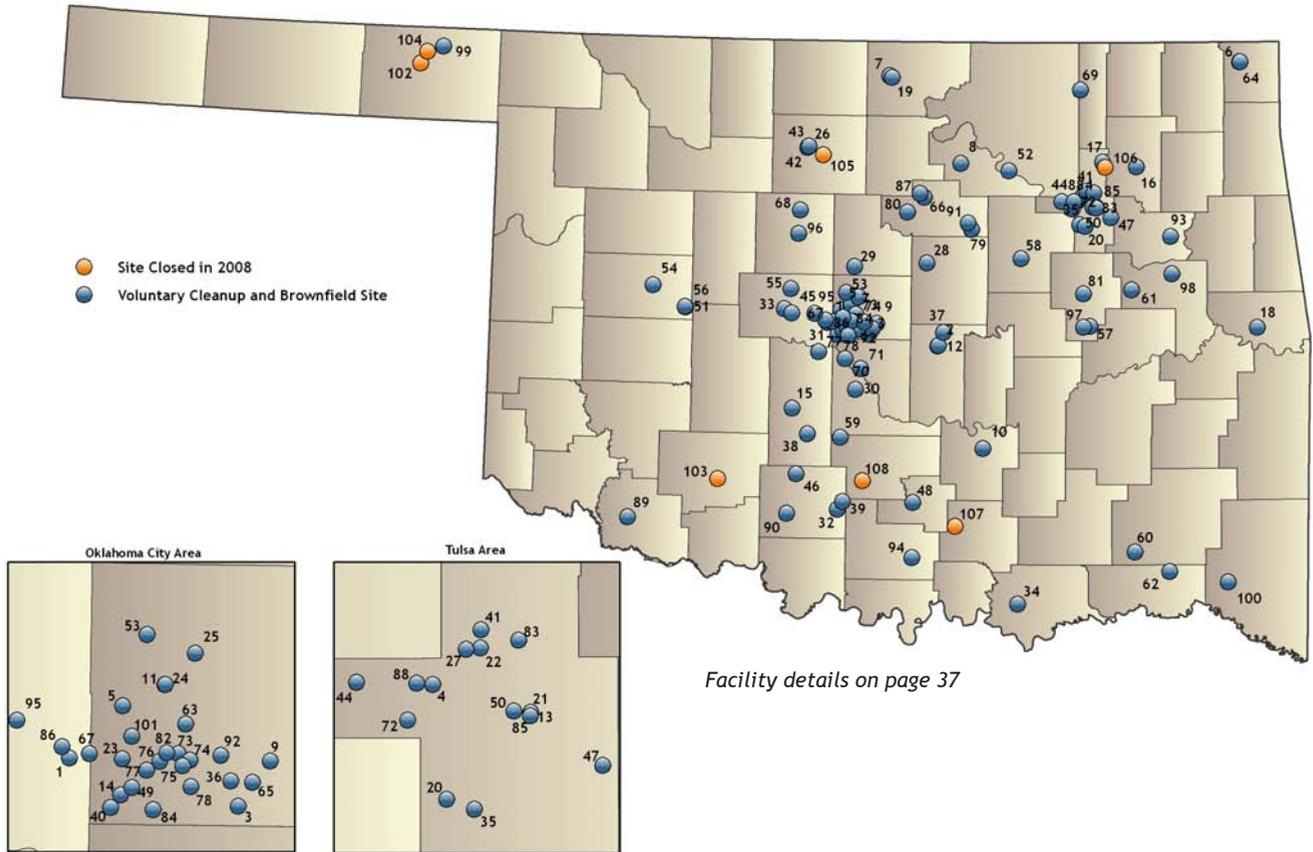
Currently, Tronox is preparing to conduct an assessment to see exactly what waste is left on the property. The company will perform the third and final phase of investigation and remediation over the next several years.

"As things are further cleaned up, there is potential for even more development on this site," said Brittain.



Redevelopment at the former Kerr McGee refinery.

Voluntary Cleanup & Brownfields Sites



Through the Voluntary Cleanup Program, individuals or companies can clean up a property with DEQ oversight. The program includes sites ranging in size from hundreds of acres of contamination to smaller sites, often less than one acre.

Working to clean up ground water contamination at an Oklahoma City Voluntary Cleanup Program site.

Tar Creek Superfund Site: A Remedy for Chat Piles, Mine Waste, and Smelter Waste

Congress passed the Comprehensive Environmental Response, Compensation and Liability Act, commonly known as the Superfund law, in 1980.

Plans to address the complex Tar Creek Superfund site continue to move forward. Most recently, DEQ reached agreement with the Environmental Protection Agency for the remedy for

chat piles, mine waste, and smelter waste. The centerpiece for that remedy is to remove as much chat as possible through chat sales. The plan also addresses cleanup of non-economic mine and smelter waste.

In addition, EPA will move forward with enforcement activities to get the companies who created the waste to clean it up. Other activities at the site this year include a hydrogeologic study to evaluate the mine pool and aquifers in the area.

“DEQ will continue monitoring activities to determine what, if any, effects the mine workings have on the aquifer that supplies drinking water to the public. Current data indicates that the public water supply wells are not impacted by the mine water,” said David Cates, project manager.

Additionally, as a result of the 2006 U.S. Army Corps of Engineers’ report that said there could be possible safety hazards due to underground mine room collapses, the voluntary buyout continues for residents and businesses in Picher, Cardin, and Hockerville. The Lead-Impacted Communities Relocation Assistance Trust has spent more than \$20 million and received an additional \$6.3 million in funding. EPA will fund the completion of buyout activities over the next three years.

Tornado Tears through Tar Creek

Toppled trees, bricks ripped off homes, scattered debris - this was the scene in Picher following a tornado that tore through the area on May 10, 2008. DEQ personnel responded to help city officials assess the aftermath.

“One concern during this time was that chat

piles stirred up by the tornado could increase levels of lead,” Cates said. DEQ contacted EPA for assistance in air monitoring and soil sampling. Data from that effort indicated that local lead contamination levels had not been increased by the tornado.

In most disasters, there are debris-related issues. In this case, there was a large amount of debris, making it a health and safety hazard. To help inform residents about staying safe, DEQ provided a fact sheet that outlined how to return home safely for clean-up activities. Agency personnel also assisted the community in determining the best options for storm debris disposal.

See tornado photos on the next page.

Fish Consumption Advisory

In early 2008, DEQ issued a series of fish consumption advisories for Tar Creek residents and the general public. The advisories centered on fish caught in the Tar Creek area or waters that may be impacted by the Tri-State Mining District and the Tar Creek Superfund site.

A 2003 study examined cadmium, lead, and zinc concentrations in fish collected from mill ponds within the Superfund site as well as the Spring and Neosho Rivers. A follow-up study was conducted in 2007, which included the same study area, and added sites extending throughout Grand Lake and the Grand Neosho River below Pensacola Dam.

Based on findings from the 2007 study, DEQ issued a fish consumption advisory. “The advisories provide guidelines for people to make informed choices about their health and diet,” said Jay Wright, environmental programs manager in DEQ’s Customer Services Division. “To reduce exposure to lead when consuming fish from waters impacted by the Tar Creek Superfund site and the Tri-State Mining District, people should eat portions that do not contain bones or skin,” he added.

While fish does provide high-quality protein and essential nutrients, not all fish should be consumed in unlimited amounts by everyone.

Specific consumption advisories can be found at www.deq.state.ok.us.



The devastation left in Picher by the May 2008 tornado.



EPA Region 6 response vehicle parked in Picher after the tornado.





A May 2008 tornado destroyed much of Picher.



DEQ Engineer Recognized for His Efforts at Tar Creek

DEQ Professional Engineer David Cates was recognized for his work on Tar Creek at an annual grassroots conference on Tar Creek this year. Cates received the Mike Synar Environmental Excellence Award from the Local Environmental Action Demanded (L.E.A.D.) Agency. This award honors people who show dedication and leadership on the Tar Creek site. Cates has focused his energy and scientific approach to problems at Tar Creek for more than a decade. The award specifically mentions his contributions to ensuring that citizens have safe drinking water by monitoring the Boone and Roubidoux aquifers. He will continue to monitor the aquifers in the area as the remedy of the waste begins.



Ardmore Superfund Site Cleaned Up

Seventy-two acres, some contaminated with refinery wastes, were cleaned up in less than one year. DEQ worked closely with EPA to address the Imperial Refining Company Superfund site in Ardmore. The former crude oil refinery operated from 1917 to 1934 and left behind a legacy of waste. Cleanup called for excavating waste material and disposing of it at a landfill.

“The project was a collaborative effort between DEQ and EPA. This helped expedite the removal of waste at the site,” said Amy Brittain, Superfund manager. Approximately 104,000 cubic yards of waste and contaminated soil and 1,700 cubic yards of sediment were removed from the site.

Some waste was discovered around a gas line; more was found along two slopes that

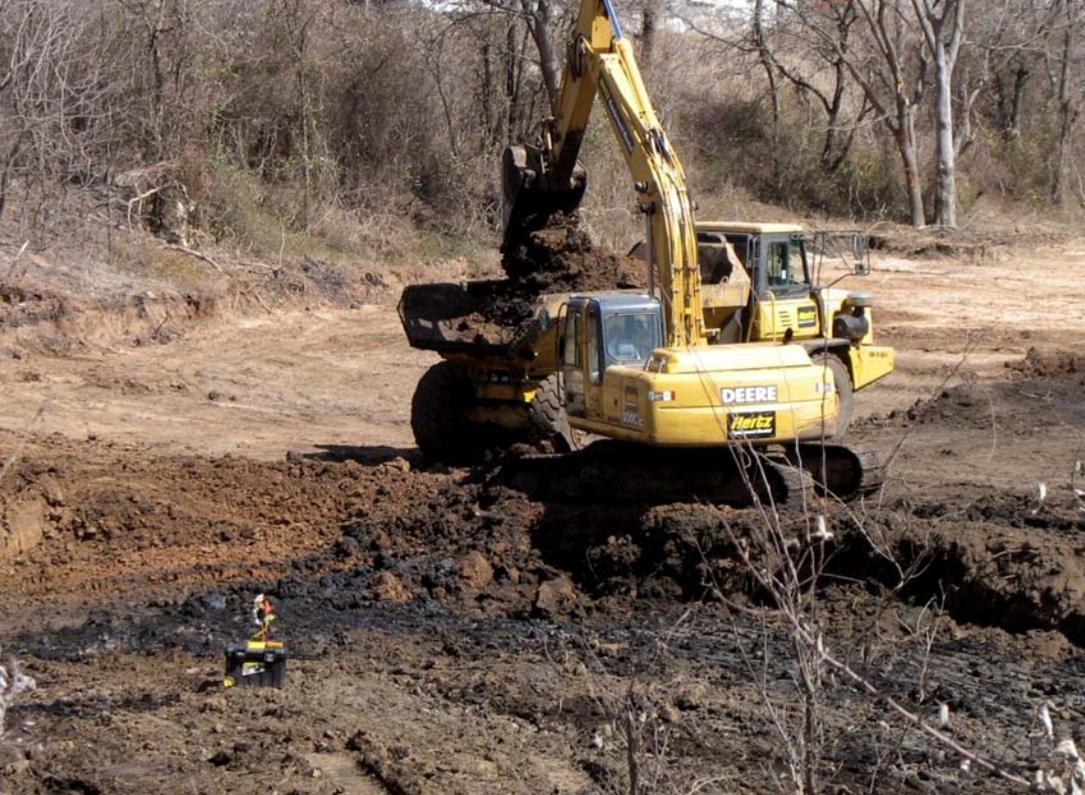
border the property. These materials were left in place since excavation was impractical and potentially dangerous. To ensure that no one is exposed to any waste left on site, DEQ plans to inspect the area regularly and file notices of remediation in the county land records.

“There will be restrictions of certain activities and land uses along with periodic inspections at the Imperial site to ensure long-term protection of human health and the environment,” said Brittain. “However, the property will be suitable for reuse as a commercial or industrial property,” she added.



Before and after pictures of the cleanup of refinery wastes and drums at the Imperial Refinery site in Ardmore.





Top-left and below are photographs of digging up a large area of waste during clean up at the Imperial Refinery site.



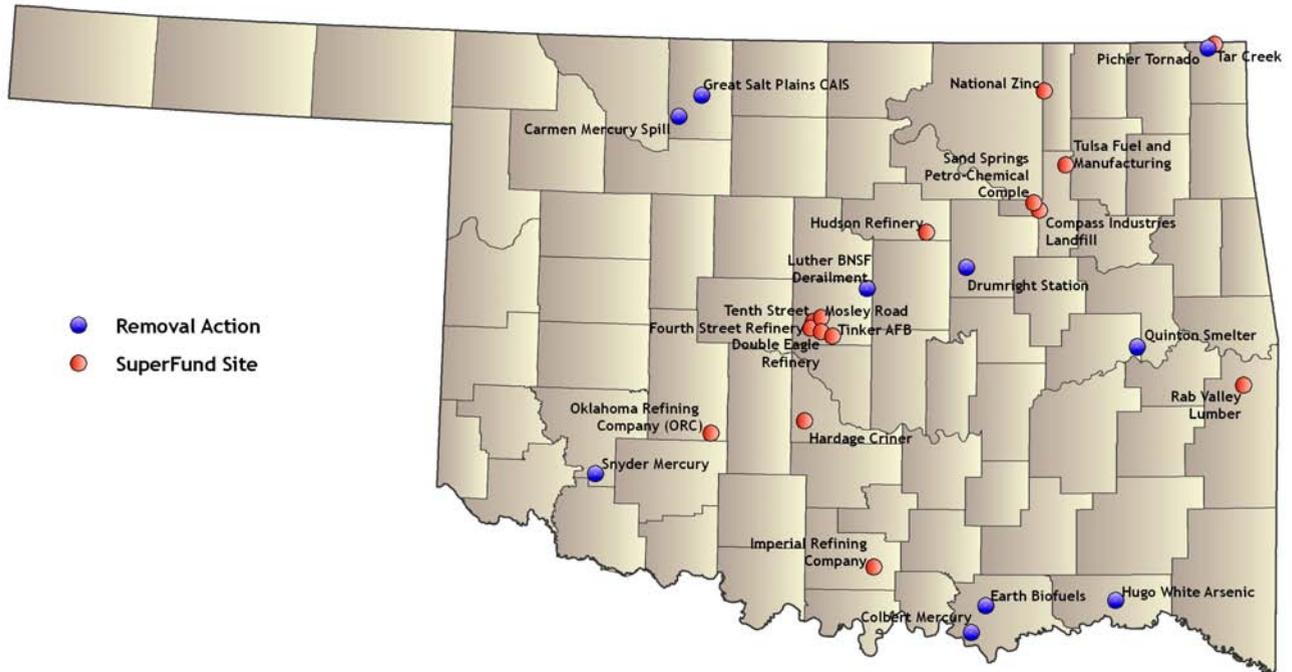
Before photograph of work to clean up a stream at the Imperial Refinery Site.



After photograph of the work to clean up a stream at the Imperial Refinery site.



SUPERFUND and Removal Sites



The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund, was passed in 1980. CERCLA created a national program to identify and clean up sites contaminated from previous hazardous waste management

practices. Superfund National Priorities List sites (NPL) are generally large and complex. Removals may occur on NPL sites or may occur on smaller properties where the removal action is the only action needed to remove a hazard.



Refinery waste uncovered at the Imperial Refinery site in Ardmore.

Capturing Landfill Gas for Reuse

According to the Environmental Protection Agency, municipal solid waste landfills are the second largest source of human-related methane emissions in the United States. In Oklahoma, some landfills are putting this gas to good use.

Methane gas captured from landfills can be reused as an energy source. This practice is currently taking place in Oklahoma. In 2007 at Southeast Landfill, which is owned and operated by Allied Waste, more than 18 million cubic feet of methane was transported to a local asphalt plant for use in an asphalt process. Additionally, a significant amount of the gas was transported to General Motors.

A Waste Connections Landfill, also in Oklahoma City, recently completed a project that captures methane gas and turns it into a market-quality natural gas. Historically, this landfill collected the gas and burned it off in a flare. With the completion of this project, the gas is being used to produce electricity.

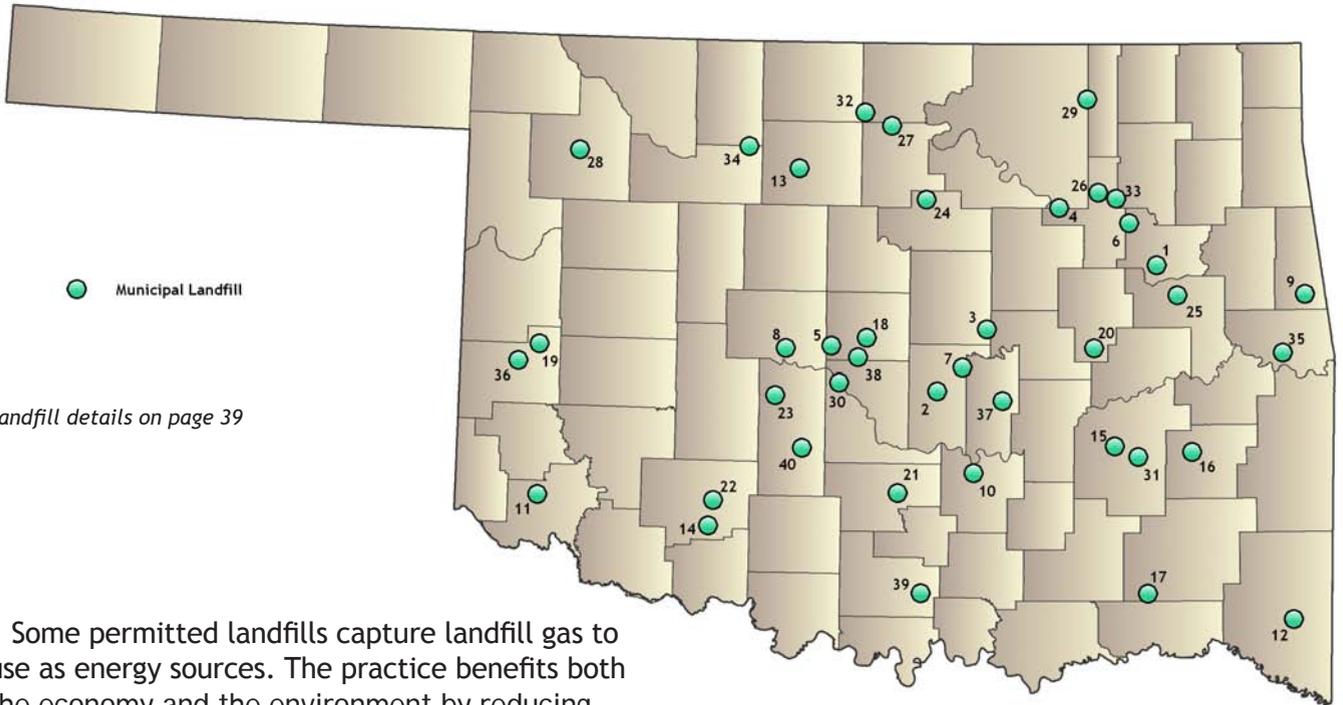
Canadian County Landfill, operated in Union City by the Oklahoma Environmental Management Authority, transports its gas to the Boral Brick plant. The gas is used in a kiln at the brick plant. In the future, Boral Brick officials hope to use landfill gas as the entire fuel source for the kiln.

East Oak, an Oklahoma City landfill operated by Waste Management, has introduced a prototype system at the site to beneficially reuse gas captured at the landfill. While the project is not currently operational, there is a pilot project underway. The goal is to someday use the landfill gas as an alternative fuel.

“Capturing landfill gas can provide positive benefits to both the environment and the economy,” said Fenton Rood, DEQ’s Director of Waste Systems Planning. “The practice can be economically feasible for landfills while at the same time helping improve air quality with the reduction in emissions.”



Municipal Landfills



Landfill details on page 39

Some permitted landfills capture landfill gas to use as energy sources. The practice benefits both the economy and the environment by reducing emissions.



Installing large wells to capture methane gas for use by a nearby manufacturing facility.

The Dangers of Radon

It is invisible, odorless, and tasteless, but radon is very dangerous. Radon is responsible for more than 20,000 lung cancer deaths per year, and it is the second leading cause of lung cancer in the United States behind smoking and the leading cause of lung cancer in non-smokers.

DEQ's Radiation Management section works to make the public aware of radon dangers. To accomplish this goal, the Radiation Management section participates in a number of outreach activities such as the annual Radon Poster Contest. Kids are encouraged to depict radon awareness through artwork.

The Radiation Management section also speaks at conferences, community events, and offers to test schools at no charge. During National Radon Action month in January, DEQ joins EPA to help get the word out through the media to further encourage Oklahomans to test their homes for radon. Radon

can be found in all 50 states. It is produced naturally from radioactive materials present in the Earth. Once produced, the gas moves through the ground and seeps into the air above and can get trapped in homes.

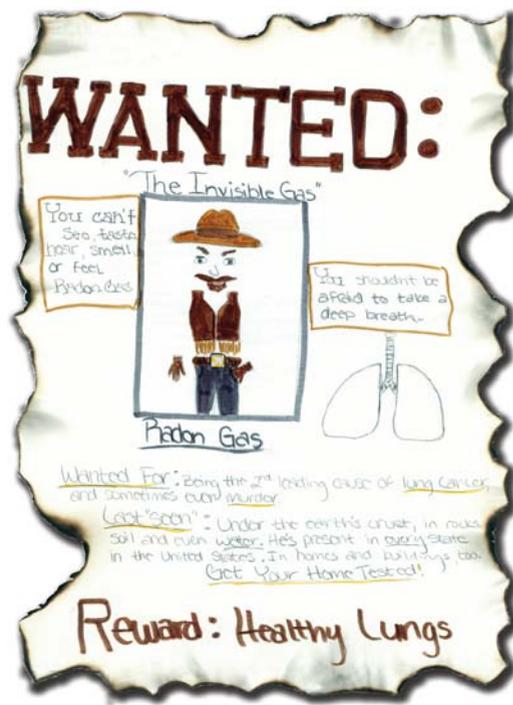
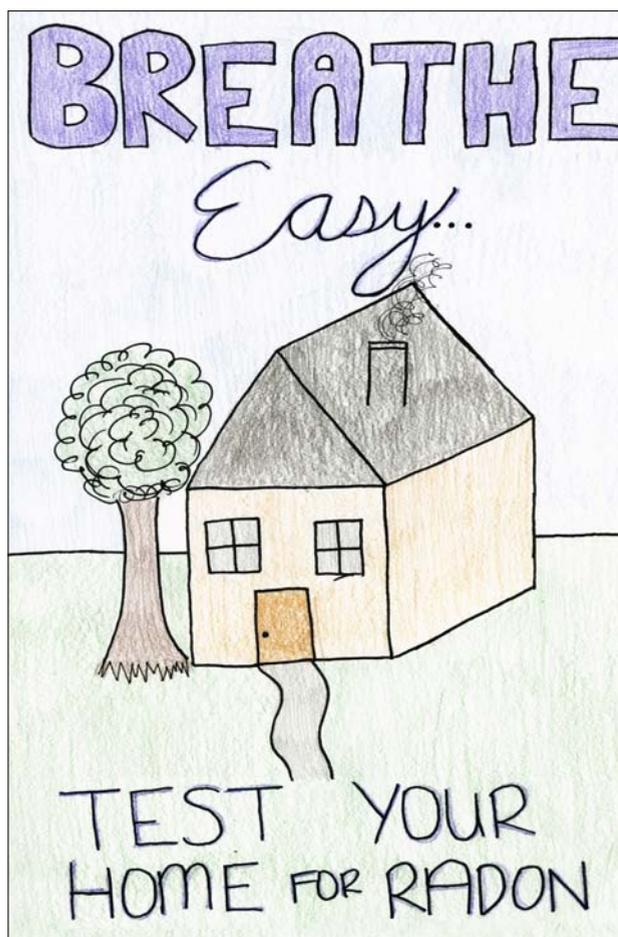
"Fortunately, the level of radon in homes, schools, and other buildings can be determined through a simple test. Testing is an easy and inexpensive step to protect your health and your family's health," said Keisha Cornelius, environmental programs specialist in the Radiation Management section.

If elevated levels of radon are discovered in a home, there are several methods to reduce the gas. Options range from having a contractor install a ventilation system to sealing foundation cracks and other openings. The solution depends on the design of a home and many other factors.

DEQ offers test kits and general information about radon to the public. The State Environmental Lab at DEQ can analyze those kits and provide a report to the homeowner for \$27.

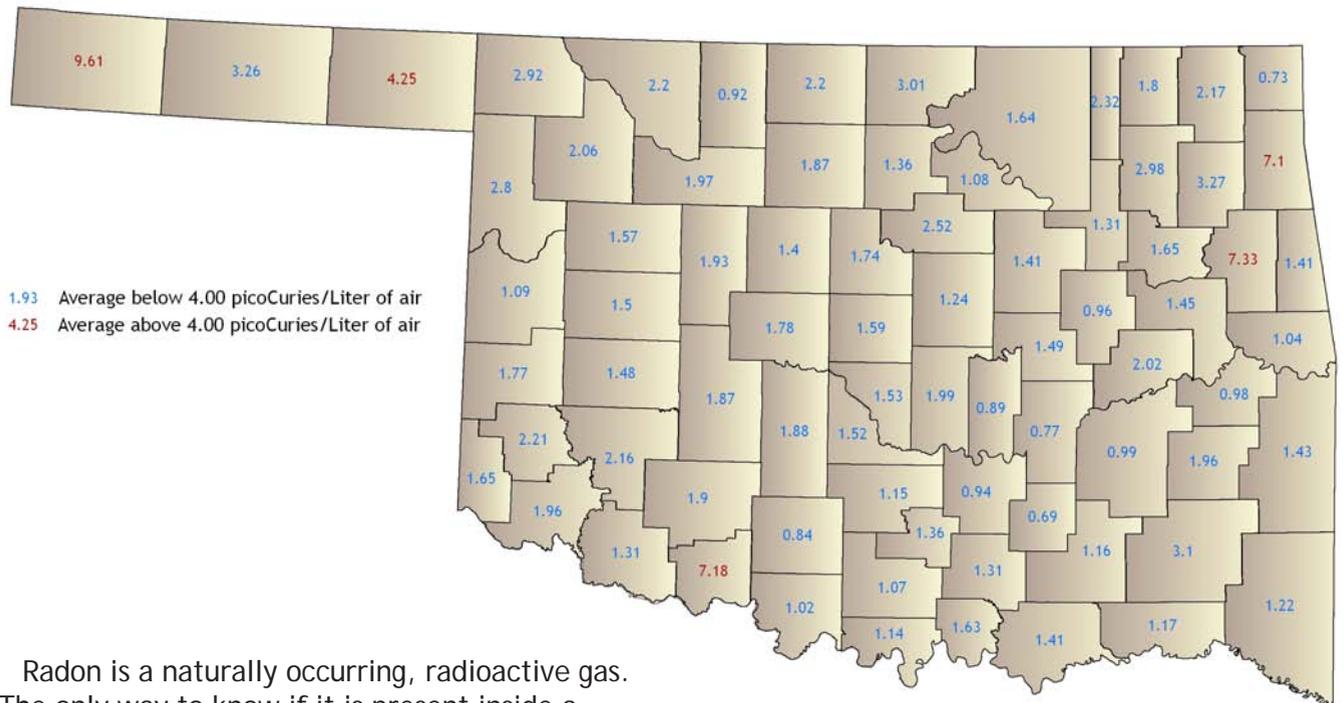
"The only way to know if radon is in your home is to test," said Cornelius.

More information on radon is available at www.deq.state.ok.us/radon or by calling (405) 702-5100.



Two of the winning posters from the Radon Poster Contest.

Average Radon Count



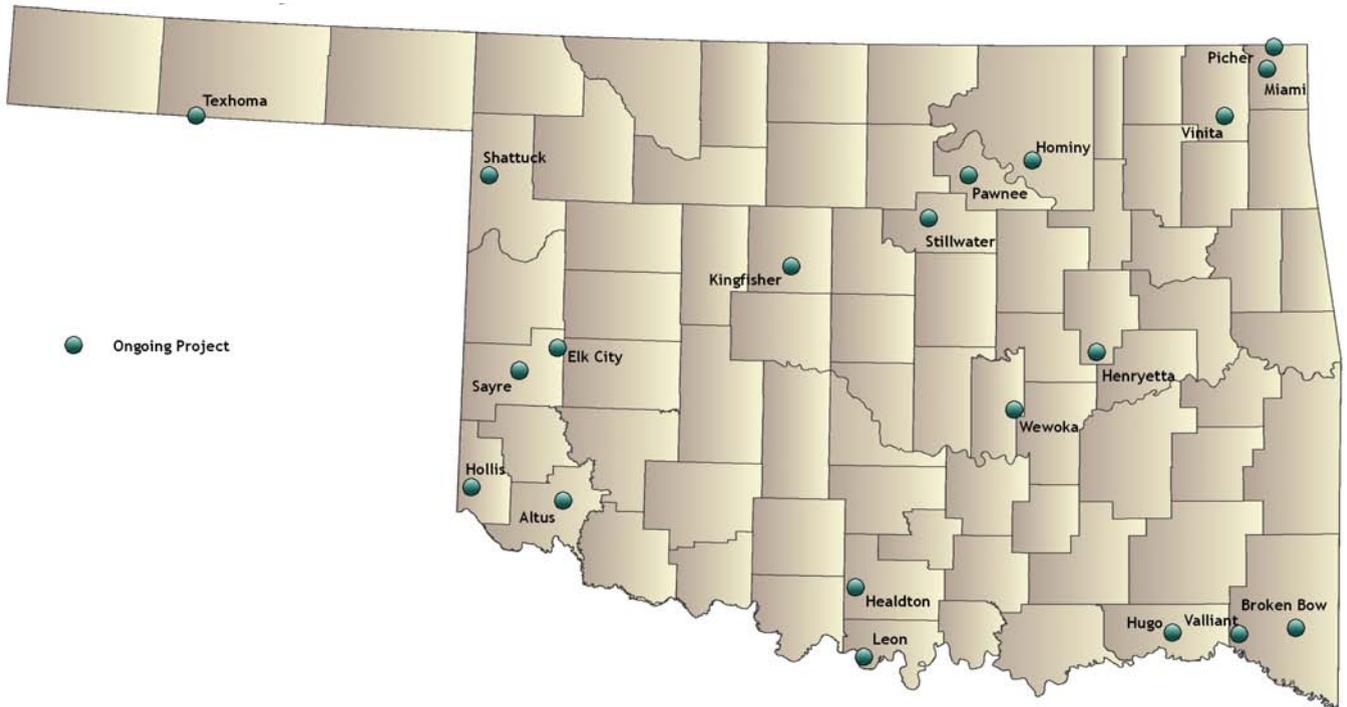
The EPA action level for Radon is 4 picoCuries / liter of air

Radon is a naturally occurring, radioactive gas. The only way to know if it is present inside a home is to conduct a simple, inexpensive test. The Land Protection Division recommends that all homes be tested.



Simple radon test kit available for testing your house.

Community Assistance projects



The Land Protection Division works with local communities and conservation districts to identify dilapidated buildings, ensure the facilities are

free of toxic material and develop a plan to use demolition material to restore scarred land. For many localities, the Community Assistance Program has made blight removal cost effective.



Work along the main street in Valliant.



Debris in Picher.

DEQ Encourages Recycling at Community Events

The National Recycling Coalition awarded DEQ recycling bins for use during community activities. In the past year, DEQ has provided the recycling bins for many events such as the Woody Guthrie Folk Festival in Okemah, the Redman Triathlon, and the Oklahoma City Memorial Marathon.

DEQ has long been involved in collecting recyclable material from community events. With the gift of the recycling bins, DEQ can now collect recyclables at numerous events without borrowing containers from local organizations.

“These recycling bins are an important way for DEQ to encourage Oklahomans to recycle. We hope to be an inspiration for groups all over the state to get involved not only in recycling but also their community,” said Fenton Rood,

To check out the recycling bins, contact Aaron Siemers at (405) 702-5195.

For assistance in establishing a recycling program in your community, contact Fenton Rood at (405) 702-5159.

Director of Waste Systems Planning.

Last year at these events, approximately 2,480 pounds of cardboard, 1,148 pounds of aluminum, 1,281 pounds of plastic, 560 pounds of paper, and 2,698 pounds of glass were collected and recycled.

“Our recycling efforts have really been a success this year. Without the bins, we would not have been able to collect such a large amount of recyclable materials,” said Rood. “Many groups in the metro area have borrowed our bins for their events, and we are thrilled that we can help.”

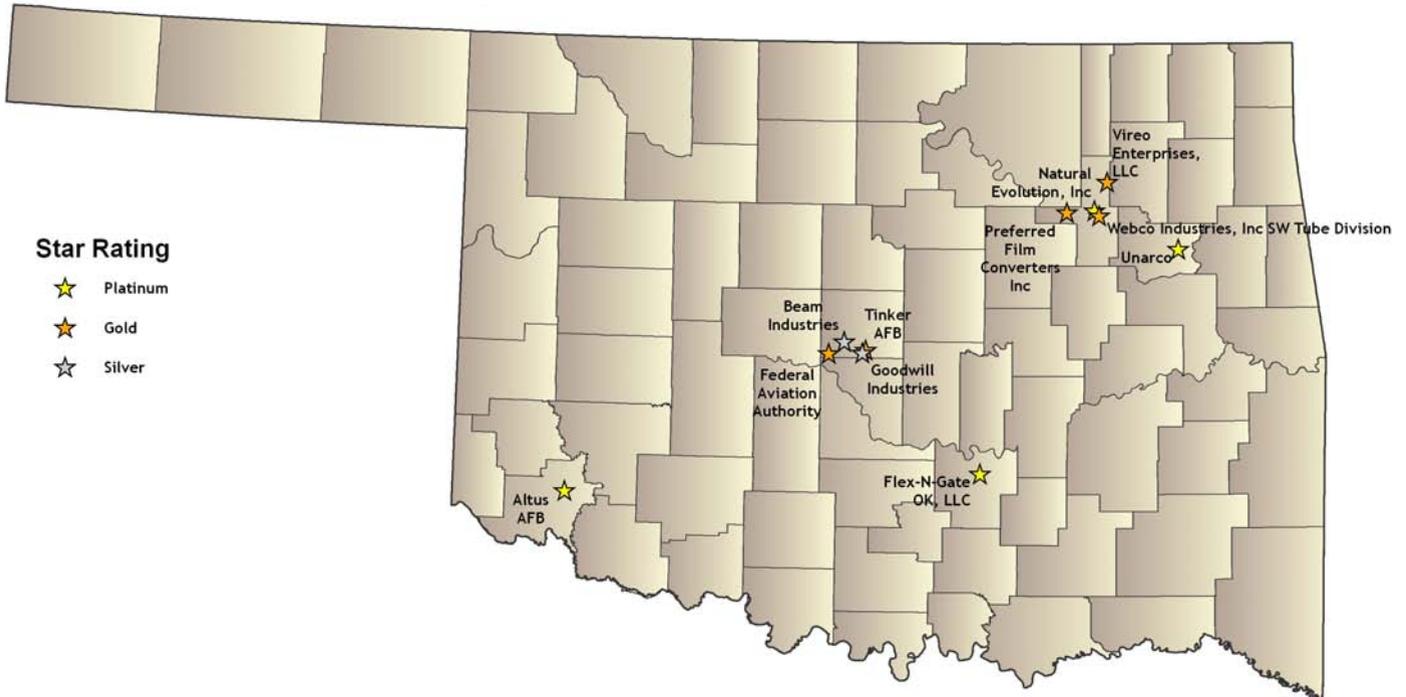
Electronic Waste

A law will go into effect Jan. 1, 2009 that will require computer companies to take back and recycle worn-out computers. The law also encourages the development of companies that can recycle electronic waste, commonly known as e-waste, in Oklahoma. Until then, Oklahoma City residents can take old computers and electronics to the City’s hazardous waste center. Other towns and cities also hold events periodically where residents can take e-waste.



Discarded e-waste that can now be recycled.

Oklahoma Star Participants



The Oklahoma Star Incentive Program recognizes businesses and organizations that have voluntarily implemented a waste reduction and prevention plan. Participants are recognized at Silver, Gold, or Platinum levels based on specific

performance criteria. As part of this program, organizations demonstrate that they have gone beyond compliance with environmental law to protect the environment and promote employee safety.



UNARCO, the world leader in the manufacture of shopping carts, accepting an Oklahoma Star Platinum award.

DEQ Program to Help Local Communities Reuse Armories

To passersby, the buildings may simply look like facilities where soldiers once trained, but in fact National Guard Armories are much more. They are buildings communities can use for schools, emergency response centers, and special events. DEQ works with the Oklahoma Military Department, the Department of Central Services, and local officials through the Site Cleanup Assistance Program (SCAP) to help return armories to communities for reuse.

In 2008, DEQ held eight ceremonies at armories across the state to acknowledge that some facilities are ready to be reused. A mainstay of SCAP is to assess and remediate environmental hazards that are common to many armories such

as contamination from indoor firing ranges, lead-based paint, and asbestos.

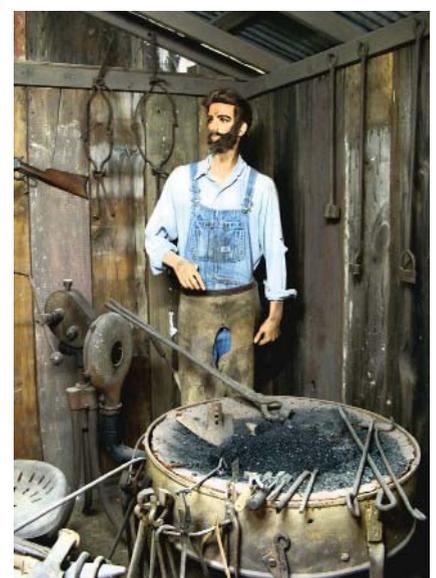
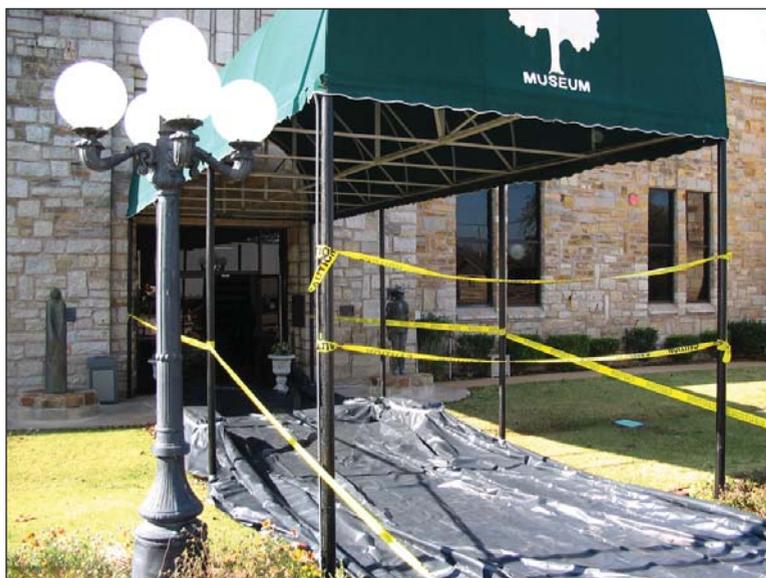
“Each armory is unique and has to be evaluated thoroughly,” said Angela Hughes, SCAP coordinator. Cleanups allow the facility to be safely transferred to local governmental entities.

More than 50 surplus armories are being addressed as part of SCAP. “The program has been a success,” Hughes said. “DEQ looks forward to several more years of working to return these facilities to communities so they can be reused,” she added.

More information on SCAP is available at www.deq.state.ok.us/LPDnew/scapIndex.htm.



The former Ardmore Armory, now the Greater Southwest Historical Museum.



Site Cleanup Assistance Program



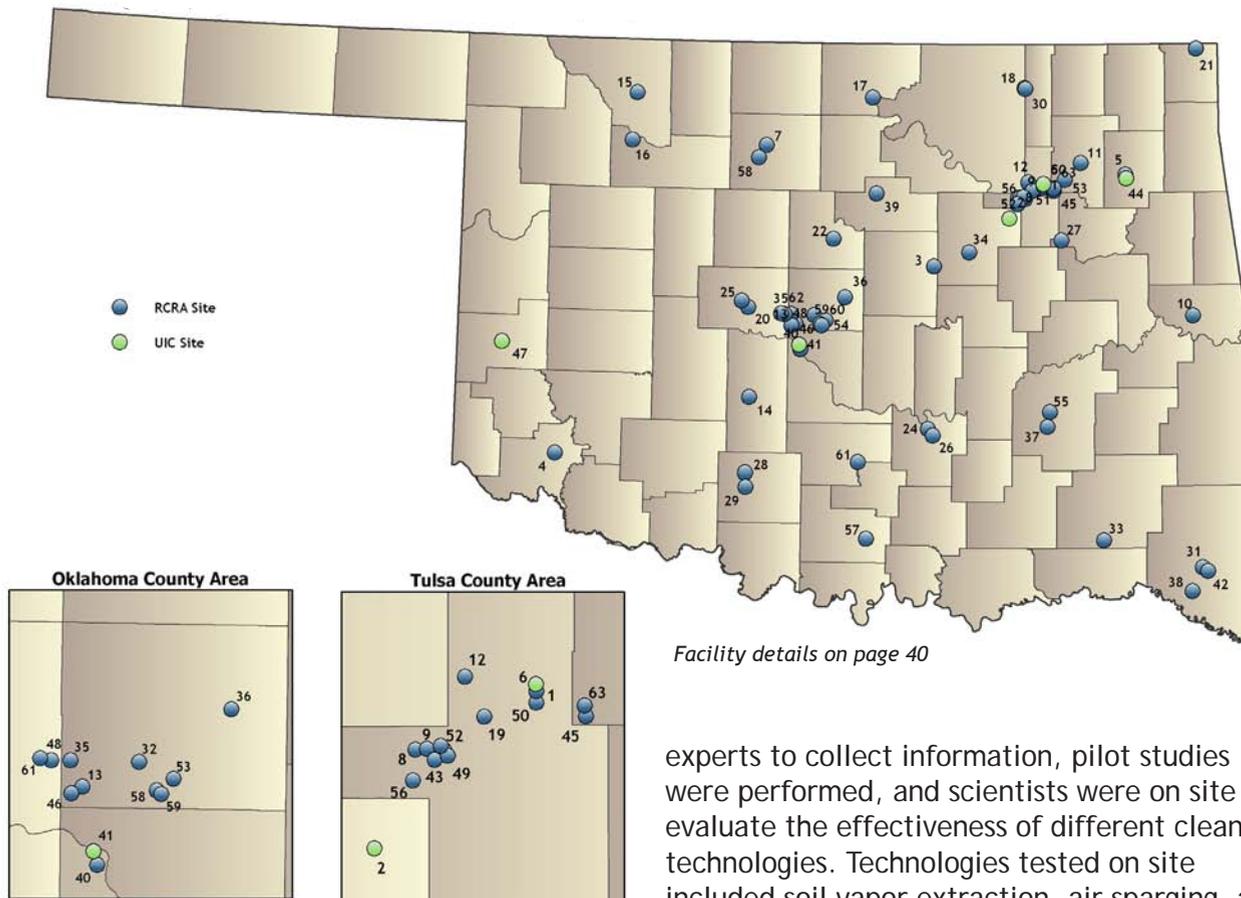
Mangum Armory



Watonga Armory

The focus of the Site Cleanup Assistance Program (SCAP) is to clean up old National Guard armories so they can be reused by local communities. There are a total of 57 armories under the Base Realignment and Closure that will be addressed by the program. The Legislature funded SCAP through a gasoline tax.

Resource Conservation and Recovery Act (RCRA) and Underground Injection Control (UIC) Sites



Facility details on page 40

experts to collect information, pilot studies were performed, and scientists were on site to evaluate the effectiveness of different cleanup technologies. Technologies tested on site included soil vapor extraction, air sparging, and augmentation with microorganisms, including fungi, green plants or their enzymes.

Vance Air Force Base Works to Restore Its Land and Involve the Community

With goals of protecting the environment, conserving resources, and reducing the amount of waste generated, Congress passed the Resource Conservation and Recovery Act (RCRA) in 1976. The Land Protection Division has broad duties under delegation of the federal RCRA law, a part of which involves overseeing various cleanups at Vance Air Force Base.

After RCRA passed, many facilities began evaluation and cleanup of historical practices. Vance Air Force Base has been involved in the cleanup of soil and ground water for more than 20 years. Numerous investigations have been conducted to determine the best remedy. During this period, forums were held with national

After extensive studies, cleanup began with the removal of a tank that contained methylene chloride (MC). The tank had leaked over the years and contaminated ground water. A centralized ground water treatment facility has been built. This facility uses mechanical and chemical treatment of extracted ground water. Three different interceptor collection trenches and 25 extraction wells throughout the base pump water to the treatment facility. One of the trenches has a parallel slurry wall to prevent inflow of clean water from a nearby creek.

Last year alone, more than eight million gallons of ground water was treated at Vance Air Force Base. More than 300 monitoring wells have been installed, with 59 of those still monitored on a semiannual basis. The monitoring well that had

recorded the highest contamination level now has no detectable MC, indicating the cleanup is working as intended.

Vance also uses plants to clean up pollution. “We have planted more than 230 cuttings from hybrid poplars in two areas for phyto-remediation projects. The poplars use enormous amounts of water which help contain and mitigate contamination. According to our testing, the localized ground water at the sites appears to have been positively impacted,” said Marilyn

Wells, remedial project manager at Vance. “Our program continues to evolve. We are currently involved in a study to create more efficient and economical cleanup practices,” Wells added.

The restoration of Vance Air Force Base actively engages public input. A Restoration Advisory Board was established in 1993 to ensure the public is always involved in the continued success of the base cleanup. Community participation in the events at Vance Air Force Base is a part of its ongoing mission.



Poplar trees in a bioremediation plot like at Vance Air Force Base

Waste Tires: An Environmental and Health Hazard

Proper disposal of waste tires was one of the messages behind a community-wide cleanup event hosted by the City of Oklahoma City in October at the State Fairgrounds. About 50 events such as this one take place every year. DEQ authorizes these events and helps communities contact processors who pick up the waste tires. From there, the tires can be recycled and used for fuel at cement kilns or broken down into crumb rubber and used to cushion playgrounds and football fields. Crumb rubber can also be used in truck bed liners.

“One of DEQ’s goals this year was to encourage community-wide cleanup events since this deters illegal tire dumping,” said Ferrella March, waste tire program manager.

Waste tires can attract vermin and serve as a

breeding ground for mosquitoes. Stacks of waste tires can be an eyesore. Additionally, tire fires are dangerous, difficult to put out and create environmental hazards.

Recently, DEQ’s role and responsibility for waste tires has changed significantly. New legislation affords the agency additional responsibility with respect to the Waste Tire Recycling Act. Specifically, DEQ is now authorized to conduct inspections of tire dealers, apportion fees, and send that information to the Oklahoma Tax Commission.

DEQ’s Waste Tire Program is authorized by the 1989 Waste Tire Recycling Act. The Act established a fee and created financial incentives for the proper disposal and recycling of tires.



Before

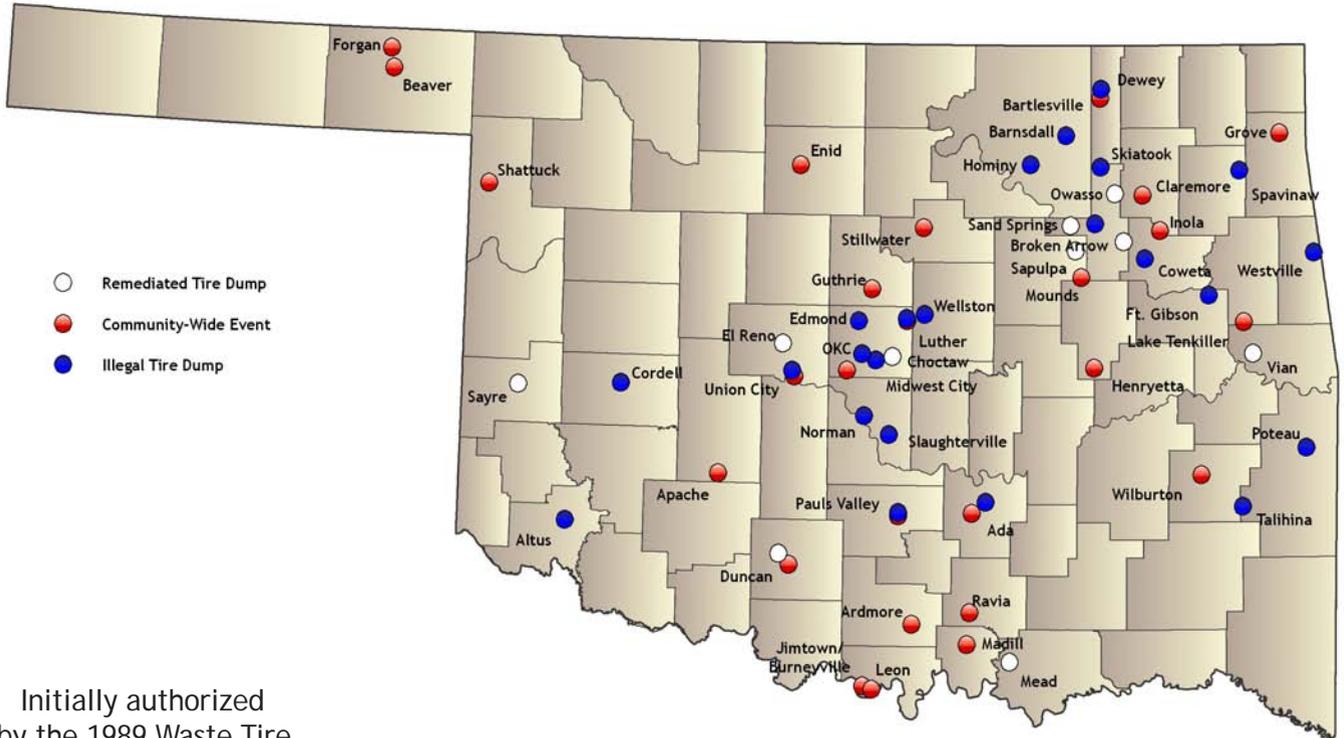


During



Tire clean up in Cleveland County

2008 Tires



Initially authorized by the 1989 Waste Tire Recycling Act, DEQ's Waste Tire Program addresses millions of discarded and abandoned tires in Oklahoma that create an eye sore and a breeding ground for vermin.



Discarded and abandoned tires are a problem wherever they are dumped.

Formerly Used Defense Sites



Working closely with the Corps of Engineers, Land Protection Division staff addresses Formerly Used Defense Sites (FUDS). Cleanups vary but generally include investigation and cleanup of hazardous, toxic, and radioactive waste sites or correction of environmental problems caused by ordnance and explosives.

Former Great Salt Plains Bombing Range in Alfalfa County.

Voluntary Cleanup and Brownfield Sites - Map on page 17

No	Site Name	City
1	Altec Lansing/Telex Communications	Oklahoma City
2	APAC-OK/Shawnee Asphalt	Shawnee
3	Baker Hughes	Oklahoma City
4	Baker Petrolite	Tulsa
5	Best Cleaners	Oklahoma City
6	BF Goodrich/Ottawa Management Company	Miami
7	Blackwell Zinc	Blackwell
8	BNSF/(Burk-Bales)/Phillips Petroleum	Pawnee
9	Boulevard Market Center	Oklahoma City
10	Camrose Tech/Flex-N-Gate	Ada
11	Casady Square	Oklahoma City
12	Central Plastics	Shawnee
13	CGB, LLC	Tulsa
14	Chemical Products	Oklahoma City
15	Chickasha Manufacturing Company	Grady
16	Claremore Hospital	Claremore
17	Collinsville Smelter/Phelps Dodge	Collinsville
18	Coltec Industries	Sallisaw
19	ConAgra Foods	Blackwell
20	ConocoPhillips Glenpool Term	Jenks
21	Crescent Mach/Scott-Macon	Tulsa
22	Crosby-McKissick	Tulsa
23	Cummins Southern Plains	Oklahoma City
24	Dollar 75/MVP	Oklahoma City
25	Dowell Schlumberger	Oklahoma City
26	Dowell Schlumberger	Enid
27	Dowell Schlumberger	Tulsa
28	Duke Energy-Carney GP	Carney
29	Duke Energy-Cashion GP	Cashion
30	Duke Energy-Goldsby GP	Goldsby
31	Duke Energy-Mustang GP	Mustang
32	E & M Oil Co.HWY 7 Spill Site	Velma
33	El Reno Federal Corrections Institution	El Reno
34	EMC Test Systems/Emerson	Durant
35	Enogex/Riverside PP	Jenks
36	Epperly/Mr. Keens Cleaners	Del City
37	ExxonMobil Chem/Shawnee Films	Shawnee
38	ExxonMobil-S. Chitwood GP	Chitwood
39	ExxonMobil-Sholem Alec GP	Tussy
40	FAA Mike Monroney	Oklahoma City
41	Facet International	Tulsa
42	ADM Elevators A & B	Enid
43	ADM Elevators Y & Z	Enid
44	Federated Metals	Sand Springs

Voluntary Cleanup & Brownfield Sites - Map on page 17

45	Gemini Coatings	El Reno
46	Glenn Oil Company	Marlow
47	Haldex Brake	Broken Arrow
48	Halliburton Services	Davis
49	Harcros Chemicals	Oklahoma City
50	Home Depot/EGS-Nelson	Tulsa
51	Imation Enterprises Corporation (3M)	Custer
52	Tronox Cleveland	Cleveland
53	Tronox Technical Center	Oklahoma City
54	Koch Industries/Custer City GP	Custer
55	Koch Industries/El Reno GP	El Reno
56	Kodak Polychrome Graphics	Weatherford
57	Kusa/ASARCO	Henryetta
58	Kwikset	Bristow
59	Larry Slack Conoco	Lindsay
60	M. I. Swaco	Antlers
61	Marathon Oil/Boynton	Muskogee
62	Martin Marietta Materials	Sawyer
63	M-D Building Products	Oklahoma City
64	Michelin/BFG	Miami
65	Midwest City/MidAmerica Mall	Midwest Cty
66	Moore Document Solutions	Stillwater
67	Mustang General Station/OG&E	Mustang
68	Mustang-Dover/Hennessey GP	Dover
69	National Zinc	Bartlesville
70	Newcastle Land Coopany	Newcastle
71	Normandy Creek	Norman
72	Norris Sucker Rod Plant	Tulsa
73	OCURA 4th & Shartel	Oklahoma City
74	OCURA/City of OKC/Phase IA	Oklahoma City
75	ODOT/40/Parcel 127	Oklahoma City
76	ODOT/Charlie O Bus. Park	Oklahoma City
77	OKC/Dell Computer Site	Oklahoma City
78	OKC-Schools S.E. Grand	Oklahoma City
79	Oklahoma Oilwell Cementing	Cushing
80	OSU burial site	Stillwater
81	Okmulgee Refinery/Phillips	Okmulgee
82	Omni Servs/Cintas	Oklahoma City
83	Omni Servs/Cintas	Tulsa
84	Lakewood Shoping Center	Oklahoma City
85	Ruhrpumpen	Tulsa
86	Samson/Global Compress	Yukon
87	Stillwater Regional Airport	Stillwater
88	Sun Container Products	Tulsa
89	Tex-Homa Cotton Company	Frederick

Voluntary Cleanup & Brownfield Sites - Map on page 17

90	Duncan Refinery	Duncan
91	Tronox [Kerr McGee] Cushing	Cushing
92	Trumbull Asphalt/Owens Corning	Oklahoma City
93	Unarco/Thorco	Wagoner
94	UNOCAL/Chevron	Ardmore
95	Union Pacific	Yukon
96	Union Pacific	Kingfisher
97	US Zinc/ASARCO	Henryetta
98	V&S Schuler Tubular Products	Muskogee
99	Warren Petroleum/Chevron	Forgan
100	Weyerhaeuser Wright City Mill	Wright City
101	Windsor Hills	Oklahoma City
102	Adolf's Convenience Store	Beaver
103	City of Lawton wastewater plant	Lawton
104	Howard Drilling	Beaver
105	Koch Nitrogen	Enid
106	Owasso Land Trust	Tulsa
107	TXI Quarry	Mill Creek
108	Cimarex	Elmore City

Landfills - Map on Page 24

No.	Facility	County
1	51B Landfill	Wagoner
2	Absolute Waste Solutions, Inc. Landfill	Pottawatomie
3	AMD, Inc. City of Prague Landfill	Lincoln
4	Americal Environmental Landfill, Inc.	Osage
5	Oklahoma Landfill	Oklahoma
6	Broken Arrow Landfill	Wagoner
7	Canadian Valley Landfill	Pottawatomie
8	CCSWDA Landfill	Canadian
9	Cherokee Nation Sanitary Landfill	Adair
10	City of Ada Municipal Landfill	Pontotoc
11	City of Altus Landfill	Jackson
12	City of Broken Bow Landfill	McCurtain
13	City of Enid Landfill	Garfield
14	City of Lawton Landfill	Comanche
15	City of McAlester Landfill	Pittsburg
16	City of Wilburton Landfill	Latimer
17	Clinton Lewis Construction Company Landfill	Pushmataha
18	East Oak Sanitary Landfill & Recycling	Oklahoma
19	Elk City Municipal Landfill	Beckham
20	Elliott Construction Company Landfill	Okmulgee
21	Foster Waste Disposal Facility	Garvin
22	Ft. Sill MSW Landfill	Comanche
23	Great Plains Landfill	Grady

Landfills - Map on Page 24

No.	Facility	City
24	HEW Waste System Landfill	Payne
25	Muskogee Community Landfill & Recycling Center	Muskogee
26	North Tulsa Sanitary Landfill	Tulsa
27	Northern Oklahoma Disposal, Inc.	Noble
28	NW Oklahoma Solid Waste Disposal Authority	Woodward
29	Osage Landfill	Osage
30	Pinecrest Landfill	McClain
31	Pittsburg County Landfill	Pittsburg
32	Ponca City Vashi Four Eyes, Phase II Landfill	Kay
33	Quarry Landfill	Tulsa
34	Red Carpet Landfill	Major
35	Sallisaw SWDF	Sequoyah
36	Sayre Municipal Landfill	Beckham
37	Sooner Land Management Landfill	Seminole
38	Southeast OKC Landfill	Oklahoma
39	Southern Oklahoma Regional Disposal Landfill	Carter
40	Southern Plains Landfill	Grady

Resource Conservation and Recovery Act & Underground Injection Control Wells - Map on page 32

No.	Facility	City
1	Air Force Plant #3	Tulsa
2	Aleris International	Sapulpa
3	Allied Materials	Stroud
4	Altus AFB	Altus
5	Amerex	Pryor
6	American Airlines	Tulsa
7	Anadarko Petroleum	Enid
8	Arkema (Ozark Mahoning)	Tulsa
9	Ashland Chemical	Tulsa
10	Cavenham Forest Industries	Sallisaw
11	Centrilift (Hughes)	Claremore
12	ChemCentral	Tulsa
13	Chemical Products Division	Oklahoma City
14	Chickasha Manufacturing	Chickasha
15	Clean Harbors-Lone & Grassy Mountain	Avard
16	Clean Harbors-Lone & Grassy Mountain	Waynoka
17	Conoco Phillips Refinery	Ponca City
18	Conoco Phillips Research	Bartlesville
19	Crosby-McKissic Products	Tulsa
20	Dowell Schlumber/El Reno	El Reno
21	Eagle Picher Technologies	Quapaw
22	Environmental Management Inc.	Guthrie

Resource Conservation and Recovery Act & Underground Injection Control Wells - Map on page 32

No.	Facility	City
23	Envirosolve-Tulsa	Tulsa
24	Exxon	Ada
25	Federal Correctional Institute	El Reno
26	Flex-N-Gate	Ada
27	Greenway (Chief)	Stone Bluff
28	Halliburton	Duncan
29	Halliburton Service Center	Duncan
30	Horsehead (ZCA)	Bartlesville
31	Huffman Wood	Broken Bow
32	Interstate Metals	Oklahoma City
33	Julian Lumber	Rattan
34	Kwikset Corporation	Bristow
35	Lucent Technologies	Oklahoma City
36	Madewell & Madewell	Jones
37	McAlester Army Ammunition Plant	McAlester
38	Mixon Brothers	Idabel
39	Moore Business Forms	Stillwater
40	Newcastle Land	Newcastle
41	OG&E McClain Energy	Newcastle
42	Oklahoma Pole & Lumber	Broken Bow
43	Perma-Fix (CRT/RTI)	Tulsa
44	Pryor Plant Chemical	Pryor
45	Safety Kleen Systems	Tulsa
46	Safety Kleen Systems	Wheatland
47	Sayre Brine Well (Class 3)	Sayre
48	Seagate	Oklahoma City
49	Sinclair Tulsa Refinery	Tulsa
50	Spirit Aerosystems	Tulsa
51	Sunoco, Inc.	Tulsa
52	Terra Nitrogen	Catoosa
53	Tinker Air Force Base	Midwest City
54	Tricat	McAlester
55	Tulsa Disposal (Clean Harbors/HRI)	Tulsa
56	Valero/Total Petroleum	Ardmore
57	Vance Air Force Base	Enid
58	Vollbrecht Association (Unit Parts)	Oklahoma City
59	Wall Colmonoy	Oklahoma City
60	Wynnewood Refining	Wynnewood
61	Xerox	Oklahoma City
62	Yuba Heat Transfer	Tulsa



