

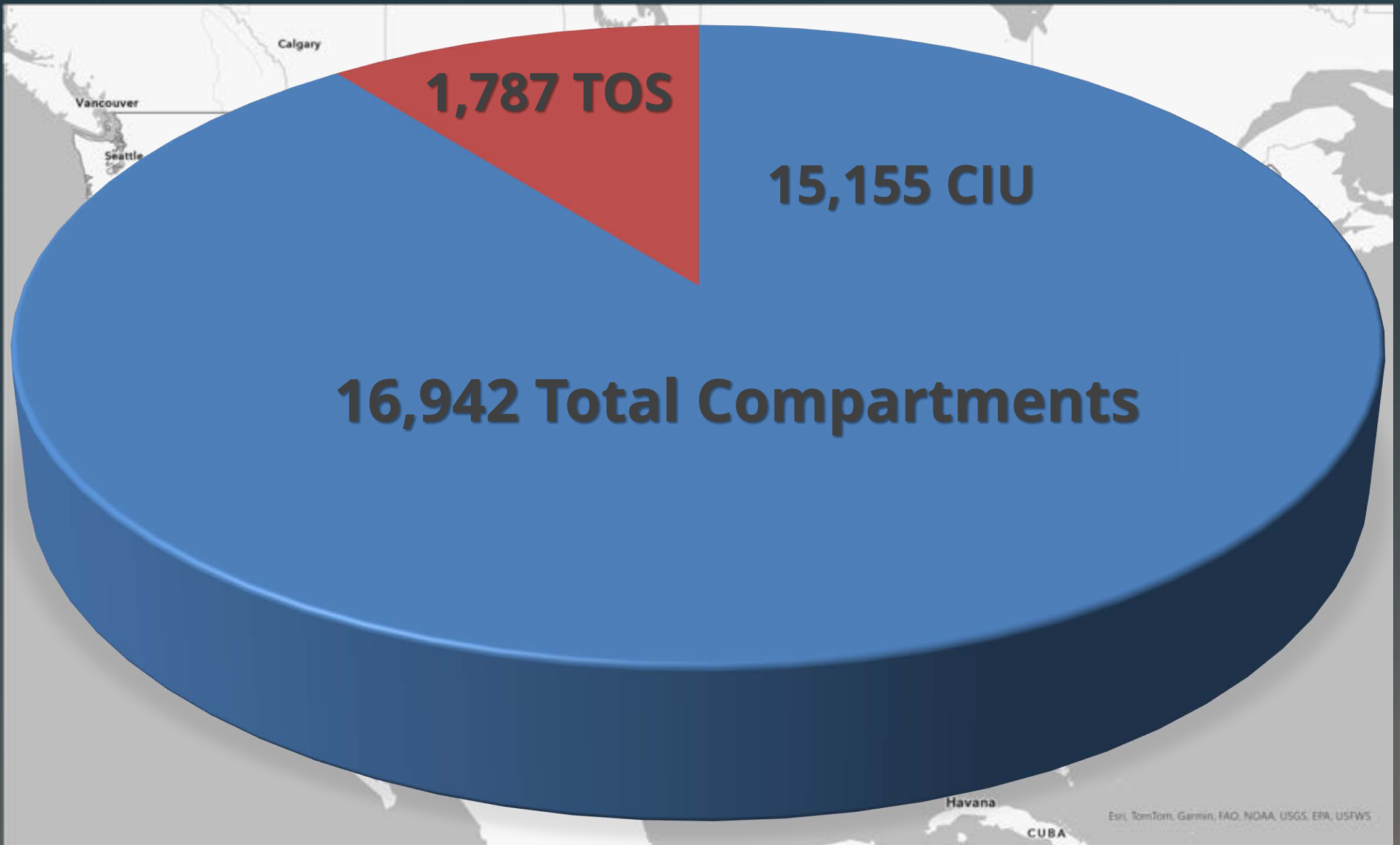
Public Viewing of Remediation Data in Tennessee

*Mapping Success; How Tennessee Communicates
Environmental Cleanup and Redevelopment*



Sharing Cleanup Achievements through StoryMaps

- Established in 1988 to identify and remediate petroleum releases
- Statewide regulatory compliance and remediation
- StoryMaps highlight cleanup achievements and redevelopment successes







Knoxville, TN
\$1.4 Million



Cookeville, TN
\$1.4 Million



Why Storytelling Matters

Contamination



Cleanup



Transformation



Community Benefit



**Multi-Phase Enhanced
Mobile Extraction**

Membrane Interface Probe

Laser-Induced Fluorescence

Membrane Interface Probe

**High-Resolution Site
Characterization**

Dual-Phase Extraction

**Volatile Organic
Compounds**

Carbon-Injection



Why StoryMaps?



Origin Story

A Story Map

BENZENE TO BEER

According to the National Association of Convenience Stores, more than 50,000 gas stations have closed their doors since 1991, accounting for over 25% of the 200,000 gas stations nationwide. Recent trends in alternative fuels and rising property costs are likely to blame for the decline in service station operations.

Historically, abandoned gas stations have been unattractive to developers and future site owners owing to the cost associated with unknown petroleum contamination. However, by virtue of location (typically entryways to business districts) and with the help of brownfield grants, these sites have recently garnered more attention for their investment potential.

TENNESSEE REDEVELOPMENT SITES

The Tennessee Division of Underground Storage Tanks is responsible for the prevention and clean-up of petroleum releases to the environment from leaking underground storage tanks. According to the National Cleanup Inventory 2018, Tennessee had the best percentage of projects completed in the Nation at 99.1%. To date, no state with an equal or greater amount of



Tennessee's Two-Pronged Approach

1

**Showcase Impact—
communicate how
UST remediation
protects public
health and the
environment**

2

**Educate & Explain—
break down
investigation and
remediation
techniques into
accessible stories**

**Storytelling + Technical Education =
Transparency, Trust, & Support**

TDEC UST Program Structure

EPA



TDEC

Division of UST



Compliance



Project
Management

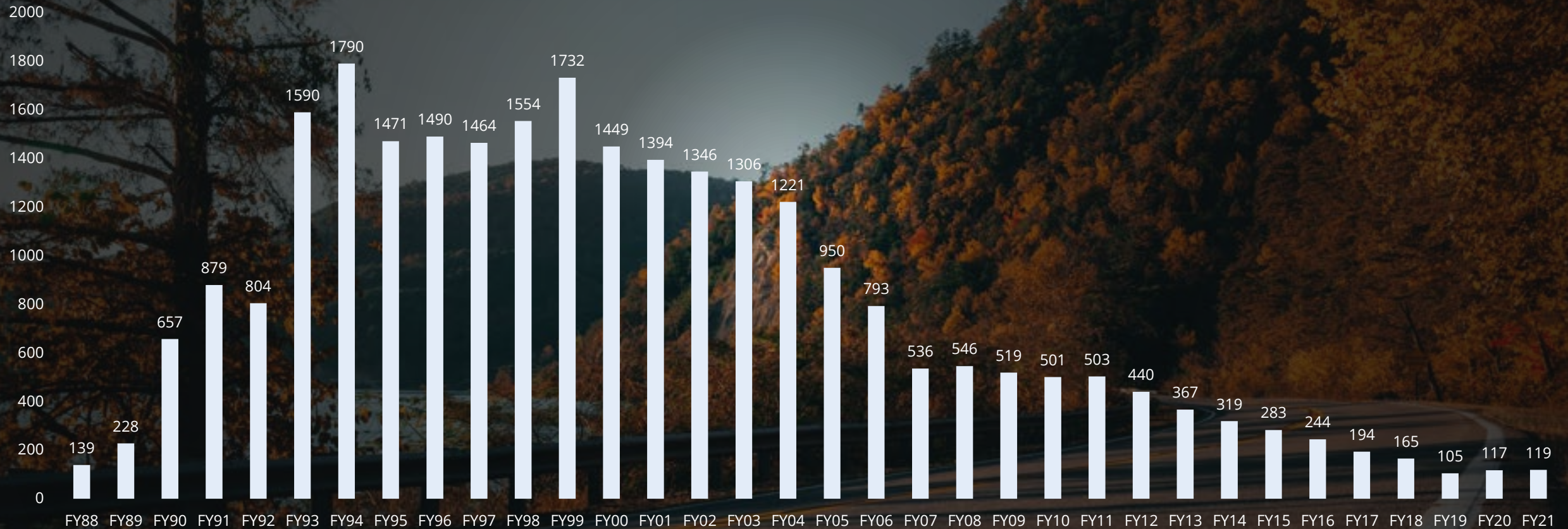


Enforcement



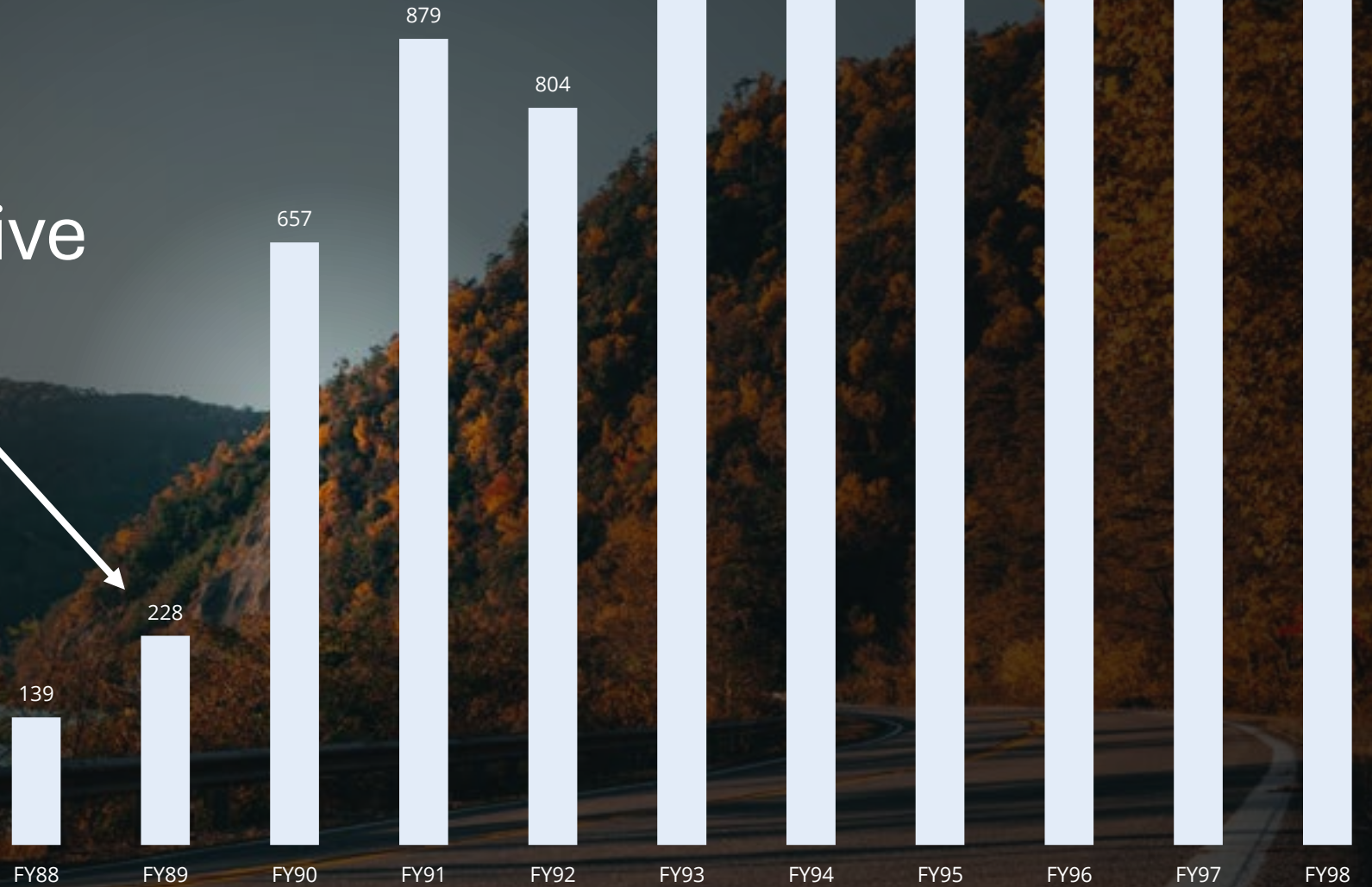
Reimbursement

UST Program Evolution and Open Remediation Projects



JULY 1, 1988

UST Act is Effective

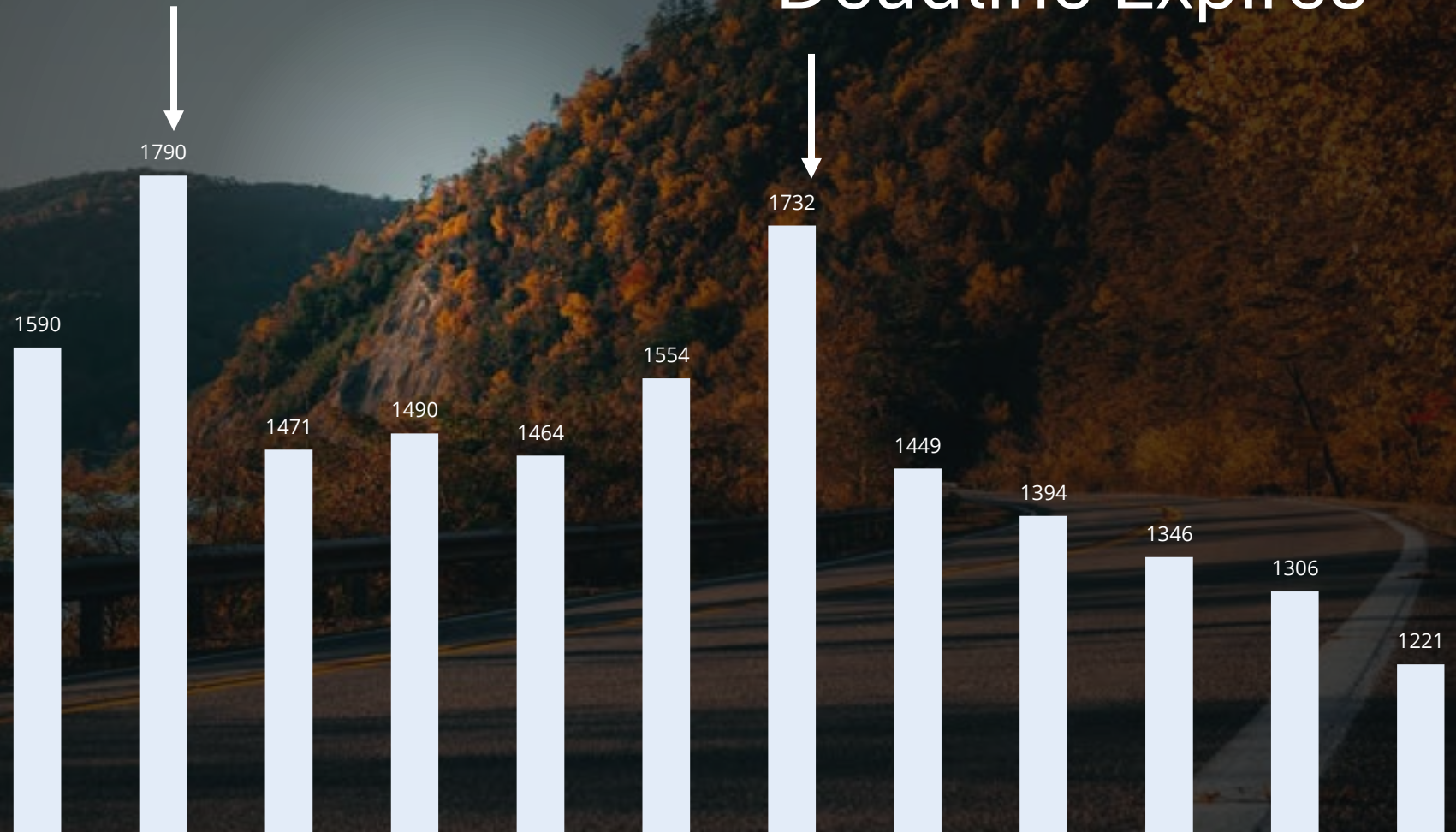


1994

Release Detection for all
UST Systems Required

December 22, 1998

Upgrade or Closure
Deadline Expires





394

1346

1306

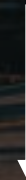
1221

950

793

2010

Deployment Begins for State
Owned Dual Phase Corrective
Action Systems



536

546

519

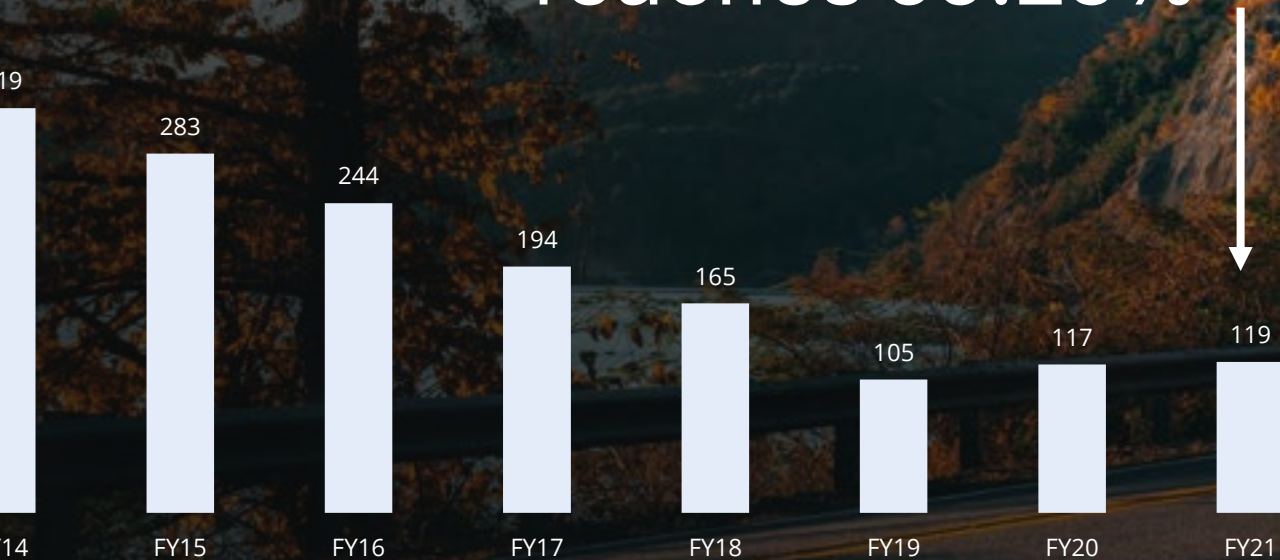
501

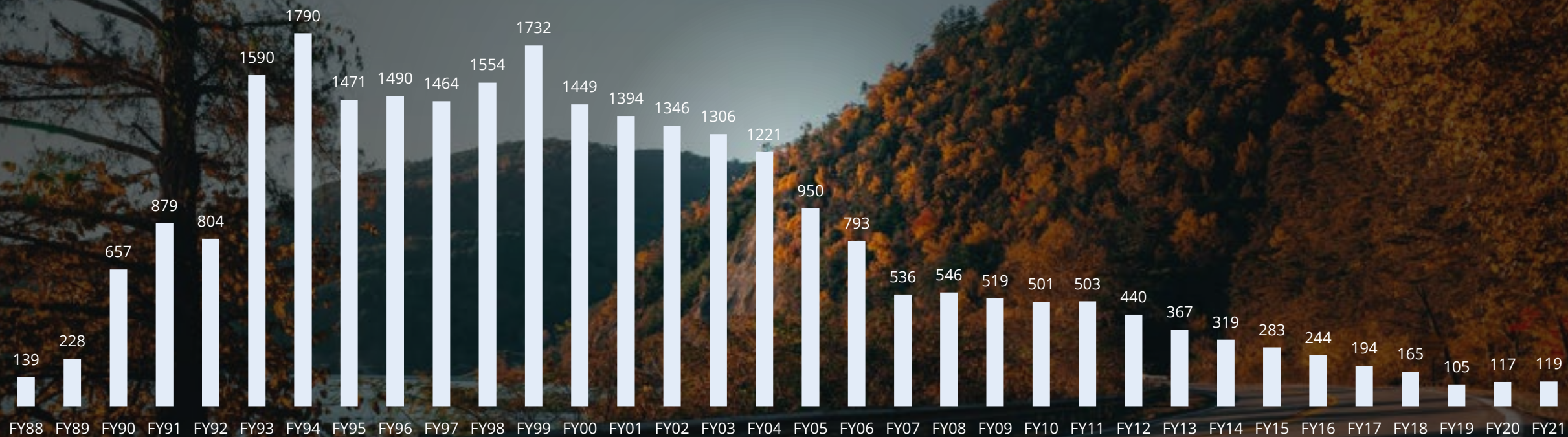
503

440

2021

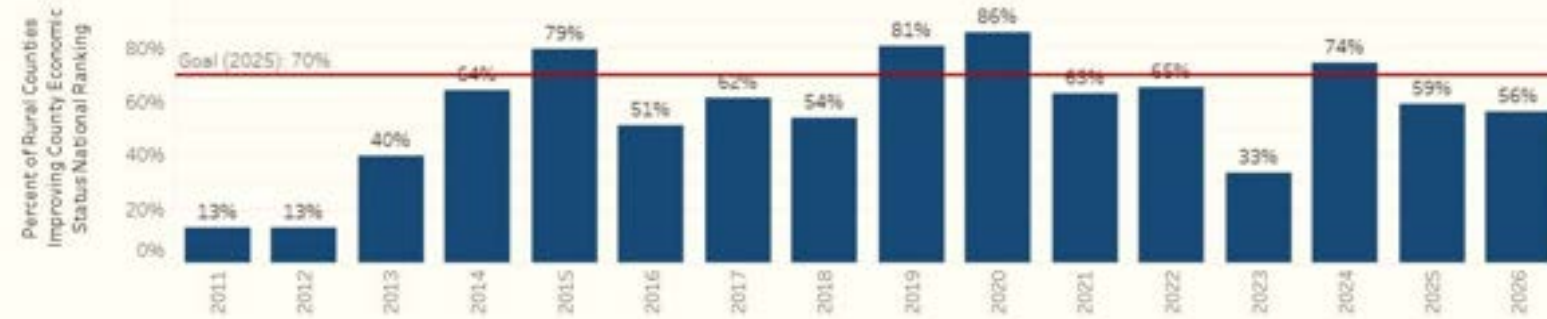
Tennessee's Cleanup Percentage
reaches 99.25%



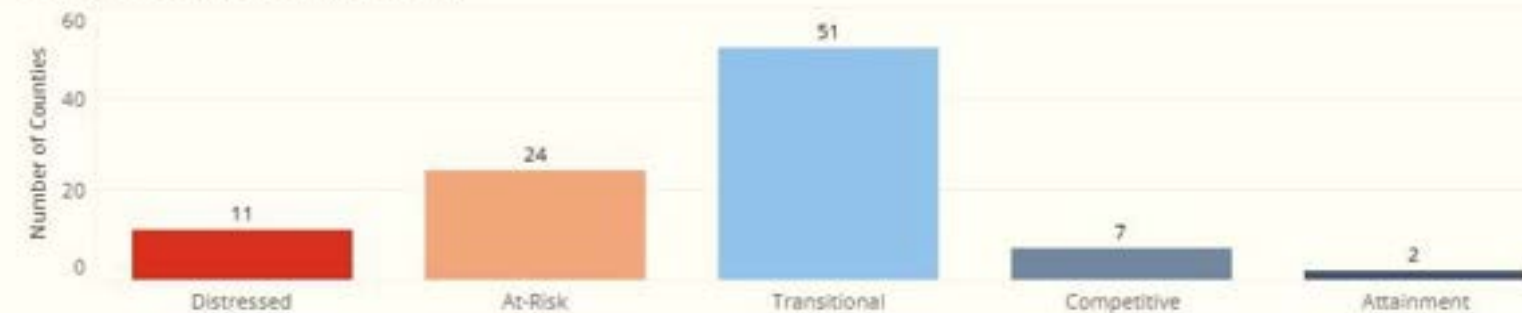


Economically Distressed Counties

Rural Counties' Annual Improvement in National Ranking



County Economic Status (Fiscal Year 2026)



Clay County



From Polluted to Prosperous



From Polluted to Prosperous

Success Stories from The Underground Storage Tank Cleanup Fund

Tennessee Department of Environment and Conservation

January 24, 2022





NO UNPILTED WATER



Cocke County



From Vacancy to Vibrancy



From Vacancy to Vibrancy

Cocke County Selected Success Stories

Petroleum Underground Storage Tank Cleanup Fund

August 31, 2023





ROUTE



Welcome to
.....
HISTORIC DOWNTOWN
NEWPORT
.....

1 8  9 0



Department of
Environment &
Conservation

Hardeman County

Leaks to Legacy



Leaks to Legacy

A journey of community endurance

TDEC Division of Underground Storage Tanks

January 14, 2025





ROBERTSON

SUMNER

TROUSDA

Gallatin

Nashville

Lebanon

WILSON





Gallatin Town Creek Greenway Project

TDEC Division of Underground Storage Tanks

July 24, 2024

Dye-Tracing Explained



12 of 14: CHL conducting stream gauging upstream of seep #1

Karst Hydrology

Where does the water go?

Bedrock

The Gallatin project area has karst geology. Containing soluble carbonate rocks, such as limestone and dolomite, this material slowly dissolves leaving voids and preferential pathways for water to travel.

Groundwater

Rainwater typically seeps into the ground and flows downhill towards creeks and rivers, however in karst areas water can sometimes be funneled to flow in unexpected directions or become trapped by an impermeable barrier.

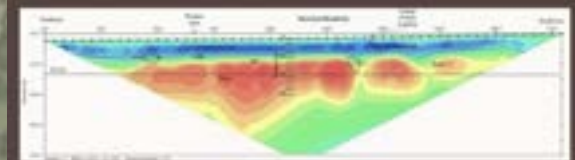


Complications

This can make remediating areas with petroleum contamination in karst difficult since petroleum floats on top of water and follows its path. In order to determine flow paths in the Gallatin project area, several advanced subsurface technologies were used to help shape the remediation plan.

Investigations

Remote sensing using 2D Electrical Resistivity helped to identify lithology, fracture or weathering zones, rock profiles, karst and epikarst features, as well as light non-aqueous phase liquids (LNAPLs) like petroleum hydrocarbon products.





crawfordhydrology laboratory

dyetracing.com
270-745-9224

Services:

- fluorescent dye analysis
- quality dye tracing supplies
- professional groundwater investigation consulting
- hydrogeologic inventory, dye injection, and monitoring
- high quality Geographic Information System (GIS) services
- cave survey, inventory, and management consulting
- karst hydrogeology workshops and on-site training

Our focus is on quality assurance and customer service while providing supplies, laboratory analyses, and expert consultation for groundwater tracing.



TN Department of
Environment &
Conservation

CORE

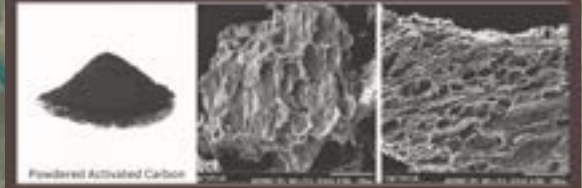
Activated Carbon

Activated Carbon

What does it do?

Material

Activated carbon is a finely ground material with extremely high surface area capable of trapping vast quantities of chemicals within its micropores.



Application

Carbon injection technologies take advantage of this process by placing the activated carbon in contact with subsurface petroleum contaminants that adsorb to the carbon and are essentially trapped in place. This sequesters the petroleum and stops contaminant plume migration.

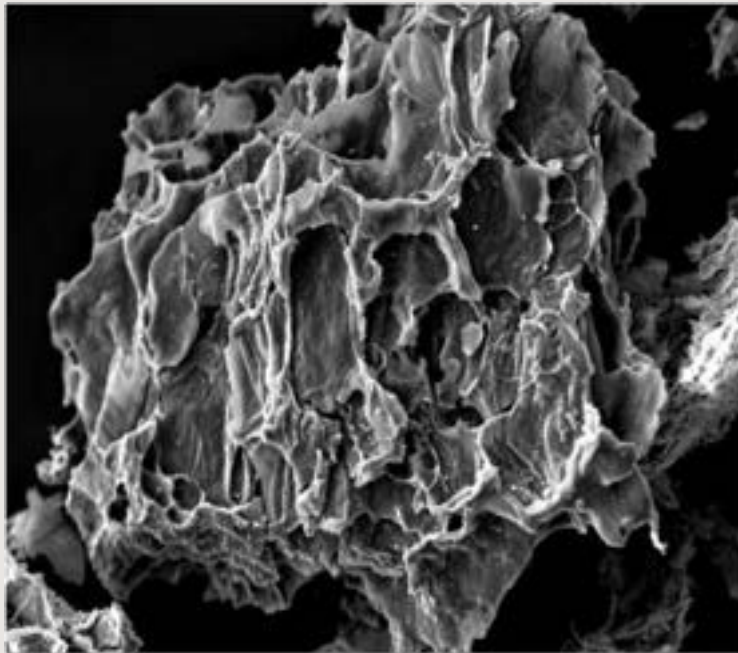
Process

The activated carbon can also be seeded with bacteria that naturally consume and break-down the petroleum contaminants accelerating biodegradation. The coupling of adsorption and degradation make activated carbon a valuable tool in addressing petroleum contaminants in soil and groundwater.



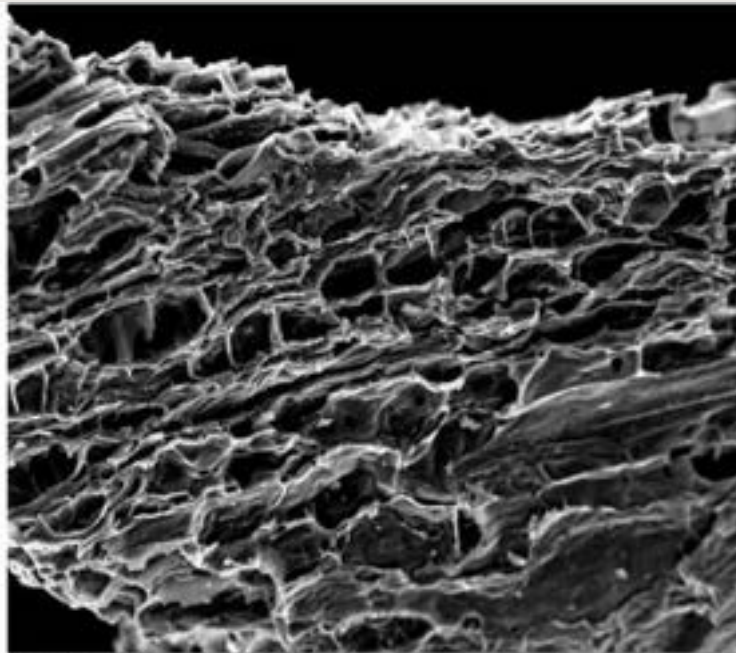
Products

A variety of activated carbon products are available for use in environmental remediation applications—BOS200 and PetroFix are examples that have been used throughout the Gallatin Town Creek Greenway cleanup.



High Tech Lab

AIS2300C SEI WD = 11.5 16.0kV X 500 100µm



High Tech Lab

AIS2300C SEI WD = 12.3 16.0kV X 500 100µm



Department of
Environment &
Conservation







Public Outreach



REMEDIATION WORK – MORTON AVENUE APRIL 4th thru APRIL 22nd

TOWN CREEK GREENWAY REMEDIATION PROJECT

The TDEC - Division of Underground Storage Tanks is partnering with the City of Gallatin on a long-term cleanup effort to remediate petroleum contamination detected along the eastern bank of Town Creek and at groundwater seeps in the nearby neighborhood. Remediation to reduce the contamination and odor is ongoing.

Starting April 4th, a line of remediation borings will be installed along the west-bound lane of Morton Avenue, between addresses 285 and 297. Each boring will be injected with a food-grade activated carbon and nutrient mixture. The activated carbon will adsorb the petroleum while the nutrients will promote biodegradation of the contamination. When the injections are finished, the drill holes will be filled and the roadway patched with asphalt.

For your safety and the workers safety, through traffic along this section of Morton Avenue (see photo at right) will be diverted during work hours. Residents will still have access to their homes from the east or west during the workday from **April 4th through April 22nd**. For special access needs, please contact Don Neill at (931) 685-0395.

At right, are photos of the typical drill rig and injection equipment that you will be seeing in the roadway on Morton Avenue.

This is a photo of the activated carbon mixture when seen on the ground surface. While it may look unpleasant, it is not hazardous. It is similar to the carbon in your home water filter and is quite harmless.

This work is being conducted by PM Environmental, Inc., under contract to the State of Tennessee. If you have any questions regarding this work, please contact PM Environmental at (931) 432-5552 or the TDEC-UST project manager, Doug Cantrell, at (865) 364-0121.



Work Area



Drilling



Injection



Carbon Mixture



TRABAJO DE REMEDIACIÓN – MORTON AVENUE 4 de abril al 22 de abril

PROYECTO DE REMEDIACIÓN DE LA VÍA VERDE DE TOWN CREEK

La División de Tanques de Almacenamiento Subterráneos del TDEC está colaborando con la ciudad de Gallatin en un esfuerzo de limpieza a largo plazo para remediar la contaminación por petróleo detectada a lo largo de la orilla oriental de Town Creek y en las filtraciones de agua subterránea en el vecindario cercano. La remediación para reducir la contaminación y el olor está en curso.

A partir del 4 de abril, se instalará una línea de sondeos de remediación a lo largo del carril oeste de Morton Avenue, entre las direcciones 285 y 297. En cada uno de los sondeos se inyectará una mezcla de nutrientes y carbón activado de grado alimenticio. El carbón activado absorberá el petróleo, mientras que los nutrientes promoverán la biodegradación de la contaminación. Una vez terminadas las inyecciones, se rellenarán las perforaciones y se cubrirá la calzada con asfalto.

Para su seguridad y la de los trabajadores, se desviará el tráfico a lo largo de esta sección de Morton Avenue (ver foto a la derecha). Los residentes seguirán teniendo acceso a sus hogares desde el este o el oeste durante la jornada de trabajo del 4 al 22 de abril. Para necesidades especiales de acceso, por favor, póngase en contacto con Don Neill en (931) 685-0395.

A la derecha, hay fotos de la típica plataforma de perforación y del equipo de inyección que se verá en la calzada de Morton Avenue.

Esta es una foto de la mezcla de carbón activado cuando se ve en la superficie del suelo. Aunque su aspecto sea desagradable, no es peligroso. Es similar al carbón del filtro de agua de su casa y es bastante inofensivo.

Este trabajo está siendo realizado por PM Environmental, Inc. bajo contrato con el Estado de Tennessee. Si usted tiene alguna pregunta con respecto a este trabajo, por favor póngase en contacto con PM Environmental al (931) 432-5552 o con el gerente del proyecto TDEC, Doug Cantrell al (865) 364-0121.



Área de trabajo



Perforación

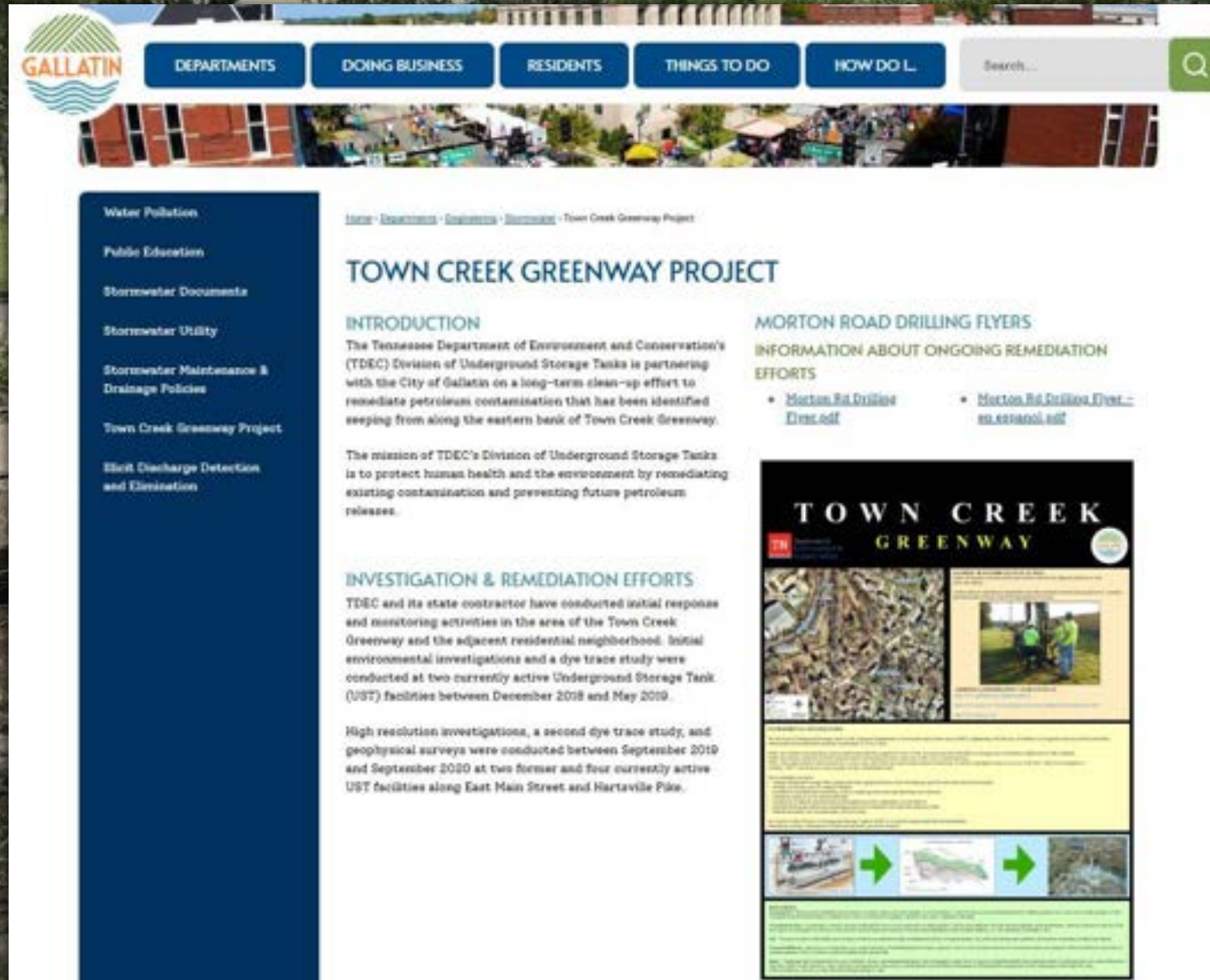


Inyección



mezcla de carbón

Public Outreach



The screenshot displays the City of Gallatin website with a focus on the Town Creek Greenway Project. The header includes the Gallatin logo and navigation tabs for DEPARTMENTS, DOING BUSINESS, RESIDENTS, THINGS TO DO, and HOW DO I. A search bar is located on the right. A banner image shows a street scene with people and trees. The left sidebar lists various categories: Water Pollution, Public Education, Stormwater Documents, Stormwater Utility, Stormwater Maintenance & Drainage Policies, Town Creek Greenway Project, and Elicit Discharge Detection and Elimination. The main content area features the title 'TOWN CREEK GREENWAY PROJECT' and an 'INTRODUCTION' section. The introduction states that the Tennessee Department of Environment and Conservation's (TDEC) Division of Underground Storage Tanks is partnering with the City of Gallatin on a long-term clean-up effort to remediate petroleum contamination. A mission statement follows, stating the goal is to protect human health and the environment by remediating existing contamination and preventing future releases. The 'INVESTIGATION & REMEDIATION EFFORTS' section describes initial response and monitoring activities, environmental investigations, and a dye trace study conducted at two active UST facilities between December 2018 and May 2019. It also mentions high resolution investigations, a second dye trace study, and geophysical surveys conducted between September 2019 and September 2020 at two former and four currently active UST facilities along East Main Street and Hartsville Pike. To the right of the introduction is a section titled 'MORTON ROAD DRILLING FLYERS' with a link to 'INFORMATION ABOUT ONGOING REMEDIATION EFFORTS'. Below this are two links: 'Morton Rd Drilling Flyer.pdf' and 'Morton Rd Drilling Flyer - es.kentool.pdf'. At the bottom right is a large flyer titled 'TOWN CREEK GREENWAY' which includes a map, photos of workers, and detailed text about the project.

GALLATIN

DEPARTMENTS DOING BUSINESS RESIDENTS THINGS TO DO HOW DO I

Search...

Water Pollution

Public Education

Stormwater Documents

Stormwater Utility

Stormwater Maintenance & Drainage Policies

Town Creek Greenway Project

Elicit Discharge Detection and Elimination

[Home](#) - [Departments](#) - [Doing Business](#) - [Residents](#) - [Things to Do](#) - [How Do I](#) - [Town Creek Greenway Project](#)

TOWN CREEK GREENWAY PROJECT

INTRODUCTION

The Tennessee Department of Environment and Conservation's (TDEC) Division of Underground Storage Tanks is partnering with the City of Gallatin on a long-term clean-up effort to remediate petroleum contamination that has been identified seeping from along the eastern bank of Town Creek Greenway.

The mission of TDEC's Division of Underground Storage Tanks is to protect human health and the environment by remediating existing contamination and preventing future petroleum releases.

INVESTIGATION & REMEDIATION EFFORTS

TDEC and its state contractor have conducted initial response and monitoring activities in the area of the Town Creek Greenway and the adjacent residential neighborhood. Initial environmental investigations and a dye trace study were conducted at two currently active Underground Storage Tank (UST) facilities between December 2018 and May 2019.

High resolution investigations, a second dye trace study, and geophysical surveys were conducted between September 2019 and September 2020 at two former and four currently active UST facilities along East Main Street and Hartsville Pike.

MORTON ROAD DRILLING FLYERS

INFORMATION ABOUT ONGOING REMEDIATION EFFORTS

- [Morton Rd Drilling Flyer.pdf](#)
- [Morton Rd Drilling Flyer - es.kentool.pdf](#)

TOWN CREEK GREENWAY

Map

Photos

Text

Timeline

Links



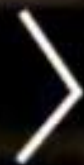
STATE CAPITOL NEWSROOM

CLEANING UP PETROLEUM LEAKS

GALLATIN



STATE CAPITOL NEWSROOM





Viewership



**Cocke
County**



**Clay
County**



**Hardeman
County**



**Gallatin
Project**

Lessons Learned

Time and Scheduling

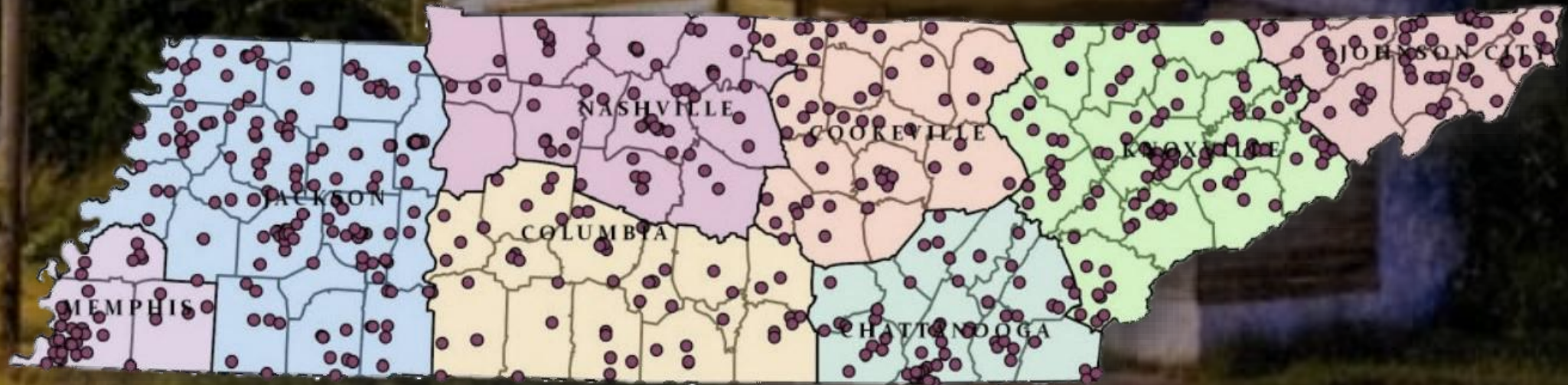
Scale and Direction

The Human Condition



Cumberland Avenue Knoxville, TN

Abandoned Facilities Project





The mission of the Division of Underground Storage Tanks is to protect human health and environment by preventing future petroleum underground storage tank releases and remediating existing petroleum underground storage tank contamination.

Credits & Acknowledgements

City of Gallatin Engineering Division

Cocke County Mayor – Rob Mathis

Oak Grove Cabinets – Cliff Sampson

TDEC Videographer – Michael Seale

TDEC UST – Bethanie Kirby, Holly Marlowe, Mac
Pointer, and Stan Boyd

TN Slide Images – Tanner Boriak, Zane Persaud,
Nathan Anderson, Brandon Jean, Maddie Burke via
Unsplash

Western Kentucky University, Crawford Hydrology
Lab – LeeAnne Bledsoe

