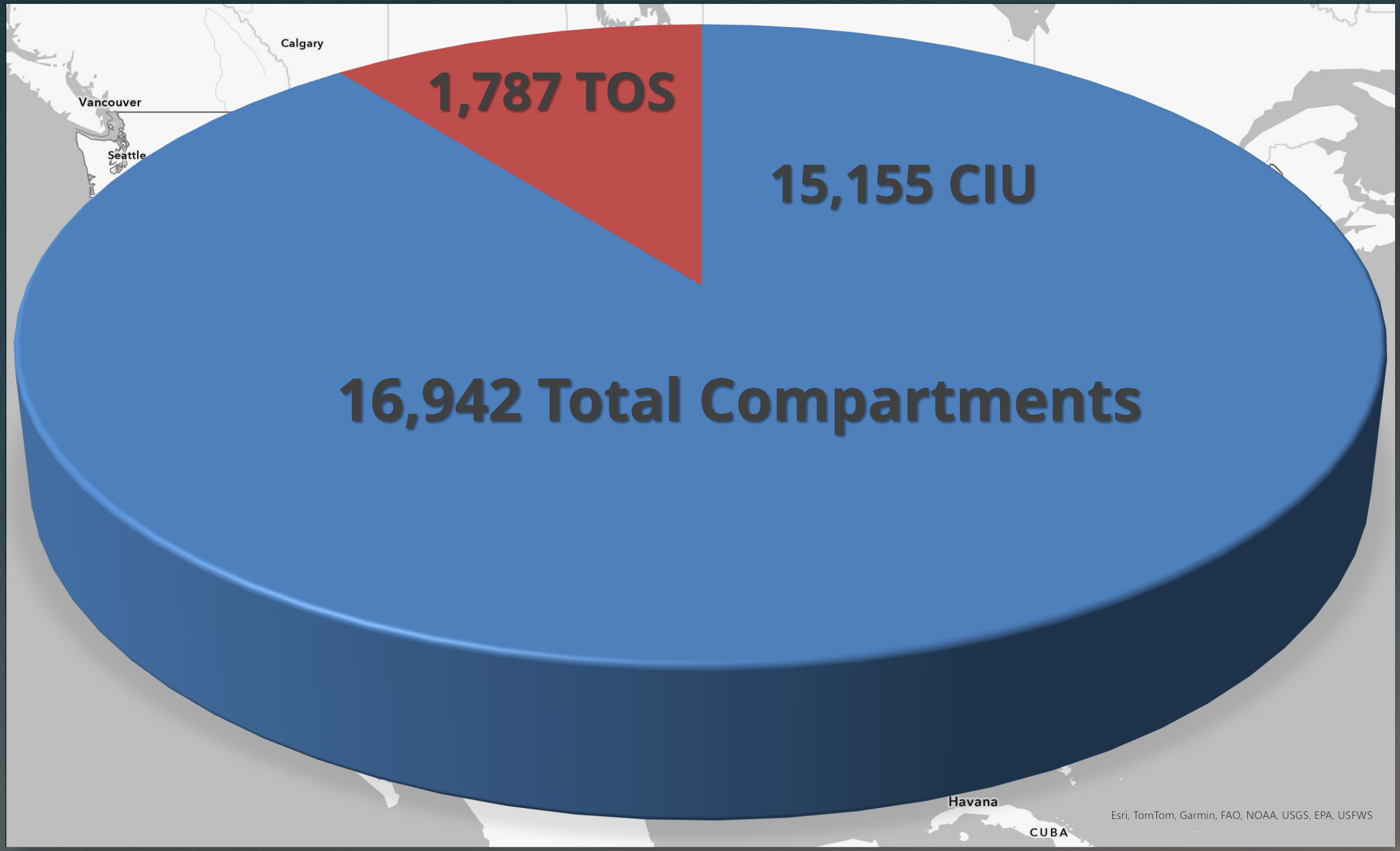
Public Viewing of Remediation Data in Tennessee

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


Calgary
Vancouver
Seattle
1,787 TOS
15,155 CIU
16,942 Total Compartments
Havana
CUBA
Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS


A


B

Knoxville, TN
$1.4 Million

Cookeville, TN
$1.4 Million


Geoprobe
Bin Hop'n Bargain Shop'n

Why Storytelling Matters

Multi-Phase Enhanced Mobile Extraction

Membrane Interface Probe

Laser-Induced Fluorescence

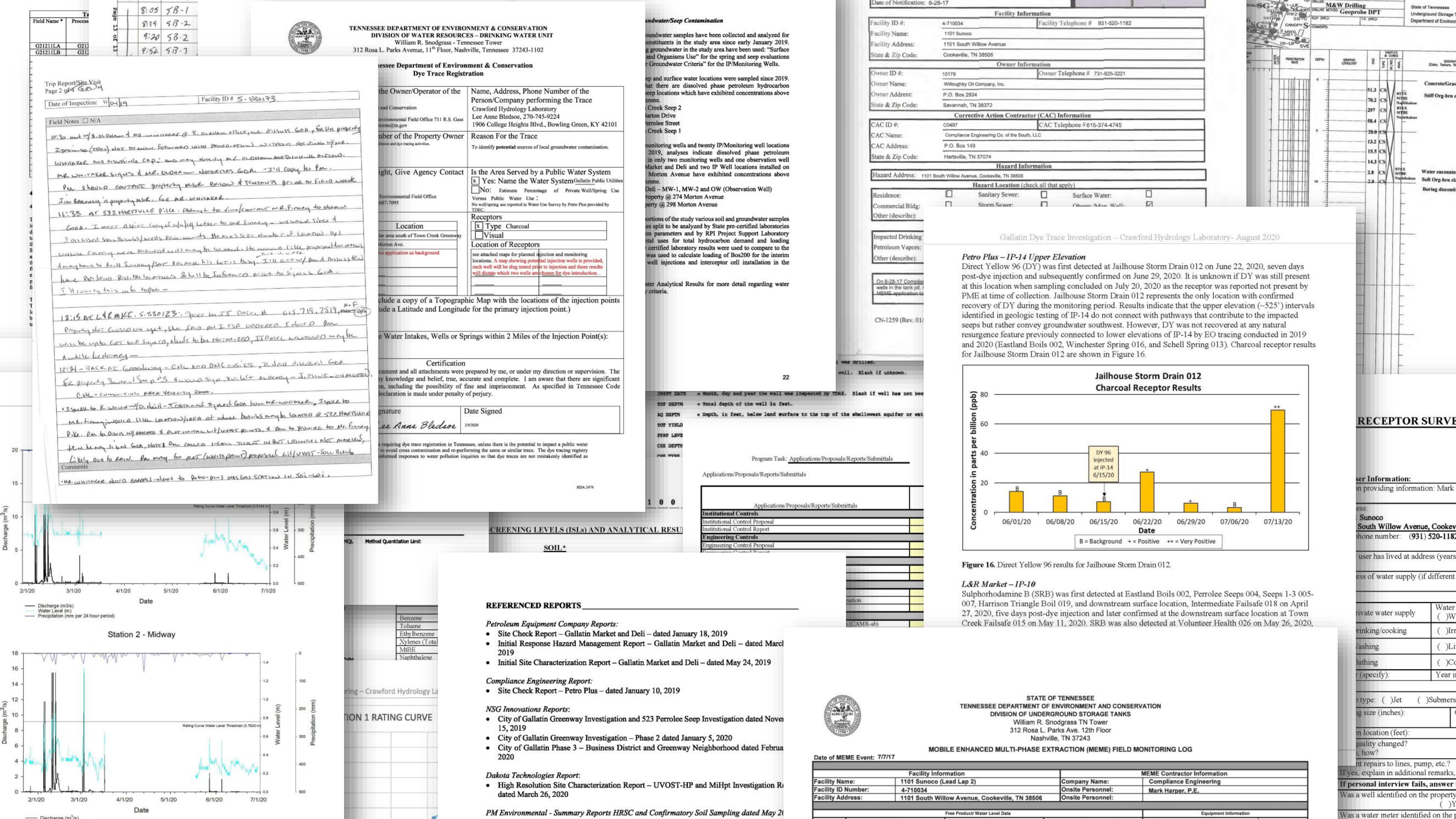
Membrane Interface Probe

Dual-Phase Extraction

High-Resolution Site Characterization

Volatile Organic Compounds

Carbon-Injection



TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER RESOURCES – DRINKING WATER UNIT
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243-1102
Tennessee Department of Environment & Conservation
Dye Trace Registration
Name, Address, Phone Number of the Person/Company performing the Trace
Crawford Hydrology Laboratory
Lee Anne Bledsoe, 270-745-9224
1906 College Heights Blvd., Bowling Green, KY 42101
Reason For the Trace
To identify potential sources of local groundwater contamination.
Is the Area Served by a Public Water System
Yes: Name the Water System Gallatin Public Utilities
Receptors
Type Charcoal
Visual
Location of Receptors
Certification
Signature
Date Signed
3/9/2020
Trip Report/Site Visit
Date of Inspection: 11/04/19
Facility ID # 5-830173
Field Notes
Comments
Date of Notification: 6-28-17
Facility Information
Facility ID #: 4-710034
Facility Telephone # 931-520-1182
Facility Name: 1101 Sunoco
Facility Address: 1101 South Willow Avenue
State & Zip Code: Cookeville, TN 38506
Owner Information
Owner ID #: 10179
Owner Telephone # 731-925-3221
Owner Name: Willoughby Oil Company, Inc.
Owner Address: P.O. Box 2934
State & Zip Code: Savannah, TN 38372
Corrective Action Contractor (CAC) Information
CAC ID #: C0497
CAC Telephone # 615-374-4745
CAC Name: Compliance Engineering Co. of the South, LLC
CAC Address: P.O. Box 149
State & Zip Code: Hartsville, TN 37074
Hazard Information
Hazard Address: 1101 South Willow Avenue, Cookeville, TN 38506
Gallatin Dye Trace Investigation – Crawford Hydrology Laboratory- August 2020
Petro Plus – IP-14 Upper Elevation
Direct Yellow 96 (DY) was first detected at Jailhouse Storm Drain 012 on June 22, 2020, seven days post-dye injection and subsequently confirmed on June 29, 2020. It is unknown if DY was still present at this location when sampling concluded on July 20, 2020 as the receptor was reported not present by PME at time of collection. Jailhouse Storm Drain 012 represents the only location with confirmed recovery of DY during the monitoring period. Results indicate that the upper elevation (~525') intervals identified in geologic testing of IP-14 do not connect with pathways that contribute to the impacted seeps but rather convey groundwater southwest. However, DY was not recovered at any natural resurgence feature previously connected to lower elevations of IP-14 by EO tracing conducted in 2019 and 2020 (Eastland Boils 002, Winchester Spring 016, and Schell Spring 013). Charcoal receptor results for Jailhouse Storm Drain 012 are shown in Figure 16.
Jailhouse Storm Drain 012
Charcoal Receptor Results
Concentration in parts per billion (ppb)
DY 96 Injected at IP-14 6/15/20
Date
B = Background + = Positive ++ = Very Positive
Figure 16. Direct Yellow 96 results for Jailhouse Storm Drain 012.
L&R Market – IP-10
Sulphorhodamine B (SRB) was first detected at Eastland Boils 002, Perrolee Seeps 004, Seeps 1-3 005-007, Harrison Triangle Boil 019, and downstream surface location, Intermediate Failsafe 018 on April 27, 2020, five days post-dye injection and later confirmed at the downstream surface location at Town Creek Failsafe 015 on May 11, 2020. SRB was also detected at Volunteer Health 026 on May 26, 2020,
REFERENCED REPORTS
Petroleum Equipment Company Reports:
Site Check Report – Gallatin Market and Deli – dated January 18, 2019
Initial Response Hazard Management Report – Gallatin Market and Deli – dated March 2019
Initial Site Characterization Report – Gallatin Market and Deli – dated May 24, 2019
Compliance Engineering Report:
Site Check Report – Petro Plus – dated January 10, 2019
NSG Innovations Reports:
City of Gallatin Greenway Investigation and 523 Perrolee Seep Investigation dated November 15, 2019
City of Gallatin Greenway Investigation – Phase 2 dated January 5, 2020
City of Gallatin Phase 3 – Business District and Greenway Neighborhood dated February 2020
Dakota Technologies Report:
High Resolution Site Characterization Report – UVOST-HP and MiHpt Investigation Report dated March 26, 2020
PM Environmental - Summary Reports HRSC and Confirmatory Soil Sampling dated May 20
STATE OF TENNESSEE
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF UNDERGROUND STORAGE TANKS
William R. Snodgrass TN Tower
312 Rosa L. Parks Ave. 12th Floor
Nashville, TN 37243
MOBILE ENHANCED MULTI-PHASE EXTRACTION (MEME) FIELD MONITORING LOG
Date of MEME Event: 7/7/17
Facility Information
Facility Name: 1101 Sunoco (Lead Lap 2)
Facility ID Number: 4-710034
Facility Address: 1101 South Willow Avenue, Cookeville, TN 38506
MEME Contractor Information
Company Name: Compliance Engineering
Onsite Personnel: Mark Harper, P.E.
Station 2 - Midway
Discharge (m3/s)
Water Level (m)
Precipitation (mm)
Date
Program Task: Applications/Proposals/Reports/Submittals
Institutional Controls
Institutional Control Proposal
Institutional Control Report
Engineering Controls
Engineering Control Proposal
SCREENING LEVELS (ISLs) AND ANALYTICAL RESULTS
SOIL*
Benzene
Toluene
Ethylbenzene
Xylenes (Total)
MtBE
Naphthalene
RECEPTOR SURVEY
M&W Drilling
Geoprobe DPT

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

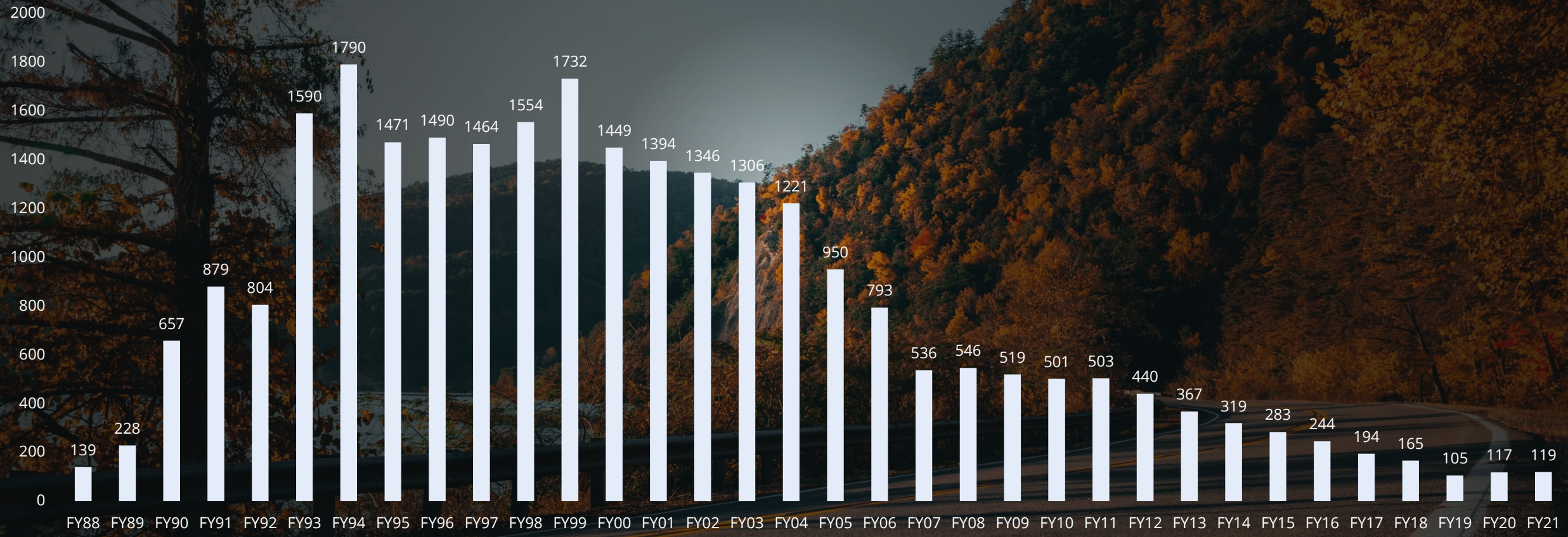
Compliance

Project Management

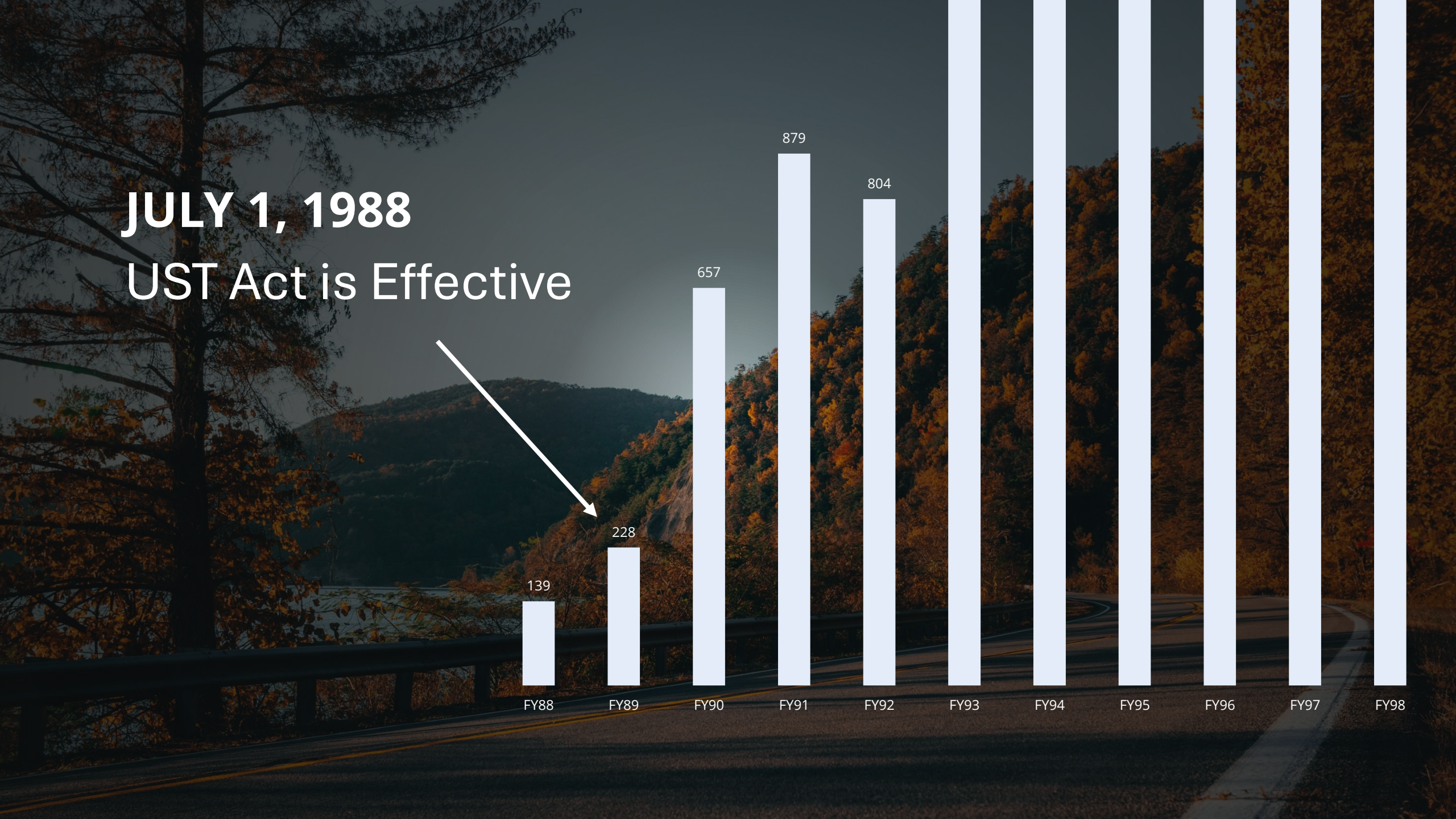
Enforcement

Reimbursement

UST Program Evolution and Open Remediation Projects

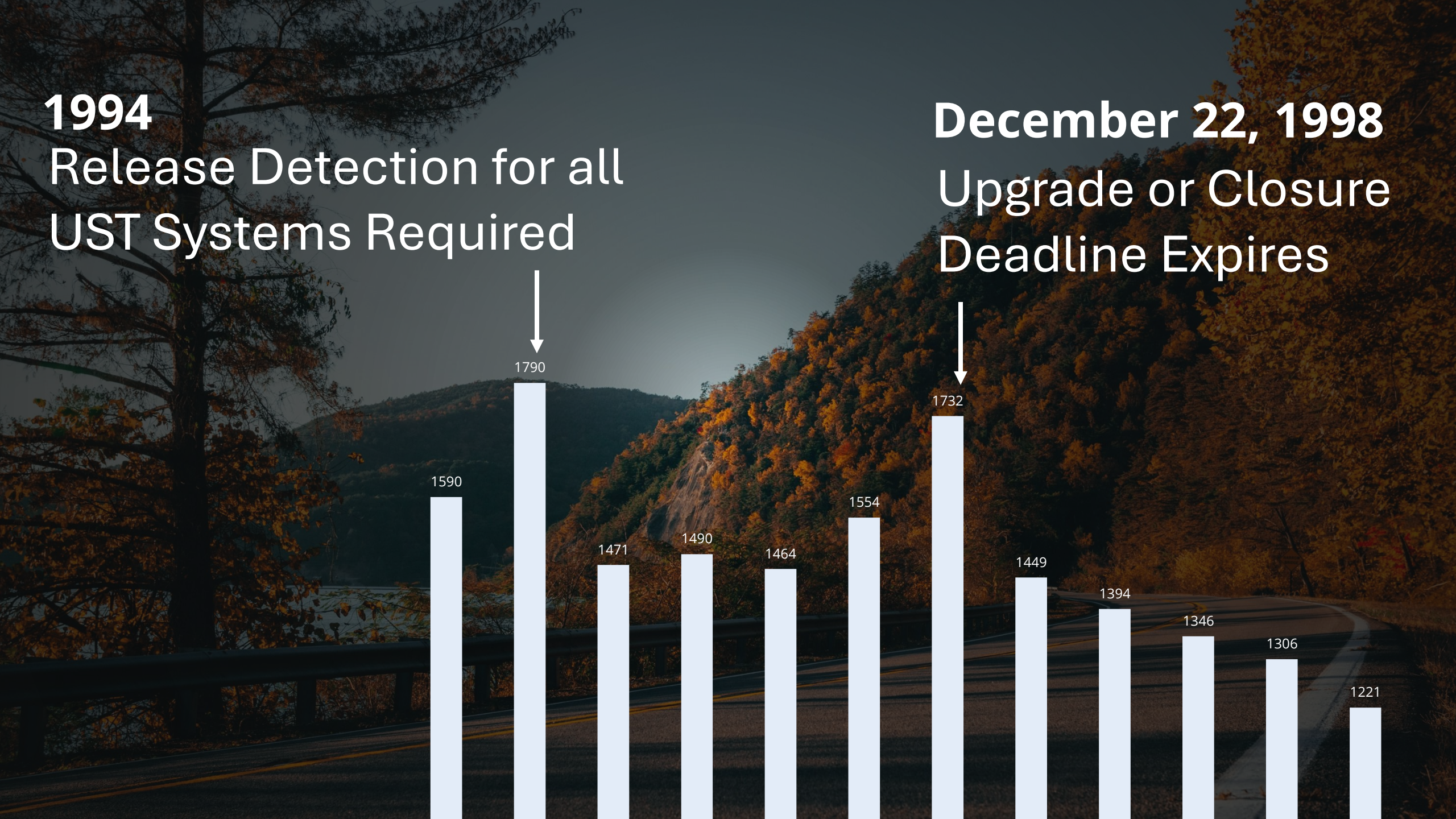


JULY 1, 1988
UST Act is Effective



1994
Release Detection for all UST Systems Required

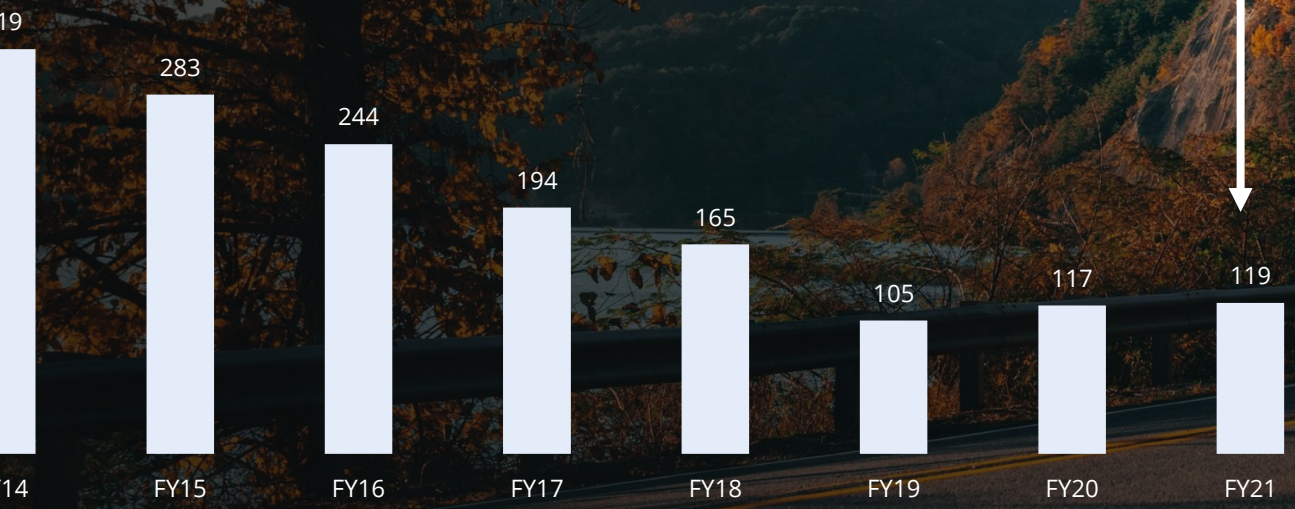
December 22, 1998
Upgrade or Closure Deadline Expires




394
1346
1306
1221
950
793
536
546
519
501
503
440
2010
Deployment Begins for State Owned Dual Phase Corrective Action Systems

2021

Tennessee’s Cleanup Percentage reaches 99.25%

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879
804
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1790
1471
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1554
1732
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1346
1306
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950
793
536
546
519
501
503
440
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319
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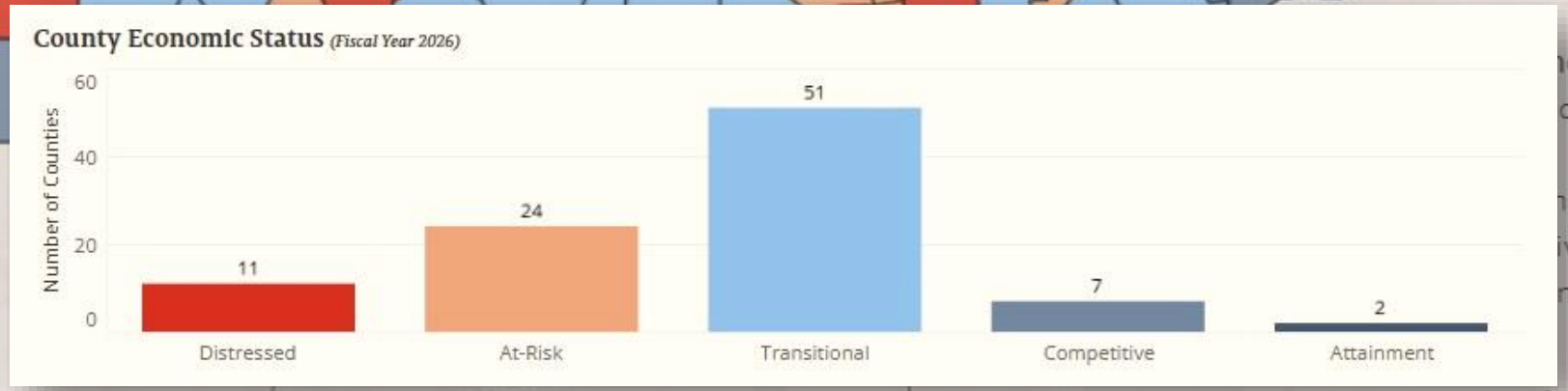
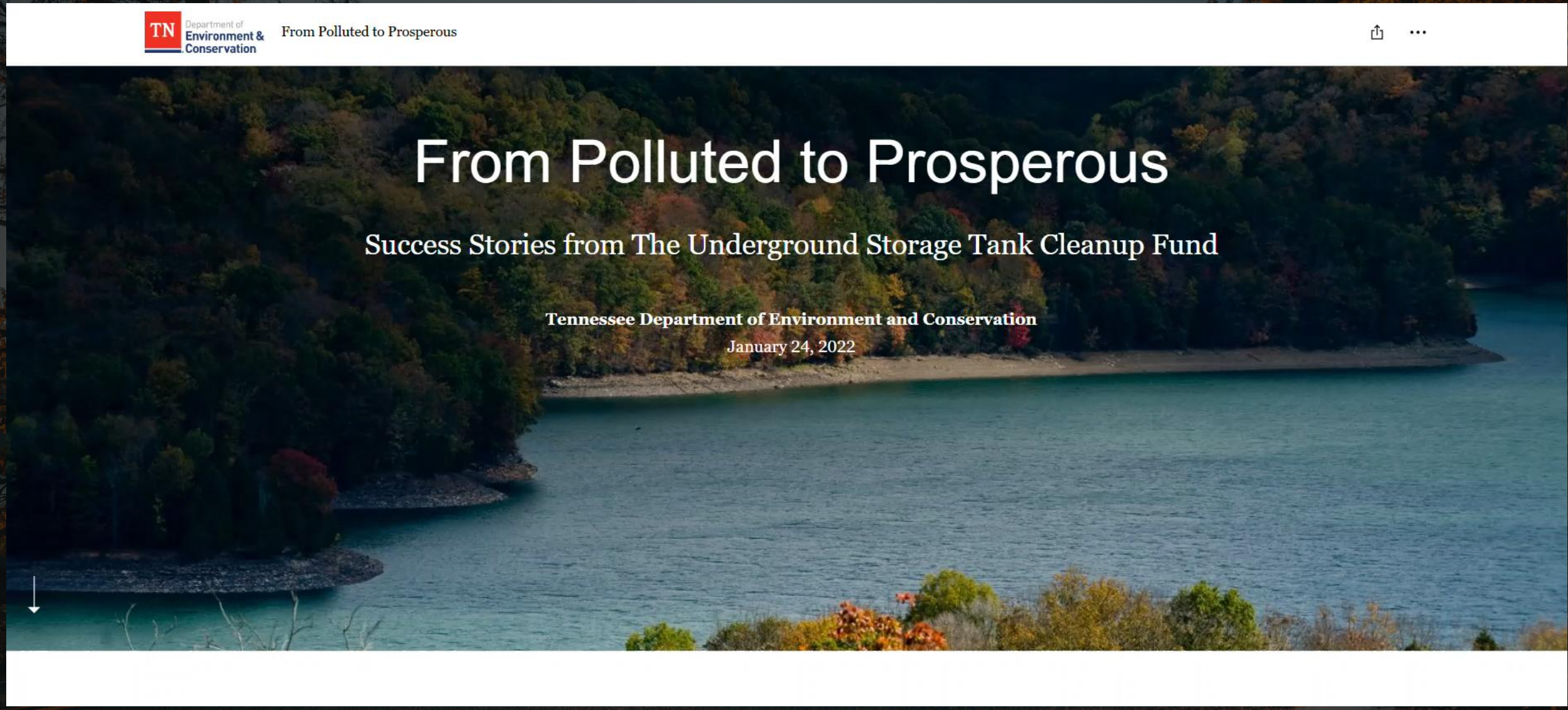
FY21

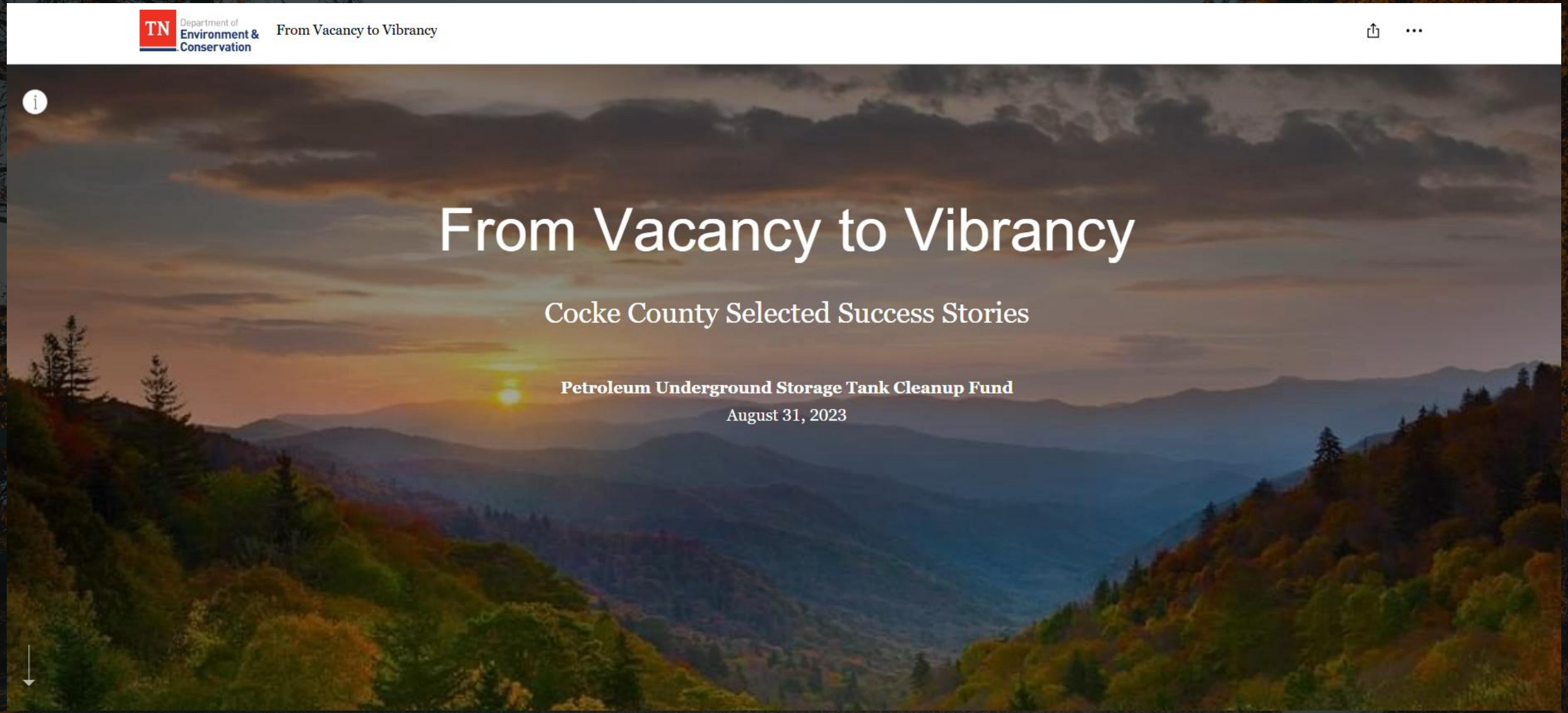
Economically Distressed Counties



Clay County


TN Department of Environment & Conservation
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

Cocke County




ROUTE
HISTORIC NEWPORT
ESTABLISHED 1890
WELCOME TO
Newport
Welcome to
HISTORIC DOWNTOWN
NEWPORT
1 8 9 0
TN
Department of
Environment &
Conservation

Hardeman County

Leaks to Legacy

A journey of community endurance

TDEC Division of Underground Storage Tanks

January 14, 2025


SURVEY
CREW
SURVEY
CREW
Leica
463 VNS


ROBERTSON
SUMNER
Gallatin
TROUSDA
Lebanon
Nashville
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

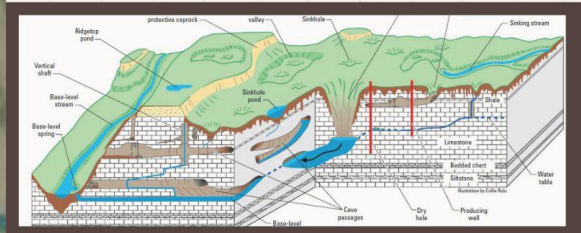
Where does the water go?

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.

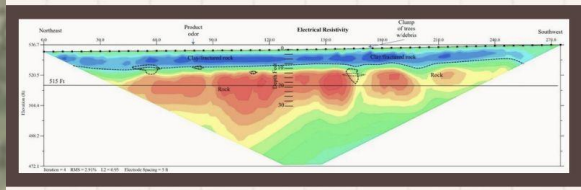


Complications

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.

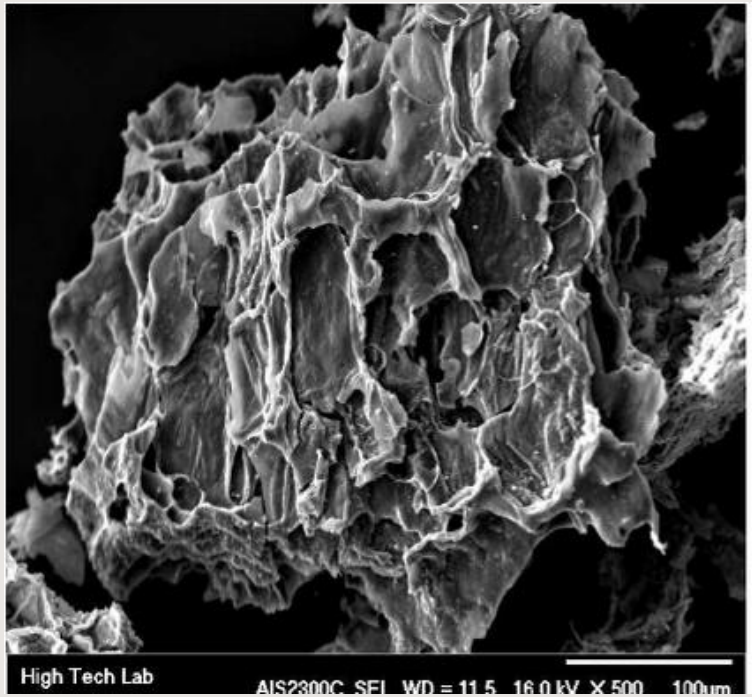
Investigations

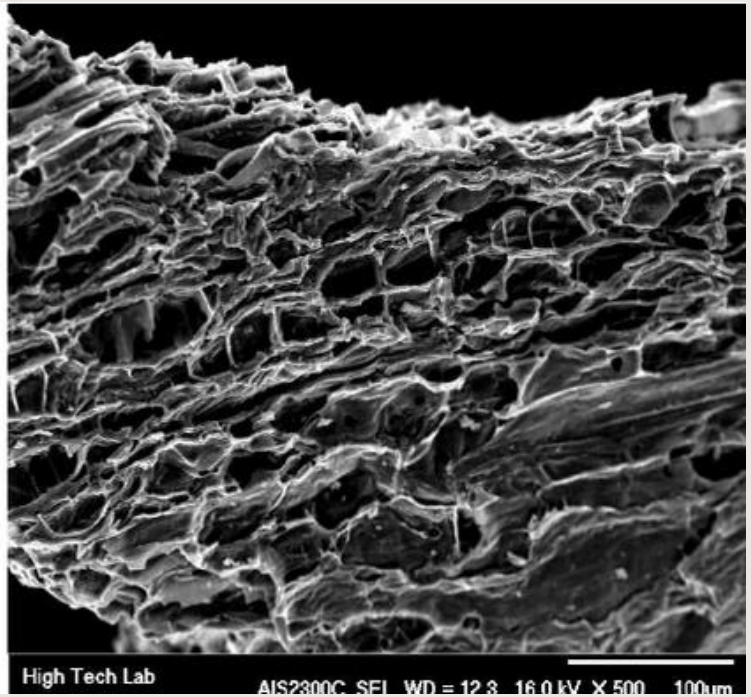
Remote sensing using 2D Electrical Resistivity helped to identify lithology, fracture or weathering zones, rock profiles, karst and epikarst features, as well as light non-aqueous phase liquids (LNAPLs) like petroleum hydrocarbon products.




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



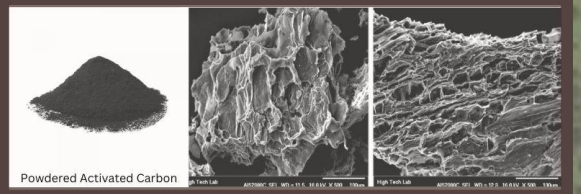


Activated Carbon

What does it do?

Material

Activated carbon is a finely ground material with extremely high surface area capable of trapping vast quantaties of chemicals within it's 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 contaminates accelerating biodegradation. The coupling of adsorption and degradation make activated carbon a valuable tool in addressing petroleum contaminates 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.


GREAT SEAL OF THE STATE OF TENNESSEE
XVI
AGRICULTURE
COMMERCE
THE ★ 1796 ★
TN
Department of
Environment &
Conservation


HONEYSUCKLE
ICE

Public Outreach

TN Department of Environment & Conservation

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.

TN Department of Environment & Conservation

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.

Public Outreach

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
- Illicit Discharge Detection and Elimination

Home › Departments › Engineering › Stormwater › 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 - en espanol.pdf


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