



Department of
**Environment &
Conservation**

**Division of UST Tank School
Release Investigation, Release Response and
Corrective Action**

WHAT,
WHEN, and
WHY?

History - Federal Laws

U.S. Code, Title 42, Chapter 82, Subchapter IX

YEAR	Congressional Action
1984	Subtitle I was added to the Solid Waste Disposal Act through the Hazardous and Solid Waste Amendments. <ul style="list-style-type: none">• Created a federal program to regulate USTs that contain petroleum and hazardous chemicals
1986	Subtitle I was amended through the Superfund Amendments Reauthorization Act. <ul style="list-style-type: none">• Leaking Underground Storage Tank (LUST) Trust Fund created
2005	Energy Policy Act of 2005 amended Subtitle I of the Solid Waste Disposal Act.
2009	American Recovery And Reinvestment Act of 2009 (Recovery Act).
2015	The 2015 UST regulation changed certain portions of the 1988 underground storage tank technical regulation.
Source: https://www.epa.gov/ust/learn-about-underground-storage-tanks-usts	

History - Federal Regulations

- 1988 - EPA initially issued UST regulations
- 2015 - EPA modified the UST regulations

40 CFR Part 280: TECHNICAL STANDARDS AND CORRECTIVE ACTION REQUIREMENTS FOR OWNERS AND OPERATORS OF UNDERGROUND STORAGE TANKS (UST)

- <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-280>

40 CFR Part 281: APPROVAL OF STATE UST UNDERGROUND STORAGE TANK PROGRAMS

- <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-281?toc=1>

State Program Approval (SPA)

State program approval objectives

- Subtitle I allows state UST programs approved by EPA to operate in lieu of the federal program, and EPA's state program approval regulations set standards for state programs to meet. States may have more stringent regulations than the federal requirements.

40 CFR Part 281 Subpart C - Criteria for No Less Stringent

- § 281.34 Release reporting, investigation, and confirmation
- § 281.35 Release response and corrective action

“In order to be considered no less stringent than the corresponding federal requirements...”

Tennessee UST Program

Federal: Subtitle 1 regulates USTs that contain petroleum and hazardous chemicals

State of Tennessee: Tenn. Code Ann. § 68-215-101 is the Tennessee Petroleum Underground Storage Tank Act

- Does not include USTs that contain hazardous chemicals

Tenn. Code Ann. § 68-215-102 states in part “It is the intent of the general assembly that this chapter shall not apply retroactively to releases or other events that occurred prior to July 1, 1988.”

- Federal does not have this

Codes and Standards Developing Organizations

API -- American Petroleum Institute

ASTM International-- formerly American Society for Testing and Materials

KWA -- Ken Wilcox Associates, Inc.

FTPI -- Fiberglass Tank and Pipe Institute

NACE International (formerly the National Association of Corrosion Engineers)

NFPA -- National Fire Protection Association

NLPA -- National Leak Prevention Association

PEI -- Petroleum Equipment Institute

STI -- Steel Tank Institute

UL -- Underwriters Laboratories Inc.



Manuals
Guidelines
Forms
Training
Policies
Etc.

State: Rules

State: Act



Federal Law
and
Regulations

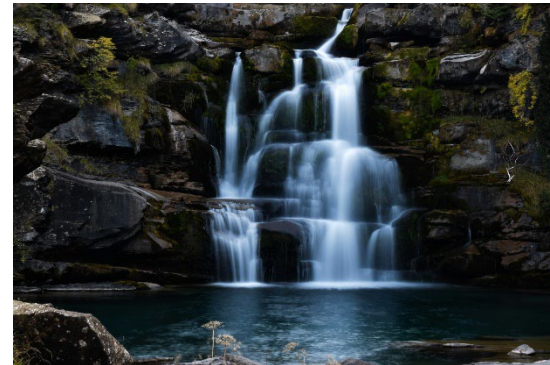
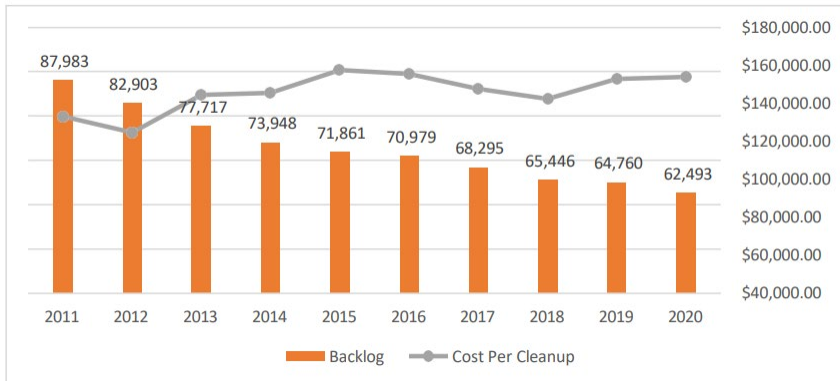
WHY?

February 24, 2023



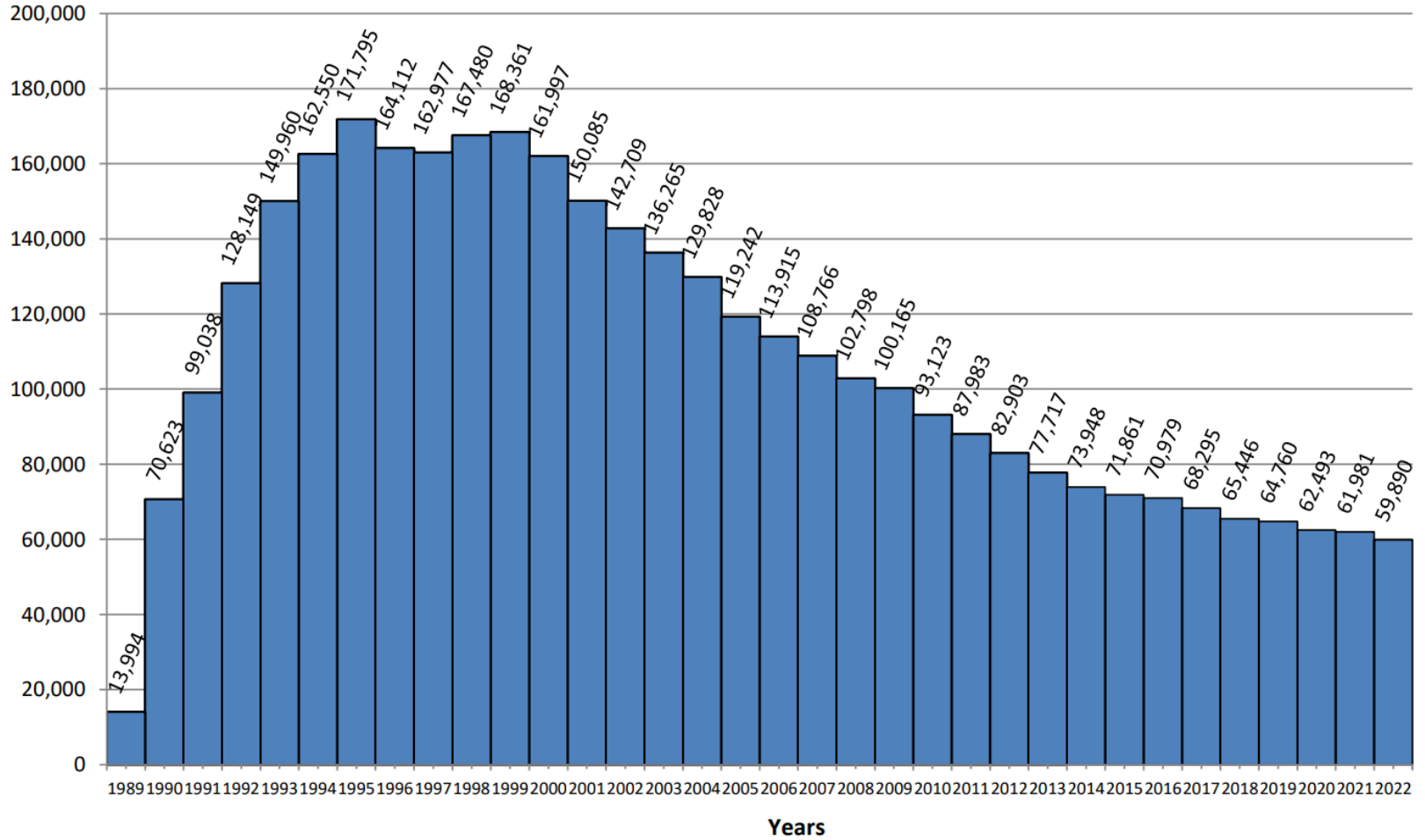
ASTSWMO, Providing Pathways to Our Nation's Environmental Stewardship Since 1921

Sustainability of State Financial Assurance Funds for the Underground Storage Tank Programs

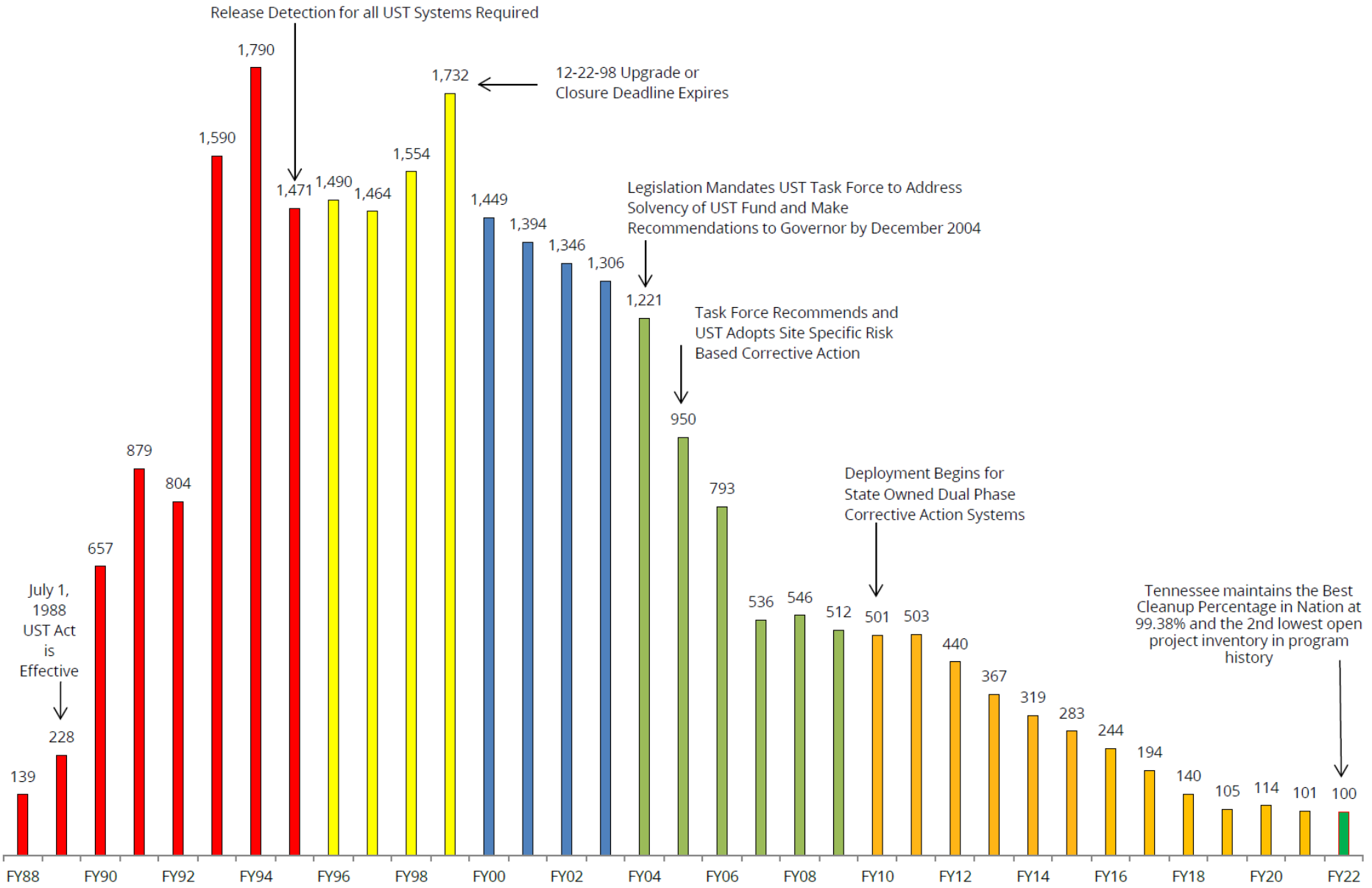


UST National Backlog: FY 1989 Through End-of-Year FY 2022

National Backlog (Confirmed Releases - Cleanups Completed)



Tennessee Open Cleanup Inventory - 2nd Lowest in Program History
 FY88 through End-of-Year FY22
 EPA Sources: <http://archive.epa.gov/oust/cat-a/web/html/camarchv.html> and
<https://www.epa.gov/ust/ust-performance-measures>



Takeaway?

An ounce of prevention is worth a
pound of cure.

Benjamin Franklin

Annual Costs

- As reported in the 2021 Annual State Fund Survey/Tanks Update by Tennessee

Total annual amount paid = \$9,100,000

Outstanding claims = \$1,400,000



<https://astswmo.org/category/tanks/state-fund-financial-responsibility-task-force/>

Funding



Funding Sources (Primary / State)

- Petroleum underground storage tank fund
 - Environmental assurance fee of four tenths of one cent (0.4¢) per gallon on each gallon of petroleum products imported into this state and petroleum products manufactured in this state
 - Underground storage tank fees – suspended from July 1, 2021 to June 30, 2026
 - Civil penalties and damages collected

Funding Sources (Other / Federal)

- Leaking Underground Storage Tank (LUST) Trust Fund
 - Financed by a 0.1 cent tax on each gallon of motor fuel sold nationwide
 - EPA provides almost 90 percent of its LUST money directly to states, territories, and tribes to implement UST cleanup and prevention programs
 - States must enter into an assistance agreement with the federal government to spend the money for its intended purpose
 - Cleanup monies used for:
 - Sites that require prompt action to protect human health and the environment and/ or where the responsible party is unknown, unwilling or unable to perform the cleanup
 - Oversee corrective actions by responsible parties

Act



Definitions

- “Release” means any spilling, overfilling, leaking, emitting, discharging, escaping, leaching or disposing of a petroleum substance from a petroleum underground storage tank or its associated piping into groundwater, surface water, or subsurface soils
- “Occurrence” means the discovery of environmental contamination at a specific time and date, due to the release of petroleum products from petroleum underground storage tanks

Tenn. Code Ann. § 68-215-103

Rules



Suspected Release

- Environmental Impact
 - These impacts include the discovery of petroleum escaping from the UST system, associated containment devices, or any component of a tank, line, dispenser, meter, or line leak detector, not designed for the purpose of dispensing petroleum as well as the discovery of petroleum in the environment (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface and drinking waters) that has been observed by the Division or brought to its attention by another party

0400-18-01-.05(2)

Suspected Release

Site check

Measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, must consider the nature of the stored petroleum, the type of initial alarm or cause for suspicion, the type of backfill, the depth of groundwater, and other factors appropriate for identifying the presence and source of the release.

0400-18-01-.05(3)(b)

Suspected Release

- If the test results indicate that a release has occurred, corrective action must be conducted in accordance with Rule 0400-18-01-.06
- If the test results do not indicate that a release has occurred, further investigation is not required

Suspected Release

Field activities and environmental data

During the course of the release investigation and confirmation activities:

- Division shall be notified at least one (1) working day in advance of activities.
- Soil borings and/or monitoring wells shall be drilled, converted to monitoring wells and/or abandoned in accordance with guidance provided by the division.
- Environmental samples must be collected, labeled, handled, transported, analyzed and reported as specified.

Confirmed Release

- A confirmed release from a UST system shall comply with Rule 0400-18-01-.06
 - Division shall be notified at least one working day in advance of any routine field activity
 - Division shall be notified by no later than one working day after any non-routine field activity, such as emergency response activities

Confirmed Release

- Soil borings and/or monitoring wells shall be drilled, converted to monitoring wells and/or abandoned in accordance with guidance provided by the division.
- Environmental samples must be collected, labeled, handled, transported, analyzed and reported as specified.
- Rule applies to all newly reported and/or discovered releases from petroleum underground storage tanks

Monitoring Well



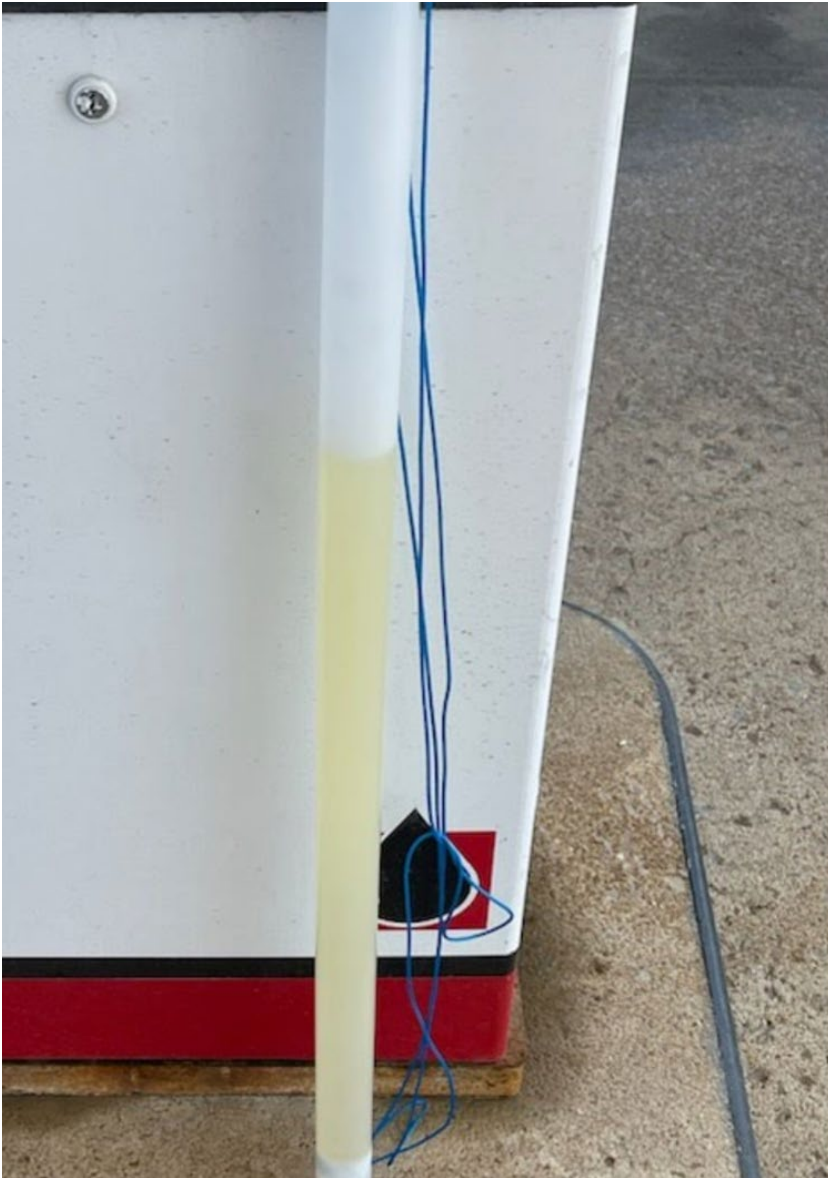
Confirmed Release

- Initial Response
 - Report release to Division within 72 hours
 - Take immediate action to prevent any further release of petroleum to the environment
 - Take immediate action to identify and manage fire, explosion, and/or vapor hazard
 - Visually inspect any aboveground releases or exposed below ground releases and prevent further migration of the petroleum into surrounding soils and/or groundwater
 - Perform water use survey, sample drinking water supplies within 0.1 mile

Confirmed Release

- Hazard Management
 - Report the discovery of impacted drinking water, petroleum vapors, free product, and/or other hazards to the Division within 72 hours
 - Abatement measures shall be taken immediately to manage human health hazards such as:
 - Impacted drinking water
 - Vapor hazards
 - Free Product
 - Other identified hazards

Free Product



Confirmed Release

- Initial Site Characterization and Exposure Assessment
 - Site Assessment
 - 4 borings completed as monitoring wells
 - Additional monitoring wells can be requested or required
 - Initial Site Characterization Report
 - Site history
 - Release history
 - Site conditions
 - Risk Factors
 - Risk Analysis Report (RAR)

Confirmed Release

- If hazards have been abated and concentrations of chemicals of concern are below Site-Specific Cleanup Levels (SSCLs) as calculated in the RAR, then:
 - Closure monitoring may be required
 - Proper abandonment of wells is required

Upon completion, contamination case can be closed, no further action required.

Confirmed Release

- Consideration of Additional Corrective and/or Risk Management Measures
 - Can be requested or Division can require if the use of specific additional measures will result in a more cost effective approach to case management and/or in faster contamination case closure
- Interim Remediation and/or Risk Management
 - Source removal, risk reduction, institutional control, or engineering control
- Advanced Risk-Based Modeling

Confirmed Release

- Corrective Action Plan
 - Notice to the public shall be made by means designed to reach those members of the public directly affected by the release and the planned corrective action
 - If implementation of an approved Corrective Action Plan does not achieve the established cleanup levels in the plan and termination of that plan is under consideration by the Division, then public notice of such will be required

Guidelines



Screening and Cleanup Levels

- For a site that previous assessment has not been conducted or cleanup levels established, and an Exposure Assessment has not been completed, then soil and/or groundwater sample results should be compared to the Initial Screening Levels (ISLs).
- For a site that a release has been confirmed, and an Initial Response and Hazard Management Report (IRHMR) and Initial Site Characterization Report (ISCR) has been required, then the Risk-Based Cleanup Levels (RBCLs) should be utilized to map and delineate contaminant plume(s), which may include interpolation and/or extrapolation, for source widths required for the RAR.

Screening and Cleanup Levels

- The RAR was utilized to establish ISLs and RBCCLs, utilizing the most stringent scenario for onsite consideration only
- RAR based in part on ASTM International: Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. Designation E 1739 - 1995
- Site-Specific Cleanup Levels are dependent on:
 - Product(s) released
 - Pathways and receptors as well as surface water
 - Onsite and offsite

RAR

- Most important step is water use and receptor survey
 - Must know use of subject property and all properties within 0.1 mile
 - Must know all drinking water supplies, both drinking water wells and surface water intakes, within 0.5 mile
 - Must know surface water, not utilized for domestic water supply, within 0.1 mile
- Soil type and depth to groundwater can affect the calculations significantly

Guidelines

- Site Check Report Guidelines
- Environmental Assessment Guidelines
- Initial Site Characterization Guidelines – Parts A and B
- Initial Response and Hazard Management Report Guidelines – Part A
- Initial Site Characterization Guidelines
- Corrective Action Plan Guidelines (associated figures and spreadsheets)
- Chemicals of Concern
- Reimbursement Guidance Document (RGD) – 002 and attachment

Technical Guidance Documents (TGDs)

- TGD-002 Division of Water Supply's Primary and Secondary Drinking Water Standard
- TGD-004 Requirements for Free Product Removal
- TGD-005 Sampling Requirements for Excavated Material
- TGD-006 Standard Drilling Log
- TGD-007 Monitoring at UST Sites (with workbook)
- TGD-009 Requirements to Treat Petroleum Contaminated Soil Generated from Release from USTs
- TGD-010 Procedures to Obtain a NPDES Permit at a Petroleum UST Site and the Division's Interim Requirements
- TGD-012 General Facility Site Check
- TGD-013 Fund Eligibility Site Check

Technical Guidance Documents (TGDs)

- TGD-016 Mobile Enhances Multi-Phase Extraction (with field monitoring logs)
- TGD-017 Risk-Based Corrective Action (with RAR and reference tables)
- TGD-018 Requirements for Conducting Soil Gas Surveys (with lookup table and cost proposal)
- TGD-019 Impacted Drinking Water Management
- TGD-020 Petroleum Vapor Management

General Information

- Traditional assessment methods include soil samples and monitoring well installation for groundwater sampling
- Alternative assessment methods include:
 - Laser Induced Fluorescence (LIF)
 - Membrane Interface Probe (MIP)
 - Optical Image Profiler (OIP)
 - Downhole Geophysics
 - Surface Geophysics

When corrective action is necessary, utilizing both traditional and applicable alternative assessment methods prior to corrective action plan has allowed for more focused plans

Direct Push



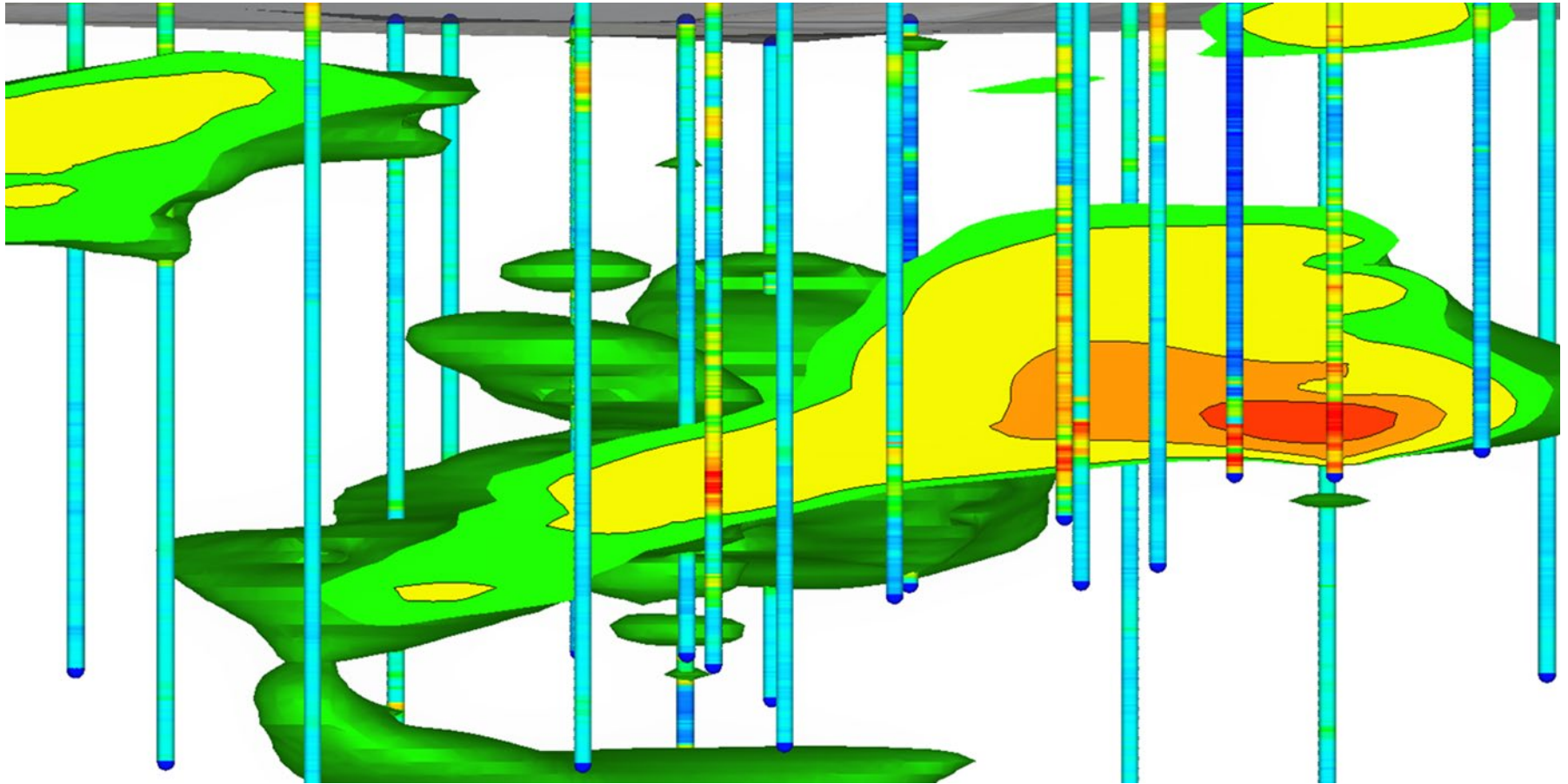
20 → 20²⁰ → 11 LIF-10

12 & 12





3-D Model of LIF data



General Information

- Preferred corrective action measures:
 - Excavation for shallow, contaminated soil
 - Dual-phase extraction for groundwater as well as soil that can't feasibly be excavated
- Alternative Corrective Actions (use increased in last 5 years)
 - Activated carbon injections or addition to backfill of excavated areas
 - UST System removal as a corrective action measure



07.29.2020 09:14



01.14.2020 11:18







**UNDERGROUND STORAGE
TANK REMEDIATION
TREATED GROUNDWATER
DISCHARGE
ATC GROUP SERVICES LLC
(901) 259-2362
NPDES PERMIT TRACKING # TNG830261
TN DIVISION OF WATER RESOURCES
(888) 891-8332
ENVIRONMENTAL FIELD OFFICE-JACKSON**

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Typical UST Site (utilities/obstructions)



Large Excavation



Activated Carbon Application to Excavated Area



Activated Carbon Injection - Grid



Large Project – Community 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.

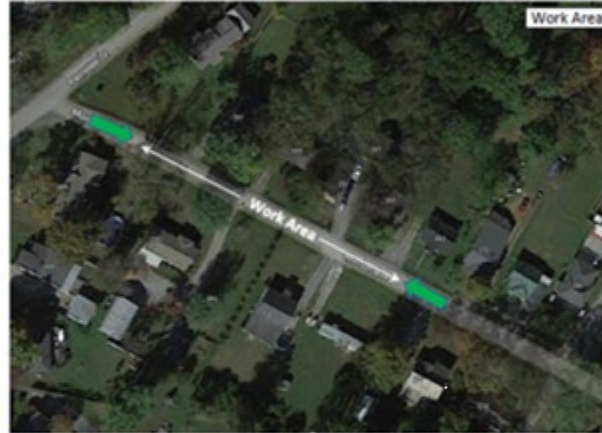
Starting April 4th, a line of remediation borings will be installed along the west-bound lane of Morton Avenue, between addresses 285 and 297. Each boring will be injected with a food-grade activated carbon and nutrient mixture. The activated carbon will adsorb the petroleum while the nutrients will 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.



Thank You!

Questions?

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TN

Department of
Environment &
Conservation