A Guide to Understanding Underground Storage Tanks
Risks, Requirements, Insurance, Lifecycle

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Abstract

Owning and/or operating one or more underground storage tanks (USTs) involves a significant upfront financial investment, along with annual costs to maintain and operate them. USTs are used to store a variety of materials including, but not limited to, water, wastewater, virgin product, hazardous materials, petroleum products and hazardous waste. As over 99% of all active, regulated USTs contain petroleum products, this paper will focus on tanks that store petroleum products.[i] This paper presents the risks involved with owning or operating USTs, a brief overview of regulatory requirements, a discussion of insurance as a financial assurance mechanism, and the potential catastrophic financial loss one could incur if they do not properly protect themselves. It will explain when and why it is financially advantageous to remove or replace a UST.

About Environmental Risk Professionals

Environmental Risk Professionals is a team of highly experienced risk professionals determined to help contractors and other business owners minimize pollution claims. Through Pollution Prevention Practices, Operation and Maintenance Plans and other services, Environmental Risk Professionals helps businesses understand their risk exposure and in turn, mitigate potential claims and effects on the environment.

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Introduction

USTs present environmental exposures that can be managed through inspections, testing and periodic maintenance. However, no matter how well a company manages their USTs, spills or leaks can occur from USTs or their associated equipment. Spills or leaks can contaminate soil and groundwater and migrate to surface waters or neighboring properties. They can also lead to third-party bodily injury and property damage, and natural resource damage claims. Owners and operators must not only comply with regulations; they must manage their tanks and their finances to protect themselves against costly environmental cleanups, claims, maintenance, and tank removal costs.

Risks Associated with Storage Tanks

A release from a UST system can impact drinking water or surface water bodies, contaminate soil and groundwater, and migrate offsite to surrounding properties. Additionally, releases can result in clean-up costs, third-party bodily injury and property damage claims, and natural resource damage claims. The risk of a release varies based on the age of the tanks, construction of the tanks and associated systems, effectiveness of tank monitoring and maintenance, type of leak detection, and other factors.

One source of releases is the delivery of product into a storage tank, where the product delivery hose is connected to a fill pipe and pumped into the tank. Improper hose connections or product left in the hose following disconnection can lead to leaks or spills. Additionally, spills can occur when a tank is overfilled with more product than it can hold. Devices such as a catchment basin (or spill bucket) to collect drips and spills that may occur when product hoses are uncoupled from the fill pipe, and overfill prevention measures including overfill alarms, automatic shutoff devices, and flow restrictors help reduce the risks of a release during delivery.

In addition to spills from product delivery, leaks can occur from one or more areas of a storage tank system. Common areas where leaks can occur include underneath the dispenser island, from the spill bucket, from submersible pumps, along the piping that conveys the fuel from the tank to the dispenser, from UST system sumps, and from the tank itself.

For metal UST system components including piping or tanks, corrosion can occur over time, leading to holes and loss of product. According to the EPA, some emerging fuels (containing ethanol or biodiesel) can increase corrosion in UST systems. The 2001 Highway Diesel Rule required cleaner burning diesel fuel, reducing the sulfur content from 500 parts per million to 15 parts per million. Since the reduction in sulfur content, state inspectors across the country have noted an increase in both fuel seeps around gaskets and corrosion in UST systems. A 2016 EPA study of 42 operational diesel tanks concluded that 83 percent exhibited moderate or severe corrosion on metal components within the UST system.[ii] In addition, data suggests there may be a greater incidence of corrosion problems in states with high humidity and temperatures favorable to microbial growth, than states with drier climates.[iii] Corrosion protection systems can help slow or prevent the degradation of metal tank components. Corrosion and installation issues resulted in the highest cost releases. [iv]

Secondary containment systems for tanks, piping, or other UST system components combined with regular maintenance and leak detection systems can help reduce the probability and extent of contamination that may result from a release from a UST system.

Tank age is another significant risk factor. The longer storage tank systems are in use, the higher the risk for the tank, piping, and other components to deteriorate and eventually have a leak.

Storage Tank Regulations

Based on the threat posed by leaking UST systems to groundwater, Congress added Subtitle I to the Solid Waste Disposal Act in 1984, which created a federal program to regulate USTs containing petroleum and hazardous chemicals, and directed EPA to establish operating requirements and technical standards. The first UST regulation was promulgated in 1988 by the EPA, with major revisions in 2015. A complete version of the federal law governing USTs can be found at U.S. Code, Title 42, Chapter 82, Subchapter IX. As of September 2020, 47 states and territories have updated their UST regulations to incorporate the 2015 federal UST requirements. State regulations regarding USTs may be more stringent that the federal requirements. Refer to the state UST program where your facility is located for information on their requirements. A source for state regulations is the following webpage:

www.sourcena.com/state-by-state-guide

A UST is defined by the EPA as a tank and any underground piping connected to the tank that has at least

10 percent of its combined volume underground.[v] Federal UST regulations only apply to UST systems that store petroleum or certain hazardous materials identified under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). There are approximately 1,200 substances currently identified as hazardous under CERCLA, refer to U.S. Code, Title 40, Chapter I, Subchapter J, Part 302.

The following types of tanks do not have to meet federal UST regulations:

- Farm and residential tanks of 1,100 gallons or less capacity holding motor fuel used for noncommercial purposes
- Tanks storing heating oil used on the premises where it is stored
- Tanks on or above the floor of underground areas, such as basements or tunnels
- Septic tanks and systems for collecting stormwater and wastewater
- Flow-through process tanks
- Tanks of 110 gallons or less capacity
- Emergency spill and overfill tanks

Although the tanks mentioned above do not need to meet federal UST regulations, some state and local regulatory agencies may include these tank types in their UST regulations.

Federal UST regulations include technical standards for UST systems, including release prevention and release detection criteria. Release prevention includes criteria to properly install USTs systems; protect USTs from spills, overspills, and corrosion; and correctly fill tanks. Release detection includes specific requirements to detect releases before they migrate away from UST sites. Detection systems can be interstitial (between primary layer and secondary containment), internal, and external to the UST systems. Other requirements include specifics on installation of USTs, operation and maintenance, record keeping and reporting, financial responsibility, and closure of USTs. The EPA's webpage, Resources for UST Owners and Operators, and the EPA publication, *Musts for USTs, November 2015* are good references to gain a better understanding of the federal UST regulations.

Many of the regulations refer to industry codes and standards for properly designing, constructing, installing, maintaining, upgrading, repairing, and closing USTs. The EPA encourages facilities to use the most current version of a code or standard. Industry codes and standards referenced by the EPA can be found on the EPA's UST Laws and Regulations webpage.

The EPA is proposing further revisions to the 2015 UST requirements regarding labeling on fuel dispensers for ethanol containing fuels and UST system compatibility provisions. Refer to the Proposed Rule at:

www.epa.gov/ust/proposed-rulemaking-e15-fuel-dispenser-labeling-and-compatibility-underground-storage-tanks

Financial Responsibility

Subpart H of the federal UST regulations requires petroleum UST owners to demonstrate financial responsibility, [vi] the ability to pay for cleanup or third-party liability compensation resulting from a release from a storage tank. Either the owner or the operator may demonstrate financial responsibility; however, if neither party complies with the financial responsibility requirements, both can be held liable. More details on financial responsibility requirements can be found in the following EPA publications: Dollars and Sense: Financial Responsibility Requirements For USTs, July 2018 and Financial Responsibility For USTs: A Reference Manual, January 2000.

According to the EPA, the most commonly used financial assurance mechanisms are state funds and private insurance. From 1992 to 2020, state UST financial assurance funds have received over 1.5 million claims and paid approximately $23.68 billion to clean up leaking UST sites.[vii]

As of the beginning of 2021, thirty-seven states had state financial assurance funds.[vii] The manner in which these funds are allocated differs from state to state. These funds typically require owners to either pay a deductible or a percentage of the cleanup costs. Also, the coverage provided by the funds differs. Some state funds do not cover third-party bodily injury or property damage claims. Also, natural resource damage claims are often not specifically addressed in state fund language.

Pollution liability insurance is a frequently used method to comply with the financial assurance requirements. It is the only financial assurance mechanism to provide legal defense costs. A storage tank policy can be used to cover losses specifically associated with UST systems. The losses include discovery of a leak from a tank or its associated piping, a leak migrating to an adjacent property, damage to natural resources, spills during loading and unloading, defense against third party claims and costs associated with responding to an emergency situation where contamination is of imminent danger to human health or the environment. For a tank to be covered, it must be scheduled on the policy.

A storage tank policy cannot be used to cover the costs associated with tank removal and/or replacement or disposal of waste materials. It also does not cover costs associated with tanks that are not listed on the policy (e.g., discovery of a previous unknown tank). Furthermore, coverage is not provided for costs associated with any other releases from other sources, such as hydraulic lifts, oil/water separators, etc. that may be present at locations where a UST may be operating. To cover the risks posed by these other sources, UST facilities may consider a premises pollution liability insurance policy. USTs must be individually scheduled on premises pollution liability policies to be covered under those policies. Most states require a certificate of financial responsibility for USTs, and a storage tank liability policy, or certain premises pollution liability policies, can satisfy that requirement.

Other less popular mechanisms for meeting financial assurance include surety bonds, self-insurance, corporate guarantees, trust funds, a letter of credit and, in some cases, local government options. Financial responsibility for a UST is no longer required after the tank has been properly closed or, if corrective action is required, after corrective action has been completed and the tank has been properly closed, as required by 40 CFR Part 280, Subpart G.

Insurance Policy Specifications

The minimum amounts required, if insurance is the sole financial assurance mechanism, are as follows:

Minimum Financial Responsibility Requirements	
Type of UST Owner/Operator	
Petroleum producers, refiners, or marketers	Nonmarketers
Per Occurrence Coverage	
$1M	$500K (less than 10,000 gallons per month throughput) $1M (greater than 10,000 gallons per month throughput)
Aggregate Coverage	
$1M (for facilities with 100 or fewer tanks) $2M (for facilities with more than 100 tanks)	

In order to satisfy financial responsibility requirements, insurance policies must have the following provisions:

- The policy must have separate defense limits with first dollar coverage.
- A six-month extended reporting period must be provided for claims-made coverage.
- The insurance policy must have required wording on the endorsement or certificate of insurance, as indicated in the Code of Federal Regulations, 40 CFR 280.97(b)(1) and (2).
- The policy should include on-site and off-site cleanup and third-party claims for property damage and bodily injury.
- The policy must cover both sudden and non-sudden releases.
- The policy must also cover releases from loading and unloading activities.

Storage tank insurance and premises pollution liability insurance policies are written on a claims-made basis, indicating that the loss must occur after the retroactive date and before the end of the policy period, and the claim must be made while the policy is in effect.

The retroactive date is important for an insurance policyholder because no coverage will be provided for remediation expenses or third-party claims associated with contamination that existed prior to the policy's effective or retroactive date. Ideally, the retroactive date would coincide with a UST's date of original installation or equipment update; however, if any gap occurs in coverage or the site changes owners, the retroactive date will be reset to the inception date of the new policy. Sometimes insurance carriers will provide discounts for a more recent retroactive date, but facility owners that take advantage of this are leaving themselves open to a gap in insurance coverage.

Other important insurance conditions that UST facility owners should be aware of that can impact their coverage include the following:

- The definition for the terms "pollution condition" and "release" can be important to coverage. Many policies only cover remediation expenses for a confirmed release from a UST, where confirmed release means contamination that has been investigated and verified by, or on behalf of an insured. Therefore, the UST facility owner should be aware that tank tightness testing, site investigations or sampling may not be covered under the policy. Broader coverage would include language that covers suspected releases, including those expenses necessary to investigate and confirm a release has occurred.

- Many policies have notification conditions that require the insured to notify the insurance company of any plans to perform a voluntary tank removal or replacement within a certain time frame prior to the removal or replacement. Furthermore, the insured typically must notify the carrier when they become aware of any contamination or incur an emergency expense that could give rise to a claim. Verbal notice may initially be given, but written notice must follow. If the policy claim notification provisions are not followed, a claim may be denied.

- Some policies have exclusions for intentional non-compliance with environmental laws that result in a release. Failure to comply with environmental laws could lead to a denial of coverage. The burden is on the insured to demonstrate that the non-compliance was not intentional.[ix]

The extended reporting period provides a period after expiration of a policy for a claim or pollution condition to be reported to the carrier. This provision can be important for a UST facility that is being closed or sold. The policy should be carefully read to determine whether coverage for claims is provided only for a loss discovered and reported during the policy period, or whether it also will cover a loss that occurred during the policy period but was discovered during the extended reporting period.

Aging Tanks Challenge

Underground petroleum tanks are typically expected to have a life expectancy of 30 years.[x] In some states, for example Connecticut, removal of USTs is required when a UST reaches 30 years of age, unless an exception is granted because it meets certain specific conditions. Trends researched by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and the EPA indicate that average age at removal for USTs was closer to 20 years.[xi] This statistic indicates that USTs, on average, are being removed before their life expectancy. The reason for removal could be a release, closure of the facility where the tanks were located, etc. Aging tanks are a risk that owners and/or operators must address. The longer they wait, the chances of the tank leaking and the costs to maintain them increase.

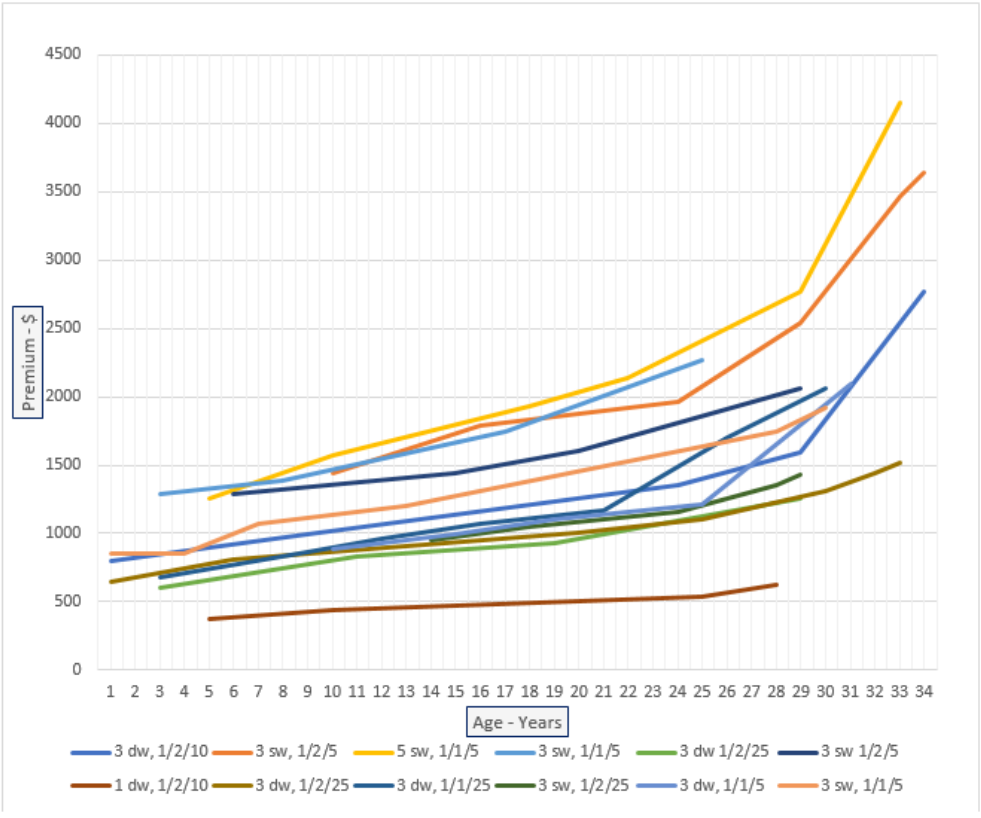
As of September 2020, 540,423 active USTs at 193,000 facilities were currently in operation across the United States with close to 40% of them over 30 years old and 70% over 20 years old.[i] Over the past 30 years, UST technology has improved and since 2000, the number of double-walled tank installations has surpassed the number of single walled installation, with over 60% of tanks being double-walled. Statistics show that the age of USTs associated with releases has increased over the past 30 years as technology improves; however, releases still occur from USTs of all ages and, on average, the cost of a release increases with tank age.[i] Between October 2019 and September 2020 alone, 4,944 confirmed releases were reported.[xiv]

Tank age is one of the biggest challenges facing UST owners and operators when trying to secure financial assurance from insurance companies.

Since 2016, the Arizona Department of Environmental Quality (ADEQ) has tracked insurability for UST owners in Arizona. For cancellations, terminations, and non-renewals, 82% were for sites with tanks installed 25 years ago or more. For these facilities with older tanks, the only policies available had significantly higher premiums and deductibles.

According to UCPM, a wholesale environmental insurance brokerage, most markets create financial barriers for tank owners and operators in order to avoid insuring older USTs. They are able to do this by only offering tank pollution liability coverage with higher minimum premiums and larger deductibles. When seeking premises pollution liability policies for facilities, affordable coverage is difficult to procure for sites with USTs aged 25 years and older. Similarly, securing tank-specific pollution liability policies for tanks 25 years and older is a costly challenge. According to UCPM, one of their markets in particular will only offer new coverage terms for USTs over 30 years old with a minimum $100,000 deductible. Most carriers are leery of providing lower deductibles to older USTs because they have a higher likelihood of paying large cleanup costs after a release. The chart below shows various UST facilities with consistent limits over time and the trends in premiums as the tanks age. There is a sharp increase in the premium curve around the time that a tank reaches about 30 years in age.

Insurance is a desirable financial mechanism even for those older tanks; however, as tanks age, it is advisable to explore options including removal, close in place, replacement and/or a switch to above ground tanks. The clock is ticking on insurance for the older tanks as all tanks will eventually need to be removed or closed in place. Preparing for this should be part of a facility owner's financial planning and risk management strategy.



Source: UCPM Environmental
(3 dw 1/2/10 = number of tanks, double-walled or single-walled, per occurrence limit/aggregate limit/deductible)

UST Removal, Replacement and Remediation

There are a number of reasons to remove a UST from service including the age of the tank(s), business closure and confirmation of a release. You may also find that the UST is no longer needed for its original intended use. To permanently close a UST, there are three options — removal from the ground, abandonment in place, and a change in service. To reduce the potential for future liability related to soil and/or groundwater contamination, the option most frequently used is to remove the UST from the ground. Abandoning a UST in place could make a future sale of the property difficult. Although there is an option to change the use of the UST from a regulated substance to a non-regulated substance, this option is rarely used. The reason for this being the level of difficulty cleaning a UST of all regulated substances, which leaves the potential for cross-contamination of contents.

The costs of UST removal are determined by many factors, some of which include jurisdiction, size of the UST, depth it was buried, geology, above ground landscaping and whether or not the tank has leaked. Leaking USTs are a common issue that result in expensive cleanup costs. According to the EPA, states and territories have been submitting information about their UST programs since 1988, and as of September 2020:

- 559,900 confirmed releases have been reported;
- 547,707 cleanups have been initiated; and
- 497,407 cleanups have been completed.[v]

A typical UST removal including excavation, transportation, disposal and returning the ground surface to the original form ranges from $15-20K for a single tank. These costs assume the UST is in good condition, with no leaks or contamination found during removal. According to the EPA, cleanup costs associated with UST removal range from $10K for a leak with a small amount of contaminated soil, to over $1M for leaks that have reached groundwater, depending on the extent of the contamination. The average cost of a cleanup is about $130,000.[v]

Preparing for the Inevitable

Although improvements to UST construction have been made in the past 20 years with the intention to reduce the number of releases to the environment, currently more than half of the estimated 415,000 USTs in service are more than 25 years old. From the day the USTs are placed into the ground, owners and operators must assume that long term operation of any UST system will eventually result in removal, replacement and potential cleanup of contamination resulting from a release.

As the UST system approaches 30 years in age, it may be time to consider replacing the system. Following removal, a new system must be installed unless the business is closing, being sold or the USTs are being replaced with ASTs. Assuming three 10,000-gallon USTs are being replaced with a similar system, replacement costs including new tanks, piping, dispensers and necessary testing can approach $300K or more and take several weeks. For many businesses, the cost to install new tanks is something they may not be prepared for, which is why it is important to start planning for tank replacement from the day your tanks are installed. Funds should be set aside each year in anticipation of having to replace the tanks at a future date. The amount which should be set aside depends on how many tanks will need to be replaced; however, using the $300K example, future equivalent dollars and annual dollars to set aside can be estimated using the following:

Future Value: F = P (1+i) ^n

Where:

F = Future Value
P = Present Value
i – Average Inflation Rate
n – Number of Years

Assuming the UST system will need to be replaced in 20 years, with an average inflation rate of 2.5% [xvii] and a present value of $300,000, the Future Value is equal to:

F = 300,000 (1+0.025) ^20 = **$491,584.93**

For 30 years, the Future Value is equal to:

F = 300,000(1+0.025) ^30 = **$629,270.27**

Now that the future value has been determined, the annual value required to be set aside for the future replacement of the UST system can be calculated assuming an interest rate of 1.11% [xviii]

Annual Value: A = F [(i) / (1+i) ^n − 1)]

Where:

A = Annual Value
F = Future Value
i − Interest Rate of Return
n − Number of Years

A = 491,584.93 (0.011) / [(1.011 ^20)-1] = **$22,108.99**

Similarly, for a 30 year horizon:

A = 629,270.27 (0.011) / [(1.011^30)-1] = **$17,818.82**

Therefore, to have the necessary cash on hand in 20 or 30 years to replace a $300K UST system installed today, the owner would need to set aside $22,109.00 or $17,818.82 each year for 20 and 30 years, respectively.

These costs do not take into account the business income lost during UST replacement, nor do they take into account costs for upgrades, maintenance, and repairs that are required over the life of a UST. Facility owners need to plan ahead for these costs, so they do not come as a surprise.

Outside Examples of Funds Available for Replacement

Neither state funds nor private insurance currently pay for the installation of new USTs when the owner decides to replace them. In addition, the cost to remove tanks is not covered by either source even if there has been a confirmed release. State funds and private insurance are intended to cover the costs associated with the cleanup of confirmed releases; however, in some cases, states may have funds available for removal and replacement of tanks to encourage tank owners to replace old UST systems. For example, Arizona has recently made available a reimbursement program designed to encourage tank owners to upgrade their old UST systems in an effort to reduce releases and cleanups associated with these systems. There are certain criteria a tank owner must meet to be eligible for the program, but for those that qualify, it can be a cost-effective way to have their tanks removed and replaced. Also, interest free loans can be obtained in Utah to upgrade, replace, or permanently close USTs. Loans up to $300,000 per facility ($100,000 per tank) can be obtained.[xx]

Summary

USTs present a myriad of environmental risks, and as tanks age, the likelihood of a release increases. Federal and state regulations require financial assurance, and the most common mechanism of financial assurance are state funds and insurance. State fund and insurance coverages differ from state to state and between carriers, respectively. Careful review of state fund provisions and insurance coverage should be performed by the UST facility owner as part of their risk management strategy.

As a UST ages beyond 25 years, the insurance options become limited and increasingly more expensive. Based on the increased risk for a spill or release for an older tank and the limited options for financial assurance as a tank ages, UST owners may want to consider replacing their tanks between the ages of 20 and 30 years old. By doing so, they reduce the likelihood of a significant release at their facility. UST facility owners must understand and financially plan for the eventual closure or replacement of their USTs.

Claims Examples

Below are some claims examples that illustrate the high costs and risk associated with operating UST facilities:

A gas station owner reported a claim when gasoline was discovered to be coming up through the concrete pad associated with the fuel dispensers. The release was confirmed by the gas station owner, and excavation and remediation began. It was determined that the underground storage tank system was leaking from several areas, piping, sumps and the tank itself. Cost of cleanup exceeded the insured's $1 million insurance policy.

A property owner complained of gasoline odors emanating from a storm sewer leading from an adjacent service station. The service station had numerous USTs that contained various grades of gasoline. An investigation of the service station's leak detection records indicated that one of the storage tanks was leaking and that several hundred gallons of gasoline were missing. Further investigation revealed that the gasoline had not only contaminated the service station's site, but had also migrated onto a neighboring property and into drinking water wells through the storm sewer. Extensive cleanup of the service station as well as mitigating third-party property damage resulted in significant costs.

An oily sheen was observed on a local stream. It was traced back to a leak from an UST at an insured gas station. It was determined that the contamination had impacted the stream for several miles, damaging the aquatic species. The station owner was responsible for the remediation and natural resource damages from the impacts to the stream, which totaled approximately $450,000.

A service station owner performing regular tank tightness testing on his fuel systems discovered a leaking underground tank supply line. Subsequent soil sampling identified diesel fuel pooling around the tank. The tank was excavated, and the contaminated soils were removed and disposed at an offsite waste facility. A total of $368,000 was spent between the costs for investigation, remediation and disposal.

A gas station customer drove away with the fueling nozzle still in his car. The hose broke off, releasing in excess of 150 gallons of fuel onto the concrete pad, which then ran into the adjacent asphalt street. The spilled fuel and impacted soil were cleaned up with total costs exceeding $750,000 for remediation and third-party property damages.

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