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The Regulation of Underground Storage Tanks

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THE REGULATION OF UNDERGROUND STORAGE TANKS

BY

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ABSTRACT

The components of gasoline are among the most toxic substances common in our environment. Yet because petroleum products are so ubiquitous and essential to the economic well being of our society, the hazards associated with exposure to these toxics have often been overlooked.

Recently, evidence of widespread groundwater pollution due to leaking underground storage of petroleum and other hazardous substances has come to light. Because dependence on groundwater for drinking water supplies is so great and because this dependence is expected to grow in the future, the Environmental Protection Agency has proposed a regulatory scheme to control and manage the hazards associated with underground storage. Groundwater aquifers are extremely fragile and finite resources deserving federal protection.

This paper will attempt to illuminate the nature and scope of the underground storage problem and explore the solutions the EPA proposed through their regulation program. Of the state regulatory programs which exceed federal minimum requirements, the Rhode Island regulation plan will be analyzed as an especially sensitive and effective program which is likely to be emulated by other states with similar groundwater and tank conditions. Finally regulatory and non-regulatory measures which may be adopted by

municipalities will be outlined along with enforcement procedures designed to ensure compliance and maximum protection of groundwater resources from pollution associated with underground storage of petroleum products and other hazardous substances.

ACKNOWLEDGEMENTS

This work would not have been possible without the kind assistance and encouragement of Dr. John Kupa. His eloquence and his philosophy of strongly advocating for environmental concerns within a practical and realistic development framework has been an inspiration to me and will continue to be a source of guidance to me in my professional endeavors.

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To my husband, Hugh Maxwell, I am more than grateful. He has been cheerful and unfailing in his emotional, financial and physical support through this project and throughout my years at C.P.A.D.

Finally, the students at C.P.A.D. provided an atmosphere of intense intellectual stimulation coupled with a memorable comaraderie. Their unflagging mutual cooperation taught me just how well groups can work together. They each contributed mightily to my development as a planner and as a human being.

M.K.M.

PREFACE

In response to perceived grave dangers to our nation's groundwaters, Congress directed the Environmental Protection Agency to develop a regulatory scheme to prevent the pollution of groundwater by leakage from underground storage tanks.

This paper will explain the scope and nature of the public health threat posed by leaking UST's in the first two chapters. The federal regulatory program proposed to control these hazards is outlined in Chapter III. The fourth chapter describes the state role in the regulation of underground storage with special emphasis on the Rhode Island regulations as an exemplary model of a state program. The final chapter outlines local initiatives that might further reduce the risk of groundwater pollution from underground storage in sensitive localities.

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THE PROBLEMS WITH UNDERGROUND STORAGE TANKS

1.1. Background

Petroleum products and other toxic chemicals leaking from underground storage tanks are one of the most common causes of groundwater pollution. Reliance on groundwater is increasing in this country as surface water supplies are becoming less available. Municipal, state and federal records indicate that thousands of underground storage tanks (UST's) are currently leaking; many more are expected to develop leaks in the future. Because so many people in this country depend on groundwater, the federal government through legislation has sought to safeguard our nation's groundwater resources.

Congress attempted to begin a program to control leaking UST's when it added Subtitle 1. to the Resource Conservation and Recovery Act. This law required the Environmental Protection Agency to develop regulations that would protect human beings and the environment from the threats that leaking UST's present.

For protection from fire and explosion risks, petroleum products are normally stored underground. The most typical storage facility is a retail gas station but

petroleum products are also stored underground at convenience stores, motor pools, trucking fleet headquarters, airports, bus companies, and marinas. Petroleum is also stored in millions of small tanks located at homes and at small businesses across the country. Leaking petroleum or chemicals can pollute groundwater and such leaks may remain undetected for years. Treating the contaminated water is usually not feasible due to high costs. Treatment methods usually result in a water quality that is less than satisfactory. Also, during any groundwater restoration effort, an alternative source of drinking water must be provided.

Leaking tanks are not the only source of danger from stored petroleum. Spills and overfills account for a significant portion of the total groundwater pollutant load of petroleum (see Figure 1). Once on the ground, the product mass coats the soil and moves downward toward the groundwater where its soluble components mix with the water. The insoluble components usually float as a mass on top of the water.

Vapors can be inhaled by humans and are strongly suspected of causing serious illness. The chemical constituents of gasoline are extremely toxic; toxicological and limited human studies have found gasoline components to cause such health problems as anemia, nervous system disorders, kidney disease, cancer and lead poisoning.[1]

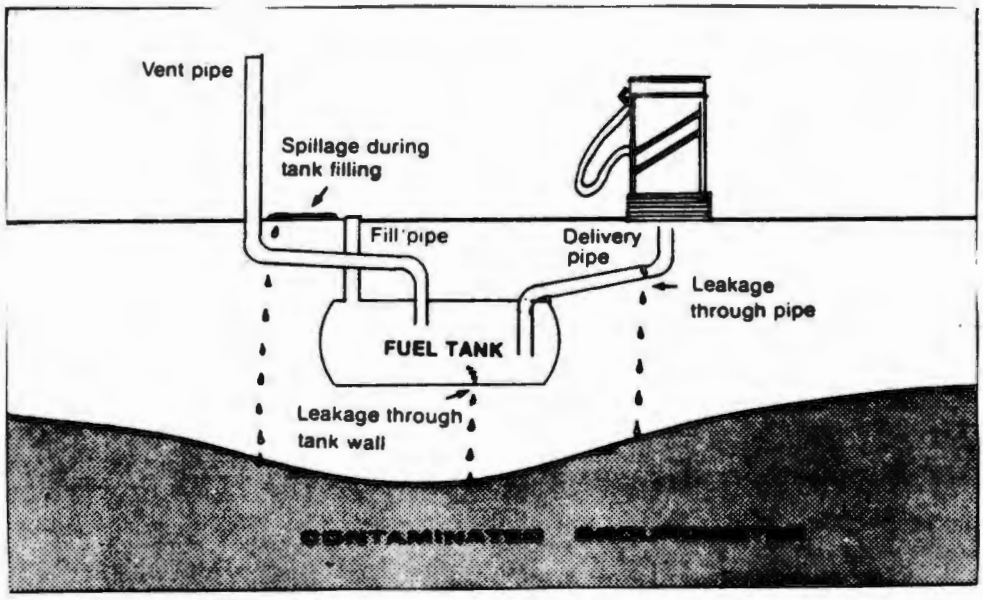


Figure 1.

Spills and Leaks Contaminating Groundwater

Petroleum products and other hazardous substances may be released into soil and eventually migrate to groundwater. This illustration shows that product may leak not only from the tank body itself but also from loose, broken or corroded pipes and fittings. Spills and overfills also account for a significant amount of free product release and eventual migration to the water table.

Source: Community Tank Census

Ingestion through drinking water and ingestion through the inhalation of fumes are both considered extremely hazardous.

It must also be remembered that gasoline and other petroleum fuels are extremely volatile. Vapors from spills or groundwater leaks may migrate to invade basements, buildings and sewer pipes, spreading the threat of explosion and fire far and wide.

1.2. Characteristics of Leaking Tanks

Most of the tanks in the ground today are made of steel coated with asphalt but many steel tanks were installed bare thus exposing the metal to the corrosive effects of the surrounding soil. Fiberglass Reinforced Plastic (FRP) has also been used as an alternative tank material for about the last twenty years. It is not subject to corrosion as steel is but FRP is subject to structural failure and must be installed with extreme care. There are approximately 1.4 million tanks across the country that will be subject to regulation; according to EPA estimates about 89% are steel and the rest are made of FRP.

Prior to promulgating rules, in October of 1984 the EPA Office of Solid Waste undertook a study to obtain, document and analyze information concerning UST release incidents. Initial data collection was undertaken at the state level, with similar data later collected at the county and local level. The goals of the study were:

- to identify the number of documented UST release incidents and the degree of documentation in the state files
- to analyze these data with respect to cause, impact, age, tank type and other relevant factors
- to determine whether any trends based on geographic distribution, tank age, materials stored, or other factors were apparent from the data.[2]

The various states surveyed had differing enforcement procedures so the final summary contains some inherent biases. However, the results substantially enhance our knowledge and understanding of circumstances surrounding UST leaks and also the results have been generally supported by subsequent studies.

The 1984 study found that there had been a continuous increase in the number of release incidents reported to state agencies annually from 1970 to 1984. While the increase may have been due to improved reporting procedures, an increase in the actual number of release incidents during this time cannot be ruled out.

The study analyzed information compiled for 12,444 UST release incidents in all 50 states. It was impossible to determine the percentage of tanks that actually leaked due to the irregularity of reporting procedures, but about 65% of the documented release incidents involved tanks at retail gas stations. This large percentage may have been due in part to the proximity of gas stations to

population centers, which increases the likelihood of detection through sighting and smelling leaks, spills and vapor.

Only about 3% of the releases involved chemicals other than petroleum fuels and the majority of these releases occurred at chemical manufacturing facilities.

A full 95% of the reported release incidents occurred at operating facilities, as opposed to abandoned facilities. Larger quantities of released product were associated with operating facilities as well.

The median age of tank systems at the time of release was found to be 17 years. Piping leaks occurred most frequently around the age of 11 years. Poor installation practices are thought to significantly contribute to early pipe failures. Pipes usually have thinner walls than do tanks and therefore are more subject to corrosion leaks. Piping leaks accounted for a signficant portion of the total number of release incidents; it was concluded that any effective leak control program must address both tank and pipe leaks.

Overfills and spills accounted for 15% of all release incidents reported.

The study identified the most common documented causes of release incidents to be corrosion and structural failure, followed by improper installation and loosened pipe fittings. Structural failure was found to be most closely associated with the more significant release

incidents, those involving 10,000 or more gallons of released product. Leaks associated with improper installation and loose fittings proved to be far more common in tank systems 10 years old or less.

Subsequent to the Summary of State Reports on Releases From Underground Storage Tanks cited above, the EPA completed a survey of underground motor fuel storage tanks conducted at 890 establishments covering 2,445 tanks. A selected subsample of this tank universe was tested for leaks (433 tanks). Major findings of this survey include the following:

- An estimated 35% of the tank systems failed the tightness test. This conclusion msut be interpreted with caution however because during the test, tanks were filled to a pressure slightly higher than that of normal operating levels.
- EPA could not identify any variable through statistical analysis, such as tank material or fuel type, that correlated strongly with test failure.
- At comparable ages, fiberglass and steel tanks showed no significant difference in the rate of test failure.
- Steel tanks showed little icnrease in the rate of failure with age in their first 20 years, but after 20 years failures increased.

- The average age of tanks in the United States is 12 years old.
- Twenty-one percent of all tanks are installed partially or completely below the water table.[3]

Leaking UST's are a major problem meriting Federal intervention. That intervention is focused upon requiring upgraded tank systems and protection through leak detection devices. It should be noted that major oil companies have already established tank upgrading programs as they are well aware of potential liability for damages and clean up costs. The tank upgrading programs have been in place for up to seven years in some cases. Spokespersons for both the American Petroleum Institute and the Steel Tank Institute assert that the largest oil companies have been in the forefront of the battle to protect the environment, especially groundwater and drinking water supplies from the hazards of petroleum contamination.

CHAPTER II

GROUNDWATER HYDROLOGY

2.1. Precipitation

It is estimated that in over half of the states in our union, more than 50% of the population depends on groundwater as the major source of water for homes and industries. In only five states does groundwater fill less than 30% of the demand.[4] Communities depend heavily upon groundwater to sustain current levels of development and must also protect reserves to supply possible future needs. As such a valuable community resource, groundwater merits protection to insure its potability and to insure sufficient quantities for present and future use. A majority of the cases of groundwater pollution can be directly attributable to the types of land uses associated with the land above or nearby the groundwater. In order to understand how land use involving the underground storage of petroleum products may pollute groundwater, it is necessary to have a basic understanding of how the hydrologic cycle operates in nature.

Precipitation in its various forms falls from the atmosphere to the surface of the land. Once on the ground, part of the precipitation runs off and follows the path

of least resistance downward to join the rivers, lakes, oceans and streams of the surface water system. Another portion of the precipitation is absorbed by the foliage and root systems of the natural vegetative cover of the land where it is used to sustain plant growth. The portion of precipitation which runs off relative to the portion which is absorbed by the land depends upon surficial conditions such as soil type, slope and intensity of development (see Figure 2).

That remainder of precipitation which does not run off or become absorbed by the natural vegetative cover of the land percolates through the soil more or less vertically until it reaches the zone of saturation of water table. The water table usually, but not always, roughly approximates the contours of the land formations on the surface above it. Intensive pumping of a groundwater aquifer may cause the groundwater to actually flow up gradient. But most often, like surface water, groundwater flows from higher elevations down gradient toward sea level. The water table meets the surface of the land in streams, lakes, ponds and rivers. Generally, groundwater flows very slowly, usually in the range of 5 to 50 feet per year.[5]

2.2. Aquifers

The saturated soil materials found in the water table along with the groundwater itself, are collectively called the aquifer. The special properties of the soils

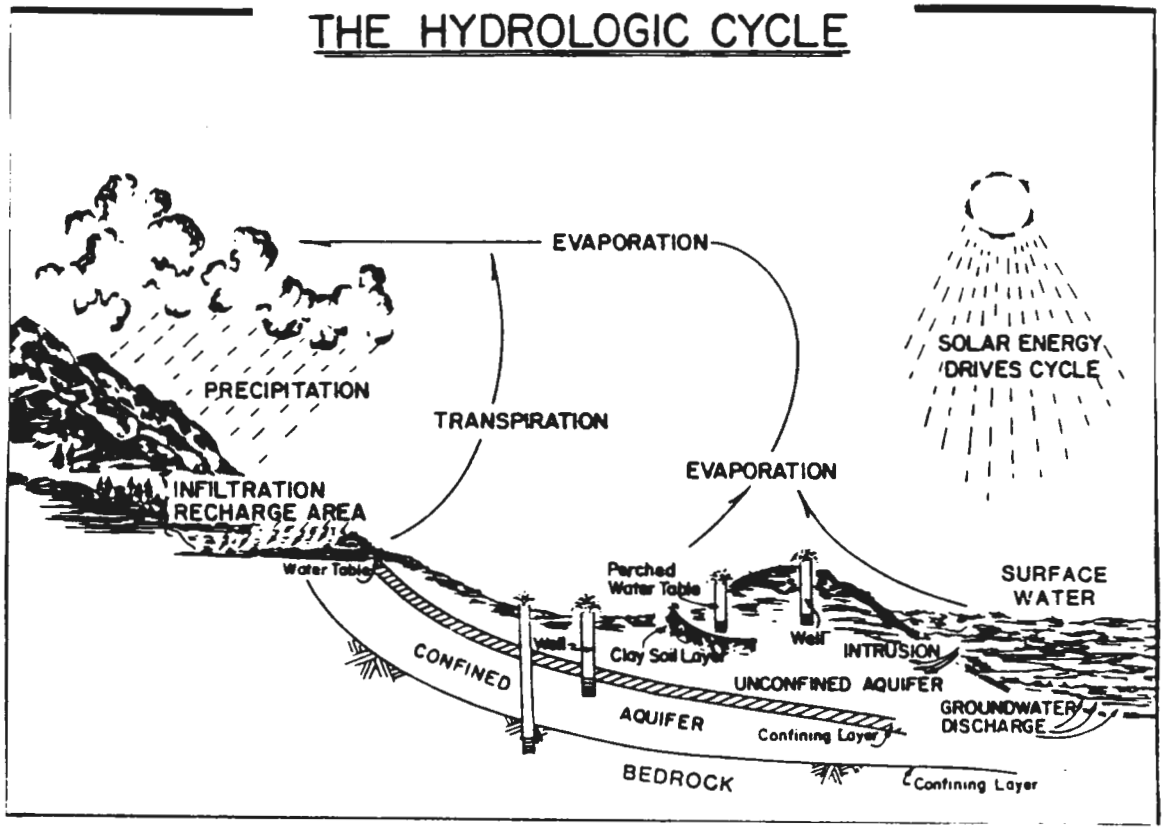


Figure 2

Precipitation will be absorbed by vegetative cover, percolate through soil to the groundwater, or else run off through surface water systems to streams, lakes or the sea.

Because of the interconnected nature of groundwater systems it can be readily seen how releases from underground storage can affect groundwater quality even in areas distant from the place of release.

Source: Nashua Regional Planning Commission

determine the holding capacity of the aquifer, especially the soil porosity (see Figure 3). The movement and melting of the glaciers of the last Ice Age have left large deposits of stratified sands and gravels which due to high porosity, have a large holding capacity for groundwater. Additionally, these stratified deposits, called outwash, are the easiest type of aquifer from which to draw water. Due to these special qualities, outwash deposits, provided that they are sufficiently thick and extensive, are considered to have potential as municipal water supplies. As such, they merit intensive protection from land uses which may compromise water quality through pollution.

Aquifers are also found in other types of soils, notably till. Till soils, which are made up of sands, silts, clays gravels and boulders are less stratified than outwash and have smaller pore spaces between the soil particles. Till may contain large amounts of groundwater, but extraction of this water is generally difficult. Therefore, while till aquifers will yield enough water to supply a few households, they are generally not considered to have potential as municipal water supplies.

Bedrock aquifers also occur in the fractures and fissures of bedrock deposits but groundwater supply potentials from bedrock aquifers are generally considered to be insufficient for municipal level water supply purposes. Yet if households or businesses use bedrock aquifers for

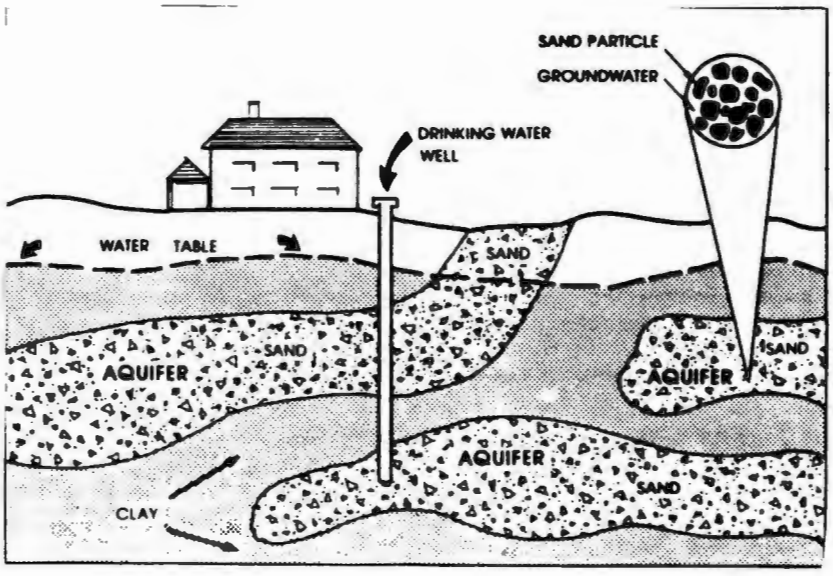


Figure 3.

Groundwater Aquifers

Aquifers are located within the water table and consist of deposits of sands and gravel of various sizes mixed with water. Potential yield of an aquifer depends upon particle size as well as an overall volume of the aquifer because particle size affects ease of water extraction.

Source: Community Tank Census

water supplies or if such a need can be reasonably anticipated in the future, these bedrock aquifers must be aggressively protected from potential sources of pollution.

The recharge zone of an aquifer is that area of land located above and adjacent to the aquifer. Precipitation falls on the recharge zone where it permeates the surface and flows downgradient to the water table. The water then moves laterally to accumulate in the deep deposits of the aquifer proper, thus recharging it. Although an aquifer is continually recharged by precipitation, the holding capacity of an aquifer is fixed according to soil and bedrock conditions. Therefore, groundwater is properly considered a finite resource.

2.3. Contamination of Groundwater

Economic factors usually favor the development of groundwater resources for new water supplies over the more costly development of new surface water reservoirs. Further, conventional wisdom holds that while surface waters are susceptible to pollution from the atmosphere and from runoff, groundwater resources are viewed as pristine because of the natural ability of the soil particles to hold and bind any pollutant material. The conventional wisdom is wrong in the case of petroleum pollutants. Gasoline hydrocarbons have a relatively poor adherence to soil particles. Soils may slow the movement of leaked gasoline but they cannot be relied upon to capture the leak.[6]

Contaminants in groundwater generally move in a plume because there is little dispersion in the saturated zone due to the mixture of soils and water that comprise it.

Gasoline is made up of many components, some of which are soluble and some not. When released into the groundwater the insoluble components will tend to float on top of the water table while the soluble components will tend to disperse more widely. Gasoline components will also tend to mound on top of the water table; this mounding will tend to effect the direction of flow of the groundwater.[7] Thus the behavior of gasoline in the groundwater is difficult to predict. The potential exists for even a small leak to contaminate millions of gallons of groundwater.

In addition to the problem of the contamination of drinking water supplies, some volatile gases emanate from the gasoline and rise vertically through the soil where they may eventually permeate building materials and sewer pipes. These gases present a considerable risk for fire and explosion. In fact, petroleum tanks were originally forced underground as a public health measure to protect people from fire hazards. Today public health concerns ironically top the list of problems posed by petroleum contamination of groundwater and soil.[8]

CHAPTER III

FEDERAL REGULATION FOR THE UNDERGROUND STORAGE OF PETROLEUM PRODUCTS

3.1. The Role of the Environmental Protection Agency

Section 9003 of the Resources Conservation and Recovery Act as amended directed the Environmental Protection Agency to promulgate rules and regulations pertaining to the underground storage of petroleum and other hazardous substances. A regulatory scheme was developed which encompassed all aspects of the issue including requirements for leak detection, leak prevention, financial responsibility and corrective action.

The proposed rule is currently under consideration. After an appropriate period for public and industry comment, the final rule will be adopted by May 1988. The following is an outline of the major provisions of the proposed rule as it appeared in the Federal Register of April 17, 1987. While it is not certain that the final adopted rule will be identical to the proposed rule, it is expected that, with one exception to be examined below, most sections of the rule will be adopted as proposed. The EPA was very painstaking in its consideration of all comparable approaches to the steps it perceived as necessary to the

containment of the problem of leaking underground storage tanks.

3.2. Exclusions to the Proposed Rule

The rules apply to all owners of underground storage tanks which contain a volume greater than 1,100 gallons and which are used to store petroleum products or other hazardous substances. Tanks are considered to be underground if at least 10% of the volume, including pipes, is located below the surface of the ground. Exceptions to the rule are as follows:

- Septic tanks
- Tanks storing heating oil for use on the premises where stored
- Pipeline facilities regulated under the National Gas Pipeline Safety Act or comparable state acts
- Surface impoundments, pits, ponds and lagoons
- Stormwater and wastewater collection systems
- Flow through process tunnels
- Liquid traps or associated lines directly related to oil or gas
- Storage tanks situated on or above the floor of underground areas such as basements, shafts or tunnels.

3.3. Summary of Proposed Federal Rule

The regulatory measures as proposed would establish requirements for both new and existing UST systems. The rules are intended to control the major causes of releases

from these tank systems. The major elements of this proposal are as follows:

- All new UST systems must be designed and constructed to retain their structural integrity for their operating life, including the use of corrosion protection of metal components. Cathodal protection must be monitored and maintained to insure that UST systems remain free of corrosion.
- Proper installation standards must be followed when putting a new UST system into service. The owner and operator of the UST must certify that correct installation procedures were followed and must identify how the installation was conducted.
- Owners and operators of both new and existing UST systems must immediately follow proper tank filling practices to prevent releases due to spills and overfills. In addition, owners and operators of all new UST systems and existing UST systems equipped with external release detection must use devices that prevent spills and overfills.
- Tanks can be repaired, but only once, if they are in sound enough condition to be repaired. Recommended industry practices must be followed to conduct repairs, and in addition, several tests must be conducted to ensure quality repairs.

- Inudstry recommended practices with regard to tank system closure must be followed, and accordingly, the UST system must be removed from the ground or left in place after removing all regulated substances and closing it off to all future outside access. In addition to these regulated industry practices, all owners and operators must perform an assessment at the time of tank closure to ensure that a release has not occurred. If a release has occurred the appropriate corrective action must be initiated.
- Release detection must be instituted at all UST systems. Secondary containment systems and interstitial monitoring will be required for all USTs containing hazardous substances. Petroleum UST systems will be allowed to use several different methods for release detection, although requirements concerning their use must be adhered to by tank owners and operators.
- Release detection systems must be phased in at existing UST systems over a 3 to 5 year period. Bare steel UST systems unprotected from corrosion are required to phase in release detection systems within the shorter period of time.
- Requirements for reporting releases are established. Indications of a potential release would have to be reported to the state implementing agency,

including positive results from release detection methods that have been immediately investigated by owners and operators. After reporting releases, release investigation and confirmation must take place and where necessary, corrective action must take place.

- All existing UST systems must be upgraded or replaced to new tank standards within 10 years, or within 3 to 5 years if a release detection method is not available that can be relied upon to detect releases. Upgrading of petroleum UST systems would include retrofitting of corrosion protection and spill and overflow controls at all tanks (see Figure 4).
- Owners and operators of leaking UST systems must follow prescribed measures for corrective action. Immediate corrective action measures include mitigation of safety and fire hazards; removal of saturated soils and floating free product; and an assessment of the extent of further corrective action required. A corrective action plan would be required for long term clean-ups addressing groundwater contamination. Clean-up levels would be established on a site by site basis as approved by the implementing agency (usually the state) that would oversee the clean-up by the owner and operator.

Typical Underground Storage Tank Installation

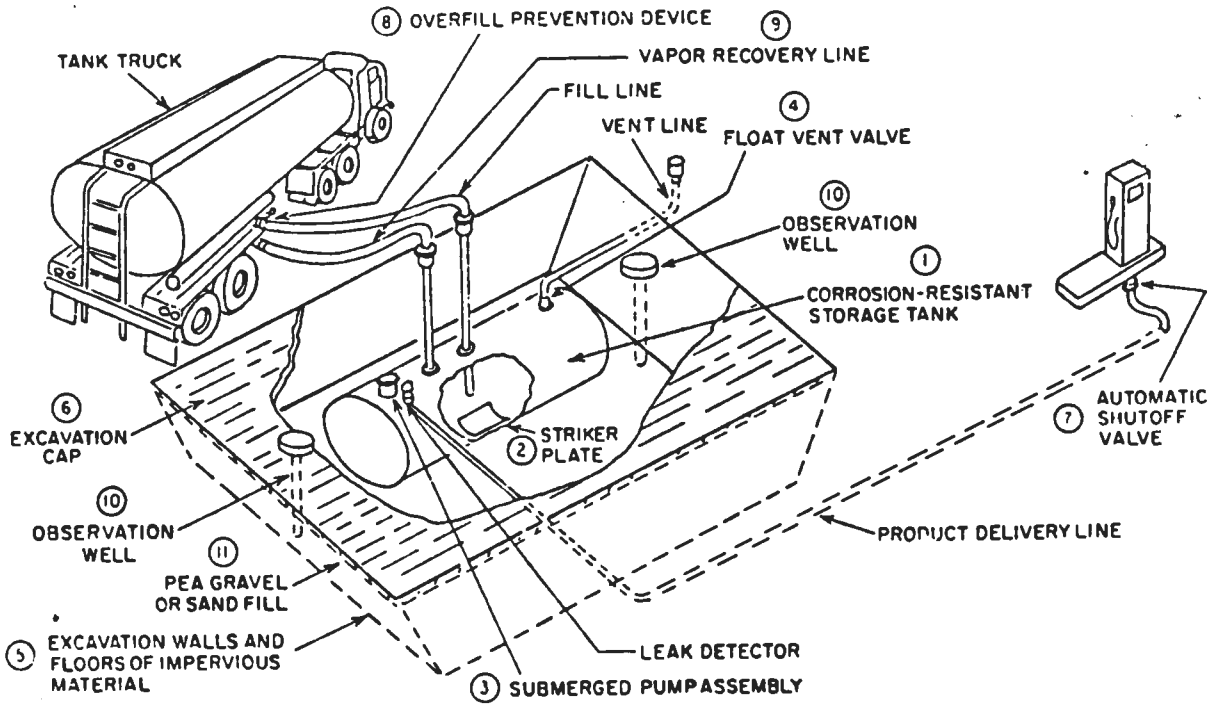


Figure 4.

This is a common type of tank installation that might be found at a recent gasoline retail outlet. Proposed federal regulation would significantly change and upgrade an installation such as this with double walled tanks and leak detection devices.

Source: The Community Tank Census

The EPA considered requiring more stringent containment systems for tanks located in environmentally sensitive areas. The idea of developing a class system for required containment based upon location in an environmentally fragile area was eventually rejected due to the difficulty in establishing criteria at the federal level for these sensitive areas. It was determined that state and local implementing agencies would be better equipped to determine those geographical areas which would merit extra protection and that it would be within the authority of the implementing agency to establish more stringent requirements than those set forth by the EPA. Since the overall success of regulation of USTs depends so heavily on state and local enforcement, it was felt that the implementing agencies would be better able to enforce the rules without the extra layer of regulation a federal standard of environmentally sensitive areas would present.

3.4. Financial Assurances

In addition to the above requirements, owners and operators of all new and existing UST systems will be required to produce financial assurances demonstrating the capability to bear the costs of clean-up of releases. As clean-up costs can be extremely expensive, the EPA has recommended that each owner and operator be required to carry one million dollars insurance coverage per UST system. The obvious financial burden created by this requirements is the cause of some concern within the

petroleum industry, especially the small business retailers. It is indeed expected that UST upgrading requirements, coupled with increased insurance requirements, will force some of the small marginal retailers to close their doors. Despite this unfortunate effect, the EPA believes that public health considerations far outweigh the problems presented to some small businesses by the proposed comprehensive UST regulatory program.

Beyond the objections by small businesses to the additional financial burden placed upon them by the financial assurances clauses of the proposed rule, the insurance industry, which would be the providers of most of the coverage, has expressed some reluctance to offer policies on a large scale to the small businesses. At the time of this writing, in fact, insurance coverage for small tank owners is difficult, if not impossible to obtain. Many tank owners are currently covered by comprehensive general liability policies. These policies usually cover sudden accidental leaks but do not cover gradual pollution--the most typical sort of leak that results in groundwater contamination.

One insurance broker described the industry stance as a reluctance to aid and abet the pollution of the environment by taking the financial responsibility for clean-up out of the polluter's hands. The feeling is that if a UST system operator does not have to worry about the financial consequences of a release, the incentive to take

precautions will be less storng. The insurer could be made to pay for clean-up when the accidental release might have been prevented. Whether this sentiment is widely held among major insurers is unclear.

The insurance industry bases its prices for coverage upon detailed statistical analysis of risk. At the present time, it is questionable whether sufficient data exist for the insurance industry to develop a firm and fair basis for charging tank owners for pollution clean-up coverage. There are many factors relative to tanks which may or may not be closely associated with a propensity towards leaks, among these factors are tank age, tank material, installation methods, piping materials and whether the tank has been repaired or relined. Extensive statistical analysis of all these factors must be accomplished before insurance rates can be set. Beyond tank variables, site variables associated with leaks must be analyzed. These variables may include soil conditions, slope, proximity to the water table, proximity to earthquake fault lines and a host of others. It is clear that the insurance industry would be required to perform enormous and time consuming studies to determine fair rates for individual tank owners. The EPA thus expects a high degree of input from the insurance industry during the public comment period prior to the promulgation of a final rule in May, 1988.

Under the proposed rule there are several other ways a UST owner can demonstrate financial reponsibility for

clean-up and damages due to releases. They are:

- Proof that the owner/operator's net worth is at least 10 times the required annual amount of coverage. The required annual amount of coverage is between $1,000,000 for a single UST to $6,000,000 for the owner of 341 or more tanks.
- Arrange for someone else to be responsible for clean-up and damage costs. Methods may include guarantee, indemnity contract, surety bond or letter of credit. There are strict requirements for these methods.
- If EPA has authorized your state to administer its own program for USTs, any method of coverage approved by your state may be used.
- If your state has established a clean-up fund that will pay for the costs of a leak then additional coverage may not be needed for the same costs. However, financial responsibility for costs of compensating those injured by leaks will still be the responsibility of the owner/operator, unless the state would also pay for those costs.[9]

3.5. The Trust Fund for Leaking Underground Storage Tanks

As alluded to above, through the same amendments Congress provided Federal funds to clean-up petroleum leaks and spills from underground storage tanks. The Trust Fund for Leaking Underground Storage Tanks will strengthen current clean-up and enforcement efforts of

many states and localities.

The UST Trust Fund is being financed by a tax of 1/10 of one cent per gallon on motor fuels which will raise $500 million dollars over the next five years. The majority of these funds will be made available to the states. The EPA wants the states to enter into cooperative agreements which will specify how the Trust money will be used. The role of the states is deemed extremely important because the EPA believes that state officials are generally closer to the scene and know more about tanks in their states and local site conditions than federal officials.[10]

States can order, as well as conduct, clean-up operations. EPA and the states may compel the tank owners or operators to undertake, or to pay for, any of the following actions:

- Test tanks for suspected leaks;
- Excavate a site to investigate the extent of contamination;
- Assess how many individuals may have been exposed to petroleum contaminants and the seriousness of their exposure;
- Clean-up contaminated soil and water;
- Provide safe drinking water to residents whose supplies have been contaminated by a tank leak;
- If necessary, relocate residents temporarily or permanently.

Although states may be provided with funds to remediate leaks through the Trust Fund, it is expected that most states will use the funds for improving enforcement and reporting procedures. The Trust Fund gives the states the flexibility to act immediately in a dangerous leak situation, but the intention of Congress is that tank owners should pay for clean-up costs and damages. After regulations go into effect, the EPA expects that the Trust Fund money will be used primarily for emergencies and clean-ups in which:

- Costs exceed the amount of coverage that tank owners and operators are required to maintain, and Fund expenditures are necessary to assure an effective corrective action;
- A solvent owner or operator cannot be found; or
- The owner or operator fails to comply with a clean-up order.[11]

States will be required to repay 10% of the Trust Fund money that will be used for clean-up operations after the regulations take effect. Tank owners and operators will be required to repay EPA or the state for clean-up costs. The existence of the Trust Fund in no way cancels the financial assurance requirements of the proposed regulations scheduled to take effect in May, 1988.

CHAPTER IV

STATE AND LOCAL INITIATIVES FOR CONTROLLING LEAKING UNDERGROUND STORAGE TANKS

4.1. Background

Inherent in the federal proposals for the upgrading of UST's and protecting humans and the environment from the hazards of product releases is the belief that officials of states and localities have more complete knowledge about tank and site conditions in their own geographic areas than do federal officials. The proposed rule is designed around allowing and encouraging state officials to develop their own implementation plans and tank standards relative to the varying degrees of environmental sensitivity and dependence upon groundwater in their areas. States have the right to develop and enforce more stringent regulations and standards than the proposed federal rule requires. States may require specific tank systems and demand certain types of testing procedures.

The Underground Storage Tank Trust Fund is made available for discretionary use by the states upon entering into an agreement with the EPA concerning Fund uses. The Trust Fund proposal reiterates the faith of Congress and the EPA in the fitness of state officials to develop effective

and efficient programs tailored to the specific conditions in their own localities.

4.2. State Regulatory Programs: The Rhode Island Example

In response to federal policy, the state of Rhode Island has been in the forefront of planning and enforcement efforts regarding UST's. Rhode Island has developed its own regulations based upon its extensive reliance on groundwater and other environmentally sensitive conditions found in the state.

The following is an outline of Rhode Island's strategies concerning containment of UST hazards. It is presented as an example of a high quality, comprehensive program that addresses the needs of UST owners as well as public health and environmental protection. While several states have thus far mandated their own tank standards, Rhode Island may be unique in its offer of assistance to tank owners.

The Rhode Island program has four major components:

1. Rules and Regulations. These are tailored to existing environmental conditions across the state.
2. UST Revolving Loan Fund. This provides low cost loans to small business tank owners.
3. UST Trust Fund. Supplements budget of Rhode Island Department of Environmental Management for UST's.

4. Emergency Response Fund. Provides flexibility for quick response to danger from UST leaks.

Rules and Regulations. The following administrative findings provided a basis for the Rhode Island regulations:

a. Approximately 30% of the population of Rhode Island depends upon groundwater as a sole or principal source of water supply.

b. The principal groundwater resources of the state are located in relatively thin glacial deposits of stratified sand and gravel which underlie about one-third of the state. These aquifers lie close to the surface and are extremely vulnerable to contamination.

c. A number of small public and private water supplies obtain water from till covered fractured bedrock aquifers which underlie about two-thirds of the state. These aquifers are especially difficult to monitor and to reclaim once contaminated.

d. A large portion of the state's future water supplies will be developed from groundwater resources due to the limited number of suitable sites for the construction of surface water reservoirs.

e. The rapid escalation of groundwater contamination by petroleum products continues to cause property damage and poses an imminent peril to human

health by the migration of product and/or product fumes into underground utilities and basements throughout the state.[12]

Appropriate to these conditions, Rhode Island has developed rules and regulations somewhat more stringent than those required by the EPA proposed rule. Some of the distinctive features of the Rhode Island rules and regulations are:

- New or repaired tanks must comply with one of three requirements which are secondary containment, approved continuous monitoring system coupled with periodic precision testing, or double walled tanks fitted with interstitial monitoring and secondary containment for pipes.[13] (See Figure 5.)
- Designated environmentally sensitive areas have been mapped out by the state. Tanks located in these areas must be equipped with monitoring wells.
- Tank testing requirements have been increased above EPA recommendations. Older tanks must be tested at 5, 8, 11, and 13 years and annually thereafter. New tanks must be tested at installation and every five years thereafter.
- Spill containment will be required for all tanks.
- Tanks may only be repaired or relined once, and then only with a method approved by the Director of the Department of Environmental Management.

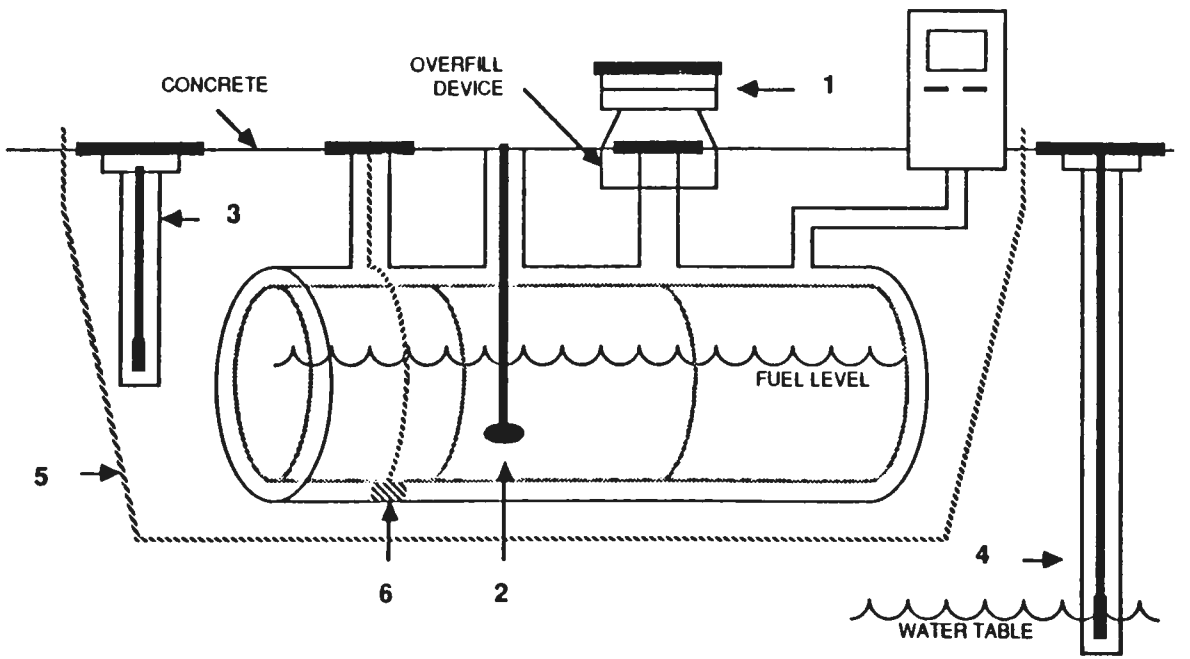


Figure 5.

Above are shown various types of methods approved by the EPA for detecting releases from underground storage tanks. State regulations vary and some may exceed federal regulation. Some leak detection methods shown above may not satisfy all state regulatory requirements for leak detection methods.

The cautious approach of Rhode Island while being environmentally appropriate obviously places a financial burden on small gasoline retailers and other small business and private tank owners, especially when increased financial assurance requirements are considered. In response to this issue, Rhode Island has instituted a Revolving Loan Program especially for UST owners. Under this program, tank owners are eligible for loans at a subsidized rate (2 pts. below 6 month T. Bill rate). The use of the fund is restricted to the upgrading and replacement of tank systems. The loan program is especially targeted for small business and private tank owners as most of the major national retail gasoline chains and major oil companies have already introduced tank replacement programs, having had ample resources of their own to do so. As loan funds are limited ($1 million dollars in the first funding cycle) a weighted score system is applied to all applications. This scoring system is designed to determine how likely a leak occurrence is in each particular tank and how great the damage might be should a leak occur. According to DEM sources, applications have been forthcoming from the desired small business and private sector.[14]

Some problems have been identified in the process. For example, the application itself is lengthy and detailed; it is expected that staff may be needed to assist some tank owners with the application process. Also, a

contractor to perform credit worthiness checks has yet to be retained as there was some difficulty in assessing a fair price for these services. Both these problems are expected to be solved as the program evolves. Full scale tank replacements are expected to cost about $80,000 per tank.[15]

Trust Fund. Passage of the federal UST Trust Fund in 1986 established a new tool for the implementation of tank programs. Rhode Island was among the first states to respond to this initiative and entered into a cooperative agreement with EPA this year. In Rhode Island the Trust Fund monies are used primarily for staff to enhance enforcement and response capabilities. Specifically, new staff members have been hired to better utilize information and to follow up on noncompliance with tank registration regulations. Better tracking of underground tanks has led to quicker response to cleanup and remediation situations. A full time attorney was also hired to assist with enforcement, compliance and recovery of state incurred clean-up costs from tank owners.

Emergency Response Fund. In emergency situations requiring immediate clean-up actions, the DEM has at its disposal monies from a contingency fund which may be used for clean-up and remediation where public health and safety are threatened. In these cases, the state has the flexibility to immediately order and pay for tank closure, clean-up, soil removal, environmental restoration and other

remediation activities. The owner/operator is later billed for the costs. As the owner of the land on which the tank is located is ultimately responsible for damages, and since land is always worth something, it is not expected that the state will have to bear the costs of clean-up and closure except in cases where the costs exceed the value of the land.

Rhode Island was quick in responding to all federal initiatives regarding the containment of hazards from leaking UST's. Its rules and regulations are stringent but they are based on careful assessment of groundwater resources and estimated present and future demands placed on these fragile aquifers. The Rhode Island program was based on careful environmental and demographic research. As such it fulfills the purpose of Congress and the EPA to allow state officials with their specific knowledge of existing local conditions develop specialized programs tailored to specific environmental and public health considerations.

The Revolving Loan Fund displays a commitment to small business and promotes a healthy economic environment as well as physical environment. This important program is very likely to be copied in other states.

(Small business tank owners in other states may be interested in obtaining the EPA document Assistance Programs for Pollution Control Financing. It outlines funding

assistance available primarily through the Small Business Administration.)

CHAPTER V

COUNTY AND LOCAL UNDERGROUND STORAGE TANK INITIATIVES

5.1. Background

The proposed federal rule on Underground Storage Tanks and the UST Trust fund both espouse a commitment to formation of control policy at the state and local level wherever possible. This stems from the opinion that state and local officials have better knowledge of special groundwater, tank, soil and demand conditions in their own areas. States have been invited to develop programs more stringent than the proposed rule if conditions merit a more cautious program approach. Beyond even this, counties and municipalities are encouraged to develop more stringent regulation programs than the proposed federal rule. This federal policy demonstrates a commitment to local control and faith in local planning endeavors. The policy was also deemed a necessary component to an effective hazard control program as states are not required to adopt their own regulation policies above and beyond the proposed federal rule. In fact, most states have chosen not to develop their own programs but are instead waiting for the expected adoption of the proposed federal

rule in May, 1988. At that time most states are expected to adopt quite similar or identical to the federal program.

Assuming, as the federal government does, that certain local conditions will require a closer analysis and stricter regulation, counties and communities should mobilize to develop their own programs. This is particularly true if they happen to be located in states that do not intend to develop their own special programs beyond what will be required by the federal rule. Local officials often have quite intimate knowledge of local environmental conditions and are thus often well equipped to act to prevent costly environmental and public health damage from leaking USTs. Many counties and municipalities across the country are currently developing or administering their own programs. An important inclusion in local programs might be registration and standards for tanks containing less than 1,100 gallons as the proposed federal rule exempts these tanks from regulation. However, a small amount of petroleum product has the potential to do a great deal of harm if released into a fragile groundwater environment. Therefore, local officials should analyze conditions to determine if these smaller tanks require regulation. If groundwater dependence is great and aquifers of a small capacity then regulation of small tanks might be a necessity.

In April of 1987 the New England states suffered through an immense rainfall which resulted in very severe

flood conditions, especially in Maine. Flood damage was compounded by many release incidents involving USTs. Statistics gathered by the state of Maine revealed that:

- The Augusta regional office reported 32 spills resulting in 130,000 gallons of petroleum products released into rivers. In addition, 3 USTs popped up from underground and floated away.
- The South Portland office responded to 21 spill reports which released an estimated 17,000 gallons. Six USTs were also lost.
- The Bangor response team answered called on 10 spills which released an estimated 15,000 gallons. Two USTs escaped down the river.[16]

The flood situation which gripped these Maine counties points up the need for strong individualized local programs to protect against the hazards that leaking USTs present. Several types of vehicles exist for controlling these hazards, some regulatory and some non-regulatory.

5.2. Local Control of UST Hazards

Local officials interested in developing a protection program at the outset need to identify their own locality's reliance on groundwater, existing and proposed development and the political, social and economic issues associated with implementing groundwater controls and the protection of their groundwater resource. Prior to taking any major legal steps, officials should obtain USGS Groundwater maps, surficial geology maps and available information

from the Soil Conservation Service. The strength of any groundwater ordinance is critically dependent on the level of scientific data which exists to support it at the time of its adoption.

The following is a discussion of some regulatory devices that counties and localities may employ if local conditions prove to warrant expanded protection against the hazards of leaking USTs.

UST Ordinance. Several cities and counties across the country have adopted local ordinances mandating tank registration, testing, leak monitoring, spill protection and closure procedures. These regulations tend to mirror the federal proposed rule but usually increase standards relative to environmentally sensitive areas. Often small tanks are regulated by local tank ordinances as well.

Overlay Zoning. Pollution of groundwater is almost always associated with the land use above or adjacent to the aquifer. Zoning by-laws and regulations are used to establish land use districts. Overlay zoning is often used to separate incompatible land uses from areas where groundwater is susceptible to contamination. An overlay zone is defined as a set of restrictions which are applied in addition to district zoning requirements.[17] Overlay zoning may be used to regulate or limit USTs in the following sensitive areas:

- Aquifers
- Watersheds

- Wetlands
- Flood plains
- Stream belts
- Coastal areas

Conditional Use Permit. This is a device established by the zoning regulations which allows certain land uses subject to review by the planning board and proof that standards set by the planning obard will continue to be met. The planning board, in approving the conditional use permit may impose restrictions or conditions on the development of the premises such that possible adverse effects on public health and safety are minimized. Conditions that are set forth in a conditional use permit are expressly set forth in a resolution granting the permit. The applicant must unconditionally agree to all conditions imposed on the approval in writing. Prior to granting the conditional use permit for a UST, the planning board must carefully study local conditions and consult with public health officials and the fire marshall to determine what level of protection is required locally and what steps the UST applicant should take to minimize any possible adverse effects on the groundwater resource and the public health and safety. Tank characteristics which might be required beyond the federal proposed rule for environmentally sensitive areas might be:

- Secondary containment
- Continuous inventory monitoring

- Precision leak testing
- Upgraded leak testing schedule
- Increased insurance requirements

Recent information shows that a substantial percentage of leaks come from home heating oil tanks. Regulation of these tanks should be of considerable importance to local communities. Besides the large number of tanks involved, an even greater reason to regulate these tanks is because of their lighter gauge and unprotected steel construction.[18] Some state and federal regulations are too rigorous, too expensive or not applicable to residential and small non-residential tanks. Appropriate regulations can be incorporated into local provisions and used effectively to regulate these small tanks through local efforts.

5.3. The Community Tank Census

Since the need for local intiatives to control groundwater protection from leaking UST hazards cannot be overemphasized, innovative strategies must be considered. The Nashua Regional Planning Commission espouses the Community Tank Census approach. This approach has certain advantages over strict land use regulations, as land use regulations can only restrict future uses of land. Hazards from leaking USTs usually come from tanks which have already been buried in the ground a number of years. In fact, abandoned tnaks constitute a considerable portion of the total threat from leaking USTs. Prior to conducting a community tank census, the community must organize a

water protection program so that high priority areas may be established and a tank census may be concentrated in the areas where it is most needed. A Water Resource Protection Board should be appointed to oversee the census. With broad membership, such a committee can increase local awareness of potential pollution problems. Registration of all tanks should be a part of any local policies to prevent leaking USTs.

With community endorsement and a sufficient budget and well defined objectives, a census can be efficiently conducted to yield important groundwater protection information. A census form could also serve as a tank registration form, thereby enhancing local knowledge of tank conditions in the locality. A census advisory committee should be established to provide technical assistance and might be composed of a town engineer, a conservation commission member, a health officer and interested persons who have knowledge of the historic land uses in the town. A census task force must actually conduct a search. As a basic plan, municipal records, tax maps, records of the building inspector, and records of the fire department ought to be examined to determine the location of all tanks, active and abandoned. A mailing program is usually part of the census.

In the absence of sufficient funds to cover contractor services for the tank survey, volunteer labor must be extensively utilized to complete the task of

registering all UST's in a given area. While a tank census might be an arduous and lengthy taks, communities with high dependence on groundwater should consider a tank survey to be supportive of their long-term interests in economic growth and environmental quality.

5.4. Enforcement

Federal, state and local programs of hazard protection geared toward the prevention of groundwater pollution from leaking UST's may be developed with accuracy and sensitivity yet all are rendered useless without a strong enforcement component built into the regulations. Insofar as local regulation is concerned, town, county and city enforcement officials contribute much to the actual reduction of pollution risk. Local officials, with their intimate knowledge of local conditions, are often in a position to know tank owners and inform them of tank registration and permitting requirements. Also, state requirements for tank registration will often trigger an inspection by a local official in cases of commercial, industrial and government-owned tanks. The local official who usually performs such inspections is either the fire marshall or the mechanical plumbing inspector.

Mechanical inspectors and fire marshalls often work closely together when involved with underground storage tanks. In the case of new tank installations, both officials would have input into the approval of plans at the preliminary stages of a proposed tank installation. After

installation, local officials may again have input by way of inspection for compliance with plan specifications and local codes.

In Rhode Island, although required tank tightness testing is performed by contractors employed by the Department of Environmental Management, local officials are always notified when a test is scheduled. The Rhode Island regulations promote a great deal of reciprocal communication between state government and local officials. By doing so, the regulations combine the resources and authority of the state with the local knowledge of the municipal officials and bring them together upon the problem of leak detection and prevention. Local enforcement is invaluable to bringing local tanks into compliance with state regulation.

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF WATER RESOURCES

REGULATIONS FOR UNDERGROUND STORAGE FACILITIES USED FOR PETROLEUM PRODUCTS AND HAZARDOUS MATERIALS

AUTHORITY: Chapter 46-12, 42-35, 42-17.1 and 23-19.1 of the General Laws of Rhode Island, 1956, as amended.

REGULATIONS FOR UNDERGROUND STORAGE FACILITIES USED FOR PETROLEUM PRODUCTS AND HAZARDOUS MATERIALS

OUTLINE

SECTION 1. AUTHORITY

These regulations are adopted pursuant to Chapters 46-12, 42-17.1, 42-35 and 23-19.1 of the General Laws of Rhode Island, 1956, as amended.

SECTION 2. PURPOSE

The purpose of these regulations is to implement a registration system and to establish facility design requirements testing schedules, and closure requirements for new and existing underground storage tank systems in order to protect the groundwaters and surface waters of the State from pollution that may result from the underground storage of petroleum products and hazardous materials.

SECTION 3. SUPERSEDED RULES AND REGULATIONS

These rules and regulations supersede the Emergency Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Materials.

SECTION 4. ADMINISTRATIVE FINDINGS

The following administrative findings are also made a basis for these regulations:

(a) Approximately 30% of the population of Rhode Island depends upon groundwater as a sole or principal source of water supply.

(b) The principal groundwater resources of the State are located in relatively thin glacial deposits of stratified sand and gravel which underlie about one-third of the State. These aquifers lie close to the surface and are extremely vulnerable to contamination.

(c) A number of small public and private water supplies obtain water from till-covered fractured bedrock aquifers which underlie about two-thirds of the State. These aquifers are especially difficult to monitor and to reclaim once contaminated.

(d) A large portion of the State's future water supplies will be developed from groundwater sources due to the limited number of suitable sites for the construction of surface water reservoirs.

(e) The rapid escalation of groundwater contamination by petroleum products continues to cause property damage and poses an imminent peril to human health by the migration of product and/or product fumes into underground utilities and basements, throughout our State.

SECTION 5. APPLICABILITY

(a) These regulations apply to new, existing and abandoned facilities at which petroleum product(s) and/or hazardous material(s) serving institutions or industrial, commercial, educational, agricultural or governmental operations are stored underground.

(b) Except for Section 14, Leak and Spill Response, these regulations do not apply to:

(1) On-site underground storage tanks used for storing heating oil and serving a one, two or three family dwelling;

(2) Farm or residential underground storage tanks holding less than 1,100 gallons and storing motor fuel or heating oil for non-commercial purposes;

(3) Septic tanks;

(4) Storage tanks located in an underground area, that is not part of a secondary containment system such as a basement or cellar, if the tank is situated upon or above the surface of the floor; or

(5) Underground storage tanks used for storing No. 4, No. 5 or No. 6 fuel oil.

(c) Section 9, Existing Facility Requirements, Section 10, New Facility Requirements, and Section 11, Facility Modification do not apply to tanks used for storing No. 2 fuel or jet propulsion fuel (JP-1).

(d) Section 13, Maintaining Records, part (a)(6) does not apply to tanks used for storing fuel oil No. 1, 1-D or 2 on site for consumptive use, or to tanks used for storing waste oil.

(e) These regulations shall be construed in harmony with and in addition to any requirements of Rhode Island General Laws Title 23, Chapters 28.21 and 28.22 or any orders by local fire chiefs issued thereunder.

SECTION 6. DEFINITIONS

ABANDONMENT means the relinquishment or termination of possession, ownership or control of underground storage tanks, by vacating or by disposition, without meeting the closure requirements listed in Section 15 of these regulations.

CLOSURE means the removal from service of any underground storage tank in accordance with the procedures contained in these regulations.

COMMENCED CONSTRUCTION means that the owner or operator has obtained local approvals or permits necessary to begin physical construction and either has (1) begun a continuous on-site physical construction program; or (2) entered into contractual obligations - which cannot be cancelled or modified without substantial loss - for physical construction of the facility to be completed within a reasonable time.

CONTINUOUS MONITORING SYSTEM means a continuous leak detection and alarm system that is automatic and operates independent of human assistance, that meets industry standards such as those of Underwriters Laboratories (UL), and that is approved by the DIRECTOR.

DIESEL OIL means any grade of distillate oil commonly referred to as diesel which is utilized for the purpose of vehicle propulsion.

DIRECTOR means the Director of the Department of Environmental Management or his/her designee.

Any documents or reports required to be submitted to the DIRECTOR by these regulations should be sent to: Chief, Division of Water Resources, R.I. Department of Environmental Management, 75 Davis Street, Providence, RI 02908.

DRY SEASON means a seasonal time period when the groundwater table is at its lowest; usually occurring during the months of May-December. Specific dates will be determined on a yearly basis by the DIRECTOR.

EXISTING FACILITY means a facility which is in full operation or at which "substantial construction" has been initiated on-site or at which construction on any modification has commenced prior to the effective date of these regulations.

FACILITY means all contiguous land, structures, facility components and other appurtenances that form a district geographic unit and at which petroleum products or hazardous materials are stored in underground storage tanks.

FACILITY COMPONENT means any underground tank and/or associated pipes, pumps, leak monitoring systems, cathodic protection systems, vaults, fixed containers or appurtenant structures, otherwise referred to as facility components, used or designed to be used for the storage, transmission, or dispensing of petroleum products and hazardous materials and serving institutions or industrial, commercial, agricultural or governmental operations or other uses not precluded by the provisions of Section 5 of these regulations.

GASOLINE means a petroleum distillate, or blends of petroleum distillates, having a Reid vapor pressure of 7 pounds per square inch absolute (48.3 k Pa) or greater and used, for example, for the purposes of vehicle propulsion.

GROUNDWATER means water in the saturated zone beneath the ground surface, and includes all underground waters of whatever nature.

HAZARDOUS MATERIALS means any material defined as a "hazardous substance" by section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC 9605), as amended (see Appendix A). Hazardous materials shall also include any material defined as a "hazardous waste" pursuant to the Rhode Island Hazardous Waste Management Act of 1978, as well as any of the following materials:

Acetone
Ethanol
Ethylene Oxide
Methanol
Methylene Chloride
Perchloroethylene

LEAK means a loss from or gain to a facility of 0.05 gallons per hour or more of fluid as determined by a "Precision Test", visual inspection, a continuous monitoring system, inventory control, or other appropriate means, and shall be considered a release from a facility.

LINE LEAK DETECTION SYSTEM means a device installed on the discharge side of the pump which is capable of interrupting product flow if there is a leak greater than or equal to 3 gallons per hour.

LOCAL FIRE CHIEF means the person responsible for the administration and direction of a fire department in a fire district or municipality, including a fire administrator or chief or that person's designee.

MEMBRANE LINER means a secondary containment system for underground storage tanks and piping constructed from a membrane sheet material.

MODIFICATION means any addition to an existing facility or replacement, restoration, refurbishment or renovation which: increases or decreases the in-place storage capacity of a facility; alters the physical configuration; alters the design and/or specifications of facility components; or impairs or affects the physical integrity of a facility or its monitoring systems.

NEW FACILITY means a facility which was not yet in operation and at which "substantial construction" had not yet begun as of the effective date of these regulations.

NFPA CODE number 30 means the National Fire Protection Association publication number 30 entitled, "Flammable and Combustible Liquids Code", (1984).

NFPA CODE number 329 means the National Fire Protection Association publication number 329 entitled, "Underground Leakage of Flammable and Combustible Liquids", (1983).

NO. 1 FUEL OIL means a distillate oil, commonly referred to as kerosene, range oil, or jet propulsion fuel (JP-1).

NO. 1-D FUEL OIL means a distillate oil, commonly referred to as light diesel oil.

NO. 2 FUEL OIL means a distillate oil, commonly referred to as home heating oil.

NO. 2-D FUEL OIL means a distillate oil, commonly referred to as medium diesel oil.

NO. 4 FUEL OIL means a distillate oil blend of No. 2 and No. 6 fuel oil.

NO. 5 FUEL OIL means a distillate oil blend of No. 4 and No. 6 fuel oil.

NO. 6 FUEL OIL means a distillate oil, commonly referred to as Bunker-C or residual fuel.

OBSERVATION WELL means a cased well that intercepts the water table and can be used to detect the presence of groundwater contamination.

ON-SITE means the same or geographically contiguous property which may be divided by public or private right-of-way, provided the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing as opposed to going along, the right-of-way. Non-contiguous properties owned by the same person but connected by a right-of-way which he controls and to which the public does not have access, is also considered on-site property.

OPERATE A FACILITY means to maintain petroleum product(s) or hazardous material(s) in underground storage tanks at a facility for purposes of storage, use or sale.

OPERATOR means the person in control of or having responsibility for the daily operation of a facility.

OWNER means the person who holds title to or lawful possession of a facility or part of a facility.

PERSON means an individual, trust, firm, joint stock company, corporation (including quasi-government corporation), partnership, association, syndicate,

municipality, municipal or state agency, fire district, club, non-profit agency or any subdivision, commission, department, bureau, agency or department of State or Federal government (including quasi-government corporation) or of any interstate body.

PETROLEUM PRODUCT includes:

- Gasoline
- Fuel Oil (No. 1 and 2)
- Diesel Oil (No. 1-D and 2-D)
- Waste Oil
- Gasohol

PRECISION TEST means a test able to determine whether or not an underground storage tank is leaking as defined by NFPA 329, "Underground Leakage of Flammable and Combustible Liquids". This test must be capable of accurately detecting a tank or piping leak as small as 0.05 gallons per hour, adjusted for all variables. The test method must be approved by the DIRECTOR prior to use, and must be conducted by persons who have demonstrated capability to properly conduct the test as determined by the DIRECTOR.

RELEASE means any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an underground storage tank into groundwater, surface water or subsurface soils.

REMOVE FROM SERVICE means to cease to operate a facility component.

SPILL means a loss of petroleum product or hazardous material in a manner other than a leak, occurring on the property where a facility is in operation, and such that the product or material is likely to enter ground water or surface water, and shall be considered a release from a facility.

SPILL CONTAINMENT BASIN means a device installed in fill pipe manholes that prevents petroleum product or hazardous material spills from leaching into the soil and groundwater.

SUBSTANTIAL CONSTRUCTION means that a continuous on-site physical construction program has progressed to a point where at least 25% of the total project is completed or which represents an expenditure of more than 25% of the total cost of the project for materials which are at the site.

SUBSTANTIAL MODIFICATION of a facility means modification to a facility, facility component or new facility plans that would conflict with information provided to the DIRECTOR in application for a certificate of registration or that would be expected to result in reduced performance of a facility component as it relates to leak prevention or detection. Such modification includes but is not limited to:

(1) The installation of tanks not recorded on the application for a certificate of registration for the facility;

(2) Underground storage tank repair, relining or replacement;

(3) For petroleum products, changes in type of product stored (gasoline, No. 1 Fuel Oil, No. 2 Fuel Oil, No. 1-Diesel Oil, No. 2-D Diesel Oil, Waste Oil, or Gasohol);

(4) For hazardous materials, changes in the material stored;

(5) For a New Facility, alterations to the site plan;

(6) Changes in the design or specifications of a facility corrosion protection system;

(7) Changes in the design, specifications or location of facility leak monitoring equipment.

SURFACE WATER means a body of water whose top surface is exposed to the atmosphere and includes all waters of the territorial sea, tidewaters, all inland waters of any river, stream, brook, pond or lake and wetlands.

UNDERGROUND means 10 percent or more of the volume of facility components (storage tanks and piping) is buried in the ground.

UNDERGROUND STORAGE TANK means any one or combination of tanks (including underground pipes connected thereto) which is used to contain an accumulation of petroleum product or hazardous material, and the volume of which (including the volume of the underground pipes connected thereto) is 10 percent or more beneath the surface of the ground.

VAULT means a secondary enclosure which houses an underground storage tank, contains any leaks from the tank, and provides protection from corrosive soils.

WASTE OIL means used or spent oil of any kind, including but not limited to those oils from automotive, industrial, aviation and other source categories.

SECTION 7. FACILITY REGISTRATION

(a) The operator of a facility shall apply for and obtain a certificate of registration from the DIRECTOR in accordance with these regulations and pursuant to the following schedule:

(1) New Facilities, shall apply for and obtain a certificate of registration before commencing construction.

(2) Existing facilities, including facilities where modifications were commenced prior to October 9, 1984 (the effective date of the Emergency Regulations for Underground Storage Facilities), shall apply for a certificate of registration by April 9, 1985.

(b) An application for a certificate of registration shall be submitted on forms provided by the DIRECTOR, and shall include but not be limited to the following:

(1) New Facilities

(i) A set of detailed engineering plans and specifications of the project, including operation and maintenance requirements, that have been certified by a registered professional engineer.

(ii) A site plan including all of the information listed below:

(A) Proposed location of all tanks, piping, and dispensing pumps.

(B) Proposed location(s) of on-site observation wells .

(C) Location of all private and public water supply wells within 1,000 feet of the facility location.

(D) Proposed building locations

(E) Legal boundaries

(F) North Arrow

(G) Description of and specifications for all proposed leak monitoring systems.

(iv) Size, construction material of tanks, and type of material stored.

(2) Existing Facilities

(i) The results of any testing conducted on all tanks and associated piping (if available).

(ii) Size, age, and construction material of tanks, type of material stored, and existence of tank and piping protection devices.

(iii) A site plan including all of the information listed below:

(A) Location of all tanks, piping, and dispensing pumps.

(B) Location of existing, on-site monitoring wells.

(C) Building locations

(D) Legal boundaries

(E) North Arrow

(F) Description of and specifications for all leak monitoring systems in operation.

(iv) A description of all spills and leaks that have occurred at the site.

(c) All certificates of registration issued under the "Emergency Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Materials", adopted 9 October, 1984, shall remain in full force and effect provided the owner and operator submit a written certification in accordance with Section 16 of these regulations.

(d) Failure to obtain a certificate of registration in accordance with these regulations shall constitute a violation of these regulations and may subject the operator to penalties referenced in Section 20, Penalties. An owner or operator of a Facility that has failed to obtain a certificate of registration in accordance with these regulations shall immediately implement facility closure procedures in accordance with Section 15 of these regulations and obtain a certificate of closure.

SECTION 8. DENIAL, MODIFICATION OR REVOCATION OF CERTIFICATE OF REGISTRATION

(a) The DIRECTOR may, after at least twenty days notice in writing to the person or persons affected, and after a hearing, if requested by the affected person or persons, deny, modify or revoke a certificate of registration for cause including, but not limited to:

(1) Information indicating that the storage, location and/or operating procedures pose an immediate threat to public health or the environment;

(2) The information submitted by the application was incomplete, false or misleading;

(3) Circumstances on which the certificate was based have materially and substantially changed since the certificate was issued.

(b) Upon the denial or revocation of the certificate of registration the owner or operator shall immediately implement facility closure procedures in accordance with Section 15 of these regulations and obtain a certificate of closure.

SECTION 9. EXISTING FACILITY REQUIREMENTS

(a) All underground storage tanks at existing facilities that are equipped with remote pumps shall be fitted with a line leak detection system within two (2) years of the effective date of these regulations.

(b) All underground storage tanks at existing facilities shall be fitted with spill containment basins around all fill pipes within two (2) years of the effective date of these regulations.

(c) All existing facility components (underground storage tanks and piping) which do not conform to the new facility requirements listed in Section 10 shall meet the following requirements:

(i) All existing facility components (tanks and piping) that were installed on or after January 1, 1965 shall be precision tested within two (2) years of the effective date of these regulations.

(ii) All existing facility components (tanks and piping) that were installed prior to January 1, 1965 shall be precision tested within one (1) year of the effective date of these regulations, and annually thereafter.

(iii) All existing facility components (underground storage tanks and piping) for which the date of initial installation is known and verifiable and that do not meet the new facility requirements listed in Section 10 shall comply with one (1) of the following:

(A) The underground storage tank(s) and piping shall be precision tested in accordance with the following schedule (years after initial installation):

5, 8, 11, 13

Precision testing shall be conducted on an annual basis for the underground

storage tanks and piping after 13 years of the date of tank installation.

(B) A continuous monitoring system or systems compatible with the product/material stored and approved by the DIRECTOR shall be installed within two (2) years of the effective date of these regulations; the underground storage tank(s) and piping shall be precision tested at five year intervals following the installation of the monitoring device; and the underground storage tank(s) shall be precision tested biennially after 20 years of the date of tank installation.

(d) All existing facility underground storage tanks for which the dates of installation are unknown or unverifiable shall be precision tested within one (1) year of the effective date of these regulations, and annually thereafter.

(e) Results of all precision tests required in this section shall be submitted to the DIRECTOR within 15 calendar days of the date of test completion; or in accordance with Section 14, Leak Response.

(f) Written verification of compliance with parts (a), (b), and (c)(iii)(B) of this section shall be submitted to the Director within 15 calendar days of installation of the required equipment.

(g) All continuous monitoring systems shall be tested by the operator on a monthly basis to ensure that they are operating effectively. Records of such tests shall be maintained in accordance with Section 13, Maintaining Records.

(h) The operator of an existing facility may, in accordance with Section 18 of these regulations, seek a variance so that existing facility components (underground storage tanks and piping) may be regulated in accordance with new facility requirements of Section 10 of these regulations.

[(i) Reserved for existing facility requirements for underground storage tanks used for storing No. 2 fuel oil.]

SECTION 10. NEW FACILITY REQUIREMENTS

(a) All facility components and all related equipment shall be installed, used, and maintained according to the manufacturers specifications and instructions and NFPA Code 30.

(b) All new facility components (underground storage tanks and piping) shall be precision tested upon completion of the installation, but before operation. Results of the precision test shall be submitted to the DIRECTOR within 15 calendar days of test completion or in accordance with Section 14, Leak Response.

(c) All underground storage tanks at new facilities shall be fitted with spill containment basins around all fill pipes.

(d) Underground Storage Tanks

(1) All new underground storage tanks shall be constructed with materials that are compatible with the stored material or product, suitable for the expected external environment, and meet the following minimum requirements:

(i) Steel Tanks - Underwriters Laboratories (U.L.) Listed Standard 58 steel tank or other national laboratory standard approved by the DIRECTOR.

(ii) Fiberglass Tanks - Underwriters Laboratories (U.L.) Listed Standard 1316 fiberglass tank or other national laboratory standard approved by the DIRECTOR.

(2) All tanks shall have one-quarter inch steel wear plates centered under all openings with minimum dimensions of 8" x 8".

(3) All tanks shall have a submerged fill tube.

(4) All tanks shall be factory tested at a minimum of five pounds per square inch gauge and guaranteed tight by the manufacturer.

(e) Pipe, Fittings and Pumping Systems

(1) All new facilities shall have piping meeting or exceeding the following requirements:

(i) Cathodically protected schedule 40 steel pipe.

(ii) Nonmetallic pipe listed by U.L. or other national laboratory approved by the DIRECTOR.

(2) All delivery piping systems using a remote pump shall be equipped with a line leak detection system.

(3) All metallic delivery piping shall employ swing joints at all changes in direction.

(4) All delivery systems employing a suction pumping system shall use one only check valve in any suction line.

(5) All delivery systems shall be pressure tested at 150% of the working capacity (minimum of 50 pounds per square inch gauge) and pressure shall be maintained during the test for a minimum of one hour. Testing shall be conducted prior to backfilling of the delivery system pipe network.

(6) All piping shall be compatible with all of the products transported and tank materials used at the facility.

(7) The terminus of remote piping systems shall have an emergency shutoff valve at the base of the dispensing unit to shut off product flow in the event that the dispensing pedestal is displaced or exposed.

(f) Corrosion Protection

(1) All tanks and their piping systems shall be protected by one of the following:

(i) A properly engineered, installed and maintained cathodic protection system in accordance with recognized standards, such as U.L. of Canada ULC 603.1-M-1982, "Standard for Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids", Steel Tank Institute Standard No. STI-P3, "Specification for STI-P3 System of Corrosion Protection of Underground Steel Storage Tanks - 1983", and National Association of Corrosion Engineers Standard RP-01-69 (1983 Rev.) Recommended Practice - "Control of External Corrosion of Underground or Submerged Metallic Piping Systems".

(ii) Corrosion resistant materials such as fiberglass reinforced plastic, or fiberglass reinforced plastic coatings, or equivalent approved system as listed by the American Society for Testing and Materials (ASTM) or other national laboratory approved by the DIRECTOR.

(g) All new facilities shall comply with one (1) of the following requirements:

(1) Installation of a continuous monitoring system compatible with the product/material stored and approved by the DIRECTOR, and precision testing of the facility (tanks and piping) at five year intervals until a tank age (years after initial installation) of twenty years and then biennially thereafter. Results of precision testing shall be submitted in writing to the DIRECTOR within 15 calendar days of the completion of the test, or in accordance with Section 14, Leak Response. Continuous monitoring systems shall be tested monthly in accordance with Section 9 (g).

(2) Installation of double-walled tanks with a continuous interstitial monitoring system and a secondary containment piping system. The tanks and piping shall be listed by a national laboratory that is approved by the DIRECTOR.

(3) One of the following secondary containment systems approved by the DIRECTOR, with a continuous monitoring system inside the containment system:

(i) Vault

(A) The vault shall be a continuous structure which is impervious to water and the stored product.

(B) The floor shall be sloped at least 1/8" per linear foot.

(C) All openings (i.e. manholes, fill pipes, etc.) shall be watertight.

(D) The tanks shall be installed and properly anchored in the vault in a manner consistent with acceptable engineering practices and standards for safety.

(ii) Membrane Liner

(A) The membrane liner shall have a permeation rate no greater than 0.25 ounces per square foot per 24-hours.

(B) The permeation rate shall be the maximum rate of transport over time of the product stored.

(C) The volume swell of the liner following 24-hours of immersion in the stored product shall not exceed 3 percent of the original membrane thickness.

(D) The maximum change in elongation of the liner following 24-hours of immersion in the stored product shall not exceed 5 percent.

(E) The liner Shore D hardness after 24-hours of immersion in the product stored shall be within 5 points of the original hardness.

(F) The rate of transport through the liner material of the product stored shall not be greater than 6 percent by weight.

(G) The solubility of the liner shall not exceed 0.1 percent by weight in a 24-hour period.

(H) The liner seam strength shall be equal to the tensile strength of the parent material.

(I) All testing of material shall be performed using accepted engineering practices approved by the DIRECTOR for materials tested. The liner shall be installed under the supervision of the manufacturer of the secondary containment membrane liner system.

(J) The tanks shall be installed and properly anchored in a manner consistent with acceptable engineering practices and standards for safety.

(iii) Approved Equal Secondary Containment System - any containment system that can be proven to be equivalent to the above sections (i,ii,) may be used subject to the approval of the DIRECTOR.

(h) <u>Observation Wells</u>

(1) Any new facility that the DIRECTOR determines to be located in an area where a leak could affect groundwater that may be used for present or future drinking purposes, in a watershed of present or

future public water supply, or in an environmentally sensitive area shall have a minimum of three (3) observation wells meeting the specifications given below. Factors to be considered by the DIRECTOR in making this determination will include but not be limited to groundwater classifications developed by the DIRECTOR or the U.S. Environmental Protection Agency (EPA), the location of sole source aquifers designated by the EPA, groundwater studies such as those of the U.S. Geological Survey and Water Resources Board, the location of sensitive or protected areas designated by local governments, and the location of public drinking water supplies.

(2) Wells shall be located in such a manner as to triangulate the facility. The location of the observation wells and/or the requirement of additional wells is subject to the approval of the DIRECTOR. Observation wells shall be constructed as described:

(i) The screen portion of the wells shall extend a minimum of 5 feet below the groundwater surface for the average water table elevation at the site during the dry season. The screen shall be open to the water surface at all times. The maximum well depth shall be thirty feet unless otherwise specified by the DIRECTOR.

(ii) The screen shall be of sufficient length to compensate for seasonal fluctuations in the water table.

(iii) All wells shall have a minimum inside diameter of two (2) inches and be constructed using a minimum of schedule 40 PVC piping.

(iv) All wells shall have bottom caps.

(v) All wells shall be gravel packed and grouted.

(vi) Where possible the wells shall have a mounded surface seal around the well casing and an above grade locking security cover. If the well must be finished at ground level, a tamper resistant cover that prevents surface runoff from entering the wells shall be used.

[(i) Reserved for new facility requirements for underground storage tanks used for storing No. 2 fuel oil.]

SECTION 11. FACILITY MODIFICATION

(a) No substantial modification may be made to an existing or new facility for which an application for a certificate of registration has been filed or for which a certificate of registration has been obtained without prior written notification to and approval by the DIRECTOR.

(b) All modification to or replacement of existing facility or new facility components shall be made in conformance with the requirements of Section 10, New Facility Requirements.

(c) Used tanks meeting the specifications given in Section 10, New Facility Requirements, can be installed in an existing or new facility provided:

(i) the used tanks have been inspected and tested by the manufacturer;

(ii) the used tank has been certified by the manufacturer to be reusable for the product to be stored; and

(iii) the used tank is given the same warranty by the manufacturer as given to a new tank.

(d) Underground storage tanks can be repaired or relined <u>once</u> provided:

(i) the DIRECTOR has approved the repair or relining method;

(ii) the tank is precision tested following tank repairs or relining, and no leaks are detected; and

(iii) the method for repairing or relining is compatible with the product or material stored.

SECTION 12. SOLE SOURCE AQUIFERS

(a) Existing facilities located in sole source aquifers, as designated by the U.S. Environmental Protection Agency, shall be subject to additional monitoring and testing requirements as determined by the DIRECTOR to be necessary for aquifer protection.

SECTION 13. MAINTAINING RECORDS

(a) All owners or operators of new and existing facilities shall maintain on the facility premises records of:

(1) all data used to complete the application for the certificate.

(2) all calibration and maintenance performed.

(3) strip chart, electronic recall device and/or manual recordings for any continuous monitoring instrumentation.

(4) any monitoring, leak detection system, inventory control system and/or tank testing.

(5) monthly tests of continuous monitoring systems as required in Section 9 and 10.

(6) a daily inventory of the product or material stored, including the following minimum information:

(i) a record of all inflows;

(ii) a record of all outflows;

(iii) a daily reconciliation between inflows, outflows and volume on hand;

(iv) written daily entries of any unusual occurrences that might affect the inflow, outflow or volume on hand;

(v) written entries explaining in detail any adjustments to the records.

If such record keeping indicates a discrepancy of 1% or more of total volume stored in any tank, as a minimum, on a weekly basis, the owner or operator shall report such discrepancy in accordance with Section 14, Leak and Spill Response.

(b) Records of the information listed in part (a) shall be maintained for a period of three (3) years from the date they are made, or for such longer periods as required by the DIRECTOR in an unresolved enforcement action.

(c) The facility owner or operator must make available to the DIRECTOR, upon request, all records which the DIRECTOR feels pertinent to the enforcement of these rules and regulations.

(d) Section (13)(a)(6) does not apply to tanks used for storing fuel oil (No. 1, 1-D, or 2) on site for consumptive use, or to tanks used for storing waste oil.

SECTION 14. LEAK AND SPILL RESPONSE

(a) Any owner or operator who is aware of or has cause to suspect a leak or spill from a facility shall report it immediately to the local fire chief and the DIRECTOR. The owner or operator shall file a written report with the DIRECTOR within seven (7) calendar days of the time the leak or spill was first discovered and shall include the known or presumed cause of the leak or spill, results of any tests, inventories, monitoring or inspections that indicate a leak or spill, the known or estimated quantity and type of product or material leaked or spilled, and the length of time the leak or spill was occurring.

(b) At the DIRECTOR'S request, the owner shall arrange to precision test any facility component (tank and piping) which the DIRECTOR has good cause to suspect is leaking within 24-hours of the request. If no leak is detected, a written report of test results shall be submitted to the DIRECTOR within 15 calendar days of test completion. A detected leak shall be reported in accordance with part (a) of this section.

(c) All leaking facility components must be emptied within 24 hours of discovery of the leak, and shall remain empty until such time that the leaking components are repaired or replaced in accordance with the requirements of Section 10 and Section 11, or until the facility component is permanently closed in accordance with Section 15.

(d) The owner or operator of a facility that is located on property at which a leak or spill has occurred or at which the DIRECTOR has good cause to suspect that a leak or spill has occurred shall install observation wells on the property at the DIRECTOR'S request. The number, construction and placement of these wells shall be approved by the DIRECTOR.

SECTION 15. CLOSURE

(a) Abandonment of underground storage tanks is prohibited.

(b) Temporary Closure - The owner or operator of underground storage tanks that are removed from service for 180 days or less shall:

(1) cap and secure against tampering all fill lines, gauge openings and pump suction lines;

(2) keep the vent lines open;

(3) maintain records regarding:

(i) underground storage tank location and size;

(ii) date on which underground storage tanks were taken out of operation; and

(iii) the procedures used to maintain the Facility in a safe condition.

(c) The DIRECTOR may extend the period of temporary closure of an underground storage tank or tanks to more than 180 days for good cause. Petitions for extension must demonstrate good cause and be filed with the DIRECTOR within 60 calendar days following the date the underground storage tank(s) is/are temporarily removed from service.

(d) Permanent Closure - All owners or operators that remove any underground storage tank from service for more than 180 days and have not been granted an extension of temporary closure by the DIRECTOR or who have abandoned any tank(s) shall:

(1) Comply with the procedures for closing the underground storage tank(s) in accordance with part (e) of this section;

(2) Apply to the DIRECTOR for a certificate of closure at least 10 days prior to the date the tank is to be permanently removed from service in accordance with the provisions of this section. Such application shall include:

(A) The date the tank is to be permanently removed from service in accordance with the procedures outlined herein;

(B) The age of the tank to be permanently removed from service;

(C) The type of substance or material that was stored in the tank;

(D) The closure procedures to be followed;

(E) The size, type and location of the tank if it is to remain in the ground;

(F) The date of tank excavation if the tank is to be removed from the ground;

(G) Appropriate documentation substantiating compliance with the closure procedures outlined in this section; and

(3) Obtain from the DIRECTOR a certificate of closure.

(e) An owner or operator that removes any underground storage tank(s) from service for more than 180 days and has not been granted an extension of temporary closure for more than 180 days by the DIRECTOR or who has abandoned any tank(s) shall either:

(1) Remove underground tank(s) and related facility components in accordance with part (f)(1) of this section; or

(2) Allow the underground tank(s) and related facility components to remain in the ground, providing that the requirements listed under part (f)(2) of this section are met.

(f) Permanent closure procedures:

(1) The owner or operator may permanently close underground storage tanks by removing the tanks and related facility components provided that:

(i) all product is removed from the tank(s) and connecting lines;

(ii) the tank is cleaned to remove any residue or material in the tank, and such residue or material is disposed of in accordance with applicable State and Local laws and regulations;

(iii) the gaseous vapors are released at the site in a safe manner approved by the DIRECTOR;

(iv) the DIRECTOR is given at least seventy-two (72) hours notice of the time of excavation of the underground components so that the site may be inspected for the presence of pollutants;

(v) upon request of the DIRECTOR, structural supports necessary to ensure that the excavated area can be safely and thoroughly inspected for the presence of pollutants are installed;

(vi) before disposal, a sufficient number of holes or openings shall be made in the tank(s) so as to render the tank(s) unfit for further use. No cutting torch or other flame or spark producing equipment shall be used until the tank has completely purged or otherwise rendered safe;

(vii) any excavated contaminated soil or debris is disposed of in accordance with appropriate State and Federal laws and regulations.

(2) The owner or operator of a Facility may permanently close underground storage tanks by allowing the tank(s) and/or associated facility components to remain in the ground provided that:

(i) a Precision Test is conducted on the tank(s) and associated piping of the Facility, the results are furnished to the DIRECTOR and the test reveals no leaks;

(ii) all product from the tank(s) and from all connecting lines is removed;

(iii) the tank is cleaned to remove any residue or material in the tank, and such residue or material is disposed of in accordance with applicable State and Local laws and regulations;

(iv) all fill, gauge, pump and vent lines are disconnected and all inlets and outlets are capped or plugged; and

(v) all tanks are filled completely with an inert solid material and all remaining underground piping associated with the tank(s) are capped and secured against tampering.

(g) If the Precision Test required in accordance with part (f)(2)(i) of this Section reveals leak(s) in the tank(s) or associated piping, the DIRECTOR shall determine which, if any, components of the Facility shall be removed to investigate the extent of environmental damage.

(h) Any owner or operator of abandoned underground storage tanks shall within six months from the effective date of these regulations close the tanks in accordance with the permanent closure requirements of this section.

(i) Certificate of Closure

In accordance with part (d) of this section, the owner or operator of a tank to be permanently removed from service shall apply to the DIRECTOR for a certificate of closure and shall provide the DIRECTOR with appropriate documentation substantiating compliance with these regulations. Such documentation shall include but not be limited to the results of precision

tests required. The DIRECTOR shall, base upon a review of the application and other infor ation, determine whether the Facility is in comp iance with these regulations, and shall:

(1) issue a certificate of closure; or

(2) require that certain deficiencies be corrected prior to the issuance of a certifica e of closure and within a specified period of tim ; or

(3) issue a certificate of closure with onditions such as but not limited to monitorin , reporting or site restoration requirements, pr vided, however, that no conditional certifi ate of closure can be transferred to a new wner or operator without conforming with the requirements of Section 17, Transfer of Certifica es of Registration and Closure.

(j) Any owner or operator that has not applie for or obtained a certificate of closure in acco dance with this section shall be in violation of the e regulations and subject to the penalties referenced i Section 20 of these regulations.

(k) All certificates of closure issued under he "Emergency Regulations for Underground Storage Facil ties Used for Petroleum Products and Hazardous Material ", adopted 9 October, 1984 shall remain in full force nd effect provided the owner and operator submit a ritten certification in accordance with Section 6 of these regulations.

SECTION 16. SIGNATORIES TO REGISTRATION AND CLOS RE APPLICATIONS

(a) All applications for a certificate of reg stration and for a certificate of closure shall be sig ed as follows:

(1) For a corporation: by a responsible corporate officer. For the purpose of this se tion, a responsible corporate officer means:

(i) a president, secretary, treasur r, or vice-president of the corporati n in charge of a principal business functio , or any other person who performs simil r policy or decision making functions for t e corporation, or

(ii) the manager of one or more manu acturing, production or operating facilit es employing more than 250 persons or having gross annual sales or expenditures exceeding $21 million (in second-quarter 1980 dollars if authority

to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

Note: DEM does not require specific assignments or delegations of authority to responsible corporate officers identified in 16(a)(1)(i). The DEM will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the DIRECTOR to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under 16(a)(1)(ii) rather than to specific individuals.

(2) For a partnership or sole proprietorship; by a general partner or the proprietor, respectively;

(3) For a municipality, State, Federal, or other public agency; by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) The chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

(4) For a military installation; by the installation Commander of a rank of 06 or higher, if the installation employs more than 250 persons and authority to sign permit applications has been assigned or delegated to the Installation Commander in accordance with applicable Department of Defense (DoD) procedures. If an Installation Commander does not meet these requirements, the permit application must be signed by a superior officer who meets the requirements.

In addition, where a tenant is present on the installation and has authority or responsibility for any aspect of the regulated activity, the Tenant Commander (rank of 06 or higher) must also sign the application. The Tenant Commander must also employ more than 250 persons and have been assigned or delegated authority to sign permit applications in accordance with applicable DoD procedures. Again, if the Tenant Commander does not meet these requirements, the permit application must be signed by a superior officer meeting the requirements.

(b) Reports. All reports required by these regulations and other information requested by the Director shall be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a) of this section;

(2) The authorization specifies either an individual or a position having responsibility for overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

(3) The written authorization is submitted to the DIRECTOR.

(c) Changes to authorization. If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the DIRECTOR prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) Certification. Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(e) All owners and operators who obtained a certificate of registration or a certificate of closure pursuant to the "Emergency Regulations for Underground Storage

Facilities used for Petroleum Products and Hazardous Materials" shall within 60 days of the effective date of these regulations submit to the DIRECTOR the following signed statement:

> I certify under penalty of law that all information previously submitted to the DIRECTOR was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Failure to submit the above-signed statement may be cause for the revocation of the certificate of registration or closure.

SECTION 17. TRANSFER OF CERTIFICATES OF REGISTRATION OR CLOSURE

(a) An owner or operator of a facility may transfer the certificate of registration or of closure to a new owner or operator provided:

(1) The current certificate holder notifies the DIRECTOR in writing by certified mail of the proposed transfer at least thirty (30) days prior to the proposed "transfer date" and includes the following information:

(i) Name and address of current Facility;

(ii) Name and address of new owners and operators;

(iii) Names and addresses of persons upon whom legal process can be served;

(iv) A notarized statement signed by a duly authorized officer or agent of the new owner or operator stating that he has:

(A) read the original application for a certificate of registration or closure and

(B) believes that there has been no substantial modification in the operations of the Facility since the certificate was issued; or

(C) describes the changes that have occurred since the certificate was issued.

(v) A proposed transfer date on which the new owner will assume the certificate and all accompanying responsibility.

(2) The DIRECTOR does not notify the existing certificate holder and the proposed new certificate holder, within twenty (20) days of receipt of notice of proposed transfer, that additional information is needed or of an intent to modify, revoke or revoke and reissue the certificate. If such notice is not received, the transfer is effective on the date specified in the notice provided to the DIRECTOR pursuant to paragraph (a)(1)(v) of this section.

(3) The existing certificate of closure does not contain any ongoing conditions in which case the certificate can only be transferred upon:

(i) the receipt by DEM of a notarized statement signed by the new owner or operator stating that he agrees to abide by all conditions of the certificate; and

(ii) the express written consent of the DIRECTOR.

SECTION 18. VARIANCES

(a) Any owner or operator of a facility may submit a written request to the DIRECTOR for a variance from some or all provisions of these regulations.

(b) The owner or operator shall have the burden of proving by clear and convincing evidence that a variance should be granted because alternative design or operating standards are substantially equivalent to the regulations and will have no adverse effect on public health and the environment.

(c) If the DIRECTOR determines that there is widespread public interest or that the variance request raises major issues that could affect other facilities then the DIRECTOR may schedule a public hearing to solicit public comment prior to rendering a decision on the variance request.

(d) The DIRECTOR'S decision to grant or deny a variance shall be in writing and may, as a condition of granting the variance, impose appropriate requirements necessary to protect the public health and environment.

(e) Any person affected by the grant or denial of a variance request may, in accordance with the Administrative Rules of Practice and Procedure for the Department of Environmental Management, file a claim for an adjudicatory hearing to review the initial decision.

SECTION 19. SEVERABILITY

If any provision of these regulations or the application thereof to any person or circumstances is held invalid by a court of competent jurisdiction, the remainder of the rules and regulations shall not be affected thereby. The invalidity of any section or sections or parts of any section or sections shall not affect the validity of the remainder of these rules and regulations.

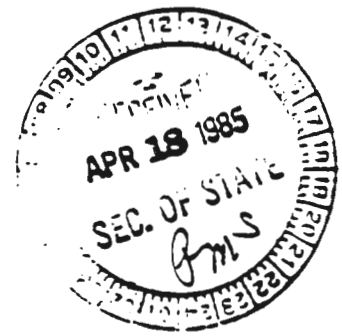
SECTION 20. PENALTIES

Penalties will be assessed in accordance with Rhode Island General Laws Chapter 46-12, 42-17.1, and 23-19.1 for any violation of these regulations.

The foregoing rules and regulations, after due notice and hearing, are hereby adopted and filed with the Secretary of State, this 18th day of April, 1985, to become effective twenty (20) days thereafter, in accordance with the provisions of Chapter 46-12, 42-17, and 42-35 of the General Laws of Rhode Island, 1956, as amended.

Robert L. Bendick, Jr.
Director
Department of Environmental Management

ATTEST A TRUE COPY:



The foregoing rules and regulations are hereby approved for filing with the Secretary of State in accordance with the provisions of the General Laws of Rhode Island, 1956, as amended, Chapter 46-35, specifically Section 42-17.3-2 and the Public Laws of Rhode Island, 1978, Chapter 229 and Chapter 46-2.

Attest a true copy.

ENVIRONMENTAL STANDARDS BOARD

4-16-85
Date

H. Derman Scott, M.D.
Director of Health

Date

Michael Doyle
Director of Administration

4/17/85
Date

Robert L. Bendick, Jr.
Director of Environmental Management

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Director of Environmental Management

APPENDIX A

Definition of Hazardous Substance

Hazardous substance, as defined by section 101(14) of CERCLA, means (a) any substance designated pursuant to section 311(b)(2)(A) of the CWA (see List 1); (b) any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA (see List 2); (c) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress); (d) any toxic pollutant listed under section 307(a) of the CWA (see List 3); (e) any hazardous air pollutant listed under section 112 of the Clean Air Act (see List 4); and (f) any imminently hazardous chemical substance or mixture with respect to which the Administrator of EPA has taken action pursuant to section 7 of the Toxic Substances Control Act (see List 5). The terms do not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (a) through (f) of this paragraph, and the term does not include natural gas, natural gas liquids, liquified natural gas or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

LIST 1

Hazardous Substances - Clean Water Act Section 102

Common name	CAS No.	Synonyms	Isomers	CAS No.
[illegible]	75070	Ethanal, ethyl aldehyde, acetic aldehyde		
[illegible]	64197	Glacial acetic acid, vinegar acid		
[illegible]	108247	Acetic oxide, acetyl oxide		
[illegible]	75865	2-methylpropanenitrile, isopropylcyanide, isobutyronitrile		
[illegible]	506967			
[illegible]	79247			
[illegible]	107028	2-propenal, allyl aldehyde, allylaldehyde, acraldehyde		
[illegible]	107131	Cyanoethylene, Acrylon, Vinyl, propenenitrile, vinyl cyanide		
[illegible]	124048	Hexadecanoic acid		
[illegible]	309002	Cedrene, $C_{15}H_{24}$		
[illegible]	107186	2-propen-1-ol, 1-propenol-3, vinyl carbinol		
[illegible]	107051	3-chloropropene, 3-chloropropylene, Chlorallylene		
[illegible]	1004301-[illegible]	Alum		
[illegible]	7784417			
[illegible]	631618	Acetic acid ammonium salt		
[illegible]	1863634			
[illegible]	1066337	Acid ammonium carbonate, ammonium hydrogen carbonate		
[illegible]	7789095			
[illegible]	1341497	Acid ammonium fluoride, ammonium hydrogen fluoride		
[illegible]	16196309			
[illegible]	1111780	Ammonium arsenomolybdate		
[illegible]	506676			
[illegible]	12125029	Ammonium nitrate, no ammonium, ammonium, Ammonium		
[illegible]	7789068			
[illegible]	3012868	Diammonium citrate, citric acid diammonium salt		
[illegible]	13826830	Ammonium fluorosilicate, ammonium hexafluorosilicate		
[illegible]	12125018	Metallic ammonium fluoride		
[illegible]	1336216			
[illegible]	8030707			
	5972736			
	14258462			
[illegible]	16919190	Ammonium fluorozirconate		
[illegible]	7773060	Ammonium, AMS, ammonium sulphamate		
[illegible]	12125761			
[illegible]	10196040			
	16196309			
[illegible]	3164292	Tartaric acid ammonium salt		
	14307458			
[illegible]	1762954	Ammonium molybdate, ammonium salt, molybdic acid ammonium salt		
[illegible]	7783186	Ammonium hydroxide		
[illegible]	528637	Arsenamide acid	ortho	123922
		Para oil	meta	626380
		Benzene oil	para	623161
[illegible]	62533	Aniline oil, phenylamine, aminobenzene, aminophen, Anilin		
[illegible]	7647189			
[illegible]	28300745	Tartar emetic, antimony potassium, potassium antimony, potassium antimonyltartrate		
[illegible]	7789619			
[illegible]	10025919	Butter of antimony		
[illegible]	7783564	Antimony fluoride		
[illegible]	1309644	Diantimony trioxide, butter of antimony		
[illegible]	1303328	Red arsenic sulfide		
[illegible]	1303282	Arsenic acid anhydride, arsenic oxide		
[illegible]	7784341	Arsenic chloride, arsenous chloride, arsenic trichloride, butter of arsenic		
[illegible]	1327522	Arsenious acid, arsenous oxide, white arsenic		
[illegible]	1303339	Arsenious sulfide, yellow arsenic sulfide		
[illegible]	542621			

Common name	CAS No.	Synonyms	Isomers	CAS No.
[illegible]	71432	[illegible]		
[illegible]	65850	[illegible]		
[illegible]	100470	[illegible]		
[illegible]	98884	[illegible]		
[illegible]	100447			
[illegible]	7787475			
[illegible]	7787497			
[illegible]	7787555			
	13597994			
[illegible]	123864	[illegible]	[illegible]	110190
			[illegible]	105464
			[illegible]	540885
[illegible]	109739	[illegible]	[illegible]	78819
			[illegible]	513495
			[illegible]	13952846
			[illegible]	75649
[illegible]	84742	[illegible]		
[illegible]	107926	[illegible]	[illegible]	79312
[illegible]	543908			
[illegible]	7789426			
[illegible]	10108642			
[illegible]	7778441	[illegible]		
[illegible]	52740166			
[illegible]	75207	[illegible]		
[illegible]	13765190	[illegible]		
[illegible]	592018			
[illegible]	26264062			
[illegible]	7778543			
[illegible]	133062	[illegible]		
[illegible]	63252	[illegible]		
[illegible]	1563662	[illegible]		
[illegible]	75150	[illegible]		
[illegible]	56235	[illegible]		
[illegible]	57749	[illegible]		
[illegible]	7782505			
[illegible]	108907	[illegible]		
[illegible]	67663	[illegible]		
[illegible]	2921882	[illegible]		
[illegible]	7790945	[illegible]		
[illegible]	1066304			
[illegible]	11115745	[illegible]		
[illegible]	10101538			
[illegible]	10049055			
[illegible]	7789437	[illegible]		
[illegible]	544183	[illegible]		
[illegible]	14017415	[illegible]		
[illegible]	56724	[illegible]		
[illegible]	1319773	[illegible]	[illegible]	108394
		[illegible]	[illegible]	95487
			[illegible]	106445
[illegible]	4170303	[illegible]		
[illegible]	142712	[illegible]		
[illegible]	12002038	[illegible]		
[illegible]	7447394	[illegible]		
[illegible]	3251238	[illegible]		
[illegible]	5893663	[illegible]		
[illegible]	7758987	[illegible]		
[illegible]	10380297	[illegible]		
[illegible]	815827	[illegible]		
[illegible]	506774			
[illegible]	110827	[illegible]		
2,4-D [illegible]	94757	[illegible]		
2,4-D [illegible]	94111	[illegible]		
	94791			
	94804			

Common name	CAS No.	Synonyms	isomers		CAS No.
	1338-23-4				
	1338-24-5				
	1338-36-8				
	1338-37-9				
	2371-52-9				
	25167-82-2				
	53467-11-1				
DDT	50-29-3	4,4'-DDT			
Diazinon	333-41-5	Diazinon, Diazinon, Basudin, Spectracide			
Dicamba	1918-00-9	3-methoxy-2,6-dichlorobenzoic acid			
Dichlobenil	1194-65-6	2,6-dichlorobenzonitrile, 2,6-DBN			
Dichlone	117-80-6	Phygon, dichloronaphthoquinone			
Dichlorvos	62-73-7	Dichlorvos	Ortho		95-50-1
		Paramark (Para)	Para		106-46-7
Dichloropropene	26952-23-8	Propylene dichloride	1,1		78-99-9
			1,2		78-87-5
			1,3		142-28-9
Dichloropropene	542-75-6		1,3		542-75-6
			2,2		78-88-6
Dichloropropene-dichloropropane (mixture)	8003-19-8	D-D mixture Vidden D			
2,3-Dichloropropene acid	75-99-0	Dalapon			
Dichlorvos	62-73-7	2,2-dichlorovinyl dimethyl phosphate, Vapona			
Dicofol	115-32-2	Kelthane			
Dicrotophos	141-66-2				
Dicrotophos	2157-98-4				
Dieldrin (mixed)	60-57-1	Dieldrin	o-		72-20-8
			p-		33213-65-9
			p-		1031-07-8
Diethatyl	38727-55-8	Antinon	(2,6-)		2832-40-8
			(2,4-)		
			(2,6-)		3732-09-2
Diethatyl	5836-29-3	DNT	2,4		121-14-2
			2,6		606-20-2
			3,4		610-39-9
Diquat	85-00-7	Aquacide			
	2764-72-9	Diquat, Reglone, Diquat dibromide			
Disulfoton	298-04-4	Disyston			
Diuron	330-54-1	DCMU, DMU			
Endothall-manganese salt	27778-41-8				
Endosulfan	115-29-7	Thiodan			
Endrin	72-20-8	Mendrin, Compound 269			
Epichlorohydrin	106-89-8	<Chloropropylene oxide>			
Ethion	563-12-2	Nialate, ethyl mercaptophos, phosphorothioic acid,			
Ethylene dibromide	106-93-4	Pharmafume			
Ethylene dichloride	107-06-2	1,2-dichloroethane			
Ethylenediaminetetraacetic acid (EDTA)	60-00-4	Edetic acid, Hamptene, ethylenedinitrilotetraacetic acid,			
Ethylene dibromide	106-93-4	1,2-dibromoethane, sodibrom, dibromoethane, symbromoethylene,			
Ethylene dichloride	107-06-2	1,2-dichloroethane, symdichloroethane			
Ferric ammonium citrate	1185-57-5	Ammonium ferric citrate			
Ferric ammonium oxalate	2944-67-4	Ammonium ferric oxalate			
	55488-87-4				
Ferric chloride	7705-08-0	Ferric methyl, iron trichloride			
Ferric fluoride	7783-50-8				
Ferric nitrate	10421-48-4	iron nitrate			
Ferric sulfate	10028-22-5	Ferric persulfate, iron sesquisulfate, iron sulfate,			
Ferrous ammonium sulfate	10045-89-3	Mohr's salt, iron ammonium sulfate			
Ferrous chloride	7758-94-3	iron chloride, iron dichloride, iron protochloride,			
Ferrous sulfate	7720-78-7	Green vitriol			
	7782-63-0	iron vitriol, iron sulfate, iron protosulfate			
Fluometuron	2164-17-2	Meturon, Cotoran, Flumeturon, Cotogard			
Fluoride ion	16984-48-8				

Common name	CAS No.	Synonyms		CAS No.
[redacted]	116178	[redacted]	[redacted]	[redacted]
[redacted]	88911	[redacted]	[redacted]	[redacted]
[redacted]	88908	[redacted]	[redacted]	[redacted]
[redacted]	78446	[redacted]	[redacted]	[redacted]
[redacted]	77474	[redacted]	[redacted]	[redacted]
[redacted]	7647010	[redacted]	[redacted]	[redacted]
[redacted]	7664382	[redacted]	[redacted]	[redacted]
[redacted]	74908	[redacted]	[redacted]	[redacted]
[redacted]	7783064	[redacted]	[redacted]	[redacted]
[redacted]	78784	[redacted]	[redacted]	[redacted]
[redacted]	4388401	[redacted]	[redacted]	[redacted]
[redacted]	115282	[redacted]	[redacted]	[redacted]
[redacted]	148589	[redacted]	[redacted]	[redacted]
[redacted]	301042	[redacted]	[redacted]	[redacted]
[redacted]	7784409	[redacted]	[redacted]	[redacted]
[redacted]	7644252	[redacted]	[redacted]	[redacted]
[redacted]	10102464	[redacted]	[redacted]	[redacted]
[redacted]	7758064	[redacted]	[redacted]	[redacted]
[redacted]	12314060	[redacted]	[redacted]	[redacted]
[redacted]	7783462	[redacted]	[redacted]	[redacted]
[redacted]	10101600	[redacted]	[redacted]	[redacted]
[redacted]	10099748	[redacted]	[redacted]	[redacted]
[redacted]	7428466	[redacted]	[redacted]	[redacted]
[redacted]	1072351	[redacted]	[redacted]	[redacted]
[redacted]	53553500	[redacted]	[redacted]	[redacted]
[redacted]	7440142	[redacted]	[redacted]	[redacted]
[redacted]	1314478	[redacted]	[redacted]	[redacted]
[redacted]	582370	[redacted]	[redacted]	[redacted]
[redacted]	58089	[redacted]	[redacted]	[redacted]
[redacted]	14307358	[redacted]	[redacted]	[redacted]
[redacted]	121728	[redacted]	[redacted]	[redacted]
[redacted]	118167	[redacted]	[redacted]	[redacted]
[redacted]	108910	[redacted]	[redacted]	[redacted]
[redacted]	200857	[redacted]	[redacted]	[redacted]
[redacted]	592041	[redacted]	[redacted]	[redacted]
[redacted]	10045940	[redacted]	[redacted]	[redacted]
[redacted]	7782328	[redacted]	[redacted]	[redacted]
[redacted]	592858	[redacted]	[redacted]	[redacted]
[redacted]	7783407	[redacted]	[redacted]	[redacted]
[redacted]	16918768	[redacted]	[redacted]	[redacted]
[redacted]	72435	[redacted]	[redacted]	[redacted]
[redacted]	74931	[redacted]	[redacted]	[redacted]
[redacted]	60359	[redacted]	[redacted]	[redacted]
[redacted]	200590	[redacted]	[redacted]	[redacted]
[redacted]	7782492	[redacted]	[redacted]	[redacted]
[redacted]	314184	[redacted]	[redacted]	[redacted]
[redacted]	75047	[redacted]	[redacted]	[redacted]
[redacted]	74828	[redacted]	[redacted]	[redacted]
[redacted]	200746	[redacted]	[redacted]	[redacted]
[redacted]	11238	[redacted]	[redacted]	[redacted]
[redacted]	1222246	[redacted]	[redacted]	[redacted]
[redacted]	19480160	[redacted]	[redacted]	[redacted]
[redacted]	37211086	[redacted]	[redacted]	[redacted]
[redacted]	7718540	[redacted]	[redacted]	[redacted]
[redacted]	12054467	[redacted]	[redacted]	[redacted]
[redacted]	14216752	[redacted]	[redacted]	[redacted]
[redacted]	7786814	[redacted]	[redacted]	[redacted]

Common name	CAS no.	Synonyms	isomers	CAS no.
[illegible]	7697372	Nitric acid		
[illegible]	10043	Nitrocalcite, 35 wt mixture		
[illegible]	10102440	Norepin bitartrate		
[illegible]	2814466	Norepinephrine	rac	55-65-7
			d-	51-35
			l-	100-27
[illegible]	1321126		Ortho	95-72
			Meta	108-61
			Para	106-42
[illegible]	26023864	Pentosan, Pentagonic, Triterpene, polymerized hemicellulose, polyanhydroxylene.		
[illegible]	56-65-5	ONTP, Nerve		
[illegible]	57-83-0	PCP, Ascis		
[illegible]	108-95-2	Carbolic acid, phenyl hydroxide, hydroxybenzene, oxybenzene.		
[illegible]	75-44-5	Dichlorogene, carbonyl chloride, chloroformic chloride.		
[illegible]	7664-38-2	Orthophosphoric acid		
[illegible]	7723-14-0	Basic phosphorus, red phosphorus, white phosphorus, yellow phosphorus.		
[illegible]	10025-87-3	Phosphoryl chloride, phosphorus oxychloride		
[illegible]	1314-80-3	Phosphorus sulfide, Tetraphosphorus decasulfide, phosphorus pentasulfide.		
[illegible]	7719-12-2	Phosphorous trichloride		
[illegible]	1336-36-3	PCB, Aroclor, polychlorinated biphenyls		
[illegible]	7784-41-0			
[illegible]	10124-50-2	Potassium monoarsenite		
[illegible]	7778-50-9	Potassium dichromate		
[illegible]	7789-00-6			
[illegible]	151-50-8			
[illegible]	1310-58-3	Potassium hydrate, caustic potash, potassa		
[illegible]	7722-64-7	Chameleon mineral		
[illegible]	2312-76-8	Citrus		
[illegible]	79-09-4	Propionic acid, methylacetic acid, ethylformic acid.		
[illegible]	123-62-6	Propionic anhydride, methylacetic anhydride.		
[illegible]	75-56-9	Propylene oxide		
[illegible]	121-29-9	Pyrethrin I		
	121-21-1	Pyrethrin II		
[illegible]	91-22-5	1-benzazine, benzo[b]pyridine, quinoline, chinoline, leukol.		
[illegible]	108-46-3	Resorcin, 1,3-benzenediol, meta-dihydroxybenzene.		
[illegible]	7446-09-5	Sulfurous oxide		
[illegible]	7761-88-8	Silver nitrate, silver (1+) salt, lunar caustic		
[illegible]	7440-22-4	Silver		
[illegible]	7631-89-2	Sodium arsenite		
[illegible]	7784-46-5	Sodium monoarsenite		
[illegible]	10588-01-9	Sodium dichromate		
[illegible]	1333-83-1			
[illegible]	7631-99-4	Sodium nitrate, sodium nitrate (2:1)		
[illegible]	7775-11-3			
[illegible]	143-33-9			
[illegible]	25155-30-0			
[illegible]	7681-49-4	Villiaumite		
[illegible]	16721-80-5	Sodium hydrogen sulfide		
[illegible]	1310-73-2	Caustic soda, lime ley, sodium hydrate		
[illegible]	7681-52-9	Bleach		
	10022-70-5			
[illegible]	124-41-4	Sodium methylate		
[illegible]	7632-00-0			
[illegible]	7758-29-4			
	10028-22-5			
	10140-65-5			
[illegible]	7775-09-9			
	7681-49-4			
	10101-89-0			
	12136-45-7			

Common name	CAS No.	Synonyms		CAS No.
	7758294			
	10124568			
Sodium arsenite	10102188			
	7778532			
Strontium chromate	7789062			
Strychnine	57240			
Styrene	100425	Vinylbenzene, phenylethylene, styrol, styrol monomer, cinnamene		
Sulfuric acid	7664939	Oil of vitriol, sulfuric		
Sulfur mustard	12771083	Sulfur dichloride		
2,4,5-T acid	93765	2,4,5-trichlorophenoxyacetic acid		
2,4,5-T amines	6369966	Amines, [2,4,5-trichlorophenoxy]-, salts with N,N-dimethylalkylamines (1:1).		
	6369977	Amines, [2,4,5-trichlorophenoxy]-, salts with triethylamine (1:1).		
	1319728	Amines, [2,4,5-trichlorophenoxy]-, salts with 1-amino-2-propanol (1:1).		
	3813147	Amines, [2,4,5-trichlorophenoxy]-, salts with 2,2'-iminodi[ethanol] (1:1).		
2,4,5-T esters	2545597	2,4,5-trichlorophenoxyacetic esters		
	93798			
	61792072			
	1928478			
	25168154			
2,4,5-T salts	13560991	Amines, [2,4,5-trichlorophenoxy]-, salts		
TCDD	72548	DDD		
2,4,5-TP acid	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)-		
2,4,5-TP esters	32534955	Propionic acid, 2-(2,4,5-trichlorophenoxy)-, esters		
Tetraethyl lead	78002	Lead tetraethyl, TEL		
Tetraethyl pyrophosphate	107493	TEPP		
Thallic oxide	12036491			
	7446186			
Thallium	7440280	Thallium, monohydrate, pentahydrate, Metallene		
Thiophene	8001502	Carbomycin		
Thiophenol	52858	Cyclan		
		Cyclic		
Thiosemicarbazide	79196	Ethylene thiourea		
Thiourea	25167822	Calcium, Diamine 2 or 3, Oral, Photo active.	(2,3,4-)	15960668
			(2,3,5-)	933788
			(2,3,6-)	933755
			(2,4,5-)	95954
			(2,4,6-)	88062
			(3,4,5-)	609198
Thiosemicarbazide monohydrochloride	27232417			
Thiotepa	121464			
Thiouracil	73622	TUA		
Uranyl acetate	541093			
Uranyl nitrate	10102064			
	36478769			
Vanadium pentoxide	1314621	Vanadic anhydride, vanadic acid anhydride		
Vanadyl sulfate	27774136	Vanadic sulfate, vanadium sulfate		
Vinyl acetate	108054	Acetic acid ethenyl ester		
Vinylidene chloride	75354	1,1-dichloroethene		
		1,1-dichloroethylene		
Xylene (mixed)	1330207	Dimethylbenzene	m-	108383
		Xylol	o-	95476
			p-	106423
Xylenol	1300716	Dimethylphenol, Trimethylphenylmethane		
Zinc acetate	557346			
Zinc ammonium chloride	14639975			
	14639986			
	52628258			
Zinc borate	1332076			
Zinc chloride	7646857			

Common name	CAS No.	Synonyms	Common name	CAS No.
Zinc [illegible]	[illegible]			
Zinc [illegible]	[illegible]	Sulfate of zinc		
Zinc [illegible]	[illegible]			
Zinc [illegible]	[illegible]			
Zinc [illegible]	[illegible]			
Zinc [illegible]	[illegible]			
Zinc [illegible]	[illegible]			
Zinc [illegible]	[illegible]	Zinc [illegible]		
Zinc [illegible]	[illegible]			
Zinc [illegible]	[illegible]	Zinc fluoride		
Zinc [illegible]	[illegible]	Zinc [illegible], zinc [illegible], [illegible]		
Zirconium [illegible]	[illegible]			
Zirconium [illegible] [illegible]	[illegible]			
Zirconium [illegible]	[illegible]	[illegible]		
Zirconium [illegible]	[illegible]			

List 2

CERCLA Section 102 Wastes (as of February 1985)

None to Date.

List 3 - Toxic Pollutants - Clean Water Act, Section 307(a)

1,1 Dichloroethane
1,1 Dichloroethylene
1,1,1 Trichloroethane
1,1,2 Trichloroethane
1,1,2,2 Tetrachloroethane
1,2 Dichlorobenzene
1,2 Dichloroethane
1,2 Dichloropropane
1,2 Diphenylhydrazine
1,2 Trans-Dichloroethylene
1,2,4 Trichlorobenzene
1,3 Dichlorobenzene
1,3 Dichloropropylene
1,4 Dichlorobenzene
2 Chloronaphthalene
2 Chlorophenol
2 Nitrophenol
2,3,7,8 Tetrachlorodibenzo P Dioxin
2,4 Dichlorophenol
2,4 Dimethylphenol
2,4 Dinitro-phenol
2,4 Dinitrotoluene
2,4,6 Trichlorophenol
2,6 Dinitrotoluene
2-Chloroethylvinyl Ether
3,3 Dichlorobenzidine
3,4 Benzofluoranthene
4 Bromophenyl Phenyl Ether
4 Chlorophenyl Phenyl Ether
4 Nitrophenol
4,4' DDD
4,4' DDE
4,4' DDT
4,6 Dinitro-3-Cresol
Acenaphthene
Acenaphthylene
Acrolein
Acrylonitrile
Aldrin
Alpha-BHC
Alpha-Endosulfan
Anthracene
Antimony, Total
Arsenic, Total
Benzene
Benzidine
Benzo (a) Anthracene
Benzo (a) Pyrene
Benzo (ghi) Perylene
Benzo (k) Fluoranthene
Beryllium, Total
Beta-BHC
Beta-Endosulfan
Bis (2 Chloroethoxy) Methane
Bis (2 Chloroethyl) Ether
Bis (2 Chloroisopropyl) Ether
Bis (2 Ethylhexyl) Phthalate
Bis (Chloromethyl) Ether
Bromoform
Butyl Benzyl Phthalate
Cadmium, Total
Carbon Tetrachloride
Chlordane
Chlorobenzene
Chlorodibromomethane
Chloroethane
Chloroform
Chromium, Total
Chrysene
Copper, Total
Cyanide, Total
Delta-BHC
Di-N-Butyl Phthalate
Di-N-Octyl Phthalate
Dibenzo (a,h) Anthracene
Dichlorobromomethane
Dichlorodifluoromethane
Dieldrin
Diethyl Phthalate
Dimethyl Phthalate
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Ethylbenzene
Fluoranthene
Fluorene
Gamma-BHC
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3 cd) Pyrene
Isophorone
Lead, Total
Mercury, Total
Methyl Bromide
Methyl Chloride
Methylene Chloride
N-Nitrosodi-N-Propylamine
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
Naphthalene
Nickel, Total
Nitrobenzene
P-Chloro-M-Cresol
PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248
PCB-1254
PCB-1260
Pentachlorophenol
Phenanthrene
Phenol
Phenols, Total
Pyrene
Selenium, Total
Silver, Total
Tetrachloroethylene
Thallium, Total
Toluene
Toxaphene
Trichloroethylene
Trichlorofluoromethane
Vinyl Chloride
Zinc, Total

List 4

Hazardous Air Pollutants Clean Air Act - CAA Section 112 (as of February 1985)

Arsenic
Asbestos
Benzene
Beryllium
Coke Oven Emissions
Mercury
Vinyl Chloride

APPENDIX B

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

UNDERGROUND STORAGE TANK REPLACEMENT REVOLVING LOAN FUND RULES AND REGULATIONS

DRAFT

March, 1987

AUTHORITY: Regulations adopted pursuant to Chapters 46-12 and 42-35 of the General Laws of Rhode Island of 1956, as amended.

TABLE OF CONTENTS

1.00 AUTHORITY - These regulations are adopted pursuant to Chapter 486 of the Public Laws of Rhode Island of 1985 and Chapters 46-12 and 42-35 of the General Laws of Rhode Island of 1956, as amended.

2.00 PURPOSE - The purpose of these regulations is to implement the provisions of Chapter 46-12 pertaining to the Underground Storage Tank Replacement Loan Fund. The goal of the loans is to provide low interest funding to replace existing underground storage tanks that may pose a danger to public health.

3.00 SEVERABILITY - If any provision of these regulations or the application thereof to any individual or circumstance is held invalid by a court of competent jurisdiction, the remainder of the regulations shall not be effected thereby. The invalidity of any section or sections shall not affect the validity of the remainder of these regulations.

4.00 DEFINITIONS - Unless the context specifically indicates otherwise, the meaning of terms used in these rules shall be as follows:

4.100 COMMERCIAL - means all non-private facilities.

4.101 FACILITY - means all contiguous land, structures, facility components and other appurtenances that form a district geographic unit and at which petroleum products or hazardous materials are stored in underground storage tanks.

4.102 HAZARDOUS MATERIALS - means any material defined as a "hazardous substance" by section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC 9605), as amended (see Appendix A). Hazardous materials shall also include any material defined as a "hazardous waste" pursuant to the Rhode Island Hazardous Waste Management Act of 1978, as well as any of the following materials:

-Acetone

-Ethanol

-Ethylene Oxide

-Methanol

-Methylene Chloride

-Perchloroethylene

4.103 PETROLEUM PRODUCT - includes:

-Gasoline

-Fuel Oil (No.1)

-Diesel Oil (No.1-D and 2-D)

-Waste Oil

-Gasohol

4.104 PRECISION TEST - means a test able to determine whether or not an underground storage tank is leaking as defined by NFPA 329, "Underground Leakage of Flammable and Combustible Liquids". This test must be capable of accurately detecting a tank or piping leak

as small as 0.05 gallons per hour, adjusted for all variables. The test method must be approved by the DIRECTOR prior to use, and must be conducted by persons who have demonstrated capability to properly conduct the test as determined by the DIRECTOR.

4.105 PRIVATE - means farm or residential underground storage tanks holding less than 1,100 gallons and storing motor fuel or heating oil for non-commercial purposes.

4.106 REPLACEMENT - means installation of new underground storage tank or tanks.

4.107 UNDERGROUND - means 10% or more of the volume of facility components (storage tanks and piping) is buried in the ground.

4.108 UNDERGROUND STORAGE TANK - means any one or combination of tanks (including underground pipes connected thereto) which is used to contain an accumulation of petroleum products or hazardous materials, and the volume of which (including the volume of the underground pipes connected thereto) is 10% or more beneath the surface of the ground.

5.00 ELIGIBILITY OF ACTIVITIES AND RECIPIENTS

5.01 ELIGIBLE COSTS AND ACTIVITIES

Costs of replacement including design, engineering, construction, parts and construction supervision.

5.02 ELIGIBILITY OF LOAN RECEIPTS

5.021 Applicant must provide evidence that he/she is the owner of the property where the underground storage tanks are located or that he/she has a long term lease equal to the duration of the loan.

5.022 Applicant must provide evidence that he/she is credit worthy.

5.023 In cases of joint, corporate or company ownership the loan application must be signed by an individual with the power to bind the corporation, company or partnership.

6.00 APPLICATION PROCEDURES & REQUIREMENTS

6.100 FORMS - Applications must be submitted on forms provided by the Rhode Island Department of Environmental Management. Applications will at a minimum contain the following information.:

6.101 The name of owner of the business which owns the underground storage tank and the name of the owner of the property at which the tank is located. The nature of the ownership, i.e., sole proprietorship, partnership, corporation or other.

6.102 Address of the property for which the loan is sought and its plat and lot number.

6.103 Certified copy of the deed or the lease for the property.

6.104 Names of all mortgage or lien holders and the original and outstanding balance of the mortgage liens.

6.200 CREDIT WORTHINESS - Applications must contain such additional information as is necessary to establish credit worthiness. Such information will be held in confidence. Information required may include but will not necessarily be limited to:

6.201 Income data including taxable yearly income and/or weekly income from all sources of the business.

6.202 Asset data including value of equipment and property or real estate.

6.203 Debt data including amounts owed on all loans, mortgages or rent payments.

6.204 Amount of the loan sought, substantiated by submission of three bids to be obtained from duly licensed engineers or contractors.

6.300 APPLICATION REVIEW PROCEDURES

6.301 Applications for loans to repair or replace underground storage tanks will be reviewed and awards made by the Department of Environmental Management pursuant to the criteria and procedures set forth in these rules and regulations.

6.400 APPLICATION REVIEW CRITERIA

The following basic criteria shall be applied in reviewing loans.

6.401 Availability of funds.

6.402 Completeness of application including required documents; incomplete applications will be returned.

6.403 Accuracy of information - untrue or misleading representations may be grounds for rejection.

6.500 CRITERIA FOR ESTABLISHING PRIORITIES

In the event that the department receives more requests for loans than it has funds available it will award loans first to those eligible applicants that have the highest score as determined according to the following criteria.

6.501 ADJACENT LAND USE

		SCORE
I	Wells in general use in area:	
	a. public water supply wells	5
	b. private wells	3
II	Density of residential development:	
	Heavy	3
	Moderate	2
	Sparse	1
		Subtotal

III Special consideration facilities:

a. hospital/clinic	3
b. convalescent/nursing home	2
c. school	1
	Subtotal

6.502 Type of Facility:

I Retail Gasoline	5
II Wholesale Gasoline	5
III (Light Fraction) Hazardous Materials	5
	SCORE
Farm/Residential Gasoline	2
Heating Oil Commercial	3
Heating Oil Residential	2
Other Commercial	1
	Subtotal

6.503 Characteristics of Tank

Leaking	5
Steel Construction	3
Other Material	-
Age 10-25 years	4
	Subtotal

Multiply this by number of tanks_____

6.504 Ownership Characteristics:

Small Business	5
Chain Affiliate	3

Major Affiliate	1
Private Residential	1
Corporate Hazardous Materials	2
	Subtotal

6.505 Total Priority Score
Total of Subtotals in
Sections 6.501 through 6.504_____

6.600 AWARDS

6.601 The Rhode Island Department of Environmental Management shall notify the applicants of the award or denial of a loan application within sixty (60) days of receipt of a complete application.

6.602 The amount of the loan shall not exceed the lowest of the three bids submitted by the applicant pursuant to Section 6.204 above.

6.603 Notice of award shall set forth all loan terms, conditions and schedules.

6.604 Notice shall be by registered mail.

7.00 TERMS AND CONDITIONS

7.100 TERMS AND CONDITIONS

7.101 Award of a loan shall become a debt of the applicant secured by enough collateral to satisfy the amount of the loan.

7.102 The loan award will set forth the repayment schedule and term at an interest rate determined according to section 7.200 below.

7.103 The entire balance of the loan shall become due and payable if the business is sold or otherwise conveyed and/or if the applicant fails to complete the work for which the loan was made.

7.104 An applicant may decline to accept 100% of the loan award, in which case the repayment schedule and term may be recomputed.

7.105 Any loan awarded under these rules may be paid up in whole or in part at any time without penalty.

7.200 RATES AND TERMS

7.201 Loan rates shall be fixed by the Department of Administration at two (2) points below the six month Treasury Bill rate as certified by the General Treasurer at the time the loan is awarded.

7.202 Rates will remain fixed during the term of the loan.

8.00 REIMBURSEMENT PROCEDURES

8.100 Loan funds for engineering or design will be released upon receipt of the Department of Environmental Management of a copy of the engineer's bill and approval of the design by the Division of Water Resources.

8.101 Loan funds for parts and materials will be released upon receipt by the Department of Environmental Management of a copy of the invoice from the manufacturer or distributor.

8.102 Loan funds for the construction of the repair or replacement will be released upon receipt by the Department of Environmental Management of a copy of the contractor's bill and a certificate of compliance issued at the completion of the project by the Division of Water Resources noting that the repair or replacement of the tanks was carried out according to the underground storage tank regulations adopted pursuant to Chapter 46-12 of the General Laws of Rhode Island.

8.20 FORM AND AMOUNT OF PAYMENT - Payment will be by Invoice Voucher drawn against the State of Rhode Island and shall be jointly payable to the applicant and his/her contractor in an amount equal to the contractor's itemized bill.

9.00 AVAILABILITY OF FUNDS

9.100 At or near the beginning of each fiscal year the Director of the Department of Environmental Management shall determine the amount of money which shall be made available and the application period for loans during that year; said funds to be appropriated from those then currently

available in the Underground Storage Tank Replacement Revolving Loan Fund.

10.00 ADOPTION AND FILING

The foregoing rules and regulations, after due notice and hearing, are hereby adopted and filed with the Secretary of State this_____day of _____, 1987, to become effective twenty (20) days thereafter, in accordance with the provisions of Chapter 42-44.1, 42-17.7 and 42-35 of the General Laws of Rhode Island, 1956, as amended.

_____

Robert L. Bendick, Jr.
Director
Department of Environmental Management

0273A

FOOTNOTES

1. New England Interstate Water Pollution Control Commission, Here Lies the Problem...Leaking Underground Storage Tanks. Boston, January, 1985. p. 3.
2. United States Environmental Protection Agency Office of Solid Waste, Summary of State Reports on Releases from Underground Storage Tanks. Washington, October, 1984. p. 14.
3. Stanley, Gerald F. A.U.S.T.--A Billion Dollar Time Bomb for Fleet Operators, Commercial Carrier Journal. March, 1987. p. 9.
4. United States Environmental Protection Agency, Office of Underground Storage Tanks, What's in the Pipeline #26A. April, 1987. p. 2.
5. Susan Redlich, The Community Tank Census; Managing the Risks of Underground Storage. Nashua Regional Planning Commission. Nashua, 1986. p. I-3.
6. Ibid, p. I-4.
7. Ibid.
8. Ibid.
9. United States Environmental Protection Agency, Office of underground Storage Tanks, Proposed Regulations for Underground Storage Tanks: Your Financial Responsibilities. Washington, April, 1987. p. 3.

10. United States Environmental Protection Agency, Office of Underground Storage Tanks, The Trust Fund for Leaking Underground Storage Tanks. Washington, March, 1987. p. 1.

11. Ibid. p. 2.

12. Rhode Island Department of Environmental Management, Regulations for Underground Storage Facilities Used for Petroleum and Hazardous Materials. Providence, April, 1985.

13. Ibid. p. 10.

14. Personal Interview, Sue Kiernan, senior Environmental Planner, Rhode Island Department of Environmental Management, Groundwater Protection Division, November, 1987.

15. Ibid.

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