SUMMARY INFORMATION

Project Title: UNDERGROUND STORAGE TANKS— ALTERNATIVE INSPECTION PROGRAMS PURSUANT TO THE ENERGY POLICY ACT OF 2005

Location: Rhode Island and Florida; partnership, state/county-wide initiative

Applicants:

Rhode Island Department of Environmental Management
(RIDEM, State Lead)
235 Promenade Street, Suite 330
Providence, Rhode Island 02908-5767
Tel: 401/222-4700; Fax: 401/222-3810

Florida Department of Environmental Protection (FLDEP)
3900 Commonwealth Blvd. M.S. 49
Tallahassee, FL 32399
Tel: 850/245-2118; Fax: 850/245-2128

Contacts:

RIDEM: Ronald N. Gagnon, P.E.
ron.gagnon@dem.ri.gov

Richard T. Enander, PhD
richard.enander@dem.ri.gov (phone/fax as above)

FLDEP: Michael Redig
michael.redig@dep.state.fl.us (phone/fax as above)

Project Partners: University of Rhode Island
Center for Pollution Prevention and Environmental Health
Department of Computer Science and Statistics

Federal Funding: This project is not being executed in cooperation with or funded by another Federal program

Regulatory Flexibility: Federal regulatory flexibility to implement the project is not required at this time.

Statement of Support: The RI Department of Environmental Management's Director W. Michael Sullivan, PhD endorses this project.

PROJECT NARRATIVE

Problem/Issue Statement

Groundwater contamination with constituents of fuel such as benzene (a known human carcinogen) and methyl tertiary butyl ether (MTBE), for example, has resulted in the impairment of potable water supplies for millions of people nationwide with more than $1 billion per year spent in state and federal funds.[1] In Rhode Island, for example, public water drawn from a well field used to service more than 4,000 people in the village of Pascoag was found to be contaminated with MTBE at levels an order of magnitude higher than the drinking water health advisory of 40 ppb.[2] Nationally, more than 418,000 such underground storage tank (UST) releases were recorded as of 30 September 2001, while more than 260,000 contaminated sites have been investigated and cleaned up.[3] In Florida alone, for example, petroleum product releases from more than 28,000 facilities have threatened groundwater supplies used by 92 percent of the population as the primary source of drinking water; as a result Florida has some of the most stringent UST rules in the country.[4]

To prevent leaks and protect groundwater resources, the Energy Policy Act of 2005 (the Act) requires that state environmental agencies inspect all USTs at least once every three years. Most states do not have enough inspectors to meet this requirement and have thus turned to alternate programs—3rd party inspectors/self-certification, for example—or have not inspected tanks at all. A key assumption of the Act is that more inspections by state inspectors will prevent further leaks. The Act also allows the EPA to work with a state to study alternatives to inspections and submit a report to Congress in four years. To assist EPA in the preparation of this Congressional report, the Rhode Island Department of Environmental Management is proposing to work with EPA and Florida as a partner state to 1) assess whether an alternative program—the Environmental Results Program (ERP)—can be just as or more effective in achieving regulatory compliance as traditional enforcement programs, 2) explore the extent to which a link can be made between facility inspections and leak prevention, and 3) compare the cost/benefit of each program.

Rhode Island anticipates that the proposed project will show "broad, strategic innovation" in an important industry sector by demonstrating efficiencies and the national implications of an alternative inspection program for USTs. Our vision for this project is to provide the necessary data for EPA to consider the ERP approach in its evaluation of national models and "alternative inspection programs" under the Act. A major focus of the study will be to identify minimum federal standards supporting effective leak prevention. The proposed project will identify variables that contribute to noncompliance. Statistical analysis will be used to test relevant hypotheses concerning quantitative measures of performance over time. A cost/benefit analysis will also be conducted to further evaluate programs. It is expected that the study will meet the criteria required in Subtitle B, Sec. 1523 (b) of the Act entitled "STUDY OF ALTERNATIVE INSPECTION PROGRAMS."

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[1] US EPA. Cleaning Up Underground Storage Tank System Releases. Available: http://www.epa.gov/swerust1/cat/index.htm

[2] RIDEM. Pascoag Water District Environmental Response Plan. Available: http://www.dem.ri.gov/programs/benviron/waste/Pascoag/erp.pdf.

[3] US EPA. ibid.

[4] FLDEP. Storage Tank Regulation. Available: http://www.dep.state.fl.us/waste/categories/pss/default.htm

BACKGROUND

Rhode Island is the first state to have developed a mandatory ERP for the underground storage tank sector. Beginning in 2003, with the support and active involvement of EPA New England (Region 1) and based on our success with the voluntary auto body certification program, RIDEM undertook as series of stakeholder meetings to launch its statewide UST ERP. The stakeholder process ultimately resulted in the development of the 2004 "Environmental Results Program Compliance Certification Checklist and Forms Booklet For Underground Storage Tank Facilities" and "Environmental Results Program Certification Workbook For Underground Storage Tank Facilities" (meeting notes, checklist and workbook available at: http://www.dem.ri.gov/programs/benviron/assist/usterp/index.htm). During this time and before the ERP program was formally launched, enforcement staff from RI DEM's Office of Waste Management conducted 100 randomly selected baseline inspections from a universe of approximately 600 federally regulated facilities. In January 2005, the mandatory self-certification program was kicked-off with workbooks and checklists mailed to all facilities with a six-month time interval for checklist and Return-to-Compliance (RTC) plan[5] completion. To facilitate program participation, six "UST Compliance Certification Training Workshops" were held at various locations throughout the state in February and March.

During the time when the checklist and workbook were being developed, RIDEM also worked on automating the entire program in an effort to improve overall efficiency through inspection streamlining while saving an estimated $200,000 by eliminating the paper data collection/storage process. The UST automation process included conversion of field inspection checklists into an electronic form (accessible on tablet personal computers used during facility audits), up-loading capability for digital photos, and centralized data storage and retrieval for software-assisted statistical analysis—the system's logical architecture was designed to operate using Microsoft's Office InfoPath®2003 (for tablet PC field data collection), SharePoint®Portal Server 2003 (document management repository), and SQL Server™2000. For more information on RIDEM's automation/streamlining process, go to the Microsoft Case Study at: http://www.microsoft.com/resources/casestudies/ CaseStudy.asp?casestudyid=16986&PF=yes

PROJECT DESCRIPTION

RIDEM proposes to undertake a study that compares ERP as an "alternate inspection approach" to the conventional facility-by-facility inspection approach currently in use by many states. In the study design, RIDEM intends to follow the "comparative/historical approach" described in the draft "White Paper: Considerations in Studying the Efficacy of the Environmental Results Program (ERP) Approach for Underground Storage Tanks (USTs)" prepared by The Cadmus Group, Inc. for the US EPA.[6] Florida was chosen as a partner due to

[5] RTC plans are corrective action statements that indicate the amount of additional time needed (but not greater than a specified limit) to come into compliance with any single regulatory requirement.

[6] UST ERP White Paper (1.5) 16 August 2005. Michael Crow and Richard Krop, the Cadmus Group, Inc. Option 4: Comparative/Historical Approach. "EPA would study a State that has already embarked upon its ERP approach (i.e., Rhode Island), and compare its results to results from other "control" states (1) for the same time period during which the ERP approach was undertaken, and (2) during and after the implementation of a tri-annual inspection regimen. *Advantages.* Can use existing data, and may be the easiest study approach to implement. High likelihood of successful ERP completion. May allow for review of a large number of control states. If ERP can continue into subsequent cycles while control states are implementing tri-annual regimen, data collection can occur during the same time frame in the treatment state and the control states. If ERP does not continue into a subsequent ERP cycle,

its success with the traditional approach to UST regulation and availability of statewide historical data dating back to 1983—making it one of the first states to have passed legislation addressing USTs. According to the FLDEP, counties perform approximately 25,000 compliance inspections (or 95 percent of the entire regulated tank universe) each year; as of January 2004, a total of about 400,000 inspections had been completed since 1983 and showed significant improvements in compliance rates. Because FLDEP inspects such a large proportion of facilities every year, it might offer somewhat of a "look into the future" of UST regulation under the Act's current requirements, and serve as an excellent control for the study.

The proposed study will be performed by developing a regression model that tests comparative compliance rates of both inspection methods. Regression analysis will be used to test a number of independent variables to determine if they are significant in improving compliance rates. The number and types of inspections, along with the time it takes the inspections to achieve compliance, will be tested to determine if they play a significant role in compliance rates. For example, can ERP achieve similar compliance rates in a short time frame (2-3 year cycle) compared to a traditional enforcement program over a longer period (20+ years). A cost/benefit analysis of each inspection method will also be conducted to further evaluate these programs.

A draft model will be presented to a group of public stakeholders to ensure that all possible dependent variables are considered, costs are accurately addressed and the opportunity for public review and discussion is available.

Specifically, the proposed project would consist of the following steps:

Rhode Island UST Random Audits and RTC Plan Data

1.0 TASKS

1.1 Tabulate and organize data from 100 random UST baseline audits.
1.2 Conduct 75-100 random post-ERP implementation audits and tabulate data.
1.3 Tally compliance data and calculate proportions for each potential compliance improvement indicator (>130 indicators should be available).
1.4 Calculate percent increase/decrease in compliance rate proportions.
1.5 Calculate Fisher p-value and apply Bonferroni procedure for multiple comparisons using software written for Rhode Island's UST program.
1.6 Tabulate all RTC plan data and screen out invalid submittals.
1.7 Organize, tabulate and analyze (descriptive statistics) by issue of non-compliance.
1.8 Develop a draft regression model and review with stakeholders
1.9 Conduct regression analysis to test independent variables re: comparative compliance rates as determinants of leaking underground tanks.
1.10 Estimate UST ERP state implementation and operational costs.

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better enables the treatment state to proceed to meet its statutory obligations. *Disadvantages.* Although perhaps the easiest study approach to implement, perhaps the most complex analytically. Does not control for differences across states, although regression analysis and careful selection of control states could temper this issue. ERP data collection approach pre-determined, and historical data from states is pre-determined and most likely not based upon random samples. Cross-state data may not be precisely comparable.

Partner State (Traditional Enforcement Approach)

2.0 TASKS

2.1 Identify control county for study. Match demographics, time period, etc. for RIDEM ERP and traditional enforcement comparisons.
2.2 Tabulate enforcement/compliance data for sample population during study time period.
2.3 Incorporate into regression model to analyze compliance rates among facilities.
2.4 Estimate costs to carry out traditional enforcement inspections and follow-up for sample population.

Deliverable

3.0 TASK

3.1 Comprehensive written report (transparent, with original data) that can be used in support of EPA's efforts to meet Congressional mandate under Subtitle B, Sec. 1523 (b) of the Act "STUDY OF ALTERNATIVE INSPECTION PROGRAMS." The transparency is intended to enable peer-review and/or independent evaluation.

Measuring Improvement

Performance Measurement. Rhode Island is the first state in the country to apply the ERP model to the regulation of underground storage tanks. This mandatory program requires approximately 600 facilities to self-certify to compliance standards (UST, Stage I and Stage II) using a comprehensive checklist developed by EPA, RI DEM and a large group of external stakeholders over the course of many months. To date, 100 baseline inspections have been conducted—data from these audits will provide the necessary information on which to quantitatively assess future improvements in performance and administrative/programmatic efficiencies attributable to the ERP approach. By comparison, the State of Florida maintains one of the oldest and richest databases in the country for a traditional UST enforcement program. Based on an initial survey, several counties (e.g., Broward, Duval, Hillsborough or West Palm) appear to be potential candidates for control purposes. Ultimately, intra- and interstate comparisons will allow for a comparative (quantitative) assessment of enforcement approaches: e.g., cost/benefit, performance improvements, leak detection, facility compliance, etc.

Short and Long-term Results. Short-term results will include the development of statistical comparisons (RI & Florida), completion of post-ERP implementation audits in RI, analysis and presentation of measurement data, and the dissemination of findings to other states via meetings, the dissemination of reports, and a web site. Beyond year three, it is anticipated that DEM will have gained substantial knowledge and experience in this industry sector. Information and "lessons learned" will be shared with EPA and states.

Outputs and Study Goal. The study will compare outputs under each method (e.g. number of inspections, number of violations, number of return to compliance plans) to determine if better outcomes are achieved through the Environmental Results Program. For example, the study will determine if ERP produces a better understanding of UST regulations, improves facility behavior through increased compliance, and results in more compliant tanks with fewer leaks and releases. The goal of the study is to determine if fewer state inspections, combined with facility self-certified inspections (the ERP method) will produce equal or better outcomes when compared to the Act's required inspection criteria. That is, can ERP produce equal or

better compliance results at equal or less cost to the American public than a traditional government inspection program.

Results and Threshold Criteria. Based on the success of ERP in other sectors, it is anticipated that results from the study will advance EPA's goals for ERP by building a national ERP constituency among States and achieving economies of scale through multiple state projects in a common business sector. All states operate a federally mandated UST Program yet many states are now reluctant to use ERP for this sector due to the constraints imposed by the Act. If our hypothesis that ERP provides equal or better protection is correct, then results from the study should allow EPA to convince Congress that ERP is a worthwhile innovation that produces results beyond traditional enforcement programs.

The project proposal meets the three threshold criteria: the study 1) consists of activities authorized under Subtitle I of RCRA and includes a learning component (comparative analysis concerning the efficacy of the ERP approach), demonstrates the applicability of ERP to the UST sector, and conducts research into a hypothesized improved model for regulatory compliance; 2) will determine if ERP can equal or exceed a traditional enforcement program's ability to prevent leaks from USTs and includes a multi-media prevention and pollution control approach (e.g., groundwater protection, volatile release prevention through vapor recovery); and 3) will not exceed the funding limits for this grant program. It is expected that the data and information contained in progress reports will assist EPA in meeting its obligations under Subtitle B, Sec. 1523 (b) of the Act "STUDY OF ALTERNATIVE INSPECTION PROGRAMS."

PROJECT SCHEDULE AND TIME FRAME

The proposed start date for the Underground Storage Tank ERP project is January 2007—project duration is expected to be approximately two years; certification materials are required to be filed with RIDEM every year. It is anticipated that Tasks 1.1 through 1.7 and Task 2.1 will be completed by January 1, 2008. Though ERP certification will be required on an annual basis, Task 1.2-1.7 will repeat on a 1-2 year cycle. Tasks 1.8 through 1.10 and 2.2 through 2.4 will be completed by January 1, 2009 and Task 3.1 by January 31, 2009.

Budget Summary

State: Rhode Island

Agency: Department of Environmental Management

Project Title: Underground Storage Tanks—Alternative Inspection Programs Pursuant to The Energy Policy Act of 2005

[Budget Withheld by EPA]