13.4.5

FINAL RESPONSIVENESS SUMMARY
SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION
(S.I.T.E.) PROGRAM

Groveland Wells Superfund Site
Groveland, Massachusetts

EPA Work Assignment No.: 428-1L32.0
REM II Document Control No.: 270-CR1-OP-EXWX-1

PREPARED FOR
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I
BOSTON, MASSACHUSETTS

Prepared by the REM II Project Team under EPA Contract No. 68-01-6939

SEPTEMBER 1987

GROVELAND WELLS SITE
Groveland, Massachusetts

FINAL RESPONSIVENESS SUMMARY
SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION PROGRAM

The U.S. Environmental Protection Agency (EPA) recently held a public comment period for interested parties to comment on EPA's proposal to conduct a short-term full-scale demonstration of vacuum extraction technology at the Groveland Wells Superfund site. The purpose of the project is to gather data that will help EPA determine the technical and economic feasibility of vacuum extraction as a remedial measure at the Groveland site and other hazardous waste sites across the country. The proposed project will be conducted under the Superfund Innovative Technology Evaluation (S.I.T.E.) program, a nationwide program to evaluate new and promising hazardous waste treatment technologies. The S.I.T.E. program was established under Section 209 of the Superfund Amendments and Reauthorization Act of 1986.

The S.I.T.E. program is designed to accomplish the following objectives:

- To identify and, where possible, remove impediments to the development and commercial use of alternative technologies.
- To conduct a demonstration program of the more promising innovative technologies to establish reliable performance and cost information for site characterization and cleanup decision making.
- To develop procedures and policies that encourage selection of available alternative treatment remedies at Superfund sites.
- To structure a development program that nurtures emerging technologies.

The public comment period on the proposed demonstration project was held from July 16 until August 12, 1987. EPA also accepted oral comments on the proposed project during a public meeting at the Groveland Town Hall on July 29, 1987. This meeting was attended by approximately 15 citizens, and local, state and federal officials. Copies of the meeting transcript are available at the information repositories located at the Groveland Town Hall and the town library. A fact sheet summarizing the demonstration project and a checklist regarding possible environmental impacts of the project (satisfying the functional equivalency under the National Environmental Policy Act, NEPA) were mailed to parties on the site public information mailing list prior to the public meeting. These and additional informational materials were provided at the public meeting. Copies of these materials are provided as Attachment A to this responsiveness summary. The transcript of the July 29, 1987 public meeting is provided as Attachment B.

The purpose of this responsiveness summary is to provide and document EPA responses to public comments and concerns raised during the public comment

period for the S.I.T.E. demonstration project, including those raised at the July 29, 1987 public meeting. All the comments summarized in this document will be factored into EPA's final decision on whether or not to proceed with the demonstration project. This responsiveness summary is divided into four sections, as follows:

A. Overview: This section describes the proposed technology demonstration project and summarizes public reaction to the project.

B. Background on Community Involvement and Concerns: This section provides a brief history of community involvement and concerns regarding the Groveland Wells Superfund site.

C. Summary of Comments Received during the Public Comment Period and EPA Responses: This section summarizes written and oral comments received from the public and provides EPA responses. The comments are categorized by subject area.

D. Remaining Concerns: This section describes community concerns raised during the public comment period that will need to be addressed during design and implementation of the proposed project.

A. OVERVIEW

The project proposed for the Groveland Wells Superfund site will evaluate vacuum extraction, a technology designed to treat soils contaminated with volatile organic compounds (compounds that vaporize easily when exposed to air). Vacuum extraction is considered a promising technology because it may be more effective, less costly, and pose fewer environmental and public health risks than other technologies currently available for remediation of contaminated soils.

The demonstration should identify the limitations of the technology, the potential need for pre-and post-processing, the waste and hydrogeologic conditions to which the technology can be applied, potential operating problems, and approximate capital and operating costs. This information will provide a basis for evaluating the performance, cost, reliability and implementability of vacuum extraction technology for use as a remedial technology at the Groveland and other Superfund sites.

The proposed S.I.T.E. demonstration project will be conducted on the property of the Valley Manufactured Products Company, Inc. (Valley, Inc.), located on Washington Street in Groveland, Massachusetts. The Valley, Inc. property is part of the Groveland Superfund site, and Valley, Inc. is a party potentially responsible for hazardous waste contamination at the site. The project will be conducted on a portion of the Valley, Inc. property that is heavily contaminated with volatile organic compounds, including an area directly underneath the main plant building. If approved, the demonstration project will be conducted by Terra-Vac, Inc., a current developer and supplier of vacuum extraction systems. The project will take place during a six-to-eight-week period in Fall 1987.

At the start of the project, three or four extraction wells will be installed on the south side of the Valley building. The wells will be installed through the building floor into the contaminated soils below. A vacuum pump will draw contaminated vapors from the soils up through the extraction wells into a separator device, which will remove moisture from the air. The air will then be drawn into an air pollution control system consisting of two carbon adsorption devices placed in series. The activated carbon in these containers will remove the volatile organic compounds and the treated air will be released to the atmosphere outside the building. The extracted soil vapors and the treated air will be monitored closely to determine the effectiveness of the technology and to ensure the health and safety of individuals in and around the project area.

Following the six-to-eight-week demonstration period, EPA and its contractor on the S.I.T.E. program will prepare a report evaluating the project results. The final report will be available to the public and the results of the project will be considered in making the final selection of a remedial alternative to treat contaminated soils at the Valley property.

Public reaction to the project, as expressed during the July 29, 1987 public meeting was generally supportive. At the public meeting, questions were raised relative to environmental impacts from the proposed project, but no specific objections or comments were raised relative to the NEPA functional equivalency checklist and EPA's finding of no significant impact. The main concerns raised at the meeting were related to the schedule for the demonstration project and for the site cleanup as a whole. Citizens expressed concern that the demonstration project might delay final site cleanup. Citizens were also concerned that, even if the demonstration project proved effective, cleanup of the entire site using this technology could not occur until the feasibility study is completed and the Record of Decision is signed. In general, it appears that the public's interest in the S.I.T.E. demonstration project is focused on the effect the project might have on the schedule for soil and ground water cleanup projects.

B. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The primary concern of the site community is the contamination and subsequent loss of their drinking water supply. In 1979, Groveland's two municipal water supply wells, Stations No. 1 and No. 2, were closed due to contamination by trichloroethylene, a volatile organic compound. The town purchased an emergency supply of water for several months while installing a new well, Station No. 3. However, the capacity of Station No. 3 was only about half of the combined capacity of Stations No. 1 and No. 2. The loss of the town's two wells created severe water shortages. The town was required to impose water restrictions and bans on any new hookups to the water system. This essentially prevented any new development in the town. These conditions have existed since 1979.

However, Groveland's water supply situation will be improving in the near future because EPA recently completed the installation of a carbon treatment unit on Station No. 1. The station is back on line and final adjustments are being made to the system. The station had been scheduled to be back in service in July 1987, and the added month's delay has caused some frustration in the community.

Aside from water supply issues, citizens are concerned about the continued migration of contamination and are interested in the Massachusetts Department of Environmental Quality Engineering (DEQE) project to intercept and treat contaminated ground water in the Mill Pond area. Citizens are also anxious for site cleanup to begin in order to prevent further migration of contaminants from the site.

C. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

EPA held a public comment period on the proposed demonstration project from July 16 to August 12, 1987. EPA received one written comment during the public comment period. EPA also accepted oral comments during a public meeting held in Groveland on July 29. There were no formal oral statements submitted at the meeting, but many questions and concerns were raised during the question-and-answer period. The question-and-answer period was transcribed, and the transcript has provided the basis for addressing public concerns in this responsiveness summary.

The following section is a summary of the written and oral comments received during the public comment period (including those concerns expressed at the July 29 public meeting) along with EPA responses to these comments. Comments have been organized by subject matter into three categories: 1) S.I.T.E. Demonstration Project; 2) Site Remediation; and 3) Comments from Potentially Responsible Parties (PRPs).

1. S.I.T.E. Demonstration Project

General Questions

a. Comment: (pgs. 24-28)*
A staff person from a state senator's office expressed concern that the town was being used as a guinea pig to demonstrate the technology.

EPA Response:
Vacuum extraction is not an experimental technology. The process has been developed and used in full-scale operations at several industrial sites. In addition, the project will not disturb the contaminated soil or the operating Valley facility. This makes it an applicable and attractive option for use in a place like the Valley facility that is in such close proximity to people and has limited space for such technologies as excavation and on-site treatment.

b. Comment: (pgs. 24-26)
The staff person from the state senator's office questioned how much input the town will have regarding the S.I.T.E. program.

EPA Response:
EPA will not proceed with any S.I.T.E. demonstration project unless

*Note: These page numbers refer to the pages in the hearing transcript that contain the specific comments and responses.

it meets with public approval during the public comment period. If the Groveland project is approved, EPA will meet periodically with the Well Pollution Committee before and during the project to brief them on the project status. Before the project begins, the project demonstration plan will be made available for public review at the information repositories. If the public is interested, EPA will hold another public meeting to discuss the project demonstration plan before startup.

c. Comment: (pgs. 14-16)
One citizen questioned why EPA had selected vacuum extraction technology for a demonstration project when it seemed apparent that the effectiveness of the technology had already been demonstrated.

EPA Response:
The primary purpose of the S.I.T.E. program is to encourage the development and demonstration of promising innovative technologies, and thereby to help establish their commercial availability as alternatives to current remedial options such as land disposal. Although vacuum extraction has been used successfully at other industrial and Superfund sites, the purpose of these projects was to solve a specific problem at a specific site. These projects did not collect appropriate data for use in evaluating its effectiveness at other sites.

Technical Questions

a. Comment: (pgs. 4, 17-18)
A citizen was interested in the size of the project area in relation to the Valley site as a whole, and asked to what extent the project would contribute to clean up of the site.

EPA Response:
The project will be conducted at the periphery of the most highly contaminated area at the site. In terms of relative size, this constitutes approximately one/third of the area of the Valley site. However, the intent of the demonstration project is not to clean up the site, but to collect enough information during the project such that projections can be made on the capital and operating costs, reliability, and feasibility of remediating contaminated soils at this and other sites using vacuum extraction.

b. Comment: (pgs. 30-31)
A state representative questioned what type of air monitoring will be conducted during the project in order to ensure that public health is being protected.

EPA Response:
Air will be sampled at three points to determine the effectiveness of the project and to ensure that public health is being protected. These three sampling points are: 1) before the soil vapor enters the first carbon adsorption device; 2) between the first and second carbon device; and 3) after the treated air exits the second carbon device and before it is released to the atmosphere. Experience with the Terra Vac technology has shown that the final air emissions do not contain any detectable concentrations of volatile organic compounds. Also, if leaks were to develop in the system, it would draw in clean air because the system operates under a vacuum. Therefore, there is no potential for accidental releases to the atmosphere.

c. Comment: (pgs. 29-30, 36-37)
A citizen asked whether the system will have to be shut down in order to replace the exhausted carbon filters and a state representative asked what EPA will do with the exhausted filters.

EPA Response:
It usually takes from two to ten minutes to change a carbon filter. The system can be shut down or system valves can be closed so that soil vapors are not drawn in during replacement of the filter. EPA will be reponsible for the exhausted carbon filters, which will be sent back to the manufacturer for regeneration.

d. Comment: (pg. 35-36)
A citizen expressed concern that the pumping action of the extraction wells might cause chemicals in the unsaturated soils to enter the ground water table and contribute to ground water contamination.

EPA Response:
The area of influence for the extraction wells will be approximately 50 feet while the water table is only about ten feet deep. Therefore, most of the movement of contaminant vapors will be in a horizontal direction towards the extraction wells, rather than in a downward direction towards the water table.

e. Comment: (pg. 8)
A town selectman questioned whether the demonstration project would interfere at all with DEQE's project to intercept and treat contaminated ground water in the Mill Pond area.

EPA Response:
The demonstration project concerns a discrete area of contamination

in unsaturated soils at the Valley plant and will not impact in any way DEQE activities to recover and treat ground water at Mill Pond.

Questions on Project Costs

a. Comment: (p. 31-32)
A citizen commented that the $600,000 project cost seemed very high for a six-week demonstration project.

EPA Response: The $600,000 figure referred to in the fact sheet is the cost associated with the evaluation phase of the project, which is funded by EPA through the S.I.T.E. program. These costs include site characterization prior to and after the demonstration, sampling and analysis during operation, evaluation of all data and information generated, and preparation of a final evaluation report. Terra-Vac, the technology developer, will bear the manpower and operating costs of the demonstration.

Questions on Project Evaluation

a. Comment: (pgs. 18-19, 27)
A member of the town Conservation Commission questioned whether the end result of the demonstration will be to provide information such that a third party can make an evaluation of the cost effectiveness of vacuum extraction at a particular site given its specific physical characteristics, or whether the information provided would only apply to the Groveland site.

EPA Response:
The demonstration project will evaluate in detail a number of geologic, engineering, and chemical paramaters in order to develop an understanding of the effect of these parameters on the vacuum extraction process. Information from the project will be widely disseminated and the understanding developed from the evaluation can be used to evaluate the technical feasibility and cost effectiveness of vacuum extraction at other sites across the country.

b. Comment: (pg. 37)
A citizen asked whether EPA's evaluation of the project will rely solely on tests conducted by Terra-Vac.

EPA Response:
Terra-Vac will probably do some testing for their own purposes, but EPA will be conducting the primary sampling and analysis during the project.

c. Comment: (pgs. 6, 18-20)
There were several comments from local officials, a congressional representative, and citizens regarding the format, availability and schedule of the final evaluation report.

EPA Response:
EPA's Hazardous Waste Environmental Research Lab and EPA's contractor Enviresponse, Inc. will be involved in developing and publishing the final evaluation report. The projected date for completion of the final evaluation report is March 1988, although information and data generated during the demonstration will be used in the source control FS this winter. The final report will be publicly available at the information repositories, and EPA will publish a notice announcing the availability of the report.

2. Site Remediation

a. Comment: (pgs. 6, 7, 10-11, 28-19)
Several commentors, including a state representative, raised comments and questions regarding the schedule for the final source control remedial action. Commentors were very concerned that the source control remedial action begin as soon as possible. They expressed concern that there might be a long delay between the demonstration project and the final site remediation, even if the project shows that vacuum extraction is a technically feasible and cost effective remedy for the Groveland site.

EPA Response:
EPA will conduct a feasibility study (FS) evaluating the technical feasibility and cost effectiveness of different source control remedial actions for the Valley site. The FS is required by law and will be conducted regardless of the results of the S.I.T.E. demonstration project. EPA expects to complete the FS in Winter 1988 and select a remedial alternative in Spring 1988 following public comment on the alternatives. In Fall/Winter 1988, EPA expects to conduct the contract bidding and award process for implementation of the final remedial action for treatment of soils and ground water at the Valley site.

b. Comment: (pgs. 12, 13, 22, 32)
Several commentors, including a state representative and town official, expressed interest in the application of vacuum extraction for the final cleanup. In particular, they questioned whether EPA considered vacuum extraction to be a reasonable remedial alternative for the Groveland site, what the costs of remediation might be, and whether the demonstration project would predict the length of time it would take to remediate the site using vacuum extraction.

EPA Response:
Vacuum extraction is an attractive, applicable approach for remediation of the Valley site because it is an in-situ process that requires no disturbance of the waste or the existing facility, and it poses little or no health and safety risks. The technology is expected to be cost effective, although cost estimates and an estimate of the time required to remediate the site using vacuum extraction will not be available until after the source control feasibility study is completed.

c. Comment: (pgs. 41-42)
A member of the town Conservation Commission questioned how EPA will select a final source control remedial alternative.

EPA Response:
During the FS, EPA will identify applicable technologies and evaluate them on the basis of technical feasibilty, public health and environmental requirements, and cost effectiveness. These technologies will then be developed into alternatives that can meet desired cleanup goals. A technology such as vacuum extraction may be combined with soil flushing or some other technology to form a viable, cost-effective alternative for remediating soil and ground water contamination at the Valley site.

3. **Comments from Potentially Responsible Parties (PRPs)**

a. Comment: (Nutter, McClennan & Fish letter)
The Groveland Resources Corporation (GRC), owner, and Valley Manufactured Products, Inc. (Valley), operator, are potentially responsible parties (PRPs) at the Groveland site. They commented that they are generally supportive of EPA's plan to conduct the demonstration project but stated that they could not comment fully on the project without a more detailed project work plan. The PRPs commented that they will not incur costs during the demonstration project except for their own monitoring and surveillance costs, and added that they may wish to continue operation of the vacuum extraction system after the demonstration project is completed. Other specific comments from the PRPs included:

i) GRC and Valley requested the right to share all field data, including the right to split samples;

ii) GRC and Valley requested copies of draft reports and data as soon as possible, prior to final approval by EPA;

iii) Site work should be coordinated with the PRP's consultant, M. Anthony Lally & Associates;

iv) Valley and GRC requested the opportunity to review and comment on the site work plan prior to initiation of work and prior to granting final permission for site access;

v) All waste products should be properly stored, handled and transported from the site by EPA for regeneration or disposal at an approved site; and

vi) Air emission controls should be provided as necessary with air quality maintained as required by EPA and DEQE.

EPA Response:

i) Valley will be allowed to obtain field data as generated and may coordinate the collection of samples with EPA;

ii) As appropriate, Valley/GRC will be given draft reports for their review;

iii) EPA agrees with the commenter;

iv) Valley/GRC will have the opportunity to review the final draft demonstration plan;

v) EPA will arrange for the storage and disposal of wastes generated from the system. Such waste will include water removed from the soil vapor and carbon from the air pollution control system;

vi) EPA agrees with the commenter.

4. REMAINING CONCERNS

The primary concerns in the site community are related to water supply and quality and the migration of contaminants at the Groveland site. EPA will keep the community apprised of the progress of the FS and any changes in schedule for remedial action at the Valley site. The FS will evaluate alternatives for remediating contaminated soil and ground water at the Valley site. The final remedial action plan for the Groveland Wells site will involve, at the least, soil and ground water remediation at the Valley site and treatment of well water at Groveland's Station 1.

In relation to the S.I.T.E. project, the community is interested in the results of the project and its applicability to the Valley site as part of a final source control remedial action. The final evaluation report will be made available in the site community and a notice of its availability will be distributed to interested parties. In addition, before the demonstration project begins EPA will make the project demonstration plan available in the information repositories and will distribute a notice of its availability. If interest is shown in the community, EPA will hold a public meeting prior to implementation of the project to discuss the project demonstration plan.

ATTACHMENT A

Handouts Distributed at the July 29, 1987 Public Meeting
Proposed S.I.T.E. Demonstration Project
Groveland Wells Site

1. Groveland Wells Superfund site, S.I.T.E. Demonstration Project Fact Sheet

2. S.I.T.E. Program, Environmental Review for Proposed Technology Demonstration (NEPA checklist)

3. EPA fact sheet on S.I.T.E. program

4. Technology Summary Sheet, Terra Vac Inc. In-Situ Vacuum Extraction Technology

5. Terra Vac Inc. brochure

ATTACHMENT 1

GROVELAND WELLS SUPERFUND SITE DEMONSTRATION PROJECT
FACT SHEET

JULY 1987

The United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Quality Engineering (DEQE) have been taking actions under the Federal and State hazardous waste Superfund programs to investigate and remediate environmental contamination problems associated with the Groveland Wells Superfund Site in Groveland, Massachusetts. This fact sheet describes a short term technology demonstration project which is planned for the fall of 1987 at the Valley Manufactured Products Company, Inc. property on Washington Street. The Valley property is one identified source area of volatile organic soil and ground water contamination within the Groveland site. The demonstration project will involve approximately six to eight weeks of field work. A final demonstration report with results/evaluation will then be prepared.

The purpose of the project is to evaluate the feasibility and cost effectiveness of this technology for use in developing remedial action plans for the Groveland site and other sites which contain volatile organic soil contamination. The technology under consideration for the project is referred to as vacuum extraction and would be used to demonstrate clean up capabilities on a portion of the contaminated area. The project will be conducted under the Superfund Innovative Technology Evaluation (SITE) program, a nationwide program to evaluate new and promising hazardous waste treatment technologies.

COMMUNITY RELATIONS

EPA seeks public comment on the proposed demonstration of the vacuum extraction method for the Groveland site. Information on the vacuum extraction technology and overall SITE program will be available for public review at the site information repositories at the Groveland Town Hall and Library. Materials that will be available consist of a generic cooperative agreement stating the roles and responsibilities of EPA and Terra Vac Inc., the company that developed the technology and that would conduct the demonstration project, and a technology summary sheet describing the vacuum extraction method.

Also, attached to this fact sheet is a checklist prepared by EPA under requirements of the National Environmental Policy Act (NEPA) which shows that the SITE demonstration project will have no adverse impacts to the environment. EPA solicts public comment on the NEPA checklist or any other aspects of the proposed demonstration of the vacuum extraction technology method at the Groveland site.

A public meeting has been scheduled for July 29, 1987 at 7:00 PM at the Groveland Town Hall. Representatives of EPA, DEQE and Terra Vac will present information and answer questions on the proposed

project. EPA will also accept any oral or written comments on the demonstration project at the public meeting. Comments may also be submitted in writing to the Groveland Site Remedial Project Manager:

James Ciriello
HRS 1903
U.S. Environmental Protection Agency
JFK Federal Building
Boston, MA 02203

Written comments will be accepted until August 12, 1987. EPA will prepare a document responding to comments received during the public comment period. EPA will then issue a decision as to whether to go forward with this project in consideration of the comments received. If the project is approved, EPA will prepare a detailed Demonstration Plan describing all aspects of the project, such as, the operating parameters, monitoring plan, procedures and health and safety plans.

In addition to the July 29 information meeting EPA will meet as necessary with the Groveland Well Pollution Committee and public to discuss the status and results of the project.

WHY WAS THE GROVELAND WELL SITE SELECTED?

EPA's criteria for selecting the vacuum extraction technology method for the Groveland site was based on the type of waste at the site and the overall site geologic conditions. The contamination at the Groveland site consists primarily of volatile organic compounds (VOCs), which can be effectively extracted from unsaturated soil by the vacuum extraction technique. Volatile organic compounds are a group of chemicals which includes materials such as cleaning solvents. Volatile organic compounds are characterized by their greater tendency to evaporate/volatilize into the air from water and soil, a characteristic which makes them ideal for this technology. It is hoped that this technology will prove to be more effective in treating the waste and less costly than any soil cleanup technique previously considered for the Groveland site (e.g., flushing contaminated soil in-place with water and recovering and treating ground water or excavating and treating soil).

VACUUM EXTRACTION TECHNOLOGY

The Vacuum Extraction Technology developed by Terra Vac, Inc. of San Juan, Puerto Rico, would work in this way at the Groveland wells site: three or four extracting wells would be installed in the highest area of contamination on the south side of the Valley building. A vacuum pump would draw the volatile organic vapors

from the subsurface soils up through extraction wells and to a separator device, which would remove any moisture from the air. The air would then be pulled into a carbon adsorption system, which adsorbs the contaminants prior to releasing the treated air into the atmosphere. The concentrations of volatile organic contaminants in the soil vapor and extracted and treated air would be monitored closely.

A single extraction well can extract contaminants from tens to hundreds of feet away from the well, depending on the soil type and depth to groundwater. Typical contaminant recovery rates range between 20 and 2500 lbs of VOCs/day (approximately 1.5 to 200 gallons/day) and depend on how easily the compounds present evaporate, or volatilize in the air. The more volatile the compound, the greater the compound recovery that can be achieved.

This system was first proven at a Superfund site in Puerto Rico, the Upjohn facility in Barcelona, where carbon tetrachloride leaked from an underground storage tank. A groundwater aquifer, located 300 feet below the surface, was the sole source of drinking water. Most of the spilled contaminant was in the soil. Since this clean-up began, over 80% of the carbon tetrachloride, (which is a volatile organic compound) has been recovered by the vacuum extraction process.

Monitoring and Safety Issues

The technologies tested under the SITE program are ones which hold promise for wide-scale application, but which have not been fully evaluated for use at Superfund sites. The vacuum extraction process has been field tested and all data indicate that the process shows promise for application at certain Superfund sites. The purpose of the proposed study is to perform more extensive testing and analysis of its performance. Therefore, careful monitoring of treatment efficiency and air emissions as well as attention to a wide range of safety issues will be part of the SITE demonstration project.

Public and Worker Safety

The vacuum extraction process should pose no danger for local residents. Air quality would be monitored and the test suspended if problems occur, though no impact on air quality is expected from this project. A health and safety plan would be developed to cover other safety issues. The local fire department, county emergency services coordinator, and local health department would be involved in the development and implementation of this demonstration.

OVERVIEW OF THE SITE PROGRAM

Through the first years of the Superfund program, land disposal was the common method of handling hazardous waste. However, because landfilling simply isolates the wastes and does not make them less hazardous, and we are rapidly running out of landfills in which to dispose of these wastes, landfilling is considered a less than ideal method of waste disposal.

Environmental regulations enacted in 1984 and recent amendments to the Superfund program discourage the continued use of landfilling of wastes, in favor of remedial methods such as incineration that will treat or destroy the wastes. The Superfund legislation now requires that, to the maximum extent practicable, cleanups at Superfund sites employ permanent treatment methods of hazardous wastes.

The SITE program is one major response to the need for finding the safest and best ways for dealing permanently with waste sites. Part of the program includes carefully planned demonstration projects at certain Superfund sites to test new waste treatment technologies. These new alternative technologies are ones which will destroy, stabilize, or treat hazardous wastes by changing their chemical, biological, or physical characteristics.

Under the SITE program, EPA will select approximately 10 Superfund sites each year at which pilot studies of promising technologies can be conducted. Sites are chosen that have specific waste material and conditions that match the effectivness and use of a particular technology. The monitoring and data collection are done to determine how effectively the technology treats the waste, to determine how cost effective the technology is, and how protective the technology is of public health and the environment. The Groveland Wells site was selected for such a demonstration project in 1987.

Anyone with questions or comments may contact any of the agency staff listed below. We are anxious to hear from you in regard to this important project.

James Ciriello
Remedial Project Manager
US EPA
Region I
JFK Federal Building
Boston, MA 02203
617-565-3680

John Kingscott
HQ-SITE Coordinator
US EPA-OSWER
401 M Street, SW
Washington, DC 20460
202-475-8600

Mary Stinson
ORD-SITE Proj. Mgr.
US EPA-ORD
GSA Raritan Depot
Bldg. 10
Edison, NJ 08837
201-321-6683

Patty D'Andrea
Superfund Community Relations Coordinator
US EPA
Region I
JFK Federal Building
Boston, MA 02203
617-565-3425

Attachment 2

Superfund Innovative Technology
Evaluation (SITE) Program

Environmental Review for Proposed
Technology Demonstration

I. GENERAL INFORMATION

A. Description of Technology and Site*

The Groveland Wells Superfund Site is located in northeastern Massachusetts in the Town of Groveland, Essex County. The Site consists of approximately 850 acres of land within the lower portion of the Johnson Creek drainage basin. Within this Site are two municipal water supply wells which, due to contamination by volatile organic compounds (VOCs), have been closed to service since June and October, 1979. Also within the Site are three identified sources of soil and groundwater contamination. This proposed project is to be conducted at one of these three identified sources of aquifer contamination: the Valley Manufactured Products Company property on Washington Street in Groveland. Valley has operated a small screw machine business on the property since 1964. Contamination on the property consists principally of the VOCs trichloroethylene (TCE) and tetrachloroethylene (PCE). TCE has been detected in soil above the water table at concentrations as high as 2500 milligrams/liter or parts per million (mg/l or ppm) and in groundwater downgradient of the facility at concentrations as high as 80 mg/l or ppm. The source of this contamination is believed to be from an underground storage tank release and poor past operating practices. The volume of identified soil contamination is estimated to be 2000 to 3000 cubic yards.

The proposed project is a demonstration of a technology developed by Terra-Vac, Inc. of San Juan, Puerto Rico. The Terra-Vac Process extracts volatile organic compounds from soils. The process is a mobile, in-situ treatment process for decontamination of unsaturated soils. The process involves recovery of soil vapor by vacuum extraction through large diameter wells developed in the unsaturated soil zone. The recovered vapor is then drawn through activated carbon beds, thereby removing contaminants. Contaminant removal rates in the carbon are anticipated to be great enough such that the air released to the atmosphere has no detectable concentrations of VOCs. The process requires only a small area for staging and operation and will be performed entirely on the Valley property.

* For more information refer to the following fact sheets: "Groveland Wells Superfund Site Demonstration Project Fact Sheet, July 1987" and the "Superfund Innovative Technology Evaluation (SITE) Program, Winter 1986" fact sheet.

RESPONSE: The extraction of volatile organics occurs in the unsaturated soil zone with no alteration of ground water flow paths and no adverse impact to ground water quality. By removing a portion of the unsaturated soil contamination, it is probable that ground water quality will be improved as a result of this demonstration. Wastewater will be generated from a dehumidification step in the process. This wastewater will be containerized on site and analyzed to determine handling/disposal requirements. No direct discharge to ground or surface water will occur which would adversely impact surface water quality or promote erosion.

C. Wetlands

Are there wetlands/floodplains present at the site, or affected by the proposed project?

Yes _____ No __X__

D. Environmentally Sensitive Areas

Describe any important features of the site and briefly describe any impacts to the following sensitive areas: a) wild and scenic rivers, b) coastal zones, c) wildlife refuges and/or sanctuaries, d) parks, beaches, recreational areas, e) areas of unique aesthetic value, f) historic and/or archaelogic sites listed on the Federal Register or identified by the State Preservation Officer, g) significant agricultural lands and h) mineral resources.

RESPONSE: This site is not located in or near any of the types of sensitive areas described above.

E. Biota

1. Are there endangered or threatened species (or their habitat) which will be affected by the project?

Yes _____ No __X__ Mitigative Measures _____

2. Will the action significantly impact any terrestrial or aquatic ecosystem or important wildlife habitat (i.e. coastal zone, fishery/wildlife breeding areas)?

Yes _____ No __X__ Mitigative Measures _____

III. DECISION

Completion and distribution of this form constitutes the functional equivalent of the environmental review required under the National Environmental Policy Act.

Attachment 3

United States Environmental Protection Agency | Office of Emergency and Remedial Response Washington DC 20460 | WH FS-86-006 Winter 1986

EPA

Superfund Innovative Technology Evaluation (SITE) Program

Since 1980, the U.S. Environmental Protection Agency's Superfund Program has been cleaning up some of America's worst hazardous waste problems. The Superfund program is authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act of 1986 (SARA). Actions, both shorter-term removals and longer-term remedials, have already been taken at hundreds of sites to deal with threats to public health and the environment from past hazardous waste disposal practices. The challenge at these sites is to find the safest and best ways for dealing with the wastes found at the sites.

EPA is trying to find better solutions to hazardous waste cleanup through its new Superfund Innovative Technology Evaluation (SITE) Program. Part of this program includes carefully planned demonstration projects at certain Superfund sites to test new treatment technologies that destroy, neutralize, or otherwise manage hazardous wastes.

Limitations of Existing Disposal Methods

The SITE program is one major response to a growing national desire to manage Superfund cleanups in the most effective manner. But, managing hazardous waste through one of the traditional ways—land disposal—is becoming more difficult because many hazardous wastes will be banned from land disposal. In addition, the new Superfund law emphasizes the use of treatment over direct land disposal. There is a need therefore for more research to develop needed treatment alternatives.

Finding Alternatives To Land Disposal —SITE Program

EPA established the SITE Program in 1985 so that the Agency could take positive steps to provide more information on treatment technologies that will be needed in the future. The Program's objective is to develop, demonstrate, and subsequently encourage the use of such alternative technologies.

A national consensus for alternatives has grown from studies by the scientific community and by EPA showing that in some cases land disposal may not be an appropriate method to handle hazardous waste. The costs of land disposal in the past have been relatively low, however, compared with treatment methods. It has been difficult to move faster on using alternative technologies because the Superfund program is required to select the most cost-effective cleanup method considering reliability, permanence, and cost that adequately protects people's health. In the past, this has frequently meant choosing land disposal over more costly treatment alternatives. The new Superfund law requires EPA to consider, in addition to costs, the total effectiveness of available technologies, with a preference for treatment over direct land disposal.

Attachment 4

June 26, 1987
1 of 1

Technology Summary Sheet

TERRA VAC INC.
IN-SITU VACUUM
EXTRACTION TECHNOLOGY

The Terra Vac process works by air stripping soils contaminated with volatile organics in place. The process is completely mobile and easy to operate.

Once a contaminated area is completely defined, an extraction well or wells, depending upon the extent of contamination, is installed. The extraction well is connected by piping to a separator device. A vacuum pump draws the sub surface contaminants through the well and separator and discharges to a carbon cannister before the vapors are allowed to be discharged to the atmosphere. Subsurface vacuum and soil vapor concentrations are monitored via vadose zone monitoring wells.

The operating range of the Terra Vac technology extends to most any geologic condition. The process is more cost effective where contaminated soils are predominantly above the water table, although systems have been designed for vapor and groundwater recovery.

The radius of influence of a single extraction well can range from tens to hundreds of feet depending on the soil type and the depth to groundwater. Typical contaminant recovery rates range between 20 and 2500 lb/day and are a function of the volatility of the compound recovered. The more volatile the compound, the faster the process works.

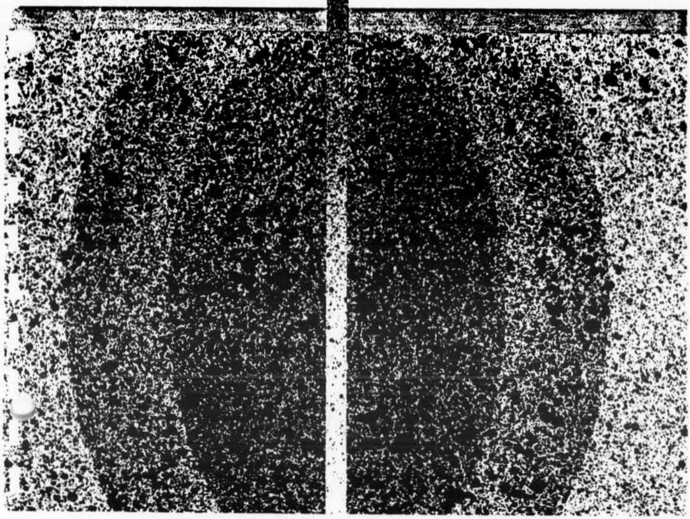
This system was first proven at a Superfund site in Puerto Rico, the Upjohn facility in Barceloneta, where carbon tetrachloride leaked from an underground storage tank. Three hundred feet below, the first aquifer was the sole source of drinking water. Although groundwater contamination occurred rapidly, most of the pollutant was in the soil. Since this cleanup began, over 80% of the spill volume has been recovered by the vacuum extraction process.

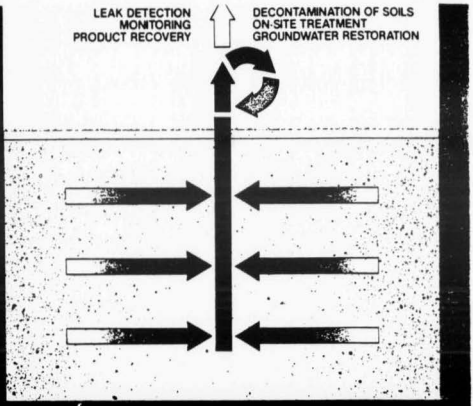
There are several advantages to the TERRA VAC technology. The process employs few equipment items; the equipment used is readily available; the process is easy to operate and requires no soil excavation since it is an in-situ process.

rd/8237D

Attachment 5

TERRA VAC INC.





What you can't see *can* hurt you. A leak or spill from a storage or transfer facility may cause severe health hazards, contaminated drinking water, polluted streams and lakes and explosive conditions. Liabilities and remedies can cost millions of dollars and take decades to resolve.

Frequently, underground pollution problems go undetected for years. Once contaminants seep underground, they spread continually until problems grow beyond control and result in undrinkable water wells, inoperable utility lines and deadly explosions.

Until recently, most clean-up and monitoring strategies worked only *after* groundwater became contaminated. But today there is Terra Vac, a unique mobile process that has created a "Total Approach" to groundwater protection and cleanup. Years of research and development have produced this new technology that detects and recovers unseen, underground contaminants *before* groundwater is affected by residual contamination within the soils.

Terra Vac's leak detection and monitoring system is unique because it can simultaneously provide with one installation: 1) leak detection for an underground storage tank, 2) differentiation between subsurface contaminants caused by a spill rather than a leak and 3) immediate on-site cleanup of lost products from the subsoils.

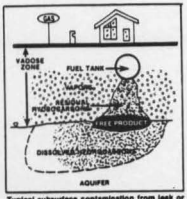
The Terra Vac Process treats the problem at the source. After a leaky tank is removed or a pipeline repaired or a spill contained. . . the long-term source of groundwater problems are the contaminated soils. Standard technologies go around or ignore this problem. Only Terra Vac solves the problem directly to eliminate continuous impact on groundwater quality. Until now, soil cleanup has been expensive, slow, indirect and marginally effective. But today, Terra Vac has developed a process to clean up soils—without excavation.

Utilizing vacuum technology, the Terra Vac Process monitors, delineates and extracts subsurface contaminants from soils, rock, and groundwater. Our economical *in-situ* treatment process works by air stripping soils in place at a rapid rate.

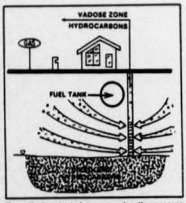
The innovative Terra Vac Process has been proven cost effective in a wide variety of soils and for a broad range of common contaminants. Our versatile, mobile recovery units are designed to monitor and/or recover pollutants at any depth, extracting from hundreds of thousands of cubic feet of soil—simultaneously.

Early warning and pollution abatement strategies have made Terra Vac's "Total Approach" process the lowest cost, most effective solution to common underground pollution problems that face industry, government and the public today.

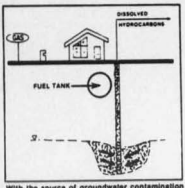
Hydrocarbon Recovery - The "Total Approach"



Typical subsurface contamination from leak or spill.



Terra Vac's patented vacuum extraction process removes residual hydrocarbons, vapors and free product floating on water table, simultaneously.



With the source of groundwater contamination from the Vadose Zone removed, groundwater restoration is rapid. Finally, dissolved contamination is pumped from the aquifer and treated on site.

The Problem:

A leaky tank, bad pipeline, or petroleum surface spill can quickly contaminate a huge volume of subsurface soil and rock. As free product migrates to the aquifer below, the residual hydrocarbons that are left behind are a greater and more lasting threat to groundwater quality than the floating free product itself.

Even if the hydrocarbon leak is small and free product never shows up in the groundwater, residual hydrocarbons will be left in the vadose zone and will leach out, undetected, contaminating the shallow aquifer for years.

Hydrocarbon vapors are also present as a "halo" around residual hydrocarbons along the path of free product flow. These vapors can migrate ahead of the free product to contaminate groundwater and cause immediate health hazards in buildings and basements at the surface.

The Solution:

The logical and obvious first step in hydrocarbon cleanup is to begin at the source—eliminate the leaky tank, bad pipeline, or surface spill. Terra Vac's "Total Approach" extends this logic one step further. Instead of focusing on the removal of free product at the expense of pumping groundwater, the "Total Approach" first prevents recharge of contaminants to the aquifer by eliminating them in the vadose zone and then concentrates on the cleanup of the groundwater after residual hydrocarbons have been removed.

Typical two-pump systems rely on extracting large quantities of groundwater for indefinite periods of time in order to skim small amounts of free product from the water surface. This recovery approach spreads free product and creates an enlarged "smear zone" of residual hydrocarbons and vapor that only continues to contaminate groundwater sources.

Terra Vac's "Total Approach" is better than the common dual pump approach because it simultaneously:

- remove liquid, vaporous, and adsorbed phases of subsurface hydrocarbons;
- is effective whether the groundwater is shallow or deep;
- extracts residual hydrocarbons from above and below the water table;
- minimizes the amount of groundwater extracted;
- decontaminates in a shorter amount of time, and thus at a lower cost.

How It Works:

Terra Vac is the first to use enhanced volatization techniques in order to recover petroleum hydrocarbons by taking advantage of their volatile character. Absorbed liquid hydrocarbons and floating free product are volatilized in-situ when our subsurface vacuum is applied. A subsurface negative pressure gradient induces migration of vaporized products towards extraction points and drives them to the surface for recovery and treatment. Soils and groundwater are essentially air stripped in place.

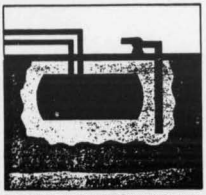
Due to the rapid rate of volatization of most liquid hydrocarbons in the soil matrix, this first stage of product recovery is relatively short: days to weeks rather than the months to years required by common recovery systems.

Next, the "Total Approach" uses the same vacuum recovery system to extract residual hydrocarbons from below the water table. Wells are adapted for a two phase recovery: hydrocarbon vapors and contaminated groundwater. Finally, when residual hydrocarbons have been reduced to a level that no longer threatens groundwater quality, groundwater is recovered, then treated on-site at low cost.

Our "Total Approach" to clean up of subsurface hydrocarbons is more effective because the source of groundwater contamination in the vadose zone is removed first. Our vacuum recovery system, unlike dual pump systems, uses small diameter wells, and is easily installed, completely mobile, low-maintenance, and highly reliable. Another difference is that our approach gives you groundwater restoration at a reduced cost and in a shorter clean-up time. Terra Vac's "Total Approach" solves the entire problem, not just the symptoms.

Leak Detection

The Problem:

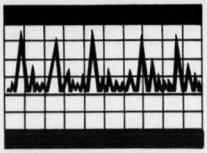


Terra Vac Leak Detection Systems discover potential contaminants present around an underground tank.

At many sites, it is impractical to monitor groundwater quality to detect leaks from storage facilities. Deep aquifers, clay soils, or fractured rock formations, often prevent adequate detection before substantial environmental damage occurs. If there is a leak at the surface, by the time stored substances reach the water table, significant losses have already saturated subsoils. As a result, a huge volume of soil and rock are the unseen source of contamination that will continue to degrade groundwater quality for a very long time.

Groundwater monitoring is often ineffective. Due to irregular geology and dipping formations of bedrock, organic solvents have been known to travel more than 1,000 feet laterally before entering the aquifer. Additionally, a small diameter groundwater monitoring well onsite may not intercept the path of leaked materials when they migrate into the aquifer.

The Solution:



Terra Vac Leak Detection Services consist of onsite testing and analysis by gas chromatography, discover leaks and spills before costly groundwater problems occur.

Today, new technology is available to detect leaks from existing storage tanks before they enter the aquifer. Terra Vac Leak Detection Sysems use proven technology to detect potential contaminants that may be present around an underground tank or storage facility. Reliable test methods using gas chromatography discover leaks and spills before costly groundwater problems erupt.

How It Works:

The Terra Vac Leak Detection System works by air stripping soils in the vicinity of the storage facility. Vacuum technology is applied to vadose zone (the underground zone above the water table), with a simple, one-time equipment installation.

Subsurface conditions are monitored with portable vacuum and testing equipment. The installation of subsurface equipment and leak detection procedures are accomplished without interruption of operations at the storage location.

Unlike other monitoring systems which may detect the presence of stored materials at a specific point or within a small area, the Terra Vac System has a large radius of influence . . . from tens to hundreds of feet underground. This system is designed to find emerging leaks from any and all points within the facility itself.

The mere presence of stored materials in subsoils does not always imply leakage. Spills can occur from overfilled tanks, quick-connect coupling operations, line flushing and other activities that lead to the inadvertent release of hazardous materials to the environment.

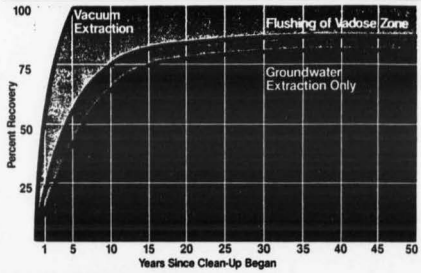
Terra Vac monitors contaminants above the water table where they are most highly concentrated. Accurate chemical analysis is done on-site; there is no two or three week delay between sampling and the availability of results. If stored materials are found in these soils, the condition is verified immediately. The same equipment used for monitoring also extracts potential groundwater contaminants. Therefore, based upon onsite data, an owner can make an intelligent, informed decision regarding implementation of contingency plans to prevent groundwater contamination.

Terra Vac Leak Detection services include onsite testing and analysis, evaluation and reporting. Monitoring of the storage facility is done on a continuous monthly or quarterly basis, depending upon the site conditions. After the subsurface equipment is installed, explosion-proof vacuum recovery equipment is mobilized and connected to the subsurface extraction point by trained technicians.

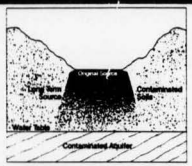
Representative samples of extracted vapors are analyzed onsite in a mobile laboratory. If stored materials are not volatile, a highly volatile tracer can be placed in the tank for verification of a potential leak.

Leak detection using the Terra Vac system can be conducted at any time. If there is a spill while filling a tank, it is imperative to mobilize portable equipment at the site for immediate recovery before potential contaminants disperse into the soil. Rapid response to spills and leaks minimizes the time and cost of clean-up.

Relative Rates for Cleanup of Subsurface Contamination



The Problem:

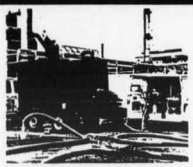


Contaminated soils are the long term source of groundwater contamination resulting from old leaks, spills or landfills.

When volatile contaminants escape from tanks, surface spills or landfills, residual contaminants are absorbed to the soils above the water table. This is important when evaluating clean-up methods, especially if groundwater is a source of drinking water.

Residual contamination in the soils is of great concern since rainwater percolates through the soil and continues to carry the contaminants to the aquifer for a very long time. As a result, absorbed contaminants in the soil are the major active source of further groundwater contamination.

The Solution:



Terra Vac's mobile recovery system cleans up soils effectively & efficiently.

The Terra Vac Recovery Process is specifically designed to recover adsorbed, dissolved, liquid, or vaporous contaminants **before** they enter the aquifer. By minimizing the recharge of contaminants into the aquifer, the extent of groundwater contamination and cost of cleanup are minimized or eliminated.

How It Works:

The Terra Vac treatment process works by air stripping the contaminated soils in place. Extraction is accomplished without excavation of soils. Our in-situ treatment process is fast, reliable and extremely cost effective.

Once the contaminated area is delineated, subsurface equipment is installed quickly and safely, even in congested industrial areas. Vacuum recovery equipment is then mobilized to the site and subsurface recovery begins. Terra Vac's recovery rates are much higher than with typical recovery systems.

This unique system was first proven at a Superfund site where volatile organic solvents leaked from an underground storage tank. Three hundred feet below, the first aquifer was the sole source of drinking water. Although groundwater contamination occurred rapidly, most of the pollutant was in the soil. Since this cleanup began, over 80% of the spill volume has been recovered by the vacuum extraction process. As a result, groundwater concentrations have been reduced more than 99%.

Following the success of the prototype system, Terra Vac has designed, installed and operated contaminant recovery systems at numerous sites. The Terra Vac Process has been effective in many types of subsoils including clay, silt, sand, gravel and weathered rock. A wide variety of chemicals have been extracted from soils including petroleum hydrocarbons, chlorinated solvents, ketones, alcohols and others.

This method has been accepted by the Environmental Protection Agency (EPA) as an alternative to more expensive remedial measures including excavation of soils, biodegradation and flushing techniques that purge subsoils of contaminants in order to protect groundwater resources.

Groundwater treatment and aquifer restoration can become a short term process only after decontaminating soils. The Terra Vac System is the most effective, economical method to cleanup soils contaminated with common pollutants.

ATTACHMENT B

Transcript of July 29, 1987 Public Meeting
Proposed S.I.T.E. Demonstration Project
Groveland Wells Superfund Site

UNITED STATES OF AMERICA

ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

RE: SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION (SITE) PROGRAM.

BEFORE: Jim Ciriello, Chairman

James Malot, Professional Engineer

Ed Malmans, Terra-Vac Industries

Peter A. Michaels, Professional Engineer

A PUBLIC MEETING held on Wednesday, July 29, 1987, at the Town Hall, Groveland, Massachusetts, commencing at 7:20 o'clock p.m.

INDEX

PROCEEDINGS

(7:20 p.m.)

MR. ARGYROS: Is there any chance that with these site controls in place, that you're going to redraw the contaminants back towards the well?

MR. CIRIELLO: It's a good question, it's not really relative to this, but we do expect -- The reason that the carbon is on Well 1 is because we do expect, under some conditions, to be drawing contamination into No. 1. Our predictions are that they will be drawing in contamination from the area of Main and Washington Street, in that area, based on some gravel and flow model, there is influence out towards Johnson Creek, and we do expect there will be some influence on Johnson Creed, Station 1.

It will be widely dependent on recharge conditions and what the base flow and the aquifer is.

With the conditions right now and real flow, then there would be a greater risk of drawing contamination.

This spring, only about four weeks ago, there was a substantial amount of water in this aquifer, the water table was very high, four or five feet below the surface. Now I don't know, it's probably dropped a couple of feet, but we do expect that, yeah, that's one of the

problems there.

Is that sort of an answer? I'll talk to you about that later, too.

Any other questions on the site program?

MR. ARGYROS: Is the site program, you call it a demonstration, but is it something that is really going to clean up the problem and it's just demonstrated here, or is it just going to, like tell you if it could solve the problem at the sites?

MR. CIRIELLO: This demonstration is not intended to clean up the valley site, although that could potentially be an advantage to it. The idea is to, is to demonstrate this and be able to determine sort of the ultimate effectiveness or the optimum effectiveness of it.

It's not our goal to necessarily clean up. We will try to isolate -- I think Ed will talk about this later -- we'll try to isolate an area and clean that area up, or bring it as far as we can. The idea is to generate enough information to be able to determine how effective it can be, and what costs and times and so forth, are associated with that.

Bit it's not the intent to necessarily clean up the area with the demonstration.

Garret?

MR. CARLSON: Well, you're only going to drill one well, is that it?

MR. CIRIELLO: No, I'll defer that to Ed, I think he's going to get into a little more specifics on that.

MR. GREENSTEIN: Mike Greenstein, Congressman's Marvoulis' office.

Jim, did you say that you had not begun the feasibility study at the valley site yet?

MR. CIRIELLO: No, we've not begun a new feasibility study, we've not carried the feasibility study that was done any further at this point.

I'm sorry, I guess I didn't really, you know, talk about that, but the way this fits in to the valley site is, the feasibility study will be getting under way very shortly. This information will go into, the information that we generate from this demonstration will be used to evaluate this technology as part of an alternative for the valley site. It will coincide very nicely with the development of the feasibility study, and it will be evaluated and compared to other alternatives that have been previously proposed, such as excavation and treatment or another in-situ process is soil flushing.

MR. GREENSTEIN: So a previous feasibility study has identified other options; is that correct?

MR. CIRIELLO: Yes. There was a feasibility study that was completed in July of 1985, which evaluated several options.

MR. GREENSTEIN: The length of this particular study, the Terra Vac study, how long will that take before you get the results, before you know what you really have here?

MR. CIRIELLO: I think -- Well, we'll answer that, too. I think it would probably be best now, if we turn to Ed and let Ed -- or Jim, Jim Malot will -- I'm sorry.

FROM THE FLOOR: If this study does show, this demonstration does show that it is going to clean up the area that is contaminated, how long until we expect to have this area fully cleaned up? You know, you're using this area as a test site as a demonstration of it.

MR. CIRIELLO: The schedule that I'm looking at for this project is, we'll be conducting investigation work characterizing the site this summer, the remainder of this summer, and into fall. We'll be performing -- and when I say "we," I mean collectively evaluating -- performing a feasibility study this fall and winter, and it's our goal to select an action, an alternative, next spring, sometime in the order of April.

And from that point, we would then, assuming

we select an alternative, we would then have to go into the process of bidding, desiging, bidding, awarding, that contract. I wouldn't speculate as to when we might get out there, it's a little too early. Next year? These people know me better than that.

FROM THE FLOOR: I guess my concern is that, you know, if it shows that it works here, and then this company, you know, another state wants to try it, you know, how long -- I know that the Suerfund money is kind of difficult to get and there are a lot of sites around the country that need to be cleaned up and, you know, what's the chance of going someplace and working another place and then we have to wait another two or three years before they come back, whoever, you know, does the work, if it does work, I don't know.

MR. CIRIELLO: Terra Vac is the company that's going to be conducting this demonstration. I guess there's no guarantees that Terra Vac would do the work ultimately anyway, and so it would be bid and anybody with the vacuum extraction technology could bid on the job, I mean they're in business, they're going to do the next job, and it's tough to say. But there is a process they would have to go through, and that would be a bidding and an awarding process. There might be other bidders besides Terra Vac, it's kind of a tough question.

Earl?

MR. SWEETSER: Mr. Ciriello, does this---

MR. CIRIELLO: He's the only one who calls me Mr. Ciriello.

MR. SWEETSER: Is that going to interfere at all with the aeration of that heavy plume that's been my pet peeve for five years?

MR. CIRIELLO: No. I think, as Jim will explain, this technology deals with a discreet area of contamination with is above the water table in soil.

MR. SWEETSER: The aeration of that plume is still---

MR. CIRIELLO: That's -- Well, I believe you're talking about the state's action, the state's action with---

Yeah, this technology, this demonstration is on unsaturated, solid space of land at the area where the wastes are currently sitting and waiting to migrate off, if you will, into groundwater. So it doesn't impact in any way as to what could take place down at Mill Pond, scheduling or otherwise. As you'll see and I'll elaborate on later, there is little, if any, adverse effects from this demonstration, from this technology. It's one that apparently works very effectively in dealing with waste before they get into groundwater. That one that deals

with removing them from soil without changing the state into something like mixing of groundwater and having to recover grounwater, so it will not effect what's happening in Mill Pond.

MR. CARLSON: Garret Carlson, Conservation Commission.

Probably these organics are just sitting in the soil as you say, not doing anything, not going anyplace?

MR. CIRIELLO: Well, we found, or Valley has found, that through investigation, there is still a good deal of contamination sitting under the building and above the water table which are not migrating, mostly because of lack of infiltration, perhaps, and so there is some waste that's still sitting in the soil which can be extracted. They're migrating by, contact with the groundwater table water by gravity migration, but they are, you know, they are moving, but slowly, as compared to something that would be out, any opening, would receive infiltration to wash them away.

MR. CARLSON: But they're not adding to it at the moment?

MR. CIRIELLO: I can't say that.

MR. CARLSON: Is the operation going on---

MR. CIRIELLO: Oh, I'm sorry. Well, see,

that -- No, there's no reason to believe that they're adding to it. But when I say, see, that's the problem, when I say "source," there's contamination, there's waste in the soil, that is now a source of groundwater contamination. That's not to imply that anybody's adding to the ground any more, but that is a source of groundwater contamination, and that's the way the condition sits as now. So there is contamination which migrates from soil into groundwater and then off and downdgrading in the ground water.

REPRESENTASTIVE PALUMBO: I'm Tom Palumbo, State Representative, representing this community.

I'm hopeful that if the technology proves to be successful, that there won't be an extended break in the chain of events, such that you can continue this technology, because I understand some of the gentlemen who have been speaking this evening talking about, and what you had said about the pumping, I don't want two antagonistic approaches to the situation, in other words if we can clean it up with this technology, I hope that we don't have an extended or protruded break in the chain of events, that we can clean this situation up in a fairly rapid period of time because, you know, if you're going to start pumping again with Station 1 and it's going to start a migration, it seems to me to be two competing

efforts.

So I would be hopeful that EPA and the state would work together, we could all work together to ensure that if the technology is successful, we can move in the direction of having the technology continue, whether you have to go through a bidding process or whatever, continue to address that problem and clean it up in that manner, as efficiently and effectively as you can.

MR. CIRIELLO: That is what we strive for, we are getting, we are at a point where we are developing an overall plan, and we are implementing parts of that plan, being Station 1 in the Mill Pond action, and some other actions.

We are looking -- This demonstration is, first of all, will be used nationally, the results of it will be used nationally. We would still, as successful as it might be, we would still need to evaluate different alternatives and compare them for cost effectiveness.

But yes, I mean it would be our goal to be able to move smoothly here through this fall, in the evaluation phase and feasibility phase, into next spring and select an action, and then into next summer, bidding and selecting a contractor and then implementing it.

REPRESENTATIVE PALUMBO: So if this approach

is successful over the three-month period, then there would be a subsequent bidding process?

MR. CIRIELLO: Well, we would need to---

REPRESENTATIVE PALUMBO: Is there a possibility of you proceeding with the approach?

MR. CIRIELLO: I don't know how much possibility that is. We wtill need to, by law, evaluate several alternatives and select a cost-effective one, and as quickly as we can do that, we will do that, but we do need to compare and support cost-effectiveness of this alternative, some permanence of the alternatives, to a feasibility study and a record decision.

So we would still need to do that, and on how successful it was.

REPRESENTATIVE PALUMBO: But it appears, though, where you chose this approach, that this, in your mind, is probably the most reasonable approach, in terms of cleaning up the waste?

MR. CIRIELLO: Yeah, I think it's a very attractive approach.

REPRESENTATIVE PALUMBO: Without driving it further into the aquifer?

MR. CIRIELLO: Exactly. It's technology that will remove it from where it is without universally changing its form or creating a larger volume of the

substance in water or air, it's a treat, and it's attractive for this property, for this site, because it's one that's in place and requires no disturbance of the waste, it requires no equipment to come in and excavate the waste and transport things around, and it requires, you know, basically no disturbance of the existing facility. It's installed through the existing floors, and so it is attractive, it is in place, there's little risk compared to other things, because you're not moving waste around, it's staying in there.

So, yes, I think it's very attractive.

MR. GREENSTEIN: Mike Greenstein from Congressman Mavroules' office. Again, one quick and last question.

Talking back to what Earl had to say, this demonstration has nothing to do with the migrating film, is that correct, it doesn't address that at all?

MR. CIRIELLO: No.

Let's let Jim get up and give his presentation, and then we can -- I think it would become a lot clearer. I apologize for not being exactly very clear right now, but it will become a lot clearer, and then we can talk a little more about it later.

(Off the record.)

FROM THE FLOOR: Jim, I've got a question.

All the things already in place, why are we demonstrating that, why don't you have all the facts that you know already, why are you calling it a demonstration?

MR. CIRIELLO: Why don't we have all the facts on this technology?

FROM THE FLOOR: You've already, the system is working, it's successful, yet we're calling this a demonstration; why is that so?

MR. CIRIELLO: Jim?

MR. MALOT: One of the things at the sites that we've used this technology before, particularly industrial sites, although there has been some Superfund sites, but they're looking for a particular contaminant, or they're, you know, they're looking for a demonstration on their own site. There's very complex geology, much different than what might be here or at other places.

And the focus of most industrial sites is not to gather data that can be used to evaluate the technology overall, so it might be applied somewhere else, but to solve their specific probem.

So what the main activity of the demonstration here is to gather that information with all of the quality control and quality assurance so that that evaluation can be scrutinized and evaluated by others,

and that then is the value of the demonstration now. And the time frame, in terms of innovative technology, we started almost five years ago. In terms of innovative technologies, that is a very short term.

And so in one sense I can see where you might see that it's already been demonstrated, but it hasn't been demonstrated in the sense that EPA's intent is, if I understand it, and you can elaborate on that, in order to be able to apply to other Superfund sites across the country.

FROM THE FLOOR: You just said that on one hand it worked, okay, you're kind of contradicting what you're saying, you're saying they're using it, use it at Superfund sites, and each site is unique, and that's one of the reasons why it's a demonstration.

You're saying that other -- And then you're saying the information that's gathered from this will say whether or not it's qualified for other sites to use it.

MR. MALOT: Okay, there's---

FROM THE FLOOR: Maybe I'm getting mixed up, I'm misunderstanding---

MR. MALOT: No, it is, it's not very clear, because it's very complex. First of all, every site is unique, okay, their hydrology, the geology, the contaminants,

the history of the site; every site is unique.

However, there are a number of geologic and engineering and chemical parameters that relate to the vacuum extraction process that can be evaluated, which is the intent of this demonstration, to evaluate those in detail, so that then those characteristics and understanding of those parameters can be applied to other sites.

Does that make sense?

FROM THE FLOOR: So otherwise, the other sites that you have used this at, you have not been able to gather any of this type of technical data to support whether or not this technology really works?

MR. MALOT: Well, yes and no. We have gathered a lot of data for those sites; however, we have not gathered it to the extent or with the prupose that this demonstration program is going to allow a third party to evaluate.

That third-party evaluation is a big part of the demonstration program.

MR. GALLI: Ken Galli, Lally Associates. I just want to -- So therefore the difference is really that you're looking to see if this is a reproduced book binding and therefore the third party gives you more input into that---

MR. CIRIELLO: Well, it's EPA's -- EPA would

be a third party, and it's EPA's goal to develop this information itself so that it can evaluate this.

I guess one goal would be to be able to develop reproducable data, and data with the reliability that we could use it on other sites and use it to evaluate this technology for other site alternatives, whether we meet alternatives on the sites.

MR. ARGYROS: Dave Argyros from Chesterton Company.

The area of contaminated soil that exists above the groundwater table at Valley, this demonstration probject, what percent of that area are you going to be demonstrating on, or if successful, would be cleaning up?

In other words, are you demonstrating on, you know, the area is this big, are you demonstrating on most of it, or are you just demonstrating on a small part of it, just, you know, roughly, are we talking big or little?

MR. MALOT: It's been a little---

MR. ARGYROS: If it's successful, are you going to clean up half the problem or just, you know, one percent of the problem?

MR. CIRIELLO: Well, in light -- Let me must start the answer by saying that I'm not clear -- Based on the information that I have now, we would be

demonstrating on that portion, maybe equivalent to a third of it or something. We don't feel that the area's completely characterized yet, and that's part of the reason why if there is any work to be done, to be more investigation work there.

But on the area that is there, it might be roughly a third of it or something.

Can you elaborate on computations?

MR. MALOT: Yeah. I think it's a, you know, my understanding of the site, there's a kind of a cental location, which is a hot spot in terms of contamination levels, very high levels, and we'll be working at the periphery of that.

The intent of the demonstration is not to clean up the entire site, but to demonstrate that this portion can be either cleaned up or cleaned up to the extent that projection of that cleanup would be feasible, and then take that information and project it over the whole area.

MR. CARLSON: Is the end result of all of this investigation some kind of information that an independent person can use to make a cost-effective evaluation, based on certain parameters? In other words, I can measure the highly carbon levels or whatever they are, I can measure the permeability index of the soil,

and determine, roughly, how many wells, how much equipment we need, and see what the cost effectiveness is as compared to other systems, or is this a unique site-by-site feeling you have to go through each time?

MR. CIRIELLO: You should be able to get a handle, based on -- You should be able to get a handle with the information generated, what the effects of permeabilities, the effects of the insaturated zone, the conetration or types of contaminants, you should be able to get an idea from the evaluation part of this demonstration and carry that towards your problem, you know, evaluate the---

MR. CARLSON: But I mean is EPA going to publish some brochures or some kind of handbooks or---

MR. CIRIELLO: There's going to be -- Yeah, there will be, what I assume is a fairly expensive evaluation document at the end of this, which will incorporate all the data generated during the tests and evaluation of that data and the success, in a sense, of the demonstration, and that will be published, it will be public record, it will be available. I'm not sure what form it will be published in, it will be some research document out of EPA, probably out of EPA, Hazardous Waste Environmental Research Lab who will be publishing it.

Pete Michaels is with EPA contractor

Enviresponse. Pete is EPA's contractor -- Enviresponse is EPA's contractor, involving the evaluation phase.

I don't know if anybody mentioned this, but basically when a program breaks down, it's the developer in the program is responsible for the demonstration costs and aspects of the project, equipment, the manpower to demonstrate it. EPA is responsible for the evaluation costs, those for sampling and analysis, and those for evaluating and publishing the results of the test.

And Enviresponse is EPA's contractor, involved in doing the evaluation phase of it. Terra Vac is the developer involved in demonstrating the technology.

MR. CARLSON: And is there any fault with sedimentation of your wells, in other words if you have a very tight soil, do you tend to get some soil particles drawn in and they clog up your wells and get into the hose or whatever you have down there?

MR. MALOT: Well, we're above the water table.

MR. CARLSON: You're above the water table, but you get soil particles?

MR. MALOT: Right.

MR. CARLSON: In a very tight soil, generally

when you vacuum, you tend to get these soil particles as well.

MR. MALOT: Right. We designed the system, the well, so that we filter that out.

MR. CARLSON: How do you filter it out?

MR. MALOT: Well, typically with the sand meeting around the screen itself. At some sites we have pulled in very small amounts of soil particles, fine grained, but really negligible amounts.

MR. CARLSON: Is there any kind of soil that the system won't work in, if it's too tight?

MR. MALOT: Well, we've done this in clay, silt, sand, gravel, fractured rock, course limestone, stratified media, virtually every type of geologic setting.

There's some that you have to apply different levels to be closed, different vacuums to accommodate those variabilities, but you would find it in virtually all.

MR. JOHNSON: Dick Johnson, Water Pollution Committee. Will you be using monitoring wells with your manometers to determine the extent of the zone you're treating during this demonstration?

MR. MALOT: Yes, that's---

MR. JOHNSON: Will you be able to tell if, be able to identify the particular zone---

MR. MALOT: That's correct, that's what we call the radius of influence---

MR. JOHNSON: Right.

MR. MALOT: ---of the extraction was, and we will be monitoring it, so that we can delineate that extend to which it's being effective from the central extraction---

MR. JOHNSON: So with that data you'll be able to almost predict the length of treatment for the entire zone of unsaturated soil that might be contaminateed?

MR. MALOT: Well, that data itself won't be extrapolated to predict the length of time, that will be used to predict how many extraction wells will be necessary to clean up whatever extent of contamination there is, based on the findings of the feasibility study.

MR. JOHNSON: But that will be part of this project?

MR. MALOT: Yes.

MR. GREENSTEIN: At this site we have already groundwater contamination, and what we have, potential source contamination, which is what Terra Vac will address.

Are you saying that in order to really clean up the problem, we have to address both the groundwater contamination and then the source contamination, so that the Terra Vac process would be in addition to what

you're doing to try to address the problem?

MR. CIRIELLO: The final remedial action plan for the site would consist of, at this point, would consist of source control actions, it would consist of groundwater, management migration of groundwater contamination, and it would involve at this point treatment of Station No. 1.

So ultimately, there will be at least three phases of this remedial action plan for this site, which would be some source control action, some groundwater cleanup action, and some point of use of action at Station No. 1.

This is, this demonstration goes into developing that source control action, and it's a step towards that end.

MR. GREENSTEIN: Is this the first time in the process that this has been explored?

MR. CIRIELLO: Excuse me?

MR. GREENSTEIN: Is this the first time in this entire process of dealing with this problem that source contamination control has been explored?

MR. CIRIELLO: Oh, absolutely not, no. Source control has always been, if nothing else, the one thing to do, it always will be. You need to control the source before you can go off and effectively deal with

the migration from that source.

So yes, it has always been something for consideration, but it's a difficult solution to come up with, but it has always been a part of it.

MR. GREENSTEIN: So in effect we really haven't come up with a solution to that yet, and this is an attempt to find that solution?

MR. CIRIELLO: Well, this is an attempt to give us alternatives to look at, alternatives in addition to the ones I mentioned earlier, and that's how it fits in, it fits in to the evaluation phase with other technologies and other alternatives.

MR. GREENSTEIN: Thank you.

MS. McCARTHY: Gentlemen, Ann McCarthy from Senator Costello's office.

You're basically saying that this site program is using the Groveland situation sort of a guinea pig to test your technology, and I'm just curious as to how much input the municipality's going to have in the whole situation, as far as deciding on cost effectiveness, does that belong strictly with EPA, is the State involved? How much more input is Groveland going to have into the site program?

MR. CIRIELLO: The EPA is required by law, under the Superfund Law, to select cost-effective

alternatives, and cost-effective alternatives, under our amendments, are generally those that are permanent solutions, not containment solutions and not solutions which involve relocating waste, in a sense. So we're required to select, to the extent practicable, a permanent solution.

The public is involved in that process in that they have the opportunity to review the results of investigations and to review the evaluations that are conducted and feasibility studies, and in selecting an alternative, we have a formal public review, public comment period. In that, the public comment, sentiment, whatever, weighs very heavily into what actions are selected, but we are in the end, mandated by ~~a lot~~ law to of select, cost-effective action, which is, when it's most practicable, permanent.

In the site program, the public's involvement is in that we pretty much won't, will not be able to do a demonstration without some public approval. We are proposing this demonstration and we're asking for input and comment from the public as to whether we can go ahead with this demonstration at the Groveland site.

So there is a substantial amount of involvement. There will also be involvement, assuming that we do proceed with the project, I will be meeting

with the Water Pollution Committee from time to time to let them know what the status is and what's taking place.

We've established two informational repositories which we've had in the past, which are the Water Department and Town Library, which receive information from us, which will receive the demonstration plan that will be put together, and that demonstration plan will be there for people to review. And again, I'll be speaking with the Water Pollution Committee as significant events arise, to let them know what's going on.

As far as this being a guinea pig, I don't think that that's an accurate use of terms. It's not really a guinea pig, in a sense that this isn't a research project, it's not an experiment, this is a tried and tested technology which we feel, based on evaluating the conditions at this site and the technology and the conditions at other sites, we feel that it is directly applicable to this site.

The risks of this demonstration are few. As you saw from the slides, it's an in-situ, it's an in-place technology. There's no disturbance of the surroundings and of the waste itself.

Unlike some other things, there is little risk, if any, from a failure in the process. I don't know

if Ed got into very much about our rights, but there's very little risk in terms of your community, in terms of failure of the system, and in creating problems to public health. So it's attractive.

As you know, the Valley site is in fairly tight quarters, there are people living in close proximity there, that's very much a consideration, and we do feel that the risks are minimal and that it's not a guinea pig, it's testing out, it's running a full-scale demonstration of the technology that is applicable here to the site.

MS. McCARTHY: But you're still using that site as a demonstration site, this is not the chosen technology, this is a technology that you think will work at this site, therefore you are also testing the technology in this unique site to gather additional information; correct?

MR. CIRIELLO: Yes.

MS. McCARTHY: Concerning the technology, so that you will have a broader scope on the technology to use at other Suerfund spots; correct?

MR. CIRIELLO: Well, yes, the information will be widely disseminated, it will be used across the country to evaluate this technology for other sites. But again, it's applicable, it's attractive, for the conditions that we're facing here, and so for those reasons, it's

been selected or matched with the site.

Does that sort of answer your question?

REPRESENTATIVE PALUMBO: Representative Palumbo This is the narrow technology, the chosen technology, and this is a successful technology in the demonstration phase over a three-month period. Are we going to have to look at other alternatives before we can address the final solution to this particular problem, and what are we talking about for a time frame, Jim?

MR. CIRIELLO: We are required to, as successful as this might be, we are required to evaluate other alternatives.

REPRESENTATIVE PALUMBO: Okay, given that, are there other alternative technologies that we can expect to be demonstrated at this site?

MR. CIRIELLO: No, I don't anticipate any others being demonstrated.

REPRESENTATIVE PALUMBO: So this will be, this is the technology you feel may work, and if it does work, we probably will go with this technology?

MR. CIRIELLO: Well, for me, from my standpoint, this is a, this program was developed, the site program was developed, this technology, and Terra Vac responded to the proposal, or submitted a propsal to EPA's request, and it is applicable to this area. So for

that reason I nominated Valley, or that site for this technology. I don't see any others on the horizon in the next round of proposals, and none in this round of proposals that would be applicable and worth demonstrating.

REPRESENTATIVE PALUMBO: Given this technology, let's say that this technology is successful over a three-month period, when could we expect a bidding process and this technology, if this is the one chosen, to be put into place to solve the problem?

MR. CIRIELLO: Uh---

REPRESENTATIVE PALUMBO: What are we talking about in a general time---

MR. CIRIELLO: Well, again, I guess what I'm looking at is completing feasibility study work, of which this is a very critical part, completing feasibility study work early next year, January, February, going through a fairly rigorous agency and public review of that feasibility study and attempting to select through a record of decision, an alternative.

I do believe that we're looking now at selecting an alternative by record of decision in April, and that would mean that we could possibly be into design next summer, or in soliciting bids next summer.

REPRESENTATIVE PALUMBO: I'm also curious about whoever, claiming the presentation. Where will the

contaminants be taken when recovered from the soil, and what type of monitoring will be conducted, relative to good air quality on this process?

MR. CIRIELLO: The waste that would be generated would be the carbon absorption in the canisters or in the drums that the vapor in the air passes through. Those would be sent, that would be the responsibility of EPA, and those would be sent for regeneration, basically, at the plant where they came from.

As far as the air monitoring, Ed had had a schematic of the way the carbon absorption system is set up in two series, in two series of, quote, "parallel absorber containers."

There will be sampling at a point before the vapor reaches the carbon and in between the two absorption systems and after the absorption system. And by sampling, among other places, but by sampling in those points, we'll be able to determine what a sort of raw vapor concentration is and what the effectiveness of the first absorbence is and effectiveness of the second, and what, ultimately, the discharge is of air.

Their experience, I understand, has been that the air that is eventually exhausted has not shown any detectable concentrations of volatile organic contaminants. So the air phase, theoretically, would be

clean, and there would be nothing being discharged, it would be totally contained and nothing would be discharged to the atmosphere.

MR. MALMANS: One other thing to bear in mind, if you develop leaks, that you have this fresh air leaking into the system, rather than other technology where you develop a leak, you may have ugraded or -- If we have a leak, material goes into they system. Fresh air leaks into the system, because of that vacuum.

MR. ARGYROS: Jim, it looks, you know, the technology looks simple and it seems that it looks effective and you might have a good application here. It seems reasonable to drill four wells and try for six weeks.

The only problem I have is the taxpayer, it seems like $600,000, I can't follow a lot of those zeros, and could you maybe enlighten me a little?

MR. CIRIELLO: I didn't -- I'd have to defer to Pete Michaels for what goes into that number, but I would just say that there is extensive sampling analysis going into this evaluation.

MR. MICHAELS: That cost is not the cost of applying the technology, that is no cost to the taxpayer. Under the Sites Program, we are bearing that cost. The figure that you've mentioned is the entire cost of evaluating that.

MR. MALOT: Most of that is in the sampling and analytical portion, which is really considerable, you know, to gather enough meaningful and unquestioned data to produce a quality report. The total cost may very well be over $600,000.

MR. ARGYROS: What does one of these systems really cost, like if it worked and the the town was going to buy one, I mean---

MR. MICHAELS: Well, Jim, maybe you'd like to answer that?

MR. MALOT: I'm sorry, I didn't hear the question, would you repeat it, please?

MR. ARGYROS: Is the cost of the system, in other words, say the study is over with and, you know, the system worked and you wanted to buy one, is that expensive, you know, I thought we were talking cost-effective technology or---

MR. MALOT: It is, it's very cost effective, and the cost to clean up sites, vary on how big the site is and how deep iit is to groundwater. This is a fairly small site, relative to that.

To clean up the site, I don't want to make any predictions here, but just to compare it to some other sites that we have cleaned up, all but one was less than that number, and that one was a site that had seven

million cubic yards of soil contamination.

MR. MALMANS: A good example, Jim brings up from time to time that kind of hits home is that lots of times the application in Terra Vac technology costs less than the study to assess the extent of the problem at the site.

MR. CIRIELLO: Yeah, I think that number is as a result of the evaluation phase of the sampling and analytical work that's going to be conducted and the evaluation part, the reports and everything else, but not the question of the technology.

Garret?

MR. CARLSON: You mentioned a leak before, The only vacuum part is downstream of the pump. Upstream of the pump it's a pressurized system, I presume.

MR. MALMANS: Well, if you recall that the sketch, you had the four wells, you had the air water separators, the carbon canisters, those are all on the pulling side of the pump.

MR. CARLSON: Well, it's at the end of the stream.

MR. MALMANS: Right, the pump is at the end of the stream.

MR. MALOT: The vacuum pump provides a driving force for the entire system.

MR. CARLSON: You do some testing of the soil permeability before you determine how many wells you need and spacing and so on and so forth, I presume? The well selection and spacing number is based on initial testing of the soil?

MR. MALOT: Well, we'll evaluate the data that's already been collected on site, relating to the stratigraphy and the soil types and the permeabilities expected for those soil types, in order to design the exact spacing and well installations.

MR. CARLSON: Well, the soil is not homogeneous, we would take that into account somehow?

MR. MALOT: That's correct.

MR. CARLSON: How close to the groundwater do you come with your wells? Do you leave a certain margin of safety for our fluctuating water table, or does it matter?

MR. MALOT: Well, you can do it either way. You can do it above the water table or you can go below the water table, it just changes your operating conditions.

MR. CARLSON: So if the bottom of the well is inundated, it doesn't affect you effectiveness?

MR. MALOT: No. You just have to control it a little differently.

Yes?

MR. PERRON: You mentioned that with this vacuum system, the air is coming from the atmosphere, that we're sucking down, okay, into the ground, and then we're pulling that through the charcoal ---

What's the chances of spraying the chemical down, only going for a short period of time, of lowering the chemicals in most flood water tables, therefore increase the amount of contamination of our groundwater in the future, and we'll clean it up.

MR. MALOT: Okay. What you've got to keep in mind is the relative scale. When you talk about recharge, you're talking about the surface. Once it gets down into the soils where the major soil or vapor in the vacuum process is operating, then it's predominently horizontal, so there's not a great deal of moving contaminants down to the water table, it's mostly moving in.

MR. PERRON: But the air has to be replaced somehow; correct?

MR. MALOT: That's correc, the air---

MR. PERRON: You're removing a vapor, you're removing something for something, so air and something has to make that up, or else you're going to---

MR. MALOT: Right. And that fresh air

source is coming from the surface, so it's fresh air that's coming through the system, not contaminated air. So every time fresh air comes into the soil system and is brought to the extraction well, you're pulling more and more contaminants out.

The fresh air cleans up the soil, rather than moving it.

MR. PERRON: So you're saying, ycu unwind and go down on the outside, like to go down one side with a vacuum,---

Where is the air coming from at this point?

MR. MALOT: Just because of the dynamics of it, it's coming from the surface, but typically, to give you an idea, the depth to the water table at the site, from the data I've seen, is about 10 feet down. Typically our influence are tens to hundreds of feet.

So what that means is you get, at the maximum, 10 feet down and say 50 feet across. So that's the kind of angle that that air is flowing to the well, in a general sense. You can get an idea that there's very little downward component. The migration of contaminants is not downward to the water table, but to the exactraction pump.

MR. PERRON: Now the carbon filters that

you're going to have to replace, you're going to have to replace at a certain point. When those are replaced, will the system be shut down to replace them, or will you rely on a secondary carbon absorption system to handle that so that the unit will keep running?

MR. MALOT: Usually the system is shut down. It takes anywhere from two minutes to 10 minutes to change on a carbon system. So sometimes we handle that in a valving mode, where we just close valves, so that the system is effectively running, but it's not actively going through that carbon. And you close that off, replace the carbon, and then bring that back on stream.

MR. PERRON: Okay, another question. Will the state be doing tests along with the tests they will be doing, or are we going to rely solely on the tests from the company?

MR. CIRIELLO: The EPA will be doing the primary testing, Terra Vac will likely do some of the testing for their own purposes, but primarily EPA will be conducting the sampling analysis.

MR. CARLSON: I think I read here where Valley Screw is going to be part of your operation somehow, are they going to cooperate, is that true, or is this strictly Terra Vac and EPA?

MR. CIRIELLO: Oh, no, this is on property owned by and operated by the Valley Company, there's---

MR. CARLSON: Well, it's on their property, but are they part of the operation of the system?

MR. CIRIELLO: They're very much cooperating with our doing this demonstration, and they'll be very involved in doing it. If it wasn't for their cooperation, we probably wouldn't be here, we wouldn't be here, because there would be no need to present the idea.

MR. CARLSON: No, but they will have no part of the actual operation of the system or the monitoring?

MR. CIRIELLO: They would -- It would be their choice as to whether they wanted to, for example, split samples, they could do any of that type of activity that they wanted to, conduct any of that activity.

They're allowing us, basically, the space to come in and conduct the demonstration, and then they can oversee or do---

MR. CARLSON: Yeah. If you were going to entertain the thought of having a source decontamination, such as you're doing here, in the future and were going to evaluate different systems, you've got to take a different system someplace else and plug it into the

Groveland site, so somehow you have to have comparative data to evaluate and see how it works, one system against another.

In other words, say you want to evaluate something like nine or ten different systems at different sites---

MR. CIRIELLO: Oh, I'm sorry, no. There are, in the site program, in the first cut, if you will, of the proposals for the technologies, there were nine or ten selected for demonstrations across the country, Terra Vac is one of those for Groveland.

There were nine technologies that were selected to do demonstrations on the site program, five of them were thermal technologies, incineration and the like, two were solidification, one's a biological, and they're being conducted, well, essentially, most of the regions in the country, New England out to the west, but they're nine different technologies on different wastes and for different purposes, mostly incineration.

MR. CARLSON: Well, is EPA going to select one technology as the one they recommend nation wide, or---

MR. CIRIELLO: We're not -- The intent of the program, the way the program operates is, is roughly every January they publish in the Register requests for proposals from developers who want to participate in the

program. The developer would submit a proposal, and then EPA would go through and evaluate each proposal and determine which technologies to use. I mean the acceptance criteria for selecting a proposal is basically the technology as a potential of being cost-effective remedy and adequate data exists already to show that it has potential of being effective.

It's a very careful selection process of the technologies. There were something like 25 or so that, proposals submitted, and of those, nine were screened out and selected for demonstration.

Some of them may only be in the merging stage, and they're really only in the lab or only in pilot scale right now. Those would be promoted on that scale for now until they're at a stage where they can be demonstrated full scale like this is being done.

There's another request for proposals being published in January, or maybe it was done this January, for additional developers and technologists to apply good programs.

The idea is to continually promote development, commercialization of technologies, and so it will be a continuing process for every year, requests for proposals will be submitted by developers, and EPA will evaluate those proposals and select the technologies

to be demonstrated.

MR. CARLSON: The question I'm really asking, Jim, is if in the future when you, if you're going to incorporate source decontamination as part of the Groveland problem, how do you select the process of this source decontamination, you've got to select some particular process in order to do that.

MR. CIRIELLO: No. I mean we select a technology that becomes a part of an alternative. We would select the vacuum extraction technology. We would select salt flushing technology or excavation technology.

MR. CARLSON: You've got these alternatives to select from, but if you're going to select one, you have to be assured that, it was demonstrated, say, in Iadaho, but it's going to work here in Groveland just as well, if you get what I'm talking about.

MR. CIRIELLO: Yeah, that is, yeah, that's subjective of the feasibility study, is to seek out technologies and to develop those into alternatives.

Excavation is a technology, air stripping is a technology. Excavation with air stripping may be an alternative.

Vacuum extraction's a technology. It may not completely remediate the site, it may have to come in after and do something else like final salt

flushing. Together, vacuum extractin technology and salt flushing would make up the alternative.

The goal of the feasibility study is to identify technologies that are applicable, evaluate those technologies, and then develop them into alternatives to achieve your goals. If our goal here is to have drinking water quality at Mill Pond, then we would need to assemble technologies, of which this may be one, assemble those technologies in dollar terms to achieve that goal.

So there are many technologies, and vacuum extraction is one of those technologies that would be developed in evaluating the feasibility study, so that we can determine what a cost-effective alternative is, not a cost-effective technology but a cost-effective alternative. There is a very real distinction between a technology and an alternative.

Does that sort of---

MR. CARLSON: Well, I presume that on the basis of all your demonstrations throughout the country, you'll have enough information that, given the parameters of a certain site, you'll have confidence in each selection, that it will work in a certain way to predict very closely what the cost will be and---

MR. CIRIELLO: Yes, that's the goal, as to

have reliable data, or data on reliability in our performance, so that we can back that up.

We don't want to be in a position of selecting a technology or an alternative that you select and believe it's cost effective, and then have to go out and demonstrate whether it is or not. We would much rather be in a position of being able to evaluate something and know that when it's selected, that you have an alternative that's going to perform well, it's going to work, it's reliable, and it's cost effective, before you select it.

So the goal would be to avail of Garret's information, so that in fact evaluation can be conducted.

Any other questions?

(No response.)

MR. CIRIELLO: In that case, I'd just like to say, first of all, thank you for all coming. Again, I will be -- Comments can be sent to me. Comments can be submitted up until August 12th, to me anyway. I guess all comments should be submitted to me at the address that's in the Fact Sheet. And if someone loses that address, it should be around from several people in town, Dick Ferrick, Earl Sweetser, and others have my address.

Comments should be submitted to me by the

12th. Again, we're looking, we're soliciting comments on this proposed project, and we'll consider those comments in determining whether we proceed with the project or not.

We are also soliciting comments on this environmental review, as required under the National Environmental Policy Act, so those are the two goals, and we'll accept comments, written, or you can call me with comments to August 12th.

Your questions have been recorded this evening, and the responses to those have been recorded. They will go into our Developmental Responsiveness Summary, which will be available in town. Anybody that would like a copy of Responsivelenss Summary should probably indicate on the sign-in sheet, and you'll receive that sometime in -- Well, in approximately two weeks from August 12th, the Responsiveness Summary will be finalized and sent to the Assistant Administrative Headquarters with the recommendation from the region as to whether to go forward with the project, and then the Assistant Administrative Headquarters would publish a decision as to whether to proceed or not.

And if we proceed, then we would be likely out toward the end of September, beginning to conduct work.

MR. CARLSON: Will the results of this particular demonstration project be included, for us to look at here in town?

MR. CIRIELLO: We'll provide an evaluation report here in town.

And again, the demonstration plan that would be developed will be at the library and the Water Department with the other information, when it's developed, and I will be speaking with the Water Pollution Committee from time to time, to let them know what the status of the project is.

Okay, thanks.

(Whereupon, at 9:05 p.m., the hearing was concluded.)

CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings before: THE E.P.A.

in the Matter of:

SITE Program

Place: Groveland, MA

Date: 7/29/87

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken of the above titled proceeding.

V. Rasmussen — 7/29/37
Reporter — Date

J. Rasmussen — 9/7/87
Transcriber — Date