UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

DECLARATION FOR THE RECORD OF DECISION

LINEMASTER SWITCH CORPORATION SUPERFUND SITE
WOODSTOCK, CONNECTICUT

STATEMENT OF PURPOSE

This Decision Document presents the selected remedial action for the Linemaster Switch Corporation Superfund Site in Woodstock, Connecticut, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601 et seq. and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as amended, 40 C.F.R. Part 300. The Region I Administrator has been delegated the authority to approve this Record of Decision (ROD).

The State of Connecticut has concurred with the selected remedy.

STATEMENT OF BASIS

This decision is based on the Administrative Record which has been developed in accordance with Section 113(k) of CERCLA and which is available for public review at the Bracken Library, Academy Road, Woodstock, Connecticut, and at the Region I Waste Management Division Records Center in Boston, Massachusetts. The Administrative Record Index (Appendix E to the ROD) identifies each of the items comprising the Administrative Record upon which the selection of the remedial action is based.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to the public health or welfare or to the environment.

DESCRIPTION OF THE SELECTED REMEDY

This ROD sets forth the selected remedy for the Linemaster Switch Corporation Superfund Site, which includes both source control and management of migration components to obtain a comprehensive remedy.

The major components of the selected source control remedy include:

- In situ vacuum extraction of contaminated soil to remove volatile organic compounds (VOCs). Carbon air emission controls will prevent the transfer of VOCs from the soils to the atmosphere. Soil cleanup levels will be achieved within an estimated three to ten years. After the vacuum extraction system has been operating for five years, EPA will evaluate the effectiveness of the system and determine whether the soil cleanup levels will be achieved within the projected ten-year period using vacuum extraction alone. If, at that time, EPA determines that the soil cleanup levels will not be achieved within the projected ten-year period using vacuum extraction alone, the vacuum extraction system will be enhanced with air sparging or other enhancement technologies to assure that the soil cleanup levels will be attained within the projected ten-year period;

- Institutional controls, that shall consist of a fence surrounding the contamination source area to restrict access to this area; and

- An environmental monitoring program.

The major components of the selected management of migration remedy include:

- Extraction of contaminated groundwater from the overburden and bedrock using extraction wells;

- Treatment of contaminated groundwater using air stripping with carbon air emission controls. Discharge of treated groundwater to an on-site pond. If current cost estimates change over the course of the remedial action to the extent that ultraviolet oxidation technology is determined to be more cost-effective than air stripping, EPA may implement ultraviolet oxidation in place of air stripping at any time during the performance of the groundwater cleanup;

- An environmental monitoring program to include, at a minimum, monitoring on-site and off-site groundwater monitoring wells and drinking water supply wells. The monitoring program shall operate until the groundwater is restored to drinking water standards at the Site and is protective of human health and the environment, which is predicted to occur within 35 years.

- Institutional controls that shall include, at a minimum, deed restrictions to prevent the use of untreated contaminated groundwater until the cleanup levels are met.

DECLARATION

The selected remedy is protective of the human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate for this remedial action, and is cost-effective. This remedy satisfies the statutory preference for remedies that utilize treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances. In addition, this remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

July 21, 1993
Date

Paul Keough
Paul Keough
Acting Regional Administrator
U.S. EPA, Region I

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I

RECORD OF DECISION

LINEMASTER SWITCH CORPORATION SUPERFUND SITE
WOODSTOCK, CONNECTICUT

JULY 21, 1993

ROD DECISION SUMMARY
LINEMASTER SWITCH CORPORATION SITE

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I. SITE NAME, LOCATION AND DESCRIPTION

The Linemaster Switch Corporation Site (the Site), is located on Plaine Hill Road in the Town of Woodstock, Connecticut (Appendix C, Figure 1). The Site is bounded on the north and east by Route 169, on the west by Plaine Hill Road and on the south by State Route 171. The Site consists of 90 acres of land, and is located on a hill.

Prior to 1952, the Site was used for residential purposes and small scale farming. Starting in 1952, the Linemaster Switch Corporation (Linemaster) began manufacturing foot operated switches at the Site. Currently, Linemaster manufactures electrical power switches, air valves, electrical cord sets and metal name plates at the Site. Linemaster's manufacturing building is located near the center the Site, and on its topographic high point.

In addition to Linemaster's manufacturing facility, several residential parcels and a commercial parcel, on which a restaurant is located, are also located on the Site. These parcels are owned by Linemaster's principal shareholder.

The Site includes woodlands, grass meadows, wetland areas, and several ponds and streams. The wetlands are located primarily on the perimeter of the Site at the bottom of the hill near Route 169.

The aquifer under the Site is classified as GA by the State of Connecticut Department of Environmental Protection (CT DEP), or suitable for direct human consumption without the need for treatment.

The Site is surrounded mainly by residential property, with most of the nearby residences located to the northeast, east and southeast. Linemaster as well as all other residential and commercial property located on and in the vicinity of the Site obtain their drinking water from individual bedrock and overburden wells.

A more complete description of the Site can be found in the "Remedial Investigation/Feasibility Study, Linemaster Switch Corporation, Woodstock, Connecticut," December 1992, in Section 1 of Volume I.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Prior to 1952, the Site property was used for residential purposes and small scale farming. In 1952, Linemaster began manufacturing foot operated switches at the Site. As part of Linemaster's manufacturing operations, paint thinner, trichloroethene (TCE) and other chemicals were used. Paint thinner use began in 1952 for a spray painting operation. From 1969 through 1979, TCE was used for vapor degreasing operations. Reportedly, the estimated amount of TCE used between 1969 and 1979 was approximately 100 to 600 gallons per year. Of this amount, approximately 20 to 200 gallons per year were disposed of in a dry well located to the east of Linemaster's manufacturing building. The exact amount of TCE and other wastes discharged to the dry well is unknown.

In July 1980, CT DEP conducted a Site inspection of the facility pursuant to the Resource Conservation and Recovery Act (RCRA) and, in July 1984, it conducted a Preliminary Assessment pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Following a review of CT DEP's reports, EPA conducted Site investigations in December 1985 and February 1986. During both the CT DEP and EPA's investigations, groundwater samples were taken from Linemaster's production wells and several residential water-supply wells located near the Linemaster facility. Results of sampling and analysis indicated the presence of volatile organic compounds (VOCs), primarily TCE, at levels above the state and federal drinking water standards.

On April 8, 1986, CT DEP issued an Abatement Order to Linemaster requiring the company to investigate the extent of groundwater, surface water and soil contamination, and to take actions necessary to minimize or eliminate the contamination. In February 1987, pursuant to the Abatement Order, Linemaster initiated investigations and thereafter began to design an Interim Removal Treatment System (IRTS) to address groundwater contamination.

On September 24, 1987, EPA and Linemaster signed an Administrative Order By Consent under which Linemaster agreed to perform a Site investigation and a drinking water well monitoring program, and to provide alternate water supplies, as necessary, in the vicinity of the Site.

In June 1989, pursuant to the CT DEP Abatement Order, Linemaster removed the former dry well. At that time, approximately 1,000 gallons of hazardous liquid were removed from the well and disposed at a licensed hazardous waste storage facility.

On February 15, 1990, EPA added the Linemaster Switch Corporation Site to the National Priorities List (NPL) making it eligible to receive federal Superfund monies for investigation and cleanup.

On September 30, 1991, EPA and Linemaster entered into a second Administrative Order By Consent under which Linemaster agreed to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Site under EPA supervision.

In June 1992, pursuant to the CT DEP's Abatement Order, Linemaster implemented the Interim Removal Treatment System (IRTS). The IRTS extracts contaminated groundwater from six on-site bedrock wells. The contaminated groundwater is treated to drinking water standards using an air stripper followed by activated carbon and is discharged into an on-site pond. Currently the emissions from the air stripper discharge to the atmosphere untreated.

Linemaster hired a contractor to perform the RI/FS. In August 1992, Linemaster's contractor submitted the first draft of the RI/FS to EPA. In a letter dated September 29, 1992, EPA provided its comments on the first draft of the RI/FS to Linemaster. In December 1992, Linemaster's contractor submitted a revised draft RI/FS to EPA. In a letter dated March 31, 1993, EPA provided its comments on the revised draft RI/FS to Linemaster. Linemaster's contractor responded to EPA's comments in a final addendum to the RI/FS, dated April 13, 1993.

Linemaster has been active in the remedy selection process for the Site. Technical comments presented by Linemaster during the public comment period have been included in the Administrative Record. A summary of these comments as well as EPA's responses are included in the Responsiveness Summary, Appendix C of this document.

A more detailed description of the Site history can be found in Section 1 of Volume I in the Remedial Investigation/Feasibility Study report (December 1992) at pages 6-7.

III. COMMUNITY PARTICIPATION

Throughout the Site's history, community concern and involvement has been minimal. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings.

In 1987, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed about and involved in activities conducted at the Site. On June 12, 1991, EPA held an informational meeting in the Woodstock Town Hall to describe the plans for the Remedial Investigation and Feasibility Study (RI/FS). While finalizing the RI/FS, EPA conducted interviews with local citizens and officials in February and March of 1993 and updated the community relations plan. The RI/FS, and final addendum to the RI/FS, were completed in April 1993. On April 1, 1993, EPA published a notice in a local newspaper announcing the availability of the final RI/FS and presenting a brief description of the Proposed Plan.

On April 14, 1993, EPA held an informational meeting in the Woodstock Town Hall to discuss the results of the Remedial Investigation, the cleanup alternatives presented in the Feasibility Study and the Agency's Proposed Plan for the remediation of the Site. Also during this meeting, the Agency answered questions from the public. EPA made the administrative record available for public review at EPA's offices in Boston and at the Bracken Library in Woodstock, Connecticut on April 15, 1993. From April 15, 1993 to May 14, 1993, the Agency held a thirty day public comment period to accept public comment on the alternatives presented in the Feasibility Study and the Proposed Plan and on any other documents previously released to the public.

On May 5, 1993, the Agency held a public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting, and a summary of the comments and the Agency's response to comments are included in the Responsiveness Summary, Appendix C of this document.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy was developed by combining components of different source control and management of migration alternatives to obtain a comprehensive approach for Site remediation. In summary, the remedy provides for the following: reducing the VOCs in the soil within the Zone 1 area; preventing continued release and further migration of hazardous substances to the groundwater (and therefore to the surface water as well); restoring contaminated groundwater to drinking water standards; and continuing environmental monitoring at the Site.

The principal threat to human health and the environment that will be addressed by this remedial action is the ingestion of contaminated groundwater.

V. SUMMARY OF SITE CHARACTERISTICS

Chapter 9, Volume IV of the Remedial Investigation/Feasibility Study contains an overview of the Remedial Investigation. The significant findings of the Remedial Investigation are summarized below.

Four source areas (labeled Zone 1, Zone 2, Zone 3, and Zone 4) were investigated during the RI. The results of the investigations are presented below.

A. Soil

Zone 1: former dry well and paint settling booth.

Based on the results of the RI, the Zone 1 area is considered to be the primary source area for this Site. Elevated levels of volatile organic compounds (VOCs) are present in the Zone 1 soils due to the disposal of hazardous substances into the dry well, which was located in this zone. VOCs are also present under Linemaster's manufacturing building (which was not specifically included in any defined zone for purposes of the RI, but is considered to be part of Zone 1 for purposes of the remedial action). Due to the difficulties associated with sampling beneath the building, the magnitude and extent of VOCs under the building is unknown, though it is estimated that approximately 38% of the contaminated soil at the Site is located directly under Linemaster's manufacturing building.

In the Zone 1 area, the maximum concentration of TCE detected was found at levels exceeding 4000 parts per billion (ppb). This concentration represents a level that is eight-hundred (800) times the cleanup level for TCE of 5, established for the remediation of the soils pursuant to this ROD, as provided in Appendix B, Table 17.

Low levels of semi-volatile organic compounds (SVOCs) were detected in samples from this area but these contaminants were determined to be from laboratory contamination and are not considered to be of significant concern.

The ranges of naturally occurring metals concentrations in soils were established based on the analytical results from soil samples collected from eight locations both on and in the vicinity of the Site. The concentrations of metals in soil samples collected during the RI/FS investigations were compared to the maximum background concentration for each metal to identify areas where elevated concentrations of metals were present.

Elevated concentrations of arsenic, barium, cadmium, chromium, lead, and zinc were identified in soil samples collected from Zone 1. Concentrations of these metals were highest in the vicinity of the former dry well and generally increased with depth, suggesting that the concentrations may be related to the presence of metals in the overburden groundwater. Elevated concentrations of arsenic, chromium, and lead detected in samples collected from the former paint settling booth location may be due to the presence of residual paint chips in this area.

The primary exposure area (Zone 1) is currently capped with a polypropylene cover to reduce exposure, rainwater infiltration and fugitive dust.

A more detailed summary of contaminants can be found in Tables 1 and 2 in Appendix B.

Zones 2, 3 and 4: former facility wastewater disposal system, former Blakely residence leaching field, and the paint shed area.

Soil sampling conducted in Zones 2 and 3 contained low and non-detectable levels of VOCs. This contamination is likely from the migration of contaminated groundwater from Zone 1. Due to the slightly elevated levels of VOCs in the Zone 4 area, Zone 4 was incorporated into the Zone 1 area[1] (i.e., the primary source area) for the Feasibility Study.

SVOCs were detected in Zone 4. However, this contamination is suspected to be from minor fuel releases and not considered to be of significant concern.

Concentrations of cadmium, chromium, lead, selenium, and zinc exceeding the maximum background soil concentrations for these metals were detected downslope of the brick dry well in Zone 2. The slightly elevated concentrations in these samples may be related to metals leaching out of plumbing fixtures and piping, or may be associated with the discharge of facility wastewater to the brick dry well. In addition, slightly elevated concentrations of several metals were detected in Zone 3 soil samples collected in the vicinity of the former Blakely leaching field. These Zone 3 soils are not believed to have been significantly impacted by historical Site operations.

In Zone 4 soil samples, barium, cadmium, chromium, and nickel were the metals that most commonly exceeded the maximum background concentrations. A general trend of increasing metals concentrations with depth suggests that the elevated concentrations of these metals in the Zone 4 soils may be influenced by metals which are naturally occurring in the overburden groundwater. Elevated levels of arsenic concentrations were only detected in the soils and fill material present immediately below the paint shed floor.

B. Overburden Groundwater

The RI found that VOCs, mainly trichloroethene (TCE), are migrating from the Zone 1 source area to the northwest, north, northeast, east, southeast and southwest through the overburden soils (Figure 2, Appendix A). The primary direction of flow is to the east-northeast following the natural hydraulic gradient. During low flow seasons, groundwater discharges from the overburden into the surface water bodies near the study area boundaries.

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1 *Hereafter in this ROD, all references to Zone 1 shall mean both the area labeled as Zone 1 and the area labeled as Zone 4 in the RI, as well as the area of contaminated soils located under Linemaster's manufacturing building.*

The highest concentrations of total VOCs were 817,000 ppb, found in overburden groundwater at the angled monitoring well with the screen located underneath Linemaster's manufacturing building. High total VOC concentrations were also found downgradient of Linemaster's manufacturing building, within 10 feet of the former dry well location (420,507 ppb). The extremely high VOC concentrations at both these wells indicate that a significant amount of the contamination still remains in the Zone 1 area.

Some SVOCs were detected at low levels in groundwater samples. However, the presence of these compounds was determined to be from laboratory contamination only, and therefore is not of significant concern.

Slightly elevated concentrations of total arsenic, beryllium, cadmium and nickel were identified in Zone 1 monitoring wells. These compounds are believed to be naturally occurring.

All contaminants found to date have been dissolved in the surrounding groundwater. However, due to the high levels of TCE detected, TCE may exist as an undissolved liquid referred to as free phase Dense Non-Aqueous Phase Liquids (DNAPLs). Because current technology cannot easily locate free phase DNAPLs, their possible existence is based on circumstantial evidence at this Site, and the amount of free phase DNAPLs, if they exist, is not possible to determine. If pockets of free phase DNAPLs are slowly dissolving and contaminating surrounding groundwater, then they may continue to be a long-term source of contamination in the aquifer.

C. Bedrock Groundwater

VOCs and TCE are also migrating from the Zone 1 source area in all directions in the deep bedrock. Like the overburden groundwater, the primary direction of groundwater flow in the deep bedrock is also to the east-northeast, which appears to coincide with the two major fracture traces. Groundwater migrates horizontally at a higher rate in the deep bedrock than in the shallow bedrock at the Site (Figure 3, Appendix A). Although the shallow bedrock is more weathered, the deep bedrock has larger and more transmissive fracture openings. Relatively high horizontal groundwater flow velocities were calculated for a number of deep bedrock wells. During certain seasons, groundwater also discharges from the bedrock to the ponds on the eastern portion of the Site.

Under the Safe Drinking Water Act, EPA has set Maximum Contaminant Levels (MCLs) as safe standards for drinking water. The MCL for TCE is 5 ppb. The highest concentration of TCE found in the deep bedrock on-site was 58,000 ppb, which significantly exceeds the MCL for TCE. Most of the contamination detected off-site during the RI was detected in the bedrock.

Since the implementation of the Interim Removal Treatment System (IRTS), pursuant to CT DEP's Abatement Order, the contamination found in all off-site bedrock wells no longer exceeds MCLs.

A more detailed summary of the contaminants found in the bedrock groundwater can be found in Table 4 in Appendix B.

D. Surface Water and Sediments

Low concentrations of VOCs have been detected in surface water samples collected from Ponds 1, 2, and 3 and in sediment samples collected from Pond 1. TCE, cis-1,2-dichloroethene, and chloroform are the VOCs that have been detected in surface water samples. Cis-1,2-dichloroethene was the only VOC detected in the sediment samples.

The presence of VOCs in the surface waters and sediment in Pond 1 are believed to be related to recharge by the contaminated groundwater and may also be related to the discharge of Pond 3 overflow into the eastern stream system just north of the inlet to Pond 1. The low concentrations of chloroform detected in Pond 2 are believed to be the result of laboratory contamination. The VOCs detected in Pond 3 are believed to be related to the diversion of contaminated groundwater to the pond by the Blakely leaching field curtain drain.

Low levels of arsenic, chromium and lead were the only metals detected in both the surface waters and sediments. Their presence is believed to be the result of natural accumulation. No SVOCs were detected in the surface waters and sediments at the Site.

E. Air

During the RI, an air pathway analysis was performed for the TCE sources at Linemaster. The sources of TCE evaluated included an area source overlaying the TCE contaminated groundwater and two air strippers utilized to remove TCE from the groundwater. The highest concentration was estimated to occur within 100 meters of Linemaster's manufacturing building. The current levels of air emissions were not found to exceed applicable federal or state laws or regulations.

F. Water-Supply Wells

Elevated levels of VOCs were detected in on-site water-supply wells and in several water-supply wells surrounding the Site. The source of these contaminants was found to be the Site.

Carbon filter treatment systems are currently being used at on-site water-supply wells to eliminate the risk associated with ingestion of on-site groundwater.

The levels of contamination in the on-site and off-site water-supply wells increased from 1986 to 1988. During this time, TCE was detected at concentrations above MCLs (i.e., above 5 ppb) during more than one sampling event at four active off-site water-supply wells. Since 1988, and the implementation of the IRTS, the levels have decreased to their current level. Quarterly sampling results during 1992 and 1993 have not indicated TCE concentrations above 5 ppb at any active water-supply well outside of the Site. Linemaster Switch Corporation has provided carbon filter treatment systems for two of the active off-site water-supply wells that had repeatedly exceeded MCLs.

A complete discussion of Site characteristics can be found in the Remedial Investigation Report on Pages 8-1 through 8-23. A more detailed summary of contaminants can be found in Table 3 of Appendix B.

VI. SUMMARY OF SITE RISKS

A Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA) were performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site. The public health risk assessment followed a four step process: 1) contaminant identification, which identified those hazardous substances which, given the specifics of the Site were of significant concern; 2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances, and 4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the Site, including carcinogenic and non-carcinogenic risks. The results of the human health risk assessment for the Site are discussed below, followed by the conclusions of the environmental risk assessment.

A. Human Health Risk Assessment

The number of contaminants detected at many Superfund sites is often too large to fully quantify all possible health risks. Therefore, a subset of these compounds, known as contaminants of concern, are usually selected to serve as a focus for further risk characterization. However, in the HHRA for this Site, all thirty-five contaminants detected were considered contaminants of concern (Table 5, Appendix B). A summary of the health effects of each of the contaminants of concern can be found in Section 3, pages 24-32 of the risk assessment.

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the Site.

1. Land Use

The land on which the Site is located is currently zoned for industrial use. However, portions of the Site are used for residential purposes. It is assumed that the future land use of the Linemaster Switch Corporation Site will continue to include residential purposes. The Site is also surrounded by residential neighborhoods, an elementary school, the Woodstock Town Hall, and a few restaurants.

The businesses and residences located on and in the vicinity of the Site are known to obtain drinking water from the overburden, shallow bedrock and deep bedrock aquifers.

2. Activities and Receptors

Current populations potentially exposed to Site contaminants were considered to be workers on the Site, trespassers, residents on the property, and residents of the surrounding area. Current risks have been estimated for residential chronic exposure, and worker sub-chronic exposure.

Due to the industrial and residential uses of the Site, two distinct activity patterns are believed to be prevalent on the Site. The first is maintenance activity pertaining to the manufacturing facility and grounds, the second is residential exposure associated with typical play activities of young children and outdoor activities of adults (e.g. landscaping, gardening, and jogging). In addition, a variety of work activities have occurred on the Site including: erosion control projects; installation of drainage systems; and landscaping of the grounds.

Small children have been identified as the primary sensitive sub-group. It is likely the children will enter the Site for a range of reasons including: to take a short-cut from one residential allotment to another; to explore nature; and to visit the three surface water bodies on-site.

Future populations potentially exposed include the current populations and other workers present at the Site for limited time periods during the construction of the remedy. Future risks have been quantified for residents only, as residential exposures are generally of longer duration and the parameters used to estimate risk for worker exposure will not change from current land use to future land use.

In the future, the current activities were assumed to continue on the Site. Additional activities associated with the building of new residences were also assumed to occur in the future.

3. Exposure Pathways

The information collected on activities associated with the Site and the surrounding area is used to characterize the Site with respect to the physical environment and the potentially exposed populations. Current and future contaminant migration pathways are identified that could result in human exposure to the contaminants originating at the Site. The pathways that were selected for quantitative evaluation are those considered to pose a significant risk to human health. These pathways are described in more detail below.

<u>Ingestion of Groundwater</u>

Currently, groundwater originating from the overburden, shallow bedrock and deep bedrock aquifers under and in the vicinity of the Site is used as a potable water source. Potentially exposed populations include future residents.

The future construction of new residences will most likely result in the continued use of the aquifers as untreated drinking water sources. Potentially exposed populations include future adult and child residents.

Risks were estimated for groundwater ingestion under the current scenario. Risks calculated for current exposure from the ingestion of groundwater are identical to future exposure scenarios.

Ingestion of Soil

The primary exposure area (Zone 1) is currently capped with a polypropylene cover. However, this cover is not assumed to keep trespassers out and/or work activity from occurring in this area, and therefore contact with the surface soil is likely on these occasions by trespassers and workers. Potential risks were characterized assuming trespassers will gain access to the source area through unattended or open gates.

In the future, the construction of residences, utilities and the remedy are assumed to occur. Following construction exposure, potential exposures include incidental ingestion of excavated sub-surface soil brought to the surface during gardening, landscaping, recreational, and construction activities.

Risks were estimated under current land use for chronic adult and child exposure to surface soils of Zone 1 (0-2 ft.) and sub-chronic worker exposure. Under future land use, risks were estimated for chronic adult and child exposure to sub-surface soils of Zone 1 (0-8 ft.).

Inhalation of Vapors

Because VOCs are currently present in the soil, the inhalation of vapors originating from soils at depths of 0-8 feet, by both workers at the Site and adult and child residents of the nearby area, is likely. However, before exposure may occur the compounds must diffuse through the soil which will decrease their concentration. In addition, once the compounds volatilize in the air above the soil, additional dilution will occur as a result of turbulent mixing. For these reasons, air concentrations, even for a potential receptor located directly above the most concentrated soils, are expected to be minimal.

Based on the water to air partitioning coefficients of the contaminants detected in surface water and their low concentration levels, associated inhalation risks from surface water vapors are not considered to be a significant concern.

Under a future use scenario, construction workers could potentially be exposed to vapors originating from sub-surface soils at depths of 0-8 feet. Residential risks would also increase as a result of new construction potentially on or near the source areas. While construction workers may be exposed to higher vapor concentrations when excavating trenches, residential exposures are generally of longer duration, and therefore chronic and sub-chronic risks based on residential exposure will also be protective of construction worker exposure.

Risks associated with acute exposure for construction workers may be addressed through a review of permissible exposure limits set by the designated occupational health and safety agency. Risks due to inhalation exposure were quantitatively evaluated for the pathway of greatest chronic exposure: future adult residential.

* * *

In summary, the exposure pathways evaluated in the HHRA were: 1) ingestion of overburden groundwater within the Site; 2) ingestion of bedrock groundwater within the Site; 3) ingestion of groundwater outside and north of the Site; 4) ingestion of groundwater outside and south of the Site; 5) ingestion of soil within the Site; and 6) inhalation of vapors during excavation of soil within the Site. A more thorough description of the Site risks can be found in Section 4 of the Human Health Risk Assessment and in Table 6 in Appendix B.

For each pathway evaluated and, where possible, an average and a reasonable maximum exposure estimate was generated corresponding to exposure to the average and the maximum concentration detected in that particular medium.

B. Risk Characterization

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical specific cancer factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g. 1×10^{-6} for 1/1,000,000) and indicate (using this example), that an average individual is not likely to have greater that a one in a million chance of developing cancer over 70 years as a result of Site-related exposure as defined to the compound at the stated concentration. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The hazard index was also calculated for each pathway as EPA's measure of the potential for non-carcinogenic health effects. A hazard quotient is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for non-carcinogenic health effects for an individual compound. Reference doses have been developed by EPA to protect sensitive individuals over the course of a lifetime and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The hazard quotient is often expressed as a single value (e.g. 0.3) indicating the ratio of the stated exposure as defined to the reference dose value (in this example, the exposure as characterized is approximately one third of an acceptable exposure level for the given compound). The hazard quotient is only considered additive for compounds that have the same or similar toxic endpoint and the sum is referred to as the hazard index (HI). (For example: the hazard quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage).

Tables 7 and 8 in Appendix B depict the carcinogenic and non-carcinogenic risk summary of on- and off-site areas for the contaminants of concern in groundwater, soil, and air. These have been evaluated to reflect present and potential future exposure pathways corresponding to the average and the reasonable maximum exposure (RME) scenarios.

Of all the exposure pathways evaluated, only ingestion of groundwater extracted from wells located within the Site poses a significant risk to human health. This risk is due to the VOCs present in the groundwater. The risk is primarily driven by trichloroethene, cis-1,2-dichloroethene, 1,2-dichloroethene, and vinyl chloride. Risk from the ingestion of arsenic in the groundwater also exceeds threshold levels due to the naturally occurring presence of arsenic in area groundwater. The estimated risks to human health from all other exposure pathways evaluated were determined not to exceed the non-carcinogenic hazard index criterion of 1 or the carcinogenic upper-bound of the lifetime cancer criterion range of 10^{-6} for total organics and inorganics.

C. Ecological Risk Assessment

The primary objective of the baseline Ecological Risk Assessment (ERA) was to evaluate, and quantify where possible, the existing ecological risks to ecological receptors from exposure to Site-derived contamination of soil, sediment, and surface water.

The ecological risk assessment considered potential exposures of terrestrial, wetland, and/or aquatic flora and fauna to contaminants in soil, sediments, and surface water. The assessment identified the following exposure pathways: 1) direct plant uptake of water-soluble contaminants via roots from soil, sediment, and surface water; 2) dermal absorption of contaminants into both invertebrate and vertebrate animals from direct contact with soil, sediment, and/or surface water; 3) respiratory intake of contaminants from surface water via gills of fish and transdermally by amphibians; 4) in-take into foliage and/or inhalation by animals of vapors from VOCs released from soils, sediments or surface water into the atmosphere; 5) direct ingestion of soil, sediment, and/or surface water by invertebrate and vertebrate species; and 6) direct ingestion of contaminated food/prey.

Table 9 found in Appendix B summarizes the levels of contamination detected in the wetland and aquatic exposure zones and the hazard quotient associated with each contaminant. The ecological risk assessment concluded that the Site consists of typical assemblages of plant and animal habitats for the northeastern region of Connecticut. In both the wetland and upland areas that were relatively undisturbed by grounds-keeping efforts, species composition, distribution and diversity appeared typical for the area. No unusual signs of stress to individual plants were observed. In the maintained portions of the Site, areas within the TCE plume path appeared no different from areas outside of the influence of the plume. Also, adjacent undisturbed wetlands appeared healthy. Surface water and sediment contaminants attributable to Site activities pose no significant risk to aquatic organisms or wetland habitats on-site or in downstream areas receiving surface water discharges from the Site.

*   *   *

In conclusion, based on the results of both the HHRA and the ERA, actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment. Specifically, the human health risk assessment identified groundwater ingestion as posing probable health risks exceeding EPA risk management criteria.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Under its legal authorities, EPA's primary responsibility at Superfund Sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances is a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these Congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to aid in the development and screening of alternatives. These remedial action objectives were developed to mitigate existing and future potential threats to human health and the environment. EPA's response objectives were:

<u>Source Control Response Objectives</u>

- Prevent or mitigate the continued release of hazardous substances to the groundwater and surface water by removing the opportunity for contact between precipitation and groundwater and the contaminated soils;

- Reduce the concentrations of VOCs in the soil within the Zone 1 area so that concentrations of VOCs in the groundwater will not exceed drinking water standards and will not pose a risk to human health and the environment.

<u>Management of Migration Response Objectives</u>

- Eliminate or minimize the threat posed to human health and the environment by preventing exposure to groundwater contaminants;

- Prevent further migration of groundwater contamination beyond its current extent; and,

- Restore contaminated groundwater to drinking water standards, and to a level that is protective of human health and the environment, as soon as practicable.

B. Technology and Alternative Development and Screening

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives were developed for the Site.

With respect to source control, the RI/FS developed a range of alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances is a principal element. This range included an alternative that removes or destroys hazardous substances to the maximum extent feasible, eliminating or minimizing to the degree possible the need for long term management. This range also included alternatives that treat the principal threats posed by the Site but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed; alternative(s) that involve little or no treatment but provide protection through engineering or institutional controls; and a no action alternative. In addition, with respect to groundwater response action, the RI/FS also developed a limited number of remedial alternatives that attain Site-specific remediation levels within different time frames using different technologies; and a no action alternative.

As discussed in Chapter 11 of the Feasibility Study, the RI/FS identified, assessed and screened technologies based on implementability, effectiveness, and cost. These technologies were combined into source control (SC) and management of migration (MM) alternatives. Chapter 12 of the Feasibility Study presented the remedial alternatives developed by combining the technologies identified in the previous screening process in the categories identified in Section 300.430(e)(3) of the NCP. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened in Chapters 13 and 14 of the Feasibility Study.

In summary, of the nine source control and six management of migration remedial alternatives initially selected for consideration in the FS, seven source control alternatives and three management of migration alternatives were retained for detailed analysis. Table 10 in Appendix B identifies these ten alternatives (seven source control alternatives and three management of migration alternatives) that were retained through the screening process, as well as those that were eliminated from further consideration.

VIII. DESCRIPTION OF ALTERNATIVES

This Section provides a narrative summary of each alternative evaluated. A detailed assessment of each alternative can be found in Sections 13 and 14 of the Feasibility Study and in the FS addendum.

A. Source Control (SC) Alternatives Analyzed

The source control alternatives that underwent detailed analysis for the Linemaster Switch Corporation Site are the following:

- **SC-1 No Action;**
- **SC-2 Containment;**
- **SC-3 Vacuum Extraction;**
- **SC-4 Vacuum Extraction With Enhancements;**
- **SC-5 In-Situ Biodegradation;**
- **SC-6 On-Site Incineration; and**
- **SC-7 Thermal Stripping.**

All seven source control alternatives would require the construction of a fence and warning signs around the Zone 1 area. All source control alternatives, except for the no action alternative (SC-1), would require short-term controls such as worker 40-hour safety training, and worker personal protective equipment. The seven source control alternatives are summarized below.

Alternative SC-1: No-Action

Alternative SC-1 was evaluated in detail in the FS to serve as a baseline for comparison with the other Source Control alternatives under consideration. Under this alternative, limited actions would be taken to prevent access to the contaminated soils in the Zone 1 area. A fence with warning signs would be constructed and maintained around portions of the Zone 1 area. Daily inspections of the fence would be conducted to assess the integrity of the fence. An environmental monitoring program, which includes periodic soil sampling, would be implemented to assess the natural attenuation of soil contaminants. Monitoring data would be evaluated every five years.

Estimated Time for Design and Construction: 2 to 3 months
Estimated Time for Restoration: Not Applicable
Estimated Capital Cost: $ 34,500
Estimated Operation and Maintenance Cost[2]: $ 1,409,000
Estimated Total Cost: $ 1,443,500

Alternative SC-2: Containment

The containment alternative involves placing an impermeable, multi-media RCRA Subtitle C cap over a portion of the Zone 1 area not already covered by impervious materials. A large part of the Zone 1 area is located underneath Linemaster's manufacturing building and paved areas and would not be covered by the multi-media cap. The cap would be used to reduce infiltration of precipitation into the soil and would reduce the amount of contamination migrating from the area to groundwater.

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[2] *All Operation & Maintenance (O&M) and Total cost estimates in this Record of Decision include net present worth values for O&M.*

The cap would be constructed over an area of approximately 12,100 square feet, adjacent to Linemaster's manufacturing building. The cap would be four feet thick and consist of four layers of materials: a low permeability soil layer, a synthetic membrane, a drainage layer of fine sands and a layer of topsoil for a vegetative cover. In order for Linemaster to continue current manufacturing operations, it would be necessary to maintain the existing elevations as nearly as possible. This would require excavation of approximately four feet of soil. The estimated volume of soil that would be excavated is approximately 2,300 cubic yards. Due to the levels of contaminants in the soil, it is estimated that approximately 300 cubic yards of material, out of a total of 2,300, would require off-site disposal.

The cap would be inspected quarterly to check for erosion, intrusion by burrowing animals or deep rooted plants, seeps, proper slopes, ponding and the integrity of the vegetative cover. Also, groundwater monitoring would be conducted on a quarterly basis to monitor the effectiveness of the cap. The monitoring data would be reviewed every five years to determine if additional remedial actions are necessary.

Estimated Time for Design and Construction: 12 months
Estimated Time for Restoration: Not Applicable
Estimated Capital Cost: $ 429,000
Estimated Operation and Maintenance Cost: $ 1,409,000
Estimated Total Cost: $ 1,838,000

Alternative SC-3: Vacuum Extraction

The soils in the Zone 1 area are contaminated with VOCs. The Vacuum Extraction alternative consists of treating the soil vapors and the groundwater in the Zone 1 area to remove the VOCs from the soil. A series of soil vapor extraction wells would be installed to extract contaminated vapors from the soils. The vapors would be extracted by blowers which would then pump the contaminated vapors through carbon filters. The carbon filters would remove the VOCs from the vapors prior to their discharge as air emissions to the atmosphere.

The vacuum extraction system would be operated in conjunction with a dewatering system. Since high groundwater levels hinder the effectiveness of the vacuum extraction system, it would be necessary to remove as much of the groundwater in the area of the extraction wells as possible. The groundwater extraction system would be integrated with the vacuum extraction system. Each vacuum extraction well would contain a dewatering pipe. Contaminated water from the dewatering of the Zone 1 area soils would be treated by the groundwater treatment facility to be implemented as part of the management of migration response.

Like the other source control alternatives, this alternative would also include environmental monitoring and an evaluation of the data every five years.

Estimated Time for Design & Construction: 12 to 18 months
Estimated Time for Restoration: 3 to 10 years
Estimated Capital Cost: $ 446,000
Estimated Operation & Maintenance Cost: $ 784,000
Estimated Total Cost: $ 1,230,000

Alternative SC-4: Vacuum Extraction With Enhancements

This alternative is essentially the same as SC-3 except the vacuum extraction system would be enhanced. The primary choice for enhancement would be air sparging.

Air sparging would involve the installation of injection wells in conjunction with the extraction wells. Air would be injected below the groundwater table. Air bubbles contacting the contaminants would cause them to volatilize and be captured by the vacuum extraction system.

Like the other source control alternatives, this alternative would also include environmental monitoring and an evaluation of the data every five years.

Estimated Time for Design & Construction: 12 to 18 months
Estimated Time for Restoration: 3 to 10 years
Estimated Capital Cost: $ 695,000
Estimated Operation & Maintenance Cost: $ 834,000
Estimated Total Cost: $ 1,529,000

Alternative SC-5: In-Situ Biodegradation

Biodegradation is the decomposition of VOCs by naturally occurring microbial organisms. Microbes need energy and carbon for growth and maintenance.

In-situ aerobic biodegradation would involve pumping contaminated groundwater to the surface, treating the extracted groundwater, enhancing the treated groundwater with nutrients and oxygen, and then reinjecting the enriched groundwater into the contaminated area.

Groundwater would be pumped to the surface from recovery wells, which would be installed around the perimeter of the Zone 1 area. The groundwater would then be treated by the groundwater treatment system to be implemented at the Site and then passed through another unit where nutrients and oxygen are added. This oxygen and nutrient enhanced groundwater would then be reinjected via injection wells centrally located in the Zone 1 area. Air would also be injected into the groundwater beneath the surface to supply further oxygen to the groundwater. Microbes would aerobically break down the VOCs into energy and carbon.

Like the other source control alternatives, this alternative would also include environmental monitoring and an evaluation of the data every five years.

Estimated Time for Design and Construction: 16 to 28 months
Estimated Time for Restoration: 1 to 10 years
Estimated Capital Cost: $ 394,000
Estimated Operation and Maintenance Cost: $ 1,122,000
Estimated Total Cost: $ 1,516,000

Alternative SC-6: On-Site Incineration

The on-site incineration alternative would involve excavation of all the soil in the Zone 1 area except the soil under Linemaster's manufacturing building. Excavated soil would be incinerated to thermally destroy all VOCs. Approximately 26,000 cubic yards of soil would be incinerated on-site with one of the following types of mobile incinerators: a rotary kiln incinerator, an infrared incinerator, or a fluidized bed incinerator. The mobile incinerator would be located in a treatment area northeast of the manufacturing facility. The incinerator would also be equipped with emission control equipment.

Soil would be excavated, screened to remove boulders and large stones, transported to the treatment area, incinerated and returned to the excavation area.

Like the other source control alternatives, this alternative would also include environmental monitoring and an evaluation of the data every five years.

Estimated Time for Design and Construction: 6 months
Estimated Time for Restoration: 20 to 23 months
Estimated Capital Cost: $ 13,588,000
Estimated Operation and Maintenance Cost: $ 322,000
Estimated Total Cost: $ 13,910,000

Alternative SC-7 Thermal Stripping

The thermal stripping alternative is similar to the on-site incineration alternative except for the type of technology utilized to treat the soils. In this alternative, the excavated soil would be transported to the treatment area (described in Alternative SC-6) and loaded into a feed hopper. The soil would be screened and fed to a thermal processor by a conveyor belt. The processor would transport the soil by augers which rotate like screws. The augers contain heated oil. The soil would be heated, by contact with the hot augers, to a temperature at which the VOCs would volatilize. Fans would remove the volatilized VOCs from the thermal processor and would transfer them to an afterburner and air pollution control device which would destroy the VOCs. The processed soils would then be returned to the excavation area.

Like the other source control alternatives, this alternative would also include environmental monitoring and an evaluation of the data every five years.

Estimated Time for Design and Construction: 7 months
Estimated Time for Restoration: 5 to 6 years
Estimated Capital Cost: $ 7,338,000
Estimated Operation and Maintenance Cost: $ 447,000
Estimated Total Cost: $ 7,785,000

B. Management of Migration (MM) Alternatives Analyzed

Management of migration alternatives address contaminants that have migrated from the original source of contamination. At the Linemaster Switch Corporation Site, contaminants have migrated from the Zone 1 source area to the northwest, north, northeast, east, southeast and southwest via groundwater. Of these directions, the primary direction of flow is to the east-northeast. During certain high water seasons, groundwater discharges from the overburden and bedrock into the surface water bodies near the study area boundaries. The management of migration alternatives that underwent a detailed analysis in the Feasibility Study for Linemaster are the following:

- **MM-1 No-Action;**
- **MM-4 Air Stripping; and**
- **MM-5 Ultraviolet Oxidation.**

A summary of each management of migration alternative can be found below.

Alternative MM-1: No-Action

Like Alternative SC-1, Alternative MM-1 was evaluated in detail in the FS to serve as a baseline for comparison with the other management of migration alternatives under consideration. Under this alternative, it is assumed that operation of the existing Interim Removal Treatment System would be discontinued and the groundwater would be restored by natural attenuation. In addition, a fence with warning signs would be constructed and maintained around portions of the Zone 1 area to restrict access, while institutional controls would place restrictions on future development. Environmental monitoring, primarily groundwater sampling of both monitoring wells and water supply wells, would be required to evaluate contaminant migration. Monitoring data would be evaluated every five years.

Estimated Time for Design and Construction: Not Applicable
Estimated Time for Restoration: 500 years
Estimated Capital Cost: $ 34,500
Estimated Operation and Maintenance Cost: $ 1,364,000
Estimated Total Cost: $ 1,398,500

Alternative MM-4: Air stripping

Currently, under the existing Interim Removal Treatment System (IRTS), contaminated groundwater is collected by six groundwater extraction wells located on-site. All of the groundwater extraction wells are located in the deep bedrock in selected locations to contain and prevent further migration of groundwater contaminants. Currently, the groundwater from the extraction wells is treated by an air stripper and carbon adsorption system. The air containing the VOCs discharges directly to the atmosphere. Alternative MM-4 (Air Stripping) would require continued operation of the extraction wells and air stripping and carbon adsorption technology at the Site. In addition, Alternative MM-4 (Air Stripping) would require the air containing the VOCs to be passed through a vapor phase carbon adsorption filter to remove the VOCs from the air prior to discharge to the atmosphere. The contaminated carbon would be replaced once per year.

The treated water would flow out of the bottom of the air stripper and would be piped to another carbon adsorption filter at the bottom of the air stripper to remove any remaining contaminants. The treated water flowing out of the carbon filters would be discharged through a pipe to Pond 3.

Institutional controls, including deed restrictions, would restrict future development. Environmental monitoring, primarily groundwater sampling of both monitoring wells and water supply wells, would be required to evaluate contaminant migration. Monitoring data would be evaluated every five years.

Estimated Time for Design & Construction: 6 months
Estimated Time for Restoration: 35 years
Estimated Capital Cost[3]: $ 70,000
Estimated Operation & Maintenance Cost: $ 1,949,000
Estimated Total Cost: $ 2,019,000

Alternative MM-5: Ultraviolet Oxidation

Like the MM-4 (Air Stripping) Alternative, this alternative involves the collection and treatment of the contaminated groundwater. However, in this alternative ultraviolet oxidation and carbon adsorption would be used to treat the contaminated groundwater water collected from the groundwater extraction wells. In this process, ozone or hydrogen peroxide is added to the extracted groundwater. The solution is then exposed to ultraviolet light in a reactor. The ultraviolet light causes the ozone or hydrogen peroxide to form molecules that, because they are highly reactive, break down the VOCs into carbon dioxide, water and harmless chloride salts. The carbon dioxide and chloride salts remain dissolved in the water and the water is passed through carbon filters to remove any remaining contaminants necessary to meet discharge standards prior to discharge to Pond 3. The gases from the reactor are passed through a catalytic decomposer which converts the remaining ozone to oxygen prior to discharging to the atmosphere.

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[3] *Capital costs for Alternative MM-4 (Air Stripping) include only the cost of installing air emission controls. The capital cost estimate of $70,000 does not include the actual cost of the air stripper or the IRTS which Linemaster has already built and currently operates at the Site.*

Institutional controls, including deed restrictions, would restrict future development. Environmental monitoring, primarily groundwater sampling of both monitoring wells and water supply wells, would be required to evaluate contaminant migration. Monitoring data would be evaluated every five years.

Estimated Time for Design & Construction: 8 to 12 months
Estimated Time for Restoration: 35 years
Estimated Capital Cost: $ 191,900
Estimated Operation & Maintenance Cost: $ 2,738,500
Estimated Total Cost: $ 2,930,400

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

A. Evaluation Criteria

Section 121(b)(1) of CERCLA presents several factors that at a minimum EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the National Contingency Plan articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a Site remedy. In Section IX. B., below, is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria are summarized as follows:

<u>Threshold Criteria</u>

The two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with applicable or relevant and appropriate requirements (ARARS)** addresses whether or not a remedy will meet all of the ARARs of other Federal and State environmental laws and/or provide grounds for invoking a waiver.

<u>Primary Balancing Criteria</u>

The following five criteria are utilized to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

3. **Long-term effectiveness and permanence** addresses the criteria that are utilized to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the Site.

5. **Short term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital and Operation Maintenance (O&M) costs, as well as present-worth costs.

Modifying Criteria

The modifying criteria are used on the final evaluation of remedial alternatives generally after EPA has received public comment on the RI/FS and Proposed Plan.

8. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS report.

A detailed tabular assessment of each alternative according to the nine criteria can be found in Tables 11 and 12 in Appendix B of this ROD.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted.

B. Summary of the Comparative Analysis of Alternatives

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a Site remedy. Following the detailed analysis, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. The section below presents the nine criteria and a brief narrative summary of the alternatives and the strengths and weaknesses according to the detailed and comparative analysis.

1. Overall Protection of Human Health and the Environment

Except for Alternative SC-1 (No Action), all of the SC alternatives would provide overall protection of human health and the environment. Currently, the Site poses a continued threat to groundwater and to the residents who utilize the groundwater. Alternative SC-1 (No Action) does not include measures to minimize the continued migration of contaminants to the groundwater and thus would not provide overall protection of human health and the environment.

Alternative SC-2 (Containment) would provide a threshold level of overall protection of human health and the environment by containing the contaminants with an impermeable cap. The cap would reduce the migration of the contaminants into the groundwater by minimizing infiltration but would not prevent the vertical migration of contaminants due to gravity. The contaminated soils located beneath the cap, and beneath Linemaster's manufacturing building, would remain a continual source of groundwater contamination.

Alternatives SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements) would provide overall protection to human health and the environment through treatment of all the contaminated soils in the Zone 1 area, including the soils beneath Linemaster's manufacturing building. Treatment of the Zone 1 area soils would prevent further migration and contamination of the groundwater, enabling the restoration of contaminated groundwater to drinking water standards.

Alternative SC-5 (Biodegradation) would also provide overall protection, if sufficient dispersion of the microbes can be achieved.

Alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) would provide protection by treating a portion of the contaminated soils. Although Alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) would provide threshold levels of overall protection, neither of these alternatives would address the contaminated soils beneath Linemaster's manufacturing building which would remain a continual source of groundwater contamination.

Except for MM-1 (No Action), the management of migration alternatives would provide overall protection of human health and the environment. Alternative MM-1 (No Action) would restore the groundwater to drinking water standards in approximately 500 years through natural attenuation. Since exposure to the contaminated groundwater may not be effectively prevented for this length of time, MM-1 (No Action) would not be protective of human health and the environment.

Alternatives MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation), would provide an equal degree of overall protection of human health and the environment by treating the contaminated groundwater. Further migration of contaminated groundwater would be prevented and the groundwater would be restored to drinking water standards within 35 years.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)**

Except for SC-2 (Containment), all of the source control alternatives would achieve ARARs. SC-2 (Containment) consists of capping the contaminated soils. However, under this alternative, no cap would be placed over the area of contaminated soils currently covered by Linemaster's manufacturing building. Because the cap would only be placed over a portion of the contaminated soils, this alternative would not satisfy the requirements of RCRA, 40 C.F.R. §264.310.

All the management of migration alternatives would achieve ARARs. The only difference between the alternatives would be the time it takes to achieve ARARs. Alternatives MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) would restore groundwater to drinking water standards in 35 years. Alternative MM-1 (No Action) would restore groundwater in 500 years.

A list of ARARs can be found in the Addendum to the Feasibility Study. ARARs that pertain to the selected remedy can be found in Tables 13 - 15 in Appendix B at the end of this document.

3. **Long-term Effectiveness and Permanence**

Alternative SC-1 (No Action) relies on institutional controls, i.e., a fence, and would not provide effective or permanent reductions in long-term risks because VOCs from the soils would continue to migrate to the groundwater.

Alternative SC-2 (Containment) would not eliminate the continued vertical migration of contamination under the cap and under Linemaster's manufacturing building. In addition, although impermeable caps have an expected life of 30 to 50 years, environmental uncertainties can shorten the life of the cap.

Alternatives SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements) would provide long-term effective reduction in risks associated with Site contaminants as well as permanence through treatment of all the contaminated soils. After the completion of treatment, no further controls would be necessary. Both of these alternatives would operate for at least three, and more probably ten years, to achieve the remedial objectives. Alternative SC-3 could be modified and enhanced to Alternative SC-4 in order to improve the efficiency of the system by adding enhancements such as air sparging.

If sufficient dispersion of the microorganisms can be achieved, Alternative SC-5 (Biodegradation) would also provide effective reduction of risks as well as permanence by substantially eliminating the contaminants in the soil.

Alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) would not eliminate the continued vertical migration of contamination beneath Linemaster's manufacturing building. The soil remaining under the building and paint shed would not receive any treatment and contaminants would continue to migrate into the deep bedrock aquifer.

With respect to the Management of Migration alternatives, Alternative MM-1 (No Action) would not eliminate long-term risks because it would take approximately 500 years to restore the groundwater to drinking water standards through natural attenuation.

Management of Migration Alternatives MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) would eliminate the long-term risks associated with exposure to groundwater by restoring the groundwater to drinking water standards within 35 years. With the aid of emission controls, Alternatives MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) would permanently destroy contamination and would not transfer contaminants to the atmosphere which would contribute to the formation of ozone.

4. Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives SC-1 (No Action) and SC-2 (Containment) would not provide any reduction in the toxicity, mobility or volume of contaminants through the use of treatment technologies.

Alternatives SC-3 (Vacuum Extraction), SC-4 (Vacuum Extraction With Enhancements) and SC-5 (Biodegradation) would treat all the contaminated soils in the Zone 1 area and would therefore significantly reduce the toxicity, mobility and volume of the contaminants at the Site. Also, Alternatives SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements) would require air emission controls on the vacuum extraction system to prevent the transfer of contaminants via the soil vapor stream to the air.

Alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) would treat only a portion of the contaminated soils in the Zone 1 area and therefore would not achieve the same reduction in toxicity, mobility and volume as SC-3 (Vacuum Extraction), SC-4 (Vacuum Extraction With Enhancements) and SC-5 (Biodegradation). The contaminated soil remaining under Linemaster's manufacturing facility, comprising approximately 38 percent of the total estimated volume of soils contaminated by VOCs, would remain a continual source of groundwater contamination.

Alternative MM-1 (No Action), would not treat the contaminated groundwater, and therefore would not provide reductions in toxicity, mobility or volume through treatment.

Alternatives MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) would provide significant reductions in the toxicity, mobility and volume by treating the contaminated groundwater. In addition, both alternatives would provide complete destruction of the contamination through treatment and air emission controls, and would therefore not result in any transfer of contamination to the air.

5. **Short-term Effectiveness**

Alternative SC-1 (No Action) would pose minimal impact on human health and the environment during the construction period because construction involves only the installation of the fence, which could be completed in two to three months. It is not expected that threats to the community and workers will be encountered. As is true for all alternatives, workers should follow safe working practices and wear protective clothing where or when appropriate. The No Action alternative, however, would not reduce the mobility, toxicity or volume of the contaminants, thus continuing the existing unacceptable environmental impact.
SC-2 (Containment) would present slightly greater short-term impacts due to fugitive dust generated during excavation to construct the cap. However, dust control measures would be initiated to minimize the generation of airborne contaminants during construction and air monitoring would be performed. The cap could be constructed in six to eight months. Impacts to workers would be minimized with protective equipment and worker safety training would be required.

Alternatives SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements) would present minimal short-term impacts on human health and the environment. The construction period would take approximately twelve to eighteen months, and the implementation period would take three to ten years until cleanup goals are achieved. During this entire period, workers could be protected with protective equipment from fugitive dust attributed to construction. Dust control, air monitoring and worker safety training would also be required.

Alternative SC-5 (Biodegradation) would provide minimal impact during construction. Neither the employees nor the nearby residents would be at risk during on-site well installation and system operation. Contaminated soil would be treated in-situ, thereby eliminating risks associated with excavation, especially air quality impacts due to contaminated dust particles. Dust control, air monitoring, worker safety training and personal protective equipment would be required.

Alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) would pose significant short-term risks during construction activities due to fugitive dust. Workers could be exposed to contaminants via dermal contact and/or the inhalation of dust or volatilized organics. Although air monitoring, dust control, worker safety training and personal protection equipment would all be required, the risks to workers would be greater than the minimal risks to workers presented by all of the other source control alternatives. In addition, unlike any of the other alternatives under consideration, the performance of this alternative would pose a risk to the on-site ponds and wetlands because excavation could lead to increased erosion and transport of contaminated soils to the ponds and wetlands. The time for restoration for alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) is twenty to twenty-three months and five to six years, respectively.

Alternative MM-1 (No Action) includes construction of a fence and would also result in minimal short-term impacts. However, restoration of the groundwater to drinking water standards through natural attenuation would not occur for approximately 500 years. It would not be possible to prevent exposure to contaminated groundwater for this length of time.

Alternative MM-4 (Air Stripping) would include only the construction of emission controls onto the already existing air stripper on-site. A groundwater extraction, treatment and discharge system has already been constructed and presumably will continue to operate as part of the Remedial Action. Construction of the emission controls (required by Alternative MM-4) would provide minimal impacts but construction could release fugitive dust. To minimize or prevent such exposure to workers or residents, dust control measures, air monitoring, worker safety training, and personal protection equipment would all be required.

Alternative MM-5 (Ultraviolet Oxidation) would also provide minimal short-term impacts, slightly greater than those of MM-4. Removal of the existing air stripper followed by the construction of the ultraviolet oxidation system could be designed and constructed with minimal impacts and construction completed within 8 to 12 months. Again, dust control measures, air monitoring, worker safety training, and personal protection equipment would all be required.

6. Implementability

Alternative SC-1 (No Action) consists of the construction of a fence and environmental monitoring, and would be relatively easy to implement. Alternative SC-2 (Containment) would also be readily implementable. Impermeable caps are a widely used technology and the materials necessary for construction are available locally.

Alternatives SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements) have been used successfully at other Sites and are also readily implementable. The materials and services for construction are available locally.

Since biodegradation is not a well developed technology, Alternative SC-5 (Biodegradation) would require significant pilot testing prior to implementation.

Alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) would be easily implementable. On-site incineration is a proven technology and thermal stripping is an accepted innovative technology. The equipment that SC-6 would require is readily available. While specialized services and materials for Alternative SC-7 may not be available locally, there are several contractors in the eastern part of the country who could provide equipment.
All of the source controls alternatives therefore would be readily implementable, or feasible to the same degree, except for Alternative SC-5 (Biodegradation) which would require significant pilot testing.

All of the management of migration alternatives would be readily implementable. Construction of the fence (required by MM-1, the no action alternative) would be easy to implement. Alternative MM-4 (Air Stripping) would also be readily implementable. Pursuant to CT DEP's Abatement Order, an air stripping system has already been constructed at the Site and is currently operational. Presumably, this system would continue to operate as part of the Remedial Action. The addition of emission control equipment would be required, and would be easy to implement. The construction of the ultraviolet oxidation system (required by MM-5) might require pilot testing during the design, but would also be readily implementable.

7. Cost

A comparison of the estimated total present worth costs for each Source Control alternative is as follows:

Alternative	Total Capital	Total Operation & Maintenance	Total Costs
SC - 1	$ 34,500	$1,409,000	$ 1,443,500
SC - 2	$ 429,000	$1,409,000	$ 1,838,000
SC - 3	$ 446,000	$ 784,000	$ 1,230,000
SC - 4	$ 695,000	$ 834,000	$ 1,529,000
SC - 5	$ 394,000	$1,122,000	$ 1,516,000
SC - 6	$13,588,000	$ 322,000	$13,910,000
SC - 7	$ 7,338,000	$ 447,000	$ 7,785,000

A comparison of the estimated total present worth costs for each Management of Migration alternative is as follows:

Alternative	Total Capital	Total Operation & Maintenance	Total Costs
MM - 1	$ 34,500	$1,364,000	$1,398,500
MM - 4	$ 70,000	$1,949,000	$2,019,000
MM - 5	$191,900	$2,738,500	$2,930,400

8. State Acceptance

The State's comments on the RI/FS and Proposed Plan, as received during the public comment period, and the EPA's responses to their comments are summarized in the Responsiveness Summary in Appendix C of this document.

In general, the State supported the preferred alternatives set forth in the Proposed Plan. Among other specific issues, the State commented on the desirability of adding air sparging technology to the soil vacuum extraction system.

9. Community Acceptance

The comments received from the community on the RI/FS and Proposed Plan during the public comment period, and the EPA's responses to the comments are also summarized in the Responsiveness Summary in Appendix C of this document.

In general, comments received from the community did not raise any objections to the preferred alternatives set forth in the Proposed Plan. Linemaster also submitted comments as a potentially responsible party. Linemaster commented on the use of air emission controls on the preferred air stripping alternative and the soil cleanup levels described in the Proposed Plan.

X. THE SELECTED REMEDY

The remedy selected to address the contamination at the Linemaster Switch Corporation Site includes: Source Control alternatives SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements); and, Management of Migration alternatives MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation). A detailed description of the cleanup levels and the selected remedy is presented below.

A. Interim Groundwater Cleanup Levels

Interim cleanup levels have been established in groundwater for a subset of the contaminants of concern identified in the Baseline Risk Assessment and were selected to be representative of the contaminants detected at the Site. Interim cleanup levels have been set based on the ARARs (e.g., Drinking Water Maximum Contaminant Level Goals [MCLGs] and MCLs) as available, or other suitable criteria described below. Periodic assessments of the protection afforded by remedial actions will be made as the remedy is being implemented and at the completion of the remedial action. At the time that Interim Groundwater Cleanup Levels identified in the ROD and newly promulgated ARARs and modified ARARs which call into question the protectiveness of the remedy have been achieved and have not been exceeded for a period of three consecutive years, a risk assessment shall be performed on the residual groundwater contamination to determine whether the remedial action is protective. This risk assessment of the residual groundwater contamination shall follow EPA procedures and will assess the cumulative carcinogenic and non-carcinogenic risks posed by ingestion of contaminated groundwater. The risk assessment will be based on a comprehensive analysis of the groundwater including all contaminants historically detected or potentially present in the contamination plume. If, after review of the risk assessment, the remedial action is not determined to be protective by EPA, the remedial action shall continue until either protective levels are achieved, and are not exceeded for a period of three consecutive years, or until the remedy is otherwise deemed protective. These protective residual levels shall constitute the final cleanup levels for this Record of Decision and shall be considered performance standards for any remedial action.

The aquifer under the Site is classified as GA by the CT DEP and should be suitable for direct human consumption without the need for treatment. The groundwater to the east and southeast of the Site is classified by CT DEP as GAA. This designation is for a groundwater tributary to a public water supply watershed or for groundwater within the area of influence of community or non-community supply wells. Under the Groundwater Protection Strategy, EPA has classified the aquifer beneath the Site as a Class IIA aquifer. MCLs and non-zero MCLGs established under the Safe Drinking Water Act are ARARs.

Interim cleanup levels for known, probable, and possible carcinogenic compounds (Classes A, B, and C) have been established to protect against potential carcinogenic effects and to conform with ARARs. Because the MCLGs for Class A & B compounds are set at zero and are thus not suitable for use as interim cleanup levels, MCLs and proposed MCLs have been selected as the interim cleanup levels for these Classes of compounds. Because the MCLGs for the Class C compounds are greater than zero, and can readily be confirmed, MCLGs and proposed MCLGs have been selected as the interim cleanup levels for Class C compounds.

Interim cleanup levels for Class D and E compounds (not classified, and no evidence of carcinogenicity) have been established to protect against potential non-carcinogenic effects and to conform with ARARs. Because the MCLGs for these Classes are greater than zero and can readily be confirmed, MCLGs and proposed MCLGs have been selected as the interim cleanup levels for these classes of compounds.

In situations where a promulgated State standard is more stringent than values established under the Safe Drinking Water Act, the State standard was used as the interim cleanup level. In the absence of an MCLG, an MCL, a proposed MCLG, proposed MCL, State standard, or other suitable criteria to be considered (i.e., health advisory, state guideline) an interim cleanup level was derived for each compound having carcinogenic potential (Classes A, B, and C compounds) based on a 10^{-6} excess cancer risk level per compound considering exposure to contaminated groundwater by ingestion. In the absence of the above standards and criteria, interim cleanup levels for all other compounds (Classes D and E) were established based on a level that represent an acceptable exposure level to which the human population including sensitive subgroups may be exposed without adverse affect during a lifetime or part of a lifetime, incorporating an adequate margin of safety (hazard quotient = 1) considering exposure to contaminated groundwater by ingestion. If a value described by any of the above methods was not capable of being detected with good precision and accuracy or was below what was deemed to be the background value, then the practical quantification limit or background value was used as appropriate for the Interim Groundwater Cleanup Level.

All Interim Groundwater Cleanup Levels identified in the ROD and newly promulgated ARARs and modified ARARs which call into question the protectiveness of the remedy and the protective levels determined as a consequence of the risk assessment of residual contamination, must be met at the completion of the remedial action at the points of compliance. On-site, the points of compliance will be throughout all groundwater at the Site, including groundwater beneath Linemaster's manufacturing building. Off-site, the points of compliance shall be throughout all groundwater within the contamination plume (See Figures 2 & 3 in Appendix A), including all groundwater where levels of contamination previously exceeded MCLs. EPA has estimated that these groundwater cleanup levels will be obtained within 35 years.

These interim cleanup levels are consistent with ARARs or suitable To-Be-Considered (TBC) criteria for groundwater, attain EPA's risk management goal for remedial actions and are determined by EPA to be protective. However, the true test of protection cannot be made until residual levels are known. Consequently, at the time that Interim Groundwater Cleanup Levels identified in the ROD and newly promulgated ARARs and modified ARARs which call into question the protectiveness of the remedy have been achieved and have not been exceeded for a period of three consecutive years, a risk assessment will be performed on residual groundwater contamination to determine whether the remedial action is protective. This risk assessment of the residual groundwater contamination shall follow EPA procedures and will assess the cumulative carcinogenic and non-carcinogenic risks posed by ingestion of on-site groundwater. If, after review of the risk assessment, the remedial action is not determined to be protective by EPA, then remedial actions shall continue until either protective levels are achieved and are not exceeded for three consecutive years or until the remedy is otherwise deemed protective. These protective residual levels shall constitute the final cleanup levels for this Record of Decision and shall be considered performance standards for any remedial action.

Table 16 in Appendix B summarizes the Interim Cleanup Levels for carcinogenic and non-carcinogenic contaminants of concern identified in groundwater.

B. Soil Cleanup Levels

Based upon data developed in the RI and the Baseline Risk Assessment, remedial measures to address risk associated with possible exposure to source soils are not warranted because present and future risks are within or below EPA's acceptable carcinogenic risk range or for the non-carcinogens generally below a Hazard Index of one. However, available data indicates that area soils are the primary source of release of VOCs to groundwater. This phenomenon may result in an unacceptable risk to those who ingest contaminated groundwater. Therefore, cleanup levels for soils were established to protect the aquifer from potential soil leachate. The Summers Model was used to estimate residual soil levels that are not expected to impair future ground water quality. The interim cleanup levels for groundwater were used as input into the leaching model. If the predicted protective soil level was not capable of being detected with good precision and accuracy, then the practical quantification limit was selected as the cleanup level for soils. Table 17 in Appendix B summarizes the soil cleanup levels required to protect public health and the aquifer which were developed for the groundwater contaminants of concern detected above the interim groundwater cleanup levels.

These cleanup levels in soils are consistent with ARARs for groundwater, attain EPA's risk management goal for remedial actions, and have been determined by EPA to be protective.

These cleanup levels must be met at the completion of the remedial action throughout all soils, including the soils beneath Linemaster's manufacturing building.

C. Description of Remedial Components

The selected remedy for the Site has two major components, a source control component to address the contaminated soils and a management of migration component to address the contaminated groundwater. EPA selected two alternatives (SC-3 and SC-4) for the source control component and two alternatives (MM-4 and MM-5) for the management of migration component. Each of the components are described below.

1. Source Control Component

Two alternatives were selected to treat the contaminated soils: SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction with Enhancements). By selecting two alternatives, EPA retains the flexibility to address the soils through vacuum extraction alone, or to enhance the vacuum extraction system if necessary.

Based on current information, EPA estimates that both SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction with Enhancements) will achieve the soil cleanup levels within the same time frame: three to ten years. The actual efficiency of these alternatives cannot be evaluated, however, until after implementation. For this reason, Alternative SC-3 (Vacuum Extraction) alone will first be implemented at the Site. After the system has been operating for five years, EPA will evaluate the effectiveness of the system and determine whether the cleanup levels will be achieved within the projected ten-year period using vacuum extraction alone. If, at that time, EPA determines that the soil cleanup levels will not be achieved within the projected ten-year period using vacuum extraction alone, the vacuum extraction system will be enhanced with air sparging or other enhancement technologies, as determined by EPA, to assure that soil cleanup levels will be attained within the projected ten-year period. In making this determination, EPA will at a minimum evaluate the results of soil borings drawn from within the Zone 1 area at the conclusion of the first five year period of operation of the vacuum extraction system, and the results of soil vapor samples taken on an ongoing basis during the first five year period of operation of the vacuum extraction system.
Both alternatives are described in more detail below.

<u>SC-3: Vacuum Extraction</u>

The Vacuum Extraction alternative consists of treating the soil vapors and the groundwater in the source area, Zone 1, to remove the VOCs from the soil. Following construction of a fence to limit access, a series of soil vapor extraction wells will be installed to extract contaminated vapors from the soils (Figure 4, Appendix A). The vapors will be extracted by blowers which pump the contaminated vapors through carbon filters. The carbon filters will remove the VOCs from the vapors prior to discharge to the atmosphere.

The vacuum extraction system will be operated in conjunction with a dewatering system. Since high groundwater levels hinder the effectiveness of the vacuum extraction system, it will be necessary to remove as much of the groundwater in the area of the extraction wells as possible. The groundwater extraction system will be integrated with the vacuum extraction system. Each vacuum extraction well will contain a dewatering pipe. Contaminated water from the dewatering of the Zone 1 area soils will be treated at the groundwater treatment facility discussed in the next section (Management of Migration).

Approximately 35 vacuum extraction wells will be installed in the Zone 1 area. The vacuum extraction wells will be spaced approximately 30 feet apart throughout the entire Zone 1 area, including within Linemaster's manufacturing building. Figure 5 in Appendix A identifies the proposed locations of the extraction wells and control buildings for the system. The vacuum extraction wells will be approximately 40 feet deep. A pilot test was conducted in 1989 to assess the feasibility of the vacuum extraction technology. The results indicated that vacuum extraction was a viable technology for the Site. A new pilot test will be conducted to verify the number and locations of the vacuum extraction wells.

The vacuum extraction wells will be connected to blowers with Polyvinyl chloride (PVC) piping. The blowers will produce a vapor flow rate of approximately 300 cubic feet per minute. Vapor phase granular activated carbon will be used to treat the vapors from the blowers prior to discharge to the atmosphere.

Actual operation would likely be on an intermittent basis to maximize the effectiveness and efficiency of the extraction system. The construction time is estimated at twelve to eighteen months and the duration of remedial activities will be from three to ten years. Soil cleanup levels will be achieved within ten years from the start of operation of the source control remedy.

SC-4: Vacuum Extraction With Enhancements

As described more fully above, Alternative SC-3 (Vacuum Extraction) alone will first be implemented at the Site. After the system has been operating for five years, EPA will evaluate the effectiveness of the system and determine whether the cleanup levels will be achieved within the projected ten year period using vacuum extraction alone. If, at that time, EPA determines that the soil cleanup levels will not be achieved within the projected ten year period using vacuum extraction alone, EPA will consider using methods to enhance the effectiveness of the vacuum extraction system to assure that soil cleanup levels will be attained within the projected ten year period.
Such enhancements may include additional vacuum extraction wells, additional dewatering wells, and different dewatering techniques such as trenches or horizontal wells. EPA may also consider enhancing the vacuum extraction system with another technique known as air sparging.

Air sparging was evaluated in the FS as a separate alternative, Alternative SC-4 (Vacuum Extraction With Enhancements). Air sparging would involve the installation of injection wells (Figure 6 in Appendix A) in conjunction with the extraction wells. Air would be injected below the groundwater table. Air bubbles contacting the contaminants would cause them to volatilize and be captured by the vacuum extraction system (Figures 7 and 8 in Appendix A).

2. Management of Migration Component

Contaminants, principally VOCs, are present in the groundwater beneath and downgradient of the Zone 1 source area. EPA has selected two alternatives to treat the contaminated groundwater: Alternative MM-4 (Air Stripping) and Alternative MM-5 (Ultraviolet Oxidation). By selecting two alternatives, EPA retains the flexibility to treat the groundwater using an air stripping system, or to switch to an ultraviolet oxidation system if ultraviolet oxidation proves to be less expensive than air stripping.

Both MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) require active restoration of the groundwater. These alternatives are equally effective and provide for equal degrees of protection and permanence. Based on the cost estimates in the FS, Alternative MM-4 (Air Stripping) is more cost-effective than Alternative MM-5 (Ultraviolet Oxidation). Alternative MM-4 will therefore be implemented at the Site. If, however, cost estimates change over the course of time to the extent that EPA determines that the air stripping system is no longer as cost-effective as the ultraviolet oxidation system, Alternative MM-5 (Ultraviolet Oxidation) may be implemented in place of Alternative MM-4 (Air Stripping) at any time during performance of the groundwater cleanup. Both alternatives are described below.

MM-4: Air Stripping

Currently, contaminated groundwater is collected and treated by an on-site air stripper as required by CT DEP's Abatement Order. The on-site air stripper transfers the contaminants in the groundwater to the atmosphere. For the management of migration component, EPA's selected remedy requires the continued collection and treatment of contaminated groundwater by an on-site air stripper, but also requires that air emission controls be used in conjunction with the air stripper to prevent contaminants from being discharged to the atmosphere.

Presently, the contaminated groundwater is collected by the six on-site groundwater extraction wells that comprise the Interim Removal Treatment System (IRTS). All of the groundwater extraction wells are located in the deep bedrock. The locations of the groundwater extraction wells were selected to contain and prevent further migration of groundwater contaminants. As part of the long-term cleanup plan, the number, locations and pumping rates of the groundwater extraction wells will be evaluated to reaffirm current locations and determine if modifications are needed to restore groundwater throughout the Site to the cleanup levels as soon as practicable. Currently, the groundwater from the extraction wells is treated by an air stripper and a carbon adsorption system. The treatment system is located on the Linemaster property, within a small building south of Linemaster's manufacturing building. Figure 1 (Appendix A) shows the current locations of the extraction wells and the treatment building.

Figure 9 in Appendix A shows the schematic of the air stripper and carbon adsorption treatment system. Groundwater from the groundwater extraction wells is pumped through individual pipes to an equalization tank within the treatment building. Groundwater from the dewatering of the Zone 1 area soils is also be pumped to the equalization tank. The equalization tank controls the flow of the groundwater entering the treatment system. The water is then pumped from the equalization tank to the top of the air stripper and allowed to cascade downward against a current of air being fed into the bottom of the stripper by a blower. An air stripper is designed to take advantage of the readiness of VOCs to volatilize, or evaporate, when exposed to the air.

Currently, the air containing the VOCs discharges directly to the atmosphere. However, EPA's selected remedy requires the air containing the VOCs to be passed through a vapor phase carbon adsorption filter to remove the VOCs from the air prior to discharge to the atmosphere. The chemistry of carbon is such that many different chemicals will readily attach themselves to carbon atoms and would thus be removed from the air stream. The contaminated carbon must be replaced and recycled at least once per year.

The treated water flows out of the bottom of the air stripper and is piped to another carbon adsorption filter at the bottom of the air stripper to remove any remaining contaminants. The treated water flowing out of the carbon filters is discharged through a pipe to Pond 3.

<u>Alternative MM-5: Ultraviolet Oxidation</u>

As discussed above, EPA has also selected ultraviolet oxidation as an alternate means of treating the contaminated groundwater at the Site. EPA has determined that both air stripping and ultraviolet oxidation would be effective technologies for treating the groundwater contamination. Preliminary estimates of the costs indicate that air stripping (including carbon adsorption) is the most cost-effective alternative. The total cost of Alternative MM-4 (Air Stripping) is $2,019,000,[4] while the total cost of Alternative MM-5 (Ultraviolet Oxidation) is $2,930,400. If, as discussed above, cost

[4] *As stated in footnote 3, the capital costs for Alternative MM-4 (Air Stripping) include <u>only</u> the cost of installing air emission controls. The capital cost estimate of $70,000 does not include the actual cost of the air stripper or the IRTS which Linemaster has already built and currently operates at the Site. However, even if these costs were included in the cost estimate, the total cost of Alternative MM-4 (Air Stripping) would still be less than the total cost of Alternative MM-5 (Ultraviolet Oxidation). EPA estimates that total cost for the groundwater containment/air stripping system, including installation of wells, air stripper and emission controls as well as operation and maintenance costs, would be $2,564,310.*

estimates change over the course of time to the extent that EPA determines that air stripping is no longer as cost-effective as ultraviolet oxidation, ultraviolet oxidation may be implemented in place of air stripping at any time during the performance of the groundwater cleanup.

Ultraviolet oxidation is a groundwater treatment technology. The only component of the selected remedy that would change if ultraviolet oxidation were implemented instead of air stripping, is the groundwater treatment system. All other components of the selected remedy, including the groundwater collection system and the discharge system (described above), and the required monitoring and institutional controls (described below), would remain the same.

Ultraviolet oxidation would be used to treat the contaminated groundwater collected from the groundwater extraction wells and sent to the equalization tank. Groundwater collected from the soil vacuum extraction dewatering system would also be sent to the equalization tank. Figure 10 in Appendix A is a schematic of the alternate groundwater treatment system. In this process, ozone or hydrogen peroxide would be added to the extracted groundwater. The solution would then be exposed to ultraviolet light in a reactor. The ultraviolet light would cause the ozone or hydrogen peroxide to form molecules that, because they are highly reactive, break down the VOCs into carbon dioxide, water and harmless chloride salts. The carbon dioxide and chloride salts would remain dissolved in the water and the water would be passed through carbon filters to remove any remaining contaminants if necessary to meet discharge standards prior to discharge to Pond 3. The gases from the reactor would be passed through a catalytic decomposer which would convert the remaining ozone to oxygen prior to discharging to the atmosphere.

* * *

The goal of this remedial action is to restore the groundwater to its beneficial use, which is, at this Site, an actual drinking water source. Based on information obtained during the remedial investigation, and the analysis of all remedial alternatives, EPA believes that the selected remedy may be able to achieve this goal. Groundwater contamination may be especially persistent in the immediate vicinity of the contaminants' source, where concentrations are relatively high. Due to the high levels of VOCs (primarily TCE), DNAPLs, i.e., undissolved chemicals, may be present and may continue to serve as a long-term source of contamination in the aquifer. The ability to achieve cleanup levels at all points throughout the area of attainment, or plume, cannot be determined until the extraction system has been operated and modified as necessary, and the plume response monitored over time.

Based on current data, EPA estimates that the groundwater will be restored to its beneficial use in 35 years after implementation of the groundwater component of this ROD, assuming that no free phase DNAPLS exist in the groundwater. During operation, the system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation. Modifications may include any or all of the following:

a) at individual wells where interim groundwater cleanup levels have been attained for a period of three years, pumping may be discontinued;

b) alternating pumping at wells to eliminate stagnation points;

c) pulse pumping to allow aquifer equilibration and encourage adsorbed contaminants to partition into groundwater;

d) installation of additional extraction wells to facilitate or accelerate cleanup of the contaminant plume; and

e) periodic reevaluation of remedial technologies for groundwater restoration.

If the selected remedy cannot meet the cleanup levels following a reasonable period of system operation, contingency measures and goals that are considered to be protective of human health and the environment may be considered by EPA. Prior to considering contingency measures and goals, EPA will evaluate, at a minimum, whether contaminant levels have ceased to decline over time and whether these levels have remained constant for a specified period of time at some statistically significant levels over remediation levels, as verified by multiple monitoring wells. If it is determined, on the basis of the preceding criteria and the system performance data, that certain portions of the aquifer cannot be restored to their beneficial use, all of the following measures involving long-term management may occur as a modification of the existing system:

a) engineering controls such as physical barriers, or long-term gradient control provided by low level pumping, as containment measures;

b) ARARs will be waived for the cleanup of the relevant portions of the aquifer based on the technical impracticability of achieving further contaminant reductions and revised cleanup levels will be established for the relevant portions of the aquifer;

c) institutional controls will be maintained to prevent use of groundwater that remains above health-based levels;

d) continued monitoring of specified wells; and

e) periodic reevaluation of remedial technologies for groundwater restoration.

The decision to invoke any or all of these measures may be made by EPA during a future review, following a reasonable period of operation of the selected remedy. If EPA determines on the basis of the stated criteria that MCLs/MCLGs or other health-based ARARs cannot be achieved at the Site, a waiver of ARARs will be invoked, which will be accompanied by an Explanation of Significant Differences (ESD) or an amendment to the Record of Decision.

3. Other Components of the Selected Remedy

A groundwater and environmental monitoring program will be implemented to evaluate the performance of the groundwater treatment system and the overall effectiveness of the remedy. The monitoring program will consist of monitoring the groundwater and the discharge from the treatment system to Pond 3. Selected on-site and off-site groundwater monitoring wells will be monitored periodically to determine if the collection and treatment system is containing and restoring the groundwater to drinking water standards as soon as practicable. The discharge from the treatment system into Pond 3 will also be monitored to ensure that the discharge is not adversely impacting the pond and that ARARs are not violated.

In addition to the groundwater monitoring wells, the on-site and off-site water supply wells will continue to be monitored quarterly to insure that the water is suitable for consumption and other domestic purposes. If it is determined that the off-site water does not meet drinking water standards or poses an unacceptable risk to public health, carbon filters will be provided to treat the water. If contamination is found in any off-site supply well, an evaluation of the effectiveness of the entire groundwater removal and collection system will be performed as soon as practicable. Based on this evaluation, adjustments or modifications to the groundwater collection system will be implemented to prevent or limit further contaminant migration. If a large number of off-site water supply wells require treatment, other alternatives for providing potable water may be evaluated and implemented.

On-site wells will require carbon filters until EPA determines that the on-site water does not pose an unacceptable risk to public health. If potable water becomes available from a source other than the aquifer beneath the Site during the course of the Site remediation, EPA may eliminate the requirement for carbon filters for on-site wells.

On-site groundwater currently exceeds drinking water standards and poses an unacceptable risk to public health. Institutional controls shall be placed on the Linemaster property until the Site cleanup levels are met. The institutional controls shall include deed restrictions which will prohibit the use of groundwater for consumption or other domestic purposes unless treated prior to use. The deed restrictions will also inform future purchasers of the property of the groundwater problems associated with the property.

A soil monitoring program to demonstrate compliance with soil cleanup levels and a performance monitoring program for the soil vapor extraction system will also performed to determine if the Soil Vapor Extraction (SVE) system is working effectively to remove the VOCs from the Zone 1 soils. Results will be evaluated to determine future pumping rates for the SVE wells.

To the extent required by law, EPA will review the Site at least once every five years after the initiation of remedial action at the Site if any hazardous substances, pollutants or contaminants remain at the Site to assure that the remedial action continues to protect human health and the environment. EPA will also review the Site before the Site is proposed for deletion from the NPL.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Linemaster Switch Corporation Site is consistent with CERCLA and the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy also satisfies the statutory preference for treatment which permanently and significantly reduces the mobility, toxicity or volume of hazardous substances as a principal element. Additionally, the selected remedy utilizes alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this Site will permanently reduce the risks posed to human health and the environment by eliminating, reducing or controlling exposures to human and environmental receptors through treatment, engineering controls, and institutional controls. Specifically, the risk presented by this Site is the possible ingestion of groundwater that is contaminated with VOCs. The selected remedy uses a soil vapor extraction system to treat soils that are contaminated with VOCs, and thereby eliminate the migration of VOCs from the soils to the groundwater. The selected remedy also uses groundwater pump and treat technology, i.e., the air stripping or ultraviolet oxidation system, to contain and reduce the levels of contamination throughout the groundwater plume. Engineering controls, such as adding enhancements to the soil vapor extraction system or modifying groundwater pumping rates, will be implemented if necessary to improve the effectiveness of the selected remedial action technologies. Institutional controls, in the form of deed restrictions, will be implemented to prevent the use of untreated contaminated groundwater until cleanup goals have been met. Groundwater monitoring will be performed to assure that the contaminant plume is receding and that off-site water supply wells do not become contaminated.

The selected remedy will achieve potential human health risk levels that attain the 10^{-4} to 10^{-6} incremental cancer risk range and a level protective of non-carcinogenic endpoints, and will comply with ARARs and to be considered criteria. At the time that the Interim Groundwater Cleanup Levels identified in the ROD and newly promulgated ARARs and modified ARARs which call into question the protectiveness of the remedy have been achieved and have not been exceeded for a period of three consecutive years, a risk assessment shall be performed on the residual groundwater contamination to determine whether the remedial action is protective. This risk assessment of the residual groundwater contamination shall follow EPA procedures and will assess the cumulative carcinogenic and non-carcinogenic risks posed by ingestion of on-site groundwater. If, after review of the risk assessment, the remedial action is not determined to be protective by EPA, the remedial action shall continue until protective levels are achieved and have not been exceeded for a period of three consecutive years, or until the remedy is otherwise deemed protective. These protective residual levels shall constitute the final cleanup levels for this Record of Decision and shall be considered performance standards for any remedial action.

EPA estimates that soil cleanup levels will be achieved in three to ten years, and that groundwater cleanup levels will be achieved in 35 years.

Considering all of the elements of the selected remedy, EPA has determined that the selected remedy is protective of human health and the environment.

B. The Selected Remedy Attains ARARs

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to the Site. Environmental laws from which ARARs for the selected remedial action are derived, and the specific ARARs include:

Chemical-Specific

- Safe Drinking Water Act (SDWA) - Maximum Contaminant Levels (MCLs) (40 CFR 141.11-141.16)
- Safe Drinking Water Act (SDWA) - Maximum Contaminant Level Goals (MCLGs) (40 CFR 141.50 and 141.51) (non-zero MCLGs)
- Resource Conservation and Recovery Act (RCRA) - Groundwater Protection Standards (40 CFR 264.94)
- Connecticut Standards for Quality of Public Drinking Water (Section 19-13-8102 of CT Regulations of State Agencies)
- Connecticut Water Quality Standards (Section 22a-426 of the Connecticut General Statutes) Subpart IV - Groundwater
- Water Quality Standards and Criteria
- Clean Air Act (CAA) - State Implementation Plan Emission Standards
- Clean Air Act (CAA) - National Emission Standards for Hazardous Air Pollutants (40 CFR 61)
- Air Pollution Control Regulations (Sections 22a-174-29 and 174-3)

Location-Specific

- None (No activities are contemplated that will take place in or affect wetlands)

Action-Specific

- Resource Conservation and Recovery Act (RCRA) - Facility Standards, (40 CFR 264)
- Resource Conservation and Recovery Act (RCRA) - General Facility Standards (40 CFR 264.10 - 264.18)
- Resource Conservation and Recovery Act (RCRA) - Preparedness and Prevention. (CFR 264.30 - 264.31)
- Resource Conservation and Recovery Act (RCRA) - Contingency Plan and Emergency Procedures (40 CFR 264.50 - 264.56)
- Resource Conservation and Recovery Act (RCRA) - Manifesting, Recordkeeping, and Reporting (40 CFR 264.70 - 264.77)
- Resource Conservation and Recovery Act (RCRA) - Releases from Solid Waste Management Units (40 CFR 264.90 - 264.109)
- Resource Conservation and Recovery Act (RCRA) - Closure and Post-Closure (40 CFR 264.110 - 264.120)
- Resource Conservation and Recovery Act (RCRA) - Surface Impoundments (40 CFR 264.220 - 264.249)
- Clean Water Act (CWA) - National Pollutant Discharge Elimination System (NPDES) (40 CFR 122, 125)
- Resource Conservation and Recovery Act (RCRA) - Air Emission Standards for Process Vents (40 CFR 264 Subpart AA)
- Resource Conservation and Recovery Act (RCRA) Air Emission Standards for Equipment Leaks (40 CFR 264 Subpart BB)
- Water Quality Standards (Section 22a-426 of the Connecticut General Statutes)
- Water Pollution Control (Section 22a-430 of the Connecticut General Statutes)
- Discharge Permit Regulations (Section 22a-430 of the Connecticut General Statutes)

To Be Considered

- Safe Drinking Water Act (SDWA) - Maximum Contaminant Level Goals (MCLGs)
- Environmental Protection Agency (EPA) - Risk Reference Doses (RfDs)
- Environmental Protection Agency (EPA) - Carcinogen Assessment Group Potency Factors
- Environmental Protection Agency (EPA) - Health Advisories and Acceptable Intake Health Assessment Documents
- Environmental Protection Agency (EPA) - Groundwater Protection Strategy
- Ambient Water Quality Criteria (AWQC)
- Office of Solid Waste and Emergency Response (OSWER) - Air Stripper Control Guidance (Directive 9355.0-28)

A detailed listing of ARARs can be found in Tables 14-16 in Appendix B of this Record of Decision. These tables give a brief synopsis of the ARARs and an explanation of the actions necessary to meet the ARARs. These tables also indicate whether the ARARs are applicable or relevant and appropriate to actions at the Site. In addition to ARARs, the tables describe standards that are To-Be-Considered (TBC) with respect to remedial actions.

C. The Selected Remedial Action is Cost-Effective

In the Agency's judgment, the selected remedy is cost-effective, i.e., the remedy affords overall effectiveness proportional to its costs. In selecting this remedy, once EPA identified alternatives that are protective of human health and the environment and that attain, or, as appropriate, waive ARARs, EPA evaluated the overall effectiveness of each alternative by assessing the relevant three criteria: long term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short term effectiveness, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs. The present worth costs of this remedial alternative are:

Combined Source Control & Management of Migration Alternatives	Capital	Operation & Maintenance	Total Costs
SC-3 & MM-4	$516,000	$2,733,000	$3,249,000
SC-3 & MM-5	$637,900	$3,522,500	$4,160,400
SC-4 & MM-4	$765,000	$2,783,000	$3,548,000
SC-4 & MM-5	$886,900	$3,572,500	$4,459,400

Of the source control alternatives, the estimated total costs of Alternatives SC-1 (No Action), SC-2 (Containment), SC-3 (Vacuum Extraction), SC-4 (Vacuum Extraction With Enhancements), and SC-5 (Biodegradation) are all between $1 and $2 million. The estimated total costs of SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) are both over $7 million. Specifically, the range of estimated total costs for the source control alternatives, from the least to the most expensive alternatives, is: $1,230,000 (SC-3, Vacuum Extraction); $1,443,500 (SC-1, No Action); $1,516,000 (SC-5, Biodegradation); $1,529,000 (SC-4, Vacuum Extraction with Enhancements); $1,838,000 (SC-2, Containment); $7,785,000 (SC-7, Thermal Stripping) and $13,910,000 (SC-6, On-Site Incineration).

The selected soil vapor extraction remedy (SC-3) is the least expensive source control alternative ($1,230,000), in part because several of the other alternatives, including the no action alternative, include the cost of 30 years of monitoring. SC-3 (Vacuum Extraction) does not include 30 years of monitoring.

If enhancements such as air sparging are added to the soil vapor extraction remedy, i.e., Alternative SC-4 (Vacuum Extraction With Enhancements) is performed, the estimated total cost of the source control remedy will be $1,529,000. This amount is greater than the estimated total cost for SC-1 (No Action), and SC-5 (Biodegradation) and SC-3 (Vacuum Extraction), but is less than the estimated total costs for SC-2 (Containment), SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping).

In comparing the effectiveness of the source control alternatives, SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements) both treat the VOCs present in the soils and therefore provide permanence. Both alternatives also treat all of the contaminated soils, including soils located under Linemaster's manufacturing building. Although SC-4 (Vacuum Extraction With Enhancements) is more expensive than SC-3 (Vacuum Extraction), enhancements to the SVE system, such as air sparging, will only be implemented if EPA determines after the SVE system has been operating for five years that performance of soil vacuum extraction alone will not achieve soil cleanup levels within the estimated ten year period.

Of the source control alternatives that were not selected, the No Action alternative (SC-1) is not considered to be protective of human health and the environment because it does not include measures to minimize the continued migration of contaminants to the groundwater. SC-5 (Biodegradation) may not be as effective as SC-3 (Vacuum Extraction) or SC-4 (Vacuum Extraction With Enhancements) in the long term because SC-5 (Biodegradation) is not a proven technology. Alternatives SC-2 (Containment), SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping), the three most expensive alternatives considered, do not reduce the mobility and volume of contaminants to the same degree as SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements).

Compared to all of the source control alternatives, no other alternatives provide the same degree of protection and long-term effectiveness as SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements), for as little cost.

Of the management of migration alternatives, the range of estimated total costs from the least to the most expensive alternatives is: $1,398,500 (MM-1, No Action); $2,019,000 (MM-4, Air Stripping); and $2,930,400 (MM-5, Ultraviolet Oxidation).

The No Action alternative, MM-1 (No Action), is not considered to be protective of human health and the environment because groundwater would not be restored to drinking water levels through natural attenuation for 500 years.

Both MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) are equally effective and provide for equal degrees of protection and permanence. The estimated total costs of MM-4 (Air Stripping) are less than the estimated total costs of MM-5 (Ultraviolet Oxidation). MM-5 (Ultraviolet Oxidation) will only be implemented at the Site if cost estimates change over time such that it becomes less expensive to perform ultraviolet oxidation than air stripping over the long-term operation of the groundwater pump and treat system.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

Once the Agency identified those alternatives that attain or, as appropriate, waive ARARs and that are protective of human health and the environment, EPA identified which alternative utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence; 2) reduction of toxicity, mobility or volume through treatment; 3) short-term effectiveness; 4)implementability; and 5) cost. The balancing test <u>emphasized</u> long-term effectiveness and permanence and the reduction of toxicity, mobility and volume through treatment; and <u>considered</u> the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the alternatives.

The selected source control alternatives, SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements), provide long-term effectiveness and permanence because VOCs in the soils will be treated and destroyed. In addition, emission controls will prevent the transfer of VOCs from the soils to the atmosphere. Following completion of the source control component, no further controls on the Site soils will be necessary. These alternatives reduce the toxicity, mobility and volume of soil contaminants through treatment. The implementation of these alternatives will have minimal adverse impacts on workers (such as inhalation of fugitive dust), and any such impacts can be controlled with protective equipment, and other protective measures. Alternatives SC-3 (Vacuum Extraction) and SC-4 (Vacuum Extraction With Enhancements) are also readily implementable. Of all of the source control alternatives considered, Alternative SC-3 (Vacuum Extraction) is the least expensive. Alternative SC-4 (Vacuum Extraction With Enhancements), approximately $300,000 more expensive than SC-3 (Vacuum Extraction), is among the least expensive source control alternatives considered for the Site. Both CT DEP and the community are supportive of the selected source control alternatives.

None of the other source control alternatives provide the same levels of protectiveness and permanence. Alternative SC-1 (No Action) is not protective of human health and the environment because it does not minimize the migration of contaminants from the soils to the groundwater. Alternatives SC-2 (Containment) does not meet ARARs, does not use treatment, and does not prevent the migration of contaminants located under the cap and under Linemaster's manufacturing building. Although Alternative SC-5 (Biodegradation) employs treatment, it is not a well developed technology and would require significant pilot testing prior to implementation. Alternatives SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) also use treatment, but these alternatives do not address contaminated soils located under Linemaster's manufacturing building. SC-6 (On-Site Incineration) and SC-7 (Thermal Stripping) would also expose workers and residents to short-term risks associated with the excavation of the soil, and would be considerably more expensive to perform than the selected alternatives.

Of the Management of Migration alternatives, both MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) provide long-term effectiveness and permanence by reducing contamination present in the groundwater. They both reduce toxicity, mobility and volume of contaminants through groundwater pump and treat technology. In addition, both of these alternatives use controls to prevent the transfer of contaminants to the atmosphere. To promote short-term effectiveness, these alternatives require the use of institutional controls to prevent the use of contaminated groundwater until cleanup levels are met. Both alternatives are also are readily implementable and cost-effective. In addition, both CT DEP and the community are supportive of the selected management of migration alternatives.

The only other Management of Migration alternative, MM-1, No Action, is not protective of human health and the environment because groundwater would not be restored to drinking water standards for 500 years.

For the above reasons, the Agency has determined that the selected source control and management of migration remedy utilizes permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable.

E. The Selected Remedy Satisfies the Preference for Treatment Which Permanently and Significantly reduces the Toxicity, Mobility or Volume of the Hazardous Substances as a Principal Element

The principal element of the selected remedy is the soil vapor extraction system and the groundwater treatment system. The source control component of the remedy will capture the VOCs in the Zone 1 area, thereby providing significant reduction in the toxicity, mobility and volume of the contaminants at the Site through treatment. In addition, carbon emission controls will be used so that contaminated vapors released from the soil vapor extraction system are not transferred to the atmosphere. The groundwater treatment system will effectively contain and treat the contaminated groundwater. In addition, the carbon adsorption system will assure that contaminated vapors released from the air stripping or ultraviolet oxidation system are not transferred to the atmosphere. The selected remedy therefore satisfies the statutory preference for treatment which permanently and significantly reduces the toxicity, mobility or volume of the hazardous substances.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

EPA presented a proposed plan (preferred alternative) for remediation of the Linemaster Switch Corporation Site on April 14, 1993.

The source control portion of the preferred alternative included:

- restoration of the soils by vacuum extraction with enhancements such as air sparging as necessary;
- monitoring to evaluate the performance of the remedy; and,
- a fence to limit access.

The management of migration portion of the preferred alternative included:

- restoration of the groundwater by extraction and treatment either by air stripping or ultraviolet oxidation;
- monitoring to evaluate performance of the remedy; and,
- institutional controls to prohibit the use of untreated contaminated groundwater.

The remedial action selected in this document includes the following changes from the preferred alternatives described in the Proposed Plan. Due to administrative error, some of the interim groundwater cleanup levels listed in Table 1 of the Proposed Plan did not include the correct MCL numerical listing. Table 16 in Appendix B of this ROD has corrected this error. In summary, the interim cleanup levels were changed for the following compounds: benzene, 1,2-dicholoroethane, and methylethylketone. In addition, the following compounds were erroneously included on the list of interim groundwater cleanup levels in the Proposed Plan, and have been removed from the list of interim groundwater cleanup levels as presented in Table 16 of this ROD: trans-1,2-dichloroethene, methyleterbutylether, and xylenes. The following compounds, however, were added to the list presented in Table 16 along with their interim groundwater cleanup levels: beryllium, carbon tetrachloride, chloroform, chloromethane, 1,1,2-trichloroethane, acetone, cadmium, and 2-hexanone.

In addition, the Proposed Plan erroneously indicated that all of the source control alternatives complied with ARARs. However, as correctly shown in the FS Addendum, Alternative SC-2 (Containment) would not comply with ARARs. Under this alternative, the placement of a cap over a portion of the contaminated soils would not meet RCRA requirements because a portion of the soils would remain beneath Linemaster's manufacturing building. This error has been corrected in this ROD.

Finally, the Proposed Plan did not clarify how or when EPA intended to determine whether enhancements to the soil vacuum extraction system would be required. The process for making this determination is described in the ROD.

XIII. STATE ROLE

The Connecticut Department of Environmental Protection (CT DEP) has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation, Risk Assessment, Feasibility Study and the Feasibility Study Addendum to determine if the selected remedy is in compliance with applicable or relevant and appropriate State Environmental laws and regulations. The State of Connecticut concurs with the selected remedy for the Linemaster Switch Corporation Site. A copy of the declaration of concurrence is attached as Appendix D.

APPENDIX A

RECORD OF DECISION
LINEMASTER SWITCH CORPORATION SUPERFUND SITE

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Figure 9 - Alternative MM-4: Air Stripper Schematic
Figure 10 - Alternative MM-5: Ultraviolet Oxidation Schematic

FIGURE 1
LINEMASTER SWITCH CORPORATION SUPERFUND SITE

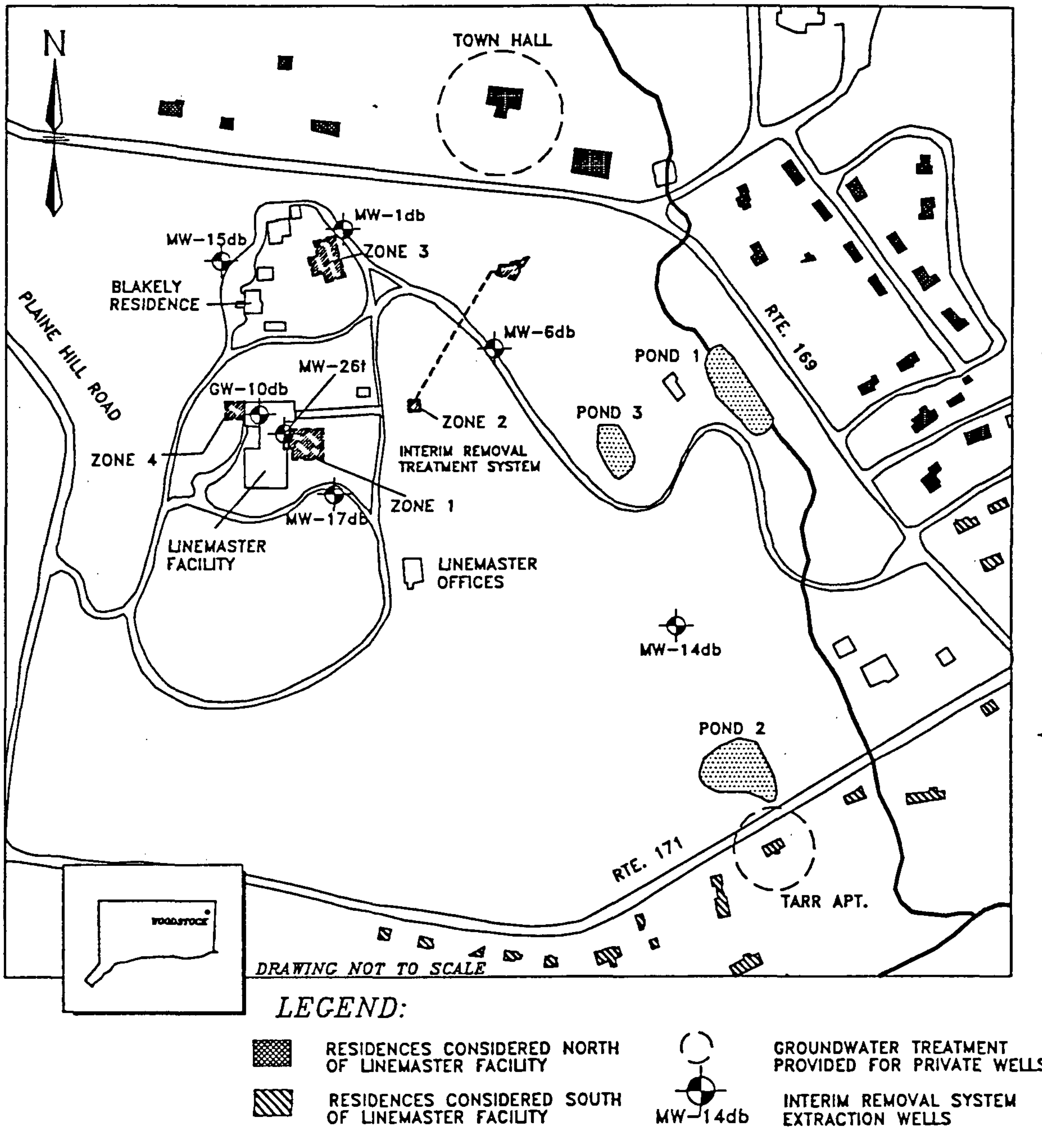


Figure 2
Extent of TCE Contamination in Overburden Groundwater

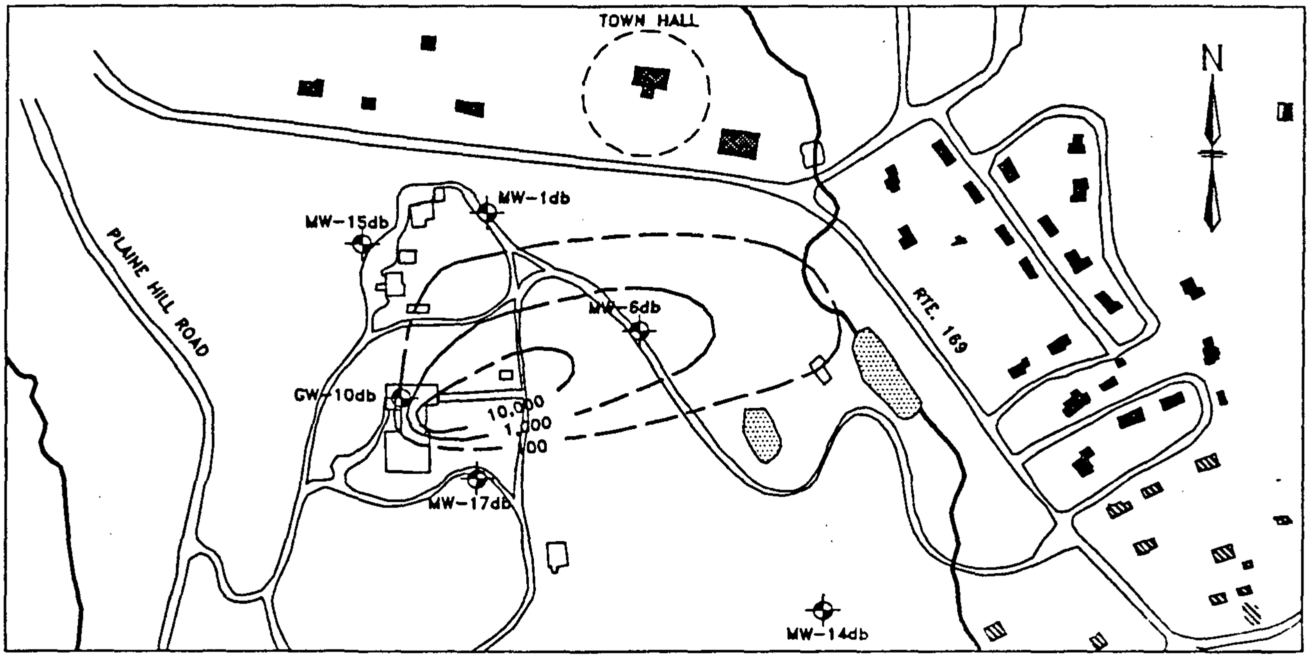
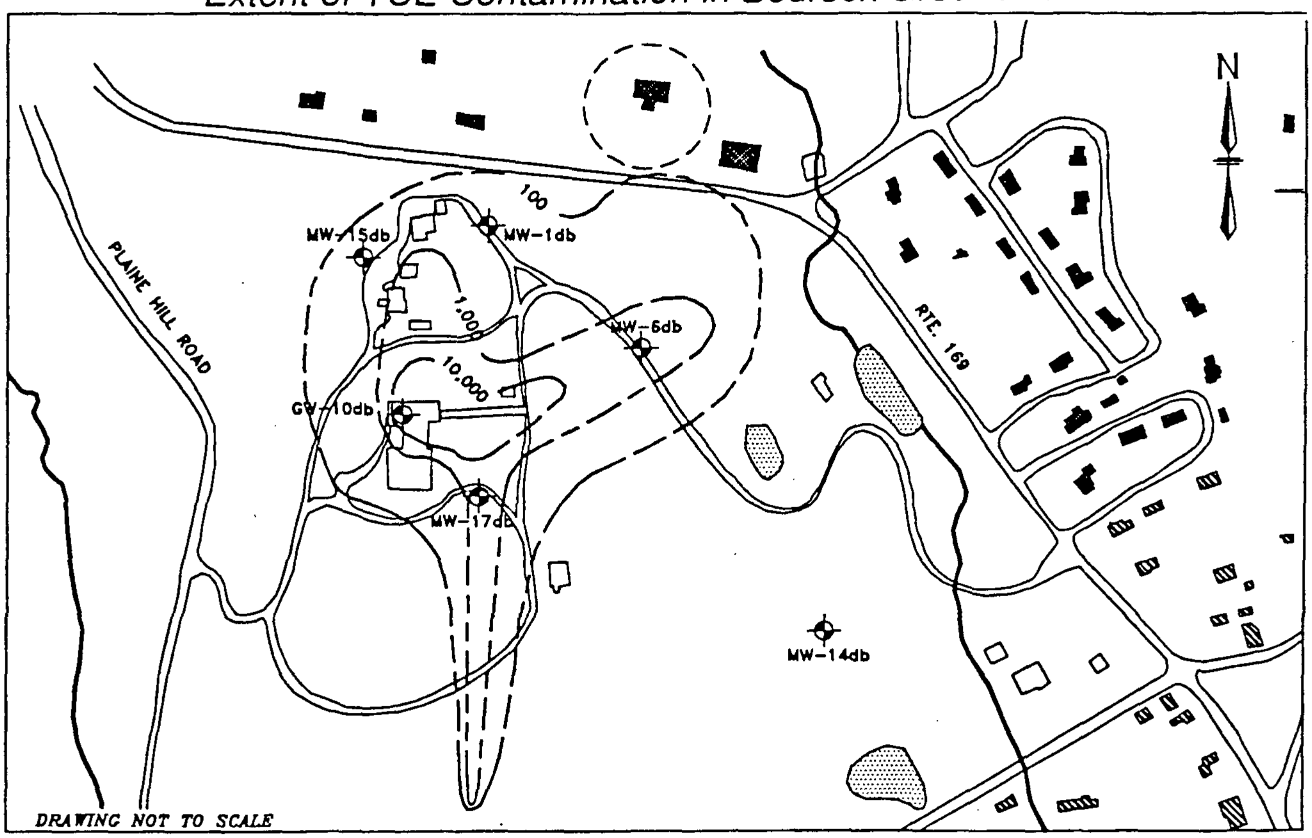


Figure 3
Extent of TCE Contamination in Bedrock Groundwater



LEGEND:

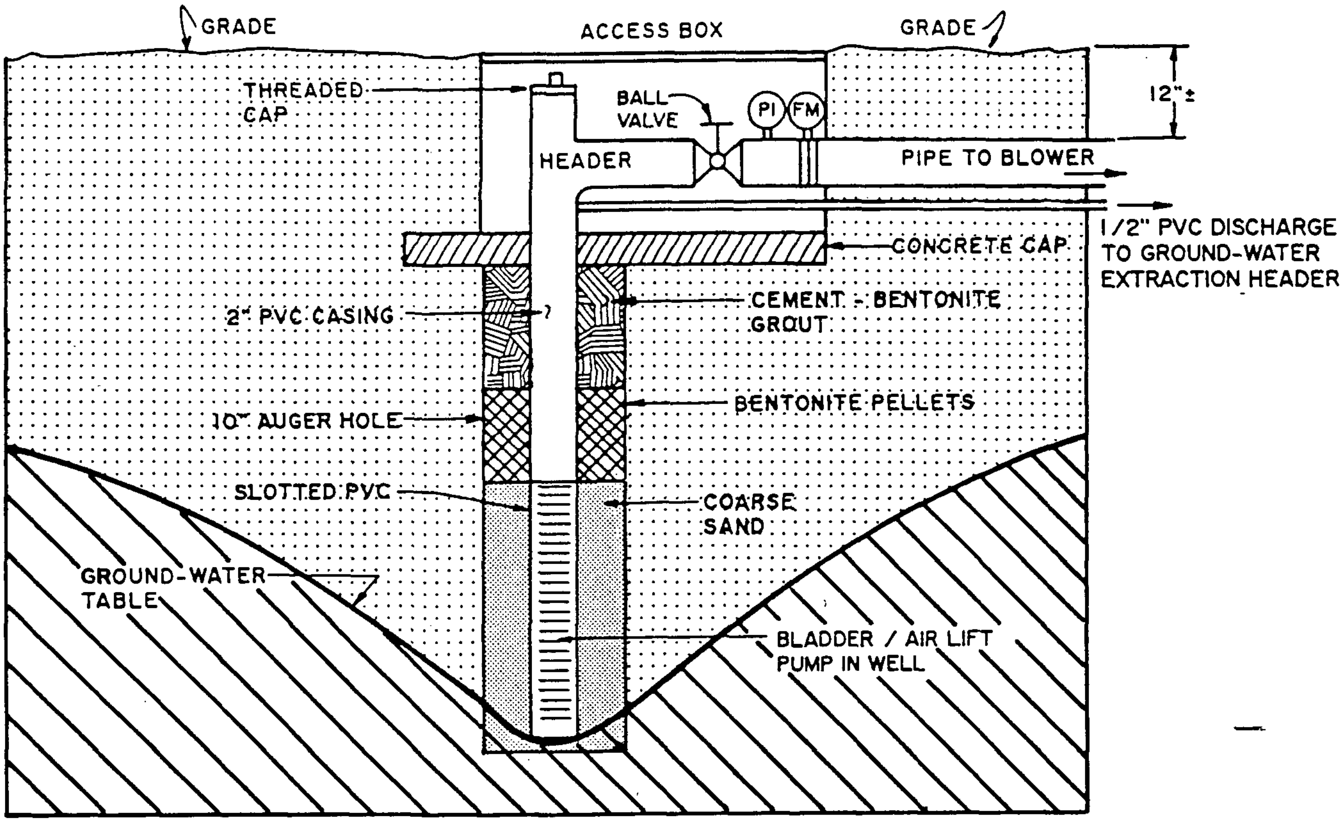
– – – – TCE CONTAMINATION IN GROUNDWATER (CONCENTRATION IN PARTS PER BILLION)

MW-14db INTERIM REMOVAL SYSTEM EXTRACTION WELLS

FIGURE 4

ALTERNATIVE SC - 3

TYPICAL EXTRACTION WELL



PI = PRESSURE INDICATOR

FM = FLOW METER
(CONNECTION POINT)

LINEMASTER SWITCH CORPORATION

PLAINE HILL ROAD WOODSTOCK, CT.

Figure 5
Alternative SC-3: Vacuum Extraction System Layout

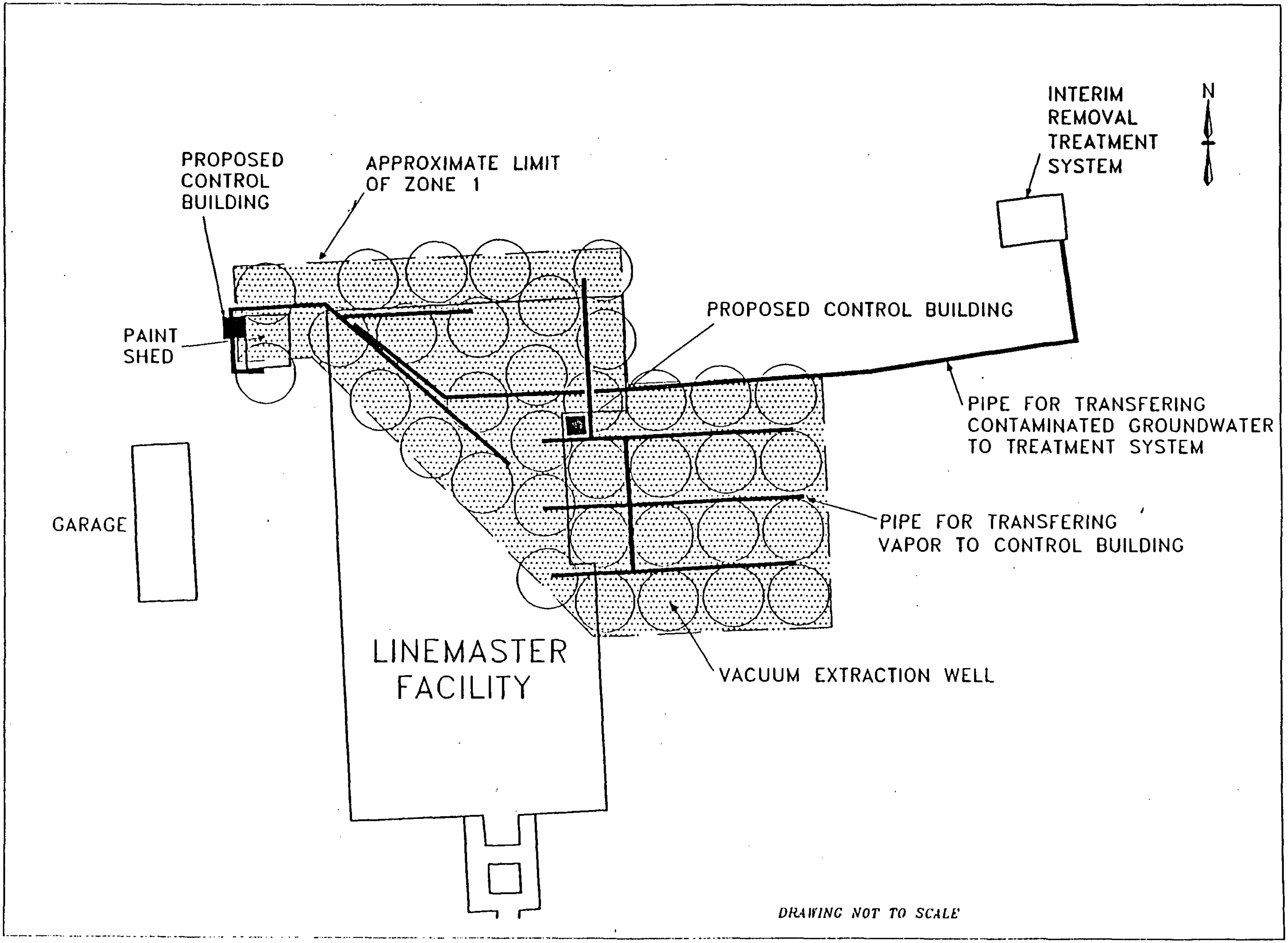
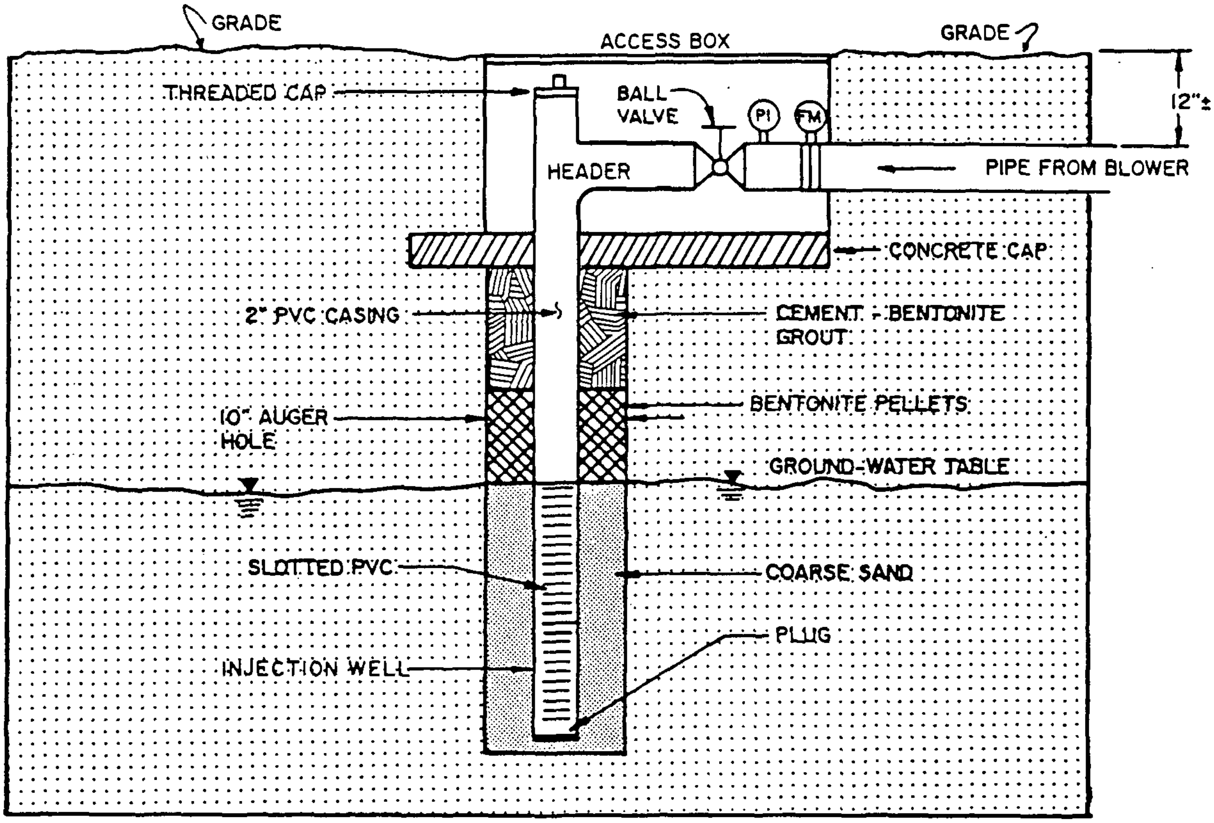


FIGURE 6

ALTERNATIVE SC - 4

TYPICAL INJECTION WELL



PI = PRESSURE INDICATOR

FM = FLOW METER
(CONNECTION POINT)

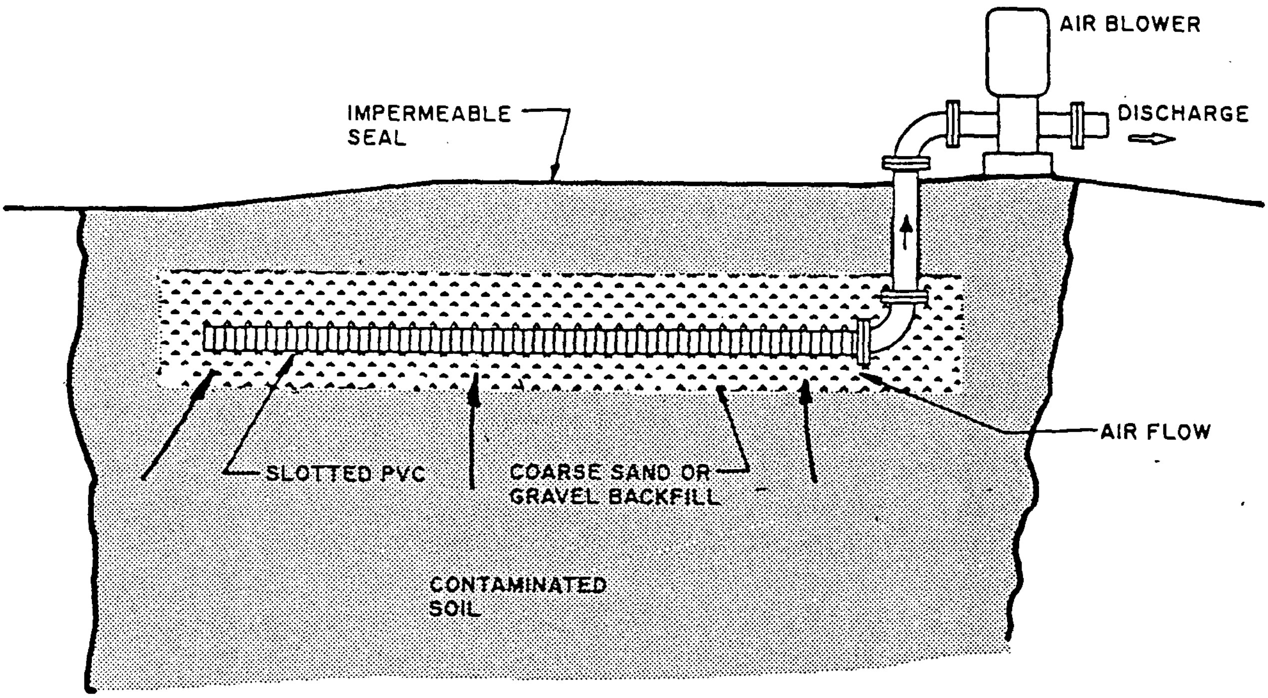
LINEMASTER SWITCH CORPORATION

PLAINE HILL ROAD WOODSTOCK, CT

FIGURE 7

ALTERNATIVE SC - 4

EXTRACTION TRENCH

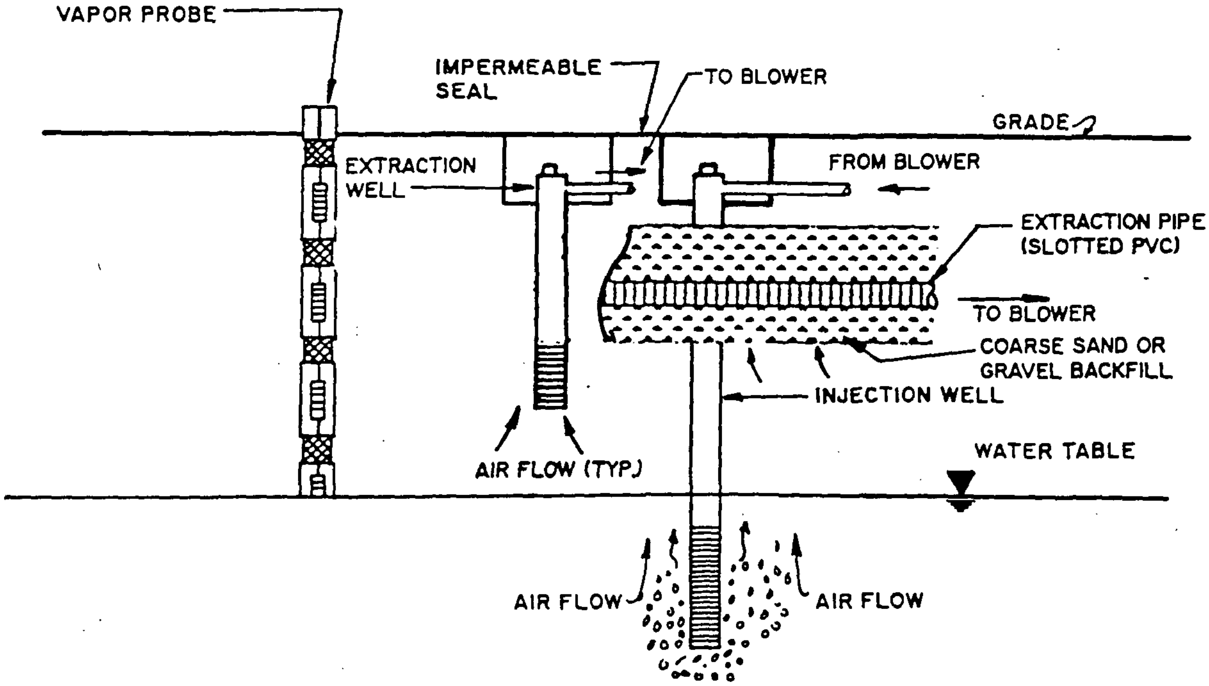


LINEMASTER SWITCH CORPORATION

PLAINE HILL ROAD WOODSTOCK, CT

FIGURE 8

ALTERNATIVE SC - 4
PROCESS ORIENTATION



NOTE :

EXTRACTION PROCESS MAY INCLUDE TRENCHES AND /OR WELLS

LINEMASTER SWITCH CORPORATION

PLAINE HILL ROAD WOODSTOCK, CT.

<u>**FIGURE 9**</u>

Alternative MM-4: Air Stripper and Carbon Adsorption Treatment Schematic

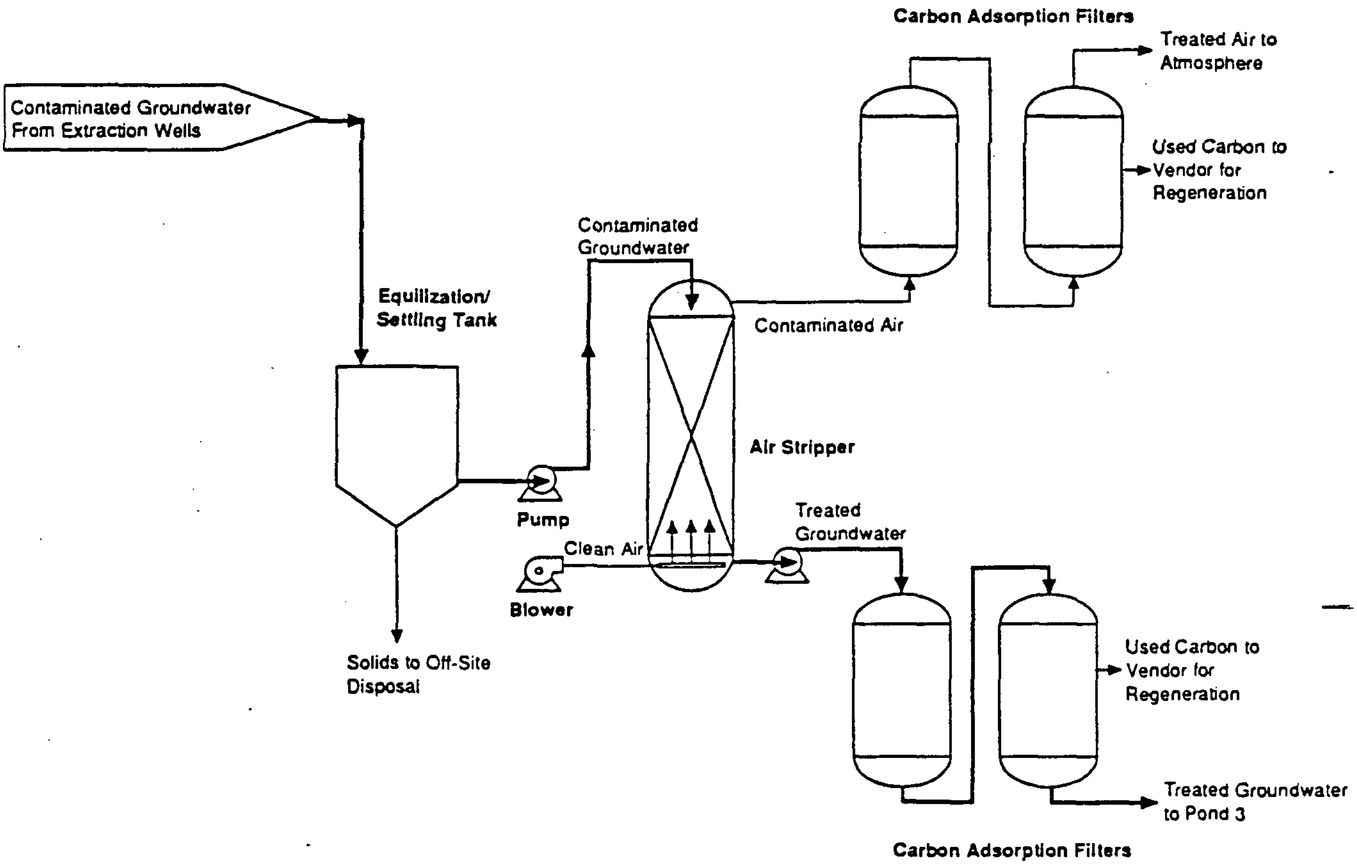
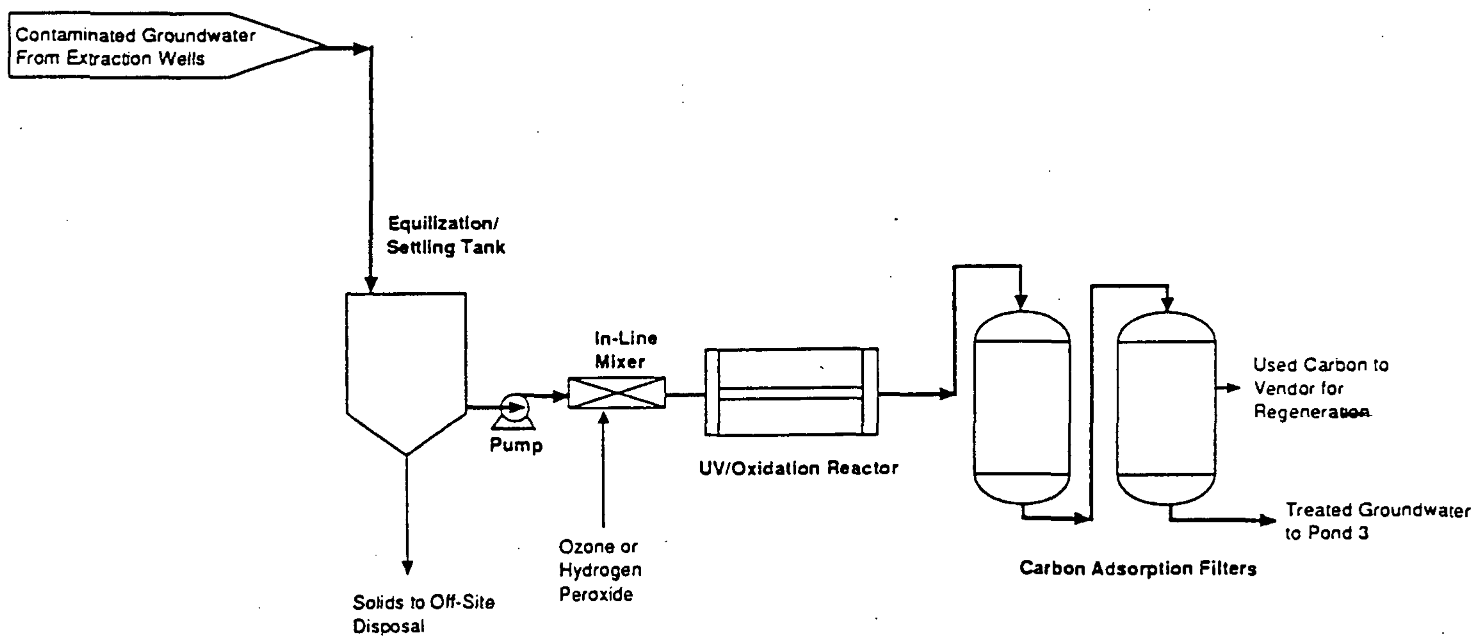


FIGURE 10

Alternative MM-5: UV/Oxidation and Carbon Adsorption Treatment Schematic



APPENDIX B

RECORD OF DECISION
LINEMASTER SWITCH CORPORATION SUPERFUND SITE

LIST OF TABLES

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TABLE 1

Linemaster Switch Baseline Risk Assessment
Soil; Zones 1 and 4
Surface (0-2 ft) Data Summary

Analyte	Arithemetic Average ug/Kg	Maximum Detected ug/Kg	Location of Maximum	Number of Detects	Number of Samples
Volatile Organics					
cis-1,2-Dichloroethene	47.2	938	OW-5t	3	27
Ethylbenzene	2.5	9.1	OW-1t	1	27
Tetrachloroethene	15.4	200	DW-4t	3	32
Toluene	10.5	180	B-38	3	27
1,1,1-Trichloroethene	2.9	11	B-25	1	28
Trichloroethene	66.6	1200	B-38	13	32
Xylenes	6.5	100	OW-1t	5	27
Semi-Volatiles					
Di-n-butylphthalate	563.1	2050	OW-2t	1	4
Metals					
Arsenic, Total	10305.8	20700	B-47	12	12
Cadmium, Total	6536.3	40300	B-34	9	12

TABLE 2

Linemaster Switch Baseline Risk Assessment
Soil; Zones 1 and 4
Sub-surface (0-8 ft) Data Summary

Analyte	Arithemetic Average ug/Kg	Maximum Detected ug/Kg	Location of Maximum (depth)	Number of Detects	Number of Samples
Volatile Organics					
1,1,1-Trichloroethene	9.1	11.0	B-25 (0-2)	1	78
Acetone	31.3	460.0	MW-10ts (5-7)	1	54
cis-1,2-Dichloroethene	25.0	938.0	OW-5t (0-2)	4	54
Ethylbenzene	84.5	2,750.0	B-23 (6-7)	4	58
Tetrachloroethene	80.1	2,800.0	MW-10ts(5-7)	9	80
Toluene	274.5	7,577.0	B-23 (6-7)	10	58
Trichloroethene	122.6	4,022.0	B-7 (4-5)	22	80
Xylenes	264.4	8,300.0	MW-10ts (5-7)	11	58
Semi-Volatiles					
Bis(2-ethylhexyl)phthalate	1814.8	13,229.0	B-50 (3)	3	12
Di-n-butylphthalate	536.7	2,050.0	OW-2t (0-2)	2	12
Metals					
Arsenic, Total	11220.9	38,100.0	B-51 (3')	26	26
Cadmium, Total	4500.9	40,300.0	B-34 (0-2)	14	23

TABLE 3

Linemaster Switch Baseline Risk Assessment
On-Property Till Ground Water Data Summary

Analyte	Arithemetic Average ug/L	Maximum Detected ug/L	Location of Maximum	MCL ug/L	Number of MCL Exceedences	Number of Detects	Number of Samples
Volatile Organics							
Acetone	2129.4	50,000.0	MW16T			3	49
Benzene	44.7	54.0	MW16T	5	1	3	77
Carbon tetrachloride	47.5	14.0	MW17TS	5	2	5	72
2-Chloroethyl vinyl ether	1.2	5.4	GW30			1	6
Chloroform	58.7	17.0	DW01TPT	100	0	6	87
1,1-Dichloroethane	109.5	813.0	MW10TD			14	72
1,2-Dichloroethane	70.9	7.8	MW17TD	5	2	4	72
1,1-Dichloroethene	76.6	275.0	MW10TD	7	9	10	72
1,2-Dichloroethene	498.2	1,950.0	MW10TD	70	3	6	6
cis-1,2-Dichloroethene	803.5	26,000.0	MW16T	70	13	34	66
trans-1,2-Dichloroethene	2.5	28.7	MW30	100	0	1	14
Dichloromethane	236.6	1,810.0	MW10TD	5	6	6	87
1,2-Dichloropropane	169.9	420.0	MW16T	5	1	2	72
Ethylbenzene	75.4	460.0	DW01TPT	700	0	13	68
2-Hexanone	766.3	2,100.0	MW16T			2	49
Methyl Isobutyl Ketone	7068.3	350,000.0	MW16T			2	63
Methyl ethyl ketone	1366.5	38,000.0	MW16T			2	49
Tetrachloroethene	132.1	1,800.0	DW01TPT	5	17	21	87
1,1,1-Trichloroethane	103.1	1,700.0	DW01TPT	200	6	24	90
1,1,2-Trichloroethane	71.9	23.0	MWEPAAT	5	1	2	71
Toluene	2529.6	64,000.0	MW16T	1000	12	23	68
Trichloroethene	42931.9	800,000.0	MW26T	5	59	68	87
Vinyl acetate	728.0	1,830.0	MW04T			1	49
Xylene	164.0	1,200.0	MW26T	10000	0	13	59
Metals							
Arsenic	15.5	185.5	MW12T	50	3	30	52
Beryllium	9.7	87.0	MW23T	1	17	18	37
Cadmium	63.3	757.0	MW23T	5	13	14	37

MCL = Maximum Contaminant Level (EPA, 1992; Drinking Water Regulations and Health Advisories)

TABLE 4

Linemaster Switch Baseline Risk Assessment
On-Property Bedrock Ground Water Data Summary

Analyte	Arithemetic Average ug/L	Maximum Detected ug/L	Location of Maximum	MCL ug/L	Number of MCL Exceedences	Number of Detects	Number of Samples
Volatile Organics							
Acetone	159.9	3,640.0	GW08DB			13	132
Benzene	9.4	29.0	MW17DB1	5	2	6	151
Carbon disulfide	73.1	409.0	GW08DB			2	150
Chloroform	6.8	30.7	GW10DB	100	0	3	266
Chloromethane	53.8	63.0	MW11DB2			5	213
1,1-Dichloroethane	11.8	120.0	MW10SB			47	217
1,2-Dichloroethane	11.6	2.8	GW10DB1	5	0	2	213
1,1-Dichloroethene	8.5	93.0	MW10SB	7	10	35	270
1,2-Dichloroethene	2,315.5	6,800.0	GW10DB3	70	33	34	34
cis-1,2-Dichloroethene	274.6	15,000.0	GW10DB3	70	29	85	145
trans-1,2-Dichloroethene	280.6	10,177.0	GW10DB	100	30	57	190
Dichlorodifluoromethane	50.0	9.9	MW12DB4			1	207
Dichloromethane	0.8	24.0	GW36DB	5	1	1	52
1,2-Dichloropropane	18.2	33.0	MW06DB3	5	5	12	214
Ethylbenzene	13.7	230.0	MW10SB	700	0	10	150
2-Hexanone	89.0	950.0	MW10SB			2	132
Methyl Isobutyl Ketone	76.1	1,180.0	MW10SB			6	156
Tetrachloroethene	11.8	430.0	GW12DB	5	28	39	269
Toluene	210.3	7,800.0	MW10SB	1000	11	78	175
1,1,1-Trichloroethane	5.5	59.0	MW10SB	200	0	25	269
1,1,2-Trichloroethane	8.2	3.3	GW10DB1	5	0	1	212
Trichloroethene	3,859.3	59,000.0	GW10DB	5	177	214	278
Trichlorofluoromethane	0.6	2.4	GW36DB			1	53
Vinyl acetate	84.2	264.0	GW10DB1			1	132
Vinyl chloride	20.3	10.0	GW10DB1	2	1	2	212
Xylene	42.2	760.0	GW10DB3	10000	0	24	149
Metals							
Arsenic	41.2	513.0	GW10DB3	50	20	112	131
Beryllium	4.7	75.0	MW27SB	1	26	32	73
Cadmium	7.1	87.0	MW15DB1	5	21	27	73

MCL = Maximum Contaminant Level (EPA, 1992; Drinking Water Regulations and Health Advisories)

TABLE 5

Linemaster Switch Baseline Risk Assessment
Contaminants of Concern
Groundwater Exposure Zones

Compound	TOXICITY INFORMATION AVAILABLE		EXPOSURE ZONES			
	Carcinogenic	Non-Carcinogenic	Till	Bedrock	Residential North	Residential South
Volatiles						
Acetone		x	•	•		
Benzene	x		•	•	•	
Carbon disulfide		x		•		•
Carbon tetrachloride	x	x	•			
2-Chloroethyl vinyl ether			•			
Chloroform	x	x	•	•	•	•
Chloromethane	x			•		
1,4-Dichlorobenzene	x					•
Dichlorodifluoromethane		x		•		
1,1-Dichloroethane		x	•	•		
1,2-Dichloroethane	x		•	•		
1,1-Dichloroethene	x	x	•	•		•
1,2-Dichloroethene		x	•	•	•	
cis-1,2-Dichloroethene		x	•	•	•	•
trans-1,2-Dichloroethene		x	•	•	•	
Dichloromethane	x	x	•	•	•	
1,2-Dichloropropane	x		•	•		
Ethylbenzene		x	•	•	•	—
2-Hexanone			•	•		
Methyl ethyl ketone		x	•			
Methyl isobutyl ketone			•	•	•	•
Methyl tert butyl ether (MTBE)					•	
1,1,2,2-Tetrachloroethane					•	
Tetrachloroethene	x	x	•	•	•	•
Toluene		x	•	•	•	
1,1,1-Trichloroethane		x	•	•	•	•
1,1,2-Trichloroethane	x	x	•	•		
Trichloroethene	x		•	•	•	•
Trichlorofluoromethane		x		•		
Vinyl acetate		x	•	•		
Vinyl chloride	x			•		
Xylene		x	•	•		
Metals						
Arsenic, Total	x	x	•	•	•	•
Beryllium, Total	x	x	•	•		
Cadmium, Total		x	•	•		

• = The analyte was detected in the indicated zone.
x = An ingestion cancer potency factor or reference dose is available, and the analyte is a contaminant of concern for estimating non-carcinogenic or carcinogenic risk via ingestion or dermal contact as indicated.

GWCOCS

TABLE 6

Potential Exposure Pathways Summary

Pathways	Exposure Pathway	Receptor Groups	Comments
Inhalation			
1	Inhalation of Vapors	On-site Workers Adult and Child Residents Construction Workers	Inhalation of vapors volatilized from soil during work and recreation activities.
2	Inhalation of Particulates	Residents Construction Workers	Heavily vegetated area; generation of airborne particulates only likely if dirt biking or all-terrain vehicles used in the area. For construction workers, inhalation of particulates is possible. Inhalation of particles is accounted for in ingestion pathway.
3	Inhalation of Basement Vapors	Adult and Child Residents	Basements in the area have very low permeability, so this pathway was not quantitatively evaluated.
Ingestion			
4	Ingestion of Fugitive Particles	Residents Construction Workers	Heavily vegetated area; generation and subsequent ingestion only likely in dirt biking scenario mentioned above. For construction workers, ingestion of particles is possible. Contaminant ingestion accounted for in ingestion of soil pathway.
5	Ingestion of Soil/Sediment On-Site	Adult and Child Residents Construction Workers Trespassers	Incidental ingestion of soil during recreation activities and work operations
6	Ingestion of Soil/Sediment Off-Site	None	Highly localized source areas; off-site areas not characterized. This pathway was not quantitatively evaluated.
7	Ingestion of Ground Water	Adult and Child Residents	Direct ingestion for by adults and children in the surrounding communities through drinking water (assumed untreated)
8	Ingestion of Plants	None	No agriculture or horticulture within study area
9	Ingestion of Surface Water	Adult and Child Residents	Incidental ingestion of surface water during play, and potential future use as drinking water
10	Ingestion of Aquatic Biota	None	No evidence of fishing in the study area
Dermal Contact			
11	Dermal Contact with Soil/Sediment On-Site	Adult and Child Residents Construction Workers Trespassers	Soil adherence to skin during recreation activities and work operations
12	Dermal Contact with Soil/Sediment Off-Site	None	Highly localized source areas; off-site areas not characterized. This pathway was not quantitatively evaluated.
13	Dermal Contact with Ground Water	Adult and Child Residents	Direct contact to ground water (assumed untreated) while bathing and washing.
14	Dermal Contact with Basement Seepage	Adult and Child Residents	Decreased contact rate and increased resistance to uptake reduce risk, insignificant compared to ingestion pathways.
15	Dermal Contact with Surface Water	Adult and Child Residents	Direct contact to surface water while playing in areas, Potential future exposure while washing or bathing in surface water.

TABLE 7: CARCINOGENIC RISK CHARACTERIZATION SUMMARY

Carcinogenic Risk Characterization for Ingestion of Groundwater		
Source of Groundwater	Estimated Incremental Cancer Risk	
	Average	Maximum
On-Property Overburden Aquifer	9E-03	1E-01
On-Property Bedrock Aquifer	2E-03	3E-02
Off-Property (North of Site)	9E-05	1E-03
Off-Property (South of Site)	1E-04	2E-03

Carcinogenic Risk Characterization for Ingestion and Dermal Contact of Soil		
Source of Soil	Estimated Incremental Cancer Risk	
	Average	Maximum
Zones 1 and 4; Surface Soil	1E-05	3E-05
Zones 1 and 4; Sub-surface Soil	6E-08	2E-07
Zones 1 and 4; Sub-surface (Future Use Scenario)	2E-06	5E-05

Carcinogenic Risk Characterization for Inhalation of Vapors	
Source of Vapors	Incremental Cancer Risk
	Estimated Average
Zones 1 and 4; Sub-surface (Future Use Scenario)	2E-08

TABLE 8: NON-CARCINOGENIC RISK CHARACTERIZATION SUMMARY

Non-Carcinogenic Risk Characterization for Ingestion of Groundwater		
Source of Groundwater	Estimated Hazard Index	
	Average	Maximum
On-Property Overburden Aquifer	5E+01	6E+02
On-Property Bedrock Aquifer	7E+01	4E+02
Off-Property (North of Site)	1E-00	2E+01
Off-Property (South of Site)	2E+00	2E+01

Non-Carcinogenic Risk Characterization for Ingestion and Dermal Contact of Soil		
Source of Soil	Estimated Hazard Index	
	Average	Maximum
Zones 1 and 4; Surface Soil	3E-01	1E+00
Zones 1 and 4; Sub-surface Soil	9E-03	4E-02
Zones 1 and 4; Sub-surface (Future Use Scenario)	3E-01	2E+00

Non-Carcinogenic Risk Characterization for Inhalation of Vapors	
Source of Vapors	Hazard Index
	Estimated Average
Zones 1 and 4; Sub-surface (Future Use Scenario)	6E-05

TABLE 9

Summary of Surface Water Contamination, Water Quality Criteria, and Hazard Indices for Aquatic Biota at the Linemaster Switch Site.

EXPOSURE ZONE AND CONTAMINANTS	CONCENTRATIONS (ug/L) AVERAGE	CONCENTRATIONS (ug/L) MAXIMUM	LOCATION OF MAXIMUM	NUMBER OF DETECTS/ NUMBER OF SAMPLES	AWQC (chronic)*	HAZARD QUOTIENT AVERAGE	HAZARD QUOTIENT MAXIMUM
UPSTREAM (SW-3,SW-15)							
Inorganics							
Arsenic, Total	1.58	3.2	SW-3	1/3	48	0.03299	0.06667
ONSITE WETLANDS (SW-1,SW-4)							
Volatile Organic Compounds							
1,2-Dichloroethene	1.13	3	SW-4	1/4	11600*	0.00010	0.00026
cis-1,2-Dichloroethene	0.49	1.2	SW-4	1/4	11600*	0.00004	0.00010
Trichloroethene	2.86	6.7	SW-4	1/4	21900	0.00013	0.00031
Inorganics							
Arsenic, Total	2.93	9.1	SW-1	2/4	48	0.06094	0.18958
						HI: 0.06121	HI: 0.19025
ONSITE POND 1 (SW-5,SW-6,SW-7,SW-14)							
Volatile Organic Compounds							
cis-1,2-Dichloroethene	0.34	0.9	SW-7	1/7	11600*	0.00003	0.00008
Trichloroethene	1.20	5.9	SW-7	1/7	21900	0.00005	0.00027
Inorganics							
Arsenic, Total	1.69	2.6	SW-5	5/7	48	0.03521	0.05417
						HI: 0.03529	HI: 0.05451
ONSITE POND 2 (SW-9,SW-10)							
Volatile Organic Compounds							
Chloroform	1.31	2	SW-9/SW-10	3/4	1240	0.00106	0.00161
Inorganics							
Arsenic, Total	1.34	1.6	SW-9/SW-10	3/4	48	0.02786	0.03333
						HI: 0.02892	HI: 0.03495
ONSITE POND 3 (SW-18)							
Volatile Organic Compounds							
Trichloroethene	2.80	2.8	SW-18	1/1	21900	0.00013	0.00013
Inorganics							
Arsenic, Total	1.80	1.8	SW-18	1/1	48	0.03750	0.03750
						HI: 0.03763	HI: 0.03763
ONSITE STREAM (SW-8)							
Inorganics							
Lead, Total	1.80	1.8	SW-8	1/1	3.2	0.56250	0.56250
OFFSITE RECEIVING AREA (SW-11,SW-12,SW-17)							
Inorganics							
Arsenic, Total	1.36	2.4	SW-11	2/3	48	0.02833	0.05000

Notes:

1. Analytical Data compiled from the RI (Fuss and O'Neill, 1992) data for sampling rounds performed in July 1990; March, April, June, and October 1991; and May 1992. Arithmentic means were calculated by : (a) Averaging duplicate samples together and using this value as a single datum; and (b) treating non-detects as one-half of the detection limit, for those contaminanants that were detected at one or more other sampling locations onsite.
2. U.S. EPA (1987) Ambient Water Quality Criteria (AWQC) used here represent chronic values where available. An asterisk (*) indicates an acute AWQC was used when chronic values are not available (e.g. dichloroethylenes). The AWQC applied to Total Arsenic is that for Pentavalent Arsenic. Units are ug/L.
3. Hazard Quotient is calculated by dividing the measured concentration by the AWQC. An Hazard Index (HI) is presented for each location with two or more contaminant-specific Hazard Quotients by summing these. This HI thus represents total risk for each exposure zone and/or sample location.

TABLE 10

SUMMARY OF SCREENING OF SOURCE CONTROL ALTERNATIVES

ACTION	LIMITING CHARACTERISTICS	EFFECTIVENESS	IMPLEMENTABILITY	COST	STATUS
No Action SC-1	None	Handles Volume Low Reliability Low Protectiveness Low	TSD Availability NA Equip. & Resources High	Capital Low O&M Low	Retained
Containment SC-2	None	Handles Volume High Reliability Low Protectiveness Low	TSD Availability NA Equip. & Resources High	Capital Low O&M Low	Retained
Vacuum Extraction SC-3	Keep water table below work zone	Handles Volume High Reliability Medium Protectiveness Medium	TSD Availability High Equip. & Resources High	Capital Low O&M Low	Retained
Air Sparging SC-4	Soil less permeable	Handles Volume High Reliability Medium Protectiveness Medium	TSD Availability Medium Equip. & Resources High	Capital Low O&M Low	Retained
In-Situ Biodegradation SC-5	Soils are devoid of nutrients	Handles Volume Medium Reliability Low Protectiveness Medium	TSD Availability Medium Equip. & Resources High	Capital Medium O&M Medium	Retained
On-Site Incineration SC-6	Excavation required	Handles Volume Low Reliability High Protectiveness High	TSD Availability Medium Equip. & Resources High	Capital High O&M High	Retained
Thermal Stripping SC-7	Excavation required	Handles Volume Medium Reliability Medium Protectiveness High	TSD Availability Medium Equip. & Resources High	Capital High O&M Medium	Retained
Off-Site Incineration SC-8	Excavation required	Handles Volume Medium Reliability High Protectiveness High	TSD Availability Medium Equip. & Resources High	Capital High O&M Low	Eliminated
Off-Site Landfill SC-9	Excavation required	Handles Volume Medium Reliability Low Protectiveness Medium	TSD Availability Medium Equip. & Resources Low	Capital High O&M Low	Eliminated

SUMMARY OF SCREENING OF MIGRATION MANAGEMENT ALTERNATIVES

ACTION	LIMITING CHARACTERISTICS	EFFECTIVENESS	IMPLEMENTABILITY	COST	STATUS
No Action MM-1	None	Handles Volume Low Reliability Low Protectiveness Low	TSD Availability NA Equip. & Resources High	Capital Low O&M Low	Retained
Containment MM-2	Fractured Bedrock Aquifer	Handles Volume High Reliability Low Protectiveness Low	TSD Availability NA Equip. & Resources Medium	Capital Meduim O&M Low	Combined with SC-2
Biological MM-3	Nutrient Source-Sludge Generation	Handles Volume High Reliability Low Protectiveness Low	TSD Availability NA Equip. & Resources High	Capital Medium O&M Medium	Eliminated
Air Stripping MM-4	Off-Gas Treatment	Handles Volume High Reliability High Protectiveness Medium	TSD Availability N/A Equip. & Resources Medium	Capital Medium O&M Low	Retained
UV/Oxidation MM-5	Power Requirements	Handles Volume High Reliability High Protectiveness High	TSD Availability NA Equip. & Resources Medium	Capital Medium O&M High	Retained
Discharge to POTW MM-6	Capacity Future Upgrade	Handles Volume High Reliability High Protectiveness Low	TSD Availability NA Equip. & Resources High	Capital Medium O&M Medium	Eliminated

LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

TABLE 11
SUMMARY-SOURCE CONTROL ALTERNATIVES
LINEMASTER SWITCH CORPORATION

CRITERIA	SC-1 NO ACTION	SC-2 CONTAINMENT	SC-3 VACUUM EXTRACTION	SC-4 AIR SPARGING	SC-5 BIODEGRADATION	SC-6 ON-SITE INCINERATION	SC-7 THERMAL STRIPPING
A. OVERALL PROTECTION OF HUMAN HEALTH AND ENVIRONMENT	The fence would control dermal contact with soil risks. Off-site migration would continue as contaminants migrate from the till to the bedrock aquifer.	The cap would reduce the risk of migration of contaminants into the bedrock aquifer. Off-site migration would continue as contaminants move from the till to the bedrock aquifer.	Continued migration of contaminants into the deep bedrock aquifer would be eliminated.	Continued migration of contaminants into the deep bedrock aquifer would be eliminated.	Continued migration of contaminants into the deep bedrock aquifer would be eliminated.	Contamination remaining beneath the facility and paint shed would result in the continued migration of contaminants to the deep bedrock aquifer.	Contamination remaining beneath the facility and paint shed would results in the continued migration of contaminants to the deep bedrock aquifer.
B. COMPLIANCE WITH ARARS	Chemical-specific ARARs for groundwater would be met within 500 years. There are no action-specific ARARs for this alternative.	Chemical-specific ARARs for groundwater would be met within 500 years. This alternative would not meet the action-specific ARARs for containment since the waste under the building would not be capped.	Chemical-specific ARARs for groundwater would be met within 35 years. This technology would comply with all the action- and location-specific ARARs.	Chemical-specific ARARs for groundwater would be met within 35 years. This technology would comply with all the action- and location-specific ARARs.	Chemical-specific ARARs for groundwater would be met within 35 years. This technology would comply with all the action- and location-specific ARARs.	Chemical-specific ARARs for groundwater would be met within 35 years. Action-specific ARARs pertaining to land disposal restrictions will be met through treatment to BDAT levels or through a treatability variance. This technology will meet all other action- and location-specific ARARs.	Chemical-specific ARARs for groundwater would be met within 35 years. Action-specific ARARs pertaining to land disposal restrictions will be met through treatment to BDAT levels or through a treatability variance. This technology will meet all other action- and location-specific ARARs.

TABLE 11
(CONTINUED)
SUMMARY-SOURCE CONTROL ALTERNATIVES
LINEMASTER SWITCH CORPORATION

CRITERIA	SC-1 NO ACTION	SC-2 CONTAINMENT	SC-3 VACUUM EXTRACTION	SC-4 AIR SPARGING	SC-5 BIODEGRADATION	SC-6 ON-SITE INCINERATION	SC-7 THERMAL STRIPPING
C. LONG-TERM EFFECTIVENESS AND PERMANENCE							
1) Magnitude of Residual Risk.	Risks would remain as present.	Contaminant migration from the till into the groundwater would continue but a lower rate.	Residual risk would be reduced permanently through treatment. Treated soil and groundwater should pose no risk provided no toxic and intermediate products result.	Residual risk would be reduced permanently through treatment. Treated soil would pose no risk provided sufficient communication can be achieved between injection and extraction wells.	Residual risk may be reduced permanently through treatment. Treated soil and groundwater would pose no risk provided no toxic intermediate products result.	Soil not excavated under the factory and paint shed would continue to pose a risk to the groundwater due to the continued vertical migration of contaminants.	Soil not excavated under the factory and paint shed would continue to pose a risk to the groundwater due to the continued vertical migration of contaminants.
2) Adequacy of Controls	The fences combined with normal facility security will prevent unauthorized entry.	The multi-layer cap would reduce the risk of continued migration of contaminants to the deep bedrock. Periodic inspection would be required to insure integrity of the cap. Long-term institutional controls would be required to prevent future development.	Vacuum extraction would mitigate the continued migration of contaminants into the deep bedrock aquifer.	Air sparging would mitigate the continued release of contaminants to the deep bedrock aquifer.	Biodegradation would mitigate the continued release of contaminants to the deep bedrock aquifer. Short and long-term monitoring would be required to assess the effectiveness of treatment and verify the lack of undesirable by-products.	Incineration would mitigate the migration of contaminants in areas other than under the building and paint shed. Long-term monitoring would be required to determine the impact of the contamination remaining under the structures.	Thermal stripping would mitigate the migration of contaminants in areas other than under the building and paint shed long term monitoring would be required to determine the impact of the contamination remaining under the structures.

TABLE 11
(CONTINUED)
SUMMARY-SOURCE CONTROL ALTERNATIVES
LINEMASTER SWITCH CORPORATION

CRITERIA	SC-1 NO ACTION	SC-2 CONTAINMENT	SC-3 VACUUM EXTRACTION	SC-4 AIR SPARGING	SC-5 BIODEGRADATION	SC-6 ON-SITE INCINERATION	SC-7 THERMAL STRIPPING
Reliability of Controls	Relies solely on the fence and institutional controls. Fence would require replacement in 15 years. Soils would continue to pose a risk to the groundwater	Cap would be anticipated to remain intact for 30 years. Subsequently, the integrity of the cap would have to be evaluated more frequently. Vertical migration of contaminants would be reduced, long-term monitoring would be necessary.	Vacuum extraction would result in a permanent solution. After treatment is completed, no further controls would be necessary.	Air sparging would result in a permanent solution. After treatment is completed, no further controls would be necessary.	Biodegradation would result in a permanent solution. Continued monitoring would be required to monitor the organic matrix.	Incineration would result in a permanent solution for the excavated soils. Soils beneath the facility would not be treated and long-term monitoring would be required.	Thermal stripping would be a permanent technology for excavated soils. Soils beneath the facility would not be treated and long-term monitoring would be required.
D. REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT							
1) Treatment or Recycling Processes and the Materials Treated.	None	None	Removal of VOCs from soil and groundwater through the extracted air stream and carbon filters.	Removal of VOCs from soil and groundwater through the extracted air stream and carbon filters.	Conversion of the VOCs in the groundwater through bacterial action.	Destruction of VOCs in the excavated soil.	Destruction of VOCs in the excavated soil.
2) Amount of Hazardous Substances Destroyed, Treated, or Recycled.	None	None	Reduce level of VOCs to concentration necessary to achieve drinking water standards in groundwater.	Reduce level of VOCs to concentration necessary to achieve drinking water standards in groundwater.	Reduce level of VOC's to concentration necessary to achieve drinking water standards in groundwater.	Complete removal of VOCs in soils except for the soil underneath the buildings (approx. 38% remaining).	Complete removal of VOCs in soils except for the soil underneath the buildings (approx. 38% remaining).
3) Degree of Expected Reduction in Toxicity, Mobility, or Volume.	No reduction in toxicity, mobility, or volume.	Slight reduction in mobility. No reduction in toxicity or volume.	Complete reduction in toxicity, mobility and volume.	Complete reduction in toxicity, mobility and volume.	Complete reduction in toxicity, mobility and volume.	Major reduction in volume. Soil remaining, under the building would not be affected.	Major reduction in volume. Soil remaining under the building would not be affected.

TABLE 11
(CONTINUED)
SUMMARY-SOURCE CONTROL ALTERNATIVES
LINEMASTER SWITCH CORPORATION

CRITERIA	SC-1 NO ACTION	SC-2 CONTAINMENT	SC-3 VACUUM EXTRACTION	SC-4 AIR SPARGING	SC-5 BIODEGRADATION	SC-6 ON-SITE INCINERATION	SC-7 THERMAL STRIPPING
4) Degree to Which Treatment is Irreversible	Not applicable	Not applicable	Completely irreversible	Completely irreversible	Completely irreversible	Completely irreversible	Completely irreversible
5) Type and Quantity of Residuals that Will Remain	No reduction of original contaminants	No reduction of original contaminants	No residuals	No residuals	Potential for degradation to vinyl chloride to occur.	Contaminants would remain underneath buildings and would continue to migrate into the deep bedrock aquifer.	Contaminants would remain underneath buildings and would continue to migrate into the deep bedrock aquifer.
6) Degree to Which Treatment Reduces the Inherent Hazards at the Site.	No treatment	No treatment	High reduction in hazards. Source of groundwater contamination significantly reduced	High reduction in hazards. Source of groundwater contamination significantly reduced	High reduction in hazards of current contaminant mix. Source of groundwater contamination significantly reduced	High reduction in hazards for soil that is excavated. Migration hazard would remain with soil under the building.	High reduction in hazards for soil that is excavated. Migration hazard would remain with soil under the building.
E. SHORT-TERM EFFECTIVENESS							
1) Short-Term Risks to Community During Remedial Action.	No additional increase over present risks would be posed.	Dust generated during construction could pose an increased risk via inhalation. Risk would be minimal because little contaminated soil would be excavated.	Little risk to the public would result from the installation of extraction wells.	Little risk to the public would result from the installation of wells. There could be a slight potential of exposure to employees from the escape of vapors sparged from the ground.	Little risk to the public would result from the installation of wells. There would be potential for migration of injected microorganisms into the deep bedrock aquifer.	Excavation would generate significant air-born dust concentrations. Dust would be suppressed by water or chemical application. Potential air impacts from incinerator would be controlled by emissions control devices.	Excavation would generate significant air-born dust concentrations. Dust would be suppressed by water or chemical application. Potential air impacts from thermal stripper would be controlled by emissions control devices.
2) Potential Impacts on Workers During Remedial Action.	No increase over present risks would be posed.	Personal protective equipment would control dermal and inhalation exposure pathways.	Personal protective equipment would control dermal and inhalation exposure pathways.	Personal protective equipment would control dermal and inhalation exposure pathways.	Personal protective equipment would control dermal and inhalation exposure pathways.	Personal protective equipment would control dermal and inhalation exposure pathways.	Personal protective equipment would control dermal and inhalation exposure pathways.

TABLE 11
(CONTINUED)
SUMMARY-SOURCE CONTROL ALTERNATIVES
LINEMASTER SWITCH CORPORATION

CRITERIA	SC-1 NO ACTION	SC-2 CONTAINMENT	SC-3 VACUUM EXTRACTION	SC-4 AIR SPARGING	SC-5 BIODEGRADATION	SC-6 ON-SITE INCINERATION	SC-7 THERMAL STRIPPING
3) Environmental Impacts.	Contaminants would continue to be released to the environment via vertical groundwater migration.	Not a reliable method to control off-site migration of contaminants. VOCs would continue to be released to the environment via vertical groundwater migration though the rate would be reduced.	Contaminant migration, both horizontally and into the deep bedrock aquifer, would be mitigated. Contaminated soil removed during well installations would be disposed of off-site. Contaminated groundwater collected would be treated in the existing on-site system.	Contaminant migration, both horizontally and into the deep bedrock aquifer, would be mitigated. Contaminated soil removed during well installations would be disposed of off-site. Contaminated groundwater collected would be treated in the existing on-site system.	Contaminant migration, both horizontally and into the deep bedrock aquifer, would be mitigated. Contaminated soil removed during well installations would be disposed of off-site. Contaminated groundwater collected would be treated in the existing on-site system.	Although much of the contaminated soil would be remediated, the soil under the building would continue to release contaminants to the groundwater. Stockpiled soil would be covered to minimize contact with the elements.	Although much of the contaminated soil would be remediated, the soil under the building would continue to release contaminants to the groundwater. Stockpiled soil would be covered to minimize contact with the elements.
4) Time Until Protection is Achieved.	Fence construction would be completed in 2-3 months.	Design and construction could be completed in approximately 12 months.	Design and construction would require 12-18 months including completion of on-site pilot testing. Mitigation would take 3 to 10 years. This includes operation of the system on a 2 month on and 1 month off schedule.	Design and construction would require 12-18 months including completion of on-site pilot testing. Mitigation would take 3 to 10 years. This includes operation of the system on a 2 month on and 1 month off schedule.	Design and construction would require 16-28 months including pilot testing. Due to the uncertainty with the effectiveness of the dispersion of microorganisms and the lack of data on aerobic biodegradation of TCE, the duration of the remedial activities is difficult to predict but is estimated to take between 1 to 10 years.	Site design and preparation would require 6 months. Mitigation would take 20-23 months. This allows time for mobilization, trial burn, treatment and site restoration.	Site design and preparation would require 6 months. Mitigation would take 5-6 years. This allows time for mobilization, low volume testing, treatment, and site restoration.

TABLE 11
(CONTINUED)
SUMMARY-SOURCE CONTROL ALTERNATIVES
LINEMASTER SWITCH CORPORATION

CRITERIA	SC-1 NO ACTION	SC-2 CONTAINMENT	SC-3 VACUUM EXTRACTION	SC-4 AIR SPARGING	SC-5 BIODEGRADATION	SC-6 ON-SITE INCINERATION	SC-7 THERMAL STRIPPING
F. IMPLEMENTABILITY							
1) Technical Feasibility	Fence installation is a simple task with readily available materials.	Cap installation would require of standard construction activities.	Vacuum extraction is a commonly used technology. Materials and equipment are readily available. Installation of the wells and collection system in the factory will require coordination	Although not a commonly used technology in this type of application, the materials and equipment to construct the air sparging system are readily available. Installation of the wells and collection system in the factory will require coordination.	The technology is not well developed to treat chlorinated hydrocarbons. Considerable bench-scale and pilot-scale testing would be required. Installation of the wells and distribution system and control of the injected materials would require coordination and intensive monitoring.	Treatment would require mobilization of specialized equipment. Technology is demonstrated. Stack monitoring would be necessary. Refilling and grading would have to be coordinated with excavation.	Treatment would require mobilization of specialized equipment. Technology is becoming more available. Exhaust gas monitoring would be necessary. Refilling and grading would have to be coordinated with excavation.
2) Administrative Feasibility	No permits required.	No permits required.	No permits required.	No permits required.	No permits required.	No permits required.	No permits required.
3) Availability of Services and Materials	Services and materials would be available locally.	Services and materials would be available locally.	Services and materials would be available locally.	Services and materials would be available locally.	Injection and extraction materials would be available locally. Specialized expertise would be required to develop the microorganisms. Pilot testing would be required to develop liquid flow rates.	Services and materials may be available locally depending on the demand for a limited supply of specialized equipment.	Specialized services and materials are not available locally, but there are several contractors in the eastern part of the country.

TABLE 11
(CONTINUED)
SUMMARY-SOURCE CONTROL ALTERNATIVES
LINEMASTER SWITCH CORPORATION

CRITERIA	SC-1 NO ACTION	SC-2 CONTAINMENT	SC-3 VACUUM EXTRACTION	SC-4 AIR SPARGING	SC-5 BIODEGRADATION	SC-6 ON-SITE INCINERATION	SC-7 THERMAL STRIPPING
G. COST							
1) Capital Cost	$34,500	$429,000	$446,000	$695,000	$394,000	$13,588,000	$7,338,000
2) Total O&M Costs (Net Present Value)	$1,409,000	$1,409,000	$784,000	$834,000	$1,122,000	$322,000	$447,000
3) Total Net Present Value	$1,443,500	$1,838,000	$1,230,000	$1,529,000	$1,516,000	$13,910,000	$7,785,000
H. STATE ACCEPTANCE	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.
I. COMMUNITY ACCEPTANCE	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.

TABLE 12
MIGRATION MANAGEMENT SUMMARY TABLE
LINEMASTER SWITCH CORPORATION

CRITERIA	MM-1 NO ACTION	MM-4 AIR STRIPPING	MM-5 UV/OXIDATION
A. OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	Groundwater migration off the site would continue affecting abutter' wells. Public health exposure to contaminated groundwater would be a chronic risk.	Control of groundwater migration off the site would be achieved and treated water would be discharged to the on-site pond. Management of migration will reduce the potential for off-site contamination.	Control of groundwater migration off the site would be achieved and treated water would be discharged to the on-site pond. Management of migration will reduce the potential for off-site contamination. VOCs would be destroyed by the UV/Oxidation system.
B. COMPLIANCE WITH ARARs	SDWA and CT drinking water quality and groundwater quality standards would be met within 500 years.	SDWA and CT drinking water quality and groundwater quality standards will be met within 35 years.	SDWA and CT drinking water quality and groundwater quality standards will be met within 35 years.
C. LONG-TERM EFFECTIVENESS AND PERMANENCE 1) Magnitude of Residual Risk	Baseline public health and environmental risk would remain as at present. Only natural attenuation would occur.	Control of the flow of contaminants would minimize the risk. Groundwater would be restored to drinking water standards and would not pose a residual risk.	Control of the flow of contaminants would minimize the risk. Groundwater would be restored to drinking water standards and would not pose a residual risk.

TABLE 12
(CONTINUED)
MIGRATION MANAGEMENT SUMMARY TABLE
LINEMASTER SWITCH CORPORATION

CRITERIA	MM-1 NO ACTION	MM-4 AIR STRIPPING	MM-5 UV/OXIDATION
2) Adequacy of Controls.	No Action will have no effect on controlling the groundwater transport of contaminants off the site. No Action would rely on institutional controls to restrict well installation and/or provide individual treatment units.	Groundwater pumping has created an area of control especially in the north and east portion of the Site. Additional wells could be added if additional control is required. The system has controlled the migration of contaminants off the Site.	Groundwater pumping had created an area of control especially in the north and east portion of the site. Additional wells could be added if additional control is required. The system has controlled migration of contaminants off the site.
Reliability of Controls.	No Action would result in the continued migration of contaminants off the site.	The collection and treatment systems would have limited service lives. Pumps would required replacement every five years, while major components would be expected to last 10 to 15 years. None of the equipment would be difficult to replace.	The collection and treatment systems would have limited service lives. Lamp replacement would be frequent. Pumps would required replacement every five years, while major components would be expected to last 10 to 15 years. None of the equipment would be difficult to replace.
D. REDUCTION OF TOXICITY, MOBILITY OR VOLUME			
1) Treatment or Recycling Processes and the Materials Treated.	None	Removal and destruction of VOCs in groundwater by air stripping and carbon adsorption.	Removal and destruction of VOCs in groundwater. By UV/Oxidation and carbon filters.
2) Amount of Hazardous Substances Destroyed, Treated, or Recycled.	None	Reduce concentration of VOCs below drinking water standards	Reduce concentration of VOCs below drinking water standards.

TABLE 12
(CONTINUED)
MIGRATION MANAGEMENT SUMMARY TABLE
LINEMASTER SWITCH CORPORATION

CRITERIA	MM-1 NO ACTION	MM-4 AIR STRIPPINGR	MM-5 UV/OXIDATION
3) Degree of Expected Reduction in Toxicity, Mobility, or Volume Through Treatment.	No reduction in toxicity, mobility, or volume through treatment.	High level of reduction in toxicity, mobility and volume of VOCs in groundwater. VOCs would be destroyed.	High level of reduction in toxicity, mobility and volume of VOCs in groundwater. VOCs would be destroyed.
4) Degree to Which Treatment is Irreversible.	Not applicable. No treatment.	The treatment process is completely irreversible. It does not, however, preclude the inclusion of other technologies.	The treatment process is completely irreversible. It does not, however, preclude the inclusion of other technologies.
5) Type and Quantity of Residuals that Will Remain.	Not applicable. No treatment.	VOCs collected in the carbon filters would require destruction by off-site regeneration.	VOCs not oxidized would be collected by the carbon filters, which then would require off-site regeneration.
6) Degree to Which Treatment Reduces the Inherent Hazards at the Site.	Not applicable. No treatment.	Significantly reduces the potential for contact with contaminated groundwater.	Significantly reduces the potential for contact with contaminated groundwater.
E. SHORT-TERM EFFECTIVENESS			
1) Short-Term Risks to the Community During Remedial Action.	There would be a continuing threat to off-site water supply wells.	Construction of the emission controls would present no risks to the community.	Additional construction would involve equipment installation only which would present no risk to the community.

TABLE 12
(CONTINUED)
MIGRATION MANAGEMENT SUMMARY TABLE
LINEMASTER SWITCH CORPORATION

CRITERIA	MM-1 NO ACTION	MM-4 AIR STRIPPING	MM-5 UV/OXIDATION
2) Protection of Workers During Remedial Action.	Not applicable. No additional increase over present risks would be posed.	Construction of emission controls would pose minimal risk to workers. Workers would be trained in health and safety procedures and would use proper protective equipment.	Workers would be trained in health and safety procedures and would use proper personal protective equipment against dermal and inhalation exposure pathways.
3) Environmental Impacts.	Contaminants would continue to migrate off the site in the bedrock aquifer.	The groundwater environment would benefit. No negative environmental impacts would be anticipated.	The groundwater environment would benefit. No negative environmental impacts would be anticipated.
4) Time Until Protection is Achieved.	Minimum natural remediation time for the bedrock aquifer would be approximately 500 years.	Approximately 6 months would be required to construct the emission control system. At the current rate of VOC removal, remediation of the deep bedrock aquifer would be achieved in approximately 35 years.	Approximately 8-12 months would be required to evaluate equipment, design the system and complete construction. At the current rate of VOC removal, remediation of the deep bedrock aquifer would be achieved in approximately 35 years.
F. IMPLEMENTABILITY			
1) Technical Feasibility.	No equipment would be required.	The existing groundwater collection system appears to be functioning well and can be easily upgraded if necessary. The treatment technology is well proven and has been effective in removing contaminants.	The existing groundwater collection system appears to be functioning well and can be easily upgraded if necessary. UV/Oxidation is a relatively new technology. Pilot testing may be necessary to develop design parameters.

TABLE 12
(CONTINUED)
MIGRATION MANAGEMENT SUMMARY TABLE
LINEMASTER SWITCH CORPORATION

CRITERIA	MM-1 NO ACTION	MM-4 AIR STRIPPING	MM-5 UV/OXIDATION
2) Administrative Feasibility.	No permits would be required. Institutional controls would have to be coordinated with the Town of Woodstock and the State of Connecticut.	No permits would be required. Agreements may have to be negotiated with abutters to allow periodic monitoring to assess the effectiveness of the extraction well network.	Although new equipment would be installed, no permits would be required. Agreements may have to be negotiated with abutters to permit periodic monitoring to assess the effectiveness of the extraction well network.
3) Availability of Services and Materials.	Groundwater sampling would continue to be performed.	The existing system is functioning to meet all discharge requirements. No off-site support currently is required.	Services and materials are readily available.
G. COST			
1) Total Capital Cost	$34,500	$70,000[1]	$191,900
2) Total O&M Cost (Net Present Value)	$1,364,000	$1,949,000	$2,738,500
3) Total Net Present Value	$1,398,500	$2,738,500	$2,930,400

1 Represents only the cost of installing air emission controls. The estimated captial cost for installation and construction of the groundwater containment system and air stripper was $545,510.

TABLE 12
(CONTINUED)
MIGRATION MANAGEMENT SUMMARY TABLE
LINEMASTER SWITCH CORPORATION

CRITERIA	MM-1 NO ACTION	MM-4 AIR STRIPPING	MM-5 UV/OXIDATION
H. STATE ACCEPTANCE	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.
I. COMMUNITY ACCEPTANCE	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.	Detailed comments and responses available in Appendix C of ROD.

TABLE 13
CHEMICAL-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
GROUNDWATER				
Federal Requirements	SDWA-Maximum Contaminant Levels (MCLs) (40 CFR 141.11-141.16)	Relevant and Appropriate	MCLs have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in drinking water supplies. In this case, MCLs are considered relevant and appropriate for groundwater because an aquifer at the site is used for drinking water and is a potential source of drinking water.	The risks to human health due to consumption of groundwater were assessed and concentrations of concern are compared to the MCLs. The selected remedy must attain MCLs.
	RCRA - Groundwater Protection Standard (40 CFR 264.94)	Relevant and Appropriate	The RCRA groundwater protection standard is established from groundwater monitoring of RCRA permitted treatment, storage or disposal facilities. The standard is set at either an existing or proposed RCRA-MCL, background concentration, or an alternate concentration protective of human health and the environment.	RCRA-MCLs may be used or ACLs may be developed at the site to identify levels of contamination above which human health or the environment is at risk and provide an indicator when corrective action is necessary.
State Requirements	Connecticut Standards for Quality of Public Drinking Water (Section 19-13-8102 of CT Regulations of State Agencies)	Relevant and Appropriate	Connecticut has adopted the SDWA MCLs to regulate concentrations of contaminants in public drinking water supplies. Connecticut standards are more stringent than SDWA MCL for some compounds.	Promulgated State standards are used as clean-up levels when more stringent than Federal requirements.
	Connecticut Water Quality Standards (Section 22a-426) Subpart IV - Groundwater	Applicable	Connecticut has adopted the SDWA MCLs to regulate contaminants in certain groundwater.	State standards for TCE and other constituents are exceeded in the groundwater at the site. Promulgated State standards are used as clean-up levels when more stringent than Federal requirements.

TABLE 13
(CONTINUED)
CHEMICAL-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
Federal Criteria Advisories and Guidance	EPA Risk Reference Doses (RfDs)	To Be Considered	RfD's are dose levels developed by EPA for noncarcinogenic effects.	EPA RfDs are used to characterize risks due to exposure to contaminants in groundwater, as well as other media.
	EPA Carcinogen Assessment Group Potency Factors	To Be Considered	EPA Carcinogenic Potency Factors are used to compute the individual incremental cancer risk resulting from exposure to carcinogens.	These factors are used to assess health risks from carcinogens present at the site.
	EPA Health Advisories and Acceptable Intake Health Assessment Documents.	To Be Considered	Intended for use in qualitative public health evaluation of remedial alternatives.	Used, if adequate data exist in assessing health risks from ingesting groundwater at the site.
	EPA Groundwater Protection Strategy	To Be Considered	Provides classification and restoration goals of groundwater based on its vulnerability, use, and value.	This strategy is considered in conjunction with the Federal SDWA and Connecticut Water Quality Standards.
	SDWA Maximum Contaminant Level Goals (MCLGs) (40 CFR 141.50 and .51)	Relevant and Appropriate (for non-zero MCLGs), otherwise To Be Considered	MCLGs are health-based limits and do not consider cost or feasibility. As health goals, MCLGs are established at levels at which no known or anticipated adverse effects on the health of persons occur and which allow for an adequate margin of safety.	Non-zero MCLGs must be attained. Zero MCLGs will be considered in assessing health risks.
	Ambient Water Quality Criteria (AWQC)	To Be Considered	AWQC are health based criteria that have been developed for 95 carcinogenic and noncarcinogenic compounds.	AWQC can be used to characterize health risks due to contaminant concentrations in drinking water.

TABLE 13
(CONTINUED)
CHEMICAL-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
SURFACE WATER				
Federal Criteria, Advisories and Guidance	Ambient Water Quality Criteria	To Be Considered	AWQC are health-based criteria that have been developed for 95 carcinogenic and noncarcinogenic compounds	AWQC can be used to characterize human health risks associated with either ingestion of water or consumption of aquatic organisms and to set surface water discharge limits. Because the surface water at this site is not used as a drinking water sources, the AWQC is developed to protect aquatic organisms from contaminant exposure and to protect human health from consuming contaminated biota.
Connecticut Regulatory Requirements	Water Quality Standards and Classifications	Applicable	These standards provide criteria for classifying and maintaining the quality of groundwater and surface water	Chemicals released to surface water and groundwater must not degrade the designated quality of the water.
AIR				
Federal Requirements	CAA-State Implementation Plan Emission Standards	Relevant and Appropriate	Emission standards designed to attain National Ambient Air Quality Standards	State Implementation Plan requirements are enforceable ARARs and must be attained.
	CAA-National Emission Standards for Hazardous Air Pollutants (40 CFR 61)	Relevant and Appropriate	Emission Standards for Hazardous Air Pollutants are those for which no air quality standards exist.	These standards would control the air discharge from air strippers or similar types of treatment.
Connecticut Regulatory Requirements	Air Pollution Control Regulations (22a-174-29 and 174-3)	Relevant and Appropriate	Standards were developed primarily to regulate stack emissions.	Excavation and emission controls for soils treatment and emissions from groundwater treatment systems must attain this ARAR.

TABLE 14
LOCATION-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
WETLANDS/FLOODPLAIN				
Federal Requirements	None	None	None	There are no areas of the site within the floodplains. No activities are contemplated that will take place in or affect wetlands.
State Requirements	None	None	None	There are no areas of the site within the floodplains. No activities are contemplated that will take place in or affect wetlands.

TABLE 15
ACTION-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
GROUNDWATER				
Federal Requirements	RCRA Facility Standards. (40 CFR 264)	Relevant and Appropriate	Facility standards specify design, groundwater monitoring, and closure, and post closure care for specific types of facilities.	The selected remedy must conform, to the extent feasible, to the governing technical standards. A groundwater monitoring program must be implemented pursuant to these regulations.
	RCRA - General Facility Standards (40 CFR 264.10 - 264.18).	Relevant and Appropriate	General facility requirements outline general waste analysis, security measures, inspections, and training requirements.	Any facility will be constructed, fenced, posted and operated in accordance with this requirement. All workers will be properly trained. Process wastes will be evaluated for the characteristics of hazardous wastes to assess further handling requirements.
	RCRA - Preparedness and Prevention (CFR 264.30 - 264.31)	Relevant and Appropriate	Outlines requirements for safety equipment and spill control.	Safety and communication equipment will be maintained at the site. Local authorities will be familiarized with the site operations.
	RCRA - Contingency Plan and Emergency Procedures (40 CFR 264.50 - 264.56).	Relevant and Appropriate	Outlines requirements for emergency procedures to be used following explosions, fires, etc.	Plans will be developed and implemented during site work including installation of monitoring wells and implementation of site remedies. Copies of the plans will be kept on-site.

TABLE 15
(CONTINUED)
ACTION-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
GROUNDWATER				
Federal Requirements	RCRA - Manifesting, Recordkeeping, and Reporting (40 CFR 264.70 - 264.77).	Relevant and Appropriate	Specifies the record keeping and reporting requirements for RCRA facilities.	Records of facility activities will be developed and maintained during remedial actions.
	RCRA - Releases from Solid Waste Management Units (40 CFR 264.90 - 264.109).	Relevant and Appropriate	Details requirements for responses to releases from Solid Waste Management Units.	A groundwater program will be developed in accordance with the requirements.
	RCRA - Closure and Post-Closure (40 CFR 264.110 - 264.120).	Relevant and Appropriate	Details specific requirements for closure and post-closure of hazardous waste facilities.	Those parts of the regulation concerned with long-term monitoring and maintenance of the site will be incorporated into the design.
	RCRA - Surface Impoundments (40 CFR 264.220 - 264.249).	Relevant and Appropriate	Details the design, construction, operation, monitoring, inspection, and contingency plans for a RCRA surface impoundment. Also provides three closure options for CERCLA sites; clean closure, containment closure, and alternate closure.	Action will comply with clean closure requirements.
	CWA - National Pollutant Discharge Elimination System (NPDES) (40 CFR 122, 125).	Applicable	Any point-source discharge must meet NPDES requirements which include compliance with corresponding water quality standards; establishment of a discharge monitoring system; and completion of regular discharge monitoring records.	Groundwater treated on-site and discharged to a surface water will need to comply with the water quality standards established by the state.

TABLE 15
(CONTINUED)
ACTION-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
AIR				
Federal Requirements	RCRA 40 CFR 264 Subpart AA, Air Emission Standards for Process Vents.	Relevant and Appropriate	Regulates facilities that have operations involving air emissions above particular levels, where appropriate.	The selected remedy, because it will have air emissions, must conform to these requirements.
	RCRA 40 CFR 264 Subpart BB, Air Emission Standards for Equipment Leaks.	Relevant and Appropriate	Requirements governing response to equipment leaks at facilities that may cause air emissions.	If during implementation of selected remedy, equipment leaks occur the response must be in conformance with this Subpart.
	OSWER Directive 9355.0-28, Air Stripper Control Guidance.	To Be Considered	Guidance regarding use of air emission controls at CERCLA sites.	The selected remedy should address this guidance.

TABLE 15
(CONTINUED)
ACTION-SPECIFIC ARARs and TBCs
FOR THE SELECTED REMEDY
LINEMASTER SWITCH CORPORATION
WOODSTOCK, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE ROD
GROUNDWATER				
Connecticut Requirements	Water Quality Standards (22a-426)	Relevant and Appropriate	Reasonable controls or best management practices (BMP) may be required on a case-by-case basis.	If reasonable controls or BMP is required, treatment facility and discharges must meet these requirements.
	Water Pollution Control (22a-430).	Applicable	Contains regulations regarding discharge requirements.	Liquid discharges will need to comply with these regulations.
	Discharge Permit Regulations (22a-430)	Relevant and Appropriate	These requirements supplement the CWA NPDES requirements.	Groundwater treated on-site and discharged to a surface water will need to comply with the water quality standards and complete routine monitoring and recordkeeping activities.

TABLE 16: INTERIM GROUNDWATER CLEANUP LEVELS

Carcinogenic Contaminants of Concern (class)	Interim Cleanup Level(ug/L)	Basis	Level of Risk
arsenic (A)	50	MCL	1.1E-04
benzene (A)	5	MCL	1.7E-06
beryllium (B2)	4	MCL	2.1E-04
carbon tetrachloride (B2)	5	MCL	7.8E-06
chloroform (B2)	100	MCL	7.3E-06
chloromethane (C)	6.5	RB*	1.0E-06
1,2-dichloroethane (B2)	5	MCL	5.5E-06
1,1-dichloroethene (C)	7	MCL	5.0E-05
dichloromethane (B2)	5	MCL	4.5E-07
1,2-dichloropropane (B2)	5	MCL	4.1E-06
tetrachloroethene	5	MCL	3.0E-06
1,1,2-trichloroethane (C)	5	MCL	3.4E-06
trichloroethene (B2)	5	MCL	6.6E-07
vinyl chloride (A)	2	MCL	4.6E-05
		SUM	4.5E-04

* Derived from a risk-based equation using USEPA standard default exposure parameters assuming a residential use of groundwater.

Non-carcinogenic Contaminants of Concern (class)	Interim Cleanup Level(ug/L)	Basis	Target Endpoint of Toxicity	Hazard Quotient
acetone (D)	3700	HQ	liver/kidney	1
cadmium (D)	5	MCL	kidney	0.3
1,2-dichloroethene (cis)(D)	70	MCL	blood	0.2
2-hexanone	1500	HQ	liver/kidney	1
methylethylketone (D)	1800	HQ	none observed	1
1,1,1-trichloroethane (D)	200	MCL	liver	0.06
toluene (D)	1000	MCL	liver/kidney	0.1
			HI liver/kidney	2.4
			HI blood	0.2

TABLE 17: SOIL CLEANUP LEVELS FOR THE PROTECTION OF HUMAN HEALTH AND THE AQUIFER BASED ON THE SUMMER'S MODEL

Carcinogenic Contaminants of Concern (class)	Soil Cleanup Level (µg/kg)	Basis for Model Input	Residual Groundwater Risk
1,2-Dichloroethane(B2)	4.0	MCL	5.5 E-06
Dichloromethane(B2)	3.0	MCL	4.5 E-07
Tetrachloroethene	10.0	MCL	3.0 E-06
Trichloroethene(B2)	5.0	MCL	6.6 E-07

Non-carcinogenic Contaminants of Concern (class)	Soil Cleanup Level (µg/kg)	Basis for Model Input	Target Endpoint of Tox.	Residual Groundwater Hazard Quot.
cis-1,2-Dichloroethene(D)	50	MCL	blood	0.2
Toluene(D)	1000	MCL	liver/kidney	0.1
1,1,1-Trichloroethane(D)	300	MCL	liver	0.06
Xylenes	100	MCL	dec. body wt.	0.001

APPENDIX C

RECORD OF DECISION
LINEMASTER SWITCH CORPORATION SUPERFUND SITE

RESPONSIVENESS SUMMARY

United States
Environmental Protection Agency
Region I

S U P E R F U N D

Responsiveness Summary
Linemaster Switch Corporation Site
Woodstock, Connecticut

July 21, 1993

Linemaster Switch Corporation Superfund Site
Responsiveness Summary

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PREFACE

The United States Environmental Protection Agency (EPA) held a 30 day public comment period from April 15, 1993 through May 14, 1993 to provide an opportunity for interested parties to comment on the Remedial Investigation (RI), Feasibility Study (FS), Feasibility Study Addendum, the Proposed Plan and other documents developed for the Linemaster Switch Corporation Superfund Site in Woodstock, Connecticut. The Feasibility Study and Feasibility Study Addendum examined and evaluated various remedial alternatives for addressing soil and groundwater contamination at the Site. EPA identified its preferred alternative for addressing soil and groundwater contamination in the Proposed Plan issued on April 14, 1993. All documents for the Site were placed in the Administrative Record for review. The Administrative Record is a collection of all the documents considered by EPA to choose the remedy for the Site. It was made available at the EPA Records Center at 90 Canal Street in Boston, Massachusetts and at the Bracken Library on Academy Road in Woodstock, Connecticut prior to the public comment period.

The purpose of this Responsiveness Summary is to document EPA responses to the comments and questions raised during the public comment period on the FS, FS Addendum, Proposed Plan and other documents in the Administrative Record. EPA considered all of these questions and comments before selecting the final remedial alternative to address the soil and groundwater contamination at the Linemaster Switch Corporation Superfund Site in Woodstock, Connecticut.

This Responsiveness Summary is organized into the following sections:

I. **Overview of Remedial Alternatives Considered in the Feasibility Study, Feasibility Study Addendum and Proposed Plan, including the Preferred Alternative** -- This section briefly outlines the remedial alternatives evaluated in the FS, FS Addendum, and the Proposed Plan, including EPA's preferred alternative.

II. **Background on Community Involvement and Concerns** -- This section provides a brief history of community interests and concerns regarding the Site.

III. **Summary of Comments Received During the Public Comment Period and EPA Responses** -- This section summarizes and provides EPA responses to the oral and written comments received from the public during the public comment period. In Part A of this section, the comments received from the citizens are presented. Part B summarizes comments received from the State. Part C summarizes comments received from potentially responsible parties (PRPs). In addition, two attachments are included in this Responsiveness Summary. Attachment A provides a chronology of community relations activities at the Site. Attachment B contains a copy of the transcript from the informal public hearing held on May 5, 1993 in Woodstock, Connecticut. The comments submitted during the public comment period are available in the Administrative Record for the Linemaster Switch Corporation Site.

I. Overview of Remedial Alternatives Considered in the Feasibility Study, Feasibility Study Addendum and Proposed Plan, including the Preferred Alternative

Using the information gathered during the Remedial Investigation (RI), EPA identified several objectives for the cleanup of the Linemaster Switch Superfund Site. The primary cleanup objective is to reduce the risks to human health and the environment. The source control response had the following objectives: 1) to prevent or mitigate the continued release of hazardous substances to the groundwater and surface water; and, 2) to reduce the concentration of volatile organic compounds in the soil within the Zone 1 area. The management of migration response had the following objectives: 1) to eliminate or minimize the threat posed to human health and the environment by preventing exposure to groundwater contaminants; 2) to prevent further migration of contaminated groundwater beyond its current extent; and, 3) to restore contaminated groundwater to drinking water standards. Cleanup levels for groundwater and soil are set at levels that EPA considers to be protective of human health and the environment.

After identifying the cleanup objectives, EPA developed and evaluated potential cleanup alternatives, called remedial alternatives. The FS describes the remedial alternatives considered to address the contaminants of concern and the pathways in which they pose a threat. The FS also describes the criteria EPA used to narrow the range of alternatives to seven (7) potential source control (SC) remedial alternatives and three (3) potential management of migration (MM) alternatives.

The seven source control remedial alternatives considered are:

SC-1: No Action
SC-2: Containment
SC-3: Vacuum Extraction
SC-4: Vacuum Extraction With Enhancements
SC-5: In-Situ Biodegradation
SC-6: On-Site Incineration
SC-7: Thermal Stripping

The three management of migration remedial alternatives considered are:

MM-1: No Action
MM-4: Air Stripping
MM-5: Ultraviolet Oxidation

The preferred alternative selected by EPA to address Site contamination includes a combination of technologies to address contaminated soil and groundwater at the Site. The preferred soil contamination (source control) alternatives (SC-3 & SC-4) includes in-situ vacuum extraction of contaminated soil. EPA estimates that the soil cleanup levels will be achieved in three to ten years. SC-3 (Vacuum Extraction) was selected as the primary method to remove the VOCs from the Zone 1 area. However, after the vacuum extraction system has been operating for five years, EPA will evaluate the progress towards achieving the soil cleanup levels. If EPA determines that cleanup levels will not be achieved within ten years after the vacuum extraction system began operating, EPA will require enhancements (SC-4), such as air sparging, to the vacuum extraction system. In making this determination, EPA at a minimum will evaluate the results of soil borings taken from the Zone 1 area, and soil vapor samples taken on an ongoing basis during system operations.

The preferred management of migration alternative consists of two alternatives to treat the contaminated groundwater: Alternative MM-4 (Air Stripping) and Alternative MM-5 (Ultraviolet Oxidation). Both MM-4 (Air Stripping) and MM-5 (Ultraviolet Oxidation) are equally protective of human health and the environment, and both involve active restoration of the groundwater. Based on the cost estimates in the FS, Alternative MM-4 (Air Stripping) is more cost-effective than MM-5 (Ultraviolet Oxidation). Alternative MM-4 will therefore be implemented at the Site. If, however, cost estimates change over the course of time to the extent that EPA determines that the air stripping system is no longer as cost-effective as the ultraviolet oxidation system, Alternative MM-5 (Ultraviolet Oxidation) may be implemented in place of Alternative MM-4 (Air Stripping) at any time during the performance of the groundwater cleanup.

After a careful review of the comments made during the public comment period, EPA documented the selected remedy in the Record of Decision. A description of all of the remedial alternatives considered for implementation at this Site can be found in the Record of Decision summary, the Proposed Plan, the Feasibility Study and the Feasibility Study Addendum.

II. Background on Community Involvement and Concerns

The Linemaster Switch Corporation Site (the Site), is located on Plaine Hill Road in the Town of Woodstock, Connecticut. The Site is bounded on the north and east by Route 169, on the west by Plaine Hill Road and on the south by State Route 171. The Site consists of 90 acres of land, and is located on a hill.

Prior to 1952, the Site was used for residential purposes and small scale farming. Starting in 1952, the Linemaster Switch Corporation (Linemaster) began manufacturing foot operated switches at the Site. Currently, Linemaster manufactures electrical power switches, air valves, electrical cord sets and metal name plates at the Site. Linemaster's manufacturing building is located near the center the Site, and on its topographic high point.

The Site is surrounded mainly by residential property, with most of the nearby residences located to the northeast, east and southeast. All residences in the vicinity of the Site obtain their drinking water from individual bedrock and overburden wells.

As part of Linemaster's manufacturing operations, paint thinner, trichloroethene (TCE) and other chemicals were used at the Site. Paint thinner use began in 1952 for a spray painting operation. From 1969 through 1979, TCE was used for vapor degreasing operations. Reportedly, the estimated amount of TCE used between 1969 and 1979 was approximately 100 to 600 gallons per year. Of this amount, approximately 20 to 200 gallons per year were disposed of in a dry well located to the east of Linemaster's manufacturing building. The exact amount of TCE and other wastes discharged to the dry well is unknown.

In July 1980, the Connecticut Department of Environmental Protection (CT DEP) conducted a Site inspection of the facility pursuant to the Resource Conservation and Recovery Act (RCRA) and, in July 1984, it conducted a Preliminary Assessment pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Following a review of CT DEP's reports, EPA conducted Site investigations in December 1985 and February 1986. During both the CT DEP and EPA's investigations, groundwater samples were taken from Linemaster's production wells and several residential water-supply wells located near the Linemaster facility. Results of sampling and analysis indicated the presence of volatile organic compounds (VOCs), primarily TCE, at levels above the state and federal drinking water standards.

On April 8, 1986, the CT DEP issued an Abatement Order to Linemaster requiring the company to investigate the extent of groundwater, surface water and soil contamination, and to take actions necessary to minimize or eliminate the contamination. In February 1987, pursuant to the Abatement Order, Linemaster initiated investigations and thereafter began to design an Interim Removal Treatment System (IRTS) to address groundwater contamination.
On September 24, 1987, EPA and Linemaster signed an Administrative Order By Consent under which Linemaster agreed to perform a Site investigation and a drinking water well monitoring program, and to provide alternate water supplies, as necessary, in the vicinity of the Site.

In June 1989, pursuant to the CT DEP Abatement Order, Linemaster removed the former dry well. At that time, approximately 1,000 gallons of hazardous liquid were removed from the well and disposed at a licensed hazardous waste storage facility.

On February 15, 1990, EPA added the Linemaster Switch Corporation Site to the National Priorities List (NPL) making it eligible to receive federal Superfund monies for investigation and cleanup.

On September 30, 1991, EPA and Linemaster entered into a second Administrative Order By Consent under which Linemaster agreed to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Site under EPA supervision. In June 1992, pursuant to the CT DEP's Abatement Order, Linemaster implemented the Interim Removal Treatment System (IRTS). The IRTS extracts contaminated groundwater from six on-site bedrock wells. The contaminated groundwater is treated to drinking water standards using an air stripper followed by activated carbon and is discharged into an on-site pond. Currently the emissions from the air stripper discharge to the atmosphere untreated.

Linemaster hired a contractor to perform the RI/FS. In August 1992, Linemaster's contractor submitted the first draft of the RI/FS. In a letter dated September 29, 1992, the EPA provided comments on the first draft RI/FS to Linemaster. In December 1992, Linemaster's contractor submitted a revised draft RI/FS. In a letter dated March 31, 1993, EPA provided comments on the revised draft RI/FS to Linemaster. Linemaster's contractor responded to EPA's comments in a final addendum to the RI/FS, dated April 13, 1993.

Linemaster has been active in the remedy selection process for the Site. Technical comments presented by Linemaster during the public comment period have been included in the Administrative Record.

Throughout the Site's history, community concern and involvement has been minimal. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings.

In 1987, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed about and involved in activities conducted at the Site. On June 12, 1991, EPA held an informational meeting in the Woodstock Town Hall to describe the plans for the Remedial Investigation and Feasibility Study (RI/FS). While finalizing the RI/FS, EPA conducted interviews with local citizens and officials in February and March of 1993 and updated the community relations plan. The RI/FS, and final addendum to the RI/FS, were completed in April 1993. On April 1, 1993, EPA published a notice in a local newspaper announcing the availability of the final RI/FS and presenting a brief description of the Proposed Plan.

On April 14, 1993, EPA held an informational meeting in the Woodstock Town Hall to discuss the results of the Remedial Investigation, the cleanup alternatives presented in the Feasibility Study and the Agency's Proposed Plan for the remediation of the Site. Also during this meeting, the Agency answered questions from the public. EPA made the administrative record available for public review at EPA's offices in Boston and at the Bracken Library in Woodstock, Connecticut on April 15, 1993. From April 15, 1993 to May 14, 1993, the Agency held a thirty day public comment period to accept public comment on the alternatives presented in the Feasibility Study and the Proposed Plan and on any other documents previously released to the public.

On May 5, 1993, the Agency held a public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting is included in Attachment B of this responsiveness summary.

III. Summary of Comments Received During the Public Comment Period and EPA Responses

This Responsiveness Summary addresses comments received by EPA during the public comment period (April 15, 1993 to May 14, 1993) concerning the Feasibility Study, Feasibility Study Addendum, EPA's Proposed Plan and other documents in the Administrative Record for the Linemaster Switch Corporation Superfund Site. Written comments were received during the public comment period from CT DEP and Linemaster Switch Corporation. In addition, several citizens submitted oral comments at the informal public hearing on May 5, 1993. A copy of the public hearing transcript is included as Attachment B to this document.

A. Citizen Comments

Citizen Comment #1: A citizen commented on the amount of money already spent on the Linemaster Switch Superfund Site, $3.6 million, and the estimated four to five million dollars more needed to remediate the Site. The citizen did not understand the chosen remedial alternatives in the proposed plan and why the total Site remediation would cost eight to nine million dollars.

EPA Response #1: Information that explains the remedial options and that supports cost estimates for each alternative, is outlined in the Proposed Plan. Additional information regarding the remedial alternatives and cost information can be found in the Feasibility Study and the Feasibility Study Addendum, as well as in the Record of Decision. In addition, the ROD explains the past response actions that have been taken at the Site, including the performance of the Remedial Investigation/Feasibility Study.

Citizen Comment #2: A citizen who already has high levels of arsenic in her drinking water well was concerned that by adding additional monitoring wells to the Linemaster Site, the water flow could be diverted and arsenic levels may increase in residential drinking water wells. The citizen had borderline arsenic level readings and was concerned that changing water flow would increase her arsenic level and render her well inoperative.

EPA Response #2: Based on Site and local area background levels, arsenic is known to be a naturally occurring element. Based on the studies performed to date, EPA does not believe that diverting water flow would cause an increase in arsenic levels. As noted in the ROD, residential water-supply wells which receive water from the aquifer where the contamination plume (Figures 2 & 3, Appendix A) is located will continue to be monitored.

Citizen Comment #3: A citizen was concerned with the lack of water she was receiving from her well. She felt that ever since additional wells were installed at the Linemaster Site, the consistency, color and odor of her water has changed.

EPA Response #3: Since the implementation of the IRTS, EPA has found that the contamination in all off-site wells no longer exceeds drinking water standards. As part of the selected remedy, a groundwater monitoring program will be implemented to evaluate the performance of the groundwater treatment system. Selected on-site and off-site groundwater monitoring wells will be monitored periodically to determine if the system is containing the groundwater contamination. In addition, on-site and off-site water-supply wells will be monitored quarterly. Residents should contact EPA if they believe they are continuing to experience drinking water problems.

Citizen Comment #4: A citizen was concerned with what the EPA will do if after spending money on remediating the Linemaster Site, the Site is not considered clean. What would be the EPA's next step and what are the citizens expected to do? Do we have to have a water system put in through the area?

EPA Response #4: The Site poses a significant risk to human health based on the possible ingestion of contaminated groundwater. Based on all available data, EPA estimates that groundwater cleanup levels will be attained within 35 years from the implementation of the remedy. As set forth in the ROD, the performance of the groundwater remedy will be monitored and adjusted as necessary. If certain portions of the aquifer cannot be restored for use as a drinking water source, several measures involving long-term management may be implemented. These measures include engineering controls for containing contaminated groundwater; waiving ARARs based on the technical impracticability of achieving further contaminant reductions and establishing revised cleanup levels; institutional controls to prevent use of groundwater contaminated groundwater; continued monitoring; and periodic re-evaluation of remedial technologies for groundwater restoration. With respect to the commenter's question of whether a water system is required, see EPA's Response to Citizen Comment #5.

Citizen Comment #5: A citizen asked if the Site cannot be remediated and the residential wells cannot be used, has the EPA put any thought to a community well.

EPA Response #5: Since 1988 and the implementation of the IRTS, groundwater contamination levels have decreased to their current levels. Quarterly sampling results during 1992 and 1993 have not indicated any MCL exceedences at any active off-site water-supply well. Currently, contaminated groundwater exceeds MCLs only on-site. As set forth in the ROD, if contamination is found in any off-site well, an evaluation of the effectiveness of the groundwater collection system will be performed as soon as practicable. Based on this evaluation, adjustments or modifications to the system will be implemented. If a large number of off-site water-supply wells require treatment, other alternatives for providing potable water may be evaluated and implemented.

Citizen Comment #6: A citizen was concerned that Linemaster representatives and school representatives were not communicating with one another with respect to groundwater contamination issues in the community.

EPA Response #6: EPA is required by the NCP to implement a Community Relations Plan for all Superfund Sites. The purpose of the plan is to ensure the concerns of the community are identified and addressed. Residents should contact EPA if they believe that specific community concerns related to the Site are not being addressed.

Citizen Comment #7: A citizen was concerned with how residents should address property values in the area if they are interested in selling their property.

EPA Response #7: As previously stated, quarterly sampling during 1992 and 1993 has revealed no MCL exceedences anywhere off-site. In addition, it should be noted that EPA's Policy Towards Owners of Residential Property at Superfund Sites (OSWER Directive # 9834.6) is designed to address certain concerns raised by owners of residential property. A copy of this policy may be obtained from EPA.

B. State Comments

The CT DEP had the following detailed comments concerning the preferred cleanup alternatives presented in the Proposed Plan of the Linemaster Switch Corporation Superfund Site.

Comment #1: Since groundwater cleanup levels presented in the Proposed Plan are "interim cleanup levels" and EPA will establish final groundwater cleanup levels for the Site at some point following implementation of the remedial action, it should be clearly stated in the Record of Decision that there will be an opportunity for public review and comment on the final cleanup levels when they are proposed by EPA.

EPA Response: As stated in the ROD, one of the primary objectives of the remedial action for the Linemaster Switch Corporation Superfund Site is to restore contaminated groundwater to drinking water standards as well as to a level which protects human health and the environment. While the selected interim cleanup levels are consistent with ARARs (or suitable TBC criteria for groundwater), there may be an unacceptable risk as a result of a cumulative risk posed by the compounds detected at the Site. Therefore, the selected cleanup levels for groundwater are considered to be interim levels until a risk assessment is performed on any residual groundwater contamination to determine whether the remedial action is protective.

If EPA determines, after its review of the risk assessment, that the remedial action is protective, then the protective residual levels would constitute the final cleanup levels for the ROD. Alternatively, if EPA determines that the remedial action is not protective, then the remedial action shall continue until either protective levels are achieved or until the remedy is otherwise deemed protective. These more stringent, protective residual levels shall constitute the final cleanup levels for this ROD.

Section 300.435(c)(2) of the National Contingency Plan (NCP) establishes the public participation requirements if changes are made to the selected remedy after the issuance of the ROD. See also Section 117 of CERCLA. In addition, the EPA Office of Solid Waste and Emergency Response has published guidance, entitled Interim Final Guidance of Preparing Superfund Decision Documents (OSWER Directive 9355.3-02), concerning the procedures for documenting changes to the ROD and for soliciting public and state input to such changes. This guidance identifies three categories of Post-ROD changes (minor, significant and fundamental) and identifies different documentation and public participation requirements for each of these categories. At this time, EPA does not know the extent of the changes, if any, that will be made to the remedial action in the future with respect to any differences between the interim and final cleanup levels to be used at the Site. If post-ROD changes are made in the future, including the adoption of final cleanup levels that differ from the interim cleanup levels, the documentation and public participation requirements specified in CERCLA and the NCP will be followed, and any applicable guidance will be considered. A public comment period, however, will only be required where differences in the remedial action fundamentally alter the basic features of the selected remedy with respect to scope, performance, or cost, such that an amendment to the ROD is required.

In any event, even if no ROD amendment is issued in the future, EPA will solicit comments from the public prior to deleting the Site from the National Priorities List, as required by Section 300.425(e)(4) of the NCP.

Comment #2: In adopting final groundwater cleanup goals, EPA should be aware that Connecticut's adopted water quality standards are ARARs which must be addressed.

EPA Response: EPA agrees that the Connecticut water quality standards are ARARs. All the chemical specific ARARs, including the Connecticut water quality standards, are identified in Table 13 of the ROD. EPA's response to comment number 1 above outlines the process that EPA will follow to establish final cleanup levels for the Site. If EPA determines that the remedial action is not protective, then the remedial action shall continue until either protective levels are achieved or until the remedy is otherwise deemed protective. The ARARs identified in the ROD were considered during the development of the interim cleanup levels and will be considered during the development of the final cleanup levels, as necessary to establish protective levels.

Comment #3: If groundwater cleanup goals are not met, there should be a provision to re-evaluate (i.e. lower) the soil cleanup levels to further remove remaining sources of contamination which may be impacting groundwater. This determination should also be subject to public review and comment.

EPA Response: Soil cleanup levels were established at levels necessary to restore the groundwater to drinking water standards. The soil cleanup levels were established using the Summers leaching model. Many of the soil cleanup levels have been established at levels which are below drinking water standards. EPA believes that the soil cleanup levels are protective of groundwater and that these levels will enable the restoration of the groundwater. While EPA considers the soil cleanup levels to be final cleanup levels, EPA will conduct reviews of the Site every five years and make modifications as necessary to insure that the remedy remains protective of human health and the environment. As stated in EPA's response to CT DEP's Comment # 1, if any post-ROD changes are made to the remedy, EPA will follow the documentation and public participation requirements set forth in Section 117 of CERCLA and Section 300.435(c)(2) of the NCP, and will consider relevant guidance documents.

Comment #4: It is stated on page 15 of the proposed plan that EPA may also consider enhancing the vacuum extraction system with another technique known as air sparging. There is no explanation or discussion of how the decision to implement this will be made by EPA, and what criteria will be used to trigger this or other enhancements. CT DEP feels it is misleading to represent the preferred alternative as a combination of two alternatives, when what is actually being proposed is one alternative (SC-3) with the possibility of an additional alternative (SC-4) — being required to supplement or enhance the "basic" alternative.

EPA Response: EPA has clarified in the ROD the process for implementing enhancements to the soil vapor extraction system. Specifically, the ROD indicates that the expected time for attaining the soil cleanup levels using either soil vacuum extraction (SVE) alone, or with enhancements such as air sparging, is three to ten years. At first, the SVE system alone will be implemented at the Site without enhancements. After the system has been operating for five years, EPA will evaluate the effectiveness of the system and determine whether the soil cleanup levels will be attained within ten years from the time that the system began operating. If EPA determines that the soil cleanup levels will not be achieved within the 10 years period using vacuum extraction alone, EPA will require enhancements to the system such as air sparging to assure that soil cleanup levels will be attained within the projected ten year period. In making this determination, EPA will at a minimum evaluate the results of soil borings drawn from within the Zone 1 area at the conclusion of the first five year period of operation of the vacuum extraction system, and the results of soil vapor samples taken on an ongoing basis during the first five year period of operation of the vacuum extraction system. EPA believes that the approach set forth in the ROD clarifies the description of the source control component and how the decision to add enhancements will be made.

Comment #5: The CT DEP strongly supports both Vacuum Extraction (SC-3) and Vacuum Extraction With Enhancements (SC-4) as the single preferred source control alternative. The inclusion of air sparging as part of the preferred alternative would require minimal additional capital cost and minimum alteration to the system lay-out. Advantages would include accelerated cleanup of Zone 1 soil and elimination of the need to retrofit any existing portion of the system at a later date. Additionally, since air sparging will enhance the effectiveness of the remedial measures, the estimated time for restoration of Zone 1 soil should be less than the estimated 3 to 10 years. Combining both alternatives provides the best balance among overall protection of human health and the environment. In addition, the source control system should be evaluated at a one or two year interval following startup as well during the five year review of the Site.

EPA Response: Based on current data, EPA believes that the estimated time to meet the soil cleanup levels is the same for both soil vapor extraction and soil vapor extraction with air sparging, i.e. three to ten years. Without data indicating that the addition of enhancements will reduce the cleanup time period, EPA does not believe that the immediate addition of enhancements such as air sparging should be required. Instead, after the SVE system alone has been operating for five years (i.e., five years after the startup date), EPA will evaluate the effectiveness of the system and require the addition of air sparging or other enhancements if the efficiency of the SVE system alone is shown to be less than currently anticipated.

It should be noted that either system, soil vapor extraction or soil vapor extraction with air sparging, would most likely be operated on an intermittent basis. Experience has shown that when such systems are stopped and re-started, their effectiveness and efficiency tends to be higher. Given that the system will most probably be operated on an intermittent basis, EPA does not believe that sufficient information will be generated during the first one or two years following startup to warrant the program of review CT DEP's suggests.

Comment #6: CT DEP strongly recommends that an evaluation of the effectiveness of the groundwater collection system be required as soon as practicable following confirmation of contamination in off-site water-supply wells. This would facilitate system adjustment or modification to prevent or limit further off-site contaminant migration.

EPA Response: EPA agrees with the CT DEP that an evaluation of the effectiveness of the groundwater collection system should be performed as soon as practicable following confirmation of contamination in off-site water-supply wells. This requirement has been included in the ROD. In addition, the ROD requires periodic monitoring of on-site and off-site wells to evaluate the effectiveness of the containment and treatment system during the remedial action to determine if it is meeting the performance criteria and whether adjustments, modifications and/or the addition of an additional treatment technology is warranted. EPA plans to conduct the first such review during the design period following the issuance of the ROD, to ensure that the current system is effectively containing and restoring the groundwater.

Comment #7: The EPA needs to clarify whether the estimated total cost of Management of Migration 4 and 5 includes carbon filters for water-supply wells both on and off the property if the monitoring wells do not meet drinking water standards, and whether the cost estimate for MM-5 includes carbon filters for air emissions.

Response: The estimated total cost of MM-4 and MM-5 does not include the cost of carbon filters for water-supply wells both on- and off-site if the water-supply wells do not meet drinking water standards. It should be noted that, pursuant to EPA's 1987 Administrative Order, Linemaster Switch Corporation is required to provide alternate water supplies in the vicinity of the Site. Pursuant to the Order, Linemaster has already installed carbon filters on one water-supply well on-site (total cost: $12,000) and four water-supply wells off-site (total cost: $12,000). Assuming that all five of these wells need carbon filter replacements in the future, the total cost of replacing all five filters would be approximately $17,000. In addition, it is estimated that carbon filter replacement would be necessary about five times during the performance of the management of migration response.

Although the above costs were not included in the cost estimates, these costs would not impact the remedy selection decision because the relative difference in costs between MM-4 and MM-5 would remain the same, and the only other alternative, MM-1 (No Action), is not protective.

With respect to MM-5, the cost estimate for this alternative does include the cost of carbon filters for air emissions.

Comment #8: CT DEP indicates that the discussion of the preferred alternative for management of migration in the Proposed Plan implies that both MM-4 and MM-5 are the preferred alternative.

Response: EPA believes that the ROD makes clear that MM-4 (Air Stripping) will be implemented at the Site, unless cost estimates change such that it becomes more cost-effective over the long-term to implement MM-5 (Ultraviolet Oxidation). Should cost estimates change, EPA retains the flexibility to implement MM-5 instead of MM-4 under the approach taken in the ROD.

C. Potentially Responsible Party Comments

The Potentially Responsible Party (Linemaster) had the following detailed comments concerning the preferred cleanup alternatives presented in the Proposed Plan of the Linemaster Switch Corporation Superfund Site.

Comment #1: Achieving ARARs for air emissions, and achieving health-based air emission levels, at the Linemaster Switch Corporation Site does not require additional emission controls for the existing air stripper. Linemaster estimates that potential emissions from the Linemaster air stripping system are 0.2 lbs. per hour and actual emissions are 0.028 lbs. per hour (or 6.4 milligrams per cubic meter).

Comment #2: Funds required for emission controls on the air stripper would be better expended on other activities mandated by the cleanup plan. Linemaster estimates that total present worth cost for implementing the air emission requirement (including capital and operation and maintenance costs) for the air stripper would be $245,000, or approximately $42.50 per pound of TCE.

<u>EPA Response (to both Comments #1 & #2):</u> Based on the current data, EPA believes that the selection of air stripping with air emission controls presents the best balance of trade-offs among the management of migration alternatives.

The Linemaster Switch Corporation Site is located in Woodstock, Connecticut, which has been designated as part of an ozone non-attainment area since 1971. This non-attainment area has been further classified as "serious," pursuant to the 1990 amendments to the Clean Air Act. Since the early 1970's, ambient air concentrations in this non-attainment area have been in excess of the National Ambient Air Quality Standards for Ozone. In addition, the primary contaminant at the Site which will be emitted from the air stripper is TCE, a known precursor to ozone.

Given the ozone non-attainment status of the area in which the Site is located, and that TCE is a known ozone precursor, EPA believes that considerations of permanence and reductions of the mobility, volume and toxicity of the contaminants through treatment outweigh the considerations of cost raised by Linemaster. It should be noted that the air stripping/carbon adsorption alternative was not the most expensive groundwater technology considered for the Site. Moreover, under the ROD, EPA retains the flexibility to alter the groundwater pump and treat technology to ultraviolet oxidation in the event that the cost of replacing the carbon filters for the air stripper, or other factors, make ultraviolet oxidation more cost effective than air stripping with emission controls over the long term. Because the cost of constructing the air emission controls is only approximately $70,000, and the bulk of the estimated total cost for emissions control is the projected cost of carbon filter replacement during system operation, the flexible approach adopted in the ROD that allows for the modification of the pump and treat technology in the event cost estimates change should assist in controlling future costs.

EPA notes that the projected air emission figures provided by Linemaster may not be accurate. It is unclear whether these figures represent the projected air emissions after treatment of groundwater that has been pumped from the groundwater containment system wells alone, or whether these figures represent the projected air emissions after treatment of groundwater that has been pumped from <u>both</u> the groundwater containment system wells and from the soil vapor extraction system wells. Given the high levels of VOCs present in the groundwater in the Zone 1 area, the dewatering portion of the source control remedy may introduce a large number of contaminants to the air stripper. For this reason, Linemaster's argument that the air emissions attain ARARs (and TBC criteria) and are within health-based levels, without emission controls is unpersuasive. Given the uncertainty of the actual emissions after treatment of groundwater from the groundwater containment system wells and the vacuum extraction dewatering wells, EPA cannot determine at this time whether uncontrolled emissions would attain ARARs (and TBC criteria) and health-based levels, as Linemaster suggests.

<u>Comment #3:</u> The proposed soil cleanup standards for Zone 1 are not consistent with ARARs. The proposed cleanup plan contains proposed cleanup levels (Table 1, page 12) indicating that drinking water standards will have to be met for the Zone 1 soil. This cleanup level is inconsistent with both the overall remedial objective for the Site and with ARARs. Also, it is unlikely that these concentrations could be achieved. Linemaster suggests that the soil cleanup levels be based on TCLP concentrations, consistent with the draft proposal for the Connecticut Cleanup Standard Regulations, April 1993.

<u>EPA Response:</u> The proposed soil cleanup levels listed in the Proposed Plan and the Record of Decision are consistent with the overall remedial objective and with ARARs.

In the Feasibility Study, one of the source control objectives was to reduce the concentration of VOCs in the soil so that TCLP concentrations will not exceed drinking water standards. However, during the review of the FS and the development of the preferred alternative, EPA modified the source control objective. The source control objective set forth by EPA in the Proposed Plan was: to reduce the concentrations of VOCs in the soil within the Zone 1 area so that concentrations of VOCs in the groundwater will not exceed drinking water standards and will not pose a risk to human health and the environment. The soil cleanup levels are consistent with this objective.

As stated in the EPA Response to CT DEP's Comment #3, soil cleanup levels were established at levels necessary to restore the groundwater to drinking water standards and to a level that is protective of human health and the environment. EPA believes that the soil cleanup levels are protective of groundwater and that these levels will enable the restoration of the groundwater. In addition, EPA believes that the selected soil cleanup levels can be attained with the selected technology.

ATTACHMENT A

CHRONOLOGY OF COMMUNITY RELATIONS ACTIVITIES AT THE LINEMASTER SWITCH SUPERFUND SITE

June 1988	EPA announced the proposal of Linemaster Switch Corporation to the National Priorities List;
November 1989	EPA issued a fact sheet, "EPA Overseeing Study of Soil and Water Contamination at Linemaster Switch";
August 1989	EPA conducted Community Interviews with citizens, local officials and business owners;
February 15, 1990	EPA announces that Linemaster Switch is finalized on the National Priorities List;
June 12, 1991	EPA held an informational meeting in the Woodstock Town Hall to discuss plans for the Remedial Investigation and Feasibility Study;
April 1, 1993	EPA published a notice in the local newspaper announcing the availability of the final Remedial Investigation and Feasibility Study and presenting a brief description of the Proposed Plan;
April 14, 1993	EPA held an informational meeting in the Woodstock Town Hall to discuss the results of the Remedial Investigation, the Feasibility Study, the Administrative Record and the Proposed Plan;
April 15, 1993	EPA initiated a 30-day comment period on the Remedial Investigation & Feasibility Study results and Proposed Plan;
May 5, 1993	The Agency held a Public Hearing to accept comments on the Proposed Plan;
July 21, 1993	EPA signed and released the Record of Decision to the public.

ATTACHMENT B

Transcript from the May 5, 1993 Informal Public Hearing

PUBLIC HEARING

* * * * * * * * * * *
ENVIRONMENTAL PROTECTION AGENCY

RE: PROPOSED PLAN FOR THE LINEMASTER SWITCH CORPORATION SUPERFUND SITE IN WOODSTOCK, CONNECTICUT

May 5, 1993

* * * * * * * * * * *

BEFORE: MICHAEL NALIPINSKI, Moderator

A P P E A R A N C E S:

FOR THE ENVIRONMENTAL PROTECTION AGENCY:

Ms. Elise Jakabhazy,
Remedial Project Manager

Ms. Kristen Fadden,
Community Relations Specialist

Ms. Trisha Kolpien,
Community Relations Specialist

MS. JENITZA A. MOCHULSKY
COURT REPORTER

. . .Public Hearing in the above-captioned matter before Michael Nalipinski, Moderator (EPA) pursuant to Notice, held on May 5, 1993, at 7:02 o'clock PM, at the Woodstock Town Hall, Route 169, Woodstock, Connecticut, at which time the parties appeared as hereinafter set forth...

MR. NALIPINSKI: Good evening. My name is Mike Nalipinski, and I'm the Remedial Project Manager for the Linemaster Switch Superfund site, and in the back is Kristen Fadden. She's the Community Relations Specialist, and the purpose of tonight's meeting is to take oral testimony from you folks and have that testimony entered into the site's administrative record.

As you can see, we have a transcriber up here this evening and transcript of this meeting will go right into the record, as will the comments you make and response to those comments will be included in an attachment to the Record of Decision.

Copies of the administrative record are available in Bracken Library as well as EPA's record seen at 90 Canal Street and written comments will be accepted on the proposed plan, which Kristen handed out earlier, until May 14, 1993 and must be post-marked no later than May 14th.

They should be submitted to my attention at the United States Environmental Protection Agency, Waste Management Division, Mail Code HEC-CAN6, Boston, Massachusetts, 02203. This address is also located on page 3 of the proposed plan.

I would like to briefly describe the proposed plan before we receive comments.

There's two major components to the proposed plan. One is the source control and soil remediation, and the other is the management of migration of groundwater contaminants.

The soil remediation proposal consists

of using a soil vapor extraction system combined with a groundwater dewatering to remove the volatile organic contaminants from the soil. The vapors from this process will be treated using carbon filters.

The groundwater from the dewatering process will be treated using the technology which will be discussed in the contaminant discussion portion of my presentation. If the contaminated area cannot be effectively treated with the SVE process, then that process can be enhanced with another process called air sparging, and basically what air sparging is is injecting air into the shallow groundwater table. It captures the volatile organic contaminants from the groundwater as well as from the soils and then those vapors are collected through a collection system of wells that are drilled into the soil.

The groundwater contaminant migration as indicated in the proposed plan is currently under way at the Linemaster property via a series of extraction wells, and the effluent from those wells is being treated by an on-site air stripper, and an air stripper is basically the contaminated water cascading down against a current of forced air, and in the proposed plan the vapors from the air stripper will have to be treated with carbon filters.

If the air stripper and carbon filters prove not to be an effective technology, there's an option in the proposed plan to use Uv/oxidation and carbon adsorption treatment. Basically the Uv/oxidation and carbon adsorption treatment consists of passing the contaminated groundwater over ultraviolet lights, and, if necessary, treat the effluent with carbon.

The procedures for tonight's hearing will be we won't answer questions from the public. The State and other folks who were present at the April 14th meeting, that was a several hour meeting in which we answered your questions. The purpose of tonight's meeting, as I indicated, is to collect oral comments from you folks, and I'm not allowed to answer questions while the hearing is underway, but I will be available afterward to discuss with you folks any of your concerns. So please try and focus your comments on the alternatives presented in the proposed plan and those which we discussed at the April 14th meeting.

I have received some cards with folks' names on it who would like to testify and would like to present oral comments, and if any other people would like to present oral comments, just raise your hand and state your name, and if you didn't fill out a card, Kristen will give you a card to fill out, and the reason we want the cards filled out is for the stenographer to get your spelling correct.

The first person we will hear comments from is Donald Harding.

MR. HARDING: I have a couple of comments. In looking through the papers here it would look to me as if they are talking about oral comments on the clean up alternatives proposed for the site. I don't know whether there is anybody but one, maybe one gentleman here who actually knows what you are talking about and could enlighten us on this subject.

I know absolutely nothing what you do. I can read through this thing and it goes right straight through my ears so this is one thing as far as the alternative is concerned.

Another thing, according to your records Linemaster Switch has already spent $3.6 million, and they are planning on spending between four million and five million more so you are talking about spending between eight and nine million dollars. It seems to me in spending this amount of money you would get an individual who should be competent and have knowledge of what is being done and what is going to be done.

I have dealt with this individual probably right next door here and they put a submersible pump in my house, and if it wasn't for a couple of people, David Branway, which I mentioned before at a meeting, and a fellow by the name of Bill Warzecha from the Department of Health in Hartford, I would have gotten absolutely nowhere in getting my water solution straightened out.

Now, in my estimation this individual is not competent, and if you are going to spend between eight and nine million dollars, it seems to me you should get somebody that is competent and has a knowledge of what is being done and what should be done.

MR. NALIPINSKI: Okay, thank you for your comments. After the hearing I'll be available to try and explain the technologies of the proposed plan in more detail, if you would like.

Are there any other folks that would like to enter oral comments? Going once? Going twice?

MS. CARPENTER: I don't have a card there, but it's Jane Carpenter. I had that testing done by Fuss & O'Neal, and everything, and it didn't show up the toxic compounds that they were looking for. It showed a high arsenic level, and, of course, I'm not a geologist and I don't really know about that type of stuff. I understand now that it's a natural thing that's found in the ground, in the bedrock, this arsenic.

Okay, now my only question about that, and it has to deal with the fact that they may no longer show the arsenic level when they do the

VOC testing. I guess it's been discussed about eliminating that from the test. If you go above like 50, I guess you have to do something and, like I say, if it shows 47, you got a borderline. I guess what I'm getting to is if it's a natural thing that's in the bedrock and you are diverting the water flow, is it possible that you might be bringing more arsenic level into the wells by, you know, all these additional wells and diverting the water flow like you are doing at Linemaster? That's my only concern.

MR. NALIPINSKI: Okay. Thank you, and, like I said, I can talk to you more after the hearing. Yes, ma'am?

MS. O'CONNOR: Holly O'Connor. I have a concern with the lack of water that I have. Ever since these wells have been drawing the water from the--I feel my well and also the consistency and the color of my water has changed and my water smells now, what little water I have.

MR. NALIPINSKI: Okay, thank you. Any other comments?

MR. MASON: May I ask this lady,

that just spoke, where she lives?

MS. O'CONNOR: 12 Wainwright Drive.

MR. MASON: Thank you.

MR. NALIPINSKI: Any other comments people would like to enter into the record? (Pause.) Yes, ma'am?

MS. WRESCHER: Nancy Wrescher. My concern is, you've had, Linemaster has spent all this money. What happens if this doesn't work? Who is responsible for that next move? What do we do? Do we have to have a water system put in through the area? That's my concern. If this just doesn't work, they just can't clean it up or we wait 30 years and then we're told "well, we can't get it all," or how does this work? Do we just keep going on? I guess it's been since 1980 that this has been an ongoing investigation, and it's 1993 and we're still going. That's my concern. Do we have an end date, or do we just keep going on with the process?

MR. NALIPINSKI: Okay, thank you, I can talk to you more after the hearing.

Any other comments to be entered into

the record?

MS. CARPENTER:. I have an additional comment. If the clean up doesn't work in the way they anticipate, have they ever thought about the possibility of like a community well, one that's far enough removed from the site that everyone can draw from? Was that ever considered to be a possibility?

MR. LALIBERTE: A lot of work has been done on that.

MS. O'CONNOR: Well--

MR. NALIPINSKI: We need one at a time here for the stenographer.

MS. O'CONNOR: All right, so that was considered, a community well was considered then, apparently. He answered my question.

MS. WRESCHER: Nancy Wrescher again. I don't know if Linemaster considered the community well, but I think the Benzene Committee had brought that up, and the Department of Health had some question about whether it was needed or not, so maybe if these two committees got together and discussed this issue, maybe we could get a result.

MR. NALIPINSKI: Okay, thank you. Any other comment?

MR. LALIBERTE: In order to explain this last problem a little more, this work was done by the Western & Simpson, consultants to the Town, and a number of alternatives was suggested as to how to bring in fresh water.

Upon final consideration it had been decided by the State that we should stick with carbon filters and that's the last information that we have available.

They considered bringing water in from Putnam. They considered drilling a well north of the school out of the flow of toxicants and various other possibilities such as bringing it up from Cromwell Point. This is east of here, and there's already a water company supplying water to a group of homes down there, but the State has apparently rejected these proposals.

MR. NALIPINSKI: Okay. Thank you.

MS. WRESCHER: I have another comment. Nancy Wrescher again.

I don't know that the people from Linemaster and the people from the school have been working together and exchanging information even though the EPA and the DEP are working both sites. They don't seem to know what is going on. That's a concern I know that several of the people in the neighborhood have, too.

MR. NALIPINSKI: Okay, thank you. Yes, sir?

MR. MASON: This has nothing to do with--

MR. NALIPINSKI: Your name?

MR. MASON: Mason, Doug Mason. This has nothing technically to do with this, but how about our property values? I'm thinking of putting my house on the market. A prospective customer comes, hears about that, and it kills my sale. What do we do?

MR. NALIPINSKI: Like I said at the beginning of the meeting, all I can do is accept your comments into the record, and we can talk about them more after the conclusion of the hearing. Are there any other issues people would like to enter into the record?

(Pause.)

Do you have any questions you would like entered into the record, or comments on the proposed plan?

(Pause.)

Okay, thank you, I would like to now formally close this hearing.

(Whereupon, the proceeding concluded at 7:20 P.M.)

APPENDIX D

RECORD OF DECISION
LINEMASTER SWITCH CORPORATION SUPERFUND SITE

STATE OF CONNECTICUT'S LETTER OF CONCURRENCE

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

June 30, 1993

Mr. Paul Keough
Acting Regional Administrator
US EPA Region I
JFK Federal Building
Boston, MA 02203

Dear ~~Mr. Keough~~ Paul,

The Connecticut Department of Environmental Protection (CT DEP) concurs with the federal Environmental Protection Agency's (EPA) selected remedy at the Linemaster Switch Corporation Superfund Site in Woodstock, Connecticut. The selected remedy includes soil vapor extraction and groundwater dewatering to reduce volatile organic compounds (VOCs) in the soil. The remedy also incorporates the existing groundwater extraction and air stripping system which has been in operation since June 1992, pursuant to CT DEP's 1986 Abatement Order. The selected remedy will add carbon adsorption to the existing air stripping unit. Regular environmental monitoring is also required. To insure that the remedy is protective of human health and the environment, the entire remedy will be evaluated every five years, as mandated in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

The remedy is described in detail in the Proposed Plan dated April, 1993.

Concurrence with EPA's selected remedy for the Linemaster Switch Corporation Superfund Site shall in no way affect the Commissioner's authority to institute any proceeding to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of any permit issued by the Commissioner.

Sincerely,

Tim

Timothy R. E. Keeney
Commissioner

TREK:LFW:lfw

APPENDIX E

RECORD OF DECISION
LINEMASTER SWITCH CORPORATION SUPERFUND SITE

ADDMINISTRATIVE RECORD INDEX

Linemaster Switch

NPL Site Administrative Record

Index

Compiled: April 14, 1993
ROD Signed: July 21, 1993

Prepared for

Region I
Waste Management Division
U.S. Environmental Protection Agency

With Assistance from

AMERICAN MANAGEMENT SYSTEMS, INC.
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Introduction

This document is the Index to the July 21, 1993 Record of Decision (ROD) Administrative Record for the Linemaster Switch National Priorities List (NPL) Superfund site. Section I of the Index cites site-specific documents, and Section II cites guidance documents used by EPA staff in selecting a response action at the site.

The Administrative Record is available for public review by appointment at the EPA Region I Records Center in Boston, Massachusetts (telephone: 617-573-5729) and at the Bracken Library, Academy Road, Woodstock, Connecticut 06281. Questions concerning the Administrative Record should be addressed to the EPA Region I site manager.

The Administrative Record is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).

Section I

Site-Specific Documents

ADMINISTRATIVE RECORD INDEX

for the

Linemaster Switch NPL Site

ROD Signed: July 21, 1993

1.0 Pre-Remedial

1.1 CERCLIS Site Discovery

1. "Site Identification," EPA Region I (March 30, 1981).

1.2 Preliminary Assessment

1. "Site Identification and Preliminary Identification," EPA Region I (July 31, 1984).

1.3 Site Inspection

1. "Final Site Inspection Report," NUS Corporation (March 27, 1987) with attached Appendix A (Form 2070-13).

2.0 Removal Response

2.1 Correspondence

1. Letter from Russell L. Brenneman, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Thomas C. Condon, EPA Region I (July 10, 1986). Concerning objection to EPA's actions in connection with removal action at the site.
2. Letter from Russell L. Brenneman, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Thomas C. Condon, EPA Region I (July 17, 1986). Concerning groundwater sampling.
3. Letter from Linda L. Ujifusa, EPA Region I to Russell L. Brenneman, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) (August 5, 1986). Concerning EPA's legal authority to undertake response actions at the site.
4. Letter from Russell L. Brenneman, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Linda L. Ujifusa, EPA Region I (September 3, 1986). Concerning request for a meeting.

2.6 Work Plans and Progress Reports

1. "Geohydrological Plan of Investigation," Roy F. Weston, Inc. (October 17, 1986).

3.0 Remedial Investigation (RI)

3.1 Correspondence

1. Letter from Robert S. Potterton Jr., Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (August 21, 1987). Concerning an interim water supply well monitoring program with attached:
   A. "Policy Statement - GAC Filters - Private Wells," Connecticut Department of Health Services (February 3, 1987).
   B. "Table 1 - August 1987," Fuss & O'Neill.
   C. "Granular Activated Carbon Filters" Chart, Connecticut Department of Health Services.
2. Letter from Geoff McGean, EPA Region I to Gary Kennett, Linemaster Switch (November 10, 1988). Concerning transmittal of the preliminary summary interpretation of the geophysical survey conducted at the site.
3. Letter from Naomi Davidson, Connecticut Department of Environmental Protection to Gary Kennett, Linemaster Switch (January 10, 1989). Concerning results of December 1988 well samples.
4. Letter from Geoff McGean, EPA Region I to Gary Kennett, Linemaster Switch (January 11, 1989). Concerning transmittal of the "Linemaster Geophysical Report," U.S. Geological Survey.
5. Letter from Robert S. Potterton Jr., Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (June 6, 1989). Concerning attached table and map for the revised well monitoring program.
6. Letter from Geoff McGean, EPA Region I to Gary Kennett, Linemaster Switch (July 10, 1989). Concerning current status of the remediation and future activities at the site.
7. Letter from Robert S. Potterton Jr., Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (July 14, 1989). Concerning the proposed water treatment system for the Tarr apartment building.
8. Letter from John Zannos, EPA Region I to Perry Cornwall, Linemaster Switch (September 20, 1989). Concerning the Phase II well installation with the attached Letter from Wayne W. Lapham, U.S. Geological Survey to John Zannos, EPA Region I (September 15, 1989).
9. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (October 26, 1989). Concerning delay in Phase II well program.
10. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (December 18, 1989). Concerning transmittal of results of borehole geophysics and well samplings.
11. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (January 11, 1990). Concerning request for completion schedule.
12. Letter from James T. Olsen, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (February 5, 1990). Concerning request to install a retention pond to the leaching field.
13. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (March 8, 1990). Concerning confirmation of slug testing.
14. Letter from Lucy M. Conley, EPA Region I to James T. Olsen, Fuss & O'Neill (April 16, 1990). Concerning receipt of sampling and analysis plan.
15. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (June 4, 1990). Concerning EPA's interest in future removal activities at the site.

3.1 Correspondence (cont'd.)

16. Letter from James T. Olsen, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (June 19, 1990). Concerning the disposal of well evacuation water.
17. Letter from James T. Olsen, Fuss & O'Neill to Bruce Cliff, Vapex Environmental Technologies (June 27, 1990). Concerning vapor extraction remediation of soils at the site.
18. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (August 20, 1990). Concerning EPA guidance on what topics should be included in a draft remedial investigation report.
19. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (August 23, 1990). Concerning extension of deadline for submittal of the draft remedial investigation report.

The map associated with the record cited in entry number 20 is oversized and may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

20. Letter from James T. Olsen, Fuss & O'Neill to Lucy M. Conley EPA Region I (September 4, 1990). Concerning feasibility of in-situ vapor extraction for Zone I soil area.
21. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (October 4, 1990). Concerning extension of deadline for submittal of the draft remedial investigation report.
22. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (November 26, 1990). Concerning schedule for completion of the remedial investigation and feasibility study.
23. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Lucy M. Conley, EPA Region I (December 18, 1990). Concerning the proposed schedule for deliverables.
24. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (June 5, 1991). Concerning EPA's decision to conduct the risk assessment at the site.
25. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (July 22, 1991). Concerning data validation of water samples.
26. Letter from David L. Bramley, Fuss & O'Neill to Lucy M. Conley, EPA Region I (November 4, 1991). Concerning transmittal of deliverables.
27. Letter from David L. Bramley, Fuss & O'Neill to Lucy M. Conley, EPA Region I (November 6, 1991). Concerning transmittal of deliverables.
28. Letter from David L. Bramley, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (December 3, 1991) with attachment. Concerning proposed improvements to the outlet structure for Pond 3.
29. Letter from David L. Bramley, Fuss & O'Neill to Lucy M. Conley, EPA Region I (December 20, 1991). Concerning request for videotapes of borehole geophysics conducted by the U.S. Geological Survey.
30. Letter from David L. Bramley, Fuss & O'Neill to Lucy M. Conley, EPA Region I (December 23, 1991). Concerning EPA's review of deliverables.
31. Memorandum from David L. Bramley, Fuss & O'Neill to Linemaster File #86088 (February 6, 1992). Concerning the February 4, 1992 meeting held with EPA Region I and Fuss & O'Neill.

3.1 Correspondence (cont'd.)

32. Letter from Forest P. Lyford, U.S. Geological Survey to David L. Bramley, Fuss & O'Neill (February 20, 1992). Concerning transmittal of requested videotapes.
33. Memorandum from David L. Bramley, Fuss & O'Neill to File 86088 (February 25, 1992). Concerning the February 19, 1992 meeting held with EPA Region I and Arthur D. Little, Inc.
34. Letter from David L. Bramley, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (February 26, 1992). Concerning inability to sample at certain locations.
35. Letter from David L. Bramley, Fuss & O'Neill to Richard C. Bowen, Arthur D. Little, Inc. (March 4, 1992). Concerning Zone 1 pump test.
36. Letter from Michael J. Nalipinski, EPA Region I to David L. Bramley, Fuss & O'Neill (March 10, 1992) with attached guidance. Concerning EPA's approval to start up the pumping operation.
37. Letter from David L. Bramley, Fuss & O'Neill to Michael J. Nalipinski, EPA Region I (March 19, 1992). Concerning submittal date for revisions to the Initial Site Characterization Report.
38. Letter from Michael J. Nalipinski, EPA Region I to David L. Bramley, Fuss & O'Neill (April 23, 1992). Concerning receipt of revisions to various deliverables.
39. Letter from Dennis P. Gagne, EPA Region I to Gary Kennett, Linemaster Switch (October 7, 1992). Concerning transmittal date for comments on the Draft Remedial Investigation/Feasibility Study Report.
40. Letter from Dennis P. Gagne, EPA Region I to Gary Kennett, Linemaster Switch (October 19, 1992). Concerning transmittal of comments on the August 1992 Draft Feasibility Study.
41. Letter from David L. Bramley, Fuss & O'Neill to Michael J. Nalipinski, EPA Region I (April 5, 1993). Concerning transmittal of tables to appear in the March 29, 1993 "Technical Memorandum - Feasibility Study Response," Fuss & O'Neill for Linemaster Switch.

3.2 Sampling and Analysis Data

The records cited in entry numbers 1 through 32 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts

Alpha Analytical Labs

1. Certificate of Analysis, Alpha Analytical Labs (December 4, 1991).
2. Certificate of Analysis, Alpha Analytical Labs (December 5, 1991).
3. Certificate of Analysis, Alpha Analytical Labs (December 6, 1991).
4. Certificate of Analysis, Alpha Analytical Labs (December 10, 1991).

Camp Dresser & McKee, Inc.

5. Letter Report - Data Validation, Camp, Dresser & McKee, Inc. (February 17, 1988).
6. Letter Report - Data Validation, Camp, Dresser & McKee, Inc. (March 1, 1988).

3.2 Sampling and Analysis Data (cont'd.)

Eastern Scientific Associates

7. Analysis Report, Eastern Scientific Associates (September 5, 1989).
8. Analysis Report, Eastern Scientific Associates (October 19, 1989).
9. Analysis Report, Eastern Scientific Associates (December 8, 1989).
10. Analysis Report, Eastern Scientific Associates (December 12, 1989).

Environmental Protection Agency

11. Volatile Organic Screening, EPA Region I (September 18, 1987).

Fuss & O'Neill

12. Letter from Robert S. Potterton Jr., Fuss & O'Neill to Geoff McGean, EPA Region I (June 27, 1988) with attachments. Concerning recommendations for additional monitor well installations.
13. Letter from Robert S. Potterton Jr., Fuss & O'Neill to Margaret Leshen, EPA Region I (September 1, 1989). Concerning Phase II monitoring well installations with attached:
    A. Well installation specifications
    B. Soil sampling locations
    C. Analysis Report, Eastern Scientific Associates (August 11, 1989).
14. Letter from James T. Olsen, Fuss & O'Neill to Lucy M. Conley, EPA Region I (December 28, 1989) with attached table. Concerning well installations.
15. "Sampling and Analysis Plan," Fuss & O'Neill for Linemaster Switch (August 1990).
16. Letter from James T. Olsen, Fuss & O'Neill to R. Bradford Fawley, Murtha, Cullina, Richter & Pinney (Attorney for Linemaster Switch) (August 8, 1990). Concerning arsenic contamination in drinking well water.
17. "Air Dispersion Modeling Plan," Fuss & O"Neill for Linemaster Switch (May 1991).
18. Comments Dated September 10, 1991 from Lucy M. Conley, EPA Region I on the May 1991 "Air Dispersion Modeling Plan," Fuss & O"Neill for Linemaster Switch.
19. Letter from David L. Bramley, Fuss & O'Neill to Lucy M. Conley, EPA Region I (December 23, 1991) with attached table. Concerning tests on Phase III wells.
20. Letter from David L. Bramley, Fuss & O'Neill to Michael J. Nalipinski, EPA Region I (February 13, 1992). Concerning revised plan for groundwater monitoring with attached:
    A. Table 1 - Summary of Well Completion Details
    B. Table 2 - Groundwater Sampling Non-Pumping Wells
    C. Letter from Adrian P. Freund, Connecticut Department of Environmental Protection to John Maloney, Linemaster Switch (February 10, 1992).
21. Letter from David L. Bramley, Fuss & O'Neill to Michael J. Nalipinski, EPA Region I (July 6, 1992). Concerning attached tables summarizing data on metal concentration in soil and groundwater samples.
22. Letter from David L. Bramley and Robert S. Potterton Jr., Fuss & O'Neill to Michael J. Nalipinski, EPA Region I (November 11, 1992). Concerning deferment of arsenic sampling at the site.
23. Letter from David L. Bramley, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (May 10, 1993). Concerning results of April groundwater samplings.

3.2 Sampling and Analysis Data (cont'd.)

Fuss & O'Neill

24. "Interim Removal Action - Quarterly Monitoring Report - Fourth Quarter, First Year," Fuss & O'Neill for Linemaster Switch (May 20, 1993).
25. Letter from David L. Bramley, Fuss & O'Neill to Rose Gatter-Evarts, Connecticut Department of Environmental Protection (June 18, 1993). Concerning the attached aquatic toxicity monitoring report.
26. Letter from David L. Bramley, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (July 6, 1993). Concerning results of May groundwater samplings.

Griswold & Fuss Environmental Laboratories

27. Analysis Report, Griswold & Fuss Environmental Laboratories for Linemaster Switch (November 16, 1987).
28. Analysis Report, Griswold & Fuss Environmental Laboratories for Linemaster Switch (November 25, 1987).
29. Analysis Report, Griswold & Fuss Environmental Laboratories for Linemaster Switch (February 1, 1988).
30. Analysis Report, Griswold & Fuss Environmental Laboratories for Linemaster Switch (February 26, 1988).

Roy F. Weston, Inc.

31. "Borehole Geophysical Logging Survey," Roy F. Weston, Inc. for Fuss & O'Neill (April 1990).
32. "Review of Split Sampling Analytical Data Package," Roy F. Weston, Inc. (December 3, 1990).

3.4 Interim Deliverables

Reports

1. "Proposed Hydrogeologic Investigation," Fuss & O'Neill for Linemaster Switch (January 1987).
2. "Draft Soil Gas Survey Report and Proposed Soil Sampling Program," Fuss & O'Neill for Linemaster Switch (September 1987).
3. "Revised Health & Safety Plan," Camp Dresser & McKee,Inc. (February 25, 1988).
4. "Draft Health and Safety Plan - Site Investigations," Fuss & O'Neill for Linemaster Switch (May 1989).
5. "Interim Removal Action Study/Draft Pilot Pumping Test Plan," Fuss & O'Neill for Linemaster Switch (March 1991).

The maps associated with the records cited in entry numbers 6 through 9 are oversized and may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

6. "Draft Phase III Monitoring Well Installation Plan," Fuss & O'Neill for Linemaster Switch (April 1991).
7. "Health and Safety Plan - Environmental Investigations," Fuss & O'Neill for Linemaster Switch (May 1991).

3.4 Interim Deliverables (cont'd.)

Reports

8. "Application for a Permit to Operate a Pack Tower Aeration Groundwater Treatment System," Fuss & O'Neill for Linemaster Switch (July 1991).
9. "Statement of Qualifications - Hazardous Waste Management," Fuss & O'Neill for Linemaster Switch (November 26, 1991).
10. "Draft Revision of Initial Site Characterization - Volume I," Fuss & O'Neill for Linemaster Switch (November 1991).
11. "Discharge Permit Application Interim Removal Treatment System," Fuss & O'Neill for Linemaster Switch (December 1991).

The map associated with the record cited in entry number 12 is oversized and may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

12. "Design Report - Interim Removal Treatment System," Fuss & O'Neill for Linemaster Switch (December 1991).
13. "Draft Ecological Assessment," IEP, Inc. for Linemaster Switch (October 29, 1991) (Revised: March 16, 1992).
14. "Baseline Risk Assessment - Data Tables Volume 1," Arthur D. Little, Inc. (May 26, 1992).
15. "Baseline Risk Assessment - Data Tables Volume 2," Arthur D. Little, Inc. (May 26, 1992).
16. "Baseline Risk Assessment - Dose-Response Summary and Exposure Pathways," Arthur D. Little, Inc. (June 10, 1992).

Comments

17. Comments Dated March 5, 1987 from Naomi Davidson, Connecticut Department of Environmental Protection on the January 1987 "Proposed Hydrogeologic Investigation," Fuss & O'Neill for Linemaster Switch.
18. Comments Dated August 21, 1987 from Naomi Davidson, Connecticut Department of Environmental Protection on the September 1987 "Draft Soil Gas Survey Report and Proposed Soil Sampling Program," Fuss & O'Neill for Linemaster Switch.
19. Comments Dated November 9, 1987 from Jan Drake and Michael Kulbersh, Camp Dresser & McKee, Inc. on the September 1987 "Draft Soil Gas Survey Report and Proposed Soil Sampling Program," Fuss & O'Neill for Linemaster Switch.
20. Comments Dated November 17, 1987 from Naomi Davidson, Connecticut Department of Environmental Protection on the September 1987 "Draft Soil Gas Survey Report and Proposed Soil Sampling Program," Fuss & O'Neill for Linemaster Switch.
21. Comments Dated October 10, 1988 from Geoff McGean, EPA Region I on the September 1987 "Draft Soil Gas Survey Report and Proposed Soil Sampling Program," Fuss & O'Neill for Linemaster Switch.
22. Comments Dated June 29, 1989 from Robert N. Lambe, Arthur D. Little, Inc. on the September 1987 "Draft Soil Gas Survey Report and Proposed Soil Sampling Program," Fuss & O'Neill for Linemaster Switch.

3.4 Interim Deliverables (cont'd.)

Responses to Comments

23. Response Dated March 12, 1987 from Robert S. Potterton Jr., Fuss & O'Neill on the March 5, 1987 Comments from Naomi Davidson, Connecticut Department of Environmental Protection.
24. Response Dated March 2, 1988 from Robert S. Potterton Jr., Fuss & O'Neill on the November 9, 1987 Comments from Jan Drake and Michael Kulbersh, Camp, Dresser & McKee, Inc..

3.5 Applicable or Relevant and Appropriate Requirements (ARARs)

1. "Water Discharge Permit Regulations," Connecticut Department of Environmental Protection (Revised: January 1977)
2. "Water Quality Standards," Connecticut Department of Environmental Protection (February 1987).
3. "Hazardous Air Pollutants," Connecticut Department of Environmental Protection (February 1989).
4. "Permits to Construct and Permits to Operate Stationary Sources or Modifications," Connecticut Department of Environmental Protection (December 1989).
5. "Hazardous Waste Management Regulations," Connecticut Department of Environmental Protection (Revised: July 1990).
6. Letter from Lucy M. Conley, EPA Region I to Naomi Davidson, Connecticut Department of Environmental Protection (November 26, 1990). Concerning request for list of state ARARs.
7. Letter from Naomi Davidson, Connecticut Department of Environmental Protection to Lucy M. Conley, EPA Region I (January 2, 1991). Concerning requested list of state ARARs.
8. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (January 17, 1991). Concerning transmittal of documents for state ARARs.

3.6 Remedial Investigation (RI) Reports

Reports

The records cited in entry numbers 1 through 5 may be reviewed, by appointment only at the EPA Region I Records Center in Boston, Massachusetts.

1. "Draft Remedial Investigation/Feasibility Study Report - Volume I - Text," Fuss & O'Neill for Linemaster Switch (August 1992).
2. "Draft Remedial Investigation/Feasibility Study Report - Volume II - Appendices A-G," Fuss & O'Neill for Linemaster Switch (August 1992).
3. "Draft Remedial Investigation/Feasibility Study Report - Volume III - Appendices H-W," Fuss & O'Neill for Linemaster Switch (August 1992).
4. "Draft Remedial Investigation/Feasibility Study Report - Volume IV - Text," Fuss & O'Neill for Linemaster Switch (August 1992).
5. "Draft Remedial Investigation/Feasibility Study Report - Volume V - Appendices," Fuss & O'Neill for Linemaster Switch (August 1992).
6. "Revised Draft Remedial Investigation/Feasibility Study Report - Volume I - Text," Fuss & O'Neill for Linemaster Switch (December 1992).
7. "Revised Draft Remedial Investigation/Feasibility Study Report - Volume II - Appendices A-G," Fuss & O'Neill for Linemaster Switch (December 1992).

3.6 Remedial Investigation (RI) Reports (cont'd.)

Reports

8. "Revised Draft Remedial Investigation/Feasibility Study Report - Volume III - Appendices H-W," Fuss & O'Neill for Linemaster Switch (December 1992).
9. "Revised Draft Remedial Investigation/Feasibility Study Report - Volume IV - Text," Fuss & O'Neill for Linemaster Switch (December 1992).
10. "Revised Draft Remedial Investigation/Feasibility Study Report - Volume V - Appendices A-H," Fuss & O'Neill for Linemaster Switch (December 1992).
11. "Technical Memorandum - Feasibility Study Response," Fuss & O'Neill for Linemaster Switch (February 23, 1993).
12. "Technical Memorandum - Feasibility Study Response," Fuss & O'Neill for Linemaster Switch (March 29, 1993).

Comments

13. Comments Dated September 29, 1992 from Dennis P. Gagne, EPA Region I on the August 1992 "Draft Remedial Investigation/Feasibility Study Report - Volumes I-V," Fuss & O'Neill for Linemaster Switch.
14. Comments Dated October 14, 1992 from Richard C. Bowen, Arthur D. Little, Inc. on the August 1992 "Draft Remedial Investigation/Feasibility Study Report - Volumes I-V," Fuss & O'Neill for Linemaster Switch.

3.7 Work Plans and Progress Reports

Work Plans

Work Plans cited in entry numbers 1 through 4 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts

1. "Initial Site Characterization Report Phase 1B Work Plan - Volumes I-V," Fuss & O'Neill for Linemaster Switch (November 1991).
2. "RI/FS Work Plan," Fuss & O'Neill for Linemaster Switch (November 1991).
3. "Work Plan for Baseline Risk Assessment," Arthur D. Little, Inc. (February 14, 1992).
4. "Draft Revised Phase 1B Work Plan - Section 11.0 Evaluation of Objectives," Fuss & O'Neill for Linemaster Switch (June 1, 1992).

Progress Reports

5. Progress Report #1, Fuss & O'Neill for Linemaster Switch (December 2, 1987).

The analytical reports associated with the record cited in entry number 6 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

6. Progress Report #2, Fuss & O'Neill for Linemaster Switch (February 3, 1988).
7. Progress Reports #3 and #4, Fuss & O'Neill for Linemaster Switch (May 10, 1988).
8. Progress Reports #5 and #6, Fuss & O'Neill for Linemaster Switch (October 1988).

3.7 Work Plans and Progress Reports (cont'd.)

Progress Reports

The attachments associated with the record cited in entry number 9 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

9. Progress Reports #7,#8 and #9, Fuss & O'Neill for Linemaster Switch (March 20, 1989).
10. Progress Report #10, Fuss & O'Neill for Linemaster Switch (June 12, 1989).
11. Progress Report, Fuss & O'Neill for Linemaster Switch (December 28, 1989).
12. Progress Report #14, Fuss & O'Neill for Linemaster Switch (January 29, 1990).
13. Progress Report #15, Fuss & O'Neill for Linemaster Switch (March 26, 1990).
14. Progress Report #16, Fuss & O'Neill for Linemaster Switch (May 29, 1990).
15. Progress Report #17, Fuss & O'Neill for Linemaster Switch (July 31, 1990).
16. Progress Report #18, Fuss & O'Neill for Linemaster Switch (October 24, 1990).
17. Progress Report #19, Fuss & O'Neill for Linemaster Switch (December 6, 1990).
18. Progress Report #20, Fuss & O'Neill for Linemaster Switch (January 25, 1991).
19. Progress Report #21, Fuss & O'Neill for Linemaster Switch (April 9, 1991).

The analytical reports associated with the record cited in entry number 20 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

20. Letter Report from David L. Bramley and Robert S. Potterton Jr., Fuss & O'Neill for Linemaster Switch to Naomi Davidson, Connecticut Department of Environmental Protection (May 30, 1991). Concerning progress on the interim removal actions.
21. Progress Report #22, Fuss & O'Neill for Linemaster Switch (June 3, 1991).
22. Progress Report #23, Fuss & O'Neill for Linemaster Switch (August 8, 1991).
23. Progress Report #24, Fuss & O'Neill for Linemaster Switch (November 14, 1991).

The analytical reports associated with the records cited in entry numbers 24 through 27 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

24. Progress Report #25, Fuss & O'Neill for Linemaster Switch(December 13, 1991).
25. Progress Report #26, Fuss & O'Neill for Linemaster Switch (January 13, 1992).
26. Progress Report #27, Fuss & O'Neill for Linemaster Switch (February 13, 1992).
27. Progress Report #28, Fuss & O'Neill for Linemaster Switch (March 12, 1992).
28. Progress Report #29, Fuss & O'Neill for Linemaster Switch (April 13, 1992).

The analytical reports associated with the records cited in entry numbers 29 and 30 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

29. Progress Report #30, Fuss & O'Neill for Linemaster Switch (May 13, 1992).
30. Progress Report #31, Fuss & O'Neill for Linemaster Switch (June 15, 1992).
31. Progress Report #32, Fuss & O'Neill for Linemaster Switch (July 15, 1992).

3.7 Work Plans and Progress Reports (cont'd.)

Progress Reports

The analytical reports associated with the record cited in entry number 32 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

32. Letter Report from David L. Bramley, Fuss & O'Neill for Linemaster Switch to Naomi Davidson, Connecticut Department of Environmental Protection (July 22, 1992). Concerning progress on the interim removal treatment system.
33. Progress Report #33, Fuss & O'Neill for Linemaster Switch (August 15, 1992).

The analytical reports associated with the records cited in entry numbers 34 through 38 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

34. Progress Report #34, Fuss & O'Neill for Linemaster Switch (September 3, 1992).
35. Progress Report #35, Fuss & O'Neill for Linemaster Switch (October 15, 1992).
36. Progress Report #36, Fuss & O'Neill for Linemaster Switch (November 11, 1992).
37. Progress Report #37, Fuss & O'Neill for Linemaster Switch (December 14, 1992).
38. Progress Report #38, Fuss & O'Neill for Linemaster Switch (January 14, 1993).
39. Progress Report #42, Fuss & O'Neill for Linemaster Switch (May 17, 1993).

The analytical reports associated with the records cited in entry numbers 40 and 41 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

40. Progress Report #43, Fuss & O'Neill for Linemaster Switch (June 15, 1993).
41. Progress Report #44, Fuss & O'Neill for Linemaster Switch (July 13, 1993).

3.9 Health Assessments

1. "Preliminary Health Assessment," U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry (ATSDR) (June 25, 1990).

4.0 Feasibility Study (FS)

4.1 Correspondence

1. Letter from Michael J. Nalipinski, EPA Region I to Gary Kennett, Linemaster Switch (January 28, 1992). Concerning proposed pumping test plan.
2. Letter from Michael J. Nalipinski, EPA Region I to Gary Kennett, Linemaster Switch (February 13, 1992). Concerning feasibility study report format.
3. Letter from Gary N. Kennett, Linemaster Switch to Michael J. Nalipinski, EPA Region I (May 14, 1993). Concerning soil sample analysis.
4. Memorandum from Ann-Marie Burke, EPA Region I to Michael J. Nalipinski, EPA Region I (May 17, 1993). Concerning cleanup levels for groundwater.

4.1 Correspondence (cont'd.)

5. Memorandum from Richard C. Bowen, Arthur D. Little, Inc. to Elise Jakabhazy, EPA Region I (July 16, 1993). Concerning attached capital costs for air stripping system.
6. Memorandum from Elise Jakabhazy, EPA Region I to Linemaster File (July 19, 1993) with attachment. Concerning air emissions.
7. Memorandum from Elise Jakabhazy, EPA Region I to Linemaster File (July 19, 1993). Concerning cost of installing off-site carbon filters.

4.4 Interim Deliverables

Reports

1. Letter Report from David L. Bramley, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (August 13, 1991) with attached map. Concerning installation of Phase III monitoring wells and a dewatering feasibility study.

The map associated with the record cited in entry number 2 is oversized and may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

2. Letter Report from David L. Bramley and Robert S. Potterton Jr., Fuss & O'Neill to Lucy M. Conley, EPA Region I (January 20, 1992). Concerning the Zone 1 dewatering feasibility study and the pumping test plan.

Comments

3. Comments Dated September 17, 1991 from Lucy M. Conley, EPA Region I on the August 13, 1991 Letter Report from David L. Bramley, Fuss & O'Neill.
4. Comments Dated October 21, 1991 from Dennis P. Gagne, EPA Region I on the August 13, 1991 Letter Report from David L. Bramley, Fuss & O'Neill.

Responses to Comments

5. Response Dated October 4, 1991 from David L. Bramley, Fuss & O'Neill on the September 17, 1991 Comments from Lucy M. Conley, EPA Region I.

4.6 Feasibility Study (FS) Reports

1. Cross-Reference: "Draft Remedial Investigation/Feasibility Study Report - Volume I - Text," Fuss & O'Neill for Linemaster Switch (August 1992) [Filed and cited as entry number 1 in 3.6 Remedial Investigation (RI) Reports].
2. Cross-Reference: "Draft Remedial Investigation/Feasibility Study Report - Volume II - Appendices A-G," Fuss & O'Neill for Linemaster Switch (August 1992) [Filed and cited as entry number 2 in 3.6 Remedial Investigation (RI) Reports].
3. Cross-Reference: "Draft Remedial Investigation/Feasibility Study Report - Volume III - Appendices H-W," Fuss & O'Neill for Linemaster Switch (August 1992) [Filed and cited as entry number 3 in 3.6 Remedial Investigation (RI) Reports].
4. Cross-Reference: "Draft Remedial Investigation/Feasibility Study Report - Volume IV - Text," Fuss & O'Neill for Linemaster Switch (August 1992) [Filed and cited as entry number 4 in 3.6 Remedial Investigation (RI) Reports].

4.6 Feasibility Study (FS) Reports (cont'd.)

5. Cross-Reference: "Draft Remedial Investigation/Feasibility Study Report - Volume V - Appendices," Fuss & O'Neill for Linemaster Switch (August 1992) [Filed and cited as entry number 5 in 3.6 Remedial Investigation (RI) Reports].
6. Cross-Reference: "Revised Draft Remedial Investigation/Feasibility Study Report - Volume I - Text," Fuss & O'Neill for Linemaster Switch (December 1992) [Filed and cited as entry number 6 in 3.6 Remedial Investigation (RI) Reports].
7. Cross-Reference: "Revised Draft Remedial Investigation/Feasibility Study Report - Volume II - Appendices A-G," Fuss & O'Neill for Linemaster Switch (December 1992) [Filed and cited as entry number 7 in 3.6 Remedial Investigation (RI) Reports].
8. Cross-Reference: "Revised Draft Remedial Investigation/Feasibility Study Report - Volume III - Appendices H-W," Fuss & O'Neill for Linemaster Switch (December 1992) [Filed and cited as entry number 8 in 3.6 Remedial Investigation (RI) Reports].
9. Cross-Reference: "Revised Draft Remedial Investigation/Feasibility Study Report - Volume IV - Text," Fuss & O'Neill for Linemaster Switch (December 1992) [Filed and cited as entry number 9 in 3.6 Remedial Investigation (RI) Reports].
10. Cross-Reference: "Revised Draft Remedial Investigation/Feasibility Study Report - Volume V - Appendices A-H," Fuss & O'Neill for Linemaster Switch (December 1992) [Filed and cited as entry number 10 in 3.6 Remedial Investigation (RI) Reports].

Comments

11. Cross-Reference: Comments Dated October 14, 1992 from Richard C. Bowen, Arthur D. Little, Inc. on the August 1992 "Draft Remedial Investigation/Feasibility Study Report - Volumes I-V," Fuss & O'Neill for Linemaster Switch [Filed and cited as entry number 14 in 3.6 Remedial Investigation (RI) Reports].

4.9 Proposed Plans for Selected Remedial Action

1. "EPA Proposes Cleanup Plan for the Linemaster Switch Corporation Superfund Site," EPA Region I (April 1993).

Comments

Comments on the Remedial Investigation/Feasibility Study and Proposed Plan received by EPA Region I during the formal comment period are filed and cited in 5.3 Responsiveness Summaries.

5.0 Record of Decision (ROD)

5.1 Correspondence

1. Letter from Dennis P. Gagne, EPA Region I to Naomi Davidson, Connecticut Department of Environmental Protection (May 27, 1993). Concerning transmittal of the draft Record of Decision.
2. Letter from Timothy R.E. Keeney, Connecticut Department of Environment Protection to Paul Keough, EPA Region I (June 30, 1993). Concerning concurrence with EPA's selected remedy detailed in the April 1993 Proposed Plan.

5.3 Responsiveness Summaries

1. Cross-Reference: Responsiveness Summary, EPA Region I (July 21, 1993) [Filed and included as an Appendix to entry number 1 in 5.4 Record of Decision (ROD)].

The following citations indicate written comments received by EPA Region I during the formal comment period:

2. Letter from Edward C. Parker, Connecticut Department of Environmental Protection to Michael J. Nalipinski, EPA Region I (May 12, 1993). Concerning the April 1993 Proposed Plan.
3. Letter from Gary N. Kennett, Linemaster Switch to Michael J. Nalipinski, EPA Region I (May 13, 1993). Concerning the April 1993 Proposed Plan.

5.4 Record of Decision (ROD)

1. Record of Decision for Linemaster Switch, EPA Region I (July 21, 1993).

9.0 State Coordination

9.1 Correspondence

1. Letter from Leslie F. White, Connecticut Department of Environmental Protection to Margaret Leshen, EPA Region I (May 10, 1991). Concerning receipt of draft statement of work and the May 1, 1991 Administrative Order.
2. Letter from Margaret Leshen, EPA Region I to Naomi Davidson, Connecticut Department of Environmental Protection (June 18, 1991). Concerning EPA's acknowledgement of outstanding work done by Ms. Davidson regarding the site.
3. Letter from David L. Bramley, Fuss & O'Neill to Naomi Davidson, Connecticut Department of Environmental Protection (February 12, 1992) with attached summary table and analysis results. Concerning reduction in sampling of monitoring well.
4. Letter from Naomi Davidson, Connecticut Department of Environmental Protection to David L. Bramley, Fuss & O'Neill (February 14, 1992). Concerning approval to reduce sampling of monitoring well.

10.0 Enforcement

10.3 State and Local Enforcement Records

1. "Order To Abate Pollution," Connecticut Department of Environmental Protection, Order No. WC4334 (April 8, 1986).
2. "Emergency Discharge Authorization," Connecticut Department of Environmental Protection, DEP/WPC 169-004 (February 10, 1992).

10.7 EPA Administrative Orders

1. Administrative Order, *In the Matter of Linemaster Switch Corporation*, Docket No. 1-87-113 (September 24, 1987).
2. Administrative Order, *In the Matter of Linemaster Switch Corporation Superfund Site*, Docket No. I-91-1104 (October 7, 1991) with Attachment A - Statement of Work.

10.9 Pleadings

1. *Linemaster Switch Corporation v. U.S. Environmental Protection Agency*, United States Court of Appeals for the District of Columbia Circuit, No. 90-1253 (July 12, 1991).

11.0 Potentially Responsible Party (PRP)

11.9 PRP-Specific Correspondence

1. Letter from Paul E. Simpson, Linemaster Switch to Frank Sampson and Jeff Heidtman, Fuss & O'Neill (March 6, 1986). Concerning confirmation of Linemaster's work arrangement with Fuss & O'Neill.
2. Letter from Paul E. Simpson, Linemaster Switch to Stanley J. Pac, Connecticut Department of Environmental Protection (April 11, 1986). Concerning the hiring of Fuss & O'Neill.
3. Letter from Edward J. Conley, EPA Region I to Linemaster Switch (November 14, 1986). Concerning request for information.
4. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Thomas C. Condon, EPA Region I (December 18, 1986). Concerning response to request for information.
5. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (October 2, 1989). Concerning notification of project management.
6. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (December 20, 1989). Concerning drilling schedule and progress reports.
7. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Douglas J. Luckerman, EPA Region I (March 7, 1990). Concerning extension of time to respond to request for information.
8. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Lucy M. Conley, EPA Region I (July 13, 1990). Concerning alternative drinking water to the Tarr Apartments.
9. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (November 20, 1990). Concerning approval to alternative drinking water to the Tarr Apartments.
10. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Lucy M. Conley, EPA Region I (December 18, 1990). Concerning schedule for field activities and deliverables.
11. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Douglas J. Luckerman, EPA Region I (March 7, 1991). Concerning schedule for field activities and deliverables.
12. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Douglas J. Luckerman, EPA Region I (March 15, 1991). Concerning schedule for submitting a draft remedial investigation/feasibility study.
13. Letter from Douglas J. Luckerman, EPA Region I to R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) (March 15, 1991). Concerning Linemaster's commitment to perform work at the site.

11.9 PRP-Specific Correspondence (cont'd.)

Attachments A through F associated with entry number 14, may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

14. Letter from Alfred E. Smith Jr., Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Lucy M. Conley, EPA Region I (April 25, 1991). Concerning Nancy B. Blakely's response to information request.
15. Letter from Merrill S. Hohman, EPA Region I to John W. Maloney, Linemaster Switch (May 23, 1991). Concerning decision not to use special notice procedures and EPA's intention to perform the RI/FS at the site.
16. Letter from Douglas J. Luckerman, EPA Region I to John W. Maloney, Linemaster Switch (June 17, 1991). Concerning lack of response to the May 23, 1991 letter from Mr. Hohman.
17. Letter from John W. Maloney, Linemaster Switch to Merrill S. Hohman, EPA Region I (June 17, 1991). Concerning response to the May 23, 1991 letter from Mr. Hohman.
18. Letter from John W. Maloney, Linemaster Switch to Douglas J. Luckerman, EPA Region I (June 21, 1991). Concerning request for negotiations meeting.
19. Letter from Douglas J. Luckerman, EPA Region I to John W. Maloney, Linemaster Switch (June 25, 1991). Concerning approval of extension deadline.
20. Letter from R. Bradford Fawley, Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Douglas J. Luckerman, EPA Region I (June 26, 1991). Concerning EPA performing investigation activities at the site.
21. Letter from Douglas J. Luckerman, EPA Region I to R. Bradford Fawley, Murtha, Cullina, Richter and Pinney and John W. Maloney, Linemaster Switch (July 26, 1991). Concerning EPA's decision to perform investigation activities at the site.
22. Letter from Merrill S. Hohman, EPA Region I to John W. Maloney, Linemaster Switch (July 26, 1991). Concerning EPA's decision to perform investigation activities at the site.
23. Letter from Merrill S. Hohman, EPA Region I to John W. Maloney, Linemaster Switch (July 26, 1991). Concerning a request for information.
24. Letter from Lucy M. Conley, EPA Region I to John W. Maloney, Linemaster Switch (August 15, 1991). Concerning time extension on information request.
25. Letter from Lucy M. Conley, EPA Region I to John W. Maloney, Linemaster Switch (August 22, 1991). Concerning clarification of time extension on information request.
26. Letter from Dennis P. Gagne, EPA Region I to John W. Maloney, Linemaster Switch (October 7, 1991). Concerning designation of Government Coordinators for the site.
27. Letter from Merrill S. Hohman, EPA Region I to John W. Maloney, Linemaster Switch (October 21, 1991). Concerning withdrawal of request for information.

13.0 Community Relations

13.1 Correspondence

1. Letter from Lucy M. Conley, EPA Region I to Gary Kennett, Linemaster Switch (November 16, 1989). Concerning transmittal of fact sheet.
2. Letter from James T. Olsen, Fuss & O'Neill to Greg Kline, Northeast District Department of Health (September 19, 1990). Concerning attached analysis of water samples.
3. Letter from James T. Olsen, Fuss & O'Neill to Doug Cutler, Town of Woodstock (October 26, 1990). Concerning attached analysis of water samples.
4. Letter from Lucy M. Conley, EPA Region I to Susan Yurasevecz, EEOH (November 13, 1990). Concerning the attached lab results of the Woodstock School well water.
5. Letter from Naomi Davidson, Connecticut Department of Environmental Protection to James T. Olsen, Fuss & O'Neill (November 19, 1990). Concerning water samples taken from the Woodstock School and Woodstock Town Hall.
6. Letter from David L. Bramley, Fuss & O'Neill to Michael Balch, Town of Woodstock (February 10, 1992). Concerning attached analysis of water samples.
7. Letter from David L. Bramley, Fuss & O'Neill to Michael Balch, Town of Woodstock (March 12, 1992). Concerning attached analysis of water samples.
8. Letter from Michael J. Nalipinski, EPA Region I to Wally Isbicki, Woodstock Public Library (March 18, 1992). Concerning transmittal of documents.
9. Letter form Gary Kennett, Linemaster Switch to Holly Anne O'Connor (April 8, 1992). Concerning the carbon filtration system.
10. Letter from David L. Bramley, Fuss & O'Neill to Anthony J. Perrelli, Woodstock Public Schools (April 13, 1992). Concerning attached analysis of water samples.
11. Letter from David L. Bramley, Fuss & O'Neill to Michael Balch, Town of Woodstock (May 12, 1992). Concerning attached analysis of water samples.
12. Letter from David L. Bramley, Fuss & O'Neill to Michael Balch, Town of Woodstock (August 3, 1992). Concerning attached analysis of water samples.
13. Letter from David L. Bramley, Fuss & O'Neill to Anthony J. Perrelli, Woodstock Public Schools (September 2, 1992). Concerning attached analysis of water samples.
14. Letter from David L. Bramley, Fuss & O'Neill to Michael Balch, Town of Woodstock (November 9, 1992). Concerning attached analysis of water samples.
15. Letter from David L. Bramley, Fuss & O'Neill to Anthony J. Perrelli, Woodstock Public Schools (November 10, 1992). Concerning attached analysis of water samples.
16. Letter from David L. Bramley, Fuss & O'Neill to Anthony J. Perrelli, Woodstock Public Schools (January 21, 1993). Concerning attached analysis of water samples.
17. Letter from David L. Bramley, Fuss & O'Neill to Michael Balch, Town of Woodstock (January 21, 1993). Concerning attached analysis of water samples.
18. Letter from David L. Bramley, Fuss & O'Neill to Michael Balch, Town of Woodstock (June 14, 1993). Concerning attached analysis of water samples.
19. Letter from David L. Bramley, Fuss & O'Neill to Anthony J. Perrelli, Woodstock Public Schools (June 14, 1993). Concerning attached analysis of water samples.
20. Letter from James T. Olsen, Fuss & O'Neill to Craig Durga (April 3, 1990). Concerning attached analysis of water samples.
21. Letter from James T. Olsen, Fuss & O'Neill to Herbert Howe (April 3, 1990). Concerning attached analysis of water samples.
22. Letter from James T. Olsen, Fuss & O'Neill to Mrs. Paul Larson (April 3, 1990). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Letters to Residents from Fuss & O'Neill

23. Letter from James T. Olsen, Fuss & O'Neill to Craig Durga (September 19, 1990). Concerning attached analysis of water samples.
24. Letter from James T. Olsen, Fuss & O'Neill to Herbert Howe (September 19, 1990). Concerning attached analysis of water samples.
25. Letter from James T. Olsen, Fuss & O'Neill to Mrs. Paul Larson (September 19, 1990). Concerning attached analysis of water samples.
26. Letter from James T. Olsen, Fuss & O'Neill to Herbert Stickney (September 19, 1990). Concerning attached analysis of water samples.
27. Letter from James T. Olsen, Fuss & O'Neill to Mr. Brown (September 26, 1990). Concerning collection of water samples.
28. Letter from James T. Olsen, Fuss & O'Neill to Mr. and Mrs. Austin (October 30, 1990). Concerning collection of water samples.
29. Letter from James T. Olsen, Fuss & O'Neill to Craig Durga (November 12, 1990). Concerning attached analysis of water samples.
30. Letter from James T. Olsen, Fuss & O'Neill to Herbert Howe (November 12, 1990). Concerning attached analysis of water samples.
31. Letter from James T. Olsen, Fuss & O'Neill to Mr. and Mrs. Paul Larson (November 12, 1990). Concerning attached analysis of water samples.
32. Letter from James T. Olsen, Fuss & O'Neill to Herbert Stickney (November 12, 1990). Concerning attached analysis of water samples.
33. Letter from James T. Olsen, Fuss & O'Neill to Harold Bishop (November 14, 1990). Concerning attached analysis of water samples.
34. Letter from David L. Bramley, Fuss & O'Neill to Nancy Blakely (March 3, 1992). Concerning attached analysis of water samples.
35. Letter from David L. Bramley, Fuss & O'Neill to Scott and Sarah Dragon (March 3, 1992). Concerning attached analysis of water samples.
36. Letter from David L. Bramley, Fuss & O'Neill to Anthony and Lynne Foote (March 3, 1992). Concerning attached analysis of water samples.
37. Letter from David L. Bramley, Fuss & O'Neill to Russel Hicks (March 3, 1992). Concerning attached analysis of water samples.
38. Letter from David L. Bramley, Fuss & O'Neill to Bernice Christopher (March 5, 1992). Concerning attached analysis of water samples.
39. Letter from David L. Bramley, Fuss & O'Neill to Paul Elmen (March 5, 1992). Concerning attached analysis of water samples.
40. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (March 5, 1992). Concerning attached analysis of water samples.
41. Letter from David L. Bramley, Fuss & O'Neill to Gardener Johnson (March 5, 1992). Concerning attached analysis of water samples.
42. Letter from David L. Bramley, Fuss & O'Neill to Holly Anne O'Connor (March 5, 1992). Concerning attached analysis of water samples.
43. Letter from David L. Bramley, Fuss & O'Neill to Charles Parham (March 5, 1992). Concerning attached analysis of water samples.
44. Letter from David L. Bramley, Fuss & O'Neill to Alan Reinhart (March 5, 1992). Concerning attached analysis of water samples.
45. Letter from David L. Bramley, Fuss & O'Neill to Walter Zevoroneck (March 5, 1992). Concerning attached analysis of water samples.
46. Letter from David L. Bramley, Fuss & O'Neill to Brian and Marie Bates (March 12, 1992). Concerning attached analysis of water samples.
47. Letter from David L. Bramley, Fuss & O'Neill to Robert Bridgeman (March 12, 1992). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Letters to Residents from Fuss & O'Neill

48. Letter from David L. Bramley, Fuss & O'Neill to Angelo Cornell (March 12, 1992). Concerning attached analysis of water samples.
49. Letter from David L. Bramley, Fuss & O'Neill to Henry Doughty (March 12, 1992). Concerning attached analysis of water samples.
50. Letter from David L. Bramley, Fuss & O'Neill to Eugene Ennis (March 12, 1992). Concerning attached analysis of water samples.
51. Letter from David L. Bramley, Fuss & O'Neill to Mark Fuller (March 12, 1992). Concerning attached analysis of water samples.
52. Letter from David L. Bramley, Fuss & O'Neill to Ronald Labranche (March 12, 1992). Concerning attached analysis of water samples.
53. Letter from David L. Bramley, Fuss & O'Neill to Donna Maramo (March 12, 1992). Concerning attached analysis of water samples.
54. Letter from David L. Bramley, Fuss & O'Neill to Douglas Masin (March 12, 1992). Concerning attached analysis of water samples.
55. Letter from David L. Bramley, Fuss & O'Neill to Constance Pershmalyan (March 12, 1992). Concerning attached analysis of water samples.
56. Letter from David L. Bramley, Fuss & O'Neill to Robert Scranton (March 12, 1992). Concerning attached analysis of water samples.
57. Letter from David L. Bramley, Fuss & O'Neill to James Wenger (March 12, 1992). Concerning attached analysis of water samples.
58. Letter from David L. Bramley, Fuss & O'Neill to Craig Durga (April 13, 1992). Concerning attached analysis of water samples.
59. Letter from David L. Bramley, Fuss & O'Neill to Gregory Hackett (April 13, 1992). Concerning attached analysis of water samples.
60. Letter from David L. Bramley, Fuss & O'Neill to Ken Hamilton (April 13, 1992). Concerning attached analysis of water samples.
61. Letter from David L. Bramley, Fuss & O'Neill to Donald Henry (April 13, 1992). Concerning attached analysis of water samples.
62. Letter from David L. Bramley, Fuss & O'Neill to Herbert Howe (April 13, 1992). Concerning attached analysis of water samples.
63. Letter from David L. Bramley, Fuss & O'Neill to William Kosche (April 13, 1992). Concerning attached analysis of water samples.
64. Letter from David L. Bramley, Fuss & O'Neill to Mrs. Paul Larson (April 13, 1992). Concerning attached analysis of water samples.
65. Letter from David L. Bramley, Fuss & O'Neill to Phillip Stark (April 13, 1992). Concerning attached analysis of water samples.
66. Letter from David L. Bramley, Fuss & O'Neill to Herbert Stickney (April 13, 1992). Concerning attached analysis of water samples.
67. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (April 13, 1992). Concerning attached analysis of water samples.
68. Letter from David L. Bramley, Fuss & O'Neill to Edwin Vonderheide (April 13, 1992). Concerning attached analysis of water samples.
69. Letter from David L. Bramley, Fuss & O'Neill to Lorraine Wysowski (April 13, 1992). Concerning attached analysis of water samples.
70. Letter from David L. Bramley, Fuss & O'Neill to Joseph Parent (May 12, 1992). Concerning attached analysis of water samples.
71. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (May 12, 1992). Concerning attached analysis of water samples.
72. Letter from David L. Bramley, Fuss & O'Neill to Gordon Brown (May 22, 1992). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Letters to Residents from Fuss & O'Neill

73. Letter from David L. Bramley, Fuss & O'Neill to Holly Anne O'Connor (May 22, 1992). Concerning attached analysis of water samples.
74. Letter from David L. Bramley, Fuss & O'Neill to Nellie Barclift (May 26, 1992). Concerning attached analysis of water samples.
75. Letter from David L. Bramley, Fuss & O'Neill to Nancy Blakely (May 26, 1992). Concerning attached analysis of water samples.
76. Letter from David L. Bramley, Fuss & O'Neill to Scott and Sarah Dragon (May 26, 1992). Concerning attached analysis of water samples.
77. Letter from David L. Bramley, Fuss & O'Neill to Paul Elmen (May 26, 1992). Concerning attached analysis of water samples.
78. Letter from David L. Bramley, Fuss & O'Neill to Anthony and Lynne Foote (May 26, 1992). Concerning attached analysis of water samples.
79. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (May 26, 1992). Concerning attached analysis of water samples.
80. Letter from David L. Bramley, Fuss & O'Neill to Alan Reinhart (May 26, 1992). Concerning attached analysis of water samples.
81. Letter from David L. Bramley, Fuss & O'Neill to Gordon Brown (May 27, 1992). Concerning attached analysis of water samples.
82. Letter from David L. Bramley, Fuss & O'Neill to Esther R. Painter (May 27, 1992). Concerning attached analysis of water samples.
83. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (July 27, 1992). Concerning attached analysis of water samples.
84. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (July 27, 1992). Concerning attached analysis of water samples.
85. Letter from David L. Bramley, Fuss & O'Neill to Gordon Brown (July 28, 1992). Concerning attached analysis of water samples.
86. Letter from David L. Bramley, Fuss & O'Neill to Scott and Sandra Dragon (July 28, 1992). Concerning attached analysis of water samples.
87. Letter from David L. Bramley, Fuss & O'Neill to Craig Durga (July 28, 1992). Concerning attached analysis of water samples.
88. Letter from David L. Bramley, Fuss & O'Neill to Anthony and Lynne Foote (July 28, 1992). Concerning attached analysis of water samples.
89. Letter from David L. Bramley, Fuss & O'Neill to Gregory Hackett (July 28, 1992). Concerning attached analysis of water samples.
90. Letter from David L. Bramley, Fuss & O'Neill to Ken Hamilton (July 28, 1992). Concerning attached analysis of water samples.
91. Letter from David L. Bramley, Fuss & O'Neill to Donald Henry (July 28, 1992). Concerning attached analysis of water samples.
92. Letter from David L. Bramley, Fuss & O'Neill to Herbert Howe (July 28, 1992). Concerning attached analysis of water samples.
93. Letter from David L. Bramley, Fuss & O'Neill to William Kosche (July 28, 1992). Concerning attached analysis of water samples.
94. Letter from David L. Bramley, Fuss & O'Neill to Mrs. Paul Larson (July 28, 1992). Concerning attached analysis of water samples.
95. Letter from David L. Bramley, Fuss & O'Neill to Nancy Petersen (July 28, 1992). Concerning attached analysis of water samples.
96. Letter from David L. Bramley, Fuss & O'Neill to Phillip Stark (July 28, 1992). Concerning attached analysis of water samples.
97. Letter from David L. Bramley, Fuss & O'Neill to Herbert Stickney (July 28, 1992). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Letters to Residents from Fuss & O'Neill

98. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (July 28, 1992). Concerning attached analysis of water samples.
99. Letter from David L. Bramley, Fuss & O'Neill to Edwin Vonderheide (July 28, 1992). Concerning attached analysis of water samples.
100. Letter from David L. Bramley, Fuss & O'Neill to Lorraine Wysowski (July 28, 1992). Concerning attached analysis of water samples.
101. Letter from David L. Bramley, Fuss & O'Neill to Joseph Parent (July 29, 1992). Concerning attached analysis of water samples.
102. Letter from David L. Bramley, Fuss & O'Neill to Paul Elmen (August 4, 1992). Concerning attached analysis of water samples.
103. Letter from David L. Bramley, Fuss & O'Neill to Bernice Christopher (August 31, 1992). Concerning attached analysis of water samples.
104. Letter from David L. Bramley, Fuss & O'Neill to Peter Cooper (August 31, 1992). Concerning attached analysis of water samples.
105. Letter from David L. Bramley, Fuss & O'Neill to Holly Anne O'Connor (September 1, 1992). Concerning attached analysis of water samples.
106. Letter from David L. Bramley, Fuss & O'Neill to Harold Bishop (September 22, 1992). Concerning attached analysis of water samples.
107. Letter from David L. Bramley, Fuss & O'Neill to Bernice Christopher (September 22, 1992). Concerning attached analysis of water samples.
108. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (September 22, 1992). Concerning attached analysis of water samples.
109. Letter from David L. Bramley, Fuss & O'Neill to Russel Hicks (September 22, 1992). Concerning attached analysis of water samples.
110. Letter from David L. Bramley, Fuss & O'Neill to Charles Parham (September 22, 1992). Concerning attached analysis of water samples.
111. Letter from David L. Bramley, Fuss & O'Neill to Alan Reinhart (September 22, 1992). Concerning attached analysis of water samples.
112. Letter from David L. Bramley, Fuss & O'Neill to Holly Anne O'Connor (September 23, 1992). Concerning attached analysis of water samples.
113. Letter from David L. Bramley, Fuss & O'Neill to Nellie Barclift (September 29, 1992). Concerning attached analysis of water samples.
114. Letter from David L. Bramley, Fuss & O'Neill to Brain and Marie Bates (September 29, 1992). Concerning attached analysis of water samples.
115. Letter from David L. Bramley, Fuss & O'Neill to Robert Bridgeman (September 29, 1992). Concerning attached analysis of water samples.
116. Letter from David L. Bramley, Fuss & O'Neill to Angelo Cornell (September 29, 1992). Concerning attached analysis of water samples.
117. Letter from David L. Bramley, Fuss & O'Neill to Henry Doughty (September 29, 1992). Concerning attached analysis of water samples.
118. Letter from David L. Bramley, Fuss & O'Neill to Gardener Johnson (September 29, 1992). Concerning attached analysis of water samples.
119. Letter from David L. Bramley, Fuss & O'Neill to Ronald Labranche (September 29, 1992). Concerning attached analysis of water samples.
120. Letter from David L. Bramley, Fuss & O'Neill to Donna Maramo (September 29, 1992). Concerning attached analysis of water samples.
121. Letter from David L. Bramley, Fuss & O'Neill to Douglas Masin (September 29, 1992). Concerning attached analysis of water samples.
122. Letter from David L. Bramley, Fuss & O'Neill to Owen J. Pepe Jr. (September 29, 1992). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Letters to Residents from Fuss & O'Neill

123. Letter from David L. Bramley, Fuss & O'Neill to Constance Pershmalyan (September 29, 1992). Concerning attached analysis of water samples.
124. Letter from David L. Bramley, Fuss & O'Neill to James Wenger (September 29, 1992). Concerning attached analysis of water samples.
125. Letter from David L. Bramley, Fuss & O'Neill to Walter Zevoroneck (September 29, 1992). Concerning attached analysis of water samples.
126. Letter from David L. Bramley, Fuss & O'Neill to Paul Elmen (September 30, 1992). Concerning attached analysis of water samples.
127. Letter from David L. Bramley, Fuss & O'Neill to Eugene Ennis (September 30, 1992). Concerning attached analysis of water samples.
128. Letter from David L. Bramley, Fuss & O'Neill to Anthony and Lynne Foote (September 30, 1992). Concerning attached analysis of water samples.
129. Letter from David L. Bramley, Fuss & O'Neill to Mark Fuller (September 30, 1992). Concerning attached analysis of water samples.
130. Letter from David L. Bramley, Fuss & O'Neill to Esther R. Painter (September 30, 1992). Concerning attached analysis of water samples.
131. Letter from David L. Bramley, Fuss & O'Neill to Nancy Petersen (September 30, 1992). Concerning attached analysis of water samples.
132. Letter from David L. Bramley, Fuss & O'Neill to Robert Scranton (September 30, 1992). Concerning attached analysis of water samples.
133. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (October 2, 1992). Concerning attached analysis of water samples.
134. Letter from David L. Bramley, Fuss & O'Neill to Scott and Sarah Dragon (October 29, 1992). Concerning attached analysis of water samples.
135. Letter from David L. Bramley, Fuss & O'Neill to Mr. and Mrs. Austin (November 9, 1992). Concerning attached analysis of water samples.
136. Letter from David L. Bramley, Fuss & O'Neill to Gordon Brown (November 9, 1992). Concerning attached analysis of water samples.
137. Letter from David L. Bramley, Fuss & O'Neill to Peter Cooper (November 9, 1992). Concerning attached analysis of water samples.
138. Letter from David L. Bramley, Fuss & O'Neill to Craig Durga (November 9, 1992). Concerning attached analysis of water samples.
139. Letter from David L. Bramley, Fuss & O'Neill to Gregory Hackett (November 9, 1992). Concerning attached analysis of water samples.
140. Letter from David L. Bramley, Fuss & O'Neill to Ken Hamilton (November 9, 1992). Concerning attached analysis of water samples.
141. Letter from David L. Bramley, Fuss & O'Neill to Donald Henry (November 9, 1992). Concerning attached analysis of water samples.
142. Letter from David L. Bramley, Fuss & O'Neill to Herbert Howe (November 9, 1992). Concerning attached analysis of water samples.
143. Letter from David L. Bramley, Fuss & O'Neill to William Kosche (November 9, 1992). Concerning attached analysis of water samples.
144. Letter from David L. Bramley, Fuss & O'Neill to Mrs. Paul Larson (November 9, 1992). Concerning attached analysis of water samples.
145. Letter from David L. Bramley, Fuss & O'Neill to Holly Anne O'Connor (November 9, 1992). Concerning attached analysis of water samples.
146. Letter from David L. Bramley, Fuss & O'Neill to Joseph Parent (November 9, 1992). Concerning attached analysis of water samples.
147. Letter from David L. Bramley, Fuss & O'Neill to Phillip Stark (November 9, 1992). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Letters to Residents from Fuss & O'Neill

148. Letter from David L. Bramley, Fuss & O'Neill to Herbert Stickney (November 9, 1992). Concerning attached analysis of water samples.
149. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (November 9, 1992). Concerning attached analysis of water samples for GW-06.
150. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (November 9, 1992). Concerning attached analysis of water samples for GW-26.
151. Letter from David L. Bramley, Fuss & O'Neill to Lorraine Wysowski (November 9, 1992). Concerning attached analysis of water samples.
152. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (November 10, 1992). Concerning attached analysis of water samples.
153. Letter from David L. Bramley, Fuss & O'Neill to Russel Hicks (November 10, 1992). Concerning attached analysis of water samples.
154. Letter from David L. Bramley, Fuss & O'Neill to Peter Cooper (December 9, 1992). Concerning attached analysis of water samples.
155. Letter from David L. Bramley, Fuss & O'Neill to Paul Elmen (December 9, 1992). Concerning attached analysis of water samples.
156. Letter from David L. Bramley, Fuss & O'Neill to Russel Hicks (December 9, 1992). Concerning attached analysis of water samples.
157. Letter from David L. Bramley, Fuss & O'Neill to Owen J. Pepe Jr. (December 9, 1992). Concerning attached analysis of water samples.
158. Letter from David L. Bramley, Fuss & O'Neill to Nancy Petersen (December 9, 1992). Concerning attached analysis of water samples.
159. Letter from David L. Bramley, Fuss & O'Neill to Phillip Stark (December 9, 1992). Concerning attached analysis of water samples.
160. Letter from David L. Bramley, Fuss & O'Neill to James Wenger (December 9, 1992). Concerning attached analysis of water samples.
161. Letter from David L. Bramley, Fuss & O'Neill to Anthony and Lynne Foote (December 17, 1992). Concerning attached analysis of water samples.
162. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (December 17, 1992). Concerning attached analysis of water samples.
163. Letter from David L. Bramley, Fuss & O'Neill to Phillip Stark (December 17, 1992). Concerning attached analysis of water samples.
164. Letter from David L. Bramley, Fuss & O'Neill to Russel Hicks (December 18, 1992). Concerning attached analysis of water samples.
165. Letter from David L. Bramley, Fuss & O'Neill to David Simmons (December 21, 1992). Concerning attached analysis of water samples.
166. Letter from David L. Bramley, Fuss & O'Neill to Scott and Sarah Dragon (January 12, 1993). Concerning attached analysis of water samples.
167. Letter from David L. Bramley, Fuss & O'Neill to Victoria Reich (January 12, 1993). Concerning well monitoring program.
168. Letter from David L. Bramley, Fuss & O'Neill to Craig Durga (January 19, 1993). Concerning attached analysis of water samples.
169. Letter from David L. Bramley, Fuss & O'Neill to Anthony and Lynne Foote (January 19, 1993). Concerning attached analysis of water samples.
170. Letter from David L. Bramley, Fuss & O'Neill to Donald Harding (January 19, 1993). Concerning attached analysis of water samples.
171. Letter from David L. Bramley, Fuss & O'Neill to Donald Henry (January 19, 1993). Concerning attached analysis of water samples.
172. Letter from David L. Bramley, Fuss & O'Neill to Russel Hicks (January 19, 1993). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Letters to Residents from Fuss & O'Neill

173. Letter from David L. Bramley, Fuss & O'Neill to Herbert Howe (January 19, 1993). Concerning attached analysis of water samples.
174. Letter from David L. Bramley, Fuss & O'Neill to William Kosche (January 19, 1993). Concerning attached analysis of water samples.
175. Letter from David L. Bramley, Fuss & O'Neill to Joseph Parent (January 19, 1993). Concerning attached analysis of water samples.
176. Letter from David L. Bramley, Fuss & O'Neill to Nancy Petersen (January 19, 1993). Concerning attached analysis of water samples.
177. Letter from David L. Bramley, Fuss & O'Neill to David Simmons (January 19, 1993). Concerning attached analysis of water samples.
178. Letter from David L. Bramley, Fuss & O'Neill to Phillip Stark (January 19, 1993). Concerning attached analysis of water samples.
179. Letter from David L. Bramley, Fuss & O'Neill to Herbert Stickney (January 19, 1993). Concerning attached analysis of water samples.
180. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (January 19, 1993). Concerning attached analysis of water samples for GW-06.
181. Letter from David L. Bramley, Fuss & O'Neill to Owen Tarr (January 19, 1993). Concerning attached analysis of water samples for GW-26.
182. Letter from David L. Bramley, Fuss & O'Neill to Lorraine Wysowski (January 19, 1993). Concerning attached analysis of water samples.
183. Letter from David L. Bramley, Fuss & O'Neill to Peter Cooper (January 21, 1993). Concerning attached analysis of water samples.
184. Letter from David L. Bramley, Fuss & O'Neill to Paul Elmen (January 21, 1993). Concerning attached analysis of water samples.
185. Letter from David L. Bramley, Fuss & O'Neill to Ken Hamilton (January 21, 1993). Concerning attached analysis of water samples.
186. Letter from David L. Bramley, Fuss & O'Neill to Mrs. Paul Larson (January 21, 1993). Concerning attached analysis of water samples.
187. Letter from David L. Bramley, Fuss & O'Neill to Owen J. Pepe Jr. (January 21, 1993). Concerning attached analysis of water samples.
188. Letter from David L. Bramley, Fuss & O'Neill to James Wenger (January 21, 1993). Concerning attached analysis of water samples.
189. Letter from David L. Bramley, Fuss & O'Neill to Victoria Reich (February 22, 1993). Concerning attached analysis of water samples.
190. Letter from David L. Bramley, Fuss & O'Neill to Anthony and Lynne Foote (May 12, 1993). Concerning attached analysis of water samples.
191. Letter from David L. Bramley, Fuss & O'Neill to Robert Packard (May 13, 1993). Concerning attached analysis of water samples.
192. Letter from David L. Bramley, Fuss & O'Neill to Owen J. Pepe Jr. (May 13, 1993). Concerning attached analysis of water samples.
193. Letter from David L. Bramley, Fuss & O'Neill to David Simmons (May 13, 1993). Concerning attached analysis of water samples.
194. Letter from David L. Bramley, Fuss & O'Neill to Mrs. Young (July 2, 1993). Concerning attached analysis of water samples.

13.1 Correspondence (cont'd.)

Municipal Correspondence

195. Letter from David Gould to Lucy M. Conley, EPA Region I (August 1, 1991). Concerning possible contamination risks associated with installation of proposed sewer line.
196. Letter from Lucy M. Conley, EPA Region I to David Gould (August 21, 1991). Concerning response to Mr. Gould's August 1, 1991 letter.
197. Letter from Dennis J. Greci, Connecticut Department of Environmental Protection to David Gould (August 30, 1991). Concerning construction-related impacts of proposed sewer line.

The map associated with entry number 198 is oversized and may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

198. "Wastewater Study," Cummings & Lafayette for Town of Woodstock (November 1990 Revised: January 1992).
199. Letter from Nancy B. Blakely, Linemaster Switch to Duane Chase, Town of Woodstock (July 7, 1992). Concerning the proposed sewer line extension.
200. Letter from Michael A. Zizka, Pepe & Hazard (Attorney for Town of Woodstock) to Nancy B. Blakely, Linemaster Switch (July 24, 1992). Concerning the proposed sewer line extension.
201. Letter from Nancy B. Blakely, Linemaster Switch to Michael A. Zizka, Pepe & Hazard (Attorney for Town of Woodstock) (August 10, 1992). Concerning the proposed sewer line extension.
202. Letter from Michael A. Zizka, Pepe & Hazard (Attorney for Town of Woodstock) to Nancy B. Blakely, Linemaster Switch (August 25, 1992). Concerning a meeting with the Town, Linemaster Switch, EPA, and Connecticut DEP.
203. Letter from Alfred E. Smith Jr., Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Michael A. Zizka, Pepe & Hazard (Attorney for Town of Woodstock) (October 1, 1992). Concerning the September 15, 1992 meeting regarding the proposed sewer line.
204. Letter from Christopher R. Klemmer and Francis C. Sampson, Fuss & O'Neill to Gary Kennett, Linemaster Switch (October 2, 1992). Concerning a cost estimate for the sewer route investigations.
205. Letter from Michael A. Zizka, Pepe & Hazard (Attorney for Town of Woodstock) to Alfred E. Smith Jr., Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) (October 14, 1992). Concerning reimbursement by the Town to Linemaster for certain expenses incurred regarding the proposed location of the sewer line.
206. Letter from Michael A. Zizka, Pepe & Hazard (Attorney for Town of Woodstock) to Alfred E. Smith Jr., Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) (November 10, 1992). Concerning Linemaster's reluctance to contribute toward the expense of the proposed sewer line.
207. Letter from Alfred E. Smith Jr., Murtha, Cullina, Richter and Pinney (Attorney for Linemaster Switch) to Michael A. Zizka, Pepe & Hazard (Attorney for Town of Woodstock) (December 11, 1992). Concerning response to the November 10, 1992 letter from Mr. Zizka.
208. "Finding of No Significant Impact - South Woodstock Sanitary Sewer System," Connecticut Department of Environmental Protection (May 10, 1993).
209. Letter from Dennis P. Gagne, EPA Region I to Dennis Greci, Connecticut Department of Environmental Protection (June 29, 1993). Concerning potential adverse impact of bedrock blasting near the site.

13.2 Community Relations Plans

1. "Community Relations Plan," EPA Region I (April 1993).

13.3 News Clippings/Press Releases

1. "Woodstock Firm on Superfund List," Norwich Bulletin - Norwich, CT (February 16, 1990).
2. "Woodstock Waste Site Added to List for Federal Aid," Hartford Courant - Hartford, CT (February 17, 1990).
3. "Woodstock Manufacturer Fouls Town Hall Water Supply," Norwich Bulletin - Norwich, CT (May 18, 1991).
4. "Hearing Set on Cleaning Toxic Water," Norwich Bulletin - Norwich, CT (June 12, 1991).
5. "Toxic Water Not Going Away Soon," Norwich Bulletin - Norwich, CT (June 13, 1991).
6. "EPA Sets Meeting for Woodstock Residents," Norwich Bulletin - Norwich, CT (April 12, 1993).
7. "EPA Cleanup Plan Ready for Show," Observer Patriot - Southbridge, CT (April 14, 1993).
8. "EPA Goes Over Cleanup Plan," Telegram & Gazette - Worcester, MA (April 15, 1993).
9. "Cleanup Plan Reviewed by Residents," Observer Patriot - Southbridge, CT (April 21, 1993).
10. "Linemaster Contamination Subject of State Interviews," Norwich Bulletin - Norwich, CT (April 27, 1993).
11. "EPA Hearing Draws Handful," Telegram & Gazette - Worcester, MA (May 6, 1993).

Press Releases

12. "Environmental News - EPA Meeting to Discuss Proposed Cleanup Plan for Linemaster Switch Corporation Superfund Site," EPA Region I (April 1, 1993).

13.4 Public Meetings

1. Summary of Public Meeting, EPA Region I (May 5, 1993).

13.5 Fact Sheets

1. "Superfund Program Fact Sheet - EPA Overseeing Study of Soil and Water Contamination," EPA Region I (November 1989).
2. "Proposed Administrative Settlement," Federal Register, Vol.57 No.25 (February 6, 1992).

16.0 Natural Resource Trustee

16.1 Correspondence

1. Letter from Merrill S. Hohman, EPA Region I to Kenneth Finkelstein, U.S. Department of Commerce National Oceanic and Atmospheric Administration (August 30, 1990). Concerning negotiations with Linemaster Switch.
2. Letter from Merrill S. Hohman, EPA Region I to William Patterson, U.S. Department of the Interior (August 30, 1990). Concerning negotiations with Linemaster Switch.
3. Letter from John A. Lindsay, U.S. Department of Commerce National Oceanic and Atmospheric Administration to Michael J. Nalipinski, EPA Region I (August 5, 1992). Concerning NOAA's jurisdictional interest in the site.

16.4 Trustee Notification Form and Selection Guide

1. Trustee Notification Form, EPA Region I.

17.0 Site Management Records

17.4 Site Photographs/Maps

All photographs and maps may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

Section II

Guidance Documents

GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at the EPA Region I Records Center in Boston, Massachusetts.

General EPA Guidance Documents

1. U.S. Environmental Protection Agency. Office of Ground-Water Protection. Ground-Water Protection Strategy (EPA/440/6-84/002), August 1984.

2. U.S. Environmental Protection Agency. Hazardous Response Support Division. Standard Operating Safety Guides, November 1984.

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