United States
Environmental Protection
Agency

North Superfund Remedial Branch
Region 4
345 Courtland St, NE
Atlanta, GA 30365

EPA 904-F-91-101

EPA

U.S. EPA Issues A Proposed Plan For Ground-Water Cleanup At The Mallory Capacitor Co. Superfund Site

June 1991

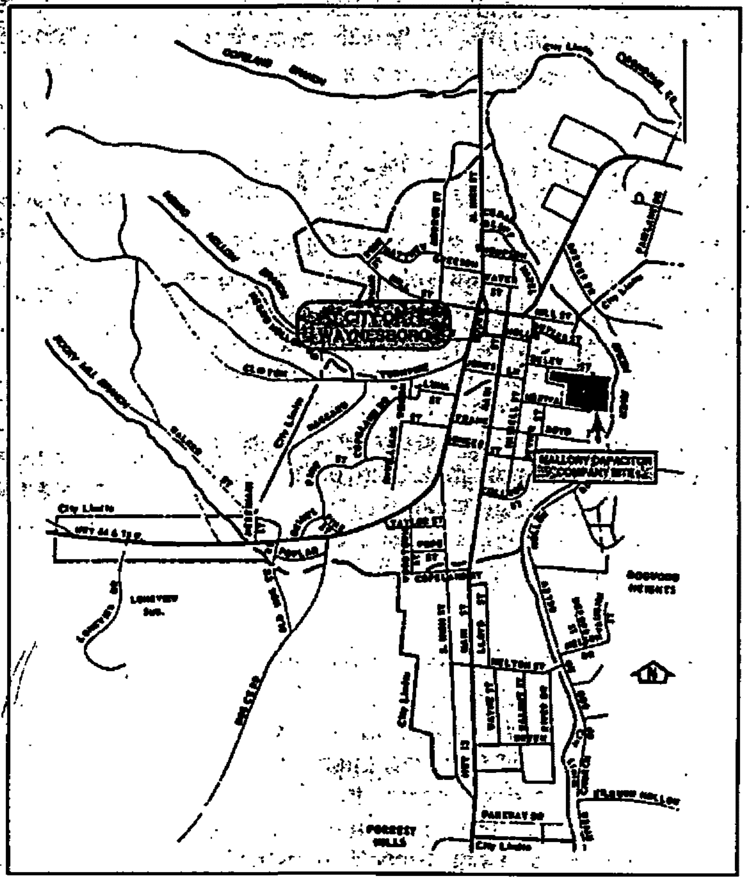
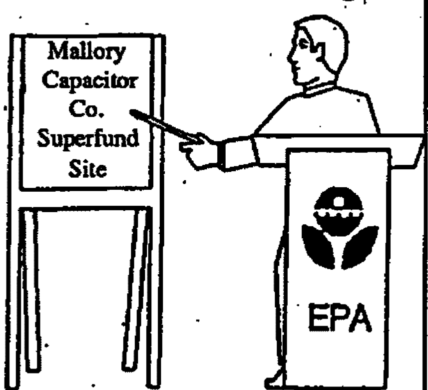


Exhibit 1: Site Location Map

This Fact Sheet will provide

- An overall review of the site.
- The results of the remedial investigation.
- The possible health risks posed by the site.
- A summary of the Feasibility Study.
- A summary of treatment alternatives.
- Information on U.S. EPA's recommended alternative.
- Information on how the public can participate in the final selection of the treatment alternative.
- Places to get more information.
- Upcoming activities in the remediation and Superfund process.

Public Meeting



Date: June 27, 1991
Time: 7 p.m.
Location: Wayne County Courthouse, Waynesboro, TN

Introduction

The United States Environmental Protection Agency (U.S. EPA) recently completed a comprehensive study of treatment alternatives for ground-water contamination found at the Mallory Capacitor Co. Superfund Site (the site) in Waynesboro, Tennessee. The study was conducted in two parts and is a part of the federal Superfund program which provides for the investigation and cleanup of hazardous substances at sites throughout the United States.

The first part of the study, the **Remedial Investigation** (RI), was conducted to determine the nature and extent of ground-water contamination at the Mallory Capacitor Co. Superfund Site. The RI also evaluated the risks the Site may present to human health and the environment. The second part of the study, the **Feasibility Study** (FS), evaluated alternatives for protecting human health and the environment based on problems that were identified during the RI. This fact sheet outlines the major findings of the RI and summarizes the **remedial alternatives** evaluated during the FS. Words appearing in bold type are defined in the glossary (See Exhibit 4).

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U.S. EPA's preferred method, known as a **Proposed Plan** for addressing the ground-water contamination problems located at the Mallory Capacitor Co. Superfund Site, is presented in this document. Also included is information on how interested members of the community can participate in U.S. EPA's remedy selection process by submitting comments on the RI and FS Reports and the Proposed Plan. Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act** (commonly referred to as CERCLA or the "Superfund Law") requires that U.S. EPA publish its Proposed Plan for addressing contamination problems at Superfund sites and provide the public with an opportunity to comment on the proposed course of action.

BACKGROUND INFORMATION

The Mallory Capacitor Co. Superfund Site is a former electrical capacitor manufacturing plant located on Belew Circle Drive in Waynesboro, Tennessee. The Site, bordered on the east by the Green River, approximately 8.6 acres in size, is in a residential / commercial / industrial / business area in the eastern section of the city. The Cold Water Creek passes the northwest corner of the Site and meets the Green River approximately seven hundred feet north of the Site. Houses are located to the north of the Site along Belew Circle Drive, to the west of the Site along Hassell Street, and to the south of the Site along Mariva Street.

The Site was originally developed in the late 1940's as a manufacturing facility for the footwear industry. In 1968, the Site was acquired by P.R. Mallory & Co., Inc. (Mallory), a subsidiary of Duracell International, Inc. (Duracell's) corporate predecessors. In 1969, Mallory (Duracell) commenced the manufacture of electrical capacitors at the facility. In 1979, Emhart Industries, Inc. (Emhart) purchased the Site and its operations. On July 27, 1984, Emhart ceased manufacturing operations at the Site. Ownership of the Site was transferred to Duracell in 1988. During periods within the time frame of 1969 to 1978, **polychlorinated biphenyls** (PCBs) were used as the dielectric fluid in the electrical capacitors manufactured at the Site. Trichloroethene (TCE) was used in the manufacturing process as a degreaser.

During the period of 1976 to 1980, remedial actions were implemented at the Site to remove materials contaminated with PCBs from process equipment within the plant, to remove an underground tank located adjacent to the plant which was used for storage of waste liquids from the manufacturing process and to remove soils contaminated with PCBs adjacent to the underground storage tank. From 1984 to 1988, investigative programs conducted at the Site identified significant concentrations of PCBs in portions of plant structure, on some of the process equipment within the plant and in soils in some areas of the Site. Significant concentrations of specific **volatile organic compounds** (VOCs) and PCBs were also identified in the ground water. The VOCs identified were TCE and 1,2-DCE.

Pursuant to the 1987 proposed inclusion of the Mallory Capacitor Co. Superfund Site on the **National Priorities List** (NPL), Duracell signed an Administrative Order on Consent (Consent Order) to conduct the RI and FS at the Site under U.S. EPA's supervision.

As a result of the findings of the 1984 to 1988 investigative programs, additional remedial actions were undertaken in accordance with the terms of the Consent Order and were implemented at the Site during 1988 and 1989. The remedial actions included the disposition of all equipment and stock, the removal of the plant (exclusive of the Warehouse) and all ancillary buildings, and removal of all soils significantly contaminated with PCBs from the Site. Sampling of surfaces within the Warehouse confirmed that the Warehouse had not been significantly impacted by past operations at the Site.

The 1988/1989 remedial actions resulted in the disposal of approximately 18,700 tons of soil and concrete contaminated with PCBs, 410 tons of equipment contaminated with PCBs, 330 cubic yards of non-hazardous equipment and 3,540 cubic yards of non-hazardous building concrete and debris at the Chemical Waste Management facility in Emelle, Alabama. In addition, the excavation and removal of contaminated soils resulted in the removal of most of the sanitary and storm sewer systems on-Site. Regrading of the Site allowed elimination of all point source discharges of storm water runoff to the Green River.

THE REMEDIAL INVESTIGATION

The RI at the Mallory Capacitor Superfund Site was conducted from early 1988 to late 1990. Activities performed can be grouped into the following categories: planning and preparation, field activities (including sampling), laboratory analyses, data validation, evaluation and analysis, and report preparation. Specific objectives of the RI were:

i) To characterize all wastes remaining at the Site after the 1988/1989 remedial actions;

ii) On the basis of the waste characterization, to define the set of Site-specific contaminants attributable to the Site;

iii) To define the areal and vertical extent of soil contamination in the grass areas west of the Plant, in the grass area south of the security fence south of the Plant, on private properties in the vicinity of the Site and in overburden soils beneath the Plant;

iv) To evaluate contamination, attributable to past activities at the Site, if any, in the Green River sediments;

v) To confirm the alignment of the Site and the City of Waynesboro sanitary sewer systems and to delineate the extent of sediment contamination, if any, attributable to past activities at the Site in both the storm sewer and sanitary sewer systems on-Site and in the City of Waynesboro sanitary sewer system downflow of the Site;

vi) To define the ground-water flow regime beneath the Site and its relationship to the Green River;

vii) To define the extent of ground-water contamination attributable to the Site;

viii) To confirm the extent of contamination, if any, attributable to the Site in the surface water of the Green River or in ambient air at or adjacent to the Site; and

ix) To collect sufficient data to complete an accurate Site map including the location of all services and buildings, the location of all drainage ditches and swales and elevation data to show the topography of the Site.

The following field sampling activities were undertaken as part of accomplishing these objectives:

i) Soil samples were collected from:

a) The grass areas east, south and west of the Plant;

b) Private properties adjacent to the Site;

c) Beneath the on-Site drainage ditches and swales;

d) Beneath the former Plant; and

e) Beneath the sanitary sewer pipe invert on-Site.

ii) Sediment samples were collected from:

a) The Green River upstream, downstream, and adjacent to the Site;

b) The on-Site sanitary and storm sewers; and

c) The City of Waynesboro sanitary sewer in the vicinity of the Site.

iii) Two rounds of ground-water samples were collected from monitoring wells located:

a) On-Site;

b) On properties adjacent to the Site;

iv) Surface water samples were collected from the Green River; and

v) Air samples were collected from locations situated about the perimeter of the Site.

KEY FINDINGS OF THE REMEDIAL INVESTIGATION

Soil

The 1988/1989 soil remedial actions referred to in the "Background" section of this report were found to be successful in removing soil contamination.

Sampling and analysis confirmed the following:

i) On-Site background soils (southern and western portions of the Site) did not contain detectable concentrations of PCBs, TCE, or 1,2-DCE;

ii) Surface and subsurface soils on-Site, including ditch and swale soils and sanitary sewer bedding material soils, had been remediated to the cleanup criterion for soils of 10 mg/kg for PCBs. Residual concentrations of PCBs in soils at the Site were as follows:

a) Average concentration in surficial soils of 1.60 mg/kg; and

b) Average concentration in subsurface soils of 4.3 mg/kg.

1,2-DCE and TCE were not identified to be contaminants of concern in any of the soils at the Site.

iii) Of the 21 properties adjacent to the Site boundary, the distribution of PCBs was determined to be as follows:

a) 14 properties did not contain detectable concentrations;

b) The remaining seven properties contained PCBs in concentrations that were within EPA's acceptable risk range for a residential scenario; and

1,2-DCE and TCE were not detected in any of the off-Site soil samples.

Sediments

Sampling confirmed that sediments within the sewer systems on-Site and in the vicinity of the Site and of the Green River upstream, adjacent to and downstream of the Site did not contain significant concentration of PCBs, 1,2-DCE, or TCE. Therefore, it was concluded that sediments had not been significantly impacted by past Site operations.

Surface Water

Sampling confirmed that surface waters within the Green River upstream, adjacent to and downstream from the Site and from the spring on private property located west of the Site, did not contain detectable concentrations of PCBs, 1,2-DCE, or TCE. Therefore, it was concluded that surface waters were not being impacted by the Site.

Air

Samples collected did not reveal PCBs, 1,2-DCE, or TCE. Therefore, it was concluded that air was not being impacted by the Site.

Ground Water

Samples confirmed that impact to ground water had occurred for PCBs, 1,2-DCE, and TCE in the shallow bedrock (20 to 40 feet below surface grade)and the deep bedrock (60 to 90 feet below surface grade) both on-Site and off-Site. Monitoring wells in the deeper bedrock aquifer (95 to 120 feet below surface grade) at locations selected to show the most probable areas of contamination in this aquifer showed no contamination.

Summary

Based on the findings of the RI, the contaminants of concern at the Site were identified to be PCBs, 1,2-DCE, and TCE. Sampling in all media confirmed that ground water was the only media impacted at the Site, besides soil, which had been previously remediated to EPA's acceptable levels.

The route of concern for contaminant movement is ground water. Ground water was found to be moving in the northeasterly direction. However, all homes adjacent to and in the area of influence of the Site were found to be on municipal water.

All other information on the sampling and analysis program and results can be found in the RI Report on file in the Mallory Capacitor Co. Superfund Site Information Repository in the Wayne County Library.

RISK ASSESSMENT

The final phase of the RI was an assessment of potential risks to public health and the environment. Earlier phases of the study determined which contaminants are present, the levels at which they are present, and where they are located. Using this information, the risk assessment examined whether existing or future contact with contaminants poses a public health or environmental risk. The risk assessment determines an upper bound estimate of risk assuming no further action is taken to clean up the Site.

EPA has classified PCBs and TCE as probable human carcinogens based on animal studies. 1,2-DCE has been shown to cause abnormal blood chemistry of laboratory animals and is therefore considered to be a systemic toxicant.

To be considered acceptable and within EPA's target risk range, the additional risk of cancer from these chemicals to an exposed individual must be no greater than 1 in 10,000 and preferably no greater than 1 in 1,000,000. For systemic toxicants, the hazard is deemed unacceptable if the estimated exposure level exceeds that level which has been determined to not cause any adverse effects in humans. The hazard is unacceptable based on residential use of ground water north of the Site.

Future exposure to PCBs, TCE, and 1,2-DCE was considered for ground water in the areas north and east of the Site. In both areas, the existing concentrations will exceed EPA's target risk levels if wells were installed for residential use. At this time, no private wells exist within the area of ground-water contamination. Three springs within the area of influence have been tested. All were found to be clean of Site-related contaminants.

The surface waters of the Green River were evaluated for potential risk from chemical exposure due to fish consumption and wading. The risk from these pathways is within EPA's target range for acceptable risk.

A recreational exposure scenario was evaluated for on-Site soils. The additional lifetime risk of cancer was well within EPA's acceptable range. All residential soil samples were evaluated for additional lifetime risk of cancer and were also found to be within EPA's acceptable range of risk.

Dermal exposure to PCBs from surfaces in the warehouse was evaluated and found to be minimal. Therefore, this potential exposure pathway would not represent any significant health risk.

In summary, the only risk found to be unacceptable was that of ground-water consumption, bathing, and showering from a hypothetical well in areas north and east of the Site. This scenario is the basis for remedial action at the Site.

For more details on the human exposure calculations in the Risk Assessment, please see Appendix I of the RI Report on file in the Mallory Capacitor Co. Superfund Site Information Repository in the Wayne County Library.

THE FEASIBILITY STUDY: DEVELOPING AND EVALUATING REMEDIAL (CLEANUP) ALTERNATIVES

Based on the results of the RI, a Feasibility Study (FS) was conducted to identify, develop and evaluate appropriate remedial alternatives for minimizing risks to public health and the environment caused by the contaminated ground water plume. Ten remedial (cleanup) alternatives were developed in the FS. Each alternative was screened for effectiveness, implementability and cost. Based on this screening process, alternatives which did not meet these remedial objectives were eliminated from further analysis and consideration. Alternatives Ia and Ib were eliminated because they did not permanently limit exposure to contaminated materials or reduce the release of contaminants. Details on each remedial alternative are presented below.

REMEDIAL ALTERNATIVE IA

* No Action

The National Contingency Plan (NCP) requires the development of a no action alternative as a basis for comparison of alternatives. Therefore, remedial Alternative Ia, consists of implementing no remedial action at the Site, including no restriction on future installation of ground-water extraction wells and no further monitoring of the contaminated ground water both beneath and hydraulically downgradient from the Site. Because no further action would be taken and the Site would remain in its present condition, there are no costs associated with this remedial alternative.

REMEDIAL ALTERNATIVE IB

* Institutional Controls and Monitoring

Alternative Ib consists of placing deed restrictions on the Site property title to identify the presence of PCBs, 1,2-DCE and TCE in ground water beneath the Site, a ban on installation of ground-water extraction wells on appropriate properties to provide protection of human health from potential future consumption of contaminated ground-water, and sampling and analyses of ground water beneath the Site and off-Site to monitor the attenuation/ degradation of PCBs, 1,2-DCE and TCE in the ground-water system. The estimated cost of this alternative is $710,000.

REMEDIAL ALTERNATIVE 2A

* Install Six Ground-Water Extraction Wells
* Install an On-Site UV Chemical Oxidation Ground-Water Treatment Facility
* Treat Ground Water to Remove TCE and 1,2-DCE
* Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site

This alternative consists of extraction of the contaminated ground water at an estimated rate of six gallons per minute from five locations on-Site and one off-Site that exhibit the highest concentrations of Site-related contaminants. The extraction wells would prevent further migration of contaminants. Extracted ground water would be pumped to the on-Site UV Chemical Oxidation facility for treatment. Site-related contaminants not within the zones of influence of the six extraction wells would not receive treatment, but would not pose additional risks to public health or the environment in excess of the range deemed acceptable by EPA.

This alternative is estimated to remove approximately 98% of the TCE and 1,2-DCE in 20 years. The estimated cost of this alternative is $2,565,000.

REMEDIAL ALTERNATIVE 2B

* Install Six Ground-Water Extraction Wells
* Install an On-Site Air Stripping/Bag Filtration/Carbon Adsorption Ground-Water Treatment Facility
* Treat Ground Water to Remove TCE and 1,2-DCE
* Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site

This alternative is identical to Alternative 2a with the exception of the treatment method used. Extracted ground water would be pumped to the on-Site air stripping tower followed by a bag filter followed by a carbon adsorbtion unit. Quality of treated ground water would be the same as for Alternative 2a, which is removal of approximately 98% of the TCE and 1,2-DCE in 20 years. The estimated cost for this alternative is $2,113,000.

REMEDIAL ALTERNATIVE 3A

- Install Seven Ground-Water Extraction Wells
- Install an On-Site UV Chemical Oxidation Ground-Water Treatment Facility
- Treat Ground Water to Remove TCE and 1,2-DCE
- Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters near the Site

This alternative consists of extraction of the contaminated ground water at an estimated rate of seven gallons per minute from seven locations on-Site. In addition to pumping water to the UV Chemical Oxidation facility for treatment, the pumping would serve to contain the contaminated ground-water plume.

This alternative is estimated to remove approximately 100% of the TCE and 1,2-DCE contamination in on-Site aquifers within 60 years. Off-Site aquifers would not be remediated. The estimated cost of this alternative is $2,858,000.

REMEDIAL ALTERNATIVE 3B

- Install Seven Ground-Water Extraction Wells
- Install an On-Site Air Stripping/Bag Filtration/Carbon Adsorption Ground-Water Treatment Facility
- Treat Ground Water to Remove TCE and 1,2-DC[redacted]
- Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site

This alternative is identical to Alternative 3a with the exception of the treatment method used. Extracted ground water would be pumped to the on-Site air stripping tower followed by a bag filter followed by a carbon adsorbtion unit. Quality of treated ground water would be the same as for Alternative 3a, which is removal of approximately 100% of TCE and 1,2-DCE from on-Site aquifers in 60 years. The estimated cost for this alternative is $2,362,000.

REMEDIAL ALTERNATIVE 4A

- Install 13 Ground-Water Extraction Wells
- Install an On-Site UV Chemical Oxidation Ground-Water Treatment Facility
- Treat Ground Water to Remove TCE and 1,2-DCE
- Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site

This alternative consists of extraction of the contaminated ground water at an estimated rate of 13 gallons per minute from seven locations on-Site and six locations off-Site. In addition to pumping water to the UV Chemical Oxidation facility for treatment, the pumping would serve to contain the contaminated ground-water plume.

This alternative is estimated to remove approximately 100 % of the TCE and 1,2-DCE contamination in on-Site and off-Site aquifers within [redacted] years. The estimated cost of this alternative is $3,860,000. 60

REMEDIAL ALTERNATIVE 4B

- Install 13 Ground-Water Extraction Wells
- Install an On-Site Air Stripping/Bag Filtration/Carbon Adsorption Ground-Water Treatment Facility
- Treat Ground Water to Remove TCE and 1,2-DCE
- Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site

This alternative is identical to Alternative 4a with the exception of the treatment method used. Extracted ground water would be pumped to the on-Site air stripping tower followed by a bag filter followed by a carbon adsorbtion unit. Quality of treated ground water would be the same as for Alternative 4a, which is removal of approximately 100% of TCE and 1,2-DCE in both on- and off-site aquifers in [redacted] years. The estimated cost for this alternative is $3,105,000. 60

REMEDIAL ALTERNATIVE 5A

- Install 22 Ground-Water Extraction Wells
- Install an On-Site UV Chemical Oxidation Ground-Water Treatment Facility
- Treat Ground Water to Remove TCE and 1,2-DCE
- Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site

This alternative consists of extraction of the contaminated ground water at an estimated rate of 22 gallons per minute from 13 locations on-Site and nine locations off-Site. In addition to pumping water to the UV Chemical Oxidation facility for treatment, the pumping would serve to contain the contaminated ground-water plume.

This alternative is estimated to remove approximately 100% of the TCE and 1,2-DCE contamination in on-Site and off-Site aquifers within 30 years. The estimated cost of this alternative is $5,216,000.

REMEDIAL ALTERNATIVE 5B

- Install 22 Ground-Water Extraction Wells
- Install an On-Site Air Stripping/Bag Filtration/Carbon Adsorption Ground-Water Treatment Facility
- Treat Ground Water to Remove TCE and 1,2-DCE
- Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site

This alternative is identical to Alternative 5a with the exception of the treatment method used. Extracted ground water would be pumped to the on-Site air stripping tower followed by a bag filter followed by a carbon adsorbtion unit. Quality of treated ground water would be the same as for Alternative 5a, which is removal of approximately 100% of TCE and 1,2-DCE in 30 years. The estimated cost for this alternative is $4,035,000.

To avoid redundancy in the summary of each alternative, several specific components which are common to all remedial alternatives except for Alternatives Ia and Ib are listed below:

i) Additional investigations to better determine the northern extent of off-Site ground-water contamination;

ii) Additional investigations to determine potential chemical contamination, if any, and biota impacts, if necessary, to the surface water tributary north of the Site (Cold Water Creek);

iii) Institutional controls and monitoring (Alternative Ib);

iv) An effectiveness monitoring program consisting of testing wells around the Site to insure that:

   a) Contamination has been hydraulically contained;

   b) Concentrations of Site-related contaminants are being reduced in on-Site ground water and off-Site ground water downgradient (north) of the Site; and

   c) The Cold Water Creek is not receiving contamination from the aquifer.

Remedial Alternatives 2a, 3a, 4a, and 5a all utilize the same ground-water treatment process, as do Remedial Alternatives 2b, 3b, 4b and 5b. The "a" alternatives involve **UV Chemical Oxidation**, which uses ultraviolet light in combination with a strong oxidant, such as hydrogen peroxide, to transform TCE and 1,2-DCE into carbon dioxide and water. The "b" alternatives involve treatment of extracted ground water by **air stripping**, **filtration**, and **carbon adsorption**.

U.S. EPA prefers the "b"-alternatives because UV Chemical Oxidation will not produce consistently clea effluent given the relatively low incoming flow rates an fluctuating concentrations.

Alternatives 2 through 5 are similar in that extractio wells will be installed and ground water will be extracte and treated. The differences in these alternatives lie i well placement and number. The various well placemer and number scenarios in Alternatives 2 through 5 ar different strategies for containing and treating the cor taminated ground-water plume. For more information o these strategies, consult the FS Report in the Mallor Capacitor Co. Superfund Site Information Repository i the Wayne County Library.

Due to the strong binding nature of PCBs and th many fractures in rock in the area, it is technically impossibl at this time to develop an alternative which will remov PCBs from the ground water to levels which EPA deem acceptable. The ground-water extraction systems pro posed will remove some of the PCBs in the aquife however, none of the alternatives being considered wi remove PCBs to health-based levels. Several alterna tives will remove TCE and 1,2-DCE to these standard A review will be conducted at this Site every five years b U.S. EPA since PCBs will remain above health-base levels. Should innovative technologies for PCB remova become available, feasibility at the Site will be assesse

U.S. EPA'S PROPOSED PLAN FOR REMEDIAL ACTION

Based on the FS, U.S.EPA has identified Alternative 4b as the best course of action for the ground-water contamination and migration problem at the Mallory Capacitor Co. Superfund Site. U.S.EPA's preferred course of action includes:

- Install 13 Ground-Water Extraction Wells
- Install an On-Site Air Stripping/Bag Filtration/Carbon Adsorption Ground-Water Treatment Facility
- Treat Ground Water to Remove TCE and 1,2-DCE
- Discharge Treated Ground Water to City Water Treatment Plant or Surface Waters Near the Site
- Investigations to better determine northern extent of off-site ground-water contamination
- Investigations to determine possible impacts to Cold Water Creek
- Institutional controls and monitoring
- An effectiveness monitoring program

This alternative is estimated to remove approximately 100% of TCE and 1,2-DCE in both on-Site and off-Site aquifers within a 60-year period. The estimated cost is $3,105,000. The exact locations and number of wells chosen are estimates and may be modified during the design phase which precedes remedial action.

Alternative 1 was not chosen because it did not permanently limit exposure to contaminants or reduce the release of contaminants. Alternative 2 was not chosen because concentrations of TCE and 1,2-DCE attained would not comply with federal and state regulations pertaining to cleanup of hazardous waste Sites. While Alternative 3 provided for cleanup of the on-Site aquifer, it did not address cleaning up the off-Site aquifer. Alternatives 4 and 5 achieve the same cleanup concentrations within the same time frame (approximately 100% reduction in TCE and 1,2-DCE in 30 years). Because Alternatives 4 and 5 give the same end results, Alternative 4 was chosen as the more cost-effective alternative. As discussed previously, U.S.EPA prefers the "b" part of this alternative, which is air stripping/filtration/carbon adsorption, because it achieves more consistent effluent concentrations.

THE NEXT STEP

The public comment period on the FS and Proposed Plan is the next step in selecting a final remedial action for the Mallory Capacitor Co. Superfund Site. The comment period provides an opportunity for local residents to submit their comments to U.S. EPA on all the remedial alternatives considered for the Site. Based on public comments or new information, U.S. EPA may modify the recommended remedial alternative or choose another of the remedial alternatives developed in the FS. The Proposed Plan outlines in detail U.S. EPA's recommended remedial alternative.

Following the public comment period, U.S. EPA will sign a **Record of Decision (ROD)** for the Site. The ROD will detail the remedial action chosen for the Site and include U.S. EPA's responses to comments received during the public comment period. After the ROD is signed, a design plan for implementing the remedial action will be prepared. Once the design is complete, construction of the remedial action can begin. A review will be conducted every five years at this Site since PCBs will remain above health-based levels. This review will insure that contaminants in the ground-water plume (including PCBs) are being effectively contained and that the TCE and 1,2-DCE are being reduced in concentration.

Criteria for Evaluating Remedial Alternatives

In selecting its preferred remedial alternative, U.S. EPA uses the following criteria to evaluate each of the cleanup alternatives developed in the Feasibility Study. The first seven criteria are used to evaluate all the remedial alternatives, based on environmental protection, cost, and engineering feasibility issues. The final two criteria, state and community acceptance, are used to further evaluate U.S. EPA's Proposed Plan after the public comment period is over and comments from the community have been received. Exhibit 5 on pages 13 and 14 summarizes how all the alternatives were evaluated using the following criteria:

1) Overall protection of public health and the environment.
U.S. EPA assesses the degree to which each alternative eliminates, reduces, or controls threats to public health and the environment through treatment, engineering methods (e.g. ground-water treatment), or institutional controls (e.g., deed restrictions on future uses of the property).

2) Compliance with federal and state regulations.
The alternatives are evaluated for compliance with those environmental protection regulations determined to be applicable or relevant and appropriate to the site conditions.

3) Cost.
The benefits of implementing a particular remedial alternative are weighed against the cost of implementation.

4) Implementability.
U.S. EPA considers the technical feasibility (e.g., how difficult is the alternative to construct and operate?) and administrative ease (e.g., the amount of coordination with other government agencies that is needed) of a remedy, including the availability of necessary goods and services.

5) Short-term effectiveness.
The length of time needed to implement each alternative is considered and U.S. EPA assesses the risks that may be posed to workers and nearby residents during implementation (e.g., would contaminated dust be produced during soil excavation?).

6) Long-term effectiveness.
The alternatives are evaluated based on their ability to maintain reliable protection of public health and the environment after implementation.

7) Reduction of contaminant toxicity, mobility, and volume.
U.S. EPA evaluates each alternative based on how it reduces (1) the harmful nature of the contaminants, (2) their ability to move through the environment, and (3) the amount of contamination.

8) State acceptance.
U.S EPA requests state comments on the Remedial Investigation and Feasibility Study Reports, as well as the Proposed Plan, and must take into consideration whether the state concurs with or opposes U.S. EPA's preferred remedial alternative.

9) Community acceptance.
To ensure that the public has an adequate opportunity to provide input, U.S. EPA holds a public comment period and considers and responds to all comments received from the community prior to the final selection of a remedial action.

Exhibit 3
Technologies Considered in Developing Remedial Alternatives

The first step in successfully meeting the objectives established for the Feasibility Study involved identifying various cleanup options that would be appropriate for the Mallory Capacitor Co. Superfund Site. U.S. EPA concluded that to meet these objectives technologies were needed to:

1) extract the ground water;
2) treat it to reduce contaminant levels to acceptable levels; and
3) dispose of it in a way that protects public health and the environment.

The following diagram describes each of the specific technologies included in the remedial alternatives for the Mallory Capacitor Co. Superfund Site.

1) Ground Water Extraction

Extraction Wells

Similar to a drinking water-supply well, but constructed so that large volumes of water can be drawn from below the ground surface. U.S. EPA determined that extraction wells could provide an effective method of intercepting contaminated ground water before it enters surface water bodies or migrates further.

2) Ground Water Treatment

Ultraviolet-Enhanced Oxidation

This technology converts hazardous waste to less toxic forms of compounds, using a chemical reaction to increase the oxygen content in the compounds, thereby reducing the level of many organic contaminants in water, particularly TCE and 1,2-DCE. This method is an innovative treatment technology, and would require pilot testing to be conducted at the Site. Although very effective in addressing TCE and 1,2-DCE contamination, it has a varying range of effectiveness on other compounds such as PCBs.

Filtration

This technology typically is used as a concluding step in ground water treatment. The water to be treated is percolated through a filter that may include several types of materials, including sand, fabric bags, and crushed glass among others. By passing the water through this material, suspended solids are filtered out. This method is often used following processes such as carbon adsorption, to filter out suspended solids, thus improving the quality of the treated water.

Carbon Adsorption

Carbon adsorption is a proven, reliable treatment process for removing a variety of organic compounds. It involves passing water through a chamber that is packed with carbon granular particles. Contaminants attach onto the carbon, effectively removing contaminants from the water.

Air Stripping

Air stripping is a proven technology for removing VOCs. Treated water enters either a packed tower or spray chamber and flows downward while air flows upward from the bottom of the chamber, stripping VOCs from the water. The treated water is collected at the bottom of the tower and pumped to discharge or subsequent processes, while air containing VOCs exits the top of the tower and either exits to the atmosphere or is treated further using a carbon adsorber.

3) Disposal

Treated Ground Water Disposal

Contaminated ground water would be treated to ensure that National Pollution Discharge Elimination System (NPDES) standards administered by the State of Tennessee, are met. Once acceptable levels are reached, feasible technologies for disposal of the treated water include discharge into the Green River or discharge to the public wastewater treatment plant, known as a publicly owned treatment works (POTW).

Hazardous Waste Disposal

As the contaminated ground water is treated, used carbon and bag filters would be removed and collected for proper disposal. Two disposal methods are possible options: landfilling the waste at an off-site, federally approved hazardous waste facility, or incineration of the materials at an off-site federally approved facility. One other option for disposal of the used carbon is regeneration. Under regeneration, the carbon is placed in a high temperature oven. After contaminants "bake" off, the carbon may be reused.

GLOSSARY

Air Stripping
A treatment system that removes or "strips" volatile organic compounds (VOCs) from contaminated ground water by forcing an airstream through the water and causing the VOCs to evaporate.

Carbon Adsorption
A process for removing a variety of organic compounds. It involves passing the water through a chamber that is packed with carbon particles, where contaminants attach to the carbon particles, effectively removing contaminants from the water.

Comprehensive Environmental Response, Compensation, and Liability Act
See definition for "Superfund."

1,2-Dichloroethene (1, 2-DCE)
A colorless pleasant-smelling liquid which is known to be toxic when absorbed by skin. 1,2-DCE is used as an industrial degreaser, among other applications.

Endangerment
A site-specific study of the actual or potential Assessment danger to human health or welfare and the environment from the release of hazardous substances.

Extraction Wells
Similar to municipal drinking water-supply wells, but constructed so that large volumes of water can be drawn from below the ground surface.

Feasibility Study (FS)
The second part of a two-part study called a Remedial Investigation/Feasibility Study (RI/FS). The FS identifies and evaluates remedial alternatives that are designed to address contamination problems found during the RI at the Superfund site. (See definition for RI on next page.)

Filtration
A method of separating solid particles from a liquid or gas by passing it through a porous substance.

Ground Water
A term pertaining to any water below the surface of the earth, filling the spaces between soil, sand, rock, and gravel particles beneath the earth's surface. Ground water typically flows very slowly compared to surface water, along routes that often lead to rivers and lakes. Rain that does not evaporate or immediately flow along the surface to streams and rivers slowly percolates through the soil until it reaches the level where the ground is saturated with water.

Monitoring Well
A well used to collect ground water, and other samples. The samples are typically analyzed in a laboratory to determine the amounts, types and distribution of contaminant beneath the site.

National Contigency Plan (NCP)
The federal regulation that guides the Superfund program.

National Priorities List (NPL)
U.S. EPA's list of the top priority hazardous waste sites that are eligible for Federal money under Superfund.

Organic Compounds
One of two large classes of chemical compounds, organic and inorganic. It is a term used to describe chemicals containing carbon. Examples of organic materials include petroleum products, solvents, oils and pesticides.

Polychlorinated Biphenyl (PCB)
A chlorinated organic compound which is colorless and may vary in consistency from oily to waxy at room temperature. PCBs are probably carcinogenic (cancer-causing) and are moderately toxic. PCB-bearing fluids are used in electrical equipment manufacturing.

Potentially Responsible Parties (PRPs)
An individual, business, or government organization identified by U.S. EPA as potentially liable for the actual or threatened release of hazardous substances from an uncontrolled hazardous waste site.

GLOSSARY

Proposed Plan
A document that describes all the remedial alternatives considered by U.S. EPA, including the alternative U.S. EPA prefers.

Record of Decision
A document issued after the Remedial Investigation and Feasibility Study that describes U.S. EPA's selective remedies for cleanup of a site.

Remedial Action
Under Superfund, cleanup is considered a remedial action when it involves a remedy to address site contamination to protect the public from exposure. An interim remedial action is a remedial action that is not considered final but is consistent with a final remedy.

Remedial Alternatives
A combination of technical and administrative methods developed and evaluated in a Feasibility Study that can be used to address contamination at a Superfund site.

Remedial Investigation
The first part of a two-part study called a Remedial Investigation/Feasibility Study (RI/FS). The RI is a study in which information is collected and analyzed to determine the nature and extent of contamination at the Superfund site.

Risk Assessment
A site specific study performed by U.S. EPA to determine the actual or potential dangers to human health and the environment from releases of hazardous substances at a site under its current and conceivable future uses.

Sediment
Materials such as sand, soil, mud and decomposing animals and plants that settle to the bottom of a ditch, stream, lake, river or pond.

Soil Borings
A hole advanced into the ground by means of a drilling rig or hand auger to obtain soil samples.

Superfund
The name commonly used in reference to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act, (SARA), in 1986. It is a law that provides the means for investigation and cleanup of hazardous waste sites.

Surface Water
Streams, lakes, ponds, rivers, or any other body of water above the ground.

Toxicity
The measure of a poisonous substance's ability to harm living tissues when ingested, inhaled or absorbed through the skin. Overexposure to some elements can result in a toxic effect as well. For example, overexposure to the sun or alcohol can result in a toxic effect on the human body.

Trichlorethene (TCE)
A colorless chloroform-smelling heavy liquid; a chlorinated organic compound which is thought to be carcinogenic (cancer-causing) and is toxic by inhalation. Symptoms of inhalation include drowsiness. TCE is used as an industrial degreaser, among other applications.

Ultraviolet-Enhanced Oxidation
A treatment method used to convert hazardous chemicals into less harmful compounds. This conversion takes place when a chemical reaction causes oxygen to bind with a hazardous compound, increasing the oxygen content in the compound.

Volatile Organic Compounds (VOCs)
Organic compounds that are characterized by being highly mobile in ground water and which are readily volatilized into the atmosphere.

Exhibit 5: Evaluation & Comparison of Remedial Alternatives

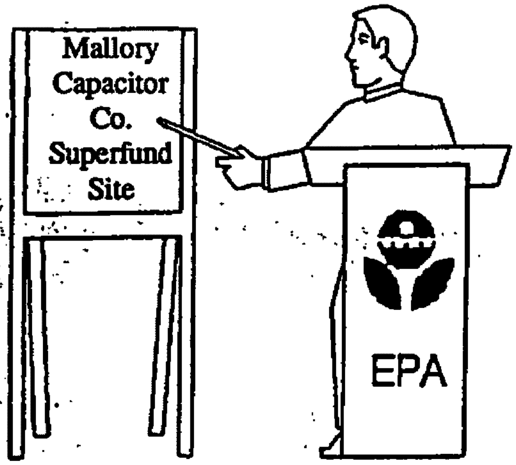
	Potential Remedial Alternative	*Reduction of Toxicity, Mobility or Volumes Through Treatment*	*Minimization of Residual Risks and Long-Term Protection*	*Compliance with State and Federal Regulations*	*Minimization of Short-Term Impacts*	*Protection of Public Health & the Environment*	*Implementability*	*Cost*
1a	No action	No reduction of toxicity, mobility or volume of contaminated media.	No minimization of risk, no long-term protection afforded.	Does not comply with regulations for ground water quality.	No short-term impact	No minimization of risk	Yes	$0
1b	Institutional Controls and Monitoring	No reduction of toxicity, mobility or volume of contaminated ground water.	No minimization of risk, identifies presence of contaminated media, ban on wells and provides for ground water monitoring.	Does not comply with regulations for ground water quality.	No short -term impact	No minimization of risk	Yes	$710,000
2a	On- and Off-Site Contaminant Mass Removal, Treatment by UV/Chemical Oxidation	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site and hydraulically downgradient from the Site.	Residual risks are reduced, long-term protection provided by extraction and treatment of both on-Site and off-Site contaminated ground water.	Does not comply with all regulations for ground water quality in the short-term; however, in the long-term natural attenuation/ degradation will occur with no significant impact to public health or the environment.	Minimal short-term impact	Partially reduces risks in ground water both on-Site and off-Site.	Yes	$2,565,000
2b	On- and Off- Site Containment Mass Removal, Treatment by Air Stripping, Filteration and Carbon Adsorption	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site and hydraulically downgradient from the Site.	Residual risks are reduced, long-term protection provided by extraction and treatment of both on-Site and off-Site contaminated ground water.	Does not comply with all regulations for ground water quality in the short-term; however, in the long-term natural attenuation/ degradation will occur with no significant impact to public health or the environment.	Minimal short-term impact	Partially reduces risks in ground water both on-Site and off-Site.	Yes	$2,113,000
3a	On-Site Hydraulic Containment, Treatment by UV/Chemical Oxidation	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site.	Residual risks are minimized on-Site but not off-Site.	Complies with regulations for VOCs in on-Site aquifers.	Minimal short-term impact	Reduces on-Site ground water risks, but does not eliminate, reduce or control off-Site ground water risks.	Yes	$2,858,000
3b	On-Site Hydraulic Containment, Treatment by Air Stripping, Filtration and Carbon Adsorption	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site.	Residual risks are minimized on-Site but not off-Site.	Complies with regulations for VOCs in on-Site aquifers.	Minimal short-term impact	Reduces on-Site ground water risks, but does not eliminate, reduce or control off-Site ground water risks.	Yes	$2,362,000

Exhibit 5: Evaluation & Comparison of Remedial Alternatives

Potential Remedial Alternative	Reduction of Toxicity, Mobility or Volume Through Treatment	Minimization of Residual Risks and Long-Term Protection	Compliance with State & Federal Redulations	Minimization of Short-Term Impacts	Protection of Public Health & the Environment	Implementability	Cost
4a On- and Off-Site Hydraulic Containment, Treatment by UV/ Chemical Oxidation	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site and hydraulically downgradient from the Site.	Residual risks are minimized both on- and off-Site, long-term remediation of VOCs provided by extraction and treatment of contaminated ground water.	Complies with regulations for VOCs but not PCBs	Minimal short-term impact with respect to securement of access for off-Site extraction wells and piping systems.	Reduces risks in ground water both on- and off-Site.	Yes	$3,860,000
4b On- and Off-Site Hydraulic Containment, Treatment by Air Stripping, Filtration and Carbon Adsorption	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site and hydraulically downgradient from the Site.	Residual risks are minimized both on- and off-Site, long-term remediation of VOCs provided by extraction and treatment of contaminated ground water.	Complies with regulations for VOCs but not PCBs	Minimal short-term impact with respect to securement of access for off-Site extraction wells and piping systems.	Reduces risks in ground water both on- and off-Site.	Yes	$3,105,000
5a On- and Off-Site Containment Mass Removal and Hydraulic Containment, Treatment by UV/ Chemical Oxidation.	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site and hydraulically downgradient from the Site.	Residual risks are minimized both on- and off- Site, long-term remediation of VOCs provided by extraction and treatment of contaminated ground water.	Complies with regulations for VOCs but not PCBs	Minimal short-term impact with respect to securement of access for off-Site extraction wells and piping systems.	Reduces risks in ground water both on- and off-Site.	Yes	$5,216,000
5b On- and Off-Site Contaminant Mass Removal and Hydraulic Containment, Treatment by Air Stripping, Filtration and Carbon Adsorption.	Reduces toxicity, mobility and volume of contaminants in ground water beneath the Site and hydraulically downgradient from the Site.	Residual risks are minimized both on- and off-Site, long-term remediation of VOCs provided by extraction and treatment of contaminated ground water.	Complies with regulations for VOCs but not PCBs	Minimal short-term impact with respect to securement of access for off-Site extraction wells and piping systems.	Reduces risks in ground water both on- and off-Site.	Yes	$4,035,000

Exhibit 6

PUBLIC MEETING



U.S. EPA will hold a public meeting to discuss the results of the Remedial Investigation and the treatment alternatives identified during the Feasibility Study. U.S. EPA representatives will be present to respond to questions and comments about the Remedial Investigation and the Feasibility Study.

Date: June 27,1991
Time: 7 p.m.
Location: Wayne County Courthouse
Waynesboro, TN

PUBLIC COMMENT PERIOD

U.S. EPA relies on public comment to ensure that the remedial alternatives being evaluated for each Superfund site are fully understood and that the concerns of the local community have been considered. Beginning June 14, 1991, U.S. EPA will initiate a public comment period during which comments on the Proposed Plan and the RI/FS should be forwarded to:

Patty Fremont
Remedial Project Manager
U.S. EPA Region IV
345 Courtland St., NE
Atlanta, GA 30365

DATES: June 14, 1991 through July 15, 1991.

FOR MORE INFORMATION

U.S. EPA CONTACTS

Please contact the following U.S. EPA personnel if you have further questions and/or comments about the Mallory Capacitor Co. Superfund Site.

Suzanne Durham
Community Relations
Coordinator
(404) 347-7791

Patricia Fremont
Remedial Project Manager
(404) 347-7791

U.S. EPA, Region 4
345 Courtland St., NE
Atlanta, GA 30365

INFORMATION REPOSITORY

If you are interested in learning more about the Mallory Capacitor Co. Superfund Site, please review the documents in the Information Repository. Information Repositories contain laws, work plans, community relations plans and other documents relevant to the investigation and cleanup of Superfund sites. This respository also contains the Administrative Record which includes all information used by the lead agency to make its decision on the selection of a response action. Citizens are encouraged to consult these documents at the following location:

Wayne County Public Library
U.S. Highway 64 East
Waynesboro, TN

Hours: Mon., Wed., Thurs. and Fri. 10-6
Tues. 10-8
Sat. 10-2

TECHNICAL ASSISTANCE GRANTS

EPA is providing communities with the opportunity to apply for Technical Assistance Grants (TAGs). These grants, of up to $50,000 (per site), are designed to enable residents or a community group to hire a technical advisor or consultant to assist them in interpreting and commenting on site findings and the remedial action. There is a limit of one TAG per site. Citizens who are interested in the TAG program may obtain an application package by calling or writing the EPA Community Relations Coordinator listed on this page.

MALLORY CAPACITOR CO. SUPERFUND SITE
PUBLIC COMMENT SHEET

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Mallory Capacitor Co. Superfund Site is important to U.S. EPA. Comments provided by the public are valuable in helping U.S. EPA select a final remedy for the site.

You may use the space below to write your comments, then fold and mail. Additional comments may be attached to this form or mailed separately to U.S. EPA.

Name ______________________________

Address ____________________________

City ____________________ State _____

Zip _______________________________

United States
Environmental Protection Agency

Region 4
345 Courtland Street, NE
Atlanta, GA 30365

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