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## A Baseline Case: The Woburn Wells G and H Superfund Site

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## A BASELINE CASE: THE WOBURN WELLS G AND H SUPERFUND SITE

This section profiles the types of disputes which arose at the Woburn Wells G and H Superfund site in Woburn, Mass. The Woburn Wells G and H case serves as a baseline because it demonstrates how obstacles cause delays and impasses. The section contains an overview of what has transpired since the discovery of contaminants in two of the town municipal wells, Wells G and H. I describe events that are important to understanding the possibility for agreement on cleanup. Twelve years after the wells were shut in May 1979, major PRPs and the EPA disagree on the extent of groundwater contamination and required cleanup, the remediation technology, and the responsibilities of various parties. This summary describes the disputes which arose and the major actions taken by the Environmental Protection Agency following listing of the site on the Superfund National Priority List.

Subsequent to discovery of the contamination by Massachusetts environmental officials, a toxic tort lawsuit was filed. The jury trial had a significant effect on data gathering, data interpretation, the remedial design, implementation schedule, the negotiations over cleanup, and the resolution of major issues being contested by a variety of stakeholders in this case. The court case sought to address the issue of compensation for alleged health effects. The case has been called a bellwether for new cases based on toxic tort law. The analysis of the Woburn Wells G and H Superfund site demonstrates the array of

stakeholders with interests in cleanup of Superfund sites and the arduous (some would say tortuous) path to achieving settlement and cleanup—a feat not yet assured at this site.

### Background

Woburn is a city in Massachusetts located approximately 10 miles north of Boston. Wells G and H are located in east Woburn, southwest of the Interstate 93 and the Route 128 (I-95) interchange (Figure 1-1). Wells G and H are located in a highly permeable and transmissive area of the Aberjona River basin aquifer, which is approximately five or six miles in length and occupies an area of about seven square miles. The Wells G and H Superfund site consists of 330 acres, characterized by extensive wetlands and the presence of the Aberjona River.

In 1978, the Beatrice Foods Company purchased the tannery operation of the J.J. Riley Company, which had been in business since the 1930s. At that time, Beatrice Foods also purchased an adjacent 15-acre undeveloped wetland property which former owner J.J. Riley had named "Wildwood," and which he managed under the aegis of the Wildwood Conservation Corporation (See Figure 1-2). J.J. Riley originally purchased the wetland parcel in the 1950s for water supply purposes and had a water well installed on the parcel to supply water to the tannery.

In a lawsuit filed in 1982, families in Woburn sued Beatrice Foods Company and two other corporations. The plaintiffs alleged two theories of liability affecting Beatrice Foods Company. The first was that the defendant negligently allowed others to dump toxic wastes on the 15-acre parcel. The second theory stated that the defendant either

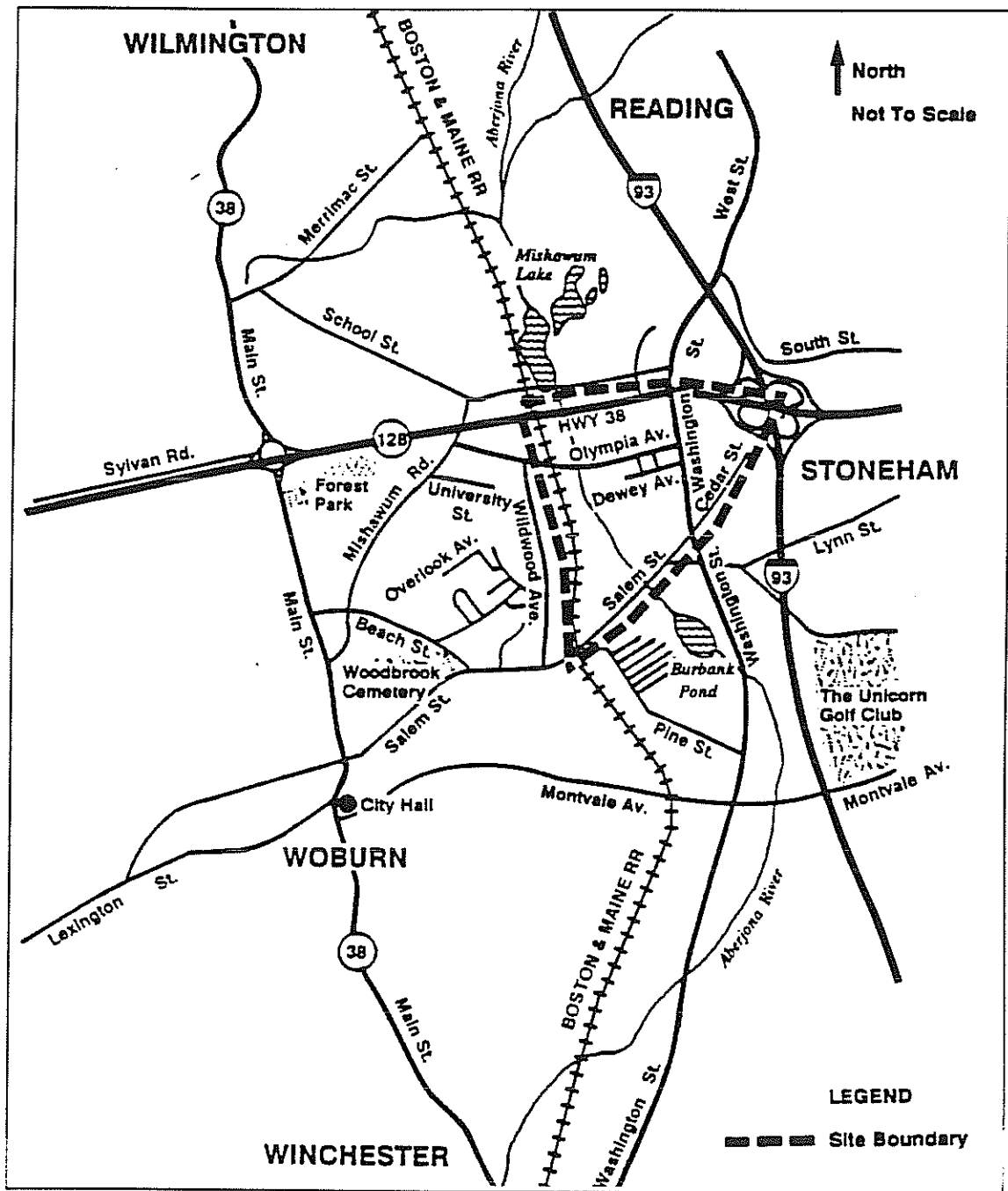


Figure 1-1 Site Location Map

Source: U.S. Environmental Protection Agency, EPA Proposed Plan (February 1989, p.4) and the Record of Decision (September 14, 1989).

dumped toxic waste from its tannery property onto the 15 acres or negligently allowed chemicals dumped at the tannery site to migrate into the Aberjona aquifer, where the "complaint chemicals," including trichloroethylene, were drawn into Wells G and H. The plaintiffs also alleged that W.R. Grace and Unifirst Corporation used and improperly disposed of the "complaint chemicals."

During the jury trial, however, Beatrice's experts showed that the groundwater originating from the 15-acre portion of the Beatrice Foods Company property—the marshy wetland—moved away from Wells G and H. The jury concluded that pumping operations at Wells G and H were not strong enough to reverse this natural direction of groundwater flow. Therefore, the jury concluded that contaminants did not move from the 15-acre property into Wells G and H.

On another part of the 330 acres, W.R. Grace Company operated a Cryovac custom machine shop, producing plastic for shrink-wrapping sides of beef for shipment across the country. The Cryovac manufacturing plant and warehouse (Figure 1-2) are located 2400 feet "upgradient" and northeast of Wells G and H. W.R. Grace Company allegedly improperly disposed of solvents and paint sludges in back of its warehouse.

Unifirst Corporation operated a uniform dry cleaning service directly north of the wells (Figure 1-2). An investigation on the Unifirst property found contents of a 55-gallon drum containing pure tetrachloroethylene had been improperly disposed of and had leaked. Contaminants, collectively referred to as dense non-aqueous phase liquid (DNAPL), were found in the shallow bedrock aquifer on the property.

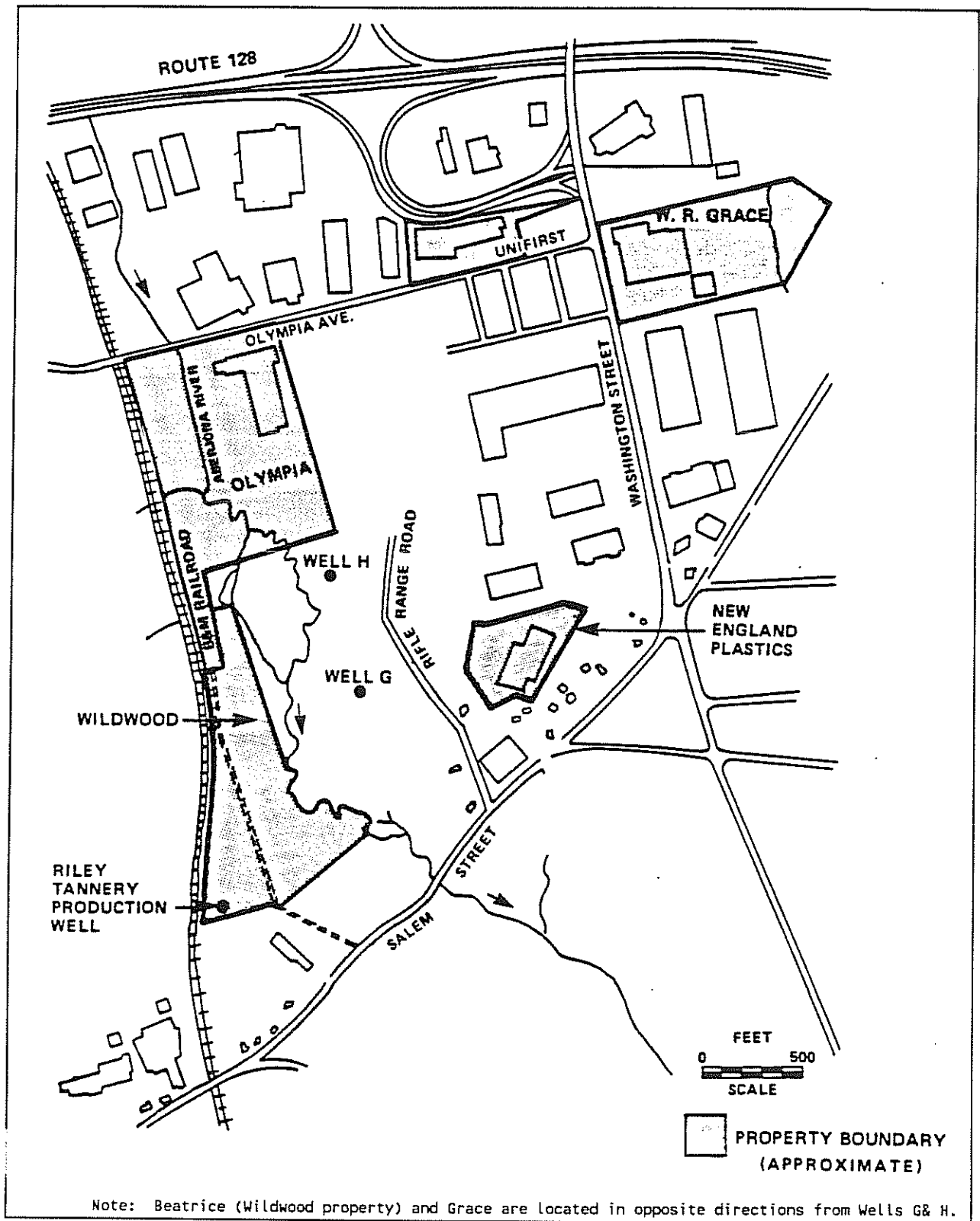


Figure 1-2. Source Area Map for the Woburn Wells G and H Superfund Site  
 Source: U.S. Environmental Protection Agency, EPA Proposed Plan  
 (February 1989, p.6) and the Record of Decision (September 14, 1989).

Specifically, Unifirst's consultants discovered DNAPL from 16.75 to 20.8 feet below the surface, in monitoring well (UC-8). The concentration of tetrachloroethylene (i.e., PCE) was 62,510 parts-per-billion (ppb)—the regulatory standard is 0.7 milligrams/liter, or 7 ppb.

A potential source of additional contamination to Wells G and H is the 245-acre Industri-Plex Superfund site. Located two miles upstream of Wells G and H, Industri-Plex is ranked fifth on the NPL and considered one of the worst hazardous waste sites in the country. In 1975, parts of the Industri-Plex site were being developed for construction of an industrial park, and workers uncovered piles of rotting animal hides left by a large glue factory. Subsequent investigations at the site revealed widespread contamination of soil with arsenic, chromium, and lead, and extensive plumes of benzene and toluene in the groundwater. Although the two Superfund sites are less than two miles apart and both are situated in the same surface water drainage basin, the EPA did not initially consider the Industri-Plex site as a potential source of pollution for Wells G and H until more attention was focused on water quality in the Aberjona River.

The history of Wells G and H and key events which occurred over the last 12 years are profiled in Appendix 2: Chronology and Stakeholder Analysis for the Woburn Wells G and H Superfund Site Cleanup Case. The case involves discovery of contamination of the municipal wells; a toxic tort lawsuit filed against three companies; disagreement over who contributed what chemicals to the wells; disputes over cleanup of source areas for chemicals and the "Central Area," which includes Wells G and H; and an impasse over structuring a cleanup settlement.

The dispute is on-going. With two exceptions, cleanup of the major source areas and/or the Central Area has not taken place. The Wildwood property, a major source of contamination, was fenced and a security guard was hired pursuant to an administrative order under Section 106 of the Superfund law (CERCLA) dated December 12, 1985. Drums containing PCB sludge and solid materials were removed, as was a pool of contaminated liquid, following issuance of an amended administrative order by the EPA. [EPA issued an amended order to the Wildwood Conservation Corporation on January 27, 1986.] Clean Harbors, Inc. performed a \$30,000 removal of 17 drums of hazardous waste found on the Olympia Nominee Trust property. The drums were found by William Cashins, a Mass. Department of Environmental Quality Engineering employee, on August 15, 1980; they were removed pursuant to an administrative order issued by the EPA, dated February 6, 1986.

#### Themes Relevant to Joint Fact-Finding

The Aberjona River and the Aberjona aquifer were the sources of contaminants drawn into Wells G and H; the disputes which arose revolved around who was responsible for the contamination and what should be done. For Superfund cleanups to be achieved, parties will have to resolve disputes like these. In the Woburn case, progress toward cleanup has been cumbersome and often delayed. The parties are still negotiating cleanup of contaminated areas, and the EPA has proposed further study of the "Central Area," from which water was drawn to supply Woburn's municipal Wells G and H. This will require going through the Superfund study and Record of Decision process again,



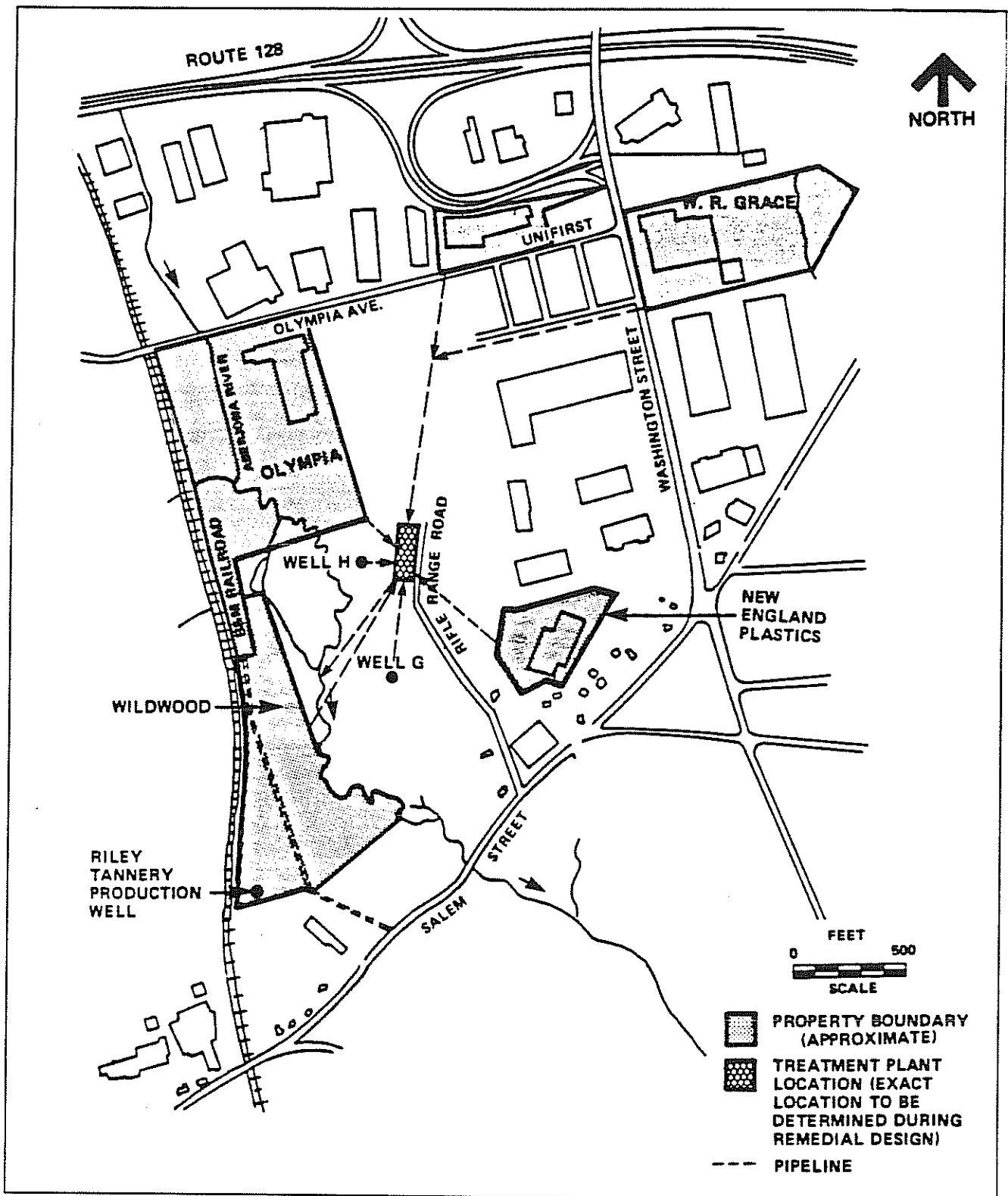


Figure 1-3. Pump Source Areas for the Woburn Wells G and H Superfund Site; Location of the EPA's Proposed Central Treatment Plant

Source: U.S. Environmental Protection Agency, EPA Proposed Plan (February 1989, p.11).

according to Barbara Newman, EPA Region I remedial project manager (RPM) (personal communication, May 30, 1990).

There is still not an agreed upon plan for cleanup of the entire site. The EPA selected a centralized treatment configuration in its Proposed Plan; however, the PRPs never agreed to implement EPA's preferred alternative (See Figure 1-3).

The EPA expects that an investigation into the extent of contamination in the Aberjona River and the area surrounding the wells will be completed in 1992. Implementing remedial action is expected to take 20 to 50 years, depending on the solution agreed to by the parties. EPA and the PRPs have little to show for their interactions and expenditures totalling well over \$20 million during the past 10 years.

The parties have consistently chosen to hire separate consultants to promote their interests and present their positions. Consultant studies have polarized the parties over technical issues, such as the migration of contaminants into the wells, cleanup technology, and the need for cleanup of the Central Area. Resources spent on these efforts have substantially reduced the amount of money available for sampling and testing during the monitoring phase (Stoler, 1989). Monitoring will be important to assure the public of the effectiveness of cleanup implementation. An outstanding issue is the suitability of the Aberjona aquifer for future water supply.

Limited cooperation was evident during the initial remedial investigation when the W.R. Grace Company invited the parties to an excavation on its property, and during the litigation, when Judge

Skinner ordered a fact-finding process regarding contamination on the Beatrice Foods Company property. However, the fact-finding was cancelled within two months of Judge Skinner's order. Changes made on the Beatrice property invalidated Judge Skinner's proposed sampling and analysis protocols. The W.R. Grace excavation and limited fact-finding failed to advance progress toward cleanup. Part of the explanation for failure is that in both cases the parties did not trust each other. The timing of Judge Skinner's order, seven years after the lawsuit was filed, also left much to be desired.

Major responsible parties involved in the cleanup dispute included five companies with sources of contamination on their properties: W.R. Grace Company, Unifirst Corporation, Beatrice Foods Company, New England Plastics Corporation, and Olympia Nominee Trust. The EPA also identified 17 others companies who were nearby and whose properties may have affected water quality in the Aberjona aquifer. Other stakeholders in disputes at the site included the EPA, the Massachusetts Department of Environmental Protection (DEP), the Massachusetts Department of Public Health (DPH), the Massachusetts Water Resources Authority (MWRA), the citizen organization For A Clean Environment, East Woburn families who experienced childhood leukemia, the Woburn Conservation Commission, and the City of Woburn.

The responsible parties, the EPA, and the other stakeholders disagreed, and continue to disagree, on how to resolve four key issues affecting the benefits and costs of cleanup:

- 1) How to structure the settlement for cleanup, including selection of a preferred remedial action;
- 2) How to define cleanup standards, including application of legally applicable or relevant and appropriate standards ("ARARs") and resolving disputes over "how clean is clean;"
- 3) How to identify responsible parties for site cleanup; and
- 4) How to resolve issues over allocation of cost and liability for the selected remedial cleanup actions.

I have developed five hypotheses targeted at disputes which arise in these areas. The disputes could arise at a variety of hazardous waste sites, from those on the National Priority List to federal facilities (operated by the Department of Energy, the Department of the Army, and others) to state-listed sites. The short titles of the hypotheses are: the treatment of scientific uncertainty hypothesis, the allocation of cost and liability hypothesis, the remedial activity hypothesis, the settlement hypothesis, and the stability hypothesis.

In Chapter Three, I evaluate the hypotheses using data from three cases (these cases are profiled in Chapter Two). For the Woburn Wells G and H baseline case, which is essentially devoid of joint fact-finding, I provide insights relevant to the hypotheses, organized, as above, along the lines of the four key issues which arose in the Woburn case.

#### Potential for Joint Fact-Finding to Resolve Disputes

##### 1. Structuring the Settlement

The structure for a settlement could have emerged from joint fact-finding regarding the selection of a preferred remedial action. The EPA and the responsible parties disagreed over estimates of the costs of implementing source area treatment and the relative cost

advantage of centralized treatment. They also preferred different technologies for treating contaminated groundwater. A mediator could have used joint fact-finding to determine where the parties agreed and where they disagreed. The mediator could have applied technical resources to carefully examine assumptions, sampling procedures, statistical and other data interpretation, and predictions of the parties; then assisted the parties in identifying underlying reasons for disparate predictions and technical conflicts. This process could have improved the scientific and technical basis for decisions made in the Record of Decision and for remedial actions negotiated by the parties.

A mediator could have assisted the parties in resolving technical conflicts by engaging them in collaborative model-building. Collaboration on the definition and extent of the problem and joint reviews during conduct of technical studies tends to facilitate joint ownership of ideas and results. In the absence of joint fact-finding, the parties rejected approaches and studies used as the basis for decision making in the EPA's *Proposed Plan*.

A mediator hired by the parties today could begin joint "scoping" efforts to resolve outstanding issues and differences of opinion. The mediator could begin by asking the parties a question such as, "What kind of information, gathered in what manner, might change your views on cleanup of the Central Area?" The mediator could assist the parties in defining the extent of remedial investigation and feasibility studies in order to reduce the need for supplemental studies. Because parties never agreed on many early issues, heated disputes continue today over delineating the site boundary and determining who should be included as

potentially responsible parties. This is logically the first order of business. In 1989, further study of the Central Area study was held up pending resolution of three basic functional issues: 1) who will pay for the study, 2) who will conduct it, and 3) who will perform the five individual source area remedies (Stoler, personal communication, May 8, 1989). Arriving at consensus on objectives for cleanup of the Central Area is a critical matter that is long overdue. It could avoid further delays or continued impasse in decision making.

## 2. The Standards Issue

The second issue concerns standards governing cleanup of the Central Area, which includes Wells G and H, and the source areas of contamination (essentially five properties adjacent to Wells G and H). On September 14, 1989, the EPA issued a Record of Decision that selected individual source control over centralized treatment. The responsible parties favor natural attenuation of contaminants in the Central Area, whereas the Massachusetts Department of Environmental Protection (DEP) and the EPA are committed to cleaning up the aquifer to standards found in the Safe Drinking Water Act (SDWA). The latter parties want to keep the option of using the aquifer for future water supply open. The Central Area is being treated as a "separate operable unit;" which means that it needs to be studied as a distinct part of cleanup, that a Record of Decision will follow, and then the parties will negotiate remedial action for that "unit." Therefore, decisions about cleaning up the Central Area and final cost allocation among the responsible parties may not be made for years.

Joint fact-finding could have assisted the parties in identifying consensual goals for cleanup of the Central Area and source areas. Initially an astute mediator could have engaged all parties in fact-finding on which policies govern use of aquifers in Massachusetts. The advantage of reaching consensus on this policy would be that sites like Woburn would be classified as either abandoned as a water supply aquifer or viable for water supply after remedial activity is implemented. The "aquifer group" could use joint fact-finding to identify objective criteria for determining "need" for new water supplies, managing state-wide demand through pricing mechanisms and incentives for conservation of water, implementing local source protection measures, and evaluating the feasibility of local sources. The group could then collect and evaluate data to formulate a policy for categorizing aquifers for use as water supply. This categorization would include abandonment of formerly used water supply sources. Then these policies could be applied to the site with explicit reference to site-specific factors.

Disputes over "How clean is clean?" and the applicability of laws and standards are commonplace in Superfund cleanup negotiations. Massachusetts has legally applicable or relevant and appropriate standards [i.e., ARARs], such as its policy governing "no net loss" of wetlands. Other ARAR provisions affect site remediation, such as discharge limits for water treated on-site. Joint fact-finding could have helped parties understand the basis for ARARs, and to identify how the choice of technology and preferred remedial options affect attainment of the ARARs.

The responsible parties raised a host of issues concerning

standards and ARARs in commenting on the EPA's *Proposed Plan*. All public comments were reported in the EPA's "responsiveness summary." This document, however, does not identify priority comments or concerns. The PRP concerns included 1) de minimis (of negligible impact) amounts of volatile organic compounds on certain pieces of property; 2) the EPA's disregard of Massachusetts drinking water standards; 3) possible introduction of microorganisms and viruses through pumping of the Central Area; and 4) levels of radionuclides (source unknown) in groundwater and the wells might be problematic. Joint fact-finding could have been used to address these concerns early in the process and to focus data collection and assessment on the most relevant issues.

### 3. Identification of Responsible Parties

Joint fact-finding could have been used after the discovery of contamination of the wells in 1979 to identify responsible parties in a much more timely fashion. EPA identified eight responsible parties in April 1988, and an additional 14 parties in February 1989. Remedial investigations could have been structured to gather and validate data on the use and disposal of specific hazardous chemicals, such as trichloroethylene, tetrachloroethylene (PCE), other solvents, polychlorinated biphenyls (PCBs), pesticides, arsenic, and heavy metals. A mediator could have conducted a thorough search of Massachusetts "Superfund Chapter 21E" records and the federal administrative records for the two Superfund sites, Woburn Wells G and H and the Industri-Plex site. Potentially responsible parties at the Woburn Wells G and H site alleged that both sites contributed contaminants to the Aberjona River.



Such a search and summarization of information could also include enforcement files, as there were a number of administrative orders issued at both sites. In this case, EPA's issuance of the first waste-in list for the Woburn Wells G and H site took nine years. The Massachusetts DEP is responsible for cleanup of three state Superfund sites that some stakeholders feel should have been included when the boundaries of the Wells G and H site were delineated. Therefore, a mediator could likely have helped to resolve issues over state versus federal listing of contaminated properties.

Federal designation on the National Priority List (NPL) has advantages. Listing on the NPL means more resources are available to deal with necessary studies, remediation, and enforcement matters. Listing some properties on the NPL and having the Mass. DEP deal with others in the watershed may not solve water quality problems in the Aberjona aquifer.

By having the parties explicitly address issues regarding the boundary of the site, the mediator could have helped them identify all properties within the "zone of contribution" of Wells G and H and within the designated Superfund site, and to develop a consensus on this matter. This could have occurred long before the NUS Corporation RI/FS findings were released in November of 1986 and before the EPA contracted for the Supplemental RI/FS with Ebasco, a consulting firm. This issue is still relevant and under study. Consolidating the state-listed properties with the properties included in the Wells G and H site boundaries is advantageous if there has been or might be a release or threatened release of hazardous substances (according to CERCLA/SARA)

which affects water quality in the Central Area. In this case, jurisdictional issues have impeded cleanup of the multiple sites.

A mediator has a significant advantage over the EPA in helping to design data collection and assessment because the mediator can encourage information sharing. A mediator also does not have a vested interest in structuring these efforts to support issuance of enforcement orders, court testimony, or the filing of lawsuits. There is an inherent conflict between objectives of prompt and effective remediation and allocation of responsibility for the original contamination. The mediator helps the parties to better understand the problem, generate viable solutions, and design solutions that meet their interests in a timely fashion. The process is an adjunct to, rather than a substitute for, formal enforcement proceedings.

#### 4. Allocation of Cost and Liability

A mediator could use joint fact-finding to develop objective criteria for allocating the cost of implementing a preferred remedial activity--assuming, of course, that the parties are able to reach consensus on a preferred remedy. A mediator could facilitate information sharing, gather information on the toxicity, mobility, weight and/or volume of contaminants from each source area, identify situations where there was off-site migration affecting properties that were not source areas, and organize modeling of the migration of contaminants from soil "hot spots" into and through the groundwater. A prime advantage of hiring a mediator is that proprietary or confidential information can be used in a way that contributes to solving allocation

and liability problems, without compromising the interests of the responsible parties with each other and in negotiations with the EPA.

Presently the responsible parties plan to treat only the contamination on their individual properties. This approach may have significant administrative advantages in that each company directs cleanup on its own property. However, it ignores the need for agreement on sampling, testing, monitoring protocols, and evaluation aimed at tracking the movement of contaminants from individual property source areas into the Central Area and Aberjona aquifer. A mediator could help the responsible parties focus on the need for a timely, effective remedy in the Central Area, while being cognizant of their more narrow and competitive focus on cleanup of their own properties.

#### How Joint Fact-Finding Might Have Helped Achieve Settlement and Cleanup

Table 1 summarizes opportunities where joint fact-finding might have contributed to achieving cleanup. The Woburn site has now been studied for over a decade. The EPA failed to gain support for its proposed plan of centralized treatment. Then the EPA resorted to a more modest objective: to get agreement on the cleanup of source areas within the Wells G and H site. EPA chose to stay out of the toxic tort litigation, even when approached by the plaintiffs. Woburn citizens, who might have viewed the EPA as on "their side," became skeptical of the EPA's effectiveness. The PRPs accomplished little in the way of actual site cleanup. In fact, W.R. Grace postponed treatment on its own property for over three years waiting for a more comprehensive settlement for the entire site.

Table 1-1

JOINT FACT-FINDING (JFF) OPPORTUNITIES IDENTIFIED IN ANALYSIS  
 OF CLEANUP DISPUTES AT THE WOBURN WELLS G AND H SUPERFUND SITE, BY ISSUE

Objective	Issues or Areas of Dispute Which Joint Fact-Finding Might Help the Parties to Resolve			
	Issue No.1	Issue No.2	Issue No.3	Issue No.4
	Identification of Responsible Parties for the Waste-In List	Cost Allocation Among Responsible Parties	Definition and Interpretation of Cleanup Standards, Including ARARs	Structure of the Settlement: Including Preferred Remedial Action
Woburn Wells G and H / Final Cleanup of Source Areas of Contamination and the Central Area	JFF could have been used: 1) to identify "major parties" in a more timely fashion; 2) to achieve consensus on site boundaries for remedial investigation and feasibility studies; 3) to avoid missing a major source area 600 feet from Well G; and 4) to identify additional PRPs who might have contributed contaminants to the Aberjona River early in the site investigation process. Although yet another study was proposed by the responsible parties, the scope of the study and who would perform it were undecided in July 1990 (Stoller, 1990)	JFF could have been used: 1) to develop objective criteria for allocation of costs of cleanup of the Central Area among five major responsible parties; 2) to assist the parties in making predictions of source area cleanup costs; 3) to assist the EPA and the PRPs in achieving consensus on the cost of several remedial pump and treat configurations; and 4) to explore possible solutions to liability issues by evaluating the viability and potential financial exposure of each of the major responsible parties	JFF could have been used: 1) to achieve consensus on a cleanup objective for the Central Area, such as whether or not to apply drinking water standards found in the Safe Drinking Water Act (SDWA) of 1974, as amended; 2) to identify promising alternative technologies for management of migration alternatives, in order to lower costs and meet previously agreed upon cleanup standards; and 3) to develop a monitoring plan for installation of wells and sampling to evaluate whether remedies are being effectively implemented	JFF could have been used: 1) to achieve a consensus on remedial actions for source areas and the central area concurrently; 2) to build a collaborative model detailing existing areas of soil and groundwater contamination and how remedial activities might be expected to change contaminant levels; 3) to integrate cleanup efforts at the Wells G and H site and state oversight activity at nearby "21(e)" sites suspected of contaminating the wells; and 4) to coordinate state & federal efforts within the 25.4-sq. mile Aberjona watershed.

In the Woburn case, the EPA and W. R. Grace, Beatrice Foods, Unifirst, and New England Plastics reached an impasse over cleanup of the wells and the associated central area, including a part of the Aberjona aquifer. The major outstanding issue is whether the EPA should apply cleanup standards in the Safe Drinking Water Act of 1974, as amended.<sup>25</sup>

Wells G and H were shut in May 1979, yet fundamental cleanup issues remain unresolved. Joint fact-finding could facilitate negotiations toward settlement regarding cleanup by improving the boundaries and conduct of additional studies and building consensus on the cost and predicted effectiveness of technical options. A consensual agreement for the entire site, rather than two separate operable units, could assure the parties of a fair, timely, appropriate, and efficient remedy that meets cleanup standards.

This case will set an important precedent regarding groundwater remediation at Superfund sites. If the aquifer is not restored, the EPA may find cleanup objectives to restore aquifers for water supply challenged via water treatment proposals at other sites and in related enforcement matters. At stake are the effectiveness of EPA policies to protect, restore, and treat public water supplies.

In contrast to the environmental gridlock at Wells G and H, where no joint fact-finding was used and the parties continue to argue central cleanup objectives, the cases profiled in Chapter Two represent complex, contentious cases where settlements were achieved and cleanups actually took place within reasonable time periods. Each cleanup problem presented EPA decision makers with difficult decisions subject to the types of contentious disputes which arose at the Woburn site.