NEW YORK STATE SUPERFUND
RECORD OF DECISION

BEDFORD VILLAGE WELLS
HUNTING RIDGE MALL SITE
WESTCHESTER COUNTY, NEW YORK
ID #360009

MARCH 1990

PREPARED BY

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Bedford Village Wells, Hunting Ridge Mall, Town of Bedford, Westchester County, New York - Site ID #360009.

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Hunting Ridge Mall, developed in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Contingency Plan (NCP), 40 CFR Part 300, November 20, 1985.

The attached index identifies the documents that comprise the Administrative Record for the Hunting Ridge Mall. The documents in the Administrative Record are the basis for the selected remedial action.

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 Record of Decision, presents a current or potential threat to public health, welfare, or the environment.

STATEMENT OF BASIS

This decision is based on the administrative record for the Hunting Ridge Mall Site. A copy of the record is available for public review and/or copying at the following locations:

New York State Department of Environmental Conservation, 50 Wolf Road, Albany, New York. Hours: 8:30 a.m. - 4:45 p.m., Monday - Friday.

New York State Department of Environmental Conservation Region 3 Office, 21 South Putt Corners Road, New Paltz, New York. Hours: 8:30 a.m. - 4:30 p.m., Monday - Friday

Bedford Free Library, Village Green, Bedford, New York

Bedford Hills Free Library, Main Street, Bedford Hills, New York

Bedford Town Clerk, Town House, Rt. 117, Bedford Hills, New York

The following documents are the primary components of the administrative record:

Final Draft Remedial Investigation Report (Volumes 1, 2 & 3), Bedford Village Wells, Hunting Ridge Mall, prepared by Dvirka & Bartilucci Consulting Engineers of Syosset, New York, Inc., February, 1990.

Final Draft Feasibility Study Report (Volume 4), Bedford Village Wells, Hunting Ridge Mall, prepared by Dvirka & Bartilucci Consulting Engineers of Syosset, New York, Inc., February, 1990.

Proposed Remedial Action Plan, Bedford Village Wells, Hunting Ridge Mall, prepared by New York State Department of Environmental Conservation (NYSDEC), February, 1990.

Responsiveness Summary, Bedford Village Wells, Hunting Ridge Mall Remedial Investigation/Feasibility Study, prepared by New York State Department of Environmental Conservation (NYSDEC), March, 1990.

Record of Decision, Bedford Village Wells, Hunting Ridge Mall, prepared by New York State Department of Environmental Conservation (NYSDEC), March, 1990.

DESCRIPTION OF THE SELECTED REMEDY

- On-site treatment of contaminated groundwater by air stripping with capabilities of a vapor phase carbon adsorption unit to insure compliance with air standards, reinjection of treated groundwater into the aquifer of withdrawal

- Groundwater monitoring to assure which path contaminants are migrating and to insure that groundwater remediation is being accomplished

- 10 Year remediation alternative

- Implementation of a site specific monitoring and evaluation plan of the Mianus River, adjacent tributaries and the ponds area to assure that fish and wildlife are not impacted by the site.

WATER SUPPLY

- Installation of Point of Entry carbon filters for affected commercial/ residence users until a new water supply can be implemented

- Water quality monitoring

- Development of a new community water supply to supply homes only affected by contamination.

- If during the design study, it is found that through air stripping, the aquifer can be restored to acceptable drinking water standards within an acceptable time time frame (<5 years), the need for a new water supply may be re-evaluated and possibly eliminated as an alternative.

DECLARATION

The selected remedy is designed to be protective of human health and the environment, is designed to comply with applicable State environmental quality standards and is cost effective. This remedy satisfies the preference for treatment that reduces the toxicity, mobility or volume of hazardous substances, pollutants or contaminants as the principal goal. Finally, this remedy utilizes permanent solutions and alternative treatments to the maximum extent practicable.

Date

Edward O. Sullivan
Deputy Commissioner
Office of Environmental Remediation

BEDFORD VILLAGE WELLS
HUNTING RIDGE MALL SITE

WESTCHESTER COUNTY, NEW YORK

NEW YORK STATE SUPERFUND

RECORD OF DECISION

MARCH 30, 1990

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

50 WOLF ROAD, ALBANY, NEW YORK 12233

TABLE OF CONTENTS

PAGE

LIST OF TABLES

APPENDICES

A. **List of Figures and Tables**

B. **Conceptual Design**

C. **Responsiveness Summary**

D. **List of Documents in the Administrative Record**

I. SITE LOCATION AND DESCRIPTION

The Hunting Ridge Mall Site (HRM) located on Old Post Road (Route 22) in the Town of Bedford is approximately one mile southwest of the Bedford Village business district (Shopping Arcade Site). Figure A-1 shows the location of the Hunting Ridge Mall Study Area. The Town of Bedford is located in northeastern Westchester County. The Town is roughly square in shape and covers approximately 40 square miles or 25,000 acres. Approximately one-half mile to the southeast of the HRM and bordering the downgradient portion of the study area is the Mianus River. A tributary to the Mianus River located northeast of the Mall and adjacent to Lake Avenue is an ephemeral stream which includes a series of three ponds. Directly adjacent to the Mall property and to the southeast is the Ponds Development Property which occupies approximately 115 acres.

II. SITE HISTORY

In 1978, the Westchester County Department of Health (WCDH) initiated an investigation to assess groundwater contamination and potential drinking water problems in areas where present and past dry cleaning establishments were located. This program started by collecting numerous well samples throughout the county. The results revealed contaminated wells in Katonah, Armonk and Bedford Village (Shopping Arcade). In 1983, WCDH located contaminated wells at the Bedford Village Hunting Ridge Mall Site which were suspected to be contaminated from the Mall dry cleaning establishment. The sampling program included the testing of 29 private wells and 3 municipal wells (Bedford Farms Water Company Inc.). Of the 32 wells sampled, 14 contained volatile organic chemicals (VOC) above NYS Department of Health Standards. The primary contaminants found were Tetrachloroethene (PCE), Trichloroethene (TCE) and 1,2 Dichloroethene (DCE). In 1983, based on these findings the Mall owner was required by WCDH to pump out the sanitary system and remove contaminated sediment from the drainage system and nearby stream to which it discharged.

In 1985, HRM owners contracted C.A. Rich Consultants to install three monitoring wells on the Mall property. Test results confirmed the presence of PCE at concentrations greater than 100 parts per billion, and levels of TCE and DCE at concentrations less than 100 parts per billion, for a specific sampling event. A tap water sampling program conducted in 1986 by the WCDH and the U.S. Environmental Protection Agency (USEPA) reaffirmed the presence of VOCs in private well supplies on Lake and Vinton Avenue, approximately 1/4 mile from the Mall Site.

III. CURRENT SITE STATUS

A Remedial Investigation/Feasibility Study (RI/FS) was undertaken by Dvirka and Bartilucci, Consulting Engineers of Syosset, New York, starting July, 1987 to determine the nature, extent and source(s) of contamination at the Site, to assess the risks to the public and to the environment, and to evaluate alternatives for reducing and/or eliminating those risks. The RI/FS was completed by Dvirka and Bartilucci in February, 1990.

The Remedial Investigation (RI) included examining available background information and an extensive field study to determine the current conditions at the Site. The field investigation program included the collection and analyses of samples from surface soil, surface water, pond sediments and groundwater.

Surficial aquifer and bedrock aquifer monitoring wells were installed and samples of groundwater collected and analyzed. Off-site private wells were sampled at locations both upgradient and downgradient of the Site. Site geologic and hydrologic data were also collected using geophysical surveys, structural geologic analyses, aquifer testing, soil borings and rock core logs and existing data such as climatic information This information was evaluated and summarized in the RI report. A public health evaluation, which was conducted using site specific data, identified various routes of human exposure to on-site contaminants and evaluated any significant health effects.

MAJOR FINDINGS OF THE REMEDIAL INVESTIGATION:

- The geology of the HRM area generally consists of a gneissic bedrock overlain by glacial sands. The bedrock, encountered at depths from approximately 4 feet to 131 feet, is overlain by varying thicknesses of glacially stratified drift deposits. These deposits are generally composed of sorted, fine-coarse sands and silts.

- Local groundwater flow within the bedrock can be characterized as migrating horizontally in a southeasterly direction from the HRM towards the Mianus River. The hydraulic gradient in the bedrock underlying the study site is 0.011-0.14 ft/ft. Groundwater flow in the overburden exhibits a southeasterly flow from the Hunting Ridge Mall to the Mianus River. The hydraulic gradient in this area is 0.0026-0.0038 ft/ft. Groundwater also migrates downward from the overburden and recharges bedrock as a result of a downward vertical gradient which ranges from 0.00011-0.21 ft/ft.

- Surface water flow at the HRM is generally towards the Mianus River and travels by overland flow through a series of small streams and ponds and/or the storm sewer systems.

- Volatile organic compounds (VOCs), particularly PCE, TCE and DCE, are the primary contaminants found in samples at the HRM Site. Some groundwater samples also contained various concentrations of Benzene, Toluene, Xylene and 1,1,1-Trichloroethane that exceed established water quality standards. The source of the groundwater and surface water contamination was identified as a dry cleaning establishment which disposed of waste in the sanitary and storm water drainage systems serving the Mall area. Since cleanup work done in 1983, the most recent data indicates that the soil/sediment in the areas sampled are no longer serving as a source of contamination.

- The present distribution of contaminants is likely the result of a series of hydrogeological events; percolation of rainwater, water table fluctuations and groundwater flow through the overburden and fractured bedrock. Figures A-2 and A-3 present the approximate extent of the groundwater contamination plume.

- VOC contamination has reached the Mianus River, though overland flow, groundwater flow and/or the sanitary storm sewer system.

Table 1 lists contamination levels for the primary contaminants, including indicator chemicals (those contaminants which pose the greatest public health and environmental concern for a particular site) in groundwater samples as the Hunting Ridge Mall along with the associated cleanup levels are presented below.

Table 1

Contaminant	Groundwater Conc. (PPB)		Cleanup Levels (PPB)
	Maximum	Mean	(*)
Tetrachloroethene (PCE)	61	15	5
Trichloroethene (TCE)	8	5	5
1,2-Dichloroethene (DCE)	15	5.5	5
Benzene	6	3	ND
Toluene	39	1.6	5
Xylene	9	5	5
1,1,1-Trichloroethane	9	7	5

(*) - Based on 6NYCRR Part 703 Groundwater Quality Standards and NYS Department of Health Standards
ND - Non-detect

IV. RISK ASSESSMENT

The Remedial Investigation for the HRM Site indicated little or no current impact to public health and the environment beyond the Site boundaries. The two primary routes of exposure for the contaminants to residents on Site are ingestion and inhalation. Ingestion of contaminants occurs through use of supply well water for drinking. Inhalation of VOCs occurs by breathing of vapors entering the residence through use of showering or running water.

The threat of exposure to contaminated water supplies is the driving force behind the recommendations outlined in the HRM Feasibility Study. Groundwater modeling results indicate migration of some volatile organic contaminants to receptor wells at concentrations above drinking water standards. Based on lifetime exposure to contaminants in the groundwater, the potential for significant elevated risk was identified. Risks associated with exposure to groundwater are described as follows:

Groundwater Exposure

Concentrations of some organic compounds detected in groundwater at the Site were above New York State groundwater standards (6 NYCRR Part 703). These include three of the selected indicator chemicals; tetrachloroethene, trichloroethene and 1,2-dichloroethene.

Groundwater quality standards have been established to minimize the risk posed to people using private domestic wells which are supplied by groundwater. These standards are set to protect against long term exposure. The risk of long term exposure is calculated in terms of a person being exposed to the above listed concentrations when ingesting two liters of water per day for 70 years.

V. ENFORCEMENT STATUS

The Mall dry cleaning establishment was identified as the contributor of waste at the Hunting Ridge Mall Site.

In September 1987, a 60-day letter was mailed to the owner of the Mall, B&B Auto Parts, Inc., informing them of our intentions to conduct the RI/FS. The owner stated they did not have the funds to conduct a site remediation. In March 1990, a 60-day notice was sent to the owner to inform them of our intentions to start the design/construction phase of the project. As of this date, no response has been generated.

VI. PUBLIC PARTICIPATION

As part of the RI/FS, Dvirka and Bartilucci submitted a public participation and community relations plan for the Bedford Village Wells Hunting Ridge Mall (HRM) Site in July, 1987. The principal objectives of this plan were as follows:

1. Provide area residents with an understanding of the New York State Superfund process. NYSDEC will clarify Superfund requirements and explain what Superfund can accomplish. Such an understanding will promote more realistic public expectations about the activities, complexities, and time involved with site investigations.

2. Provide accurate, understandable information concerning all phases of the Hunting Ridge Mall Site RI/FS program to interested citizens. NYSDEC will work closely with officials of the area to identify and fulfill the information needs of the community. Information will be disseminated through many media sources including press releases, direct mailing of newsletters, fact sheets, meetings, workshops and others.

3. Provide residents and local officials with an opportunity for input into related issues and decisions. Through the RI/FS process, the community will be encouraged to express their views and to discuss issues of concern with NYSDEC. At key milestones, community input will be solicited.

4. Maintain good relations with the local media so that information about RI/FS activities are reported accurately. An important emphasis of the public participation program will be to keep the media informed about the project and to obtain accurate newspaper, television and radio coverage of RI/FS activities. This will be achieved through timely press releases, supporting documentation to the media and appearances and interviews with the media as appropriate.

A State Superfund contract was signed in June, 1987 with Dvirka and Bartilucci to perform a Remedial Investigation/Feasibility Study. The following public participation activities have been carried out since this RI/FS contract was signed:

1. A Public Participation Planning Meeting was held on July 17, 1987 to outline the public participation and Community Relations Plan (CRP) for the Bedford Village Wells Hunting Ridge Mall Site.

2. A Public Meeting/Workshop was held on August 6, 1987 to provide an opportunity for the public to meet the key individuals associated with the HRM RI/FS study and to learn of NYSDEC's work plans for the HRM Site. This meeting provided an opportunity for the State and the public to exchange concerns and ideas pertaining to the Site and for local citizens to give site-specific information to the study team.

3. On March 14, 1990 a Public Meeting was held to present the proposed remedial alternatives for the HRM Site and to outline the remedial design proposal. Questions and answers recorded during this meeting are used to develop the Responsiveness Summary, presented in Appendix C of this document.

VII. GOALS FOR REMEDIATION

The alternatives under consideration for remediation of the HRM Site, including the NYSDEC preferred alternatives, are in compliance with the New York State Environmental Conservation Law (ECL) and are consistent with both Section 105 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the National Contingency Plan (NCP). The goal of the Feasibility Study is to select alternatives which meet the following six screening criteria:

Short Term Effectiveness
This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until removal response objectives are met.

Long Term Effectiveness
This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual remaining at the site after response objectives have been met.

Reduction of Toxicity, Mobility and Volume
This evaluation criterion assesses the remedial alternatives use of treatment technologies that permanently and significantly reduce toxicity, mobility or volume of the hazardous wastes as their principal element.

Implementability
This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation.

Protection of Human Health and the Environment
This evaluation criterion provides a final check to assess whether each alternative meets the requirement that it is protective of human health and the environment.

Cost
This evaluation criterion is used to apply cost estimates to evaluation of alternatives and may include capital, operations and maintenance costs and net present worth costs.

VIII. SUMMARY OF THE EVALUATION OF ALTERNATIVES

A. Initial Screening of Alternatives
Twenty-one remedial alternatives were initially considered for the HRM Site. These alternatives were screened using the six above-described criteria and are presented below. This list excludes nine technologies which were considered inappropriate and infeasible at the onset of the screening process. The reasons for eliminating these technologies are covered in detail in the Feasibility Study.

The twelve alternatives retained for consideration are as follows:

Groundwater Remedial Alternatives
G.1 No Action/Limited Action
G.2 Carbon Adsorption/Reinjection
G.3 Air Stripping (Vapor Recovery)/Reinjection
G.4 Air Stripping/Carbon Adsorption-Reinjection
G.5 Carbon Adsorption/Discharge to Storm Drain
G.6 Air Stripping (Vapor Recovery)/Discharge to Storm Drain
G.7 Air Stripping/Carbon Adsorption-Discharge to Storm Drain

Water Supply Alternatives
W.1 - No-Action
W.2 - Expansion of Farms Water Supply
W.3 - Expansion of Planned Ponds Development
W.4 - Development of New Water Supply
W.5 - Development of Point of Use District

B. Description of Groundwater Remedial Alternatives
Seven alternatives (G.1 through G.7) were developed for remediation of the contaminated groundwater. Remedial activities, with the exception of the No-Action Alternative, consist of pumping of groundwater using extraction wells and treatment of water. The only difference between the alternatives is how and where water treatment takes place and the disposal of the treated groundwater.

G.1 - No Action - Contaminated groundwater would be sampled and monitored. Cleanup of contaminants would be accomplished by natural attenuation which has been estimated to take in excess of 120 years.

G.2 - Carbon Adsorption-Recharge - On-site treatment of extracted groundwater using carbon adsorption, reinjection of treated water to the aquifer.

G.3 - Air Stripping (Vapor Recovery)-Recharge - Similar to G.2 except that on-site treatment of groundwater would use air stripping with capabilities of vapor phase carbon adsorption.

G.4 - Air Stripping/Carbon Adsorption-Recharge - On-site treatment with air stripping with liquid phase carbon adsorption, reinjection of treated water to the aquifer.

G.5 - Carbon Adsorption-Discharge - On-site treatment with carbon adsorption and discharge of treated water to storm water drainage system.

G.6 - Air Stripping (Vapor Recovery)-Discharge - Similar to G.5 except that on-site treatment of groundwater would use air stripping with capabilities of vapor phase carbon adsorption.

6.7 - Air Stripping/Carbon Adsorption-Discharge - On-site treatment with air stripping with liquid phase carbon adsorption, discharge of treated groundwater to storm water drainage system.

C. Description of Water Supply Alternatives

Five alternatives (W.1 through W.5) were developed to provide the affected area with an alternative potable water source. With the exception of the No-Action Alternative, remedial actions consist of new supplies, filtering of water sources or revamping existing systems.

W.1 - No-Action - This alternative results in no change in the current situation with affected commercial and residential users within the HRM study area. This alternative would allow the continued use of the existing water supply with concentrations of certain chemicals in excess of NYSDOH Standards and would include boil water notices as appropriate.

W.2 - Expansion of Existing Bedford Farms Community Water Supply - This alternative would consist of the expansion of the existing Bedford Farms Community Water Supply System ("the Farms") to service those affected users within the HRM study area.

W.3 - Expansion of Planned Ponds Development Water Supply System - This alternative would consist of incorporating the water supply needs of those affected users within the HRM study area into the planned ponds water supply system.

W.4 - Development of a New Community Water Supply System - This alternative would consist of the construction of an entirely new community water supply system to service, at a minimum, the affected users of the HRM study area.

W.5 - Development of a Point-of-Use Treatment District - This alternative would consist of the installation and ongoing maintenance of groundwater treatment units at all affected point-of-entry locations. The groundwater treatment units would consist of a granular activated carbon filter designed to remove the contaminants of concern to a level which complies with applicable New York State Standards.

D. Description of Whole-Site Remedial Alternatives

The Feasibility Study identified 12 remedial alternatives which address groundwater remediation and water supply alternatives for the site. These 12 alternatives are based on various combinations of the seven site-specific groundwater alternatives where were retained following the initial screening process. Table 2 identified these alternatives along with their estimated cost.

All alternatives except "no action" would include stopping the migration and treatment of contaminants. All alternatives including "no action" call for long-term groundwater monitoring to gauge the effectiveness of the alternative.

Table 2

Groundwater Remedial Alternatives		Total Worth (*)
G.1	No Action/Limited Action	137,000
G.2	Carbon Adsorption/Reinjection	1,929,000
G.3	Air Stripping (Vapor Recovery)/Reinjection	1,708,000
G.4	Air Stripping-Carbon Adsorption/Reinjection	1,771,000
G.5	Carbon Adsorption/Discharge to Storm Drain	1,558,000
G.6	Air Stripping (Vapor Recovery)/Discharge to Storm Drain	1,337,000
G.7	Air Stripping-Carbon Adsorption/Discharge to Storm Drain	1,400,000

Water Supply Alternatives	Total Worth (*)
W.1 - No-Action	0
W.2 - Expansion of Farms Water Supply	1,152,491
W.3 - Expansion of Planned Ponds Development	990,448
W.4 - Development of New Water Supply	1,568,723
W.5 - Development of Point-of-Use Filter District	986,621

(*) Present worth represents the sum of the capital costs plus the adjusted operations and maintenance costs over a thirty year period based upon an 8 percent discount rate.

E. Selection of the Preferred Alternatives

The preferred groundwater remedial alternative for the Hunting Ridge Mall Site is Alternative G.3, Extraction and Recharge of Groundwater with Treatment by Air Stripping with Vapor Recovery by Carbon Adsorption.

The preferred water supply alternative is W.4, Development of a New Water Supply to Deal with Wells on Site Affected by Contaminants.

A detailed assessment of the costs associated with Alternatives G.3 and W.4 are presented in Table 3.

Based on an evaluation of existing data, this package of remedial alternatives best meets the response objectives as outlined in the RI/FS and best satisfies the screening criteria, meeting the NYS Superfund objective of protecting human health and the environment.

Table 3

Alternative G.3: Groundwater Treatment Using Extraction Wells, Air Stripping, Vapor Recovery Through Carbon Adsorption and Recharge of Aquifer Through Injection Wells

Remedial Alternative Component	Cost
- Extraction/Recharge Wells	$586,875
- Air Stripping System	40,000
- Shelter, Including Fencing	25,000
- Vapor Phase Carbon System	20,000
	671,875
- Engineering/Design and Contingencies (at 20% of Direct Costs)	17,000
- Present Worth of O&M Costs	1,019,125
Cost for Alternative G.3	$1,708,000

Alternative W.4: Development of a New Water Supply

Remedial Alternative Component	Cost
- Construction of a test well	$25,000
- Construction of two 100 GPM supply wells and associated pump systems	75,000
- Site piping, metering and chlorination	25,000
- Construction of two 2,000 gallon storage tanks	8,000
- Electrical services with a stand-by generator	20,000
- Construction of a control building and site work	23,000
- Approximately 4,700 feet of distribution piping (6 inch diameter)	141,000
- Service connections (approximately 21 @ $500 per connection)	13,000
	$330,000
- Engineering/Design and Contingencies (at 20% of Direct Costs)	66,000
- Present Worth of O&M Costs	1,172,723
Costs for Alternative W.4	$1,568,723

There will be an interim remedial measure of installing granulated activated charcoal filters on affected wells. This will alleviate the immediate threat of consuming contaminated water. This measure will be used until the new water supply is constructed and on line.

If during the design study, it is found that through air stripping, the aquifer can be restored to acceptable drinking water standards within an acceptable time frame (<5 years), the need for a new water supply may be re-evaluated and possibly eliminated as an alternative.

F. Detailed Assessment of the Preferred Alternative

During the detailed evaluation of the remedial alternatives, each alternative was assessed based on six criteria previously described under "Summary of Alternatives." All six elements of Preferred Alternatives G.3 will be addressed with respect to these six screening criteria. The "element" of Alternative G.3 are as follows:

1. Groundwater extraction, treatment by air stripping with vapor phase carbon adsorption and reinjection to the aquifer of withdrawal.

Groundwater treatment by air stripping with vapor phase carbon adsorption

This water treatment process is commonly used at many wastewater and chemical treatment plants. Groundwater is extracted from downgradient wells, the water is treated to remove contaminants such that the water quality is restored to applicable standards, and returned to the ground in upgradient wells. This treatment method is effective for all contaminants in the groundwater. The air stripper removes volatile organic compounds (VOCs) from the contaminated groundwater. Contaminated vapor from the air stripper is captured by a vapor phase carbon filtration system. Contaminated carbon from these filtration systems is regenerated or disposed of off site.

Short Term Effectiveness

The alternatives were evaluated based on ten and twenty year remediation periods. The ten year period was chosen so that cleanup would be accomplished in a short term. Natural attenuation may occur due to flushing of contaminants by percolation of rainwater. No time frame has been set for this process. There should be no adverse impacts during construction.

Long Term Effectiveness

The process of air stripping with vapor phase carbon adsorption would remove contaminants to below NYS Drinking Water Standards. Monitoring will be required to verify performance of the extraction system.

Reduction of Toxicity, Mobility and Volume

This groundwater treatment process will reduce contamination concentrations while hydraulically controlling the migration of contaminants both off site and between surface and bedrock aquifers.

Implementability

This alternative is easily implemented and the equipment and manpower necessary to carry it out is readily available. This system is expected to operate for a minimum of ten years or until the groundwater meets applicable standards.

Protection of Human Health and the Environment

This alternative would provide adequate overall protection. The treatment will eliminate the potential for contamination of any off-site groundwater receptors and any atmospheric impacts. The cleanup goals for groundwater are consistent with NYS Standards.

Cost

A breakdown of the total present worth cost associated with this Alternative (including operation and maintenance costs and assuming a 20% contingency) is presented in Table 3. The total cost for all other alternatives evaluated in the Feasibility Study is presented in Table 2. This alternative meets the cost screening criteria as outlined in the Feasibility Study.

XI. SUMMARY OF GOVERNMENTS DECISION

The preferred remedial alternative, treatment and recharge of extracted groundwater using air stripping with vapor phase carbon adsorption includes proven treatment technologies. The recommended groundwater technology would effectively remove organic groundwater contaminants, meeting all groundwater cleanup standards while limiting migration of contaminants outside the Site boundary and between the surficial and bedrock aquifers.

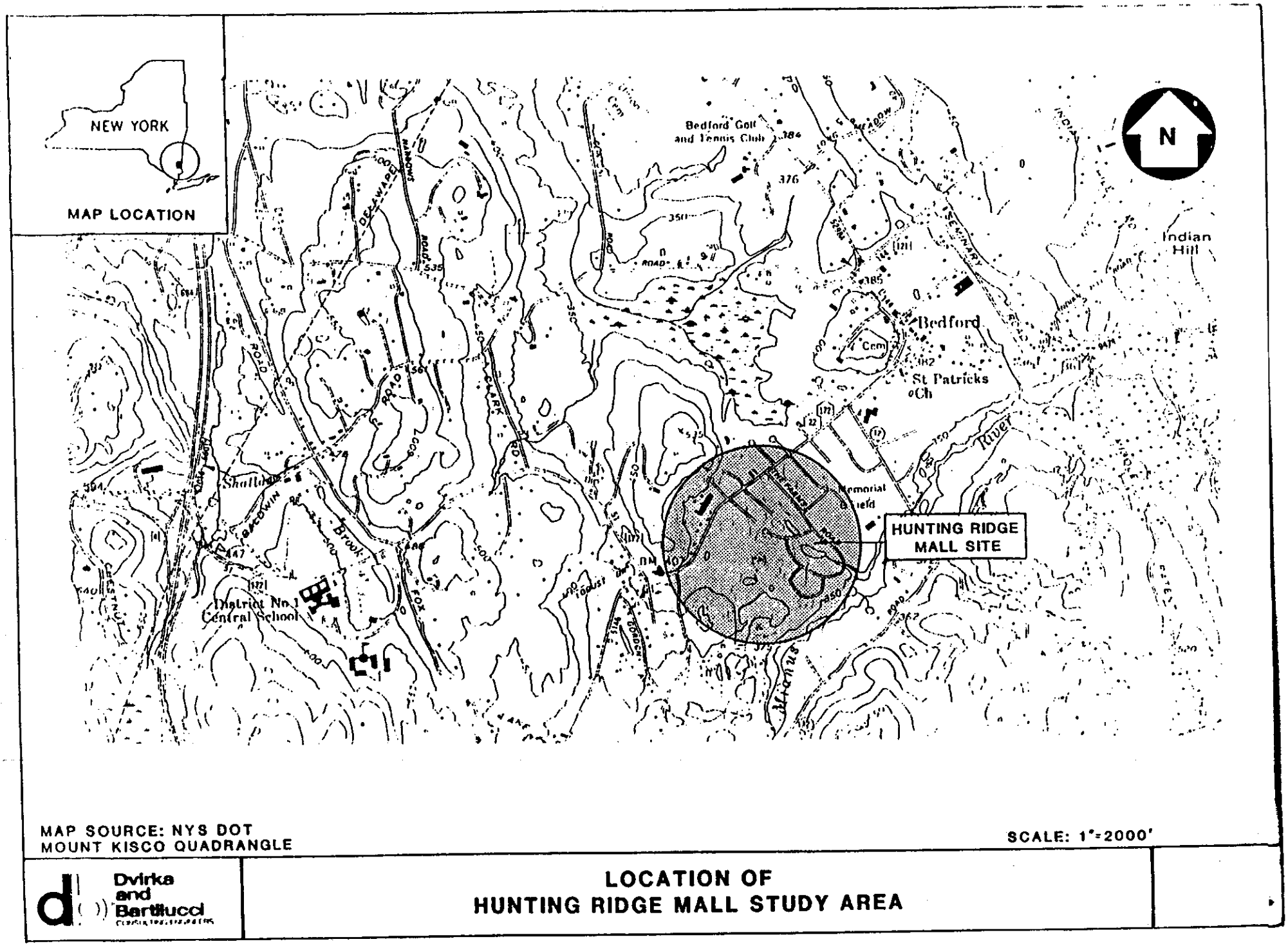
The remedies selected represent a sound balancing of cost considerations with the need to protect public health and the environment by eliminating, reducing or controlling risk through treatment and engineering controls. Long-term monitoring would ensure the reliability of these technologies.

APPENDICES

APPENDIX A	FIGURES AND TABLES
APPENDIX B	CONCEPTUAL DESIGN
APPENDIX C	RESPONSIVENESS SUMMARY
APPENDIX D	ADMINISTRATIVE RECORD

APPENDIX A

FIGURES AND TABLES

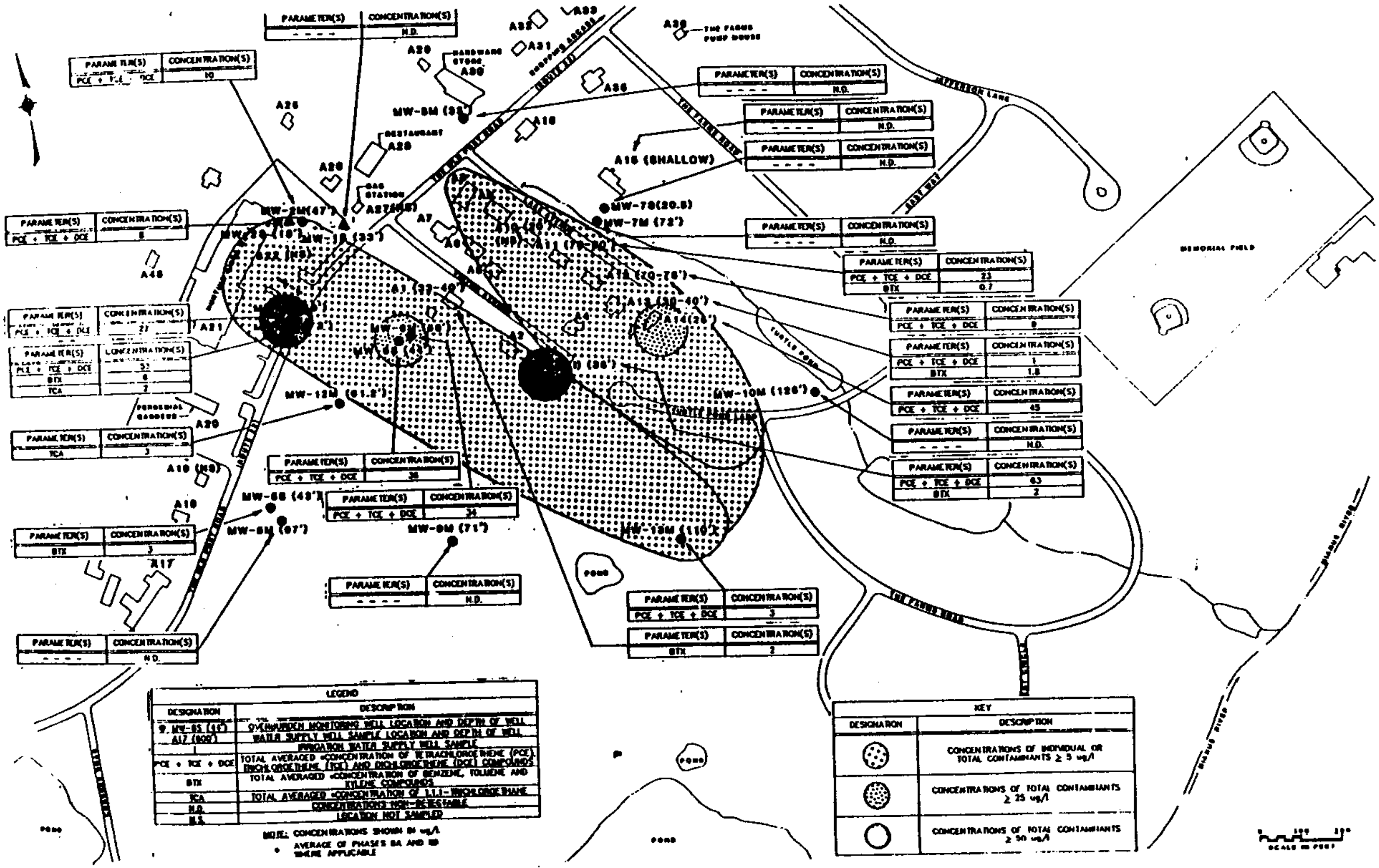


Dvirka and Bartilucci

LOCATION OF HUNTING RIDGE MALL STUDY AREA

FIGURE A-1

Total Organic Contamination in Overburden Wells

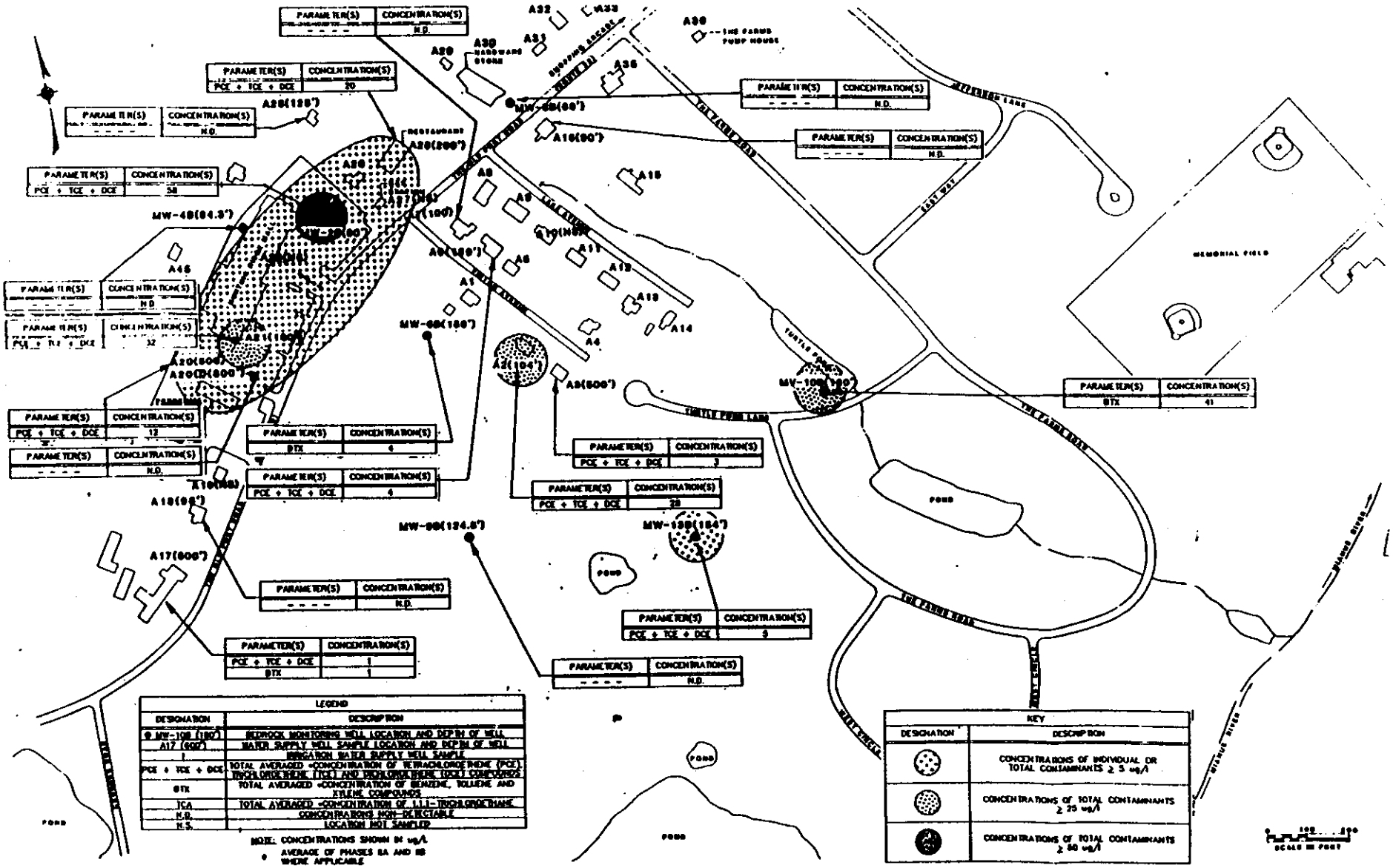


Prepared by Dvirka & Bartilucci Consulting Engineers

SCS ENGINEERS

FIGURE A-2

Total Organic Contamination in Bedrock Wells



Prepared by Dvirka & Bartilucci Consulting Engineers

SCS ENGINEERS

FIGURE A-3

Table A1 - SITE CHRONOLOGY AND HISTORY

1979 - A Westchester County Department of Health releases an "Information Bulletin" to certain dry cleaning establishments in Westchester County outlining proper storage and disposal methods for cleaning wastes.

1983 - The Westchester County Department of Health completes an Interim Report-Investigation of the Occurrence of Volatile Organic Chemicals in Well Water Supplies in the Vicinity of Lake Avenue and Vinton Avenue in the Town of Bedford, New York. The sampling program included the testing of 29 private wells, 3 municipal wells (The Farms Community), a storm water drainage system, Turtle Pond, the Hunting Ridge Mall sanitary system, and the dry cleaner's waste solvents. Of the 29 wells sampled, 14 contained elevated levels of volatile organic chemicals. High levels of these chemicals were also found in the Mall sanitary system and in the adjacent storm water drainage system. As a result of these findings, WCHD order the Mall owner to clean out all catch basins and drainage pipes.

- Four drums of dry cleaning solvent wastes were removed from the rear of the Mall and sediments were removed from the Mall's storm water drainage system as well as along Route 22 and Lake Avenue.

1984 - Wehran Engineering completes the Bedford Village Wells Phase II Investigation Report for the New York State Department of Environmental Conservation. The Phase II Report, which focuses primarily on the Shopping Arcade Site, does contain sampling results for the Hunting Ridge Mall Site. Although the Mall is located just 4,000 feet southwest of the Shopping Arcade, researchers feel that the contamination at the two sites is not related.

1985 - C.A. Rich Consultants completes a February 1985 - Monitoring Well Report for the Hunting Ridge Mall, Bedford, New York for the Hunting Ridge Mall owner. The three monitoring wells installed on the Mall property confirm the presence of tetrachloroethene, trichloroethene and cis-1,2-dichloroethene at maximum concentrations of 141 micrograms per liter (ug/l), 24 ug/l and 30 ug/l, respectively. Two of the wells exceed the New York State Department of Health drinking water guidelines of 100 ug/l for total VOCs (this level has since been revised).

- C.A. Rich Consultants, under contract to the Mall owner, completes Soils Sampling and Analysis Hunting Ridge Mall, Bedford, New York, September 30, 1985. Eleven sampling locations were chosen around the sanitary system area behind the Mall. Neither the Westchester County Department of Health Laboratory nor Nytest Laboratories (retained by C.A. Rich Consultants) found concentrations of tetrachloroethene, trichloroethene or cis-1,2-dichloroethene

- Leggett, Brashaers & Graham, Inc., consulting groundwater geologists for the Town of Bedford, completes Groundwater Assessment Town of Bedford, New York. The report provided a comprehensive description of Bedford's hydrogeology.

1986 - Tap water sampling programs undertaken by the Westchester County Department of Health and the United States Environmental Protection Agency (USEPA) reaffirm the presence of VOCs in three private well water supplies on Lake and Vinton Avenues.

- NYSDEC requests five engineering firms to submit proposals for the Bedford Village Wells Remedial Investigation/Feasibility Study project.

1987 - NYSDEC, in cooperation with the New York State Department of Health (NYSDOH), Town of Bedford and the Westchester County Department of Health, selects Dvirka and Bartilucci (D&B) Consulting Engineers of Syosset, New York, Sadat Associates and SCS Engineers to undertake the project.

- The State approves the Bedford Village Wells, Hunting Ridge Mall Site and Shopping Arcade Site RI/FS contract between D&B and the Department of Environmental Conservation.

1989 - D&B completes a preliminary draft of the RI Report, and a Health Risk Assessment was prepared by Sadat Associates, Inc. for D&B and NYSDEC.

1990 - D&B completes a final RI Report and Health Risk Assessment.

- NYSDEC completes RI/FS

APPENDIX B

CONCEPTUAL DESIGN

CONCEPTUAL DESIGN

GENERAL

The purpose of the conceptual design is to provide an understanding of the concepts included in the remedial alternatives proposed for the Hunting Ridge Mall Site. The conceptual design also serves to link the study phases of the project (Remedial Investigation and Feasibility Study) to the remedial design phase. Topics to be discussed within this section include additional engineering considerations and design support activities to be performed, site layout, coordinations of the remedial activities, work schedule and applicable permits.

RECOMMENDED REMEDIAL ALTERNATIVE

Based on the detailed evaluation of alternatives presented in the Feasibility Study, it is recommended that the Hunting Ridge Mall Site be remediated using Alternatives G.3 and W.4: treating groundwater by air stripping with vapor phase carbon adsorption, and implementation of a new water Supply to supply only homes affected by contamination.

The remedial alternative proposed will cleanup groundwater and will prevent or minimize further groundwater contamination. The water supply alternative will furnish a potable water source.

REMEDIAL ALTERNATIVE COMPONENTS

The selected groundwater remedial alternative consists of several components as follows:

- Site security
- Site access
- Site fencing
- Warning signs
- Air monitoring requirements
- Groundwater monitoring requirement
- Vapor controls
- Groundwater extraction system
- Aquifer recharge system
- Air stripping system

DESIGN SUPPORT TESTING

GENERAL

Several design support testing activities must be conducted prior to completion of the final design and construction of the preferred remedial alternative. The design support testing will focus on determining the physical properties of the overburden and bedrock aquifers in the area for use in designing the groundwater extraction and treatment system. These tests should include the following:

- An aquifer pump test to determine the transmissivity and storage capacity of the aquifer.
- Slug tests on several existing groundwater monitoring wells to determine the hydraulic conductivity of the aquifers.
- A pilot test of the injection wells to determine the feasibility and operational parameters for each well.
- Air monitoring and modeling of the air stripping discharge to assess impact on air quality and the need for a vapor phase carbon adsorption system.
- Continued monitoring and sampling of tributaries of and including the Mianus River to assure contaminants are not effecting water quality of river. Additional cleanup (i.e., sediments) of tributaries and/or of river will be addressed at this stage.
- Further evaluation of contaminant effects on biota inhabiting the tributaries and ponds in this area.

Additional design support activities include:

- Existing limits of contamination
- Groundwater monitoring
- Property boundaries, easements and access
- Utilities
- Treatability studies

EXISTING LIMITS OF CONTAMINATION

The limits of the contamination were delineated during the remedial investigation. The monitoring wells should be resampled to determine the present extent of the contamination. Additional monitoring wells may be necessary, depending on the results of the groundwater sampling.

GROUNDWATER MONITORING

As mentioned above, the overburden and bedrock monitoring wells installed during the remedial investigation should be resampled to determine the present extent of the contamination. In addition, water level readings should be taken regularly to assess seasonal variations of the groundwater table.

PROPERTY BOUNDARIES, EASEMENT AND ACCESS

Property boundaries are available on Bedford Village, New York tax maps. However, the property boundaries should be verified by field survey. Temporary and permanent easements need to be defined before design. Easements along the Old Post Road, Lake and Vinton Avenues and a portion of the Hunting Ridge Mall parking lot are proposed to be used.

UTILITIES

There are existing water and electric utilities available at the Hunting Ridge Mall Site for the proposed treatment system and temporary buildings. Service availability for extraction well will have to be field checked during the preliminary design.

TREATABILITY STUDIES

Analytical testing of groundwater for specific geochemical parameters needs to be performed to determine if any pretreatment will be required before the water enters the treatment system. These tests would include at a minimum:

- Hardness
- Total suspended solids
- Metals

SITE LAYOUT/TREATMENT AND STAGING LOCATIONS

The proposed location of the groundwater treatment facilities is in the northeast corner of the Hunting Ridge Mall parking lot. The treatment facility and associated buildings will require an area of approximately 2,500 square feet. The proposed location of the injection wells will be an easement along Old Post Road. These locations were chosen based on the need for an upgradient location for the injection wells and treatment system. In addition, the area is densely populated and the parking lot provides sufficient space with little impact on surrounding residents and the businesses located within the Hunting Ridge Mall. Also, the are is located on an existing road, thereby providing ease of access for equipment and utilities.

APPLICABLE PERMITS, REGULATIONS AND STANDARDS

Several permits will be required for the construction and operation of the preferred remedial alternatives. The permits required will include:

- Appropriate and applicable building permits from the Town of Bedford.
- Permit for air discharge from air stripping: NYCRR Part 212, Form 76-19-3 Process, Exhaust or Ventilation System Application to Construct or Certificate to Operate.
- Applicable permits for groundwater extraction and injection from the New York State Department of Environmental Conservation and the Westchester County Health Department.

REMEDIAL ALTERNATIVE COMPONENTS

The selected water supply alternative consist of several components as follows:

- Clearing, Grading and Drainage
- Building Structure/Pump House
- Three Production Wells
- One Hydropneumatic Tank
- Three Submersible Pumps
- One Generator Set for Stand-by Power
- Chlorination System
- Piping, Metering, Other Instrumentation
- Electrical Service, Wiring
- Security Fencing and Site Security
- Groundwater Monitoring System
- Review of Flood Records

DESIGN SUPPORT TESTING

GENERAL

Design support activities will be required prior to final design and implementation of this alternative. These are primarily field activities and are necessary in order to obtain additional information where data gaps presently exist. Design support activities requiring further investigation include test well installation and pump testing; determination of property boundaries, easements and access; identification of utility locations; and treatability studies.

TEST WELL INSTALLATION AND PUMP TESTING

In order to accurately determine the site-specific groundwater yield associated with this location, a test well must be installed and a pump test(s) performed. This well will be installed in the same general location and at the depth below ground surface where the maximum yield of groundwater is anticipated (estimated to be 150 feet).

PROPERTY BOUNDARIES, EASEMENTS AND ACCESS

Property boundaries are available from the Town of Bedford, New York tax maps. These boundaries will be verified by a field survey and/or from recorded deeds. As noted previously in this report, the Memorial Field property is owned by the Town of Bedford. Access to the property will be via Greenwich Road.

UTILITIES

Existing electric utilities are available from New York State Electric and Gas for service to the proposed facility. Service capability will be verified during the preliminary design phase of the project.

TREATABILITY STUDIES

Treatability studies and pilot testing may be required to determine whether water treatment will be necessary and, if so, the extent of the treatment program.

Groundwater samples will be collected from the test well described above and those samples will be analyzed for Target Compound List plus 30 parameters (TCL + 30) as well as drinking water parameters as required by the Westchester County Health Department (WCHD). In addition, analysis will be conducted for total suspended solids, pH, hardness and iron content. Such analyses will determine what, if any, pretreatment requirements are likely to be implemented.

If treatment is determined to be needed, bench scale studies will be conducted. Depending upon the number and types of contaminants identified, the treatment technology that removes the "worst" contaminants identified in the groundwater are traced through the treatment system to determine the efficiency of such a system. It is possible that other or additional treatment technologies would also have to be tested.

If necessary, pilot scale testing may be performed subsequent to the bench scale test(s) to verify the processes, refine the design criteria and obtain a more accurate estimate for the operation and maintenance (O&M) costs needed.

SITE LAYOUT

As described previously in this report, the proposed location for this community water supply system is within the Bedford Village Memorial Park, located on Greenwich Road in Bedford Village, New York. Specifically, the proposed location is at the northwestern portion of the Memorial Park at Lot 34 and consists of approximately 5.6 acres of land.

APPLICABLE PERMITS, REGULATIONS AND STANDARDS

The construction of a new community water supply system involves the coordination of a number of entities including governmental agencies.

Permits that must be applied for and obtained prior to operation include those required by the New York State Department of Environmental Conservation and the Westchester County Department of Health. The specific permitting requirements are as follows:

- NYSDEC Application for a Public Water Supply Permit
- NYSDEC State Environmental Quality Review (SEQR) Application for Permit
- NYSDOH Application for Approval of Plans for Public Water Supply

The Westchester County Health Department will also be involved in the permitting process in coordination with the State permit program. Applications for local building and construction permits from the Town of Bedford will be submitted to the Building Department.

REMEDIATION SCHEDULE

GROUNDWATER REMEDIATION

Implementation of the alternative consisting of groundwater extraction treatment by air stripping, and injection by wells will include the following activities, listed in the order of occurrence and with a projected time table.

Activity	Schedule Range
Design Support Testing	0 to 8 months
Obtain Necessary Permits	0 to 6 months
Construction of Treatment and/or Water Supply Facilities	8 to 26 months
Start-Up	26 to 28 months
System Performance Monitoring	26 to 32 months
Groundwater Monitoring	26 months +

ALTERNATIVE WATER SUPPLY DISTRICT

Implementation of this alternative will include the following activities and schedule:

Activity	Schedule Range
Creation of Municipal Water Supply District	0 to 6 months
Design Support Testing	0 to 8 months
Obtain Necessary Permits	0 to 6 months
Construction of Treatment and/or Water Supply Facilities	8 to 26 months
Start-Up	26 to 28 months
System Performance Monitoring	26 to 32 months
Groundwater Monitoring	26 months +

PHILIP LESHIN
325 E 79 ST
NYC NY 10021

PUBLIC RELATIONS
212/794-0291

March 14, 1990

Mr. Jeffrey B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
N.Y.S. Dep't of Environmental Conservation
Rm 222
50 Wolf Road
Albany, NY 12233-7010

RE: WELL WATER POLLUTION
HUNTING RIDGE MALL AREA
BEDFORD VILLAGE, NY

Dear Mr McCullough:

I am writing this as a 10 year resident of Vinton Avenue, one of the areas plagued by water pollution problems for the past several years.

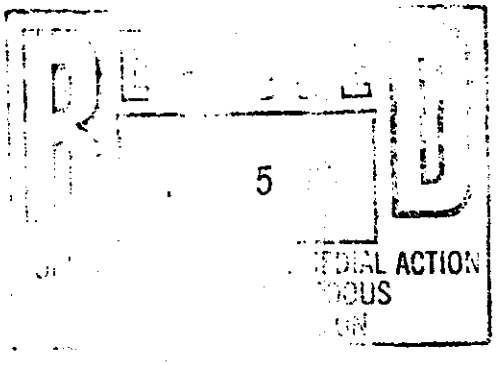
My wife and I were most impressed with the thorough study prepared by your good offices regarding this problem. Although it hasn't yet struck our particular house with the severity that it has some of our neighbors on Lake and Vinton Avenues, we are fearful and anticipate a worsening situation that could affect us and our two-and-one-half year old daughter.

Having witnessed the carbon filtration system failures of some of our friends, we do not hold much hope for same. It is our feeling that with your help, and that of our town and county officials, the serious problem of providing us with some kind of mutually acceptable alternate water supply will be addressed in the most expeditious and efficient manner.

Very truly yours,

Philip Leshin
20 Vinton Avenue
Bedford, NY 10506

cc: Larry Dwyer
Hank Barnett
Mary Goodhue
Patty Hotchkiss



March 9, 1990

Mr. Jeffrey B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Re: Well Water Pollution
Hunting Ridge Mall Site
Bedford Village, New York

Dear Mr. McCullough:

We applaud the Department's Proposed Remedial Action Plan and more than hope that the piping from an alternate water source will be included. We look forward to an expedited start of the clean up and new alternate community water supply to the affected area.

We also wish to let you know that the location of injection wells and the air stripping facility, etc. will be important to us and hope you will seek our feedback before beginning the construction.

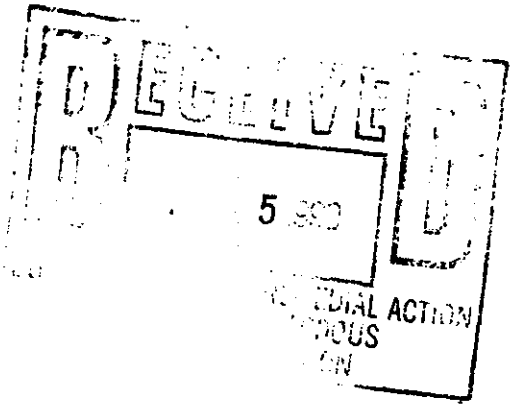
Very truly yours,

LAKE & VINTON AVENUE ASSOCIATION

Jon Lazarus
President

JL/hw

cc: H. Barnett
L. Dwyer
M. Goodhue
P. Hotchkiss



9 Vinton Avenue
Bedford, New York 10506

March 12, 1990

Mr. Jeffrey B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Re: Well Water Pollution
Hunting Ridge Mall Site
Bedford Village, New York

Dear Mr. McCullough:

Since 1983, the quality of our drinking water has been a constant source of concern to our neighborhood. People with high levels of VOC contamination worry about health risks; those with carbon filtration systems worry if the systems are working right, so they drink only bottled water; those with low levels wonder when the plume will get them, too.

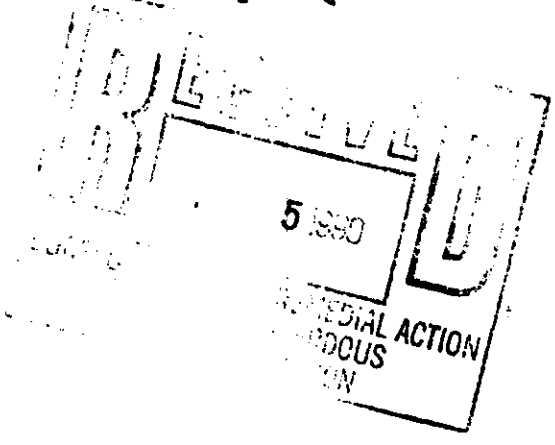
For seven years now, we've seen contamination levels fluctuate and carbon filtration systems fail. We've had our water sampled, tested and monitored by experts ... and the bottom line is: we still don't have confidence in the quality of our drinking water.

Installing more carbon filtration won't change a thing. We need an alternate water supply system to guarantee water quality. Please do whatever you can to bring this about as soon as possible.

Very truly yours,

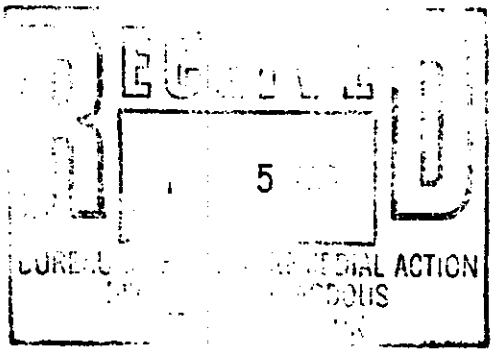
Patricia Healy

cc: H. Barnett
L. Dwyer
M. Goodhue
P. Hotchkiss



Anthony J. Schembri
5 Lake Avenue
Bedford, New York 10506

March 12, 1990



Mr. Jeffrey B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Dear Mr. McCullough:

This letter is written to you as a resident of Lake Avenue in Bedford, New York.

I write to urge you to do what you can to help us with a new water supply system for our neighborhood as opposed to installing carbon filtrations and testing our water for another two years.

Every citizen of our street either purchases or brings water home from other sources to drink because of this condition which has existed over the past several years.

We are family members and believe that this contamination should be addressed with our needs uppermost in your thoughts. We are in dire need of a new water supply system for our neighborhood and we stand opposed to installing carbon filtrations and the continual testing of our water for another several years.

Please help us and use your good offices to insure that this occurs.

Cordially,

Anthony J. Schembri

Mr. & Mrs. CARL J. NOE
8 Vinton Avenue
Bedford, New York 10506

3/8/1990

Mr. Jeffrey Mc Cullough
Bedford Project Engineer
N.Y. State Department of Environmental Conservation

Dear Sir:

For the record our name is: NOE (No-e).
Mrs. Noe is a life-long resident of the Town of Bedford, a graduate of Katonah High School, of New Rochelle School of Nursing (R.N.) and Columbia University. She was for a number of years a member of the District Nursing Ass'n, a school nurse and a school nurse teacher.
I went to school in Katonah beginning in 1905 graduated from Katonah High School, served in the first U.S. Army military training camp in 1916- enlisted in the U.S. Army served in Camp Colt Gettysburg under then acting Captain Dwight David Eisenhauer, left him at Gettysburg for England and France and action.
Subsequently spent over thirty years as a Deputy and as a Commissioner for the County of Westchester. We are proud of our service.
We have separately and jointly paid town, school, county and state taxes during all our mature years.
We now demand that the State of New York reciprocate
We voted for the Clean Water Act and it is long since time for action by the State
Two or three years from now would be too late for us and for four of our nearest neighbors all in their eighties and nineties.
Real action now - no substitution.

Yours truly,
Carl J. Noe - Gretchen S. Noe

Connecticut-American Water Company

Old Track Road • P.O. Box 2529 • Greenwich, CT 06836-2529

(203) 869-5200 • From Mystic: (800) 342-5203

275-362

March 21, 1990

Mr. Jeffrey McCullough
New York State
Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

Dear Mr. McCullough:

As down stream purveyors of water predominantly dependant on the Mianus River as the source of supply for 130,000 customers, we would like to comment on the proposed remedial action to be taken at the Hunting Ridge Mall and the Arcade Building in Bedford Village, New York.

We would like to applaud the findings and proposed action of the New York State Department of Environmental Conservation. We would, however, like to submit to you the enclosed sample results taken from the effluent of the culvert under the Farms Road within the affected area. The results show the presence of Tetrachloroethene at 4 and 6 ppb. on samples taken in January and February of this year. These samples indicate to us that this tributary is still being affected by the contamination at levels approaching New York State Standards and those levels found in the wells in the affected area, despite the clean up effort in 1983.

The report states the most recent data indicates that soil/sediment in the area sampled are no longer serving as a source of contamination. This may indicate that there is a natural spring or other source of groundwater in the area, allowing groundwater contamination to reach the surface supply. We would like to suggest that this be further investigated.

On Page 10 of the Proposed Remedial Action Plan, you recommend a remedial action that includes a site specific monitoring plan for the Mianus River. We would like to see this alternative implemented.

We would like to state, finally, that we would not want our comments and suggestions to impede the timely implementation of the Proposed Action.

CONNECTICUT-AMERICAN WATER COMPANY

Michael Andersen (alf)

Michael Andersen
Production Supervisor

MA:alf

cc: R. Mastrorandi

APPENDIX D

LIST OF DOCUMENTS IN THE ADMINISTRATIVE RECORD

ADMINISTRATIVE RECORD
BIBLIOGRAPHY

1. "Groundwater Assessment, Town of Bedford, New York," Leggette, Brashers and Graham Inc. - December 1985

2. "Technical Proposal to Conduct a Remedial Investigation/Feasibility Study of Bedford Village Wells, Hunting Ridge Mall/Shopping Arcade Sites, Westchester County, New York," Dvirka and Bartilucci - November 1986

3. "Contract Document for a Remedial Investigation/Feasibility Study of the Bedford Village Wells, Hunting Ridge Mall, Shopping Arcade Sites," New York State Department of Environmental Conservation - March 1987

4. "Public Participation Plan, Bedford Village Wells, Hunting Ridge Mall Site," New York State Department of Environmental Conservation - July 1987

5. "Remedial Investigation Work Plan - Quality Assurance/Quality Control Plan and Health and Safety Plan, Bedford Village Wells, Hunting Ridge Mall Site," Dvirka and Bartilucci - August 1987

6. "Westchester County-North County, Water Supply Study" for Westchester County Department of Health, Velzy Associates, Inc., - August 1987

7. "Seismic Refraction Investigation, Bedford Village, New York," Delta Geophysical Services - October 1987

8. "Remedial Investigation - Interim Report, Phase IA Sampling Program, Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - December 1987

9. "Field Investigation - Phase IIA, Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - January 1988

10. "Field Report - Phase IIA Investigation, Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - January 1988

11. "Remedial Investigation - Interim Report, Phase IIA Sampling Program, Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - March 1988

12. "Field Report, Phase IIA Investigation (Groundwater Sampling), Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - April 1988

13. "Supplemental Agreement No. 1 - Contract for a Remedial Investigation/Feasibility Study of the Bedford Village Wells, Hunting Ridge Mall, Shopping Arcade Sites," New York State Department of Environmental Conservation - May 1988

14. "Field Report, Phase IB Investigation, Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - June 1988

15. "Quality Assurance/Quality Control Data Validation Report, Phase IIA Sampling Program, Bedford Village Wells," Dvirka and Bartilucci - July 1988

16. "Soil Gas Survey, Hunting Ridge Mall and Shopping Arcade, Bedford Village, Westchester County, New York," United States Environmental Protection Agency - August 1988

17. "Field Report, Phase IIB Investigation (Groundwater Sampling), Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - October 1988

18. "Field Report - Tap Water Sampling Program, Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - November 1988

19. "Quality Assurance/Quality Control - Data Validation Report, Phase IA-A and Phase IB Sampling Programs, Bedford Village Wells," Dvirka and Bartilucci - December 1988

20. "Field Report, Phase IA, IB, IIA, IIB Investigation (Resampling Program), Bedford Village Wells, Hunting Ridge Mall," Dvirka and Bartilucci - March 1989

21. "Analytical Data Report Package, Volumes 1-8," NYTEST Environmental, Inc. - April 1989

22. "Remedial Investigation, Bedford Village Wells, Hunting Ridge Mall Site," Dvirka and Bartilucci - February 1990

23. "Remedial Investigation Report Appendices, Bedford Village Wells, Hunting Ridge Mall Site," Dvirka and Bartilucci - February 1990

24. "Remedial Investigation Health Risk Assessment, Bedford Village Wells, Hunting Ridge Mall Site," Dvirka and Bartilucci - February 1990

25. "Feasibility Study, Bedford Village Wells, Hunting Ridge Mall Site," Dvirka and Bartilucci - February 1990

26. "Proposed Remedial Action Plan, Bedford Village Wells, Hunting Ridge Mall Site, Remedial Investigation/Feasibility Study," New York State Department of Environmental Conservation - February 1990

27. "Public Meeting for the Bedford Village Wells, Hunting Ridge Mall - Shopping Arcade Sites, Remedial Investigation/Feasibility Study," Transcript Prepared by Am Court Reporting for New York State Department of Environmental Conservation, March 1990

28. "Responsiveness Summary, Bedford Village Wells, Hunting Ridge Mall, Shopping Arcade Sites, Remedial Investigation/Feasibility Study," New York State Department of Environmental Conservation - March 1990

APPENDIX C

REPSONSIVENESS SUMMARY

BEDFORD VILLAGE WELLS
HUNTING RIDGE MALL SITE - SHOPPING ARCADE SITE
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Public Meeting
Bedford Historical Hall
March 14, 1990
7:45 PM

A. Anderson	Bedford Resident
Michael Andersen	Connecticut American Water Co.
Arthur Bevacqua	Bedford Res.
B. Branch	Mt. Kisco Res.
W. N. Bump	Bedford Res.
Felix Cacciato	Bedford Res.
Frances Carey	Bedford Res.
Grace Coan	Bedford Res.
Marilyn Coffey	NYSDEC - New Paltz
Marilyn Decker	Katonah Res.
Joe Del Sindard	Bedford Res.
Lawrence Dwyer, Jr.	Bedford Town Supervisor
Laura Eifert	Mt. Kisco Res.
Jerry Fine	Town of Bedford Consulting Engineer
Patricia Floss	Katonah Res.
Robert Foltin	NYSDEC - Albany
Anne Francis	Bedford Res.
Doris Gordon	Bedford Res.
Stephen Gordon	Bedford Res.
Scott Green	Connecticut American Water Co.
C. Gregory	Bedford Res.
Jim Hahn	Brewster Res.
P. Haskell	Bedford Res.
Patricia Healy	Bedford Res.
Broda Helmes	Katonah Res.
Bill Kemble	Bedford Hills Res.
Mary Kennedy	Bedford Res.
John Kirkpatrick	White Plains Res.
Ken Kurzweil	Bedford Res.
Ella Laverty	Bedford Res.
Jon Lazarus	Bedford Res.
Daniel Levey	Bedford Res.
James Lorep	Bedford Res.
T. Lorep	Bedford Res.
Thomas Mahar	Dvirka & Bartilucci Engineers
Thomas Maguire	Bedford Res.
Kim Mann	NYSDOH - Albany
Tad Mantross	Bedford Res.
Rocco Mastronardi	Westchester Co. Dept. of Health
Diane Mattfeldt	Bedford Res.
Otto Mattfeldt	Bedford Res.
Alice McCarthy	NYSDEC - White Plains
Jeffrey McCullough	NYSDEC - Albany

Ann McDuffie	Bedford Hills Res.
Michael McLaughlin	SCS Engineers
John Mullaney	Bedford Res.
James Meskill	Bedford Red.
Jean Palmer	Bedford Res.
Joseph Palmer	Bedford Res.
Paul Pendeville	SCS Engineers
R. Purcell	Mt. Kisco Res.
A. Rooney	Bedford Res.
Anthony Schembri	Bedford Res.
Bob Siemers	Bedford Res.
Tracey Slack, Jr.	Bedford Res.
Russell Slayback	Town of Bedford Consulting Engineer
Susan Soremus	Representative for Sen. Marry B. Goodhue
Suzanne Sunday	Bedford Res.
Cathy Tautel	Connecticut American Water Co.
Lois Vetase	From Office of Assemb. Henry Barsatt
Richard Walka	Dvirka & Bartilucci Engineers
C. Walker	Bedford Res.
J. Wilberding	Bedford Hills Res.
Peter Wolle	Bedford Res.
W. Yeager	Bedford Town Board

TOWN OF BEDFORD

Westchester County

TOWN HOUSE
BEDFORD HILLS
NEW YORK 10507

Supervisor
LAWRENCE E. DWYER, JR.

Deputy Supervisor
WILLIAM H. JOYNER, JR.

Secretary to Supervisor
KATHERINE A. NELLIGAN
(914) 666-6530

Town Board Members
WILLIAM H. JOYNER, JR.
CAROLINE A. WALKER
JOHN R. DININ
W. DEWEES YEAGER, JR.

March 9, 1990

Jeffrey B. McCullough
Project Engineer
New York State Department of
Environmental Conservation
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, New York 12233-7010

Re: Bedford Village Wells
a. Hunting Ridge Mall
b. Shopping Arcade

Dear Jeff:

After our discussion today, I wish to go on record with the following recommendations under the official comment period as provided.

1. We, as a Town, reject a filtering district as the long term solution.

2. Remediation should start now.

3. As per the Westchester County Health Department, injection wells should be used by the State Department of Environmental Conservation.

4. Remediation plans should go forward while the new water system(s) is being designed and implemented.

5. We should strongly urge an implementation of two water systems - the Bedford Village Arcade area and the Hunting Ridge Mall area. A new water source is essential for these areas.

6. The State should provide us with a schedule for
a) remediation
b) long term service implementation

7. A statement of no liability for the Town should be issued by the Department of Environmental Conservation.

8. A statement regarding financial consideration and the allocation of funds by the State is necessary.

Sincerely,

Lawrence E. Dwyer, Jr.

LEDjr/kan

March 10, 1990

Mr. Jeffrey B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Re: Well Water Pollution
Hunting Ridge Mall Site
Bedford Village, New York

Dear Mr. McCullough:

The Department's Proposed Remedial Action Plan calls for the development of a new community water supply to serve the areas affected by VOC contamination and we applaud this decision.

However, we have been led to believe that the new water supply system might not be included in the Decision of Record; instead, further testing will be conducted before a decision is reached.

This would be an unacceptable solution to us. We have lived with carbon filtration since 1983 (7 years) and have seen the systems fail, malfunction and, in at least once case in our neighborhood, increase the levels of volatile organic compounds. The people who currently have granulated activated carbon filter systems in their houses do not drink their water. We have witnessed first hand the problems and pitfalls of carbon filtration reported in the Remedial Investigation/Feasibility Study.

We realize that the State's position is to clean up pollution under the ground, but please do not forget the people living on top of the ground. We need clean water coming into our houses and ask that the development of a new water supply be expedited.

Very truly yours,

The Lake & Vinton Avenue Association Residents

Suzanne Sunday
Kenneth Kunzweil
Otto Mattfeldt
Diane Mattfeldt
Frances Carey
Gerald Condreau
John Mullaney

cc: H. Barnett
L. Dwyer
M. Goodhue
P. Hotchkiss
E. Hendricks
K. Mann
R. Paccione
T. Jorling

12 Virginia Avenue
Bedford, New York 10506
March 12, 1990

Mr. Jeffrey B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Dear Mr. McCullough,

I am writing you in your capacity as Bedford Project Engineer for the Hunting Ridge Mall Site - Shopping Arcade Site feasibility study. I am a home owner and resident in the affected area of the study, and thus extremely concerned about the decisions that will be made regarding out neighborhood.

I have read the entire report done by Dvirka and Bartilucci with obvious great interest and concern, and am pleased to say that for the most part I endorse the conclusions reached in the report. I agree with the report's major conclusion that the affected area must be provided with a long term remedial plan. I likewise agree that of all the various options which were explored in the report, the only satisfactory remediation is to create a new water supply for the affected area in Memorial Park. Concerns about hooking into the Farms supply or the proposed Ponds supply are well founded and are too risky to be taken seriously.

My biggest concern is that the State will take the "easy way out" and provide "temporary" granular activated charcoal filters to the homes affected, and that this will then turn into the permanent solution. Many of the homes in my neighborhood already have these home filters. Few if any of these home are now using the water for drinking purposes. They are buying bottled water for their use. The reasons for these actions by our neighbors are well founded. There have been many instances of these filters failing, for a variety of reasons. Residents have found out after the fact that their filters have not worked. The report by D&B itself cites the possible liability of the state with the use of this type of device.

We are looking for a solution to the problem which will be long term and safe. Without constant monitoring of the water from the filters, none of can ever feel secure that we are drinking safe water. With a 2 year old son in my home, are you willing to say unequivocally that the water that he would drink and bathe in daily from these filters would be safe for him? The only viable answer that I can see is to create a water supply for our entire neighborhood that would provide safe, potable water for all of us without the feeling that we are playing Russian Roulette, and that any one of us

far easier to mo(:or one supply than each k ividual home involved.

When I bought and moved into my home three years ago, the levels of contamination were 0.0. We now have levels of VOC at or above the allowed limits. I am obviously concerned about this drastic increase, and disagree with the summary of the report which states that the VOCs are decreasing in our area.

I very strongly ask you to consider my letter and act expeditiously in creating a permanent water supply in our area. I also ask that the time that we use household filtration systems be kept at the absolute minimum amount of time to keep any possible risk at the minimum possible amount.

Thank you for your consideration of this matter.

Sincerely,

Kenneth Kurzweil

cc: Hon. Mary B. Goodhue
Hon. Henry W. Barnett
Hon. patricia V. Hotchkiss
Mr. Lawrence E. Dwyer

12 Vinton Avenue
Bedford, New York 10506
March 11, 1990

Jeffrey McCullough
Bedford Project Engineer
NY State Dept. of Environmental Conservation, Rm. 222
50 Wolf Rd.
Albany, New York 12233-7010

Dear Mr. McCullough,

I am writing to strongly support the NYSDEC report of Dvirka and Bartilucci concerning the Hunting Ridge Mall Remedial Investigation/Feasibility Study. I feel that both the study and the report were very thorough and that the conclusions of the report should be implemented immediately. The proposed groundwater extraction and treatment, short-term installation of carbon filters in affected homes (such as ours), and the development of a public water supply will provide residents of our area with an effective and safe solution to a dangerous health risk.

I was especially pleased to see that one of the three findings stated unequivocally that a new public water supply should be developed (at Memorial Field) to provide potable water for the affected area. I am the mother of a 2 year old and feel that this is the only answer to the VOC water pollution which will protect my child's long-term health. New York State has recently lowered the allowable levels of these VOCs from 50 to 5 and who is to say that the levels will not be further lowered, especially for children. Since the granular activated charcoal filters and proposed ground water treatment will not bring the levels to zero, the new water supply is the only truly safe alternative. I was very disturbed to hear that this is the one recommendation which may not be implemented on a timely basis. Our community has been living with this situation since 1983 and should not be asked to wait any longer. To provide the affected households with in-house carbon filters and to continue testing rather than begin developing the public water supply is unconscionable. Further, the report stated that the levels are going down; this is definitely not true for all households. When we purchased our home in 1986, the VOC level was .1. It remained there until 1988 when it increased to our current level of 7. I am concerned that our levels will continue to increase.

I am also very concerned about the usage of granular activated charcoal filters. We were looking forward to the installation of the system in our home for the two years it would take to hook us up to the new municipal system (we currently have only a small filter on our kitchen sink); however, I am now very nervous about this prospect. We have spoken with many of our neighbors who currently have the household system and have heard numerous horror stories of higher levels of VOCs after the installation. No one in our area with a filter drinks the filtered water for fear of consuming VOCs or bacteria. Even the report mentioned the

"liability" of the state for long-term (never defined) usage of these filters. No matter how often the water is monitored after installation of these filters, the water cannot be tested before I pour my son, my husband, or myself a glass of water. Now that I hear that the development of the municipal water supply may be postponed, I wonder how long the state intends to leave us with an in-house filter as our only health protection. Knowing all the possible health risks, would you be willing to give that water to your 2 year old son for many years?

Although I support the clean-up recommendations of the report, I did have some questions which I would like clarified. It was stated in the report that a 10-year (as opposed to a 20-year) clean-up posed a higher risk that the increased rate of pumping might adversely affect local wells. How likely is that to happen? If it were to happen, what would be done to remedy the situation? It was also stated in the report that the air-stripping might produce air pollution of VOCs. How often will the air be monitored and what will be done to assure us that no air pollution will be produced? Finally, the report suggests that injection wells be placed on the Lake and Vinton Avenue side of Rt. 22. I feel that this will exacerbate an already dangerous traffic situation. Route 22 in our area is a narrow, heavily travelled road with a blindspot just south of Vinton Avenue and many people drive at excessive speeds. Construction work would necessitate further narrowing of the road and would, therefore, increase the danger. I feel that it is very important to find another location for these wells.

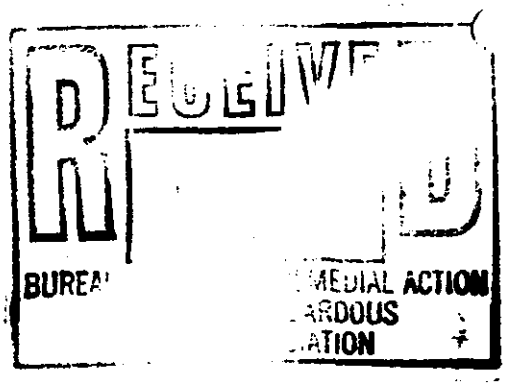
I applaud the careful and thorough work which has been done to correct the water pollution in the Hunting Ridge Mall Area and I am grateful for the solicitation of feedback from the affected community. From our neighborhood meetings, it is clear that residents of Lake and Vinton Avenues speak with one voice; we want a <u>completely</u> safe water supply and that can be accomplished only by the development of a new community water district. You have solicited our comments and I hope you will take them to heart and see that all three of the conclusions of the report are implemented in a timely fashion. Thank you for your help and consideration. Please keep me informed of any additional information and decisions affecting our water supply.

Sincerely,

Suzanne Sunday

Dr. Suzanne R. Sunday

cc: Mary Goodhue, Henry Barnett, Patricia Hotchkiss, Lawrence Dwyer, New York State Health Department



(Mrs.) Frances Carey
Lake Avenue
Bedford Village, NY 10506

March 9, 1990

Mr. Jeffrey McCullough
Bedford Project Engineer
NYS Dept. of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Dear Mr. McCullough:

Although my home is situated between two houses whose wells are heavily contaminated with chemicals; my well appears, for today, relatively free of chemicals (my well is only about 25 feet from my neighbor's well). I cannot drink my water though or even wash off food with it, as it is contaminated with bacteria. I have tried unsuccessfully to have the well disinfected many times, but the bacteria is a continuing source. The contamination is not from my septic tank, as my septic system is fairly new and quite a distance from my well and running downhill, away from my well.

Hopefully you will find a solution to our seemingly unending dilemna on Lake and Vinton Avenues; piping seems to us the only answer. I have been hauling gallons of water for a long, long time, and often wonder what it would be like to turn on a faucet in my home and drink a glass of untainted water.

I did not receive the Public Hearing Notice to be held on March 14, 1990, or any other mailings you have sent to my neighbors. Please include me in your mailings.

Very truly yours,

Frances Carey

(Mrs.) Frances Carey

Dee Mattfeldt
Lake Avenue
Bedford Vlg. N. Y. 10506
914-234-3268

March 9, 1990

Jeff B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Dept. of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Dear Mr. McCullough:

In May of 1982 two neighbors decided to have their well water tested for various reasons. It was decided that having one well tested would tell if indeed there was problems in the area and therefore the other well would be either fine or contaminated as well. We took a sample (after having visited the County Laboratory in Valhalla to learn how to do the procedure) to the lab to be tested. The water was contaminated with chemicals which we later learned to be VOC's. I spoke to the lab technician who analyzed our sample and I was informed that although the levels were than under NYS guidelines they should not be in drinking water and the source must be found. All of this was done on our own, we paid for the test ourselves only to find out that the Westchester County Board of Health was testing well water in the area because samples taken in the Village Shopping Arcade and Hunting Ridge Mall area showed VOC's under than state guidelines.

Less than six months later I received a telephone call from a Mr. Cal Weber, Assistant Commissioner of Health for Westchester. He called to tell me not to drink my water because it was no longer safe. The Voc's had gone above the than state guidelines of 50 ppb. I asked if I should boil my water and he said absolutely not. He said that the vapors given off by boiling would be more hazardous to our health than drinking the water. I asked if showering was harmful and he suggested taking only short showers with the bathroom well ventilated. Fortunately I could not drink or use our water since first discovering that there was chemicals in it and had begun carrying in bottled water six months before.

In February of 1984 we had a carbon activated filter and UV light installed at the source of water into our home. Unfortunately I cannot drink our water although I am told it is safe after the filter. I've learned enough to know these

systems can and do have problems so I can never be sure our water is safe from day to day.

We have lived like this though no fault of our own. A precious resource has been taken away from us. My young children have been exposed to drinking apple juice diluted with contaminted water. I diluted the apple juice so they would not suffer from diarrhea if given pure juice. For seven years we have work to resolve this matter and I am so sick of it I could scream. Please help us live in peace again. If there was a community well system I would not have to worry about being home from work so my water could be tested. The main well would be tested and watched for the entire community is serves. When our water is tested there is no knowledge about the results for many months to come. Therefore always leaving me uncertain as to whether or not the water is safe. PLEASE HELP US NOW!!!!

Sincerely,

Dee Mattfeldt

Dee Mattfeldt

cc: Mary B Goodhue
Henry W Barnett
Patricia V Hotchkiss
Lawrence E Dwyer, Jr.

Lake Avenue
Bedford, NY 10506
March 9, 1990

Mr. Jeffrey McCullough
Bedford Project Engineer
New York State Department of
Environmental Conservation
Room 222
50 Wolf Road
Albany, NY 12233-7010

Re: Remedial Investigation - Hunting Ridge Mall, Lake and Vinton Avenues

Dear Mr. McCullough:

The DEC has spent over $1 million on the above mentioned investigation and it appears to be very thorough. Any additional monies must be directed to the installation of a permanent clean water supply. There is no other solution. We have lived with the worry and concern of serious health hazards as a result of consuming this water prior to May 1983, and the inconvenience of bottled water and carbon filters since that time. We need your help.

Carbon filters are only an interim measure. Residents who presently have them installed don't drink their water. They purchase bottled water. If the filter breaks down, how do we know? Testing the drinking water one day every six months is no indication of what is present in the water on any of the untested days. Toxic levels rise and fall with the increase and decrease in rainfall. Therefore, levels may change but the toxic chemicals remain. Federal EPA standards indicate acceptable levels to be ZERO. Now we have the added concern of the presence of benzene and toluene in our water. These chemcials are known to be carcinogenic.

We must have a permanent clean water supply piped directly into our homes. There is no other solution. Too much time has already passed. No more studies, just action, please.

Sincerely,

Grace Jackson

Grace Jackson

cc: Lawrence Dwyer

March 13, 1990

Jeffrey B. McCullough
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
Room 222
50 Wolf Road
Albany, New York 12233-7010

Dear Sir:

We are writing this letter in regards to the water situation on Vinton and Lake Avenues, we hope that you will make the correct decision to provide us with pure water as soon as possible.

This is a most serious situation, which is affecting our health, our investments and peace of mind, and it is no fault of ours. This was caused by careless, thoughtless actions as well as illegal. We should not have to put up with this condition a moment longer than necessary. A 10 year clean-up is not acceptable. A new pure water system is needed stat to replace our once pure water systems. We are the injured parties and every body should be doing everything possible to correct this injustice.

This has been a dangerous situation for seven years, health concerns being a major factor, also I would dread the thought of having to sell my home under the present conditions, no one would want to buy a home with this water condition. Therefore the only decision that can be made is for a new water system at once.

Yours truly,
Jean Palmer
Joseph Palmer

Jean and Joseph Palmer, Jr.
P.O. Box 249
21 Vinton Avenue
Bedford, NY 10506

CC: Mary B. Goodhue
Henry Barnett
Patricia Hotchkiss
Lawrence Dwyer, Jr.