



Superfund Record of Decision:

AUBURN ROAD, NH

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA/ROD/R01-86/018		2.		3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE SUPERFUND RECORD OF DECISION Auburn Road, NH				5. REPORT DATE September 17, 1986	
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				14. SPONSORING AGENCY CODE 800/00	
15. SUPPLEMENTARY NOTES					
16. ABSTRACT <p>The Auburn Road Landfill site, located in the Town of Londonderry, New Hampshire, consists of approximately 200 acres which contain four documented hazardous waste disposal areas. The site was owned by Ms. Hariclia Thomopoulus from 1931 until 1974, when Mr. George Thomopoulus inherited ownership from his mother. In 1977, the present owner, Derry Sand and Gravel, Inc., purchased the site. Prior to the 1960s, activities at the site consisted of sand and gravel excavation. Between 1964 and 1974, the New Hampshire Division of Public Health issued permits to the Town of Londonderry to operate separate sections of the Thomopoulus property as disposal sites currently referred to as the Town Dump, the Tire Dump, the Septage Lagoon, and the Solid Waste Landfill. Although authorized for disposal of only municipal refuse, tires and demolition debris, all four source areas contain evidence of disposal of industrial wastes including numerous exposed and partially buried 55-gallon steel drums. In August 1979 the State of New Hampshire required that no more drums be accepted, and later the same year, the New Hampshire Water Supply and Pollution Control Commission found contamination of surface water and ground water caused by VOCs. In January 1980, landfill operations were terminated on the entire site. Ground water, used as a drinking water source for approximately 275 homes and 260 mobile homes - all within a one-mile radius of the site, is the principal problem of concern. The primary contaminants of concern include: VOCs (See attached sheet)</p>					
17. KEY WORDS AND DOCUMENT ANALYSIS					
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS		c. COSATI Field/Group	
Superfund Record of Decision Auburn Road, NH Contaminated Media: sw, gw, soil, sediments Key contaminants: VOCs, TCE, organics, inorganics, heavy metals					
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EPA/ROD/R01-86/018
Auburn Road, NH

16. ABSTRACT (continued)

including TCE, extractable organics, heavy metals, and inorganics.

The selected remedial action consists of extending the current water service provided by the Manchester Water Works to 17 homes along Auburn Road and to approximately 260 mobile home units in the Whispering Pines Mobile Home Village. The estimated present worth cost for this remedy is \$2,372,000 with estimated annual O&M of \$57,000.

RECORD OF DECISION
OPERABLE UNIT REMEDIAL ALTERNATIVE SELECTION

Site: Auburn Road Landfill, Londonderry, New Hampshire

DOCUMENTS REVIEWED

I am basing my decision primarily on the following documents describing the analysis of operable unit remedial alternatives for the Auburn Road site:

1. Auburn Road Landfill Remedial Investigation Report, Volumes I-IV, April 10, 1986, prepared by the NUS Corporation
2. Auburn Road Landfill Site Final Focused Feasibility Study Report, Londonderry, New Hampshire, July 8, 1986, prepared by the NUS Corporation
3. Summary of Remedial Alternative Selection
4. Community Relations Responsiveness Summary
5. State and EPA staff summaries and recommendations

DESCRIPTION OF SELECTED OPERABLE UNIT ALTERNATIVE

- ° Installation of approximately 9,000 linear feet water line from the Route 128/Auburn Road intersection, northerly along Auburn Road and tying into the existing distribution system for the residents along Auburn Road and in the Whispering Pines Mobile Home Village. Operation and maintenance of this operable unit shall consist of servicing each residential water connection and monthly sampling and analysis of bedrock wells along Auburn Road.

DECLARATION

Consistent with the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, dated November 20, 1985, I have determined that at the Auburn Road Landfill site, extension of a water line to replace threatened water supplies of residents along Auburn Road and at the Whispering Pines Mobile Home Village is a management of migration response action that is cost-effective, consistent with a permanent remedy for the total site cleanup, effectively mitigates and minimizes threats to and provides adequate protection of public health and welfare and the environment, and attains or exceeds applicable or relevant and appropriate Federal health and environmental requirements that have been identified for this site.

The State of New Hampshire has been consulted and concurs with the selected operable unit alternative. The action will require operation and maintenance activities to ensure continued effectiveness of the operable unit. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period not to exceed one year.

I have also determined that the operable unit remedial alternative that will be undertaken is consistent with Section 300.68(c) of the National Contingency Plan and is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

The recommended operable unit alternative will not address the sources of contamination or the residual groundwater contamination at the site. EPA will prepare a comprehensive feasibility study that will address source control and further management of migration alternatives which are adequately protective of public health, welfare and the environment and otherwise consistent with CERCLA and the NCP. An additional Record of Decision will be prepared for the approval of any future remedial actions at the site.

9/17/86
Date

Michael P. Zel
Regional Administrator

SUMMARY OF OPERABLE UNIT REMEDIAL ALTERNATIVE SELECTION

Auburn Road Landfill Site Londonderry, New Hampshire

SITE LOCATION AND DESCRIPTION

The Auburn Road Landfill Site ("the Site") is located in the northeast corner of the Town of Londonderry, New Hampshire and is approximately bounded by Auburn Road to the west, Old Derry Road to the south, By-pass 28 to the east and the Londonderry-Auburn town line to the north. The Site's coordinates are approximately 42° 56' 15" north and 71° 21' 15" west. The USGS Map, on which the Site appears, is the Derry, New Hampshire Quadrangle Map which was published in 1968 and photo-revised in 1974.

The climate of Londonderry is typical of northern New England. The mean annual temperature in 1985 was 46.1° F. The total annual precipitation (as water) was 48 inches and a total annual snowfall of 55 inches. As with most of New England, precipitation in the area occurs throughout the year.

The Town of Londonderry, New Hampshire, based on the 1980 U.S. Census, has a total population of 13,598. The Site is located in a rural area. Within a 1-mile radius of the Site, there are approximately 275 homes plus approximately 260 mobile home units in the Whispering Pines Mobile Home Village. The population within the 1-mile radius is estimated to be between 1,300 to 1,900 people.

Groundwater in this area, from both the overburden and bedrock aquifers, is classified as Class IIA under the EPA Groundwater Protection Strategy. Class IIA groundwaters are groundwaters which are currently being used as a source of drinking water.

The Site consists of approximately 200 acres on which four disposal areas containing hazardous wastes have been documented. The Old Town Dump, which is the oldest of the four source areas, consists of approximately 2.9 acres. The next oldest area is the Tire Dump area which is contained within 2.0 acres followed by the Solid Waste area within 6.2 acres and the Septage Lagoon within 0.7 acres. There are numerous hills and other topographic features on and around the Site. Two unnamed brooks drain the local area and flow in a northwesterly direction eventually emptying into Whispering Pines Pond to the north of the Site. Outflow from Whispering Pines Pond combines with Cohas Brook and flows to the northwest (Figure 1). The Auburn Road Landfill Site was listed on the Superfund National Priority List on September 8, 1983, ranking 383 out of 416 sites.

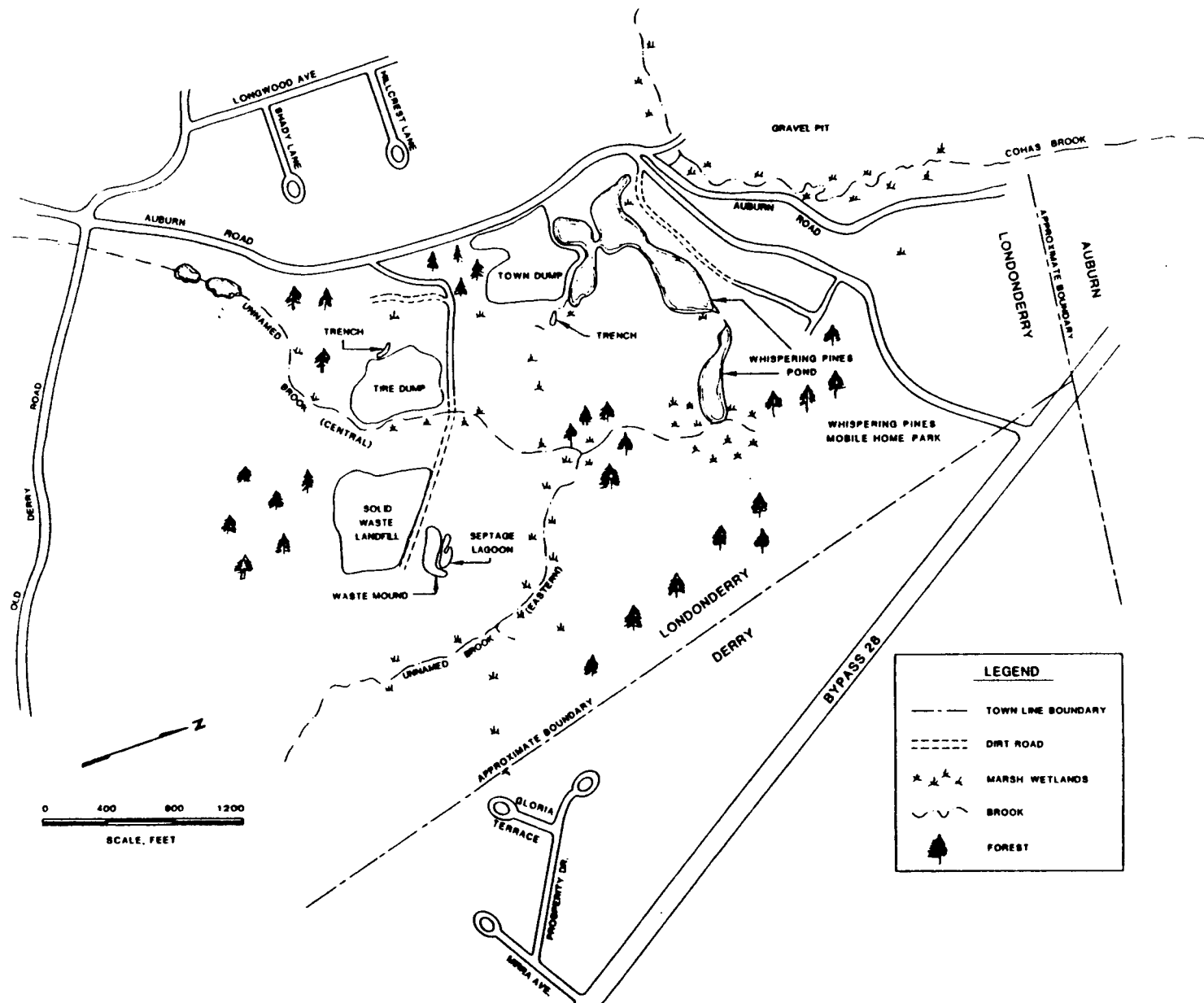


Figure 1 Ecological areas of the Auburn Road Landfill Site referred to in Environmental Exposure.

Source: GCA site investigation combined with NUS, 1986 base map.

SITE HISTORY

Prior to the 1960s, activities at the Auburn Road Site consisted of sand and gravel excavation. From 1931 - 1974 the Site property was owned by Ms. Hariclia Thomopoulus. In 1974, Mr. George Thomopoulus inherited ownership of the Site from his mother upon her death. In 1977, Derry Sand and Gravel, Inc., purchased the Site and it continues to own the Site at the present time.

In 1964, the New Hampshire Division of Public Health issued a permit to the Town of Londonderry ("the Town") to operate a section of the Thomopoulus property as a disposal site, currently referred to as the Town Dump. Throughout the 1960s and 1970s several other permits were issued to the Town for operation of the Tire Dump, the Septage Lagoon and finally in October of 1974 the Solid Waste Landfill.

Although authorized for disposal of only municipal refuse, tires and demolition debris, all four source areas contain evidence of disposal of industrial wastes including numerous exposed and partially buried 55 gallon steel drums. In August 1979, an investigation by the State of New Hampshire substantiated that industrial wastes were being disposed of on Site and issued a letter to the Town of Londonderry requiring that no more drums be accepted. Later the same year, the New Hampshire Water Supply and Pollution Control Commission sampled and analyzed monitoring wells and surface water on and around the Site and found contamination of surface water and groundwater caused from volatile organic compounds. In January 1980, the current site owner, Derry Sand and Gravel, Inc., terminated landfilling operations on the entire Site.

In 1981, an EPA contractor, Ecology and Environment, Inc. ("E&E"), prepared a "Preliminary Site Assessment for the Auburn Road Landfill" which concluded that the Site could contain hazardous wastes and recommended further study. A hydrogeologic investigation was performed by E&E in 1982 to further define the presence and extent of groundwater contamination. There are presently no natural or man made barriers which act to contain or limit the movement of groundwater through the Site. The Site was formally listed in the National Priority List on September 8, 1983 and, in the Spring of 1984, EPA contracted with NUS Corporation ("NUS") to perform a Remedial Investigation (RI). The RI Report was completed and presented to the public in April 1986 and concluded:

- ° All four disposal areas are contributing to the contamination of the Site.
- ° Contamination onsite is attributable to volatile organic compounds, extractable organic compounds and inorganic substances.

- ° Although highly variable in concentration, composition and distribution, contamination has been detected in all onsite environmental media with the highest contamination found in groundwater and soils.
- ° All four source areas contain buried and exposed steel drums in varying conditions.
- ° The Whispering Pines Mobile Home Village supply wells, which are down gradient of the source areas, are receptors of groundwater contamination.
- ° Contamination in groundwater, surface water and sediments has been confirmed offsite.

Other findings made in the RI Report are summarized in the Current Site Status - Groundwater Contamination section below.

Also in April 1986 a draft Feasibility Study ("FS") Report was completed by the NUS Corporation and submitted to EPA for review. The draft FS Report evaluated source control remedial options as well as management of migration options.

During the months of May and June of 1986, the EPA Environmental Services Division (ESD) commenced the removal of exposed and partially exposed drummed materials from the four source areas. Approximately 1900 drums were excavated and are being stored onsite until final disposition is arranged. Although this action resulted in a significant number of drums being removed from the source areas, the likelihood that all of the buried drums were removed is remote. Further removal actions to secure the Site (e.g., fencing) appear necessary.

As result of the removal action, the evaluation of the source control and management of migration alternatives and associated costs evaluated in the draft FS may have been affected. Rather than delay implementation of an alternative water supply response action pending a re-evaluation of source control and management of migration alternatives, EPA decided to divide the response action into Operable Units in accordance with Section 300.68(c) of the National Contingency Plan (NCP). A Focused Feasibility Study ("FFS") was prepared that addresses the provision of an alternate water supply to off site areas threatened by contaminated groundwater. This action is consistent with achieving a permanent remedy at the Site. The FFS was completed and presented to the public in July 1986. EPA held a public hearing on the RI and FFS and closed the public comment period on August 14, 1986. The findings of the FFS and RI are summarized below.

CURRENT SITE STATUS - GROUNDWATER CONTAMINATION

Groundwater contamination is the principal problem of concern identified in the Remedial Investigation ("RI") Report. Drums of buried hazardous substances appear to have been deteriorating and releasing such substances into the environment. These

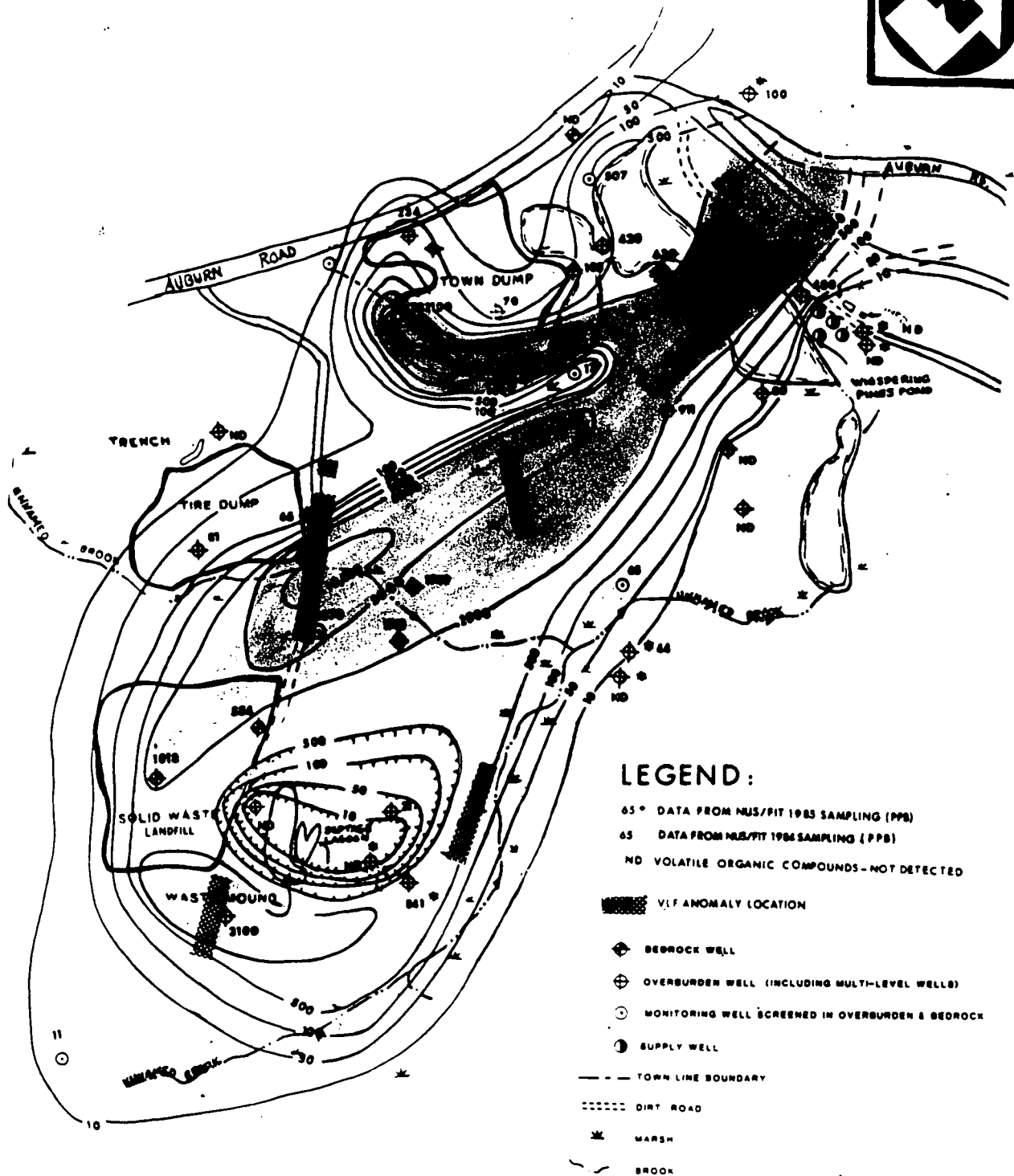
contaminants have leached through the soils and debris and have eventually combined and traveled with the groundwater flow. Figure 2 presents the general plume configurations observed at the Auburn Road site. The elongation of the contaminant contours indicates the direction of groundwater and contaminant travel. Figure 3 is a schematic profile of each of the source areas and shows the relation of each source area to bedrock and the groundwater elevation. As seen in Figure 3, the base of each of the source areas is at or near the average groundwater elevation.

The hazardous substances found at the Site include both volatile and semi-volatile organic compounds. These have been identified in both the overburden and the bedrock aquifers, with the volatile organic compounds (VOCs) being predominant. This is expected, as VOCs are typically more soluble and mobile in water than semi-volatile compounds. Sampling data from 1984 and 1985 indicates that the concentration and distribution of VOCs in the groundwater fluctuates. This fluctuation may be related to the irregular release of contaminants from the source areas.

At the Auburn Road Landfill Site, the overburden aquifer is used to supply water to the Whispering Pines Mobile Home Village while private residents along Auburn Road rely on bedrock wells for water. Figure 2 shows that the groundwater contaminant plumes in the overburden aquifer converge south of the Whispering Pines Pond, then pass under it, discharging to the wetlands north of Auburn Road. The Whispering Pines supply wells draw water from this aquifer and also draw some of the contaminants along with the groundwater.

At present, because such supply wells are only at the fringes of the contaminant plume, only low levels of a few contaminants are being captured. Compounds detected in samples obtained from the supply wells are presented in Table 1. The highest concentration of total volatile organic compounds detected was 60 parts per billion (ppb) which occurred in April, 1986. Although the contaminants detected in the supply wells have been few in number and of low concentrations (within federal and state drinking water standards), the number and concentration of contaminants found in groundwater across the entire site are much higher. Table 2 presents the highest concentrations of contaminants detected onsite. Therefore, increased pumping rates or higher concentration of contaminants in the groundwater plume due to intermittent or unpredictable releases of source area hazardous substances could result in significantly higher contaminant levels in the Whispering Pines supply wells which are less than 200 feet away.

The movement of groundwater in the bedrock aquifer is more difficult to define than the flow in the overburden aquifer. This is because fracture patterns within the bedrock can result in significant variations in water bearing characteristics in



**GROUNDWATER CONTAMINATION PLUME
AUBURN ROAD LANDFILL
LONDONDERRY, NH**



APRIL 1986

FIGURE 2

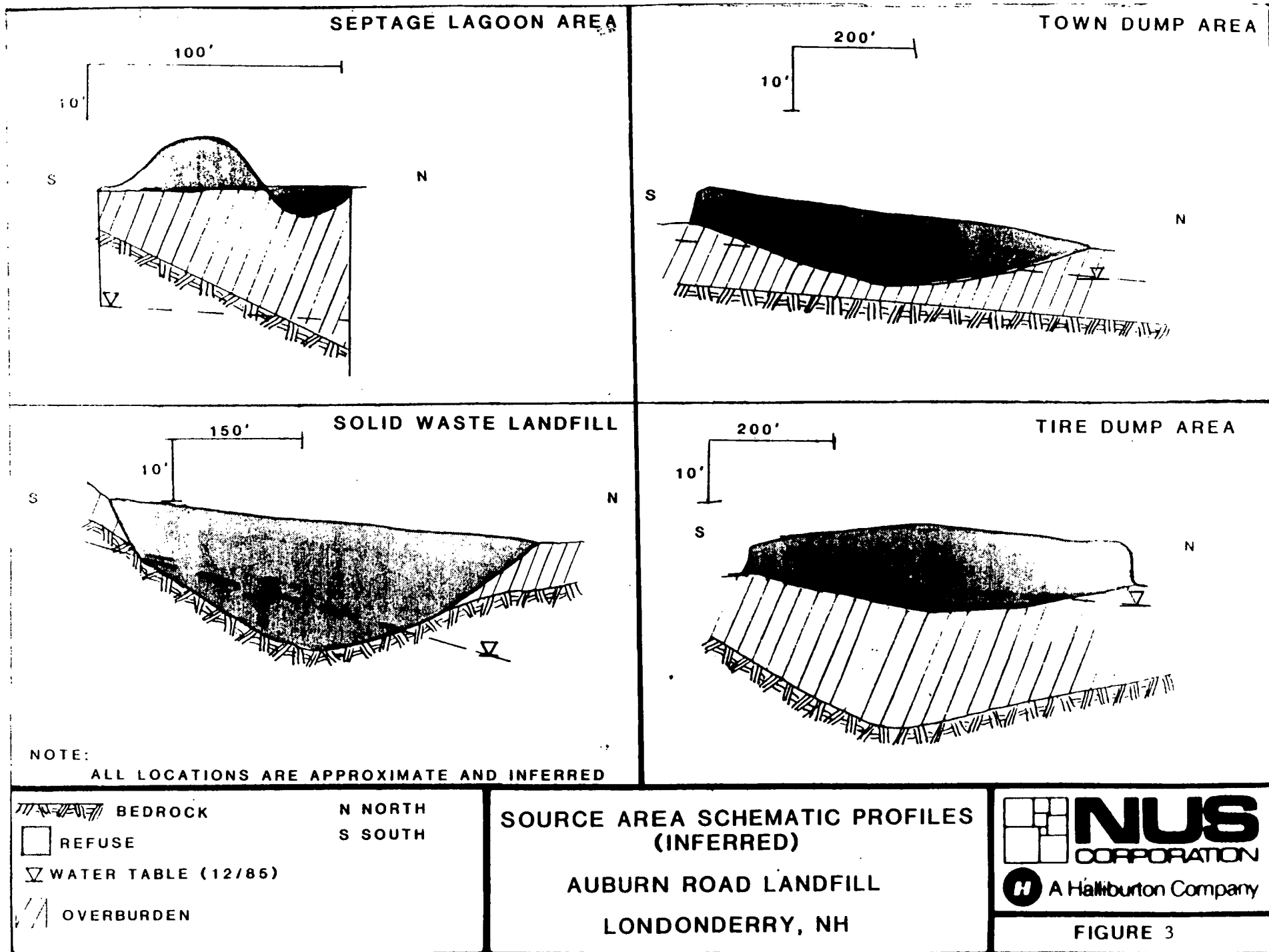


TABLE 1
MAXIMUM VOC LEVELS DETECTED IN WHISPERING PINES SUPPLY WELLS
AUBURN ROAD LANDFILL SITE

	Date:	8/23/85	10/9/85	11/20/85	1/14/86	2/20/86	3/19/86	4/8/86	5/14/86
Well No.:		#3, #4	#3, #4	#3, #4	#3*, #4*	#3, #4	#3*, #4	#3, #4	#3, #4
Trichlorofluoromethane		- -	- -	- -	- -	6 6	- 9	9 11	<5 5
1,1-Dichloroethane		- -	- -	- -	- -	1 <1	- -	2 2	- -
1,2-Dichloroethylene Isomers		2 3	2 <1	2 2	11 11	15 20	14 26	24 28	8 13
1,2-Dichloroethane		- -	- -	- -	- -	2 2	- 3	3 3	- -
1,1,1-Trichloroethane		<1 4	<1 -	1 -	- -	4 3	- 2	18 12	1 1
Trichloroethylene (Trichloroethene)		<u>- -</u>	<u>- -</u>	<u>- -</u>	<u>2 2</u>	<u>3 2</u>	<u>6 3</u>	<u>3 4</u>	<u>1 2</u>
Total VOC's Detected		2 7	2 <1	3 2	13 13	31 33	20 43	59 60	15 21

- = Not Detected
 * = Analyzed on Photovac 10A10 GC, screening only.
 Results are measured in parts per billion (ppb)

TABLE 2
MAXIMUM CONCENTRATIONS OF CONTAMINATED GROUNDWATER
DETECTED ONSITE
(VALUES IN ppb)

	Highest Conc.		Highest Conc.
<u>Volatile Organic Compounds</u>		<u>Extractable Organic Compounds</u> (Semi-Volatile Organic Compounds)	
Chloromethane	59J	2-Chlorophenol	3J
*Vinyl Chloride	82J	Phenol	12J
Chloroethane	120	Aniline	ND
*Methylene Chloride	300	1,2-Dichlorobenzene	ND
Acetone	4840	2-Methylphenol	ND
Carbon Disulfide	20J	4-Methylphenol	120J
1,1-Dichloroethene	540	Isophorone	ND
1,1-Dichloroethane	1800	Benzoic Acid	600J
*Trans-1,2-Dichloroethene	330000	1,2,4-Trichlorobenzene	ND
Chloroform	140J	Naphthalene	3J
1,2-Dichloroethane	51	4-Chloro-3-Methylphenol	2J
*2-Butanone	12000	2-Methylnaphthalene	1J
1,1,1-Trichloroethane	730J	2-Chloronaphthalene	ND
1,1,2,2-Tetrachloroethane	ND	Dimethyl Phthalate	ND
1,2-Dichloropropane	8J	Acenaphthylene	ND
*Trichloroethene	1600	Aenaphthene	ND
		Dibenzofuran	ND
1,1,2-Trichloroethane	44	Diethylphthalate	34J
Benzene	12J	Fluorene	ND
2-Hexanone	16	*N-Nitrosodiphenylamine	ND
4-Methyl-2-Pentanone	500J	Phenanthrene	ND
*Tetrachloroethene	8500	Anthracene	ND
*Toluene	6500J	Di-n-Butylphthalate	10J
Chlorobenzene	8J	Fluoranthene	ND
Ethylbenzene	77	Pyrene	1J
Styrene	ND	Butylbenzylphthalate	ND
Total Xylenes	320	Benzo(a)Anthracene	ND
		*bis(2-Ethylhexyl)Phthalate	330J
		Chrysene	ND
		Di-n-Octyl Phthalate	11J
		Benzo(b)Fluoranthene	ND
		Benzo(k)Fluoranthene	1J
		Benzo(a)Pyrene	ND
		2,4-Dimethylphenol	21J
		Pentachlorophenol	3J
		1,4-Dichlorobenzene	2J
		Beta-BHC	ND
		*Aroclor-1242	0.86
		Aroclor-1248	ND
		Aroclor-1254	ND
<u>Inorganics</u>			
*Arsenic	130J		
*Cadmium	36J		
*Lead	231J		

Footnotes:

- * - Selected as indicator chemicals of concern (GCA Corp., 1986)
- J - Approximate value after quality control review
- ND - Not detected in groundwater

different zones of the bedrock aquifer. The bedrock underlying the Site varies (laterally and with depth) with regard to the occurrence of open faults and fractures. There also appears to be a major structural zone of weakness (faults/fractures) near the western border of the Site, roughly parallel to Auburn Road. These variations influence groundwater movement within the bedrock aquifer.

Bedrock wells supplying the residents along Auburn Road are threatened by contaminants detected onsite. Most bedrock monitoring wells onsite show at least some level of contamination from volatile organic compounds (VOCs). Concentrations over 3,400 parts per billion (ppb) of VOCs have been detected in a bedrock monitoring well adjacent to Auburn Road. Geophysical logging of bedrock monitoring wells onsite near Auburn Road suggests that many significant water bearing fractures exist even at depths in excess of 200 feet. Orientation of the bedrock fractures in the area is believed to be in a northeast, southwest direction. The water supply wells which intercept and are hydrologically connected to the same faults and fractures identified in the bedrock monitoring wells onsite are threatened by aquifer contamination.

RISK ASSESSMENT

As presented in the Remedial Investigation Report (Volume III, Appendix P.), groundwater samples collected in 1984 from monitoring wells in the vicinity of the Auburn Road site showed the groundwater in the overburden as well as the bedrock aquifer to be contaminated with the soluble, highly mobile contaminants that are readily leached from waste sources. However, in recent sampling (1985), the less soluble, less mobile contaminants (semi-volatile compounds and inorganics) have also begun to appear in groundwater samples taken onsite. This suggests that contaminants were released from the source areas and are slowly migrating with the flow of groundwater. The remaining buried drums have the potential to contribute additional release of contaminants in the future. As depicted in Figure 2, a groundwater contaminant plume emanates from each of the four source areas and flows in a northerly direction. These plumes converge to form one combined plume south of the Whispering Pines Pond, then pass under the pond and continue in a northwesterly direction toward Cohas Brook. The vertical groundwater flow gradient in Cohas Brook is upward, which suggests that the contaminant plume migrates upward and discharges to the Cohas Brook and its associated wetland. Horizontally, the main longitudinal axis of the plume is located only several hundred feet to the west of the Whispering Pines supply wells. The low level volatile organic contamination found in the Whispering Pines water supply is attributable to the two western most wells, indicating that the western side of the cone of depression is slightly intercepting the eastern edge of the contaminant

plume. This plume could possibly shift laterally to the east or west. In any event, any significant increase in water withdrawal which increases the cone of depression could increase the levels of contamination in the water from the supply wells.

The most probable pathway of human exposure to contaminants in groundwater is through ingestion of and direct contact (i.e., bathing and showering) with water that comes from contaminated residential wells. Volatile organic compounds (VOCs) have been detected in onsite overburden monitoring wells in excess of 300,000 parts per billion (ppb) while total semi-volatile organic compounds were detected at levels up to 1,000 ppb. Contaminants in bedrock monitoring wells along Auburn Road have also been detected at concentrations up to 3,400 ppb.

Analysis of samples taken from the Whispering Pines supply wells in April 1986 shows total contaminant levels of 60 ppb consisting of Trichlorofluoromethane; 1,1 Dichloroethane; 1,1,1 Trichloroethane; Trichloroethylene; Tetrachloroethylene and 1,1,2-Trichloro-1,2,2 Trifluoroethane. The cumulative cancer risk from life time exposure to these compounds at the maximum concentrations detected to date is 9.13×10^{-6} (Table 3). This current risk level falls within EPA guidance which indicates that the target total individual carcinogenic risk resulting from exposures at a Superfund site may range between 10^{-4} and 10^{-7} . However, the cancer risk associated with the potential lifetime exposure to the highest levels of contaminants detected onsite is 7.2×10^{-2} (Table 4). Comparing the detected concentrations of each contaminant to applicable or relevant and appropriate Federal and State health standards reveals that at present levels the contaminants detected in the supply wells are not anticipated to cause significant adverse health effects. Life time exposure (70 years) to this mixture of contaminants is, however, not considered acceptable. In addition, if the higher contaminant levels detected onsite migrate to the supply wells, then the following contaminants would exceed "acceptable levels": 2-Butanone; Tetrachloroethylene; Toluene; trans 1,2 Dichloroethylene; Trichloroethylene; Vinyl Chloride; Arsenic; Cadmium and Lead (Table 5). Based on analyses of site conditions and the results of a one-dimensional contaminant transport model, the contaminant plume centers (areas of highest contaminant concentration detected onsite) could reach the Whispering Pines supply wells within 1 to 7 years. Until then, the contaminant concentrations in the supply wells may continue to increase.

Sampling of residential bedrock wells in the vicinity of the Auburn Road Landfill site has not identified the presence of any recurrent organic compounds. A tap water sample taken from a residence along Auburn Road in October of 1984 did show 57 ppb of 2 - Butanone. However, re-sampling this well later in 1984 and again in 1985 could not confirm the presence of this compound. A tap water sample from a different residence along Auburn Road, taken in March 1986, showed 6 ppb of Toluene. Re-sampling of this residence in May 1986 could not confirm the presence of Toluene

TABLE 3

**POTENTIAL CARCINOGENIC RISK FROM LIFETIME INGESTION
OF CONTAMINATED GROUNDWATER AT
THE WHISPERING PINES SUPPLY WELLS**

Potential Carcinogens	Highest Conc. (ppb) a/	Est. Lifetime Exposure Dose b/	Unit of Cancer Risk c/	Est. Cancer Risk d/
1,2-Dichloroethane	3.0	0.086	6.90E-02	5.90E-06
Trichloroethene	6.0	0.14	1.90E-02	3.23E-06

Cumulative Estimated
Cancer Risk = 9.13E-06

a/ maximum concentration detected in Whispering Pines wells #3 and #4 from Aug. 1985 thru May 1986.

b/ estimated exposure dose averaged over a lifetime of 70 yrs.; expressed in ug/kg/day.

c/ unit. cancer risk is the carcinogenic potency factor developed by the EPA Carcinogen Assessment Group; expressed in $(\text{mg/kg/day})^{-1}$.

d/ estimated cancer risk = est. lifetime exposure $(\text{mg/kg/day}) \times$ unit cancer risk $(\text{mg/kg/day})^{-1}$.

E - exponential value (eg. $2.4\text{E}-04 = 2.4$ times 10 to the negative 4)

TABLE 4

POTENTIAL CARCINOGENIC RISK FROM LIFETIME INGESTION OF CONTAMINATED GROUNDWATER

AT THE AUBURN ROAD LANDFILL

NO ACTION ALTERNATIVE

CONTAMINANT OF CONCERN	REMEDIAL ALTERNATIVE	CONC. BEFORE REMEDIATION a/	CONC. AFTER REMEDIATION b/	UNIT CANCER RISK c/	EST. EXPOSURE DOSE d/	EST. CANCER RISK e/
Methylene Chloride	No Action	300	n/a	1.23E-02	8.57	1.1E-04
Tetrachloroethene		8500	n/a	3.98E-02	242.86	9.7E-03
Trichloroethene		1600	n/a	1.90E-02	45.71	8.7E-04
Vinyl Chloride		823	n/a	2.3	2.34	5.4E-03
N-Nitrosodiphenylamine		33	n/a	4.92E-03*	0.004	4.2E-07
PCBs		0.86	n/a	4.34	0.025	1.1E-04
Arsenic		1303	n/a	15	3.71	5.6E-02

Cumulative Est.
Cancer Risk = 7.2E-02

- a/ - maximum concentration of contaminant detected in onsite wells; expressed in ug/L
b/ - theoretical concentrations; expressed in ug/L
c/ - unit cancer risk is the carcinogenic potency factor developed by the EPA Carcinogen Assessment Group expressed in (mg/kg/day)⁻¹; Health Effects Assessment Documents (US EPA, 1985)
d/ - estimated exposure dose averaged over a lifetime; expressed in ug/kg/day
e/ - estimated exposure risk = est. exposure dose (ug/kg/day) x unit cancer risk (mg/kg/day)⁻¹
E - exponential value (eg. 2.4E-04 = 2.4 times 10 to the negative 4)
J - approximate value
n/a - not applicable
* - carcinogenic potency factor obtained from Ambient Water Quality Criteria (US EPA, 1980).

TABLE 5

POTENTIAL NON-CARCINOGENIC RISK FROM INGESTION OF CONTAMINATED GROUNDWATER AT THE AUBURN ROAD LANDFILL:

NO ACTION ALTERNATIVE

CONTAMINANTS OF CONCERN	REMEDIAL ALTERNATIVE	CONC. BEFORE REMEDIATION a/	CONC. AFTER REMEDIATION b/	STANDARD/ CRITERIA c/	EST. EXPOSURE DOSE d/	HAZARD INDEX e/
2-Butanone	No Action	12000	n/a	24.57 (HA)	342.86	13.95
Methylene Chloride		300	n/a	NA	8.57	NA
Tetrachloroethene		8500	n/a	19.43 (RRfd)	242.86	12.5
Toluene		6500J	n/a	57.14 (RMCL)*	185.71	3.25
Trans-1,2-Dichloroethene		330000	n/a	2.0 (RMCL)*	9428.6	4714.3
Trichloroethene		1600	n/a	0.14 (MCL)*	45.71	326.5
Vinyl Chloride		82J	n/a	0.03 (MCL)*	2.34	78
Bis(2-ethylhexyl)phthalate		330J	n/a	600 (ADI)	9.43	0.016
N-Nitrosodiphenylamine		3J	n/a	NA	0.086	NA
PCBs		0.86	n/a	NA	0.025	NA
Arsenic		130J	n/a	1.43 (MCL)	3.71	2.59
Cadmium		36J	n/a	0.29 (MCL)	1.03	3.55
Lead		231J	n/a	1.43 (MCL)	6.60	4.62

a/ - maximum concentration of contaminant detected in onsite wells expressed in ug/L

b/ - theoretical concentrations expressed in ug/L

c/ - applicable standard/criteria (ug/L) converted to daily intake(ug/kg/day)

* - proposed RMCL or MCL value, Federal Register, Nov. 13, 1985

d/ - maximum conc. detected onsite (ug/L) converted to daily intake(ug/kg/day)

e/ - hazard index = exposure dose/ applicable standard or criteria

J - approximate value

n/a - not applicable

NA - not available

ADI - acceptable daily intake(US EPA,1984)

RRfd - Risk Reference dose(US EPA,Sept. 1985)

Overburden and bedrock monitoring wells onsite, along Auburn Road, show significant levels of contamination present. The levels of contamination found in these monitoring wells are indicative of levels of contamination to which the residents on Auburn Road, across the street from the Site, may potentially become exposed. The cumulative cancer risk from life time exposure to the concentration of compounds detected in the onsite bedrock monitoring wells is 1.3×10^{-2} .

ENFORCEMENT

Three potentially responsible parties (PRPs) have been identified for the Auburn Road Site: Mr. Thomopoulos, Derry Sand and Gravel Inc., and the Town of Londonderry, New Hampshire. Notice Letters were sent on March 12, 1986 to Mr. Thomopoulos and on June 30, 1986 to the other two PRPs.

Negotiations between EPA and the Town of Londonderry for implementation of this operable unit are underway and the likelihood of reaching an agreement with Londonderry is favorable.

Although levels of contamination in the Whispering Pines supply wells have dropped considerably, based on the high levels detected over the winter of 1986, an increase in contamination could again occur during the winter of 1987. Therefore, an expeditious completion of a water line extension is recommended.

ALTERNATIVES EVALUATION

Section 300.68 (d) of the NCP states that a Remedial Investigation/Feasibility Study ("RI/FS") shall be undertaken to determine the nature and extent of the threat presented by the release of hazardous substances and to evaluate proposed remedies. The RI provides site characterization data that serve as the basis for development of the FS. In the FS, alternative remedial actions are developed and evaluated in terms of cost, engineering implementation and constructability, the extent to which each alternative provides protection to public health and the environment, and environmental impacts during or remaining after implementation.

In accordance with EPA "Guidance on Feasibility Studies Under CERCLA" the following technologies were developed in the Focused Feasibility Study:

- No Action with Monitoring
- Wellhead Water Treatment
- New Supply Wells and Distribution System
- Extension of an Existing Water System
- Blending of Clean and Contaminated Water Supplies
- Bottled Water

The technology of blending clean water with contaminated water from the Whispering Pines supply wells to reduce the level of contamination to within an acceptable range was eliminated from consideration because this was considered the same as installing totally new supply wells without blending, an alternative which would be evaluated. Providing bottled water for an extended period was also eliminated from consideration as it would not provide protection from dermal adsorption and inhalation of contamination and was determined impracticable as a long term solution.

The remaining technologies were then assembled into remedial alternatives, in accordance with Section 300.68(f) of the NCP, to meet, as appropriate, one or more of the following criteria:

- ° Treatment or disposal at an off-site facility, as appropriate;
- ° Attain applicable or relevant and appropriate Federal public health and environmental requirements;
- ° As appropriate, exceed applicable or relevant and appropriate Federal public health and environmental requirements;
- ° As appropriate, not attain applicable or relevant and appropriate Federal public health and environmental requirements but will reduce the likelihood of present or future threat from the hazardous substances and that provide significant protection to public health and welfare and the environment. This must include an alternative that closely approaches the level of protection provided by the applicable or relevant and appropriate requirements;
- ° No action.

The following is a summary of these alternatives and Table 6 sets forth how they meet the Section 300.68(f) criteria.

- ° No Action with Monitoring

Under this alternative additional remedial activities would not be performed. The monitoring program which is presently in place would continue so that possible adverse health impacts that could arise would be identified and addressed. The monitoring program would consist of biweekly sampling of the Whispering Pines supply wells, monthly sampling of private residential wells along Auburn Road and quarterly sampling of selected onsite bedrock and overburden monitoring wells.

° Extension of an Existing Water Line

This alternative would consist of installing approximately 9,000 linear feet of water line along Auburn Road from the intersection of Auburn Road and Route 28, north to the existing distribution system for the Whispering Pines Mobile Home Village. This alternative would provide water to 17 homes along Auburn Road north of Old Derry Road and approximately 260 mobile home units in the Whispering Pines Mobile Home Village. The new water line would be an extension of the current water service provided by the Manchester Water Works (MWW). Because of the uncertainty of where bedrock contamination could migrate to, monitoring of residential wells along Auburn Road would continue so that if bedrock contamination began migrating toward Hillcrest Lane, Shady Lane or Longwood Avenue it could be identified. The water line could then be extended to serve these areas.

° New Wellfield with Distribution System

This alternative would consist of installing four new gravel pack overburden wells, a pump house with storage tank and a distribution system to serve 17 residences along Auburn Road and approximately 260 units in the Whispering Pines Mobile Home Village. Included with this alternative would be a hydrologic investigation to determine if the aquifer can provide sufficient yield. For the purposes of this evaluation the new wells were assumed to be locatable on the south west corner of the landfill site. The distribution system would consist of approximately 6,000 linear feet of 12 inch diameter pipe. As with Alternate 2- Extension of a Water Line, continued monitoring of bedrock wells along Auburn Road would continue. Additional quarterly monitoring of the new supply wells would also be performed in compliance with New Hampshire Drinking Water requirements.

° Wellhead Treatment

This alternative would consist of providing treatment of the groundwater at the Whispering Pines supply wells, plus installation of a distribution system to serve 17 homes along Auburn Road. The treatment process itself would consist of chemical precipitation for removal of inorganic compounds followed by air stripping for removal of the volatile organic compounds. Activated carbon adsorption units, following air stripping, would be used to remove residual contaminants and insure drinking water quality. For this alternative the distribution system would consist of approximately 4,200 linear feet of 12 inch diameter pipe. Extensive monitoring of the influent and effluent contaminant levels would be required to insure

proper performance of the treatment process. As with the previously discussed alternatives, monitoring of bedrock wells along Auburn Road would continue.

Alternatives for treatment or disposal at an off-site facility were not developed because the site conditions do not make this criteria possible or appropriate. An alternative that did not meet applicable or relevant and appropriate Federal public health and environmental requirements but that will provide adequate protection was not developed because all appropriate and possible technologies met or exceeded these requirements.

These alternatives were screened on the basis of costs, acceptable engineering practices and effectiveness (i.e. adequate protection of public health and welfare and the environment) in accordance with Section 300.68 (g) of the NCP. All of these alternatives passed this initial screening.

In accordance with Section 300.68(h) of the NCP, a more detailed evaluation was then performed for each of the above four alternatives, that included:

- ° A detailed cost estimation including operation and maintenance cost, and distribution of costs over time.
- ° An evaluation in terms of engineering implementation, reliability and constructability;
- ° An assessment of the extent to which each alternative is expected to effectively prevent, mitigate, or minimize threats to and provide adequate protection of public health and welfare and the environment. This includes an evaluation of the extent to which each alternative attains or exceeds applicable or relevant and appropriate Federal public health and environmental requirements; and
- ° An analysis of any adverse environmental impacts.

Table 7 summarizes the results of the initial screening and the more detailed evaluation in general terms of cost, technical, and environmental and public health issues. The third criteria listed above is discussed below in more detail in the section entitled APPLICABLE or RELEVANT and APPROPRIATE PUBLIC HEALTH and ENVIRONMENTAL STANDARDS.

COMMUNITY RELATIONS

The residents along Auburn Road, adjacent to the site, and the residents and owner of the Whispering Pines Mobile Home Village have been actively involved in discussion about conditions and response actions at this Site. The residents primary concern has always been about protection of public health, principally protection against exposure through ingestion of contaminated groundwater. Other concerns have been protection from direct contact with exposed barrels onsite,

TABLE 6
AUBURN ROAD REMEDIAL ALTERNATIVES
FOR ALTERNATE WATER SUPPLY

		No Action	Does Not Meet ARA* (1)	Meets ARA Federal Public Health and Env. Requirements	Exceeds ARA Federal Public Health and Env. Requirements	Treatment or Disposal at Offsite Facility
Alternatives						
1:	No-Action with surface water and groundwater monitoring	X	-	-	-	NA
2:	Water line	-	-	X	X	NA
3:	New wellfield and distribution system, with monitoring	-	-	X (May)	X (May)	NA
4:	Wellhead Treatment, with monitoring	-	-	X (May)	X (May)	NA

(1) But will reduce the likelihood of present or future threat from the hazardous substances and that provide significant protection to public health and welfare and the environment.

*ARA: Applicable or relevant and appropriate

NA: No applicable

TABLE 7

<u>Alternative</u>	<u>Present Worth Cost*</u>	<u>Technical Evaluation</u>	<u>Environmental Evaluation</u>	<u>Public Health Evaluation</u>
1. No Action	\$2,946,000	<p>.Can be implemented using existing monitoring wells.</p> <p>.Proper sampling and analytical procedures needed to yield reliable results.</p> <p>.Long turnaround time between sampling and results.</p>	<p>.Will have no effect on wetlands or flood-plains.</p>	<p>.Residents of Whispering Pines Mobile Home Village would continue to be exposed to contamination. Potential risk level could reach 7.2×10^{-2}.</p> <p>.Residents along Auburn Road could potentially be exposed to high levels of contamination.</p>
2. Water Line Extension	\$2,372,000	<p>.Manchester Water Works must apply for a franchise extension to serve residents of Auburn Road and Whispering Pines.</p> <p>.Manchester Water Works has the equipment and expertise to properly maintain a water line.</p> <p>.Installation would occur within Town right-of-way.</p> <p>.No unusual construction techniques required.</p>	<p>.One minor stream crossing would be required resulting in a temporary disruption.</p> <p>.No other wetland or flood plain impacts are expected.</p>	<p>.Provides a safe, reliable source of potable water.</p> <p>.Eliminates human exposure to contaminated groundwater.</p> <p>.Estimated risk from Trihalomethanes (THM's) resulting from chlorination is 5×10^{-5}</p>

*The sum of money which if invested now at a given interest rate would provide exactly the funds needed to construct, operate and maintain an alternative for a specific period of time.

<u>Alternative</u>	<u>Present Worth Cost*</u>	<u>Technical Evaluation</u>	<u>Environmental Evaluation</u>	<u>Public Health Evaluation</u>
2. Water line Extension (cont.)		<p>.Distribution pipe size is 24 inch diameter for compatibility with Manchester Water Works system.</p> <p>.No additional sampling and analysis required by Manchester Water Works.</p> <p>.Bedrock wells along Auburn Road would continue to be sampled and analyzed.</p> <p>.System could be easily expanded to serve other areas.</p>		
3. New Wells with Distribution System	\$2,481,000	<p>.Hydrological study to site new wells would be needed.</p> <p>.If wells could not be installed on site, costs could increase further due to increased land costs and longer distribution system.</p> <p>.Iron removal may be necessary which would increase capital and O&M costs.</p> <p>.A new water district would have to be formed.</p>	<p>.Siting of new pump house and storage tank would not be within a wetland or flood plain.</p> <p>.One minor stream crossing during installation of the distribution system would be required resulting in temporary disruption.</p>	<p>.Eliminates human exposure to contaminated groundwater.</p> <p>.A source of groundwater would be located to insure a risk factor lower than 10^{-4}.</p>

TABLE 7 cont.-

<u>Alternative</u>	<u>Present Worth Cost*</u>	<u>Technical Evaluation</u>	<u>Environmental Evaluation</u>	<u>Public Health Evaluation</u>
3. New Wells and Distribution System (cont.)		<p>.Distribution pipe size could be reduced to 12 inch.</p> <p>.Would not have the expandability of Alt. 2.</p> <p>.New water district would be responsible for sampling and analyzing raw water in addition to routine maintenance of equipment and distribution system.</p> <p>.Bedrock wells along Auburn would continue to be sampled and analyzed.</p> <p>.Requires at least one full time operator.</p>		
4. Well Head Treatment with Distribution.	\$4,318,000	<p>.Can be located close to residents.</p> <p>.Shortest length of distribution system needed.</p> <p>.A new water district would have to be formed.</p> <p>.Would require at least two full time operators.</p>	<p>.Siting of treatment facility would not be within a wetland or floodplain.</p> <p>.One minor stream crossing during installation of the distribution system would be necessary resulting in temporary disruption.</p>	<p>.Would reduce the extent of human exposure to contaminants to within a target risk range of 10^{-4} to 10^{-7}.</p>

TABLE 7 cont.-

<u>Alternative</u>	<u>Present Worth Cost*</u>	<u>Technical Evaluation</u>	<u>Environmental Evaluation</u>	<u>Public Health Evaluation</u>
4. Well Head Treatment with Distribution (cont.)		<p>.Not easily expanded.</p> <p>.Requires more extensive monitoring of influent and effluent.</p> <p>.Would require chemical deliveries for the treatment process.</p> <p>.Bedrock wells along Auburn Road would continue to be monitored.</p>	<p>.Any effluent, sludge disposal or air emissions will be in compliance with applicable Federal requirements.</p>	

protection from air contamination and the impact this site has had on property values and marketability of homes in the area. There have also been concerns voiced that EPA is spending too much time and money studying the site rather than cleaning it up.

At a recent public meeting to discuss the alternatives evaluated in the Focused Feasibility Study, the general consensus was for EPA to approve Alternate 2 - Water Line Extension, and begin construction as soon as possible.

APPLICABLE OR RELEVANT AND APPROPRIATE PUBLIC HEALTH AND ENVIRONMENTAL STANDARDS

Alternate 1 - No Action

Alternate 1 involves monitoring of existing wells and requires no construction. Therefore, the Occupational Safety and Health Act, which regulates protection of construction and operational personnel, is not applicable. As no construction is to take place there will be no impact to wetlands or floodplains in the area.

The Clean Air Act regulates discharges to the air while the Clean Water Act regulates discharges to surface waters. Since neither of these discharges will occur under the No Action Alternative, the requirements of these regulations are not applicable. The Resource Conservation and Recovery Act (RCRA) regulates the disposal of hazardous wastes and the Toxic Substances Control Act (TSCA) regulates disposal of Polychlorinated Biphenyls (PCBs). The No Action Alternative would not involve any disposal, therefore, these regulations are also not applicable.

Although the levels of contamination detected in the Whispering Pines water supply wells currently meet the Safe Drinking Water Act requirements as well as the New Hampshire drinking water requirements, if the levels of contaminants detected onsite migrate to the supply wells, as expected, these requirements would not be met. See Table 5, above.

Alternate 2 - Supply Line

Construction of a water line would not result in discharges to air or surface waters nor would disposal of hazardous wastes or PCBs be involved. Therefore the Clean Air Act, Clean Water Act, RCRA and TSCA are not applicable to this alternative. The construction contractor, however, would be required to comply with all applicable OSHA requirements.

Construction of a water line along Auburn Road would involve one stream crossing. Protection of the wetland associated with the stream crossing would be taken into account during design. Impacts to these wetlands are considered temporary, occurring only during construction. The design would require that the wetlands be returned to their original conditions. There would be no impact to any flood plain.

The quality of water supplied through the new supply line would be regulated by the State of New Hampshire and is required to comply with State drinking water standards and the Federal Safe Drinking Water Act.

Alternate 3 - Well Field and Distribution System

As with Alternate 2, construction of new wells with a distribution system would not result in discharges to the air or surface waters nor would it involve disposal of hazardous wastes or PCBs. Therefore the Clean Air Act, Clean Water Act, RCRA and TSCA are not applicable. OSHA requirements would however be applicable during construction.

As with Alternate 2, a stream crossing of a brook leading from the Whispering Pines Pond would be necessary during installation of the distribution system. All necessary precautions would be included in the design specifications for protection of any wetland impacted during construction of the stream crossing and the wetlands will be returned to their original conditions. Siting of any necessary structures would be outside of wetland or floodplains therefore, no floodplains would be impacted.

As discussed in a previous section, a hydrogeologic investigation would be required to locate a suitable source of water. Included with this investigation would be an analysis of the groundwater quality to insure it meets the Federal Safe Drinking Water Act and all State drinking water requirements.

Alternate 4 - Wellhead Treatment and Distribution System

Operation of a wellhead treatment facility would require a discharge to the air either directly from the air stripper or from an after burner or incinerator if one is used to incinerate the VOCs removed from the groundwater by the air stripper. Design of the air stripper and/or incinerator would have to insure that air quality requirements under the Clean Air Act could be met.

The treated water from the air stripper would be discharged either back to the groundwater onsite or to a surface water such as the Cohas Brook. If the discharge is to the Cohas Brook then discharge limits required under the Clean Water Act would have to be complied with.

A preliminary stage of the wellhead treatment process involves removal of inorganics (metals) by chemical precipitation. This process produces a sludge which must be disposed. Tests on this sludge would have to be performed to determine if it contained any hazardous waste as defined under RCRA or TSCA. If hazardous wastes or PCBs were detected, then disposal of the sludge would have to comply with the requirements of RCRA and/or TSCA.

As with Alternates 2 and 3, the purpose of wellhead treatment is to supply the residents of Whispering Pines and along Auburn Road with a safe reliable source of water. To do this, the wellhead treatment process would be designed to insure that the water quality meets state drinking water requirements and the Safe Drinking Water Act requirements.

As with Alternates 2 and 3, all construction as well as operation activities for this alternative would comply with applicable OSHA requirements. Installation of a distribution system would also require one stream crossing. Design specifications would incorporate measures to mitigate impacts to wetlands disturbed during the stream crossing and require that the wetlands be returned to their original conditions. Sufficient area exists in the vicinity of the Whispering Pines supply wells to enable the treatment facility to be constructed outside of floodplains or wetlands.

Due to the uncertainties that will exist until completion of treatability studies and pilot plant studies, compliance with certain Federal requirements cannot be definitely determined at this time.

Table 8 presents a comparative summary of each alternative's ability to meet or exceed the applicable or relevant and appropriate public health and environmental standards.

RECOMMENDED ALTERNATIVE

Section 300.68(i) of the National Contingency Plan states that the appropriate extent of remedy shall be determined by the lead agency's selection of a cost-effective remedial alternative that effectively mitigates and minimizes threats to and provides adequate protection of public health and welfare and environment.

EPA has determined the cost effective alternative for providing an alternate source of water to the residents of the Whispering Pines Mobile Home Village and along Auburn Road adjacent to the landfill site to be Alternate 2 - Extension of a Water Line. Of the four alternatives evaluated, Alternate 1 - No Action, was eliminated from consideration because it provided no protection of human health from potential exposure to levels of contamination detected onsite in both the bedrock and overburden aquifers. Alternate 4 - Wellhead Treatment and Distribution System, was not chosen because of its high cost. This alternative is also highly dependent on proper operation of a complex treatment facility making this alternative less reliable than either Alternate 2 or 3.

As shown in Table 4, both Alternate 2 - Extension of a Water Line and Alternate 3 - Installation of New Wells and Distribution System, would meet all applicable or relevant and appropriate federal public health and environmental standards. There are several

TABLE 8

Applicable or Relevant and Appropriate
Federal and Public Health and Environmental Standards

	Alt. 1 <u>No-Action</u>	Alt. 2 <u>Supply Line</u>	Alt. 3 <u>Wellfield and Distribution System</u>	Alt. 4 <u>Wellhead Treatment and Distribution System</u>
Clean Air Act	NA	NA	NA	may meet
Clean Water Act	NA	NA	NA	may meet
Safe Drinking Water Act	meets (currently) may not (future)	meets	meets	may meet
RCRA	NA	NA	NA	may meet
TSCA	NA	NA	NA	may meet
OSHA	NA	meets	meets	meets
Wetlands/Floodplains	NA	meets*	meets*	meets*
NH Regulations	NA	meets	meets	meets

NA: Not applicable

*Proper design and construction of a stream crossing would be required to mitigate adverse impacts.

reasons why Alternate 2 was chosen rather than Alternate 3. First, the present worth cost for Alternate 2 is lower than Alternate 3 (Table 8). Moreover, the present worth cost for Alternate 3 was based on the assumption that an adequate source of water with acceptable water quality could be located in the southern portion of the landfill site. If the hydrologic study determines that the new wells cannot be located onsite, another location would have to be found. This would also increase the cost of the hydrologic study and could result in increased land costs and increased distribution system costs if the wells were located further away from Auburn Road. Second, as discussed previously, a water district would have to be formed before Alternate 3 could be implemented. A time estimate of two to 12 months for establishing a water district has been used, but the process could conceivably extend beyond 12 months. This in turn would mean a delay of 18 months or longer before water is actually provided to the residents of Auburn Road and Whispering Pines.

In contrast, Alternate 2 has many advantages over Alternate 3. Extension of a new water line (Alt. 2), could be accomplished in 6 to 8 months. Alternate 2 also provides greater expansion capabilities should the water line have to be extended to other areas not initially served if the contaminants begin to migrate. Finally, Alternate 2 would provide a more reliable source of water to the area. The Manchester Water Works is already equipped to deal with the day-to-day operation and maintenance of a large distribution system as well as the continued monitoring of its water quality.

OPERATION and MAINTENANCE

Operation and maintenance of this operable unit shall consist of servicing each residential water connection and monthly sampling of bedrock wells along Auburn Road. These costs are estimated to be approximately \$57,000 per year and are considered part of the approved action and eligible for Trust Fund monies for a period not to exceed one year.

SCHEDULE

Signing of the Record of Decision	09/26/86
Signing of an Administrative Consent Order between EPA and the Town of Londonderry for design and construction of the water line	10/15/86
Complete Design	10/31/86
Begin Construction	03/15/87
Complete Construction	09/15/87

FUTURE ACTIONS

The recommended alternative will not address the contamination source areas or the residual groundwater contamination at the site. Alternatives to address possible source control and additional management of migration remedial alternatives will be presented in a forthcoming Feasibility Study. A Record of Decision will be prepared for approval of future remedial actions.

**COMMUNITY RELATIONS
RESPONSIVENESS SUMMARY
AUBURN ROAD LANDFILL SUPERFUND SITE
LONDONDERRY, NEW HAMPSHIRE**

INTRODUCTION

This community relations responsiveness summary for the Auburn Road Landfill site documents for the public record concerns and issues raised during remedial planning, comments raised during the comment period on the feasibility study, and the responses of EPA to these concerns.

The responsiveness summary is divided into the following sections:

- Section I. Overview. This section discusses EPA's preferred alternative for remedial action, and the public reaction to this alternative.
- Section II. Background on Community Involvement and Concerns. This section provides a brief history of community interest and concerns raised during remedial planning activities at the Auburn Road Landfill Site.
- Section III. Summary of Major Comments Received During the Public Comment Period and the EPA Responses to the Comments. Both written and oral comments are categorized by relevant topics. EPA responses to these major comments are also provided.
- Section IV. Remaining Concerns. This section describes remaining community concerns that EPA should be aware of in conducting the remedial design and remedial action at the Auburn Road Landfill Site.

In addition to the above sections, Attachment A, included as part of this responsiveness summary, identifies the community relations activities conducted by the EPA during remedial response activities at the Auburn Road Landfill Site.

OVERVIEW

The focused feasibility study (FFS) was designed to evaluate remedial actions at the Auburn Road Landfill Site which would provide an alternate water supply to 17 residences along Auburn Road and to the Whispering Pines Mobile Home Park. The increasing levels of contaminants detected in drinking water near the site warrant an alternate water source. A number of barrels were removed from the site in the spring of 1986, altering the source of contamination, and necessitating additional field investigations. Rather than waiting for additional field studies to be completed for the comprehensive feasibility study (FS) of the site, EPA requested that a FFS be prepared focusing on an alternate water supply.

Almost all the comments received during the public comment period from residents and local officials strongly supported extending the water line from the Manchester Water Works. This would provide municipal water to the Whispering Pines Mobile Home Park and 17 residences along Auburn Road. In

general, residents viewed the water line extension as the only alternative that would guarantee them a safe, clean drinking water supply.

BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Community interest in the Auburn Road Landfill Site dates back to 1979 when area residents began to complain of health problems. Complaints from nearby residents of respiratory problems and skin rashes were reported from 1979 to 1982. Public attention regarding the site began to swell as concern grew over what chemicals had been buried at the site. Residents along Auburn Road unified and formed a neighborhood group of approximately 20 citizens who attempted to put pressure on State and local officials to take action at the site. In the summer of 1981, EPA became involved with the site for the first time. While a number of different concerns were expressed by residents during the remedial planning activities at the site, a majority of these concerns were related to the ground-water contamination problem at the site.

These concerns and how EPA and the State addressed these concerns are described below.

1. Residents along Auburn Road who were concerned about health effects from groundwater contamination at the site undertook a health survey between March 1981 and June 1981.

State Response: Review of the results by the State Health Department indicated that there was not an excessive number of illnesses when the figures were compared to the national average.

2. During the remedial investigation (RI) residents expressed concern and confusion over the levels of contaminants in their water and what was considered safe or unsafe.

EPA Response: EPA notified residents by mail of all well sampling results. In addition, following completion of the RI, EPA officials held a public meeting and issued a fact sheet which summarized the results of the RI and indicated potential health effects associated with contaminants found at the site.

3. Citizens and local officials expressed a great deal of concern over the immediate need for a safe drinking water supply for residents in the Whispering Pines Mobile Home Park and along Auburn Road.

EPA Response: EPA conducted a focused feasibility study to address the means to provide an alternative water supply.

SUMMARY OF PUBLIC COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

Comments raised during the Auburn Road Landfill Site public comment period are summarized below. The comment period was held from July 24 to August 14, 1986 to receive comments on the focused feasibility study. The

comments received during the comment period are categorized by relevant topics.

REMEDIAL ALTERNATIVE PREFERENCES

All of the commentors on the focused feasibility study report expressed a preference for the water line extension alternative. These preferences are as follows:

1. The New Hampshire Water Supply and Pollution Control Commission recommended Alternative 2, extension of the water line. The commission suggested that the water line extension is the most expedient remedy available for providing a safe, long-term drinking water supply. In addition, the Division of Public Health Services (DPHS) suggested that if the new water line alternative is chosen, continued monitoring should be performed on residences within the study area who are not connected. The DPHS stated that this monitoring will provide quantitative data to confirm the RI conclusion that eliminating the use of Auburn Road wells and Whispering Pine supply wells will decrease the possibility of other wells becoming contaminated.

EPA Response:

EPA concurs with the recommendation of the New Hampshire Division of Public Health Services that continued monitoring should be performed on residences within the study area which will not be connected to the proposed water line. The cost for monitoring of residential bedrock wells has been accounted for in an amendment to the Focused Feasibility Study that has been made available to the public.

2. An attorney representing the owners and residents of the Whispering Pines Mobile Home Park strongly supported the extension of the water line from the Manchester Water Works. He suggested that it is the only alternative which assures residents of a clean safe drinking water supply. He added that another advantage to the water line extension alternative is that the Manchester Water Works has already undertaken preliminary design and engineering studies and has submitted an application to have its franchise extended to the Auburn Road area. In addition, the extension would require no monitoring of groundwater, no treatment and no additional management and maintenance costs.

EPA Response:

The Record of Decision concludes that extension of a water line is the most cost-effective alternative for providing a safe, reliable, long term source of water to the 17 residences along Auburn Road, north of Old Derry Road and the Whispering Pines Mobile Home Village.

3. Over 200 residents from the Whispering Pines Mobile Home Park signed a petition supporting the water line extension alternative.

The residents expressed concern that one year is too long to wait for clean water and they want EPA to act as soon as possible to install the waterline. They feel that since the RI confirmed that the Whispering Pines supply wells are contaminated, the EPA should consider this an emergency situation and install the water line immediately.

EPA Response:

EPA concurs that construction of the waterline should be initiated as soon as possible. A period of one year to design and construct a 9000 ft. water line with all appurtenance is not considered unreasonable particularly in an area where winter conditions can severely impact construction. Actual construction of the water line was estimated to take a maximum of 6 months. The remaining 6 months was estimated for design (3 months) and winter shutdown (3 months). These estimates are subject to adjustment dependent upon actual design length, severity of cold weather and construction conditions encountered. Until the water line is installed, EPA will continue to monitor the residential supply wells along Auburn Road and the Whispering Pines supply wells and provide an alternate temporary source of water if necessary.

4. All of the individual residents who submitted comments expressed strong support for extending the water line. Several residents stated that it was a mental and physical stress not knowing what kind of water they were using for cooking or bathing. Many residents stated that EPA should act immediately to install the waterline. Several residents suggested that people have invested their life's savings into homes, not knowing the water situation, and would suffer unduly should this problem be allowed to persist. Other residents stated that it was EPA's duty to take immediate action to protect residents from the hazards of toxic waste. In general, residents agreed that Alternative 2 is the best option in terms of protecting public health, quick results, and lowest long-term costs.

EPA Response:

The levels of contaminants detected thus far in the Whispering Pines supply wells have been determined not to present an immediate health threat to those exposed through ingestion, inhalation or dermal contact. EPA agrees however, that long term exposure (70 years) to levels currently detected in the supply wells is not acceptable. In addition, EPA believes that an imminent and substantial endangerment may exist if levels detected onsite migrate to such supply wells. To that end, EPA proposes that a water line be installed as soon as possible.

TECHNICAL QUESTIONS/CONCERNS
REGARDING REMEDIAL ALTERNATIVES

1. The attorney representing Whispering Pines Mobile Home Park expressed concern over Alternative 3, finding a new well field. He

stated that finding a new, clean well field would require excessive hydrogeologic studies and still the new well field might not be safe. He added that Alternative 3 would be time consuming, would require acquisition of land or property rights and still might require an expensive treatment process. Several residents also expressed concern that the new well field option would be very time consuming and would not guarantee them safe drinking water.

EPA Response:

EPA concurs that locating a new well field would require a hydrogeologic study to insure that the new source of water is safe and of sufficient quantity to meet the needs of the area. If new wells could not be located onsite then an extended period of time would be needed to locate an acceptable area. The acquisition of property has now been incorporated into a revised cost analysis for Alternative 3. The revised capital cost for new wells is now estimated at \$1,454,200 which includes \$124,600 for the purchase of 7 acres of land.

2. The New Hampshire Water Supply and Pollution Control Commission suggested that the cost of Alternative 3 has been underestimated since the FFS Report does not consider the cost of the land area needed for the facility and to provide a protective buffer zone. In addition, the commission stated that the costs optimistically assumed that a suitable site could be found in close proximity to the residences that would be serviced. Other factors the commission cites are time constraints that could prevent Alternative 3 from coming on line for several years and the fact that Alternative 3 does not guarantee a clean, permanent water source.

EPA Response:

EPA has re-evaluated the cost of Alternate 3 and agrees that the Focused Feasibility Study did not account for the purchase of property. This has now been corrected (see response to Technical Question 1). As indicated in the Focused Feasibility Study, the time required to fully implement Alternate 3 is dependent upon the time necessary to locate an acceptable source of groundwater and establish a water district. EPA agrees that delays in either implementing requirement could exceed the 12 month implementation period specified in the Focused Feasibility Study.

3. The attorney representing the Whispering Pines Mobile Home Park expressed concern that Alternatives 1 (no action) and 4 (treatment) would not assure that human exposure to the contaminated groundwater is eliminated. Several residents stated that "no action" makes no sense because people are already having reactions to the water and toxic levels could easily rise. In addition, residents suggested that options 1, 3, and 4 could be much more expensive if they prove to be ineffective in improving the drinking water.

EPA Response:

EPA concurs that Alternative 1 would not provide adequate protection of human health and that Alternative 4 may not be as protective as Alternative 2. In addition, Alternative 3 or 4 could be more expensive if either was selected and proven to be ineffective.

4. The New Hampshire Water Supply and Pollution Control Commission expressed concern that Alternatives 1 and 4 are too costly, too time consumptive and do not assure that human exposure to the contaminated groundwater will be minimized.

EPA Response:

EPA concurs with the New Hampshire Water Supply and Pollution Control Commission in that Alternatives 1 and 4 are costlier, more time consuming and not as protective of human health as Alternative 2.

HEALTH EFFECTS/RISKS

1. Several residents expressed concern over the potential health effects from continued use of the contaminated water during design and construction of the remedial alternative. One resident recommended supplying clean water in the form of bottled water to residents in the interim. This resident stated that bottled water was necessary because of the possible health effects from drinking the contaminated water.

EPA Response:

As presented in the Focused Feasibility Study, the health risk associated with exposure to the highest levels of contaminants detected so far in the water supply wells for the Whispering Pines Mobile Home Village is 9.13×10^{-6} . Independent evaluations by the EPA, the Centers for Disease Control in Atlanta, Georgia and the New Hampshire Division of Public Health conclude that exposure to this current level of contamination does not constitute an immediate health threat. EPA will continue monitoring the Whispering Pines supply wells on a regular basis. If contaminant levels begin to approach unacceptable concentrations, steps will be taken to provide residents with some alternate source of water, such as bottled water, until completion of the water line extension.

2. A resident expressed concern about drinking water that has not been tested for just under two weeks. This resident suggested that EPA can not guarantee that some adverse health effect may or may not occur from drinking the water.

EPA Response:

The testing program for the Whispering Pines supply wells should identify rises in contaminants levels long before they become an

immediate health threat because contaminant movement through the overburden aquifer and fluctuation of contaminant levels of these wells is gradual.

3. A resident questioned what further health problems could arise from the site other than those related to the contaminated groundwater.

EPA Response:

Future health problems, other than those related to the contaminated groundwater, will be addressed in a future Feasibility Study. Exposures as result of future cleanup efforts will be evaluated for each cleanup alternative addressed in the future Feasibility Study. Discussion of the future cleanup alternatives and associated impacts will be held in a public meeting forum for the cleanup Feasibility Study, and the public will have the opportunity to comment on the feasibility study alternatives.

4. The DPHS reviewed the carcinogenic potency factors used in the FFS Report and suggested that certain factors being used are outdated. The DPHS stated that 1,2-dichloroethane, trichloroethylene and tetrachloroethylene carcinogenic potency factors have been revised by the EPA Carcinogen Assessment Group and can be located in a recently published Health Assessment Document. The DPHS suggested that using the updated values would lead to increased estimated cancer risk.

EPA Response:

The carcinogenic potency factors for these three compounds were obtained from Health Effects Assessment documents (U.S. EPA, 1985). These numbers are being constantly updated. The most recent document published by the EPA Carcinogenic Assessment Group (Mutagenicity and Carcinogenicity Assessment of 1,3-Butadiene, September 1985) contains an updated listing of the potency factors. The potency factors used in the FFS compare to those found in this list as follows:

	Carcinogenic Potency	
	FFS	September 1985 Listing
1,2-Dichloroethane	6.90×10^{-2}	9.1×10^{-2}
Trichloroethylene	1.90×10^{-2}	1.1×10^{-2}
Tetrachloroethylene	3.98×10^{-2}	5.1×10^{-2}

If the values from the September 1985 listing were used, the estimated cancer risk for 1,2-dichloroethane would increase by approximately a factor of 1.3, for trichloroethylene the estimated risk would decrease by a factor of 0.6 and for tetrachloroethylene the estimated risk would increase by a factor of approximately 1.3. Since the net change would be considerably less than an order of magnitude, the carcinogenic potency factors used in the FFS should be adequate to provide an estimate of the cancer risk.

5. The DPHS questioned what standard/criteria was used for trichloro-fluoromethane.

EPA Response:

The standard/criteria for trichlorofluoromethane of 349 ug/kg/day is a verified Reference Dose (RfD) for Oral Exposure which was prepared by the ADI Work Group of the Risk Assessment Forum on 1/9/86 and published by U.S. EPA ECAO, Cincinnati, January, 1986.

6. The DPHS suggested that when presenting "acceptable levels" in the discussion of non-carcinogenic effects, the rationale for selecting one acceptable level rather than another should be stated.

EPA Response:

In order to provide internal consistency and to ensure that the most applicable standard was used for a particular exposure route, a route-specific hierarchy was developed for the relevant standards/criteria/guidelines. The first standard/criterion/guideline on the list was used preferentially. If that particular value did not exist for a particular compound, the next value on the list was used, and so on.

For oral exposure to contaminants, the following values were used (in order of preference):

1. Maximum Contaminant Levels (MCLs). These are the only available proposed enforceable standards and are specific to ingestion of drinking water.
2. Recommended Maximum Contaminant Levels (RMCLs). (For noncarcinogens only). Proposed RMCLs are the first step in setting MCLs; they are nonenforceable health goals, based on health effects only, and are specific to ingestion of drinking water.
3. Health Advisories (HAs) - Lifetime. Recommendations of Office of Drinking Water. Specific to ingestion of ground water, therefore the most applicable guideline.
4. Risk Reference Dose (RRfd). The Risk Reference Dose is an estimate of lifetime daily exposure to the human population which is not anticipated to result in any adverse non-carcinogenic effects. RRfDs are non-enforceable health goals rather than regulatory standards.
5. Acceptable Daily Intake (ADI). The Acceptable Daily Intake is an estimate of an exposure level which would not be expected to cause adverse effects when exposure occurs for a significant portion of a lifespan. ADIs are non-enforceable health goals rather than regulatory standards (U.S. EPA Environmental Criteria and Assessment Office, September, 1984).

7. Regarding the discussion of the no-action alternative, the DPHS suggested that the restrictions to prevent accidental exposure to contaminated surface and groundwater should be discussed in the public health evaluation, since human health is being evaluated.

EPA Response:

The no-action alternative should serve as a baseline against which other alternatives are compared. By definition, therefore, restrictive actions to prevent accidental exposure should not be discussed, as this would no longer serve to fulfill the CERCLA requirement that the FS examine and present to the EPA an alternative in the "No Action" category. It should be stressed that this discussion was meant to evaluate the present and future potential risk to public health in the absence of any restrictions or remedial action.

8. The DPHS questioned what concentration levels and what semi-volatile compounds were detected in the Whispering Pines supply wells close to the Auburn Road Landfill Site. In addition, the DPHS wanted to know why these semi-volatile compounds were not included in the evaluation of potential health risks in the FFS Report.

EPA Response:

Semi-volatile compounds were not included in the evaluation of current potential health risks because they have not been detected in the Whispering Pines supply wells to date. However, the semi-volatile contaminants of concern that were detected in onsite monitoring wells at the Auburn Road Landfill site were used to evaluate potential worst-case exposure conditions (see pp. 4-15 through 4-19 in the FFS).

9. The DPHS stated that the cumulative estimated cancer risk after well-head treatment is not an acceptable risk. The DPHS suggested that this estimated cancer risk (5.8×10^{-3}) should be included in Table ES-1.

EPA Response:

EPA concurs with the New Hampshire Division of Public Health Services in that the risk factor of 5.8×10^{-3} for Well Head Treatment does not fall within the EPA target risk range of 10^{-4} to 10^{-7} . Omission of this risk factor from Table ES-1 was an oversight, however it was adequately covered in Section 4 of the Focused Feasibility Study.

DESIGN/CONSTRUCTION PHASE

1. A resident questioned whether there were any problems that might occur during design and construction that could inhibit extending the water line.

EPA Response:

The amount of rock excavation during construction could delay completion of the water line extension. This delay can be minimized through proper design and quantity estimations. The six month time period estimated for construction accounts for a quantity of rock excavation and should be sufficient.

2. A resident questioned whether the residents would have an opportunity to review the design study before construction begins.

EPA Response:

The community relations plan for the Auburn Road Landfill Site will be updated to provide for public input during the design and construction phases.

3. A resident questioned whether EPA will continue to monitor and test residents wells during construction.

EPA Response:

Monitoring of the Whispering Pines water supply wells and the residential wells along Auburn Road will continue throughout construction. Residential wells along Auburn Road will no longer be needed once the new water line is activated, but will still be used for periodic sampling of the bedrock aquifer.

FINANCIAL RESPONSIBILITY

1. A few residents questioned who will finance the water line. One resident wanted to know whether the town of Londonderry would be released of any present and future liabilities if it is allowed or required to pay for the water line.

EPA Response:

The new water line will be financed either by Federal Superfund monies that will subsequently be recovered from responsible parties or by a Responsible Party under an administrative order by EPA. The Town of Londonderry has expressed an interest in financing the proposed water line extension. Any release from liabilities would be addressed in the administrative order.

2. A resident questioned whether the town of Londonderry might charge or tax residents for the cost of the water line extension.

EPA Response:

If the Town of Londonderry were to finance the construction of the proposed water line, the Town administrators would decide how funds would be raised.

3. A resident questioned whether EPA is actively pursuing the potentially responsible parties (PRPs) and whether the PRPs will be financially responsible. In addition, the resident wanted to know why EPA has not released the names of other PRPs.

EPA Response:

EPA is in the process of identifying Potentially Responsible Parties (PRPs) for the Auburn Road Landfill Site. EPA has released the names of the following PRPs that have been notified:

- (1) Town of Londonderry, N.H.
- (2) Mr. George Thomopoulos
- (3) Derry Sand & Gravel, Inc.

Under CERCLA any PRP may be liable for some or all costs incurred in undertaking response actions at the site.

4. A few residents stated that finances should not be an obstacle when protecting public health. They encouraged EPA to take strong legal action against the PRPs involved.

EPA Response:

EPA concurs with taking strong legal actions against PRPs and will pursue all appropriate administrative and legal actions necessary to protect public health.

REMAINING PUBLIC CONCERNS

Issues and concerns that EPA was unable to address during remedial planning activities include the following:

- o If the water line alternative is chosen, who will pay for it? EPA was unable to address this question since negotiations are still ongoing and because Superfund has yet to be reauthorized.

APPENDIX A COMMUNITY RELATIONS

ACTIVITIES CONDUCTED AT AUBURN ROAD LANDFILL SITE

- o EPA and State officials held a public meeting to discuss conditions at the site (October 1981).
- o Information repositories were established at the Leach Library and the Londonderry Town Hall (May 1984).
- o EPA held a public meeting to discuss plans for the RI/FS. In addition, EPA issued a fact sheet summarizing cleanup plans (June 1984).
- o EPA conducted on-site discussions with local officials and interested residents and prepared a community relations plan (May 1985).
- o Press releases were issued announcing the RI/FS work plan (June 1984), progress and plans at the site (May 1985), plans for drum removal (March 1986), results of the RI (April 1986), and results of the FFS (July 1986).
- o EPA held an informational public meeting to explain progress and plans at the site May 1985.
- o EPA issued several progress and plans fact sheets during the RI/FS.
- o EPA held a public meeting at the Londonderry High School to describe the results of the RI and to respond to citizen's questions (April 30, 1986). Approximately 200 local citizens, officials and media attended the meeting. A fact sheet describing the RI was distributed and a public meeting summary was prepared.
- o Focused feasibility study was released for public review and comment (July 1986).
- o EPA held a public meeting at the Londonderry Junior High School to announce the results of the FFS and to respond to citizen's questions (July 30, 1986). Approximately 50 local citizens, officials and media attended the meeting. A fact sheet describing the cleanup options was distributed. In addition EPA presented the results of the endangerment assessment which assessed the potential risks to public health from contaminants at the site.
- o EPA held a public hearing at the Londonderry Junior High School to record comments from the public (August 6, 1986). A transcript of this hearing is available at the Leach Library and the Londonderry Town Hall.
- o The public comment period on the FFS lasted from July 24 until August 14, 1986.