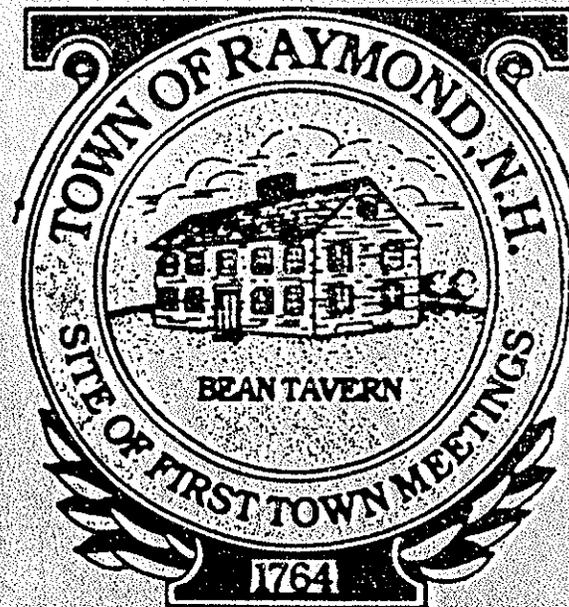


# WELLHEAD PROTECTION PROGRAM

RAYMOND, NEW HAMPSHIRE



Prepared by the  
Southern New Hampshire Planning Commission

May 1992

# **WELLHEAD PROTECTION PROGRAM**

Prepared for the

**TOWN OF RAYMOND, NEW HAMPSHIRE**

by the

**Southern New Hampshire Planning Commission**

May 1992

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## FORWARD

Financial support for the development of this program was provided by the United States Environmental Protection Agency.

One of the objectives of this project is to demonstrate how a transferrable and cost-effective local wellhead protection program can be developed for a municipal water system with regional planning assistance and the use of available local, regional, and state data base resources.

In so doing, this project also complements and helps to accelerate the State's efforts to implement an effective statewide wellhead protection program.

The Board of Selectmen and the Southern New Hampshire Planning Commission greatly appreciate the support and assistance provided by personnel of the Ground Water Management Section of the U.S. Environmental Protection Agency, Region I; the staff of the Wellhead Protection Program, New Hampshire Department of Environmental Services; and the New Hampshire Office of State Planning.

The numerous Town officials, employees, landowners, and members of the Raymond business community who cooperated on this project are also recognized and thanked for their assistance.

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## PURPOSE

The purpose of this project is to develop and implement a local wellhead protection program to prevent or minimize the potential for contamination of the Town of Raymond municipal water supply. This effort was undertaken in support of state and federal efforts to protect valuable groundwater resources.

Section 1428 of the federal Safe Drinking Water Act Amendments of 1986 established a national "Wellhead Protection Program" to safeguard groundwater resources supplying public drinking water systems. This program requires each of the states to develop and implement its own plan in accordance with U.S. Environmental Protection Agency (EPA) requirements.

New Hampshire's wellhead protection program was developed by the New Hampshire Department of Environmental Services (NHDES) and was approved by the EPA in September 1990. This program provides for a comprehensive process to protect and preserve groundwater quality in wellhead areas.

Raymond officials and residents know all too well that groundwater can be contaminated by a variety of human activities and land uses. The accidental discharge or spillage of hazardous materials on the land, or their wrongful disposal can have severe and lasting adverse impacts on the quality of groundwater and can often render it unsuitable for drinking water supply.

The Town of Raymond Wellhead Protection Program is not only an example of a changing attitude toward the way that business is conducted in the wellhead areas, which represents a shifting of emphasis away from the after-the-fact identification and remediation of contaminated groundwater supplies, but it is also an example for other groundwater suppliers as to how they can develop similar programs of their own.

With the completion of this project, local officials will have the supporting documentation necessary to implement wellhead protection under the provisions of the "Groundwater Protection Act" (New Hampshire Revised Statutes Annotated Chapter 485-C). RSA 485-C, most of which became effective on June 28, 1991, provides the community with the legislative framework within which land use activities and practices can be managed at the local level to provide maximum protection for groundwater flowing to the public water supply wells. The statute also provides a mechanism whereby other locally important groundwater resources can be afforded a measure of protection which was heretofore not available.

## BACKGROUND

The Town of Raymond is located in southeastern New Hampshire, approximately midway between the City of Manchester, which lies to the west, and the seacoast area to the east (see Map 1). New Hampshire Route 101 is the primary east-west highway through the community, providing access to Interstate Highway 93 in Manchester and Interstate Highway 95 along the coast. Each of these Interstates is approximately seventeen miles from Raymond.

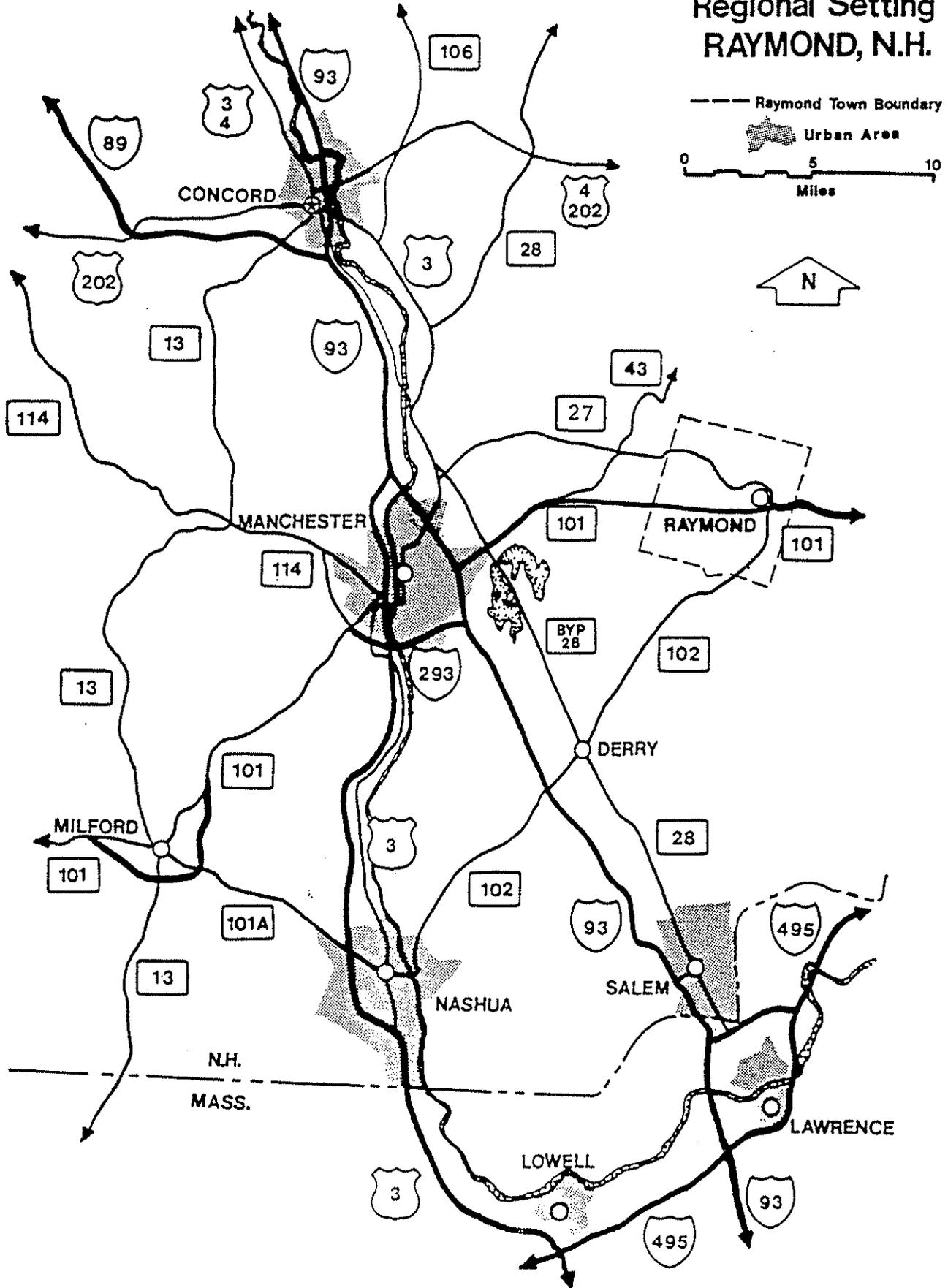
Raymond had a 1990 Census population of 8,713, approximately thirty percent of whom (2,800 residents) are served by the municipal water system (see Map 2) which derives its supply from two gravel-packed wells (PW-1 and PW-2) located in the floodplain of the Lamprey River. The wellfield is located approximately 1,400 feet north of Old Manchester Road and approximately 2,000 feet east of Onway Lake Road. The wellhead locations range from approximately 150 to 250 feet from the Lamprey River. PW-1 was originally developed (date unknown) by the Manchester Sand and Gravel Co. and was purchased by the Town in 1972. PW-2 was developed by the Town in 1989.

The Town's original dug well, which is located at the end of School Street, has not been accepted by the NHDES as a source of supply for the municipal water system, and has therefore, not been considered for protection under this program.

The municipal water system provides approximately 200,000 gallons per day to its customers. Nearly seventy percent of the demand (140,000 gallons) is used for domestic purposes. Commercial and industrial uses each consume approximately 20,000 gallons daily. An estimated 20,000 gallons daily is unaccounted for. According to the Water Supply Study For Southern New Hampshire (May 1990), the available source capacity is estimated to be approximately 1.7 million gallons per day (MGD). The projected year 2000 average and maximum daily demands are 0.40 MGD and 0.80 MGD, respectively.

In recent years, the Town has constructed several extensions of the municipal water distribution system, with at least one such project having been undertaken to replace a number of private wells that had become contaminated and had to be abandoned. That incidence, and the discovery of an illegal hazardous waste disposal site within the Exeter River basin in the southeastern corner of the community, some distance removed from the municipal wells, has made Town officials and residents painfully aware of the dangers associated with groundwater contamination. In addition, local efforts to expand the economic base of the community, and the presence of a relatively large amount of generally undeveloped industrial land in proximity to the municipal wellfield, have provided the impetus to undertake this program.

# Regional Setting RAYMOND, N.H.



## THE PROCESS

The development of this protection program followed a relatively uncomplicated and inexpensive process which utilized professional and technical assistance services and data base resources which are readily available to all New Hampshire communities. These resources are briefly described below.

**Professional and Technical Assistance** - Every New Hampshire community has access to the professional and technical services provided by the regional planning agency which serves its area. By virtue of their educational and professional backgrounds, the personnel of these organizations are experienced in dealing with water resource management and protection issues, and the processes which must be followed to develop credible wellhead protection programs. The records of these agencies often contain a wealth of resource material concerning the communities which they serve. In addition, their staff are familiar with state agency personnel and programs, and they are experienced in tracking information and resources that may only be available in state agency files.

Technical assistance is also available to New Hampshire communities from the Wellhead Protection Program, New Hampshire Department of Environmental Services (NHDES). On request, the Wellhead Protection Program will perform the Phase I wellhead protection area delineation, or review the local process for consistency with established delineation guidance. The appropriate forms to be used to request such assistance appear in the appendices of the NHDES publication Phase I Wellhead Protection Area Delineation Guidance, October 1991. This document provides an excellent explanation of the accepted delineation process and a description of the types and uses of the information necessary to conduct the delineation process.

**Data Base Resources** - Various resources are available for the identification of potential contamination source data. At the state level, the NHDES will provide a record of the availability of data in their files relative to a groundwater hazards inventory, underground petroleum storage tank registrations, sludge and septage disposal sites, hazardous waste handlers, hazardous waste compliance inspections and complaints records, solid and hazardous waste disposal sites, etc. The data request form to be used to obtain such information is provided in Appendix I of the NHDES publication Developing a Local Inventory of Potential Contamination Sources, October 1991. This publication also identifies other state agency and local and private data sources that should be considered when developing the local inventory of potential contamination sources.

## METHODOLOGY

The Southern New Hampshire Planning Commission utilized the above-cited NHDES publications for basic guidance in carrying out this project. This was done for several reasons.

First of all, since the officials of the Town of Raymond are expected to consider implementing a local groundwater management program as authorized by the New Hampshire "Groundwater Protection Act" (RSA 485-C), the development of that program must occur in compliance with the requirements of the Act and the administrative rules adopted under the Act. The NHDES guidance documents specify the process by which those requirements and rules can be satisfied.

In addition, one of the objectives of this project is to demonstrate a transferrable and cost-effective process whereby other groundwater suppliers can develop their own programs for implementation under RSA 485-C. Their plans, if they are to be consistent with the requirements of the Act and the administrative rules, must be developed in accordance with the same guidance.

Last, but not least, the project provided a first opportunity to test the workings of the guidance process.

**Phase I Delineation** - One of the early activities in the wellhead protection area (WHPA) delineation process was to accurately identify the locations of the municipal wells to Geographic Information System (GIS) standards to facilitate the entry of the locations into the statewide data base. This was done by NHDES personnel using the Global Positioning System. These locations were then plotted on a U.S. Geological Survey (U.S.G.S.) quadrangle (Mt. Pawtuckaway, N.H., 7.5 minute series, 1981) having a scale of 1:24,000 (1" = 2,000'). The quad sheet, which provides topographic information to help establish watershed and flow boundaries for the wells, was used as the base map for delineating the wellhead protection area.

The procedures followed for the delineation of the down gradient, side gradient and upgradient boundaries of the wellhead protection area, each of which is determined somewhat differently, were those outlined in the Phase I Wellhead Protection Area Delineation Guidance manual.

Down and Side Gradient Boundaries - The guidance manual provides that the down and side gradient boundaries of the wellhead protection area be calculated by the Uniform Flow Equation which utilizes three factors - - aquifer transmissivity data (the average daily rate at which the aquifer transmits water); the hydraulic gradient of the water table (the difference in elevation over a given horizontal distance); and the maximum pumping rate of the wells (in gallons per minute).

The October 1989 engineering report Production Well PW-2 Town of Raymond, New Hampshire prepared by Ground Water Associates, Inc., consultant to the Raymond Water Department, was the source for the transmissivity data, as well as the recommended maximum combined pumping rate of the two wells. The water table gradient was determined from the 1990 study Geohydrology and Water Quality of Stratified-Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire.

The Uniform Flow Equation is as follows:

$$\frac{-Y}{X} = \tan \frac{2 \text{ pi } (Ti)}{Q} Y$$

$$X = \frac{Q}{2 \text{ pi } (Ti)} \quad Y = \frac{Q}{Ti}$$

Q = Maximum Pumping Rate (in ft<sup>3</sup>/day)  
(To convert GPM to ft<sup>3</sup>/day, multiply the GPM value by 192.5)

T = Transmissivity (in ft<sup>2</sup>/day) = Hydraulic Conductivity times the Saturated Thickness  
(To convert Gal/Day/ft to ft<sup>2</sup>/day, multiply the Gal/Day/ft value by 0.1330)

$$2 \text{ pi } = 6.28318$$

X = Down Gradient Distance (in feet)

Y = Total Width of the WHPA (in feet)

i = Hydraulic Gradient, represented by the fraction

$$\frac{\text{Change in Elevation of Water Table}}{\text{Distance in Which Change Occurs}} = \frac{\text{Rise}}{\text{Run}}$$

The following values were used in the equation:

$$Q = 125,125 \text{ ft}^3/\text{day} \text{ (650 GPM X conversion factor of 192.5)}$$

650 GPM represents the maximum combined pumping rate for the two wells, as recommended by the Water Department's engineering consultant

$$i = 0.00316$$

This water table gradient was calculated from data provided in the aquifer mapping project.

$$T = 7,714 \text{ ft}^2/\text{day} (58,000 \text{ Gal/Day/Ft X conversion factor of } 0.1330)$$

58,000 Gal/Day/Ft represents the "effective transmissivity" of the aquifer as determined by the engineering consultant.

The input of these known values into the Uniform Flow Equation is as follows:

- a. To determine the down gradient boundary:

$$X = \frac{125,125}{(6.28318)(7,714)(0.00316)} = \frac{125,125}{153.160} = 817 \text{ feet}$$

817 feet is the distance from the wells to the down gradient boundary.

- b. To determine the side gradient boundaries:

$$Y = \frac{125,125}{(7,714)(0.00136)} = \frac{125,125}{24.4} = 5,128 \text{ feet}$$

5,128 feet is the maximum width of the WHPA. Thus, the radii to each side, from the wells, was calculated as being approximately 2,600 feet.

These distances were then plotted on the U.S.G.S. quad sheet and connected by an arc intersecting all three points.

Upgradient Boundary - The manual further provides that the upgradient boundary be plotted on the U.S.G.S. quadrangle on the basis of topography (to identify the watershed area for natural drainage toward the wellfield), and/or a 4,000-foot horizontal distance measured upstream from the wells. It is necessary that both be plotted in order to distinguish which of the two, or portions thereof, lie closer to the wells. Whichever one is encountered first, at a particular location, becomes the boundary at that point. In this case, both the drainage divide and the horizontal distance were used to define the approximate limits of the upgradient boundary.

The side gradient termini were then extended to intersect with either the drainage divide or the 4,000-foot horizontal distance, as appropriate, in order to complete the WHPA boundary. (see Map 3)

It should be noted that the Town of Raymond Code Enforcement Officer/Health Officer (CEO/HO) expressed concern for what he felt was a limited WHPA. He identified potential contamination sources located beyond the wellhead protection area boundary, in proximity to the Lamprey River. Furthermore, he was familiar with the 1990 aquifer mapping project, Geohydrology and Water Quality of Stratified-Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire, which was undertaken by the U.S. Geological Survey and the Water Resources Division of the N. H. Department of Environmental Services.

The aquifer mapping project identifies the highly productive aquifer which supplies the municipal wells, and a somewhat less productive, but nevertheless locally important aquifer and its contributing drainage area which extends beyond the boundary of the WHPA. Several potential contamination sources are associated with land use activities conducted on this aquifer or within its contributing area. Thus, the CEO/HO is concerned that a discharge occurring in this area might have an adverse impact on existing and future development which is now and will likely continue to be dependent upon this adjacent water resource.

There is a similar concern for the municipal water supply because of the apparent relationship between the two aquifers. In the likely event that the production of the existing municipal wells is increased or if additional municipal wells are needed in order to meet increased future demand, a portion of this adjoining aquifer could be expected to contribute groundwater to the municipal system. Thus, a discharge within the adjoining area could possibly contaminate the municipal supply.

The value of this adjacent aquifer as a locally important water resource is further indicated by the fact that seven non-municipal public water systems and a great many private wells which have been developed in the adjoining area serve approximately three hundred (300) dwelling units and several commercial activities.

This project will demonstrate how these concerns are addressed without compromising the Phase I WHPA delineation process, and how the municipality can implement an effective groundwater protection program, for both areas, under the provisions of RSA 485-C.

**Delineation of the Lamprey River Aquifer Area** - Extending from the delineated wellhead protection area boundary, the topographic drainage divide which identifies the area contributing to the adjacent Lamprey River aquifer was also defined on the quad sheet. This resulted in the delineation of the geographic area within which surface flows would gravitate to the aquifer, and included most of the potential contamination sites located outside of the WHPA for which the Health Officer had concern.

The wellhead protection area boundary and the contributing drainage area for the adjoining aquifer were then manually transferred from the U.S.G.S. quadrangle to a 1,000-foot scale composite tax map supplied by the Town. The boundary locations were then compared to the property tax map index sheet to identify the individual property tax maps that would be needed initially, to compile a listing of the individual parcels within or in proximity to each area, and later, to locate potential contamination sources in the field.

The delineated areas were again, manually transferred from the composite tax map to the individual property tax maps, the scales of which ranged from seventy-five (75) to five hundred (500) feet per inch.

**Identification of Potential Contamination Sources** - A list of parcels, by tax map number, was compiled from the large-scale tax maps to identify every parcel contained wholly or partially within each of the boundaries. This list also included the numbers of all parcels which are adjacent to those crossed by the boundaries. This was done to ensure that, in the event that field observations warranted adjusting the boundaries outward, any "fringe area" parcels containing potential contamination sources would be identified.

Having completed the boundary delineations and the parcel listings by tax map, a meeting was then held with the Code Enforcement Officer/Health Officer (CEO/HO). Using the tax maps and the parcel listings, he identified the land use status of each listed parcel. The status of each parcel e.g. residential (with number of dwelling units), auto body shop, gravel pit, quarry, small engine repair shop, parking lot, etc., etc. was recorded on the listing opposite the appropriate parcel number. In all, the study area (including adjacent lots) contains in excess of three hundred (300) parcels.

The Raymond Fire Department and several state agencies were also contacted for purposes of identifying any additional potential contamination sources that might have been inadvertently overlooked during the local phase of the data gathering process. (see Appendix I)

Working from the completed parcel listings, Commission personnel then compiled a new listing for each tax map containing the number of every parcel believed to be a potential contamination source. Only nonresidential land use activities were entered on these lists because the contaminant inventory was only concerned with the use of hazardous substances in quantities greater than that normally associated with household use. A total of thirty-five (35) parcels were thus initially identified as being potential contamination sources. Nine (9) of these sites were within the delineated wellhead protection area. The remaining twenty-six (26) sites were within the adjacent Lamprey River aquifer area.

The Town Assessor's office was then provided with a separate form for each property. These forms contained the tax map and parcel number for each property preliminarily determined to contain a potential contamination source. Space was provided on the forms for the Assessor's office to enter the street address of the parcel, the name and mailing address of the property owner, and the common name of the business as shown on the individual tax cards for the listed properties. In most cases, the tax cards did not contain street addresses for the parcels or the business names. Such information would have been helpful when a windshield survey was conducted for purposes of verifying land use information because it is often difficult to identify sites in the field using just the property tax maps.

Other in-house preparations made prior to conducting the land use verification work included: a) highlighting the number of each of the thirty-five (35) parcels on the appropriate large-scale tax map; and b) identifying the Standard Industrial Classification code (SIC) for each land use activity that was to be field checked.

The SIC is a very specific and widely used system for classifying businesses, industries, and government employers by type of industry. Categories in the classification system are often distinguished by the services or products they either deliver, manufacture, sell, maintain, store, or otherwise treat on-site. The significance of knowing the SIC code is that it helps to confirm the land use activity as a potential contamination source rather than simply relying on the name of the business as might be indicated in the local tax records. As an example, an automotive repair and service station business is more important to include in the inventory than a business which deals exclusively with the retail sale of auto parts manufactured off site. Both could be identified as Joe's Automotive in the tax records.

The information identifying the type of land use activity, as provided by the Code Enforcement Officer/Health Officer, was particularly helpful in assigning the SIC code. Although the Department of Environmental Services guidance document Developing a Local Inventory of Potential Contamination Sources (October 1991) contains a list of 2-digit SIC codes of the types of activities that should be considered as potential contamination sources, Commission personnel found that the Standard Industrial Classification Manual (1987) was more comprehensive, in addition to being faster and easier to use, because it contains an extremely detailed alphabetical listing of literally thousands of land use activities. Thus, the SIC manual was the source of the 3-digit codes which were assigned to the activities that were to be verified in the field.

**(NOTE: Although the NHDES guidance document referred to in the preceding paragraph contains a listing of thirteen recommended 2-digit SIC codes which should be considered if data bases are to be sorted by SIC codes, that listing should not be construed to be all inclusive. In the case of this particular project, the local land use inventory, and the on-site inspections and owner/operator interviews resulted in the identification of activities considered to be potential contamination sources which were representative of nine (9) SIC codes which are not listed in the document.)**

**Public Information** - Prior to initiating the on-site inspections and landowner interviews to confirm the identification of potential contamination sources, the Board of Selectmen held a public information meeting. At this session, a representative of the Wellhead Protection Program, Groundwater Protection Bureau, of the New Hampshire Department of Environmental Services provided a brief explanation of the statewide wellhead program, as well as a summary of the provisions of the state's new "Groundwater Protection Act."

A representative of the Southern New Hampshire Planning Commission then explained the circumstances under which the Town and the Commission became involved with the development of this project. From there, the delineation and identification processes were reviewed in much the same manner as they are described above. Representatives of the Raymond Planning Board and the Conservation Commission were in attendance for this briefing, as were the Code Enforcement Officer/Health Officer and the Public Works Director, although the latter two individuals were familiar with the project and the process, having been previously involved in the preparatory work.

Following the public information meeting, local officials wrote to the owners of record of all properties preliminarily identified as being potential contamination sources. These letters informed the owners of the study, advised them of the time when the on-site inspections and interviews would be conducted, and requested their cooperation in assisting the Southern New Hampshire Planning Commission personnel with the field work.

The sample landowner notification letter provided in the NHDES publication Developing a Local Inventory of Potential Contamination Sources was modified to identify the property of interest by tax map and lot number; to help obtain the name and telephone number of a contact person for those businesses that are not operated by the property owner; to locate a local representative of an out-of-town owner/operator; and to make arrangements to enter sites that are operated intermittently or on a seasonal basis. The need for such modifications was prompted by comparing information contained in the local tax records with observations made in the field during the preliminary land use verification process. The sample letter appears in Appendix II.

**On-Site Inspections** - The on-site inspections were conducted during late March and early April 1992. One of the hazards of conducting such surveys during the winter months is that snow cover can make it difficult or, in some cases, impossible to obtain accurate on-site observations. Thus, all field inspections were scheduled for times when there was no snow cover.

The potential contamination source (PCS) inventory process (sample form is contained in Appendix III) utilized the tax map method (described in the NHDES October 1991 publication Developing a Local Inventory of Potential Contamination Sources) of identifying each PCS. However, prior to going on-site, Commission personnel determined that there was a better mapping technique available as an alternative to sketching site characteristics on the tax maps, in the field, as suggested by guidance materials.

To facilitate the process of mapping PCS features during the on-site inspections and owner/operator interviews, the Commission obtained copies of the building "footprints" from the respective property tax cards. The footprints were then transferred, to scale, to plain paper thereby eliminating all extraneous notations which often appear on such cards, leaving "clean" copies of the structure outlines. In most cases, these copies were then photographically enlarged to provide better detail when noting the locations of features in the field.

This proved to be extremely beneficial for several reasons. First of all, given the scales of most tax maps, there is not enough space to plot structures and other pertinent features on the parcels. Furthermore, the inspection process was expedited because time did not have to be taken, in the field, to sketch the structures, which should be done accurately. In addition, the enlarged footprints allowed the field worker to accurately plot detailed locations of interior features such as floor drains, work sinks, and hazardous materials storage locations. Exterior conditions could also be noted with much more detail and accuracy on the footprint page of the inventory form than could be shown on the tax maps.

At several of the sites, the activities were either seasonal or intermittent operations; some activities had been discontinued; the owners/operators were not on site; or the property and/or business owners were out-of-town residents. In these cases, the owners and operators, present and former, were contacted by telephone to obtain any information that was not readily apparent from the on-site inspections.

In the process of conducting the field work and the detailed on-site inspections, eleven (11) of the original sites were dropped from the list because it was determined that they did not qualify as potential contamination sources, and three (3) additional sites, which were not part of the preliminary inventory, were picked-up in the field. Thus the original list of thirty-five (35) potential contamination sources located within or immediately adjacent to the study area was reduced to twenty-seven (27) sites.

Table 1 contains a listing, by tax map and parcel number, of the nine (9) confirmed potential contamination sources which were identified, through on-site inspections and the landowner/business owner interviews, as being located within the delineated wellhead protection area.

**Table 1**  
**Potential Contamination Sources**  
**Within the Wellhead Protection Area**

<u>Map</u>	<u>Lot</u>	<u>Address</u>	<u>Common Name</u>	<u>Activity</u>
5	14	S.W. corner Scribner & Gile roads	Midway site	quarry
5*	37	Cider Ferry Rd.	Cammett Recreation area	baseball, sand pit & wellfield
5	next to 45-3	Sundeen Parkway	none	cemetery
5	46	Cider Ferry Rd.	Midway pit	gravel pit
5	46A	Cider Ferry Rd.	Turcotte pit	gravel pit
5	52-6	1 Scribner Rd.	Safety Complex	Police & Fire depts.
5	56	11 Batchelder Rd.	T-C-B Towing	towing service
5	next to 59	Gile Rd.	none	cemetery
46	15	Green Rd.	Midway site	quarry

\*According to Public Service of New Hampshire, the three electric transformers located at the wellfield pumping station were manufactured after 1979 and do not contain PCBs.

Table 2 contains a listing, by tax map and parcel number, of the sixteen (16) confirmed potential contamination sources which were also identified through on-site inspections and landowner/business owner interviews as being located within the contributing area of the Lamprey River aquifer which adjoins the wellhead protection area.

**Table 2**

**Potential Contamination Sources  
Within the Contributing Lamprey River Aquifer Area**

<u>Map</u>	<u>Lot</u>	<u>Address</u>	<u>Common Name</u>	<u>Activity</u>
5	38	Old Manchester Rd.	Lamprey River Elementary School	school
5	52-5	4 Industrial Dr.	Pike Ind., Inc.	asphalt
7	3A	Rte. 27	Town pit	gravel pit
7	4	263 Rte. 27	Dave's	eng. rep.
7	7	Rte. 27	Hammond pit	gravel pit
7	7-4	266 Rte. 27	NH Elect. Co-op.	parking
7	12	Rte. 27	Thibeault pit	gravel pit
7	13	Rte. 27	Thibeault pit	gravel pit
7	14	Rte. 27	Thibeault pit	gravel pit and quarry
8	21-4	181 Rte. 27	J.C. Reed	vehicle rep. & parking
15	4	223 Rte. 27	none	junk yard
15	5	221 Rte. 27	formerly Lou's	truck rep.
15	8	Rte. 27	none	parking & asphalt disposal
15	27-3	246 Rte. 27	Grant's	auto rep.
15	32	236 Rte. 27	Don's	auto rep.
21	1	169 Rte. 27	Raymond Animal Hospital	veterinary clinic

Table 3 identifies two (2) confirmed potential contamination sources which are located immediately adjacent to the contributing Lamprey River aquifer area.

**Table 3**  
**Potential Contamination Sources**  
**Adjacent to the Contributing Lamprey River Aquifer Area**

<u>Map</u>	<u>Lot</u>	<u>Address</u>	<u>Common Name</u>	<u>Activity</u>
7	30	16 Dudley Rd.	Beardsley homestead	art lab.
7	next to 30	Dudley Rd.	Dudley-Tucker	cemetery

Copies of the Potential Contamination Source Inventory forms prepared for each of the twenty-seven (27) confirmed sites are on file with the Town of Raymond Planning Board. These records contain all the information that was obtained for each site on the basis of the on-site inspections and the owner/operator interviews. In addition to the location, ownership, operator, and land use activity information, these forms identify the types and estimated amounts of potential contaminants handled and/or produced by the activities. Where the sites contain structures, the structure "footprints" are provided, and as appropriate, the locations of the contaminants, wells, and septic systems are identified, along with other pertinent characteristics of the sites or the activities carried out on the sites.

Table 4 contains an aggregate summary of the types and estimated quantities of hazardous materials identified within or immediately adjacent to the study area.

**Table 4**

**Types and Estimated Quantities of Hazardous Materials**

<u>Type of Substance</u>	<u>Estimated Quantity</u>
Gasoline	40 gallons
Diesel	505 gallons
Kerosene	280 gallons
#2 Fuel oil	12,125 gallons
#4 Fuel oil	15,000 gallons
Propane	5,000 gallons
Liquid asphalt	40,000 gallons
Motor oil	526 gallons
Waste Oil	700 gallons
Automatic transmission fluid	16 gallons
Anti-freeze (gasoline and/or coolant)	41 gallons
Grease (lubricating)	123 pounds
Battery acid	1 gallon
Solvents	115 gallons
Waste solvent	51 gallons
Hydraulic fluid	62 gallons
Paint thinner	11 gallons
Brush cleaners	2 gallons
Degreasers	1 case
Automotive paint	6 gallons
Duplicating fluid	200 gallons
Photochemicals (x-ray developer)	2 gallons

Approximately 87%, by volume, of the above-noted contaminants have been identified at the Pike Industries asphalt plant which is located just outside of the delineated wellhead protection area.

Not specifically accounted for are miscellaneous quantities of motor vehicle touch-up paints (spray cans), which were reported by various operators; the potential for one or more old transformers containing PCBs being temporarily stored in the area; and unspecified quantities of numerous products containing hazardous substances which the Raymond School District has reported as being available at the Lamprey River Elementary School.

Other potential contamination sources, which are categorized as non-point pollutant sources (as opposed to the site-specific contaminants previously identified), include all Town and state roadways located within the delineated protective areas. These are included for two reasons.

First of all, these transportation corridors are salted during the winter season by the Raymond Highway Department and the New Hampshire Department of Transportation. Road salt and other deicing chemicals, if not applied sparingly, can contaminate surface as well as groundwater supplies. Because of this concern, the Raymond Highway Department utilizes a mix of salt and sand (one part salt to three parts sand) in an effort to help minimize the adverse effects of winter road maintenance on the community's water resources. According to the Public Works Director, this is the least amount of salt that can be used effectively and still help to ensure highway safety. The Department of Transportation applies straight salt, without any sand mix.

The transportation corridors are also considered potential contamination sources because of the risks inherent in the movement of petroleum products and other hazardous substances, by highway transport. The accidental discharge of regulated substances as the result of a motor vehicle accident should be considered a potential danger, particularly in the area of exit 4 on NH Route 101 (because of its proximity to the Town wellfield), or along any other roadway within the protective areas.

The locations of the twenty-seven (27) potential contamination sources are identified on Maps 4 and 4a. All transportation corridors within the study area are treated with deicing chemicals during the winter season and are, therefore, also considered as potential contamination sources.

## CONCLUSIONS

**Assessment of Best Management Practices** - Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the risk of contamination of groundwater. BMPs are intended to strike a reasonable balance between environmental, energy, and economic impacts, and to be common sense procedures and standards that can be practically implemented. Although the New Hampshire Department of Environmental Services has developed proposed rules governing best management practices (to be enacted as PART Env-Ws 421 under the New Code of Administrative Rules), there currently are no local or statewide requirements for compliance with such practices as a means of preventing and/or minimizing the risks of groundwater contamination. The on-site inspections and owner/operator interviews conducted under this wellhead protection program revealed that there is, indeed, a need for such requirements.

It was apparent that some of the owners/operators have attempted to minimize contamination risks, but it was also apparent that there is either a disregard for, or ignorance of, the need to protect both surface and groundwater quality.

Examples of attempts to institute protective measures were noted in several instances where above-ground petroleum storage facilities were observed to have been positioned within concrete containment vessels, but there was also evidence that some, if not most of the containments appeared to be of inadequate size to accommodate the capacity of the tanks contained therein.

Where such containment vessels were uncovered (exposed to the elements), there did not appear to be sufficient capacity within the vessels to contain both the tank contents and precipitation. This was not confirmed through actual measurement.

One uncovered concrete containment vessel was observed to have leaked in one or more locations which has allowed petroleum to enter the surrounding ground. This same vessel was constructed with an open drain pipe which will permit the discharge of approximately one-half of its contents to the ground. A 1,000 gallon capacity diesel tank (which was determined to be full to within about four inches of its top) which was within this containment was leaking. The filler hose from this tank was not equipped with an automatic nozzle which would shut off the flow when the receiving tank was full. (Note: This situation has been observed by the Planning Board, and has since been corrected.)

No drip pans were observed in any instance where transfers of petroleum products were likely to be made from one vessel to another.

In one instance, a "holding tank," rather than a septic system, is reportedly being used for sanitary wastewater disposal, and the owner claimed that it has never been pumped. It is more likely that the facility might be nothing more than a dry well.

**Review of Health Regulations** - The "Health Officer Regulations, Town of Raymond, New Hampshire" (amended May 7, 1984), which have been enacted under the provisions of RSA 147, although rather comprehensive, do not contain any provisions requiring periodic inspection and maintenance of sanitary wastewater disposal systems. Furthermore, these Regulations do not address the relatively new concept of instituting best management practices for the handling or use of hazardous materials.

**Control Over Land Use and Development** - The local tax records, which were reviewed during the land use inventory process, indicate that the vast majority of the land located within the delineated wellhead protection area is privately owned. Relatively little land in this area is directly controlled, through ownership, by the Town of Raymond. Thus, for most parcels, land use and development activities within the wellhead protection area must now be controlled through the enforcement of the zoning ordinance, and the subdivision, nonresidential site plan review, and health regulations. Active management of potential threats within the wellhead area could be instituted through a protection program authorized under RSA 485-C.

**Other Regulatory and Nonregulatory Mechanisms** - The Southern New Hampshire Planning Commission is, on the behalf of the Raymond Planning Board, in the process of completing a local water resource management and protection plan for the entire community. This wellhead protection program will become an important element of that document. The local water resource management and protection plan, which is a required component of the master plan, will include an in-depth evaluation of all local codes, ordinances and regulations for the express purpose of identifying areas where gaps and deficiencies in the local regulatory controls need to be corrected.

The local water resource management and protection plan will also be required to address nonregulatory mechanisms which could be utilized by the local school district, the Water Department and others to provide educational and informational programs and materials to help facilitate groundwater protection throughout the community.

There is a demonstrated need for the development of particular regulatory and nonregulatory mechanisms which should focus on minimizing the risk potential associated with the other types of human activities that will not be subject to best management practices under PART Env-Ws 421 of the New Hampshire Code of Administrative Rules.

**Program Maintenance** - Because there are statutory bases for separate planning and enforcement responsibilities, continued maintenance and active inspection and management of the wellhead protection program will involve more than a single entity. The recommendations made in this document call for joint participation in the program implementation and maintenance process.

The Planning Board has specific responsibilities under RSA 674 "to prepare and amend from time to time a master plan to guide the development of the municipality." RSA 674:2, VIII makes particular reference to a water resource management and protection plan, as specified in RSA 4-C:22, which should be included in the master plan. State statute also

requires that the water resource management and protection plan be reviewed and revised, as necessary, at least every five years. Thus, the wellhead protection program, which is an important element of the water resource component, would be subject to periodic review and possible revision, by the Planning Board, as circumstances change.

The Health Officer has specific responsibilities to protect the public health of the community under RSA 147, and will inherit additional authority for enforcement of best management practices under RSA 485-C when reclassification of groundwater, as recommended herein, is accomplished under the Groundwater Protection Act.

Therefore, the adoption, implementation, enforcement and continued maintenance of the wellhead protection program will not be the responsibility of a single actor.

## RECOMMENDATIONS

The protective areas delineation process and potential contamination sources inventory will not have achieved lasting significance unless and until certain additional steps are instituted by local officials. Therefore, it is recommended that the following actions be taken in the order indicated:

1. The Local Water Resource Management and Protection Plan should be completed at the earliest convenience, and this Wellhead Protection Program should be incorporated therein, by reference.
2. The Planning Board should submit the completed Local Water Resource Management and Protection Plan to the New Hampshire Office of State Planning for consistency review as required by RSA 4-C:20,I.
3. Following receipt of the consistency determination, the Town of Raymond Planning Board should take appropriate action in accordance with the provisions of NH RSA 674:4 and NH RSA 675:6 to adopt the Local Water Resource Management and Protection Plan as an amendment to the 1989 Master Plan.
- 4.\* The Town of Raymond Health Officer should prepare, for the consideration of the Board of Selectmen, appropriate amendments to the Town of Raymond "Health Officer Regulations" which would implement an inspection and management program to protect water quality within the delineated groundwater protection areas in particular, and throughout the community.

A suggested replacement for the existing "Health Officer Regulations," which is subject to further modification, is presented in Appendix V.

5. The Planning Board, acting as the local entity under NH RSA 485-C, should submit a copy of this adopted Program, including the proposed inspection and management program referenced above, to the Director of the Division of Water Supply and Pollution Control, New Hampshire Department of Environmental Services, and petition the Director to seek, from the Commissioner, a reclassification of the groundwater within the delineated wellhead protection area as GAA, and a reclassification of the groundwater within the adjacent delineated area as GA1.
6. The Board of Selectmen should concur, in writing, with the Planning Board request for reclassification, and such concurrence should accompany the Planning Board's submission as required by NH RSA 485-C.
7. Upon receipt of notification of reclassification from the Commissioner, the Board of Selectmen should take appropriate action to enact the recommended inspection and management program.

(NOTE: Enforcement of the best management practices inspection program requirements authorized under RSA 485-C, as would be enacted under the local health ordinance, would be applicable only in the areas where groundwater is reclassified GAA and GA1. Thus, such requirements would pertain to only those sites identified in Tables 1 and 2, in addition to any potential contamination sources which might subsequently be established in these delineated protection areas.)

- 8.\* Following completion of the above actions, the Planning Board should propose the suggested amendment to the Zoning Ordinance, which is contained in Appendix VI, to the voters at the March 1993 Annual Town Meeting.
9. Concurrent with the above activities, the Conservation Commission and the Health Officer should work together to develop nonregulatory mechanisms which should focus attention on informational and educational materials and processes whereby the community at-large and land use activities which are not subject to inspection and management under the New Hampshire Code of Administrative Rules can be kept informed of water quality issues. An area of particular concern should be the development of a program to educate the public about the proper use of septic systems. The main threat to groundwater from septic systems comes from the disposal of non-sanitary materials which can be discharged untreated to the groundwater.
10. By definition, the New Hampshire Groundwater Protection Act includes the suppliers of privately-owned non-municipal public water systems drawing from groundwater as local entities for purposes of preparing wellhead protection programs for their wells.

There are obvious limitations imposed on such suppliers with respect to their ability to implement effective inspection and management programs within their wellhead protection areas when they do not have direct control over those areas through ownership. The Planning Board should explore one or more alternative means whereby the customers of those suppliers can receive protection similar to that given the residents served by the municipal system.

- \* The New Hampshire Department of Environmental Services, the Office of State Planning, and the New Hampshire Municipal Association have reviewed the provisions of NH RSA 485-C and all have concluded that the reclassification of groundwater to GAA and GA1 would automatically institute a best management practices inspection program in the GAA and GA1 areas. Furthermore, a reclassification would automatically impose certain land use prohibitions within the GAA area. They further agree that the adoption of local ordinances to implement these provisions is not necessary. Thus, any community could simply begin enforcement of the provisions of 485-C following reclassification. Implementation of the 485-C provisions through local ordinance enactment is optional.

In Raymond's case, the health and zoning ordinance recommendations contained in Appendix V and Appendix VI respectively, are made for several reasons. First of all, they are intended to publicly advise all concerned parties of the specific requirements

of RSA 485-C rather than simply making reference to that statute. Secondly, the Town of Raymond has a rather comprehensive health ordinance and zoning ordinance. Specifically citing the RSA 485-C requirements in the respective ordinances will complement the existing provisions and should help to avoid any misunderstanding of the requirements which are applicable townwide as opposed to those which would only apply within the GAA and GA1 groundwater protection areas. Thirdly, by enacting the various protective provisions in ordinance form, oversights and errors can be avoided should local administrative or enforcement personnel change.

# **APPENDIX I**

## **Other Data Sources**

Data sources, other than the local land use inventory, that were checked by Commission personnel for purposes of identifying additional potential contamination sources are as follows:

1. Local Emergency Response Plan - The Raymond Fire Chief reported that the local emergency response plan had not been prepared, however, the Fire Department was in the process of compiling materials safety data sheets from all users/handlers of hazardous materials. Review of the available files revealed only two potential contamination sources within the study area, both of which had already been identified through the land use inventory, and one of which had also reported to the New Hampshire Office of Emergency Management.
2. Toxic Release Inventory Data Base for New Hampshire - This inventory, maintained by the N.H. State Library, did not identify any facilities located in the Town of Raymond.
3. SARA Title III Tier Two Materials Safety Data Sheets - These files, maintained by the N.H. Office of Emergency Management (NHOEM), contained reports on only one facility located within the delineated wellhead protection area or the delineated groundwater protection area. This potential contamination source had been identified previously through the land use inventory process.
4. New Hampshire Department of Environmental Services - Numerous files and records of the NHDES which were checked included:
  - a. Underground Storage Tank Program - The computer listing of Underground Petroleum Storage Tank Registrations required under the N.H. Code of Administrative Rules, PART Env-Ws 411 identified sixteen sites, none of which are located within the study area.
  - b. Groundwater Hazard Inventory - This file identified a total of twenty-four sites, townwide, however, only one (which had been identified through the land use inventory process) was found to be within the study area.
  - c. Sludge and Septage Disposal Sites - No sludge or septage disposal sites were identified in the study area.
  - d. Resource Conservation and Recovery Act (RCRA) Handler List for Groundwater Protection Requests - No data was on file for any site within the study area.
  - e. Hazardous Waste Compliance Inspections/Complaints - No data was on file for any site within the study area.

- f. Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Sites - Three sites were identified, however, all are located outside of the study area. The closest site, the former Regis Tannery, is located approximately 4,000 feet downstream from the wellfield. The others are located 2.5 and 3.2 miles away, and within the Exeter River Basin.

This was the first instance of testing the "Community Data Request for Local Inventory of Potential Contamination Sources" form contained in the October 1991 NHDES publication Developing a Local Inventory of Potential Contamination Sources (Appendix I, Form I-2). NHDES is now reviewing its in-house response procedures and the data request form in order to help improve upon the response process.

**APPENDIX II**  
**Sample Property Owner Letter**

Town of Raymond

Wellhead/Groundwater Protection Program

Sample Landowner Notification Letter

RE: Property identified as Map \_\_\_ Lot \_\_\_

Dear Local Landowner:

In our community, many of our residents and businesses rely upon groundwater, which supplies our municipal water system, for drinking water and other purposes. Throughout New Hampshire, as well as in the Town of Raymond, groundwater contamination incidents have shown us the fragility of our water resources. Accordingly, we that are responsible for the health and welfare of our citizens are taking a proactive approach to help assure that our municipal water supply maintains its good quality.

One important step towards developing that strategy is to undertake an inventory of existing land use activities within the wellhead area of our municipal wells. Such an inventory is a prerequisite to identifying potential contamination sources and developing a reasonable approach to groundwater management and protection.

During the week of March 9, a representative of the Southern New Hampshire Planning Commission will be in your area working on the land use inventory and map, on our behalf. Your land/business is scheduled to be included in the inventory. It is important to note that this in no way implies that contamination has occurred on your property. The inventory and map is being prepared for groundwater protection planning purposes only.

We would appreciate your cooperation by allowing our representative onto your property, and by answering his/her questions. If you are not the owner of the business being conducted on your property, please provide the Planning Commission with the name and the telephone number of the business owner. If your business is not currently operating, please make arrangements with the Commission for access and an interview.

Should you have any questions about the inventory, or about groundwater protection generally, please contact Martha St. Amand, Town Manager (895-4735) or Jim Tethers, Chief Planner, Southern New Hampshire Planning Commission (669-4664).

Thank you in advance for participating in this Town project, which is most important to the future of our groundwater.

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Roberta Johnson, Chairman  
Board of Selectmen

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Diane White, Chairman  
Planning Board

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Richard Mailhot,  
Health Officer

**APPENDIX III**

**Potential Contamination Source Inventory Form**

Town of Raymond  
Wellhead/Groundwater Protection Program  
Potential Contamination Source Inventory Form  
(Tax Map Method)

Common Name of Site: JCR Util. Const. + Maint. SIC Code: 753  
 Land Use Category: utility const. equip. office + storage Tax Map #: 8  
 Site Address: 181 Route 27 Lot #: 21-4

Property Owner:  
 Name: Mrs. Joseph Reed Telephone #: 895-4062  
 Address: P.O. Box 331  
Raymond, NH 03077 JCR office

Business Owner: (if other than property owner)  
 Name: Christopher Reed  
 Address: 181 Route 27  
Raymond, NH 03077

Contact Person: (if other than property or business owner)  
 Name: Christopher Reed Telephone #: 895-4062

Site Conditions Checklist

Note: Include all explanations, etc. on next sheet and accurately locate the items which are cited below on the tax map.

	Yes	No
1. Is the site served by <u>on-site septic</u> or holding tank? (if neither, explain)	✓	
2. Is there an on-site water supply well? (if not, explain)	✓	
3. Are there <u>fuel</u> , other petroleum, or chemical storage <u>tanks</u> <u>drums</u> or pumps? (circle all that apply, and indicate the number, capacity, and contents, and whether they are <u>above</u> or <u>below</u> ground)	✓	
4. Are there sumps, <u>floor drains</u> , catch basins, or parking lot drains? (circle all that apply, and indicate what they are used for)	✓	
5. Are there monitoring wells? (if yes, explain their purpose)		✓
6. Are there <u>motor vehicle</u> or <u>motorized equipment</u> <u>storage</u> or <u>maintenance</u> areas? (circle all that apply, and indicate whether they are <u>indoors</u> or <u>out doors</u> )	✓	

Attachment - Land Use Inventory Form

Comments: (Identify by number from Site Conditions Checklist)

2 - Well is located approximately 30'-40' west of building; is surrounded by parked utility trucks (unpaved area with evidence of oil spillage)

3 - 500 gallon diesel fuel tank in covered area at doors -- is located within poured concrete containment 37 feet in height. Evidence of spill in front of containment, in unpaved area.

- motor oil and hydraulic oil containers in separate room with poured concrete floor w/ concrete sills for containment.

- waste oil is burned on-site in waste oil furnace used to heat garage area.

- office area heated by fuel oil contained in U.S.T. at rear of building

4 - floor drains for water used to wash vehicles, where it drains to not known

6 - vehicle maintenance performed in doors

Evidence of oil spills/leakage in unpaved out door vehicle/equipment storage area. Numerous motor vehicles and pieces of mechanized equipment stored out doors in unpaved area.

Other Comments: (Not related to Site Conditions Checklist)

Owner stated that back has advised that monitoring wells might be needed in future.

Field verification complete: Yes  No

Name of field worker: Jim Tethers, SNAHC Date: 3/25/92

Confidence in locations of sites on map:

1. Very Confident  2. Fairly Confident

Date of Inspection: 3/25/92

POTENTIAL CONTAMINATION SOURCE (PCS) HAZARDOUS MATERIAL FORM

INSTRUCTIONS: This form should be completed for each PCS, during each inspection, to identify hazardous materials used and hazardous waste generated.

Does the PCS produce hazardous wastes? Yes  No

Type of Waste Produced	Quantity Generated Per Year	Disposal Method Used
Used motor oil + hydraulic oil	500 <sup>+</sup> gallons	buried in waste oil furnace to heat garage area.
Used solvent	60 <sup>+</sup> gallons	removed by Sat-T-Kleen

Note: Contact the NH Wellhead Protection Program (271-1168) with questions or concerns regarding reported disposal practices.

Does the PCS use hazardous materials? (Note: Household size containers of common products should not be included.)

Yes  No

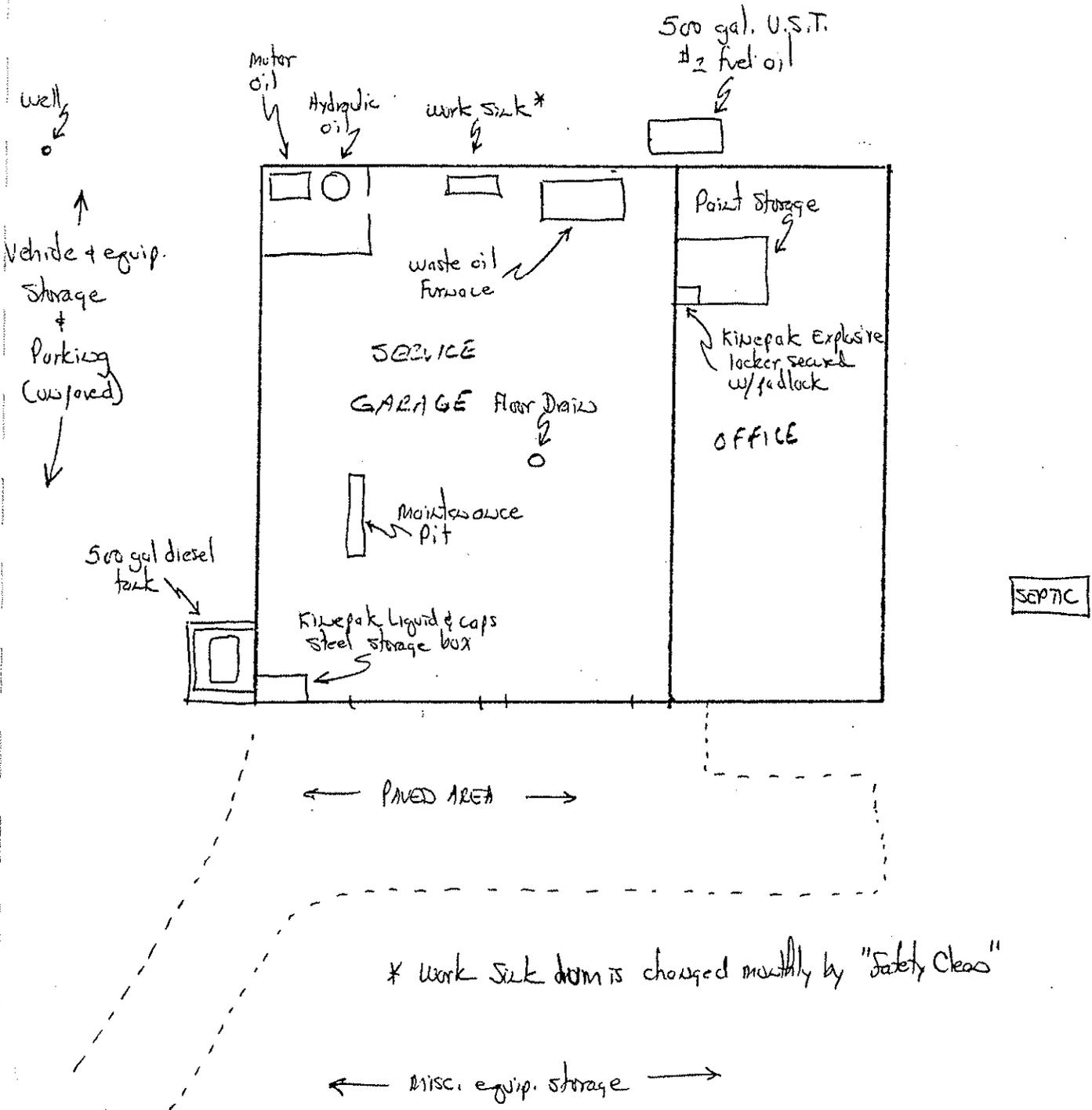
If yes, complete the following chart:

	Quantity (Gal)		Quantity (Gal)
<input checked="" type="checkbox"/> Antifreeze (for gasoline or coolant system)	6 gals	<input type="checkbox"/> Cesspool cleaners	
<input checked="" type="checkbox"/> Automatic transmission fluid	6 gals	<input type="checkbox"/> Disinfectants	
<input checked="" type="checkbox"/> Engine and radiator flushes		<input type="checkbox"/> Road salt (halite)	
<input checked="" type="checkbox"/> Hydraulic fluid (including brake fluid)	55 gals.	<input type="checkbox"/> Refrigerants	
<input checked="" type="checkbox"/> Motor oils/waste oils	250 gals. each	<input type="checkbox"/> Pesticides (insecticides, herbicides, rodenticides)	
<input checked="" type="checkbox"/> Gasoline, jet fuel		<input type="checkbox"/> Photochemicals	
<input checked="" type="checkbox"/> Diesel fuel, kerosene, #2 heating oil	500 gals. each	<input type="checkbox"/> Printing ink	
<input checked="" type="checkbox"/> Other petroleum products (grease, lubricants)		<input type="checkbox"/> Wood preservative (creosote)	
<input checked="" type="checkbox"/> Degreasers for engines or metal	1 case	<input type="checkbox"/> Lye or caustic soda	
<input type="checkbox"/> Battery acid (electrolyte)		<input type="checkbox"/> Jewelry cleaners	
<input type="checkbox"/> Rustproofers		<input type="checkbox"/> Leather cleaners	
<input type="checkbox"/> Car wash detergents		<input type="checkbox"/> Fertilizers (if stored outdoors)	
<input type="checkbox"/> Car waxes and polishes		<input type="checkbox"/> PCBs	
<input checked="" type="checkbox"/> Asphalt and roofing tar		<input type="checkbox"/> Other chlorinated hydrocarbons including carbon tetrachloride	
<input checked="" type="checkbox"/> Paints, varnishes, stains, dyes	6 gals. automotive	<input type="checkbox"/> Any other products with "Poison" labels (including chloroform, formaldehyde, hydrochloric acid, other acids)	
<input checked="" type="checkbox"/> Paint and lacquer thinners	6 gals.	<input type="checkbox"/> Other products not listed which you feel may be toxic or hazardous (please list)	
<input checked="" type="checkbox"/> Paint brush cleaners	1 gal.		
<input type="checkbox"/> Floor and furniture strippers			
<input type="checkbox"/> Metal polishes			
<input type="checkbox"/> Laundry soap and stain removers			
<input checked="" type="checkbox"/> Spot removers and cleaning fluids (dry cleaners)			
<input type="checkbox"/> Other cleaning solvents	60 (est. 5 gals/mo.)		

Name and position of person(s) completing form: Jim Tetters, SW+PC w/Christopher Ford

MAP B LOT 214

J. C. REED, INC.  
181 Route 27



## **APPENDIX IV**

### **Materials Needed**

Materials that will be needed by a municipality or other supplier of groundwater for a public water system in order to develop a wellhead protection program, and the likely sources of such materials, include the following:

1. Publications which can be obtained from the New Hampshire Department of Environmental Services:
  - a. A Guide to the New Hampshire Wellhead Protection Program and the Groundwater Protection Act;
  - b. Phase I Wellhead Protection Area Delineation Guidance;
  - c. Developing a Local Inventory of Potential Contamination Sources; and
  - d. Local Techniques Available for Groundwater Protection Under The New Hampshire Wellhead Protection Program.
2. U.S. Geological Survey quadrangle, 7.5 minute series, 1:24,000 scale for the area within which the well or wellfield is located. These can usually be purchased from a local retailer of hunting and/or fishing supplies.
3. Engineer's scale and drafting compass which should be available at any office or art supply store.
- \* 4. Composite tax map (1" = 1,000' scale preferred).
- \* 5. Large scale tax map sheets for the delineated wellhead protection area.
- \* 6. Photocopies of that portion of the property tax cards containing the building "footprint."

**\*These materials should be available at the municipal government offices.**

## **APPENDIX V**

### **Suggested Health Ordinance**

#### **Town of Raymond**

This material is a suggested replacement for the existing "Health Officer Regulations, Town of Raymond, New Hampshire." It includes all provisions of the Regulations currently in effect, and incorporates selected provisions of the "Draft Model Health Ordinance" (version dated 1/31/92) which was developed by the Office of State Planning. This material further incorporates the provisions of the draft proposed rules governing best management practices PART Env-Ws 421 (version dated 3/17/92) which were developed by the New Hampshire Department of Environmental Services (NHDES).

This material is subject to further review and modification pending local review of the final "Model Health Ordinance" and the adoption of the PART Env-Ws 421 rules.

A best management practices compliance inspection form for local enforcement use is available from NHDES.

SUGGESTED

HEALTH ORDINANCE

TOWN OF RAYMOND, N.H.

ARTICLE 1. AUTHORITY

Pursuant to the authority granted by the provisions of New Hampshire RSA 147:1 and RSA 485-C:1-20, the regulations contained herein have been promulgated by the Health Officer of the Town of Raymond.

ARTICLE II. PURPOSE

The purpose of this Ordinance is to provide for the prevention or removal of nuisances and to protect the public health and safety of the people of the Town of Raymond.

ARTICLE III. DEFINITIONS

Terms, words, and phrases used in this Ordinance shall have the following meanings:

- 3.01 Best Management Practices - Structural designs, non-structural controls and management practices for the operation of a specific business, industry, activity, or mechanism which minimizes the risk of release of contaminants to groundwater. Best management practices are further defined in the N.H. Code of Administrative Rules PART Env-Ws 421.
- 3.02 Groundwater Protection Area - The area of land surface within which a contamination control program is required.
- 3.03 Local Wellhead Protection Program - The plan, adopted by the Planning Board of the Town of Raymond, which delineates the wellhead protection area; the locally-important aquifer(s); identifies potential contamination sources located within the delineated area(s); and which recommends the actions necessary to protect important groundwater resources.
- 3.04 Potential Contamination Source - A location where human activities or operations upon the land surface pose a reasonable risk that hazardous materials may be introduced into the environment in such quantities as to degrade the natural groundwater quality. Potential contamination sources, as they are defined in RSA 485-C:7, include the following:
  - 3.041 Vehicle service and repair shops, including, but not limited to: automobile, truck, and equipment service and repair shops, autobody shops; aircraft fueling, deicing, and maintenance areas.

- 3.042 General service and repair shops, including, but not limited to: furniture stripping, painting, and refinishing; photographic processing; printing; appliance and small engine repair; boat repair, service, and refinishing; refrigeration, heating, ventilating and air conditioning shops.
- 3.043 Metalworking shops, including, but not limited to: machine shops; metal plating, heat treating, smelting and jewelry making shops.
- 3.044 Manufacturing facilities including, but not limited to: electronics and chemical manufacturing, processing, and reclamation; paper, leather, plastic, fiberglass, rubber, silicon and glass making; pharmaceutical production; pesticide manufacture; and chemical preservation of wood and wood products.
- 3.045 Underground and aboveground storage facilities for petroleum products and hazardous substances, as defined in RSA 146-C.
- 3.046 Waste and scrap processing and storage, including, but not limited to: junkyards, scrap yards, and auto salvage yards; wastewater treatment plants; dumps, landfills, transfer stations, and other solid waste facilities; and wastewater or septage lagoons.
- 3.047 Transportation corridors, including, but not limited to highways and railroads.
- 3.048 Septic systems, including but not limited to large septic systems which require a groundwater discharge permit under RSA 485-A:13.
- 3.049 Laboratories and professional offices, including, but not limited to: medical, dental, and veterinary offices; and research and analytical laboratories.
- 3.0410 Use of agricultural chemicals, including, but not limited to: golf courses; feed lots, kennels, piggeries, and manure stockpiles; parks; nurseries and sod farms; and the usage of registered pesticides.
- 3.0411 Salt storage and use for winter road and parking lot maintenance.
- 3.0412 Snow dumps.
- 3.0413 Storm water infiltration ponds and leaching catch basins.
- 3.0414 Cleaning services, including, but not limited to: dry cleaners, laundromats; beauty salons; and car washes.
- 3.0415 Food processing plants, including, but not limited to: meat packing and slaughterhouses; dairies; and processed food manufacture.

3.0416 Fueling and maintenance of excavation and earthmoving equipment.

3.0417 Concrete, asphalt and tar manufacture.

3.0418 Cemeteries.

3.0419 Hazardous waste facilities regulated under the Resource Conservation and Recovery Act, as implemented by RSA 147-A.

3.05 Private Sewerage Disposal System - Any subsurface sanitary wastewater disposal system, or part thereof, which is not owned or operated by the Town of Raymond.

3.06 Private Water Supply Well - Any water supply system which draws from a groundwater source and which is not owned or operated by the Town of Raymond.

#### ARTICLE IV. SUBSURFACE SANITARY DISPOSAL SYSTEMS

##### Section 4.01 Applicability

The provisions of this Article shall apply to all subsurface sanitary wastewater disposal systems (septic systems) located within the Town of Raymond.

##### Section 4.02 Local Review of Applications for System Approval Required

All applications for new or replacement subsurface sanitary wastewater disposal systems, and all subdivision plans for such systems shall be submitted to the Health Officer for review and approval prior to submission to the Water Supply and Pollution Control Division.

##### Section 4.03 Design Plans Required

All applications for approval of subsurface sanitary wastewater disposal systems governed by this Ordinance shall be accompanied by design plans prepared by a licensed system designer in accordance with the following minimum standards:

4.031 Plans for all proposed private sewerage disposal systems shall be drawn to a scale of one (1) inch equals twenty (20) feet.

4.032 All plans shall bear the seal and signature of a licensed system designer.

4.033 All plans shall be prepared in accordance with the design standards as specified in the Subdivision and Individual Sewage Disposal System Design Rules of the N.H. Department of Environmental Services, as may from time-to-time be revised.

#### Section 4.04 General Requirements

- 4.041 No private sewerage disposal system, including but not limited to privies, cesspools, septic tanks, dry wells, and/or leach fields shall hereafter be constructed or installed less than thirty-seven and one-half (37 1/2) feet from a property line, except any property line which abuts a public right-of-way. The set-back requirement for systems or system components from the edge of the public right-of-way shall be thirty-seven and one-half (37 1/2) feet, less one-half (1/2) of the width of the right-of-way, but not less than ten (10) feet.
- 4.042 No private sewerage disposal system including, but not limited to privies, cesspools, septic tanks, dry wells, and/or leach fields shall be located less than seventy-five (75) feet from any well.
- 4.043 No sewerage disposal system line shall cross a private water supply line, unless the sewerage line is encased in accordance with the specifications of the Water Supply and Pollution Control Division of the N.H. Department of Environmental Services.
- 4.044 No private sewerage disposal system shall serve, or be allowed to continue serving, more than one dwelling unit, except as otherwise provided for herein. In a manufactured housing park, one system may serve no more than two manufactured homes unless a state-approved system is installed to serve the entire park.
- 4.045 All plans for proposed private sewerage disposal systems shall include:
- a. the locations of all existing wells situated within one hundred (100) feet of any part of the proposed systems; and
  - b. the location of any well to be constructed on the lot.
- 4.046 Test pits shall be prepared and percolation tests shall be performed prior to the design of any septic system. The pits and the tests shall be observed by the Town of Raymond Health Officer. This provision shall also apply to the tests required by the Water Supply and Pollution Control Division for subdivision approval.
- 4.047 All private sewerage disposal systems for residential use, other than those serving multi-family dwellings, shall be designed for a minimum of three (3) bedrooms, and have a minimum of a one-thousand (1,000) gallon concrete septic tank.
- 4.048 All septic systems for multi-family dwellings shall be designed for minimum usage as two-bedroom units, and shall include designed flow usage for washing machines.

4.049 No construction, alteration, expansion, or replacement of any private sewerage disposal system, or any part thereof, shall commence until the plans therefore have been submitted as herein required and have been approved, in writing, by the Town of Raymond Health Officer and the Water Supply and Pollution Control Division.

Section 4.05 Inspection Required

All new and replacement private sewerage disposal systems shall remain uncovered until they have been inspected by the Health Officer for satisfactory compliance with the approved design plans.

Section 4.06 Final Approval and Occupancy Permit to be Withheld

In the event that a new or replacement private sewerage disposal system is not constructed and/or installed in accordance with the approved plan, or if a system is covered prior to being inspected and approved by the Health Officer, the Health Officer shall refuse to issue an occupancy permit until such system complies with this Ordinance.

Section 4.07 Periodic Inspection and Maintenance Required

All private sewerage disposal systems shall be inspected, at the owner's expense, by a licensed system designer at least once every three (3) years. The inspection shall be recorded, in triplicate, on a form to be provided by the Health Officer. The report shall indicate the general operational condition of the system and determine whether the system needs to be pumped or otherwise serviced. The original inspection report shall be filed with the Health Officer; a copy shall be given to the system owner; and the third copy shall be retained by the inspector.

The Health Officer shall have the authority to require the system owner to perform any necessary maintenance.

Section 4.08 Enforcement of Maintenance Requirement

Compliance with any maintenance order issued for a private sewerage disposal system shall be enforceable by the Health Officer as provided in RSA 147. Penalties for neglect or refusal to comply with such order shall be as provided for in state statute.

## ARTICLE V. PRIVATE WELLS AND WATER SUPPLY LINES

Section 5.01 Applicability

The provisions of this Article shall apply to all private water supply wells and water supply lines constructed in the Town of Raymond.

Section 5.02 Local Review of Applications for Private Water Supply Well Approvals Required

All applications for new or replacement water supply wells shall be submitted to the Town of Raymond Health Officer for review and approval prior to submission to the Water Supply and Pollution Control Division.

Section 5.03 Design Plans Required

All applications for approval of private water supply wells governed by this Ordinance shall be accompanied by plans prepared by a licensed system designer in accordance with the following minimum standards:

- 5.031 Plans for all proposed private water supply wells shall be drawn to a scale of one (1) inch equals twenty (20) feet.
- 5.032 All plans shall bear the seal and signature of a licensed system designer.

Section 5.04 General Requirements

- 5.041 No well shall be constructed within thirty-seven and one-half (37 1/2) feet of a property line.
- 5.042 No well shall be located less than seventy-five (75) feet from any private sewerage disposal system including, but not limited to privies, cesspools, septic tanks, dry wells, and/or leach fields.
- 5.043 For the purpose of these regulations, any water supply line (except municipally-owned main supply lines) lying within any property line shall be deemed to be a private water supply line.
- 5.044 No private water supply line shall cross beneath any sewerage disposal system line, unless said water supply line is encased as specified by the Water Supply and Pollution Control Division.
- 5.045 No construction, alteration, expansion, or replacement of any private water supply well, or system component, shall commence until the plans thereof have been submitted as herein required and have been approved, in writing, by the Town of Raymond Health Officer and the Water Supply and Pollution Control Division.

Section 5.05 Water Quality Test Required

Any new or replacement water supply well constructed in the Town of Raymond shall be tested for water quality at the installer's expense. The results of such test shall indicate the water to be of drinking water quality before the well may be used as a drinking water supply.

The Town of Raymond shall not be liable for any well that develops water quality problems due to unforeseen circumstances or undisclosed information.

## ARTICLE VI. WELLHEAD AND AQUIFER PROTECTION MANAGEMENT PROGRAM

### Section 6.01 Applicability

The provisions of this Article shall apply to all potential contamination sources located within the wellhead and aquifer protection areas of the Town of Raymond. Said areas shall be as delineated in the adopted Wellhead Protection Program as may, from time-to-time, be amended by the Town of Raymond Planning Board.

### Section 6.02 Notification of Potential Contamination Source Owners

The owner of each facility being a potential contamination source shall receive a written notice from the Health Officer, at least once annually, to advise that the facility is located within an area contributing to a GAA or a GA1 groundwater resource, and to advise of an impending site inspection. The notice shall specify the date and purpose of the inspection, and shall include a statement that the facility is subject to compliance with best management practices, and that copies of said best management practices may be obtained from the New Hampshire Department of Environmental Services or from the Town of Raymond Health Officer.

### Section 6.03 Site Inspection Required

All potential contamination sources, as defined herein, and governed by this Article shall be inspected by the Health Officer, at least annually, for compliance with best management practices as they are prescribed by the New Hampshire Code of Administrative Rules Ws 421.

The Health Officer shall complete, in duplicate, a best management practices inspection form. The original shall be retained in the official records of the Health Officer and the copy shall be given to the facility owner.

### Section 6.04 Certificate of Compliance

#### 6.041 Satisfactory Compliance

A certificate of compliance shall be issued by the Health Officer if, upon inspection as required under Section 6.03, the facility is found to satisfactorily comply with best management practices in accordance with the New Hampshire Code of Administrative Rules Part Ws 421. Such certificate shall be valid for a period of one (1) year.

6.042 Unsatisfactory Compliance

If the facility is found not to employ best management practices in accordance with Ws 421, the Health Officer shall issue a written warning of violation. Such warning shall specify the type of violation(s) and the corrective action(s) that are to be taken by the facility owner within thirty (30) days.

6.043 Failure to Correct a Violation

At the end of the thirty-day period specified in Sub-section 6.042, the Health Officer shall re-inspect the facility. If the violation(s) has not been corrected, the Health Officer shall issue a cease and desist order which shall specify the action(s) that must be taken by the facility owner within five (5) working days to correct the violation(s).

A copy of the cease and desist order shall also be filed with the Wellhead Protection Program, New Hampshire Department of Environmental Services.

6.044 Enforcement of Best Management Practices

In the event the facility owner fails to comply with a cease and desist order issued under Sub-section 6.043 within five (5) working days, the Health Officer shall submit a written request to the Commissioner of the Department of Environmental Services to impose an administrative fine of up to \$2,000 for each offense, as provided for under the RSA 485-C:18.

ARTICLE VII. FEES

Reasonable fees to cover the cost of review of applications; the conduct of inspections and re-inspections; and the issuance of permits and certificates required under the provisions of this Ordinance shall be set by the Board of Selectmen in accordance with RSA 41:9-a.

ARTICLE VIII. PENALTY

Any person who violates any of the provisions or regulations contained herein shall be punished as provided for under RSA 147:1, III, or any amendments or successors thereto, in addition to any penalty applicable under Sub-section 6.044.

ARTICLE IX. WAIVER

The regulations contained herein may be waived by the Health Officer, with the approval of the Board of Selectmen, provided that the granting of such waiver will not adversely affect the health or welfare of the residents of the community, or the enjoyment of the use of any abutting property, and further provided that all requirements of the Water Supply and Pollution Control Division are met.

## ARTICLE X. OTHER REGULATIONS

Whenever the provisions herein specified conflict with those of other ordinances or regulations, the more stringent requirement shall apply.

## ARTICLE XI. AMENDMENT

This Ordinance may, as deemed necessary by the Health Officer, be amended in accordance with the provisions of RSA 147:1,I.

## ARTICLE XII. SEVERABILITY

In the event that any part or provision of this Ordinance is found by a court of competent jurisdiction to be invalid, such finding shall not have the effect of invalidating any other part or provision of this Ordinance.

## ARTICLE XIII. EFFECTIVE DATE

This Ordinance, and any subsequent amendments thereto, shall become effective immediately upon adoption by the Board of Selectmen of the Town of Raymond.

**APPENDIX VI**  
**Suggested Amendment**  
**Town of Raymond Zoning Ordinance**

Amend Article III - Zones, by deleting the existing reference to Zone I and replacing it with the following:

ZONE I - GROUNDWATER CONSERVATION DISTRICT

- A. Purpose - Pursuant to the provisions of NH RSA 674:16 and 21, and in order to help maintain the quality of living in the Town of Raymond as set forth in the Master Plan, the Town believes that an adequate water supply is essential to the health, welfare, and safety of its citizens. Such an adequate supply is also essential to the maintenance of the ecological balance of the natural environment of the Town, an environment which the Town wishes to protect. These water resources are subject to an ever increasing demand for new and competing uses. Thus, the Town declares and determines that such water resources, whether occurring above or below ground, constitute a precious, finite, and invaluable public resource for current and future generations. The intent of this district is to provide for the protection of the water resources from contamination by polluting, hazardous, and toxic materials.
- B. Applicability - The Groundwater Conservation District shall be considered as an overlay district.
- C. Location - The Groundwater Conservation District is comprised of the following areas:
  - 1. The wellhead protection area and the locally-important aquifer area(s) as delineated in the Wellhead Protection Program (May 1992) adopted by the Planning Board of the Town of Raymond as may, from time-to-time, be amended by the Planning Board.
  - 2. All other stratified-drift aquifers identified in the Town of Raymond as delineated in the report Geohydrology and Water Quality of Stratified-Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire (1990 revised) by the U.S. Geological Survey.

The above-cited documents, and the maps associated therewith, are incorporated herein by reference and are available for review in the office of the Code Enforcement Officer.

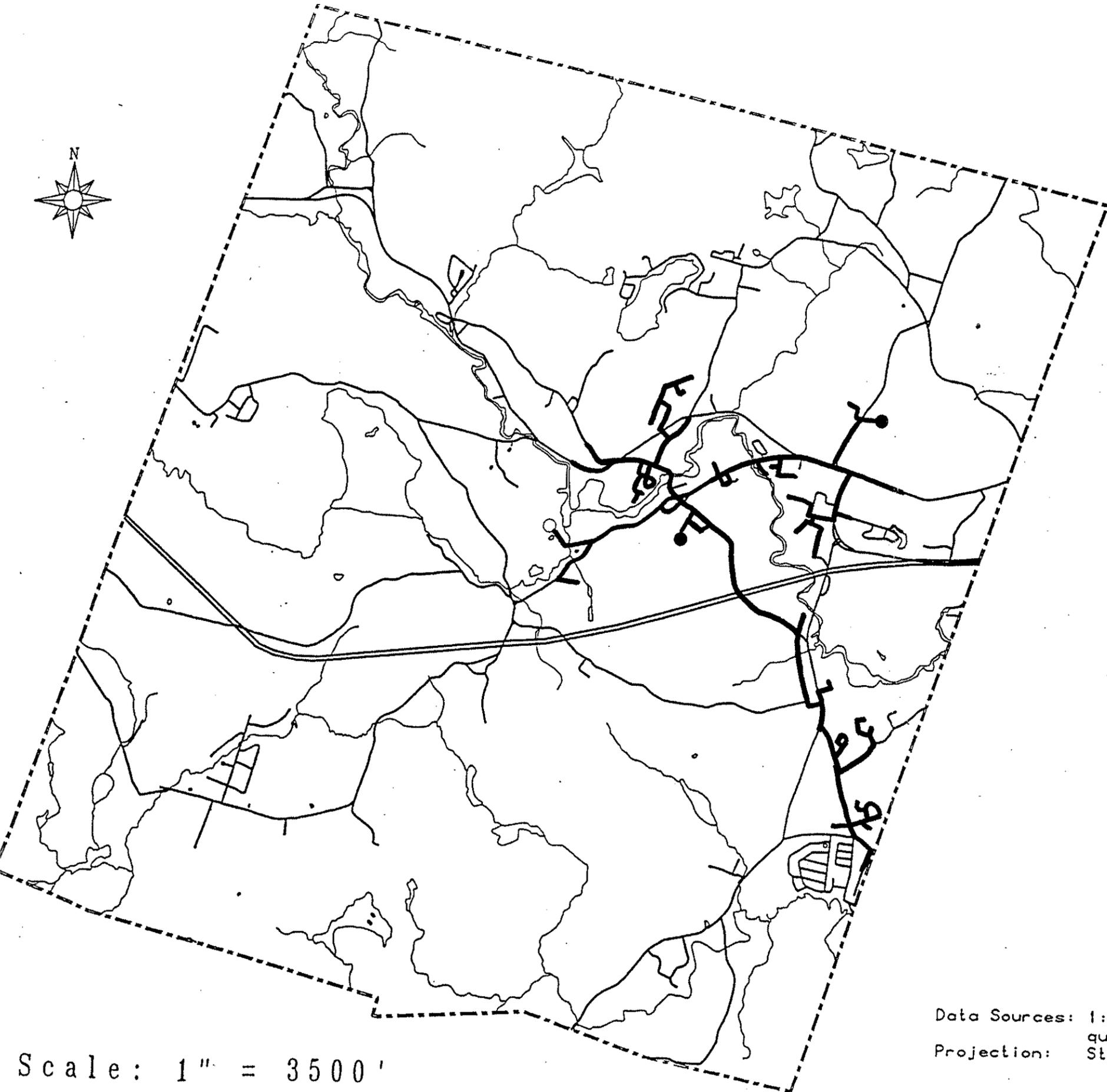
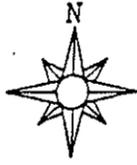
- D. Groundwater Classification - In accordance with the provisions of New Hampshire RSA 485-C, the groundwater within the Groundwater Conservation District has been classified by the Commissioner of the New Hampshire Department of Environmental Services as follows:
  - 1. Within the delineated wellhead protection area, the groundwater has been reclassified as GAA.

2. Within the delineated locally-important aquifer area(s), the groundwater has been reclassified as GA1.
3. All other groundwater within the Town of Raymond has been assigned the classification GB.

Amend Article IV - Allowed Uses, by deleting the existing Zone I - Aquifer Conservation District and by replacing with the following:

**Zone I - Groundwater Conservation District**

- A. Uses permitted within this overlay District shall be limited to those otherwise allowed in the underlying District, subject to the following requirements and conditions:
  1. Uses which are permitted in the Industrial or Commercial zones shall not discharge any substances or wastes which are classified as regulated substances under the N.H. Code of Administrative Rules.
  2. Residential uses shall be limited to low density uses as defined in the Ordinance.
  3. Forestry uses shall be conducted in such a manner as to ensure that the land is returned to its natural state in order to prevent the loss of top soil through erosion, and to prevent the alteration of natural drainage patterns and flow.
- B. Prohibited Uses - Within the delineated wellhead protection area, where the groundwater has been reclassified as GAA, the following uses are strictly prohibited:
  1. The siting or operation of a hazardous waste disposal facility as defined under RSA 147-A.
  2. The siting or operation of a solid waste landfill.
  3. The outdoor storage of road salt or other deicing chemicals in bulk.
  4. The siting or operation of a junk or salvage yard.
  5. The siting or operation of a snow dump.
  6. The siting or operation of a wastewater or septage lagoon.



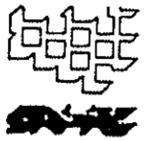
MUNICIPAL WATER SYSTEM

- Distribution Line
- Standpipe
- Wellfield

Source: Raymond Water Department  
March 1992

Scale: 1" = 3500'

Data Sources: 1:24000 Roads and Water by SNHPC, from 1981 USGS  
quad sheets.  
Projection: Stateplane Feet



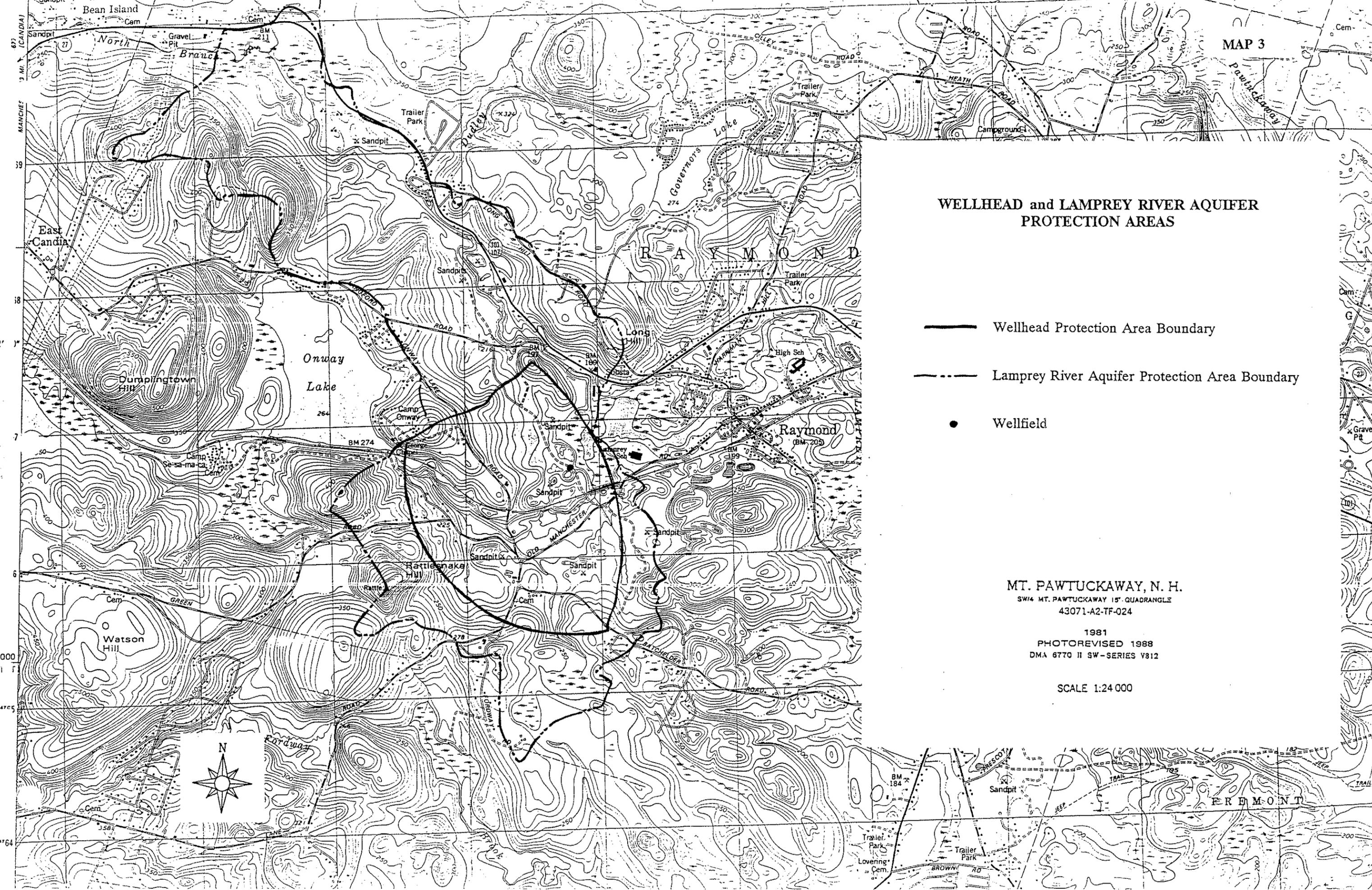
### WELLHEAD and LAMPREY RIVER AQUIFER PROTECTION AREAS

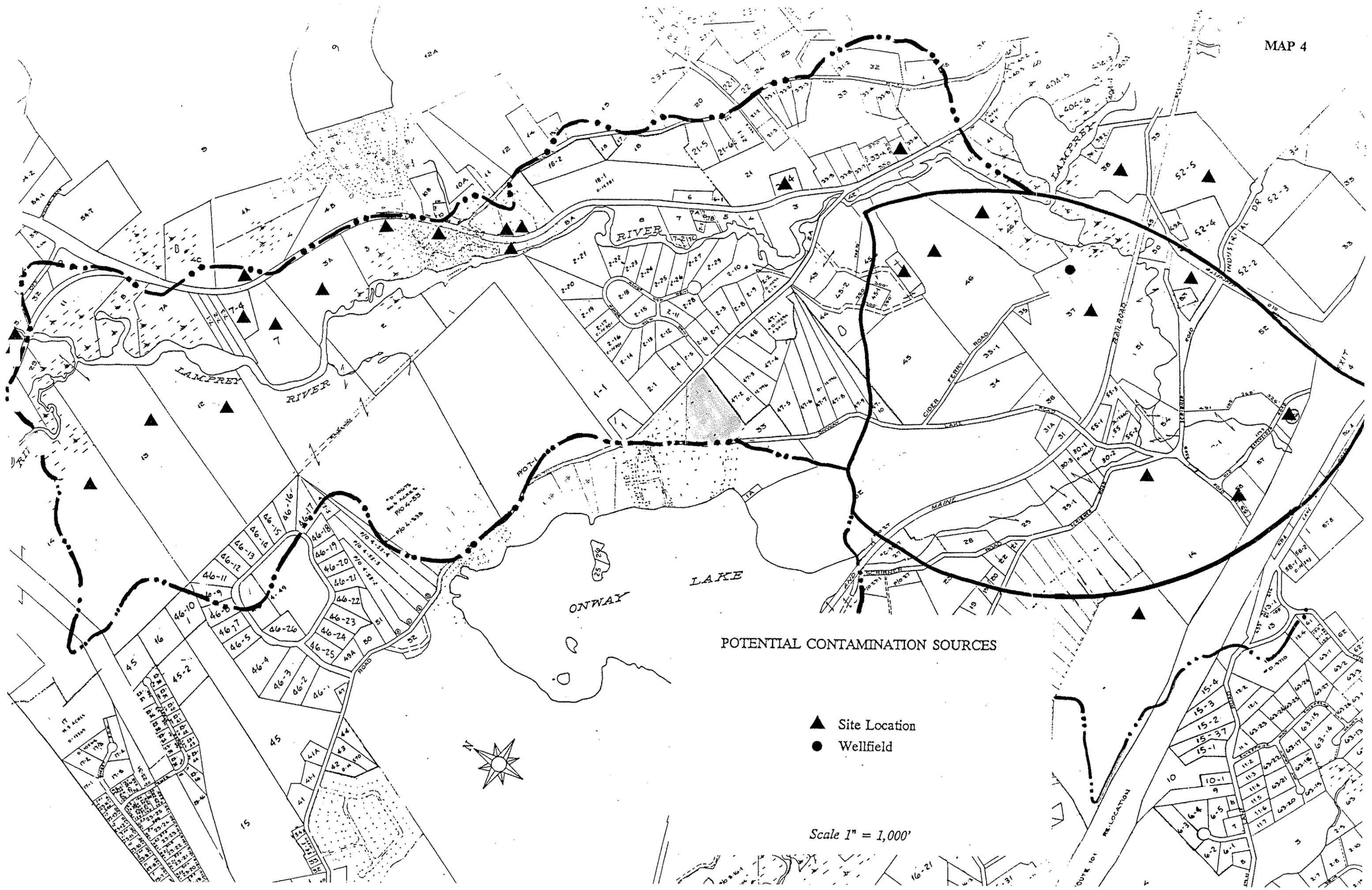
-  Wellhead Protection Area Boundary
-  Lamprey River Aquifer Protection Area Boundary
-  Wellfield

MT. PAWTUCKAWAY, N. H.  
 SW¼ MT. PAWTUCKAWAY 15' QUADRANGLE  
 43071-A2-TF-024

1981  
 PHOTOREVISED 1988  
 DMA 6770 II SW-SERIES V812

SCALE 1:24 000

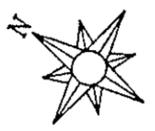


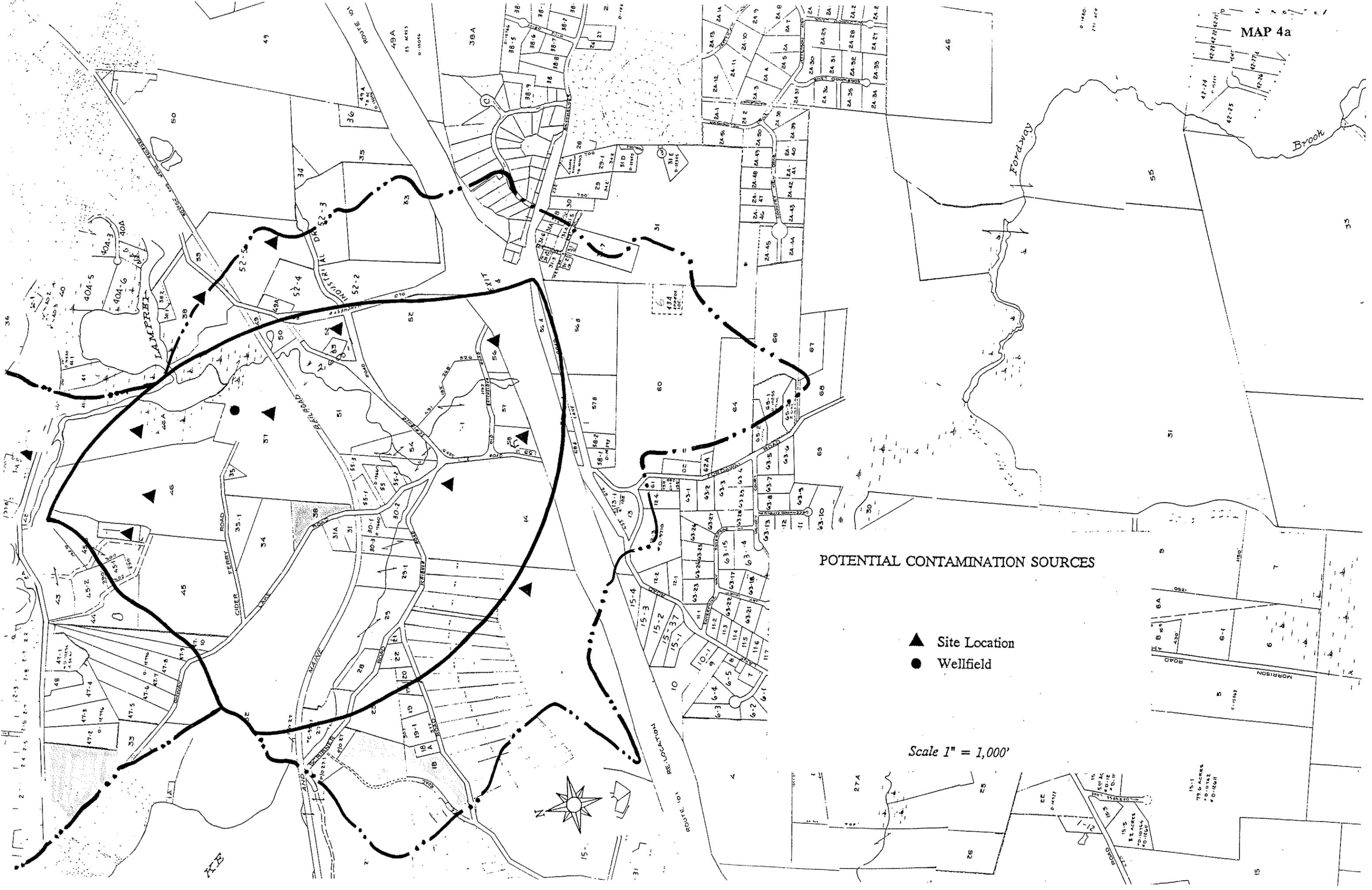


POTENTIAL CONTAMINATION SOURCES

- ▲ Site Location
- Wellfield

Scale 1" = 1,000'





POTENTIAL CONTAMINATION SOURCES

- ▲ Site Location
- Wellfield

Scale 1" = 1,000'