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EXETER RIVER WATERSHED NONPOINT SOURCE POLLUTION POLICY IMPLEMENTATION AUDIT

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ABBREVIATIONS

BMP - Best Management Practice
CT DEP - Connecticut Department of Environmental Services
DES - Department of Environmental Services (New Hampshire)
GIS - Geographical Information System
HO - Health Officer
NHCP - New Hampshire Coastal Program
NPS - Nonpoint Source Pollution
OSP - Office of State Planning
RCCD - Rockingham County Conservation District
RPC - Rockingham Planning Commission
RSA - Revised Statutes Annotated

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EXETER RIVER WATERSHED NONPOINT SOURCE POLLUTION POLICY IMPLEMENTATION AUDIT

I. OVERVIEW

Nonpoint sources of pollution are a principal cause of water quality problems in the Exeter River Watershed and coastal waters of New Hampshire. Land use policies in and around riparian zones have the potential to influence this problem. The objective of the *Exeter River Nonpoint Source Pollution Policy Implementation Audit* conducted by the University of New Hampshire Department of Natural Resources in conjunction with the NH Office of State Planning (OSP), was to build on work completed for the Exeter/Squamscott River Watershed Project conducted as part of the New Hampshire Coastal Program's 308 project. The focus of the study was to determine if land uses, likely to be the sources of nonpoint source pollution impacting the Exeter River, are or can be effectively addressed through existing policies and land management efforts. Recommendations will be made for future water quality monitoring strategies.

A. PROJECT OBJECTIVES

The objectives of the project were to:

1. Inventory the land uses around the Great Brook and Wheelwright Creek tributaries to the Exeter River to note structure setbacks and specific land use practices in the riparian zone, as well as locate the areas served by on-site septic systems along with outfalls and potential sites from which leaching can occur.

2. Assess the types of land use practices which may be contributing to nonpoint source pollution identified by the Coastal Program's 308 Watershed project.

3. Perform a content analysis of the policies and land use regulations for the Town of Exeter in order to determine their purpose, how they are intended to function, how they are being implemented and enforced, and who is responsible for enforcement.

4. Develop instruments to ascertain the degree to which implementation and enforcement of regulations for pollution source control and land use practices are in effect.

5. Conduct interviews of local officials, facility managers and landowners who have authority and/or implementation responsibilities to determine how existing policies and regulations are being administered, monitored and enforced.

6. Enter data on the two focus tributaries to the Exeter River (Great Brook & Wheelwright Creek) into the University's Geographic Information System (GIS) for final analysis and development of recommendations.

B. PROJECT ACTIVITIES AND PRODUCTS:

Project activities and associated products are briefly outlined. A review of regulations for the town of Exeter, was followed by a land use assessment, interviews and surveys of local planning boards, conservation commissions, health officers, boards of selectman and agricultural landowners. Data was compiled and analyzed. The University of New Hampshire worked in conjunction with the Rockingham Planning Commission (RPC) to collect relevant information and generate GIS maps showing the results of the project.

1. Land use inventories of Great Brook and Wheelwright Creek watersheds were developed. These inventories summarized land uses and existing regulatory frameworks and are presented in Section IV. The final GIS map illustrates the results of this project component.

2. Land use practices which may be contributing to nonpoint source pollution as identified by the Coastal Program's 308 Watershed project were identified and evaluated as reported in Section IV, and Appendix III-I. This analysis was informed as a result of the content analysis of existing policies and practices in the Town of Exeter, as well as on the basis of information obtained through interviews and surveys. The results of the survey of Town Planning Boards and Conservation Commissions in the towns of Exeter, Kensington and East Kingston are addressed in Sections III and V and tabulated in Appendix III-H. The survey, as tailored to three target sample populations is found in Appendix III-D.

3. Instruments were developed to ascertain the degree to which implementation and enforcement of regulations for pollution source control and land use practices are in effect. Instruments included: 1) a survey questionnaire; 2) focused interview questionnaires; 3) a Pollution Potential Index; 4) and two GIS coverages of the tributary watersheds.

The survey questionnaire was distributed to the entire membership of local land use decision making bodies in Exeter, E. Kingston, and Kensington. A focused interview questionnaire was generated and focused interviews were held with the chairpersons of Planning Boards and Conservation Commissions from the three towns. A structured interview was developed and administered to agricultural landowners on riparian lands in the Great Brook watershed. These assessment instruments are found in Appendix III-D (the survey); Appendices III-B and III-C (the questionnaire which served as the basis for the focused interview); and in Appendix I, The Nonpoint Source Pollution Policy Assessment Index. Finally, the addition of the institutional overlays in the GIS, allows visual correlations of areas identifiable as being susceptible to nonpoint source pollution with the various components of the relevant institutional and regulatory framework in place as of 1996. See Figures 1 and 2.

4. The degree to which implementation and enforcement of regulations for pollution source control and land use practices were actively being pursued was determined through the use of interviews and surveys. The results were compared with written documentation of in place policies (e.g., zoning regulations) and those Best Management Practices (BMPs) claimed by entities with land use management or oversight

responsibilities. The degree to which these are actively pursued is indicated by the Index Rating assigned in the Nonpoint Source Pollution Policy Assessment Index. See Appendix III-I; and Sections VII below.

5. Interviews of local officials, facility managers and landowners with authority and/or implementation responsibilities were conducted to determine how they approached the administration, monitoring and enforcement of local policies with an objective of controlling or preventing nonpoint source pollution. Interview results were supplemented by the information obtained through the surveys. See Appendices III-E, III-F and III-G.

6. Data on the two tributaries to the Exeter River, Great Brook and Wheelwright Creek, were entered on the Geographic Information System maintained by the Rockingham Planning Commission, to facilitate its use by the local governments in addressing nonpoint source pollution in the Exeter River watershed, and in particular in the watersheds associated with Great Brook and Wheelwright Creek. See Figures 1 and 2 and Appendix III-J.

II. BACKGROUND

A. PREVIOUS RESEARCH

The New Hampshire Coastal Program completed a one year study in 1995 to address nonpoint source pollution in the Exeter River/Squamscott Watershed. Project activities included a review of local land uses and regulations in the watershed and a summary of existing water quality data augmented with additional site specific monitoring. The report concluded the watershed is rural in character. However land development activities and land use practices in the watershed have the potential to impact water quality in the area. Additionally, the study found that: (1) Many towns in the watershed have regulations in place that can control potential nonpoint sources of pollution. However, there are a number of regulations that towns may want to adopt or update to strengthen the effort to prevent nonpoint sources of pollution; (2) maintenance and inspection programs required by land use regulations should be evaluated and strengthened where necessary; (3) stormwater runoff in the more urbanized part of the watershed is a major concern; (5) levels of contaminants that exceeded state standards, which were observed for both dry weather and storm events, elevated bacteria was the most frequent water quality problem; and (6) Although generally at lower levels and with less frequency, bacteria levels that exceeded state standards were observed in the upper part of the watershed. Sites were not as pristine as originally thought (OSP, 1995).

Based upon the results of the Exeter/Squamscott Watershed Nonpoint Pollution Control Project Report, it was determined that there was a need to identify potential sources of pollution coming from tributaries draining into the Exeter River. This study identifies potential sources and also provides an assessment of whether existing policies and Best Management practices (BMPs) are in place, the extent to which they are actively monitored and enforced and provides an indication of the areas in need of the most assistance, given their present situation.

B. NONPOINT SOURCE POLLUTION

Past efforts to achieve water quality standards have focused on reducing point sources of pollution. Recent water quality data and studies suggest that nonpoint sources of pollution (NPS) are the existing major cause of current water quality problems in New Hampshire (OSP, 1996).

Nonpoint source pollution is responsible for more than half of all water quality problems in the United States (CT DEP, 1995). NPS results from precipitation that becomes contaminated as it travels through the atmosphere, along the land surface, or through subsurface flow as water passes over soils making its way to rivers, aquifers, and oceans. NPS, unlike point sources of pollution, originates from scattered land uses in a watershed. As water passes over city streets, farm operations and construction sites, it picks up pollutants such as bacteria, oil, or fertilizers (OSP, 1996). These pollutants travel to bodies of water through overland flow or storm drains, degrading existing water quality and altering the ecology of these systems.

There are numerous negative effects nonpoint pollution can have on water quality. Excessive sedimentation from nonpoint sources can accelerate surface-water eutrophication leading to fish kills. It also decreases the recreational and aesthetic use of surface waters (Tim et al, 1995). Coliform bacteria are found in large numbers in the intestines and feces of warm-blooded animals and as organisms in soil or vegetation. Coliform bacteria concentrations in excess of one colony per 100 ml of water indicate a possible source of animal waste contamination and possible presence of pathogenic organisms. Pathogenic bacteria can cause diseases such as: intestinal infection, dysentery, typhoid, and hepatitis (Plowman, 1989). Fecal matter deposited from livestock is a source of pathogenic bacteria which settles in stream bottoms, dies or becomes resuspended. Similarly, overflows from failed septic systems or combined sewers provide pathways for such materials to both surface and groundwater, contaminating local streams and rivers. Intestinal bacteria can survive days to months in aquatic environments. Animals walking in streams and increased stream turbulence due to runoff have demonstrated the ability to resuspend sediment-bound enteric bacteria on stream bottoms (Sherer et al, 1992).

Management of nonpoint source pollution in watersheds requires an integrated approach involving implementation of on-site and off-site management controls. Off-site controls include land use and water quality regulations and polices created to minimize potential pollution sources. On-site controls include Best Management Practices (BMPs). BMPs include land management practices such as vegetative buffers, conservation tillage, integrated nutrient and pest management, sediment detention basins, forest riparian zones and the use of natural or constructed wetlands (Tim, 1995). They also include proper siting, design and maintenance of on-site wastewater treatment facilities such as septic systems. For the purposes of this study, a policy implementation audit was used to evaluate off-site controls and a combined policy implementation audit-land use assessment was used to evaluate on-site controls.

C. WHAT IS LAND USE ASSESSMENT?

Within watersheds, different types of land uses may contribute specific types of pollution. Agricultural farms and septic systems, if they are not operating properly, may be a source of nutrients and bacteria to water bodies. Storm water drains from parking lots are potential sources of heavy metals and oils. If water quality sampling shows high levels of nutrients and bacteria, this is likely to be associated with corresponding riparian land uses. Designing a remedy for polluted water in the Great Brook watershed involved assessing rural land owners property to determine: 1) the type of land uses on the property and 2) any land use management practices being used to reduce pollution runoff from the sites.

A combination of factors can influence the potential for land uses to contribute to nonpoint source pollution. The size of the land use and the types of management practices in place will affect the resulting capability for a land owner to control pollution. For the purposes of this study, land use assessment involved evaluating BMPs as well as other relevant applications which are operative under regulatory standards and guidelines applicable to particular and/or site specific conditions. Examples evaluated for this project included: 1) the land use type, 2) the proximity of the land use to a stream, 3) duration and type(s) of BMPs used on site, 4) and how successfully BMPs have been implemented and are working. Information derived from this comparison aids in determining the pollution potential for specific riparian land uses and/or associated with a particular constellation of associated policies and practices.

D. WHAT IS A POLICY IMPLEMENTATION AUDIT?

Land use policies and regulations have been created by the federal, state, and local governments in an attempt to minimize and prevent impacts from current and future development activities and promote appropriate land use planning. Land use regulations are found in state Revised Statutes Annotated (RSAs), state land use planning guides for local officials, municipal zoning ordinance manuals, and municipal site plan and subdivision manuals. Land use regulations only fulfill their intended purpose if they become implemented in towns and are monitored and enforced by officials. The function of a policy implementation audit is to ascertain the degree to which policies and regulations are in place and being enforced. Information from the audit can be used to reduce NPS in the Exeter River Watershed.

This study uses three methods of evaluating policies and regulations in the towns of Exeter, E. Kingston and Exeter. 1) Content analysis- Compiling regulations from manuals and evaluating their effectiveness with respect to their function; 2) Interviews- of local officials and riparian landowners who have the authority or experience with the process and results of enforcement efforts; 3) Surveys- of planning boards, selectmen, and conservation commissioners to substantiate how enforcement of land use polices is occurring.

III. METHODS

A. STUDY SITES

Two tributaries of the Exeter River were selected for investigation: Great Brook and Wheelwright Creek. Both are sources of nonpoint pollution to the Exeter River.

1. Great Brook

The Great Brook tributary was chosen as the focus study site for this project (See Figure 1). Great Brook headwaters begin in the town of E. Kingston flowing northeast through Kensington into Exeter draining into the Exeter River. The Brook flows approximately 5 miles. Four tributaries drain into Great Brook: Spring Brook, Brickyard Brook, Hobbs Brook, and York Brook.

The entire watershed of Great Brook is unsewered. All buildings are served by septic or other on-site wastewater treatment systems. The predominant land uses around the Great Brook tributary consist of livestock and cropland farms, residential housing, a golf course in E. Kingston, one gravel pit, forest lands and open space.

There is residential housing along Route 108 in E. Kingston and adjacent to Great Brook. The back yards of these houses extend into flood zones, wetland areas, and in locations with either very low or medium suitability for septic systems. These are sensitive areas which may be of concern.

Water quality sampling taken by OSP during the months of May to September 1995 indicated high bacteria and nutrient levels at the Route 108 culvert and Great Brook intersection. Bacteria levels were the highest of all sites sampled in the Exeter River Watershed and exceeded state limits set for class B waters (E. coli. 400-9800 cts/100 ml) (OSP, 1995). Total phosphorus and ammonia were in the range for urban and agriculturally impacted surface waters (OSP, 1995).

2. Wheelwright Creek

Wheelwright Creek headwaters begin east of Portsmouth Avenue at the Exeter Reservoir and South of Jady Hill (See Figure 2). Wheelwright Creek is a tidal river. It extends approximately half a mile, draining into the Squamscott River which flows to Great Bay. Riparian land uses differ between the Great Brook and Wheelwright watersheds. While Great Brook is surrounded by agricultural land, Wheelwright Creek runs through the urban center of Exeter which is in close proximity to shopping malls, gas stations and receives runoff from storm drains on Portsmouth Avenue. It also flows adjacent to the Exeter Country Club.

All residential and commercial developments are within sewer service areas. However, this does not indicate that all houses are hooked up to the system.

Wheelwright Creek was also sampled from May to September 1996 by OSP at Jady Hill. Bacteria levels were consistently over the state standards. Bacteria levels were higher on storm dates than dry dates. Total phosphorous levels were elevated on storm sample days whereas nitrate levels were elevated for two dry days. The Exeter/Squamscott Watershed Nonpoint Pollution Control Project Report suggested that

the combination of high bacteria and nutrients, during both storm and dry events, could be the result of stormwater runoff and septic systems influences (OSP, 1995).

B. CONTENT ANALYSIS

Determining the effectiveness of certain policies/regulations involves substantive evaluation of their contents. A content analysis matrix was completed for the Town of Exeter. See **Appendix III-A** and **Figure 2**. Between February and June 1996 a review of regulations was compiled using local zoning, site plan and subdivision manuals, and Revised Statutes Annotated (RSAs). The matrix completed from this analysis includes: 1) subject headings of zoning regulations, 2) the regulation as it is written in Exeter's zoning manuals (showing how the regulation is intended to function), 3) the authority which is responsible for enforcing the regulation, and 4) the current enforcement/monitoring provisions. The checklist of current land use regulations made by the Office of State Planning (OSP) in the Exeter/Squamscott Watershed Nonpoint Pollution Control Project Report was used as an initial basis to identify existing regulations in the three towns.

C. INTERVIEWS

A focused interview questionnaire (Appendix III-B) was generated to assist the process of obtaining information from decision makers to determine whether and/or how regulations were being implemented and enforced in the three towns. Chairs of the Planning Boards and Selectmen in Exeter, Kensington, and E. Kingston were interviewed. Interviews, each of which lasted approximately an hour and a half were taped and transcribed (Appendix III-E and III-F).

A structured interview was developed and administered to agricultural landowners on riparian lands. Farmers, (four livestock and one cropland) who live in the Great Brook watershed, were interviewed. The structured interview posed questions about existing regulations and Best Management Practices (BMPs) presently being used on-site (Appendix III-C). Additional questions addressed subjects such as fertilizer and manure use, proximity of the property to the Brook and monitoring. Interviews from agricultural landowners were conducted on-site. The results are summarized in **Appendix III-G**.

D. SURVEYS

A questionnaire survey was generated to collect information about the degree to which implementation and enforcement of regulations for pollution source control and land use practices are in effect. Three different surveys (Appendix III-D) were generated to target planning board members, selectmen, and conservation commissioners. All surveys had 35 questions. Questions 1-17 were the same in all surveys and asked to every respondent. Questions 18-28 were tailored specific to the decision-making authority. Questions 19-35 include demographic information (Appendix III-H). In the beginning of March, approximately 50 surveys were either distributed directly at town meetings or mailed to Planning Board members, Selectmen, and Conservation Commissioners from Exeter, E. Kingston, and Kensington. A follow-up postcard was sent to those who did not return the survey by the initial deadline in an

attempt to maximize the number of surveys returned. The results of the surveys have been summarized in tabular form (Appendix III-H).

E. LAND USE ASSESSMENT

Land use assessment was completed for both tributaries. Aerial photography, Geographical Information Systems (GIS) maps, topography maps, on site inspections, interviews with landowners, and communication with personnel at the Rockingham Planning Commission were used to inventory land uses in the riparian areas of the two focus tributaries. GIS maps (Figures 1 and 2) made by RPC were used to determine areas in the three towns which are served by sewer hookups. Setbacks from the streams was estimated during on site inspections and using distances on maps. Therefore setbacks shown are approximate rather than measured distances. See Section IV below.

F. MAPS

The land use assessment inventory (Objective # 1&2) of Great Brook and Wheelwright Creek as well as interview and survey information were used to determine potential sources of pollution in these watersheds. The GIS maps in Figures 1 and 2 show the results of the land use inventory for the two study areas.

1. Great Brook

The RPC plotted a 24" X 36" map of the Great Brook at a scale of 1:600'. This map showed all land uses currently entered in their GIS database.

Aerial photography flown for the town of Exeter in April 1995 was also at a scale of 1:600. Aerial photography was used for the towns Kensington and E. Kingston that was at a scale of 1:400. A mylar sheet was overlaid on top of the 24" X 36" map. Polygons were drawn outlining approximate boundaries of land uses aided by the use of the aerial photography and on site descriptions of boundary lines. The mylar overlay was digitized into the RPC database and a 17" X 11" map was printed out. The new GIS coverage titled, "Nonpoint Source Pollution Potential from Riparian Land Uses around Great Brook" shows the results of data synthesis (Figure 1).

A summary attribute table which includes information about each land use mapped was generated, input into the RPC database, and joined to the polygons. The attribute table includes the following information: the polygon number, regulations for the associated land use, jurisdictional authority, enforcement occurring, land use type/land cover, the proximity the landuse is to the river and current BMPs being used (Appendix III-J). Based upon this information, a potential to pollute index was generated (Appendix III-I).

2. Wheelwright Creek

An 8.5" X 11" map was printed to show the land uses around Wheelwright Creek. Potential land uses contributing to nonpoint source pollution were determined using aerial photography, on-site inspections and interviews. Symbols were digitized into the GIS database showing land uses which have the potential to contribute to nonpoint source pollution. A new coverage was printed titled, "Nonpoint Source Pollution Potential from Riparian Land Uses around Wheelwright Creek" (Figure 2).

IV. LAND USES IN THE GREAT BROOK WATERSHED

A. LAND USE ASSESSMENT

An inventory of the land uses around the Great Brook and Wheelwright Creek tributaries to the Exeter River was completed to better ascertain potential pollution sources. **Types of land uses which may be contributing to nonpoint source pollution in the Great Brook and Wheelwright Creek tributaries include livestock farms, septic waste application facilities, golf courses, septic systems and stormwater and/or urban runoff.**

1. Livestock farms:

Improper management of livestock farms can lead to sediment, nutrient and bacteria loss to water bodies. As the number of cattle increases on-site, so does the potential for pollution. There are four livestock farmers in the riparian zone of the Great Brook watershed. All four livestock landowners were interviewed and agreed that sections of their property drain directly into the Great Brook or one of its tributaries. This was verified by direct observation. None of these owners were using buffers on their land to restrict animals from walking near or in the Brook. Three of the four farms have cows that can and do move through the Brook or its tributaries. The other farmer's property abuts the edge of a wetland that drains into the Brook. Her livestock are fenced and prevented from entering the wetland. However the wetland is considered the buffer zone between the brook and farmland in this instance.

Two of the four farmers interviewed are composting their manure or storing it during periods when land application is not suitable.

2. Septic application facility:

Land spreading of septic waste creates the potential for nutrient loss by overland flow and groundwater infiltration. There is one septage application facility in E. Kingston. This facility accepts waste from septic systems in the Rockingham County. The waste is held in a large holding tank approximately 12 feet deep and 80 feet across. A constructed wetland was created in 1994, with assistance from the EPA and NH DES, in an attempt to reduce nutrient and bacteria loss from this site to soils. The constructed wetland consists of 5 cells and drains out onto a receiving wetland. Approximately 20,000 lb./acre of septic waste is applied once-twice a year between July and August. The waste is used as a fertilizer between crop rotations. The waste is applied to about 30 acres of hay field and 3 acres of corn fields. The corn is grown for cattle feed. The hay field surrounds Great Brook. Application of septic waste stops approximately 100 ft from the Brook.

The majority of the hay field adjacent to Great Brook where waste is applied is located in a flood plain, with wetlands, in very low suitability soil for septic systems. The field slopes downward to the Brook causing excessive ponding during Spring rains. If nutrients and bacteria are not readily taken up by the hay vegetation the potential for runoff is high.

3. Golf Courses:

Great Brook runs through the middle of the E. Kingston golf course. The slope of the golf course drains into the Brook.

The Exeter River Country Club banks the Wheelwright Creek. A wetland with cattail vegetation is adjacent to the golf course. During high tidal flow the water comes up to the edge of the golf course (personal communication, Lee Lemieux, grounds keeper). Seventy-five percent of the Exeter Country Club is on conservation lands, therefore town Conservation Commissioners monitor the course on a yearly basis. The golf course must meet EPA standards and an inspector from the EPA takes samples to determine pesticide concentrations. Fertilizer and pesticide applications stop about 100 feet from the edge of the wetland. An insecticide is sprayed for sod worms twice a year. Fertilizers are applied to the greens, tees and fairways four months of a year using from 150 lb.-200 lb. per acre.

4. Septic systems

Septic systems which are not properly installed, pumped regularly or functioning properly may be contributing to nonpoint source pollution. Those septic systems in close proximity to streams increase the chances of water quality problems. The locations of residential housing are shown on land use maps for both Great Brook and Wheelwright Creek. It is difficult to accurately determine which systems may be contributing to the problem. However, residential houses in riparian areas, as a group, pose a potential to pollute.

V. LAND USE REGULATIONS IN THE EXETER RIVER WATERSHED

A. CONTENT ANALYSIS OF REGULATIONS

Municipalities in the Exeter River Watershed have the authority to enact local land use regulations which may reduce nonpoint source pollution. The presence/absence of certain policies, how they are implemented and enforced, will contribute to reducing nonpoint source problems.

The content analysis matrix (Appendix III-A) helps to determine which regulations are missing across the three towns, how the wording of regulations may influence their effectiveness, and where monitoring initiatives can be strengthened.

1. Purpose of Regulations:

Regulatory measures are often the backbone of any land use management program, including watershed protection. However, regulations must be properly administered and enforced to be effective (CT DEP and CT OSP, 1993). Land use regulations provide a means for protecting the ecology of watersheds. Certain standards are kept for activities which may alter or impact ecosystems. Land use regulations include: zoning ordinances, subdivision and site plan regulations and environmental resource regulations such as wetland protection (CT DEP, 1993). Additionally, the Exeter River serves as a drinking water supply for the town of Exeter, a habitat for wildlife and a system for aquatic organisms. Therefore, existing regulations in this

watershed aim to control potential pollutants such as sediment loading, nutrients, pathogens and toxic pollutants from degrading the water quality.

2. Intended Function:

Dominant potential nonpoint sources of pollution to these watersheds include local land uses of agriculture, residential housing, golf courses, commercial development, parking lots and road construction and/or maintenance activities. Causes associated with these land uses include livestock, cropland runoff, manure and/or septic applications to croplands, faulty or improperly maintained septic systems, timing and/or over application of fertilizers and pesticides on golf courses and/or residential lots, storm sewer overflows, parking lot run-off, and failure of road construction or repair crews to implement erosion and sediment control measures. Specific land use regulations have been created in the towns of Exeter, E. Kingston, and Kensington appropriate to each town's perceived need. Below, is a compilation of local and state regulations summarized by subject. Subject categories were chosen based upon existing major land uses within the geographic areas of the focus tributaries.

a. Agricultural Regulations:

The State of New Hampshire has agricultural regulations in place to control manure, agricultural compost and chemical fertilizers under RSA 431: 33-35. The NH Department of Agriculture is required to investigate complaints of improper handling of manure or fertilizers. If the department finds that improper handling is caused by failure to use BMPs, the person responsible must be notified of the findings in writing and must submit a plan for compliance with BMPs if they have not already made the corrections within 10 days of notification. If the farmer does not comply, NHDA notifies NHDES and or the local health officer and action is taken by NHDES (under RSA 485 A: 12) or by the local health officer (under RSA 147: 4). The NH Agriculture BMP manual lists management practices which can reduce nonpoint source pollution from impacting streams. The United States Farm Service Agency (USFSA), under the department of the United States Department of Agriculture (USDA) provides cost sharing services for farmers. A district conservationist from the RCCD monitors the actions of these farmers who are getting federal assistance from the federal government.

The United States Natural Resources Conservation Services (USNRCS) will provide technical assistance for farmers to implement and design structural changes and at a regional level the RCCD works with farmers on conservation plans. However, the NH Department of Agriculture (NHDA), NH Department of Environmental Services (DES), the district conservationist from the RCCD, local health officers and public complaints are the means of enforcing federal and state agricultural regulations. The Office of State Planning (OSP) and RCCD function to provide technical assistance to farmers and local municipalities.

Under the Comprehensive Shoreland Protection Act RSA 483-B, agricultural practices and operations are exempt from the law if they are in conformance with BMPs determined by USDA's NRCS, the Cooperative Extension Service, and New Hampshire Department of Agriculture (NHDA).

At a local level, the town of Exeter permits agricultural use in a Shoreland District if it can be shown that such use will not cause increases in surface or ground water

contamination by fertilizers, pesticides or cause substantial soil erosion. There is a requirement that all pesticide applications are to be conducted in strict accordance with the requirements in NH RSA 430: 28.

b. Septic Systems:

Septic systems which have not been maintained, constructed properly, or which were installed prior to adequate construction requirements may be contributing sources of bacteria and nutrients to streams. New Hampshire Department of Environmental Services (NHDES) regulates the design and installation of new systems (OSP, 1995). None of the three towns require annual inspection of septic systems. Kensington requires a setback of 75 feet from leach field boundaries to standing or running water. E. Kingston requires a 100 foot setback to water bodies. The Planning Board chairmen indicated this regulation was increased from 75 feet to 100 feet because much of the land in E. Kingston lies in floodplain areas. Exeter requires a 100 foot setback from the shoreline of perennial brooks and streams located within the Exeter Shoreland Protection District. Exeter also requires a 150 foot setback from the shoreline of the Exeter River, and Squamscott River and their major tributaries. In an effort to improve water quality, the Town of Exeter imposes more stringent requirements than the other two towns with respect to the distance a septic system can be placed above the seasonal high water table, requiring two feet rather than six inches of natural permeable soil above the seasonal high water table (Exeter, 1993).

B. IMPLEMENTATION AND ENFORCEMENT OF LANDUSE REGULATIONS

1. The Written Regulations

Regulatory provisions concerning how monitoring and enforcement of land use regulations intended to address nonpoint pollution source controls are within the authority of both state and local governments. Written regulations to address various sources of NPS pollution are currently in place for both jurisdictional levels of government in the three towns located within the area of the Exeter River Watershed included in this study. It is also permissible for regulations to indicate frequency and/or conditions when monitoring should occur and to assign responsibility as to who should undertake the monitoring and report its results. The wording of regulations provides insight as to which regulations are more stringent. For instance, regulations will use the words "may," "shall" or "will" according to the situation.

State land use regulations provide for enforcement by the NH Department of Environmental Services (DES) by use of on site inspections and water quality sampling. At a regional level, the RCCD monitors farms which receive cost sharing aid from the Farm Service Agency. However, there is only one District Conservationist who is monitoring these farms. Because, at present, there are at least 600 New Hampshire farms with conservation plans, an effective monitoring program currently does not exist (personal communication, RCCD). Many of these farms are also receiving federal assistance.

Public complaints are the most common means of triggering monitoring. Upon public complaint, the Health Code Officer (HCO) or Code Officer (CO) along with a

Conservation Commissioner (CC) member will go out to the site and determine if BMPs need to be put in place.

At a local level, municipalities receive their powers for planning and zoning from NH RSA 672-676. Planning Boards can regulate site plans and subdivisions. Planning board members usually do not do on site inspections. The HCO and CO of Exeter, E. Kingston, and Kensington provide the means of monitoring/enforcement for new septic systems, agricultural operations, and subdivisions. That is, they issue permits to install septic systems if the site meets proper conditions as specified, but no periodic inspections are required or undertaken to monitor septic system performance. Only if there is a complaint and subsequent follow-up by the Health Code Officer, is there likelihood that malfunctioning systems will be found in violation and corrective action taken. Upon violation, the HCO can give a verbal warning and instructions to modify activities to comply with existing regulations. If the violation proceeds, the Conservation Commission and Selectmen will be contacted. Written notices may be given, if the property owner does not address the written notice findings, fines may be levied or court action initiated. In Exeter, E. Kingston, and Kensington, Selectmen indicated that usually only one time during their term as chair(s) of their respective agencies have they needed to issue a fine or take court action.

2. Focused Interviews

a. Planning Board Chairs

Planning Board and Selectmen Chairs provide insight about how well provisions written in State and local manuals are being carried out, monitored and enforced by local officials. Planning board members indicated that the Building Inspector (BI) and the Code Enforcement Officer (CEO) are the means of monitoring site plan and subdivision regulations. The BI is looking for conformance with code requirements and site approval. The degree of monitoring across the three towns varies. Exeter has a BI who works in the Planning department. A bonding requirement is imposed on applicants for building permits. As the applicant completes stages of the project, percentages of the bond are released. The E. Kingston Planning board chair indicated that the BI will not sign the plat until he gives approval that boundary markers are right. It was expressed that the BI is a part time voluntary position and that he has a lot of ground to cover. The Kensington chair indicated that the chair can ask for follow-up of an application by the BI. The CEO goes to the site. However the chair also noted that [at least in some cases] it appears that the BI does not go to the site after the work has been done.

In response to the question: "If a resource issue arises before the board which you feel strongly about protecting, how can you influence an outcome in your favor?", members interviewed indicated that new regulations can be made or that existing regulations could be changed. It was also noted that the "interests" of board members will affect the types of issues which are given implementation and enforcement priority. They acknowledged that Planning Board members must evaluate the need of all resource issues in the town. Members' opinions about the importance of the environment compared to other issues may influence the degree of land use monitoring occurring in towns as well as the extent to which existing policies and regulations are enforced.

When asked about implementing Best Management Practices or which BMPs were being used in their town, none of the planning board chairs was aware of which were being used aside from setback regulations. Most chairs did not feel that fencing cattle back from the river would be a useful BMP due to the restrictions it would impose on farmers. On the other hand, farmers interviewed admitted they knew that fencing was a desirable BMP, and that given incentives or across-the-board policies, they would not necessarily be opposed to such a requirement. Planning Board members indicated they rely on the help of the Conservation Commissions and master plans to make decisions about BMPs.

b. Board of Selectmen Chairs

Selectmen are usually only contacted if a resource problem arises and is not addressed to the constituent's satisfaction by another unit of local government (e.g., the Planning Board, Conservation Commission, etc.). They are appointed or elected on a volunteer basis and don't have the time to monitor all actions occurring in the town. The BI and CC monitor land use regulations and contact the Selectmen who issue verbal or written warnings upon violation.

Selectmen in Exeter indicated that they are concerned about malfunctioning septic systems, underground storage tanks and chemical pollutants which spill along truck routes relative to known nonpoint source pollution in their town. In E. Kingston the livestock farms were highlighted as contributors to nonpoint source pollution. It was expressed that E. Kingston is an agricultural town and most people accept that.

c. Agricultural Landowners

There are four livestock operations (one of which is also a septic application facility) and one cropland farm within the Great Brook watershed. Of the four livestock operations, one is an Arabian Horse farm and the other three are cattle operations. In the Great Brook watershed, 30 years is the average duration of time that agricultural landowners have owned and farmed their property. The largest farm in the riparian area consists of 180 acres of rented and owned land which is utilized for a dairy cattle raising operation. All of the cattle farms are spreading manure on their lands. Manure is stored in piles during the winter months when application is not beneficial. However, the manure is kept in open piles which may become susceptible to runoff during spring thaws. Great Brook is surrounded by wetlands and floodplains along its course, making it a wet area during spring floods. All but one landowner had experienced some type of ponding, runoff, or wet areas on their property in the spring of 1996. Fertilizers are utilized by the farms to support hay production for cattle consumption. They are usually applied once or twice in the spring. Three farms' fields where fertilizers are applied have slopes which drain into Great Brook. Two of these fields have no buffer zone, while the third has a buffer zone of approximately 200-300 feet.

Farmers were asked about the types of BMPs being used on-site, why they began using BMPs, and if they felt that BMPs had affected their land's productivity. Two of the farmers were controlling access of livestock to water bodies while two were not. Two farmers were controlling runoff from barnyards and feedlots while the other two were not (Appendix III-G). All of the farmers were managing pastures to reduce concentrations of manure, and storing it in constructed facilities during periods when land application is not suitable. However, none of the livestock operations are

composting their manure. A farmer in the Great Brook watershed has constructed a wetland behind his feedlot in an attempt to reduce inputs of nutrients and bacteria from manure runoff. Gutters have also been installed at this location to minimize the amount of rain reaching the cement feedlot pad. Most of the agricultural landowners feel the BMPs they are using have helped the property to become more productive in the long run and as a result they have recommended that other farmers in the area use similar BMPs. When asked if landowners were concerned with animal waste affecting the water quality of the Brook, two of the four livestock farmers in this watershed indicated that agriculture and their particular locations are not a contributing source of pollution to the Great Brook. One livestock farmer mentioned that there should be a greater concern for the cattle walking throughout the Brook. Most farmers are not affected by state or town regulations unless they pertain to pesticide or septage application.

3. Surveys

a. Planning Board Members

Question number seventeen on the Planning board survey showed members a list of possible barriers and constraints when monitoring for compliance with regulations. Members were asked to rate on a scale of 1-6 each category; with 1 indicating the least barrier and 6 the greatest barrier.

The majority of Kensington and E. Kingston Planning Board members indicated that a lack of personnel and insufficient funds were the largest barriers to their being able to monitor for compliance with regulations. Inadequate communication between decision-making bodies was perceived as being only an intermediate barrier to obtaining compliance with existing regulations. The majority of the Planning Board members from the three towns felt that land use regulations, as they currently exist, are not a barrier to getting compliance.

Survey results indicated that the three most common means of enforcing existing regulations and policies were: verbal notification of violation, written notice of violation, and utilization of performance bonds. Legal action and reporting the incident to DES are less frequently initiated. The use of fines is the least common means of enforcement of policies and regulations in all three towns. The majority of planning board members felt that their town's regulations and Best Management Practices were effective in controlling local nonpoint source pollution.

Most planning board members responded that if building construction is underway, on site inspection occurs routinely to ensure that erosion and sediment controls are in place and functioning. To ensure that compliance is occurring for erosion and sediment controls, the town engineer, conservation commissioners or the building inspector will inspect the site periodically. The conservation commissioners can evaluate the site for potential resource problems but the building inspector and health officer will impose warnings or fines if violations occur.

VI. MAPS

The two maps generated by RPC show land use types adjacent to the Great Brook and Wheelwright tributaries. The map titled, "Nonpoint Source Pollution Potential from

Riparian Land Uses around Great Brook" illustrates eight possible sites of nonpoint source pollution within the Great Brook watershed. These sites are shaded according to land use. The pollution potential matrix coincides with the map by giving a numerical value to each riparian land use. This index number summarizes the potential for that land use to contribute to nonpoint source pollution in the Great Brook watershed (Appendix III-I) and Section VII.

The map functions to give a spatial representation of a combination of factors that affect nonpoint source pollution. The categories which were chosen as fundamental when influencing pollution and therefore displayed on the map include: streams, roads, wetlands, floodplains, septage lagoons, pesticide application areas, lakes and reservoirs, residential housing, nonpoint sources of pollution, mining, recreational, commercial development, conservation areas, industrial use, mixed use, storm drains symbol, agricultural land use, protected lands. Spatially, the map shows that many of the livestock operations are in locations which contain low or medium suitability soils for septic systems. The property boundaries of these landowners extend to Great Brook. Because of this much of their property falls within floodplains and wetland areas.

VII. CONCLUSIONS AND RECOMMENDATIONS

A. POLLUTION POTENTIAL INDEX NUMBER

As water washes over a watershed different types of pollution will be collected in the run-off depending on land uses and management of those uses. Factors which influence the volume of run-off include: soil type, the amount and intensity of rainfall, the slope of the land and the amount and type of wastes existing on-site (Misselbrook et. al., 1995). Overland flow is expected even in pristine environments. The main difference between degraded and pristine systems is that a pristine system is able to extract, utilize and minimize concentrations of nutrients before they reach water bodies. As stated above, a number of management strategies (both regulatory and non-regulatory) can be utilized to reduce pollution leaving a site. If regulations are in place and monitored, appropriate BMPs are implemented on-site, and conditions such as soil type and distance to a water body are adequate, a land use's potential to pollute should be lower than from an area where these strategies are not utilized.

Using all data collected from the project, a summary matrix was generated showing the potential to pollute index number from various riparian land uses in the Great Brook watershed (Appendix III-I). Land uses practices from eight sites are summarized under this matrix. In addition to the five farmers interviewed, the matrix includes a golf course, residential land, and a pond. The potential to pollute index number was based upon information in the summary matrix: land use type, distance to Great Brook or one of its tributaries, jurisdiction, state regulations for the associated land uses, active BMPs for the land uses in the watershed as well as monitoring and enforcement provisions.

1. Developing the Pollution Potential Index Number

Utilizing combinations of Best Management Practices (BMPs) as well as appropriate land use regulations serve as a complete approach to minimizing NPS in watersheds. **Appendix I** lists BMPs and regulations associated with land uses in the

Great Brook watershed. In order to determine how these management practices are operating at the eight study sites three criteria were chosen: 1) implementation; 2) monitoring; and 3) enforcement. The potential to pollute matrix identifies which regulations and BMPs have been implemented, monitored and enforced at each of the eight sites. For all three criteria they are either occurring on-site or not occurring. An X will be given for each category (i.e. implementation, monitoring, and enforcement) that is occurring for individual management practices. An X indicates a score of 0 (the least potential to pollute). If a landowner has not fulfilled the criteria a 1 is assigned to all missing categories. Therefore, if a landowner has implemented a BMP, an authority has monitored, and enforcement has occurred, the site is given three X's resulting in a score of 0 for that particular BMP. If a BMP has been implemented on-site but has not been monitored or enforced that site will receive a score of 2 for that BMP. Lastly, if that BMP was never implemented the site is scored a 3 for missing all three categories.

The points assigned for implementation, monitoring, and enforcement for each BMP and regulation will be totaled for each site. **The final number is that location's potential to pollute index number (Appendix III-I).**

The lower the number the less potential for that land use to be contributing nonpoint source pollution. The higher the number the greater the chance the land use is contributing to nonpoint source pollution. These values are based upon utilization of the above assessment instruments. Recognizing differences between measuring the "amount" of BMPs and regulations per site compared to measuring water quality by samples taken at various segments of a stream, the given pollution potential numbers may not represent actual on-site pollution conditions. To make this index completely viable, similar ratings must be generated for instream water quality data. Once this combination of data is entered into a GIS and mapped, the locations which need future attention should be apparent. Therefore, the information collected for this phase of the Great Brook project provides an initial step when thinking about where future monitoring efforts should be focused. It provides a means for municipalities to maximize their resources for water quality monitoring on areas which may be contributing to nonpoint source pollution, as opposed to those areas that may not be.

Management of nonpoint source pollution in local watersheds requires an integrated approach which (1) deliberately targets both on-site and off-site management controls with effective regulatory, incentives and/or best management practices; (2) incorporates a monitoring strategy designed to assess the effectiveness of inplace initiatives; and (3) provides for active enforcement of violations. Requiring, implementing and enforcing maintenance and inspection programs to monitor performance of septic systems and other on-site waste treatment systems is a key to success where these are a problem. Integrated approaches also incorporate measures to inform and educate local officials as well as those expected to comply with the strategy. These are most effective when the local people are made aware of both successes (the stream quality is improving) and failures (High bacterial counts indicate we had better find out why - What are the causes and sources?"). Perhaps the conclusion will be that more effective stormwater run-off controls are needed.

Certain land use related regulations intended to reduce nonpoint sources of pollution to local watersheds already exist at the state and/or federal level. However, to

be effective they must be implemented locally. Local land use regulations combined with the use of best management practices associated with resource uses and construction are necessary. Those "police powers" reserved to local units of government must be exercised in concert with state and/or federal policies to address nonpoint source pollution problems which affect local watersheds.

Nonpoint sources of pollution to Great Brook are mainly caused by land uses associated with agriculture, residences and golf courses. Commercial development and associated parking lots, storm sewer run-off and generalized urban area run-off provide the major nonpoint sources of pollution to the Wheelwright Creek Basin.

Sources of fecal contamination to Great Brook appear to be livestock, but nonfunctioning septic systems could also be contributing to this problem. None of the watershed is sewered. With respect to livestock, requiring fencing, with riparian zone vegetative cover, may be an appropriate measure. Wisconsin has required its farmers to take similar measures. Given the interview results, it does not appear that most farmers in this watershed would object, particularly if some funding support to help alleviate the up-front capital costs was available. Although there are some aesthetic problems with fencing the buffer zones between the golf courses and the brook, these zones should be "structurally delineated," possibly with shrubbery and appropriate landcover to reduce the risks of fertilizer and pesticide run-off. Such solutions could be considered for East Kingston as well.

The bacteria count in Wheelwright Creek is high. However this entire area is sewered, although a mobile home development adjacent may not have all units hooked to the sewage system. Alternatively, leakage from the sewer system may also be occurring. The Exeter Town Sewer and Water department indicated that the Exeter Country Club has had problems with their sewer hookup becoming clogged and overflowing. The overflow has reportedly been draining down Webster street and through a storm drain. The Exeter Sewer and Water department indicated this storm drain may flow into Wheelwright Creek. Complaints from the neighbors in this area to the Sewer department indicated that this type of overflow has occurred repeatedly. Because this location is in close proximity to the Jady Hill location where OSP sampled it may be one contributing source of the E. coli which was detected. Also, is it feasible for this to be partially a tidal effect from the Squamscott River?

Future Projects:

Policy implementation Audits can be important and very useful for the purposes of evaluating the impacts and effectiveness of nonpoint source pollution control initiatives. They can also be an effective means for determining likely causal factors for continuing nonpoint sources of pollution within a given watershed. The necessary ingredients for a successful audit include:

* a land use assessment, including identification of likely problem areas.

* an inventory of existing land uses and water resource management regulations and management practices within the watershed of interest.

* an assessment of relevant jurisdictions' approach to implementation of land use and water resource management regulations and practices, including their monitoring and enforcement strategies and results.

* a time series set of water quality data which can be used to identify "hot" spots within the watershed. To encourage efficient use of resources, it may be useful to identify likely problematic areas early in the audit process, so that adequate water quality data can be acquired to serve as a baseline. Such data can help the audit focus on "hot spots." Subsequent data should be acquired over a full year for the area of concern in order to account for seasonal effects. Following an audit, if recommendations for improved regulatory or management practices are put into effect, regular monitoring should occur to track the effects of these efforts on water quality.

* a geographic information system (GIS) will incorporate the data developed through the audit process. Because such a system can be easily updated and is able to display several kinds of information simultaneously, it is an excellent decision tool. A GIS will assist decision makers in determining where problem areas are located, where enforcement or new initiatives might be needed, where existing policies and management approaches seem to be appropriate and effective, where additional monitoring might be necessary, where new problem areas might be anticipated, etc. As whole watershed assessments are completed, the GIS can provide a basis for integrating audit information from a number of subwatersheds within a basin.

For future projects of this type, the time frame should be realistic. Eighteen months to two years is much more realistic, with one year as a minimum time period. However, the latter would work only if existing water quality data was appropriate for the watershed in question. Ideally the water quality monitoring strategy and the policy implementation audit should be designed collaboratively. For the policy implementation evaluation (not including the water quality monitoring) for a watershed more complex either institutionally, or land use wise, and/or larger than Great Brook, the resources required to complete a project would be more realistically calculated at $6,000-$10,000. If the GIS requires a great deal of work because the area is not currently using a GIS system to map its land use data, then the figure would be slim. The water quality sampling costs are not included in either estimate.

VIII. WORKS CITED

Connecticut DEP. Assessment of Nonpoint Sources of Pollution in Urbanized Watersheds: A Guidance Document for Municipal Officials. Connecticut Department of Environmental Protection, 1995.

CT DEP, CT DES, CT OPM, CT RPAAC. Protecting Connecticut's Water-Supply Watersheds: A Guide For Local Officials. Connecticut Department of Environmental Protection, 1993.

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Misselbrook, T. H., Pain B. F., Stone A. C., Scholefield D. 1995. "Nutrient Run-off Following Application of Livestock Wastes to Grassland." Environmental Pollution, 88: 51-56.

New Hampshire Office of State Planning. Exeter/Squamscott Watershed Nonpoint Pollution Control Project. New Hampshire Office of State Planning, 1995.

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New Hampshire Office of State Planning and New Hampshire Coastal Program, Department of Environmental Services. New Hampshire Coastal Nonpoint Pollution Control Program. NHOSP and NH Coastal Program, DES, 1995.

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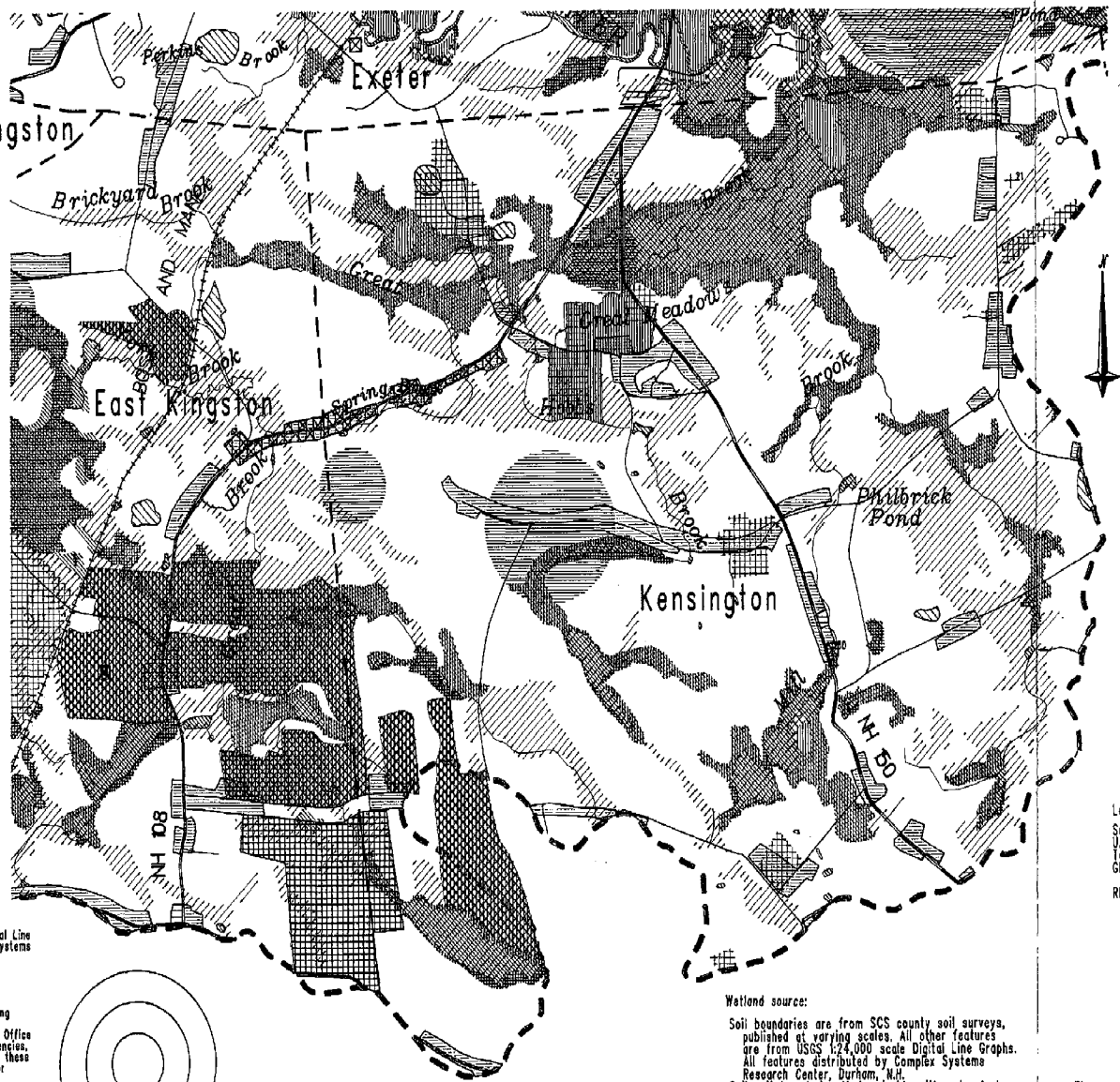
Sherer. B., Miner R., Moore J., and Buckhouse J. 1992. "Indicator Bacterial Survival in Stream Sediments." Journal of Environmental Quality, 21: 591-595.

Tim, U., Jolly R., and Liao H. 1995. "Impact of Landscape Feature and Feature Placement on Agricultural Nonpoint Source Pollution Control." Journal of Water Resources Planning and Management, 121(6), 464-469.

Nonpoint Source Pollution Potential from Riparian Land Uses around Great Brook



- Primary Routes
- Secondary Routes
- Roads or Streets
- Town Boundaries
- Active Railroad
- Lakes, Ponds and Reservoirs
- U.S.G.S. Wetlands
- Floodplains
- Coincidence of Wetlands and Floodplains
- Protected lands
- Pesticide Application Areas
- CERCLA Sites
- Landfills
- Septage lagoons
- Old Dumps
- Cropland
- Livestock Farms
- Residential Septics
- Golf Course Applications

- Open Space, Agriculture, Forest, Developable Land
- Residential
- Mixed use
- Commercial
- Industrial
- Recreational
- Non-point sources
- Underground Storage Tanks
- Facilities regulated under the SARA Program
- Other Potential Contamination Sites
- DES Groundwater Hazard Inventory
- Facilities Regulated under the RCRA Program (users of regulated chemicals and substances)
- Salt piles
- Storm drains

Pollutant sources:

205j Non-point Pollution Sources; RPC Staff research, 1992.
Superfund Amendment Reauthorization Act(SARA) sites; RPC Staff research, 1994.
National Resource Conservation and Recovery Act(RCRA) sites; Exeter Water Plan, 1993.
Junk Yards; DES Bureau of Pollution Sources.
Other contamination areas and sites, USTs; DES Groundwater Protection Bureau.
Threats, such as Automotive shops, medical offices, etc.; Exeter Water Plan, 1993.
Groundwater Hazard sites; DES Groundwater Protection Bureau.
Pesticide Application Areas; NH Dept. of Agriculture.

Land Use source:

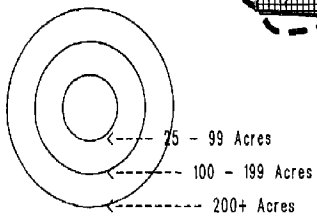
Soil Conservation Service 1:24,000 aerial photography; 1986.
U.S.G.S. Quadrangle mylars; pre-1980.
Town Master Plan Maps.
GRANIT Digital Base Data, Complex Systems Research Center, UNH; December 1991.
RPC staff aerial photo interpretation; 1991, 1992.

Sources:

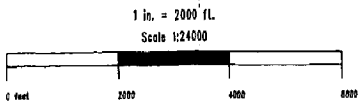
"Base data (town boundaries, hydrography, roads) from USGS Digital Line Graphs, 1:24,000, as archived in the GRANIT database, Complex Systems Research Center, University of New Hampshire."

These digital layers are registered to NAD 83 and N.H. State Plane Coordinates.

"Digital data in NH GRANIT represent the efforts of the contributing agencies to record information from the cited source materials. Complex Systems Research Center (CSRC), under contract to the Office of State Planning (OSP), and in consultation with cooperating agencies, maintains a continuing program to identify and correct errors in these data. Neither OSP nor CSRC make any claim as to the validity or reliability or to any implied uses of these data."



GIS Protected Lands layer forthcoming to show protected land parcels of two(2) acres or more.

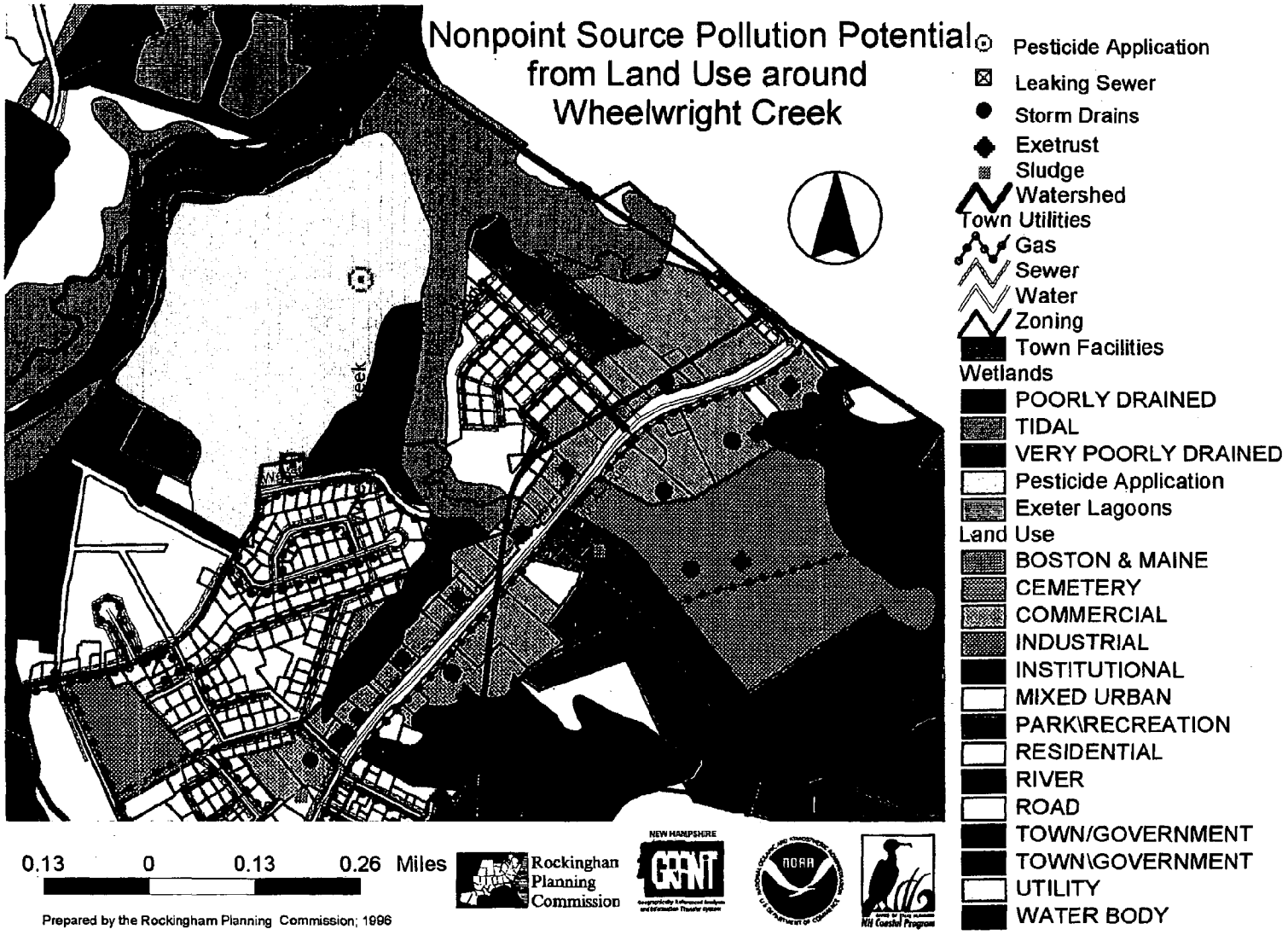


Wetland source:

Soil boundaries are from SCS county soil surveys, published at varying scales. All other features are from USGS 1:24,000 scale Digital Line Graphs. All features distributed by Complex Systems Research Center, Durham, N.H.
Soil unit boundaries that coincide with water body boundaries in the field will not always coincide on the map, due to their differing data sources.

The preparation of this map was funded by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, Award Number NA57OZ0320.

Prepared by the Rockingham Planning Commission
July 25, 1996


Nonpoint Source Pollution Potential
from Land Use around
Wheelwright Creek
Pesticide Application
Leaking Sewer
Storm Drains
Exetrust
Sludge
Watershed
Town Utilities
Gas
Sewer
Water
Zoning
Town Facilities
Wetlands
POORLY DRAINED
TIDAL
VERY POORLY DRAINED
Pesticide Application
Exeter Lagoons
Land Use
BOSTON & MAINE
CEMETERY
COMMERCIAL
INDUSTRIAL
INSTITUTIONAL
MIXED URBAN
PARK\RECREATION
RESIDENTIAL
RIVER
ROAD
TOWN/GOVERNMENT
TOWN\GOVERNMENT
UTILITY
WATER BODY
0.13 0 0.13 0.26 Miles
Rockingham Planning Commission
NEW HAMPSHIRE GRANIT
NOAA
Prepared by the Rockingham Planning Commission; 1996

APPENDIX III-A

III. CONTENT ANALYSIS OF EXISTING REGULATIONS AND AUTHORITIES IN EXETER WHICH INFLUENCE NONPOINT SOURCE POLLUTION

TOWN OF EXETER			
SUBJECT AREA	**REGULATION/POLICY[1]**	**AUTHORITY**	**MONITORING/ ENFORCEMENT PROVISIONS[2]**
Subdivision regulations		Exeter Planning Board, Selectmen	
minimize disturbance -avoid development of sensitive areas -preserve riparian areas -site roads to preserve natural drainage features -limit impervious area -limit land disturbance, cut & fill	• The Board may require the designation of buffer strips of at least 50' width around surface water, wetlands or other natural features which may be adversely affected by erosion or stormwater runoff. • The subdivision and development shall whenever possible, preserve in their natural condition important natural features. The Board may request an advisory opinion from the Conservation Commission in the determination of the value of the natural features and the boundaries of such systems. Such areas include watercourses, waterbodies, floodplains, wetland areas, steep slopes, aquifer recharge areas, wildlife habitats, large or unique trees and scenic views.		

[1] Sources used to reference Exeter regulations included:
Exeter Zoning Ordinance Manual. 1993, Site Plan and Review Manual. 1993, Subdivision Regulation Manual.1993, Exeter Master Plan. 1994, New Hampshire Planning and Land Use Regulation. 1994.

[2] Sources included the above manuals as well as interview and survey information from Planning Board members.

erosion/sed control (ESC) 1. ESC plans required preconstruction 2. What size areas? (13) 3. Outside review agency? 4. performance std. (80% TSS) 5. Design stds 6. guidance manual (14)	• The applicant shall submit such plans to the Board for any tract of land being developed or subdivided, where one or more of the following conditions are proposed: a. A cumulative disturbed area exceeding 20,000 sq. ft. b. Construction of a street or road. c. Disturbed critical areas. • The design standards shall apply to all development projects regardless of size and/or scope.		
permanent stormwater treatment 1. perf. stds (80% TSS, pre-dev't runoff rates) 2. design stds 3. guidance manual	• Where it is determined that the additional runoff incidental to the development will overload or significant increase an existing downstream drainage facility, the Board may require the provision of drainage easements or other improvements necessary to alleviate such problems. All drainage improvements shall be designed to accommodate a 25-yr. storm event. • Drainage calculations shall be prepared in conformance with the document Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in NH prepared by RCCD. • Detailed design and construction stds for the installation of drainage facilities can be found in the Public Works Specifications.		

additional studies/ performance bonds	• The Board shall set the amount of the performance guarantee prior to the final approval of the subdivision plan. The developer shall post such guarantee with the town prior to recording the subdivision plan with the Rockingham County Registry of Deeds and prior to the issuance of any building permits for the site. • In an effort to determine the completeness of a subdivision application and its conformity to all applicable ordinances and regulations, the TRC may request an applicant to submit studies and/or exhibits above and beyond those outlined in Sec.7.1.4. In addition, the Board may also request the submission of studies. Examples of such studies but are not limited to the following: a. A hydrogeologic study in accordance with section 9.2.7 if applicable. b. A sewer and water availability study c. Environmental Impact Study d. Traffic Impact Study		
Site Plan Review Regulations (same regulations as site plan review regulations)			
minimize disturbance -avoid development of sensitive areas -preserve riparian areas -site roads to preserve natural drainage features -limit impervious area -limit land disturbance, cut & fill	• The Board may require the designation of buffer strips of at least 50' width around surface water, wetlands or other natural features which may be adversely affected by erosion or stormwater runoff. • The **subdivision** and development shall whenever possible, preserve in their natural condition important natural features. The Board may request an advisory opinion from the Conservation Commission in the determination of the value of the natural features and the boundaries of such systems. Such areas include watercourses, waterbodies, floodplains, wetland areas, steep slopes, aquifer recharge areas, wildlife habitats, large or unique trees and scenic views.		• PB has the authority to review (accept/deny) applications to build. • Town planner reviews applications. • Technical Review Committee makes recommendations to applicant to comply with regulations. • PB must act within 90 days, if not Selectmen are contacted.

erosion/sed control (ESC) 1. ESC plans required preconstruction 2. What size areas? (13) 3. Outside review agency? 4. performance std. (80% TSS) 5. Design stds 6. guidance manual (14)	• The applicant shall submit such plans to the Board for any tract of land being developed or **subdivided,** where one or more of the following conditions are proposed: a. A cumulative disturbed area exceeding 20,000 sq ft. b. Construction of a street or road. c. Disturbed critical areas. • The design standards shall apply to all development projects regardless of size and/or scope.		• Building inspector will review applications and at site for conformance with code requirements.
permanent stormwater treatment 1. perf. stds (80% TSS, pre-dev't runoff rates) 2. design stds 3. guidance manual	• Where it is determined that the additional runoff incidental to the development will overload or significantly increase an existing downstream drainage facility, the Board may require the provision of drainage easements or other improvements necessary to alleviate such problems. All drainage improvements shall be designed to accommodate a 25-yr. storm event. • Drainage calculations shall be prepared in conformance w/ the document Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in NH prepared by RCCD. • Detailed design and construction stds for the installation of drainage facilities can be found in the Public Works Specifications.		• The PB has retained the power to require drainage improvements and stormwater management plans when deemed necessary.
additional studies may be required			
chemical control			
ZONING			
lot sizes	• Range from 5,000 sq. ft (commercial central area)- 2 ac. in rural area. These are minimum lot sizes.		• Zoning officer is appointed by the Selectmen to enforce provisions.
impervious limits	• Ranges from 10% in rural areas to 75% in central area and waterfront area.		
building setbacks surface water, wetlands	• Subdivision regulations =50'setback from wetlands. shoreland district=100-150' from surface waters.		

agriculture related -erosion/sed consv., run-off -control/mgt. of nutrients, pesticides, state BMP manual referenced?	• Permitted agricultural use in the Shoreland District: Agriculture that such uses will not cause increases in surface or ground water contamination by pesticides, fertilizers or will not cause or contribute to substantial soil erosion and stream sedimentation. No clear cutting of natural vegetation within the vegetated buffer shall be permitted. All pesticide applications shall be conducted in strict accordance with the requirements in N.H. RSA. 430: 28.		
Septic Systems	• The PB has reserved the right to have its designated agent inspect the installation of public water and sewer systems. PB has retained the power to require following studies when deemed necessary: a hydrogeologic study, a sewer and water availability study, and an environmental impact study	Planning Board	• Currently, Exeter does not have a monitoring program for on-site septic systems. When problems are detected the matter is handled by the town's code enforcement officer and in some cases the Health Officer. Most instances of septic failure have been located in close proximity to streams and water bodies.
setbacks > 75 ft.			
from wetlands (12)	• No subsurface wastewater disposal system from which wastewater is to be discharged shall be constructed within 50' of any poorly drained soils or within 75' of any very poorly drained soils.		
from surface water	• 150'/100'		
distance above seasonal high water table	• **the town of Exeter, in an effort to improve water quality , makes the more stringent requirements. Two feet rather than six" of natural permeable soil above the seasonal high water table.**		

review of design & construction applications	• All subdivisions shall provide public sewage disposal when available or required by the Planning Board.		• The Board shall reserve the right to have its designated agent inspect the installation of all public sewage disposal systems in accordance with the State's installation standards.
inspection of new systems	• The PB requires that all test pit and percolation test data be verified by its designated agent.		
annual inspection	no requirements		
operating guidelines			
inspection, upgrade required for expansion, conversion			
slope restrictions			
sept./sludge regulations			
Riparian/Shoreland Areas			

shorelands protected: depth of shoreland (depends on body of water-major tribs vs. perennial stream	• This district is defined as all land within 300 feet horizontal distance of the seasonal high water level of the Exeter River, Squamscott River. and their major tributaries. In addition, the district includes all land within 150' horizontal distance of the seasonal high water level of all perennial brooks and streams. Also part of the district are the lands within 150' horizontal distance of the upland extent of any tidal marsh adjacent to the Squamscott River.		• The provisions of the Ext. Shoreland Protection District Ordinance shall be administered by the following: a. Building Inspector for building permits b. Planning Board for subdivision, site plan review, and conditional use approval c. Zoning Board of Adjustment for special exception approval of existing lots. • Enforcement: The Code Enforcement Officer shall be responsible for the enforcement of the provisions and conditions of the Ext. Shoreland Protection District Ordinance.
salt storage, junk yards, solid waste prohibited	• Prohibited uses include: outdoor salt storage, junk and salvage yards, disposal of solid waste.		
land alteration requires Erosion & sed, controls			
septic setbacks >75'	• 150 feet		

Setback for primary structures	• No building , septic system, or septic system leaching field shall be constructed on or moved to a site within 150 feet from the shoreline of the Exeter River, the shore line of the Squamscott River, or their major tributaries as herein defined or within 100 feet from the shoreline of perennial brooks and streams located within the Exeter Shoreland Protection District.		• Alteration of the land or the vegetative. buffer within the district is permitted under certain circumstances.
vegetated buffer-depth	• Alteration of natural vegetation or managed woodland within 75 feet of the shoreline of the Exeter river, Squamscott River or their major tributaries shall be permitted only to the extent necessitated by a permitted or conditionally permitted use.		
50 % tree cutting limit	• Partial cutting of trees is limited to 30 % of the preharvest basal area for all live trees measuring six" diameter, breast height (4.5' above ground level) or greater.		
impervious limits	• Lots within the district can't have more than 20% of the lot covered by impervious surfaces.		
non-sewered lot size			
agriculture exemption requires BMP			
Gravel Excavation			
erosion & sed controls	Yes		• Excavation operations may be permitted only upon authorization by the Board of Adjustment by Special Exception providing regulations are met in addition to sec 5.20 of the Exeter Zoning Manual.
exposure limit/phasing requirements			
reclamation requirements			• Planning Board must approve of reclamation plans

equip. main restricted			
permit time	Two years		• Planning Board must approve amount and duration of performance bond.
Wetland Protection			
Septic systems (12)			
buffer protection/ building setback (12)	• No subsurface wastewater disposal system from which wastewater is to be discharged shall be constructed within 50 feet of any poorly drained soils or within 75 feet of any very poorly drained soils.		
Roads, Parking Lots			
Aquifer/ Groundwater Protection			
overlay district	• provisions must be made to protect against toxic or hazardous mat. discharge through the use of spill control provisions, secured storage areas, indoor storage provisions and the use of closed vapor recovery systems.		
impervious limits	• Within the Aquifer Protection District no more than ten percent (10%) of a single lot may be rendered impervious to groundwater infiltration.		• The ordinances gives the PB the power to require a hydrogeologic study in some circumstances.
land use restrictions	• Within the district, septic systems must be installed by a sanitary engineer licensed in NH. The town's construction and installation standards are more stringent than the state's requirements. • Prohibited uses include: snow dumps, animal feedlots, automotive service and repair shops, sand and gravel excavation and other mining within 3' vertical of the seasonal high water table.		
larger lots	• Sec 9.20 For lots not connected to the municipal sewer system, the min. lot size shall be three acres.		

APPENDIX III-B

FOCUSED INTERVIEW QUESTIONNAIRE: PLANNING BOARD CHAIRMEN

_____Town _____Body _____Date

_____location _____Code

****

Name: _____

Address: _____
Street/PO # City State Zip Code

Telephone: _____

Decisionmaking body: _____ Role: _____

Occupation: _____ Employer: _____
Your expertise:

****

Questions will be asked throughout the interview to better understand what your role as a decisionmaker is and how your local community uses their polices and regulations to address nonpoint sources of pollution in the watershed. The interview will be recorded but if at any time you want to pause, ask a question, or turn the tape recorder off let me know. The recorder will be used only for my note taking. The interview will be completely confidential.

For the purposes of this project we are defining nonpoint source pollution as pollution which originates from water flowing over land and transporting pathogens, nutrients, and particulate matter into bodies of water. Nonpoint source pollution usually originates from diffuse sources in a watershed. Best Management Practices are an alternative way of using and managing resources to reduce or minimize potential sources of pollution and its use.

****

1. How long have you been participating as a planning board chairman?

2. How was it that you became interested in serving in this capacity?

Explain your involvement and the responsibilities you have fulfilled:

3. What is the role of the chair of the Planning Board?

4. What is the process of hearing an application for a subdivision or site plan review? What documents need to be submitted to the Board

5. Before an applicant can proceed to build does the Health Code Enforcement Officer and Building Inspector visit the site or is approval granted on the basis of the design standards? Is verification done prior to building?

6. If building is taking place near a body of water or a wetland what actions take place?

7. Are subdivisions and site plan reviews usually granted relatively easily? For those which are not granted what was usually the reason why?

8. After the PB makes a decision is it subject to review by the ZBA or selectmen or is it the final decision?

9. How are decisions made? (by mutual consensus, majority rule, unanimous vote)

Issues which are addressed by the decisionmaker:

10. Are you aware of any types of nonpoint source pollution such as runoff from croplands, septic system waste, runoff from livestock farms, timber harvesting, etc. occurring in your town?

11. In your opinion, what is the largest source of nonpoint source pollution? What leads you to believe this is the case?

12. Spring runoff draining from manure in livestock farms can increase E. coli bacteria and nitrate counts. (E. coli is an indicator for pathogenic bacteria in water.) To your knowledge are their in place to control this type of pollution? Are their other methods being used?

Regulations/Policies:

13. In your opinion, when reviewing an application for a subdivision or site plan review which regulations either town or state do you feel are the most effective at reducing nonpoint source pollution? What makes these regulations/policies more effective compared to others?

14. For what specific nonpoint source issues have local policies been made more stringent than the state standards? Would you be willing to discuss an example?

15. Exeter has a 300' buffer setback regulation from major rivers. This is much larger than other town and the state minimum of 75' how did this come about? Do you feel this is a good decision?

Implementation:

16. What is the process for decisions/regulations you make to become implemented?

17. Since the Exeter River is used as a drinking water supply what actions have been made to implement Best Management Practices to minimize runoff coming from livestock and cropland farms?

Monitoring:

18. Who monitors the decisions of the PB and how frequently does this occur? Is the Building Inspector required to check the work afterward and report back?

19. How are old septic systems monitored? Are there any pamphlets being given out to inform people how to manage their septic properly?

20. If a resource issue arises before the board which you feel strongly about protecting how can you influence an outcome in your favor?

21. How do you interact with the selectmen, ZBA and HCO and Rockingham Country Conservation District?

22. How often are recommendations made by the Conservation Commission related to nonpoint source pollution incorporated into final decisions made by your decision making body? What would have to happen to have the Conservation Commissions recommendations incorporated?

23. Overall, how would you rate the process your decision making body uses in making, implementing, enforcing and monitoring regulations? Rate the effectiveness of the decisionmaking body on a scale of 1-6.

Thank you for your time. The results will be made available to the NH Office of State Planning.

APPENDIX III-C

INTERVIEW SHEET: AGRICULTURAL LANDOWNERS

Location of site:	Acreage of farm:
Owner/Landowner:	Date:
Polygon number:	Type of farm:

1. How long has the farm been under your operation?

2. What types of crops do you grow?

    a. How long have theses crops grown on your land?

3. What types of livestock are you raising on this farm?

4. Where is the feed lot in relationship to drainage ways?

    a. Are there berms/ wetlands between the feedlot and the stream?

5. How do you handle manure which accumulates on your property?

    a. How is livestock waste stored during the winter or when it's not in use?

6. Have you experienced periods of flooding this spring? Do spring floods produce visual changes in the terrain?

7. What types of fertilizers and pesticides are you currently using?

    a. Frequency and time of year for fertilizer(s) application:

8. Where is the location of fields sprayed with fertilizers/pesticides in relationship to the stream?

9. Are any of the following Best Management Practices (BMPs) being used on your farm?

BMP	Aware	Using	Not Using	N/A
1. Control access of livestock to water bodies				
2. Control runoff from barnyards and feedlots				
3. Manage pastures to reduce concentrations of manure				
4. Composting of manure				
5. Store manure in constructed facilities during periods when land application is not suitable. (e.g. on frozen ground)				
6. Use soil tests to determine background levels of nutrients and soil pH.				
7. Keep fertilizer and manure application records and crop yield records to determine proper manure and fertilizer rates.				
8. Crop rotation (to make efficient use of Nitrogen)				
9. Maintain filter strips next to surface waters receiving runoff from crop fields where manure is applied. (buffer strips)				
10. Conservation tillage				
11. Other				

10. Why did you first begin using BMPs?

11. In your opinion, do you feel that land conservation practices have or will allow your land to become more productive? Or are BMPs more costly than beneficial?

    a. Do you encourage other farmers in town to use BMPs?

12. How do you work with the Rockingham County Conservation District (RCCD), United States Natural Resources Conservation Services (USNRCS), the Department of Environmental Services (DES) or Office of State Planning (OSP) to receive technical assistance for implementing farming practices?

a. How frequently have you asked for the assistance of one of these agencies? Was the advise useful?

13. Are there portions of your property where livestock have direct access to Great Brook or another creek?

14. Are you concerned with animal waste affecting the water quality of this stream?

15. Have you undertaken any management practices to reduce animal wastes or sediment runoff? Did you receive any technical assistance or incentives to do this. If not what would be needed to carry out these change?

Practices	Yes	No
1. Installation of a wetland or retention pond to clean manure on site		
2. Planting vegetation around the stream to absorb nutrients		

16. During the year do you experience any soil erosion problems immediately adjacent to the stream?

17. What State or town regulations do you routinely deal with?

****

QUESTIONS SPECIFIC TO DAN BODWELL'S LAND SEPTAGE APPLICATION FARM

****

1. How many tons of septage/acre is applied to your land?

2. How often to you apply septic waste to your land?

3. Is the septage applied in the same location every time or do you rotate locations?

4. Do you know where the septage waste comes from that you apply on your land?

5. Do you accept waste from outside of E. Kingston?

6. What type of crops are growing on land which has been used for septage application?

7. Do these crops (or certain types) grow better in areas where septage has been applied?

8. Does septage waste produce greater crop yields than manure application?

9. Initially, why did you begin a septage application facility? Are you satisfied with its results?

10. What type of assistance do you receive from the United States Environmental Protection Agency (USEPA), New Hampshire Department of Environmental Services (NHDES) to implement this project?

11. Has the EPA or DES taken surface and ground water samples on-site?

12. Were water samples taken before the installation of the wetland lagoons to compare water quality changes before and after septage application?

APPENDIX III-D

1 _____

THE EXETER RIVER NONPOINT SOURCE POLLUTION POLICY IMPLEMENTATION AUDIT

The University of New Hampshire: Department of Natural Resources

****

It is our intent that this survey be answered by current Planning Board members. Please read through each question and mark an X on the line which represents your choice. If your choice is not listed please write it in under the OTHER option.

****

1. In what town do you contribute as a decision maker?
Check one:

_____a. EAST KINGSTON
_____b. KENSINGTON
_____c. EXETER

2. On which of the following decision making bodies are you a member?
Check all groups you serve on:

_____a. PLANNING BOARD
_____b. BOARD OF ADJUSTMENTS
_____c. SELECTMAN
_____d. CONSERVATION COMMISSION
_____e. HEALTH OFFICER
_____f. OTHER (PLEASE SPECIFY) _____

3. Below is a list of possible sources of nonpoint source pollution. For each source please check the response category which, *in your opinion*, best describes the degree the sources affect the Exeter River Watershed.

- **Sediments due to erosion:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Runoff from cropland:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Household septic systems:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Household lawn and garden chemicals:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Home auto maintenance (cars, boats, etc.):**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Runoff from livestock operations:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Timber Harvesting (e.g. erosion and runoff due to operations):**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Stormwater drainage:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Runoff from urban areas:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Highway Maintenance Practices:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Erosion at Construction sites:**

_____ a. DOES NOT AFFECT	_____ b. SLIGHTLY AFFECTS	_____c. MODERATELY AFFECTS	_____ d. MOST STRONGLY AFFECTS	_____ e. UNSURE

- **Parking lots and paved areas:**

_____ a.	_____ b.	_____c.	_____ d.	_____ e.
DOES NOT AFFECT	SLIGHTLY AFFECTS	MODERATELY AFFECTS	MOST STRONGLY AFFECTS	UNSURE

- **Landfills/ Solidwaste disposal facilities:**

_____ a.	_____ b.	_____c.	_____ d.	_____ e.
DOES NOT AFFECT	SLIGHTLY AFFECTS	MODERATELY AFFECTS	MOST STRONGLY AFFECTS	UNSURE

- **Leaking underground storage tanks:**

_____ a.	_____ b.	_____c.	_____ d.	_____ e.
DOES NOT AFFECT	SLIGHTLY AFFECTS	MODERATELY AFFECTS	MOST STRONGLY AFFECTS	UNSURE

- **Other (please specify) _____:**

_____ a.	_____ b.	_____c.	_____ d.	_____ e.
DOES NOT AFFECT	SLIGHTLY AFFECTS	MODERATELY AFFECTS	MOST STRONGLY AFFECTS	UNSURE

4. In your opinion, which of the above sources of nonpoint pollution are the most significant problems in your local area?

_____

5. In general, do you think nonpoint pollution is a serious problem, somewhat of a problem, or not a problem in your town?
check one:
_____a. NOT A PROBLEM
_____b. SOMEWHAT OF A PROBLEM
_____c. SERIOUS PROBLEM
_____d. UNSURE

6. To your knowledge has anyone evaluated the policies/regulations related to nonpoint source pollution in your town within the last five years?
check one:
_____a. YES
_____b. NO
_____c. UNSURE

6b. To your knowledge, what was the purpose of the evaluation?

_____

6c. Please indicate the government agency that was responsible for the evaluation and when it took place?

_____

7. In your opinion, how effective are the existing land use regulations in your town for preventing nonpoint source pollution?
circle one choice:
EXTREMELY INEFFECTIVE... 1 2 3 4 5 6 EXTREMELY EFFECTIVE

8. In your opinion, which of the land use policies/regulations do you believe are the most effective to minimize nonpoint source pollution in your town?

_____

9. In your opinion, have any of the following helped policies/regulations in your town work more effectively?
check those which apply:
_____a. MONITORING
_____b. ENFORCEMENT
_____c. ADEQUATE FINANCIAL RESOURCES
_____d. SUFFICIENT HUMAN RESOURCES
_____e. PUBLIC INTEREST
_____f. ISSUE ISN'T A PROBLEM IN OUR TOWN
_____g. POLICY MATCHES THE PROBLEM
_____h. UNSURE
_____j. POLICIES/REGULATIONS HAVE REACHED THOSE AFFECTED
_____k. OTHER (PLEASE SPECIFY) _____

10. The state minimum requirement for septic system setbacks from a river are 75 feet. If your town has a setback requirement of 100 feet or greater please explain how it became evident that a greater setback was needed?

_____
_____

10b. If your town <u>does</u> have a septic system setback greater than 75 feet, did the increase in distance improve the regulation, not affect the regulation, decrease the effectiveness of the regulation?
Please check one:
_____a. IMPROVE THE REGULATION
_____b. NOT AFFECT THE REGULATION
_____c. DECREASE THE EFFECTIVENESS OF THE REGULATION
_____d. UNSURE
_____e. OTHER (PLEASE SPECIFY) _____

10c. In your opinion, if septic systems are setback from a river 100 ft and nutrients and bacteria are still leaking into the river what are the best courses of action to take?

_____
_____

****

A Best Management Practice (BMP) is an alternative way of using and managing resources to reduce and minimize pollution and impact on the natural resource base. For BMPs to work effectively usually requires at a minimum a) new information to individuals and b) resources and incentives to carry them out.

---

11. Below is a list of BMPs which can be used to minimize potential sources of nonpoint pollution.
Please check those currently in place in your town and indicate if they seem to be ineffective or effective.

BMP	Currently in use	Unsure	Ineffective	Effective
SEPTIC SYSTEMS				
a) KNOW THE LOCATION OF YOUR TANK AND LEACHING AREA.				
b) INSPECT YOUR SEPTIC TANK YEARLY				
c) DO NOT FLUSH TOXIC MATERIALS SUCH AS PAINT THINNER, PESTICIDES OR CHLORINE INTO YOUR SYSTEM SINCE THEY KILL THE NECESSARY BACTERIA IN THE TANK.				
d) AVOID COLORED TOILET PAPER; IT DOES NOT BREAK DOWN IN THE TANK AS RAPIDLY AS WHITE PAPER.				
ROAD CONSTRUCTION AND MAINTENANCE				
a) MINIMIZE OR AVOID CONSTRUCTING ROADS NEAR SENSITIVE AREAS SUCH AS WETLANDS, LAKES, OR RIVERS.				
b) MINIMIZE THE AMOUNT OF BARE SOIL EXPOSED BY SCHEDULING PHASES OF CONSTRUCTION AND STABILIZATION.				
c) USE THE STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE.				
d) STABILIZE AND PROTECT CONSTRUCTION AREAS WITH SEEDING, MULCHING, ETC. AS SOON AS POSSIBLE.				
AGRICULTURAL USE				
a) CONTROL ACCESS OF LIVESTOCK TO WATER BODIES				
b) MAINTAIN BUFFER STRIPS BETWEEN AGRICULTURAL FIELDS AND SURFACE WATERS				

c) INTEGRATED PEST MANAGEMENT AND REDUCED APPLICATIONS OF CHEMICAL				
d) AVOID APPLICATION OF MANURE ON FROZEN GROUND				
GRAVEL OPERATIONS				
a) INVESTIGATE PROPOSED PIT AREAS AS PART OF PLANNING.				
b) MAINTAIN AN ADEQUATE DEPTH OF UNEXCAVATED MATERIAL ABOVE THE SEASONAL HIGH WATER TABLE, AS A FILTER.				
c) PROVIDE BUFFER STRIPS OF NATURAL VEGETATION BETWEEN THE PIT AND THE SURFACE WATER, WETLANDS, PUBLIC ROADS, AND PROPERTY LINES.				
BMP	Currently in use	Unsure	Ineffective	Effective
SITE EXCAVATION AND DEVELOPMENT				
a) USE MUNICIPAL QUALITY MANAGEMENT BY PROFESSIONAL PLAN REVIEW AND DETAILED FIELD CHECKING OF CONTRACTOR'S ONSITE INSPECTION, TESTING, AND MONITORING.				
b) PROVIDE IMMEDIATE EROSION PROTECTION, SUCH AS MATTING FOR ALL CONCENTRATED FLOW AREAS.				
c) CONSIDER RETENTION BASINS WITH CONSTRUCTED WETLANDS TO IMPROVE WATER QUALITY WHERE DETENTION IS REQUIRED.				
d) PROVIDE POLLUTANT CONTROL BY PROFESSIONAL PLANNING, DESIGN, CONSTRUCTION, AND IMPLEMENTATION OF BMPs.				

12. In your opinion, which of the BMPs listed in question 11, need alteration to make them more effective?

_____

_____

12b. If you feel changes are needed, what would you recommend?

_____

_____

13. Currently there are no regulations that require livestock to be kept from walking through rivers which directly serve as a drinking water supply. In your opinion, do you feel that a regulation requiring cattle to be kept back a certain distance from the water would be useful enough for you to support it?
check one:

_____a. YES
_____b. NO
_____c. UNSURE

13b. If you would or would not support this type of a regulation please state why.

_____
_____

14. To your knowledge are there farmers who have voluntarily adopted the use of buffer strips when their land abuts a body of water?
check one:

_____a. YES
_____b. NO
_____c. UNSURE

15. In your opinion, are the most effective way(s) to ensure the use of Best Management Practices?
check those which are the most effective:

_____a. PROVIDE TRAINING OR TECHNICAL ASSISTANCE
_____b. PEOPLE DO THEM VOLUNTARILY
_____c. REGULATE BMPs
_____d. PROVIDE INCENTIVES
_____e. OTHER (PLEASE SPECIFY) _____
_____f. UNSURE

16. In your opinion, what is the best approach for reducing nonpoint source pollution in your town?
check one:

_____a. POLICIES/REGULATIONS
_____b. BEST MANAGEMENT PRACTICES (BMPs)
_____c. A COMBINATION OF POLICIES/REGs AND BMPs
_____d. OTHER (PLEASE SPECIFY) _____

Why?

_____
_____

****

Questions which were asked only to Planning Board Members

****

17. Below is a list of possible barriers and constraints when monitoring for compliance with regulations. Out of a scale of 1-6, 1 indicates the least of a barrier and 6 is the greatest barrier.
Please circle the numerical value which is appropriate:

a. lack of personnel to monitor:

LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

b. insufficient funding to do effective monitoring:

LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

c. existing regulations are not aiding in monitoring process:

LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

d. inadequate communication between decision making bodies:

LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

e. difficulty in locating proposed sites/areas once they are completed:

LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

18. What tools do you use to enforce the regulations/ policies related to nonpoint source pollution in your town?
Check all means currently being used:

_____a. FINES
_____b. WRITTEN NOTICE OF VIOLATION
_____c. VERBAL NOTIFICATION OF VIOLATION
_____d. UTILIZATION OF PERFORMANCE BONDS
_____e. LEGAL ACTION
_____f. REPORT THE INCIDENT TO DEPARTMENT OF ENVIRONMENTAL PROTECTION (DES)
_____g. OTHER (PLEASE SPECIFY) _____

19. Overall, how would you rate your town's regulations and Best Management Practices in controlling nonpoint source pollution?
Circle one number:

EXTREMELY INEFFECTIVE ... 1 2 3 4 5 6 .. **EXTREMELY EFFECTIVELY**

20. What has been the duration of time you have served on the Planning Board?
check one:

_____a. 0 --- 1 MONTH
_____b. 1 MONTH --- 6 MONTHS
_____c. 6 MONTHS --- 1 YEAR
_____d. 1 YEAR ---- 3 YEARS
_____e. GREATER THAN THREE YRS. (PLEASE SPECIFY) _____

21. When reviewing subdivision design plans who usually participates in the review process?
Please check those involved from the list below.

OFFICIAL	INVOLVED IN PROCESS	UNSURE
a. PLANNING BOARD CHAIR		
b. PLANNING BOARD MEMBERS		
c. HEALTH CODE ENFORCEMENT OFFICER		
d. ENGINEER		
e. BUILDING INSPECTOR		
f. REGIONAL PLANNING COMMISSION		
g. CONSERVATION COMMISSION		
h. APPLICANT		
i. OTHER (PLEASE LIST) _____		

22. In your opinion, how effective are your town's erosion and sediment controls for minimizing site disturbance?
Circle one choice:
EXTREMELY INEFFECTIVE ... 1 2 3 4 5 6 **EXTREMELY EFFECTIVE**

23. While an applicant is in the construction process how often does on site inspection occur to ensure erosion and sediment controls are in place and functioning?
check all that apply:
_____a. ROUTINELY
_____b. DURING MAJOR STORM EVENTS
_____c. NOT AT ALL
_____d. OTHER (PLEASE SPECIFY) _____
_____e. UNSURE

24. To your knowledge what measures are taken to ensure compliance to erosion and sediment controls?
_____
_____

25. In your opinion, how effectively have the subdivision regulations for erosion and sediment control, septic system installation, and stormwater treatment been carried out in your town?
Circle one choice:
EXTREMELY INEFFECTIVELY 1 2 3 4 5 6 | **EXTREMELY EFFECTIVELY**

26. How effective are subdivision and site plan review regulations for minimizing nonpoint sources of pollution?
Circle one choice:
EXTREMELY INEFFECTIVE 1 2 3 4 5 6 **EXTREMELY EFFECTIVE**

26b. If you indicated 3 or less in your answer to #26 please explain why you believe this is the case?

_____

_____

27. Have you encountered any problems in implementing regulations/decisions that affect nonpoint source pollution?
check one:

_____a. YES
_____b. NO
_____c. UNSURE

27b. If you answered yes to question #27, please explain examples of the problems encountered?

_____

_____

27c. What suggestions would you make for the problems listed above?

_____

_____

28. In your opinion, as a Planning Board member are there any types of training sessions which are currently not in place that you would like to see initiated?
check one:

_____a. YES
_____b. NO
_____c. UNSURE

28b. If you answered yes to # 28 what types of training sessions would be the most effective?

_____

_____

****

Questions which were asked only to Selectmen

****

17. Below is a list of possible barriers and constraints when monitoring for compliance with regulations. Out of a scale of 1-6, 1 indicates the least of a barrier and 6 is the greatest barrier.
Please circle the numerical value which is appropriate:

a. lack of personnel to monitor:
LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

b. insufficient funding to do effective monitoring:
LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

c. existing regulations are not aiding in monitoring process:
LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

d. inadequate communication between decision making bodies:
LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

e. difficulty in locating proposed sites/areas once they are completed:
LEAST BARRIER ... 1 2 3 4 5 6 ... GREATEST BARRIER

18. What tools do you use to enforce the regulations/ policies related to nonpoint source pollution in your town?
Check all means currently being used:

_____a. FINES
_____b. WRITTEN NOTICE OF VIOLATION
_____c. VERBAL NOTIFICATION OF VIOLATION
_____d. UTILIZATION OF PERFORMANCE BONDS
_____e. LEGAL ACTION
_____f. REPORT THE INCIDENT TO DEPARTMENT OF ENVIRONMENTAL PROTECTION (DES)
_____g. OTHER (PLEASE SPECIFY) _____

19. Overall, how would you rate your town's regulations and Best Management Practices in controlling nonpoint source pollution?
Circle one number:

EXTREMELY INEFFECTIVE ... 1 2 3 4 5 6 **EXTREMELY EFFECTIVELY**

20. What has been the duration of time you have been a selectman?
Check one:

_____a. 0 --- 1 MONTH
_____b. 1 MONTH --- 6 MONTHS
_____c. 6 MONTHS --- 1 YEAR
_____d. 1 YEAR ---- 3 YEARS
_____e. GREATER THAN 3 YEARS (PLEASE SPECIFY) _____

21. In your opinion, how easy is it to monitor nonpoint source regulations to determine if they are working appropriately?
Circle one:
EXTREMELY DIFFICULT 1 2 3 4 5 6 **EXTREMELY EASY**

22. How often have you been notified of a nonpoint source violation by a Conservation Commissioner?
Check one:
_____a. REGULARLY
_____b. ALMOST NEVER
_____c. ONCE IN A WHILE
_____d. OTHER (PLEASE SPECIFY) _____
_____e. UNSURE

23. What types of monitoring devices are currently being used in your town to evaluate how policies and regulations are operating?
check all that apply:
_____a. HEALTH CODE ENFORCEMENT OFFICER
_____b. QUALIFIED SPECIALIST
_____c. RECORD OF PERMITS GRANTED
_____d. NUMBER OF PERFORMANCE BONDS COLLECTED
_____e. NUMBER OF FINES LEVIED
_____f. OTHER (PLEASE SPECIFY) _____

24. To your knowledge how frequently does monitoring of riparian lands (e.g. land adjacent to a river) occur?
check one:
_____a. ANNUALLY OR LESS OFTEN
_____b. ONLY IF A PROBLEM IS SUSPECTED
_____c. ROUTINELY
_____d. FOLLOWING CORRECTIVE ACTION
_____e. OTHER (PLEASE SPECIFY) _____
_____f. UNSURE

25. To your knowledge, if you need additional resources or expertise how do you obtain these types of resources?
check all that apply:
_____a. APPLY FOR STATE OR FEDERAL GRANTS
_____b. ROCKINGHAM PLANNING COMMISSION
_____c. USE OF VOLUNTEER HELP
_____d. OTHER (PLEASE SPECIFY) _____

26. Overall, how would you rate the process your desision making body uses in making, implementing, enforcing, and monitoring regulations which apply to nonpoint source pollution?
Circle one:
EXTREMELY INEFFECTIVE 1 2 3 4 5 6 **EXTREMELY EFFECTIVELY**

****

Questions which were asked only to Conservation Commissioners

****

17. How long have you have served on the Conservation Commission?
Check one:
_____a. 0 --- 1 MONTH
_____b. 1 MONTH --- 6 MONTHS
_____c. 6 MONTHS --- 1 YEAR
_____d. 1 YEAR ---- 3 YEARS
_____e. OVER 3 YEARS (PLEASE SPECIFY) _____

18. To your knowledge approximately how often are stormwater drains inspected and cleaned?
please check one:
_____a. ONCE EVERY SIX MONTHS OR LESS
_____b. ONCE EVERY YEAR
_____c. ONCE EVERY TWO YEARS
_____d. WHEN A PROBLEM ARISES
_____e. OTHER (PLEASE SPECIFY) _____
_____f. UNSURE

19. To your knowledge, under what conditions are crop and livestock farms visited by a Conservation Commissioner?
check all that apply:
_____a. AFTER A PUBLIC COMPLIANT
_____b. IF THE FARM IS APPLYING SLUDGE
_____c. IN THE SPRING TO MONITOR EROSION
_____d. TO CHECK IF BEST MANAGEMENT PRACTICES ARE IN PLACE
_____e. OTHER (PLEASE SPECIFY) _____
_____f. NONE OF THE ABOVE

20. To your knowledge, approximately how often does inspection and maintenance of existing septic systems occur in your town?
please check one:
_____a. ONCE EVERY SIX MONTHS OR LESS
_____b. ONCE EVERY YEAR
_____c. ONCE EVERY TWO YEARS
_____d. WHEN A PROBLEM ARISES
_____e. OTHER (PLEASE SPECIFY) _____
_____f. UNSURE

21. To your knowledge, if a Conservation Commissioner is aware that a landowner suspects his/her septic system is not operating properly what actions are taken?
Check one:

_____a. NOTIFY THE HEALTH CODE ENFORCEMENT OFFICER
_____b. THE LANDOWNER SHOULD SUPPORT THE COST TO FIX THE SYSTEM
_____c. THE STATE SHOULD PROVIDE ASSISTANCE TO FIX THE SYSTEM
_____d. THE TOWN SHOULD PROVIDE ASSISTANCE TO FIX THE SYSTEM
_____e. DO NOT CHECK THE SYSTEM AT ALL AND IT WILL FIX ITSELF
_____f. OTHER (PLEASE SPECIFY) _____

22. In your opinion, if it becomes evident that many septic systems aren't operating properly in the town what is the best course of action to take?
Check one:

_____a. YEARLY INSPECTION OF ALL SEPTICS BY THE TOWN OR STATE
_____b. INSTALLATION OF SEWER LINES TO INDIVIDUALS CURRENTLY ON SEPTIC SYSTEMS
_____c. STATE/ TOWN DECIDES WHICH SYSTEMS MUST BE FIXED BUT PROVIDES A PERCENTAGE OF THE MONEY TO FIX THE SYSTEM
_____d. LET THE SYSTEMS FAIL BECAUSE IT IS TOO COSTLY AND TIME CONSUMING TO REMEDIATE THE PROBLEM
_____e. DETERMINATION IF SEPTIC SYSTEMS ARE LOCATED WHERE THEY WERE INTENDED TO BE
_____f. REQUIRE ANNUAL PUMPING OF SEPTIC SYSTEMS

23. In your opinion, when a recommendation is made to the Planning Board or the Selectmen's Board is it usually the case that your decision incorporated into their final decision?
Check one:

_____a. ALMOST NEVER
_____b. ALMOST ALWAYS
_____c. FREQUENTLY
_____d. UNSURE
_____e. OTHER (PLEASE SPECIFY) _____

24. In your town what has been the most effective way for the Conservation Commission to protect/ manage natural resources?

_____a. EDUCATE THE PUBLIC ABOUT THEIR IMPORTANCE
_____b. SUGGEST NEW REGULATIONS TO MANAGE THEIR USE
_____c. WORK WITH THE DES AND CONSERVATION DISTRICT ON RESOURCE ISSUES
_____d. RELY ON THE USE OF EXPERTS IN THE FIELD
_____e. WORK CLOSELY WITH THE PLANNING BOARD AND BOARD OF SELECTMEN
_____f. OTHER (PLEASE SPECIFY) _____

25. To your knowledge has land which is vulnerable to nonpoint source pollution in your town been acquired for protection?

_____a. YES
_____b. NO

26. In your opinion, has the use of buffer zones around sensitive resource areas helped minimize the effects of pollution in your town?

_____a. YES
_____b. NO

26b. If you indicated yes to #26 please state why.

_____

_____

26c. In your opinion, if buffer zones were increased to greater distances would this change their effectiveness?

_____

_____

27. Overall, how would you rate the Conservation Commission's practices in preventing and addressing nonpoint source pollution?

Circle one:

EXTREMELY INEFFECTIVE 1 2 3 4 5 6 **EXTREMELY EFFECTIVE**

28. If you could add anything to the role of a Conservation Commissioner to make it more effective what would it be?

_____a. BETTER ACCESS TO RESOURCE MANAGEMENT EXPERTISE
_____b. INCREASE IN FUNDING
_____c. MORE AUTHORITY IN FORMING AND IMPLEMENTING REGULATIONS
_____d. NOTHING NEEDS TO BE CHANGED
_____e. OTHER (PLEASE SPECIFY) _____

****

In this section, we would like to ask you some questions about your background. This information will help in comparing your answers to those of other people. All of your answers are strictly confidential.

****

29. Do you live in the same town where you serve in a decision making capacity?

check one:

_____a. YES
_____b. NO

30. Do you own property adjacent to the Exeter River or one of its tributaries?

Check one:

_____a. YES
_____b. NO

31. What is your age category (*circle one set*):

_____a. 15-19
_____b. 20-29
_____c. 30-39
_____d. 40-49
_____e. 50-59
_____f. 60-69
_____g. 70 +

32. How do you use the Exeter River or its tributaries? *Check as many as apply*:

_____a. DRINKING WATER
_____b. CAMPING
_____c. FISHING/HUNTING
_____d. BIRD WATCHING
_____e. RECREATIONAL BOATING
_____f. SWIMMING
_____g. OTHER (PLEASE SPECIFY)

33. Are you : *check one*:

_____a. FEMALE
_____b. MALE

34. What is your primary occupation?

_____a. HOME MAKER
_____b. TRADE
_____c. MANAGERIAL
_____d. SCIENTIST
_____e. EDUCATOR
_____f. PUBLIC OFFICIAL
_____g. SERVICE
_____h. PROFESSION
_____i. STUDENT
_____j. AGRICULTURIST
_____k. RETAIL/BUSINESS
_____l. MANUFACTURING
_____m. OTHER (PLEASE SPECIFY)
_____

35. Please indicate your highest level of education.
Check one:

_____a SOME HIGH SCHOOL
_____b. HIGH SCHOOL DIPLOMA
_____c. SOME COLLEGE
_____d. BACHELORS DEGREE
_____e. MASTERS DEGREE
_____f. PH.D., ED, OR EQUIVALENT
_____g. POSTGRADUATE PROFESSIONAL DEGREE

****

ADDITIONAL COMMENTS

THANK YOU FOR YOUR TIME AND RESPONSES! Please fold completed survey and return by **March 7, 1996** in stamped envelope to: Sara Radacsi, Department of Natural Resources, 215 James Hall, Durham, NH 03824.

APPENDIX III-E

COMPILED PLANNING BOARD INTERVIEWS

****

Planning Board interviews were transcribed into a table format to make comparisons across responses. Responses may include additional information beyond the question asked which is also pertinent to the study. Interviews were conducted over the course of three weeks.

****

1. How long have you been participating as a planning board member?

Ext.	1-2 years
Ken.	1-2 years
E. King.	20 years

2. How was it that you became interested in becoming chair?

All positions were filled on a volunteer basis. They either appeared interesting or a challenge(Kensington). Wanted his street to become listed as a public street on the maps in Exeter. (Ext. chair).

3. What is the role of the Chair of the Planning Board?

As a mediator between the applicant and the Board. Drag our questions from the board. Applicants make changes on application as necessary. Control meetings. Request relevant people at meetings. Public is given a opportunity to speak.

4. What is the process of hearing an application for a subdivision or site plan review? What documents need to be submitted to the Board?

Ken.	Process includes showing the project: lot sizes by soil, potential well and septic locations, distance from neighbors, engineering review.
E. Kin	Showing maps and plats at a preliminary meeting and having a public hearing at the second meeting.
Exe.	Applicant goes through a checklist of items to comply with in the subdivision regulations. Town planner reviews applications and schedules a meeting with the Technical Review Committee (TRC). TRC can be composed of technical assistance. TRC makes recommendations to the applicant to meet subdivision regulations. Applicants make changes and bring them to the Planning Board (PB). PB begins an acceptance process. PB must act within 90 days. Can get an extension of another 90 days if needed. If action is not taken by 90 days Selectmen can take action under the authority of State RSAs. By this time the application has met the zoning requirements also. PB makes sure of specific details to ensure application meets the intent of the regulations. Planning board's role is to gel the will of applicant and the public.

5. Before an applicant can proceed to build does the Health Code Enforcement Officer and Building Inspector visit the site or is approval granted on the basis of the design standards? Is verification done prior to building?

Ken	There is no mandatory monitoring required. The PB is never really aware of the extent of monitoring which is occurring. There is spotty checking by the Building Inspector (BI). However, the BI does not sit in on the Planning Board Meetings. The town engineer oversees regulations during construction and the code enforcement officer inspects the site after the work has been completed.
E. Kin	Septic systems are monitored by the BI as well as buildings. He inspects and signs permits before they go to Concord. BI does not go out to look at the site. Occasionally the PB members will go out to the site.
Exe.	Depending on the type of building some inspections are made. Code enforcement officer (CEO) sometimes. PB can set up a site walk if they needed to. Depends on the acreage and magnitude of the lot being subdivided, especially if it is in an unknown area. More concerned about what the applicant proposes to the Board than what is out there.

6. If a building is taking place near a body of water or wetland what actions take place?

Ken.	If building is occurring near a wetland the builders need to show setbacks from the wetland and get a permit from the State.
E. Kin.	A soil survey is required with a confirmed soil scientist.
Exe.	TRC (chaired by Peter Dow) decided who is involved in the review process. He [Dow] can involve the Conservation Commission, RPC, County Conservation District (CCD). PB can ask questions about who has been contacted for input. Minor developments may not be requested for additional technical input. Application is submitted with memo of TRC's changes/recommendations.

7. Are subdivisions and site plan reviews usually granted relatively easily? For those which are not granted what was usually the reason why?

Ken.	Not asked question
E. King	Most subdivisions are passed fairly easily. For large subdivisions a traffic study is required. Only one was not done because the builders could not come up with the money and would have to start the entire application process over again from the beginning.
Exe.	In past six years none have been turned down. Applications are accepted after modifications are completed. Some have been withdrawn due to concerns by the abutters. Changes made in the application in the future must come before the board. Applications usually go through two PB meetings before they become finalized.

8. After the PB makes a decision is it subject to review by the ZBA or Selectmen or is that the final decision?

Ken	The Zoning Board of Approval (ZBA) can review the application if it's not satisfied with any changes made to it. Usually the PB won't approve the application if the ZBA has denied it.
E. King	The PB makes the final approval. If something in application doesn't coincide with regulations they send it to the ZBA to get a variance. If they get the variance they go back to PB and set the plan up with the changes in the variance and approve it.
Exe.	PB makes the final decision unless application is appealed. Won't approve applications unless the zoning ordinances are all in order anyway. PB can give conditional approvals. A condition may be that the applicant get a variance or a special exception from ZBA . Once the condition is completed from the ZBA then the PB condition is fulfilled and the application can be signed and approved. No usual joint meetings with ZBA.

9. How are decisions made on the Board?

Ken	Majority rule. Seven full members need the approval of four members
E. King	Majority rule. Five members on the board. One member is the Selectmen rep. no alternates.
Exe.	Majority rule. Motion on approval, list conditions, second it, discussion, amend the conditions, amended motion and majority rules.

<u>ISSUES ADDRESSED BY THE DECISIONMAKER</u>

10. Are you aware of any types of nonpoint source pollution such as runoff from croplands, septic system waste, runoff from livestock farms, timber harvesting etc. occurring in your town?

Ken.	Yes, she was aware but did not want to comment on specific locations of potential sources.
E. Kin	Septage disposal system in town approved by the State with grant from the Federal government. Lagoon system with series of trenches with wetlands vegetation to purify septage. Spreads sewage on fields. Bodwell put this in with the help with the County Conservation District (CCD). The U.S. Soil Service too. He is in favor of using constructed wetlands as a means of septage disposal.
Exe.	Yes, they do have them but the Master Plan gives the most complete inventory of potential sources of pollution and the known sources also. PB role is to review new applications not to review existing land uses this is the role of the Code enforcement Officer. Only if people are not compiling to past agreements or current problems. PB not the enforcers of past decisions.

11. In your opinion, what is the largest source of nonpoint source pollution? What leads you to believe this is the case?

Ken.	Pesticide use and household pollutants are the largest sources of pollution in Kensington.
E.Kin	Septage lagoon probably is but it is also the answer to the towns septage disposal problem. Thinks this is a good idea for farmers as well as in and around large subdivisions.
Exe.	Need to check in the Master plan for the answer to this.

12. Spring runoff draining from manure in livestock farms can increase E. coli bacteria and nitrate counts. To your knowledge are their BMPs in place to control this type of pollution? Are there other methods being used?

Ken.	No comment about this.
E. King	Feel that fencing of cattle back from the River may not work because you would have to pay farmers for not using that land. Solutions to overcome that problem are slim. State and federal government are working to put farmers out of business. We support farmers.
Exe.	Not really aware about this in Exeter. Would rely on the help of Peter Dow, CC and master Plan to make any decisions about BMPs

<u>REGULATIONS/POLICIES</u>

13. In your opinion, when reviewing an application for a subdivision or site plan review which regulations either town or state do you feel are the most effective at reducing nonpoint source pollution. What makes these regulations/policies more effective compared to others?

Ken.	Can't really say which regulations are more effective.
E. Kin	State regulations are 75' from water body and E. Kingston are 100'. Feels this is more effective. E. Kingston has a minimum 2 acre building lot requirement 3/4 of that must be dry land in order to build.
Exe.	The more restrictive regulation applies whether state or town.

14. For what specific nonpoint source issues have local policies been made more stringent than the state standards. How did that change come about?

Ken	No comment
E. Kin	Area in E. Kingston is so wet that the town needed the greater setback of 100' to ensure building was not taking place in wetlands. The PB is the main vehicle for this change to occur. PB decides what they want in the regulation, hold a public hearing (not good public interest), and then the PB approves the change of the reg. Good vote on issues at town meetings. Subdivision changes occur at public hearings, zoning changes need to be voted by ballot by people in town.
Exe.	Not really aware of the differences between local and state regulations or specific ones that are used for nonpoint source pollution only that they use the more stringent one.

15. Exeter has a 300' buffer setback regulation from major rivers. This is much larger than other towns and the state minimum requirement of 75'. How did this change come about? Do you feel this was a good decision? (For other towns: If there are issues which you feel should be changed currently how would that regulation be changed?)

Ken.	Wasn't asked
E. King	The chair of the CC attends the PB meetings. CC has engineer who will evaluate the situation and report back to the PB. The town can also hire an engineer and the subdivider can pay for it. Subdivider must hire their own engineer in the beginning of the process. The State only hires the 2nd one if problems arise. CC hasn't asked or felt a need to change existing regulations to be more strict
Exe.	He doesn't know how it came about. Because they are in the Shoreland Protection District this is probably why it is 300'. Probably the PB in the past proposed an amendment to the ZBA to change it. The PB can hear requests from the public to change existing regulations, then the ZBA holds hearings on those. He guesses the PB would have originated this, not the public. Usually today the town planner or RPC will recommend changes to existing regulations to zoning ordinance, the PB reviews these and then has a town vote on these changes. Close reliance on RPC.

IMPLEMENTATION

16. What is the process for decisions/regulations made to become implemented?

Ken.	Once the subdivision is approved and signed, papers are processed and work can be done immediately. The PB can conditionally approve a decision. They can impose stipulations such as time limits.
E. Kin	
Exe.	Once the decision is approved work can begin and there is usually a follow up report the next month to update work done.

17. Since the Exeter River is used as a drinking water supply what actions have been made to implement Best Management Practices?

Ken	Not sure about BMPs in place in Kensington
E. Kin	Not aware of BMPs aside from setbacks being used.
Exe.	Is not aware about Best Management Practices going on in Exeter especially outside of the Exeter Area.

MONITORING

18. Who monitors the decisions of the PB and how frequently does this occur? Is the Building Inspector required to check the work after it has been completed and report back to the PB?

Ken	The PB follows up on the time limits imposed by the applicant. Can ask for follow up by the BI. The HCO goes to the site but it appears that the BI does not go to the site after the work has been done.
E.Kin	The BI will not sign the Plat until he gives the approval that boundary markers are right. The BI tells the builder to make the necessary changes, he comes back a second time to determine if the changes have actually been made. It is a lot of ground to cover for the BI. These are part time voluntary positions.
Exe.	The BI works in planning Dept. and goes out and inspects construction for conformance with code requirements and site approval. The PB will not know what the layout of the house/facility will be. Can't change the outside walls. BI enforces by bonding requirement which must equal the site improvement cost. Bond must be complete as it was approved. When applicant completes stages of project, percentages of bond are released. Sewer impact fee will help us know how many bathrooms are made. Too many sewers hookups will require a larger fee.

19. How are old septic systems monitored? Are there any pamphlets being given out to inform people how to manage their septic systems properly?

Ken	There are currently no pamphlets being handed out to inform landowners how to properly manage their septic systems.
E. King	Building inspector inspects septic systems. Fifteen dollars and BI checks on septics if they are going to be upgraded. He comes and checks on the project while they are working on it. There are no BMPs that he knows the town is using. Just feels best to pump it out every two years
Exe.	The Water Management portion of the Master Plan and the town planner and HCO have more of a role than PB in this issue.

20. If a resource issue arises before the board which you feel strongly about protecting how can you influence on outcome in your favor?

Ken	You can make new regulations, change existing subdivision regulations through public hearings. Change zoning regulations and put them up for town vote by the people. e.g.) requiring on site testing of road material.
E. King	Same as Ken.
Exe.	Land owners have certain rights to use their land. However, you can make regulations to protect the land. Individual member of PB could determine an area of town that needs to be protected, propose a zoning ordinance, hearing, and town vote. This hasn't happened. Would require convincing the town. You could also join the PB to help carry out your agenda. As PB get input from planning dept. as directions to take to protect land in town. Master Plan determines future direction for actions. Updated every 5 years. PB will request planning dept. to propose regulations in accordance with the Master Plan. Will help to see how well they are following the recommendations of the Master Plan.

21. How do you interact with the Selectmen, ZBA, HCO, and Rockingham County Conservation District?

Ken	Selectmen representative also sits on the PB. Vice chair works with the Selectmen. Health Code enforcement Officer instigates changes in septic system regulations. HCO and selectmen can put a lean on your house to cover the cost of not compiling to the regulations.
E. King	One member of the PB is the Selectman. He is at each meeting. They deal with basically enforcement. They enforce the regulations by the BI he is also like the Code enforcement officer. He goes out to see who is not complying with regulations. It is a volunteer position and only one person for the entire town.
Exe.	The Exeter PB and planning dept. work closely with the Rockingham Planning dept. They make the master plan and the watershed component. They have located potential nonpoint sources of pollution in the town of Exeter. They have a Selectman representative on the board, but interact with selectmen usually for enforcement decisions

22. How often are recommendations made by the Conservation Commission related to nonpoint source pollution incorporated into final decisions made by your decision making body? What would have had to happen for the Conservation Commissions recommendations incorporated?

Ken	It varies. Sometimes the CC will ask for changes to be made and the developer follows through with them. Usually the CC makes recommendations for buffer zones, hay bales, increased protection of wetlands. Usually now, they are just asking for the CC's opinion in matters. The CC gets notified of the action 2 weeks before the abutters. There is submission of a plan the CC sees it too. May help to make it a more formal process for the CC since they have little authority for their recommendations to become implemented.
E. King	CC and PB and Selectmen work closely in E. Kings. Their recommendations are usually incorporated, but the system is "real lax". The CC has workshops twice a year and the public officials come and learn for a 10 $ fee.
Exe.	Input from CC about every application that may impact the environment. Input also from the TRC process too. Input from zoning amendments. The PB takes the recommendation of CC, applicant can respond to the input, (the applicant hears input from CC at the TRC), usually the changes have been made by the applicant after TRC process and before it goes to the PB. Some times there is a problem when the CC feels there is an impact and the applicant feels no impact. This does not occur very often. Sometimes when CC proposes a certain type of action and the applicant proposed something different. The Planning board's role is to ensure the regulations are upheld throughout the process. If everything meets the PB regulations and the CC wants more undertaken then there could be a potential problem but this usually doesn't happen.

23. Overall, how would you rate the process you decision making body uses in making, implementing, enforcing and monitoring regulations? Rate the effectiveness of the decision making body on a scale of 1-6. What improvements do you feel could be made in the decision making structure of your town that would result in a reduction of nonpoint source pollution?

Ken	4. The PB doesn't always enforce regulations and there is little to no effective monitoring. The Master Plan could be improved as well as requiring HIS drainage analysis.
E. King	6-7. No real recommendations because it is working well now.
Exe.	6. Very efficient. Recommendations could be made in zoning ordinances. Increases in setbacks for certain areas especially if there are none now. Also having full time people involved in reviewing applications. Time consuming.

APPENDIX III-F

COMPILED SELECTMEN INTERVIEWS

****

Selectmen interviews were transcribed into a table format to make comparisons across responses. Responses may include additional information beyond the question asked which was also pertinent to the study. Interviews were conducted over the course of two weeks. Kensington Selectmen was unable to be interviewed.

****

1. How long have you been participating as Chair of the Selectman?

Ext.[1]	One year
E. King.	

2. How did you become interested in serving as Chair of the Selectmen?

Ext.	He was chairmen back in 1982. Liked it and will serve as chair for the next three years. The board works well together.
E. King.	Interest in helping in towns issues.

3. What is the role of the Chair?

Ext.	To preside over the meetings, set agenda and keep order.
E. King	Oversee the meetings. Split up into three different groups (there are three selectmen) and discuss different problems, chair oversees budgets. The State or the Conservation Commission (CC) tells the selectmen about potential nonpoint source pollution problems.

4. When someone is going to build a subdivision or siteplan do the selectmen go out to the site to see of the plats match the piece of land?

Ext.	The selectmen do not really go out to the site. The Technical Review Committee(TRC) usually does that aspect of the project. Occasionally the Selectmen walk the site. The selectmen are all on different committees to represent different interests. One other selectmen present on the board is on the Water and Sewer Advisory Committee which deals with water rates, leakage of water from pipes that may affect the plant, monetary, etc.
E. King	The Selectmen don't usually inspect, the Building Inspector (BI) does that instead.

[1] Abbreviations: Ext: Exeter, E.King.: East Kingston.

5. How are decisions made on the Board?

Ext.	Mutual consensus. Most of the decisions are made in public.
E. King	Mutual consensus. If a nonpoint source issue arises it's usually the State or the CC which informs the Selectmen of the problem.

6. How do you go about changing existing regulations to make them stricter (e.g. greater setbacks if there appears to be a need)

Ext.	Conservation Committee can initiate a change and recommend to the Selectmen. Exeter River is exempt for about a mile up river because it's the drinking water supply. A public citizen or the HCO can all suggest changes. The town usually does look into most of these suggestions and gets help from the state and the county. The public works director or town manager can also initiate these changes
E. King	

7. Are you aware of any types of nonpoint source pollution such as runoff from croplands, septic system waste, runoff from livestock farms, timber harvesting, etc. occurring in your town?

Ext.	To his knowledge is not really a problem. On Court street there may be some leaking septic systems. Most of the homes are hooked up to the sewer system now. Problems in town with an underground storage tank (oil) leaking into the river, Franklin street. Great Bridge. The Iocoka movie theater was leaking and was fixed.
E. King	Rile Rd. None other than Great Brook.

8. In your opinion, what is the largest source of nonpoint source pollution? What leads you to believe this is the case?

Ext.	See below
E. King.	The cows are always around and in the water [Great Brook] and are probably contributing to the pollution problem around this brook. "This is an agricultural town and I think people accept that." Designated floodplain area from Stumpfield on, mostly swamp area that can't be used.

9. Spring runoff draining from manure in livestock farms can increase E. coil bacteria and nitrate counts. To your knowledge are there Best Management Practices (BMPs) in place to control this type of pollution? Are there other methods being used?

Ext.	BMPs are being used and are listed in the Watershed Management Plan section of the Master Plan. Water treatment plant was upgraded to remove more pollutants and larger demand. Fecal bacteria can be treated easily. More concerned with the chemical pollutants spilling along truck routes. Contamination coming from animals is treatable. Don't want to see the farmers and or practices restricted. NH has lost many farms so there is interest in keeping these farms open to make a living. Use discretion.
E. King	No BMPs being used. Bodwell farm is using septic application. Environmental Protection Agency (EPA) has given him a grant to enlarge his land treatment area.

10. In your opinion, which regulations either town or state do you feel are the most effective at reducing nonpoint source pollution? What makes these regulations/policies more effective compared to others?

Ext.	In Exeter, the Shoreland Protection District has stricter regulations than for town surface water regulations, which have increased buffer zones to protect the water.
E. King	Health officer (HO) is the main enforcer of regulations and reports back. E. Kingston has regulations for wetlands and septic application. Usually problems are reported by public complaint to the Health Officer who informs the Conservation Commission. Selectmen are usually contacted last and don't get involved unless there is a problem.

11. Aside from regulations what other types of initiatives seem to work best when addressing nonpoint source pollution problems?

Ext.	Most BMPs work well. (Question about fencing animals back from the stream) Reply: Crossing a stream may be necessary for grazing. The treatment plant can treat animal waste readily. We don't want to see farmers livelihood restricted. If the animals have to go to the water you can't say they can't do that. NH has lost many farms. Common sense.
E. King.	Having the Conservation district work with the farmers.

12. If someone is in violation of a regulation pertaining to nonpoint source pollution what steps are taken? Who does the enforcement? Does enforcement occur routinely or only following a public complaint?

Ext.	The Building Inspector (BI) monitors subdivision and site plan regulations. If someone is in violation he will issue a cease and desist order. If they continue to not comply the Selectmen are notified and can take court action. Court action has not been taken thus far. Still, most violations of regulations are notified by public complaint.
E. King	The Building Inspector will check septic system, wetland, and well regulations in subdivisions. The Conservation Commission has seven members and will look at a site upon public complaint. CC works on the wetland evaluation regulations. If there is a State violation the Department of Environmental Services (DES) will be contacted. No fines have been issued.

13. How do Conservation Commissioners and Selectmen interact? How often are recommendations made by the Conservation Commission related to nonpoint source pollution incorporated into final decisions made by your decision making body?

Ext.	The Selectmen have a CC representative which go to Selectmen meetings. The CC members need to get Selectmen approval about buying land, easements etc. They usually get approval for these actions during Selectmen meetings.
E. King	The CC does not have much enforcement authority but works with the County Conservation District (CCD) about farming practices. The CCD will make conservation plans for farmers and recommend BMPs. If a health problem occurs the HO will take action or contact the State. The CC will provide input in all subdivision regulations and has influenced changes prior to building. The Selectmen rely on the CC for input because they are familiar with the current status of projects being undertaken. Most of the time the CC's recommendations will be incorporated into the Selectmen's final decision. Monitoring of septic systems is only done by CC or HO following a complaint. Only had a problem with one camp having a leaking septic system in town.

14. Overall, how would you rate the process you decision making body uses in making, implementing, enforcing and monitoring regulations? Rate the effectiveness of the decision making body on a scale of 1-6.

Ext.	6. Selectmen work well together.
E. King	5-6. Water quality problems are usually dealt with fairly quickly.

APPENDIX III-G

COMPILED FARMER INTERVIEWS

Location of site:	Names of farmers interviewed:
1 Crop farm in Kensington 4 Livestock farms in E. Kingston 0 Farms in Exeter	1. Bodwell, Daniel- Cattle and septage application facility 2. Bodwell, Hal & Harry- Cattle 3. Marston, Robert- Cattle, chickens, sheep 4. O'Shea, Patricia- Horses 5. Tutthill, Allen- Crops (corn, tomatoes, peppers, squash)

1. How long has the farm been under your operation?

1= The Bodwell family has farmed D. Bodwell's land continually for about 30 years. Bodwell owns about 3 acres of corn, 3 acres of hay and 30 acres of constructed wetlands for septage application (see figure ___).

2= The farm was started in 1928. He owns or rents about 180 acres of land in E. Kingston.

3= Marston has owned the farm since 1974.

4= Patricia O'Shea has owned the Arabian Horse Farm for seven years. The University of New Hampshire owned the property before her.

5= The Tuthill family has owned the crop farm since 1970. Before that time it was a dairy farm.

2. What types of crops do you grow?

1= Dan grows approximately 3 acres of corn used as cattle feed. About 3 acres of hay grows across the street adjacent to Great Brook.

2= H. Bodwell grows hay or grasses for cattle consumption on about 430 acres of land. About 200 acres are for pasture where the cattle feed.

3= no crops are grown.

4= O'Shea owns a small vegetable garden, which is approximately one acre.

5= The Tuthill's have a mixed vegetable farm. They grow five acres of corn and have green houses which contain tomatoes, peppers, squash and flowers.

a) How long have theses crops grown on your land?

1= Theses crops have been planted since the farm was started.

2= The grasses have grown and been harvested since 1928.

5= Corn has been grown on the property since 1920.

3. What types of livestock are you raising on this farm?

1= Dan owns about 30 cows.

2= H. Bodwell owns about 230 milking cows and 230 young stock. H. Bodwell uses low input dairy farming. He shifted from high input dairy farming about 3 years ago to low input and has still been able to make a profit.

3= Marston owns about 200 chickens, 26 cows, 66 goats, 25 sheep. These livestock are grown to sell.

4= O'Shea owns about 14 horses which pasture on 31 acres of grassland.

5= The Tuthill's own no livestock.

4. Where is the feed lot in relationship to drainage ways?

1= The feedlot is across the street from Great Brook in the barn.

2= The feedlot is on a small slope which drains down into a tributary of Great Brook. This feedlot is not totally covered and includes 80 acres of confined area by the barn.

3= The feedlot drains out into a wetland in back of Marston's property. This wetland drains into York Brook, a tributary to the Great Brook.

4= The feedlot is uphill from a wetland that drains into Great Brook.

a. Are there berms/ wetlands between the feedlot and the stream?

1= A road, and hay fields separates the feedlot from the stream.

2= A constructed wetland has been put in behind the feedlot to reduce nutrients from reaching the tributary stream.

4= There is a wetland at the edge of the property which separates the feedlot and the stream.

5. How do you handle manure which accumulates on your property?

1= Manure is spread on all fields.

2= Manure is spread on fields.

3= Manure is spread on fields/grassland.

4= The staff collect the paddocks into one large pile year round. People who live in the neighborhood come to collect the manure to put on their gardens. O'Shea spreads manure on her vegetable garden.

5= There is no accumulation of manure on the property.

a. How is livestock waste stored during the winter or when it's not in use?

1= Manure is stored in piles on the fields during the winter.

2= During the winter (Nov. - Feb.) manure is stored in windrows on the fields. Only about 200 acres of the land is tillable and the other 200 acres is rentable from neighbors.

3= Manure is stored inside during winter months.

4= By June almost all of the manure has been taken away. Saw dust is put in the left over manure to break it down. No manure is left by the winter.

6. Have you experienced periods of flooding this spring? Do spring floods produce visual changes in the terrain?

1= There was excessive ponding on the hay fields adjacent to Great Brook this spring. Canadian geese accumulated at this location in large numbers until the water receded. There is no visual signs of erosion, the hay takes hold after the water level becomes reduced.

2= The Brook flows high onto their property in early Spring. H. Bodwell doesn't let the milkers out in the early spring to the fields because they will tear up the ground. The cows are let out in early May. There were visual signs of soil erosion around Great Brook where grass had not taken hold.

3= Marston has experienced some flooding in the back wetland this spring.

4= Stormwater from Stumpfield road runs off on to their property. The land adjacent to the wetland at the edge of the property also becomes wet during spring floods. O'Shea will be putting in a drainage system on the property to reduce runoff problems.

5= The property slopes downward into a wetland that drains into Great Brook. Therefore, there is little flooding or ponding on the property. The land along the boarders of the property is seeded with hay.

7. What types of fertilizers and pesticides are you currently using?

1= No fertilizers are being used. Manure is the source of fertilizer.

2= Thirty tons of fertilizer is used in the spring to induce hay development. No herbicides or pesticides are used.

3= No fertilizers or pesticides are being used.

4= No fertilizers or pesticides are being used.

5= The Tuthill's use horse manure on about 2 acres/year. A half a ton of corn starter fertilizer (10:20:10) is applied in the spring. A fertilizer is applied for nitrogen addition (15:8:12) in the spring also. Organic fertilizers Prostart and Progrow are used on lettuce, broccoli and onion plants.

a. Frequency and time of year for fertilizer(s) application:

1= Manure is spread once or twice a year in between harvesting and planting of corn (July-August).

2= Fertilizers are applied twice a growing season for hay.

8. Where is the location of fields sprayed with fertilizers/pesticides in relationship to the stream?

1= The corn fields are across the street and the hay fields are adjacent to Great Brook.

2= H. Bodwell's property runs adjacent to the Great Brook.

5= The corn fields which receive fertilizers are a slope which drains into Great Brook. However, there is about a 200-300ft buffer of hay on their property before the runoff reaches the wetland at the edge of Great Brook.

9. Are any of the following Best Management Practices (BMPs) being used on your farm?

BMP	Using	Not Using	N/A
1. Control access of livestock to water bodies	3, 4	1, 2	5
2. Control runoff from barnyards and feedlots	2, 4	1, 3	5
3. Manage pastures to reduce concentrations of manure	1, 2, 3, 4		5
4. Composting of manure		1, 2, 3, 4, 5	
5. Store manure in constructed facilities during periods when land application is not suitable. (e.g. on frozen ground)	1, 2, 3, 4		5
6. Use soil tests to determine background levels of nutrients and soil pH.	1, 5	3, 4	
7. Keep fertilizer and manure application records and crop yield records to determine proper manure and fertilizer rates.	1, 2, 5		4
8. Crop rotation (to make efficient use of Nitrogen)	5	1	4
9. Maintain filter strips next to surface waters. (buffer strips)	1= 100' 3= 300' f/m GB 5= 300'	2 3= none for York B. 4= wetland at edge of property.	
10. Conservation tillage	5		
11. Other			

10. Why did you first begin using BMPs?

1= More cost effective to use manure and septage waste than buying fertilizer.

2= BMPs have helped on the farm. Because the feedlot is not completely covered, 6 years ago there was visual evidence of manure runoff coming off the cement feedlot into the snow. Gutters were put up on the existing roofs of the feedlot which have reduced the manure runoff.

3= Marston felt it was better not to spread manure on frozen ground.

4= O'Shea collects manure because she can sell it for a profit and it reduces on-site pollution.

5= The slope by the wetland near the edge of their property was too steep to plant crops so hay was planted. They also felt that hay would reduce runoff and absorb excess nutrients.

11. In your opinion, do you feel that land conservation practices have or will allow your land to become more productive? Or are BMPs more costly than beneficial?
1= BMPs have helped Bodwell's land to become more productive.

2= In the short term it is probably more costly but in the long-term conservation practices are better.

5= Conservation practices have helped the Tuthill's farm to become more productive. Rotating crop plantings helps reduce bug infestation and maintain fertility of soils.

> **a. Do you encourage other farmers in town to use BMPs?**
> 2= H. Bodwell encouraged Bob Sargent (a farmer in Kensington) to install a cement holding pad for manure.
>
> 3= Yes.
>
> 4= O'Shea mentioned that horse manure dries faster than cow manure and that the wetland buffer should be sufficient to help water quality.
>
> 5= Yes.

12. How do you work with the Rockingham County Conservation District (RCCD), United States Natural Resources Conservation Services (USNRCS), the Department of Environmental Services (DES) or Office of State Planning (OSP) to receive technical assistance for implementing farming practices?
1= D. Bodwell received a grant from the EPA for $128,000 to construct a wetland treatment facility for biosolids. Bodwell has matched the grant with an additional $128,000 for the project. The RCCD provided technical assistance and labor to install the wetlands cells. The nonpoint source division of the DES has installed ground water wells within the wetland and throughout D. Bodwell's property to determine reductions in nutrients and bacteria levels.

2= Works with Sue Hoy at the RCCD when he needs help with land practices.

3= Marston used to have corn fields that he put back into grassland and the RCCD gave him advise on the best way to make the transition.
4= The RCCD did a soil potential index on-site and determined that there are wetland soils at the edge of O'Shea's property. Further in off the property is a cattail wetland.

5= The Tuthill's were interested in putting in a pond for crop irrigation last fall. The RCCD came out and inspected the site but recommended that an additional well be put in instead.

> **a. How frequently have you asked for the assistance of one of these agencies? Was the advise useful?**
> 1= The RCCD and DES monitor and work with Bodwell on a routine basis.
>
> 2= RCCD aided in designing land to meet town and state regulations when putting in the constructed wetland.

5= The RCCD suggested planting Rye seed to minimize soil erosion.

13. Are there portions of your property where livestock have direct access to Great Brook or another creek?

1= Bodwell's property runs adjacent to Great Brook near the hay fields (Figure 1)

2= H. Bodwell's property runs adjacent to the Great Brook. The cattle have direct access to the Brook.

3= Direct access to York Brook. Marston's property is separated by a road and about 300-400' from Great Brook.

14. Are you concerned with animal waste affecting the water quality of this stream?

1= D. Bodwell feels that agriculture is not the source of pollution to Great Brook. Failed septic systems supporting residents in the area may be the source of this pollution.

2= H. Bodwell realizes that the cattle drink from this stream and that he probably should be more concerned with their walking through the stream.

4= Landowner doesn't feel that this site is a contributing source of pollution.

15. Have you undertaken any management practices to reduce animal wastes or sediment runoff? Did you receive any technical assistance or incentives to do this. If not what would be needed to carry out these changes.

Practices	Yes	No
1. Installation of a wetland or retention pond to clean manure on site	1, 2	3, 4, 5
2. Planting vegetation around the stream to absorb nutrients	1, 2, 5= winter rye	3, 4

16. During the year do you experience any soil erosion problems immediately adjacent to the stream?

1= No

2= Yes, in the Spring before the grass takes hold there are problems with soil erosion in portions of Great Brook.

3= Yes, during the interview the lower portions of the land near the wetland appeared wet. Also aerial photography taken in April shows small streams flowing off the property into the wetland.

17. What State or town regulations do you routinely deal with?

1= Those applying to septage spreading at a federal, state and town level.

4= Landowner doesn't routinely deal with any state or town regulations.

5= The State monitors pesticide use on their farm.

APPENDIX III-H

SUMMARY OF SURVEY RESULTS
(Percent of Responses)[1]

Sara Radacsi, University of New Hampshire

****

Planning board members, Selectmen, and Conservation Commissioners where surveyed from Exeter, Kensington, and E. Kingston. Questions 1-16 where standard in all surveys while questions 17-35 ask information specific to the groups authority. As a result, responses from questions 1-16 were compiled together to note similarities/differences between Planning Boards and Conservation Commissions, questions 1-17 are summarized separately for each decision making authority.

****

1. In what town do you contribute as a decision maker?

	Question #1		
		Number of Responses	Percentage of total Planning Board Members
a	**Exeter**	3	30
b	**Kensington**	4	40
c	**E. Kingston**	3	30

2. On which of the following decision making bodies are you a member?

	Question #2						
		Exeter		**Kensington**		**E. Kingston**	
		PB[2]	**CC**	**PB**	**CC**	**PB**	**CC**
a	Planning Board	100	0	100	0	100	0
b	Board of Adjustments	0	0	0	0	0	0
c	Selectmen	0	0	0	0	0	0
d	Conservation Commission	0	100	0	100	0	100
e	Health Officer	0	0	25	0	0	0
f	Other	67	0	0	50	0	0

Exeter: "Affordable Housing Committee; Rockingham Planning Commission."

[1] Responses were rounded to the nearest whole per cent, so columns may total to more or less than 100%. For questions where respondents could choose more than one selection, columns may total more than 100%.

[2] PB will indicate Planning Board responses and CC will abbrreviate Conservation Commission responses.

3. Below is a list of possible sources of nonpoint source pollution. For each source please check the response category which, in your opinion, best describes the degree the sources affect the Exeter River Watershed.

Question #3

3.1. Sediments due to erosion:

		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	0	0	0	0
b	Slightly affects	33	0	50	0	67	0
c	Moderately affects	33	50	25	100	33	0
d	Most strongly affects	33	0	25	0	0	0
e	Unsure	0	50	0	0	0	25

3.2. Runoff from Cropland:

		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	25	0	0	0
b	Slightly affects	67	100	25	50	100	75
c	Moderately affects	33	0	25	50	0	25
d	Most strongly affects	0	0	25	0	0	0
e	Unsure	0	0	0	0	0	0

3.3 Household septic systems:

		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	33	0	0	0	0	25
b	Slightly affects	33	0	25	50	67	50
c	Moderately affects	0	50	75	50	33	0
d	Most strongly affects	33	50	0	0	0	0
e	Unsure	0	0	0	0	0	25

3.4. Household lawn and garden chemicals:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	25	0	0	50
b	Slightly affects	33	0	25	50	0	0
c	Moderately affects	33	100	50	50	67	50
d	Most strongly affects	33	0	0	0	33	0
e	Unsure	0	0	0	0	0	0

3.5. Home auto maintenance (cars, boats, etc.):							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	33	0	25	0	67	50
b	Slightly affects	0	0	0	100	33	0
c	Moderately affects	33	50	50	0	0	0
d	Most strongly affects	33	0	0	0	0	25
e	Unsure	0	50	25	0	0	25

3.6. Runoff from livestock operations:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	33	0	25	0	67	25
b	Slightly affects	33	100	0	50	0	50
c	Moderately affects	33	0	25	0	0	25
d	Most strongly affects	0	0	25	50	0	0
e	Unsure	0	0	25	0	33	0

3.7. Timber Harvesting (e.g. erosion and runoff due to operations):							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	0	0	0	25
b	Slightly affects	67	100	50	100	67	75
c	Moderately affects	33	0	25	0	0	0
d	Most strongly affects	0	0	25	0	0	0
e	Unsure	0	0	0	0	33	0

3.8. Stormwater drainage:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	0	0	0	25
b	Slightly affects	0	0	25	0	0	50
c	Moderately affects	33	0	50	100	67	0
d	Most strongly affects	67	100	25	0	33	0
e	Unsure	0	0	0	0	0	25

3.9. Runoff from urban areas:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	25	0	0	50
b	Slightly affects	0	50	0	0	0	0
c	Moderately affects	33	0	50	100	67	0
d	Most strongly affects	67	50	0	0	0	0
e	Unsure	0	0	25	0	33	50

3.10. Highway Maintenance Practices:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	0	0	33	0
b	Slightly affects	33	0	25	0	0	25
c	Moderately affects	33	50	25	50	67	50
d	Most strongly affects	33	50	25	50	0	0
e	Unsure	0	0	25	0	0	25

3. 11. Erosion at Construction Sites:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	25	0	0	25
b	Slightly affects	33	0	0	0	100	25
c	Moderately affects	33	50	50	100	0	25
d	Most strongly affects	33	0	25	0	0	0
e	Unsure	0	50	0	0	0	25

3.12. Parking lots and paved areas:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	0	0	33	75
b	Slightly affects	0	0	0	0	0	0
c	Moderately affects	67	0	25	100	33	25
d	Most strongly affects	33	100	25	0	0	0
e	Unsure	0	0	50	0	33	0

3.13. Landfills/ Solidwaste disposal facilities:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	50	25	0	33	50
b	Slightly affects	67	50	0	100	0	0
c	Moderately affects	33	0	50	0	33	25
d	Most strongly affects	0	0	25	0	0	25
e	Unsure	0	0	0	0	33	0

3.14 Leaking underground storage tanks:							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	25	0	33	50
b	Slightly affects	67	0	0	100	33	0
c	Moderately affects	33	0	50	0	0	0
d	Most strongly affects	0	0	25	0	0	25
e	Unsure	0	100	0	0	33	25

3.15 Other (Please Specify):							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Does not affect	0	0	0	0	0	0
b	Slightly affects	0	0	0	0	33	0
c	Moderately affects	0	50	0	0	0	25
d	Most strongly affects	0	0	25	0	0	0
e	Unsure	0	0	0	0	0	25

4. In your opinion, which of the above sources of nonpoint source pollution are the most significant problems in your area?

PB responses:

- Exeter: "Erosion sediment, fertilizers, chemical, urban parking lots and stormwater runoff; stormwater runoff, highway maintenance, paved areas; runoff from urban areas."
- Kensington: "Erosion; stormwater drainage; livestock runoff and septic."
- E. Kingston: "Highway maintenance; urban runoff."

CC responses:

- Exeter: "Stormwater, especially near towns; stormwater drainage plus vehicular effects."
- Kensington: "Livestock; stormwater drainage, suburban runoff, construction erosion, highway maintenance practices."
- E. Kingston: "Home auto repairs (i.e. oil gas, oil filters also I wonder about the two Exeter campgrounds on 108); agricultural runoff; highway runoff and cropland."

5. In general, do you think nonpoint source pollution is a serious problem, somewhat of a problem, or not a problem in your town?

question #5							
	Item			PB			
		Exeter		**Kensington**		**E. Kingston**	
		PB	**CC**	**PB**	**CC**	**PB**	**CC**
a	Not a problem	0	0	25	0	33	25
b	Somewhat of a problem	100	50	75	50	0	75
c	Serious problem	0	50	0	50	0	0
d	Unsure	0	0	0	0	33	0

6. To your knowledge has anyone evaluated the policies/regulations related to nonpoint source pollution in your town within the last five years?

question #6							
		Exeter		**Kensington**		**E. Kingston**	
		PB	**CC**	**PB**	**CC**	**PB**	**CC**
A	Yes	0	0	0	0	33	50
B	No	33	0	50	50	33	25
C	Unsure	67	100	50	50	33	25

6b. To your knowledge, what was the purpose of the evaluation?

PB responses:

- Exeter: "The town does have independent review of subdivision plans for stormwater/erosion and sediment control plans done by Rockingham County Conservation District. The town has adopted the "Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire."
- Kensington: "Determine the level of importance of various nonpoint pollution sources."
- E. Kingston: "River pollution/Site Plan Review."

CC responses:

- E. Kingston: "To determine presence of nonpoint source pollution; Master Plan."

6c. Please indicate the government agency that was responsible for the evaluation and when it took place?

PB responses:

- E. Kingston: "Unsure, ongoing Planning Board concern."

CC responses:

- E. Kingston: "OSP- Coastal Zone Office in the Summer and Fall of 1995; conservation commission last year."

7. In your opinion, how effective are the existing land use regulations in your town for preventing nonpoint source pollution?

Question #7						
	Exeter		**Kensington**		**E. Kingston**	
	PB	**CC**	**PB**	**CC**	**PB**	**CC**
Extremely ineffective						
1	0	0	0	0	0	0
2	0	50	0	50	0	25
3	0	0	25	50	33	25
4	33	50	50	50	33	50
5	67	0	25	0	33	0
6	0	0	0	0	0	0
Extremely effective						

- Exeter: "Especially when reviewed by outside engineering consultant at Rockingham County Conservation District."

8. In your opinion, which of the land use policies/regulations do you believe are the most effective to minimize nonpoint source pollution in your town?

PB responses:

- Exeter: "Treatment swales, sediment and erosion control measures- but need periodic site construction inspections!; site plan review regulations and subdivision regulations; stormwater/erosion and sediment BMPs."
- Kensington: "Septic regulations and subdivision drainage regulations; use of protective barriers during excavation and construction, regulations of septic installation."
- E. Kingston: "Site plan review."

CC responses:

- Exeter: "Wetland ordinances; setback regulations."
- Kensington: "Subdivision laws, recycling program; wetlands restrictions."
- E. Kingston: "Septic system lot sizes; septage/sludge ordinance; buffer setbacks; zoning regulations."

9. In your opinion, have any of the following helped policies/regulations in your town work more effectively?

	Question #9	Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Monitoring	100	50	50	50	0	75
b	Enforcement	33	50	50	50	33	25
c	Adequate financial resources	0	0	0	0	0	0
d	Sufficient Human Resources	0	0	0	0	0	25
e	Public Interest	67	0	50	0	33	50
f	Issue isn't a problem in our town	0	0	25	0	33	25
g	Policy matches the problem	0	0	25	0	0	25
h	Unsure	0	50	25	0	33	0
j	Policies/regulations have reached those affected	0	0	0	0	0	50
k	Other	0	0	0	0	0	0

10. The state minimum requirement for septic system setbacks from a river are 75 feet. If your town has a setback requirement of 100 feet or greater please explain how it became evident that a greater setback was needed?

PB responses:

- Exeter: "Don't know what Exeter uses. Most of the town is on sewer. I think 75' is adequate. This really is an arbitrary distance anyway with little or no scientific proof; N/A- we had a requirement for >75' but modified it to 75' several years ago after reviewing input from the State."
- Kensington: "We follow State regulations."
- E. Kingston: "More wetland in our area; we thought it prudent; arbitrary decision erring on the side of caution."

CC responses:

- Exeter: "Septic setback is 150 feet from Exeter."
- E. Kingston: "Setback established when state standard was 100', has not been reevaluated to date; unsure how our setback was arrived at; State requires 75' based on experimental data is enough. I think it was just chosen with no research to back it up. Concern because Pow Wow River runs through town."

10.b. If your town does have a septic system setback greater than 75 feet, did the increase in distance improve the regulation, not affect the regulation, decrease the effectiveness of the regulation?

	Question #10						
		Exeter		**Kensington**		**E. Kingston**	
		PB	**CC**	**PB**	**CC**	**PB**	**CC**
a	Improve the regulation	0	50	0	0	33	0
b	Not affect the regulation	0	0	25	0	67	25
c	Decrease the effectiveness of the regulation	0	0	0	0	0	0
d	Unsure	33	0	25	0	0	25
e	Other	0	0	0	0	0	25

10c. In your opinion, if septic systems are setback from a river 100 ft and nutrients and bacteria are still leaking into the river what are the best courses of action to take?

PB responses:

- Exeter: "Show me the scientific evidence to demonstrate the nature of the problem."
- Kensington: "Re-evaluation of the relation of soil types to regulate setback, re-evaluate type of septic systems best in system absorption near water flow areas; change regulations; go to a track system (holding)- no leach field and pump regularly."
- E. Kingston: "Obtain expert explanation and advice; plant grass; Health Officer takes action."

CC responses:

- Kensington: "Increase required distance further- at least in specific soil types, slopes etc.; redevelop the system at town expense if it is built in conformity now."
- E. Kingston: "Report the fact with study material to DES; evidence of inadequate system. Health dept. should investigate, evaluate, and force remedy; An existing leaking septic system should at least be updated to the point that it no longer leaks with some kind of cost effective incentives if a more high tech system needs to be created particularly in a grandfathers lot or existing structure where a traditional leach field may not be adequate; replace the system with one that works."

11. Below is a list of BMPs which can be used to minimize potential sources of nonpoint pollution. Check those currently in place in your town and indicate if they seem to be ineffective or effective.

	Question #11						
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
11.1 Septic systems							
	a) KNOW THE LOCATION OF YOUR TANK AND LEACHING AREA.						
11.1.ac	Currently in use	0	0	50	50	67	0
11.1.au	Unsure	33	0	0	0	0	75
11.1.ai	Ineffective	0	0	0	0	0	0
11.1.ae	Effective	0	0	0	0	33	25
	b) INSPECT YOUR SEPTIC TANK YEARLY		0		0		0
11.1.bc	Currently in use	0	0	0	0	0	75
11.1.bu	Unsure	33	0	25	0	0	0
11.1.bi	Ineffective	0	0	0	0	33	0
11.1.be	Effective	33	0	0	0	33	0

	Question #11 (Cont.)						
	c) DO NOT FLUSH TOXIC MATERIALS SUCH AS PAINT THINNER, PESTICIDES OR CHLORINE INTO YOUR SYSTEM SINCE THEY KILL THE NECESSARY BACTERIA IN THE TANK.						
11.1.cc	Currently in use	0	0	0	50	0	0
11.1.cu	Unsure	33	0	25	0	0	75
11.1.ci	Ineffective	0	0	0	0	0	0
11.1.ce	Effective	33	0	0	0	67	0
	d) AVOID COLORED TOILET PAPER; IT DOES NOT BREAK DOWN IN THE TANK AS RAPIDLY AS WHITE PAPER						
11.1.dc	Currently in use	0	0	0	0	0	0
11.1.du	Unsure	33	0	0	0	0	75
11.1.di	Ineffective	0	0	25	0	0	0
11.1.de	Effective	33	0	0	0	67	0
11.2 Road Construction and Maintenance							
		Exeter		**Kensington**		**E. Kingston**	
		PB	**CC**	**PB**	**CC**	**PB**	**CC**
	a) MINIMIZE OR AVOID CONSTRUCTING ROADS NEAR SENSITIVE AREAS SUCH AS WETLANDS, LAKES, OR RIVERS.						
11.2.ac	Currently in use	100	0	25	50	33	75
11.2.au	Unsure	0	0	25	0	33	0
11.2.ai	Ineffective	0	0	0	0	0	0
11.2.ae	Effective	100	0	50	50	33	25
	b) MINIMIZE THE AMOUNT OF BARE SOIL EXPOSED BY SCHEDULING PHASES OF CONSTRUCTION AND STABILIZATION.						
11.2.bc	Currently in use	100	0	50	0	33	25
11.2.bu	Unsure	0	0	0	0	0	50
11.2.bi	Ineffective	0	0	0	0	0	0
11.2.be	Effective	100	0	25	0	67	0

	c) USE THE STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE.						
11.2.cc	Currently in use	100	0	25	0	0	25
11.2.cu	Unsure	0	0	50	0	0	50
11.2.ci	Ineffective	0	0	0	0	0	0
11.2.ce	Effective	100	0	75	0	67	0
	d) STABILIZE AND PROTECT CONSTRUCTION AREAS WITH SEEDING, MULCHING, ETC. AS SOON AS POSSIBLE.						
11.2.dc	Currently in use	100	0	75	50	0	75
11.2.du	Unsure	0	0	25	0	0	0
11.2.di	Ineffective	0	0	0	0	0	0
11.2.de	Effective	100	0	50	50	67	25
11.3 Agricultural Use							
		Exeter		**Kensington**		**E. Kingston**	
		PB	**CC**	**PB**	**CC**	**PB**	**CC**
	a) CONTROL ACCESS OF LIVESTOCK TO WATER BODIES						
11.3.ac	Currently in use	33	0	0	0	0	0
11.3.au	Unsure	67	0	25	0	33	50
11.3.ai	Ineffective	0	0	0	0	33	25
11.3.ae	Effective	67	0	0	0	0	0
	b) MAINTAIN BUFFER STRIPS BETWEEN AGRICULTURAL FIELDS AND SURFACE WATERS						
11.3.bc	Currently in use	0	0	25	0	0	0
11.3.bu	Unsure	67	0	0	0	0	50
11.3.bi	Ineffective	0	0	0	0	33	25
11.3.be	Effective	33	0	0	0	33	0
	c) INTEGRATED PEST MANAGEMENT AND REDUCED APPLICATIONS OF CHEMICAL						
11.3.cc	Currently in use	0	0	25	0	0	0
11.3.cu	Unsure	67	0	0	0	33	50
11.3.ci	Ineffective	0	0	0	0	0	25
11.3.ce	Effective	0	0	0	0	33	0
	d) AVOID APPLICATION OF MANURE ON FROZEN GROUND						
11.3.dc	Currently in use	0	0	25	50	0	0
11.3.du	Unsure	67	0	0	0	0	75
11.3.di	Ineffective	0	0	0	0	0	0
11.3.de	Effective	0	0	0	0	67	0

Gravel Operations							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
	a) INVESTIGATE PROPOSED PIT AREAS AS PART OF PLANNING.						
11.4.ac	Currently in use	67	0	25	50	33	50
11.4.au	Unsure	0	0	0	0	0	0
11.4.ai	Ineffective	0	0	0	0	0	0
11.4.ae	. Effective	67	0	25	0	67	25
	b) MAINTAIN AN ADEQUATE DEPTH OF UNEXCAVATED MATERIAL ABOVE THE SEASONAL HIGH WATER TABLE, AS A FILTER.						
11.4.bc	Currently in use	33	0	50	50	0	50
11.4.bu	Unsure	33	0	0	0	0	25
11.4.bi	Ineffective	0	0	0	50	0	0
11.4.be	. Effective	33	0	75	0	67	25
	c) PROVIDE BUFFER STRIPS OF NATURAL VEGETATION BETWEEN THE PIT AND THE SURFACE WATER, WETLANDS, PUBLIC ROADS, AND PROPERTY LINES.						
11.4.cc	Currently in use	67	0	25	50	0	75
11.4.cu	Unsure	0	0	0	0	0	0
11.4.ci	Ineffective	0	0	0	0	0	0
11.4.ce	Effective	67	0	25	50	67	25

11.5 Site Excavation and Development							
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
	a) USE MUNICIPAL QUALITY MANAGEMENT BY PROFESSIONAL PLAN REVIEW AND DETAILED FIELD CHECKING OF CONTRACTOR'S ONSITE INSPECTION, TESTING, AND MONITORING.						
11.5.ac	Currently in use	67	0	50	50	0	50
11.5.au	Unsure	33	0	50	0	0	25
11.5.ai	Ineffective	0	0	0	0	0	0
11.5.ae	Effective	33	0	25	50	67	25
	b) PROVIDE IMMEDIATE EROSION PROTECTION, SUCH AS MATTING FOR ALL CONCENTRATED FLOW AREAS.						
11.5.bc	Currently in use	67	0	50	50	0	25
11.5.bu	Unsure	0	0	0	0	0	50
11.5.bi	Ineffective	0	0	0	0	0	0
11.5.be	Effective	67	0	50	50	67	0

	c) CONSIDER RETENTION BASINS WITH CONSTRUCTED WETLANDS TO IMPROVE WATER QUALITY WHERE DETENTION IS REQUIRED.						
11.5.cc	Currently in use	67	0	25	0	0	25
11.5.cu	Unsure	0	0	0	0	0	50
11.5.ci	Ineffective	0	0	0	0	0	0
11.5.ce	Effective	67	0	25	0	67	0
	d) PROVIDE POLLUTANT CONTROL BY PROFESSIONAL PLANNING, DESIGN, CONSTRUCTION, AND IMPLEMENTATION OF BMPs.						
11.5.dc	Currently in use	33	0	25	0	0	25
11.5.du	Unsure	33	0	0	0	0	50
11.5.di	Ineffective	0	0	0	0	0	0
11.5.de	Effective	33	0	25	0	67	0

12. In your opinion, which of the BMPs listed in question 11, need alteration to make them more effective?

PB responses:

- Exeter: "More town inspections of construction sites; septic system operation."
- Kensington: "Education regarding home septic systems and lawn chemical applications; construction a, b and c, agriculture b, c, and (d near water bodies and waterflow), gravel a, b, and c and site development a and d."
- E. Kingston: "Road construction and maintenance; effectiveness relates greatly to enforcement. Such structures are perceived to be infringement and un- New Hampshire like.

CC responses:

- Kensington: "Spreading of manure on fields in winter is very important to wild turkey survival- suggest requiring/recommending grass strips if close to stream otherwise probably not a problem."
- E. Kingston: "The single nonpoint source pollution is at rt. 108 and Great Brook, measured at storm levels- probably caused by up river farming, 300+ cows, 18 hole golf course and Bodwell's bio-soild disposal. Separately each is in compliance but together, they impact a small area; if we had a code enforcement officer who was able to have the time to go door to door to police such actions such as monitor construction, these BMPs may have a chance. Gravel pits should have replication plan to minimize work area; I don't know any department that educates the public in these topics, I know our department doesn't. Although most things are good ideas. I personally don't know to what extent our town monitors the activities in our town, for example I know Bodwell's septic has to meet many state regulations but I have no idea if the local golf course has any restrictions for possible chemical run off; those related to septic systems."

12b. If you feel changes are needed, what would you recommend?

PB responses:

- Exeter: "Don't know but willing to consider."
- Kensington: "More on-site evaluation prior to excavation and construction- more on-site monitoring; in general locals have no idea of the significance of our watershed area a broad based educational information pack should be mailed to each home."
- E. Kingston: "Less spreading of salt and sand."

CC responses:

- Kensington: "Our town is very apathetic about safeguarding natural resources- in keeping with the Yankee republican mentality of 'live free or die'."
- E. Kingston: "We need a set of controlled scientific experiments the courts will accept."

13. Currently there are no regulations that require livestock to be kept from walking through rivers which directly serve as a drinking water supply. In your opinion, do you feel that a regulation requiring cattle to be kept back a certain distance from the water would be useful enough for you to support it?

	Question #13						
		Exeter		**Kensington**		**E. Kingston**	
		PB	**CC**	**PB**	**CC**	**PB**	**CC**
a	Yes	33	100	50	100	0	100
b	No	33	0	0	0	67	0
c	Unsure	33	0	50	0	33	0

13b. If you would or would not support this type of a regulation please state why.

PB responses:

- Exeter: "Don't believe too many livestock in Exeter, but great idea to regulate; I would want to know the extent of this occurring, or potentially occurring prior to regulating it."
- Kensington: "I am not sure this would not get blown into a situation where every river and stream would become considered to ban livestock; drinking water is too valuable a commodity to waste."
- E. Kingston: "What about the wild animals?; would not people are more of a problem; apply such structures where called for, blanket regulation will be resisted."

CC responses:

- Exeter: "Public health takes priority over property rights."
- Kensington: "Very few dairy farms left in this area and they are having a tough time and would fight and resent outside meddling but it makes sense anyway; cattle make a mess of everything."
- E. Kingston: "It should apply to larger farms- Pollution is always a mater of scale; to keep cattle from directly polluting the water; truth be told, I wouldn't care if a person has a cow or two that gets into the water but if you start talking about 5,10, 15 20 or more than there is a concern. I think the farmers are taking a hard hit on this. I think someone changing there oil on some dead end road by the river has equal impact."

14. To your knowledge are there farmers who have voluntarily adopted the use of buffer strips when their land abuts a body of water?

	Question #14			% Response			
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Yes	33	50	0	0	33	0
b	No	0	0	25	50	33	25
c	Unsure	67	50	75	50	33	50

15. In your opinion, what are the most effective way(s) to ensure the use of Best Management Practices?

	Question #15						
		Exeter		Kensington		E. Kingston	
		PB	CC	PB	CC	PB	CC
a	Provide training or technical assistance	100	50	50	100	0	75
b	People do them voluntarily	33	0	0	0	33	25
c	Regulate BMPs	33	0	50	50	0	25
d	Provide Incentives	33	50	50	100	67	25
e	Other	33	50	25	0	0	0
f	Unsure	0	0	0	0	0	0

PB responses:

- Exeter: "**(Other)**: Inspection and Enforcement."
- Kensington: "**(Other)**:Close scrutiny of BMP to be sure they are not getting to a point of over kill."

CC responses:

- Exeter: "**(Other response)**: Public education campaign."

16. In your opinion, what is the best approach for reducing nonpoint source pollution in your town?

	Question #16						
		Exeter		**Kensington**		**E. Kingston**	
		PB	**CC**	**PB**	**CC**	**PB**	**CC**
a	Policies/regulations	0	0	0	0	0	0
b	Best Management Practices	33	0	25	0	67	25
c	A combination of policies/regs, and BMPs	67	100	75	100	0	75
d	Other	0	0	25	0	0	0

PB response:

- Kensington: (Other: increase knowledge)

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16 b. Why?

PB response:

- Exeter: "Need both regulations and construction BMPs used with inspections and enforcement; we do not want to over regulate."
- E. Kingston: "We would resist regulations."

CC Response:

- Exeter: "Flexibility and balance."
- Kensington: "Local people especially the 'old guard' resent and resist may infringement on their rights. They believe a landowner should be able to do whatever they want on their land. Even some conservation commission members feel that way."
- E. Kingston: "I believe a combination has a broader base of effectiveness; BMPs are less regulatory and easier to implement without forcing them on people."

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QUESTIONS WHICH WHERE ASKED TO ONLY PLANNING BOARD MEMBERS

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17. Below is a list of possible barriers and constraints when monitoring for compliance with regulations. Out of a scale of 1-6, 1 indicates the least of a barrier and 6 is the greatest barrier.

	Question #17		
A. LACK OF PERSONNEL TO MONITOR			
Least Barrier	**Exeter**	**Kensington**	**E. Kingston**
1	33	0	33
2	0	0	0
3	0	25	0
4	0	25	33
5	67	50	33
6	0	25	0
Greatest Barrier			

B. INSUFFICIENT FUNDING TO DO EFFECTIVE MONITORING			
Least Barrier	**Exeter**	**Kensington**	**E. Kingston**
1	33	0	33
2	33	0	0
3	33	25	33
4	0	25	0
5	0	50	0
6	0	25	33
Greatest Barrier			

C. EXISTING REGULATIONS ARE NOT AIDING IN MONITORING PROCESS			
Least Barrier	**Exeter**	**Kensington**	**E. Kingston**
1	0	0	0
2	33	0	100
3	33	75	0
4	0	0	0
5	33	25	0
6	0	0	0
Greatest Barrier			

D. INADEQUATE COMMUNICATION BETWEEN DECISION MAKING BODIES			
Least Barrier	**Exeter**	**Kensington**	**E. Kingston**
1	33	0	0
2	0	0	100
3	67	25	0
4	0	50	0
5	0	25	0
6	0	0	0
Greatest Barrier			

E. DIFFICULTY IN LOCATING PROPOSED SITES/AREAS ONCE THEY ARE COMPLETED			
Least Barrier	**Exeter**	**Kensington**	**E. Kingston**
1	33	50	0
2	33	0	33
3	0	25	67
4	33	0	0
5	0	0	0
6	0	0	0
Greatest Barrier			

18. What tools do you use to enforce the regulations/ policies related to nonpoint source pollution in your town?

	Question #18			
		Exeter	**Kensington**	**E. Kingston**
a	Fines	0	0	33
b	Written notice of violation	100	75	33
c	Verbal notification of violation	100	100	33
d	Utilization of performance bonds	100	75	0
e	Legal action	67	50	33
f	Report the incident to DES[3]	67	25	33
g	Other	0	0	33

[3] Department of Environmental Services

19. Overall, how would you rate your town's regulations and Best Management Practices in controlling nonpoint source pollution?

	Question #19		
Extremely ineffective	**Exeter**	**Kensington**	**E. Kingston**
1	0	0	0
2	0	0	0
3	0	50	0
4	67	75	100
5	33	0	0
6	0	0	0
Extremely effective			

20. What has been the duration of time you have served on the Planning Board?

	Question #20			
		Exeter	**Kensington**	**E. Kingston**
a	0-Month	0	0	0
b	1 Month- 6 Month	0	25	0
c	6 Months- 1 Year	0	0	0
d	1 Year- 3 Years	67	25	33
e	Greater than 3 Years	33	50	67

- Exeter: "(Greater): Six years."
- Kensington: "(Greater): Four years; more than ten years."
- E. Kingston: "(Greater): Twenty years."

21. When reviewing subdivision design plans who usually participates in the review process?

	Question #21			
		Exeter	**Kensington**	**E. Kingston**
a	Planning Board Chair	67	100	100
b	Planning Board Members	100	100	100
c	Health Code Enforcement Officer	67	75	33
d	Engineer	100	100	67
e	Building Inspector	33	0	100
f	Regional Planning Commission	33	0	100
g	Conservation Commission	100	50	100
h	Applicant	100	75	100
i	Other	33	0	0

※ Exeter: "(Other): Especially good to have reviewed by Ed Minnick, RCCD engineer; fire and police dept."

22. In your opinion, how effective are your town's erosion and sediment controls for minimizing site disturbance?

	Question #22		
Extremely Ineffective	**Exeter**	**Kensington**	**E. Kingston**
1	0	0	0
2	0	0	0
3	0	0	0
4	33	0	33
5	67	100	0
6	0	0	33
Extremely effective			

23. While an applicant is in the construction process how often does on site inspection occur to ensure erosion and sediment controls are in place and functioning?

	Question #23			
		Exeter	**Kensington**	**E. Kingston**
a	Routinely	33	50	67
b	During major storm events	0	0	0
c	Not at all	0	0	0
d	Other	0	50	0
e	Unsure	67	0	33

- Exeter: "Should be weekly."
- Kensington: "(Other): On occasion and upon request by Board chair; sporadic

24. To your knowledge what measures are taken to ensure compliance to erosion and sediment controls?

- Exeter: "Periodic inspection, verbal warnings and up the line; inspections; site inspections."
- Kensington: "Town engineer inspects; routine monitoring by town engineer."
- E. Kingston: "Conservation chairman and building inspector check on it; close monitoring by building inspector and Planning Board."

25. In your opinion, how effectively have the subdivision regulations for erosion and sediment control, septic system installation, and stormwater treatment been carried out in your town?

	Question #25		
Extremely Ineffectively	**Exeter**	**Kensington**	**E. Kingston**
1	0	0	0
2	0	0	0
3	0	0	0
4	0	50	33
5	67	25	33
6	33	25	33
Extremely effectively			

26. How effective are subdivision and site plan review regulations for minimizing nonpoint sources of pollution?

	Question #26		
Extremely ineffective	**Exeter**	**Kensington**	**E. Kingston**
1	0	0	0
2	0	0	0
3	0	0	0
4	67	50	33
5	33	50	33
6	0	0	33
Extremely effective			

26b. If you indicated 3 or less in your answer to #26 please explain why you believe this is the case?

⁂ Exeter: "I haven't specifically read them to verify what our regulations say on this item."

27. Have you encountered any problems in implementing regulations/decisions that affect nonpoint source pollution?

	Question #27			
		Exeter	**Kensington**	**E. Kingston**
a	Yes	0	0	0
b	No	67	50	33
c	Unsure	33	50	67

27b. If you answered yes to question #27, please explain examples of the problems encountered?

27c. What suggestions would you make for the problems listed above?

28. In your opinion, as a Planning Board member are there any types of training sessions which are currently not in place that you would like to see initiated?

	Question #28			
		Exeter	**Kensington**	**E. Kingston**
a	Yes	0	75	0
b	No	100	25	67
c	Unsure	0	0	33

28b. If you answered yes to # 28 what types of training sessions would be the most effective?

* Exeter: "Are you aware of the 2 times a year training now offered to PB and ZBA members by the NH Office of State Planning? They are great!"

Kensington: "More information sessions on nonpoint source pollution especially construction and BMPs; more frequent Planning Board training sessions more available seminars on land use and controlling effects of development as this relates to maintaining healthy conditions of man in our environment; I believe a position paper by a specific reputable organization- also community mailing hitting highlights of position paper."

29. Do you live in the same town where you serve in a decision making capacity?

	Question #29			
		Exeter	**Kensington**	**E. Kingston**
a	Yes	100	100	100
b	No	0	0	0

30. Do you own property adjacent to the Exeter River or one of its tributaries?

	Question #30			
		Exeter	**Kensington**	**E. Kingston**
a	Yes	33	0	100
b	No	67	100	0

31. What is your age category (*circle one set*):

	Question #31			
		Exeter	**Kensington**	**E. Kingston**
a	15-19	0	0	0
b	20-29	0	0	0
c	30-39	33	0	0
d	40-49	33	75	0
e	50-59	33	25	67
f	60-69	0	0	0
g	70+	0	0	33

32. How do you use the Exeter River or its tributaries?

	Question #32			
		Exeter	**Kensington**	**E. Kingston**
a	Drinking water	33	0	0
b	Camping	0	0	0
c	Fishing/ Hunting	0	25	67
d	Bird watching	67	0	33
e	Recreational Boating	33	0	0
f	Swimming	33	0	0
g	Other	0	0	0

33. Are you male or female?

	Question #33			
		Exeter	**Kensington**	**E. Kingston**
a	Female	33	25	0
b	Male	67	75	100

34. What is your primary occupation?

	Question #34			
		Exeter	**Kensington**	**E. Kingston**
a	Homemaker	0	0	0
b	Trade	0	0	0
c	Managerial	0	50	0
d	Scientist	0	0	0
e	Educator	0	0	0
f	Public Official	0	0	0
g	Service	33	0	0
h	Profession	33	25	0
i	Student	0	0	0
j	Agriculturist	0	0	33
k	Retail/Business	0	0	0
l	Manufacturing	0	0	0
m	Other	33	25	67

- Exeter: "(Other): Licensed professional civil engineer in private consulting practice."
- Kensington: "(Other): Landscaper."
- E. Kingston: "(Other): Veterinarian; retired."

35. Please indicate your highest level of education.

	Question #35			
		Exeter	**Kensington**	**E. Kingston**
a	Some High School	0	0	0
b	High School Diploma	0	0	0
c	Some College	0	25	33
d	Bachelors Degree	67	50	0
e	Masters Degree	33	25	33
f	Ph.D., ED, or Equivalent	0	0	0
g	Postgraduate Professional Degree	0	0	33

ADDITIONAL COMMENTS

- Exeter: "Thank you very much for your time and effort to collect this research. I look forward to receiving the results. As stated I would like to see the scientific evidence which demonstrates the effectiveness of these policies. What about pollution levels from on sewer treatment plant? I feel that a lot could be done in Exeter to promote conservation (as Hampton Water Works does) low flow fixtures sold at cost by Water Dept., educational handouts included in bills etc.;

  "I am employed by the Rockingham County Conservation District which assists the town of Exeter in subdivision reviews and witnessing test pits for septic systems. We also wrote the Stormwater Handbook."

APPENDIX III-I

POLLUTION POTENTIAL INDEX NUMBER FROM RIPARIAN LAND USES AROUND GREAT BROOK

1. Best Management Practices:

It is important that Best Management Practices (BMPs) be designed to address the causes of nonpoint sources of pollution that arise from particular land mangement practices, not just to manage the results of inadequate practices. Clearly, combinations of management practices may be required. For example, pesticide application BMPs should be used in combination with requirements for vegetative buffer zones in riparian areas to reduce the risk of NPS pollution from the use of pesticides. Most BMPs, unlike regulations, are implemented voluntairly by landowners with the technical assistance of regional and state agencies. However, once implemented, local municipalities and the State usually do no do follow up inspections of BMPS currently in use unless they are informed by a public complaint. Therefore the landowner must initiate the necessary changes to maintain or upgrade BMPS.

2. Regulations:

Land use policies and regulations have been created in New Hampshire in an attempt to minimize and monitor land uses to reduce potential sources of pollution. Specific regulations pertain to different land uses. Similar to BMPs, combinations of regulations should be used on-site. Regulations should be monitored and enforced by state and local authorities to reduce a varitey of types of pollution which may become introduced in runoff.

3. Monitoring and Enforcement:

Having BMPs and regulations implemented on-site is just the initial step in reducing NPS from land uses. These management strategies must be inspected to determine if they are operating correctly to carry out their intended function. If inadequacies are detected steps must be taken to correct the practice or ensure that existing regualtions are being used appropriately.

The combination of utilizing appropriate BMPs and land use regulations as well as determining if those measures are being monitored and enforced reduces possible sources of nonpoint pollution from leaving a site.

A potential to pollute index matrix was generated below. Within the matrix is a list of regulations and BMPs associated with the Great Brook watershed. The eight sites shown on the GIS map will be included in this matrix. Each site will show which regulations and BMPs are being used, if they are monitored and enforced. If the regulation has been implemented, monitored or enforced an X will be put under that category. If the policy or regulation has not been implemented, monitored, or enforced a 1 will be put next to that category.
X= 0 points
1= one point

The points will be added for each site. **The greater the number of points the higher the potential to pollute the lower the number the less of a potential the site contribues to NPS.**

BEST MANGEMENT PRACTICES IN GREAT BROOK WATERSHED

Best Management Practices for Livestock Farms

BMP
Control access of livestock to water bodies
Maintain vegetative buffer strips next to surface waters.
Divert runoff away from barnyards and feedlots.
When and where feasible compost manure.
Store manure in constructed facilities when land application is not feasible.
Maintain a balance between the number of livestock and acres of agr. land available for spreading manure.
Utilize soil tests to determine background levels of nutrients and soil pH.
Keep accurate fertilizer and manure application records.

Best Management Practices for Cropland Farms

BMP
Maintain vegetative buffer strips next to surface waters.
Access all available nutrients including manure and other organic sources and legume contributions.
Use realistic growth expectations and appropriate timing for application of chemical fertilizer.
Diversify crop rotations to include crops that can utilize residual nitrogen, where appropriate.
Use of conservation tillage.

Best Management Practices for Septic Systems

BMP
Know the location of your tank and leaching area.
Inspect your tank yearly. If the sludge and surface scum combined are as thick as 1/3 the liquid depth of your tank, have the tank pumped out by a licensed pumper.
Do not flush toxic materials such as paint thinner, pesticides, or chlorine into your system since they kill the bacteria in the tank.

Best Management Practices for Golf Courses

BMPs
Leave a buffer strip between fields sprayed with fertilizers and pesticides and water bodies.
Apply pesticides only when needed.
Hire a licensed applicator for pesticide application
Store and handle pesticides properly, according to State and Federal regulations.
Do not spray or apply pesticides on windy days or before a heavy rain storm.
Use realistic growth expectations and appropriate timing for application of chemical fertilizer.

REGULATIONS USED IN THE GREAT BROOK WATERSHED

Regulations for Pesticide Use

Regulations
RSA 430 28-48, the Pesticide Controls law, requires pesticide applications to obtain from or to be licensed by the Pesticides Control Board, within the NH Department of Agriculture, prior to application. Each pesticide sold in the state must be registered annually. Private and commercial applicators are required to submit annual reports of pesticide usage describing the types and amounts of pesticides uses, and the type of crop and acreage if applicable. The Pesticides Control Board has adopted rules, 100-1000, which addresses handling and storage of pesticides and setbacks from water resources.
RSA 485-A: 4 XI (Duties of the Water Supply and Pollution Control Division), NHDES is required to scientifically measure and monitor residual pesticides in the waters and in the aquatic resources in the waters of the state.
Special permits are required for application under "special conditions," such as application to public water-supply watersheds, rights-of-ways, aerial applications and aquatic applications (Pes 603.03). NH code of Administrative Rules lists several prohibitions on pesticide use regarding water quality.

Regulations for Septic systems

Regulations
RSA 485 gives the DES authority to regulate septic systems. Design, operating, and permit requirements are found in Administrative Rule Env-Ws 1000.
All subdivisions creating lots smaller than 5 acres to obtain approval from Des, except within protected shoreland areas where all lots regardless of their size, require approval from DES (RSA 483-B).
All work must be performed by a licensed septic system designer and/or installer, unless done by the homeowner for a primary residence.
Approvals are also required for all individual septic system designs prior to construction, and for septic system operation prior to backfill.

Regulations for Agricultural Lands

Regulations
RSA 431- 33-35, Manure, Agricultural Compost, and Chemical Fertilizer Handling, required the NH Department of Agriculture to develop best management practices for handling these materials. The department is required to investigate complaints of improper handling. If the department finds that improper handling is caused by failure to use BMPs, the person must be notified of the findings in writing and must submit a plan for compliance with BMPs if corrections have not been made within 10 days of notification. If the farmer does not comply, NHDA notifies NHDES and or the local health officer and enforcement action is taken by NHDES (under RSA 485 A:12) or by the local health officer (under RSA 147: 4).
Although RSA 485-A: 17 III exempts "normal agricultural operation" from the Alteration of Terrain permit requirements, ENV-Ns 415.03 (c) requires such a permit for "conventional agricultural tillage operations only if water quality degradation is demonstrated to occur.
Erosion problems addressed under RSA 485-A would typically be handled in an informal manner, in which representatives of NHDES, NHDA, and USDA would meet to determine the most appropriate BMPs needed to correct the problem under consideration.
(Exeter): Permitted agricultural use in the Shoreland District: Agriculture that such uses will not cause increases in surface or ground water contamination by pesticides, fertilizers or will not cause or contribute to substantial soil erosion and stream sedimentation. No clear cutting of natural vegetation within the vegetated buffer shall be permitted. All pesticide applications shall be conducted in strict accordance with the requirements in N.H. RSA. 430: 28

POLLUTION POTENTIAL MATRIX

LAND USE [1]				Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Golf C.	Pond	Res.
LAND USE TYPE				Crop Farm							
SITE CHARACTERISTICS											
DISTANCE TO WATER BODY < 50' 100' >150'											
JURISDICTION E. Kingston Exeter Kensington				**Ken.**							
REGULATIONS											
Regulations for Septic Systems	**I**	**Mon.**	**Enf**								
RSA 485 gives the DES authority to regulate septic systems. Design, operating, and permit requirements are found in Administrative Rule Env-Ws 1000.											
All subdivisions creating lots smaller than 5 acres to obtain approval from DES, except within protected shoreland areas where all lots regardless of their size, require approval from DES (RSA 483-B).											
All work must be performed by a licensed septic system designer and/or installer, unless done by the homeowner for a primary residence.											

[1] Farm 1: Shaw's Hill, Farm 2: Dan Bodwell, Farm 3: Hal Bodwell, Farm 4: Robert Marston, Farm 5: Patricia O'Shea, GC: E. Kingston Golf Course, Pond: Sandra Bennet, Res: Residential housing.

Approvals are also required for all individual septic system designs prior to construction, and for septic system operation prior to backfill.												
Regulations for Pesticide Use												
RSA 430 28-48, the Pesticide Controls law, requires pesticide applications to obtain from or to be licensed by the Pesticides Control Board, within the NH Department of Agriculture, prior to application. Each pesticide sold in the state must be registered annually. Private and commercial applicators are required to submit annual reports of pesticide usage describing the types and amounts of pesticides uses, and the type of crop and acreage if applicable. The Pesticides Control Board has adopted rules, 100-1000, which addresses handling and storage of pesticides and setbacks from water resources.												
RSA 485-A: 4 XI (Duties of the Water Supply and Pollution Control Division), NHDES is required to scientifically measure and monitor residual pesticides in the waters and in the aquatic resources in the waters of the state.												
Special permits are required for application under "special conditions," such as application to public water-supply watersheds, rights-of-ways, aerial applications and aquatic applications (Pes 603.03). NH code of Administrative Rules lists several prohibitions on pesticide use regarding water quality.												

Regulations for Agricultural Lands											
RSA 431- 33-35, Manure, Agricultural Compost, and Chemical Fertilizer Handling, required the NH Department of Agriculture to develop best management practices for handling these materials. The department is required to investigate complaints of improper handling. If the department finds that improper handling is caused by failure to use BMPs, the person must be notified of the findings in writing and must submit a plan for compliance with BMPs if corrections have not been made within 10 days of notification. If the farmer does not comply, NHDA notifies NHDES and or the local health officer and enforcement action is taken by NHDES (under RSA 485 A:12) or by the local health officer (under RSA 147: 4).											
Although RSA 485-A: 17 III exempts "normal agricultural operation" from the Alteration of Terrain permit requirements, ENV-Ns 415.03 (c) requires such a permit for "conventional agricultural tillage operations only if water quality degradation is demonstrated to occur.											
Erosion problems addressed under RSA 485-A would typically be handled in an informal manner, in which representatives of NHDES, NHDA, and USDA would meet to determine the most appropriate BMPs needed to correct the problem under consideration.											

LAND USE NAME				Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Golf C.	Res.	Pond
BEST MANAGEMENT PRACTICES	**I**	**Mon.**	**Enf.**								
BMPs for Livestock Farms											
Control access of livestock to water bodies											
Maintain vegetative buffer strips next to surface waters.											
Divert runoff away from barnyards and feedlots.											
When and where feasible compost manure.											
Store manure in constructed facilities when land application is not feasible.											
Maintain a balance between the number of livestock and acres of agr. land available for spreading manure.											
Utilize soil tests to determine background levels of nutrients and soil pH.											
Keep accurate fertilizer and manure application records.											
BMPs for Cropland Farms											
Maintain vegetative buffer strips next to surface waters.											
Access all available nutrients including manure and other organic sources and legume contributions.											
Use realistic growth expectations and appropriate timing for application of chemical fertilizer.											
Diversify crop rotations to include crops that can utilize residual nitrogen, where appropriate.											

Use of conservation tillage.												
BMPs for Septic Systems												
Know the location of your tank and leaching area.												
Inspect your tank yearly. If the sludge and surface scum combined are as thick as 1/3 the liquid depth of your tank, have the tank pumped out by a pumper.												
Do not flush toxic materials such as paint thinner, pesticides, or chlorine into your system since they kill the bacteria in the tank.												
BMPs for Golf Courses												
Leave a buffer strip between fields sprayed with fertilizers and pesticides and water bodies.												
Apply pesticides only when needed.												
Hire a licensed applicator for pesticide application												
Store and handle pesticides properly, according to State and Federal regulations.												
Do not spray or apply pesticides on windy days or before a heavy rain storm.												
Use realistic growth expectations and appropriate timing for application of chemical fertilizer.												
Total number= Potential to pollute index number												

APPENDIX III-J

RIPARIAN LAND USES AROUND GREAT BROOK

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
Farm # 1 *	Under RSA 431: 33-35 a complaint driven Manure Mgnt. Program is in place. If a problem arises the NH Ag. BMP manual is implemented. If farmers want federal aid they need a conservation plan.	Kensington Planning Board, Selectmen, town HO, Rockingham County Conservation District (RCCD)NH DES, NH OSP. [1]	The State commissioner of agriculture enforces RSA 431 33-35. RCCD, through a district conservationist, will monitor those farms who receive aid from the US Farm Service Agency. OSP and DES monitor water quality.	Cropland and pasture Cover- 5 acres of corn, also tomatoes, peppers, squash, flowers, hay.	Approx. 80-100 ft.-This is a buffer from cropland to wetland edge. [2]	Conservation tillage - Composting manure - Manure stored during winter - Fertilizer records are kept to determine rates/year. - Crop rotation - Use of filter strips next to surface waters. [3]

* Farm 1: Shaw's Hill farm; Farm 2: Robert Marston; Farm 3: Patricia O'shea; Farm 4: Hal Bodwell; Farm 5: Dan Bodwell;

[1] HO: Health Officer, RCCD: Rockingham County Conservation District, RPC: Rockingham Planning Commission, NH DES New Hampshire Department of Environmental Services.

[2] All distances were approximated using aerial photography and on site inspection.

[3] Source: Interview with landowner, Allen Tuthill.

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
Farm # 2	See above State and town regulations.	E. Kingston Planning Board, town HO, Rockingham County Conservation District (RCCD) NH DES, NH OSP.	See above enforcement measures	Livestock farm -(cows, chickens, goats, sheep)Cover - pasture and forest cover	200-250 ft.- from York Brook a tributary to Great Brook. 400 ft from Great Brook which is across the street and RR tracks, in the woods.	Composting manure. Maintaining filter strips next to surface waters receiving runoff from crop fields where manure is applied. Use soil tests to determine background levels of nutrients and soil pH. Store manure during winter. [5]

4 Source: E. Kingston Zoning Ordinance Manual.
5 Source: Interview with Robert Marston

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
Farm # 3	See above town and State regulations pertaining to agricultural landuse.	E. Kingston Planning Board, Selectmen. town HO, Rockingham County Conservation District (RCCD) NH DES, NH OSP.	See above Enforcement measures.	Pasture land Arabian horse farm	Apprximately 75-100 ft away from Great Brook.	Control access of livestock to water bodies. Manage pastures to reduce concentrations of manure. Composting/storing of manure. Using soil tests to determine background levels of nutrients and soil pH. [6]

6 Source: Interview with Patricia Oshea.

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
Farm # 4	See above town and State regulations pertaining to agricultural landuse.	E. Kingston Planning Board, Selectmen, town HO, Rockingham County Conservation District (RCCD) NH DES, NH OSP.	See above enforcement measures	Livestock Farm, *230 cows, *200 acres tillable/ useable	Approx. 300 ft. to a tributary which runs into Great Brook.	Contolling runoff from barnyards and feedlots using constructed wetlands. Manage pastures to reduce concentrations of manure. Composting manure. Storage of manure when ground is frozen. Use of soil tests to monitor pH. [7]

7 Source: Interview with Hal Bodwell.

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
Farm # 5	RSA 485-A:29-485-A:44 requires submission of plans to DES for sewage disposal systems and also sets forth procedures and penalties. Also see the above State regulations. E. Kingston septic regs: 14.3.1-14.3.19 in the E. Kingston Zoning Ordinances.	E. Kingston Planning Board, Selectmen, town HO, Rockingham County Conservation District (RCCD) NH DES, NH OSP, EPA.	The EPA, DES and RCCD have aided D. Bodwell in funding and buidling the constructed wetlands. DES will monitor water quality for 2 years. Groundwater wells are located within the wetlands and throughout Dan's property.	Farm with about 30 cows. Owns or rents about 100 acres of land.	Property runs adjacent to Great Brook. Septic application is not occuring near GB, only manure application.	Currently using a holding tank and series of constructed wetland ponds to improve septic waste. Maintaining a 100' buffer from Great Brook when appling livestock manure.[8]

8 Interview with Dan Bodwell, tour of the constructed wetlands led by the DES and EPA, water quality monitoring data from the DES.

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
#6 Resident Septic Systems	RSA 485 A: 12-44 explains enforcement, installation, maintence, safety regs and penalties for septic systems. Town regulations: Under Article IV: D.1-D.6 in the E.Kingston Zoning Ordinance Manual.	E. Kingston Planning Board, Selectmen, town HO, Rockingham County Conservation District (RCCD)NH DES, NH OSP.	Upon public complaint the HO will go to the site, make recommendations. The DES will assist. If changes are not made fines can be imposed until system becomes operational	grass and forest	Approx. 100 ft.	

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
# 7 East Kingston Golf Course	RSA 430: 28-48 explains appliction for license, inspections of soil and water that the believed to be exposed to pesticides. RSA 485: 17: fuilds put into rivers, lakes which cause pollution.	E. Kingston Planning Board, Selectmen, town HO, Rockingham County Conservation District (RCCD)NH DES, NH OSP.	NH Pesticide Control Board, NH DES, EPA, E. Kingston CC all do on-site inspections of the course. DES and EPA take soil samples.	grass, wetlands and forest	adjacent to the river.	

Polygon number	Regulation/town	Jurisdictional Authority	Enforcement/Monitoring occuring	Landuse Type/Land Cover	Proximity to river	Current BMPs being used/effectiveness
# 8 Sandra Benett - Geese Pond	Septic regulations apply.	E. Kingston Planning Board, Selectmen, town HO, Rockingham County Conservation District (RCCD)		grass	Pond in Benett's front yard drains directly into Hobbs Brook a tributary to Great Brook	

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