Appendix B

Master Sewer Plan Update (1986 by SEA)

MASTER SEWER PLAN UPDATE
TOWN OF LANCASTER, MASSACHUSETTS

MARCH 1986

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CHAPTER 1

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Most areas of Lancaster have soils which have severe restrictions with respect to subsurface wastewater disposal.

2. Most existing homes are located on soils with slight or moderate restrictions with respect to subsurface disposal. The major exceptions to this are the town center area near the town hall, parts of the North Village area, North Main Street, lower Parker Road, and Ponakin Road. There are additional houses on poor soils scattered throughout the town.

3. The quality of the municipal water supply is very good. Subsurface disposal systems are located near the municipal wells, but is unknown whether the potential for groundwater contamination exists since a study to locate the aquifer has not been done.

4. Questionnaires regarding septic systems were sent to 575 homes in Lancaster, a total of 279 questionnaires were returned. Problems indicating a possible system failure were noted by 136 of the questionnaires returned.

5. Many of the failed systems in the town center area and North Village area will not be able to be rehabilitated to meet Title V requirements.

6. There is ample capacity in Lancaster's sewer system to accept additional flow. Lancaster is currently using approximately 27 percent of its available capacity at the Clinton Wastewater Treatment Plant allowed under its contract with the Metropolitan

District Commission (MDC). Plans to upgrade the Clinton facility are on hold until ownership is determined.

7. Strict adherence to Title V and Nashoba Board of Health Regulations is necessary to prevent expensive sewer extensions into more sparsely populated areas.

Recommendations

1. An aquifer study should be conducted to locate the aquifer of the municipal wells and assess the potential for contamination of the municipal water supply. Area of study should include the present wells and any future well sites.

2. Sewer construction should be done in phases and should include the following areas:

   Phase I - Lower end of Parker Road, Five Corners area, town center area, and North Village area.

   Phase II - Neck Road, Harvard Road area and North Main Street to the crest of the hill.

   Phase III - Fort Pond, Spectacle Pond and Little Spectacle Pond.

3. The town should persuade the state to study the extent of pollution from septic systems in the ponds.

4. Strict adherence to State and Nashoba Board of Health onsite system regulations should be maintained. Development on soils that cannot support subsurface disposal where the sewer is not available should be prohibited.

5. The River Terrace Nursing Home and the Lancaster Industrial School for girls should be encouraged to connect to the sewer system.

6. The Lancaster Sewer District boundaries should be expanded to encompass the entire town and retain responsibility for all sewers in the town.

7. Frequently obtain and analyze data on septic system pumpings in Lancaster from the Leominster treatment plant. With data on the location and frequency of pumpings the town can assess how well residents are maintaining their systems and the location of failures.

CHAPTER 2
INTRODUCTION

Background and Purpose

In 1967 the Lancaster Sewer District was formed by enabling legislation passed by the Massachusetts legislature. The District included the densely populated areas of South Lancaster which were in immediate need of sewers. A report titled "Comprehensive Sewerage Plan" prepared in 1975 by S E A Consultants Inc. provided a framework for the design and administration of the proposed sewer system. Although the report included a plan for sewering the entire town, the streets to be sewered at that time were selected and approved by the members of the District. Construction was completed in 1980.

Since the completion of the existing sewer system, additional areas have been experiencing septic system failures. The 1985 Lancaster town meeting approved the formation of the Sewer Expansion Study Committee which engaged S E A Consultants Inc. to update the Master Sewer Plan.

The purpose of this study is to assess the sewage disposal needs of unsewered areas of Lancaster and to recommend the layout of sewer system extensions, if required.

Area of Study

All unsewered areas of Lancaster will be assessed for sewerage needs. This includes all areas of Lancaster outside the Sewer District and unsewered areas within the District boundaries.

CHAPTER 3
EXISTING CONDITIONS

Population

Lancaster's past population growth is shown in Table 3.1. After a large jump in population between 1960 and 1970 Lancaster's population increased only slightly between 1970 and 1980.

Table 3.1

Population

Year	1930	1940	1950	1960	1970	1980
Population	2,897	2,963	3,601	3,958	6,095	6,334

Land Use

Lancaster is generally rural in character but density of development varies considerably. South Lancaster is densely developed while many other areas of the town are essentially undeveloped. The total land area of the town is 28 square miles of which seven square miles are part of the Fort Devens Military Reservation and are not developed.

The extreme northern area of town, around Route 2, contains several commercial establishments and residences, but is still largely undeveloped. The exception to this is the area around the ponds. Many summer homes and cottages are located on or just off Fort Pond, Spectacle Pond, Little Spectacle Pond and White Pond. Each pond is a pocket of dense development situated in an area essentially undeveloped. The State Industrial School for Boys occupies a large tract of land in this area and is mostly undeveloped.

Central Lancaster, the area from the confluence of the north and south branches of the Nashua River north to Ballard Hill and the Fort Devens Reservation, is mostly undeveloped. Most of the residences are on Main

Street and North Main Street which stretch across the entire area. With the exception of several small streets, all areas off Main Street and North Main Street are largely undeveloped.

South Lancaster, the area around Main Street south of the North Nashua River, is densely developed with residences and some commercial establishments. In addition, Atlantic Union College is located just off Main Street in this area. As noted earlier in this report, a large part of South Lancaster is already sewered.

Five Corners is the intersection of High Street, Center Bridge Road, Bolton Road, Old Common Road and Still River Road. This area is sparsely populated except for a number of houses along High Street and Old Common Road. There are also a number of commercial establishments at Five Corners itself. The State Industrial School for Girls is located between Old Common Road and Still River Road.

The area around Clinton Road is a mixture of residential development. There are farms, vacant land and scattered homes plus several subdivisions in the area.

Zoning

The Town of Lancaster recently revised the minimum lot sizes of its zoning ordinance. Until this year, the basic minimum lot size was 48,000 square feet. The minimum lot size if town water service was available was 36,000 square feet and 24,000 square feet if both town water and town sewer were available. The basic minimum lot size has been increased to 80,000 square feet. Where town water is available the minimum is now 60,000 square feet and 40,000 square feet where both town water and town sewer are available. The minimum frontage has been increased from 125 feet to 165 feet. These requirements apply to all residentially zoned land in the town.

The Neighborhood Business (NB) District, which allows small retail stores, includes several lots in South Lancaster and lots at the intersection of Clinton Road and South Meadow Road. The Highway Business (HB) District allows shopping centers, automobile dealers and repair shops and most general business. Only two areas, both near Route 2, are zoned HB. One is a small 10 acre area and the other is much larger totaling approximately 200 acres.

Light industry (LI) is permitted in one area between High Street and Bolton Road and in several areas near Route 2. General Industry (GI) is permitted only in an area near the Town of Sterling of Sterling Road.

Flood plains, as determined by the National Flood Insurance Program, have been included on the zoning map. The by-laws limit development in flood plains to nonstructural uses.

Economy

Lancaster has been a farming community through most of its history, but most farm land has been abandoned and Lancaster is now basically a residential community with relatively few commercial or industrial establishments. Today Lancaster is basically a bedroom community dependent on nearby commercial and industrial centers such as Clinton, Leominster and Worcester and the newer industry on Route I-495.

Existing Sewer System

The existing sewer system includes approximately seven miles of lateral and interceptor sewers ranging in size from 8 inches to 36 inches in diameter. Two interceptors, one in High Street and one in Main Street, carry sewage collected from laterals to the Clinton Wastewater Treatment Plant located just over the town boundary in Clinton. Three pumping stations are presently in service. The pumping stations are sized to handle a sewered population of 6,460 in the year 2000 and the

interceptors are sized to handle a sewered population of 10,710 in the year 2020. The sewered population was expected to be 70 percent of the total population in the year 2000 and 86 percent in the year 2020. Interceptors are also sized to receive sewage from the Town of Sterling. The existing sewer system is shown in Figure 3.1.

The Lancaster Sewer District currently has a contract with the MDC to treat sewage generated within the District up to a maximum average daily flow of 370,000 gallons per day at the Clinton Wastewater Treatment Plant. The present average daily flow is estimated to be 127,000 gpd. The District is required to pay its proportionate share of the operation and maintenance of the Clinton Plant. This cost is based on the District's flow compared to the total flow to the plant.

The District is also required to pay a proportionate share of the debt service. The existing debt service was retired in fiscal year 1985 but the District is also responsible for 12 percent of the proposed plant upgrade cost not covered by state and federal grants. The current cost estimate of the plant upgrading is approximately 26 million dollars. Assuming 90 percent of the cost is covered by grants, the District's share will be approximately $312,000.

The Clinton Treatment Plant is currently owned and operated by the MDC. The MDC Water and Sewerage Divisions have been transferred to the newly created Massachusetts Water Resources Authority (MWRA). The MWRA was given the task of improving operation of the sewerage system in the Boston area and has not taken over the ownership of the Clinton Plant. The MDC does not want to retain any sewerage facilities and as a result the ownership of the plant is a matter of contention between the two authorities, neither of which want it. Plant ownership will have to be determined by the state legislature which is drawing up a bill but is not close to acting on it.

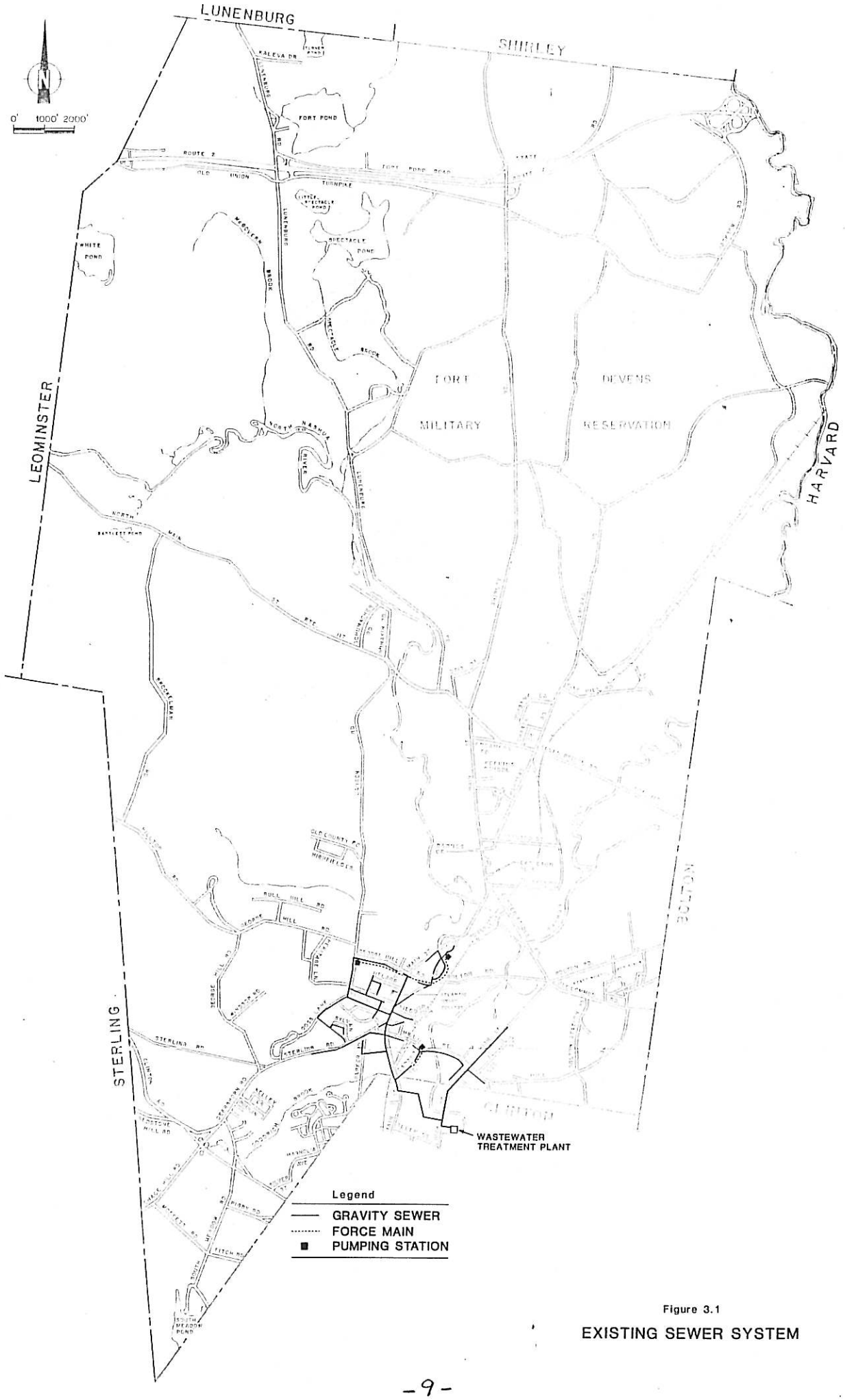


Figure 3.1

EXISTING SEWER SYSTEM

Soils

A map of soil classifications with regard to septic system disposal limitations is shown in Figure 3.2. Reasons for severe limitations include impermeable soil, high groundwater, shallow depth to hard pan or bedrock, and excessive slopes. As indicated on the map, most soils in Lancaster have severe restrictions for septic system use. However, most of the homes are located in areas with slight or moderate restrictions.

As shown in Figure 3.2, most of South Lancaster, the area around Main Street from the North Nashua River to the Clinton town line has soil types with only slight restrictions for septic system disposal. Favorable soils are also found along Sterling Road, Deershorn Road and most areas in the southwest corner of the town. Areas of severe soil conditions also exist in the area but development has avoided these areas for the most part.

Soils conditions along High Street, Old Common Road, and Mill Street and most of the Five Corners area have only slight limitations. Bolton Road and Center Bridge Road, however, have severe limitations. These two streets cross the floodplain of the Nashua River.

Soil types in the center of Lancaster, including Main Street near the town hall, George Hill and Ballard Hill all have severe limitations for septic system use. A number of old homes line Main Street in this area but homes are scattered over widely undeveloped land on George Hill and Ballard Hill.

The North Village area contains pockets of better soils along Main Street, Seven Bridge Road, Shirley Road and North Main Street but much of the area also has severe restrictions. Virtually all of the soils along North Main Street have severe limitations except the area adjacent to the Leominster town line and an undeveloped area north of the road.

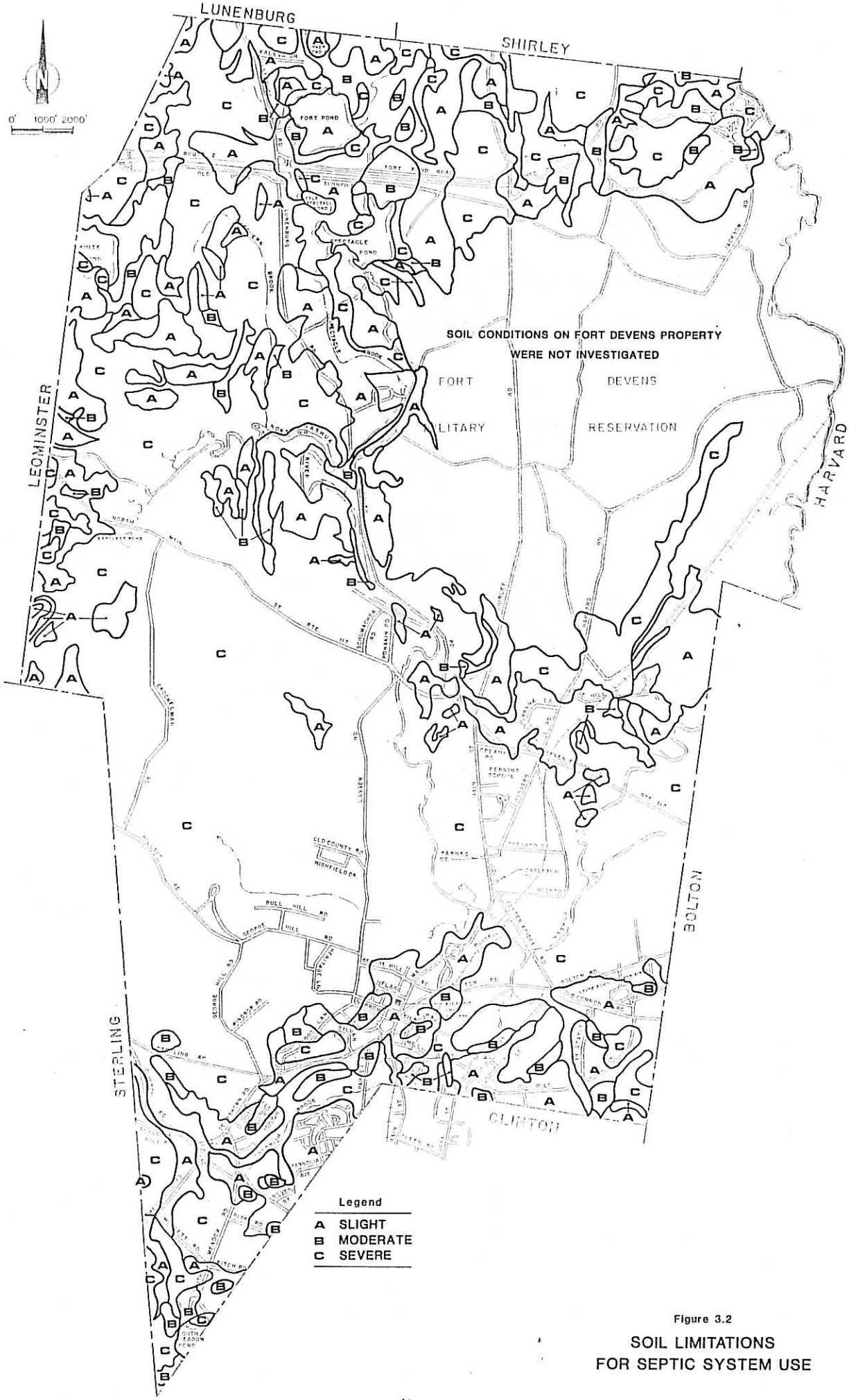


Figure 3.2

SOIL LIMITATIONS
FOR SEPTIC SYSTEM USE

Most of the North Lancaster soils have severe restrictions but are interspersed with many areas with slight or moderate limitations. Most of the population in the area is located in areas with favorable soils. Permeable soils around the lakes in this area provide good sewage disposal but may also allow sewage to reach open water before proper treatment. However, pollution of the lakes by septic system effluent does not appear to be a problem at this time.

Most of the soil in South Lancaster and the center of town is very poor for on-site sewage disposal use. However, most of the development has occurred on favorable soils and as a result most of the population should not have extensive problems. The major exceptions are Main Street near the town hall, Center Bridge Road, Ponakin Road, and most of North Main Street. Several small streets or sections of streets may also have problems. There is also very little undeveloped land which can easily support septic system use. Extensive residential and industrial growth in this area of Lancaster will be difficult if it is dependent on on-site sewage disposal. North Lancaster has many undeveloped areas of favorable soil conditions and as a result could easily be further developed. Most of the land zoned for commercial and industrial use in Lancaster is situated in this area.

Surface Water Quality

The greatest impact on surface water quality is effluent from sewage treatment plants on the North Nashua River and Nashua River upstream of Lancaster.

The Clinton Wastewater Treatment Plant, which receives flow from Lancaster, periodically discharges flow which has bypassed the treatment process. Clinton's sewer system is in very poor condition and allows high volumes of rainwater and groundwater to enter the system.

Rainwater and groundwater added to the normal sewage flow creates total flows which exceed the capacity of the treatment plant and must be discharged directly to the river.

Treatment plants in Leominster and Fitchburg are also not providing the degree of treatment necessary to prevent pollution of the North Nashua River. The river is very slow moving and a computer model used by the Massachusetts Division of Water Pollution Control has predicted that advanced wastewater treatment must be employed at all plants discharging to the North and South Branches of the Nashua. Dissolved oxygen levels below the minimum of 5.0 milligrams per liter (mg/l) will result during low flow periods if advanced treatment is not employed. Advanced wastewater treatment removes 99 percent of the organic matter in normal sewage.

Few homes in Lancaster are close enough to the Nashua or North Nashua River to have the potential of polluting these rivers. The impact on the rivers from these homes will not be significant compared to the impact caused by treatment plant effluent.

One establishment in Lancaster which has recently been causing water pollution is the River Terrace Nursing Home on North Main Street. Its sand filter failed causing untreated sewage to bypass the treatment process and discharged to the North Nashua River.

The relative impact of on-site systems on surface water quality in Lancaster many become significant in the future if considerable development takes place and pollution caused by treatment plants upstream is reduced. This condition is unlikely to occur for a number of years.

The potential for pollution of the ponds in northern Lancaster from on-site systems is high. Many homes are close to open water and lot sizes are very small. In this area, permeable soils allow septic tank leachate to flow quickly toward open water and can pollute the pond if many systems are discharging to open water without adequate treatment. very little sampling data from ponds in Lancaster is available, and the impact of on-site systems cannot be assessed. However, no serious pollution has been observed.

Drinking Water Quality

The quality of municipal drinking water has been reviewed to determine if contamination by septic system effluent is occurring. The majority of homes in the town are served by the municipal water system. Two gravel packed wells about 150 feet deep are the source of the water. The wells are located off Bolton Station Road south of Old Common Road. In 1984, approximately 500,000 gallons per day (gpd), of water was pumped from the two wells. Peak flow rates of approximately 1,000,000 gpd are recorded during the course of the day.

The quality of Lancaster's water is very good and records show it has been of consistently high quality for the years the wells have been used. However, the town presently has no aquifer protection plan to protect its wells from contamination in the future. Normally, on-site disposal systems are not allowed within recharge areas of municipal water supplies. The master sewer plan would recommend sewering the recharge areas in order to eliminate the possibility of on-site disposal systems but a study to identify these areas has not been done. The aquifer protection study and plan should include future water supply areas so Lancaster's supply can be safely expanded.

On-Site Sewage Disposal

All residences and businesses in Lancaster not served by the sewer system use on-site systems. On-site systems are generally either septic systems or cesspools. The one exception is the River Terrace Nursing Home on North Main Street which uses a septic tank and sand filter for treatment and then chlorinates the effluent before discharge to the North Nashua River. The nursing home has a discharge permit for the river discharge.

In October 1985 a questionnaire was mailed to 575 homes in Lancaster asking residents to answer questions regarding the operation and adequacy of their septic system. Most of the questionnaires were sent to homes in areas suspected of having septic system problems, specifically High Street, Old Common Road, Center Bridge Road, Russell Lane, Main Street, Barnes Court, Carleton Place, Neck Road, Packard Street, Harvard Road, Creamery Road, Seven Bridge Road, North Main Street, Shirley Road south of Fort Devens, Otis Street, Ponakin Road, Schumacher Road, Parker Road, and George Hill Road.

A copy of the questionnaire is contained in Appendix A. Questionnaire responses revealed a number of homes experiencing septic system problems. Homes reporting systems with problems have been plotted in Figure 3.3. For the purposes of this study, a problem is defined as system backups, odors, recent repairs or a pumping frequency of once per year or more. A repair may be the result of a need for additional capacity and not a system failure but this indicates that sewers may be beneficial to homes in the area.

As shown in Figure 3.3, the greatest concentration of system problems is on Main Street in the Town Hall area. Problems are also apparent on North Main Street and Ponakin Road but not to as great a degree as Main Street. There are also problems on Center Bridge Road, Neck Road,

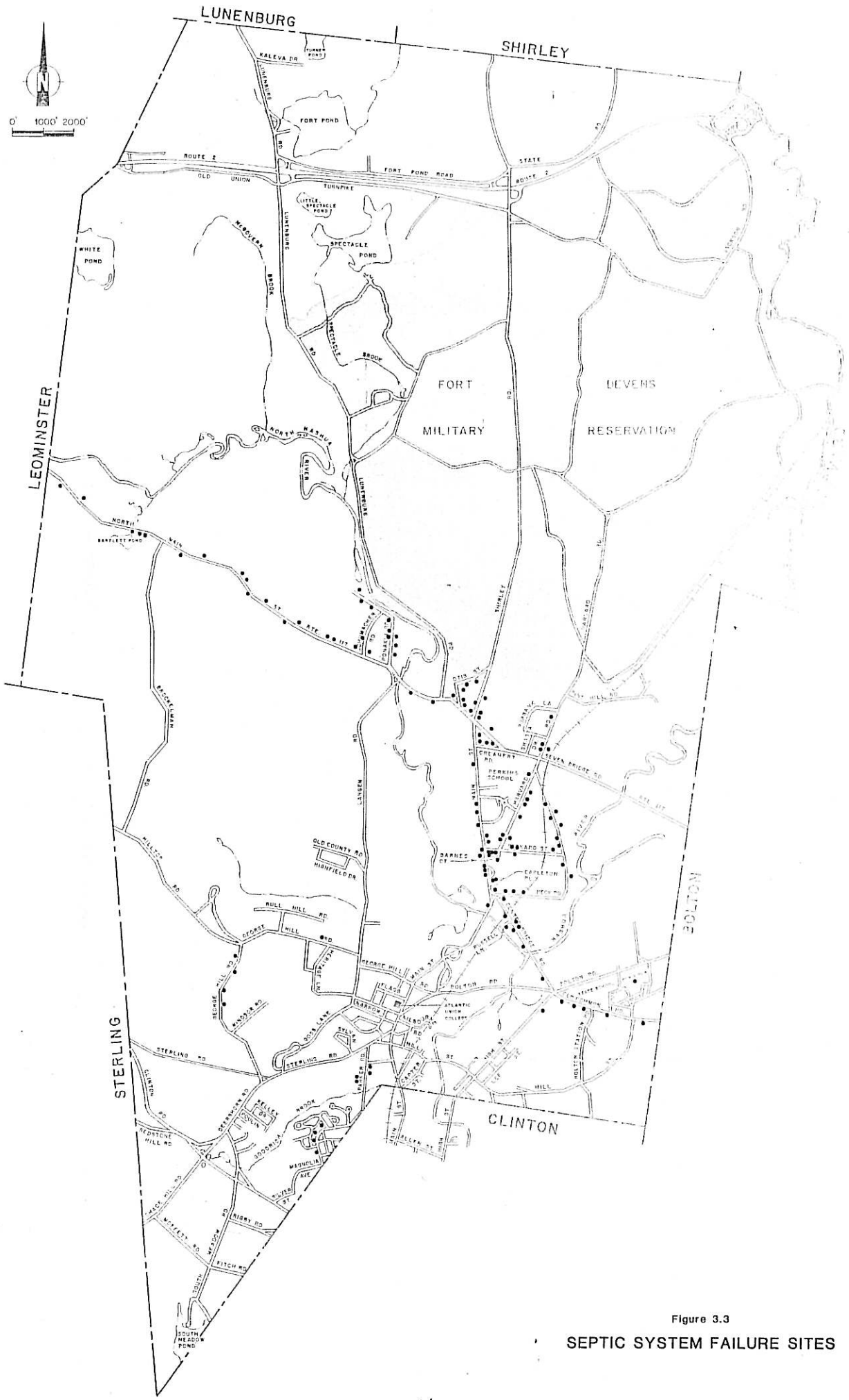


Figure 3.3

SEPTIC SYSTEM FAILURE SITES

Packard Street, and Harvard Road but they are grouped in pockets, not spread evenly along the street.

High Street, Old Common Road, Shirley Road and Otis Street do not have as many problems as would be expected when considering the density of homes on these streets. Favorable soil conditions in these areas apparently prevent serious problems from developing.

Questionnaires were also sent to George Hill Road and Parker Road in the southwestern area of town. George Hill Road has severe soil restrictions but homes are spread out and many are on large lots and few problems were reported. Parker Road has adverse soil conditions in lower areas near Charolette Road and many problems considering the number of houses.

Based on questionnaire responses, it can be concluded that problems with septic systems problems in Lancaster tend to occur in areas densely populated and having soil conditions which are adverse to on-site disposal. Areas with severe restrictions but where homes are sited on large lots or areas that are densely developed but have good soil conditions do not have as many problems.

CHAPTER 4
FUTURE CONDITIONS

Population

The 1975 Lancaster Sewer Master Plan had predicted a 1980 population of approximately 7,000 and a 1990 population of approximately 8,000. Planners had expected the high growth rates experienced between 1960 and 1970 to continue at a somewhat slower rate.

The actual population growth between 1970 and 1980 was much lower than expected. The population in Lancaster grew only four percent during those 10 years. The population between 1980 and 1985 grew four percent and recent state planning estimates expect a 10 percent population increase between 1980 and 1990. The 1990 state population estimate for Lancaster is 6,940.

Local officials expect significant growth to occur in the immediate future. Industrial development along Route I-495 has caused considerable economic growth in the area. As people move to the area, pressure for residential development is expected to be high in Lancaster. For this reason the population estimates for the years 2000 and 2020 have not been adjusted for this report.

However, the estimates of sewered population have been adjusted. Sewer construction is not expected to occur at as high a rate as previously expected. Federal grants are no longer available for sewer extensions making construction costs much higher. It is expected that people will live with problem systems or make repairs rather than approve costly sewer construction. At present, approximately 30 percent of the town population is sewered. For design purposes it is estimated that 50 percent of the town population will be sewered in the year 2010 and 70

percent in the year 2030. The year 2010 sewered population is expected to be 5,300 and the year 2030 sewered population is estimated at 10,200.

Even though sewered populations are expected to be less than anticipated by the original Master Plan it is recommended that pipes size not be changed. No pipes in the incompleted portions of Lancaster's recommended sewer systems are larger than fifteen inches in diameter. Reducing the size would not be a significant savings and since pipes are relatively permanent the additional capacity may be needed sometime in the future. The pumping stations, however, should be designed to reflect the lower flows. Pumping stations are not as permanent and can have operational problems when oversized. They also can be designed to allow for expansion of their capacity in the future. The Five Corners Pumping Station can be designed for 950 gpm and the North Nashua River pumping station on North Main Street should have a capacity of 450 gpm*.

Land Use

As discussed above, Lancaster's population is expected to increase significantly in the near future and a corresponding increase in residential development will also occur. This development will be exclusively single family homes since zoning by-laws allow only single family homes with one exception. Apartment buildings are allowed in a small area around Atlantic Union College but this area is already developed.

Since any new development would be dependent on on-site disposal systems, it is expected that most development will be sited in the remaining areas with suitable soils. These areas include the Mill Street - High Street area and some areas in the southwest corner of town around Clinton Road. Although little development has taken place in the

*refer to calculation in Appendix B.

Route 2 area there are suitable soils here and development can be expected. The large tracts of land available for large scale development have restrictive soils making such development difficult. The extension of sewers into relatively undeveloped areas will make these large scale developments more likely. Secondary impacts from growth in the town can be expected from sewer extensions in undeveloped areas. This assumes of course, that expected development pressures continue.

The zoning by-laws increase the impact sewers will have on future land use. The minumum required lot size decreases from 80,000 square feet to 60,000 square feet when town water is available and it decreases to 40,000 square feet when town sewerage is available. This causes a situation where sewer installation directly affects land use, population and their impacts.

Water Quality

It is expected that the water quality of the Nashua River will improve as the treatment plants in Clinton and Leominster are upgraded. Urban runoff will continue to impact the river and will become a relatively major source of pollution. It is unlikely that any on-site systems in Lancaster will be a significant source of pollution to the river. Runoff in cities upstream of Lancaster will continue to have a much greater impact. One exception is the River Terrace Nursing Home's treatment system. Even after rehabilitation it is likely that the system will fail periodically and require additional rehabilitation. Every time the system fails, untreated effluent will be discharged to the river until rehabilitation is completed or a municipal sewer is provided.

Drinking water quality could be impacted by on-site sewage disposal or other groundwater contamination. The likelihood of well contamination

cannot be assessed without a study to identify the aquifer, as discussed earlier. The area near the wells has soil suitable for septic system disposal and is being developed now and will likely continue to be developed. Excessive development which uses on-site disposal may threaten the drinking water supply in the future.

On-Site Systems

Except for several congested areas on poor soils, the use of on-site sewage disposal systems appears to be adequate for the majority of the unsewered areas. In the future, however, it may not be adequate in many areas with poor soils. More failures will occur as systems reach the end of their useful life. Problems will also occur where older couples move out and younger families with children and much higher water use rates move in. A number of homes will be built in poor soils. How well these systems perform will be dependent on how well the provisions of Title V are enforced. If development is allowed where conditions cannot support on-site systems many failures will occur and sewer extension will be necessary. Sewer extensions will probably be very costly because of the low density of development in many areas.

CHAPTER 5
DISCUSSION OF SEWERAGE NEEDS

Introduction

As mentioned earlier, questionnaires were sent to areas suspected of having septic system problems. The various streets which received questionnaires are ranked in Table 5.1 according to the number of problem systems reported per number of questionnaires returned. Main Street near the town hall, with 75 percent of the questionnaires returned reporting a problem, was ranked first. High Street, with only 13 percent of the responses reporting a problem was ranked last. The various districts refered to here are delineated in Figure No. 5.1.

Five Corners Area

Most of the homes in this area are on soils with only slight restrictions for septic system use. Old Common Road, High Street and Lee Street are the only streets densely developed. They have sandy soils and few serious septic system problems. High Street and Old Common Road were sent questionnaires and as shown in Table 5.1, 13 percent of the responses from High Street and 41 percent of the responses from Old Common Road noted problems. It is also more likely the rehabilitation of septic systems will be possible in these areas with sandy soils. The municipal wells are in this area but it is not known if subsurface sewage disposal will contaminate the wells. For this reason the town should be prepared to construct sewers in this area and conduct an aquifer study to determine the potential for contamination.

The State owned Lancaster Industrial School for Girls on Old Common Road has serious sewage disposal problems and should be connected to a sewer. However, the present need for sewers in adjacent streets is not high. Interceptors in High Street and Center Bridge Road and a pumping

station at Five Corners must be built if areas north of Five Corners need sewerage however as a problem area, Old Common Road is ranked fourteenth out of twenty-one in Table 5.1. Depending on the severity of the problem and the cost, the State may opt to pay for a sewer in Old Common Road to connect the School for Girls.

Town Center Area

Center Bridge Road north of the river and Main Street are densely developed, sited on poor, clayey soils with high groundwater and have a number of serious disposal problems. It is unlikely that rehabilitation of systems to Title V requirements will be possible for most homes in this area. As shown in Table 5.1, a high percentage of homes in this area reported problems.

Since homes are fairly close together in this area the cost of sewering should not be excessive. However, a pumping station must be built at Five Corners and an interceptor and force main is needed to carry the sewage to the nearest existing sewer in High Street. The total construction cost of sewering this area is estimated to be approximately $15,000 per house.

Neck Road Area

The Neck Road area is being considered separately because a cross-country interceptor between Center Bridge Road and Neck Road is necessary to sewer this area. The area includes the eastern end of Packard Street, the northern end of Harvard Road (but south of Fort Devens), Shasta Drive and Burbank Lane.

The Shasta Drive and Burbank Lane area soils are good and lot sizes should be large enough to support septic system use. Further south, along Harvard Road and Neck Road, soils have severe septic system use restrictions. A number of problems were revealed by questionnaire

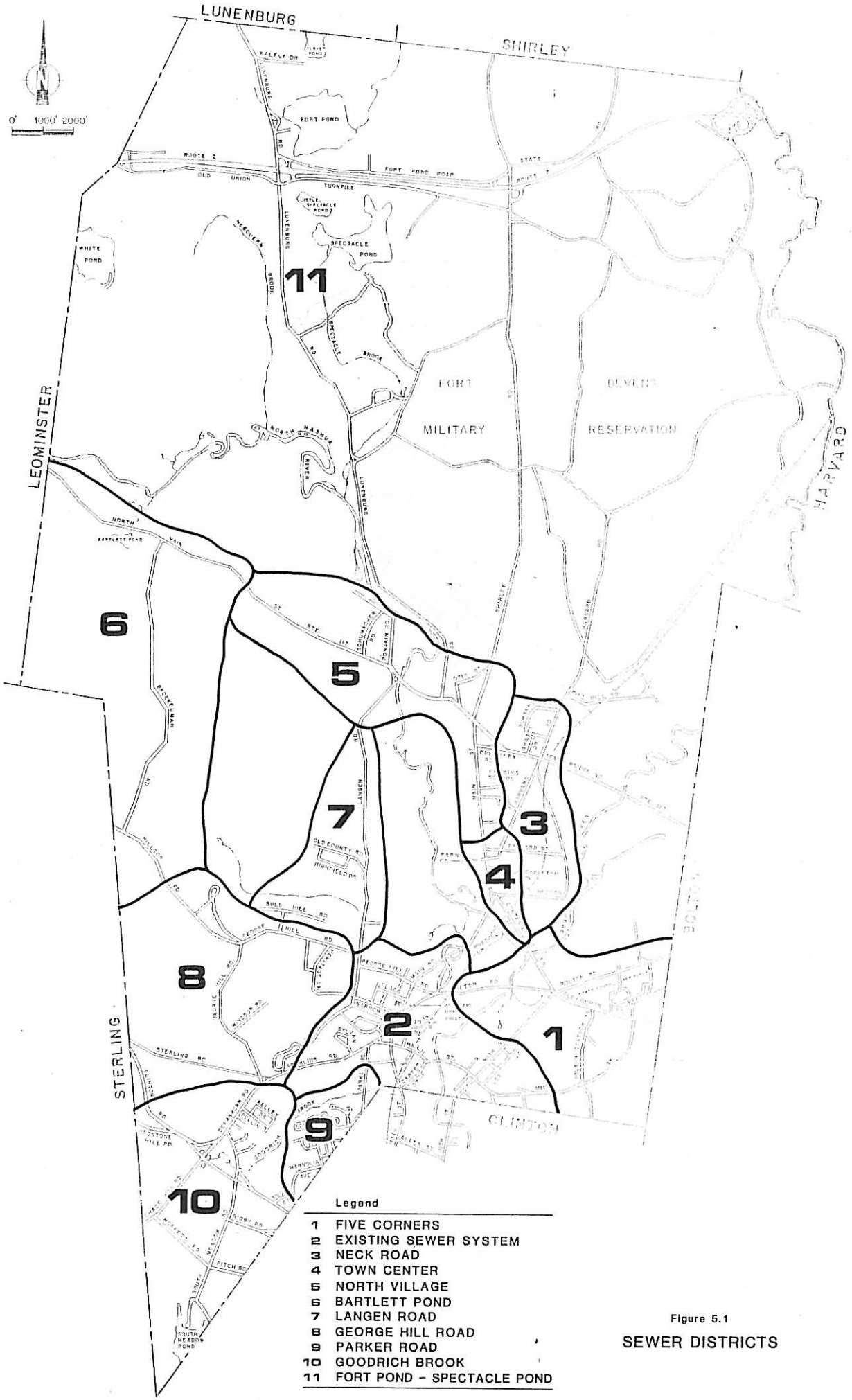


Figure 5.1

SEWER DISTRICTS

Table 5.1
Rank of Septic System Problem Areas

Rank	Street	No. of Problems	No. of Responses	No. of Houses	% Responding	Problems Per House %	Problems Per No. of Responses %
1	Main Street (incl. Barnes Ct. & Carleton Pl.)	9	12	32	38	28	75
2	Parker Rd. (Lower Section)	5	7	15	47	33	71
3	Ponakin Rd.	10	14	29	48	38	71
4	Harvard Rd. (North Section)	9	14	23	61	39	64
5	Center Bridge Rd. (Incl. Russel Lane)	9	15	28	53	32	60
6	Neck Rd.	9	15	29	51	31	60
7	Harvard Rd. (South Section)	4	7	11	64	36	57
8	Packard St. (West Section)	5	9	15	60	33	56
9	Main St. (Packard St. to No. Main St.)	8	16	34	47	24	50
10	Neck Rd. (Near Main St.)	2	4	7	57	29	50
11	North Main St. (Nursing Home to top of hill)	9	18	43	42	21	50
12	North Main St. (Main St. incl. Creamery Rd. to Nursing Home)	8	18	30	60	27	44
13	George Hill Rd.	11	27	33	82	33	41
14	Old Common Rd.	7	17	22	77	32	41
15	Otis St.	4	10	11	91	36	40
16	Schumacher Rd.	2	5	5	100	40	40
17	North Main St. (to Leominster-Line)	6	15	50	30	12	40
18	Parker Rd. (Upper Section)	4	11	18	61	22	36
19	Shirley Rd.	3	9	23	39	13	33
20	Packard St. (Near Neck Rd.)	1	3	6	50	17	33
21	High St.	1	8	12	67	8	13

responses but houses and the systems with problems are more widely scattered than nearby Main Street. Large lot sizes in this area mean the cost of sewering this area per house will be high and rehabilitation of on-site systems will be more feasible. Among the large lots are several homes on much smaller lots. These will have more problems, have more difficulty rehabilitating existing systems and have a greater need for sewers. However, the low average housing density throughout the area makes sewering difficult.

North Village Area

This area runs along Main Street from Packard Road north and continues up North Main Street to the top of the hill near Colony Lane. Also included are Schumacher Road, Ponakin Road, Otis Street, Shirley Road, Creamery Road and a short section of Seven Bridge Road.

Soil conditions along Main Street and North Main Street have severe restrictions with regard to subsurface disposal and many house lots are small. Further north on North Main Street there are many vacant lots and lot sizes are somewhat larger.

The secondary roads in the area are also densely developed. However, Otis Street and Shirley Road are situated on a pocket of soil favorable for subsurface disposal. As expected, the questionnaire responses revealed few serious problems on Otis Street and Shirley Road but a number of problems were found along Main Street, North Main Street and Ponakin Road. Ponakin Road had a very high percentage of problems. The somewhat fewer problems in this area than the town center area, reflects the lower density of development and better overall soil conditions. The cost of sewering this area is approximately equal to the cost of sewering the town center on a per house basis.

Bartlett Pond Area

This area includes North Main Street from the end of the North Village area near Colony Lane to the town boundary with Leominster. The area also includes Brockelman Road and a portion of Hilltop Road near the Sterling town line.

Soil types across the entire area have severe restrictions for subsurface disposal. Both Brockelman and Hilltop Roads are very sparsely settled, however, there are a number of homes on North Main Street. Most houses on North Main Street are on small lots but there are several large lots, some of which are vacant.

The cost per house to sewer this section of North Main Street is approximately equal to sewering other areas of Main Street and North Main Street. However, fewer problems were noted in questionnaire responses. Questionnaires were not sent to Brockelman Road or Hilltop Road. The low density of development results in very high costs per house for constructing sewers. Repairs of on-site systems, even if very expensive, would be less expensive than providing public sewers.

Parker Road Area

Parker Road can be divided into two distinct areas when considering sewage disposal. The lower end, from the bottom of the hill to the existing sewer at Charlotte Street, has poor soil conditions for septic system use. Several serious problems were reported in the questionnaire responses in this area. The upper end of Parker Road reported very few serious problems. This would be expected due to the favorable soil conditions.

The lower end of Parker Road can be sewered at a relatively low cost since it is adjacent to the existing sewer. The cost per house is approximately $6,000. The cost to sewer the rest of the Parker Road

areas including Magnolia Avenue, the lower portion of Clinton Road and all the streets between the Clinton town line, Clinton Road and Goodrich Brook is approximately $15,000 per house. This cost is equal to the cost of sewering the town center area on a per house basis. The need for sewers, however, is much lower.

Goodrich Brook - Meadow Road Area

This area includes the area which would be served by an interceptor paralleling Goodrich Brook. It includes the subdivisions between Deershorn Road and Goodrich Brook, Deershorn Road itself, Clinton Road from Redstone Hill Road to Meadow Road and all areas to the southwest of Clinton Road.

Even though much of the soils in this area have severe limitations for septic system use, most of the population is situated in the areas with more favorable soil conditions. No questionnaires were sent to this area but it is unlikely that many residents have serious septic system problems at the present time. Development in this area is not dense except for the subdivisions off Deershorn Road. The cost of constructing the interceptor to bring public sewers to the area is high and as a result the cost of sewering most of the Goodrich Brook area is fairly high, approximately $20,000 per house. The cost per home is even higher in outlying areas such as South Meadow Road.

George Hill Road Area

This area includes George Hill Road, Sterling Road from the end of the existing sewer to the Sterling town line, the northern portion of Clinton Road, the southern half of Hilltop Road, Windsor Road and Heritage Lane. Virtually all soil in this area has severe limitations. Questionnaires were sent to residents on George Hill Road and 41 percent of the returned questionnaires noted problems.

This area is sparsely developed and sewers would be very expensive on a per house basis. The only exception is the southern end of George Hill Road and Windsor Road. These streets can be sewered at a cost of approximately $15,000 per house. However, the need to sewer these streets does not appear to be high.

Langen Road Area

Streets included in this area are all of Langen Road except for the extreme northern portion, Bull Hill Road, Highfield Drive and Old County Road. All soils in this area are considered to have severe septic system restrictions. It is also very sparsely developed except for Highfield Drive and Old County Road. These two streets are relatively densely developed, but because they are located far from existing sewers the cost to construct a sewer to these two streets is high. The entire area would be very costly to sewer.

Fort Pond and Spectacle Pond Area

Most of the homes in northern Lancaster are clustered around the ponds - Fort Pond, Spectacle Pond, Little Spectacle Pond and White Pond. The 1975 Master Plan did not plan on sewering homes along other roads in the area becuase they are so widely scattered. It also did not plan to sewer the homes near White Pond. If significant development occurs, future updates of the Master Plan will plan for sewers in these areas but there is no need at this time.

The soil conditions are quite variable across northern Lancaster, according to the soils map, but much of the soil types around the ponds have only slight restrictions for subsurface disposal. Permeable soils are good for subsurface disposal but have the potential to cause a different problem when the septic system is near a water body. Permeability may be high enough to allow wastewater to flow to the pond before it has been properly treated and filtered by the soil. Pollution

of the pond can occur if many septic systems are under these conditions. Many homes around the ponds are seasonal. As a result, the total volume of wastewater being disposed is much less than the volume which would be discharged from year round homes. The potential for problems will increase if many seasonal homes are converted to year-round homes. Presently, as many as 50 percent are year-round.

The Massachusetts Regional Planning Commission conducted a survey of several ponds in the region as part of the 208 Water Quality Management Plan in 1977. One of the ponds surveyed was Fort Pond in Lancaster. The data found low dissolved oxygen concentrations and high concentrations of phytoplankton (microscopic plant life such as algae). However, the survey found relatively low concentrations of nitrogen, phosphorous and aquatic vegetation and the water was relatively clear.

The water quality of all lakes slowly decays and eventually becomes swamps and bogs. The rate at which lakes decay, called eutrophication, varies and can be affected by human activity. If septic systems are adding significant amounts of nutrients and organic matter to the lake it can cause an increase of the rate of eutrophication. Algae blooms and aquatic weeds accompany the greater decay. Sewers are needed to prevent added nutrients and an increase in the eutrophication rate.

In 1977, Fort Pond was rated as mesotrophic, an intermediate stage in the eutrophication process. Periodic water sampling and septic system inspection is needed to assess the present water quality, the rate of decay and the need for sewers.

Even though the ponds are approximately two miles from the populated areas near North Village, the cost of sewering this area is not much higher on a per house basis than the cost of sewering the town center area. The cost is estimated to be $16,000 to $22,000 per house depending on the extent of areas actually sewered.

CHAPTER 6
RECOMMENDED PLAN

Sewer Needs

Chapter 5 discussed the need for sewerage in all areas of the town. In general, it concluded that areas in southern and northern Lancaster have varied soil conditions and most homes are sited on soils favorable to subsurface disposal. Central Lancaster has soils which are severely restrictive for subsurface disposal. However, only the areas around Main Street and North Main Street have population densities which justify sewer installation. These areas have conditions which will make it difficult to rehabilitate systems to Title V requirements.

It is recommended that sewers be constructed in streets ranked one through twelve in Table 5.1. It is also recommended that Old Common Road, Otis Street and Shirley Road be sewered. These three streets do not have a great need for sewers but they are adjacent to streets which will be sewered. The additional cost will not be great and the additional houses sewered will reduce the cost per house for the entire project.

The sewering of Fort Pond, Spectacle Pond and Little Specatcle Pond is also recommended. This recommendation, however, is contingent on water quality testing results of the ponds. Sewers in these areas should not be constructed until a study shows that water quality is being degraded by septic system effluent.

Phasing

The cost of constructing sewers in all areas recommended above is a considerable economic burden for a town of Lancaster's size. Not all areas are in immediate need of municipal sewers so it is possible to phase the recommended sewer construction over a period of years. The areas recommended for sewers are listed and evaluated in Table 6.1.

Table 6.1
Sewer Priority

Area	Construction Cost[1] ($)	No. of Homes	Cost per Home ($)	No. of Problems	No. of Problems Per Home	Cost per Problem ($)
Parker Road	80,000	15	5,300	4	27%	20,000
Town Center	1,493,000	121	12,400	35	29%	42,700
North Village	1,829,000	135	13,600	34	25%	53,800
North Main Street Ext.	510,000	39	13,000	9	23%	56,700
Neck Road	520,000	40	13,000	9	23%	57,800
Harvard Road[2]	976,000	51	19,100	10	20%	97,600
Fort Pond and Spectacle Pond[3]	3,090,000	203	15,200	--	--	--

[1] ENR-CCI=4,200

[2] Questionnaires were not sent to all streets in this area.

[3] Questionnaires were not sent to this area.

The problems used in Table 6.1 are the number of septic systems identified in questionnaire responses as having problems such as backups, frequent pumpouts, odors or repairs.

The cost per problem given in Table 6.1 reflects the relative number of problems solved per dollar spent and is helpful in establishing priorities. The cost per home is also given to estimate the cost to the homeowner. The costs include only construction costs and do not include any state grants.

Table 6.2 shows the areas ranked according to priority and grouped according the phases. These costs are in 1985 dollars and will increase with inflation. Costs will increase significantly for phases delayed for a number of years. The location of the recommended sewers are shown in Figure No. 6.1.

Table 6.2
Sewer Construction Phases

Priority	Area	Phase	Construction Costs $
1	Parker Road	1	80,000
2	Town Center	1	1,493,000
3	North Village	1	1,829,000
	Total Phase 1		3,402,000
4	North Main Street Extension	2	510,000
5	Neck Road	2	520,000
6	Harvard Road	2	976,000
	Total Phase 2		2,006,000
7	Fort Pond and Spectacle Road	3	3,090,000
	Total Phase 3		3,090,000

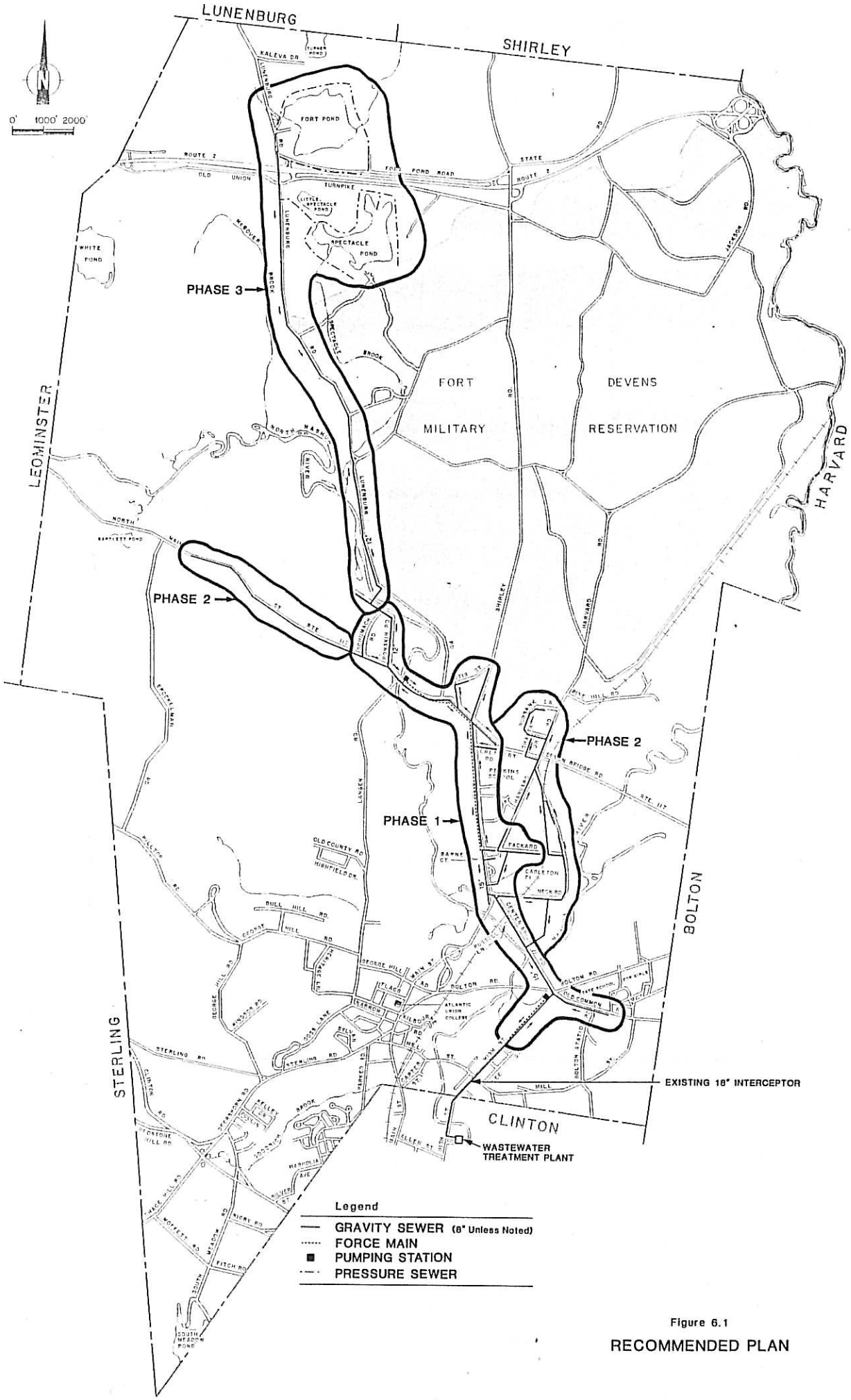


Figure 6.1

RECOMMENDED PLAN

On-Site System Rehabilitation and Maintenance

Sewers have been recommended for more congested areas of the town. When on-site systems fail outside these areas to be sewered, system rehabilitation is required. Rehabilitated systems and new systems must meet regulations of Title V, of the state sanitary code. Seeing that guidelines are met and the approval of new and repaired systems is the responsibility of the town Board of Health. The Board of Health uses the Nashoba Associated Boards of Health to obtain expert advice on various health issues. All costs are borne by the homeowner.

Maintenance of on-site systems is the responsibility of the homeowner. Septic tanks are pumped by private haulers on orders from individual homeowners. No maintenance is required and no records are kept by the town. Haulers presently charge around $100 for each pump out. Septage is dumped at the Leominster Wastewater Treatment Plant.

If systems are not well maintained premature failure will occur. Otherwise, sewer extensions in addition to those recommended previously will be necessary. Sewer extensions to most of these more sparsely populated areas will be much more expensive. To prevent inadequate septic systems from being built and prevent failures, strict adherence to construction guidelines must be enforced. Most of the buildable land left in Lancaster has severe restrictions for septic system use. House construction must not be allowed where soils will not allow efficient subsurface disposal. Expensive sewer extensions will be necessary if guidelines are not strictly enforced.

There are several alternatives available to the town of Lancaster that may help ensure the proper operations and maintenance (O&M) for on-site wastewater disposal systems. By implementing certain steps, the town can prevent sewer extensions, avoid expensive reconstruction of

on-site systems, and comply with the provisions of Title V of the State Sanitary Code. Two of these alternatives are discussed below.

Educational Program

The simplest method of on-site wastewater disposal systems management is to institute a public awareness and education program. Such a program can be conducted by the Lancaster Board of Health. In some communities, the DPW has run the program, which may involve periodic information meetings, newspaper articles or pamphlet distribution. The information disseminated may describe proper O&M of subsurface disposal systems, including but not necessarily limited to:

A. Descriptions of proper/improper O&M practices

B. The logic behind the proper techniques and the results of improper methods

C. How to maximize effective operation and usefulness of on-site systems

The effectiveness of such a program is, of course, dependent on the ultimate response of individual homeowners.

Septage Management Program

A more involved subsurface disposal management system is the institution of public septic system maintenance. Under such a program, the town would have increased involvement and responsibilities beyond that of an education program. Some communities have taken the approach of mandatory inspections and/or pumping of septic tanks on a regular basis. A common variation includes yearly inspections with pumping every three years.

Extreme forms of septage management programs have been adopted by some communities in response to severe problems in areas where sewering is not feasible. Some programs have included the following policies:

A. Strict adherence to guidelines for design and construction of subsurface disposal systems.

B. Comprehensive schedule for physical inspection and pumping to ensure proper maintenance.

C. Periodic testing of potable wells nearby to evaluate performance of existing systems.

D. Granting of easements by the homeowner for the regulatory authority, to gain access to systems for inspection, pumping and upgrading as necessary.

E. Requirement that septic systems be inspected and pumped, if necessary, before transfer of property title can take place.

Under the construction grants program, certain costs incurred by instituting such a program may be considered eligible for grant funding. Costs that have been eligible in the past include vehicles and other capital equipment required for pumping septic systems, and planning for establishment of management agencies or districts, including public hearings.

Environmental Assessment

The recommended plan will have a positive environmental impact by relieving numerous failing septic systems. The installation of sewers will prevent sewage backups and breakouts, nuisance odors, groundwater contamination and protect the public health. There are 109 septic

systems known to be failing now which will be relieved by a sewer system. Seventy-five will be relieved under the first phase of construction. Many more failing systems are likely to exist in areas to be sewered but not all questionnaires were returned and they were not sent to all areas recommended for sewers.

Phase 1 will add 105,000 gpd average daily flow to the sewer system. Phase 2 and 3 will add an additional 31,000 gpm and 49,000 gpd respectively. Only existing homes are included in these estimates. Future growth is not assumed for these calculations. The total average flow from existing sewered homes and existing homes to be sewered under Phases 1, 2 and 3 is estimated to be 312,000 gpd.

There will be short term negative impacts associated with the construction of sewers. However, virtually all construction will occur in town streets minimizing loss of vegetation and the potential for siltation. During Phase 1 a cross-country sewer will be required behind the town hall between Packard Street and Carleton Place. This area is not wetland or floodplain. Under Phase 2 a sewer will be built in an easement between Neck Road and Center Bridge Road. This area is in the floodplain. Phase 2 also requires sewer construction in the B&M right-of-way near Neck Road. Phase 1 will also require two river crossings. Another will be required under Phase 3. The construction of these crossings will cause some siltation but will have no adverse long term impact.

Sewer construction can also cause secondary impacts related to development and population growth. The extent of these impacts depend on the regional economic pressure for growth and the existence of other inhibitors to development. If the pressure for growth is high, development controls are not restrictive and the lack of suitable soil for on-site disposal is the only physical restraint, sewer extensions

to this area will allow growth and increase impacts. Although regional economic development has increased recently, residential development in Lancaster has been moderate but may be increasing. Some development has occurred, especially along Lee Street off High Street, but development is still not completely restricted by poor soils.

The extension of sewers to the Five Corners area will not have a great impact since most of the vacant land is either suitable for septic system use or floodplain and is undevelopable in any case. The construction of sewers in this area may be necessary to protect the municipal wells depending on the results of an aquifer study. The extension of sewers to the Town Center area will also have little impact. This area is essentially completely developed.

The North Village area is fairly well developed but there is some vacant land. Much of this land is suitable for septic systems anyway. Sewers will have a moderate impact in this area. Sewering the lower end of Parker Road will have no impact as it is 100 percent developed.

Overall, the secondary impacts of Phase 1 are not expected to be significant. However, after the completion of Phase 1, extensive vacant land will be just past the limits of the sewer system. Land on North Main Street and Seven Bridge Road could easily be developed if the developer is willing to extend the municipal sewer himself. This situation already exists in South Lancaster near the existing sewer system. Land on George Hill Road, Langen Road and Mill Street could be developed if a developer extended the existing sewer. George Hill Road and Langen Road are outside the existing sewer District and their inclusion must be voted on by the District residents. Mill Street, however, is already within the District boundaries. No development of this kind has occured but could in the future because of development pressure.

Secondary impacts under Phase 2 are likely to be somewhat greater than Phase 1. There is more vacant land available for development. This is especially true along North Main Street. Just off the road are large tracts of vacant land. Phase 3 will extend sewer service to North Lancaster but since soil is not as restrictive for septic system use it is not likely to have a significant impact.

Development is likely to occur in Lancaster in the near future and sewer extensions will increase the amount of development. The Town needs to prepare for and mitigate secondary impacts by strictly controling the quality of the development and requiring developers to contribute to the cost of mitigation.

CHAPTER 7
IMPLEMENTATION AND FINANCING

Expansion of the Sewer District

Presently the Lancaster Sewer District has the authority to construct sewers only within its district boundaries. Most of the sewers recommended previously are outside the District and under present rules would have to be constructed by the Town of Lancaster.

One option is to expand the District to include additional sewered areas as it is needed. This means each additional areas would have to be voted on by the District members each time new sewers are constructed. The District could also be expanded once to include all areas recommended for sewers. Chances are the District would not have to be expanded again for some time but an area not anticipated to be in need of sewers may have to be included at some point.

Grants

The existing sewer system was built at a time when federal grants were more readily available. At that time federal grants were being made for 75 percent of eligible costs and state grants were for 15 percent of eligible costs. The grants received by the District totaled approximately 70 percent of the total cost. The grants were less than the 90 percent available because of ineligible costs.

Federal grants for sewer construction are no longer available but a new state program for collection system construction will pay for 50 percent of eligible construction costs. Because engineering costs are ineligible and because of strict eligibility requirements for construction costs it is estimated that grants will cover close to 40 percent of the total costs. No grants are available for on-site rehabilitation.

The state collection system construction grants program has limited funds and many applicants. This has resulted in the use of a priority list based on need. All applicants for grant funds are ranked according to the number of failing systems and other environmental impacts. Funds are distributed to those at the top of the list first. If funds are not available to fund the entire list those at the bottom must wait until the next fiscal year. Depending on Lancaster's rank, the town may have to delay construction even if plans and specifications are ready.

Financing

Grants will cover only a portion of the cost of sewer construction. The remaining costs must be covered by local funds. Cost estimates will be made for Phase 1 only. The costs for the other phases will vary greatly depending on exactly when they are constructed, inflation rates over the years until construction, and available grants. The summary of costs for Phase 1 is:

Table 7.1

Cost Summary

Construction Cost (1985 $)	
ENR = 4,200	3,402,000
Construction Cost (1988 $)	
(ENR = 5,000)	4,050,000
Design Costs	405,000
Construction Services Cost	729,000
Total Costs	5,184,000
State Grant	-1,997,000
Local Share	3,187,000

The total number of houses to be sewered under Phase I is 270. This means the total cost per house will be approximately $11,800.

APPENDIX A

QUESTIONNAIRE

TOWN OF LANCASTER, MASSACHUSETTS
DOCUMENTATION OF SEWERAGE NEEDS

STREET ADDRESS: _____

_____

YEARS AT THIS ADDRESS: _____

APPROX. DATE WHEN HOME WAS BUILT: _____

Over the past years, have you witnessed any of the following problems associated with your septic system?

TYPE OF PROBLEM	NO	YES	DURATION AND NUMBER OF OCCURENCES	OTHER REMARKS
Standing Water in Yard				
Toilet, sink, or other drain backup				
Nuisance Odors				
Odors from Neighbor's Yard				
Have you ever repaired your septic system? - List repairs made				
Have you ever pumped out your septic tank: - How often? - How many times?				
What type of soil is your house built on?				
Do you consider your soil to be permeable? (Does water flow thru it?)				
Do you have a "Wet Basement?				
Do you have your own well?				

Please provide in the space any other comments pertaining to your septic system or your neighbor's septic system. Please return to: Lancaster Sewer Expansion Study Committee, P.O. Box 593, South Lancaster, MA 01561.

HOUSE NO.	STREET	HOUSE AGE (YEARS)	YEARS IN RESIDENCE	WATER IN YARD YES	WATER IN YARD NO	BACK UPS YES	BACK UPS NO	ODORS YES	ODORS NO	ODOR FROM NEIGHBOR YES	ODOR FROM NEIGHBOR NO	REPAIRS YES	REPAIRS NO	PUMPOUTS PER YEAR	SOIL TYPE	PERMEABLE SOIL? YES	PERMEABLE SOIL? NO	WET BASEMI YES	WET BASEMI
	BALLARD RD.	120	48		1		1		1		1		1	0.1		1			
53	BALLARD RD.	75	60	1			1	1			1		1	0.5			1		
24	BARNES CT.	130	1		1		1		1	1			1	1	TILL	1			
20	CARLETON PL.	60	18		1				1		1	1		0.5		1			
	CENTER BRIDGE RD.				1		1		1		1		1	2		1		1	
66	CENTER BRIDGE RD.	150	30		1		1		1		1		1	1	SAND/GRAV	1		1	
77	CENTER BRIDGE RD.	150	37	1			1		1		1		1	0.1	GRAV	1			
85	CENTER BRIDGE RD.	100	20		1		1		1		1		1	0	I			1	
104	CENTER BRIDGE RD.	20	20		1		1		1		1		1	0.05			1		
113	CENTER BRIDGE RD.	85	33	1			1	1		1		1		1	HARD PAN		1	1	
124	CENTER BRIDGE RD.	30	30		1		1		1		1		1	0.05	GRAV/CLAY	1			
125	CENTER BRIDGE RD.	83	20		1		1			1			1	0.1	CLAY	1		1	
136	CENTER BRIDGE RD.	115	6		1		1		1		1		1	0	CLAY		1	1	
146	CENTER BRIDGE RD.	20	13		1		1		1		1	1				1			
156	CENTER BRIDGE RD.	20	10	1		1		1		1			1	1			1	1	
157	CENTER BRIDGE RD.	13	2	1		1		1			1	1		1	?	1		1	
199	CENTER BRIDGE RD.	4	9	1		1		1			1		1	1	?				
307	CENTER BRIDGE RD.	17	17		1		1		1		1	1		1	SAND	1			
32	CREAMERY RD.	25	25		1		1		1		1		1	0.1	SAND	1			
40	CREAMERY RD.	25	25	1		1			1		1		1	0.5	CLAY		1		
60	CREAMERY RD.	25	12		1	1			1		1	1		0.1		1			
	GEORGE HILL RD.		4		1		1		1		1	1		0		1			
	GEORGE HILL RD.	20	15		1		1		1		1		1	0		1			
	GEORGE HILL RD.	15	8		1		1	1			1		1	0	SAND/CLAY	1			
	GEORGE HILL RD.	16	1		1		1		1		1		1	1		1			
	GEORGE HILL RD.	85	16		1		1		1		1	1		0.5		1			
	GEORGE HILL RD.	82	6		1		1		1		1		1	0.3			1	1	
	GEORGE HILL RD.	26	6		1		1		1		1		1	0.2		1			
	GEORGE HILL RD.	19	2		1		1		1		1		1		?				
	GEORGE HILL RD.	12	10		1		1		1		1		1	0.5	?	1			
	GEORGE HILL RD.	20	20		1		1	1		1			1	0.1	CLAY	1			
	GEORGE HILL RD.	1	1		1		1		1		1		1	0	CLAY/GRAV	1			
	GEORGE HILL RD.	35	25	1			1		1		1	1		0.1	?	1			
302	GEORGE HILL RD.	20	8		1	1			1		1		1	0.2	?	1			
325	GEORGE HILL RD.	153	MANY		1		1		1		1		1	0	LEDGE	1			
412	GEORGE HILL RD.	22	11	1			1		1	1			1	0.6	?	1		1	
450	GEORGE HILL RD.	2	2	1			1		1	1			1	0	CLAY		1		
712	GEORGE HILL RD.	16	4		1		1		1		1		1	0.3	?	1			
717	GEORGE HILL RD.	12	4		1		1		1		1		1	0.2		1			
794	GEORGE HILL RD.	20	20		1		1		1		1	1		0.2	CLAY	1			
852	GEORGE HILL RD.		12		1		1		1		1		1	0	CLAY	1			
901	GEORGE HILL RD.	13	6		1		1		1		1		1	0.5	CLAY		1		
937	GEORGE HILL RD.	16	8		1		1		1		1	1		1	?				
1016	GEORGE HILL RD.	25	2		1		1		1		1		1		?	1			
1048	GEORGE HILL RD.	30	8		1		1		1		1		1	0.1	?	1			
1053	GEORGE HILL RD.	17	5		1	1			1		1		1	0	CLAY	1			
1116	GEORGE HILL RD.	35	8		1	1		1		1			1	0.4	CLAY		1		
1611	GEORGE HILL RD.	16	8		1		1		1		1		1	0	LOAM	1			
	HARVARD RD.	185	5		1		1		1		1		1	0	GRAVEL	1			
67	HARVARD RD.	?	32		1		1		1		1	1		0.2	CLAY	1			
82	HARVARD RD.	?	36		1		1		1		1		1	0.2	GRAVEL	1			
87	HARVARD RD.	?	11		1		1		1		1		1	0.5	CLAY	1			
92	HARVARD RD.	30	22	1				1		1		1		1	CLAY	1		1	
97	HARVARD RD.	73	71		1		1		1	1			1	0	CLAY		1		
104	HARVARD RD.	35	24		1	1			1	1			1	0.5	LOAM/CLAY		1		
105	HARVARD RD.	125	12	1		1		1		1		1		0.5	?	1		1	
201	HARVARD RD.	131	40	1			1		1		1	1		0	CLAY		1	1	
213	HARVARD RD.	10	10		1		1		1		1		1	0.5	FILL/CLAY	1			
241	HARVARD RD.	28	28	1		1		1		1			1	0.3	CLAY		1	1	

	[illegible] RD.	[illegible]	[illegible]	1													0.3	CLAY		1		1	
279	HARVARD RD.	60	12	1			1			1			1	1			0.5	CLAY	1			1	
320	HARVARD RD.	85	1			1	1			1			1			1	1	CLAY		1			
455	HARVARD RD.	156	26			1	1				1		1			1	0.25						
456	HARVARD RD.	24	21			1		1			1		1			1	1		1				
472	HARVARD RD.	133	7	1				1			1		1			1	0.1	?	1				
473	HARVARD RD.	191	60			1		1			1		1	1			0.1	SAND	1				
508	HARVARD RD.	21	21			1		1			1		1			1	0.2	CLAY/SAND	1				
512	HARVARD RD.	235	10			1	1				1		1	1			1	SAND/CLAY	1				
540	HARVARD RD.	10	10			1		1			1		1			1	0		1				
	HIGH ST.	50	17			1		1			1		1			1	0	SAND	1				
185	HIGH ST.	24	24			1		1			1		1			1	1	LOAM	1				
210	HIGH ST.	75	16			1		1			1		1			1	0.1	SAND	1				
213	HIGH ST.	18	7			1		1			1		1			1	0.3	GRAVEL	1				
227	HIGH ST.	30	7			1		1			1		1			1	0.25	GRAVEL	1				
239	HIGH ST.	25	17			1		1			1		1			1	0.04	GRAVEL	1				
258	HIGH ST.	35	5			1		1			1		1			1	0	GRAVEL	1				
268	HIGH ST.	4	4	1				1			1		1			1	0.5	GRAVEL	1				
275	HIGH ST.	22	8			1		1			1		1			1	0.4	SAND	1				
278	HIGH ST.	1	1			1		1			1		1			1	0	SAND/GRAV	1				
317	HIGH ST.	19	16			1		1			1		1			1	1	SAND/CLAY	1				
317	HIGH ST.	19	16			1		1			1	1				1	1	SAND/CLAY	1				
395	HIGH ST.	1	1			1		1			1		1			1			1				
602	MAIN ST.	200	10			1		1			1		1	1			0	LEDGE	1			1	
634	MAIN ST.	153	9			1		1	1			1		1			1	?	1				
659	MAIN ST.	135	26			1		1			1		1			1	0		1				
674	MAIN ST.	122	40			1		1			1	1		1			0	?	1				
686	MAIN ST.	75	2			1		1			1	1				1				1		1	
687	MAIN ST.	85	10	1			1		1				1			1	1	CLAY	1				
724	MAIN ST.	134		1					1			1		1			1	SD/CLY/GR	1				
732	MAIN ST.					1		1	1			1				1	0.5	CLAY		1			
742	MAIN ST.	165	15	1				1	1				1			1	1	GRAVEL	1			1	
783	MAIN ST.	180				1	1		1				1			1	12	CLAY	1			1	
783	MAIN ST.	150	9			1	1				1		1	1			24	CLAY		1		1	
792	MAIN ST.	165	14			1		1				1		1			0	CLAY					
818	MAIN ST.	145	30			1		1			1		1			1	0.5		1				
823	MAIN ST.	171	4	1				1	1				1			1	0.25		1				
843	MAIN ST.	115	30			1		1			1		1			1	0	?	1			1	
849	MAIN ST.	113	6	1			1		1			1				1	2	CLAY		1		1	
863	MAIN ST.	100	4	1				1			1	1				1	0.3		1			1	
887	MAIN ST.																						
892	MAIN ST.			1			1				1		1			1	2		1			1	
942	MAIN ST.		30			1		1			1	1		1			1		1				
962	MAIN ST.	29	23			1		1			1		1	1			0.2	CLAY	1				
976	MAIN ST.	89	20			1		1			1		1			1	0	GRAVEL	1				
1030	MAIN ST.	55	31			1		1			1		1	1				CLAY	1				
1046	MAIN ST.	91	14			1		1			1		1			1	0.2	?	1				
1131	MAIN ST.	7	7			1		1			1		1			1	0.2		1				
1153	MAIN ST.	23	23			1		1			1		1			1	0.05	?	1				
1171	MAIN ST.	25	22	1			1				1		1			1	0	?	1				
1183	MAIN ST.	13	13	1			1		1			1				1	0.5	CLAY		1		1	
	NECK RD.	18	18			1		1			1		1			1	0.05	?	1				
	NECK RD.	23	6			1		1			1		1			1	0	?	1				
24	NECK RD.	85	30																1			1	
36	NECK RD.	98	50			1		1			1		1	1			0	HARD PAN	1				
56	NECK RD.		8																				
82	NECK RD.	258	1	1					1			1				1	1	CLAY		1		1	
122	NECK RD.	25	25	1			1		1			1		1			0.4	CLAY/SAND		1			
177	NECK RD.	7	5			1		1			1		1			1	0	SAND/LOAM	1				
206	NECK RD.	7	7			1		1			1	1				1	0.2	SAND	1				
257	NECK RD.	9	9			1		1			1		1			1	0.2	FILL	1				
267	NECK RD.	214	11	1				1			1		1	1			0.4	?	1				
290	NECK RD.	30	30			1		1			1		1	1			0.5	SAND	1				
311	NECK RD.	210	8			1		1			1		1			1	0	SAND	1				
406	NECK RD.	90	21			1		1	1				1	1			0.5	CLAY		1			
[illegible]	[illegible]	[illegible]	[illegible]																				

469	NECK RD.	105	12			1			1			1			1	1		0	CLAY		1	
498	NECK RD.	21	21		1			1			1			1			1	1	CLAY		1	
499	NECK RD.	20	20			1			1			1			1		1	1	SAND	1		
501	NECK RD.	60	25			1			1			1			1		1	0.2	ROCK/LOAM	1		
560	NECK RD.	19	19			1		1				1			1		1	0.2	ROCK/LOAM	1		1
586	NECK RD.		3			1			1			1			1		1	0	CLAY		1	1
	NORTH MAIN ST.	79	11			1			1			1	1		1		1	0.2	?	1		1
1219	NORTH MAIN ST.	100	13			1			1			1		1				0			1	
1234	NORTH MAIN ST.	140	5			1			1			1		1	1			0.8	SAND/GRAV	1		
1257	NORTH MAIN ST.	185	67			1			1			1		1	1				CLAY		1	1
1263	NORTH MAIN ST.	46	46			1			1			1		1					CLAY		1	
1272	NORTH MAIN ST.	150	1			1			1			1	1		1				?		1	
1331	NORTH MAIN ST.	135	5			1			1			1	1		1				GRAVEL	1		
1334	NORTH MAIN ST.	97	3			1			1	1				1	1			0.25			1	
1361	NORTH MAIN ST.	?	2			1		1				1		1	1			1				
1387	NORTH MAIN ST.	?	64			1			1			1		1	1					1		1
1408	NORTH MAIN ST.	151	14		1				1				1			1		0.5	CLAY			1
1427	NORTH MAIN ST.	159	7			1			1			1		1	1			0	SAND	1		
1430	NORTH MAIN ST.	6	5			1			1			1		1	1			0		1		1
1444	NORTH MAIN ST.	268	11			1		1		1			1					0.3	GRAVEL	1		
1453	NORTH MAIN ST.	100	21			1			1			1			1			0.05	ROCK/SAND	1		
1461	NORTH MAIN ST.		4			1			1						1			0.5	SAND/GRAV	1		
1745	NORTH MAIN ST.	135	8		1			1		1				1	1			0.6	CLAY		1	1
1765	NORTH MAIN ST.	25	25		1				1			1				1		1.5	CLAY		1	
1845	NORTH MAIN ST.	15	15			1			1			1		1	1			0.5	CLAY/TILL	1		
1887	NORTH MAIN ST.	15	13			1		1				1		1				0.5	CLAY	1		1
1903	NORTH MAIN ST.	70	16			1			1			1			1			0		1		
1920	NORTH MAIN ST.	50	21		1			1				1		1	1			0	CLAY		1	
2007	NORTH MAIN ST.	75	11		1				1			1		1	1			1	?		1	1
2042	NORTH MAIN ST.	20	7			1			1			1		1	1			0	GRAVEL	1		
2056	NORTH MAIN ST.	17	13			1			1			1		1	1			0.2	CLAY/GRAV	1		
2069	NORTH MAIN ST.		5			1			1			1		1	1			0			1	
2078	NORTH MAIN ST.	185	18			1			1			1		1		1		0	SAND/CLAY	1		1
2081	NORTH MAIN ST.	85	8			1			1			1			1			0		1		
2107	NORTH MAIN ST.	30	15		1			1				1		1	1			0.75	CLAY	1		
2120	NORTH MAIN ST.	45	7			1			1			1		1	1			0.1	SAND	1		
2121	NORTH MAIN ST.	235	20			1			1			1	1			1		0.05	CLAY	1		
2222	NORTH MAIN ST.		36		1				1			1		1	1			0	CLAY	1		1
2237	NORTH MAIN ST.	38	38			1			1			1			1			0	CLAY		1	
2273	NORTH MAIN ST.	40	20			1			1			1	1			1		1			1	1
2324	NORTH MAIN ST.	14	14		1				1	1			1			1		0.2	CLAY		1	1
2327	NORTH MAIN ST.	18	16			1			1			1			1			0.2	clay			
2343	NORTH MAIN ST.	30	23			1			1			1			1			0.2				1
2363	NORTH MAIN ST.	100	25			1			1			1			1			0.3	CLAY		1	
2372	NORTH MAIN ST.	40	23			1			1			1			1					1		
2429	NORTH MAIN ST.	16	6			1			1			1			1			0	CLAY	1		
2492	NORTH MAIN ST.	37	9			1			1			1		1				0.1	FILL	1		1
2500	NORTH MAIN ST.	85	39			1			1			1		1				0.2	CLAY/SAND	1		1
2518	NORTH MAIN ST.		5			1		1				1				1		0.5	GRAVEL	1		1
2685	NORTH MAIN ST.	85	35			1			1			1				1		0.1	SAND/CLAY	1		
2731	NORTH MAIN ST.	45	3		1			1			1				1			3	SAND	1		
2748	NORTH MAIN ST.	75	40			1			1			1			1			0			1	
2754	NORTH MAIN ST.		50			1			1			1			1			0	SAND	1		
2789	NORTH MAIN ST.	42	42			1			1			1			1			0	SAND	1		
2806	NORTH MAIN ST.	78			1				1	1					1			1		1		
	OLD COMMON RD.	30	10			1			1			1	1			1		0.3		1		
	OLD COMMON RD.	260	53			1			1			1		1	1				GRAVEL	1		
	OLD COMMON RD.	60	8			1			1			1			1			0	SAND	1		
	OLD COMMON RD.	23	23			1			1			1			1			0.5	GRAVEL	1		
17	OLD COMMON RD.	2	2			1			1			1	1		1			0	SAND	1		
37	OLD COMMON RD.	13	13			1			1			1		1	1			0.1	SAND	1		
51	OLD COMMON RD.	38	38			1			1			1		1				0	SAND	1		
65	OLD COMMON RD.	38	26			1			1			1			1			0.05	SAND	1		
85	OLD COMMON RD.	20	20			1		1				1			1			0.5	SAND	1		
105	OLD COMMON RD.	31	5		1				1			1			1			0.2	SAND/GRAV	1		1
119	OLD COMMON RD.	114	7			1			1			1			1			1	SAND	1		1

119	OLD COMMON RD.	134	2		1		1	1			1		1	1	SAND	1		1
169	OLD COMMON RD.	45	16		1		1		1		1		1	0.2	SAND		1	1
195	OLD COMMON RD.		10		1		1		1		1		1	0	SAND	1		1
207	OLD COMMON RD.	30	1		1		1		1		1		1	1	SAND	1		
251	OLD COMMON RD.	70	37		1		1		1		1		1	0.2	SAND	1		
357	OLD COMMON RD.	14	14		1		1		1		1	1		0.1	SAND	1		
	OTIS ST.	22	12		1		1		1		1		1	0.2	SAND	1		
	OTIS ST.		MANY		1		1		1		1		1	0		1		
	OTIS ST.	50	6		1		1		1		1		1	0.3	SAND/GRAV	1		
9	OTIS ST.		36		1		1		1		1	1				1		
27	OTIS ST.	185	20		1		1		1		1	1		0		1		
59	OTIS ST.		25		1		1		1		1	1		0.5	SAND/CLAY	1		
76	OTIS ST.	89	48		1		1		1		1		1	0	SAND	1		
89	OTIS ST.	34	34		1	1			1		1	1		1	GRAV/SAND	1		
97	OTIS ST.		33		1		1		1		1		1	0	SAND			
149	OTIS ST.	22	22		1		1		1	1			1	0.4	SAND/GRAV	1		
	PACKARD ST.	12	12		1		1		1		1		1	0.5		1		
25	PACKARD ST.		31		1	1		1		1		1		0.1	SAND/CLAY	1		1
28	PACKARD ST.	65	6		1		1		1		1		1	0.5	CLAY	1		
35	PACKARD ST.	160	60		1		1	1		1		1		0.5		1		1
94	PACKARD ST.	100	76	1			1		1		1	1		0.2		1		1
95	PACKARD ST.	33	5		1		1		1	1			1	0.5	CLAY	1		1
102	PACKARD ST.	100	75	1		1			1		1		1	1	CLAY		1	1
107	PACKARD ST.	185	34	1		1			1			1		2	CLAY/LOAM	1		1
163	PACKARD ST.	85	22		1		1		1		1		1	0.1	LOAM/CLAY	1		
200	PACKARD ST.	14	14		1		1		1		1		1	0.2	CLAY	1		1
400	PACKARD ST.	18	18		1	1			1		1	1		0.1	CLAY/LOAM	1		
630	PACKARD ST.	18	4	1			1		1		1		1	0.2	CLAY/LOAM			1
	PARKER RD.	45	15		1	1		1		1			1	0.5	CLAY		1	
14	PARKER RD.																	
45	PARKER RD.	22	16		1		1		1		1		1	0	SAND	1		
74	PARKER RD.	28	13	1		1		1			1		1	1		1		
94	PARKER RD.	25	5	1		1			1		1	1		1	CLAY		1	1
108	PARKER RD.	30	6		1		1		1		1		1	0	SAND		1	
123	PARKER RD.	58	25	1		1		1		1		1		1		1		
137	PARKER RD.	30	20		1	1			1	1			1	0.3	GRAV	1		
297	PARKER RD.	28	25		1		1		1		1		1	0	SAND	1		
324	PARKER RD.	29	9		1		1		1	1			1	0	GRAV/SAND	1		
344	PARKER RD.	?	28		1		1		1		1		1	0.5	SAND	1		
352	PARKER RD.	30	8	1		1		1			1		1	1	CLAY	1		
352	PARKER RD.	25	2		1		1		1		1		1	0.5	SAND	1		
380	PARKER RD.	35	15		1		1		1		1	1			SAND/GRAV	1		
394	PARKER RD.	56	26		1		1		1		1		1	0.1	?	1		
408	PARKER RD.	25	25		1		1		1		1		1	0.1	SAND/GRAV	1		
426	PARKER RD.	32	31		1		1		1		1	1		0.1	GRAV/SAND	1		
440	PARKER RD.	32	17		1		1		1		1		1	0.5	SAND	1		
450	PARKER RD.	32	7		1		1	1		1			1	0.5	GRAVEL	1		
	PONAKIN RD.	4	4		1		1	1			1		1	0			1	
39	PONAKIN RD.	100	12		1		1	1		1			1	0	CLAY	1		1
65	PONAKIN RD.	20	2	1		1			1		1		1	0.5	CLAY		1	
77	PONAKIN RD.	28	19		1		1		1		1		1	0	LOAM	1		
93	PONAKIN RD.	22	17		1	1			1	1		1		0.3	CLAY			1
112	PONAKIN RD.	20	18		1		1		1	1		1		0.1				1
124	PONAKIN RD.	20	5	1			1	1		1		1		1			1	1
160	PONAKIN RD.	5	5	1			1	1		1			1	0.2	CLAY/SAND	1		
212	PONAKIN RD.	40	7	1			1		1	1			1	0.5	?		1	1
266	PONAKIN RD.	55	40	1			1		1		1	1		1	CLAY		1	1
266	PONAKIN RD.	60	7	1		1		1		1								1
326	PONAKIN RD.	150	40	1		1		1		1		1		2	CLAY		1	1
327	PONAKIN RD.	?	31		1		1		1		1		1	0.5	CLAY/SAND		1	1
333	PONAKIN RD.		25		1		1	1			1		1	0.3				1
27	RUSSEL LN.	135	62		1	1			1	1			1	1	CLAY		1	1
11	SCHUMACHER RD.	100	38		1		1		1			1		0.4	CLAY	1		
33	SCHUMACHER RD.	15	15		1		1		1		1		1	0.3	CLAY	1		
4?	SCHUMACHER RD.	118	43		1		1		1		1	1		0.1	LOAM	1		

79	SCHUMACHER RD.	21	21	1			1		1		1		1	0.5	CLAY		1		
	SEVEN BRIDGE RD.	0	0		1		1		1		1		1	0.5	SAND/CLAY	1		1	
	SEVEN BRIDGE RD.	195	13		1		1		1		1		1	1	SAND	1			
	SEVEN BRIDGE RD.	0	0		1		1		1		1		1	0.2	?	1			
	SEVEN BRIDGE RD.	21	21	1			1		1			1	1	0.6	CLAY		1	1	
46	SEVEN BRIDGE RD.	173	1		1		1	1				1		1	SAND	1		1	
238	SEVEN BRIDGE RD.	21	0		1		1		1			1		1	0.3	CLAY		1		
264	SEVEN BRIDGE RD.	295	18		1		1		1			1		1	0.3	SAND	1		1	
7	SHIRLEY RD.	62	39		1		1		1			1	1		0.2	CLAY		1		
26	SHIRLEY RD.	45	17		1		1		1			1	1		0	?	1			
74	SHIRLEY RD.	85	37		1		1		1			1		1	0.3	CLAY	1		1	
75	SHIRLEY RD.	55	26	1		1		1		1			1		2	CLAY/GRAV		1	1	
95	SHIRLEY RD.	58	0		1		1		1			1		1	0.3		1			
117	SHIRLEY RD.	85	46		1		1		1			1		1	0	SAND/LOAM	1			
141	SHIRLEY RD.	70	70		1		1		1			1		1	0	SAND/LOAM	1			
157	SHIRLEY RD.	45	4		1		1		1			1		1	0	GRAVEL	1			
188	SHIRLEY RD.	70	7		1		1		1			1		1	0.3	SAND	1			
1000	SHIRLEY RD.	13	13		1		1		1			1		1	0	SAND	1			
1754	SHIRLEY RD.	11	0		1		1		1			1		1	0.2	SAND	1			
1813	SHIRLEY RD.	0	1		1		1		1			1		1		GRAVEL	1			
1842	SHIRLEY RD.	10	10		1		1		1		1			1	0.1	SAND	1			
1964	SHIRLEY RD.	12	2		1		1		1			1	1		0.5		1			
78	WHITCOMB DR.	12	0		1		1		1	1				1	0	SAND	1			

APPENDIX B

SEA Consultants Inc.
Engineers/Architects

54 Canal Street
Boston, MA 02114-2084
617-742-1133

415 Congress Street
Portland, ME 04101-3505
207-775-2281

850 Silas Deane Highway
Wethersfield, CT 06109-3412
203-721-7993

Client Lancaster
Project Master Plan Update
Detail

Job No. 144-8511
Comptd. By D. Breg
Ck'd By

Page
Date 3/7/86
Date

Pumping Station Capacities

Initial (Phase I only)

Five Corners -

255 houses x 240 gpd /home = 61,200 gpd ave daily flow

\+ 21,000 gpd (Industrial School)
11,000 gpd (Perkins School)
8,000 gpd (Nursing Home)

101,200 gpd Total

x 5 (peaking factor) = 506,000 gpd

= 351 gpm

North Nashua River

135 houses x 240 gpd /home = 32,400 gpd ave daily flow

\+ 11,000 gpd (Perkins School)
8,000 gpd (Nursing Home)

51,400 gpd Total

x 5 (peaking factor) = 257,000 gpd

= 178 gpm

SEA Consultants Inc.
Engineers/Architects

54 Canal Street
Boston, MA 02114-2084
617-742-1133

415 Congress Street
Portland, ME 04101-3505
207-775-2281

850 Silas Deane Highway
Wethersfield, CT 06109-3412
203-721-7993

Client Lancaster	Job No.	Page
Project Master Plan Update	Comptd. By	Date
Detail	Ck'd By	Date

Pumping Station Capacities (cont.)

Design

Five Corners P.S.

3,267 people ÷ 3.5 people/house × 240 gpd/home = 224,000 gpd ave flow

+ 21,000 gpd (Ind. School)
11,000 gpd (Perkins School)
8,000 gpd (Nursing Home)

264,000 gpd Total

× 5 (peaking factor)

= 1,320,000 gpd
= 917 gpm say 950 gpm

North Nashua River P.S.

1,560 people ÷ 3.5 people/house × 240 gpd/home = 107,000 gpd ave. flow

+ 11,000 gpd (Perkins School)
8,000 gpd (Nursing Home)

126,000 gpd Total

× 5 (peaking factor)

= 630,000 gpd

= 438 gpm say 450 gpm

FAILED (OR TT)

FAILED (ER)

P-W/VARIANCE

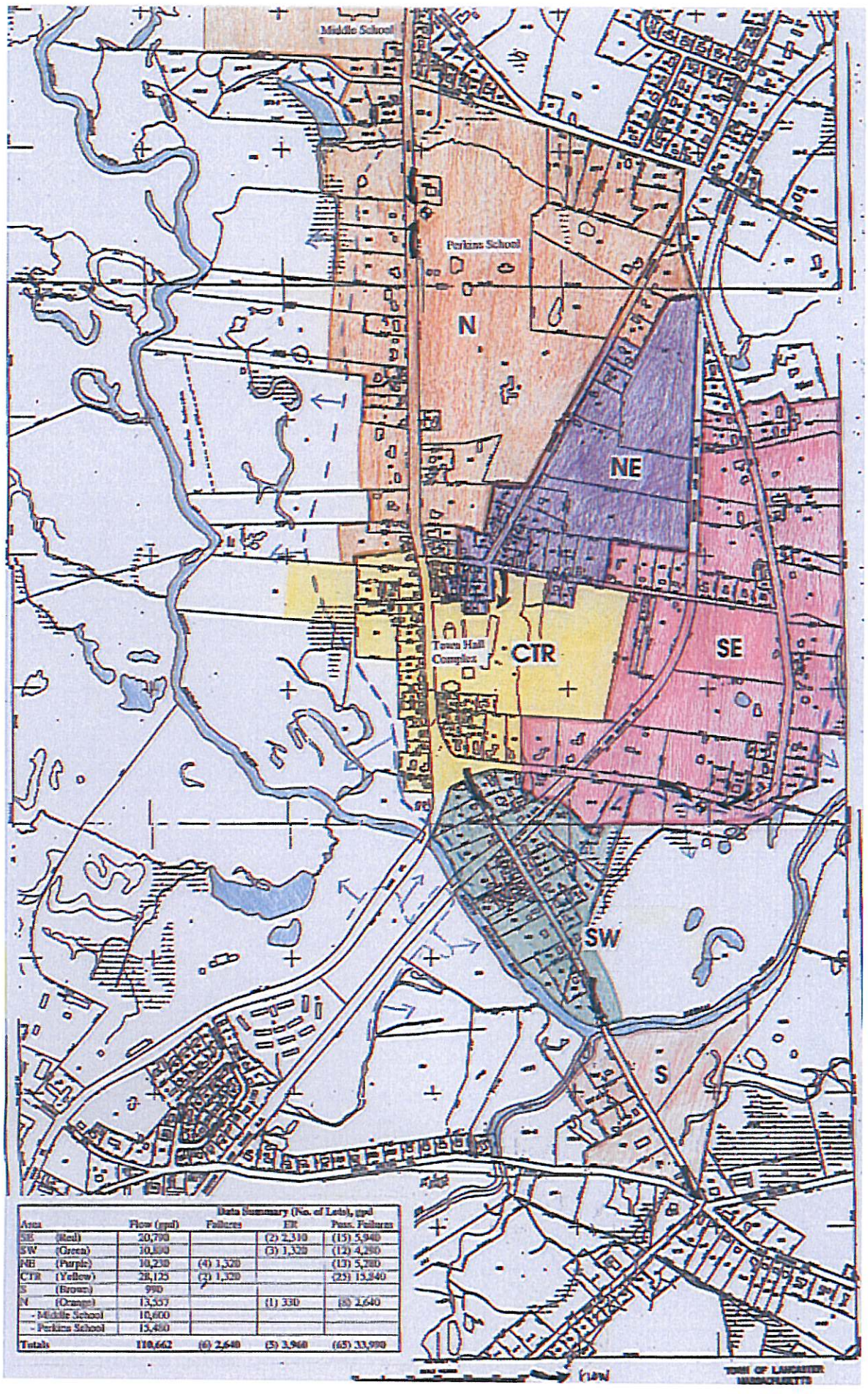
P-W/UPGRADE

PASSED

/// SUITABLE SOILS

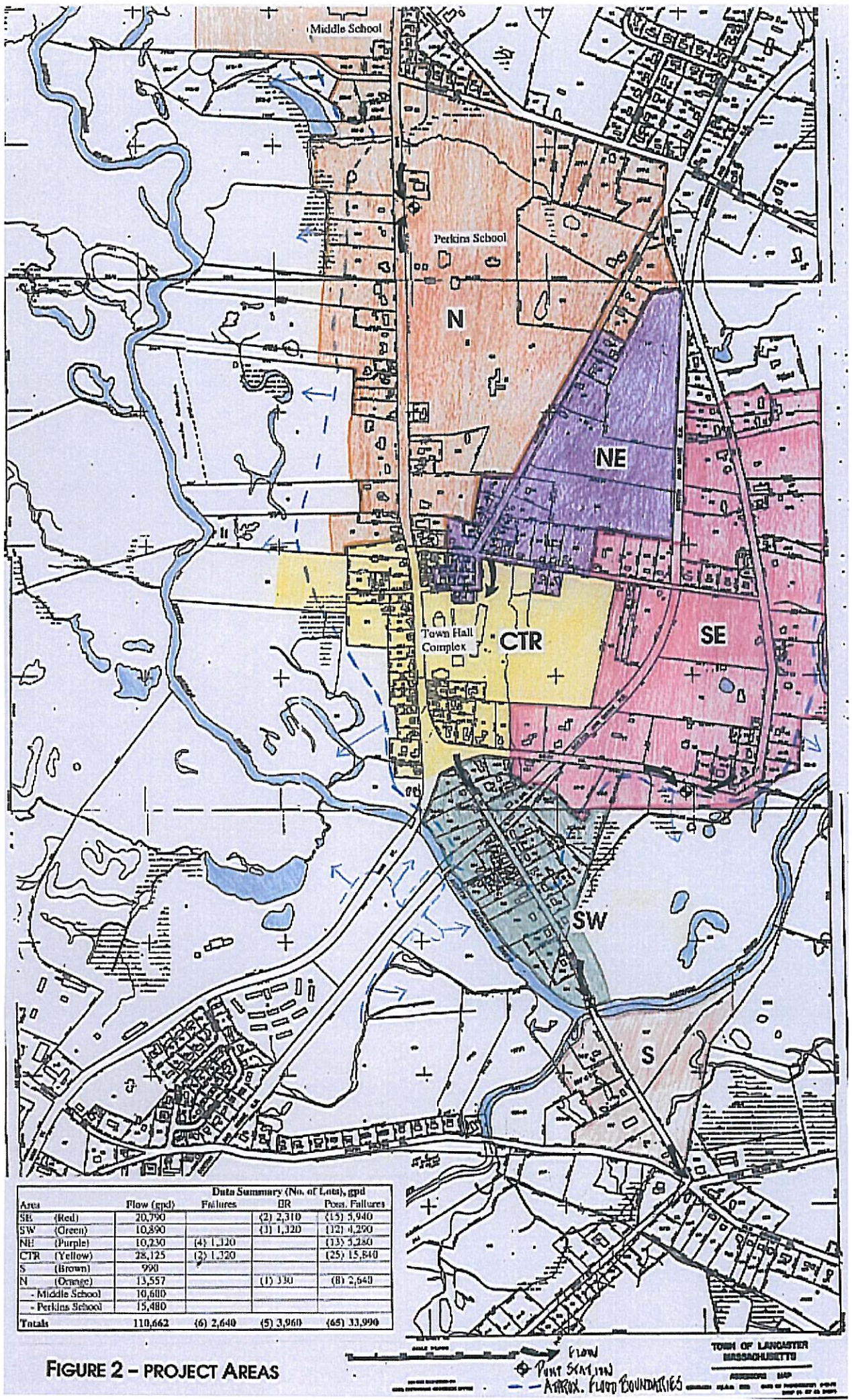
Proposed sewer

\\\ UNSUITABLE



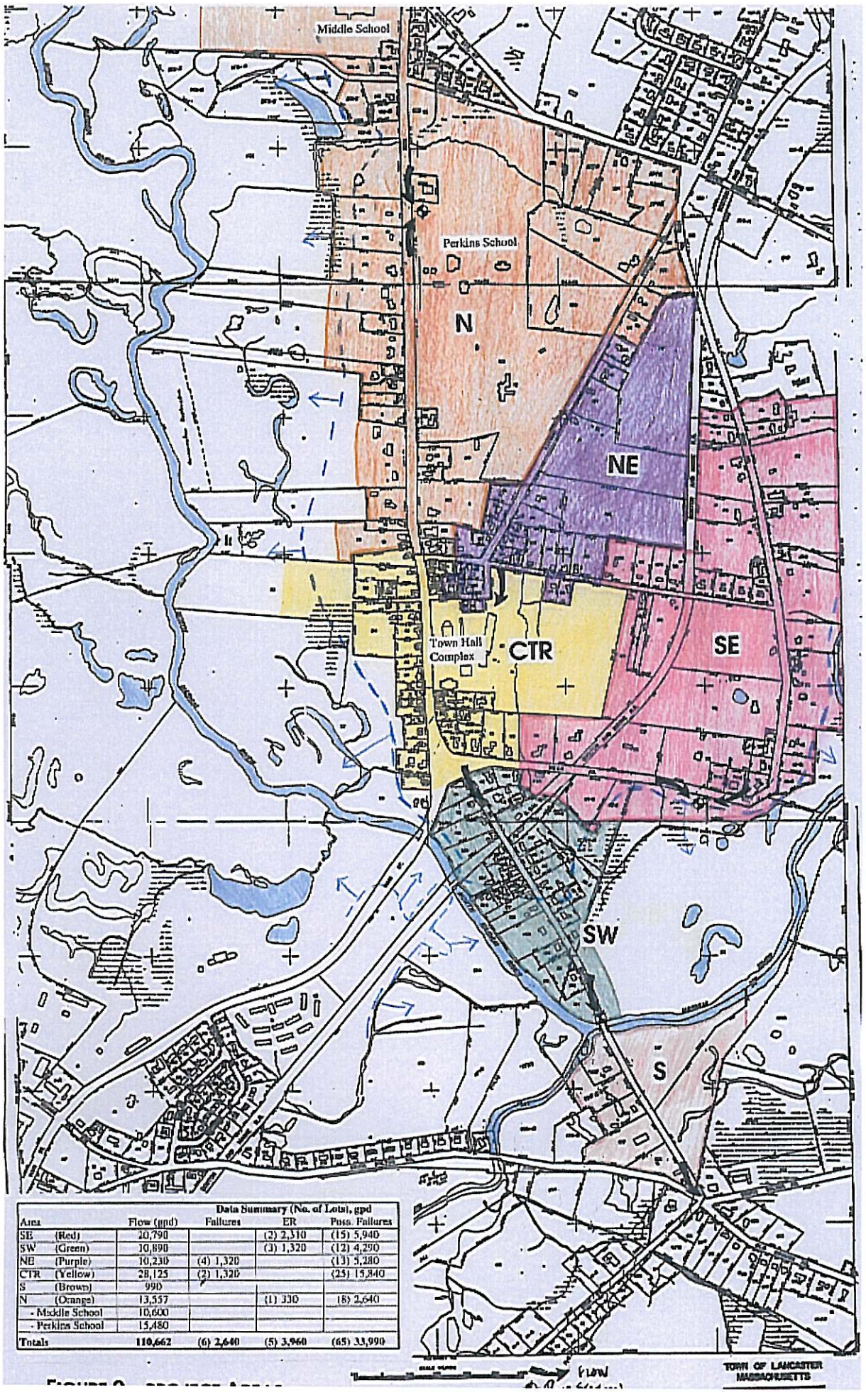
Area	Flow (gpd)	Data Summary (No. of Lots), gpd Failures	Elt	Pass. Failures
SE (Red)	20,790		(2) 2,310	(15) 5,940
SW (Green)	10,890		(3) 1,320	(12) 4,290
NE (Purple)	10,230	(4) 1,320		(13) 5,280
CTR (Yellow)	28,125	(2) 1,320		(25) 15,340
S (Brown)	990			
N (Orange)	13,557		(1) 330	(8) 2,640
- Middle School	10,600			
- Perkins School	15,480			
Totals	110,662	(6) 2,640	(5) 3,960	(65) 33,990

TOWN OF LANCASTER
MASSACHUSETTS

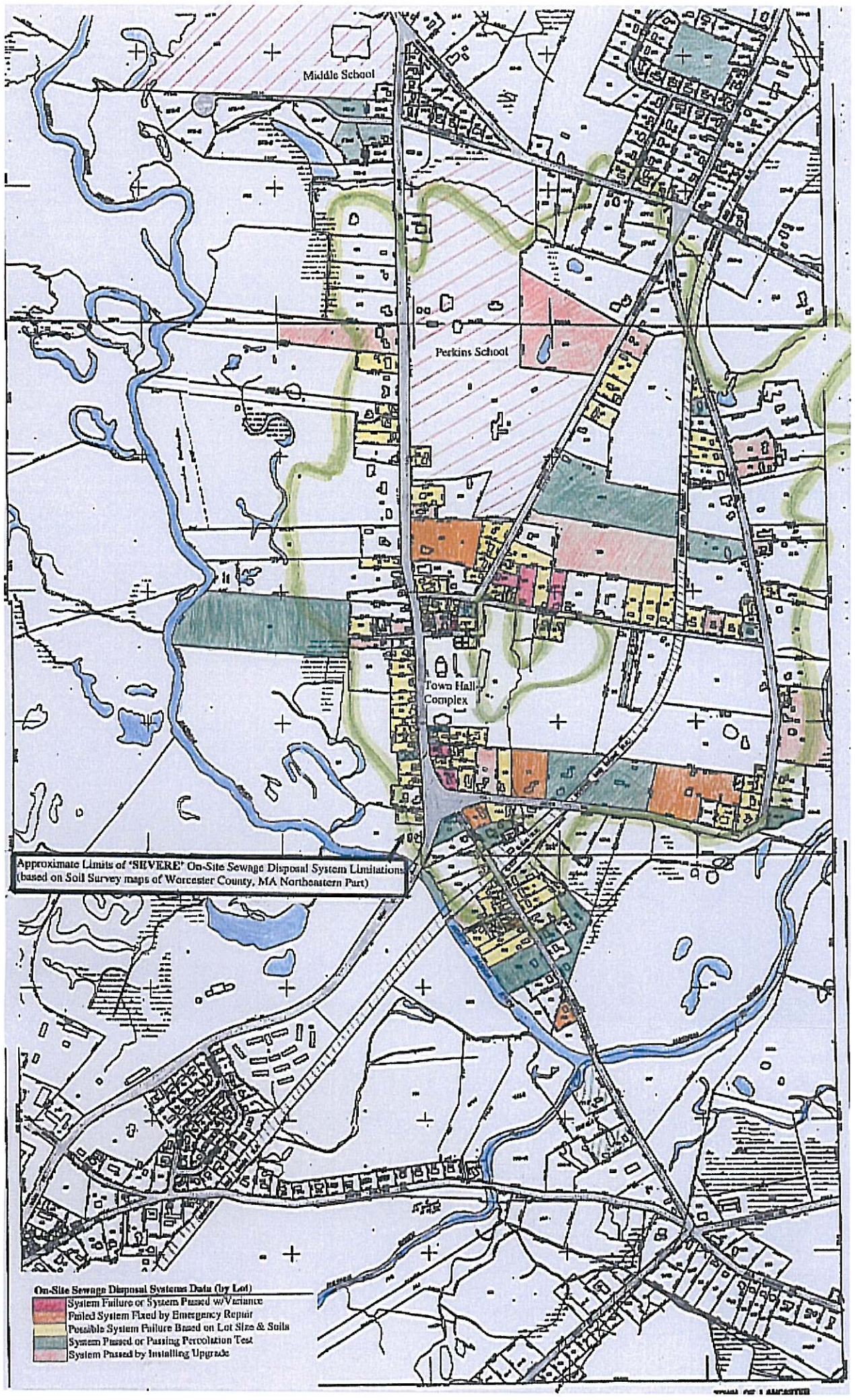


Area		Flow (gpd)	Data Summary (No. of Lots), gpd Failures	BR	Poss. Failures
SE	(Red)	20,790		(2) 2,310	(15) 5,940
SW	(Green)	10,890		(3) 1,320	(12) 4,290
NE	(Purple)	10,230	(4) 1,320		(13) 5,280
CTR	(Yellow)	28,125	(2) 1,320		(25) 15,840
S	(Brown)	990			
N	(Orange)	13,557		(1) 330	(8) 2,640
- Middle School		10,680			
- Perkins School		15,480			
Totals		110,662	(6) 2,640	(5) 3,960	(65) 33,990

FIGURE 2 – PROJECT AREAS



Area		Flow (gpd)	Data Summary (No. of Lots), gpd Failures	ER	Poss. Failures
SE	(Red)	20,790		(2) 2,310	(15) 5,940
SW	(Green)	10,890		(3) 1,320	(12) 4,290
NE	(Purple)	10,230	(4) 1,320		(13) 5,280
CTR	(Yellow)	28,125	(2) 1,320		(25) 15,840
S	(Brown)	990			
N	(Orange)	13,557		(1) 330	(8) 2,640
- Middle School		10,600			
- Perkins School		15,480			
Totals		110,662	(6) 2,640	(5) 3,960	(65) 33,990


Middle School
Perkins School
Town Hall Complex
Approximate Limits of 'SEVERE' On-Site Sewage Disposal System Limitations
(based on Soil Survey maps of Worcester County, MA Northeastern Part)
On-Site Sewage Disposal Systems Data (by Lot)
System Failure or System Passed w/Variance
Failed System Fixed by Emergency Repair
Possible System Failure Based on Lot Size & Soils
System Passed or Passing Percolation Test
System Passed by Installing Upgrade

Appendix C

Septage Pumping and Hauling BOH Records

Haulers List

PumpCompan	Last name	First name	Mailing Address	Town	Zip	Telephone	Pieces of Equip
A community Sanitation	Bonentant	Edward	17 Flagg Road	Westford	01886	(978) 692-0021	1
ABC Cesspool Co. Inc.	Dolan, Jr.	Richard	292 High Street	Acton	01720	(978) 263-5802	2
Action King Sewer Service	King, Jr.	Francis R.	26 Livingston Street	Lowell	01852	(978) 452-7750	3
Acton Concord Septic Inc	Spinelli	Margaret	PO Box 1142	Concord	01742	(978) 897-6414	2
Airport John	Alonso	Juan J	134 Crawford Street	Fitchburg	01420	(978) 955-5552	1
American Rooter Inc	Tessier	Bernard	1 Richards Way	Lunenburg	01462	(800) 689-7867	2
Arrow Septic Drain Service	Whittemore	Carlene R	PO Box 803	Townsend	01469	(978) 597-5378	2
Bancroft Silva Septic	Silva	Todd J	PO Box 620	Pepperell	01463	(978) 433-6659	2
Casaceli Trucking Inc.	Casaceli	Richard F.	5 Coolidge Street	Hudson	01749	(978) 562-6477	1
Chase/Harris Corp dba Larry Adams Septic	McGuirk	George	108 North Main Street	North Grafton	01536	(508) 839-6500	2
Cove Construction Corp	Cove, Sr.	Michael	7 Crowley Road	Sterling	01564	(978) 422-6905	1
CSI : Culley's Septic Service	Curtis	Jeff	3 McDonald Place	Westboro	01581	(508) 366-5055	1
Dave's Septic Service	Howe	John	PO Box 10237	Bedford, NH	03110	(603) 668-3402	1
Dracut Sewer Service Inc.	Patenaude	Richard	344 Aiken Avenue	Lowell	01850	(978) 452-4851	1
Ernies Septic Service	Sweet	Ernest	233 Pleasant Street	Dunstable	01827	(978) 649-7837	1
ESI Septic Service	Stuart	Eric	106 Main Street	Princeton	01541	(978) 464-0540	1
Favereau LR Septic	Favereau	Lawrence	91 Chase Hill Road	Sterling	01564	(978) 365-4300	1
Forrest Hill Septic Service Inc.	Wells	Philip	42 Lawton Road	Shirley	01464	(978) 425-8901	2
Greenwood Sewer Service	Greenwood	Donald	3 Greenwood Road	Westford	01886	(978) 692-8930	1
Handy House	Quintel	Steven	239 Neck Road	Haverhill	01835	(978) 372-0427	1
Lakeside Sewerage Service Inc	Lynde	Gary H.	780 North Bigelow Street	Marlboro	01752	(508) 485-1063	3
Lancaster Septic & Excavation	Culley	David	547 Neck Road	Lancaster	01523	(978) 368-8022	1

PumpCompan	Last name	First name	Mailing Address	Town	Zip	Telephone	Pieces of Equip
Moschetti & Sons Inc. FA	Moschetti	Franklin A.	104 Rice Road	Templeton	01468		2
Northboro Septic Service	Curtis	Andrew	124 Main Street	Northboro	01532	(508) 393-7234	2
R.J. Lacombe Septic Service	Lacombe	Robert	20 Orr Road	Groton	01450	(978) 448-5495	3
R.M. Ratta Corp.	Ratta	Robert M.	PO Box 945	Littleton	01460	(978) 772-1600	2
Raggs Septic Service	Comeau	E.A.	PO Box 1027	Concord	01742	(978) 369-1100	1
Rodenhiser Excavating	Rodenhiser	William	70 Bartzak Drive	Holliston	01746	(508) 429-9553	1
S. Penniman Sewer Service	Penniman	Scott	146 Burrage Street	Lunenburg	01462	(978) 582-0900	1
Sewer-Man Inc.	MacDonald	Vincent	PO Box 290	North Billerica	01867	(978) 667-1144	2
Sheldon Farm	Masse	David	320 Damon Road	Ashby	01431	(978) 386-5616	3
Soares Sanitation Pumping	Soares, Sr.	Robert	285 Thrasher Street	Taunton	02780	(508) 824-8370	1
Steve Lynde Sewer	Lynde	Steve	PO Box 5	Berlin	01503	(978) 838-2318	1
Stewart's Septic	DiVincenzo	John	20 South Mill Street	Bradford	01835	(978) 372-7471	2
The Septic Guys, Inc.	Labovitz	Patricia	PO Box 959	Westboro	01581	(800) 240-2400	1
The Traveling Outhouse	Fiola	Paul	39 Davis Road	Ashby	01431	(978) 386-7702	1
Wayne's Drains Inc.	Barme	Dorothy	PO Box 298	Wilmington	01887	(781) 272-3100	1
Wind River Environmental	Kelleher	Jessica	577 Main Street, Suite 110	Hudson	01749	(978) 562-4500	13

Nashoba Associated Boards of Health

Pumping Report For the Town of Lancaster for Period: 1/1/03 - 6/14/06

Address	Date	Pumper	Volume	Comments	Failed
19 BARNES COURT					
	11/21/2005	CSI : Culley's Septic Service	1000		☐
	11/21/2005	CSI : Culley's Septic Service	1000		☐
20 BARNES COURT					
	7/13/2005	CSI : Culley's Septic Service	500	CESSPOOL	☐
23 BARNES COURT					
	11/21/2005	CSI : Culley's Septic Service	1000		☐
	11/21/2005	CSI : Culley's Septic Service	1000		☐
6 BEACH AVE.					
	2/11/2004	Forrest Hill Septic Service Inc.	800		☐
18 BEACH AVE.					
	9/12/2005	S. Penniman Sewer Service	1000		☐
99 BEACH AVE.					
	9/19/2005	Favereau LR Septic	1000		☐
75 BEACH DRIVE					
	4/3/2004	S. Penniman Sewer Service	1000		☐
63 BEACH POINT RD.					
	4/27/2005	Culley R.L. Septic Service	1000		☐
87 BEACH POINT RD.					
	5/29/2004	Culley R.L. Septic Service	1000		☐
115 BEACH POINT RD.					
	6/16/2005	CSI : Culley's Septic Service	1500		☐
123 BEACH POINT RD.					
	7/13/2005	CSI : Culley's Septic Service	1000		☐
133 BEACH POINT RD.					
	5/13/2004	Culley R.L. Septic Service	1000		☐
3 BOGAN AVE.					
	11/25/2005	CSI : Culley's Septic Service	500		☐
29 BOLTON RD.					
	4/30/2004	Favereau LR Septic	1000		☐
185 BOLTON RD.					
	5/21/2004	Favereau LR Septic	1500		☐
215 BOLTON RD.					

	5/28/2004	Favereau LR Septic	1500	☐
225 BOLTON RD.				
	8/1/2005	Casaceli Trucking Inc.	1500	☐
	8/1/2005	Casaceli Trucking Inc.	1500	☐
230 BOLTON RD.				
	6/4/2004	Favereau LR Septic	1000	☐
280 BOLTON RD.				
	6/21/2004	Forrest Hill Septic Service Inc.	1000	☐
292 BOLTON RD.				
	6/10/2005	Favereau LR Septic	1000	☐
344 BOLTON RD.				
	5/19/2004	Bill's Sewer Service Inc.	1000	☐
358 BOLTON RD.				
	12/22/2003	Favereau LR Septic	1500	☐
360 BOLTON RD.				
	12/22/2003	Favereau LR Septic	1500	☐
417 BOLTON RD.				
	7/6/2004	American Rooter Inc	2000	☐
152 BOLTON STATION RD.				
	5/6/2004	American Rooter Inc	1500	☐
	4/18/2005	American Rooter Inc	1500	☐
158 BOLTON STATION RD.				
	10/21/2005	Culley Excavation	1000	☐
192 BOLTON STATION RD.				
	8/30/2005	Casaceli Trucking Inc.	1000	☐
238 BOLTON STATION RD.				
	5/13/2004	Culley R.L. Septic Service	2100	☐
246 BOLTON STATION RD.				
	6/17/2005	Cove Construction Corp	1500	☐
258 BOLTON STATION RD.				
	10/5/2005	CSI : Culley's Septic Service	1000	☐
290 BOLTON STATION RD.				
	7/15/2005	Favereau LR Septic	1000	☐
0 BRADBURY RD.				
	11/8/2004	Favereau LR Septic	1000	☐
33 BRADBURY RD.				
	8/8/2005	Favereau LR Septic	1000	☐
61 BRADBURY RD.				

		1/20/2006	Favereau LR Septic	800	TIE-IN
4	**BRAZAO LANE**				
		11/21/2005	CSI : Culley's Septic Service	1250	
30	**BRAZAO LANE**				
		7/17/2005	Favereau LR Septic	1000	
110	**BRAZAO LANE**				
		10/10/2003	Culley R.L. Septic Service	1500	
124	**BRAZAO LANE**				
		4/25/2004	Culley R.L. Septic Service	1500	
		3/27/2006	Favereau LR Septic	1000	
53	**BRIAN RD.**				
		10/18/2005	CSI : Culley's Septic Service	1500	
56	**BRIAN RD.**				
		9/9/2005	Favereau LR Septic	1500	
55	**BROCKELMAN RD.**				
		12/22/2003	Culley R.L. Septic Service	1500	
134	**BROCKELMAN RD.**				
		12/1/2005	Favereau LR Septic	1000	
155	**BROCKELMAN RD.**				
		12/22/2004	Favereau LR Septic	1000	
343	**BROCKELMAN RD.**				
		11/5/2003	Culley R.L. Septic Service	1000	
373	**BROCKELMAN RD.**				
		9/20/2004	Culley R.L. Septic Service	1000	
430	**BROCKELMAN RD.**				
		4/7/2004	American Rooter Inc	1500	
453	**BROCKELMAN RD.**				
		7/27/2005	American Rooter Inc	1500	
693	**BROCKELMAN RD.**				
		9/14/2005	Favereau LR Septic	1000	
726	**BROCKELMAN RD.**				
		10/4/2005	Steve Lynde Sewer	1250	
		10/4/2005	Steve Lynde Sewer	1250	
825	**BROCKELMAN RD.**				
		10/2/2004	Favereau LR Septic	1000	
865	**BROCKELMAN RD.**				
		6/15/2004	Favereau LR Septic	1500	
906	**BROCKELMAN RD.**				

	4/30/2004	Bill's Sewer Service Inc.	1000		☐
913 BROCKELMAN RD.					
	9/30/2004	Wind River Environmental	1500		☐
918 BROCKELMAN RD.					
	2/15/2005	Favereau LR Septic	1500		☐
	3/31/2005	Favereau LR Septic	1500		☐
934 BROCKELMAN RD.					
	6/22/2005	American Rooter Inc	1000		☐
953 BROCKELMAN RD.					
	4/2/2004	Casaceli Trucking Inc.	1500		☐
250 BULL HILL RD.					
	11/16/2004	Culley R.L. Septic Service	3500		☐
340 BULL HILL RD.					
	6/29/2004	Favereau LR Septic	1000		☐
350 BULL HILL RD.					
	4/29/2005	Favereau LR Septic	1500		☐
4 BURBANK LANE					
	6/16/2004	Culley R.L. Septic Service	1000	MACDONALD?	☐
11 BURBANK LANE					
	11/1/2005	Culley Excavation	1000		☐
12 BURBANK LANE					
	7/6/2004	Culley R.L. Septic Service	1000		☐
14 BURBANK LANE					
	4/21/2005	Culley R.L. Septic Service	1000		☐
16 BURBANK LANE					
	6/16/2004	Culley R.L. Septic Service	1000	MACDONALD?	☐
	11/23/2004	Casaceli Trucking Inc.	1000		☐
23 BURBANK LANE					
	4/8/2004	Favereau LR Septic	1000		☐
1 BUTTONWOOD LANE					
	12/22/2003	Culley R.L. Septic Service	1000		☐
	5/23/2005	CSI : Culley's Septic Service	1500		☐
	9/7/2005	Sheldon Farm	3000		☐
13 BUTTRICK LANE					
	5/29/2004	Culley R.L. Septic Service	1500		☐
113 CARTER ST.					
	10/4/2004	Casaceli Trucking Inc.	500	cesspool	☐
	4/22/2005	Casaceli Trucking Inc.	1000		☐

66	**CENTER BRIDGE RD.**				
		4/18/2005	Culley R.L. Septic Service	1000	☐
156	**CENTER BRIDGE RD.**				
		7/18/2005	CSI : Culley's Septic Service	1000	☐
173	**CENTER BRIDGE RD.**				
		4/8/2004	Favereau LR Septic	1000	☐
731	**CENTER BRIDGE RD.**				
		11/11/2005	CSI : Culley's Septic Service	500	☐
236	**CHACE HILL RD.**				
		3/20/2006	Favereau LR Septic	1000	☐
2	**CHASE HILL RD.**				
		4/28/2004	Culley R.L. Septic Service	500	☐
12	**CHASE HILL RD.**				
		10/28/2004	Favereau LR Septic	1000	☐
86	**CHASE HILL RD.**				
		10/6/2005	Favereau LR Septic	1000	☐
89	**CHASE HILL RD.**				
		9/27/2005	Favereau LR Septic	1500	☐
96	**CHASE HILL RD.**				
		9/1/2005	CSI : Culley's Septic Service	1000	☐
110	**CHASE HILL RD.**				
		4/19/2004	Favereau LR Septic	1000	☐
124	**CHASE HILL RD.**				
		4/19/2004	Favereau LR Septic	1000	☐
132	**CHASE HILL RD.**				
		2/27/2004	Favereau LR Septic	1500	☐
140	**CHASE HILL RD.**				
		11/26/2004	Favereau LR Septic	1500	☐
183	**CHASE HILL RD.**				
		7/6/2004	Favereau LR Septic	500 cesspool	☐
241	**CHASE HILL RD.**				
		12/13/2004	Favereau LR Septic	1500	☐
0	**CLEVERLY COVE RD.**				
		5/7/2004	Favereau LR Septic	1000	☐
		2/4/2005	Favereau LR Septic	1000 ROTTI	☐
71	**CLEVERLY COVE RD.**				
		9/30/2005	Favereau LR Septic	1500	☐

230	**CLEVERLY COVE RD.**				
	10/14/2005	R.M. Ratta Corp.	1000		☐
7	**COLE FARM RD.**				
	10/10/2004	Favereau LR Septic	1000		☐
37	**COLE FARM RD.**				
	10/1/2004	Favereau LR Septic	1000		☐
10	**COLONY LANE**				
	10/12/2004	Favereau LR Septic	1000		☐
20	**COLONY LANE**				
	4/24/2004	Culley R.L. Septic Service	1000		☐
	3/18/2005	Culley R.L. Septic Service	1000		☐
91	**COLONY LANE**				
	11/19/2003	Culley R.L. Septic Service	1000		☐
127	**COLONY LANE**				
	2/17/2005	Favereau LR Septic	2000	SEPTIC TANK & PUMP CHAMBER	☐
134	**COLONY LANE**				
	12/12/2003	Favereau LR Septic	1000		☐
5	**CONNER LN**				
	1/17/2004	Culley R.L. Septic Service	500		☐
27	**CONNER LN**				
	10/22/2003	Culley R.L. Septic Service	1000		☐
2	**CONNOR LANE**				
	7/7/2005	Favereau LR Septic	1000		☐
17	**CONNOR LANE**				
	7/28/2005	Favereau LR Septic	1000		☐
77	**CONNOR LANE**				
	12/19/2005	American Rooter Inc	1700		☐
	1/17/2006	Casaceli Trucking Inc.	1500	Septic tank & D-box	☑
	2/6/2006	Casaceli Trucking Inc.	2000	Septic Tank & D-box	☑
80	**DEERSHORN RD.**				
	5/5/2004	Culley R.L. Septic Service	1000		☐
	5/12/2004	Culley R.L. Septic Service	1000		☐
	1/12/2006	CSI : Culley's Septic Service	500		☐
140	**DEERSHORN RD.**				
	3/11/2005	Favereau LR Septic	1000		☐
160	**DEERSHORN RD.**				
	11/21/2004	Favereau LR Septic	1000	cesspool	☐
200	**DEERSHORN RD.**				

		6/15/2004	Favereau LR Septic	1500	☐
303	**DEERSHORN RD.**				
		9/23/2005	Favereau LR Septic	1000	☐
305	**DEERSHORN RD.**				
		11/30/2005	Casaceli Trucking Inc.	1000	☐
310	**DEERSHORN RD.**				
		7/27/2004	Favereau LR Septic	1500	☐
29	**DONELLE WAY**				
		5/11/2005	Bancroft Silva Septic	1500	☐
100	**DUVAL RD.**				
		2/5/2004	Sheldon Farm	13500 ORCHARD HILLS	☐
		5/2/2004	Sheldon Farm	3300 ORCHARD HILLS	☐
		9/7/2004	Sheldon Farm	10000 ORCHARD HILLS	☐
		9/14/2004	Sheldon Farm	4000 ORCHARD HILL	☐
		4/5/2005	Sheldon Farm	8400	☐
		4/10/2005	Sheldon Farm	9000	☐
		6/7/2005	Sheldon Farm	12000	☐
		8/3/2005	Sheldon Farm	12800 ORCHARD HILLS	☐
		8/7/2005	Sheldon Farm	12000 ORCHARD HILLS	☐
20	**EVELYN PLACE**				
		9/7/2005	Wind River Environmental	1500	☐
40	**FARM LAND LANE**				
		8/25/2005	Favereau LR Septic	1500	☐
11	**FIRE RD 7**				
		6/29/2005	R.M. Ratta Corp.	1500 MORRISETTE	☐
33	**FIRE RD 7**				
		9/28/2004	Forrest Hill Septic Service Inc.	1500	☐
65	**FIRE RD 7**				
		7/11/2005	American Rooter Inc	1000	☐
40	**FIRE RD 10**				
		10/25/2004	ESI Septic Service	1500	☐
50	**FIRE RD 10**				
		10/26/2005	Sheldon Farm	1000	☐
		3/31/2006	Favereau LR Septic	1500	☐
51	**FIRE RD 10**				
		8/25/2005	CSI : Culley's Septic Service	1500	☐
110	**FIRE RD 10**				
		9/21/2004	Bill's Sewer Service Inc.	1500	☐
		9/21/2004	Bill's Sewer Service Inc.	1000	☐

		1/12/2005	Culley R.L. Septic Service	1000	☐
0	**FIRE RD 11**				
		10/6/2004	R.M. Ratta Corp.	1000	☐
80	**FIRE RD 11**				
		11/9/2005	CSI : Culley's Septic Service	1500	☐
		11/29/2005	CSI : Culley's Septic Service	1500	☐
107	**FIRE RD 11**				
		11/21/2004	Favereau LR Septic	1000	☐
		10/20/2005	Favereau LR Septic	1000	☐
127	**FIRE RD 11**				
		6/30/2004	R.M. Ratta Corp.	1500	☐
0	**FIRE RD 12**				
		8/5/2004	S. Penniman Sewer Service	1000 FAVREAU	☐
64	**FIRE RD 12**				
		11/23/2005	Culley Excavation	1000	☐
117	**FIRE RD 12**				
		4/28/2004	Favereau LR Septic	1000	☐
125	**FIRE RD 12**				
		9/7/2004	S. Penniman Sewer Service	1500	☐
126	**FIRE RD 12**				
		6/15/2004	Favereau LR Septic	800	☐
130	**FIRE RD 12**				
		7/21/2004	Favereau LR Septic	1000 cesspool	☐
		8/27/2004	Favereau LR Septic	1000 CESSPOOL	☐
		6/30/2005	Favereau LR Septic	1000	☐
		7/26/2005	Favereau LR Septic	1000	☐
140	**FIRE RD 12**				
		9/1/2004	American Rooter Inc	1250	☐
143	**FIRE RD 12**				
		9/23/2005	Favereau LR Septic	1500	☐
147	**FIRE RD 12**				
		4/15/2004	R.M. Ratta Corp.	1500	☐
		8/29/2005	R.M. Ratta Corp.	1500	☐
150	**FIRE RD 12**				
		10/10/2004	Favereau LR Septic	1500	☐
151	**FIRE RD 12**				
		12/15/2004	Favereau LR Septic	1500	☐
161	**FIRE RD 12**				

		9/23/2005	Favereau LR Septic	1500	☐
220	**FIRE RD 3**				
		9/23/2004	R.M. Ratta Corp.	1000	☐
		5/16/2005	R.M. Ratta Corp.	1000	☐
		11/15/2005	R.M. Ratta Corp.	1000	☐
		5/9/2006	R.M. Ratta Corp.	1000	☐
0	**FIRE RD 3A**				
		8/27/2004	Favereau LR Septic	1000	☐
6	**FIRE RD 6**				
		6/16/2004	Favereau LR Septic	1000	☐
	FIRE RD 8				
		11/18/2004	Bill's Sewer Service Inc.	1000	☐
20	**FIRE RD 8**				
		5/17/2004	Bill's Sewer Service Inc.	1500	☐
		9/23/2005	Bill's Sewer Service Inc.	1000	☐
52	**FIRE RD 8**				
		12/3/2005	CSI : Culley's Septic Service	500	☐
65	**FIRE RD 8**				
		8/27/2004	Sheldon Farm	500	☐
102	**FIRE RD 8**				
		10/28/2005	Culley Excavation	1000	☐
22	**FITCH RD.**				
		5/11/2005	Favereau LR Septic	1000	☐
23	**FITCH RD.**				
		10/23/2003	Culley R.L. Septic Service	1000	☐
37	**FITCH RD.**				
		5/6/2005	Favereau LR Septic	1000	☐
53	**FITCH RD.**				
		10/24/2003	Culley R.L. Septic Service	1000	☐
		9/15/2005	Favereau LR Septic	1000	☐
80	**FITCH RD.**				
		6/18/2004	Favereau LR Septic	1000	☐
83	**FITCH RD.**				
		6/7/2004	Culley R.L. Septic Service	1500	☐
		5/18/2005	CSI : Culley's Septic Service	1000	☐
97	**FITCH RD.**				
		6/7/2004	Culley R.L. Septic Service	1500	☐
114	**FLAGG HILL RD.**				

210	**FORT POND HILL RD.**	5/11/2006	ABC Cesspool Co. Inc.	1000	☐
192	**FORT POND INN RD.**	11/4/2005	R.J. Lacombe Septic Service	750	☐
200	**FORT POND INN RD.**	11/18/2005	Favereau LR Septic	1000	☐
216	**FORT POND INN RD.**	5/21/2004	American Rooter Inc	1000	☐
77	**FORT POND LANE**	7/28/2005	Favereau LR Septic	1000	☐
0	**FORT POND RD**	4/6/2004	Culley R.L. Septic Service	1500	☐
77	**FORT POND RD**	5/5/2004	Favereau LR Septic	0 amount pumped N/A CAMP LOWE	☐
192	**FORT POND RD**	12/12/2004	Culley R.L. Septic Service	1500	☐
220	**FORT POND RD**	8/19/2004	Favereau LR Septic	1500	☐
240	**FORT POND RD**	9/7/2004	Culley R.L. Septic Service	1000	☐
		5/5/2004	American Rooter Inc	500	☐
		6/6/2006	American Rooter Inc	2500	☐
310	**FORT POND RD**	7/27/2004	American Rooter Inc	1500	☐
332	**FORT POND RD**	3/2/2005	American Rooter Inc	4000 Pit - Old	☐
500	**FORT POND RD**	6/11/2004	Forrest Hill Septic Service Inc.	4000 ROCKPORT	☐
580	**FORT POND RD**	4/22/2004	Forrest Hill Septic Service Inc.	4000 ROCKPORT	☐
18	**FULLER AVE.**	3/23/2004	Culley R.L. Septic Service	1000	☐
28	**FULLER AVE.**	5/23/2005	American Rooter Inc	2600 OLD	☐
		9/9/2005	American Rooter Inc	350 old	☐
		12/7/2005	American Rooter Inc	500	☐
		3/14/2006	American Rooter Inc	350	☐
288	**GEORGE HILL RD.**				

	8/26/2004	American Rooter Inc	1000		☐
302 GEORGE HILL RD.					
	4/13/2005	Favereau LR Septic	1000		☐
314 GEORGE HILL RD.					
	5/6/2005	CSI : Culley's Septic Service	1000		☐
325 GEORGE HILL RD.					
	9/28/2005	CSI : Culley's Septic Service	1500		☐
405 GEORGE HILL RD.					
	6/8/2004	Culley R.L. Septic Service	2500		☐
	9/28/2005	CSI : Culley's Septic Service	1000		☐
679 GEORGE HILL RD.					
	9/15/2004	American Rooter Inc	12000		☐
	9/21/2004	American Rooter Inc	500		☐
	7/25/2005	CSI : Culley's Septic Service	10000	MAHARISHI	☐
712 GEORGE HILL RD.					
	12/22/2003	Culley R.L. Septic Service	1000		☐
717 GEORGE HILL RD.					
	11/10/2003	Culley R.L. Septic Service	1000		☐
750 GEORGE HILL RD.					
	11/14/2005	Favereau LR Septic	1000		☐
774 GEORGE HILL RD.					
	10/7/2003	Culley R.L. Septic Service	1500		☐
913 GEORGE HILL RD.					
	5/20/2005	Favereau LR Septic	1000		☐
	5/20/2005	Favereau LR Septic	1000		☐
937 GEORGE HILL RD.					
	12/8/2003	Favereau LR Septic	1000	ER PUMP	☐
	8/5/2005	Favereau LR Septic	6000	2 PITS	☐
1000 GEORGE HILL RD.					
	10/5/2005	Favereau LR Septic	800		☐
1048 GEORGE HILL RD.					
	11/5/2004	Favereau LR Septic	1000		☐
	10/13/2005	Favereau LR Septic	1000		☐
1053 GEORGE HILL RD.					
	12/17/2004	Favereau LR Septic	1000		☐
	5/20/2005	Favereau LR Septic	1000		☐
1073 GEORGE HILL RD.					
	12/15/2004	Favereau LR Septic	1000	sewer tie-in	☐

1116	**GEORGE HILL RD.**				
		12/6/2004	Favereau LR Septic	1000	sewer tie-in
111	**GOSS LANE**				
		3/26/2004	Casaceli Trucking Inc.	1500	
123	**GOSS LANE**				
		4/5/2005	Favereau LR Septic	1000	
127	**GOSS LANE**				
		10/15/2003	Culley R.L. Septic Service	1000	
38	**GRANT WAY**				
		3/31/2004	Wind River Environmental	1500	
		7/11/2005	Wind River Environmental	1500	
45	**GRANT WAY**				
		8/23/2004	Wind River Environmental	1300	
105	**GRANT WAY**				
		9/27/2004	Culley R.L. Septic Service	1000	
123	**GRANT WAY**				
		6/2/2005	American Rooter Inc	1500	
165	**GRANT WAY**				
		4/5/2005	American Rooter Inc	1500	
194	**GRANT WAY**				
		9/7/2004	Wind River Environmental	1500	
255	**GRANT WAY**				
		11/18/2005	Favereau LR Septic	1500	
0	**HARVARD RD**				
		11/10/2005	Culley Excavation	1000	
92	**HARVARD RD**				
		12/29/2003	Culley R.L. Septic Service	500	
125	**HARVARD RD**				
		3/23/2005	Casaceli Trucking Inc.	2000	2 TANKS
201	**HARVARD RD**				
		9/7/2004	Culley R.L. Septic Service	1000	
241	**HARVARD RD**				
		9/9/2005	CSI : Culley's Septic Service	1000	
265	**HARVARD RD**				
		10/24/2005	Culley Excavation	500	CESSPOOL
456	**HARVARD RD**				
		6/2/2005	CSI : Culley's Septic Service	1000	

540	**HARVARD RD**				
		10/13/2005	Favereau LR Septic	1000	☐
65	**HEMLOCK LANE**				
		1/11/2004	Favereau LR Septic	1500 ER PUMP	☐
		1/24/2006	CSI : Culley's Septic Service	1700	☐
72	**HEMLOCK LANE**				
		11/2/2004	Favereau LR Septic	1000	☐
82	**HEMLOCK LANE**				
		5/20/2005	Casaceli Trucking Inc.	1000	☐
185	**HIGH ST.**				
		3/14/2005	Culley R.L. Septic Service	500	☐
213	**HIGH STREET EXT.**				
		8/9/2005	Favereau LR Septic	1000	☐
227	**HIGH STREET EXT.**				
		8/29/2005	Favereau LR Septic	1000	☐
263	**HIGH STREET EXT.**				
		11/12/2004	Favereau LR Septic	800	☐
		12/9/2004	Favereau LR Septic	1000 sewer tie-in	☐
275	**HIGH STREET EXT.**				
		10/28/2005	CSI : Culley's Septic Service	1250	☐
2	**HIGHFIELD DR.**				
		12/13/2004	Culley R.L. Septic Service	1000	☐
8	**HIGHFIELD DR.**				
		8/1/2005	CSI : Culley's Septic Service	1000	☐
10	**HIGHFIELD DR.**				
		9/16/2004	American Rooter Inc	1000	☐
15	**HIGHFIELD DR.**				
		7/25/2004	Favereau LR Septic	1000	☐
16	**HIGHFIELD DR.**				
		6/1/2004	Culley R.L. Septic Service	1000	☐
		8/1/2005	CSI : Culley's Septic Service	1000	☐
17	**HIGHFIELD DR.**				
		11/15/2005	Favereau LR Septic	1000	☐
20	**HIGHFIELD DR.**				
		11/4/2005	CSI : Culley's Septic Service	1000	☐
		11/4/2005	CSI : Culley's Septic Service	1000	☐
21	**HIGHFIELD DR.**				
		8/26/2004	American Rooter Inc	1000	☐

22	**HIGHFIELD DR.**				
		11/10/2005	Culley Excavation	1000	
2	**HIGHLAND ST**				
		5/2/2005	Forrest Hill Septic Service Inc.	1000	
389	**HILL RD.**				
		9/12/2005	Sheldon Farm	600	cesspool
		9/12/2005	Sheldon Farm	600	
448	**HILL TOP DR.**				
		6/29/2004	Favereau LR Septic	1500	
122	**HILL TOP RD.**				
		8/9/2005	Favereau LR Septic	1000	
202	**HILL TOP RD.**				
		4/13/2005	Culley R.L. Septic Service	1000	
248	**HILL TOP RD.**				
		5/3/2005	CSI : Culley's Septic Service	1500	
290	**HILL TOP RD.**				
		4/19/2005	Culley R.L. Septic Service	1500	
547	**HILLTOP DR.**				
		4/29/2005	Cove Construction Corp	1500	
202	**HILLTOP RD.**				
		5/26/2005	Wind River Environmental	1000	
396	**HILLTOP RD.**				
		11/28/2005	Culley Excavation	600	
515	**HILLTOP RD.**				
		10/11/2004	American Rooter Inc	1500	
1	**HOLIDAY LANE**				
		4/27/2004	Bill's Sewer Service Inc.	1500	
		9/18/2004	Sheldon Farm	1500	
34	**HOLIDAY LANE**				
		3/2/2004	Culley R.L. Septic Service	500	
53	**HOLIDAY LANE**				
		4/6/2004	American Rooter Inc	1500	
60	**HOLIDAY LANE**				
		6/15/2004	Favereau LR Septic	1000	cesspool
81	**HOLIDAY LANE**				
		7/22/2005	American Rooter Inc	1000	
22	**HUNTER LANE**				
		10/21/2004	ESI Septic Service	1500	

24 HUNTER LANE					
	10/21/2004	ESI Septic Service	1500		☐
31 HUNTER LANE					
	7/27/2005	American Rooter Inc	1500		☐
39 HUNTER LANE					
	12/21/2004	Favereau LR Septic	1000	AKA FIRE RD 12	☐
17 IVY CT.					
	6/9/2005	Steve Lynde Sewer	1000		☐
	6/9/2005	Steve Lynde Sewer	1000		☐
22 IVY DR.					
	5/27/2004	Favereau LR Septic	1000		☐
31 IVY DR.					
	6/1/2004	Favereau LR Septic	800		☐
69 IVY DR.					
	8/24/2005	CSI : Culley's Septic Service	1500		☐
25 KALEVA RD.					
	10/9/2004	R.J. Lacombe Septic Service	1500		☐
	12/14/2005	CSI : Culley's Septic Service	1250		☐
40 KALEVA RD.					
	9/30/2005	Sheldon Farm	1500		☐
	9/30/2005	Sheldon Farm	1500		☐
45 KALEVA RD.					
	10/17/2004	Favereau LR Septic	1500		☐
71 KALEVA RD.					
	8/18/2005	Sheldon Farm	1000		☐
85 KALEVA RD.					
	11/2/2005	Culley Excavation	1000		☐
103 KALEVA RD.					
	8/26/2004	Favereau LR Septic	1000		☐
131 KALEVA RD.					
	7/17/2004	Favereau LR Septic	1500		☐
143 KALEVA RD.					
	11/3/2005	Favereau LR Septic	1000		☐
185 KALEVA RD.					
	3/31/2004	Bancroft Silva Septic	1500		☐
195 KALEVA RD.					
	2/15/2006	American Rooter Inc	1500		☐
90 KELLY DR.					

	8/8/2005	Favereau LR Septic	1000		☐
132 KILBOURN RD.					
	8/3/2005	Favereau LR Septic	1000		☐
28 KINNEAR AVE.					
	2/11/2004	Culley R.L. Septic Service	2000		☐
	7/6/2004	Culley R.L. Septic Service	1000		☐
	5/9/2005	CSI : Culley's Septic Service	1500		☐
	11/2/2005	CSI : Culley's Septic Service	1000		☐
	11/2/2005	CSI : Culley's Septic Service	1500		☐
65 LANCASTER COUNTY RD.					
	8/5/2005	Acton Concord Septic Inc	1000		☐
75 LANGEN RD.					
	6/29/2004	Culley R.L. Septic Service	1000		☐
	8/24/2004	Culley R.L. Septic Service	500	CESSPOOL	☐
97 LANGEN RD.					
	12/3/2005	Culley Excavation	1000		☐
111 LANGEN RD.					
	9/20/2005	CSI : Culley's Septic Service	1000		☐
185 LANGEN RD.					
	8/27/2004	Culley R.L. Septic Service	1500		☐
201 LANGEN RD.					
	7/20/2005	American Rooter Inc	1000		☐
275 LANGEN RD.					
	11/1/2004	Wind River Environmental	1500		☐
341 LANGEN RD.					
	9/20/2005	American Rooter Inc	1000		☐
391 LANGEN RD.					
	6/2/2005	Favereau LR Septic	1000		☐
407 LANGEN RD.					
	4/14/2005	Favereau LR Septic	1000		☐
423 LANGEN RD.					
	12/26/2005	Bill's Sewer Service Inc.	1000		☐
471 LANGEN RD.					
	9/11/2004	Culley R.L. Septic Service	2000		☐
803 LANGEN RD.					
	8/9/2005	Favereau LR Septic	1000		☐
842 LANGEN RD.					
	11/11/2005	CSI : Culley's Septic Service	1000		☐

	11/11/2005	CSI : Culley's Septic Service	1000	☐
10 LARKIN RD.				
	6/7/2005	Favereau LR Septic	2000	☐
	11/17/2005	Favereau LR Septic	1000	☐
7 LAWSON AVE.				
	6/20/2005	Favereau LR Septic	800	☐
	12/3/2005	CSI : Culley's Septic Service	500	☐
10 LAWSON AVE.				
	12/19/2004	Favereau LR Septic	2000	☐
	4/26/2005	Favereau LR Septic	2000	☐
	8/30/2005	Favereau LR Septic	1500	☐
	1/30/2006	Favereau LR Septic	1500	☐
20 LAWSON AVE.				
	10/19/2004	Bill's Sewer Service Inc.	1000	☐
	7/9/2005	Bill's Sewer Service Inc.	1000	☐
	11/15/2005	Bill's Sewer Service Inc.	1000	☐
6 LEE ST.				
	7/15/2005	Favereau LR Septic	1000	☐
8 LEE ST.				
	12/10/2004	American Rooter Inc	1500	☐
11 LEE ST.				
	9/12/2005	CSI : Culley's Septic Service	1000	☐
13 LEE ST.				
	11/24/2003	Culley R.L. Septic Service	2000	☐
	4/26/2005	Casaceli Trucking Inc.	1000	☐
15 LEE ST.				
	9/1/2004	Culley R.L. Septic Service	1500	☐
22 LEE ST.				
	8/6/2004	Culley R.L. Septic Service	1000	☐
24 LEE ST.				
	3/31/2004	Steve Lynde Sewer	1000	☐
25 LEE ST.				
	10/13/2005	Favereau LR Septic	1000	☐
27 LEE ST.				
	10/28/2005	Casaceli Trucking Inc.	1000	☐
0 LUNENBURG RD.				
	6/9/2004	Bancroft Silva Septic	300	☐
19 LUNENBURG RD.				
	6/14/2004	Favereau LR Septic	1000	☐

24 LUNENBURG RD.					
	6/14/2004	Favereau LR Septic	1500		☐
834 LUNENBURG RD.					
	4/6/2004	Favereau LR Septic	1000		☐
	12/29/2004	Favereau LR Septic	1000		☐
860 LUNENBURG RD.					
	4/19/2005	Culley R.L. Septic Service	1500		☐
1983 LUNENBURG RD.					
	6/25/2004	Culley R.L. Septic Service	1250		☐
2029 LUNENBURG RD.					
	8/17/2004	American Rooter Inc	500		☐
	6/16/2005	Bancroft Silva Septic	500		☐
2164 LUNENBURG RD.					
	5/13/2005	CSI : Culley's Septic Service	1000		☐
2175 LUNENBURG RD.					
	11/18/2004	Sheldon Farm	1000		☐
2180 LUNENBURG RD.					
	4/22/2004	Culley R.L. Septic Service	1000		☐
2198 LUNENBURG RD.					
	4/20/2004	Favereau LR Septic	1000		☐
2215 LUNENBURG RD.					
	7/9/2004	Culley R.L. Septic Service	1000		☐
2243 LUNENBURG RD.					
	7/21/2004	Casaceli Trucking Inc.	1000		☐
2251 LUNENBURG RD.					
	10/18/2005	Bancroft Silva Septic	1000		☐
2301 LUNENBURG RD.					
	4/20/2004	Forrest Hill Septic Service Inc.	500		☐
2349 LUNENBURG RD.					
	6/24/2005	Favereau LR Septic	1000	PIT	☐
10 MAGNOLIA AVE.					
	7/27/2004	Culley R.L. Septic Service	1000		☐
12 MAGNOLIA AVE.					
	12/30/2004	Culley R.L. Septic Service	1000		☐
15 MAGNOLIA AVE.					
	7/12/2005	Favereau LR Septic	1000		☐
17 MAGNOLIA AVE.					
	3/17/2006	Favereau LR Septic	1500		☐

26	**MAGNOLIA AVE.**				
		5/20/2005	Favereau LR Septic	1500	☐
5	**MAGNOLIA DR.**				
		4/22/2004	Culley R.L. Septic Service	1000	☐
16	**MAGNOLIA DR.**				
		6/15/2004	Culley R.L. Septic Service	1000	☐
0	**MAIN ST**				
		4/22/2005	Steve Lynde Sewer	1000	CASHIN ☐
		4/22/2005	Steve Lynde Sewer	1000	☐
368	**MAIN ST**				
		4/15/2004	Culley R.L. Septic Service	1000	FROMMER? ☐
		2/7/2005	R.J. Lacombe Septic Service	500	☐
381	**MAIN ST**				
		9/23/2005	Favereau LR Septic		CESSPOOL/NO AMOUNT GIVEN ☐
		9/23/2005	Favereau LR Septic		CESSPOOL/NO AMOUNT GIVEN ☐
		9/26/2005	Favereau LR Septic	1500	☐
		9/26/2005	Favereau LR Septic	1500	☐
		10/27/2005	Favereau LR Septic	1500	☐
		10/27/2005	Favereau LR Septic	1500	☐
		11/8/2005	Favereau LR Septic	1500	CESSPOOL ☐
		11/8/2005	Favereau LR Septic	1500	CESSPOOL ☐
648	**MAIN ST**				
		4/15/2004	Culley R.L. Septic Service	1000	FROMMER? ☐
		4/16/2004	Culley R.L. Septic Service	1000	FROMMER/ ☐
668	**MAIN ST**				
		6/11/2004	Culley R.L. Septic Service	1000	☐
674	**MAIN ST**				
		11/15/2005	Favereau LR Septic	1500	☐
742	**MAIN ST**				
		12/19/2005	CSI : Culley's Septic Service	2000	☐
762	**MAIN ST**				
		5/21/2004	Sheldon Farm	1500	☐
868	**MAIN ST**				
		1/14/2005	Culley R.L. Septic Service	1500	☐
		6/9/2005	CSI : Culley's Septic Service	1500	☐
922	**MAIN ST**				
		10/26/2005	Bancroft Silva Septic	1500	☐
1104	**MAIN ST**				
		7/18/2005	Favereau LR Septic	1000	☐

1130 MAIN ST					
	3/1/2004	Culley R.L. Septic Service	1000		☐
1150 MAIN ST					
	10/9/2003	Culley R.L. Septic Service	1000		☐
	9/7/2005	CSI : Culley's Septic Service	1000		☐
1164 MAIN ST					
	9/22/2004	Culley R.L. Septic Service	500	DONE FOR PRENTIS/SEWER	☐
1219 MAIN ST					
	12/6/2004	American Rooter Inc	1000		☐
1263 MAIN ST					
	9/22/2004	Culley R.L. Septic Service	500	DONE FOR PRENTIS/SEWER	☐
1272 MAIN ST					
	5/13/2004	Culley R.L. Septic Service	1250	FINNERTY?	☐
1292 MAIN ST					
	5/13/2004	Culley R.L. Septic Service	1250	FINNERTY?	☐
1312 MAIN ST					
	11/18/2005	Sheldon Farm	1000		☐
1339 MAIN ST					
	10/28/2005	Culley Excavation	1500		☐
1357 MAIN ST					
	9/20/2004	Forrest Hill Septic Service Inc.	2000		☐
1368 MAIN ST					
	4/16/2004	Culley R.L. Septic Service	1000	FROMMER?	☐
	10/17/2005	CSI : Culley's Septic Service	1500		☐
1379 MAIN ST					
	5/7/2004	Culley R.L. Septic Service	500		☐
1405 MAIN ST					
	6/1/2005	Bill's Sewer Service Inc.	1000		☐
1408 MAIN ST					
	11/16/2005	Favereau LR Septic	1000	CESSPOOL	☐
1461 MAIN ST					
	12/17/2004	Steve Lynde Sewer	600	CESSPOOL	☐
1675 MAIN ST					
	8/25/2004	Rutland Sanitation Service	33000	RIVER TERRACE HEALTHCARE	☐
1745 MAIN ST					
	1/2/2006	Favereau LR Septic	1000		☐
1757 MAIN ST					
	4/19/2004	Culley R.L. Septic Service	2000		☐

1835 MAIN ST					
	3/31/2006	Favereau LR Septic	1500		☐
1845 MAIN ST					
	12/6/2003	Culley R.L. Septic Service	1000		☐
1906 MAIN ST					
	5/22/2006	American Rooter Inc	1500		☐
1921 MAIN ST					
	11/29/2004	Favereau LR Septic	1000		☐
2050 MAIN ST					
	9/23/2005	Favereau LR Septic	1000		☐
2107 MAIN ST					
	4/7/2004	Culley R.L. Septic Service	500	MOODY?	☐
	4/7/2004	Culley R.L. Septic Service	500	MOODY?	☐
	9/15/2004	Culley R.L. Septic Service	500	CESSPOOL	☐
2120 MAIN ST					
	12/1/2003	Favereau LR Septic	1000		☐
	7/1/2004	ESI Septic Service	1000	Being replaced	☐
2156 MAIN ST					
	7/23/2004	Culley R.L. Septic Service	1000	HOLDEN?	☐
	6/24/2005	American Rooter Inc	1000		☐
2187 MAIN ST					
	7/9/2004	Favereau LR Septic	800		☐
	5/16/2005	Sheldon Farm	1000		☐
2250 MAIN ST					
	10/4/2005	Favereau LR Septic	1000		☐
2273 MAIN ST					
	8/1/2005	Favereau LR Septic	1000		☐
2338 MAIN ST					
	4/7/2004	Culley R.L. Septic Service	500	MOODY?	☐
	4/7/2004	Culley R.L. Septic Service	500	MOODY?	☐
2360 MAIN ST					
	11/16/2005	Favereau LR Septic	500		☐
2366 MAIN ST					
	11/29/2004	Favereau LR Septic	1000		☐
2372 MAIN ST					
	12/5/2003	Favereau LR Septic	500	CESSPOOL	☐
	4/28/2004	Favereau LR Septic	500	cesspool	☐
2493 MAIN ST					

2500	**MAIN ST**	7/21/2004	Culley R.L. Septic Service	1000	☐
2517	**MAIN ST**	7/23/2004	Culley R.L. Septic Service	1000 HOLDEN?	☐
2567	**MAIN ST**	7/23/2005	Favereau LR Septic	1000	☐
		7/23/2005	Favereau LR Septic	1000	☐
8	**MAYFLOWER DR.**	12/14/2004	Favereau LR Septic	1000	☐
41	**MEDITATION LN.**	11/26/2004	Favereau LR Septic	1000	☐
87	**MILL ST**	4/11/2005	Favereau LR Septic	1500 EMERGENCY PUMPING	☐
88	**MILL ST**	12/31/2004	American Rooter Inc	1200	☑
		4/4/2005	American Rooter Inc	1100	☐
132	**MILL ST**	8/8/2005	CSI : Culley's Septic Service	1000	☐
		2/17/2006	CSI : Culley's Septic Service	1000	☐
158	**MILL ST**	7/12/2004	Culley R.L. Septic Service	1000	☐
176	**MILL ST**	9/22/2005	CSI : Culley's Septic Service	1000	☐
210	**MILL ST**	11/26/2004	Favereau LR Septic	1000 cesspool, sewer tie-in	☐
224	**MILL ST**	4/11/2006	Wind River Environmental	1500	☐
271	**MILL ST**	4/14/2004	Culley R.L. Septic Service	1000	☐
281	**MILL ST**	4/30/2004	Culley R.L. Septic Service	1000	☐
291	**MILL ST**	8/9/2004	Culley R.L. Septic Service	300 SEWER	☐
316	**MILL ST**	10/12/2004	Favereau LR Septic	1000 ER PUMP	☐
		1/10/2005	Favereau LR Septic	1000	☐
		1/17/2005	Favereau LR Septic	1000	☐
		11/12/2004	Casaceli Trucking Inc.	1500	☐

332	**MILL ST**			
		7/25/2005	Favereau LR Septic	1000
501	**MILL ST**			
		6/3/2004	Cove Construction Corp	1000
556	**MILL ST**			
		6/3/2004	Steve Lynde Sewer	1000
617	**MILL ST**			
		11/5/2004	R.J. Lacombe Septic Service	1000
46	**MILL ST. EXT.**			
		12/14/2004	Favereau LR Septic	1000
70	**MILL ST. EXT.**			
		5/9/2005	Favereau LR Septic	1000
161	**MILL ST. EXT.**			
		12/14/2004	Favereau LR Septic	1000
187	**MILL ST. EXT.**			
		9/19/2005	Bill's Sewer Service Inc.	1500
217	**MILL ST. EXT.**			
		6/30/2004	Sheldon Farm	1000
224	**MILL ST. EXT.**			
		4/14/2004	Culley R.L. Septic Service	1000
254	**MILL ST. EXT.**			
		5/11/2005	American Rooter Inc	900
271	**MILL ST. EXT.**			
		4/30/2004	Culley R.L. Septic Service	1000
281	**MILL ST. EXT.**			
		3/29/2004	Culley R.L. Septic Service	500
328	**MILL ST. EXT.**			
		12/1/2005	Favereau LR Septic	1500
392	**MILL ST. EXT.**			
		7/11/2005	Favereau LR Septic	1000
485	**MILL ST. EXT.**			
		9/1/2005	CSI : Culley's Septic Service	1000
604	**MILL ST. EXT.**			
		7/15/2005	Favereau LR Septic	1000
16	**MOFFETT ST.**			
		11/21/2004	Favereau LR Septic	1000
46	**MOFFETT ST.**			
		8/20/2004	Favereau LR Septic	1000

51	**MOFFETT ST.**				
	4/11/2005	Favereau LR Septic	1500		☐
52	**MOFFETT ST.**				
	5/24/2005	Favereau LR Septic	1500		☐
61	**MOFFETT ST.**				
	8/18/2005	Favereau LR Septic	1000		☐
83	**MOFFETT ST.**				
	9/27/2005	Favereau LR Septic	1500		☐
114	**MOFFETT ST.**				
	11/12/2003	Culley R.L. Septic Service	1500		☐
150	**MOFFETT ST.**				
	7/12/2005	Favereau LR Septic	1500		☐
170	**MOFFETT ST.**				
	4/29/2005	Favereau LR Septic	1500		☐
9	**MT. LAUREL LANE**				
	12/16/2003	Favereau LR Septic	1000		☐
	11/20/2004	Sheldon Farm	1000		☐
	11/20/2004	Sheldon Farm	1000		☐
	1/26/2005	Bancroft Silva Septic	1500		☐
11	**MT. LAUREL LANE**				
	3/8/2006	American Rooter Inc	1000	11-A	☐
	3/8/2006	American Rooter Inc	1500	11-B	☐
	3/8/2006	American Rooter Inc	1000	11-A	☐
	3/8/2006	American Rooter Inc	1500	11-B	☐
29	**MT. LAUREL LANE**				
	12/28/2004	Favereau LR Septic	1000		☐
	1/4/2005	Favereau LR Septic	1000		☐
33	**MT. LAUREL LANE**				
	8/2/2005	Favereau LR Septic	500	CESSPOOL	☐
14	**MYLES STANDISH RD.**				
	5/25/2004	Culley R.L. Septic Service	1000		☐
	10/14/2005	CSI : Culley's Septic Service	1000		☐
0	**NECK RD.**				
	10/19/2003	Culley R.L. Septic Service	500	HAWKINS?	☐
	11/25/2003	Culley R.L. Septic Service	1500	HAWKINS?	☐
	6/24/2004	Culley R.L. Septic Service	1000	HAWKINS/4 ADDRESSES ON 1 STREET	☐
56	**NECK RD.**				
	4/6/2004	Culley R.L. Septic Service	500	HAWKINS?	☐
	11/29/2004	Favereau LR Septic	1000		☐

82 NECK RD.					
	4/6/2004	Steve Lynde Sewer	1000	cesspool, poor condition, no tees	☐
119 NECK RD.					
	4/7/2004	Favereau LR Septic	1500		☐
170 NECK RD.					
	11/24/2003	Culley R.L. Septic Service	1000		☐
240 NECK RD.					
	3/11/2004	Favereau LR Septic	1000		☐
257 NECK RD.					
	10/30/2003	Culley R.L. Septic Service	1000		☐
267 NECK RD.					
	7/21/2004	Culley R.L. Septic Service	400		☐
	3/20/2006	Favereau LR Septic	1000	SEWER TIE IN	☐
290 NECK RD.					
	4/6/2004	Culley R.L. Septic Service	500	HAWKINS?	☐
311 NECK RD.					
	10/1/2003	Culley R.L. Septic Service	1500		☐
	9/19/2005	Favereau LR Septic	1000		☐
406 NECK RD.					
	2/8/2005	Favereau LR Septic	1000		☐
413 NECK RD.					
	4/6/2004	Culley R.L. Septic Service	500	HAWKINS?	☐
	11/11/2005	Culley Excavation	500		☐
436 NECK RD.					
	12/12/2004	Culley R.L. Septic Service	1000		☐
441 NECK RD.					
	10/10/2003	Culley R.L. Septic Service	1500		☐
442 NECK RD.					
	1/4/2005	Favereau LR Septic	1000		☐
455 NECK RD.					
	4/6/2004	Culley R.L. Septic Service	500	HAWKINS?	☐
489 NECK RD.					
	5/26/2004	Culley R.L. Septic Service	1000		☐
498 NECK RD.					
	12/26/2004	Favereau LR Septic	1000		☐
509 NECK RD.					
	5/17/2005	American Rooter Inc	2500		☐
528 NECK RD.					

		6/16/2005	Favereau LR Septic	1000	☐
560	**NECK RD.**				
		6/24/2005	Casaceli Trucking Inc.	1000 PUMP CHAMBER	☐
1361	**NORTH MAIN ST.**				
		7/15/2005	CSI : Culley's Septic Service	500 CESSPOOL	☐
1882	**NORTH MAIN ST.**				
		7/15/2004	Culley R.L. Septic Service	1000 SLIWA?	☐
1887	**NORTH MAIN ST.**				
		11/28/2005	Culley Excavation	1000	☐
1906	**NORTH MAIN ST.**				
		7/15/2004	Culley R.L. Septic Service	1000 SLIWA?	☐
2098	**NORTH MAIN ST.**				
		9/28/2004	Culley R.L. Septic Service	1000	☐
2286	**NORTH MAIN ST.**				
		11/29/2005	CSI : Culley's Septic Service	1200	☐
		11/29/2005	CSI : Culley's Septic Service	1200	☐
2429	**NORTH MAIN ST.**				
		11/17/2004	Culley R.L. Septic Service	1000	☐
2476	**NORTH MAIN ST.**				
		7/7/2004	Acton Concord Septic Inc	1500	☐
2677	**NORTH MAIN ST.**				
		5/9/2005	CSI : Culley's Septic Service	1500	☐
2725	**NORTH MAIN ST.**				
		8/4/2005	Favereau LR Septic	1000	☐
2806	**NORTH MAIN ST.**				
		11/17/2004	Culley R.L. Septic Service	1500	☐
2824	**NORTH MAIN ST.**				
		11/2/2005	Favereau LR Septic	2000 CESSPOOL	☐
2832	**NORTH MAIN ST.**				
		6/29/2004	Culley R.L. Septic Service	2500	☐
85	**OLD COMMON RD.**				
		6/20/2005	Casaceli Trucking Inc.	1000	☐
105	**OLD COMMON RD.**				
		9/11/2004	Culley R.L. Septic Service	1500	☐
106	**OLD COMMON RD.**				
		2/16/2006	CSI : Culley's Septic Service	5000	☐
119	**OLD COMMON RD.**				
		4/8/2004	Favereau LR Septic	1000	☐

124	**OLD COMMON RD.**				
		10/21/2004	American Rooter Inc	1000	
237	**OLD COMMON RD.**				
		4/26/2004	Culley R.L. Septic Service	1000	
357	**OLD COMMON RD.**				
		11/17/2004	Culley R.L. Septic Service	1000	
100	**OLD COUNTY RD.**				
		4/16/2004	Favereau LR Septic	1500	
124	**OLD COUNTY RD.**				
		11/4/2005	Sheldon Farm	200	
128	**OLD COUNTY RD.**				
		5/11/2004	Favereau LR Septic	800	
		11/4/2004	Sheldon Farm	200	
137	**OLD COUNTY RD.**				
		7/20/2004	American Rooter Inc	1000	
164	**OLD COUNTY RD.**				
		8/19/2005	Favereau LR Septic	800	
30	**OLD HICKORY RD.**				
		11/10/2004	ESI Septic Service	1000	
45	**OLD HICKORY RD.**				
		8/30/2005	Casaceli Trucking Inc.	600	
48	**OLD HICKORY RD.**				
		6/6/2005	Favereau LR Septic	500	
64	**OLD HICKORY RD.**				
		10/13/2005	Favereau LR Septic	500	
93	**OLD HICKORY RD.**				
		12/12/2003	Culley R.L. Septic Service	1000	
35	**OLD LUNENBURG RD.**				
		11/12/2003	Culley R.L. Septic Service	1000	
5	**OLD TURNPIKE RD.**				
		1/30/2004	Favereau LR Septic	1000	CESSPOOL
		8/3/2004	Favereau LR Septic	1000	CESSPOOL
		4/8/2005	Favereau LR Septic	1000	CESSPOOL
		8/2/2005	Favereau LR Septic	1000	
		1/25/2006	Favereau LR Septic	1000	CESSPOOL
95	**OLD TURNPIKE RD.**				
		5/10/2005	Favereau LR Septic	1500	
141	**OLD TURNPIKE RD.**				

		8/12/2005	CSI : Culley's Septic Service	1500	☐
141	**OLD UNION TNPK.**				
		11/12/2004	American Rooter Inc	2500 TANK AND CHAMBER	☐
438	**OLD UNION TNPK.**				
		4/15/2005	American Rooter Inc	2500	☐
479	**OLD UNION TNPK.**				
		6/1/2005	CSI : Culley's Septic Service	3000	☐
		1/9/2006	CSI : Culley's Septic Service	3000	☐
700	**OLD UNION TNPK.**				
		10/20/2005	Forrest Hill Septic Service Inc.	4000 TIGHT TANK	☐
748	**OLD UNION TNPK.**				
		4/12/2004	Raggs Septic Service	1500	☐
		5/2/2005	Raggs Septic Service	1500	☐
9	**OTIS ST.**				
		5/6/2004	Culley R.L. Septic Service	500	☐
		2/23/2006	Alpha Excavating & Septic	1000	☐
58	**OTIS ST.**				
		9/23/2005	Favereau LR Septic	1000	☐
59	**OTIS ST.**				
		11/8/2005	Favereau LR Septic	500	☐
89	**OTIS ST.**				
		6/8/2004	Culley R.L. Septic Service	500	☐
149	**OTIS ST.**				
		10/25/2003	Culley R.L. Septic Service	1000	☐
		11/4/2005	Culley Excavation	1000	☐
102	**PACKARD ST.**				
		8/7/2004	Favereau LR Septic	1000 SEWER TIE-IN	☐
183	**PACKARD ST.**				
		11/11/2003	Culley R.L. Septic Service	500	☐
94	**PARKER RD.**				
		7/18/2005	Favereau LR Septic	1000	☐
137	**PARKER RD.**				
		4/27/2004	Favereau LR Septic	1000 city tie in	☐
394	**PARKER RD.**				
		8/4/2004	Culley R.L. Septic Service	500 DONE FOR SULLIVAN	☐
		6/10/2005	Favereau LR Septic	1000	☐
408	**PARKER RD.**				
		8/4/2004	Culley R.L. Septic Service	500 DONE FOR SULLIVAN	☐

440	**PARKER RD.**			
	10/20/2005	Favereau LR Septic	1000	☐
450	**PARKER RD.**			
	5/25/2004	Favereau LR Septic	1500	☐
473	**PARKER RD.**			
	12/15/2004	Favereau LR Septic	1500	☐
478	**PARKER RD.**			
	5/28/2005	Favereau LR Septic	1000	☐
0	**PERRY RD.**			
	12/8/2004	Sheldon Farm	1500	☐
2	**PERRY RD.**			
	11/14/2005	Sheldon Farm	1000	☐
4	**PERRY RD.**			
	11/14/2005	Sheldon Farm	1000	☐
6	**PERRY RD.**			
	11/14/2005	Sheldon Farm	1000	☐
9	**PERRY RD.**			
	11/4/2004	Sheldon Farm	1000	☐
40	**PILGRIM RD.**			
	4/12/2004	Favereau LR Septic	1000	☐
	11/6/2004	Forrest Hill Septic Service Inc.	1000	☐
	10/14/2005	Favereau LR Septic	1000	☐
62	**PILGRIM RD.**			
	10/2/2003	Culley R.L. Septic Service	500	☐
22	**PLYMOUTH DR.**			
	11/2/2005	CSI : Culley's Septic Service	1000	☐
23	**PLYMOUTH DR.**			
	5/5/2005	CSI : Culley's Septic Service	1000	☐
22	**PONAKIN RD.**			
	12/2/2004	Sheldon Farm	600	☐
	12/9/2004	Favereau LR Septic	1000	☐
93	**PONAKIN RD.**			
	6/1/2004	Favereau LR Septic	1000	☐
	12/5/2005	Favereau LR Septic	1000	☐
98	**PONAKIN RD.**			
	11/5/2004	Favereau LR Septic	1000	☐
112	**PONAKIN RD.**			
	9/23/2005	Favereau LR Septic	1000	☐

119	**PONAKIN RD.**			
	12/1/2005	Favereau LR Septic	1500	☐
124	**PONAKIN RD.**			
	9/3/2004	American Rooter Inc	1000	☐
	9/13/2005	American Rooter Inc	1000	☐
148	**PONAKIN RD.**			
	6/15/2004	Favereau LR Septic	1000	☐
	6/16/2005	Sheldon Farm	1000	☐
155	**PONAKIN RD.**			
	11/29/2005	Favereau LR Septic	1000	☐
174	**PONAKIN RD.**			
	12/24/2004	Favereau LR Septic	1000	☐
212	**PONAKIN RD.**			
	1/20/2006	American Rooter Inc	1500	☐
228	**PONAKIN RD.**			
	11/15/2005	Favereau LR Septic	1000	☐
316	**PONAKIN RD.**			
	4/30/2004	American Rooter Inc	1000	☐
	5/18/2005	Sheldon Farm	1000	☐
326	**PONAKIN RD.**			
	3/3/2006	Favereau LR Septic	1500	☐
333	**PONAKIN RD.**			
	9/15/2004	Sheldon Farm	500	☐
52	**POULIN DR.**			
	11/28/2005	CSI : Culley's Septic Service	1500	☐
66	**POULIN DR.**			
	11/10/2005	Culley Excavation	1000	☐
90	**POULIN DR.**			
	5/23/2005	Favereau LR Septic	1000	☐
93	**POULIN DR.**			
	5/23/2005	Favereau LR Septic	1000	☐
200	**PROSPECT ST**			
	6/27/2005	Favereau LR Septic	1000	☐
29	**PUBLIC RD.**			
	9/15/2005	Favereau LR Septic	1500	☐
54	**REDSTONE HILL RD.**			
	7/6/2004	Favereau LR Septic	1000	☐
9	**RIGBY RD.**			

		9/9/2005	Favereau LR Septic	1500	☐
33	**RIGBY RD.**				
		6/20/2005	Favereau LR Septic	1000 CESSPOOL	☐
51	**RIGBY RD.**				
		1/9/2006	Favereau LR Septic	800 CESSPOOL	☐
55	**RIGBY RD.**				
		3/31/2005	Favereau LR Septic	1500	☐
64	**RIGBY RD.**				
		5/9/2005	CSI : Culley's Septic Service	1000	☐
0	**ROUTE 2, WESTBOUND**				
		2/23/2004	Raggs Septic Service	1800 JOHNNY APPLESEED VISITOR CENTER	☐
		4/12/2004	Raggs Septic Service	1300 JOHNNY APPLESEED VISITOR CENTER	☐
		5/20/2004	Raggs Septic Service	1800 JOHNNY APPLESEED VISITOR CENTER	☐
		7/1/2004	Raggs Septic Service	2000 JOHNNY APPLESEED VISITOR CENTER	☐
		8/12/2004	Raggs Septic Service	1600 JOHNNY APPLESEED VISITOR CENTER	☐
		9/27/2004	Raggs Septic Service	1700 JOHNNY APPLESEED VISITOR CENTER	☐
		11/2/2004	Raggs Septic Service	1500 JOHNNY APPLESEED VISITOR CENTER	☐
		12/7/2004	Raggs Septic Service	2600 JOHNNY APPLESEED VISITOR CENTER	☐
		2/23/2005	Raggs Septic Service	1800 JOHNNY APPLESEED VISTORS CTR.	☐
		4/25/2005	Raggs Septic Service	1800 JOHNNY APPLESEED VISITOR CENTER	☐
		6/1/2005	Raggs Septic Service	1100 JOHNNY APPLESEED	☐
		7/26/2005	Raggs Septic Service	2100	☐
		9/9/2005	Raggs Septic Service	1800	☐
		9/30/2005	Raggs Septic Service	700	☐
		11/21/2005	Raggs Septic Service	1800 JOHNNY APPLESEED	☐
		1/10/2006	Raggs Septic Service	2800 JOHNNY APPLESEED VISITOR CTR.	☐
11	**SCHUMACHER RD.**				
		10/18/2005	CSI : Culley's Septic Service	1500	☐
141	**SCHUMACHER RD.**				
		5/24/2004	Raggs Septic Service	1000	☐
141	**SEVEN BRIDGE RD.**				
		1/21/2004	Culley R.L. Septic Service	500	☐
190	**SEVEN BRIDGE RD.**				
		7/19/2005	Favereau LR Septic	800	☐
206	**SEVEN BRIDGE RD.**				
		12/20/2005	Culley Excavation	2000	☐
230	**SEVEN BRIDGE RD.**				
		12/5/2003	Favereau LR Septic	1000 CESSPOOL	☐
250	**SEVEN BRIDGE RD.**				

	3/26/2004	Culley R.L. Septic Service	1000		☐
1 SHASTA DR.					
	12/20/2005	Culley Excavation	2000		☐
4 SHASTA DR.					
	7/19/2005	Favereau LR Septic	1000		☐
26 SHIRLEY RD.					
	1/19/2005	American Rooter Inc	1000		☐
27 SHIRLEY RD.					
	9/9/2005	CSI : Culley's Septic Service	1000		☐
75 SHIRLEY RD.					
	11/15/2005	Steve Lynde Sewer	1250		☐
130 SHIRLEY RD.					
	12/5/2003	Favereau LR Septic	500	CESSPOOL	☐
	4/19/2005	Favereau LR Septic	500	CESSPOOL	☐
140 SHIRLEY RD.					
	10/25/2003	Culley R.L. Septic Service	1000		☐
	11/4/2005	Culley Excavation	1000		☐
157 SHIRLEY RD.					
	10/15/2004	Favereau LR Septic	1000	CESSPOOL	☐
171 SHIRLEY RD.					
	6/15/2005	Sheldon Farm	500		☐
1705 SHIRLEY RD.					
	5/30/2006	American Rooter Inc	1500		☐
1722 SHIRLEY RD.					
	6/2/2005	Favereau LR Septic	1000		☐
1754 SHIRLEY RD.					
	9/30/2004	Arrow Septic Drain Service	1000		☐
1771 SHIRLEY RD.					
	11/30/2005	R.M. Ratta Corp.	1000		☐
1789 SHIRLEY RD.					
	6/2/2004	American Rooter Inc	1500		☐
1813 SHIRLEY RD.					
	10/20/2005	CSI : Culley's Septic Service	1000		☐
1822 SHIRLEY RD.					
	10/5/2004	Bill's Sewer Service Inc.	1000		☐
1842 SHIRLEY RD.					
	3/19/2004	Favereau LR Septic	1000		☐
	11/9/2005	Favereau LR Septic	1000		☐

1857	**SHIRLEY RD.**					
		5/21/2004	American Rooter Inc	1000		☐
		5/20/2005	American Rooter Inc	1000		☐
1858	**SHIRLEY RD.**					
		4/22/2005	American Rooter Inc	2150	LEACH PIT / OLD	☐
1871	**SHIRLEY RD.**					
		5/13/2004	American Rooter Inc	1000		☐
1883	**SHIRLEY RD.**					
		11/8/2004	R.M. Ratta Corp.	1000		☐
1930	**SHIRLEY RD.**					
		8/13/2004	Forrest Hill Septic Service Inc.	1000		☐
23	**SILVER ST.**					
		10/10/2004	Favereau LR Septic	1000		☐
24	**SILVER ST.**					
		4/22/2004	Favereau LR Septic	1000		☐
41	**SILVER ST.**					
		12/19/2003	Favereau LR Septic	1500		☐
51	**SILVER ST.**					
		12/18/2003	Favereau LR Septic	1000		☐
56	**SILVER ST.**					
		10/7/2003	Culley R.L. Septic Service	1000		☐
		5/23/2005	CSI : Culley's Septic Service	1000		☐
		6/25/2005	CSI : Culley's Septic Service	1000		☐
	SOUTH MEADOW RD.					
		12/19/2004	Favereau LR Septic	1000		☐
11	**SOUTH MEADOW RD.**					
		5/21/2004	Favereau LR Septic	1500	cesspool	☐
59	**SOUTH MEADOW RD.**					
		7/7/2004	American Rooter Inc	1000		☐
80	**SOUTH MEADOW RD.**					
		10/5/2005	CSI : Culley's Septic Service	1000		☐
83	**SOUTH MEADOW RD.**					
		1/25/2006	Favereau LR Septic	1500		☐
90	**SOUTH MEADOW RD.**					
		6/11/2004	Favereau LR Septic	1000		☐
194	**SOUTH MEADOW RD.**					
		6/2/2004	Culley R.L. Septic Service	200		☐
267	**SOUTH MEADOW RD.**					

	8/9/2005	Favereau LR Septic	1000	☐
317 SOUTH MEADOW RD.				
	1/24/2006	American Rooter Inc	1300	☐
	1/27/2006	American Rooter Inc	1000	☐
388 SOUTH MEADOW RD.				
	11/10/2005	Favereau LR Septic	1000	☐
389 SOUTH MEADOW RD.				
	10/29/2005	Lakeside Sewerage Service Inc	1500	☐
400 SOUTH MEADOW RD.				
	12/29/2004	Favereau LR Septic	1000	☐
422 SOUTH MEADOW RD.				
	12/3/2003	Favereau LR Septic	1500	☐
423 SOUTH MEADOW RD.				
	4/6/2005	Culley R.L. Septic Service	1500	☐
436 SOUTH MEADOW RD.				
	8/26/2004	Favereau LR Septic	1000	☐
445 SOUTH MEADOW RD.				
	5/23/2005	Favereau LR Septic	1500	☐
514 SOUTH MEADOW RD.				
	11/2/2004	Favereau LR Septic	1000	☐
	11/15/2005	Favereau LR Septic	1000	☐
526 SOUTH MEADOW RD.				
	8/22/2005	Favereau LR Septic	1000	☐
558 SOUTH MEADOW RD.				
	3/26/2004	Favereau LR Septic	1000	☐
566 SOUTH MEADOW RD.				
	10/7/2004	Favereau LR Septic	1000	☐
585 SOUTH MEADOW RD.				
	10/5/2005	Favereau LR Septic	1000	☐
597 SOUTH MEADOW RD.				
	8/20/2004	Favereau LR Septic	1000	☐
	12/30/2005	Favereau LR Septic	1000	☐
617 SOUTH MEADOW RD.				
	10/28/2005	CSI : Culley's Septic Service	1000	☐
630 SOUTH MEADOW RD.				
	5/26/2004	Culley R.L. Septic Service	1000	☐
	5/4/2005	Bancroft Silva Septic	1500	☐
643 SOUTH MEADOW RD.				

		8/20/2004	Favereau LR Septic	1000		☐
		8/23/2005	Favereau LR Septic	1000		☐
10	**SOUTH SHAKER ROAD.**					
		1/1/2005	Bancroft Silva Septic	900	NEBS	☐
43	**SPEC POND AVE.**					
		7/29/2004	S. Penniman Sewer Service	1000		☐
59	**SPEC POND AVE.**					
		9/15/2004	American Rooter Inc	550		☐
80	**SPEC POND AVE.**					
		9/17/2004	American Rooter Inc	500		☐
50	**STAGECOACH RD.**					
		4/5/2004	American Rooter Inc	2500	TANK AND PUMP CHAMBER/EMERGENCY	☐
		1/2/2005	American Rooter Inc	2000		☐
		12/27/2005	American Rooter Inc	2300		☐
76	**STAGECOACH RD.**					
		2/11/2004	American Rooter Inc	1500		☐
		8/22/2005	American Rooter Inc	1500		☐
87	**STAGECOACH RD.**					
		5/24/2004	American Rooter Inc	1000		☐
116	**STAGECOACH RD.**					
		10/3/2005	Favereau LR Septic	1500		☐
123	**STAGECOACH RD.**					
		4/20/2004	American Rooter Inc	1250		☐
0	**STERLING RD.**					
		5/4/2004	ESI Septic Service	3000		☐
		11/21/2005	Favereau LR Septic	1500		☐
8	**STERLING RD.**					
		11/8/2004	Favereau LR Septic	2500	cesspool	☐
121	**STERLING RD.**					
		12/12/2003	Culley R.L. Septic Service	2000		☐
164	**STERLING RD.**					
		12/12/2004	Culley R.L. Septic Service	1000		☐
289	**STERLING RD.**					
		5/12/2005	CSI : Culley's Septic Service	1000		☐
338	**STERLING RD.**					
		8/3/2004	Culley R.L. Septic Service	500	CESSPOOL/SEWER FOR KILBOURN	☐
		7/17/2005	Favereau LR Septic	1000	CESSPOOL	☐
		10/3/2005	Favereau LR Septic	1000	CESSPOOL	☐

458	**STERLING RD.**				
		2/7/2006	Favereau LR Septic	3000	Cesspool
499	**STERLING RD.**				
		1/1/2005	ESI Septic Service	1000	
546	**STERLING RD.**				
		8/3/2004	Culley R.L. Septic Service	500	CESSPOOL/SEWER FOR KILBOURN
637	**STERLING RD.**				
		4/19/2004	Favereau LR Septic	1000	
675	**STERLING RD.**				
		7/1/2004	Lakeside Sewerage Service Inc	1000	
		9/2/2005	Lakeside Sewerage Service Inc	1000	
691	**STERLING RD.**				
		4/26/2004	Culley R.L. Septic Service	1000	
		5/19/2005	Favereau LR Septic	1000	
767	**STERLING RD.**				
		6/4/2004	ESI Septic Service	3000	Monroe Wire & Cable
		9/21/2005	ESI Septic Service	3000	
807	**STERLING RD.**				
		12/13/2005	CSI : Culley's Septic Service	1000	
835	**STERLING RD.**				
		3/5/2004	Favereau LR Septic	1000	
840	**STERLING RD.**				
		2/14/2006	CSI : Culley's Septic Service	1250	
851	**STERLING RD.**				
		12/13/2005	CSI : Culley's Septic Service	1500	
8	**STERLING ST.**				
		7/3/2004	Culley R.L. Septic Service	1000	
14	**STERLING ST.**				
		7/27/2005	Casaceli Trucking Inc.	1500	
31	**STERLING ST.**				
		3/22/2004	Favereau LR Septic	1500	
36	**STERLING ST.**				
		6/2/2004	Favereau LR Septic	1500	
37	**STERLING ST.**				
		8/26/2005	Favereau LR Septic	1500	
97	**STERLING ST.**				
		8/30/2004	Casaceli Trucking Inc.	1500	
121	**STERLING ST.**				

		1/8/2004	Culley R.L. Septic Service	1500	☐
		2/11/2004	Culley R.L. Septic Service	1500	☐
268	**STERLING ST.**				
		5/7/2004	Favereau LR Septic	1000	☐
338	**STERLING ST.**				
		12/8/2005	Favereau LR Septic	1000	☐
387	**STERLING ST.**				
		12/1/2003	Favereau LR Septic	1000	☐
414	**STERLING ST.**				
		6/2/2005	Favereau LR Septic	1000 CESSPOOL	☐
458	**STERLING ST.**				
		12/12/2003	Favereau LR Septic	2000 CESSPOOL	☐
640	**STERLING ST.**				
		2/23/2006	CSI : Culley's Septic Service	3000	☐
710	**STERLING ST.**				
		8/7/2004	Favereau LR Septic	1000	☐
59	**SYLVAN LANE**				
		8/20/2004	Favereau LR Septic	500 SEWER TIE-IN	☐
7	**SYLVAN RD.**				
		4/7/2003	Favereau LR Septic	1000	☐
59	**SYLVAN RD.**				
		5/20/2004	Favereau LR Septic	500 cesspool	☐
4	**TURNER LANE**				
		3/11/2004	Favereau LR Septic	1500	☐
		2/28/2005	Favereau LR Septic	500 CESSPOOL	☐
		2/28/2005	Favereau LR Septic	500	☐
6	**TURNER LANE**				
		4/11/2005	American Rooter Inc	1500	☐
36	**VINCENT AVE.**				
		12/26/2004	Favereau LR Septic	1500	☐
56	**VINCENT AVE.**				
		1/13/2004	Favereau LR Septic	500	☐
2731	**WEST MAIN STREET**				
		4/29/2005	Favereau LR Septic	1000	☐
120	**WHITCOMB DR.**				
		10/31/2003	Culley R.L. Septic Service	500	☐
250	**WHITE POND RD.**				
		9/3/2004	American Rooter Inc	1500	☐

385	**WHITE POND RD.**				
		11/4/2004	American Rooter Inc	1000	☐
424	**WHITE POND RD.**				
		6/8/2004	American Rooter Inc	1500	☐
463	**WHITE POND RD.**				
		3/13/2006	American Rooter Inc	1000	☐
470	**WHITE POND RD.**				
		10/26/2004	American Rooter Inc	1500	☐
503	**WHITE POND RD.**				
		6/2/2005	Bancroft Silva Septic	1500	☐
517	**WHITE POND RD.**				
		6/2/2005	Bancroft Silva Septic	1500	☐
84	**WHITE TAIL LANE**				
		11/11/2005	CSI : Culley's Septic Service	1500	☐
140	**WHITE TAIL LANE**				
		4/21/2005	Favereau LR Septic	1500	☐
9	**WHITETAIL WAY**				
		3/20/2006	Favereau LR Septic	1000	☐
84	**WHITETAIL WAY**				
		11/11/2005	CSI : Culley's Septic Service	1500	☐
0	**WINSOR RD.**				
		8/5/2005	Favereau LR Septic	1000 PARRISH	☐
23	**WINSOR RD.**				
		3/10/2004	Favereau LR Septic	1000	☐
		4/26/2005	Favereau LR Septic	1000	☐
34	**WINSOR RD.**				
		2/27/2004	Favereau LR Septic	1000	☐
		8/1/2005	Favereau LR Septic	1000	☐
72	**WINSOR RD.**				
		12/16/2004	Favereau LR Septic	1000	☐
		11/9/2005	Favereau LR Septic	1000	☐
75	**WINSOR RD.**				
		12/3/2003	Favereau LR Septic	1000	☐
		12/17/2004	Favereau LR Septic	1000	☐
		3/20/2006	Favereau LR Septic	1000	☐
19	**WOODLAND MEADOW DR.**				
		4/19/2005	Favereau LR Septic	1500	☐
43	**WOODLAND MEADOW DR.**				

	7/6/2004	Culley R.L. Septic Service	1000	☐
61 WOODLAND MEADOW DR.				
	11/4/2005	Culley Excavation	1000	☐
	11/4/2005	Culley Excavation	1000	☐

Appendix D

S.J. Mullaney - N. Lancaster Development District

DPW

S. J. MULLANEY ENGINEERING, INC.
CIVIL SITE DESIGN & PERMITTING

August 5, 2005

Lancaster Board of Selectmen
Town Hall; 695 Main Street
P.O. Box 293
Lancaster, MA 01523-0293

Re: North Lancaster Development District Special Town Meeting Warrant Article

Dear Members of the Board of Selectmen:

On November 12, 2004, on behalf of my clients, Mr. Dan Chisholm of Mountain Laurel Realty Company, Mr. Steve Boucher of Central Mass. Sand and Gravel, LLC, and Mr. Stephen Harper of Harper Brothers Tree Farm, I circulated to your Board and to other town offices and boards plan 8-D-1 and an accompanying letter, that describe a proposed North Lancaster Development District. As noted on the plan, the first step in establishing a Development District entails a Town Meeting vote to designate the land to be included in the district. My clients respectfully request that the October 24, 2005 Special Town Meeting warrant include the following proposed article:

"To see if the Town will vote to designate as a Development District, pursuant to M.G.L. Chapter 40, Section Q, the following described area:

Beginning at the Lancaster, Leominster, Lunenburg corner,

Then proceeding southerly along the Leominster city line to the North Nashua River,

Then proceeding easterly along the North Nashua River to Spectacle Brook,

Then proceeding northerly along Spectacle Brook to the New England Power Co. easement,

Then proceeding easterly along the New England Power Co. easement to Old Union Turnpike,

Then proceeding easterly along Old Union Turnpike to Shirley Road,

Then proceeding northerly along Shirley Road to Route 2,

Then proceeding easterly along Route 2 to Shaker Road,

Then proceeding northerly along Shaker Road to the Shirley town line,

Then proceeding westerly along the Shirley town line to the Lancaster, Lunenburg, Shirley corner,

Then proceeding westerly along the Lunenburg town line to the point of beginning,

or act in any manner relating thereto."

Following favorable Town Meeting action, the Massachusetts Economic Assistance Coordinating Council (EACC) must approve the Development District. Submittal materials include plans showing the roadways and zoning

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information for the proposed district along with associated property values of each parcel. Plan 8-D-1 depicts the proposed district, existing underlying zoning districts, property parcels and roadways.

Enclosed herewith please find a report entitled, "North Lancaster Development District – Wastewater and Tax Revenue Projections," dated June 28, 2005. The report and its accompanying plan 8-D-2 analyze existing conditions and full build-out projections for each of the 551 properties in the proposed Development District. They are the culmination of the research efforts described in the closing paragraphs of my November 10, 2004 letter.

In addition to entertaining the requested warrant article, my clients ask that you schedule an informational session to discuss this matter with us during an upcoming Wednesday working meeting of the Board, when all selectmen can attend. We will ask MassDevelopment officials who have been providing us guidance in this endeavor to attend the working meeting as well.

Thank you for your consideration in this matter.

Very truly yours,
S. J. MULLANEY ENGINEERING, INC.

Stephen J. Mullaney

Stephen J. Mullaney, P.E.
President

Cc: Mike Mitchell, Assistant Vice President, Planning & Development, MassDevelopment
Jack Sonia, Lancaster Superintendent of Public Works
Bruce Hamblin, Lancaster Planning Director
Dan Chisholm, Mountain Laurel Realty Company
Steve Boucher, Central Mass. Sand and Gravel, LLC
Stephen Harper, Harper Brothers Tree Farm

S. J. MULLANEY ENGINEERING, INC.

CIVIL SITE DESIGN & PERMITTING

June 28, 2005

NORTH LANCASTER DEVELOPMENT DISTRICT
Wastewater and Tax Revenue Projections

EXECUTIVE SUMMARY:

Data was gathered to estimate projected wastewater flows for the potential full build-out of the 4000-acre tract presently proposed to comprise the North Lancaster Development District (NLDD). The potential new district includes 551 properties. The potential assessable area (excluding the areas of roadways and ponds) totals 3487.61 acres or 87.2% of the total NLDD area. Since the NLDD consists of both residential and nonresidential properties, a sewer flow rate (ratio) was determined that could be applied to both types of properties. A flow ratio expressed in terms of bedrooms per assessable acre was utilized to estimate wastewater flows for residential and nonresidential properties. Flows from non-residential properties were converted into equivalent bedrooms per assessable acre. The flows from developed residential and nonresidential properties were compiled and were determined to have an average flow ratio of two (2) bedrooms per assessable acre. The flow ratio was applied to the undeveloped residential and nonresidential properties. The wastewater flows for the potential full build-out of the all the properties in the NLDD is estimated to be 697,730 gallons per day (GPD).

The NLDD boundaries are anticipated to be refined based available capacities of existing and future wastewater treatment facilities. Including only 42.5% of the equivalent bedrooms within the residential properties would offset the education costs associated with the residentially zoned areas. Further reduction of residential properties included in the district would be needed to balance other municipal costs and the costs of infrastructure improvements. The refined NLDD is anticipated to favor nonresidential properties and properties with failing sewage disposal systems.

Plan 8-D-2 depicts the number of bedroom equivalents per assessors map and parcel under full build out. The potential sewer flow for each property is determined by multiplying the number of bedrooms by 110 GPD. The plan is intended as a tool in helping to define the boundaries of the NLDD.

INTRODUCTION:

NLDD TOTAL AREA		
USE	TOTAL AREA (AC)	PERCENT OF TOTAL AREA (%)
RESIDENTIAL	1,792.61	44.8
NON-RESIDENTIAL	1,695.00	42.4
PONDS: (FORT, SPECTACLE, WHITE, LITTLE SPECTACLE, TURNER & OAK HILL)	220.5	5.5
ROADWAYS	291.89	7.3
TOTAL	4,000	100

Mr. Stephen Harper and Mr. Steve Boucher, and Mr. William Daniel "Dan" Chisholm, owners of several large tracts of land in north Lancaster, have been investigating the feasibility of establishing a development district. The district's purposes would include providing community sanitary sewer service. The proponents' properties and the surrounding area are currently served by private on-site sewage disposal systems and wells which may affect the development potential of the area. On behalf of the proponents, this office gathered data to estimate future

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wastewater flows for the potential full build-out of a 4000-acre tract presently proposed to comprise the North Lancaster Development District (NLDD). Our plan entitled, "Plan of Projected Wastewater Flows in Lancaster, Massachusetts, Generated from Proposed 'North Lancaster Development District'," plan number 8-D-2, dated June 1, 2005, maps the study results. The NLDD contains land zoned residential, land zoned non-residential (including Light Industry, Limited Office and Highway Business), ponds, local roads and state roads. The chart above summarizes area and area percentages based on assessors records and maps.

Based on current assessment records the NLDD contains 551 existing properties, developed and undeveloped. The data obtained from assessment records includes: property owner name, address, map & parcel, deed book & page, use code, number of bedrooms, non-residential building area, assessed value and current tax. Additional data on sewage disposal system flows for non-residential properties was obtained from previously prepared projects located within the NLDD, including properties owned by Dan Chisholm, Stephen Harper and Steve Boucher (see Appendix G, chart entitled Non-residential Flow Estimates – Existing and Proposed Uses in the NLDD). Water usage records were available for only one of the properties in the NLDD since the remaining properties are served by on-site wells. The NLDD also includes potential properties currently located within Devens that have been previously identified as desirable for development should they become available. The potential assessable area, excluding the areas of roadways and ponds, totals 3487.61 acres or 87.2% of the total NLDD area.

The estimated sewer flows calculated will be utilized to further refine the NLDD boundaries. Available capacities of existing and future wastewater treatment facilities (WWTF) will limit the properties included. The proponents seek to discharge a portion of the sewer flows to the Devens Wastewater Treatment Plant via the Town of Shirley sewer system, through property owned by Dan Chisholm. The remaining sewer flows are proposed to be treated utilizing a small WWTF to be located on property owned by Stephen Harper and Steve Boucher. As presently defined, the NLDD would provide a mix of residential and nonresidential wastewater flows which would optimize the efficiency of a small WWTP, provide sewage disposal relief to densely developed areas by the ponds and balance the tax revenue/cost of future development for the Town. Refining of the NLDD boundary is anticipated to favor areas with failing sewage disposal systems and nonresidential zoned properties.

ANALYSIS OF DATA (Appendix A):

The assessment information was sorted by assessors map and parcel (see appendix A). Then the data was divided into two main categories, residential use and non-residential use. The two categories of residential and non-residential were each further divided into two subcategories, developed and undeveloped. The non-residential properties were not further divided into the Zoning classifications of Light Industry, Limited Office and Highway Business for simplicity. The assessors use code, assessment value and first-hand knowledge of properties within the NLDD were used in determining whether a property was developed.

To estimate the potential wastewater flows from the potential full build-out of the various properties in the NLDD, we determined that the number of bedrooms per property would be the simplest common unit to estimate wastewater flow. The number of bedrooms is a value easily identifiable that can be converted into gallons per day. The Department of Environmental Protections (DEP) Technical Guidance for Review of Sewer Connection/ Extension Permit Applications manual (hereafter referred to as DEP Technical Guidance) identifies the design sewage flow of a bedroom to be 110 gallons per day (gpd) which is assumed to be a peak design flow value. Since the assessors records do not list the number of bedrooms for all of the developed residential properties, the developed residential property subcategory was further divided into two categories, residential developed and residential estimated developed. The ratio of existing bedrooms per acre was used to determine the equivalent number of bedrooms on the undeveloped properties. Flows from non-residential properties were converted into bedroom equivalents from known sewage disposal system designs. The following five categories (appendices) were created from the assessors records in Appendix A based on the use and development of each parcel:

1. NLDD Residential Developed (Appendix B1 & B2).

2. NLDD Residential Estimated Developed (Appendix C).
3. NLDD Residential Undeveloped (Appendix D).
4. NLDD Non-Residential Developed (Appendix E).
5. NLDD Non-Residential Undeveloped (Appendix F).

1. NLDD Residential Developed: (Appendix B1 & B2)

Analysis of the developed residential areas resulted in identifying two bedrooms per acre as an appropriate ratio to apply to the undeveloped residential areas. Determining the ratio was trial and error based on the data sample analyzed. This category contains 283 properties, 502.28 acres and 773 bedrooms. The average number of total bedrooms per total acre for this sample is 1.54. This value is low compared with the rate of two bedrooms per acre that results from applying the current zoning which requires a minimum of 2 acres per lot, and applying the typical house size of four-bedrooms (or 2 bedrooms per ac). A higher bedroom per acre density than the calculated sample average is more representative as several cottages around the ponds have been converted into year round residences on lots smaller than allowed by current zoning. The total area of NLDD Residential Developed also includes several larger properties which are under developed. To develop a more accurate ratio, using statistical methods, a smaller sample size of 246 properties was chosen, containing properties with less than four (4) acres. Less than four (4) acre cut off was chosen because the current Zoning By-laws would not allow further by-right property division of these properties. Including lots with area up to four (4) acres also offsets the 182 substandard lots containing less than two (2) acres. The smaller sample set results in an average of 2.18 bedrooms per average acre (see appendix B-2, the shaded properties). This statistical result of approximately two bedrooms per acre correlates with the current Zoning. This ratio of 2 bedrooms per acre was then applied to the undeveloped residential areas.

The potential of existing residential developed properties adding bedrooms was also analyzed. Such properties in the NLDD are presently served by on-site sewage disposal systems and on-site wells which currently limit the number of potential bedrooms per acre. It is possible that existing properties would increase the numbers of bedrooms should public sewer service become available. The assumption applied was that each existing home would be increased in size to four (4) bedrooms on average. Accordingly, each existing residential lot with less than four (4) bedrooms was increased to four bedrooms. Developed residential lots with an area greater than four (4) acres, with the potential to be subdivided, were assumed to contribute an additional four (4) bedrooms per potential two (2) acre lot. A total of 1,118 existing and potential bedrooms are tabulated for this category (see Appendix B-1).

2. NLDD Residential Estimated Developed: (Appendix C)

This category contains 110 properties totaling 144.63 acres. These residential properties were known to be developed from assessment use code and assessed values; however, the assessment records did not indicate the number of bedrooms. The existing number of bedrooms was estimated based on similarly assessed and sized abutting properties. The potential of these properties adding additional bedrooms was analyzed using the same criteria as the properties for which the number of bedrooms was known (see Appendix C). A total of 498 existing and potential bedrooms are tabulated for this category (see Appendix C).

3. NLDD Residential Undeveloped: (Appendix D)

This category consists of 102 properties totaling 1,145.70 acres. The ratio of 2 bedrooms per acre (or four (4) bedrooms per two (2) acres) determined in Appendix B-2 for developed residential areas was applied to the undeveloped residentially zoned properties. [redacted] Lancaster Assessors maps depict approximate wetland areas. The wetland areas were measured and 90% of the wetland areas were removed from the total area before determining the number of potential 2 acre lots (see Potential #Res. Lots from Area Column in Appendix D). Each potential lot was multiplied by the ratio of 4 bedrooms per lot and summed to determine the total number of potential bedrooms. Not all properties were deemed developable,

including; properties with area less than 5,000 square feet, properties owned by the Lancaster Conservation Commission, properties within riverfront areas and properties within wetland areas. A total of 1,952 potential bedrooms are tabulated for this category (see Appendix D).

4. NLDD Non-Residential Developed: (Appendix E)

This category contains 10 properties and 494.04 acres. A ratio of flow of 2 bedrooms per acre was determined for the nonresidential properties. Sewer flows from developed nonresidential properties were converted from gallons per day (GPD) into equivalent number of bedrooms for consistency with the residential properties. To first determine the flow rate, the GPD for each property was determined from sewage disposal designs, water usage records or by calculating the sewer flow based on the size of the building per DEP's Technical Guidance manual. The resulting total equivalent bedrooms (205) per total acre for this sample equals 0.4 equivalent bedrooms per total acre (see Appendix E). However, this ratio of flow is low since many of the developed properties are on large under developed parcels and include wetland areas.

Next, to determine a more realistic flow ratio, we analyzed the 10 developed nonresidential properties together with 5 undeveloped nonresidential properties for which the flows were known (based on sewage disposal designs or water meter readings). The flows were then divided by the total area. The total area used for the larger properties was limited to the area they are currently utilizing. The ratio equaled 205.3 GPD per acre or 1.87 equivalent bedrooms per acre (see Appendix G). This flow to area ratio is similar to the 2 bedrooms per acre ratio applied to residentially zoned property. Sewer flows from the nonresidential properties were calculated based on the same ratio for simplicity and consistency. The potential number of residential lots for each nonresidential property was determined. Based on the number of possible lots, the potential additional flows from under utilized areas were determined as they were for the undeveloped residential areas by removing 90% of wetland area from the total area and determining the number of potential lots. The existing flow for each property was added to the potential flow in terms of total number of equivalent bedrooms. Properties with flows greater than 2 bedrooms per acre did not receive additional flows. A total of 983 existing and potential equivalent bedrooms are tabulated for this category (see Appendix E).

5. NLDD Non-Residential Undeveloped: (Appendix F)

This category contains 46 properties and 1200.96 acres. The ratio of 2 bedrooms per acre determined for developed nonresidential areas was applied to the undeveloped nonresidential areas. The required minimum 2 acre residential lot with 90% non wetland area was used for the nonresidential properties also. The wetland areas were measured and 90% of the wetland areas were removed from the total area before determining the number of potential 2 acre lots (see estimated equivalent #Res. Lots Column in Appendix F). Each equivalent lot was multiplied by the ratio of 4 bedrooms per lot and summed to determine the total number of equivalent bedrooms. Not all properties were deemed developable, including properties within riverfront areas and properties within wetland areas. Five (5) of the 46 properties totaling 189.29 acres are located within an existing rock quarry and were also assumed to remain undeveloped. A total of 1792 potential equivalent bedrooms are tabulated for this category (see Appendix F).

SUMMARY CHARTS:

The following charts summarize the total residential and nonresidential developments by compiling data tabulated in Appendices A, B, C, D, E and F. Total sewer flows are summarized in terms of bedrooms and GPD. Assessment values listed include current assessment (developed and undeveloped), projected values and total projected assessment values. Assessment values are also expressed in terms of value per acre for developed, undeveloped acre, projected increase per acre and total value per acre.

CHART 1: TOTAL BEDROOM EQUIVALENT OF ASSESSABLE AREA				
	TOTAL ASSESSABLE AREA (AC)	EXISTING BEDROOM EQUIVALENT	ADDITIONAL POTENTIAL BEDROOM EQUIV.	TOTAL POTENTIAL BEDROOM EQUIVALENT
RESIDENTIAL	1792.61	1,124	2,444	3,568
NON-RESIDENTIAL	1695.00	205	2,570	2,775
TOTAL	3487.61	1,329	5,014	6,343

Chart 1 summarizes the total projected bedroom equivalents for both residential and non residential properties for the NLDD assessable area. The total assessable area excludes the area of roads and ponds.

CHART 2: TOTAL GALLONS PER DAY OF ASSESSABLE AREA				
	TOTAL ASSESSABLE AREA (AC)	EXISTING GALLONS PER DAY	ADDITIONAL PROJECTED GALLONS PER DAY	TOTAL GALLONS PER DAY
RESIDENTIAL	1792.61	123,640	268,840	392,480
NON-RESIDENTIAL	1695.00	22,550	282,700	305,250
TOTAL	3487.61	146,190	551,540	697,730

Chart 2 is Chart 1 expressed in GPD versus bedrooms (110 GPD per bedroom).

CHART 3: TOTAL DEVELOPED VALUE PER TOTAL ASSESSABLE AREA					
	TOTAL ASSESSABLE AREA (AC)	DEVELOPED AREA (AC)	DEVELOPED ASSESSED VALUE	DEVELOPED VALUE PER DEV'D ACRE	DEVELOPED VALUE PER TOTAL ACRE
RESIDENTIAL	1792.61	646.91	$117,434,200	$181,531	$65,510.18
NON-RESIDENTIAL	1695.00	494.04	$23,967,400	$48,513	$14,140.06
TOTAL	3487.61	1,140.95	$141,401,600	$123,933	$40,543.98

Chart 3 summarizes the NLDD developed residential and non-residential properties current assessed value, their current developed value per developed acre and current developed value per total acre. See Appendices B1 and C for residential properties. See Appendix E for non-residential properties.

CHART 4: TOTAL UNDEVELOPED VALUE PER TOTAL ASSESSABLE AREA					
	TOTAL ASSESSABLE AREA (AC)	UNDEVELOPED AREA (AC)	UNDEVELOPED ASSESSED VALUE	UNDEV'D VALUE PER UNDEV'D ACRE	UNDEV'D VALUE PER TOTAL AC
RESIDENTIAL	1792.61	1,145.70	$95,311,500	$83,191	$53,169.12
NON-RESIDENTIAL	1695.00	1,200.96	$7,785,500	$6,483	$4,593.22
TOTAL	3487.61	2,346.66	$103,097,000	$43,934	$29,560.93

Chart 4 summarizes the NLDD undeveloped residential and non-residential properties current assessed value, their current undeveloped value per undeveloped acre and current undeveloped value per total acre. See Appendix D for residential properties. See Appendix F for non-residential properties.

CHART 5: VALUE OF CURRENT ASSESSABLE AREA					
	TOTAL ASSESSABLE AREA (AC)		TOTAL ASSESSED VALUE		TOTAL VALUE PER TOTAL AC
RESIDENTIAL	1792.61		$212,745,700		$118,679.30
NON-RESIDENTIAL	1695.00		$31,752,900		$18,733.27
TOTAL	3487.61		$244,498,600		$70,104.91

Chart 5 summaries the total assessable area, the current assessed value and the current value per total acre.

CHART 6: PROJECTED VALUE INCREASE FOR UNDEVELOPED AREA					
	TOTAL ASSESSABLE AREA (AC)	UNDEVELOPED AREA (AC)	TOTAL PROJECTED VALUE INCREASE	NET VALUE INCREASE PER UNDEV'D AC	TOTAL PROJECTED VALUE PER TOTAL AC
RESIDENTIAL	1792.61	1,145.70	$112,668,533	$98,340	$62,851.67
NON-RESIDENTIAL	1695.00	1,200.96	$50,476,764	$42,030	$29,779.80
TOTAL	3487.61	2,346.66	$163,145,296	$69,522	$46,778.54

Chart 6 summaries the total projected assessment value increase for the undeveloped residential and nonresidential properties per undeveloped acre and total projected value increase per total acre. The Net Value Increase per Undeveloped Acre was determined by subtracting the Undeveloped Value per Acre (in Chart 4) from the Developed Value per Acre (in Chart 3). The Net Value Increase per Acre Undeveloped Acre was then multiplied by the undeveloped area to determine the Total Projected Value.

CHART 7: PROJECTED TOTAL VALUE FOR ASSESSABLE AREA					
	TOTAL ASSESSABLE AREA (AC)		TOTAL PROJECTED VALUE		TOTAL VALUE PER TOTAL AC
RESIDENTIAL	1792.61		$325,414,233		$181,530.97
NON-RESIDENTIAL	1695.00		$82,229,664		$48,513.08
TOTAL	3487.61		$407,643,896		$116,883.45

Chart 7 summaries the total projected value and total projected value per total acre for the residential and non residential properties for the NLDD assessable area. Total Projected Value is a sum of the current assessment values (Chart 5) and of the Projected Value Increase (Chart 6).

CHART 8: NLDD PROJECTED TAX REVENUE					
	CURRENT ASSESSED VALUE	CURRENT TAX ($14.16/ $1,000)	TOTAL PROJECTED VALUE INCREASE	PROJECTED TAX REVENUE INCREASE ($14.16/$1,000)	TOTAL PROJECTED TAX REVENUE
RESIDENTIAL	$212,745,700	$3,012,479	$112,668,533	$1,595,386	$4,607,866
NON-RESIDENTIAL	$31,752,900	$449,621	$50,476,764	$714,751	$1,164,372
TOTAL	$244,498,600	$3,462,100	$163,145,296	$2,310,137	$5,772,238

Chart 8 summarizes the current tax value (see Chart 5), projected tax value (see chart 6) and determines the total projected tax revenue for all properties by applying the current tax rate of $14.16/$1,000 of assessed value.

CHART 9: NLDD EQUIVALENT NUMBER OF BEDROOMS PER ASSESSOR'S MAP					
ASSESSORS MAP	TOTAL RESIDENTINAL DEVELOPED	TOTAL RESIDENTINAL UNDEVELOPED	TOTAL NON-RESIDENTINAL DEVELOPED	TOTAL NON-RESIDENTINAL UNDEVELOPED	TOTAL BEDROOMS PER MAP
1	186	4	0	0	190
2	0	0	0	0	0
3	0	0	43	84	127
4	343	28	241	352	964
5	307	148	268	324	1047
6	0	400	0	0	400
8	188	292	0	0	480
9	193	84	308	204	789
10	395	404	0	0	799
11	0	0	0	0	0
13	0	532	0	44	576
14	0	60	123	784	967
15	0	0	0	0	0
18	0	0	0	0	0
19	4	0	0	0	4
TOTAL PER CATEGORY	1616	1952	983	1792	6343

This Chart summarizes the Total Equivalent Bedrooms per Assessors Map, which will assist in defining the final boundaries of the NLDD based on areas with the greatest flow potential.

PROJECTED TAX REVENUE:

Tax revenue from the NLDD was estimated based on current assessment records. The current tax revenue is $3,462,100 (residential and nonresidential). The projected total tax increase is estimated at $2,310,137 (residential and nonresidential). The total projected tax revenue is $5,772,238 (residential and nonresidential) (see Chart 8).

While residential properties are projected to generate higher tax revenue as compared with non-residential properties, residential properties create a greater tax burden. While all development increases demand on general municipal services, only residential development increases the demand on education.

The additional 2,444 bedrooms (see Chart 1) generated by full build-out of the residential areas are equivalent to 611 four-bedroom homes (assuming four bedrooms per home). The tax revenue would equal $2,611 per additional home ($1,595,386 / 611 equivalent homes).

The number of school age children generated by the 611 equivalent homes can be approximated from the existing population density per house and multiplying it by number of equivalent homes. The demographics for the Town of Lancaster provided by the Massachusetts Department of Housing and Community Development indicates the Town population was 7,380 in 2,000 (see Appendix H), of which 16.7% was between the ages of 5 and 18. The number of occupied housing units was 2,049. The resulting density ratio of school age children per household is approximately 0.601 (7,380 x 0.167 / 2,049). Appling this ratio to the 611 equivalent homes would generate [redacted] school age children (611 x 0.601).

The education cost can be determined by multiplying the number children by the cost to educate a child. In Appendix I, Massachusetts Department of Education, FY04 Preliminary per Pupil Expenditures has the Nashoba District listed as costing $8,895 per child (including special education). The additional 368 children would cost $3,273,360 (368 x $8,895 per child) or $5,357 per equivalent home ($3,273,360 / 611 equivalent homes). The $1,595,386 additional tax revenue generated (see Chart 8) by the 611 equivalent homes would cover only 48.7% of the education cost ($1,595,386 / $3,273,360), and none of the other municipal costs (e.g., administrative, Department of Public Works, Fire Department, Police Department, etc.). The additional $714,751 revenue from the nonresidential properties (see Chart 8) would not offset the education cost, but could cover 21.8% ($714,751 / $3,273,360) of that cost, while also not covering any of the other municipal costs. 29.5% of the education costs would remain from full build out of the all the residential properties in the NLDD (100% - 48.7% - 21.8%).

Decreasing the percentage of residential properties included in the NLDD would assist in balancing the cost of education associated with school age children from the equivalent homes. Disregarding other municipal costs, the education cost shortfall per home is $2,746 ($5,357 education cost per equivalent home - $2,611 tax revenue per equivalent home). The additional revenue from nonresidential development is $714,751, which would offset the revenue shortfall of 260 equivalent homes ($714,751 / $2,746 cost shortfall per home). Including only 260 additional or bedroom equivalent homes (or 42.5%) of the residential properties and all of the nonresidential properties would offset the education costs within the NLDD area. Further reduction in residential properties included in the district would be needed to balance other municipal costs and the costs of infrastructure improvements.

Summary of Potential Bedroom Equivalents for Steve Boucher and Stephen Harper per Category:

The following table summarizes the number of bedroom equivalents for properties owned by Steve Boucher and Stephen Harper for the five categories previously identified.

Category	Bedroom Equivalents	
1. NLDD Residential Developed (Appendix B1):	4	
3. NLDD Residential Undeveloped (Appendix D):	172	
4. NLDD Non-Residential Developed (Appendix E):	24	
5. NLDD Non-Residential Undeveloped (Appendix F):	368	
Boucher & Harper NLDD TOTAL:	568	(equal to 142 houses or 62,480 GPD.)

Summary of Potential Bedroom Equivalents for Dan Chisholm per Category:

The following summarize the number of bedroom equivalents for properties owned by Dan Chisholm for the five categories previously identified:

Category	Bedroom Equivalents	
1. NLDD Residential Developed (Appendix B1):	12	
2. NLDD Residential Estimated Developed (Appendix C):	16	
5. NLDD Non-Residential Undeveloped (Appendix F):	268	
W.D. Chisholm NLDD TOTAL:	296	(equal to 74 houses or 32,560 GPD).

Sewer Flow Allocation and Inclusion into the NLDD:

The NLDD is divided by Route 2 into two main areas. The area north of Route 2 has the potential of connecting to the existing Lower Shirley sewer system with the sewer lift station located along Laurel Circle. A sewer connection could be provided through properties owned by Dan Chisholm. The area south of Route 2 could connect to a small wastewater treatment facility (WWTF) proposed on properties owned by Steve Boucher and Stephen Harper.

The current lift station located along Laurel Circle primarily serves non-residential properties with some residential properties north of Route 2. A sewage holding tank could be provided on property currently owned by Dan Chisholm. Such a sewage holding tank would collect flows from the northern area during the day and discharge to the Laurel Circle lift station during periods of lower sewage flow such as the over night hours of 10:00 pm to 4:00 am. The limiting factors to connecting to the existing lift station include: pump capacity, wet well capacity and gravity main capacity. Should connection to the Shirley sewer system be determined to be politically feasible, the lift station pump and wet well capacities would need to be analyzed. Pump upgrades may be required. However, the primary limiting factor physically would be the Town of Shirley sewer mains' capacity and Town of Shirley sewer allocation established by Devens. The discharge from the holding tank to the lift station would be limited by the capacity of the existing 8" sewer main receiving flow from the lift station. The minimum slope that 8" sewer main can be installed is 0.004 ft/ft per DEP's Technical Guidance. Applying the Chezy-Manning equation the maximum flow for an 8" main flowing full (with N=0.013) is 0.76 cubic feet per second (CFS) which is equivalent to 341 gallons per minute (gpm). For a six (6) hour period the capacity of the existing sewer main is estimated to be 122,760 gallons (341 gpm x 60 min/hr x 6 hours). Applying DEP's Technical Guidance peak design flow value, the six hour capacity is equivalent to 1,116 bedrooms (122,760 / 110 gpd per bedroom). 1,116 bedrooms is equivalent to 279 four bedroom homes. The properties north of Route 2 have an estimated potential sewer flow of 1,992 bedrooms (see sheets 3, 4 & 5 of plan 8-D-2). Since the potential sewer flow is greater than the capacity of

the gravity sewer, the properties included should be limited to those in need. The limited area would include all Residential Zoned properties north of Route 2 as they appear on Assessor's Maps 4 and 5, excluding the residential properties located off Grant Way, Evelyn Place and Chisholm Trail. The limited area would also include all the properties Zoned Limited Office and Highway Business located off Fort Pond Road.

The properties south of Route 2 are proposed to be served by an on-site WWTF on property owned by Steve Boucher and Stephen Harper. The capacity of the WWTF would limit properties included in the NLDD. Currently, a 100,000 gpd to 200,000 gpd WWTF is anticipated to be provided on the Harper and Boucher properties. 200,000 gpd is equivalent to 1818 bedrooms (454 four bedroom homes). The area south of Route 2 is anticipated to include more non-residential sewer flows then residential flows. Including some residential sewer flows is recommended for improved WWTF effluent quality. Residential flows recommended to be included are properties with failing sewage disposal systems near the various ponds.

The length of new sewer main will also limit the total sewer flows available. Infiltration of groundwater needs to be considered with longer gravity sewer lines. For every mile of 8-inch sewer proposed, 800 gpd of infiltration is allowed by DEP (inflow allowed = 100 gpd per inch in diameter per mile). Infiltration would reduce the number of bedrooms by 8 for every mile of 8 inch gravity sewer (800 gpd / 110 gpd = 7.27 bedrooms, rounded to 8).

The establishment of the NLDD sewer boundaries will be limited by the capacities of the existing sewer systems and the proposed WWTF. Giving non-residential properties priority over residential properties for inclusion in the district would offset the higher financial burden created by homes on the school system. Including residential properties in the sewer boundaries areas of dense development with older failing on-site sewage disposal systems would address existing environmental concerns. Limiting sewage flows per home would allow more properties to be included.

Appendix E

Innovative and Alternative Systems

New Development Wastewater Treatment Systems

*Onsite or Community Treatment Systems**

Conventional Title 5 System

- Septic tank

Alternative Approved Systems -**Approved for Nitrogen Sensitive Area (Zone II, IWPA, etc)

- Orenco Intermittent Sand Filter
- FAST (Bio-Microbics)
- FAST (Modular - S&L)
- Norweco Singulair
- Recirculating Sand Filter (Generic)- BOD5, TSS, and Nitrogren Removal
- RUCK <2000 GPD can use higher Nitrogen loading rates

Alternative Approved Systems -**flow < 440 gpd/acre unless use aggregate method or Alternative System approved for Nitrogen Sensitive Area

- Advantex
- SeptiTech
- Bioclere
- Cromaglass WWT Systems
- JET Aerobic WT
- Amphidrome
- Waterloo Biofilter

Alternative Approved Systems for Piloting -**flow < 440 gpd/acre unless use aggregate method or Alternative System approved for Nitrogen Sensitive Area

• Omni Recirculating Sand Filter System • Cromaglass WWT System • Amphidrome Process • Norweco • Nitrex	BOD5 and TSS removal Nitrogen reduction
• RID	Phosphorus removal
• Waterloo	Increased loading rates and reduced separation to groundwater
• SeptiTech Treatment Systems	BOD5 and TSS removal & Nitrogen reduction
• RUCK • OAR	Nitrogen reduction

* Community systems can be used in combination but may not exceed 10,000 GPD (about 90 bedrooms) or a groundwater discharge permit is required

** Alternative Approved Systems are allowed only if conventional Title V system requirements can be met at the site.

New Development Wastewater Treatment Systems

Soil Absorption Systems

Conventional Title V System

- Conventional Soil Absorption System
- Mounded Soil Absorption System

Alternative SAS in trench, bed or gallery

- Eljen In-Drain System
- Eljen Xpandable Chamber
- EZ Flow
- Hancor Enviro Chambers

Alternative SAS with 40% reduction in size

- BioDiffuser Chambers
- Cultec Chambers
- Infiltrator Chambers
- Enviro-Septic Leaching System

Alternative Systems Approved for General Use (New Development)								
Technology	**DEP Approved Systems**	**Max Flow**	**Method**	**Regulatory Flow Restrictions**	**Requirements**	**Limitations**	**Limitations**	**Purchase Cost Installed Cost Electricity Cost**
Advantex	Advantex AX20	200 GPD	Textile Filter	<10,000 GPD	>6 bedrooms requires additional septic tank Installed between sewer with properly sized septic tank & SAS Title V Site & Site evaluations approved	Electronic Alarms Not allowed for Nitrogen Reduction in Nitrogen sensitive or limited area	The AdvanTex® AX Series Textile Filter Treatment System is small enough to install right on top of or next to your septic tank. The AdvanTex® Treatment System is a compact package that produces effluent clean enough to use for subsurface irrigation.	
SeptiTech	400 550 750 1200 1500 3000H	4 bedroom 6 bedroom 8 bedroom 1200 GPD 1500 GPD 4500 GPD	Tricking Filter	Nonres or >3,000 GPD requires manuf. Review; <10,000 GPD	Installed between septic tank with effluent tee filter and SAS Title V Site & Site evaluations approved Nonres requires electronic monitoring	Not allowed for Nitrogen Reduction in Nitrogen sensitive or limited area	Effective solution for high water situations Ultraviolet (UV) and denitrification models available Rugged, low profile access ports Built-in discharge pump eliminates need for pump station	comparable with others: no price listed
Intermittent Sand Filter by Orenco Systems	Low-Rate		Sand Filter	Sand Filter sized < 1.2 GPD/SF	Installed between septic tank and SAS Screened Pump Vault in Septic tank Disposal to SAS through pressurized distribution system min. 1" dia. Title V Site & Site evaluations approved			--- $8000-15000 ---
Bioclere	16, 22, 24, 30, 36		Tricking Filter	Nonres or >3,000 GPD requires manuf. Review; <10,000 GPD	Installed between septic tank and SAS Title V Site & Site evaluations approved	Not allowed for Nitrogen Reduction in Nitrogen sensitive or limited area	Bioclere is a modified trickling filter over a clarifier that reduces biochemical oxygen demand (BOD5) and total suspended solids (TSS) to levels that meet or exceed NSF and EPA standards. A modular technology, Bioclere's natural fixed film biological process is a cost-effective system for the secondary treatment of wastewater. Units can be installed in parallel to treat	No single family costs, in clusters approx. $800/home
Cromaglass WWT Systems	CA-5 CA-12 CA-25 CA-30 CA-50 CA-60 CA-100 CA-120 CA-150	500 GPD 1200 GPD 2500 GPD 3000 GPD 5000 GPD 6000 GPD 10000 GPD 12000 GPD 15000 GPD	Sequencing Batch Reactor (SBR)	<10,000 GPD	Title V Site & Site evaluations approved No septic tank, requires SAS	Not allowed for Nitrogen Reduction in Nitrogen sensitive or limited area	Covers and locking hatches are also of fiberglass.Being light in weight means expensive cranes are not required, saving installation costs. Because Cromaglass wastewater treatment and recycling systems are completely integrated, compact and transportable, they can be reused, relocated and/or resold when changing circumstances warrant.	$6800 $8000-$8300 $0.68-$0.82/day
JET Aerobic WT	JET-500 JET-750 JET-1000 JET-1250 JET-1500	500 GPD 750 GPD 1000 GPD 1250 GPD 1500 GPD	Aerobic Treatment Unit	<10,000 GPD	1000, 1250 & 1500 installed between septic tank with effluent tee filter & SAS 500 & 750 installed between sewer & SAS Title V Site & Site evaluations approved	Not allowed for Nitrogen Reduction in Nitrogen sensitive or limited area	JET is particularly well suited for use where small lots, high groundwater, and/or poor soils are encountered.	--- $5600 $0.60-$0.73/day ($320/year for quarterly maintenance)
FAST	MicroFAST High Strength FAST NitriFAST	Several models available from 500-9000 GPD	Aerobic Treatment Unit	<10,000 GPD	Title V Site & Site evaluations approved One or Two tank system with SAS		MicroFAST® wastewater treatment systems are ideally suited for use in single family dwellings, clustered residential developments and small communities. HighStrengthFAST® wastewater treatment systems are ideally suited for use in restaurants, schools, trailer parks, office buildings, commercial properties and other high-strength waste applications.	>$2000 per system
FAST	Modular FAST		Aerobic Treatment Unit	increase number of modular units	Title V Site & Site evaluations approved Installed between septic tank and SAS		Able to be installed below or above grade, Modular FAST offers high-quality treated wastewater and preserves the aesthetics of the surrounding environment.	

Alternative Systems Approved for General Use (New Development)								
Technology	**DEP Approved Systems**	**Max Flow**	**Method**	**Regulatory Flow Restrictions**	**Requirements**	**Limitations**	**Limitations**	**Purchase Cost Installed Cost Electricity Cost**
Norweco	Singulair 960 & 960 DN	500 GPD, 750 GPD, 1000 GPD, 1250 GPD, 1500 GPD	Aerobic Treatment Unit	<10,000 GPD	Installed between sewer line and D-box of SAS Title V Site & Site evaluations approved		The SINGULAIR wastewater treatment system is designed to treat domestic wastewater from individual homes, clusters of homes, or commercial developments. The SINGULAIR utilizes the extended aeration method of wastewater treatment to achieve the level of treatment demonstrated by the NSF Certification.	
Amphidrome	Amphidrome Process		Submerged Attached-Growth SBR	<10,000 GPD	Title V Site & Site evaluations approved Installed between sewer line and SAS	Not allowed for Nitrogen Reduction in Nitrogen sensitive or limited area	The Amphidrome™ process is an advanced biological wastewater treatment system that utilizes a fixed film, sequencing batch biofilter. The system consists of a deep bed filter that alternates between aerobic and anoxic treatment.	$6500 $12000-$14000 $0.70 / day
Waterloo Biofilter		Scalable system for different sizing	Tricking Filter	<10,000 GPD	Title V Site & Site evaluations approved Installed between septic tank with effluent tee filter & pump tank or vault and gravity or pump SAS		This system is especially effective for difficult sites such as small lots, heavy clay soils, shallow or exposed bedrock, and high water table. Above or below ground systems.	
RUCK	Systems < 2,000 GPD	2,000 GPD		<2,000 GPD	Title V Site & Site evaluations approved In Nitrogen Sensitive or limited area: loading <660 GPD/acr Effluent <19 mg/l or loading <550 GPD/acr Effluent <25 mg/l			

Notes: Design wastewater flow= 110 gal/bedroom/day; approx. 440 GPD / home

Alternative Systems Approved for Piloting			
Technology	**Model(s)**	**Technology Description**	**Approved Use**
Omni Recirculating Sand Filter System	RSF System	Recirculating Sand Filter	BOD_5 and TSS removal Nitrogen reduction
Cromaglass WWT System	CA-5D, CA-12D, CA-25D, CA-30D, CA-50D, CA-60D, CA-100D, CA-120D, and CA-150D	Sequencing Batch Reactor	
Amphidrome Process	Amphidrome Process	Submerged Attached-Growth Sequencing Bioreactor	
Norweco	Singulair 960 DN	Aerobic Treatment Unit	
Nitrex	Nitrex Filters and Nitrex Plus Filters	Filter with nitrate-reactive media	
RID	RID Phosphorus Removal System	Upflow filter	Phosphorus removal
Waterloo	Biofilter	Trickling Filter	Increased loading rates and reduced separation to groundwater
SeptiTech Treatment Systems	400N, 550N, 750N, 1200N, 1500N, 3000N, SeptiTech Engineered Systems	Enhanced recirculating biological trickling filter	BOD_5 and TSS removal & Nitrogen reduction
RUCK	CFT System	Aerobic RUCK filter	Nitrogen reduction
OAR	OAR System	Aerobic reactor with Bio-augmentation	

Alternative Soil Absorption Systems (SAS)			
Technology	**DEP Approved Systems**	**Approved for**	**Notes**
Eljen In-Drain Systems	Type B43	Alternative SAS in trench, bed, or gallery configurations	
Eljen Xpandable Chamber	XP1607 through XP 3614		Pretreats Effluent with a 2-stage Biomat; Greater Long Term Leaching Capacity; Requires a Much Smaller Installation Area; Lower Site Impact; No Stone required
EZ Flow	EZ1202V, EZ1203T, EZ1203H, EZ1402V, EZ1203 Bed, EZ1203 Mound		EZflow septic drainfields have proven to be the longest lasting, most effective drainfield on the market today. Make sure your septic tank contractor is EZflow certified and ask for the EZflow septic drainfield on new installations or repairs on existing systems.
Hancor Enviro Chambers	Standard Capacity, High Capacity, and Narrow		Designed to replace old-fashioned stone and pipe leach fields, these on-site waste water chambers are available in three sizes, narrow, standard and high capacity.
BioDiffuser Chambers	Biodiffuser 14 inch and 16 inch High Capacity, 11 inch Standard and Bio 2 and Bio 3 Biodiffusers	Alternative SAS in trench, bed, or gallery configurations with 40% reduction in size with effluent loading rates specified in Title 5 (310 CMR 15.242).	Product is sturdy, lightweight plastic units that provide optimum unmasked leaching surface. Effluent flows freely to uncompacted backfill through open bottoms and innovative louvered sidewalls that prevent migration into the chamber. Installation requires no stone or gravel, and requires one person with only a backhoe, level, and rake.
Cultec Chambers	EZ-24, Recharger 280 and 400		Low Profile Options; Contactor® models come in either Standard Duty H10 for non-traffic applications and Heavy Duty H20 for use in traffic applications. Their low profiles work well in areas with high water tables or other depth constraints. The perforated sidewalls and full open bottoms allow for maximum infiltration capability.
Cultec Chambers	Contactor 75, 100, 125; Recharger 180 and 330		
Cultec Chambers	Contactor Field Drain C1, C2, C3, and C4		
Infiltrator Chambers	High Capacity Chamber, Standard Chamber, Infiltrator 3050 (Storm Tech SC-740) and Equalizer 24 and 36		The Quick4™ Standard Chamber's patent-pending Contour Swivel Connection™ allows septic systems to be constructed on sloped leachfield sites and avoid obstructions without additional parts or accessories.
Enviro-Septic Leaching System	Enviro-Septic		treats septic tank wastewater more efficiently and completely; lasts longer; is less expensive; installs more quickly; requires less space uses no costly stone; adapts readily to irregular and/or sloping sites; accelerates natural digestive environmental processes

Failing Wastewater Treatment System Upgrade Alternatives

*Onsite or Community Treatment Systems**

Conventional Title 5 System

- Septic tank with Leaching Field

Alternative Approved Systems -

• White Knight Inoculator / Generator Alternative Treatment System • Piranaco Alternative Treatement System	Renovation of failed SAS
• Geoflow Subsurface Drip Wastewater Disposal System	Alternative SAS
• Recirculating Sand Filters • Puraflo • Jet Home Aerobic Wastewater Systems • Amphidrome • Orenco Intermittent Sand Filter • Norweco • Waterloo Biofilter • AdvanTex Treatment Systems • FAST • FAST • SeptiTech Treatment Systems • Cromaglass Wastewater Treatment System • Bioclere • Jet	BOD5 and TSS Removal (May replace septic tank or be installed between septic tank and SAS)
• Enviro-Septic	Alternative SAS

Alternative Systems Approved for Remedial Use

Technology	Model(s)	Company	Technology Description	Approved Use	Max Flow	Design	Options	Limitations
White Knight Inoculator / Generator Alternative Treatment System	Bacterial Augmentation and	Knight Treatment Systems 281 County Route 51A Oswego, NY 13126	Bio-augmentation	Renovation of failed SAS	2,000 GPD	Installed in existing Septic tank w/ Eff Tee filter with SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Min. 2' separation of GW to bottom of SAS, Septic tank must be tested to be watertight, Can't replace failed cesspool, Existing undersized unit must be upgraded
Piranaco Alternative Treatement System	Bacterial Augmentation and Aeration System	Piranaco 1875 Joy Road Occidental, CA 95465			2,000 GPD	Installed in existing Septic tank with SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Min. 2' separation of GW to bottom of SAS, Septic tank must be tested to be watertight, Can't replace failed cesspool, Existing undersized unit must be upgraded
Geoflow Subsurface Drip Wastewater Disposal System	Drip Irrigation System	Geoflow Inc. 500 Tamal Plaza, Suite 506 Corte Madera, CA 94925	Alternative SAS	Alternative SAS trench-drip irrigation	2,000 GPD	Replaces SAS	Reduction in GW Separation Reduction in Pervious Separation	Input from Alternative must be <30 mg/l TSS & <30 mg/l BOD5; Soil < 90 min per inch; Not allowed in Class IV Soils
Recirculating Sand Filters	custom system	Generic	Sand Filter	BOD_5 and TSS removal	10,000 GPD	Installed between Septic tank and pump chamber of SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Puraflo	Peat Fiber Biofilter	Bord na Mona Environmental Products U.S. Inc. 4106 Bernau Avenue Greensboro, NC 27407	Peat Filter		10,000 GPD	Installed between Septic Tank with Eff Tee Filter & Pressure Dist. Chamber of SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Jet Home Aerobic Wastewater Systems	J-500, J-750, J-1000, J-1250, and J-1500	Clearwater Recovery (Stephen B. Nelson) 175 Spring Street Rockland, MA 02370	Aerobic treatment system		10,000 GPD	May Require Septic Tank with Effluent Tee Filter	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Amphidrome	Amphidrome Process	F.R. Mahony & Associates, Inc. 131 Weymouth Street Rockland, MA 02370	Submerged Attached-Growth Sequencing Bioreactor		10,000 GPD	Installed between Anoxic EQ Tank & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Orenco Intermittent Sand Filter	Low-Rate Filter	Saneco, Inc. Box 9B 65 Eastern Avenue Essex, MA 01929	Sand Filter		10,000 GPD	Installed between Bldg Sewer & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Norweco	Singulair Systems 960N, 960/750, 960/1000, 960/1250, and 960/1500	NORWECO, Inc. 220 Republic Street Norwalk, OH 44857	Aerobic treatment		1,500 GPD		50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Waterloo Biofilter	Biofilter	Waterloo Biofilter System, Inc. 143 Dennis Street Rockwood, ONT, N0B 2K0	Trickling Filter		10,000 GPD	Installed between Septic tank & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
AdvanTex Treatment Systems	AX-15, AX-20 and AX-100	Orenco Systems, Inc. 814 Airways Avenue Sutherlin, OR 97479	Textile media aerobic treatment		10,000 GPD	Installed between Septic Tank & SAS - > Bedrooms requires additional design	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
FAST	Modular FAST	Smith & Loveless, Inc. 14040 Santa Fe Trail Drive Lenexa, KS 66215	Aerobic Treatment Unit		10,000 GPD	Installed between Septic tank & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch

Alternative Systems Approved for Remedial Use								
Technology	**Model(s)**	**Company**	**Technology Description**	**Approved Use**	**Max Flow**	**Design**	**Options**	**Limitations**
FAST	MicroFAST, High Strength FAST, and NitriFAST	Bio-Microbics, Inc. 8450 Cole Parkway Shawnee, KS 66227	Aerobic Treatment Unit		10,000 GPD	Installed between Bldg sewer & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
SeptiTech Treatment Systems	300, 400, 550, 750, 1200 3000, and SeptiTech Engineered	SeptiTech, Inc. 220 Lewiston Road Gray, ME 04039	Aerobic Treatment unit		10,000 GPD	Installed between Septic tank & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Cromaglass Wastewater Treatment System	CA-5, CA-12, CA-15, CA-25, CA-30, CA-50, CA-60, CA-100, CA-120, CA-150	Cromaglass Corporation P.O. Box 3215 2902 N. Reach Road Williamsport, PA 17701	Sequencing Batch Reactor		10,000 GPD	Installed between Bldg sewer & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Bioclere	16, 22, 24, and 30 series	Aquapoint 241 Duchaine Blvd. New Bedford, MA 02745	Trickling Filter		10,000 GPD	Installed between Septic tank & SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Jet	J-335 Tertiary Sand Filter	Clearwater Recovery (Stephen B. Nelson) 175 Spring Street Rockland, MA 02370	Sand filter	NA	450 GPD	Installed between aerobic treatment system & pressure distribution chamber of SAS	50% Reduction in SAS Size Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch
Enviro-Septic	Enviro-Septic System	Presby Enviromental Inc. Route 117, PO Box 617 Sugar Hill, NH 03586	Alternative SAS	Alternative SAS in trench, bed, or gallery configurations	10,000 GPD	Replaces SAS	Reduction in GW Separation Reduction in Pervious Separation	Soil < 90 min per inch

Appendix F

Waste Loads at White Pond and Spectacle Pond

White Pond - Nutrient Loading Approach

Known Information						
No. Parcels		37		0.39		
Persons/Parcel		2.8				
Total Acres		14.3				
Assumptions						
Percent Impervious		25%				
Percent Lawn		65%				
Septic Loading		5.9	lbs nitrogen/person/yr			
Annual Rainfall		49.5	inches/year			
Rainfall Recharge on Pervious Surface		0.49	mg/acre/yr			
Impervious Runoff Coefficient 'C'		0.95				
Wastewater Generation		55	gal/day/person			
Nitrogen Application on Lawns		33	lbs nitrogen/yr/acre			
Runoff Nitrogen Loading		1.5	mg/l		1.25182E-05	lbs/gal
Nitrogen Loads (lbs/yr)						
Source	**lbs/year**					
On-site Systems	611.24					
Fertilizer	306.74					
Runoff	57					
Total	975					
Volume of Recharge (MGY)						
Source	**mgy**					
Wastewater	2.08					
Rainfall	5.26					
Impervious Surface	0					
Total	7.34					
Nitrogent Load from On-site Systems						
	lbs/MG	mg/l				
Load/Volume	133	15.93				

Spectacle Pond - Nutrient Loading Approach

Known Information						
No. Parcels		96		0.17		
Persons/Parcel		2.8				
Total Acres		16.1				
Assumptions						
Percent Impervious		25%				
Percent Lawn		35%				
Septic Loading		5.9	lbs nitrogen/person/yr			
Annual Rainfall		49.5	inches/year			
Impervious Runoff Coefficient 'C'		0.95				
Wastewater Generation		55	gal/day/person			
Nitrogen Application on Lawns		33	lbs nitrogen/yr/acre			
Runoff Nitrogen Loading		1.5	mg/l		1.25182E-05	lbs/gal
Nitrogen Loads (lbs/yr)						
Source	**lbs/year**					
On-site Systems	1585.92					
Fertilizer	185.96					
Runoff	64					
Total	1836					
Volume of Recharge (MGY)						
Source	**mgy**					
Wastewater	5.40					
Rainfall	11.47					
Impervious Surface	0					
Total	16.87					
Nitrogent Load from On-site Systems						
	lbs/MG	mg/l				
Load/Volume	109	13.04				

Appendix G

Public Response to Comment

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May 18, 2007

Mr. Orlando Pacheco
Town Administrator
Town of Lancaster
P.O. Box 293, 695 Main Street
Lancaster, MA 01523

RE: RESPONSE TO REVIEW COMMENTS DATED MARCH 21, 2007
FROM SJ MULLANEY ENGINEERING, INC.

Dear Mr. Pacheco:

The following provides CEI's response to comments on the March 7, 2007 draft Integrated Water Resources Management Plan as submitted to the Town of Lancaster. We have numbered the comments as shown in Appendix G. Responses below correspond to each number.

1-4 Commenter notes naming conventions. Edits have been made addressing these.

5. Commenter indicates that water systems classified as 'non-community transient' and 'non-transient non-community' public water supplies in Lancaster should be shown because they might preclude future public water supplies. CEI disagrees that future public water supply sites or distribution would be precluded by existing non-community public water supplies because these smaller systems are often incorporated into larger municipal systems as they grow, or the larger municipal system may simply grow around the smaller system. However, these systems can be shown on the maps and have been added to Figure 1-2.

6. Commenter requested that the Lancaster Board of Health Regulations be added to the discussion of Title 5 constraints, which they were.

7. Commenter requests that Zone IIs for each non-municipal public water system be described. CEI responds that these non-municipal public water systems do not have Zone II. They may have an Interim Wellhead Protection Area (IWPA) which is a simple radius based on pumping rate and type of system. Minimum IWPA radius is 400 feet while the maximum is ½ mile. These have been shown on Figure 1-2.

8. Commenter states that an NOI does not need to be filed for work within or abutting an ACEC area. CEI disagrees. Under the Wetland Protection Act

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21 Depot Street, Merrimack, New Hampshire 03054 603-424-8444 Fax: 603-424-8441
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regulations at 310 CMR 10.00, work within an ACEC requires filing of a Notice of Intent with the local Conservation Commission. Additionally, higher performance standards apply to bordering vegetated wetlands in an ACEC that are affected by relatively small projects. Also, any work within an ACEC that receives State financial assistance or otherwise involves State agencies such as through a permitting project, is required to file an Environmental Notification Form through MEPA.

9. Text does not match figure. Text has been corrected.

10. Commenter notes that the statement "all of Lancaster's residents rely on...municipal or private wells" does not account for a few residences that receive water from Wachusett and/or public non-municipal wells. The statement has been changed to "nearly all of Lancaster's residents rely on public or private wells".

11. See response to Comment 7.

12. Figure 2-5 was under revision at the time of the draft due to a lack of clarity. It has been redone and added to the final.

13. Noted.

14. The Commenter asks why Table 3-3 does not itemize the existing commercial space. The reason is that this Table is based on the EOEA build out, which does not identify existing commercial building space. Further, getting the square footage of building space would require an in-depth analysis based on the building footprint and number of floors which was not a part of this scope since that level of detail goes beyond the needs of the IWRM.

15. The Commenter asks whether Table 3-4 Limited Office Impervious Percentage takes into account that the Fort Pond Road LO District is in the Water Resources District which restricts impervious coverage and that the LO District at the northwest corner of Town is an expansive quarry with an intended end use as a pond. CEI's response is that the Table does not take into account the Fort Pond Road LO District limitation on impervious coverage since the assumptions are worst case buildout. This could be done if there were an agreement and assurance that the quarry will be a pond upon reclamation.

16. Repeating from Comment 10, the Commenter lists the community and non-community public water supply wells located in the area. The Commenter asks

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whether water consumption from these properties was excluded from the water balance. It also notes that Shirley Water District could serve more of Lancaster. CEI responds that the existing water consumption was estimated using EOEA assumptions for future development. All of the well withdrawals were included in the water balance. CEI could assume that the area within the Shirley Water District would be served by the District, but we have no information that would suggest Capital Improvement Plans for serving the entire area have been approved by that entity, or that all residents would desire this service.

17. The Commenter notes that properties on Grant Way get water from the Shirley Water District in the Town of Shirley, not the Town of Shirley. Noted.

18. The Commenter asks why the Shirley Water District portion of Lancaster is not analyzed in detail similar to that of areas served by Lancaster Water System. CEI responds that the purpose of the water supply demand projections is to establish potential demands and compare these to potential capacity to identify needs. The study is about Lancaster rather than on Shirley Water District, which might better be detailed in a separate study specific to the Shirley Water District.

19. The purpose of the comment is not clear. It notes that the sales of water outside Town must be decided as part of a Town Meeting but then quotes a Board of Health meeting on a large development in Harvard. CEI simply discussed capacity in this section, without commenting on whether or not the water would be available to Lancaster, since in every case of requesting water from other communities a specific situation and volume request would need to be made along with negotiations with the particular community for that water.

20. The Commenter notes that in 1996 the Clinton Board of Selectmen declined to allow and eight lot subdivision on Sterling Street to connect to the Clinton Water System. CEI's communications in January 2007 indicated that Clinton would consider providing Lancaster with additional supply, however, a specific proposal would likely be needed.

21. Town of Leominster has been changed to City of Leominster.

22. The Commenter indicates that water flow directions shown are incorrect and notes the flow. CEI responds that without a network model, flow directions are based on demand and could change significantly diurnally and due to other circumstances.

23. Commenter notes that some water service is provided from Leominster.

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24. Commenter notes that a subdivision in Lancaster was previously declined service by Leominster in 1996, so no new connections will be permitted. CEI responds again that the IWRM analysis was to see what capacity was available where. Decisions on what might be politically allowable are likely to change over time and are usually quite specific to the proposed transfer of water or wastewater. Therefore, guidance on whether new service might be available in the future was based on priority, cost and capacity instead of current politics that may change radically over time. See also Comment/Response 20.

25-26 See Comment/Response 17.

27. See Response 21.

28. See Response 5, 7 and 10.

29. Commenter states that certain mains shown on this figure (5-8) are not part of the Lancaster water system but belong to other neighboring systems. CEI responds that the figure simply shows water supply features within Lancaster as the purpose of the project is to identify who has public water and who does not.

30. This figure is in process by Lancaster DPW and was not available for the draft.

31. Definition of TMDL added in glossary.

32. Commenter states that Lancaster and Leominster are finalizing an intermunicipal agreement for certain areas. CEI responds that any such agreements are specific to those areas and were occurring after this project evaluation occurred. These issues are explored further in the alternatives analysis.

33. Commenter requests that the recipient of the MCI-Shirley flows be clarified. CEI responds that MCI-Shirley discharges to a 42-inch line in Ayer that also collects excess flow from the Ayer wastewater treatment plan and conveys this flow to Devens wastewater treatment plant for treatment.

34. See Response 21.

35. The comment is unclear as the study area is in north Lancaster.

36. Commenter notes that there is a planned affordable housing development in Sterling. CEI responds that this goes beyond the level of detail needed for this analysis. Further, this project is a long-term analysis and cannot report on projects that are ongoing or have occurred recently.

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37. See Comment/Response 6.

38. Partially developed parcels are not included. Table heading has been reworded. In-fill such as Rockport has not been evaluated as this is beyond the level of detail of the study.

39. Edit made.

40. Due to soils and parcel sizes, Fort Pond was not identified as a high priority subwatershed. Although a few residents indicate their interest in sewers, the ranking table compares numbers of parcels in need of sewers. Since the Fort Pond area has only a few homes that appear to be unable to meet Title 5, it does not rank as highly as other sub-areas where many more homes are unable to meet the criteria.

41-43 All have been noted previously.

44-46 The Commenter asks about a southern alternative where Leominster could take additional sewage from western Route 117. CEI responds that Leominster indicated (during discussions related to this project) that it is not currently interested in taking any additional areas beyond that being paid for by Massachusetts Highway Department near Route 2. They have only earmarked 50,000 gallons per day in capacity for the Route 2 area, which is being paid for by others. Although this alternative could be considered, due to the high number of two acre parcels, it is likely that most can meet Title 5 requirements through raised systems. Although sewers might be desirable for some residents, the IWRM study ranked areas in terms of need and this area did not rank highly in comparison with others. Any unused capacity will likely be needed for areas with the most severe problems.

47. The Commenter asks whether DEP will allow no peaking factor with diurnal discharge. CEI responds that it will make little difference because it is a pressure line and should DEP require a peaking factor, it would be a minor difference in the size of the main.

48. This is outside the Town of Lancaster.

49. The Commenter asks whether the flows should be split with part going to a package treatment plant and part going to Devens. CEI responds that although we agree that gravity flows might work better following subwatershed divides, the additional piping cost of splitting the flow to transport to Devens would be enormous and prohibitive.

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50-51 The Commenter wishes to show locations of pump stations and gravity vs. pumped force mains. CEI responds that the drawings are shown for purposes of general costing on an order of magnitude scale. Based on selected alternatives, more detailed costs will be prepared in later phases.

52. These comments have been addressed previously.

53. The Commenter provides a number of comments on Appendix A, the Environmental Overlay District Pilot Project. That report as appended is a final report, with comments having been requested previously. A summary of responses is provided briefly below.

a. A number of comments relate to the study area and whether it is just North Lancaster or the entire Town. CEI responds that the study area is North Lancaster only. The entire Town was not evaluated due to the limited scope and budget. At the same time, the Commenter asks why a study was not done outside Lancaster following subwatershed boundaries. CEI responds that it was based only on the North Lancaster area and although maps were sometimes extended to other towns for visual purposes only, Lancaster can not enforce or request other towns to change their zoning or overlay districts.

b. A number of comments are about the level of detail, or that more recent data is available. CEI responds that this project's purpose was to better understand the water balance of the study area and how much it might be improved by the addition of an overlay district or districts. It is also a state pilot and had to be somewhat generic by nature. New projects that have been done and are not included on Mass GIS were not included as that is too great a level of detail. Other things such as the personal wireless service overlay district are not involved in stormwater or water supply/wastewater management and are not important to the study. Other areas such as highway business district shown as forest are simply indicating existing conditions, not future, potential conditions.

c. Some comments discussed meeting lot area requirements without including wetlands. Again, CEI responds that it used the EOEA buildout methodology. This has been accepted on state and federal levels and could be used in any community in Massachusetts.

d. The Commenter notes that overlay district boundaries should be adopted townwide. CEI agrees that in reality overlay districts would probably be adopted townwide, but could also be done in a limited area. Because most of

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the future development in Lancaster will occur in the northern area, it would be possible to have a limited overlay district.

e. Other comments describe that state courts have ruled it is illegal for a district's boundaries not to be fixed. CEI responds that we followed the Wetlands Act boundaries for one of the districts and this would be defined similarly to bordering vegetated wetlands, which do not have a defined, mapped district except as provided on Mass GIS.

f. The Commenter notes that pathogen and nutrient controls on wastewater systems greater than 1,000 gpd should be accompanied by expanded sewer districts. CEI disagrees. Many innovative treatment systems add additional components, particularly at this large sized system. However, a management district could be developed.

g. The Commenter notes on several example language provided in the report, for example steep slope language, that these should be provided with tax abatements and would affect Approval Not Required plans. CEI responds that these are simply examples or model languages that would require adaptation to meet Lancaster's specific needs. As with the entire Environment Overlay District report, it was a State model designed for generic use anywhere in the State. Regulations and overlay districts to match the report would require adaptation to Lancaster.

Should you have any questions regarding the above responses, please do not hesitate to contact me at 1-800-725-2550 ext. 301.

Sincerely,

COMPREHENSIVE ENVIRONMENTAL INC.

Eileen Pannetier
President

S. J. MULLANEY ENGINEERING, INC.

CIVIL SITE DESIGN & PERMITTING

March 21, 2007

Orlando Pacheco, Town Administrator
Town Hall; 695 Main Street
P.O. Box 293
Lancaster, MA 01523-0293

Re: Review Comments – 3/7/07 Draft Lancaster Integrated Water Resource Management Plan

Dear Mr. Pacheco:

As requested, I offer the following comments on the March 7, 2007 Draft Integrated Water Resource Management (IWRM) Plan.

1.0 Introduction

1 Page 1-1, 1st paragraph: Ayer does not neighbor Lancaster.

2 Page 1-1, 2nd paragraph: The Federal Bureau of Prisons Federal Medical Center (FMC) Devens is located in Harvard, not Lancaster. The Souza-Baranowski Correctional Center, a state maximum security prison, is located in northeast Lancaster.

3 Page 1-1, 2nd paragraph: Northwest Lancaster is near Route 2 and Route 190, not northeast Lancaster.

4 Page 1-1, 3rd paragraph: The IWRM Plan considers infrastructure issues in northwest Lancaster, not northeast Lancaster.

5 Figure 1-2: Each "Public Water Supply" (PWS) depicted is a "Community" PWS. A number of Non-Community Transient and Non-Transient PWSs are located in Lancaster and should be depicted. Placement of future PWSs in town may be precluded in certain locations by the presence of existing non-community PWSs.

2.0 Community Profile

6 Page 2-3, last paragraph: The phrase, "and the Lancaster Board of Health Regulations" should be added after "Title 5" in both instances.

7 Page 2-5, Groundwater and Wetlands, third paragraph: The Zone II for each Non-Community PWS should also be described.

8 Page 2-7, first paragraph: The statement, "a Notice of Intent must be filed for any work within or abutting an ACEC area," is incorrect. In general, activities proposed on a property in an ACEC that necessitate a state action, such as appealing to DEP for approval of a Superseding Order of Conditions if aggrieved by an Order issued or denied by the local Conservation Commission, must process an Environmental Notification Form (ENF) with the Massachusetts Environmental Policy Act (MEPA) office before state agency action can proceed.

9 Page 2-7, second paragraph: The text indicates that Lancaster has eight certified vernal pools; however, Figure 2-1 depicts nine.

10 Page 2-9, Town Government: The statement, "All of Lancaster's residences rely on ... municipal or private wells," is incorrect. The Lancaster Woods condominium complex near Route 2 and Lunenburg Road is served by a Community Groundwater Well that is classified by DEP as a PWS. Grant Way, Chisholm Trail, Evelyn Place and portions of Shirley Road are served by the Shirley Water District, a non-municipal, territorial public water system.

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Certain Sterling St. residences are connected to the Town of Clinton Water Department that obtains its water from the MWRA's Wachusett Reservoir, not wells. Likewise, certain other Sterling St. residences are connected to the portion of the City of Leominster Department of Public Works Water Division that also obtains its water from the MWRA's Wachusett Reservoir, not wells.

11 Figure 2-2: Each "Public Water Supply" (PWS) depicted is a "Community" PWS. A number of Non-Community Transient and Non-Transient PWSs are located in Lancaster and should be depicted. The Zone II – Recharge Area for each Non-Community PWS should also be depicted.

12 Figure 2-5: This figure is missing.

3.0 Water Balance

13 Page 3-3, Table 3-1, Fort Pond: After discharging from Tophet Swamp, Bow Brook flows into Catacunemaug Brook, which flows into the Nashua River, not into Lake Shirley.

14 Page 3-5, Table 3-3, Additional Commercial Buildout Space: Why this table does not itemize existing commercial space is unclear.

15 Page 3-6, Table 3-4, Percent Land Type: Whether this table's Limited Office (LO) impervious percentage takes into account that the Fort Pond Road LO District is in the Water Resource District, which restricts impervious coverage, and that the LO District at the northwest corner of town is an expansive quarry with an intended end-use as a pond, is unclear.

16 Page 3-9, Water Withdrawals: The statement, "There are no public water supply wells within the study area," is incorrect. While no municipal PWS wells are located within the study area, both community and non-community, transient and non-transient PWS wells are located within the study area. These include the Lancaster Woods Community PWS; the Rockport Non-Transient, Non-Community PWS near Bow Brook and the Lunenburg and Shirley town lines; the Wagner Toyota Non-Transient, Non-Community PWS at Routes 2 and 70; the D'Ambrosio Eye Care Non-Transient, Non-Community PWS on Old Union Turnpike near the Leominster city line; the Lancaster Golf Center Transient Non-Community PWS on Old Union Turnpike near the Leominster city line; and the Montachusett Regional YMCA Transient, Non-Community PWS on Fort Pond Inn Road. In addition, the Johnny Appleseed Visitors Center on Route 2 and the Orchard Hills Athletic Club on Duval Road are served by the City of Leominster Department of Public Works Water Division's Notown Reservoir system. Whether water consumption from any or all of these properties was excluded from the water balance is unclear. In addition, why future development is assumed to be supplied with private wells is unclear, as Figure 5-7 identifies the broad, but as yet untapped, territory of the Shirley Water District, and since page 5-13 reports that the District is open to serving more of Lancaster.

17 Page 3-9, Water Withdrawals: The statement, "properties along Grant Way receive water from the Town of Shirley," is incorrect. Grant Way properties receive water from the Shirley Water District, which is independent of the Town of Shirley.

5.0 Water Supply Demand Projections and Supply Sources

18 Page 5-1, 5.1 Existing Sources: Why water use in the Shirley Water District-served portion of town is not analyzed in detail similar to that in areas served by the Lancaster water system is unclear.

19 Page 5-11, Town of Ayer: According to Ayer General By-Laws Article XVII, Extension of Water and Sewer Lines, no permanent water or sewage line may be extended outside the town boundaries unless authorized by an Ayer

Town Meeting. The following appeared in the article, "Board of Health responds to railway plans, water request," in the March 9, 2007 edition of the Ayer Public Spirit newspaper:

> "In other business, the Board of Health reviewed a request for input from the DPW regarding a proposed 140-unit development in Harvard -- the Shaker Hills project -- that has asked to connect to Ayer's water and sewer systems.
>
> Board member Mary Spinner pointed out that there were many potential complications with cross-municipal agreements for such systems, particularly questions of who would be responsible for maintenance.
>
> "'We need the water for our own town residents,' added Spinner.
>
> "'We have problems with water right now. We can't afford it,' agreed McMillan. The board decided not to endorse the plan, and to send a letter to the DPW expressing that opinion."

20 Page 5-11, Town of Clinton: In 1996, the Clinton Board of Selectmen declined to allow the 8-lot Deershorn Estates (Farm Land Lane) subdivision on Sterling St. to connect to the Clinton water system. Then-Clinton DPW Superintendent Bill Gilmour indicated that the Clinton water system was nearing capacity.

21 Page 5-12, Town of Leominster: Leominster is a city, not a town.

22 Page 5-12, Town of Leominster: The water flow direction described is incorrect. Water flows from the Wachusett Reservoir in Clinton along South Meadow Road and Sterling Street in Lancaster to Clinton Road, Pratts Junction Road and Leominster Road in Sterling before entering the city on Central Street.

23 Page 5-12, Town of Leominster: The City of Leominster Department of Public Works Water Division's Notown Reservoir system serves the Johnny Appleseed Visitors Center on Route 2 and the Orchard Hills Athletic Club on Duval Road.

24 Page 5-12, Town of Leominster: In 1996, the Leominster DPW declined to allow the 8-lot Deershorn Estates (Farm Land Lane) subdivision on Sterling St. to connect to the Leominster water system. The Leominster DPW indicated at the time that limited connections to the 30" main were allowed at the time of its construction in the 1960's, but that no new connections are permitted.

25 Page 5-13, Town of Shirley: This heading should be, "Shirley Water District."

26 Page 5-13, Town of Shirley: The Shirley Water District provides water to more than 20 homes in the Grant Development subdivision.

27 Page 5-15, Interconnections: Leominster is a city, not a town.

28 Figure 5-1: Each "Public Water Supply" (PWS) depicted is a "Community" PWS. A number of Non-Community Transient and Non-Transient PWSs are located in Lancaster and should be depicted. The Zone II – Recharge Area for each Non-Community PWS should also be depicted.

29 Figure 5-8: The 30" main depicted on Sterling St. is not part of the Lancaster water system, but is part of the City of Leominster water system. Likewise, the 16" main depicted on Sterling St. is not part of the Lancaster water system, but is part of the Town of Clinton water system.

6.0 Stormwater Needs Assessment

30 Figure 6-1: This figure is missing.

31 Page 6-2, Existing or Planned TMDLs: The acronym TMDL (Total Maximum Daily Load) should be defined.

7.0 Wastewater Management Systems

32 Page 7-1, Regional Wastewater Management: The Town of Lancaster and the City of Leominster are finalizing an intermunicipal agreement for the city to provide sewer service to the Johnny Appleseed Visitors Center on Route 2 and to properties on Duval Road.

33 Page 7-2, Town of Ayer, second paragraph: This paragraph states that MCI-Shirley discharges wastewater to Ayer. However, under the heading, Town of Shirley, page 7-5 states that the Devens WWTP receives flows from MCI-Shirley. The recipient of the MCI-Shirley flows should be clarified.

34 Page 7-3, Town of Leominster: Leominster is a city, not a town.

35 Page 7-6, Town of Shirley: Whether the Laurel Circle lift station option described on page 9 of Appendix D is a viable alternative is unclear.

36 Page 7-6, Town of Sterling: A planned affordable housing development in Sterling, at the Leominster city line, is presently negotiating connection to the Leominster sewer system.

37 Page 7-6, Types of Systems in Lancaster: "Lancaster Board of Health Regulations Criteria" should be itemized in addition to "Title 5 Criteria."

38 Page 7-9, Tables 7-2 and 7-3: Whether "Developed Parcels Area" encompasses portions or the entirety of underdeveloped parcels is unclear. For example, Rockport only utilizes approximately one third of its 137 acres. Substantial development is possible on the remainder.

39 Page 7-10, Old Country Road: The correct name is Old County Road.

8.0 Wastewater Needs

40 Page 8-3, Table 8-4: Fort Pond is not identified as a high priority subwatershed. However, page 30 of Appendix C indicates that in 1977 Fort Pond was rated as mesotrophic. This condition has likely intensified over the last 30 years as development around the pond has increased. On August 25, 2005, then-Town Planner Bruce Hamblin referred to me Fort Pond resident Arthur Brassard. Mr. Brassard was planning to jointly upgrade his septic system together with two neighbors, but expressed a preference to connect to sewer. Mr. Brassard stated that he would rather contribute financially to a sewer program than spend money on a septic system. He indicated that he intended to prepare a mass mailing list of pond residents and to rally his neighbors.

41 Page 8-5, Rte. 2 Commercial/Industrial Area: The name "Roll Over America" is incorrect. The correct name is "Roll-On America."

42 Page 8-6, Wastewater Alternative #1, second paragraph: The name "Roll Over America" is incorrect. The correct name is "Roll-On America." Leominster is a city, not a town.

43 Page 8-8, Spectacle and White Pond, second paragraph: Leominster is a city, not a town. The Leominster/Lunenburg/Lancaster town lines converge, not the Leominster/Shirley/Lancaster town lines.

44 Page 8-9, Southern Alternative: An additional option for the Wekepeke Brook, Ballard Hill and North Nashua River subwatersheds should be considered. Attached hereto please find excerpts from the City of Leominster Sewer System Plan, Figure 2, Collection System Map, revised September 7, 2001, by Maguire Group, Inc. The figure identifies existing sewer mains in the Route 117 area of Leominster in close proximity to the Lancaster town line, including mains at Jungle Rd. and Old Mill Rd. and at Willard St., Garfield St. and Old Lancaster St. Extensions of these mains even closer to the Lancaster line are underway for a Lowe's Home Improvement store between Rt. 117 and Old Lancaster St., west of Rt. 190, and for a Super Wal-Mart at Rt. 117 and Jungle Rd. If necessary, a STEP system in conjunction with the diurnal flow fluctuations of the Leominster wastewater treatment plant could be considered.

45 Page 8-10, Wastewater Alternative #3: The additional option described in "Page 8-9, Southern Alternative," above should be considered for this alternative as well.

46 Page 8-11, Wastewater Alternative #4: The additional option described in "Page 8-9, Southern Alternative," above should be considered for this alternative as well.

47 Page 8-12, Wastewater Alternative #2, second paragraph: Whether DEP allows no peaking factor to be applied with diurnal discharge is unclear.

48 Page 8-14, Wastewater Alternative #3: Connection of the White Pond subwatershed to the package treatment plant should be considered given proximity. Just over the town line in Leominster, White Pond discharges into the North Nashua River, which flows into Lancaster.

49 Page 8-14, Wastewater Alternative #3 and Page 8-15, Wastewater Alternative #4: For each of these alternatives, a variation should be considered which directs north areas flows north of Route 2 to Devens and north area flows south of Route 2 to the package treatment plant as described on pages 9 and 10 of Appendix D. This split approach would better correlate with subwatershed divides.

50 Figures 8-2 and 8-3: Each figure should depict the locations of the anticipated pump stations listed in Table 8-7 on Page 8-15 and Table 8-8 on Page 8-16.

51 Figures 8-2 and 8-3: Whether all "Potential Sewer Pipes" depicted are gravity lines is unclear.

52 Loose Summary Sheet, Wastewater Alternative #2: Leominster is a city, not a town. The name "Ballard Street" is incorrect. The correct name is "Ballard Hill."

53 Appendix A Environmental Overlay District Pilot Project

Page E-1, fourth paragraph: Whether the 21% improvement in performance criteria would result from implementation of the EOD in just the study area or the entire town is unclear.

54 Page 1-2, second paragraph: Why unintended development impacts are not sought to be prevented in the southern part of town is unclear.

55 Page 1-3: Why a greater level of protection is not needed in southern Lancaster, which is home to the town's existing municipal wells as well as Priority Habitats of Rare Species and an ACEC, is unclear.

56 Page 2-1, Reduced Recharge: Significant upstream impacts beyond the Lancaster town limits are beyond the town's control. These include the Leominster wastewater treatment plant's discharges to the North Nashua River,

the Clinton wastewater treatment plant's discharges to the South Nashua River, and controlled releases from the Wachusett Reservoir in Clinton to the South Nashua River at the Wachusett Dam.

57 Page 2-2, Higher Pollutant Loads, first paragraph: Whether Lancaster has any shellfish beds is unclear.

58 Page 2-3, 2.2 - Study Area Subwatersheds, third paragraph: The basin approach water balance premise is flawed by the use of town lines to restrict subwatershed review. A more complete approach would define subwatersheds based upon areas tributary to the Leominster, Clinton and Devens wastewater treatment plants, respectively.

59 Figure 2-3: Each "Public Water Supply" (PWS) depicted is a "Community" PWS. A number of Non-Community Transient and Non-Transient PWSs are located in Lancaster and should be depicted.

60 Page 3-1, last paragraph: Use of the 2002 MassGIS attributes omits major recent development projects that are visible on the 2005 MassGIS orthophotos. These include the Lancaster Woods condominium project, Meditation Lane subdivision, the Massachusetts Youth Soccer Association complex and D'Ambrosio Eye Care.

61 Page 3-2, 3.2 - Zoning: This section overlooks the 20-acre Highway Business (HB) district on Fort Pond Road and the Light Industry 2 (LI2) district west of Route 190 that were created in 2003. It also misses the Personal Wireless Service Overlay District.

62 Figure 3-1: This figure incorrectly identifies the cleared 20-acre Highway Business (HB) district on Fort Pond Road as forest.

63 Figure 3-2: This figure overlooks the 20-acre Highway Business (HB) district on Fort Pond Road and the Light Industry 2 (LI2) district west of Route 190 that were created in 2003. It also misses the Personal Wireless Service Overlay District.

64 Figure 3-3: Each "Public Water Supply" (PWS) depicted is a "Community" PWS. A number of Non-Community Transient and Non-Transient PWSs are located in Lancaster and should be depicted. The Zone II – Recharge Area for each Non-Community PWS should also be depicted.

65 Figure 3-5: This figure, particularly the depiction of western Lancaster, is outdated by updated mapping of the Natural Heritage and Endangered Species Program effective October 1, 2006 and December 1, 2006.

66 Figure 3-5: This figure mistakenly includes as Open Space land the following parcels controlled by Central Mass. Sand and Gravel, LLC: Tax Map 13-4, 14-13 and 14-11 (west part).

67 Page 4-1, first paragraph: It is unclear for whom, "Prevention is a far more cost-effective approach than trying to reestablish a hydrologic balance when the land has already been developed." This seems to place a disproportionate burden on the owners of land not previously developed.

68 Page 4-1, second paragraph: The North Lancaster Development District analysis in Appendix D provides a more comprehensive buildout analysis than the assumptions used by EOEA.

69 Page 4-1, third paragraph: The parcel level analysis is flawed as it appears to have overlooked the existence of the Fort Pond Road HB district and the Route 190 LI2 district.

70 Page 4-1, fifth paragraph: The assumption that 75% of wetlands would be included in lot sizing appears excessive as the Lancaster Zoning Bylaw requires at least 90% of the lot area requirement to be met without including any wetlands.

71 Page 4-2, FAR: FARs for the HB and LI2 districts are missing.

72 Page 5-1, 1. Stormwater Overlay District: If such a district is adopted, it should be townwide.

73 Page 5-1, 2. Fisheries Overlay: State courts have ruled that it is illegal for a district's boundaries to not be fixed. If bordering vegetated wetlands and their 100-foot buffer are intended to delineate a district, they must be specifically defined and not be variable over time. If changes over time (e.g., wetlands expansion or contraction) are intended to be accommodated, the clearly defined boundaries should be periodically specifically reestablished. Accordingly, the district's boundaries should be able to be defined by a map, just as the Zone II-defined Water Resource District can be depicted.

74 Page 5-1, 3. Expanded Water Resources Protection District: If pathogen and nutrient controls on wastewater systems greater than 1,000 gpd are deemed necessary in the Water Resources District, then expanded sewer districts should encompass the Water Resource District.

75 Page 5-2, last paragraph: The performance criteria and overlay district, if instituted, should apply townwide and not just to the study area.

76 Figure 5-1: Why the Revised Water Resource Protection District extends into neighboring towns is unclear.

77 Figure 5-1: The source of the elevation contours is unclear. If they are based on the most recent USGS quadrangle mapping, the maps encompassing Lancaster were last revised in 1988, based on aerial photographs taken in 1981. Given the several mining operations in town and all of the development over the last quarter century, contours taken from quadrangle mapping may not be accurate.

78 Figure 5-4: Disturbed areas less than one acre should not be exempt from the Performance Criteria. The cumulative impact of multiple uncontrolled incremental disturbances can be more detrimental than the impacts of larger controlled disturbances.

79 Page 6-1, second paragraph: The most recent USGS quadrangle maps encompassing Lancaster were last revised in 1988, based on aerial photographs taken in 1981. Given the several mining operations in town and all of the development over the last quarter century, topography taken from USGS mapping may not be accurate.

80 Page 6-2: Development intensity of undeveloped land should be consistent with historical development density, as demonstrated in the North Lancaster Development District analysis in Appendix D.

81 Page 6-2, Percent Land Type Used in Water Balance: 85% impervious coverage in the Fort Pond Road Limited Office District and in the Route 190 LI2 district appears excessive, as these areas are already in the Water Resource District and the Lancaster Zoning Bylaw limits impervious lot coverage in such areas to 15%, unless the Planning Board grants a special permit.

82 Page 6-3, Water Withdrawals: The statement, "There are no public water supply wells within the study area," is incorrect. While no municipal PWS wells are located within the study area, both community and non-community, transient and non-transient PWS wells are located within the study area. These include the Lancaster Woods Community PWS; the Rockport Non-Transient, Non-Community PWS near Bow Brook and the Lunenburg and Shirley town lines; the Wagner Toyota Non-Transient, Non-Community PWS at Routes 2 and 70; the D'Ambrosio Eye Care Non-Transient, Non-Community PWS on Old Union Turnpike near the Leominster city line; the Lancaster Golf Center Transient Non-Community PWS on Old Union Turnpike near the Leominster city line; and the Montachusett Regional YMCA Transient, Non-Community PWS on Fort Pond Inn Road. Also, Grant Way, Chisholm Trail, Evelyn Place and portions of Shirley Road are served by the Shirley Water District, a non-

municipal, territorial public water system. In addition, the Johnny Appleseed Visitors Center on Route 2 and the Orchard Hills Athletic Club on Duval Road are served by the City of Leominster Department of Public Works Water Division's Notown Reservoir system. Whether water consumption from any or all of these properties was excluded from the water balance is unclear. In addition, why future development is assumed to be supplied with private wells is unclear, given the broad, but as yet untapped, territory of the Shirley Water District.

83 Page 6-3, Wastewater Imports and Exports: What at one time was the Division of Youth Services has been MCI-Shirley for many years.

84 Water Balance Summary: Whether this table reflects the Fort Pond subwatershed's service by the Shirley Water District, the White Pond subwatershed's service by the Leominster water system and/or the Shaker Hill subwatershed's discharge to the Devens wastewater treatment plant is unclear.

85 Page 7-2, item 5: The environmental costs (e.g., fossil fuel use and other energy consumption) of pumping should be quantified.

86 Page 7-2, 7.3 – Offset Sites Matrix Evaluation: The funding source for the retrofitting of existing facilities is unclear.

87 Table 7-1, item 2: The Rockport facility does not contain leaching catchbasins. The site consists of a serial catchbasin system that discharges to onsite natural kettle holes where stormwater recharges.

88 Page 8-2, item 1: Private entities have already tapped these aquifers for PWSs. These include The Rockport Co., Inc., Lancaster Woods, Wagner Toyota, D'Ambrosio Eye Care, Lancaster Golf Center and the Montachusett Regional YMCA. Such taps may preclude future municipal PWS taps in such areas.

89 Appendix A, Example Steep Slope Language, a.: The statement, "No land intended for subdivision or development may be regarded or filled ...," defeats the purposes of Earth Products Removal as a site preparation tool. In 1990, the Town of Lancaster removed a scenic gravel esker ridge as preparation for development on the land where Rockport is now sited.

90 Appendix A, Example Steep Slope Language, c. and d.: Tax abatements should be available to landowners whose properties are restricted by these provisions.

91 Appendix A, Example Steep Slope Language, d.: This requirement will necessitate demonstrating topography to the Planning Board for the endorsement of Approval Not Required (ANR) plans.

Thank you for your consideration in this matter. Please contact me with any questions.

Very truly yours,
S. J. MULLANEY ENGINEERING, INC.

Stephen J. Mullaney

Stephen J. Mullaney, P.E.
President

Encl.

* * * * LEGEND * * * *

═══	STREET
———	SEWER LINE (GRAVITY)
———	COMBINATION SEWER & DRAINAGE GRAVITY LINE
- - - - -	FORCE MAIN
10"	SEWER PIPE SIZE
↗	SEWER FLOW DIRECTION
	SEWER PUMP STATION
———	DRAINAGE LINE
▬▬▬	HIGHWAY
———	APPROXIMATE PROPERTY LINE
———	RAILROAD
———	CITY OWNED PROPERTY LINE (APPROXIMATE)
▨	CITY OWNED PROPERTY (APPROXIMATE)

CITY OF LEOMINSTER
LEOMINSTER, MASSACHUSETTS 01453

SEWER SYSTEM PLAN

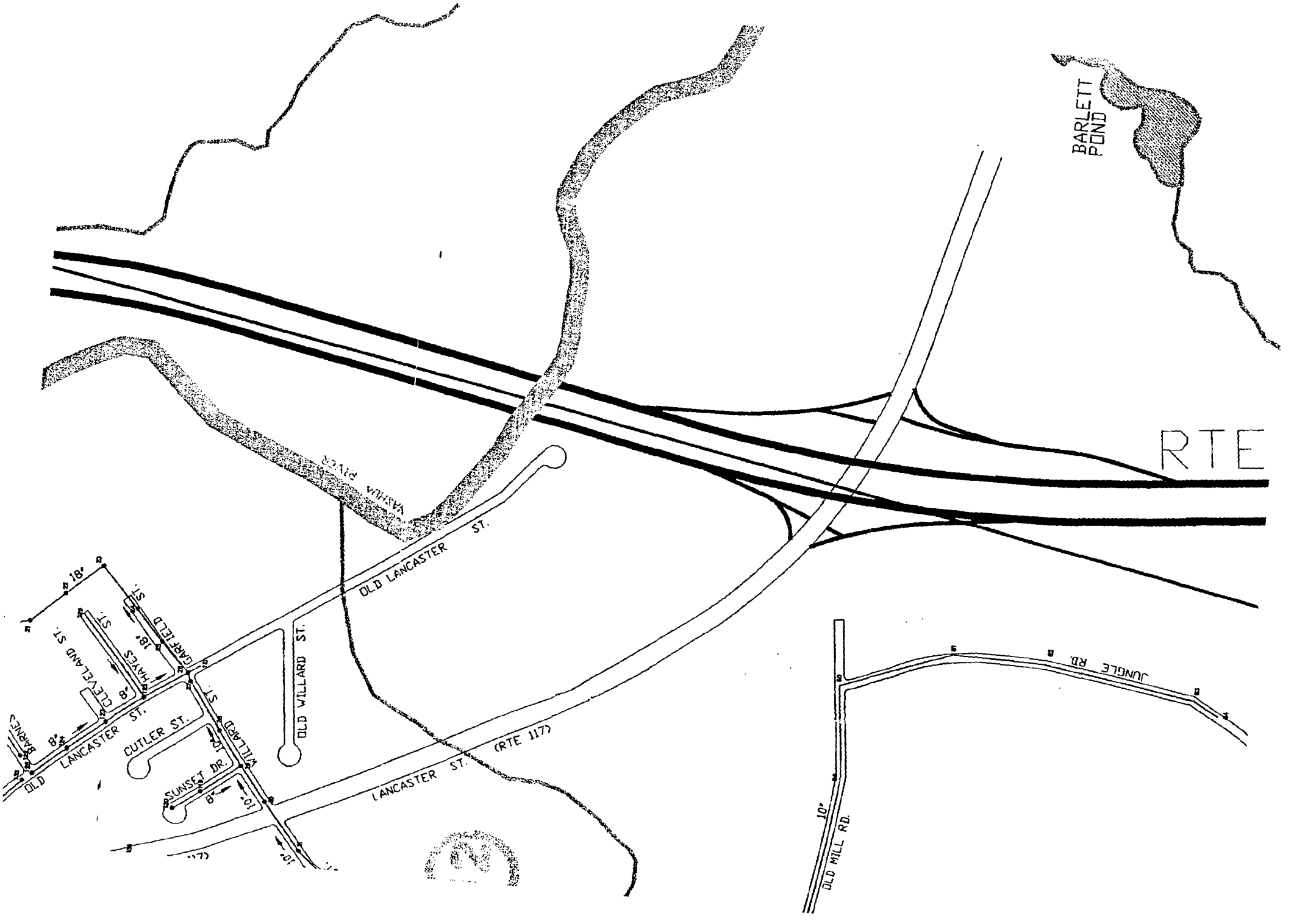
DEPARTMENT OF PUBLIC WORKS
109 GRAHAM STREET
LEOMINSTER MASSACHUSETTS 01453
978-534-7590
DATE: JULY 2001 (REV. AUG 2001)
SCALE: AS NOTED
DRAWN BY: DEA - DPW
REV. BY: JCJ - MGI

MAGUIRE GROUP
Maguire Group, Inc.
Architects / Engineers / Planners
One Court Street
New Britain, Connecticut 06051

FIGURE 2

COLLECTION SYSTEM MAP

Infiltration / Inflow Report – August 3, 2001
Revised – September 7, 2001


BARLETT POND
RTE
OLD LANCASTER ST.
OLD WILLARD ST.
LANCASTER ST. (RTE 117)
CUTLER ST.
SUNSET DR.
CLEVELAND ST.
GARFIELD ST.
HAYES ST.
WILLARD ST.
JUNGLE RD.
OLD MILL RD.
18'
8'
10'