

DRAFT

EXECUTIVE SUMMARY

The Comprehensive Wastewater Management Plan (CWMP) for the Town of North Andover has been formulated in response to the needs of the Town, and designed to protect the environmental resources both within North Andover and within the broader regions surrounding the Town. The Town has completed its sewer extensions within the Lake Cochichewick watershed, and is using the CWMP as a planning tool to determine if there is wastewater management needs in other areas of the Town. The following sections summarize the findings of the CWMP.

Needs Assessment

There are a total of four study areas determined to have the highest need for alternative wastewater management, one study area was determined to have a moderate need and a total of six study areas that were determined to have a low priority for an alternative to on-site Title 5 systems. The high and moderate priority areas are highlighted in the following Table 2.25 – Wastewater Needs Assessment.

Table 2.25
Wastewater Needs Assessment

Area	Area Name	Final Assessment
1	Bruin Hill Road	Low
2	Winter Street	Low
3	Bridges Lane	Low
4	Boxford Street	Low
5	Forest Street	Low
6	Salem Street	High
7	Laconia Circle	High
8	Farnum Street	High
9	Boston Street	Moderate
10	Ash Street	Low
11	Bradford Street	High

There are also five neighborhoods that are literally surrounded by sewer and are a priority for sewer. The neighborhoods are listed below.

1. Salem Street, from Anne Road to Nutmeg and Bannon Drive
2. Johnson Street, from Mark Road to Holly Ridge Road
3. Rea Street
4. Innis Street
5. North Cross Road – existing dry sewer

Alternatives Analysis

The following seven potential wastewater management approaches were established for North Andover and screened for feasibility.

1. Conventional On-Site Systems
2. On-Site Systems with Innovative/Alternative (I/A) Technologies
3. Comprehensive On-site System Management Program
4. Cluster Systems
5. Centralized System
6. Centralized System with Water Reuse
7. Regional System

Based on the final screening of alternatives and the evaluation of impacts, S E A recommends that the Town pursue the regional approach to use GLSD as the means of wastewater management in the needs areas. In order to mitigate the risk of Sewer System Overflows (SSOs) as a result of additional flows, the Town should implement sewer extensions in conjunction with continued infiltration and inflow removal throughout the Town's existing sewer system. Additionally, the Town should consider implementing a Town-wide comprehensive Septage Management Program as a means to support the low priority unsewered areas, and as an interim measure to protect the Town's natural resources before sewers can be constructed in the moderate and high needs areas.

Recommended Plan

The following sections summarize the recommended wastewater management plan for the needs areas in North Andover.

Sewer Extensions

S E A recommends that the Town's existing sewer system be extended to serve the high and moderate priority needs areas that were identified as part of this CWMP. The following lists the recommended phasing and streets proposed for sewer extensions.

Phase 1 – Encapsulated Area

1. Rea Street (Chestnut Street to Abbott Street)
2. Jay Road
3. Johnson Street (Mark Road to Rea Street)
4. Salem Street (Anne Road to Nutmeg Lane)
5. Bannan Drive

Phase 2 – Osgood Street Corridor

1. Osgood Street (Bradford Street to Barker Street)
2. Bradford Street (Barker Street to Bradford Street)
3. Holt Road
4. Clark Street

Phase 3 – Farnum Area

1. Chestnut Street (Marian Drive to Turnpike Street/Route 114)
2. Evergreen Street
3. Marion Drive
4. Spring Hill Road

5. Johnson Street (Holly Ridge Road to Turnpike Street/Route 114)
6. Oakes Drive
7. Mill Road
8. Tucker Farm Road
9. Raleigh Tavern Lane
10. Carlton Lane
11. Johnny Cakes Lane
12. Farnum Street
13. Gilman Lane
14. Shannon Lane
15. Summer Street (Molly Towne Road to Farnum Street)
16. Cricket Lane
17. Brook Street

Phase 4 - Salem / Laconia Areas

1. Salem Street (Boxford Street to Sharpners Pond Road)
2. Patton Lane
3. Granville Lane
4. Hawkins Lane
5. Turtle Lane
6. Pheasant Brook Lane
7. Beaver Brook Lane
8. Olympic Lane
9. Laconia Circle
10. Equestrian Drive
11. Crossbow Lane
12. Ingalls Street (Forest Street to Crossbow Lane)
13. Lacy Street (Forest Street to 5,000 ft East)
14. Forest Street (Pasture Lane to Sharpners Pond Lane)

Phase 5 – Boston / Turnpike Area

1. Gray Street
2. Turnpike Street (Brook Street to Berry Street)
3. Sullivan Street
4. Old Cart Way
5. Boston Street (Town Line to Turnpike Street/Route 114)
6. Paddack Lane
7. Willow Ridge Road
8. Penni Lane
9. Windkist Farn Road

The completion of the five sewer extensions would add approximately 134,000 linear feet of gravity sewer, 6,500 linear feet of low-pressure sewer, 5 pumping stations and 13,100 linear feet of force main. Table 6.6 – Recommended Sewer Extensions Summary lists the infrastructure associated with each phase of sewer.

**Table 6.6
Recommended Sewer Extensions Summary**

Sewer Phase	Proposed Gravity Sewer (feet)	Proposed Low Pressure Sewer (feet)	Total Sewer Extension (feet)	Proposed Force Main (feet)	Proposed Pumping Station (each)
Phase 1 – Encapsulated Areas	8,400	800	9,200	0	0
Phase 2 - Osgood Street Corridor	15,800	1,200	17,000	2,800	2
Phase 3 - Farnum Street Area	42,500	2,400	44,900	7,000	2
Phase 4 - Salem/Laconia Area	39,900	1,500	41,400	0	0
Phase 5 - Boston/Turnpike Area	27,400	600	28,000	3,300	1
Proposed Sewer Extension (feet)			140,500		
Proposed Force Main (feet)				13,100	
Proposed Pumping Stations					5

Table 6.7 – Existing and Proposed Wastewater Flow lists the existing average daily, max day and peak existing wastewater flows in the North Andover sewer system, and also flows estimated from the recommended sewer extensions.

**Table 6.7
Existing and Proposed Wastewater Flow**

	Wastewater Flow		
	Average Daily Flow (gpd)	Max. Daily Flow (gpd)	Peak Daily Flow (gpd)
Existing Wastewater Flow			
Residential	1,456,000	3,640,000	5,824,000
Industrial & Commercial	260,000	650,000	1,040,000
Municipal	16,000	40,000	64,000
Infiltration / Inflow	2,048,000	2,048,000	2,048,000
Total Existing Wastewater Flow (gpd)	3,780,000	6,378,000	8,976,000
Proposed Wastewater Flow			
Residential	368,600	921,500	1,474,400
Industrial & Commercial Flow	395,900	989,600	1,583,400
Infiltration/Inflow	105,800	105,800	105,800
Total Proposed Wastewater Flow (gpd)	870,300	2,016,900	3,163,600
Total Existing and Proposed Flow (gpd)	4,650,300	8,394,900	12,139,600

Costs to design and construct the recommended sewer were developed. Costs were based on \$320 per foot for gravity sewer, \$220 per foot for low-pressure sewer, \$220 per foot for pumping station force main, \$250,000 for each smaller sized pumping station and \$500,000 for each large pumping station. A twenty percent contingency was applied to the total construction costs. Engineering cost for design, permitting and construction oversight was based on thirty percent of the total construction costs. The Town is in the midst of negotiations with a private developer and property owner in the area proposed for sewer within Phase 2 - Osgood Street Corridor. Therefore, components of the anticipated project costs are currently under negotiation. Table 6.8 – Estimated Project Costs lists the total estimated project cost for each recommended phase of sewer.

**Table 6.8
Estimated Project Costs**

Sewer Phase	Project Cost
Phase 1 - Encapsulated Areas	\$4,500,000
Phase 2 - Osgood Street Corridor	Components under Negotiation
Phase 3 - Farnum Street Area	\$24,000,000
Phase 4 - Salem/Laconia Area	\$20,500,000
Phase 5 - Boston/Turnpike Area	\$14,000,000
Contingency for Potential System Upgrades	\$15,000,000

Financial Evaluation

The Town of North Andover is evaluating its betterment policy as part of this CWMP. The betterment policy was developed based on constructing sewer within the Lake Cochichewick watershed to protect the Town’s drinking water source. The policy shares projects costs with twenty percent of the project cost being absorbed by the project abutters, and eighty percent of the cost financed through the Town’s water and sewer rates. The Town has evaluated betterment policies of other Massachusetts towns, and is evaluating new financing options to allocate costs between existing and new users.

Continued Infiltration and Inflow(I/I) Removal

Infiltration and inflow (I/I) refers to groundwater that seeps into the sewer system through pipe defects and stormwater that enters the sewer system directly through illicit pipe connections. I/I can overburden a sewer system with extraneous water. This reduces the capacity of the sewer system to convey wastewater which can potentially lead to Sewer System Overflows (SSOs), which is a violation of the Clean Water Act. I/I can also potentially reduce levels of treatment at the wastewater treatment facility.

With the substantial increase in facilities recommended with this sewer phasing, it is important to integrate a comprehensive infiltration and inflow control plan at the onset to reduce the impacts to the existing collection system and the GLSD treatment facility. The Town has been diligent in I/I removal programs for the past 15 years. S E A recommends that the sewer system extensions be completed in coordination with continued infiltration and inflow removal throughout the Town’s existing sewer system.

Comprehensive Septage Management Program

A Town administered on-site wastewater management program appears beneficial for portions of Town that would continue to utilize Title V management, as well as an interim basis before sewer is constructed in the needs areas. An on-site wastewater management program will ensure regular maintenance of on-site systems and will allow the Board of Health to gradually locate failing septic systems in Town. S E A recommends that the Board of Health consider implementing an on-site wastewater management program over the next five years (2009 – 2014).

Sewer System Hydraulic Model

It is recommended that the Town develop a computerized, GIS-based hydraulic model of its existing sewer system. This will help the Town understand where downstream pipe size capacity issues may exist within the Town's sewer system. This information would help determine where downstream improvements should be constructed to increase capacity for new flows from the needs areas and help mitigate the potential SSOs.

Environmental Impacts

The sewer expansion plan is similar with regard to scope of work and construction methods to other typical utility installation projects, and no significant environmental impacts are anticipated to occur during construction. Based on the conceptual designs, the majority of the sewer and force main extensions are proposed within existing roadway rights-of-way in North Andover, which are paved surfaces. Some easements are necessary to connect certain streets. The actual locations will be selected to avoid impacts to environmental resources discovered during survey, such as wetlands and vernal pools.

S E A anticipates that the recommended sewer expansion plan will require submission and approval of an Environmental Impact Report (EIR) through the Massachusetts Environmental Policy Act (MEPA) Office of the Executive Office of Environmental Affairs (EOEA). The length of proposed sewer main exceeds the review threshold for an EIR [301 CMR 11.03 (5a)]. However, no other review thresholds were identified as being exceeded. The Town has already performed substantial evaluations of the recommended plan and its impacts in this CWMP. Therefore, an Expanded Environmental Notification Form (ENF) will be submitted with a request for a Single EIR. The following narrative provides a brief overview of anticipated impacts based on the conceptual designs for informational purposes. The overview follows the general format of an ENF:

Land Section:

- The recommended plan is not expected to meet or exceed MEPA review thresholds related to land.
- The recommended plan does not alter sites within the project areas, agricultural areas, forestry lands, Article 97 conservation lands, or restricted-use lands.
- The recommended plan includes five wastewater pump stations. These pump stations will consist of small enclosures that are located on easements either at grade or below grade. The plan also includes upgrades to three existing pump stations.
- Potential stormwater impacts from construction will be mitigated. A brief narrative of proposed mitigation measures will be provided.
- Areas regulated under MGL Chapter 21E or the Massachusetts Contingency Plan were identified within the properties abutting the recommended sewer.
- The project is mostly within the Ipswich River Basin, and a small portion on the Merrimack River Basin.
- The project does not propose use of land designated for current or potential open space in Town.

Rare Species Section:

- The recommended plan is not expected to meet or exceed MEPA review thresholds related to rare species.
- Estimated and priority species habitats were identified within the recommended project areas based on the MassGIS Natural Heritage and Endangered Species Program data.

Wetlands, Waterways, and Tidelands Section:

- The recommended plan is not expected to meet or exceed MEPA review thresholds related to wetlands, waterways, and tidelands.
- Based on MassGIS interpreted wetlands and waterways data, the recommended plan will likely require construction adjacent to existing wetlands. Therefore, a local Order of Conditions will be required, though no alterations to wetlands, waterways, or tidelands are proposed.

Water Supply Section:

- The recommended plan is not expected to meet or exceed MEPA review thresholds related to water supply.
- The recommendations of this plan do not include any projects at this time that require state permits related to water supply.

Wastewater Section:

- The recommended plan exceeds one EIR review threshold related to wastewater. This threshold is the proposed construction of new sewer mains in excess of ten miles in length. The total proposed length of new sewer main under the recommended plan is above the EIR review threshold of ten miles or more.
- The project will require a MA-DEP sewer extension permit and the estimated wastewater flow volumes from the recommended plan are included in this chapter of the report.
- The recommended capacity improvements to the existing municipal sewer system provide adequate capacity to manage the increased flow.
- There exists sufficient treatment capacity at the GLSD facility for the additional wastewater flow and residuals.
- The majority of the source water in the recommended plan originates from Lake Cochichewick, located in the Merrimack River watershed, with a small amount originating from private drinking water wells located in the Ipswich River Watershed. The recommended plan will have all water discharged by these homes treated and discharged into the Merrimack River. This would not be considered an Interbasin Transfer, because the Interbasin Transfer Act exempts transfers between basins that occur within the same municipality.

Transportation Section:

- Though minor roadway improvements may occur in conjunction with pavement restoration during the projects, the recommended plan is not expected to meet or exceed MEPA review thresholds related to transportation.

Energy, Air Quality, and Solid and Hazardous Waste Sections:

- The recommended plan is not expected to meet or exceed MEPA review thresholds related to the above sections.

Historical and Archeological Resources Section:

- No state listed historical or archeological sites were identified within the project areas using the MassGIS state register data.