Section 2
Existing Sewer System

2.1 Introduction

Manchester is located in Hillsborough County and encompasses approximately 34.9 square miles of land area and 1.9 square miles of inland water area. The City is bounded by Hooksett to the north, Londonderry to the south, Auburn to the east, and Bedford and Goffstown to the west. Four major bodies of water are located in the City: Lake Massabesic on the eastern border, the Merrimack River running north to south along F.E. Everett Turnpike, the Piscataquog River generally running west to east in the western portion of the City, and Cohas Brook running north along Interstate 93 and then east to west to the Merrimack River.

Currently, the existing wastewater collection system does not include the eastern border of the City, including areas that are in the Lake Massabesic and Cohas Brook Watersheds, see Figure 2-1.

2.2 Wastewater Treatment Plant

The City of Manchester owns and operates a WWTP at 300 Winston Street. Wastewater is collected predominately from Manchester, but also includes flow from neighboring towns of Bedford, Goffstown, and Londonderry. Wastewater is conveyed to the plant, where it is treated and discharged to the Merrimack River. The WWTP was constructed in 1976 and a major plant upgrade was completed in 1996.

The existing WWTP has an average day design capacity of 34 million gallons per day (MGD) and a peak wet weather flow of 85 MGD. The average daily flow to the treatment plant from January 1, 2004 to June 30, 2007 was 23.1 MGD (taken from AECOM's May 2009 Draft Faciltiy Plan Report – Chapter 2). The components of flow are listed in Table 2-1.

2.3 Existing Wastewater Collection System

2.3.1 General

The majority of Manchester is sewered by traditional gravity sewer and pump stations. The sewer system consists of more than 360 miles of sanitary sewer ranging from 8 inch lateral sewers to sewer interceptors up to 10-foot by 12-foot box culverts.

2.3.2 Cohas Brook Interceptor Project

General

Construction of Phase I of the Cohas Brook Interceptor project was completed in September 2002 and starts on Pine Island Road and extends to 300 feet west of the point where Cohas Brook intersects Interstate 93 (see Figure 2-1). This phase included 21,000 linear feet of 18 to 42 inch sewer interceptor and 120 feet of 8 inch lateral sewer. The interceptor has two siphons crossing Cohas Brook; just west of South Mammoth

Insert Figure 2-1 – Map of Manchester

Community	Source	Current Wastewater Flow[1] (mgd)
Manchester	Residential	6.0
	Commercial, Class III & IV Industrial	1.8
	Municipal	0.4
	Class I & II Industrial	0.8
	Septage	0.02
	Infiltration/Inflow	11.4
	Subtotal:	20.4
Member Communities:		
Auburn	All Sources	-
Londonderry	All Sources	1.2
Bedford	All Sources	0.4
Goffstown	All Sources	1.1
	Subtotal:	2.7
	TOTAL:	23.1

1. Estimated existing sewer flow taken from AECOM's May 2009 Draft Facility Plan Report – Chapter 2

Table 2-1
Summary of Current Wastewater Flow

Road and just east of Interstate 93. The Phase I Sewer Area includes pump stations on South Mammoth Road and on Sheffield Road.

Construction of Phase II of the Cohas Brook Interceptor Project will be completed soon. The Phase II interceptor starts at the end of Phase I (300 feet west of the point where Cohas Brook intersects Interstate 93) and ends at the intersection of Wellington Road and Londonderry turnpike (State Highway Bypass 28). This phase includes 23,300 linear feet of 15 to 24 inch sewer interceptor and 4,100 feet of 8 to 10 inch sewer laterals. The Phase II Area also includes a pump station at the intersection of Candia Road and Lake Shore Road.

Phase III of the Cohas Brook Interceptor Project also starts at the end of Phase I (300 feet west of the point where Cohas Brook intersects Interstate 93) and was proposed to end at the Londonderry Town-Line on Bodwell Road. The Phase III Area interceptor to date includes 1,900 linear feet of 24 inch sewer interceptor that was installed by a private contractor during the construction of the Cohas Estates development. The remainder of the Phase III will be evaluated as part of this study.

As shown in Figure 2-2, the entire Sewer Master Plan Area is either in the Lake Massabesic or Cohas Brook Watersheds. Protection of these two resource areas is important as they provide drinking water and recreation activities for the residents of Manchester.

Insert Figure 2-2 – Map of Project area

2.4 Unsewered Areas in the Cohas Brook Sewer Master Plan Area

2.4.1 General

There are more than 700 properties in the Cohas Brook Sewer Master Plan area currently using onsite septic systems. The Cohas Brook Interceptor Phase I area is mostly sewered with the exception of a few lateral streets. These unsewered streets include the southernmost portion of South Mammoth Road, Lucas Road, Skyline Drive, Bernice Avenue, two homes on Corning Road, Glen Forest Drive, and Lone Pine Drive. The Cohas Brook Interceptor Phase II area includes subareas that have already been sewered. The Ledgewood Adult Community is sewered by a system of private gravity sewers and a private pump station and the Governors Hill/Eastwind Estates neighborhood is also sewered by a system of private gravity sewers and a private pump station. The remainder of the unsewered streets will be evaluated in this Sewer Master Plan. The Cohas Brook Interceptor Phase III area includes subareas with private sewer in the area at the southernmost end of Bodwell Road, Cohas Overlook Luxury Townhouses, East Meadow Way Condominiums, and Cranberry Way. The remaining unsewered properties adjacent to the Cohas Brook Sewer Interceptor (Phases I, II, and III) that are within the project area will be analyzed in this study.

2.4.2 Sewer Questionnaire Results

Some of the Cohas Brook Sewer Master Plan study area has unsuitable conditions for supporting a properly designed septic system (i.e., depth of ground water is shallow, lot sizes are small, and soil types don't drain well). As part of this Sewer Master Plan, CDM distributed a sewer questionnaire to the residents in the study area. The objective of the survey was to identify the areas of most concern, prioritize areas with higher rates of septic failure, and to gauge the citizen's desire for sewer in these areas. More than 700 questionnaires were distributed and the results are discussed below.

The results of the sewer questionnaire show that the majority of the lots are within 500 feet of a water body, stream or wetland, and 66 percent are more than 15 years in age. A summary of the notable results of the sewer questionnaire responses is provided in Table 2-2. Approximately 76 percent of the questionnaires were returned and the complete responses are summarized in Appendix A. A 76 percent return rate is considerably high for this type of questionnaire. About 73 percent of the returns indicated a desire for sewers in their neighborhood, and 13 percent indicated problems with their onsite disposal system. These problems often include odors and/or frequent pumping of the septic systems. Figure 2-3 shows the location of systems that were reported to be experiencing problems and/or exceed 15 years in age. Fifteen to 20 years is the generally assumed life expectancy of a septic system. It can be seen that all of the failures are within the Lake Massabesic or Cohas Brook watersheds and therefore present a risk to water quality. Although questionnaire results may not always be a reliable indicator of need, results in Appendix A clearly show a desire for sewer and a significant number of problems in the study area.

Number of questionnaires sent	709
Number of questionnaires returned	538
Percent of questionnaires returned	76%
Septic system problems reported in the questionnaires returned	13%
Population who want sewers in the questionnaires returned	73%
Septic systems exceeding 15 years in age	66%

Table 2-2
Sewer Needs Questionnaire Results

Insert Figure 2-3 – Sewer Questionnaire Results