

Chapter IX.1

**WASTEWATER MANAGEMENT PLAN
FOR
SALEM COUNTY, NEW JERSEY
LOWER DELAWARE WATER QUALITY
MANAGEMENT PLANNING AREA**

ALLOWAY TOWNSHIP CHAPTER

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Sickels & Associates, Inc.

***Wastewater Management Plan for
Salem County, New Jersey
Alloway Township Chapter***

I. INTRODUCTION

This chapter represents the Alloway Township portion of the Salem County WMP. The Salem County WMP has been submitted to the New Jersey Department of Environmental Protection for approval so that it may be incorporated into the Lower Delaware Water Quality Management Plan via the Plan Amendment Procedure (N.J.A.C 7:15).

Alloway Township is located in the Delaware River Drainage Basin and the Lower Delaware Water Quality Management Planning Area. The Planning Area is not located within the jurisdiction of the Pinelands Commission nor is it located within the Coastal Area Facility Review Act (CAFRA) area. The future wastewater service area (FWSA) for the Township of Alloway is identified on Map No.3. This service area does not include any areas that lay within adjacent municipalities.

The Township of Alloway is bounded by Cumberland County (to the south-east), and four Salem County municipalities including Pilesgrove Township (to the north), Upper Pittsgrove Township (to the north-east), Quinton Township (to the south-west), and Mannington Township (to the northwest). Alloway Township encompasses a total area of 21,703 acres (33.9 square miles), including approximately 195.6 acres of which is surface water (ponds, lakes, reservoirs) and 59.6 miles of streams (shown in Map No.1) flowing in the municipality. This municipality is largely undeveloped, containing mostly farms, forests and rural residential developments. However, Alloway Village does contain low to high-density residential development. Alloway Township has one of the lowest population densities in Salem County (approximately 84.5 people/sq mi) according to (2010) U.S. Census data. The remaining land area for future development consists of a large number of underdeveloped and undeveloped parcels throughout the municipality.

Alloway Township has a population of 3,467 persons. The municipality’s population trend over the last decade can be seen as a 2.5% average (increase) in population each year (25% over ten years), according to the most recent (2010) U.S. Census data. Table 1.1 is a summary of the historic population and trends for the Township of Alloway. In terms of population change over the next three decades, Alloway is expected to experience steady growth. This is according to the most recent study by the South Jersey Transportation Planning Organization, prepared in 2011. A summary of the SJTPO projected population can be found below in Table 1.2:

Table 1.1: Alloway Township- Historic Population

Year	Population	Population Change	
		#	avg yearly %
1980	2,680		
1990	2,795	115	0.43%
2000	2,774	-21	-0.08%
2010*	3,467	693	2.50%

~Source: 1990 U.S. Census, *2010 U.S. Census

Table 1.2: Alloway Township- Projected Population

Year	Population	Population Change	
		#	avg yearly %
2010*	3,467		
2020	3,975	508	1.47%
2030	4,461	486	1.27%
2040	4,987	526	1.27%

~Source: SJTPO, 2011

A. STATUS OF PREVIOUS APPROVED WMPs

The current WMP in effect for the Township of Alloway is an amendment to the Lower Delaware WQMP submitted in coordination with Quinton Township, and Salem City. This amendment, which formally included the Village of Alloway and other specific sites within Elsinboro Township, Lower Alloways Creek Township, Quinton Township and Mannington Township into the SSA of the City of Salem, was adopted on September 24, 2003.

The enclosed plan reflects current zoning with proposed sewer service areas consistent with the Municipality's Master Plan. The Alloway Township WMP has been incorporated within the overall Salem County Wastewater Management Plan. The proposed plan, upon adoption, will remain in force and in effect until the expiration date noted in the Chapter 1, Salem County Summary.

B. CURRENT WASTEWATER SERVICES

Alloway Township currently owns and operates a public sewer collection system within the Alloway Village area. All sanitary flow collected by the system is conveyed to the Salem City Sewerage Treatment Plant for treatment. The Township sewer service area serves a population of approximately 684 people according to current DEP online sources and related municipal data. This equates to 1.04% of the total Salem County population (66,083 persons, 2010 U.S. Census) being served by the wastewater treatment plant.

Sewer service areas may include industrial facilities that discharge process wastewater to the collection system for treatment. The existing sewer service limits, delineated on Map No.2, are maintained by the Alloway Township and contribute sanitary flow to the larger Salem City sewer system. The limits were derived from existing sanitary sewer infrastructure currently constructed and/or approved. The treatment process and information for the Sewerage Treatment Plant (STP) is located within the Salem City municipal chapter in this report.

C. CURRENT WATER SERVICES

Alloway Township does not currently own or operate a public community water supply system and is not currently served by any adjacent water supply systems. All development within Alloway Township is supplied by individual or private community drinking water wells.

D. OVERVIEW OF ENVIRONMENTAL, AND LOCAL CONSIDERATIONS TO WASTEWATER SERVICES

Wastewater Management Planning is part of the continuing planning process required by the New Jersey Water Quality Planning Act (N.J.S.A. 58:11A-1 et seq.) and Section 208 of the federal Clean Water Act. The intent of the continuing planning process is to align federal, State, regional and local land use planning to ensure that these land use plans do not conflict with each other.

The provision of environmental infrastructure, in particular centralized sewer service, has a profound influence on development patterns and intensity. The wastewater management planning process is intended to assign an appropriate wastewater management treatment alternative to geographic areas based on environmental sensitivity and other land use planning objectives such as regional center-based development or farmland preservation. The extension of public sewers into areas designated for protection by federal, State, regional or local land use plans would be inconsistent with those protection objectives.

The adopted Water Quality Management Planning Rules (N.J.A.C. 7:15) generally exclude the extension of sewer service into large contiguous areas, defined as 25 acres or more, of wetlands, category one water buffers, Natural Heritage Priority Sites and/or endangered and threatened species habitat. The extension of sewer service into these areas would encourage their development and thus conflict with the Department of Environmental Protection's statutory mandate to protect these resources.

It should be noted that under limited circumstances environmentally sensitive areas that meet the 25 acre threshold may be included in the sewer service area as necessary to preserve the investment in projects having already received certain local and State approvals, to relate sewer service areas to recognizable geographic features, or to accomplish center based development proposed by the local land use planning authority and approved by the Department of Environmental Protection through the plan endorsement process. Additional local land use planning objectives used in delineating appropriate areas for public sewer service are discussed in this municipal chapter.

E. OVERVIEW OF WATER RESOURCE MANAGEMENT ISSUES

Alloway Township's existing sewer service area is completely served by individual water wells. The municipality has not identified any issues regarding water quality, water supply or concerns with non-sewered areas.

F. OVERVIEW OF FUTURE WASTEWATER SERVICES

The Township of Alloway has identified the future sewer service area necessary to implement a portion of the goals and objectives of the Township's Master Plan. Those areas have been reduced to account for the environmental constraints pertaining to wetlands, the habitats of Threatened and Endangered Species, Riparian Corridors, and FW-2 Waters. The proposed Sewer Service Area is identified on Map No.3.

The proposed future sewer service areas delineated on Map No.3 consist of proposed future areas outside the existing sewer service area. The remaining areas, not designated as a sewer service area will continue to be serviced by Individual subsurface sewage disposal systems (ISSDS's) with wastewater flows less than or equal to 2,000 gpd.

Based on the environmental, and local land use planning objectives discussed above, Map No.2 and Map No.3 identify areas presently served by public sewers and the areas planned to be served by public sewers in the future. These maps also identify sites that are served by an on-site treatment works, if applicable, that are regulated under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit. Each sewer service area is keyed to a specific sewage treatment plant which is the facility authorized under this plan to accept and treat wastewater from that sewer service area. Each sewage treatment plant identified in this plan has an accompanying facility table that provides information concerning that facility's owner, operator, permitted flow, existing flow, remaining permitted flow, and projected build-out flow summarized by municipality.

Based on the build-out analysis of each sewer service area and the existing permitted capacity of the sewage treatment plant identified in this plan, sufficient wastewater treatment capacity exists to accommodate the currently proposed Sewer Service Area. Future expansion of the identified treatment works serving the municipality is not required to meet the future wastewater generation needs of the municipality.

G. SUMMARY OF SIGNIFICANT ACTIONS

Amendments to the Water Quality Management Planning Rules adopted on July 7, 2008, 40 N.J.R. 4000(a), necessitated a modification to certain sewer service areas based on environmental sensitivity and local planning objectives as described in this document. In accordance with the regulatory requirements, undeveloped lands within the existing sewer service area have been removed based on the limits of environmental constrained areas. In addition, areas have been added based on local planning objectives and an environmental sensitivity assessment. Maps No.2 and No.3 reflect the changes in sewer service area as a result of this wastewater management plan.

1. All areas not proposed to be included within the sewer service area in this WMP will be served by ISSDS's with 2,000 gpd or less flows.

II. EXISTING INFRASTRUCTURE AND TREATMENT FACILITIES

A. Existing Areas Served by Wastewater Facilities

Map No.2 depicts the areas actively served by existing wastewater facilities, and the facilities tables in Chapter 7 (VII) provide detailed information on each facility. As with sewer service, the term “actively served” means that the collection lines exist and that the property either is connected or has all regulatory approvals necessary to be connected.

B. MAJOR TRANSMISSION PIPING AND PUMPING STATIONS

Alloway Township owns and operates a series of pump stations, vacuum sewer collection mains, and force mains used to convey wastewater flow to the Salem City STP. The system is owned and maintained by the Township of Alloway. There are approximately 3.9 miles of vacuum sewer mains with pipes ranging in size from 4 to 10 inches in diameter. The Authority currently owns and operates one (1) pump station located on E Main Street. All flow is conveyed to the Salem City STP for treatment.

C. EXISTING ON-SITE, NON-INDUSTRIAL WASTEWATER FACILITIES

These facilities serve single developments, sites or other properties under single ownership, but do not treat industrial flows. These facilities typically provide wastewater treatment for apartment complexes, commercial properties and businesses where regional sewerage is not available. Table 2.C.1 lists all existing on-site, non-industrial treatment facilities that discharge 2,000 gallons per day or more of domestic wastewater and are regulated under a NJPDES permit. The Wastewater Facilities Tables provided in Chapter 7 (VII) list all existing on-site, non-industrial treatment facilities that discharge 2,000 gallons per day or more of domestic wastewater and are regulated under a NJPDES permit.

Municipal Map Designation	Facility Name	NJPDES Permit Number	Discharge Type (Groundwater or Surface Water)	Facility Table Number
1	Alloway Township Landfill - (Closed)	NJ0054283	GWIND	1
2	Salem County Solid Waste Facility	NJ0102113	GWIND	2
3	Yogi Bear Jellystone @ Tall Pines Resort	NJG0086959	T1	3
4	Roosevelt Scout Reservation	NJG0088781	T1	4

D. EXISTING INDUSTRIAL WASTEWATER FACILITIES

Some industrial land uses have independent wastewater treatment facilities that treat and discharge manufacturing process waste or sanitary sewage, rather than other types of effluent such as non-contact cooling water. They may be discharged to ground water or to surface water. The Wastewater Facilities Tables provided in Chapter 7 (VII) list all existing industrial treatment facilities that discharge 2,000 gallons per day or more of domestic wastewater and are regulated under a NJPDES permit. However, Alloway Township does not contain any industrial wastewater treatment facilities.

E. GENERAL WASTEWATER MANAGEMENT AREAS FOR SEPTIC SYSTEMS

Generally, the remaining areas of the Municipality, not otherwise designated as service areas for treatment facilities requiring a NJPDES permit, are included within a general wastewater management area for septic systems and other small treatment works that treat less than 2,000 gallons per day of wastewater and discharge to ground water.

F. EXISTING WASTEWATER FLOWS

The existing wastewater flows conveyed to the Salem City STP were calculated based on flows metered by the Salem City Water and Sewer Department. The present average annual wastewater contributed by Alloway to the plant for 2010 is 0.016mgd. The present average flow includes residential and commercial flows as well as an I/I component.

Alloway Township executed an inter-local service agreement with the City of Salem on December 17, 2001. The intent of the agreement was to allocate 64,200 gpd of sanitary sewer capacity from the Salem City Sewerage Treatment Plant to Alloway Township for proposed development.

The following Table 2.F.1 summarizes the permitted capacity and associated average daily flows of 2010 for the wastewater treatment plants serving Alloway Township.

WWTP	Allocated Capacity (mgd)	Average Daily Flow 2010 (mgd)	Build-Out Projection (mgd)	Total (mgd)	Remaining Capacity (mgd)
Salem WWTP	0.0642	0.016	0.034	0.05	0.0142

The flows from these connections are identified within the specific municipal chapter or facilities tables provided within Chapter 7 (VII) of this report. Monthly wastewater flow data specific to Alloway Township are identified for 2010 in Table 2.F.2 below. Based upon the above analysis, Alloway Township has sufficient capacity to support the proposed sewer service area.

Table 2.F.2: Existing Wastewater Flows	
Month	Monthly Avg. Flow to Salem City STP (mgd)
Jan-10	0.0051
Feb-10	0.0056
Mar-10	0.0058
Apr-10	0.0169
May-10	0.0113
Jun-10	0.0089
Jul-10	0.0193
Aug-10	0.0197
Sep-10	0.0189
Oct-10	0.0276
Nov-10	0.0259
Dec-10	0.0249
Yearly Average	0.016

G. Existing Wastewater Treatment

Alloway Township does not own a wastewater treatment plant, or any treatment infrastructure associated with treating the wastewater from Township’s collection system. All flow is pumped via force main to the Salem City Sewerage Treatment Plant. Specific information on the Salem City STP is provided in Salem City municipal chapter.

H. Existing Public Water Supply Infrastructure

The Township of Alloway does not own or operate a public water supply system, nor does it own water supply infrastructure. Developments are presently served by privately owned wells and systems. Map No.1 depicts the areas actively served by existing public water supply facilities. As with sewer service, “actively served” means that the distribution lines exist and that the property either is connected or has all regulatory approvals necessary to be connected with no further review.

I. Existing Public Water Supply Allocation and Daily Demands

This Section is not applicable as Alloway Township does not own or operate any public community water supply facilities, water treatment plants, potable water wells or distribution mains.

III. ENVIRONMENTAL AND OTHER LAND FEATURES

A full description of the mapping of environmental features for the County can be found in **Chapter I** of this report. This section includes a summary of the environmental features and public open space for the municipality that were taken into account when preparing the mapping. These features are significant to wastewater management planning for three reasons: they may influence the delineation of sewer service areas, they may reduce the potential future wastewater generation due to existing regulatory programs, or they may be subject to federal grant limitations that prohibit the extension of sewer service into these areas. Some of this mapping has been used in the development of a map of environmentally sensitive areas where the extension of sewer service areas is restricted (see **Delineation of Sewer Service Areas**, below).

Development in areas mapped as wetlands, flood prone areas, designated river areas, or other environmentally sensitive areas may be subject to special regulation under Federal or State statutes or rules. Interested persons should check with the Department of Environmental Protection for the latest information. Depiction of environmental features is for general information purposes only, and shall not be construed to define the legal geographic jurisdiction of such statutes or rules.

The following environmental features have been identified within the County map set:

- A.** Surface Waters and Classifications—Refer to Map No.5A of County map set
- B.** Riparian Zones -- Refer to Map No.5C of County map set
- C.** Flood Prone Areas – Refer to Map No.5A of County map set
- D.** Freshwater Wetlands -- Refer to Map No.5B of County map set
- E.** Coastal Wetlands –Refer to Maps 5A and 5B of County map set
- F.** Public Open Space and Recreation Areas –Refer to Map No.5B of County map set
- G.** Preserved Agricultural Areas and Other Conservation Easements on Private Lands – Refer to Map No.5C of County map set
- H.** Suitable Habitat for Threatened and Endangered Species – Refer to Maps 5B and 5C
- I.** Natural Heritage Priority Sites –Refer to Map No.5C of County map set

IV. DELINATION OF SEWER SERVICE AREAS AND PLANNING INTEGRATION

The results of the environmental analyses, summarized in Section III above, provide justification for the established service area delineations by demonstrating consistency with all applicable NJDEP requirements and criteria. This WMP chapter provides the most current planning efforts within the municipalities WMP planning area.

The WQMP rules at NJAC 7:15-5.22 require coordination with and solicitation of comments or consent from certain agencies, entities and plans, and consistency with other plans. These requirements are addressed in the Chapter 1, Salem County Summary within this document.

This chapter provides the method used to delineate future sewer service areas based on the mapping of significant environmentally sensitive areas, and consistency with other regional plans.

A. Environmentally Sensitive Areas Map

Under the Water Quality Management Planning Rules, large contiguous environmentally sensitive areas, generally defined as 25 acres or greater in size should be excluded from sewer service areas except under certain circumstances such as providing service to development that has already secured prior approvals or center based development approved by the Department of Environmental Protection through the Plan Endorsement process. Maps 5A, 5B and 5C, of the County map set, reflect the final results for the mapping of environmentally sensitive areas, based on the information described above and the WQMP rules. These maps were created using the following process:

1. Identify areas (to the extent that GIS interpretations are available) where pre-existing grant conditions and requirements (from Federal and State grants or loans for sewerage facilities) provide for restriction of sewer service to environmentally sensitive areas, and then delete areas (if any) where a map revision or grant waiver has been approved by USEPA. Note: pre-existing grant conditions and requirements (from Federal and State grants or loans for sewerage facilities) which provide for restriction of sewer service to environmentally sensitive areas are unaffected by adoption of this WMP and compliance is required.
2. Merge the GIS layers for wetlands, Category One riparian zones, Natural Heritage Priority Sites, and Threatened and Endangered Species habitats, and any others used by the County areas into a single composite GIS coverage.
3. Correct the composite areas by eliminating areas designated as urban in the most recent land use land cover layer (2002) to address land use/land cover modifications that have occurred since the environmental feature layers were prepared.
4. Identify and delete any composite areas less than 25 acres in size from the map of environmentally constrained areas. The resulting map shows the final environmentally sensitive areas, which is used to eliminate the potential for sewer service areas except where sewer service already exists, or exceptions are allowed for infill development or approved endorsed plans. It is noted for public information purposes that the excluded areas will be protected through other NJDEP regulatory programs such as the Flood Hazard Area Control Act and Freshwater Wetlands Act rules, and may be protected by municipal ordinances as well.

B. Sewer Service Areas in Environmentally Sensitive Areas

The WQMP rules allow for inclusion of environmentally sensitive areas under limited conditions. The following modifications were considered for the WMP:

1. Where a development has secured approval under the Municipal Land Use Law and possesses a valid wastewater approval, the site may be included in the sewer service area if consistent with that valid wastewater approval. This information was gathered in consultation with municipalities.
2. Where a project has an approved site-specific water quality management plan and wastewater management plan amendment from the Department the project may be included in the wastewater management plan consistent with that approved site specific amendment for a period of six years from the date the amendment was adopted. The general locations of these developments are indicated on Map No.3, if applicable, and are keyed to a list of qualifying developments in each municipal chapter.
3. Where environmentally sensitive areas are bordered on either side by areas with existing sewer service, and where the infill development would generate 2,000 gpd or less of sewage based on existing zoning and where the area to be included does not include habitat critical to the recovery potential or the survival of a local population of an endangered or threatened species.
4. Where sewer service is necessary to support for center based development under an “endorsed plan” (through the State Planning Commission relative to the State Development and Redevelopment Plan) and would not remove habitat critical to endangered or threatened species. Where such modifications have been made, they are noted in the individual municipal chapters.
5. Where necessary to create a linear boundary that related to recognizable geographic features and would not remove habitat critical to the recovery potential or the survival of a local population of an endangered or threatened species. Where necessary to create a linear boundary that related to recognizable geographic features and would not remove habitat critical to the recovery potential or the survival of a local population of an endangered or threatened species.

C. Exceptions to the Use of Geographic or Political Boundaries

The existing Sewer Service Area boundary was derived from existing sanitary sewer infrastructure currently constructed or approved. These boundaries hold tightly to the geographical boundary of the municipality. No exceptions were made for the delineations used in this WMP. Environmentally constrained areas that were identified through the process have been removed within the sewer service area boundary, where applicable.

D. Environmentally Sensitive Areas – Data Sources

The information described above with regard to the mapping of proposed sewer service areas and Environmentally Sensitive Areas was obtained from various sources. Table 4.D.1 below highlights the information and sources used to delineate environmentally constrained areas.

Category	Source	Source Location	Original Date	Date Last Revised
Wetlands	NJDEP	www.state.nj.us/dep/gis	11/9/99	
Floodplains	FEMA	www.msc.fema.gov/webmap/wcs	1/9/03	
Stream Corridors	NJDEP	www.state.nj.us/dep/gis	8/1/08	12/1/10
Threatened & Endangered Species	NJDEP	www.njfishandwildlife.com	11/1/09	2/13/09
Parks, Preserves, & Open Space	Green Acres Recreation Program & NJDEP	www.state.nj.us/dep/gis	2/13/09	
Preserved Agricultural Lands	NJ SADC	www.nj.gov/agriculture/sadc	1/25/11	
Surface Water Quality Standards	NJDEP	www.state.nj.us/dep/gis	10/1/07	1/19/11
National Heritage Priority Sites	NJDEP	www.state.nj.us/dep/gis	2/13/09	
Zoning	Municipality	Current Master Plan	N/A	8/1/10

V. FUTURE WASTEWATER DEMAND AND FACILITIES

Proposed future sanitary sewer flows conveyed to the Salem City WWTP projected under build-out conditions were evaluated based on two sets of data; sanitary flows projected within the existing sewer service area and proposed flows for the future sewer service area. Future flows within the existing sewer service area utilize a “parcel based” method for calculating the flows of infill development. Whereas, future sanitary flows within the expanded sewer service area utilize a “zoning based” method for calculating the build-out. The build-out data is then converted to a projected future wastewater flow by applying the planning flow criteria from N.J.A.C. 7:14A based on the type of development projected.

All projected flows were separated into residential, commercial, and industrial components. Total projected build-out flow for residential, commercial and industrial development was determined based on the available developable land and current zoning ordinances for the municipality within areas proposed as the future sewer service area. Environmental constraints with required buffers were also considered and indicated within the Mapping section of this report.

For example, single-family residential development is assumed to consist of houses having three or more bedrooms per house, and each projected new house is multiplied by 300 gallons per day to predict the future wastewater generated. For non-residential land uses the anticipated floor area is multiplied by 0.1 gallon per day to predict future wastewater generation. A more detailed explanation of build-out flow calculations and criteria used is provided in the tables below.

The build out in the non-sewer service area was calculated by applying the zoning over all undeveloped land except polygons too small to support additional development. The number of residential units and non-residential floor area were then multiplied by the wastewater planning flow estimates in either N.J.A.C. 7:14A or 7:9A as appropriate.

The build out method used for the wastewater demand was also used to predict future water supply demand, except that the flow multiplier used to predict future water supply demand is slightly higher than that used for wastewater demand. The results of the analysis are presented within this chapter and in the facilities tables found in the appendices at the end of this document.

A. Conformance and Nonconformance with Zoning and Prior Land Use Approvals

Where the WMP build out deviates from either current zoning or prior land use approvals, such deviation and the reasons for the deviation are explained in this chapter

B. Municipal Zoning and Composite Zoning

The municipal zoning information provided below is specific to this chapter. Because municipal zoning ordinances are not uniform in their nomenclature or definitions, a composite zoning map has not been developed. Table 5.B.1 below identifies the zoning specific to this chapter and was been utilized for the associated build-out analyses.

“SSA Developable Area” includes both undeveloped and underdeveloped parcels within the proposed sewer service area. “Undeveloped” parcels are those where no development exists and the land has not been restricted from development through dedicated open space or agricultural preservation programs. “Underdeveloped” parcels are those where some level of development exists, but at a density less than allowed by zoning and where deed restrictions do not prevent further development.

Zone Name	Zone Description	Municipal Area (ac)	SSA Developable Area (ac)
A	AGRICUTURAL	6,330.5	0.0
C	COMMERCIAL	44.4	4.6
HP	HIGH PUBLIC	44.3	0.0
HR	HIGH RESIDENTIAL	333.4	41.2
LR	LOW RESIDENTIAL	8,179.8	81.5
MR	MEDIUM RESIDENTIAL	164.4	19.0
P	PUBLIC	3.4	0.0
RR	RURAL RESIDENTIAL	6,646.8	75.6

C. Calculating Future Wastewater and Water Supply Needs and Capacity

Using the municipal information provided above regarding existing wastewater and water supply facilities, sewer service area delineation, environmentally sensitive areas, and municipal zoning to project build-out or 20 year growth projections for the listed urban municipalities, an analysis of wastewater and water supply demands was performed to determine whether existing infrastructure capacity or zoning is a constraining factor.

There are two methods used for projecting future wastewater management needs: a 20-year projection for urban municipalities or a build out based on existing zoning for non-urban municipalities. An urban municipality is defined as those municipalities where less than 10 percent of the total land area of the municipality is “available land for development” after subtracting out permanently preserved open space.

D. Municipal Demand Projections in Urban Municipalities

The Township of Alloway does not meet the definition of an urban municipality as defined above. Consequently, future wastewater build out projections are based on existing zoning identified below.

E. Municipal Demand Projections in Non-urban Municipalities

Development of vacant land will be the predominant factor in determining future wastewater treatment needs. Further, because external market and economic forces, such as interest rates, are a dominant factor in determining the rate of construction, this analysis assesses the ability to provide wastewater treatment while protecting surface and ground water quality for the entire projected build out allowable by zoning. There are two separate methods employed for calculating future wastewater generation at build out, based on the wastewater service area designation.

1. Future Wastewater from Non-Urban Municipalities' Sewer Service Areas

In designated sewer service areas the following features have been removed prior to the application of zoning to the undeveloped land area because they are unlikely to generate wastewater in the future: wetlands, riparian zones, permanently preserved farmland, permanently preserved open space, steep slopes, floodplains, and cemeteries. The existing zoning is then applied to the remaining developable land area within the sewer service area(s) to project a build out condition for use in estimating the future wastewater management needs of each sewer service area. Build out data for each municipality has been provided on a compact disk (cd) for reference.

Proposed future sanitary sewer flows to be conveyed to the Salem City WWTP projected under build-out conditions were evaluated based on two sets of data; sanitary flows projected within the existing sewer service area and proposed flows for the expanded sewer service area. Future flows within the existing sewer service area utilize a “parcel based” method for calculating the flows of infill development. Whereas, future sanitary flows within the expanded sewer service area utilize a “zoning based” method for calculating the build-out. The build out data is then converted to a projected future wastewater flow by applying the planning flow criteria from N.J.A.C. 7:14A based on the type of development projected.

All projected flows were separated into residential, commercial, and industrial components. Total projected build-out flow for residential, commercial and industrial development was determined based on the available developable land and current zoning ordinances for the municipality within areas proposed as the future sewer service area. Environmental constraints were also considered and indicated within the Mapping section of this report.

For example, single-family residential development is assumed to consist of houses having three or more bedrooms per house, and each projected new house is multiplied by 300 gallons per day to predict the future wastewater generated. For non-residential land uses the anticipated floor area is multiplied by 0.1 gallon per day to predict future wastewater generation. A more detailed explanation of build-out flow calculations and criteria used is provided in the tables below.

The Township of Alloway's sewer service area extends as defined on Map No.3. Consequently, infill development has been identified by utilizing a parcel based build-out approach as defined below. The zoning based analysis was not required for this municipality.

2. Existing Sewer Service Area Build Out Analysis

The build-out of the existing sewer service area consisted of evaluating residential, commercial and industrial flow projections to the extent of development that could occur according to applicable zoning in developable areas. The projections are based on the potential for development of existing infill lots within areas zoned for each use and the most current land use regulations for the municipality. Generally, infill development of the existing sewer service area was prepared utilizing a “parcel based” build out approach.

The total number of potential units within each residential, commercial and industrial district was then multiplied by the maximum percent building coverage specified in the zoning ordinances to reach a maximum building area at build-out. Residential flows were projected assuming 300gpd / dwelling unit. Commercial and industrial flows were projected assuming 0.1 GPD/sq.ft. of building area.

Table 5.E.2.1 summarizes the build-out flow projections for the existing sewer service area. In addition, the table reflects a breakdown of the acreage of land available for development (i.e., either undeveloped or underdeveloped, and not constrained due to environmentally sensitive areas) within each general zone of the municipality, based on the build-out analysis.

Zone	Developable Acres	Potential Units	Average Daily Flow (GPD)	Total ADF (GPD)
	<i>See Note (a)</i>	<i>See Note (b)</i>	<i>See Note (c)</i>	<i>See Note (d)</i>
HR	4.68	3.00	300	900
MR	4.00	8.00	300	2,400
RR	30.45	7.00	300	2,100
TOTAL				5,400 gpd (0.005 mgd)

The notes referenced below are indicated in the above table.

Notes:

(a) “Developable Acres” represents the available acreage per zone of the entire municipality in accordance with the current Alloway Township Master Plan.

(b) “Potential Units” represent the number of remaining units that may be constructed within each zone within the existing sewer service area.

(c) Average Daily Flow has been calculated based on current NJDEP regulations.

- Residential Zones RR, MR, and HR Average Daily Flow Based on 300 GPD established for 3 or more bedroom dwellings

(d) Total ADF represents the calculated potential build-out within the existing sewer service area. Individual parcels with less than the minimum lot size for each zone have not been assessed an ADF. value.

3. Future Sewer Service Area Buildout Analysis

Generally, the future sewer service area build out is prepared utilizing a “zoning based” build out approach. The build-out of future sewer service areas typically consists of evaluating residential, commercial and industrial flow projections to the extent of development that could occur according to applicable zoning in developable areas, which are outside of the existing SSA.

Zone	Developable Acres	Potential Units	Average Daily Flow (GPD)	Total ADF (GPD)
	<i>See Note (a)</i>	<i>See Note (b)</i>	<i>See Note (c)</i>	<i>See Note (d)</i>
C	5.58	14.00	360	5,040
HR	42.52	30.00	300	9,000
LR	90.51	20.00	300	6,000
MR	15.03	23.00	300	6,900
RR	58.03	7.00	300	2,100
TOTAL				29,040 gpd
				0.029 mgd

The notes referenced below are indicated in the above table.

Notes:

- (a) “Developable Acres” represents the available acreage per zone of the entire municipality in accordance with the current Alloway Township Master Plan.
- (b) “Potential Units” represent the number of remaining units that may be constructed within each zone within the existing sewer service area.
- (c) Average Daily Flow has been calculated based on current NJDEP regulations.
 - Residential Zones HR, LR, MR, RR Average Daily Flow Based on 300 GPD established for 3 or more bedroom dwellings
 - Commercial Zone C, Average Daily Flow Based on 0.1 gal/SF established for Offices and Industry (30% coverage of 12,000 or 3,600sf)
- (d) TOTAL ADF represents the remaining potential build-out within the existing sewer service area. Individual parcels with less than the minimum lot size for each zone have not been assessed an average daily flow value.

F. Future Wastewater Outside of Sewer Service Areas

Generally, the default wastewater management alternative to support development in areas that are not designated as sewer service area is discharge to groundwater less than 2,000 gallons per day. A nitrate dilution analysis for septic systems is typically performed, in similar fashion to that conducted for sewer service areas, except that environmentally sensitive areas are not removed prior to performing the build out analysis. The intent of this analysis is to assess the available dilution on a HUC 11 basis used to establish the maximum number of units that can be built in a watershed and continue to meet the regulatory nitrate target.

This analysis used NJDEP’s nitrate-nitrogen target of 2 mg/L, with the assumption that all ammonium and other nitrogen compounds are converted to nitrate within the property, and that the nitrate concentrations dilute evenly across the HUC11. These assumptions are implicit in the nitrate dilution model developed by NJDEP. The County ran the analysis using annual average recharge (provided in the GSR-32 model).

Table 5-F-1 summarizes the number of residential units and commercial square footage that could potentially generate wastewater per zone within each HUC11, outside the sewer service area, within the municipality.

Table 5.F.1: HUC-11 BUILDOUT (Based on Existing Zoning)				
HUC11	Zoning	Total Acres	Residential (Units)	Commercial (SF)
02040206040	RR	1,092.43	360.50	0.00
	TOTALS	1,092.43	360.50	0.00
02040206060	AR	2,239.11	2,239.11	0.00
	C	7.46	0.00	97,495.92
	HR	148.64	148.64	0.00
	LR	4,356.65	2,178.32	0.00
	MR	4.26	10.32	0.00
	RR	2,499.82	824.94	0.00
	TOTALS		9,255.94	5,401.33
02040206070	LR	214.11	107.05	0.00
	TOTALS	214.11	107.05	0.00
02040206080	A	3,053.72	3,053.72	0.00
	LR	950.88	475.44	0.00
	TOTALS	4,004.60	3,529.16	0.00

The wastewater summary projections presented above for areas outside the SSA were prepared on behalf of the County of Salem by Fralinger Engineering in accordance with the Wastewater Estimation tool provided by the Department.

The Wastewater Estimation model builder was provided to assist with the preparation of a countywide Wastewater Management Plan consistent with the Water Quality Management Planning rule (N.J.A.C. 7:15). The application of this tool is specific to the estimation of new Wastewater Flows within Sewer Service Areas and to compare existing zoning to HUC 11 Nitrate Dilution Septic Densities. In addition, it compares new development potential, based on local zoning, to regional septic density standards for those areas outside of sewer service area. The nitrate dilution standards of

the Water Quality Management Planning rule result in a "septic density" for each watershed in the State. This septic density identifies the maximum *comparable residential zoning density* that meets the groundwater quality goal.

The Wastewater Estimation model builder uses results from a separate nitrate dilution model designed by New Jersey Geological Survey to estimate septic densities. This separate model is titled: *A Recharge-Based HUC 11-Scale Nitrate-Carrying-Capacity Planning Tool for New Jersey, v1.0 (MS Excel Workbook)*. The method presented here combines a model of nitrate dilution (based on Trela and Douglas, 1978) with one of ground-water recharge on a HUC11 basis (based on Charles and others, 2003).

The goal of this HUC11-scale planning exercise to estimate the number of residential and commercial units within each HUC 11 on a municipal basis. The number of units that could be built under the existing zoning is compared to the allowable number of residential and commercial units in an effort to ensure that the current nitrate dilution standards can be satisfied. This method is intended to be a guide for estimating the impact of nitrate from septic tanks on HUC11-scale ground-water quality. This analysis scale is at a regional watershed level. Other, more specific, methods may be required to further detail impacts to the zoning of each municipality.

To further develop this tool, The County provided additional customization to the application. The information depicted within this application was provided by the Department as a resource in the development of a GIS Model Builder Application tool for Counties/Municipalities. The information depicts regional overlays, which are not site specific.

The condition of any area appearing suitable for an intended use must be assessed by a comprehensive, due diligence investigation of several factors, including but not limited to a Natural Resource Inventory, physical on-site conditions, local, State and Federal requirements, approvals, status of any outstanding violation, the past uses and possible residual contamination of a site. NJDEP Land Use/ Land Cover and 2002 aerial photographs were utilized as the base layers.

The method/data generated by the Wastewater Estimation model builder has specific limitations within the application, as identified by the Department. As a result of these limitations, the current output of this GIS tool can only be qualified as an initial screen of current field conditions per County/ Municipality. Any other representation of generated results from this tool is not an accurate depiction of development potential and will be deemed to be a misrepresentation. Further customization of the application was performed at the municipal level, by the County, as identified above. However, more specific, methods will be required to further detail impacts to the zoning of each municipality.

VI. ANALYSIS OF CAPACITY TO MEET FUTURE WASTEWATER NEEDS

This section of the wastewater management plan analyzes whether there is sufficient wastewater treatment capacity to meet the needs of the Municipality based on the projections described above. For sewer service areas this requires a comparison of the projected future demand to the existing capacity of the sewage treatment plant.

A. Adequacy of Sewage Treatment Plant Capacity

Table 6.A.1 provides a comparison of existing Salem City wastewater treatment capacity with existing and future flow demands within the municipality. The final column determines whether additional capacity is available and can be obtained through an amendment to the existing agreement between Alloway Township and the City of Salem. Details of the projections are included within the appendices and municipal chapters, which also address any needs for new or expanded treatment facility discharges.

Treatment Works	Permit No.	Current Treatment Capacity (mgd)	Average Daily Flows 2010 (mgd)		Existing SSA Build-Out Projection (mgd)	Proposed SSA Build-Out Projection (mgd)	Remaining Treatment Capacity (mgd) <i>Note (a)</i>
			Alloway Township	Entire System (Salem WWTP)			
Salem WWTP	NJ0024856	1.4	0.016	0.696	0.005	0.029	0.670

Note (a): The remaining capacity identified above reflects the current available surplus of the Salem City WWTP. The capacity analysis is further defined within the Salem City municipal chapter of this report.

Alloway Township executed an interlocal service agreement with the City of Salem on December 17, 2001. The intent of the agreement was to allocate 64,200 gpd of sanitary sewer capacity from the Salem City Sewerage Treatment Plant to Quinton Township for proposed development. The current average daily flows of 0.016 mgd and proposed build-out of 0.034 mgd require an available capacity of 0.050 mgd to support development for the currently proposed WMP.

The total allocated treatment capacity for the sanitary sewer system that serves the municipality (0.0642 mgd) is greater than the projected flows necessary to support the combination of existing demands, proposed development within the sewer service area, and proposed development within the expanded sewer service area (0.050 mgd). The calculations were based on the existing build-out projections, proposed build-out projections, and average daily flow values utilized within the regulations for each type of development. Based on the analysis presented above, Alloway Township has sufficient wastewater treatment capacity exists to accommodate the currently proposed Sewer Service Area.

It should be noted that in the event that additional capacity is needed in the future, City of Salem currently has surplus capacity available to accommodate an expanded sewer service area. This would require an amendment to the existing interlocal service agreement.

B. ANALYSIS AND SELECTION OF TREATMENT ALTERNATIVES

This section is not applicable to this municipality, as sufficient capacity currently exists to address the future wastewater management needs projected by the plan.

C. ANTIDEGRADATION ANALYSIS FOR NEW AND EXPANDED DOMESTIC TREATMENT WORKS

This section is not applicable to this municipality as new or expanded wastewater facilities are not being proposed at this time.

D. Discharges to Ground Water

The number of units allowed by zoning exceeds that which can be supported in a particular watershed. The Municipality is currently reviewing the results of the dilution analysis in an effort to determine what zoning adjustments may be appropriate to meet both the regulatory requirements and the development objectives of the municipality. The method/data generated by the Wastewater Estimation model builder has specific limitations within this application, as identified above. Consequently, this initial step does not provide sufficient data or an accurate depiction of development potential for the municipality. The Municipality will need to apply more specific methods of analysis prior to making adjustments to the current zoning.

E. Adequacy of dilution to meet future non-sewer service area demand

The Wastewater Estimation model builder was utilized to compare existing zoning to the available nitrate dilution within each HUC11. The HUC11 analysis was performed for each municipality independently. The available land use within each HUC was proportioned based upon the total number of acres located within the municipal boundary. Consequently, distributing the total number of allowable units among municipalities, within a given HUC11, was not necessary as the land area used for the analysis had already been proportioned. When determining the number of potential units, based on zoning, permanently preserved open space was removed from the potential buildout. Conversely, the number of allowable units, based on available dilution capacity within each HUC, utilized permanently preserved open space areas.

Table 6-E-1 below summarizes the allowable number of residential units and commercial square footage that could be developed by the municipality outside the wastewater service area, while maintaining a target concentration of nitrate in groundwater.

Table 6.E.1: HUC-11 BUILDOUT CAPACITY / DENSITY				
HUC11	Zoning	Total Acres	Residential (Units)	Commercial (SF)
02040206040	RR	1,092.43	143.74	0.00
	TOTALS	1,092.43	143.74	0.00
02040206060	AR	2,239.11	306.73	0.00
	C	7.46	1.02	4,088.03
	HR	148.64	20.36	0.00
	LR	4,356.65	596.80	0.00
	MR	4.26	0.58	0.00
	RR	2,499.82	342.44	0.00
	TOTALS	9,255.94	1,267.94	4,088.03
02040206070	LR	214.11	31.96	0.00
	TOTALS	214.11	31.96	0.00
02040206080	A	3,053.72	436.25	0.00
	LR	950.88	135.84	0.00
	TOTALS	4,004.60	572.09	0.00

The following Table 6-E-2 summarizes the results of the nitrate dilution capacity analysis. The table reflects the differences between the potential number of residential units and commercial square footage that could be projected by the municipality outside the wastewater service area and number of allowable units necessary to maintain a target concentration of nitrate in groundwater.

TABLE-6-E-2: HUC11 Dilution Analysis Summary- Potential Development and Available Dilution						
HUC11	Total Acres	Residential Buildout (Units)	Residential Capacity (Units)	Commercial Buildout (SF)	Commercial Capacity (SF)	
02040206040						
TOTALS	1,092.43	360.50	143.74	0.00	0.00	
02040206060						
TOTALS	9,255.94	5,401.33	1,267.94	97,495.92	4,088.03	
02040206070						
TOTALS	214.11	107.05	31.96	0.00	0.00	
02040206080						
TOTALS	4,004.60	3,529.16	572.09	0.00	0.00	

The comparison of analyses shows that a build-out based on zoning would result in much more development than can actually be sustained to achieve adequate nitrate dilution. Therefore, the build-out based on the nitrate dilution analysis should be used in future planning. In addition, the current septic densities for the HUC-11's in Alloway Township are also expected to be much lower than required to achieve adequate nitrate dilution, when compared to the results of the nitrate dilution analysis.

The nitrate dilution analysis prepared for the Water Quality Management Plan results in the number of residential units and commercial square footage allowable for each for each watershed within the Municipality. *The method/data generated by the Wastewater Estimation model builder has specific limitations within the application*, as previously indicated above. As a result of these limitations, the current output of this GIS tool can only be qualified as an initial screen of current field conditions per County/Municipality.

VII. FUTURE WATER SUPPLY AVAILABILITY

The purpose of the Depletive/Consumptive Water Use Analysis is to determine if there is sufficient water supply to serve the proposed development of the municipality. The analysis should compare the build out water supply need with the existing permitted water allocation. To complete the objective of this analysis, water allocation and drinking water within the existing sewer service area are compared. A build-out projection of the proposed sewer service area is then prepared to determine the additional water demands that may result. Finally, the demands are compared to the water allocation to verify whether sufficient water supply exists to serve the proposed development.

A. SUFFICIENCY OF WATER SUPPLY

Alloway Township does not own or operate any public potable water supply wells or distribution mains. The Township is currently supplied by individual private water wells. Extension of the Salem City water distribution system to Alloway Township is not planned. Future development within the Township will continue to be supplied by individual water wells.

VIII. MAPPING REQUIREMENTS

A. Basis for Service Area Delineations

The results of the required environmental analyses, summarized in Section III and the delineation of the sewer service areas identified in section IV above provide justification for the established service area delineations by demonstrating consistency with all applicable NJDEP requirements and criteria. The Salem WMP provides the most current planning efforts within the Sewer Service Area.

The Alloway Township proposed Sewer Service Area encompasses the future sewer service area necessary to implement the goals and objectives of the municipality. Those areas have been reduced to account for the buffer requirements regarding wetlands, the habitats of Threatened and Endangered Species and Riparian Corridors.

The proposed Alloway Township Sewer Service Area does not contain any areas located within the Pinelands. Areas located within the watershed of a Fresh Water One (FWI) stream, as classified in the Surface Water Quality Standards, and/or that have Class I-A ground water (Ground Water of Special Ecological Significance), as classified in the Ground Water Quality Standards, are identified as "Non-degradation water areas based on the Surface Water Quality Standards at N.J.A.C. 7:9B, and/or the Ground Water Quality Standards at N.J.A.C. 7:9-6." Areas so designated are included on Map No.3. Non-degradation water areas shall be maintained in their natural state (set aside for posterity) and are subject to restrictions.

B. Mapping Classification

The mapping for this municipal chapter of the WMP was created by using available data from NJDEP, online GIS data sets and has been prepared in accordance with NJDEP WMP guidelines. The maps included within this submission reflect the requirements for preparing a Water Quality Management Plan Amendment. Five (5) maps with specific features have been provided. Supplemental maps have been included to clarify information in an effort to clearly depict the required information. Each map has been provided with a complete and readily understandable legend. All 24" x 36" maps have been developed using New Jersey Department of Environmental Protection Geographic Information System digital data at a scale of 1" = 2,000'. Additional 11" x 17" maps have been provided within each report for convenience. The maps are classified below:

1. MAP NO.1: WMP MUNICIPAL MAP/WATER INFRASTRUCTURE

The map depicts the municipal boundary as well as the potable water infrastructure, if applicable. The map also includes HUC-11's, and existing water service infrastructure. Map No.1 shows areas of the municipality that lay within the Hackensack Meadowlands District, Pinelands Areas, Pinelands National Reserves, or franchise areas.

2. Map No.2: Existing Facilities & Service Areas

The map depicts the existing wastewater service area. This map also identifies the present extent of actual sewer infrastructure within the municipal boundary of Alloway Township, including all sewer department buildings, existing NJPDES facility (WWTP) locations, pump stations, force mains, and gravity sewers. All areas outside the existing sewer service area are served by ISSDS with wastewater planning flows of less than or equal to 2,000 gpd.

3. Map No.3: Proposed Facilities & Service Areas

The map illustrates the wastewater service areas, non-degradation areas, pumping stations, major interceptors and trunk lines, which are proposed to exist in the future. The boundaries of future service areas coincide with recognizable geographic or political features (i.e., roads, lot lines, zoning area boundaries, water bodies). The proposed future infrastructure and facilities are also depicted on the map. The existing infrastructure and facilities from Map No.2 are also included in this map.

4. Map No.4: Alloway Township Zoning Map

The map depicts the current zoning of Alloway Township. The zoned minimum lot acreage for Commercial, Industrial and Residential areas within the WMP proposed Sewer Service Area indicated in Table 8.B.4.1 below were utilized to determine calculated flows within the future sewer service area.

Table 8.B.4.1: Zoning Regulations									
Zone	Zone Title		Minimum Lot Area	Minimum Lot Width	Minimum Lot Depth	Minimum Front Yard Setback	Minimum Side Yard Setback	Minimum Rear Yard Setback	Maximum Building Height
P	PUBLIC		12,000 SF	75'	125'	30'	15'	30'	50'
A	AGRICUTURAL		1 ACRE	150'	200'	40'	25'	50'	45'
RR	RURAL RESIDENTIAL	MUNICIPAL BUILDINGS, WATER, FOREST OR WILDLIFE CONSERVATION AREAS AND USES	3 ACRES	200'	200'	40'	25'	50'	45'
		ACCESSORY USES				40'	25'	25'	45'
LR	LOW RESIDENTIAL	PRINCIPAL USES	2 ACRES	200'	200'	40'	25'	40'	35'
		ACCESSORY USES				40'	10'	10'	25'
MR	MEDIUM RESIDENTIAL	PRINCIPAL USES	18,000SF	90'	150'	30'	15'	30'	35'
		TWO-FAMILY DWELLINGS	24,000SF	120'	150'	30'	15'	30'	35'
		ACCESSORY USES				40'	10'	10'	25'
HR	HIGH RESIDENTIAL	PRINCIPAL USES	1 ACRE	150'	200'	40'	25'	50'	35'
		ACCESSORY USES				40'	10'	10'	25'
C	COMMERCIAL	PRINCIPAL USES	12,000 SF	75'	125'	40'	20'	20'	35'
		ACCESSORY USES				40'	20'	20'	35'
* SINGLE STORY: 1,100 SF - SPLIT LEVEL: 1,300 SF - 1 1/2 AND 2 STORY: 1,500 SF									
** SINGLE STORY: 960 SF - SPLIT LEVEL 1,200 SF - 1 1/2 & 2 STORY: 1,400 SF									

5. Map No.5A: Environmental Features (Refer to County Map Set)

The map depicts environmental features indicated in N.J.A.C. 7:15-5.17 including major drainage basin boundaries (U.S.G.S. Hydrologic Unit Code (HUC) 11 Watersheds), CAFRA boundary and flood prone areas (FEMA). Map No.5A shows any New Jersey and Federal Wild and Scenic Rivers, FW 1-Trout Production or FW 2 Trout Production or farmlands preservation areas. Streams with FW2-NTC1/SE1 and FW2-NT/SE1 ranking are also shown.

6. Map No.5B: Environmental Features (Refer to County Map Set)

The map depicts environmental features indicated in N.J.A.C. 7:15-5.17 including wetlands, required wetlands buffers, public open space and recreation areas greater than or equal to (10) ten acres. Additional information including major drainage basin boundaries (U.S.G.S. hydrologic unit code (HUC) 11 watersheds), landscape project areas for grasslands, emergent and forested areas with rankings of 3, 4 and 5 are also shown. MapNo.5B shows any New Jersey and Federal Wild and Scenic Rivers, FW 1 Trout Production or FW 2 Trout Production or farmlands preservation areas.

7. Map No.5C: Environmental Features (Refer to County Map Set)

The map depicts environmental features indicated in N.J.A.C. 7:15-5.17 including the natural heritage priority sites for threatened and endangered species. Landscape Project Areas for Forested Wetlands and Bald Eagle Foraging are shown on this map. Map No.5C shows any New Jersey and Federal Wild and Scenic Rivers, FW 1-Trout Production or FW 2 Trout Production or Farmlands Preservation areas. C-1 water bodies are identified on the map as well. Sewer service areas are excluded from the 300ft buffers of C-1 water bodies and on all tributaries within the HUC 11 watershed.