

Chapter IX.4

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

ELSINBORO TOWNSHIP CHAPTER

PREPARED BY:

**SICKELS & ASSOCIATES, INC.
SHERWOOD MEWS
833 KINGS HIGHWAY
WOODBURY, NEW JERSEY 08096**



TABLE OF CONTENTS

- I. INTRODUCTION**
 - A. Status of Previous Approved WMPs
 - B. Overview of Current Wastewater Services
 - C. Overview of Current Water Services
 - D. Overview of Environmental, and Local Considerations to Wastewater Services
 - E. Overview of Water Resource Management Issues
 - F. Overview of Future Wastewater Services
 - G. Summary of Significant Actions

- II. EXISTING INFRASTRUCTURE AND TREATMENT FACILITIES**
 - A. Existing Areas Served by Wastewater Facilities
 - B. Major Transmission Piping and Pumping Stations
 - C. Existing On-site, Non-industrial Wastewater Facilities
 - D. Existing Industrial Wastewater Facilities
 - E. General Wastewater Management Areas for Septic Systems
 - F. Existing Wastewater Flows
 - G. Existing Wastewater Treatment
 - H. Existing Public Water Supply Infrastructure
 - I. Existing Public Water Supply Allocation and Daily Demands

- III. ENVIRONMENTAL AND OTHER LAND FEATURES**

- IV. DELINATION OF SEWER SERVICE AREAS AND PLANNING INTEGRATION**
 - A. Environmentally Sensitive Areas Map
 - B. Sewer Service Areas in Environmentally Sensitive Areas
 - C. Exceptions to the Use of Geographic or Political Boundaries
 - D. Environmentally Sensitive Areas – Data Sources

- V. FUTURE WASTEWATER DEMAND AND FACILITIES**
 - A. Conformance and Nonconformance with Zoning and Prior Land Use Approvals
 - B. Municipal Zoning and Composite Zoning
 - C. Calculating Future Wastewater and Water Supply Needs and Capacity
 - D. Municipal Demand Projections in Urban Municipalities
 - E. Municipal Demand Projections in Non-urban Municipalities
 - F. Future Wastewater Outside of Sewer Service Areas

- VI. ANALYSIS OF CAPACITY TO MEET FUTURE WASTEWATER NEEDS**
 - A. Adequacy of Sewage Treatment Plant Capacity

Sickels & Associates, Inc.

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

- B. Analysis and Selection of Treatment Alternatives
- C. Antidegradation Analysis for New and Expanded Domestic Treatment Works
- D. Discharges to Ground Water
- E. Adequacy of dilution to meet future non-sewer service area demand

VII. FUTURE WATER SUPPLY AVAILABILITY

- A. Sufficiency of Water Supply

VIII. MAPPING REQUIREMENTS

- A. Basis for Service Area Delineations
- B. Mapping Classification

LIST OF TABLES

SECTION 1: INTRODUCTION

- Table 1.1: Historic Population
- Table 1.2: Projected Population

SECTION 4: DELINEATION OF SEWER SERVICE AREAS AND PLANNING INTEGRATION

- Table 4.D.1: Information Sources for Environmentally Constrained Areas

SECTION 5: FEATURE WASTEWATER DEMAND AND FACILITIES

- Table 5.B.1: Summary of Municipal Zones
- Table 5.F.1: HUC-11 Build-Out Projections

SECTION 6: ANALYSIS OF CAPACITY TO MEET FUTURE WASTEWATER NEEDS

- Table 6.E.1: HUC-11 Build-Out Capacity / Density
- Table 6.E.2: HUC-11 Dilution Analysis Summary

SECTION 8: MAPPING REQUIREMENTS

- Table 8.B.4.1: Zoning Regulations

Sickels & Associates, Inc.

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

I. INTRODUCTION

This chapter represents the Elsinboro Township portion of the WMP. The 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 (NJAC 7:15).

The Township of Elsinboro 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 Elsinboro is identified on Map No.3. This service area does not include any areas that lay within adjacent municipalities.

The Township of Elsinboro 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 Township of Elsinboro is a rural, agriculturally based municipality, bounded by three (3) municipalities including Pennsville Township (to the north-west), Salem City (to the north-east), and Lower Alloways Creek Township (to the south). The Delaware Bay runs along the western boundary of the township as well. Elsinboro encompasses a total area of 8,427 acres (13.2 square miles) including approximately 18.9 acres of which is surface water (ponds, lakes, reservoirs), and 146.9 miles of streams (shown on map No.1) flowing in the municipality. This municipality has been developed mostly agriculturally or for rural residential use, though low to medium density residential development can be found along the Delaware Bay. There are also some sparse tracts of commercial development in the township's northeast section, where the Salem-Hancocks Bridge Road extends from Salem City. Elsinboro Township has a low population density of approximately 78 people/sq mi according to (2010) U.S. Census data.

Elsinboro Township has a population of 1,036 persons. The municipality's population trend over the last decade can be seen as an average -0.51% decrease in population each year (-5.1% 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 Elsinboro. In terms of population change over the next three decades, Elsinboro is expected to stagnate and eventually grow slowly 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: Elsinboro Historic Population				Table 1.2: Elsinboro Projected Population			
Year	Population	Population Change		Year	Population	Population Change	
		#	avg yearly %			#	avg yearly %
1980	1,200			2010	1,036		
1990	1,170	-120	-0.93%	2020	1,018	-18	-0.17%
2000	1,092	-78	-0.67%	2030	1,027	9	0.08%
2010*	1,036	-56	-0.51%	2040	1,035	8	0.08%
~Source: 1990 U.S. Census, *2010 U.S. Census				~Source: SJTPO, 2011			

A. Status of Previous Approved WMPs

Elsinboro Township has not previously submitted a Wastewater Management Plan to the New Jersey Department of Environmental Protection, as it has not developed sewer or water infrastructure. However, the Salem County Women’s Services facility located in the Township was included as part of an amendment to the Lower Delaware WQMP, adopted on September 24, 2003. This plan is the current WQMP in effect for Elsinboro Township.

The enclosed plan reflects current zoning with a potential future sewer service areas consistent with the Municipality’s Master Plan and includes the default wastewater management alternative to support development in areas that are not designated as sewer service area, which is a discharge to groundwater of less than 2,000 gallons per day. The Elsinboro 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

Elsinboro Township is not currently served by a public sewer system, nor does it own or operate any wastewater treatment facilities. The Elsinboro Women’s Services facility contributes flow to the Salem City Wastewater Treatment Plant and is currently the only facility to be served by sanitary sewer service.

C. Current Water Services

Elsinboro Township is not currently served a by public community water system, nor does it contain any infrastructure for potable water service. The Elsinboro Women’s Services facility receives potable water service from the Salem City Water Department via 8” water main, and is currently the only facility to receive such service.

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 Major Water Resource Management Issues

Elsinboro Township does not currently own or operate a public community water supply system and is served by Salem City. However, the Township has identified specific areas of the municipality for inclusion within the FWSA. Upon review of these areas with the Department, the areas under consideration are within the coastal zone and regulated by CAFRA. Consequently, these areas have not been included as part of the FWSA at this time. The County is prepared to assist the Township with the regulatory issues presented by the CAFRA jurisdiction. The Township will pursue an approved SSA, through the amendment process, upon working through the regulatory planning approval process.

F. Overview of Future Wastewater Services

There is currently only one (1) facility served by public sewers within the Township of Elsinboro. The Township has not identified future sewer service areas for inclusion within this submission of the Salem County Wastewater Management Plan (WMP).

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. Elsinboro does not currently have any sewer service areas identified.

1. All areas not proposed to be included in 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. These facilities consist of on-site treatment works that are regulated under a New Jersey Pollutant Discharge Elimination System permit. Tables located in Chapter 7 (VII) provide detailed information on each facility. “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

Elsinboro Township does not own or operate any wastewater treatments or major conveyance systems consisting of major interceptors, trunk lines and pumping stations for public wastewater treatment facilities. Currently the only infrastructure is 675 feet of 8” diameter sanitary sewer main that extends service to the Salem County Women’s Services facility from Salem City.

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. All existing on-site, non-industrial treatment facilities that discharge 2,000 gallons per day or more of domestic wastewater must be regulated under a NJPDES permit. However, Elsinboro Township does not contain any non-industrial treatment facilities under NJPDES permit, or any non-industrial wastewater treatment facilities.

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, Elsinboro Township does not contain any industrial wastewater treatment facilities.

E. General Wastewater Management Areas for Septic Systems

Remaining areas within 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

As noted above, the Salem County Women's Services facility is the only location in Elsinboro that contributes wastewater flow to sewer. The facility discharges approximately 520 gallons per day to the Salem City WWTP.

G. Existing Public Water Supply Infrastructure

Elsinboro Township does not own or operate any public potable water supply wells or distribution mains. Map No.1 generally 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.

The extent of water infrastructure in Elsinboro Township is a (620 L.F) stretch of 8" diameter water main that extends service to the Salem County Women's Services building from the Salem City Water and Sewer Authority.

H. Existing Public Water Supply Daily Demands

As noted above, the Salem County Women's Services facility is the only location in Elsinboro Township that is served by a public water system. The facility is supplied by Salem City and has an average demand of approximately 0.277 MGY.

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 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	8/15/08

V. FUTURE WASTEWATER DEMAND AND FACILITIES

This chapter describes the build out methodology used to project future wastewater treatment demand for future sewer service areas and general wastewater management service areas within the County WMP.

The Township of Elsinboro is not proposing future wastewater demand or public wastewater treatment facilities at this time. Consequently, wastewater demand projections have not been included within this municipal chapter. However, zoning, as described below has been utilized to assess the potential build out and available dilution for each HUC-11 area.

Zoning, as described below, is applied to the developable area within the existing sewer service areas after removing those areas where development is not expected to occur: These areas consist of small irregular polygons, open space, wetlands, steep slopes and riparian zones. However, Elsinboro Township contains no sewer service areas and therefore needed only to consider build-out in non-sewer service areas.

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 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.

“HUC-11 Developable Area” includes both undeveloped and underdeveloped parcels. “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)	HUC-11 Developable Area (ac)
C	COMMERCIAL	672.7	268.1
CONS	CONSERVATION	4,154.9	41.4
LR	LOW DENSITY RESIDENTIAL	123.5	10.4
MR	MEDIUM DENSITY RESIDENTIAL	100.4	25.8
RR-A	RURAL RESIDENTIAL- AGRICULTURE	3,375.7	1,425.6

C. Calculating Future Wastewater and Water Supply Needs and Capacity

This Section is not applicable as Elsinboro Township does not own or operate a wastewater treatment plant or sanitary sewer conveyance system consisting of major interceptors, trunk lines and pumping stations associated with public wastewater treatment facilities. In addition, Elsinboro Township does not own or operate any public community water supply facilities, potable water wells or distribution mains.

D. Municipal Demand Projections in Urban Municipalities

This Section is not applicable as Elsinboro Township is not designated as an Urban Municipality.

E. Municipal Demand Projections in Non-urban Municipalities

Development of vacant land is 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 depending based on the wastewater service area designation.

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

The Township of Elsinboro has identified areas of existing development that are believed to have failing septic systems. Pursuant to 7:15-3.5(b)4.ix, a revision to an adopted SSA is allowed to provide for connection of an existing structure(s) with a malfunctioning subsurface sewage disposal system that is not currently within an approved sewer service area to an identified sewage treatment plant, provided the applicant demonstrates that it is not feasible to repair or replace the malfunctioning subsurface sewage disposal system under N.J.A.C. 7:9A-3.4 and the property where the existing structure is located is contiguous to the existing sewer line.

The County and the Township are currently working with the Department to identify documentation and reporting requirements necessary to substantiate the inclusion of these areas within the FWSA through the amendment process.

2. Existing Sewer Service Area Build Out Analysis

Elsinboro Township currently contains an existing SSA of 3.8 acres. This area consists of the above-mentioned Women’s Services facility and surrounding residential development. This area is not expected to have infill development or changes due to environmental constraints, nor has Elsinboro Township identified any other change to this area that would require a proposed SSA. Therefore, an analysis of the existing sewer service area does not apply to the Township of Elsinboro as this municipality is not proposing a sewer service area as a part of this submission of the Salem County WMP.

3. Future Sewer Service Area Build-Out 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.

An analysis of the future sewer service area does not apply to Elsinboro Township as this municipality is not proposing a sewer service area as a part of this submission of the Salem County WMP.

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 BUILD-OUT (Based on Existing Zoning)				
HUC11	Zoning	Total Acres	Residential (Units)	Commercial (SF)
02040206040	C	268.10	0.00	4,671,444.88
	CONS	27.12	5.42	0.00
	LR	6.86	11.95	0.00
	MR	25.75	62.32	0.00
	RR-A	820.38	476.48	0.00
	TOTALS		1,148.22	556.17
02040206060	C	0.00	0.00	15.90
	CONS	14.30	2.86	0.00
	LR	3.57	6.23	0.00
	RR-A	605.26	351.54	0.00
	TOTALS		623.13	360.62

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. This analysis does not apply to Elsinboro Township as this municipality is not currently served by public sewer.

A. Adequacy of Sewage Treatment Plant Capacity

Elsinboro Township does not own or operate a Wastewater Treatment Plant. The Township is not proposing a future sewer service area at this time. Consequently, wastewater treatment plant capacity and associated demand projections have not been included within this municipal chapter.

B. Analysis and Selection of Treatment Alternatives

Elsinboro Township identified specific areas of the municipality for inclusion within the FWSA. These areas have not been included within this WMP submission as they are within the coastal zone and regulated by CAFRA.

The build-out analysis and associated evaluation of treatment alternatives will be reviewed as the Township works through the regulatory planning approval process related to CAFRA. However, it should be noted that the City of Salem currently has a surplus of capacity that may be sufficient to accommodate flows generated within this area.

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 build-out. 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 BUILD-OUT CAPACITY / DENSITY				
HUC11	Zoning	Total Acres	Residential (Units)	Commercial (SF)
02040206040	C	268.10	35.28	141,107.39
	CONS	27.12	3.57	0.00
	LR	6.86	0.90	0.00
	MR	25.75	3.39	0.00
	RR-A	820.38	107.95	0.00
	TOTALS		1,148.22	151.08
02040206060	C	0.00	0.00	0.50
	CONS	14.30	1.96	0.00
	LR	3.57	0.49	0.00
	RR-A	605.26	82.91	0.00
	TOTALS		623.13	85.36

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 Build-Out (Units)	Residential Capacity (Units)	Commercial Build-Out (SF)	Commercial Capacity (SF)
2040206040					
TOTALS	1,148.22	556.17	151.08	4,671,444.88	141,107.39
2040206060					
TOTALS	623.13	360.62	85.36	15.9	0.5

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 taken used in future planning. In addition, the current septic densities for the HUC-11's in Elsinboro 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 were compared. A build-out projection of the proposed sewer service area is then prepared to determine the additional water demands that may result. These demands are then compared to the water allocation to verify whether sufficient water supply exists to serve the proposed development.

A. Sufficiency of Water Supply

The Township of Elsinboro does not own or operate any public potable water supply wells or distribution mains, nor proposing a service area included as part of this WMP. Consequently, a Depletive/Consumptive Water Use Analysis was not performed at this time.

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.

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 #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 portions of the municipality that lay within the CAFRA areas. The Hackensack Meadowlands District, Pinelands Areas, Pinelands National Reserves, or franchise areas do not apply to this municipality.

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 Elsinboro 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: Potential Future 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: Elsinboro Township Zoning Map

The map depicts the current zoning of Elsinboro 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	Maximum Building Coverage	Maximum Additional Lot Coverage
C	COMMERCIAL	25,000 SF	125'	175'	50'	20'	30'	35'	40%	35%
LR	LOW DENSITY RESIDENTIAL	25,000 SF	125'	175'	40'	20'	35'	35'	20%	35%
MR	MEDIUM DENSITY RESIDENTIAL	18,000 SF	100'	150'	35'	15'	30'	35'	20%	25%
RR- A	RURAL RESIDENTIAL- AGRICULTURE	75,000 SF	175'	200'	50'	25'	50'	35'	15%	15%
CONS	CONSERVATION	5 ACRES	300'	400'	50'	30'	60'	35'	5%	5%

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) 14 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 14 watershed.