2007 CAPE MAY COUNTY
WATER QUALITY MANAGEMENT PLAN/
WASTE WATER MANAGEMENT PLAN
(208 Plan)
September 27, 2007

October 16, 1995
Revised May 1, 1999
Revised September 28, 2001 by N.J.D.E.P.

Prepared By:
Cape May County Department of Health
4 Moore Road
Cape May Court House, N.J. 08210-1601
(609) 465-1187

Gerald M. Thornton
Freeholder

Kevin L. Thomas, M.A.
Health Officer
Public Health Coordinator

Linda Wilde
Director of Environmental Services

CAPE MAY COUNTY
WATER QUALITY MANAGEMENT PLAN/
WASTE WATER MANAGEMENT PLAN

TABLE OF CONTENTS

CHAPTER 1 - INTRODUCTION 1-1
1.1 Background 1-1
1.2 Division of Water Resources 1-1
1.3 Planning Boundaries 1-1
1.4 Geographic Sketch 1-2
1.5 WQMP Planning Regions 1-4
CHAPTER 2 - SUMMARY TABLE 2-1
CHAPTER 3 - EXISTING AND FUTURE DOMESTIC AND INDUSTRIAL TREATMENT FACILITIES 3-1
3.1 Discussion of Existing and Future Domestic and Industrial Treatment Facilities 3-1
3.2 Discussion of Wastewater Treatment Plant Flows 3-2
CHAPTER 4 - WATER QUALITY 4-1
4.1 Introduction 4-1
4.2 Surfacewater Quality 4-1
4.3 Groundwater Quality 4-1
4.4 Discussion of Cape May County Water-Bearing Zones 4-2
4.5 Water Supply Issues 4-4
4.6 Groundwater Recharge Mapping 4-6
4.7 Conclusions and Recommendations 4-7
CHAPTER 5 - SEPTICS MANAGEMENT PROGRAM 5-1
5.1 Introduction 5-1
5.2 Background 5-1
5.3 Administration 5-2
5.4 Purpose 5-2
5.5 Original Septics Management Program 5-2
5.6 Municipal Zoning Ordinances - Upgraded Minimum Lot Size Requirements 5-4

5.7 2000 Septics Management Program 5-5
5.8 Alternatives 5-9
5.9 Development in the New Jersey Pinelands 5-9
5.10 NJPDES Review 5-10
5.11 Summary 5-10
CHAPTER 6 - STORMWATER RUNOFF 6-1
6.1 Introduction 6-1
6.2 Coastal Zone Management 6-2
6.3 Pinelands Comprehensive Management Plan 6-3
6.4 Soil Erosion and Sediment Control 6-3
6.5 New Jersey Pollutant Discharge Elimination System (NJPDES) Permits 6-4
CHAPTER 7 - WELL HEAD PROTECTION 7-1
7.1 Introduction 7-1
7.2 Legislative Authority Establishing Well Head Protection 7-1
7.3 Cape May County Well Head Protection Program 7-1
7.4 Summary 7-2
CHAPTER 8 - PUBLICLY OWNED LANDS MAPPING 8-1
CHAPTER 9 - 208 PLAN MAPS 9-1

LIST OF TABLES

Table 2-1 Upper Township Community Wastewater Treatment Facilities 2-2
Table 2-2 Upper Township On-Site Septic Disposal Systems (Greater than 2,000 gpd) 2-2
Table 2-3 Upper Township Industrial Treatment Facilities 2-3
Table 2-4 Upper Township Proposed Community Wastewater Treatment Facilities 2-4
Table 2-5 Dennis Township Community Wastewater Treatment Facilities 2-6
Table 2-6 Dennis Township On-Site Septic Disposal Systems (Greater than 2,000 gpd) 2-6
Table 2-7 Dennis Township Proposed Community Wastewater Treatment Facilities 2-7
Table 2-8 Dennis Township On-site Sewage Disposal (Facilities Greater Than 2,000 gpd.) 2-7
Table 2-9 Community Wastewater Treatment Facilities 2-13
Table 2-10 On-Site Septic Disposal Systems 2-13
Table 2-11 Holding Tanks 2-13
Table 2-12 Summary of NJPDES Permitted Facilities within the Planning Area 2-17
Table 2-13 Summary of Significant Actions 2-19
Table 2-14 Lower Township MUA Sewage Treatment Plant Flow Data 2-21
Table 2-15 Lower Township Municipal Utilities Authority Facilities Table 2-22
Table 2-16 Projected Wastewater Flows (Lower Township MUA) 2-25
Table 2-17 Projected Wastewater Flows (CMCMUA) 2-25

LIST OF FIGURES

Figure 1-1 Regional Areas 1-2
Figure 1-2 Cape May County Planning Area 1-4
Figure 3-1 Capacity Assurance Program Community Flow Status 3-6
Figure 3-2 Cape May County Annual Report Growth Chart – 2006 3-8
Figure 5-1 Derivation of Acceptable Volume of Wastewater 5-3
Figure 5-2 2000 Cape May County Dilution Model 5-8
Figure 9-1 Ocean City - Upper Township Wastewater Management Area 9-2
Figure 9-2 Dennis Township - Woodbine Wastewater Management Area 9-3
Figure 9-3 Seven Mile - Middle Township Wastewater Management Area 9-4
Figure 9-4 Wildwood/Lower Township Wastewater Management Area 9-5
Figure 9-5 Cape May Wastewater Management Area 9-6

CHAPTER 1 - INTRODUCTION

The purpose of this document is to provide a comprehensive Water Quality Management Plan (WQMP) for Cape May County. This document has been prepared by the Cape May County Department of Health and was submitted to the New Jersey Department of Environmental Protection (Department) for approval as an amendment to the existing Cape May County WQMP via the plan amendment procedure (N.J.A.C. 7:15).

1.1 Background

The original Cape May County Water Quality Management (208) Plan was derived from Section 208 of the Federal Water Pollution Control Act Amendments of 1972 and subsequent Clean Water Act of 1977. The Cape May County 208 Plan was approved by the United States Environmental Protection Agency (USEPA) on August 26, 1980. The current County Water Quality Management (208) Plan was prepared on October 16, 1995, revised May 1, 1999 and approved by the Department on September 2000. Since that time there have been several individual amendments to the plan.

Since the adoption of the original WQMP, the role of the 208 program has greatly expanded in Cape May County. The 208 program manager is responsible for the development, approval and implementation of:

A Regional Wastewater Management Plan
The Cape May County (205j) Wellhead Protection Plan
The Cape May County Water Conservation Plan
The Cape May County (208) Water Quality Management Plan

This document has been prepared to reflect current water quality planning and development considerations. This document provides both an updated Water Quality Management Plan and a Wastewater Management Plan for Cape May County.

1.2 Division of Water Resources

The review of development proposals requires various involvements of county, state and federal agencies, at one time or another. The numerous regulatory responsibilities of each agency have necessitated the establishment of one central office within the county for the coordination and review of proposed developments with respect to water quality management issues.

The central office will house the 208 Program Manager. The 208 Program Manager is involved with most matters relating to water resources and wastewater disposal.

1.3 Planning Boundaries

This Plan is limited in its jurisdiction to Cape May County, New Jersey. Figure 1-1 delineates the approved State 208 planning areas. Figure 1-2 delineates the political border of Cape May County that encompasses the Cape May County area-wide planning area.

1.4 Geographic Sketch

Cape May County is located at the southernmost tip of New Jersey in the Atlantic Coastal Plain. It has an area of 267 square miles and is bounded on the north by Atlantic and Cumberland Counties, on the east by the Atlantic Ocean, and on the west and south by the Delaware Bay. It is an area composed largely of wet soils and wetlands.

The county has a current permanent population of about 103,000. Seasonal fluctuations occur, with the summertime population reaching approximately 700,000 with approximately 66 percent residing on the barrier islands.

The overall physiography of Cape May County is a low lying, gently rolling plain. In the northwestern part of the county, the area is a nearly level sandy plain with a maximum elevation of 54 feet above mean sea level. The southernmost part of the county is a low sandy peninsula with elevations ranging from 0 to 27 feet above mean sea level. The Great Cedar Swamp and the Timber and Beaver Swamp are two large wetland areas located in the north-central part of the county. The predominance of streams within the county are tidal in their lower reaches achieving their head in the fresh water swamps and discharging to saltwater marshes near the shore. Extensive tidal marshes border the lower reaches of the Tuckahoe River in the north and Dennis Creek in the west-central part of the county. The entire eastern part of the county mainland consists of a broad tidal marsh area flanked by the five low-lying barrier islands to the east. These islands contain major resort areas that are the heart of the county's economy. The barrier islands extend 32 miles from Ocean City in the north to Cape May City in the South. They are approximately one mile wide at their widest point with the average width being ¼ to ½ mile. The construction of the Cape May Canal during the Second World War separated the cities of Cape May, West Cape May, Cape May Point and a portion of Lower Township at southern tip of the county from the remainder of the mainland. This canal is presently managed as a navigable waterway.

Figure 1-1 Regional Areas

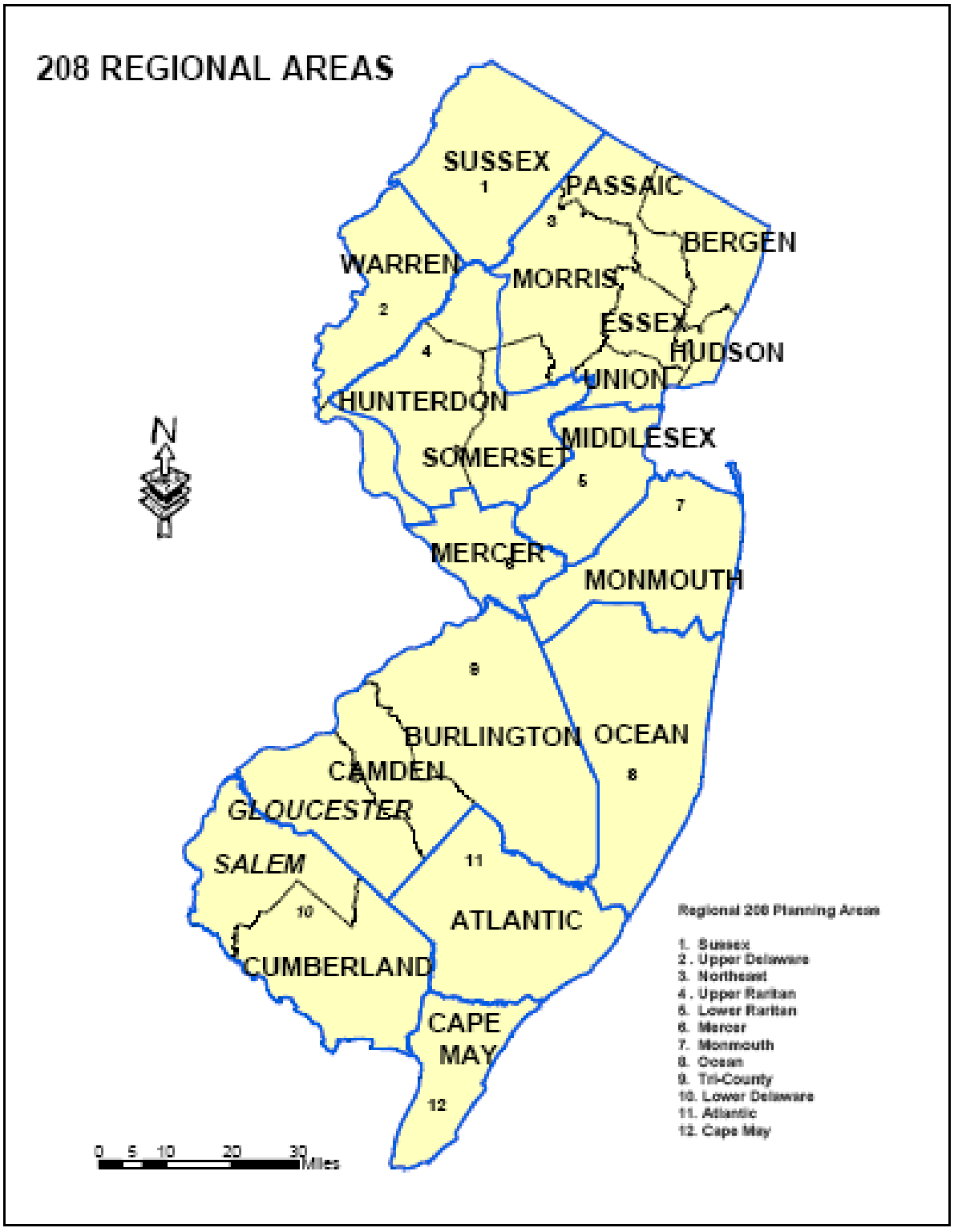
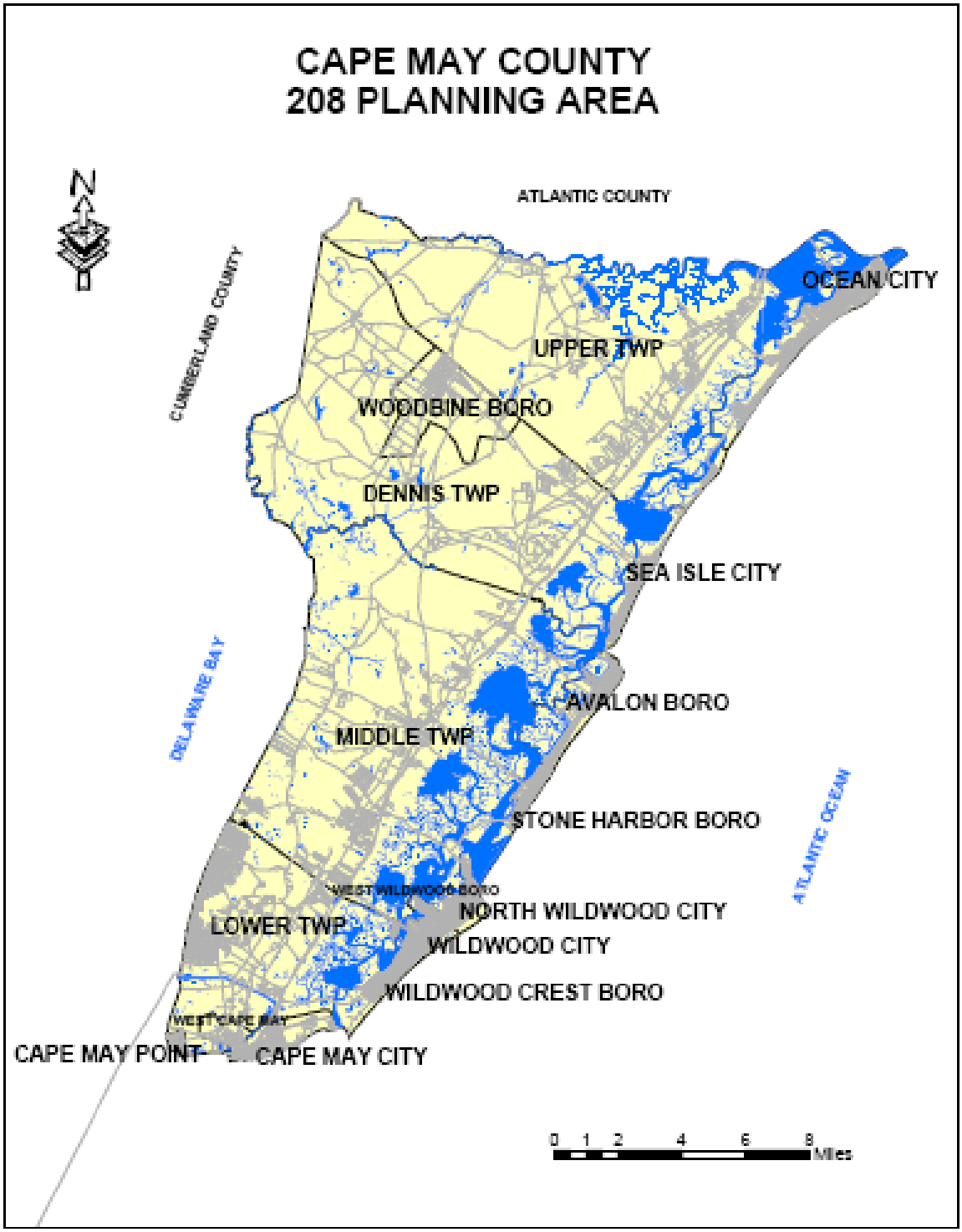

208 REGIONAL AREAS
SUSSEX
1
PASSAIC
3
BERGEN
WARREN
2
MORRIS
4
ESSEX
HUDSON
UNION
HUNTERDON
MIDDLESEX
SOMERSET
5
7
MERCER
6
MONMOUTH
8
BURLINGTON
OCEAN
8
CAMDEN
GLOUCESTER
SALEM
11
10
ATLANTIC
CUMBERLAND
CAPE
MAY
12
N
0 5 10 20 30 Miles
Regional 208 Planning Areas
1. Sussex
2. Upper Delaware
3. Northeast
4. Upper Raritan
5. Lower Raritan
6. Mercer
7. Monmouth
8. Ocean
9. Tri-County
10. Lower Delaware
11. Atlantic
12. Cape May

Figure 1-2 Cape May County Planning Area



1.5 WQMP Planning Regions

The Cape May County WQMP/WMP has its origins in the five municipal wastewater management plans that precede this document. The municipalities that heretofore have had municipal wastewater management plans consist of Upper Township, Dennis Township, the Borough of Woodbine, Middle Township and Lower Township. The remainder of the county's 16 municipalities consists of Ocean City, Sea Isle City, Avalon, Stone Harbor, North Wildwood, West Wildwood, the City of Wildwood, Wildwood Crest, the City of Cape May, West Cape May and Cape May Point. These areas are predominantly sewered and prior to the adoption of the County WQMP/WMP have been regulated under the existing 201 Facilities Plan.

This WQMP/WMP amendment shifts the wastewater management plan emphasis from a municipal to a regional basis. The county has been divided into five service area regions consistent with the 201 facilities planning areas. These regions, their respective wastewater treatment plants and municipalities are identified in the following summary:

1. Ocean City - Upper Township Region

   Ocean City Regional Wastewater Treatment Plant- Cape May County Municipal Utilities Authority (CMCMUA)

Upper Township
Ocean City

2. Dennis Township - Woodbine Region

   No Regional Wastewater Treatment Plant

Dennis Township
The Borough of Woodbine

3. Seven Mile - Middle Township Region

   Seven Mile/Middle Regional Wastewater Treatment Plant (CMCMUA)

Middle Township
Sea Isle City
Avalon Borough
Stone Harbor Borough

4. Wildwood - Lower Township Region

   Wildwood/Lower Regional Wastewater Treatment Plant (CMCMUA)
   Lower Township M.U.A. Sewage Treatment Plant

North Wildwood City

West Wildwood Borough
Wildwood City
Wildwood Crest Borough
Portions of Middle Township (south)
Lower Township

5. Cape May Region

Cape May Regional Wastewater Treatment Plant (CMCMUA)

Portions of Lower Township (south)
The City of Cape May
West Cape May Borough
Cape May Point Borough

CHAPTER 2 - SUMMARY TABLE

The following is a listing of the significant points of the 2007 Cape May County Water Quality Management Plan Amendment:

The WQMP program will remain at the Cape May County Department of Health, under the direction of the 208 Program Manager. The WQMP and WMP planning area will remain as the political boundary of Cape May County.

Cape May County is divided into five service area regions as reflected in the WMP mapping. This division represents a change from the existing municipal WMP basis. The entire county is now reflected in the regional WMP mapping.

The following are significant points for the five service area regions as reflected in the WMP mapping:

I. Ocean City - Upper Township Region

A. Summary of New Community Wastewater Treatment Facilities for the Upper Township Area.

Encourage community wastewater treatment facilities within the Town Center Core Zone and for residential cluster development in the environs.

New community wastewater treatment facility on Block 559 Lots 36.01, 37 & 39. Hidden Pond is a 140 unit age restricted development with a projected flow of 31,150 gpd discharging to ground water.

New community wastewater treatment facility on Block 567 Lots 49 & 50.01. Heritage Links is a 124 unit age restricted development with a projected flow of 27,900 gpd discharging to ground water.

New community wastewater treatment facility on Block 561 Lot 25. Seaville Park is a 150 unit mobile home park with a projected flow of 29,350 gpd discharging to ground water.

New community wastewater treatment facility on Block 630 Lots 15.01 & 15.02. Shaw Farm Park is a 210 unit mobile home park with a projected flow of 40,650 gpd discharging to ground water.

New community wastewater treatment facility on Block 567 Lots 45.18 and 45.11. Shore Acres is a proposed 210 unit mobile home park with a projected flow of 40,650 gpd discharging to ground water.

New community wastewater treatment facility on Block 549 Lots 70, 87, 102-104. Upper Township Senior Apartments is a 75 unit senior rental apartments with a projected flow of 16,875 gpd discharging to ground water.

New community wastewater treatment facility on Block 453 Lot 1. Petersburg Disability Center is a 24 bedroom facility for the housing of physically and mentally disabled adults with a projected flow of 3,000 gpd discharging to ground water.

B. Summary of Existing and Future Domestic and Industrial Treatment Facilities for the Upper Township Area.

Existing Facilities

There are no existing regional sewage treatment facilities located with the Upper Township WMP planning area. There are several community wastewater treatment facilities located Upper Township and are they listed in Table 2-1. These facilities provide secondary treatment of the wastewater collected and permitted discharge is to groundwater. There are numerous facilities that are served by conventional on-site septic disposal system that discharge more than 2,000 gpd. and they are listed in Table 2-2. There is several industrial discharges to surface water and they are listed in Table 2-3.

Table 2-1 Upper Township Community Wastewater Treatment Facilities

Facility	NJDPES Permit No.	Flow
B.L. England	NJ0005444	16,000
Cedar Square	NJ0062944	16,600
Osprey Point	NJ0137847	25,330
Upper Primary & El. Sch.	NJ0135623	20,000

Table 2-2 Upper Township On-Site Septic Disposal Systems (Greater than 2,000 gpd)

Facility	NJDPES Permit No.	Flow
All Seasons Marina	NJ0066257	3,000
Bayberry Cove Campground	NJ0075558	46,050
Bayview Marina		
Deauville Inn	NJ01019924	3,600
Dino's Diner	NJ0109550	2,000
Echo Farm Campground	NJ0135071	45,000
Econo Lodge	NJ0108537	
Frontier Campground	NJ0084972	29,400
Guiseppe's Restaurant		4,020
Mildred's Restaurant		3,300
N.J. Bell Telephone	NJ0071676	
Oakcrest Office Complex		>2,000
Oak Ridge Campground	NJ0084891	36,000
Obadiah's Restaurant	NJG0100773	6,030
Ocean Beach Trailer Resort	NJ0089681	18,000
Ocean Sands Campground Resort	NJ0135470	32,550
Pinehill Trailer Park	NJ0100242	47,600
Plantation Campground	NJ0084964	33,450
Riverview Campground	NJ0129003	22,500
Seaville Shores Campground	NJ0085309	41,250
Shady Oaks Campground	NJ0085171	32,700
Shore Acres Trailer Park	NJ0084743	68,600
Shore Birds Campground	NJG0134309	20,000
South Shore Ford	NJ0069949	
Strathmere Motel		
Triton Bar		
Tuckahoe Inn Restaurant	NJ0073725	7,700
Upper Township Middle School	NJ0069922	8,320
U.S. Coast Guard Housing Facility	NJG0088561	
Wayside Village Shopping Center	NJ0108227	20,000
Whippoorwill Campground	NJ0085294	43,200
Yesterday's Restaurant	NJ0100765	

Table 2-3 Upper Township Industrial Treatment Facilities

Facility	NJDPES Permit No.	Flow
B.L. England	NJ0077771	

Proposed Facilities

Proposed development shall either be constructed with individual subsurface sewage disposal systems or community wastewater treatments systems that discharge to groundwater. Through the Plan Endorsement process Upper Township is proposing to concentrate future development in the approved Town Centers and within the Suburban Planning Area along the Route US9 corridor.

Proposed community wastewater treatment facilities are listed in Table 2-4 and are located in approved Town Centers or Suburban Planning Area (PA2). Upper Township's Plan Endorsement Petition and the State Development and Redevelopment Plan encourage community wastewater treatment facilities within these planning areas.

Table 2-4 Upper Township Proposed Community Wastewater Treatment Facilities

Facility	Block & Lot	Flow
Heritage Links Age Restricted Residential 124 units x 225 gpd	567 – 49 & 50.01	27,900
Hidden Pond Age Restricted Res. 70 units x 225 gpd + 70 units x 170 gpd Commercial	35,000sf x 0.1 gpd	31,150
Seaville Park Mobile Home Park 70 units x 225 gpd + 80 units x 170 gpd	561 - 25	29,350
Shaw Farm Park Mobile Home Park 90 units x 225 gpd + 120 x 170 gpd	630 – 15.01, 15.02, 15.03, p/o 14	40,650
Shore Acres Mobile Home Park 90 units x 225 gpd + 120 x 170 gpd	567 – 45.18, 45.11	40,650
Township Senior Apartments 75 x 225 gpd	549 – 70, 87, 102-104	16,875
Petersburg Disability Center 24 x 125 gpd	453 – 1	3,000

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 statues or rules. Interested persons should check with the Department for the latest information. Depiction of environmental features if for general information purposes only, and shall not be construed to define the legal geographic jurisdiction of such statues or rules.

New Jersey's coastal zone extends from the New York boarder south to Cape May Point and then north to Trenton. It encompasses the waters and waterfronts of the Hudson River and related water bodies south of the Raritan Bay, the Atlantic Ocean and some inland areas from Sandy Hook to Cape May, the Delaware Bay and some inland areas, and the waterfront of the Delaware River and related tributaries.

The coastal zone encompasses areas in which the State has the authority to regulate land and water uses through the Coastal Area Facility Review Act (CAFRA), Waterfront Development Law and Wetlands Act of 1970.

For on-site community wastewater treatment systems which are located in the Pinelands Area, as defined by N.J.S.A. 13:18A-11, the approval of the Pinelands Commission pursuant to the requirements of the Pinelands Comprehensive Management Plan (CMP) is required prior to construction. All facilities and activities included within this WMP should be consistent with the requirements of the CMP. This CMP is not recommending any new facilities within the Pinelands Management Area.

The Strathmere portion of Upper Township was shown on the sewerable area in the County 201 Plan with a project flow at full build out of 0.360 MGD. Presently, Strathmere is served by individual subsurface sewage disposal systems on 4,000 – 8,000 S.F. lots.

Since the issuance of the Finding of New Significant Impact for this region on August 31, 1981, environmental concerns have been raised with regard to the sewering of Strathmere through Whale Beach and connecting to the Seven Mile Beach/Middle Treatment Plant. The Department has addressed this issue by stating that "the proposal to connect Strathmere to the Seven Mile Beach/Middle Treatment Plant (WTP) vai a sewer line through Whale Beach area is in direct conflict with the Rules on Coastal Zone Management, specifically regarding secondary impacts and Special Areas." Therefore, the community of Strathmere is not included within the sewer service area of this plan amendment. However, it remains the intention of Upper Township and Cape May County to allow for the future servicing of Strathmere. The Consent Agreement between the Department and the County of Cape May dated November 30, 2000 in paragraph nine would not allow the extension of the sewer to Strathmere, "until undeveloped properties located along any approved sewer extension route have been purchased and placed in public ownership. The parties agree that the purpose of such extension is solely the elimination of the public health risk that failing septic system pose, not to facilitate further development of adjacent areas or to increase the number of residential or commercial units on properties with failing septic systems." As the resolution of these issues is not immediately forthcoming, the provision for additional servicing of Strathmere beyond the existing subsurface sewage disposal systems will be required to be addressed through a future amendment to the Cape May County WPMP/WMP.

II. Dennis Township and Woodbine Region

Summary of sewer service flows for the Dennis Township/Woodbine Borough Area. No Existing Flow, no additional flow proposed to regional facilities.

A. Summary of New Community Wastewater Treatment Facilities for Dennis Township Area.

Encourage community wastewater treatment facilities within Town Centers.

New Community wastewater treatment facility on Block 245, Lot 37.01. Shore Gate Golf Club propose a new clubhouse facility and a 16 unit golf residence inn with a projected flow of 21,050 gpd discharging to ground water.

New community wastewater treatment facility on Block 245, Lots 56.01, 56.02, 57, 58.01 and 58.02. School House Development is a proposed mixed use shopping center and residential development with a projected flow of 31,250 gpd discharging to ground water.

B. Summary of existing and future Domestic Treatment Facilities for the Dennis Township Area

Existing Facilities

There are no existing regional sewage treatment facilities located with Dennis Township WMP planning area. There is one community wastewater treatment facility located in Dennis Township and it is listed in Table 2-5. This facility provides secondary treatment of the wastewater collected and permitted discharge is to groundwater. There are numerous facilities that are served by conventional on-site septic disposal system that discharge more than 2,000 gpd. and they are listed in Table 2-6.

Table 2-5 Dennis Township Community Wastewater Treatment Facilities

Facility	NJDPES Permit No.	Flow
Outdoor World Lake & Shore Resort	NJ0087734	62,250

Proposed Facilities

Proposed development shall either be constructed with individual subsurface sewage disposal systems or community wastewater treatments systems that discharge to groundwater. Through the Plan Endorsement process Dennis Township is proposing to concentrate future development in the approved Town Centers.

Proposed community wastewater treatment facilities are listed in Table 2-7, and are located in proposed Town Centers. Proposed individual subsurface sewage disposal systems greater than 2,000 gpd are listed in Table 2-8, and the majority of these systems are located in proposed Town Centers. Specific locations are as follows:

Ocean View Gardens Health Care Facility, proposed flow up to 26,000 gpd.
Factory Outlet Center, proposed flow up to 20,000 gpd.
Dolphin Square Shopping Center, proposed flow up to 20,000 gpd.
Clermont Business Park, existing and proposed flow up to 20,000 gpd.

Table 2-6 Dennis Township On-Site Septic Disposal Systems (Greater than 2,000 gpd)

Facility	NJDPES Permit No.	Flow
Seashore Line Campers Resort		56,100
Avalon Campground		54,000

Belleplain Sanitary Landfill		
South Seaville Sanitary Landfill	NJ0052086	
Tamerlane Campground		40,500
Dennis Township Board of Education Elementary School	NJ0070246	12,500
Dennisville Lake Campground	NJ0062936	13,500
Diocese of Camden Elementary School		20,000
Driftwood Campground		9,000
Hidden Acres Campground	NJ0086312	26,250
Holly Lake Campground	NJ0063673	54,000
Jersey Shore Haven Campground		20,000
Little Oaks Campground		15,000
Lutheran Nursing Home at Ocean View	NJ0052183	27,600
Coastal Shore Resort	NJ0105660	88,000

Little Oaks Campground

The project mapping for Little Oaks Campground in Dennis Towship has been revised to correct inaccuracies in previous site mapping. The correct site location is in tax block 256.05, on lots 9, 10 and 11. The campground is cited in the Dennis Township WMP as an existing non-permitted development with a flow of 15,000 GPD.

Table 2-7 Dennis Township Proposed Community Wastewater Treatment Facilities

FACILITY	BLOCK & LOT	FLOW
Shore Gate Golf Club		
Sea Quest Enterprises 8 Inn Units x 150 gpd + 8 Units x 75gpd 550 Non-residential Club Members x 35gpd	245 – 37.01	21,050

Table 2-8 Dennis Township On-site Sewage Disposal (Facilities Greater Than 2,000 gpd.)

FACILITY	BLOCK & LOT	FLOW
Ocean View Gardens	236 – 6.17 thru 6.21	Up to 26,000gpd
Factory Outlet Center	241 – 5.01 thru 5.08 And 2.02 thru 2.07	Up to 20,000gpd
Dolphin Square Shopping Center	244 – 2 and 5	Up to 20,000gpd
Clermont Business Park	262 – 10, 11.02 thru	Up to 20,000gpd

Note: Clermont Business Park is approximately 80% developed.	11.18	
School House Development Residential Units 50 x 225gpd Commercial 200,000 S.F. x .1gpd	245 – 56.01, 56.02, 57, 58.01, 58.02	31,250

III. Seven Mile Beach - Middle WWTF Revised Sewer Service Area, Township of Middle (Swainton and Cape May Court House Centers)

A. Summary of flows for the North end of Sea Isle City

The existing calculated flow for Sea Isle City has already incorporated the flow figures for this area because the original 201 plan always included this flow calculation.

B. Summary of flows for the Swainton Area

Existing flow is 0.005 MGD, proposed future flow is 0.057 MGD to the Seven Mile - Middle Regional Wastewater Treatment Plant.

1. Sewer Service Area Expansion for the "Swainton Center":

Map Area A1 - The sewer service area has been expanded to include all portions of Block 12.01; Lots 27.02, 48, 49, 55, 56, 57.01, 57.02, 59.01, 63.01, 63.02 and 63.03 which are located west of the existing 500-foot offset from NJSH Route 9. A portion of Block 12.01; Lot 62.01 has also been included, which is located west of the existing 500-foot offset from NJSH Route 9. This expansion has been included in conformance with the "Swainton Center" area as submitted to the NJ Office of Smart Growth.

2. Sewer Service Area Deductions for the "Swainton Center":

Map Area D1 - The sewer service area has been reduced to exclude all portions of Block 12.01; Lots 66.03, 66.04, 66.09 and 66.10, as well as Block 12.03; Lots 1, 2 and 3 in conformance with the revised "Swainton Center" area as submitted to the NJ Office of Smart Growth.

Map Area D2 - The sewer service area has been reduced to exclude portions of Block 12.01; Lots 73.01, 73.02, 73.03, 73.04, 73.05, 73.14, 73.13 and 73.12, as well as portions of Block 114; Lots 5.01, 6.01 and 6.02 located at the southern most boundary in conformance with the revised "Swainton Center" area as submitted to the NJ Office of Smart Growth. The proposed southern most boundary is to follow the outer limits of Block 12.01; Lot 72.03 and Block 114; Lots 5.02 and 5.03.

Map Area D3 - The sewer service area has been reduced to exclude portions of Block 114; Lots 1.01and 3.02 and the existing 1,000-foot offset from Avalon Boulevard has been revised to follow the "Acme Site" 50-foot Wetlands Buffer delineated as per LOI No. 0506-95-0022.2 in conformance with the revised "Swainton Center" area as submitted to the NJ Office of Smart Growth.

C. Summary of flows for the Cape May Court House Area

Existing flow is 0.618 MGD (which includes the Swainton area), proposed future flow is 1.504 MGD to the 7 Mile-Middle Regional Wastewater Treatment Plant.

1. Sewer Service Area Expansion for the "Cape May Court House Center":

Map Area A2 - The sewer service area has been expanded to include all portions of Block 99.02; Lot 41 and Block 125; Lot 8.01, Block 99.02; Lots 42, 45.05, 45.06, 46.01, as well as Block 96; Lots 7.01 and 7.02 in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

Map Area A3 - The sewer service area has been expanded east of the Garden State Parkway adjacent to Crest Haven Road to the delineated Upper Wetland Boundary and 300-foot Category One Waterway Buffer (Block 115.01, Lots 11, 12, 13.01, 13.02, 14.01, 14.02, 15.01, 15.02, 15.03, 16.01, 16.02 and 17.06) in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

Map Area A4 - The sewer service area has been expanded west of Goshen Road to include all of Block 56.01; Lots 39.01, 39.02, 40.01 and 40.02, as well as a portion of Block 56.01; Lot 44.01 for the proposed "Thoroughbred Estates" development to the delineated 50-foot wetlands buffer approved by the NJDEP as per LOI 0506-04-0042.1. These properties have been added in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

Map Area A5 - The sewer service area has been expanded north of Church Street and East of Goshen Road to include Block 215; Lots 5.02, 8 and 9 in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

Map Area A6 - The sewer service area has been expanded along Hand Avenue and east of English Way to include all portions of Block 56.01; Lots 53.06 thru 53.11 on the north side of Hand Avenue, as well as Block 163.01; Lots 59.03 thru 59.20 and Block 163.10; Lots 1 thru 6 on the south side of Hand Avenue in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

Map Area A7 - The sewer service area has been expanded to include all properties within an area bounded by the intersection of the NJ Transit easement and Block 325; Lot 1 to the east; heading south along the NJ Transit easement to the north side of Johnston Lane; heading west on Johnston Lane to the intersection of Shunpike Road; following Shunpike Road north to Shell Bay Avenue; heading west along Shell Bay Avenue then north along the western side of Block 322; Lots 23.01, 22 and 21.02 where it then heads east along the northern side of Block 322; Lot 21.02 back to Shunpike Road; then north along Shunpike Road to the southeastern corner of Block 322; Lot 11.01; then west along the southern side of Block 322; Lots 11.01, 11.03 and 11.02, across the Atlantic City Electric Easement and along the southern side of Block 166; Lot 26; continuing on the same bearing west across Block 166; Lot 7 to the intersection of Block 166; Lot 7 and 4.05; then heading north along the eastern side of Block 166; Lots 4.05 thru 4.01; then heading west along the common boundary of Block 166; Lots 4.01 and 4.26; then heading north along Galloping Way; then heading west along the southern side of Block 166; Lots 1.04, 103 and 1.02; then heading north along the western side of Block 166; Lot 1.02; then heading west along Dias Creek Road to the intersection of Stagecoach Road; then heading north along the western border of Block 163.01; Lot 68.03; following this same bearing across Block 163.01; Lots 68.01 and 67 to the common point of Block 163.01 Lot 67 and Block 163.05; Lots 10 and 11; then following the existing sewer service area boundary east and south to the intersection of Block 325; Lot 1 and the NJ Transit easement. This area has been added in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

2. Sewer Service Area Deductions for the "Cape May Court House Center":

Map Area D4 - The sewer service area has been reduced to exclude Block 212.03; Lots 11, 12.01, 13.01, 14.01 and 17 located north of Magnolia Drive and east of the NJ Transit Railroad easement in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

Map Area D5 - The sewer service area has been reduced to exclude portions of Block 56.01; Lots 46, 47, 49.01, 50 and 52.01 north of Mechanic Street and west of Railroad Avenue in conformance with the revised "Cape May Court House Center" area as submitted to the NJ Office of Smart Growth.

3. Existing Sewered Properties to Be Included within the "Cape May Court House Center":

Map Area R1 - Under Middle Township's Cape May Court House Central Sanitary Sewer System project, sanitary sewer service was provided to Block 56.01; Lots 53.01 thru 53.05 and Lots 54.01 thru 54.09 along Hand Avenue. The sewer service area should be expanded to include these currently sewered properties.

IV. Wildwood-Lower Township Region

A. Summary of flows for the Rio Grande Area:

Existing flow is 0.344 MGD, proposed future flow is 1.466 MGD to the Wildwood-Lower Wastewater Treatment Plant.

1. Sewer Service Area Expansion for the "Whitesboro-Burleigh Center":

Map Area A8 - The sewer service area has been expanded to include all properties within an area bounded by the intersection of the Atlantic City Electric easement and Oyster Road; heading south along the Atlantic City Electric easement to the intersection of Main Avenue; heading west along Main Avenue to the intersection of Fishborn Street (French Street); heading north along the eastern side of Block 475; Lots 14, 13 and 11; heading west along the northern side of Block 475; Lots 11, 10, 9 and 8; heading north along the northeastern corner of Block 475; Lot 7; heading west along the paper street of Cincinnati Avenue; heading north along Cherry Street (paper street); keeping the same bearing heading north along the eastern property lines of Block 475; Lot 5 to the intersection of Indian Trail Road (County Route 618); heading west along Indian Trail Road to the southeastern corner of Block 168; Lot 11; heading north along the eastern side of Block 168; Lots 11, 10 and 9.01; heading east along the southeastern corner of Block 168; Lot 9.01; heading north along New York Avenue (paper street) to the intersection of Sound Drive (paper street); finally heading east along Sound Drive (paper street) to the intersection of Oyster Road and the Atlantic City Electric easement. This area has been added in conformance with the revised "Whitesboro-Burleigh Center" area as submitted to the NJ Office of Smart Growth.

Map Area A9 - The sewer service area has been expanded to include all properties within an area bounded by the intersection of the Garden State Parkway and Lena Street (paper street); heading south along the Garden State Parkway right-of-way to the southeastern corner of Block 1436; Lot 2.06; heading west along the south side of Block 1436; Lot 2.06; thence heading north along the existing sewer service boundary (1,000-foot offset east from NJSH Route 9) to the intersection of Lena Street and Franklin Street (paper street); finally heading east along Lena Street (paper street) to the intersection of the Garden State Parkway right-of-way. This area has been added in conformance with the revised "Whitesboro-Burleigh Center" area as submitted to the NJ Office of Smart Growth.

2. Sewer Service Area Deductions for the "Whitesboro-Burleigh Center":

Map Area D6 - The sewer service area has been reduced to exclude Block 1434; Lots 5, 6, and 7 in conformance with the revised "Whitesboro-Burleigh Center" area as submitted to the NJ Office of Smart Growth.

3. Sewer Service Area Expansion for the "Rio Grande Center":

Map Area A10 - The sewer service area has been expanded to include all portions of Block 1435.03; Lots 15, 16.01, 16.02 and 17 in conformance with the revised “Rio Grande Center” area as submitted to the NJ Office of Smart Growth.

Map Area A11 - The sewer service area has been expanded to include all portions of Block 1436; Lots 16.01 and 16.02 in conformance with the revised “Rio Grande Center” area as submitted to the NJ Office of Smart Growth.

Map Area A12 - The sewer service area has been expanded to include the eastern portion of Block 1414.01; Lots 15.01 and 15.02 in conformance with the revised “Rio Grande Center” area as submitted to the NJ Office of Smart Growth.

Map Area A13 - The sewer service area has been expanded to include all portions of Block 1524; Lots 2.02, 2.03, 4, 5 and 6 up to the boundary of Lower Township in conformance with the revised “Rio Grande Center” area as submitted to the NJ Office of Smart Growth.

Map Area A14 - The sewer service area has been expanded to include Block 466.01; Lot 38.04 and a portion of Block 466.01; Lot 38.01 350-linear feet west of and parallel to Fulling Mill Road in conformance with the revised “Rio Grande Center” area as submitted to the NJ Office of Smart Growth.

4. Sewer Service Area Deductions for the “Rio Grande Center”:

Map Area D7 - The sewer service area has been reduced to exclude all of Block 1410.01; Lot 44 in conformance with the revised “Rio Grande Center” area as submitted to the NJ Office of Smart Growth.

EXISTING AND FUTURE DOMESTIC AND INDUSTRIAL TREATMENT FACILITIES

The following lists identify the sewage treatment facilities within the WQMP/WMP planning area for the Township of Middle.

Table 2-9 Community Wastewater Treatment Facilities

Facility	NJPDES Permit No.	Flow (GPD)
Seven Mile/Middle Regional WWTP	NJ0052990	7,670,000
The Links at Avalon	NJ0069884	67,180
Bay Cove Resort Condo Association, Inc.	NJ0083984	31,950
Stone Harbor Lakes, LLC	NJ0100927	4,300
Sand Barrens Golf Club	NJ0139653	12,250

Table 2-10 On-Site Septic Disposal Systems

Facility	NJPDES Permit No.	Flow (GPD)
Delsea Woods-Middle Township MHP	NJG0084247/NJ0130281	GW>20,000
A&J Mobile Home Ct, Inc.	NJG0084565/NJ0130281	GW<20,000
Old Stagecoach Resort Campground	NJG0084727/NJ0130281	GW>20,000
Cedar Spring Mobile Home Park	NJG0084875/NJ0130281	GW>20,000
Acorn Campground	NJG0084999/NJ0130281	GW>20,000
Edgewood Village Homes MHP	NJG0085049/NJ0130281	GW>20,000
King Nummy Trail Campground	NJG0085227/NJ0130281	GW>20,000
Big Timber Lake Campground	NJG0085332/NJ0130281	GW>20,000
North Wildwood Campground	NJG0085375/NJ0130281	GW>20,000
Sea Pines Resort Campground	NJG0087351/NJ0130281	GW>20,000
Eastern Shore Nursing Home	NJG0088552/NJ0130281	GW<20,000
Country Court Condo Association	NJG0108634/NJ0130281	GW<20,000
Cape Shores Resort Campground	NJG0135089/NJ0130281	GW>20,000
Kelleher T/A Ponderosa Campground	NJG0136018/NJ0130281	GW<20,000
Green Holly Camping Resort, Inc.	NJG0136522/NJ0130281	GW>20,000
Presidential Courts MHP	NJG0143031/NJ0130281	GW<20,000
Cape May County Park & Zoo	NJG0105937/NJ0130281	GW<20,000
Hideaway Beach Condo Association	NJG0101133/NJ0130281	GW>20,000
Samuel DiPasquale	Unpermitted	GW<20,000
Shell Bay Campground	Unpermitted	GW>20,000
Captain Walts	Unpermitted	GW<20,000
SC Holdings, Inc./Waste Managemetn	Unpermitted	GW>20,000

Table 2-11 Holding Tanks

Facility	NJPDES Permit No.	Flow (GPD)
Grassy Sound Village	N/A	N/A

Lower Township Region

The WMP provides a framework and description on how Lower Township treats and disposes of the wastewater that is generated by its residents and businesses. The WMP also serves as a basis for future changes to existing sewer service areas (SSA), treatment facilities and infrastructure.

The Lower Township WMP Planning Area (Planning Area) includes Lower Township and the Del Haven and the Green Creek sections of Middle Township. The Planning Area is entirely within the Cape May County WMP Planning Area. Upon adoption of this WMP, all information within the Cape May County WMP regarding the Planning Area will be updated.

There is one (1) regional wastewater treatment facility operating under an individual New Jersey Pollution Discharge Elimination System (NJPDES) permit in the Planning Area. Lower Township Municipal Utilities Authority (Lower Township MUA) Sewage Treatment Plant is owned and operated by the Lower Township MUA. Lower Township MUA Sewage Treatment Plant is a secondary wastewater treatment facility designed to treat domestic and light industrial waste. The Lower Township MUA sewer service area (SSA) includes Lower Township and the Del Haven and the Green Creek sections of Middle Township.

There are four (4) campground sites served by subsurface disposal (septic) systems with design flows greater than 2,000 GPD within the planning area. These facilities are operated under T1 General NJPDES permit authorizations.

Additionally, there is one (1) facility in the planning area, Cape May National Golf Club, which is served by an individual on-site wastewater treatment facility, which is operated under a Discharge to Groundwater Individual NJPDES permit.

Furthermore, several portions of Lower Township that are currently (and have been for a number of years) being served by the Lower Township MUA appear to be located outside of the existing WMP designated sewer service area. Table 2-12 presents a summary of the NJPDES permitted facilities within the Planning Area.

A. Summary of flows for the Del Haven/Green Creek Area:

Existing flow is 0.176 MGD, proposed future flow is 0.267 MGD to the Lower Township MUA Treatment Plant.

1. Sewer Service Area Expansion for the “Green Creek Center”:

Map Area A15 - The sewer service area has expanded to include Block 466.01; Lot 32 in conformance with the revised “Green Creek Center” area as submitted to the NJ Office of Smart Growth.

Map Area A16 - The sewer service area has expanded to include all properties within Block 1410.06; Lots 4 thru 27 and 31, as well as Block 1410.01; Lots 11, 12.01, 12.02, 13 thru 17, 18.01, 18.02, 19.02 thru 19.05, 29.01 and 29.02 in conformance with the revised "Green Creek Center" area as submitted to the NJ Office of Smart Growth.

Map Area A17 - The sewer service area has expanded to include all of the properties within Block 473; Lots 3.01, 3.02, 4, 5.01, 5.02, 7.25, 12, 22.01, 22.02, 22.03, 23, 24.02 thru 24.05, 25, 26, 27.01 and 28, all of the properties within Block 388; Lot 30 and 31.01, a portion of the properties within Block 473; Lots 5.03, 7.01, 7.02, 15, 24.01, 27.02, as well as a portion of property within Block 388; Lot 31.01 in conformance with the revised "Green Creek Center" area as submitted to the NJ Office of Smart Growth.

Map Area A18 - The sewer service area has expanded to include the northern portions of Block 466.01; Lots 14 and 15 which are located within uplands, west along Bayshore Road to a point opposite to the western most property line of Block 389; Lot 9.03 in conformance with the revised "Green Creek Center" area as submitted to the NJ Office of Smart Growth.

2. Existing Sewered Properties to Be Included within the "Green Creek Center":

Map Area R2 - Under Middle Township's Green Creek Pump Station and Sanitary Sewer System project, approved under NJDEP Treatment Works Approval Permit No. 03-0084a, sanitary sewer service was provided to Block 471; Lots 1 thru 26, as well as the entire portion of Block 1410.01; Lot 37.01. The sewer service area should be expanded to include these currently sewered properties.

Map Area R3 - Under Middle Township's Green Creek Pump Station and Sanitary Sewer System project, approved under NJDEP Treatment Works Approval Permit No. 03-0084a, sanitary sewer service was provided to Block 467; Lots 11 thru 26. The sewer service area should be expanded to include these currently sewered properties.

Map Area R4 - Under Middle Township's Green Creek Pump Station and Sanitary Sewer System project, approved under NJDEP Treatment Works Approval Permit No. 03-0084a, sanitary sewer service was provided to Block 1410.07, Lots 1 and 2, to Block 1410.03, Lots 8, 9.01 and 9.02 and to Block 1410.06; Lots 1, 2.01, 2.03, 3.01 thru 3.03. The sewer service area should be expanded to include these currently sewered properties.

Map Area R5 - Under Middle Township's Green Creek Pump Station and Sanitary Sewer System project, approved under NJDEP Treatment Works Approval Permit No. 03-0084a, sanitary sewer service was provided north and south of Norbury's Landing Road within the upland portions of Block 466.01; Lots 15 and 16, as well the entire portion of Block 389; Lots 9.03 and 24. The sewer service area should be expanded to include these currently sewered properties.

Map Area R6 - Under Middle Township's Green Creek Pump Station and Sanitary Sewer System project, approved under NJDEP Treatment Works Approval Permit No. 03-0084a, sanitary sewer service was provided to Block 473; Lots 6, 7.01 and 7.03, as well as Block 389; Lots 1.01, 1.02, 31.02 and 32. The sewer service area should be expanded to include these currently sewered properties.

3. Existing Sewered Properties to Be Included within the "Del Haven Center":

Map Area R7 - Under Middle Township's Del Haven Sanitary Sewer System project, sanitary sewer service was provided to Block 390; Lot 1.03, as well as Block 404; Lots 1.01, 1.02, 2, 3, 4.01, 4.01, 5.01, 5.02, 6 thru 11, 12.01, 12.02, 13, 14, 15.01, 15.02 and 16 thru 18. The sewer service area should be expanded to include these currently sewered properties.

Map Area R8 - Under Middle Township's Del Haven Sanitary Sewer System project, sanitary sewer service was provided to Block 434; Lot 13. The sewer service area should be expanded to include this currently sewered property.

Map Area R9 - Under Middle Township's Del Haven Sanitary Sewer System project, sanitary sewer service was provided to Block 436; Lots 1 thru 4, 5.01 and 5.02, as well as Block 443; Lots 1 thru 8, Block 447; Lots 1 thru 8, Block 451 and Lots 1 thru 8. The sewer service area should be expanded to include these currently sewered properties.

4. Sewer Service Area Deduction for the "Del Haven Center":

Map Area D8 - The sewer service area has been reduced to include Block 433; Lots 11, 12 and 13, as well as the portion of the Block 434; Lot 1 which borders these lots in conformance with the presence of wetland which makes these lots undevelopable.

Table 2-12 Summary of NJPDES Permitted Facilities within the Planning Area

Facility Name	NJPDES Permit #	Permit Type	Location	Permitted Flow, MGD	Actual Flow, MGD	Owner/Operator	Wastewater Description
Lower Township MUA	NJ0023809	Discharge to Surface Water	Lower Township	4.0	2.0	Lower Township MUA	Municipal Wastewater
Seashore Campground	NJ0085006	T1 - Discharge to Ground Water	Lower Township	0.0975	N/A	Seashore Campsites, Inc	Sanitary Wastewater
Lake Laurie Campground	NJ0084981	T1 - Discharge to Ground Water	Lower Township	0.1113	N/A	Lake Laurie, Inc	Sanitary Wastewater
Holly Shores Campground	NJ0085383	T1 - Discharge to Ground Water	Lower Township	0.0417	N/A	ROBBRO LLC T/A Holly Shores	Sanitary Wastewater
Beachcomber Camping Resort	NJ0100455	T1 - Discharge to Ground Water	Lower Township	0.08475	N/A	Beachcomber Campground, Inc	Sanitary Wastewater
Cape May National Golf Club	NJ0081183	T1 - Discharge to Ground Water	Lower Township	0.01225	N/A	Cape Country Club, Inc.	Sanitary Wastewater

Additionally, portions of Lower Township located along the border with Middle Township, are connected to the Wildwood/Lower Sewer Treatment Plant SSA of the Cape May County Municipal Authority (CMCMUA) (NJPDES 0053007).

No new treatment facilities are being considered in this WMP. No expansion of existing treatment facilities is being proposed in this WMP.

This WMP proposes the following significant actions:

Extending LTMUA SSA to existing developments currently served by subsurface disposal (septic) systems (increase of 669.5 acres).
Extending CMCMUA SSA to existing developments currently served by subsurface disposal (septic) systems (increase of 230 acres).
Extending SSA to the areas of Lower Township currently connected to the Public Sewer, but not shown as a part of the SSA in the NJDEP database (331 acres).
An increase of SSA by 34.5 acres
Re-designation of 43.5 acres of SSA as open space

Summary of Significant Actions

This WMP proposes the following significant actions:

Table 2-13 Summary of Significant Actions

Action	Description
1	Extending LTMUA sewer service to existing developments currently served by subsurface disposal (septic) systems with design flows less than 2,000 GPD. The following sections of Lower Township are currently served by septic systems (reportedly failing in some areas): George Street Section; Long Brothers Track; Freedom Track; Lennox Track; Kechemeche Street Track 2; Douglas Memorial Recreational Fields; Various individual (in fill) lots throughout Lower Township.
2	Extending LTMUA sewer service to existing developments currently served by Subsurface Disposal Systems (Septic) with Design Flows Greater than 20,000 GPD Lake Laurie Campgrounds (NJPDES permit # NJ0084981).
3	Abandon Lake Laurie Subsurface Disposal Facilities (NJPDES permit # NJ0084981)
4	Extending LTMUA Sewer Service Area to the areas of Lower Township currently connected to the Public Sewer, but not shown as a part of the SSA in the NJDEP database: Cape May County Airport (connected since early 1970's); Sheridan Track (permitted through Treatment Works Approval process with NJDEP Department of Water Quality); Cape Island Camp Ground; Kechemeche Street Track 1; Commercial development along Ocean Drive.
5	Extending LTMUA Sewer Service Area to a new development: Shepherds Run; Future Recreational Fields/Complex.
6	Re-designation of 43.5 acres of existing LTMUA SSA as Open Space
7	Adjustment of SSA designation based on most up-to date aerial and parcel mapping
8	Extending CMCMUA sewer service to existing developments located in Lower Township currently served by subsurface disposal (septic) systems with a design flow less than 2,000 GPD: Erma Section.

No new or expanded wastewater treatment facilities are being considered in this WMP.

Existing and Future Domestic and Industrial Treatment Facilities

Discussion of Existing Treatment Facilities

There is one (1) regional wastewater treatment facility operating under an individual New Jersey Pollution Discharge Elimination System (NJPDES) permit in the Planning Area. Lower Township MUA Sewage Treatment Plant Treatment Plant (STP) is owned and operated by the Lower Township MUA. Lower Township MUA is a secondary wastewater treatment facility designed to treat domestic and light industrial waste. The Lower Township MUA SSA includes Lower Township and the Del Haven and the Green Creek sections of Middle Township.

The design, treatment and NJPDES permitted capacity of the Lower Township MUA STP is 4 million gallons per day (MGD). Between June 2006 and May 2007, Lower Township MUA treated an average of 2.0 MGD. After receiving treatment, the plant's effluent is disinfected and is pumped to the Cape May County Municipal Utilities Authority Pump Station for ultimate discharge to the Atlantic Ocean via an outfall pipe.

Table 2-14 summarizes the Lower Township MUA flow data from August 2006 to July 2007. Table 2-15 is the Lower Township MUA Facilities Table. For projected wastewater flow calculations, see Table 2-16.

Table 2-14 Lower Township MUA Sewage Treatment Plant Flow Data

Date	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
1	2.21	2.50	1.99	1.71	1.74	2.21	1.70	1.84	1.86	1.91	1.88	2.36
2	2.23	2.25	1.84	1.63	1.86	1.98	1.77	1.88	1.89	1.87	1.90	2.32
3	2.33	2.17	1.82	1.74	1.96	1.82	1.84	1.78	1.89	1.95	2.00	2.41
4	2.42	2.13	1.69	1.80	1.90	1.78	1.75	1.82	1.98	1.97	1.87	2.50
5	2.44	2.17	1.91	1.83	1.85	1.78	1.76	1.73	1.79	1.98	1.87	2.34
6	2.45	1.93	2.11	1.79	1.83	1.87	1.74	1.86	1.89	2.00	1.82	2.30
7	2.23	1.92	1.96	1.77	1.84	1.97	1.71	1.83	1.84	1.98	1.79	2.46
8	2.17	1.97	1.89	1.69	1.75	2.11	1.66	1.87	1.83	1.95	1.89	2.36
9	2.18	2.10	1.89	1.75	1.74	2.00	1.72	1.85	1.72	1.79	1.95	2.29
10	2.32	2.05	1.83	1.73	1.84	1.80	1.76	1.70	1.78	1.89	1.91	2.18
11	2.37	1.94	1.88	1.96	1.81	1.81	1.75	1.72	1.78	1.91	1.78	2.05
12	2.39	1.92	1.94	2.26	1.77	1.73	1.67	1.70	1.95	2.03	2.00	1.98
13	2.22	1.79	1.89	2.03	1.78	1.83	1.83	1.74	1.89	1.99	1.92	2.17
14	2.21	1.88	1.82	1.88	1.75	1.99	1.98	1.74	1.91	1.93	1.95	2.16
15	2.14	1.82	1.81	1.74	1.83	1.96	1.76	1.89	2.41	1.99	2.02	2.09
16	2.24	1.88	1.87	1.82	1.78	1.88	1.78	2.38	2.30	1.93	2.12	2.13
17	2.07	1.88	2.03	1.79	1.81	1.80	1.80	2.14	2.14	1.93	2.11	2.13
18	2.20	1.79	2.23	1.96	1.80	1.90	1.81	2.01	2.01	1.95	1.99	1.97
19	2.23	1.78	1.97	1.86	1.80	1.85	1.76	2.01	1.94	1.96	1.97	1.98
20	2.18	1.98	1.90	1.90	1.66	1.79	1.72	1.90	1.98	1.96	1.86	2.00
21	2.13	1.93	2.05	1.84	1.70	1.85	1.72	1.78	2.07	1.89	1.88	2.13
22	2.11	1.92	1.86	2.15	1.69	1.79	1.77	1.79	2.08	1.92	1.99	2.14
23	2.09	1.98	1.93	1.96	1.71	1.75	1.67	1.89	2.01	1.78	2.12	2.04
24	2.21	2.00	1.97	1.88	1.64	1.76	1.75	1.91	1.98	1.78	2.15	2.00
25	2.32	1.84	1.87	1.93	1.69	1.78	1.96	2.15	1.90	1.99	2.15	1.96
26	2.29	1.82	1.92	1.86	1.69	1.80	1.84	1.88	2.02	2.25	2.10	2.00
27	2.32	1.74	1.99	1.85	1.77	1.79	1.78	1.81	2.01	2.31	2.08	2.14
28	2.22	1.68	1.88	1.87	1.74	1.72	1.80	1.78	1.89	2.21	2.18	2.18
29	2.06	1.78	1.85	1.76	1.78	1.81		1.96	1.99	1.90	2.12	2.25
30	1.92	1.87	1.81	1.73	1.83	1.75		1.93	1.91	1.81	2.27	2.36
31	1.89		1.71		1.94	1.78		1.88		1.82		2.03
Max.	2.45	2.50	2.23	2.26	1.96	2.21	1.98	2.38	2.41	2.31	2.27	2.50
Min.	1.89	1.68	1.69	1.63	1.64	1.72	1.66	1.70	1.72	1.78	1.78	1.96
Avg.	2.22	1.95	1.91	1.85	1.78	1.85	1.77	1.88	1.95	1.95	1.99	2.17
Total	68.79	58.41	59.11	55.47	55.28	57.44	49.56	58.15	58.64	60.53	59.64	67.41

Table 2-15 Lower Township Municipal Utilities Authority Facilities Table

DOMESTIC OR INDUSTRIAL TREATMENT FACILITIES TABLE FORMAT OUTLINE

DOMESTIC OR INDUSTRIAL TREATMENT FACILITIES TABLE FORMAT OUTLINE

Lower Township Municipal Utilities Authority Sewage Treatment Plant
(Name of Facility)

1 Existing or proposed facility: Existing

2 New Jersey Pollutant Discharge Elimination System Permit Number: NJ: 0023809

3 Discharge to ground water (dgw) or surface water (dsw): DSW

4 Receiving water or aquifer: Atlantic Ocean through forcemain to CMCMUA

5 Classification of receiving water or aquifer:

6 Owner of facility: Lower Township Municipal Utilities Authority

7 Operator of facility: Lower Township Municipal Utilities Authority

8 Co-Permittee of facility (where applicable): N/A

9. Location of facility:
   a. Municipality & County Lower Township / Cape May County
   b. Street address 2900 Bayshore Road, Villas NJ
   c. Block(s) and Lot(s) Block 410.01 Lot 46.01

10. Location of discharge (i.e. degrees, minutes, seconds):
   a. Longitude 74° 55' 59.9" b. Latitude 39° 00' 15.0"
   or c. State Plane Coordinates

11. Present permitted flow or permit condition or daily maximum: 4 MGD

12. Summary of population served/to be served including major seasonal fluctuations:

	Present (2007) Population Served*:		Ultimate Buildout (2017) Population Served*:
		Municipality	
		Lower Township	
	32,529		35,900
		Middle Township	
	1,610		1610
Total	34,139		37,510

* Square footage for commercial development

13. Summary of wastewater flow received/to be received expressed in million gallons per day (mgd) and as a 30-day average flow for dsw or a daily maximum flow for dgw:

	Present (2007) Wastewater Flow (mgd)		Ultimate Buildout (2017*) Wastewater Flow (mgd)
		Municipality	
		Lower Township	
Residential flow	1.52 MGD		1.796 MGD
Commercial flow	0.33 MGD		0. 39 MGD
Industrial flow			
Infiltration/Inflow			
Total			
		Middle Township	
Residential flow	0.15 MGD		0.15 MGD
Commercial flow			
Industrial flow			
Infiltration/Inflow			
Total			
Total	2.0 MGD		2.336 MGD

There are four (4) campground sites served by subsurface disposal (septic) systems with design flows greater than 2,000 GPD within the planning area. These facilities are operated under category T1 General NJPDES permit authorizations.

Additionally, there is one (1) facility in the Planning Area, Cape May National Golf Club, which is served by an individual on-site wastewater treatment facility, which is operated under an individual NJPDES permit.

Furthermore, several portions of Lower Township that are currently (and have been for a number of years) being served by the Lower Township MUA are appear to be located outside of the NJDEP designated SSA.

Additionally, portions of Lower Township located along the border with Middle Township, are connected to the Wildwood/Lower Sewer Treatment Plant SSA of the Cape May County Municipal Authority (CMCMUA) (NJPDES # NJ0053007).

Discussion of Future Treatment Facilities

There are no proposed significant future actions.

Planned Future Development

Depending upon the nature of future development and redevelopment and extension of existing sewer infrastructure, upgrades may be necessary in terms of pump stations and/or improvements or additions to the collection system.

Several significant projects have been approved by or are under review by Lower Township.

Existing Development Served by Subsurface Disposal Systems (Septic) with Design Flows Greater than 20,000 GPD

*Lake Laurie Campground*s

Lake Laurie Campgrounds is an existing campground resort currently served by a number of septic systems operating under a single T1 General NJPDES permit (NJPDES permit #NJ0084981). As the result of the adoption of this WMP the Lake Laurie Campgrounds are will be connected to the Lower Township MUA and the existing disposal facilities will be abandoned.

Existing Housing Served by Subsurface Disposal Systems (Septic) with Design Flows Less than 2,000 GPD

The areas of Lower Township listed below are currently served by individual septic systems and will benefit greatly from connecting to public sewer:

George Street Section;

Long Brothers Track;
Freedom Track;
Lennox Track;
Kechemeche Street Track 2;
Douglas Memorial Recreational Fields;
Various individual (in fill) lots throughout Lower Township.

Due to the nature of local area soils, somewhat shallow groundwater and relatively small sizes of individual lots, a number of septic systems in the above areas of Lower Township are reportedly failing. The above mentioned portions of Lower Township are located such that the public sewer can be easily extended to these areas. Because of the generally small sizes of the individual lots, extending the sewer service area to these portions of Lower Township will not trigger further development in Lower Township, but merely alleviate the situation with the failing septic systems.

Proposed Development

Sheppard's Run Development
Future Recreational Center

Existing Development with Existing LTMUA connection; however are outside the NJDEP approved Sewer Service Area (no additional flow generation)

Cape May County Airport;
Sheridan Track;
Kechemeche St Track 1;
Cape Island Campground;
Commercial Development along Ocean Drive;
Mobile Home Development near intersection of Route 9 and Cape May Lewes Ferry Approach Rd.

The above listed developments are currently connected to the Lower Township MUA sewer system. However, these developments are located outside the existing SSA as depicted in NJDEP, Division of Watershed Management (DWM), Bureau of Watershed Regulation (BWR) October 2006 Sewer Service Area Map.

Projected Wastewater Flows (Lower Township MUA SSA)

The projected wastewater flows for the proposed developments and the existing developments that are currently serviced by septic systems but are proposed to be connected to the Lower Township MUA STP were estimated based on the criteria specified in N.J.A.C. 7:14A-23.3 and is summarized in Table 2-16 below.

Table 2-16 Projected Wastewater Flows (Lower Township MUA)

Development	Number of Parcels	Unit Flow, GPD	Total Flow, GPD
Lennox Track	138	300	41,400
George Street Section/Long Brothers Track/Freedom Track	249	300	74,700
Shepherds Run	36	300	10,800
Lake Laurie	742	150	111,300
Various (in fill) Lots (residential)	120	300	36,000
Future Commercial Development	1	55,000	55,000
Existing Commercial currently served by septic	1	7,500	7,500
Total			336,700

Projected Wastewater Flows (CMCMUA SSA)

Erma Section is a section of Lower Township located near the border with Middle Township and is currently served by septic systems. However, as with other parts of Lower Township, a large number of septic systems are reportedly failing. Therefore, a connection of the Erma section to the CMCMUA is proposed. The projected wastewater flow for this section of the Township was estimated based on the criteria specified in N.J.A.C. 7:14A 23.3 and is summarized in Table 2-17 below.

Table 2-17 Projected Wastewater Flows (CMCMUA)

Development	Number of Parcels	Unit Flow, GPD	Total Flow, GPD
Erma Section	742	300	222,600
Total			222,600

V. Cape May Region

No significant points for this area.

Proposed Expansion of Regional Sewage Treatment Plant Capacities

Ocean City Regional Sewage Treatment Plant

Design Capacity = 8.240 MGD
Permitted Flow = 8.240 MGD
Peak Summer Flow = 6.454 MGD
Planning Flow = 6.635 MGD

Seven Mile - Middle Township Regional Sewage Treatment Plant

Design Capacity = 9.27 MGD
Permitted Flow = 7.670 MGD
Peak Summer Flow = 6.521 MGD
Planning Flow = 7.992 MGD

Wildwood - Lower Township Regional Sewage Treatment Plant

Design Capacity = 17.590 MGD
Permitted Flow = 14.180 MGD
Peak Summer Flow = 9.895 MGD
Planning Flow = 18.436 MGD

Lower Township Municipal Utilities Authority Sewage Treatment Plant

Design Capacity = 4.000 MGD
Permitted Flow = 4.000 MGD
Peak Summer Flow = 2.385 MGD
Planning Flow = 4.000 MGD

Cape May Regional Sewage Treatment Plant

Design Capacity = 3.700 MGD
Permitted Flow = 3.000 MGD
Peak Summer Flow = 2.325 MGD
Planning Flow = 3.000 MGD

General Future Development Environmental Requirements

Individual Subsurface Sewage Disposal Systems (ISSDS) for individual residences can only be constructed in depicted sewer service areas if legally enforceable guarantees are provided before such construction, that use of such systems will be discontinued when the depicted sewer service becomes available. This applies to ISSDS that require certification from the Department under the Realty Improvement Sewerage Facilities Act (N.J.S.A. 58:11-23) or individual Treatment Works Approval or New Jersey Pollutant Discharge Elimination System Permits (under N.J.A.C. 7:14A). This also applies to ISSDS which require only local approvals if the WMP acknowledges adequate arrangements for enforcement of other requirements (such as adherence to municipal or sewerage authority ordinances).

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.

Pre-existing grant conditions and requirements (from USEPA and NJDEP grants or loans for sewage facilities) which provide for restriction of sewer service to environmentally sensitive areas, are unaffected by the adoption of this WMP and compliance is required.

New Jersey's coastal zone extends from the New York border south to Cape May County Point and then north to Trenton. It encompasses the waters and waterfronts of the Hudson River and related water bodies south of the Raritan Bay, the Atlantic Ocean and some inland areas from Sandy Hook to Cape May County, the Delaware Bay and some inland areas, and the waterfront of the Delaware and related tributaries. The coastal zone encompasses areas in which the State has the authority to regulate land and water uses through the Coastal Area Facility Review Act (CAFRA), Waterfront Development Law and Wetlands Act of 1970.

Because sections of the Cape May County WMP Planning Area are within New Jersey's regulated Coastal Zone as defined at N.J.A.C. 7:7E-1.2(b), compliance with the following statement is mandatory:

"Proposed developments tying into existing and proposed sewer service areas which require coastal permits must demonstrate compliance with all applicable sections of the Coastal Zone Management rules including, but not limited to, Wetlands (N.J.A.C. 7:7E-3.27), Wetlands Buffers (N.J.A.C. 7:7E-3.28), Endangered or Threatened Wildlife or Vegetation Species Habitat (N.J.A.C. 7:7E-3.38), Secondary Impacts (N.J.A.C. 7:7E-6.3), Public Facility Use Policies (N.J.A.C. 7:7E-7.6), Water Quality (N.J.A.C. 7:7E-8.4), Ground Water Use (N.J.A.C. 7:7E-8.6) and the policies under General Land Areas rules, Subchapters 5, 5A and 5B."

Basis for Service Area Delineations

The service area delineation for the Lower Township WMP Planning Area (Planning Area) is based on pre-existing municipal boundaries, sewage treatment facility service area and practical considerations such as local topography, existing roads, and proximity to existing infrastructure. Development within these areas is guided by the current zoning ordinances, development regulations, and master plans of the applicable municipality, Cape May County, the New Jersey Department of Environmental Protection, and the appropriate Coastal Zone Management rules.

The future sewer service areas considered in this WMP within the Planning Area consist of infill throughout Lower Township, planned developments, and the connection of existing residences currently utilizing sanitary septic systems.

CHAPTER 3 - EXISTING AND FUTURE DOMESTIC AND INDUSTRIAL TREATMENT FACILITIES

3.1 Discussion of Existing and Future Domestic and Industrial Treatment Facilities

The following lists identify the sewage treatment facilities within each of the five service regions within the WQMP/WMP planning area. The facilities are listed in alphabetical order by region.

The following policies/requirements apply to the existing and proposed STPs and/or service areas:

1. All existing, new or expanded industrial pretreatment facilities requiring Significant Indirect User (SIU) permits in accordance with N.J.A.C. 7:14A-13 and/or Treatment Works Approvals (TWA) in accordance with N.J.A.C. 7:14A-22, and which are located within the specified sewer service area, are deemed to be consistent with the WQMP/WMP.

2. Subsurface sewage disposal systems for individual residences and commercial operations can only be constructed within delineated sewer service areas if legally enforceable guarantees are provided, before such construction, that use of such systems will be discontinued when the depicted sewer service becomes available in accordance with the municipal ordinance requirements.

3. 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 and conceptually descriptive purposes only, and shall not be construed to define the legal geographic jurisdiction of such statutes or rules.

4. Pre-existing grant conditions and requirements associated with Federal and/or State grants or loans which were used to finance sewerage facilities, which established specific restrictions on sewer service to environmentally sensitive areas, remain in place and are unaffected by adoption of this WQMP/WMP. Compliance with all such grant conditions is required.

5. Proposed developments that are expected to tie into existing and/or proposed sewer service areas which require coastal permits must demonstrate compliance with applicable coastal policies. These policies include, but not limited to, policies under the Rules on Coastal Zone Management (7:7E-1.1 et seq.), Wetlands (7:7E-3.27), Wetland Buffers (7:7E-3.28), Endangered or Threatened Wildlife or Vegetation Species Habitat (7:7E-3.38), Secondary Impacts (7:7E-6.3), Public Facility Use Policies (7:7E-7.6), Water Quality (7:7E-8.4), Ground Water Use (7:7E-8.6) and the policies under General Land Areas - Subchapter 5 (7:7E-5.1 through 5.7). This is in order to show consistency with New Jersey's Coastal Zone Management Program.

6. Sewerage facilities (including but not limited to sewer connections, sewer extensions and on-site treatment systems) that are located in the Pinelands Area, as defined at N.J.S.A. 13:18A-11, must obtain approval of the Pinelands Commission pursuant to the requirements of the Pinelands Comprehensive Management Plan (CMP) prior to construction. Where applicable all facilities and activities included within this WQMP/WMP should be consistent with the requirements of the CMP.

7. The location of future pump stations, major interceptors, and trunk sewers shown in WMP mapping are being provided for general information. This will not serve as the basis for any future consistency determination or permit reviews unless the pump station, major interceptor or trunk sewer is part of a State or Federally funded project.

8. Compliance with the Sewer Ban regulations (N.J.A.C. 7:14A-22) including all subsequent revisions thereto pursuant to the State of New Jersey's "Capacity Assurance Program" is required for wastewater treatment plants. As required by the Cape May County Health Department, any municipality proposing an increase in sewer capacity and/or expansion of sewer service area beyond the revisions proposed herein shall prepare a study showing the location and extent of additional development which would result from the proposed changes. Proposals for an increase in sewer capacity and/or service area shall provide projected sewage flow generation rates in million gallons per day (MGD) format. The applicant must demonstrate the existence of adequate treatment plant capacity, the capacity of existing sewage infrastructure, and feasibility of service connection. Proposals involving discharge to any of the CMCMUA’s four regional treatment plants must obtain the endorsement of the Cape May County Municipal Utilities Authority prior to contacting the CMCHD to request an amendment to the WQMP/WMP. Proposals involving discharge to the Lower Township Municipal Utilities Authority Sewage Treatment Plant must first receive LTMUA endorsement.

3.2 Discussion of Wastewater Treatment Plant Flows

This section discusses the flow projections for existing and future sewer service areas for the thirteen municipalities contributing sewage flow to the five publicly owned wastewater treatment plants operating in Cape May County. Currently permitted treatment plant capacity is analyzed with respect to wastewater flows received from the identified service area at full build-out for each of the four regional treatment facilities under the jurisdiction of the Cape May County Municipal Utilities Authority (CMCMUA) and also The Lower Township M.U.A. Wastewater Treatment Plant. Existing sewer service areas are defined as those areas that are already serviced by public sewers and those areas previously planned for service per adopted 201 Facilities Plans and as modified within individual municipal Wastewater Management Plans, as approved by the NJDEP and the USEPA, whenever required.

Historical Perspective

During the period from the late 1970's through the early 1980's both the 208 Plan and the 201 Plan were being developed for Cape May County. These Plans were completed after nearly ten years of study, producing extensive documents that rigidly defined the areas of the County that would receive regional wastewater treatment services. The 201 Plan identified, on a lot and block basis, all lands that were environmentally sensitive. These environmentally sensitive lands within and adjacent to the CMCMUA sewer service areas were prohibited from receiving regional wastewater treatment service in the USEPA's approval of the 201 Plan.

The 201 and 208 Plans provided a method for determining future population projections and the corresponding number of equivalent dwelling units which would occur at full build-out within the defined limits of the sewer service areas in each of the participant municipalities. The projected number of dwelling units at full build-out formed the basis for the wastewater flow projections within those portions of each community that were to become part of the regional wastewater treatment service system. The specific areas mapped to receive regional wastewater treatment service by the CMCMUA, as well as the population and wastewater flow projection figures developed were used consistently throughout both the 201 and 208 Plans. These Plans were approved by the USEPA and the NJDEP after an extensive review and public participation process.

The wastewater flow projections contained in the 201 Plan were utilized to precisely size the regional pumping stations in each community and to size the force main pipes which connect the remote pumping stations to their respective wastewater treatment plants. The pumping structures and interconnecting force mains were sized for the wastewater flows projected to be received from each community at full build-out as delineated in the approved 201 Plan. It was estimated at that time that full build-out would occur by the year 2020.

The total sum of the average summer daily flows from the remote regional pumping stations which service each community was used to design and size the regional wastewater treatment facilities, as well as, the effluent disposal facilities. While the physical structures such as all buildings, flow channels and effluent disposal piping at each regional wastewater treatment were sized and constructed based on wastewater flows projected to be generated at full build-out within the service area, the modular tanks and process equipment were sized for an initial ten year horizon. The current NJDEP operating permits for the regional treatment plants provide for the wastewater flows projected in the 201 Plan for that initial ten year planning horizon. The Ocean City Regional Wastewater Treatment Plant has already been rerated at its final capacity projected to be received at full build-out. Federal and State grant monies were received by the CMCMUA for the planning, design and construction of the regional wastewater conveyance and treatment system.

The design flows for the regional pumping stations and force mains which were based upon full build-out in the 201 Plan were used to establish limitations, or "allocations" of flow for each community which represented the maximum wastewater quantity that could be transmitted and treated by the Cape May County Municipal Utilities Authority (CMCMUA).

The Capacity Assurance Program (CAP) (N.J.A.C. 7:14A-22.16) requires that whenever the committed flows to a wastewater treatment facility reaches or exceeds 80% of the permitted flow, a CAP must be submitted to the NJDEP. Since the CMCMUA's design flows at the regional wastewater treatment facilities are represented by the sum of the design flows from each community, the CMCMUA adopted its own CAP to insure that wastewater flows originating in each of its participating communities would not exceed their flow allocations. The CMCMUA cannot control the aggregate flow to its regional wastewater treatment facilities without limiting the allowable flow contributed by the individual participant municipalities. The CMCMUA's CAP insures that the wastewater flow from each community does not exceed its municipal allocation and thereby enables the regional wastewater treatment plant to operate in accordance with its design at ultimate flow and its permit limits. The CMCMUA will not endorse a Treatment Works Approval (TWA) for any project within its service area if the allocation for that community is exceeded or will be exceeded as a result of the proposed project.

Figure 3-1 "Capacity Assurance Program Community Flow Status 2006" identifies the year 2020 flow allocations for each of the contributing municipalities of the CMCMUA. Since these figures represent the maximum daily average flow that can be transmitted from each community, they become, in essence, not to exceed flow figures as enforced by the CMCMUA under its CAP.

Updated Wastewater Flows

Figure 3-1 identifies the flow rates from each community serviced by the CMCMUA during the summers of 1995 through 2006. The summer flow rates (July and August) are significant because they represent the peak tourist season when wastewater flows are at their sustained maximums. The use of annual average flows are of little significance in evaluating the ability of existing treatment systems to adequately handle and treat the wastewater flow from a County which experiences dramatic population changes as a result of seasonal tourism. As a result, this updated WQMP will evaluate and focus only on summer flow rates without further discussion of annual flow rates.

Figure 3-1 Capacity Assurance Program Community Flow Status

MUNICIPALITY	1995 ALLOCATION		2020 ALLOCATION		TWO MONTH AVG. JUL/AUG 95	TWO MONTH AVG. JUL/AUG 96	TWO MONTH AVG. JUL/AUG 97	TWO MONTH AVG. JUL/AUG 98	TWO MONTH AVG. JUL/AUG 99	TWO MONTH AVG. JUL/AUG 00	TWO MONTH AVG. JUL/AUG 01	TWO MONTH AVG. JUL/AUG 02	TWO MONTH AVG. JUL/AUG 03	TWO MONTH AVG. JUL/AUG 04	TWO MONTH AVG. JUL/AUG 05	TWO MONTH AVG. JUL/AUG 06	PERCENT ALLOCATION 1995	PERCENT ALLOCATION 2020
STRATHMERE	0.240		0.360		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEA ISLE CITY	1.910		2.390		2.132	2.344	2.157	2.157	2.044	2.178	2.198	1.960	2.143	2.129	2.060	2.007	105.08%	83.97%
AVALON	N/A		N/A		1.072	1.241	1.127	1.092	1.167	1.171	1.211	0.952	0.910	0.902	0.973	1.047	N/A	N/A
15TH ST.P.S.	N/A		N/A		0.810	0.927	0.879	0.842	0.745	0.757	0.798	0.750	0.905	0.748	0.760	0.724	N/A	N/A
AVALON TOTAL FLOW	2.350		2.740		1.882	2.213	2.006	1.934	1.912	1.927	2.009	1.702	1.801	1.650	1.733	1.770	75.32%	64.60%
STONE HARBOR	1.760		1.990		0.945	1.244	1.137	1.129	1.081	1.066	1.017	0.907	0.981	0.988	0.958	0.953	54.12%	47.86%
MIDDLE TOWNSHIP	1.190		1.510	**	0.4652	0.4929	0.476	0.479	0.454	0.492	0.506	0.518	0.618	0.600	0.613	0.563	47.27%	37.25%
CREST HAVEN	0.220		0.280		0.078	0.081	0.076	0.074	0.070	0.081	0.070	0.071	0.088	0.084	0.088	0.084	38.18%	30.00%
OCEAN CITY	6.300	##	8.240		5.748	6.454	6.015	5.365	5.169	6.073	5.399	4.991	5.333	5.185	5.116	5.053	80.21%	61.32%
CAPE MAY CITY	2.270	@@	2.510		1.635	1.833	1.552	1.572	1.474	1.980	1.670	1.501	1.707	1.747	1.612	1.545	68.04%	61.53%
WEST CAPE MAY	0.470	@@	0.810		0.126	0.136	0.122	0.105	0.126	0.149	0.138	0.126	0.159	0.138	0.162	0.133	28.19%	16.36%
CAPE MAY POINT	0.240	@@	0.350		0.120	0.133	0.134	0.135	0.125	0.143	0.135	0.125	0.125	0.124	0.131	0.109	45.42%	31.14%
NORTH WILDWOOD	3.920		4.650		2.589	3.124	2.603	2.510	2.361	2.808	2.532	2.081	2.283	2.285	1.999	2.010	51.28%	43.23%
WILDWOOD	6.060		7.420	1	2.418	2.739	2.398	2.097	2.208	2.666	2.738	2.217	2.164	2.265	2.157	2.013	33.21%	27.12%
WEST WILDWOOD	0.380		0.540		0.169	0.205	0.192	0.152	0.151	0.185	0.185	0.157	0.196	0.209	0.190	0.171	44.87%	31.57%
WILDWOOD CREST	3.520		4.140		2.559	2.908	2.613	2.530	2.965	3.255	3.378	2.440	2.652	2.656	2.321	2.281	64.79%	55.08%
SHAWCREST	0.134		0.134		0.072	0.101	0.088	0.072	0.076	0.088	0.078	0.068	0.076	0.082	0.081	0.079	58.96%	58.96%
RIO GRANDE	0.374		0.986	1	0.277	0.286	0.295	0.313	0.344	0.298	0.310	0.288	0.290	0.283	0.300	0.329	87.83%	33.32%
Garden State Pky	N/A		N/A		N/A	N/A	0.014	0.012	0.009	0.013	0.013	0.010	0.012	0.011	0.011	0.008	N/A	N/A
TOTAL	31.338		39.050		21.212	24.290	21.873	20.633	20.563	23.397	22.374	19.158	20.624	20.432	19.528	19.104	60.96%	48.92%

N/A:NOT APPLICABLE - PUMP STATION NOT ACTIVATED

** INCLUDES STONE HARBOR BLVD, AVALON MANOR, MAYVILLE, AND COURT HOUSE

NJPDES PERMITTED FLOW INCREASED FROM 7.30 MGD TO 8.24 MGD EFFECTIVE 4/1/01.

@@ 1990 ALLOCATIONS

NOTE: ALL FLOWS IN MGD(MILLION GALLONS PER DAY)

1 500,000 GPD transferred from City of Wildwood to Rio Grande

This WQMP/WMP amendment updates the wastewater flow projections from each community based upon actual flows received from the dwelling units in existing sewered areas. The projections of new dwelling units that would be permissible under current zoning for in fill within existing sewer service areas plus the number of projected additional dwelling units from proposed future sewer service areas in each community determine the sewer service capacity needs for future years. This update of the WQMP continues to recognize the approved 201 Facility Plans, including the utilization of all planned treatment system capacity to meet the long-term needs of Cape May County's municipalities. From a planning perspective, this WQMP/WMP update utilizes current NJPDES permitted flows and projects flows at maximum build-out. For this analysis, the peak seasonal flow was extracted from Figure 3-1 for each municipality. The number of current equivalent dwelling units (Year 2006) for each community was derived from the "Annual Report Growth Chart - 2006" (Figure 3-2), as prepared by the Cape May County Planning Board. The County Comprehensive Plan figures were utilized to determine flows at full build-out unless more accurate information was available from, and provided by, the municipalities.

The current allocation system utilized by the CMCMUA for controlling the quantity of flow from each community will continue to be based upon the municipal flow projections (allocations) provided in the previously adopted 201 Facility Plans. If it becomes necessary to expand or re-rate one of the CMCMUA's wastewater treatment plants beyond current permitted capacity or beyond the projected wastewater flow as set forth in this WQMP/WMP update, the CMCMUA will have to apply for an amendment to the WQMP/WMP and provide justification for the proposed flow increase irrespective of the ultimate flows estimated to be generated within the original 201 Plans.

Figure 3-2 Cape May County Annual Report Growth Chart – 2006

Municipality	Dwelling Units From 2000 Census	2000-2006 Building Permits	Motel & Hotel Units In 2006	Campground Sites In 2006	Gross Dwelling Units	Demolitions 2000-2006	Net Dwelling Units
Avalon	5,281	843	599	0	6,723	749	5,974
Cape May City	4,064	161	3,255	0	7,480	57	7,423
Cape May Point	501	57	0	0	558	31	527
Dennis Township	2,327	128	14	5,400	7,869	32	7,837
Lower Township	13,924	732	267	2,812	17,735	176	17,559
Middle Township	7,512	1,303	316	4,140	13,269	158	13,111
North Wildwood	7,411	1,300	2,302	0	11,013	292	10,721
Ocean City	20,298	3,037	2,752	0	26,087	2,443	23,644
Sea Isle City	6,622	1,439	218	0	8,279	888	7,391
Stone Harbor	3,428	258	233	0	3,919	250	3,669
Upper Township	5,472	496	70	2,417	8,455	36	8,419
West Cape May	1,004	69	14	240	1,327	27	1,300
West Wildwood	775	77	52	0	904	47	857
Wildwood	6,488	1,209	4,321	0	12,018	302	11,716
Wildwood Crest	4,862	1,037	4,463	0	10,362	218	10,144
Woodbine	1,080	58	0	538	1,676	0	1,670
TOTAL	91,047	12,204	18,876	15,547	137,674	5,712	131,962

I. Ocean City Regional Wastewater Treatment Plant

The Ocean City Regional Wastewater Treatment Plant has a NJPDES permitted flow of 8.24 MGD.

The following presentation calculates the projected seasonal flow at build-out for the Ocean City Wastewater Treatment Plant:

Peak Summer Flow (Jul. & Aug.) (MGD)	2006 Net D.U.'s	Flow/D.U. (GPD/D.U.)	Comp. Plan Limits (D.U.'s)	Potential Additional Dwelling Units	Additional Future Flow (MGD)	Total Future Flow (MGD)
6.454	23,644	273	24,305	661	0.181	6.635

Ocean City's peak two (2) month average flow for July and August occurred in 1996 at 6.454 MGD. This peak summer usage represents 78% of the permitted 8.24 MGD treatment plant capacity.

Residential/Commercial and Industrial Flows for Ocean City

The following table provides an approximation of the annual residential and commercial flow mix to the Ocean City Regional Wastewater Treatment Facility. There is no industrial flow generated in this region.

Flow Contributor	Peak Summer Existing Flow (MGD)		2020 Future Flow (MGD)	
	Residential	Commercial	Residential	Commercial
Ocean City	5.912	0.542	6.078	0.557

II. Cape May Regional Wastewater Treatment Plant

The Cape May Regional Wastewater Treatment Facility has a NJPDES permitted flow of 3.0 MGD. In a letter to the CMCMUA from the Regional Administrator of the USEPA, dated October 12, 1978, the initial design flow for the Cape May Region was established at 3.0 MGD. This same transmittal also established the flows at full build-out (in the year 2020) at 3.7 MGD. The treatment plant presently services, Cape May City, West Cape May, the U.S. Coast Guard Base and Cape May Point. The Cape May County 201 Facilities Plan provides the following 2020 flow projections for each of these communities: Cape May City (2.510 MGD); West Cape May (0.810 MGD); and Cape May Point (0.350 MGD). The original 201 Plan provided that the flow from the Schellengers Landing area of Lower Township would continue to be treated at the Cape May Regional Wastewater Treatment Facility. Prior to January 1997, the wastewater flows from the Schellengers Landing area of Lower Township were transmitted through the Cape May City sewer system to the CMCMUA's Cape May Regional Treatment Facility. However, due to a break in the Schellengers Landing sewer line during 1997, flow was diverted to the LTMUA Sewage Treatment Plant and continues to be treated by that facility.

Municipality	Peak Summer Flow July/ Aug (MGD)	2006 Net D.U.'s	Flow/D.U. (GPD/D.U.)	Comp. Plan Limits (D.U.'s)	Potential Additional Dwelling Units	Additional Future Flow (MGD)	Total Future Flow (MGD)
Cape May City	1.980	7423	267	8,650	1,227	0.327	2.307
West Cape May*	0.202	673	300	837	164	0.049	0.251
Cape May Point	0.143	527	271	759	232	0.063	0.206
Total	2.325	8,623	270 (Avg.)	10,246	1,623	0.439	2.764

* Figures from West Cape May Planning Board (August 2007)

The Cape May Region experienced a peak two month average flow for July and August of 2.325 MGD. This peak summer usage represents 77.5% of the current permitted capacity of 3.0 MGD and 62.8% of the ultimate flow capacity of 3.7 MGD provided in the 201 Facility Plan.

Residential/Commercial/Industrial Flow Mix for the Cape May Region

The following table provides an approximation of the residential and commercial flow mix for the contributing municipalities of the Cape May Regional Wastewater Treatment Facility. There is no industrial flow generated in this region.

Municipality	Peak Summer Existing Flow (MGD)		WQMP 2020 Future Flow (MGD)	
	Residential	Commercial	Residential	Commercial
Cape May City	1.352	0.628	1.576	0.732
West Cape May	0.182	0.020	0.227	0.025
Cape May Point	0.143	0.000	0.205	0.000
Total	1.677	0.648	2.008	0.757

III. Seven Mile/Middle Regional Sewage Treatment Plant

The Seven Mile/Middle Regional Sewage Treatment Plant has a NJPDES permitted flow of 7.67 MGD. The treatment plant presently services Sea Isle City, Avalon, Stone Harbor, parts of Middle Township and the Crest Haven Complex. The Crest Haven Complex is identified apart from Middle Township as it is a separate entity under the jurisdiction of the Cape May County Board of Chosen Freeholders. The Finding of No Significant Impact (FNSI) was issued by the USEPA for these regional facilities on August 31, 1981. The FNSI described the project to include a 9.27 MGD sewage treatment plant which was based upon population projections at build out in the year 2020.

Strathmere

The Strathmere portion of Upper Township was shown as a sewerable area in the 201 Plan with a projected flow at full build out of 0.360 MGD. Presently, Strathmere is served by subsurface sewage disposal systems.

Since the issuance of the Finding of No Significant Impact for this region on August 31, 1981, environmental concerns have been raised with regard to sewering Strathmere through the Whale Beach section of Sea Isle City to the Seven Mile Beach/Middle Treatment Plant. The NJDEP has addressed this issue by stating that "the proposal to connect Strathmere to the Seven Mile/Middle Wastewater Treatment Plant (WTP) via a sewer line through the Whale Beach area is in direct conflict with the Rules on Coastal Zone Management, specifically regarding secondary impacts and Special Areas." Therefore, the community of Strathmere is not included within the sewer service area in this WQMP amendment. However, it remains the intention of Cape May County and the Township of Upper to allow for the future servicing of Strathmere. Future alternatives to the extension of sewer service through the Whale Beach area could include sewering Strathmere from the north to the Ocean City WTP; incorporation of various on-site alternatives for failing septic systems such as individual or community holding tanks, composting toilets, or recycling systems; and the acquisition of vacant Whale Beach land through Coastal Blue Acres funding, the N.J. Department of Transportation Mitigation Plan, and/or Cape May County acquisition funding. As the resolution of these issues is not immediately forthcoming, the provision for servicing of Strathmere beyond the existing subsurface sewage disposal systems will be required to be addressed through a future amendment to the Cape May County WQMP/WMP.

Island Communities

There is very little growth projected on the island communities other than development on vacant in fill lots and demolition of single family residences for replacement by multi-family structures where allowed by zoning. There is no growth anticipated from the development of larger tracts of vacant land.

Middle Township

The municipal engineer for the Township of Middle, Hatch Mott MacDonald, completed an extensive build-out analysis, in September 2007, of the sewerable areas within the portions of the Township to receive regional wastewater treatment service at the Seven Mile Beach/Middle Regional Wastewater Treatment Facility. Some areas were deleted from the previously approved sewerability maps and some areas were added, consistent with the Centers designations and the need to plan for affordable housing. The wastewater flow projections for Middle Township actually decreased from the currently approved WQMP as a result of the sewerable area modifications proposed.

Municipality	Peak Flow July/Aug. (MGD)	2006 Net DU	Flow/DU GPD/DU	Comp Plan Limits	Potential Additional Dwelling Units	Additional Future Flow (MGD)	Total Future Flow (MGD)
Avalon	2.213	5,974	370.4	6,288	314	0.116	2.329
Sea Isle City	2.344	7,391	317.1	8,056[1]	665	0.211	2.555
Stone Harbor	1.244	3,669	339.1	3,747[2]	78	0.026	1.270
Crest Haven & Zoo	0.088					0.192	0.280[3]
Garden State Parkway	0.014					0.040	0.054
Middle Township	0.618					0.886[4]	1.504
TOTAL	6.521						7.992

he Seven Mile Beach/Middle Wastewater Treatment Plant received a peak two month average daily flow for July and August of 6.521 MGD. This peak summer flow represents 85% of the current permitted capacity of 7.67 MGD and 70% of the ultimate flow capacity of 9.27 MGD provided in the approved 201 Facility Plan.

Residential/Commercial/Industrial Flow Mix for the Seven Mile Beach/Middle Region

The following table provides an approximation of the residential and commercial flow mix for the contributing municipalities within this Region. There is no industrial flow generated in this region.

Municipality	Peak Summer Existing Flow (MGD)		WQMP 2020 Future Flow (MGD)	
	Residential	Commercial	Residential	Commercial
Avalon	2.135	0.078	2.147	0.182
Sea Isle City	2.243	0.101	2.432	0.123
Stone Harbor	1.128	0.116	1.152	0.118
Crest Haven	0	0.088	0	0.280
Garden State Parkway	0	0.014	0	0.054
Middle Township	0.514	0.104	1.396	0.108
Total	6.02	0.501	7.127	0.865

1 Build-out analysis performed by Norman Day Associates 2/10/92
2 Stone Harbor Tax Office reports there are only 78 vacant lots for build out
3 Design flows
4 Flows based on build-out analysis within sewerable area prepared by Hatch Mott MacDonald in September 2007

Wildwood/Lower Regional Wastewater Treatment Plant

The Wildwood/Lower Regional Wastewater Treatment Facility has a NJPDES permitted flow of 14.18 MGD. The treatment plant presently services North Wildwood, Wildwood, Wildwood Crest, West Wildwood, the Shawcrest and Del Camino sections of Lower Township, and the Rio Grande section of Middle Township. The Finding of No Significant Impact (FNSI) for these regional facilities was issued by the USEPA on August 31, 1981. The FNSI describes an initial design phase of 14.18 MGD, with a final design phase based on full build-out within the sewerable areas of 17.59 MGD. The FNSI also discussed that the force main and pumping structures would be sized initially for the flow of 17.59 MGD.

Island Communities

There is limited growth potential on the island communities. There will be some development on vacant in-fill lots and there is additional development potential related to the demolition of single family residences and the construction of multi-family structures where permitted by local zoning. The exceptions to this limited development potential is the recently approved "Comprehensive Plan Update - City of Wildwood", wherein a zone is approved within the City for the construction of high rise structures.

Middle Township

The municipal engineer for the Township of Middle, Hatch Mott MacDonald, completed an extensive build-out analysis in September 2007 of the sewerable areas within the Wildwood/Lower Region sewer service area. Some areas where deleted from the currently approved sewerable maps and some areas were added to the sewer service area, consistent with the Centers designations and the need to plan for affordable housing. An additional flow of 0.45 MGD is proposed to be generated from the Rio Grande, Whitesboro and Edgewood areas over that projected in the 2002 WQMP. The wastewater flow from Willow Drive and Del Camino in Lower Township is conveyed into the Middle Township collection system for transmission to the Wildwood/Lower Regional Wastewater Treatment Plant. The flow conveyed from this area is estimated to be less than 10,000 gallons per day.

Municipality	Peak Flow July/Aug. (MGD)	2006 Net DU	Flow/DU GPD/DU	Comp Plan Limits	Potential Additional Dwelling Units	Additional Future Flow (MGD)	Total Future Flow (MGD)
Wildwood	2.739	11,716	233.8	31,737[5]	20,021[10]	4.681[6]	7.42[6]
Wildwood Crest	3.378	10,144	333.0	12,453[7]	2,309[7]	0.762[7]	4.14[7]
No Wildwood	3.124	10,741	290.8	15,989[7]	5,248[7]	1.526[7]	4.65[7]
West Wildwood	0.209	857	243.9	2,539	1,682	0.410	0.62
Shawcrest	0.101					0.039[8]	0.14[8]
Rio Grande[9] & Whitesboro/ Edgewood	0.344					1.122[9]	1.466[9]
TOTAL	9.895						18.436

The Wildwood/Lower Regional Wastewater Treatment Plant received a peak two month average daily flow of 9.895 MGD. This peak summer flow represents 69.8% of the current permitted capacity of 14.18 MGD and 56.3% of the ultimate flow capacity of 17.59 MGD provided in the approved 201 Facility Plan.

Residential/Commercial/Industrial Flow Mix for the Wildwood/Lower Region

The following table provides an approximation of the residential and commercial flow mix for the contributing municipalities within this Region. There is no industrial flow generated in this region.

Municipality	Peak Summer Existing Flow (MGD)		WQMP 2020 Future Flow (MGD)	
	Residential	Commercial	Residential	Commercial
Wildwood	1.553	1.186	4.230	3.190
Wildwood Crest	2.196	1.182	2.691	1.449
North Wildwood	2.365	0.759	3.535	1.116
West Wildwood	0.200	0.009	0.591	0.029
Shawcrest	0.091	0.010	0.130	0.010
Rio Grande & Whitesboro/Edgewood	0.275	0.069	1.294	0.172
Total	6.680	3.215	12.471	5.966

V. Lower Township M.U.A. Sewage Treatment Plant

5 Calculated from "2007 Comprehensive Plan Update - City of Wildwood"
6 From "2007 Comprehensive Plan Update - City of Wildwood"
7 Estimates at build-out provided by City Engineer - Van-Note Harvey Associates
8 Estimates from 2002 WQMP as prepared by Township Engineer - Hatch Mott MacDonald
9 Flow from 2007 build-out analysis within sewerable area provided by Township Engineer, Hatch, Mott, MacDonald

The Lower Township Municipal Utilities Authority (LTMUA) Sewage Treatment Plant has a NJPDES permitted flow of 4.0 MGD. The treatment plant presently services Lower Township and the Del Haven section of Middle Township. The treatment plant experienced a summer peak flow of 2.385 MGD which occurred in 2005. The plant is therefore presently operating at 60% capacity. The Schellengers Landing area is now part of the LTMUA Sewage Treatment Plant service area.

Extension of Public Sewers to Existing Development

The areas of the Township of Lower listed below are currently served by individual septic systems and are proposed to be connected to public sewer:

George Street Section;
Long Brothers Track;
Freedom Track;
Lennox Track;
Kechemeche Street Track 2;
Douglas Memorial Recreational Fields; and
Various individual (in fill) lots throughout the Township**.**

Due to the nature of local area soils, somewhat shallow groundwater and relatively small sizes of individual lots, a number of septic systems in the above areas of the Township are reportedly failing. The above mentioned portions of the Township are located such that the public sewer can be easily extended to these areas. Because of the generally small sizes of the individual lots, extending the sewer service area to these portions of the Township will not trigger further development in the Township, but merely alleviate the situation with the failing septic systems.

Extension of Public Sewers to Proposed Development

The following areas are proposed on the sewerability maps to be connected to public sewers:

Sheppard's Run Development; and
Future Recreational Center.

Extension of Public Sewers to Existing Development Proposed to be Serviced by Others

The Erma Section of Lower Township is located near the border with Middle Township and is currently served by septic systems. However, as with other parts of Lower Township, a large number of septic systems are reportedly failing. Therefore, a connection of the Erma Section to the CMCMUA Wildwood/Lower Regional Wastewater Treatment Plant is proposed. The projected wastewater flow for this section of the Township was based on the criteria specified in N.J.A.C. 7:14A.23.3 and is summarized in the table below. If the flow cannot be accommodated by the CMCMUA, it will be considered for diversion to The Lower Township M.U.A. treatment plant.

Development	Number of Parcels	Unit Flow, GPD	Total Flow, GPD
Erma Section	742	300	222,600
Total			222,600

There is some existing development currently connected to the LTMUA; however, they are shown outside the NJDEP approved Sewer Service Area (no additional flow generation):

Cape May County Airport;
Sheridan Track;
Kechemeche Street Track 1;
Cape Island Campground;
Commercial Development along Ocean Drive; and
Mobile Home Development near intersection of Route 9 and Cape May Lewes Ferry Approach Road.

These developments are shown as lying outside the existing Sewer Service Area, as depicted in *NJDEP, Division of Watershed Management (DWM), Bureau of Watershed Regulation (BWR) October 2006 Sewer Service Area Map*, and are corrected on the Sewer Service Area Maps provided within this WQMP Update.

Seasonal Flows

The following table shows the seasonal average daily flow projections for the existing and future sewer service areas of the Lower Township M.U.A. Sewage Treatment Plant, assuming the extension of public sewers to areas as proposed above:

	Peak Flow July/Aug. (MGD)	Existing DU's Served by Sewers	Flow/DU GPD/DU	DU's at Build-out	Potential Additional Dwelling Units	Additional Future Flow (MGD)	Total Future Flow (MGD)
LTMUA Sewer* Service Area	2.385	9,940	240	11,224	1,284	0.337	2.722
Erma*	0				742	0.223	0.223
Del Haven/Green Creek**	0.179 (included above)				123	0.048	0.048
TOTAL	2.385				2,149	0.608	2.993

Residential/Commercial/Industrial Flow Mix for The Township of Lower M.U.A. Wastewater Service Area

The following table provides an approximation of the residential and commercial flow mix within The Township of Lower M.U.A. Sewer Service Area:

Peak Summer Existing Flow (MGD)		WQMP Future Flow (MGD)	
Residential	Commercial	Residential	Commercial
1.991	0.394	2.301	0.692

* Dwelling Unit and flow projections based upon a build-out analysis within sewerable area by Schoor DePalma/CMX Engineering in September 2007.

** Dwelling Unit and flow projections based upon a build-out analysis for these areas by Middle Twp. Engineer, Hatch, Mott, MacDonald in September 2007.

CHAPTER 4 - WATER QUALITY

4.1 Introduction

Water in Cape May County is not only necessary to sustain life, it is the single most essential element to sustain the county's economic base. Without fishable and swimmable waters, the economic vitality of Cape May County would be threatened. The waters in and around the county must be of a high enough quality to permit primary contact recreation and human consumption.

4.2 Surfacewater Quality

The "Cooperative Coastal Waters Program" of 1975 was a joint surface water monitoring program between the New Jersey Department of Environmental Protection and the Cape May County Health Department. The analysis of the coastal monitoring program data revealed the existence of unsatisfactory water quality trends in back bay areas of Ocean City, North Wildwood, Wildwood, Wildwood Crest, Cape May City and Lower Township due to municipal sewage treatment plant outfalls. The subsequent implementation of the Cape May County Municipal Utilities Authority 201 Facilities improvements has eliminated all sewage treatment plant point discharges to back bay waters. These discharges have been diverted to regional treatment plant ocean outfalls. The only water presently draining to the back bays is stormwater runoff. The NJDEP has adopted regulations for the permitting of stormwater runoff from industrial activities and new construction sites. The elimination of the municipal treatment plant discharges into back bay receiving waters has enabled the NJDEP Bureau of Shellfisheries to reclassify and open many of these areas for shellfishing. A map of Cape May County Shellfish Growing Areas is available on NJDEP or Cape May County web sites.

4.3 Groundwater Quality

Groundwater provides virtually all of the potable water supply for Cape May County. Groundwater is utilized on-site via individual wells, diverted to some island communities from well fields on the mainland, and pumped from deep aquifers in other shore towns

Cape May County lies within the Outer Atlantic Coastal Plain. Pumping of groundwater and the reduction of aquifer recharge by the surface water discharge of stormwater drainage systems has threatened the groundwater in localized parts of the coastal zone. Saltwater intrusion can occur in groundwater wells near coastal bodies of saltwater when the hydraulic head of the freshwater aquifer is depressed sufficiently to cause the adjacent saltwater to move toward the center of the pumping area.

Well overpumping may result in the consistent lowering of the groundwater table in the upper aquifers, and has the potential to alter the base flow characteristics of surface streams and adversely impact ecological conditions of the aquatic environment. Since the time of the original Cape May County WQMP adoption, the implementation of the county regional wastewater treatment system has eliminated most of the concerns of wastewater point source pollution. The primary concern of non-point source wastewater pollution is from the impact of septic system effluent. The degradation of county groundwater quality as evidenced from individual potable well contamination has occurred in areas of high development density. This has resulted in the implementation of minimum lot size standards for areas utilizing subsurface sewage disposal as discussed in the Septics Management Program in Chapter 5 of this plan.

4.4 Discussion of Cape May County Water-Bearing Zones [10]

Introduction

Cape May County has a minimum of five distinct bodies of ground water. "From the surface downward they are: a zone of unconfined water called the Holly Beach water-bearing zone, which includes the Bridgeton Formation, the deltaic sand facies of the Cape May Formation, and the Recent beach and dune deposits. The zones of confined water include the estuarine sand facies of the Cape May Formation, the Cohansey Sand, and two zones in the Kirkwood Formation."

Holly Beach Water Bearing Zone

The Holly Beach water-bearing zone is an unconfined or water table aquifer located in the "upper 50 feet of surficial sands and gravels which blanket most of the county. It has a 30 to 40 foot saturated thickness and is separated from the underlying freshwater zones by the relatively impermeable estuarine clay facies of the Cape May Formation on the Cape May peninsula and an impermeable zone at the top of the Cohansey Sand at the Northwestern part of the county. The Holly Beach water-bearing zone supplies domestic and irrigation wells which have capacities up to 300 gallons per minute. The aquifer is also tapped to supply water for light industries throughout the county." The aquifer receives recharge directly by precipitation. "An average of 160 million gallons per day is recharged to the Holly Beach water-bearing zone, the major portion of which is discharged into streams and from the fringes of the county to the ocean and bay."

10"Groundwater Resources of Cape May County, New Jersey, Salt-Water Invasion of Principal Aquifers" Special Report 18, 1962.

The Holly Beach aquifer is utilized for private wells in Upper, Middle, Lower and Dennis Townships. Water in the Holly Beach water-bearing zone occurs under unconfined conditions and is readily subject of surface contamination from human as well as storm activity. During severe subtropical or hurricane-type storms, salt spray is driven appreciable distances inland in Cape May County. Salt spray flooding in areas of low elevation during these storms could cause severe pollution. Other localized sources of ground water pollution include septic tanks and sanitary landfills.

The major problem with future development of the Holly Beach aquifer is the danger of salt-water encroachment. In the lower peninsular area of Cape May County, there is no chance for a build-up of fresh water head in the aquifer to prevent the salt-water interface from moving inland. The construction of wells near surface water bodies in the area where there is a known hydraulic connection with the aquifer affords the opportunity to develop a large-capacity supply by inducing infiltration of surface water. The water in this area is slightly acidic, but high in iron (treatment for removal of this may be necessary to make the water suitable for most purposes).

Estuarine Sand Facies - Cape May Formation

The estuarine sand facies of the Cape May Formation is the uppermost body of confined fresh ground water in the county. This zone ranges from 50 to 140 feet below mean sea level and has an average thickness of 30 feet. "This water-bearing zone is restricted to the Cape May peninsula where it is tapped principally for domestic and industrial supplies." The estuarine sand facies is recharged through vertical leakage downward from the Holly Beach water-bearing zone through the confining estuarine clay facies. Presently, only the City of Wildwood utilizes the estuarine sand facies for public water supply via the Rio Grande well field.

Cohansey Sand Aquifer

The Cohansey Sand aquifer is the principal confined aquifer in Cape May County. "The aquifer is confined between relatively impermeable zones at the top of the Cohansey Sand and the upper clay stratum of the Kirkwood Formation. The top of the most permeable part of the Cohansey Sand ranges in depth from 75 feet below mean sea level in the Northwestern part of the county to a maximum depth of about 270 feet in the Wildwood area."

"The Cohansey Sand crops out along the Maurice River in Cumberland County and north of the Tuckahoe and Great Egg Harbor Rivers in Atlantic County. The principal high-level recharge area for the Cohansey Sand is not in the outcrop area but in the Bellplain area of Cape May County. In this area, the Cohansey Sand contains an upper zone of low permeability which is overlain by surficial sands and gravels of the Bridgeton Formation. The main aquifer in the Cohansey is replenished by vertical leakage from the surficial deposits through the confining layer. The water moves horizontally within the aquifer, north and west to points of discharge along the Maurice and Tuckahoe Rivers and south and east to the Delaware Bay and Atlantic Ocean."

"Cohansey Sand is the most productive aquifer in Cape May County. It is tapped extensively on the lower peninsula for public and industrial supplies. Yields between 500 and 1,000 gpm from large diameter wells are common." In the lower peninsula of the county, extensive use of the aquifer has lowered the water level below sea level in places reversing the vertical and horizontal hydraulic gradient and allowing for salt water encroachment.

The following entities have wells which tap into the Cohansey Sand: Cape May City, Cape May Point, U.S. Coast Guard, Lower Township, Wildwood, and the Borough of Woodbine.

Kirkwood Formation

The Kirkwood Formation represents a thick section of marine sand and clay beneath the Cohansey Sand. The formation contains two confined water bearing zones. The top of the upper aquifer-Rio Grande water-bearing zone occurs from 260 feet below mean sea level in northwestern part of the County, to about 600 feet below mean sea level in the southeast at Wildwood; the zone is an average of 50 feet thick.

The lower aquifer or Atlantic City "800-foot" sand is more widely used and has a greater potential than the upper aquifer. South of Wildwood it contains water of high chloride concentration (more than 250 milligrams per liter or parts per million) and relatively high dissolved solid content. Yields of between 500 to 800 gallons per minute are common from the Atlantic City "800-foot" sand. The major source of recharge to the aquifers in the Kirkwood Formation is precipitation in the outcrop area. The aerial extent of the outcrop of the Kirkwood Formation extends for about 250 square miles from Gloucester to Monmouth Counties.

The withdrawal from the Atlantic City "800-foot" sand in Atlantic and Cape May Counties have reversed the hydraulic gradient and started a landward migration of salt water from the ocean. The deterioration of water quality in the Kirkwood Formation in the lower peninsular area of Cape May County is the result of saltwater encroachment caused by excessive withdrawals from the aquifer.

4.5 Water Supply Issues

According to the NJDEP, the 1995 New Jersey Statewide Water Supply Plan (SWSP), states that the Cape May coastal watershed (Planning Area 23), which includes all of Cape May County, is expected to be in a water supply deficit by the year 2010. Saltwater intrusion is the major problem in the southern Cape May area in the unconfined and upper confined aquifers. The Cohansey aquifer in particular is considered by the NJDEP to be a threatened regional water resource based on present and anticipated withdrawals as well as the rate of documented saltwater intrusion. There are large regional declines in ground water levels (cones of depression) which have induced vertical recharge from above and lateral movement of ground water within the Cohansey aquifer. Implementation of an alternative water supply plan for southern Cape May County at this time is necessary in order for the Cohansey aquifer to remain a viable water supply. The Atlantic City 800-foot sand aquifer is also experiencing saltwater intrusion in the peninsular portion of Cape May County and a regional decline in water levels as a result of increasing ground water withdrawals. Water levels have declined as much as 95 feet near Ocean City and 50 feet near Stone Harbor.

The following references provide further discussion on the issue of saltwater intrusion:

"Ground Water Hydrology and Simulation of Saltwater Encroachment, Shallow Aquifer System of Southern Cape May County, New Jersey", Spitz, F.J. and Barringer, T.H., 1992, U.S. Geological Survey Water Resources Investigations Report 91-4191;

"Evaluation of Saltwater Intrusion and Travel Time in the Atlantic City 800-Foot Sand, Cape May County, New Jersey, 1992, By Use of a Coupled-Model Approach and Flow-Path Analysis", Voronin, L.M., Spitz, F.J. and McAuley, S.D., 1993, U.S. Geological Survey Water Resources Investigation Report 95-4280.

"Saltwater Intrusion and Proactive Water Supply Planning in Cape May County, New Jersey", prepared by the NJDEP with the participation of the Cape May County Health Department.

Long-term regional water supply planning is needed so that the County may optimize the use of all available water resources and minimize saltwater intrusion. Reuse of wastewater effluent through spray irrigation or other alternative means, approvable by the NJDEP, are encouraged. A second water conservation measure is the reverse osmosis desalination plant for the City of Cape May. This plant provides municipal water service while reducing the demand on the regional aquifer.

The expansion of sewer service areas within Cape May County has the potential to accelerate the decline in ground water levels and the rate of saltwater intrusion within the region. Future WQMP efforts will need to more closely link water supply and wastewater management issues. Since this region is on the verge of a water supply deficit, the water managers within the region, in coordination with local officials, should be utilizing the ground water recharge maps available on NJDEP or Cape May County web sites. These maps should be used as a means of keeping impervious surfaces to a minimum so as to aid the area's ability to obtain as much recharge as possible regardless of wastewater service area designations.

4.6 Groundwater Recharge Mapping

Introduction

The intent of the preparation of ground water recharge mapping for Cape May County is to provide an overview of where and to what degree recharge occurs within the county as well as an indication of which areas are most suitable for future recharge. The Cape May County Ground Water Recharge Maps were prepared through analysis of county soil classifications, municipal land use, upland area delineation, location of the 250 milligrams-per-liter isochlor of chloride concentration and publicly owned lands delineation. The result is a series of maps grouped by municipality at quadrangle scale (USGS base, 1" = 2,000') which indicate areas of anticipated high, medium and low ground water recharge and the anticipated range of recharge in inches per year.

Background Methodology

New Jersey Geological Survey Report GSR-32, "A Method for Evaluating Ground-Water-Recharge Areas in New Jersey", (1993) prepared by the New Jersey Department of Environmental Protection - Division of Science and Research was used as the model for the recharge methodology. GSR-32 proposes a site specific approach towards the assessment of recharge areas on a municipal basis. The source data used for this method consists of USGS quads, photoquads, Natonal Wetlands Inventory (NWI) quads, and the county soil survey. A systematic overlayment of the USGS, upland area, land-use/land-cover, and soil survey mapping creates a series of polygons within the study area. The ground water recharge for each of these polygons can be estimated on the basis of climate, soil classifications and land-use/land-cover. Through a simulation of the soil-water budget ground water recharge can be estimated by the following relationship:

recharge = precipitation - surface runoff – evapotransporation - soil water deficit

GSR-32 uses recharge, climate, and basin factors and a recharge-constant to derive the following formula for average annual recharge in inches per year:

recharge = (recharge-factor x climate-factor x basin-factor) - recharge-constant

In this method the recharge-factor and the recharge constant are dependent on the soils and land-use/land-cover classification. The climate factor is a constant for each municipality. The basin-factor is a constant of 1.3, assigned by calibrating predicted volumetric ground water recharge to reported basin-wide stream baseflow values.

County Mapping Methodology

The mapping of ground water recharge areas in Cape May County is based on a macroscopic approach to the one outlined in GSR-32. Due to given constraints within the task scope, the delineation of site specific land-use/land-cover was impractical. Alternatively, municipal zoning was defined in accordance with the land-use/land-cover descriptions provided in GSR-32. The municipal zones were then ranked in accordance with their anticipated ground water recharge. An overlayment of this mapping with the uplands and soils classification mapping created a mapping of areas of high, medium and low ground water recharge. Publicly owned land within these recharge areas was then identified on the recharge map. Areas of Cape May County with chloride concentrations of greater than 250 milligrams per liter are not considered for ground water recharge. The 250 milligrams per liter isochlor indicating the salt water interface is shown on the mapping for the lower portions of the county, available on NJDEP or Cape May County web sites.

4.7 Conclusions and Recommendations

The maintenance of surface and groundwater quality is of primary importance in preserving Cape May County's economic vitality and residential health. Improvements to surface water quality have been realized through the implementation of regional outfalls to eliminate back bay discharge from municipal treatment plants. Benefits of the improved back bay surface water quality are seen in the reclassification of shellfish growing areas. Measures to preserve future surface water quality have been implemented with the adoption of NJPDES stormwater permitting regulations.

Overpumping of groundwater supply wells without sufficient recharge can create conditions leading to environmental problems such as saltwater intrusion and the alteration of stream baseflow conditions. Additionally, septic system overcrowding can lead to local well contamination. In order to mitigate these concerns and preserve future groundwater quality, the Department of Health promotes the use of the following measures as policy when considering future growth in Cape May County:

1. Continued enforcement of minimum lot size standards established in the Septics Management Program.

2. Encouraged use of public sewers in areas presently zoned for high density development.

3. Promotion of public water in sewered areas where feasible.

4. Encouraged optimization of groundwater recharge areas within Cape May County outside of sewer service areas.

CHAPTER 5 - SEPTICS MANAGEMENT PROGRAM

5.1 Introduction

The original Cape May County On-Site Wastewater Disposal System (Septics) Management Program was approved by the United States Environmental Protection Agency (EPA) on August 26, 1980 as part of the Cape May County Water Quality Management (208) Plan. Thereafter, approved by the NJDEP on September 2000 within the most recent Cape May County Water Quality Management (208) Plan.

The Septics Management Program (SMP) was developed to establish development guidelines in areas of the county where subsurface sewage disposal systems are to be utilized. The program's primary impact is in the establishment of minimum lot size criteria to reduce the potential for well contamination when septic systems are placed on lots with insufficient area to allow for the successful assimilation of wastewater. In the intervening period between the program's adoption and present day, significant changes have occurred in State regulations concerning the discharge to groundwater of wastewater.

The SMP will only address minimum lot sizes for proposed developments served by subsurface sewage disposal systems with design flows of less than or equal to 2,000 gallons per day (GPD). The SMP also only applies to sanitary wastewater. Discharges from subsurface sewage disposal systems with design flows of greater than 2,000 GPD and discharges of process wastewater are regulated by NJDEP under N.J.A.C. 7:14A.

5.2 Background

The upland soils of Cape May County consist primarily of well drained sandy soils. Subsurface sewage disposal systems constructed in these soils typically function with a high hydraulic efficiency. Rapid percolation of effluent through the soil media serves to successfully eliminate surface ponding associated with a malfunctioning system. However, as these sandy soils provide low cation exchange capacity, the filtering of pollutants from the wastewater is reduced. This poses a significant problem when shallow, private water supply wells are located in the same unconsolidated water-bearing zone that is receiving the septic system effluent. The potential for well contamination is further increased when wells and septic systems are located on lots with insufficient area to provide successful assimilation of the wastewater. The potential for well contamination in Cape May County has greatly increased due to development in high water table areas, the laminar flow of groundwater, the proximity of water supply wells and septic system disposal beds, and growth pressures in unsewered areas. The Septics Management Program has established minimum lot size standards to provide the best method for adequate nitrate (NO3-N) dilution, without costly alternative means of on-site wastewater disposal.

5.3 Administration

The Septics Management Program (SMP) will essentially be administered as it has been since 1980. When a subdivision or site plan application is submitted to the Cape May County Planning Board (CMCPB), pursuant to N.J.S.A. 40:27-1, et seq., County Planning Act, a copy of the application is forwarded to the Cape May County Health Department (CMCHD). The development application is then reviewed for consistency with the SMP.

New subdivisions of land may not create lots that are less than 35,000 square feet (SF). Proposed developments generating 500 gallons per day (GPD) of wastewater or less, on existing lots, are grandfathered.
New subdivisions of single family residences (SFR's) are assumed to average three bedrooms per residence. According to N.J.A.C. 7:9A-1, et seq., Chapter 9A - Standards for Individual Subsurface Sewage Disposal Systems, a three bedroom residence generates 500 GPD of wastewater. Newly created SFR lots have a minimum lot size requirement of 35,000 SF. Proposed developments, excluding SFR's, generating more than 500 GPD and less than or equal to 2,000 GPD of wastewater must comply with the minimum lot size requirements in the Septics Management Program.

It should be noted that the Septics Management Program applies only to sanitary wastewater, not process wastewater from industrial treatment works. Projects involving 50 or more realty improvements are subject to regulation pursuant to N.J.S.A. 58:11-25.1 (Realty Improvement Sewerage and Facilities Act) and may therefore be subject to more stringent requirements than provided in the SMP.

5.4 Purpose

The 2000 Cape May County Water Quality Management Plan (WQMP) amendments to the Septics Management Program are intended to make the program as effective and efficient as possible. The SMP will include, but not be limited to:

1. A coordination program with the Cape May County Planning Board (CMCPB) in the subdivision and site plan review process,

2. Minimum lot size requirements for proposed developments in areas not served by municipal sanitary sewers, and
3. A review letter issued by the Cape May County Health Department (CMCHD) as to the proposed development's consistency with the Cape May County On-Site Wastewater Disposal System (Septics) Management Program.

5.5 Original Septics Management Program

Since its inception, the Septics Management Program (SMP) centered on the premise that one acre of land can safely assimilate 497 gallons of wastewater per day (see Figure 5-1). A proposed single family detached dwelling is required to have a fixed minimum lot size of 35,000 square feet. This requirement is on pages 117 and 117A of the original Cape May County Water Quality Management (208) Plan [original WQMP]. In the plan a three (3) bedroom home had a minimum lot size requirement of 31,000 square feet and a four (4) bedroom home had a minimum lot size requirement of 39,000 square feet. Most single family residential developments have a mixture of three and four bedroom homes. Counting the number of bedrooms and determining the size requirements for each lot in a multiple lot subdivision proved to be impractical. The ultimate owner of a lot could build a home with the number of bedrooms they desired as long as they complied with local zoning requirements. Thus an average home of 3.5 bedrooms was selected with a minimum lot size requirement of 35,000 square feet. The original WQMP was certified by Governor Brendan Byrne on August 11, 1980, and approved by the United States Environmental Protection Agency on August 26, 1980.

Commercial development proposals submitted to the CMCHD for minimum lot size approval are presently reviewed under the following procedure:

1. The proposed use is located in Chapter 9A (N.J.A.C. 7:9A) and a projected volume of wastewater for the specific land use is calculated.

2. The projected volume of wastewater is then divided by the 497 GPD/Acre standard to determine the lot size necessary to support the proposed development.

Volume of Wastewater / 497 GPD per Acre = Minimum Lot Area

An example of this application is seen in the following evaluation of a 10,000 square foot (SF) commercial development:

Area = 10,000 SF x 0.125 G/SF / 497 GPD/Acre
Area = 2.52 Acres

3. Consistent with minimum lot size requirements for residential development, no lot may be created that is less than 35,000 square feet.

Figure 5-1 Derivation of Acceptable Volume of Wastewater

43,560 square feet per acre x 1.67 feet (20 inches water available for recharge) = 72,745.2 cubic feet

72,745.2 cubic feet x 7.481 gallons per cubic foot =
544,206.8 gallons available for recharge per acre

544,206.8 gallons available for recharge per acre / 365 days per year =
1,490.9 gallons available for recharge per acre per day
(1,491 GPD per acre)

1,491 GPD per acre / 3 parts of fresh water necessary to dilute 1 part wastewater to meet the 10 mg/L NO3-N water quality standard with the average of 40 mg/L NO3-N in the septic system effluent =
497 GPD per acre

5.6 Municipal Zoning Ordinances - Upgraded Minimum Lot Size Requirements

TOWNSHIP OF UPPER ZONING DISTRICTS

AR - Agriculture and Low Density Single-Family Residential - 120,000 SF
R - Moderate Density Residential - 40,000 SF
CM - Commercial - 20,000 SF to < 1 acre

All other zoning districts are in the Pinelands, in fully developed Strathmere, or in Mining, Utility, Airport or Conservation Districts.

TOWNSHIP OF DENNIS ZONING DISTRICTS

R3 - Single Family Residential - 3 acres
R10 - Low Density Single Family Residential - 10 acres
VR - Village Residential, DVR - Dennisville Village Residential - 35,000 SF
RB - Residential Business - 3 acres
HC - Historic Commercial - 20,000 SF
GC - General Commercial - 40,000 SF

B - Business - 60,000 SF
M- Marina - 5 acres

All other areas are not zoned for development or are in the Pinelands.

TOWNSHIP OF MIDDLE ZONING DISTRICTS

SL - Sensitive Lands District - 1 acre
RR - Rural Residential - 1 acre
SR - Suburban Residential - 35,000 SF
TR - Town Residential - 35,000 SF

All other areas are zoned either for no development or for commercial use that comply with the WQMP/WMP minimum lot size requirements when outside the sewer service area.

TOWNSHIP OF LOWER ZONING DISTRICTS

R1 - Single Family Residential - 1 acre
R2 - Single Family Residential - 1 acre
R3 - Mainland Residential - 20,000 SF (New lots created in this district must be at least 35,000 SF if outside a sewer service area)
RB - Residential Business - 1 acre

All other areas are zoned for no development or are in sewer service areas.

The above minimum lot size requirements are derived from the most recent zoning ordinances available for the four mainland townships in Cape May County. These are the municipalities containing large unsewered areas, thus requiring on-site wastewater disposal (septic) systems when development occurs. These communities had minimum lot sizes ranging from 10,000 to 30,000 SF prior to the implementation of the Cape May County WQMP in 1980.

Upper, Dennis, Middle and Lower Townships are essentially the only communities remaining in Cape May County that are not either fully developed or sewered. Thus, there is little need to recommend lower density development zoning ordinance amendments for the remaining twelve communities.

The Cape May County Wellhead Protection Program - Domestic Well Clusters revealed well contamination in areas containing small lots created prior to the implementation of the County WQMP/WMP.

5.7 2000 Septics Management Program

Background

Research on much of the literature on groundwater and on-site wastewater disposal systems reinforces the County's position in the Septics Management Program. It is concluded that the rate of denitrification in sandy soils of the Pine Barrens region (soils similar to those in Cape May County) will be almost nil, and almost all (99%) of the nitrogen in the effluent will reach the water table as nitrate. (1) Denitrification only occurs in the presence of denitrifying bacteria, under anaerobic conditions when a carbon source (soil organic matter or effluent organics) and nitrate are present.

The anionic forms of nitrogen (nitrate and nitrite) will move freely in the aquifer with groundwater flow. The only significant mechanism of attenuation is dilution. (2) Once disposal trench infiltrate percolates to the groundwater table it is diluted via hydrodynamic dispersion. It has been proposed that dilution due to hydrodynamic dispersion should be the criteria for assessing on-site disposal system density. (2) Where on-site disposal systems (OSDS) placement in suitable areas is not practicable, ensure that the OSDS is designed or sited at a density so as not to adversely affect surface waters or groundwater that is closely hydrologically connected to surface water. (3) The interface of surface and groundwater is the hydrological environment of Cape May County. Unsuitable areas include, but are not limited to, areas with poorly or excessively drained soils areas with shallow water tables or areas with high seasonal water tables. (3) Unless conditions for denitrification (conversion to nitrogen gas in an anaerobic environment) exist, nitrate will not undergo further transformation in groundwater. Dilution is therefore the best hope of reducing concentrations of nitrate from septic systems in groundwater. (4)

Local governments can and are encouraged to institute stricter regulations to protect sensitive ground and surface water areas. The siting of a septic system should maximize the distance between the system and any water supply wells on the same lot as the system and adjacent lots. (5) Counties should be involved in groundwater planning which is related closely to normal county activities, such as planning for nonpoint pollution control and recharge maintenance and enhancement. It is sound policy to encourage county involvement wherever possible. County agencies include planning boards, health boards/departments, soil conservation districts and water resource management agencies that implement the consistency provisions of Areawide Water Quality Management Plans. (6) In Cape May County, The Board of Chosen Freeholders is the Areawide Water Quality Management Agency.

Trela-Douglas, basically, established the viability of dilution as a solution to pollution in New Jersey. They conducted an evaluation of the nature of the soils-groundwater system (septics) in conjunction with climatological data to establish a carrying capacity and minimum lot size required to maintain water quality at minimum levels prescribed by law. Trela-Douglas recognized that the Pine Barrens soils have very low potential for renovating septic system effluents containing nitrogen and phosphorus. They also state, **"The major mechanism responsible for attenuation of the effluents is dilution."** (1)

The Cape May County 2000 Septics Management Program (SMP) does consider the entire lot for dilution for planning purposes. The areas where septic systems are utilized are sparsely developed and contain a small percentage of impervious surface. Additionally, the NJDEP requires a zero lot run-off plan for certain subdivisions and site plans.

Regarding parameter standards, the literature reflects differing levels. In the case of the effluent concentration, the County utilized the figure of 40 milligrams per liter (mg/L) for nitrate-nitrogen. According to John W. Stinton, "It appears that generally nitrogen concentration in the unsaturated zone below the disposal field is about 40 mg/L of expressed nitrate-nitrogen." (2) A study by Robertson, et al, in 1991, found that two septic systems in sandy soils had contaminant plumes averaging 33 and 39 mg/L NO3-N. (7)

The SMP pertains to individual subsurface sewage disposal systems, the County utilizes Chapter 9A (N.J.A.C. 7:9A) in calculating the design flow for a given development proposal. Specifically, the flow figures listed by land use category in N.J.A.C. 7:9A-7.4 are used in the calculations. In Chapter 9A, for example, a three bedroom dwelling unit would generate 500 GPD of wastewater. This is the pivotal flow figure in that any development that generates more than 500 GPD and less than or equal to 2,000 GPD of wastewater will be subject to the minimum lot size requirements in the SMP, regardless of when said lot was created.

The 2000 On-Site Wastewater Disposal Systems (Septics) Management Program establishes the following minimum lot size criteria for review of proposed developments generating sanitary wastewater in non-Pinelands areas of the County:

1. Single family residences proposed in areas not served by municipal sewers are required to have a minimum lot size of 35,000 square feet. This criterion is consistent with the existing SMP as administered by the Cape May County Health Department.
2. Proposed development, other than single family residences, generating greater than 500 GPD and less than or equal to 2,000 GPD of wastewater in areas not served by sanitary sewers shall be reviewed through the use of a modification to the Trela-Douglas NO3-N Dilution Model to determine the minimum lot size requirement. Chapter 9A flow figures shall be utilized in the determination of facility discharge.
3. In no case shall a lot be created that is less than 35,000 square feet.

Dilution Model

The modified Trela-Douglas Model utilizes the following formula:

$$Ah = Q(Cs - Co)/(74.39CoRi)$$

Ah = minimum lot size (Acres)
Q = facility design flow (GPD) (1)
Co = allowable NO3-N concentration in groundwater (mg/L) (2)
Cs = nitrate concentration in effluent (mg/L) (3)
Ri = recharge to aquifer (in/yr) (4)
74.39 = mathematical constant developed in the modification of the Trela-Douglas NO3-N Dilution Model

(1) Use N.J.A.C. 7:9A for facility discharge determination
(2) 10 mg/L for potable water protection
(3) Assumed at 40 mg/L
(4) Assumed at 18 in/yr *

* - The recharge to the surficial aquifer has been reduced from 20 to 18 inches per year. It reflects the results of a 1992 U.S. Geological Survey study entitled, Water Resources of the Unconfined Aquifer System of the Great Egg Harbor Basin, New Jersey, 1989-90 by Martha K. Watt and Melissa L. Johnson. (8)

Figure 5-2 2000 Cape May County Dilution Model

A = F (N-NA) / 74.39 x NA x R

A = minimum lot size required (acres)
F = facility design (flow) in GPD
N = (nitrate) concentration in mg/L
NA = concentration of (nitrates allowed)
74.39 = mathematical constant

R = (recharge) to aquifer in inches per year

EXAMPLE

A development is proposed that will generate 2,000 GPD of wastewater. Utilizing the dilution model the calculations are as follows:

A = 2,000 (40-10) / 74.39 x 10 x 18
A = 2,000 x 30 / 743.9 x 18
A = 60,000 / 13,390.2
A = 4.48 acres

As the only variable in the formula is the flow of wastewater, the model can be streamlined to:

A = 2,000 x 30 / 13,390.2
A = 60,000 / 13,390.2
A = 4.48 acres

NOTE: The revised dilution model uses 18" of precipitation available for recharge versus 20" in the former model.

5.8 Alternatives

When an applicant's proposal exceeds the assimilative capacity of the site, the applicant may exercise other options. These options include the acquisition of additional contiguous land or downsizing the proposed development.

An applicant may wish to install an alternative means of on-site wastewater disposal, if he cannot acquire additional contiguous land or cannot reduce the size of the proposed development. This would be necessary to reduce the discharge of nitrate-nitrogen to meet the objectives of the SMP. The approval for alternative systems is obtained through the NJDEP (which reviews "alternate" septic system designs - that do not conform to Chapter 9A). (9) It should be noted that, it may not be cost-effective to install an alternative system on a site that will generate wastewater volumes of 2,000 GPD or less.

5.9 Development in the New Jersey Pinelands

The water quality standards of the Pinelands Comprehensive Management Plan allow the use of individual on-site septic systems. The design of the system and the size of the parcel on which the system is located must ensure that the concentration of nitrate- nitrogen in the groundwater exiting the parcel or entering a surface water body will not exceed 2 mg/L (N.J.A.C. 7:50-6.84 (a) (4iii). The model used to calculate the minimum land area necessary to dilute nitrogen from septic systems to concentrations that will comply with the water quality standards can be found in N.J.A.C. 7:50-Appendix A. (10)

5.10 NJPDES Review

Proposed facilities with sewage design flows greater than (>) 2,000 GPD require review and approval from the New Jersey Department of Environmental Protection (NJDEP) for the issuance of a New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Groundwater (DGW) Permit.

5.11 Summary

The following outline summarizes developer/applicant alternatives when proposing groundwater discharge facilities in Cape May County:

A. Proposed Development - Design Sewage Flows Equal to or Less Than 2,000 GPD.

1. Property meets County minimum lot size requirement.

   a. Project reviewed by County. Approval subject to compliance with N.J.A.C. 7:9A design requirements.

2. Property does not meet County minimum lot size requirement.

   a. Applicant must acquire additional contiguous land, or

   b. Down scale proposed development, or

   c. Applicant must obtain a letter from the County verifying the applicant's status with regard to the minimum lot size requirements. Install an alternative system that is approved by the NJDEP.

B. Proposed Development - Design Sewage Flows Greater Than 2,000 GPD.

Regulated by the NJDEP under NJPDES Rules, N.J.A.C. 7:14A.

END NOTES

1. John J. Trela and Lowell A. Douglas, SOILS, SEPTIC SYSTEMS AND CARRYING CAPACITY IN THE PINE BARRENS, Paper presented at the First Annual Pine Barrens Conference, Atlantic City, New Jersey, May 22, 1978

2. John W. Stinton, Editor, NATURAL AND CULTURAL RESOURCES OF THE NEW JERSEY PINE BARRENS: Inputs and Research Needs for Planning, Paper presented at the First Research Conference on the New Jersey Pine Barrens, Atlantic City, New Jersey, May 22-23, 1978

3. New Jersey Department of Environmental Protection, NEW JERSEY COASTAL NONPOINT POLLUTION CONTROL PROGRAM PLAN, Trenton, New Jersey, July 1995

4. T.J. Bicki and R.B. Brown, ON-SITE SEWAGE DISPOSAL --NITROGEN BEHAVIOR, Notes in Soil Science No. 20, Soil Science Department, University of Florida, Gainesville, Florida, 1985

5. New Jersey Department of Environmental Protection, GROUND WATER PROTECTION PRACTICES FOR SEPTIC SYSTEMS, Trenton, New Jersey, June 1992

6. New Jersey Department of Environmental Protection, A GROUND WATER STRATEGY FOR NEW JERSEY, Trenton, New Jersey, June 1989

7. Eduard M. Eichner and Thomas C. Cambareri, NITROGEN LOADING, Cape Cod Commission, Water Resources Office, Barnstable, Massachusetts, April 1992

8. Martha K. Watt and Melissa L. Johnson, WATER RESOURCES OF THE UNCONFINED AQUIFER SYSTEM OF THE GREAT EGG HARBOR RIVER BASIN IN NEW JERSEY, 1989-90, U.S. Geological Survey in cooperation with the New Jersey Department of Environmental Protection, West Trenton, New Jersey, 1992

9. New Jersey Department of Environmental Protection, NEW JERSEY COASTAL NONPOINT POLLUTION CONTROL PROGRAM, Trenton, New Jersey, July 1995

10. New Jersey Administrative Code 7:50-Appendix A, PINELANDS MANAGEMENT PLAN, Pinelands Septic Dilution Model, December 1993.

CHAPTER 6 - STORMWATER RUNOFF

6.1 Introduction

The effective control of stormwater runoff has become a major concern in the preservation of water quality both in the coastal zone and Pinelands Area. [11]"Stormwater runoff is a natural process of surface hydrology, whereby precipitation flows on the surface of the ground into a surface water body or into the soil through infiltration. Development changes this process as the volume and rate of runoff increase due to grading, paving and construction. Unless managed properly, the stormwater runoff generated by buildings and paved surfaces has the potential to adversely affect the coastal environment in several ways: increased erosion, increased flooding in streams, destruction of flood plain vegetation, contamination by pollutants and sediment, increased turbidity in the surface waters, and decreased aquatic productivity.

Therefore, all municipalities were mandated by NJDEP to adopt model ordinances and stormwater management plans in compliance with NJAC 7:7E-8. This requires all municipalities as part of their approval process to regulate the stricter standards with include measures for non-structural stormwater control, design criteria for water recharge, rate of runoff, quantity of runoff and quality of runoff, but also requires municipalities to inspect and mandate long-term maintenance of those facilities.

The two primary objectives in designing a stormwater management system are water quality control and flood/erosion control. Many of the concerns related to water quality control and flood/erosion control can best be addressed during the site planning and design phase of a development. Non-structural management practices, including land use, site design and source controls for nonpoint source pollution control shall be used in the planning of a project, unless it can be demonstrated that these practices are infeasible on a particular site."

Recent trends in federal and state stormwater policy have provided greater control over development during the design, construction and post development phases. Site compliance is required in accordance with the following regulations dependent upon the location and nature of development:

Coastal Area Facilities Review Act Rules (N.J.A.C. 7:7) and Coastal Zone Management (N.J.A.C. 7:7E) for development within the coastal zone.
Pinelands Comprehensive Management Plan (N.J.A.C. 7:50) for development within the New Jersey Pinelands.
Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A).
Flood Hazard Area Control Act Rules (N.J.A.C. 7:13-1).

11N.J.A.C. 7:7E-8.7(f) Stormwater Runoff - Rationale.

Standards for Soil Erosion and Sediment Control in New Jersey (N.J.A.C. 2:90).
New Jersey Stormwater Permitting Rules (N.J.A.C. 7:14A).
Stormwater Management Rules (N.J.A.C. 7:8). These rules are applicable to a municipality if a grant for 90 percent of the costs of the preparation of a stormwater management plan are made available by the NJDEP.
Residential Site Improvement Standards (N.J.A.C. 5:21). A portion of these rules address stormwater facilities, specifying design and construction standards for storm sewers, detention basins and other site drainage improvements.

The NJDEP "Stormwater and Nonpoint Source Pollution Control Best Management Practices Manual", December 1994, is recommended for use as guidance for planners, engineers and others responsible for stormwater and nonpoint source management.

6.2 Coastal Zone Management

CAFRA policy on Stormwater Management (N.J.A.C. 7:7E-8.7) states the following:

Coastal development shall employ a site design which, to the extent feasible, minimizes the amount of impervious coverage on a project site. In addition, the development shall use the best available technology to minimize the amount of stormwater generated, minimize the rate and volume of stormwater runoff, maintain existing on-site infiltration, simulate natural drainage systems and minimize the discharge of pollutants to ground and surface waters. Consistent with the provisions of the Stormwater Management rule, the overall goal of the post-construction stormwater management system design shall be the reduction from the pre-development level of total suspended solids (TSS) and soluble contaminants in the stormwater.

Flood control shall be provided such that "the post-development peak runoff rate for the two-year storm event is 50 percent of the pre-development peak runoff rate and the post-development peak runoff rates for the 10 and 100 year storm events are 75 percent of the pre-development peak runoff rates".

CAFRA policy on water quality identifies the following six stormwater management techniques as "Conditionally Acceptable":

1. Newly constructed wetlands.
2. Wet ponds/retention basins.
3. Detention basins.
4. Vegetated swales.
5. Infiltration basins.
6. Perforated pipe for the purposes of underground recharge.

"The following list represents techniques which are not likely to be approved, unless it can be clearly documented that the use of other "Conditionally Acceptable" techniques has been maximized or is infeasible for engineering reasons."

Underground storage.
Sediment traps and oil/grease separators.
Porous asphalt pavement.

6.3 Pinelands Comprehensive Management Plan

Pinelands standards for the control of surface water runoff are contained in N.J.A.C. 7:50-6.84(a)6. Surface water runoff must be controlled such that:

"The total runoff generated from any net increase in impervious surfaces by a 10 year storm of a 24 hour duration shall be retained and infiltrated on site."
"The rates of runoff generated from the parcel by a two year, 10 year and 100 year storm, each of a 24 hour duration, shall not increase as a result of the proposed development."
"Surface water runoff shall not be directed in such a way as to increase the volume and rate of discharge into any surface water body from that which existed prior to development of the parcel."
"Excessively and somewhat excessively drained soils, as defined by the Soil Conservation Service, should be avoided wherever practical."
"Maintain a minimum separation of 2 feet between the bottom of the infiltration or detention facility and the seasonal high water table."

6.4 Soil Erosion and Sediment Control

The Soil Erosion and Sediment Control Act of New Jersey (Public Law 1975, Chapter 251) requires the preparation and submission of a Soil Erosion and Sediment Control Plan (SESC) to the applicable New Jersey Soil Conservation District for review and approval for projects with a total land disturbance of 5,000 square feet or more. The following activities may be considered for exemption:

Commercial construction (including utilities, public facilities, and demolition projects) with a total land disturbance of less than 5,000 square feet in area.

Construction of a single family dwelling which is not part of a proposed subdivision, planned development or construction permit application involving two or more such single family dwelling units.

Construction of a single family home within a MINOR Subdivision where one does not plan to own or build more than one home at a time.

Agriculture (crop farming, including orchards) or horticulture (cultivation of nursery stock). This applies only to cultivation and not the construction of buildings, greenhouses and similar structures.

Cape May County is within the Cape-Atlantic Soil Conservation District located in the Atlantic County Office Building, 6260 Old Harding Highway, Mays Landing, New Jersey 08330, (609) 625-3144. The SESC Plan must be prepared in accordance with the current "Standards for Soil Erosion and Sediment Control in New Jersey".

6.5 New Jersey Pollutant Discharge Elimination System (NJPDES) Permits

NJPDES stormwater discharge permits fall into two categories: construction and industrial activities. Construction activities including clearing, grading and excavation disturbing five acres or more of total land area and mining/quarrying operations involving the excavation of gravel, stone, sand, soil, shale and clay with no chemical treatment are eligible for a "Construction General Permit". The applicant must submit a "Request for Authorization" (RFA) through the Cape-Atlantic Soil Conservation District for the general permit. This application must include a
"Stormwater Pollution Prevention Plan" as defined in N.J.A.C. 7:14a-3 App. B, Part III-B.

The stormwater permitting of industrial activities and industrial regulated activity conducted on site is dependant upon a facility's Standard Industrial Classification (SIC) Code. The NJDEP has also developed two general permits for the concrete and scrap metal industries. Applicants are referred to N.J.A.C. 7:14A-3 Appendix A for guidance on the eligibility requirements for a NJPDES/DSW General Industrial Stormwater Permit. Those regulated facilities not eligible for a General Permit need to apply for an individual discharge permit. For more information on these items contact the NJDEP, Bureau of Stormwater Permitting at (609) 633-7021.

CHAPTER 7 - WELL HEAD PROTECTION

7.1 Introduction

The information of this chapter represents an abridged version of the "Well Head Protection Plan for Domestic Well Clusters", prepared by the Cape May County Planning Board in cooperation with the New Jersey Department of Environmental Protection and Energy in June of 1992. Well Head Protection maps prepared by the Cape May County Department of Health are available on the Cape May County web site.

7.2 Legislative Authority Establishing Well Head Protection

The Amendments to the Federal Safe Drinking Water Act (SDWA), passed in June 1986, established the first nationwide program to protect groundwater resources used for public water supplies from a wide range of potential threats. The SDWA seeks to accomplish this goal with the development and implementation of state Well Head Protection Programs (WHPP) that "protect well head areas within their jurisdiction from contaminants which may have adverse effects on the health of persons" (USEPA, 1987).

Nearly half the population in the United States uses wells or springs to obtain drinking water (USGS, 1984). Improper management of contamination sources resulting from human activities often causes degradation of these supplies (USEPA, 1987). One solution to this problem is to prevent contaminated ground water from reaching wells and springs by establishing areas of protection around them (USEPA, 1987).

The Well Head Protection Areas (WHPAs) are defined in the SDWA as "the surface and subsurface area surrounding a water well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field" (USEPA, 1987).

The guidelines assume that WHPA delineation and protection will be targeted to three general threats. The first is the direct introduction of contaminants to the area immediately contiguous to the well through improper casing, road runoff, spills, and accidents. The second basic threat is from microbial contaminants such as bacteria and viruses. The third major threat is the broad range of chemical contaminants, including inorganic and naturally occurring or synthetically derived organic chemicals (USEPA, 1987).

7.3 Cape May County Well Head Protection Program

The Cape May County Well Head Protection Program is a pilot program designed to locate and delineate domestic well cluster areas within the county for current and future ground-water resource preservation. The overall purpose of the WHPP is to minimize the risk of water supply well pollution due to new discharges of ground water pollutants (NJDEP, 1990). The Well Head Protection Areas for the clusters are delineated and management programs for these areas have been developed for implementation.

All domestic well clusters meeting established criteria are found within four of the mainland municipalities as presented below.

Municipality	Total Dwelling Units in Municipalities	Total Wells in Clusters	% Dwelling Units in Clusters
Lower Township	12,740	6,244	49.0%
Middle Township	6,970	1,367	19.6%
Dennis Township	1,960	231	11.8%
Upper Township	5,285	1,894	35.8%

Addressing the four referenced municipalities, about thirty-seven percent (36.69%) of the domestic wells are within the Well Head Protection Areas. The high percentage of domestic wells affected by the Well Head Protection Areas for the identified clusters adds an emergent nature to aggressive implementation strategies.

7.4 Summary

The County of Cape May developed a program to protect domestic clusters of wells from pollutant sources under a pass-through grant by the Environmental Protection Agency. Data on the unconfined aquifer was developed, three tier structures were produced around each well cluster and placed on tax maps, and the clusters were based on the time-of-travel by which a drop of water would reach the individual wells. Twenty-seven clusters were identified in the mainland communities of Upper, Dennis, Middle, and Lower Townships. The pollutant sources surrounding the wells were field investigated and were found to include septic systems, above and below ground storage tanks, and cemeteries.

The implementation of Well Head Protection initiatives at the local level will require continued public education efforts on the part of the state and the county. In Cape May County the key element to acceptance of regulatory programs will be an increased awareness of the impact of degraded ground water quality to residents, industries and commercial interests. Mainland residents need to understand how easily privately owned wells, public community or public non-community wells can be contaminated by pollution sources. Education of the residents whether they live in urban, suburban or rural areas is a critical component of Cape May County's long range management plan. Since many of these interests rely on tourism for their livelihood, water resource education of Cape May vacationers is vital to the County.

CHAPTER 8 - PUBLICLY OWNED LANDS MAPPING

Publicly owned lands provide and environmental buffer between the developed areas in Cape May County. These lands have become more important as development has expanded and the need for potable water has intensified. These lands provide relatively undeveloped areas for aquifer recharge that is vital to the County's groundwater supply. Specific areas identified are parks, farmland preservation, fish and wildlife areas and open space greater than 5 acres. This information has been compiled through the use of the Geographic Information System (GIS) and is on file at the CMPD in digital format.

CHAPTER 9 - 208 PLAN MAPS

The 208 (Wastewater Management Area) Maps contained in this document are for general reference. They may not be a true representation of the latest mapping revisions. The most current 208 Plan Maps can be obtained at the:

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT
BUREAU OF WATERSHED REGULATION
401 E.STATE ST. 7th FLOOR W. WING
PO BOX 418
TRENTON, NJ 08625-0418

Updated information on the 208 Plan is available on the County web site:

WWW.CMCHEALTH.NET

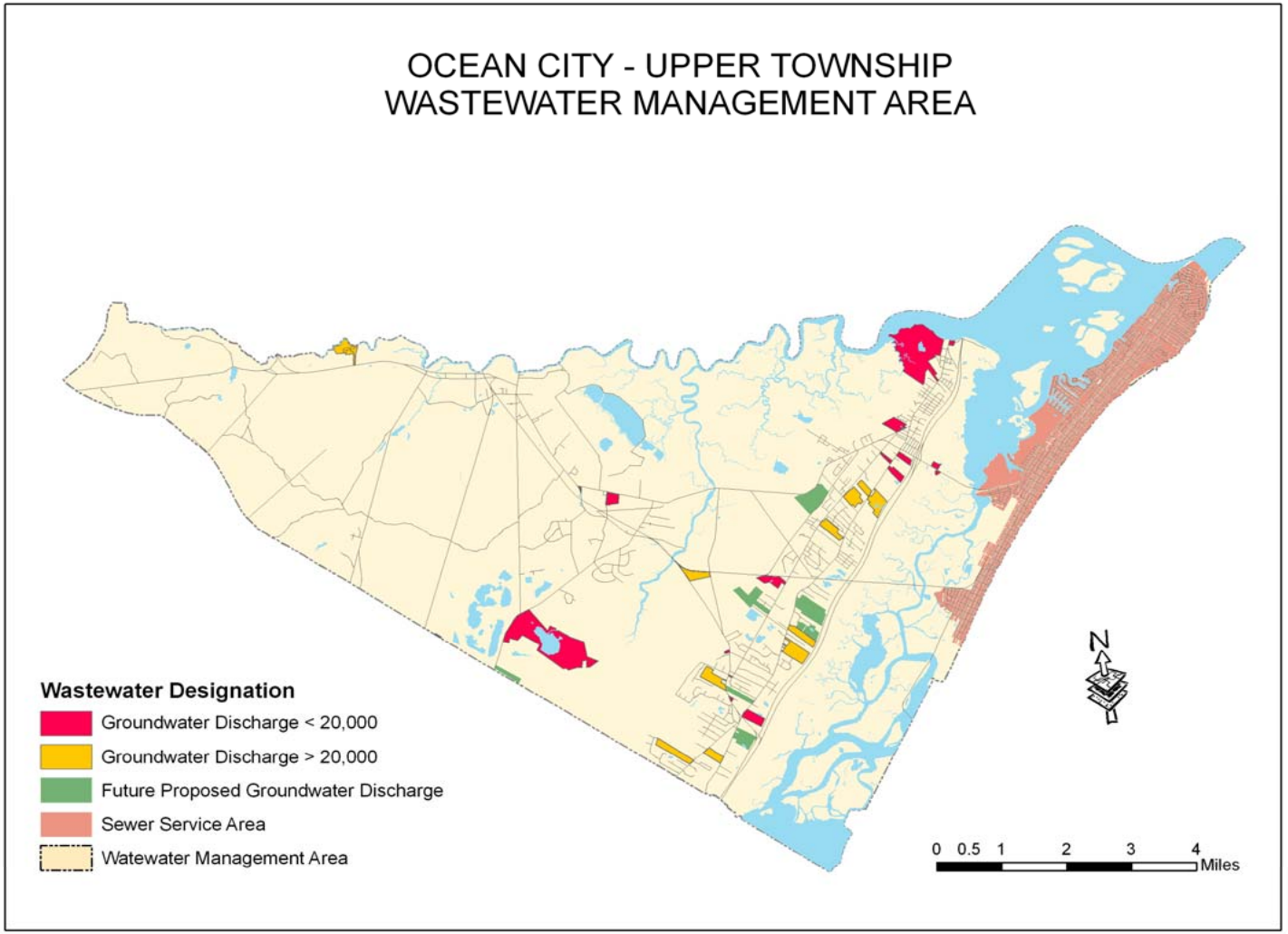


Figure 9-1 Ocean City - Upper Township Wastewater Management Area

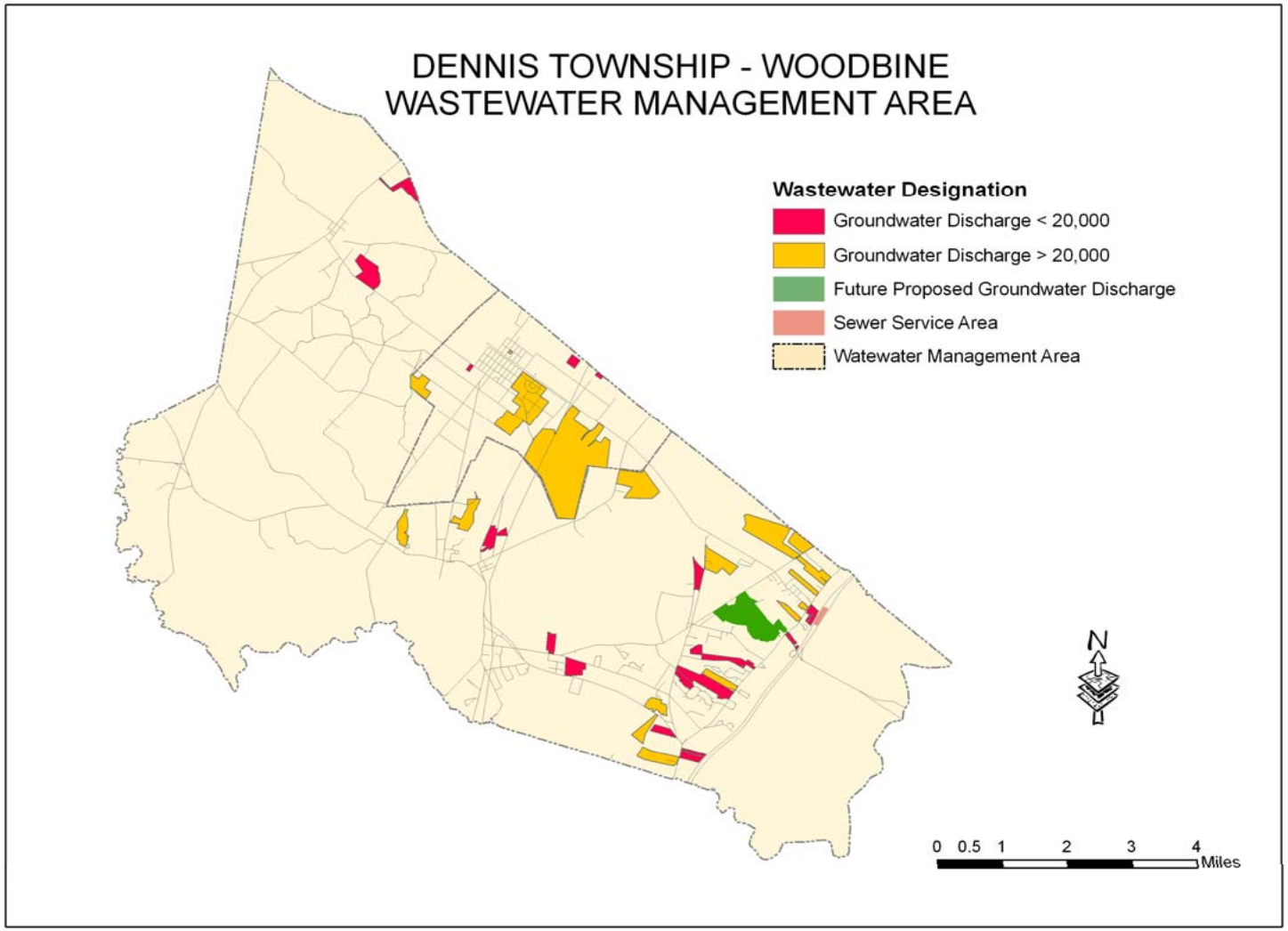


Figure 9-2 Dennis Township - Woodbine Wastewater Management Area

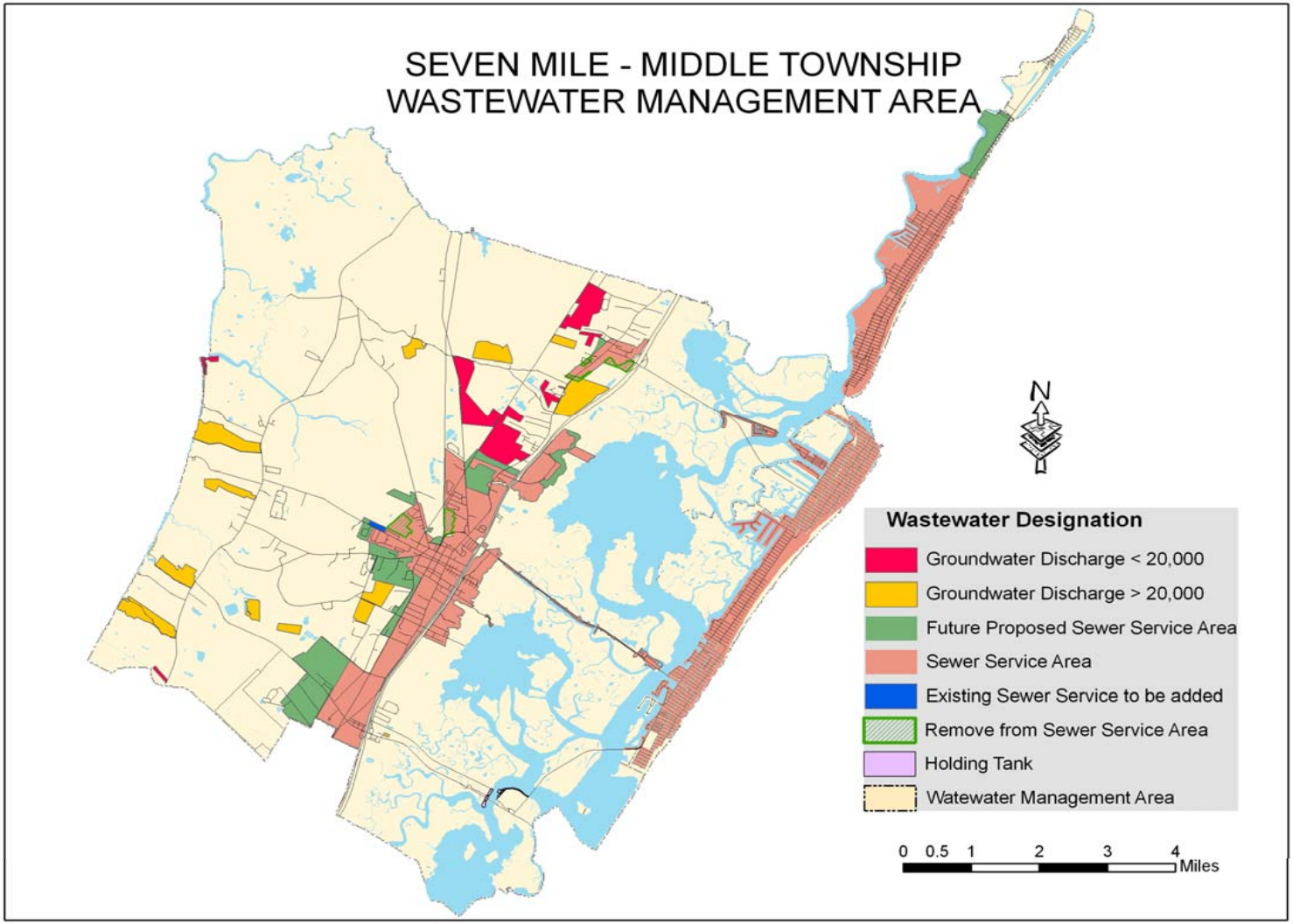


Figure 9-3 Seven Mile - Middle Township Wastewater Management Area

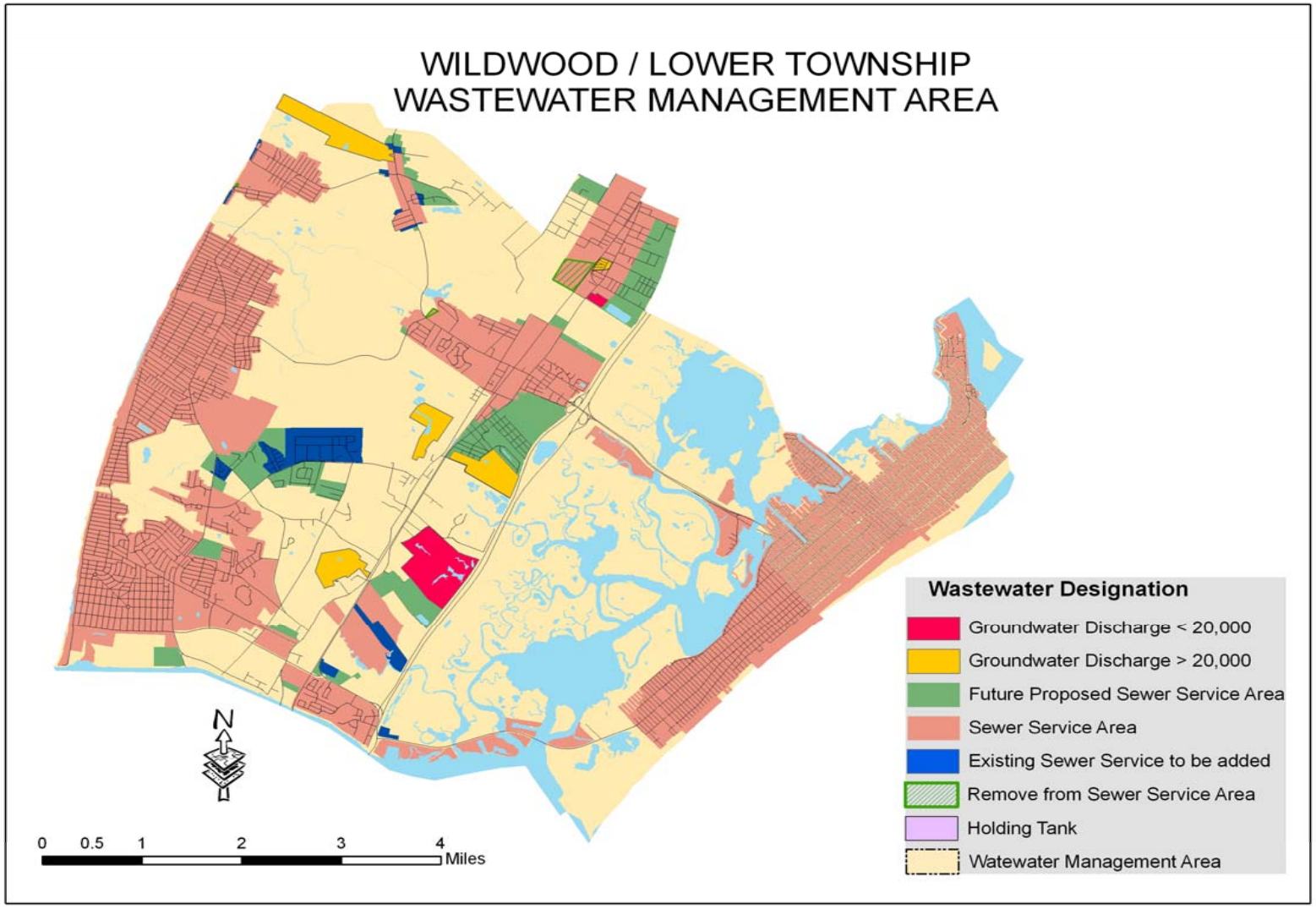


Figure 9-4 Wildwood/Lower Township Wastewater Management Area

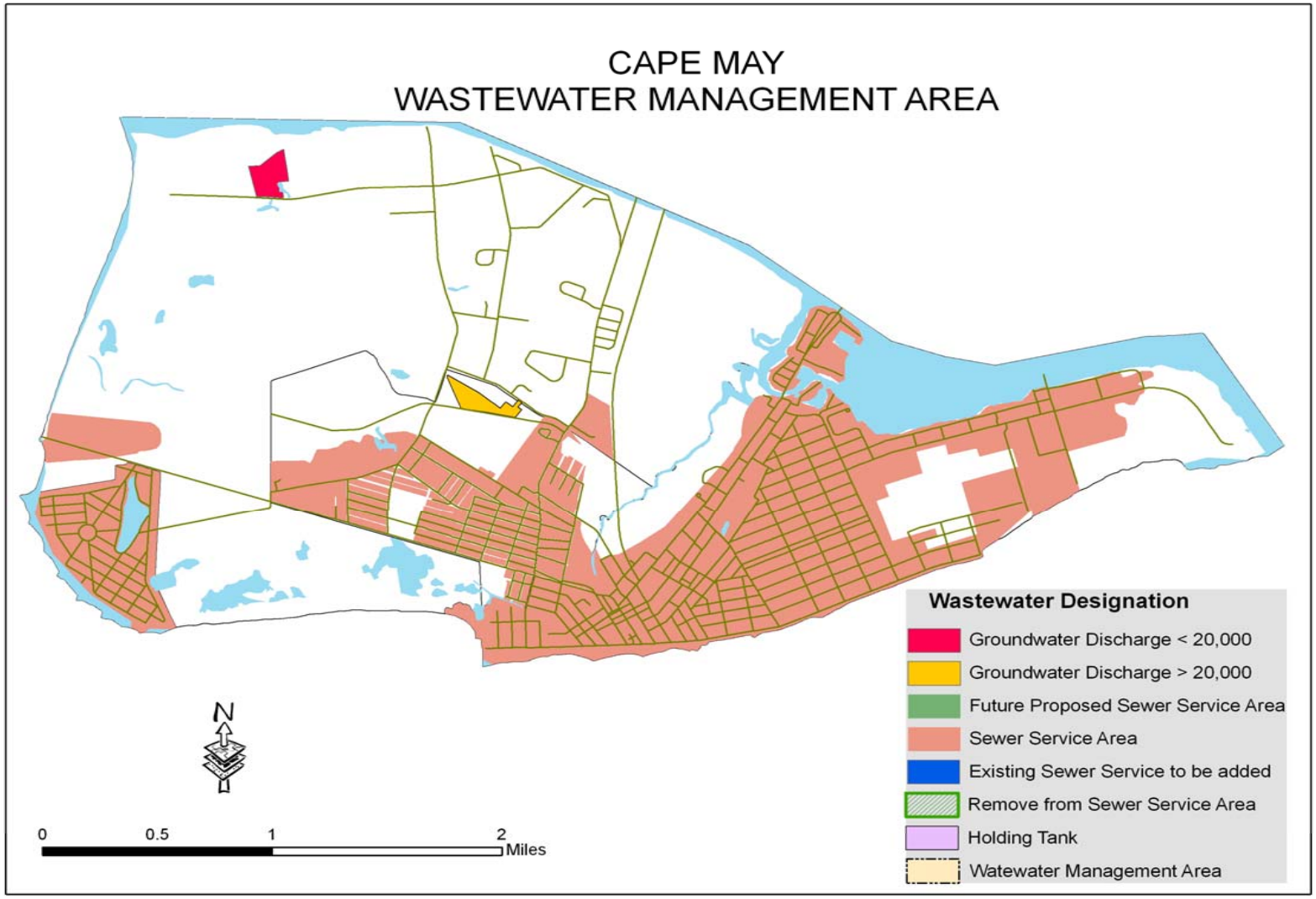


Figure 9-5 Cape May Wastewater Management Area