

## **VIII. Municipal Wastewater Management Chapter** **Sussex Borough**

**2010 Population = 2,130**

**Land Area = 0.60 square miles**

**2010 Population Density = 3,590 persons/sq. mile**

This municipal chapter is an element of the Sussex County Wastewater Management Plan prepared by Sussex County Planning Division in accordance with N.J.A.C. 7:15.

### **Existing and Proposed Wastewater Infrastructure**

Sussex Borough has a wastewater collection system that conveys wastewater to the Sussex County Municipal Utilities Authority wastewater treatment facility located in Hardyston Twp. The SCMUA Upper Walkkill Water facility has a surface water discharge to the Walkkill River. The Existing Sewer Service Area map shows there is one existing pump station in Sussex Borough. Sussex Borough owns the force main that extends from the Borough along Route 23 in Wantage Township to the SCMUA Upper Walkkill wastewater facility in Hardyston Twp.

The Sussex Borough force main also serves the A & P shopping center, as an existing SCMUA sewer service area in Wantage Twp. There is an Interlocal Service Agreement between Sussex Borough and Wantage Township related to the force main. There are additional properties in Wantage Township that are proposed to be served by SCMUA and Sussex Borough force main. The following properties have received Preliminary Approval in Plan Amendment process and are shown on Future Sewer Service Area map as part of County Wastewater Plan submittal to DEP: Hampshire Companies (Block 2 Lots 36.01 and 36.02); "Wantage Plaza" owned by Main Land Sussex (Block 7 Lots 12 and 13.02); and Bicsak Brothers Realty LLC (Block 11 Lot 5, Block 10 Lot 10.01). There will be future studies to verify the capacity of the force main to handle the additional flow from serving SCMUA sewer service area in Wantage, subject to DEP approval.

Also in Wantage Twp., there is a Wastewater Plan for "Wantage Village/ Wantage Ridge" project located on Route 628 (Block 116 Lots 10.01 and 10.06) included as part of the County WMP. According to an agreement between the property owners/developers and the Borough of Sussex, the water for the proposed mixed-use development would be supplied by an extension of the Borough's water system.

Wastewater facilities (discharge greater than 2,000 gallons per day) are regulated by NJ Dept. of Environmental Protection with individual New Jersey Pollutant Discharge Elimination System (NJPDES) Permits. There are no individual wastewater facilities with NJPDES Permits in Sussex Borough.

## **Build-out Analysis for Sussex Borough Sewer Area**

In March 2014, CP Engineers prepared a “Sanitary Sewer Build-out Analysis”, shown on following pages. Parcel based mapping was used to estimate wastewater flow projections based on 2009 Borough Master Plan and 2013 Redevelopment Plan. The attached table provides an analysis of land available for development within different Municipal Zoning Districts, and applies zoning densities to project residential units, commercial and mixed-use development and redevelopment in the sewer area. The build-out analysis shows that over 130 additional residential units, more than 500,000 square feet of commercial uses (such as retail and office), and mixed-use development can occur in the sewer service area.

Since the County Wastewater Management Plan is meant to be a 20-year plan, using that time period is valuable to realistically assess the possible need for additional sewer capacity and infrastructure for future development. The following chart compares the SCMUA allocation amount, existing flow and build-out flow to evaluate whether additional wastewater capacity would be needed in the future.

<b>Table A – Analysis of Future Wastewater Needs for Sussex Borough (Million Gallons per Day)</b>							
Allocation Amount (MGD)	Existing Flow (over 5 Yrs 2009 -2013)	Residential Build-out Flow (MGD)	Non-res. Build-out Flow (MGD)	Mixed Use Build-out Flow	Existing Septics Flow	Total Projected Build-out Flow	Remaining Allocation (MGD)
0.464	0.245	0.037	0.044	0.028		0.35507	0.109

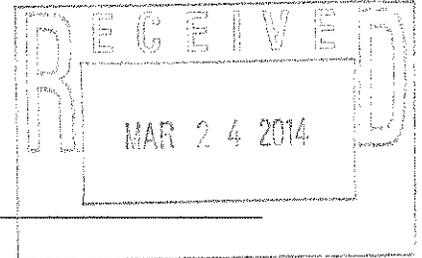
## **Build-out in Septic Area and DEP Nitrate Dilution Model**

The DEP build-out model was used with updated GIS layers for Sussex County municipalities to calculate future development and wastewater flow in septic system areas. All undeveloped land was included as available for nitrate dilution for future septic density, and used to calculate “Total New Septics Allowed”. For “Total New Septics based on Zoning”, the results from the DEP Build-out Model were further modified using the Sussex County Strategic Growth Plan build-out analysis done by municipality and by zone. Most of Sussex Borough is in a sewer service area, and not served by septic systems.

The NJDEP Build-out Model is a regional planning tool with just one focus: to identify possible areas of future stresses on ground water quality. **Appendix J** further describes the NJDEP Build-out Model and some of its limitations as well.

MEMORANDUM

Date: 03-21-14 CPE&A Project No.: 578.010  
To: Borough of Sussex From: Joe Weaver, PE  
Attn: Mark Zschack, Borough Clerk/Administrator  
Cc: Sabine Watson, PE (CPE), Steve Donati, PE, (CPE), Stan Puszczyk, PE (CPE)  
Subject: Sanitary Sewer Build-Out Analysis



ANALYSIS

As requested, CP Engineers (CPE) has performed a Built-Out Analysis of the Borough based upon redevelopment that is likely to occur in the Borough pursuant to the 2009 Master Plan and 2013 Redevelopment Plan, as well as input from your office; the purpose of which was to determine the adequacy of the Borough's current waste water treatment allocation from the Sussex County Municipal Utilities Authority (SCMUA). The following is a summary of our analysis, the details of which are included in the attached Built-Out Analysis spreadsheet.

The 2009 Master Plan included recommendations of building coverage and number of stories of future structures in the three (3) Redevelopment Areas, A, B and C; these parameters were further qualified based upon additional input from the Borough and a commercial building coverage of 35 percent, with a height of 1 story was established for Redevelopment Areas A and B. The developable area of Redevelopment Area A was also reduced to account for the amount of land that is environmentally constrained due to proximity with the Clove Brook. The Master Plan recommends that only residential development at a density similar to that of the High Density Residential Zone be allowed in Redevelopment Area C. While this area is best suited for residential development, it is our opinion a density more in kind with the neighboring Medium Density Residential Zone is more feasible given the steep topographic conditions of this area.

Our analysis assumes that the Low Density and Medium Density Residential Zones would not be further developed, as they are all but completely built out and contain a minimal number of properties that could be further subdivided. The density recommended in the Master Plan was assumed for the Very Low Density Residential Zone. With regard to the Borough's Commercial Zones, a building coverage of 40 percent was assumed for the various Commercial Zones, which is consistent with the coverage currently permitted by the Borough Code. The allowable building coverage was then used to determine the size of commercial uses on grade level, as well as the number of dwelling units on upper floors. Commercial zones are currently developed and 20 percent of the area was assumed for additional expansion. The estimated waste water flow amounts specific to residential and commercial uses was determined in accordance with N.J.A.C. 7:14A-23.3 Technical Requirements for Treatment Works Approval Applications.

The existing flows from the Borough are based on the average daily flows over the past five years. This includes inflow and infiltration (I&I) influences. While this cannot be assumed consistent from year to year, the average presented is over an adequate time span that we believe to be reasonably representative of actual flows under current development conditions. The total build-out flow estimated is the summation of estimated flows from all future development and redevelopment allowable under current land development parameters and average flows from existing development.

### FINDINGS / CONCLUSIONS

In addition to performing the Build-Out Analysis as described above and attached, CPE has reviewed waste water flow records for the preceding five (5) years, 2009 through 2013. In general, the Borough generates an average less than 200,000 gallons per day (GPD) of waste water under normal flow conditions. However, the minimum average daily flow the Borough is contractually obligated to pay for is 312,000 GPD. It is acknowledged that the conveyance system is influenced by I&I during average to heavy rain events, however, the Borough is committed to reducing these errant flows into the sewers. In fact, the recent efforts to address I&I conditions has been evident in the overall reduction of the daily flow volumes during storm events for the past two years. That being said, the average daily flow rate based on the data from the past five years is 245,000 GPD, which includes I&I flows. With an extension of service of 100,000 GPD or more, the Borough would realize increased revenue of approximately one third the current income amount. The impact of this increased base flow upon the previous two years of actual data results in approximately twice the volume exceeding the maximum allocation currently generated annually. While this will result in twice the current cost for the excess flow, the increase in revenue will more than compensate this anticipated increase. Furthermore, it is our understanding that SCMUA may be willing to discuss reducing the current penalty rate for exceeding the maximum allocated flow.

The total projected build-out for the Borough alone, including I&I flows, is 355,074 GPD. The addition of 100,000 GPD or more from customers outside of the Borough would maintain flows within the current maximum treatment allocation of 464,000 GPD. However, as stated above, this maximum flow may be exceeded with greater frequency. This frequency is expected to be reduced as the Borough continues to perform maintenance and improvement projects to reduce I&I flows. This may be a stipulation in advance of redevelopment projects, such that total flows can be maintained below the Borough's maximum treatment allocation.

### RECOMMENDATIONS

Based upon our findings above, as well as the Borough's intent to encourage development and redevelopment CPE recommends the following tasks be performed/initiated immediately.

1. Allow additional connections to the sewer system to increase the Borough's base flow from 200,000GPD to the 312,000GPD that corresponds with the Borough's minimum payments to SCMUA.
2. Perform an inventory of all waste water system infrastructure and create GIS a system map and database.
3. Further refine an Inflow & Infiltration (I&I) Analysis of the waste water system.
4. Establish Annual Lining/Sealing and Replacement Programs for components contributing to I&I.
5. Initiate discussions with SCMUA for reduce the penalty rate for exceeding monthly treatment allocation.

Attachment – Build-Out Analysis Spreadsheet (Dated 03-20-14)

P:\Sussex Borough\WaterSewer Engineer\Sanitary Build Out Analysis\Report\San Build Out Summary 03-21-14.docx

**CP ENGINEERS ARCHITECTURE**

35 Sparta Avenue  
Sparta, New Jersey 07801

**WASTE WATER MANAGEMENT BUILD-OUT ANALYSIS  
FOR THE BOROUGH OF SUSSEX, SUSSEX COUNTY, NEW JERSEY**

ZONE	NO. OF EXISTING LOTS	TOTAL ZONE AREA (S.F.)	MASTER PLAN ALLOWABLE DENSITY	MAX NO. OF UNITS (Density Based)	Projected Additional Sanitary Flow (GPD)	Comments
<b>RESIDENTIAL ZONES</b>						
VDR	81	1,857,210	3 Dwelling Units Per 1 Ac.	14	4,264	Existing Lots Undeveloped; Density Used to Estimate Flow. 300 GPD for 3+ Bedroom Dwelling Units
LDR	312	4,037,670	1 Dwelling Unit Per 10,000 S.F.	404	0	Redevelopment Unlikely
MDR	145	1,775,940	1 Dwelling Unit Per 10,000 S.F.	178	0	Redevelopment Unlikely
HDR	11	1,064,222	12 Dwelling Units Per 1 Ac.	293	0	Redevelopment Unlikely
<b>Total Estimate Residential Flow =</b>					<b>4,264</b>	
<b>COMMERCIAL / MIXED USE ZONES</b>						
CBD*	80	770,567	Assumed 40% Building Coverage		17,723	0.1 GPD per S.F. for 1st Flor Retail + 150 GPD per 800 S.F. for 2nd Floor Residential (@25% Redevelopment)
ORC*	33	459,459	40% Building Cover Per Code		10,568	0.1 GPD per S.F. for 1st Flor Retail + 150 GPD per 800 S.F. for 2nd Floor Residential (@25% Redevelopment)
RC	17	958,479	Assumed 20% Building Cover Based on 40% Lot Cover Per Code		19,170	0.1 GPD per S.F. for Retail
<b>Total Estimated Commercial / Mixed Use Flow =</b>					<b>47,460</b>	
<b>PUBLIC / SERVICE ZONES</b>						
P	24	2,044,828	Assumed 35% building Cover, 2 Stories		0	MINIMAL DEVELOPMENT EXPECTED IN THIS ZONE, FLOW IS NEGLIGIBLE
INST	7	149,092			0	Redevelopment/Expansion Unlikely
<b>Total Estimated Public / Service Flow =</b>					<b>0</b>	
<b>Total Additional Estimated Build Out Flow Based On 2009 Master Plan =</b>					<b>54,724</b>	
<b>REDEVELOPMENT ZONES</b>						
RA-A	11	278,034	35% Com. Building Coverage, 4 Stories		9,731	0.1 GPD per S.F. for Retail & Offices
RA-B	7	427,997	Assumed 35% Com. Building Coverage		14,980	0.1 GPD per S.F. for Retail & Offices
RA-C	17	1,103,488	1 Dwelling Unit Per 10,000 S.F.	110	33,105	300 GPD for 3 Bedroom Dwelling Units
<b>Total Estimated Flow to Accommodate Redevelopment Plans =</b>					<b>57,816</b>	
<b>Five Year Average Daily Actual Flow Including 1 &amp; I =</b>					<b>245,535</b>	
<b>Future Flow Capacity Required =</b>					<b>355,074</b>	