List of Maps

Map 1-1. Municipal Wastewater Treatment Plants in Delaware – 2011 (Including Major Private Wastewater Utility Providers)

Map 1-2. Wastewater Serviced Areas in Delaware – 2011 (Including Major Private Wastewater Utility Providers)

Map 1-3a. Wastewater Service Areas in New Castle County Delaware – 2011 (Including Major Private Wastewater Utility Providers)

Map 1-3b. Wastewater Service Areas in Kent County (North) Delaware – 2011 (Including Major Private Wastewater Utility Providers)

Map 1-3c. Wastewater Service Areas in Kent County (South) Delaware – 2011 (Including Major Private Wastewater Utility Providers)

Map 1-3d. Wastewater Service Areas in Sussex County (Northwest) Delaware – 2011 (Including Major Private Wastewater Utilities)

Map 1-3e. Wastewater Service Areas in Sussex County (Southwest) Delaware – 2011 (Including Major Private Wastewater Utilities)

Map 1-3f. Wastewater Service Areas in Sussex County (Northeast) Delaware – 2011 (Including Major Private Wastewater Utilities)

Map 1-3g. Wastewater Service Areas in Sussex County (Southeast) Delaware – 2011 (Including Major Private Wastewater Utilities)

Map 2-1a. Level of treatment over Watersheds New Castle County, Delaware (Including Major Private Wastewater Utilities)

Map 2-1b. Level of Treatment over Watersheds Kent County, Delaware (Including Major Private Wastewater Utilities)

Map 2-1c. Level of Treatment over Watersheds Sussex County, Delaware (Including Major Private Wastewater Utilities)


Map 2-3. Average Daily Wastewater Flows by Service Area Delaware 2011 (Including Major Private Wastewater Utilities)
Map 2-4. Service Areas with Inflow & Infiltration Concern Delaware – 2011 (Including Major Private Wastewater Utilities)

Map 2-5a. Current Nutrient Limits/Problems over Watersheds in New Castle County, Delaware (Including Major Private Wastewater Utilities)

Map 2-5b. Current Nutrient Limits/Problems over Watersheds in Kent County, Delaware (Including Major Private Wastewater Utilities)

Map 2-5c. Current Nutrient Limits/Problems over Watersheds in Sussex County, Delaware (Including Major Private Wastewater Utilities)

Map 2-6a. Anticipated Nutrient Limits/Problems over Watersheds in Sussex County, Delaware (Including Major Private Wastewater Utilities)

Map 2-7a. Effluent Problems Delaware – 2011 (Including Major Private Wastewater Utilities)

Map 3-1a. Planning and Growth Areas in Sussex County Delaware – 2011 (Including Major Private Wastewater Utilities)

Map 3-1b. CPCN Areas Delaware – 2011 (Including Major Private Wastewater Utility Providers)

Map 3-1c. Map of Georgetown Area Sussex County vs. CPCN’s Sewer Coverage Area

Map 4-1. Sufficient Revenue to WW over MHI; Reserve Dedicated to WW over MHI (Census 2000 w/ CPI floated to 2010) Delaware - 2011

Map 5-1. UD Parcel Study for Slow Rate Application of Wastewater (DRAFT Data Supplied by UD) Delaware – 2011 (Including Major Private Wastewater Utility Providers)

Map 6-1. Visited Mobile Home Parks Delaware – 2011
Municipal Wastewater Treatment Plants - Permit Type
(including Artesian and Tidewater)

- Surface Water Permit
- Groundwater Permit
- Dual Permit (SW and GW)
- Other GW Permit Types (RIBS, etc)
- Other Large System GW Permits (Draft)

Note: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.

Map 1-1
Municipal Wastewater Treatment Plants in Delaware - 2011
(Including Major Private Wastewater Utility Providers)

Inset: 1" = 5 Miles

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Note: Most of NCC Southern Planning Area is still on septic or community systems.
Managed By:
- New Castle County (Special Services)
- City of Newark
- City of Wilmington
- Town of Middletown
- NCC's Southern Planning Areas
- Treatment Plant
- Spray Field
- Main Sewr Lines
- Major Pump Stations
- Large System - GW Permit (Draft)
- Septic Locations (Draft)

Middletown Mains (Assumed)
- Collection (Assm'd)
- Distrib to Spray (Assm'd)
- MobileHomeComm

Note 1: Most of NCC's Southern Planning Area is still on septic or community systems (septic points not shown).

Note 2: Most NPDES Outfalls within vicinity of WWTP.

Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.
Note 1: All waste flows south to Kent County Regional (see next map, Kent - South).

Note 2: Clayton has limited paper sewer maps available. Dover's sewer maps were not requested.

Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.
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Note 1: All waste flows to Kent County Regional (see previous map, Kent - North) except Breeder’s Crown (RIBS). Harrington is in the process of connecting to KC Regional.

Note 2: Harrington has limited to no paper sewer maps available of old system including Farmington connection. Forcemain shown is latest design for interconnection to Kent Regional.

Note 3: West Kent County is decentralized (individual, shared, or community system). Not shown on this map.

Note 4: Note 2: KC Regional NPDES Outfall is within the vicinity of WWTP.

Note 5: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.
Note 1: Most NPDES Outfalls are within vacinity of WWTP, with the exception of Bridgeville.

Note 2: Most septic locations in Sussex County's service areas have been converted to central sewer, or are in the process of conversion. Sussex County pump stations are not shown.

Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.
Note 1: Most NPDES Outfalls are within vicinity of WWTP.
Note 2: Sussex County pump stations not shown.
Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.
Note 1: Most NPDES Outfalls are within vicinity of WWTP.

Note 2: Rehoboth and Milton have limited to no sewer maps available.

Note 3: Most septic locations in Sussex County’s service areas have been converted to central sewer or are in the process of conversion. Sussex County pump stations not shown.

Note 4: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.

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Map 1-3g
Wastewater Service Areas in Sussex County (Southeast), Delaware - 2011
(Including Major Private Wastewater Utilities)

Managed By:
- Sussex County
- Millsboro
- Selbyville
- Artesian
  - Treatment Plant
  - Spray Field
  - Large System - GW (Draft)
  - Septic Locations (Draft)
- Main Sewer Lines
- Main Pump Stations
- Mobile Home Cmmnty (Draft)
- DE Muni Bounds (Underlay)

Note 1: Most NPDES Outfalls are within vicinity of WWTP, except for Selbyville/South Coastal's shared ocean outfall (5+/- miles off-shore).

Note 2: Most septic locations in Sussex County's service areas have been converted to central sewer, or are in the process of conversion. Sussex County pump stations not shown.

Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.

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TETRA TECH
250 Corporate Drive, Suite 300
South Brunswick, New Jersey 08852
Phone: 302.736.7351 Fax: 302.454.5980

Note: Most NPDES Outfalls are within vicinity of WWTP, except for Selbyville/South Coastal's shared ocean outfall (5+/- miles off-shore).

Note: Most septic locations in Sussex County's service areas have been converted to central sewer, or are in the process of conversion. Sussex County pump stations not shown.

Note: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.

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Map 2-1a
Level of Treatment over Watersheds
New Castle County, DE
(Including Major Private Wastewater Utilities)

Note:

WW Areas w/ Tertiary Treatment
- Secondary
- Second and Tertiary

Delaware Major Basins
- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

Add'l Treatment (see note)
- N Removal
- N Removal and Other
- N, P Removal
- N, P, Removal and Other
- Other Treatment
- Collection Only

NCC WWTPs
- NPDES (SW Permit)
- Spray TP (GW Permit)
- Dual Permit (GW, SW)
- Inactive
- NPDES Outfall
- Spray Field

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Level of Treatment

WW Areas w/ Tertiary Treatment
- Secondary
- Second and Tertiary

Delaware Major Basins
- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

Add'l Treatment (see note)
- N Removal
- N Removal and Other
- N, P Removal
- N, P, Removal and Other
- Other Treatment
- Collection Only

Kent WWTPs
- NPDES (SW Permit)
- RIBS
- Stream Outfall

Note:
Level of Treatment

**WW Areas w/ Tertiary Treatment**
- Secondary
- Second and Tertiary

**Delaware Major Basins**
- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

**Add'l Treatment (see note)**
- N Removal
- N Removal and Other
- N, P Removal
- N, P Removal and Other
- Other Treatment
- Collection Only

**Sussex_WWTP**
- NPDES (GW Permit)
- Spray TP (GW Permit)
- Dual Permit (GW, SW)
- Drip Irrig (GW Permit)
- RIBS (GW Permit)
- Subsurf Trench (GW Permit)
- NPDES Outfall
- Spray Field

**Note:**

http://www.fao.org/docrep/t0551e/t0551e05.htm
For collection systems, most pump stations have on-site power generation, hookups for portable generators, or both. This survey did not detail which pump stations had on-site generators. All systems owners either own or have access to a portable generator.
Average Daily Flows *
(MGD)

DE WW Areas

<table>
<thead>
<tr>
<th>Category</th>
<th>Color</th>
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<tbody>
<tr>
<td>&lt; 0.01</td>
<td>White</td>
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<tr>
<td>0.01 - 0.10</td>
<td>Light Pink</td>
</tr>
<tr>
<td>0.10 - 0.50</td>
<td>Purple</td>
</tr>
<tr>
<td>0.50 - 1.0</td>
<td>Blue</td>
</tr>
<tr>
<td>1.0 - 5.0</td>
<td>Light Blue</td>
</tr>
<tr>
<td>5.0 - 10</td>
<td>Medium Green</td>
</tr>
<tr>
<td>10 - 25</td>
<td>Light Green</td>
</tr>
<tr>
<td>25 - 50</td>
<td>Yellow</td>
</tr>
<tr>
<td>50 - 65</td>
<td>Orange</td>
</tr>
<tr>
<td>&gt; 65</td>
<td>Red</td>
</tr>
</tbody>
</table>

Flow Not Reported

* Reported flows are cumulative and include flows from contract/satellite users.
Examples:
Newark >> NCC North of Canal >> Wilmington
or
Clayton >> Smyrna >> Kent County Regional

Map 2-3
Average Daily Wastewater Flows by Service Area
Delaware - 2011
(Including Major Private Wastewater Utility Providers)
Note 1: Wilmington did not list I & I as a problem in consideration of the Long-Term Combined Sewer Control Strategy.

Note 2: Laurel is the only municipality besides Wilmington that reported combined sewer. Ongoing replacement is part of Laurel's I & I strategy.

Note 3: Most collection-only systems (contract users) are not required to manage I&I unless requested by the treatment provider, and were not required to report I&I in the survey. Most collection-only systems reported their I&I concerns as good-will towards the state-wide assessment.

Note 4: Some municipalities reported having I & I but feel it is either manageable or not a concern. This is further discussed in the I&I comments or the report.
Current Nutrient Limits / Problems

NH3-TN-TP - Current Limits / Problems

Current Nutrient Limits
- TN (NH3 Unsure)
- TP
- TN, TP

Current Nutrient Problems
- TN
- TP
- TP (N not appl.)
- TN, TP
- NH3, TN, TP

Other WW Areas
- Collection Only
- No Current Nutrient Limit

Delaware Major Basins
- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

NCC WWTPs
- NPDES (SW Permit)
- Spray TP (GW Permit)
- Dual Permit (GW,SW)
- NPDES Outfall
- Spray Field
- Inactive

Note:
Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.

Map 2-5a
Current Nutrient Limits/Problems over Watersheds in New Castle County, DE
(Including Major Private Wastewater Utilities)
NH3-TN-TP - Current Limits / Problems

Current Nutrient Limits:
- TN (NH3 Unsure)
- TN
- TP
- TN, TP
- NH3, TN, TP

Current Nutrient Problems:
- TN
- TP
- TP (N not applic.)
- TN, TP
- NH3, TN, TP

Other WW Areas:
- Collection Only
- No Current Nutrient Limit

Delaware Major Basins:
- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

Kent WWTP:
- NPDES
- RIBS
- Stream Outfall

Note:
Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.
Note:
Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.
Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.

### Anticipated Nutrient Limits / Problems

<table>
<thead>
<tr>
<th>Tennessee-Phosphate - Anticipated Limits / Problems</th>
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<tbody>
<tr>
<td><strong>Anticipated Nutrient Limits</strong></td>
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<tr>
<td>- TN Only</td>
</tr>
<tr>
<td>- TP Only</td>
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<tr>
<td>- TN,TP</td>
</tr>
<tr>
<td><strong>Anticipated Nutrient Problems</strong></td>
</tr>
<tr>
<td>- Unknown TN</td>
</tr>
</tbody>
</table>

### Delaware Major Basins

- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

### Other WW Areas

- Collection Only
- No Current Nutrient Limit

### Sussex WWTPs

- NPDES (SW Permit)
- Spray TP (GW Permit)
- Dual Permit (GW, SW)
- Drip Irrig (GW Permit)
- RIBS (GW Permit)
- Subsurf Trench (GW Permit)
- NPDES Outfall
- Spray Field

### Notes:

No treatment systems located in either New Castle County or Kent County anticipate future Nutrient Limits/Problems.

Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.
Effluent Problem Reported

Note:
Statement of Effluent Problems may not indicate a DNREC violation notice or non-compliance. See report for nature of effluent problems. Most of the reported effluent violations were temporary and instantaneous.
Legend
- Municipal District
- Artesian District
- Artesian - ANSWRF Planning Area
- Tidewater (TESI) District
- TESI - Wandendale Planning Area
- TESI - Trussum Planning Area
- Sussex County District
- Sussex Anticipated Growth Areas
- Sussex Western Planning Area
- Sussex North Planning Area
- Other
- WWTP

Notes:
- Municipal Limits may not match Sewer Area Limits or CPCN Areas.
- Data is as of December 2010 through March 2011, and may not reflect current status.
- Data was provided by Sussex County, Artesian, and Tidewater.
- "Missing" areas, such as Cape Henlopen area were not provided in the data set.
Notes:
CPCN Areas were downloaded from Delaware's Public Service Commission website between December 2010 and March 2011.
Data may not reflect current status of data or CPCN Areas.
This area is shown as an example of the discrepancy between municipal boundaries and CPCN areas on record at the PSC. It is not specific to this area and is typical throughout the state.
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Map 4-1
Sufficient Revenue to WW over MHI; Reserve Dedicated to WW over MHI (Census 2000 w/ CPI floated to 2010)
Delaware - 2011
This map is not part of the Statewide Wastewater Assessment. It is shown to demonstrate that the State is coordinating with the University of Delaware to help identify parcels that could be used for agricultural reuse.

The study is not completed, and the data provided is a progress set. This particular set of parcels is defined as:
- Parcels over 50 acres
- Having appropriate NRCS related soils
- Appropriate type of Land Use
- Not within certain environmental buffers

Map 5-1
UD Parcel Study for Slow Rate Application of Wastewater (DRAFT Data Supplied by UD) Delaware - 2011 (Including Major Private Wastewater Utility Providers)