

**Rehoboth Beach Wastewater Discharge to the Environment  
(Originally Distributed ) Homeowner's Meeting  
20 October 2007**

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**Facts about Rehoboth Beach Wastewater Discharge**

Total Annual Discharge =	$5 \times 10^7$ L/yr	
Phosphorus Load =	2250 kg/yr	(prior to 2002)
	750 kg/yr	(2002 to present)
Nitrogen Load =	15000 kg/yr	(prior to 2002)
	8000 kg/yr	(2002 to present)

Major Issue: Wastewater Discharge to Lewes-Rehoboth Canal and northern Rehoboth Bay, both poorly flushed systems isolated from the coastal ocean.

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**Comparison with Delaware Bay**

Total Annual Discharge =	$\sim 1.3 \times 10^{16}$ L/yr (tidal)	$250 \times 10^6$ RBWTP
	$\sim 1.3 \times 10^{15}$ L/yr (freshwater)	$25 \times 10^6$ RBWTP
Minimum Phosphorus Load = (Based on freshwater discharge and $0.3 \mu\text{M P}$ ) RBWTP	$\sim 1.2 \times 10^7$ kg/yr	5,000 x old RBWTP 15,000 x new
Minimum Nitrogen Load = (Based on freshwater discharge and $10 \mu\text{M N}$ ) RBWTP	$\sim 1.8 \times 10^8$ kg/yr	10,000 x old RBWTP 22,000 x new

Major Advantages: Well flushed by freshwater discharge, well mixed by tidal exchange, large dilution volume

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**Data Sources**

- RBWTP data from R. Stenger, City of Rehoboth Beach
  - Delaware Bay discharge data from PhD dissertation of M.M Whitney (2003), College of Marine Studies, University of Delaware and Prof. K.C. Wong (personal communication).
  - Delaware Bay nutrient data from "The Delaware Estuary: Rediscovering a forgotten resource," Delaware Sea Grant College Program, University of Delaware
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Data compiled by William Ullman, College of Marine and Earth Studies,  
University of Delaware, Lewes. 19 October 2007

**Water Budgets for the Rehoboth Bay Watershed and Sussex County  
Potential Impact of Offshore or Onshore Wastewater Disposal  
Rehoboth Beach City Commission — 21 July 2008**

<b>Water Budget Facts for the Rehoboth Bay Watershed (148 km<sup>2</sup> of land area)</b>				
Rehoboth Beach Wastewater Discharge	0.01 in	5 X 10 <sup>7</sup> L/yr	0.1% of recharge	City of Rehoboth Beach
Annual Rainfall	43.77 in	1.6 X 10 <sup>11</sup> L/yr	3200 X RBWTP	Research and Education Center, Georgetown
Annual Recharge	12 in	4.5 X 10 <sup>10</sup> L/yr	900 X RBWTP	Delaware Geological Survey; Johnston, 1976
Water in Storage in 30m Aquifer*		8.9 X 10 <sup>11</sup> L	17800 yrs of water use	Delaware Geological Survey
<b>Water Budget Facts for Sussex County (2400 km<sup>2</sup> of land area)</b>				
Groundwater Use (2000)	0.003 in	2.1 X 10 <sup>8</sup> L/yr	0.03% of recharge	US Geological Survey Fact Sheet 111-03
Annual Rainfall	43.77 in	2.7 X 10 <sup>12</sup> L/yr	12860 X use	Research and Education Center, Georgetown
Annual Recharge	12 in	7.4 X 10 <sup>11</sup> L/yr	3525 X use	Delaware Geological Survey; Johnston, 1976
Water in Storage in 30m Aquifer*		1.5 X 10 <sup>13</sup> L	69400 yrs of water use	Delaware Geological Survey

\* Volume = Area X Depth X Water Content (assumed to be 20%; range of 10-20% reported).

### Data Sources

- Hutson, S.S., N.L. Barber, J.F. Kenny, K.S. Linsey, D.S. Lumia, and M.A. Maupin, 2004. Estimated Use of Water in the United States in 2000 U.S. Geological Survey Circular 1268 <http://pubs.usgs.gov/circ/2004/circh1268/pdf/circular1268.pdf>
- Johnston, R.H., 1976. Relation of ground water to surface water in four small basins of the Delaware Coastal Plain. Report of Investigation No. 24. Delaware Geological Survey. <http://www.dgs.udel.edu/publications/pubs/ReportOfInvestigations/ri24e.pdf>
- Research and Education Center, 2008. Historical Weather. College of Agriculture and Natural Resources, University of Delaware, Georgetown. <http://www.rec.udel.edu/TopLevel/weatherHistory.htm>
- Wheeler, J.C., 2003. Freshwater use in Delaware, 2000. U.S. Geological Survey Fact Sheet 111-03. <http://pubs.usgs.gov/fs/fs11103/>