

City of Rehoboth Beach

***Wastewater Treatment
Facilities***

A Historical Narrative

June 16, 2008

***Presented by Bob Stenger, Superintendent
Rehoboth Beach Wastewater Treatment Plant***



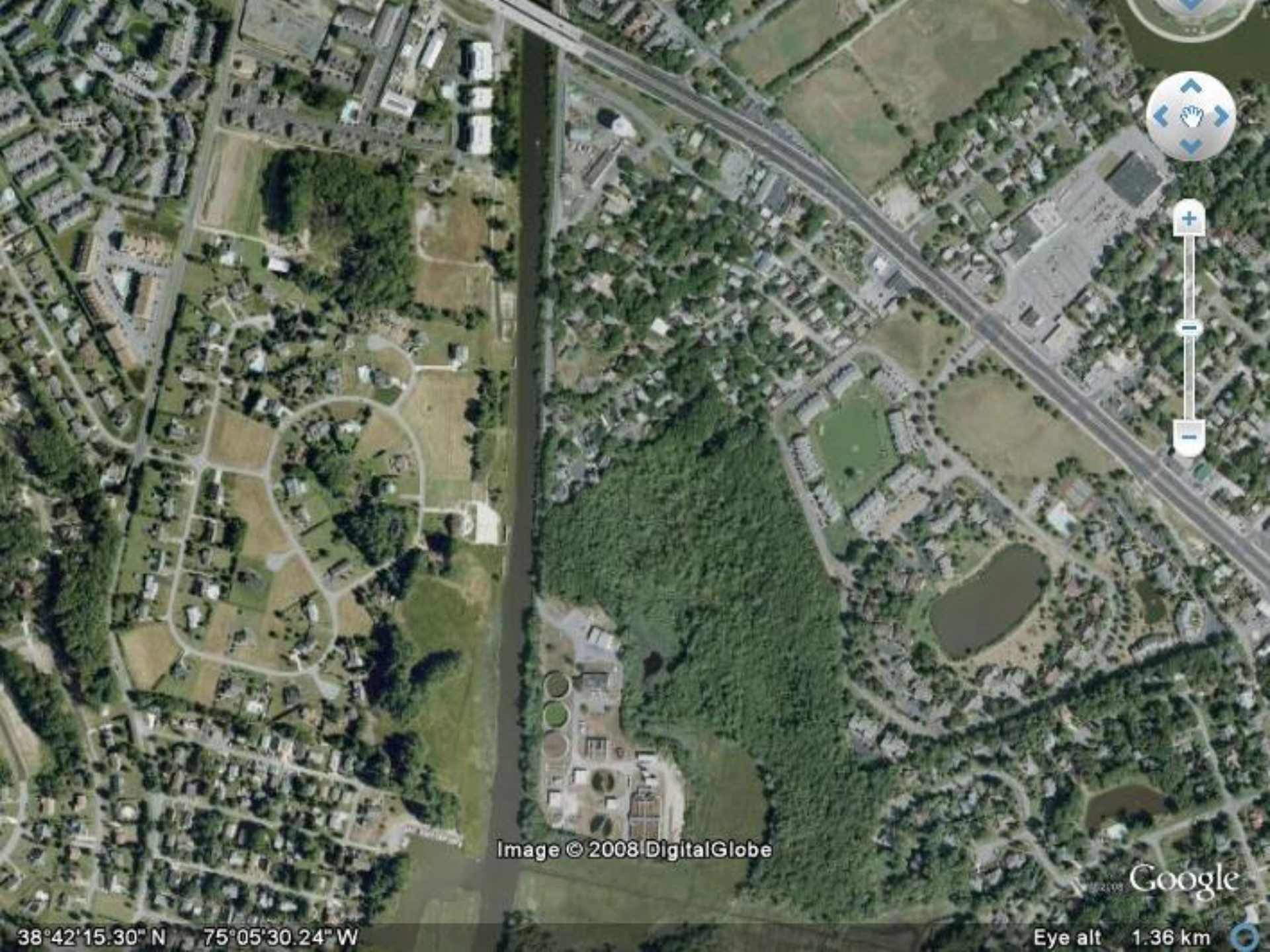


Image © 2008 DigitalGlobe

Google

38°42'15.30" N 75°05'30.24" W

Eye alt 1.36 km



Image © 2008 DigitalGlobe

Google

2008

38°42'03.08" N 75°05'31.12" W

Eye alt 340 m





Service area

- **The City of Rehoboth Beach**
- **North Shores** – about 4 % of Flow
 - *Rehoboth Agreement*
- **Henlopen Acres** – About 5 % of flow
 - *County agreement*
- **Dewey Beach** - About 31 % of flow
 - *County agreement*

Employees

- 11.5 full time
- 3 part time (mid May to Mid September)

Duties

- **Operations and maintenance of treatment plant and 7 wastewater pumping stations**
- **Maintenance of about 20 miles of wastewater collection lines**
- **Land application of biosolids**
- **Electrical & maintenance support for other City Departments**

Plant Description

- High rate secondary treatment system with advanced treatment for nitrogen and phosphorous
- Wastewater design flow – 3.4 MGD
- Average annual flow – 1.3 MGD
- Seasonal flow range: 0.6 MGD to 3.2 MGD

Biosolids Program

- Lease 85 acres of farmland about 5 miles south of Milford
- Subsurface injection of Biosolids
- Transport & apply about 2.4 million gallons of biosolids per year
- 170 Dry Tons per Year





CAUTION
THIS TRUCK
MAKES
WIDE TURNS

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Ancient History

- **1935 - Original plant and sewer lines built**
- **1959 - Major upgrade, still primary treatment**
- **1975 Area Wide Waste Treatment Management Planning Grant Application**

November 1980

- City of Rehoboth Beach entered agreement to upgrade treatment Facilities
 - *Secondary Treatment Facility*

Modern History

- June 1986 – City hired new operator
 - *Thank You!*
- 1987- Current facility startup
 - *Replaced original primary treatment plant*

August 1990

- DNREC held a public Hearing for Permit Amendment
 - *Set performance based nitrogen limits*
 - *Cap the total amount of nitrogen discharged annually*

June, 1991

- **Completion of Feasibility Assessment for Biological Nutrient Removal**
 - *Virginia Polytechnic Institute*
 - funded by DNREC
- **Recommendations - Nitrogen Removal**
 - Automated system to control Dissolved Oxygen Level

1993

- Consent order issued requiring nutrient reductions below 1989 levels by 1998
- 1989 Baseline
 - *N = 46,324 lbs/yr, P = 23,589 lbs/yr*
- September 1994 through December 1996
 - *N = 39,375 lbs/yr, P = 16,512 lbs/yr*
- January 1, 1997 through Permit Expiration
 - *N = 32,427 lbs/yr, P = 7,077 lbs/yr*

1994

- **Completed upgrade for biological nutrient removal**
- **Cost - \$250,000**
 - **Variable Frequency Drives to control output of blowers**
 - **Programmable logic controller to manage operation**

August 1996

- American Littoral Society and Sierra Club
 - *filed a complaint in United States District Court against EPA for failure to establish TMDL's for water quality limited segments.*

1997

- **Completed upgrade for chemical phosphorous removal, disinfection improvements and biosolids storage**
- **Cost - 2,600,000**
 - **Chemical facilities for phosphorous removal**
 - **Chlorination / de-chlorination facility**
 - **Aerated biosolids storage tank**

July 1997

- Ruling on 1996 suit by the American Littoral Society and Sierra Club
 - *EPA required by a consent order*
 - *Establish TMDL for Inland Bay if DNREC failed to do so by December 1998*

August 1998

- **DNREC's TMDL requires “Systematic Elimination” of Point Sources**
- **City of Rehoboth Beach objected to complete elimination**

September 2, 1998

- Public Hearing for Total Maximum Daily Loading
 - *(TMDL) proposal*

September 25, 1998

- **Comments filed by City of Rehoboth Beach to DNREC on the proposed Total Maximum Daily Loading TMDL plan**
 - **Suggested Zero Standard for Rehoboth WWTP is impractical and not feasible**
 - **TMDL development process was rushed**
 - **Questionable science to support zero discharge requirement**

December, 1998

- **December 1, 1998**
 - *Final TMDL published in the Delaware Register.*
- **City filed appeal of the TMDL order**
 - *State Environmental Appeals Board*
 - *DNREC objected*
- **December 30, 1998**
 - *City filed a complaint for relief with the Superior Court in case the Environmental Appeals Board lacked jurisdiction over the City's appeal.*

February 2000

- Superior Court
 - *Ruled the Environmental Appeals Board had Jurisdiction over the City's Appeal.*
- This decision appealed by the DNREC

May 2000

- **Supreme Court dismissed the State's appeal**

June 2000 through June 2002

- **Negotiations between the City and DNREC began**
 - **Voluntarily resolve the City's TMDL concerns**
 - **Avoid litigation**
 - **Included discussions with the City's of Rehoboth Beach, Lewes, Sussex County and DNREC on regional solutions**

June 17, 2002

- **Commissioners Meeting to vote on Consent Order**

August 2002

- Received Wastewater Facility Planning Grant to identify most practical alternative for disposal of treated effluent
- Sussex County, City of Lewes and City of Rehoboth Beach
 - Evaluate current and future Wastewater needs for the region

Planning Grant Options

- Rapid Infiltration Beds
- Land Application
- Deep Well Injection
- Ocean Outfall

December, 2002

- Consent Order executed between the City and DNREC to resolve TMDL issue.
- Timeline for Consent Order to be effective from the date of issuance of new NPDES permit
 - *Permit issued October, 2005*

December 2002, Continued

- **Sterns and Wheler Presentation**
 - **Outline for a Regional Wastewater Effluent Disposal Study**
 - **Identify viable alternatives for Rehoboth Beach, Rehoboth Beach and Sussex County, and a potential regional solution**
 - **Evaluate options**
 - **Estimate capital and user fee costs**

October 2004

- **Effluent Disposal Study draft report submitted**

October 2005

- **Permit signed**
- **Consent order Timeline begins**

Consent Order Timeline

- **October 2005 – Date of Permit**
 - Permit N - 32,427 lbs/yr, P - 7,077 lbs/yr
- **October 2007 – meet interim Limit**
 - Permit N - 24,300 lbs/yr, P - 5,308 lbs/yr

Consent Order Timeline Continued

- **March 2008 - Complete the study for “elimination in fact”**
 - **Anticipated finalization of the Effluent Disposal Study**
 - **Prepared by Sterns and Wheler**

Consent Order Timeline continued

- **March 2009 – Identify funding sources**
- **September 2009 – Submit action plan**
- **June 2010 – Start design**
- **June 2011 – complete design**
- **January 2012 – Bid project**
- **June 2012 – Start construction**
- **December 2014 – Project complete**

November 6, 2007

- **Public Meeting Rehoboth Beach Convention Center**
 - **Opportunity for public to comment on Sterns and Wheler Study**
 - Artesian Water Company
 - Tidewater Utilities
 - Sussex County

Nutrient Removal Summary

- 1985: Nitrogen = 88, 400 lbs/yr
Phosphorous – not monitored
- 1989: Nitrogen = 46,324 lbs/yr
Phosphorous = 23,590 lbs/yr
- 1998: Nitrogen = 26,500 lbs/yr
Phosphorous = 4,265 lbs/yr
- 2007: Nitrogen = 15,087 lbs/yr
Phosphorous = 1,210 lbs/yr

Special note to City Manager

- January 2015 – Send Bob on 2 week all expenses paid vacation to Bali.



Now What?

0

Permit Limits

- 1989 Baseline
 - $N = 46,324 \text{ lbs/yr}$, $P = 23,589 \text{ lbs/yr}$
- September 1994 through December 1996
 - $N = 39,375 \text{ lbs/yr}$, $P = 16,512 \text{ lbs/yr}$
- January 1, 1997 through Permit Expiration
 - $N = 32,427 \text{ lbs/yr}$, $P = 7,077 \text{ lbs/yr}$

Permit Limits, continued

- September 21, 2005 Permit Reissued
 - $N = 32,427 \text{ lbs/yr}$, $P = 7,077 \text{ lbs/yr}$
- October 1, 2007
 - $N = 24,300 \text{ lbs/yr}$, $P = 5,308 \text{ lbs/yr}$