



City of Rehoboth Beach Stormwater Implementation Plan

Phase III Results

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Stormwater Sampling Phase I & II Recap

- Phase I – Theoretical modeling – Beach Action Value (BAV) - multiple days
- Phase II – Actual samples modeling – 6 storms
 - 3 locations BAV potential -18 hours
 - Found high bacteria levels at Rehoboth, Wilmington, and Baltimore/Maryland Avenues



Phase II Recommendations

1. Maintenance & Clean up
2. Public Education & Outreach – Business Leaders
3. Evaluate Grease Trap and Fats, Oils & Grease (FOG) Program
4. Business assessment with site visits
5. Determine major bacteria sources (Human vs Non-human)
6. Range of long term “structural changes”

1. **Maintenance** & Clean-up

- ✓ Rehoboth Avenue vault cleaning and pump replacement
- ✓ Wilmington Avenue filter sand replacement
- ✓ Stormwater pipe cleaning
- ✓ CCTV

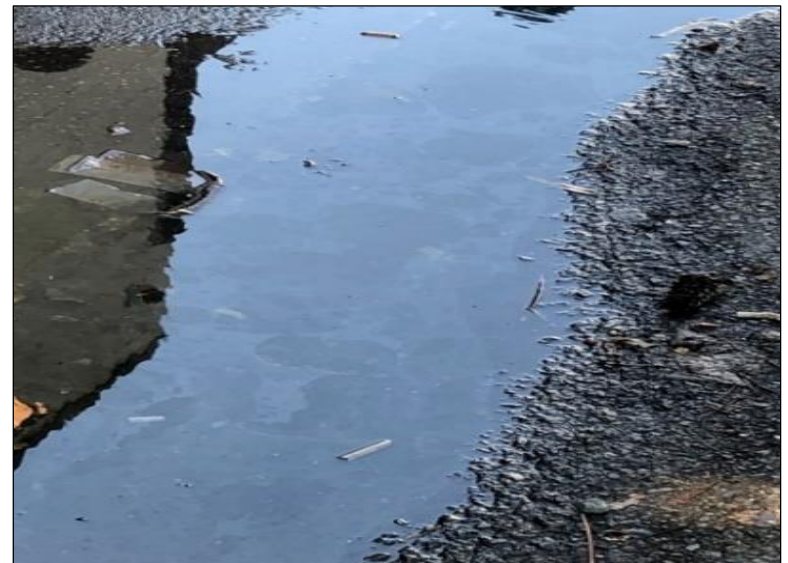


2. **Public** Education and Outreach

- ✓ Department of Public Works (DPW) discussed concerns over previous findings with the public
- ✓ DPW pre-notified business owners of Phase III
 - Via emails, flyers, and multiple web-site postings
- ✓ Held business Owner's "Town Hall" – low attendance
- ✓ Provided grease trap literature from Del Health Dept. to the businesses

3. **Evaluate** Grease Trap Ordinance/FOG Program

- ✓ Reviewed current Grease Trap Program/Ordinance
- ✓ Performed site visits to 66 businesses
- ✓ Updated Commercial Business Inventory
- ✓ Existing program is not enough
- ✓ Enforcement is difficult



4. **Business** Assessments and Site Visits



Site Visit Results

Trash and bird problems



Poor housekeeping



5. Determine Major Bacterial “hot spots”



Bacteria Results Comparison

Table 4.1 **Average Bacteria Values (cfu/L)**

Location	Baltimore Avenue	Rehoboth Avenue	Wilmington Avenue
Phase III Location #3	9,280	1,354	31
Phase III Location #2	7,295	9,059	>24,195**
Phase III Location #1	5,755	6,981	13,065
<i>Phase II Location #1</i>	<i>62,109</i>	<i>35,791</i>	<i>18,100</i>
<i>Typical Stormwater***</i>	<i>8,000</i>	<i>8,000</i>	<i>8,000</i>

- Levels of bacteria reduced after pipe cleaning
- Cleaning may only be needed at the end of each season
- Delaware Filter continues to have high bacteria levels

* Wilmington Avenue at Delaware Filter

***EPA Urban Storm Water Summary

HEI Results (HEI = Human Enteric Indicator (Bacteria))

Table 4.2 HEI Results (Detected or Not Detected)

Location	Detected	Not Detected	Date
Baltimore Ave #3		X	8/13/2019
Rehoboth Ave #1	X		8/13/2019
Rehoboth Ave #1	X		9/6/2019
Rehoboth Ave #3	X		9/6/2019
Wilmington Ave #1		X	9/6/2019
Wilmington Ave #3		X	9/6/2019

- Additional investigation needs to occur
- Need to determine the cause of high FENT and HEI in Rehoboth line

Bacteria Results Comparison

Table 4.1 Average Bacteria Values (cfu/L)

Location	Baltimore Avenue	Rehoboth Avenue	Wilmington Avenue
Phase III Location #4*	-	>24,195*	-
Phase III Location #3	9,280	1,354	31
Phase III Location #2	7,295	9,059	>24,195**
Phase III Location #1	5,755	6,981	13,065
Phase II Location #1	62,109	35,791	18,100
Typical Stormwater***	8,000	8,000	8,000

- Levels of bacteria reduced after pipe cleaning
- Cleaning may only be needed at the end of each season
- Delaware Filter continues to have high bacteria levels

* Rehoboth Avenue above #3

** Wilmington Avenue at Delaware Filter

***EPA Urban Storm Water Summary

Phase I, II & III Comparisons

- Phase I
 - Showed BAV at multiple days
 - Provided large scale costly structural options
- Phase II
 - Showed BAV achieved after 18 hours at all outfalls
 - Developed short and long term recommendations & options
 - Eliminated 3 potential high bacterial locations
 - Identified 3 potential bacteria “hot spots”
- Phase III
 - Identified only 2 of 3 potential bacteria “hot spots”
 - Demonstrated effectiveness of short term recommendations
 - Demonstrated Food Service Establishments (FSE) contribution to high bacterial counts

Phase III FOG Recommendations

Grease traps and Food Service Establishments (FSE)

- **Develop strong FOG/Grease Trap Ordinance**
 - Develop encompassing ordinance
 - Continue to provide FSE education materials
 - Require additional grease trap emptying confirmation
 - Standardize inspections
 - Perform routine unannounced inspections
- **Perform rigorous Ordinance enforcement**
- **Include trash storage and disposal**
- **Other municipalities available for reference**

GREASE TRAP/INTERCEPTOR MAINTENANCE LOG
RECORD VERIFICATION FORM

Facility Name: _____

Address: _____

Please select one


☐ The grease trap is self-cleaned.

☐ The grease trap/interceptor is serviced by:

Company Name _____

Company Phone _____

DATE _____ CLEANED BY _____ WITNESSED BY _____ DISPOSAL SITE _____ REMARKS _____



The seal of the City of Rehoboth Beach, Delaware, is circular with a scalloped border. It features a lighthouse on a small island in the middle of the ocean. The words "CITY OF REHOBOTH BEACH" are written in a circle around the top, and "DELAWARE" is written at the bottom.

Phase III Overall Recommendations

Action	Effect
Develop FOG/Grease Trap/Interceptor Ordinance	Keeps FOG from entering both storm sewer and sanitary sewer
FSE inspections and outreach	Enforces the Ordinance
Pipeline cleaning at season end	Removes bacteria collected over season
Wilmington Avenue filter north side rehabilitation	Confirm effectiveness of the filter
Rehoboth Avenue potential cross-connection	Greatly reduce ocean bacterial discharge
Rehoboth Avenue vault minor modifications	Further reduce ocean bacterial discharge
Continued monitoring	Confirm effectiveness of program



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