



CLIENTS | PEOPLE | PERFORMANCE

Orleans Town-Wide Preliminary Stormwater Assessment

Town of Orleans, MA

Sandra L. Tripp, P.E., BCEE | GHD Senior Project Manager

Alex Rouchaleau, EIT | GHD Project Engineer

September 30, 2013



Table of Contents

| | |
|---|--|
| 1 | Fact Sheet |
| 2 | Conceptual Cost Estimate Memorandum |
| 3 | Stormwater Mitigation Team Presentation |
| 4 | Sampling Plan |
| 5 | Outfall Worksheets |
| 6 | Outfall Prioritization Spreadsheets |
| | i. Prioritization based on Public Benefit |
| | ii. Prioritization based on Phosphorous Sensitivity |
| | iii. Prioritization based on Watershed Nitrogen Sensitivity |
| 7 | Outfall Location Map |
| 8 | Digital Copy |



Town of Orleans: Preliminary Town-Wide Stormwater Assessment

Background

The Town's Stormwater Mitigation Task Force has initiated and supported the development of a Preliminary Town-Wide Stormwater Assessment. This fact sheet for public education and outreach has been developed as part of the assessment.

The Task Force is comprised of members of the Town of Orleans departments and has been assisted by GHD Inc. from the Hyannis, Massachusetts office.

Problem Summary

There are many impervious surfaces (roads, roofs, etc.) in Orleans that generate stormwater runoff when it rains or snows. This stormwater is either discharged to the groundwater or is conveyed to freshwater ponds or marine estuaries through surface discharges (outfalls). Over 100 stormwater outfalls have been documented in Orleans. Stormwater from these outfalls carry pollutants such as excess nutrients (nitrogen and phosphorus), biological and/or infectious agents (measured as fecal coliform), sediments, and other pollutants that are washed off impervious surfaces. The nitrogen and phosphorus promotes eutrophication (fertilization that causes an overabundance of algae growth) in the Town's marine and fresh surface waters (respectively). The fecal coliform can shut down shellfishing resource areas; and the sediments can foul the bottoms of the surface waters and cause cloudy/dirty water, impacting nearby animals and vegetation.

In the past, fecal coliform and sediments have been the primary indicator of pollution in stormwater and are the current targets of new federal and state stormwater discharge permits. Recently, nitrogen and phosphorus in the stormwater have been documented as contributing to eutrophication in the surface waters.

Stormwater is a source of nitrogen to the Town's estuaries, as documented by the Massachusetts Estuaries Project (MEP). The MEP main findings were as follows:

- Stormwater nitrogen loading has been estimated at five to nine percent of the total loading to the estuaries.
- Stormwater flows are intermittent and can be very large.
- Some watersheds are more critical towards nitrogen and/or phosphorus loading, and should be prioritized.

The following pie chart diagram (Figure 1) is based on the MEP report of the Nauset Estuary (Town Cove) and illustrates the nitrogen sources for that estuary. Water body surface areas and natural surfaces are considered unmanageable nitrogen sources.

Stormwater Remediation Technologies

In the past, stormwater pretreatment in a catch basin and infiltration to the groundwater system has been a primary best available technology (BAT) for treating stormwater at outfalls and removing pollutants such as sediments, fecal coliform, and some of the nutrients in the stormwater. Soluble phosphorus is

generally adsorbed to soil particles as the water flows through the ground. Soluble nitrogen remains in solution in the groundwater and can travel with the groundwater to emerge in estuaries and contribute to eutrophication. Additional treatment is needed to mitigate the nitrogen in stormwater and typically is achieved biologically by microbial denitrification in a contained soil layer or by plant uptake. The best available technologies used for this type of treatment include:

- Detention Basins/Trenches—Depressions designed to retain a specified water quality volume for 24 to 48 hours, allowing for pollutant removal through plant uptake, sedimentation, and microbial activity. (Nitrogen Removal Rate: up to 25%)
- Bioretention/Rain Gardens—Landscaped runoff areas that effectively filter stormwater by using precise plantings and soil specifically designed for the mitigation site. (Nitrogen Removal Rate: up to 55%)
- Gravel Wetlands—Similar in appearance and function to a natural wetland, they removes pollutants, sedimentation, and excess nutrients through biological activity. (Nitrogen Removal Rate: up to 75%)

The University of New Hampshire Stormwater Center is a national leader in the research and application of these technologies and is the basis of the recommendations in this fact sheet.

Nitrogen Removal Technologies—Main Findings:

The following summarizes the main findings for the treatment of nitrogen in stormwater using current BATs:

- Significant land areas are typically required.
- Costs for the land and treatment facilities can be high.
- Facility maintenance is needed and annual costs range from 5 to 20 percent of total capital cost.

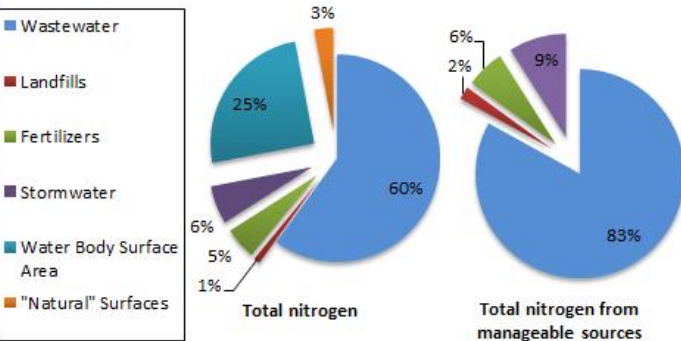


Figure 1: Nitrogen Sources Identified by MEP Nauset Marsh Estuary System

- Facility lifetime is estimated at 20 years.
- These technologies are relatively new for areas with porous soils.

Prioritized Project Summary

A computer generated prioritization of the Town's 100+ stormwater outfalls was developed with input from the Task Force. The prioritization incorporated field data, engineering calculations, as well as environmental and public benefit criteria. The stormwater outfall located at the intersection of Uncle Harvey's Way and Pochet Road was selected as the top priority project for remediation. Approximately 10 million gallons of stormwater runoff are discharged through this area annually, generating an estimated 115 pounds of nitrogen per year. Using bioretention as the treatment method, the estimated cost to remove 50 percent of the total nitrogen discharged is \$8,100 per pound of nitrogen.

For more information, please contact:

[Town of Orleans](http://www.town.orleans.ma.us)

T 508-240-3700

W www.town.orleans.ma.us



Figure 2: Site Photo of Pochet Road near Uncle Harvey's Way





Figure 1

Discharge ID: 44-OUT-2

Date: 7/17/2013

Address: Intersection of Uncle Harvey's Way & Pochet Road

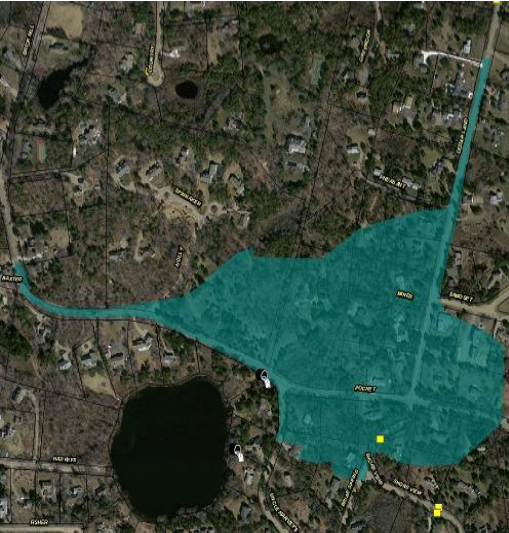
Weather: Sunny, 85°

Drainage Area Description:

Residential area with average 3/4 acre lots and multiple large open space areas.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|--------|-------------------|--|--------------------------|---|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 10 | CM | 28.88 | 71% | 29% | 15,347 | 30,695 | 132 | 10.10 | 52 | Major roadway runoff draining off Pochet Road into wetland which discharges into culvert leading to Uncle Harvey's Pond | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, **High**)

Cleaning Recommendation:

Priority: (**Low**, Medium, High, Very High)

Mitigation Recommendations:

See attached memo



Legend

 Bioretention Area

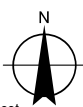
 44-OUT-2 Outfall

Paper Size ANSI A

40 20 0 40 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983

Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet



Town of Orleans, MA
CWMP

Job Number 86-15148
Revision A
Date 25 Sep 2013

Outfall 44-OUT-2 Possible
Stormwater Mitigation Locations

Figure 2



CLIENTS | PEOPLE | PERFORMANCE

Orleans Town-Wide Preliminary Stormwater Assessment

Stormwater Mitigation Team Presentation
March 26, 2013

Nathan Weeks, P.E., BCEE | GHD Senior Project Manager

Alex Rouchaleau, EIT | GHD Project Engineer



Presentation Outline

- Project scope
- MEP nitrogen assumptions and loadings
- Technologies for stormwater nitrogen removal
- Stormwater outfalls and evaluations
 - Information sources
 - Site visits
 - Contributing areas
 - Calculations
- Possible prioritization criteria
- Possible approach for revised Town Drainage Code
- Next steps



Project Scope

1. Kickoff meeting
2. Team input, and order-of-magnitude costs
3. MEP nitrogen loading assumptions
4. Nitrogen loading graphics
5. Technologies for stormwater nitrogen removal
6. Develop Fact Sheet for public education



Project Scope (continued)

7. Identify stormwater outfalls
8. Stormwater sampling plan
9. Outfall watershed (contributing area) delineation
10. Estimated flows and loads
11. Next steps and prioritization
12. Tabular summary to illustrate prioritization
13. Identify highest priority project and estimate capital costs
14. Meetings



MEP Nitrogen Assumptions and Loadings

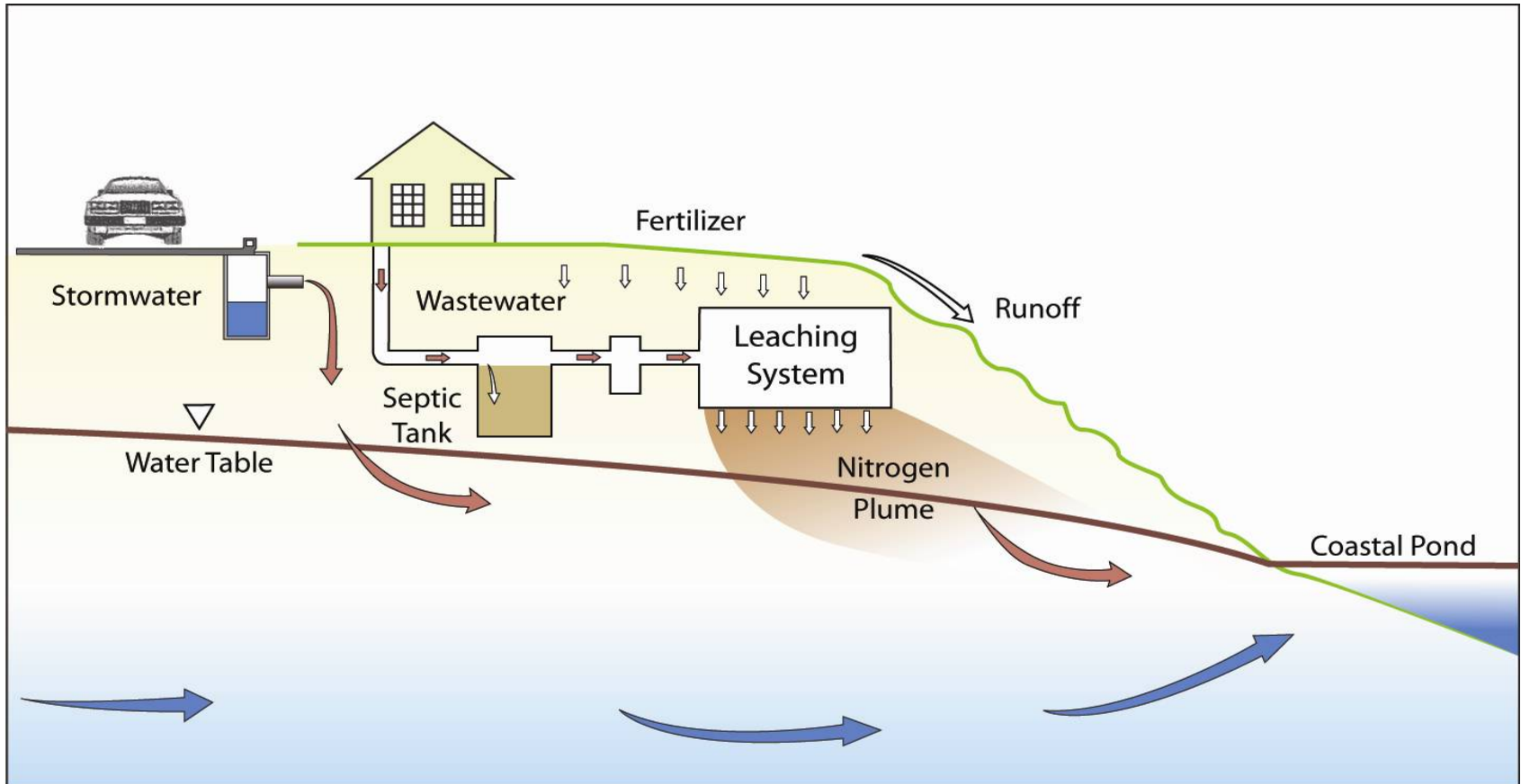
MEP assumptions

- Watersheds based on USGS models
- MassDOT GIS road coverage
- Parking lots digitized from aerial photos
- Driveways estimated at 1,500 s.f. area each with scaling factor applied
- Roof areas estimated based on Assessors data
- Typical nitrogen concentrations for runoff:
 - 1.5 mg/L for road runoff
 - 0.75 mg/L for roof runoff
 - (for comparison: 1.09 mg/L used for direct precipitation on embayments and ponds)



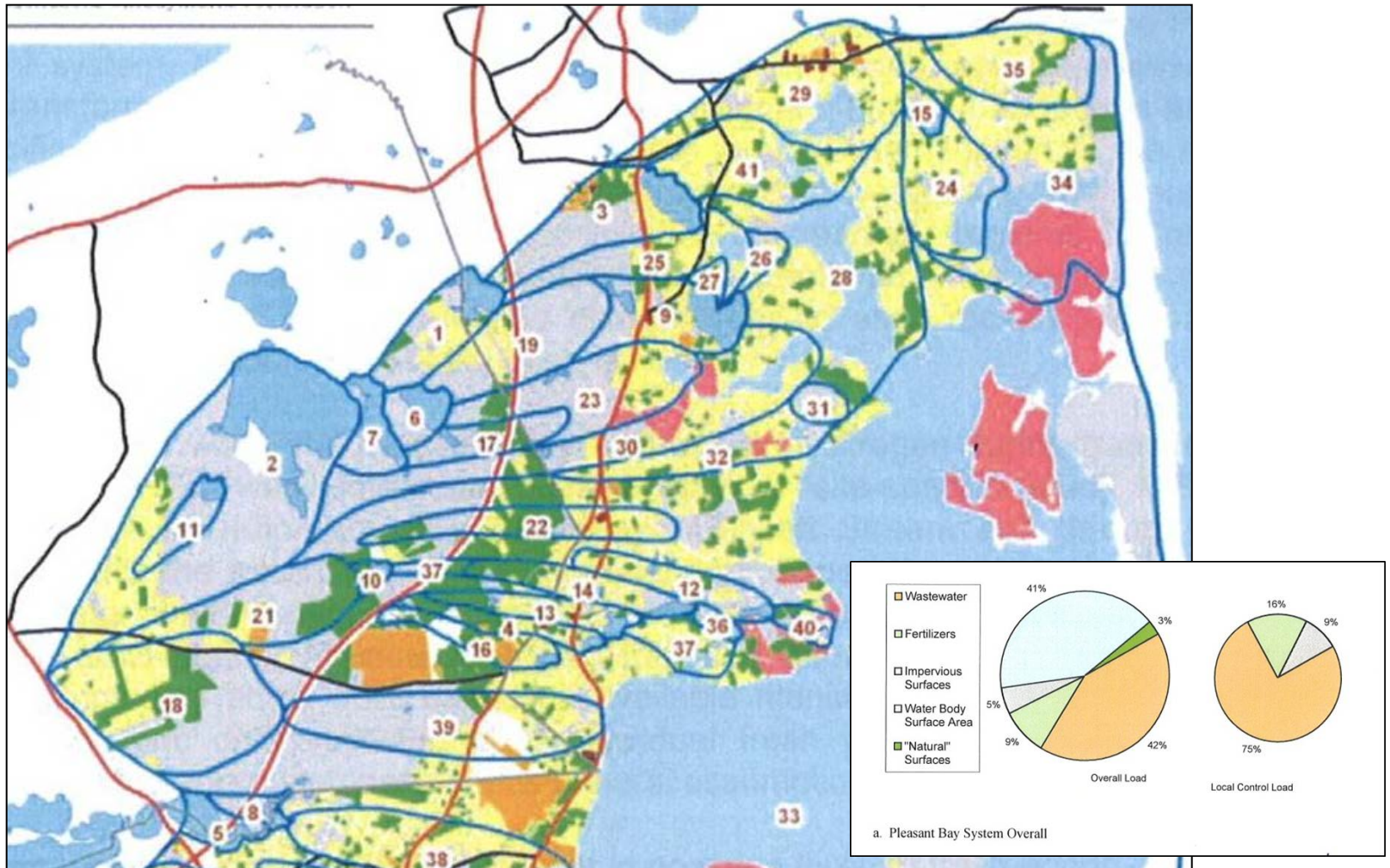
MEP Nitrogen Assumptions and Loadings (continued)

Several sources of Nitrogen



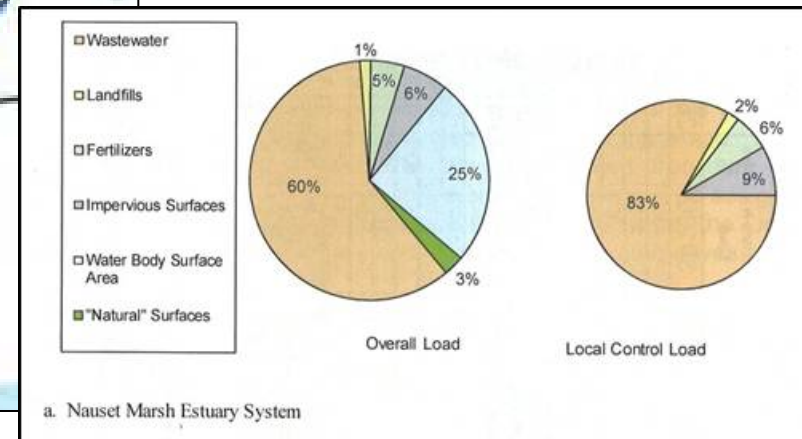
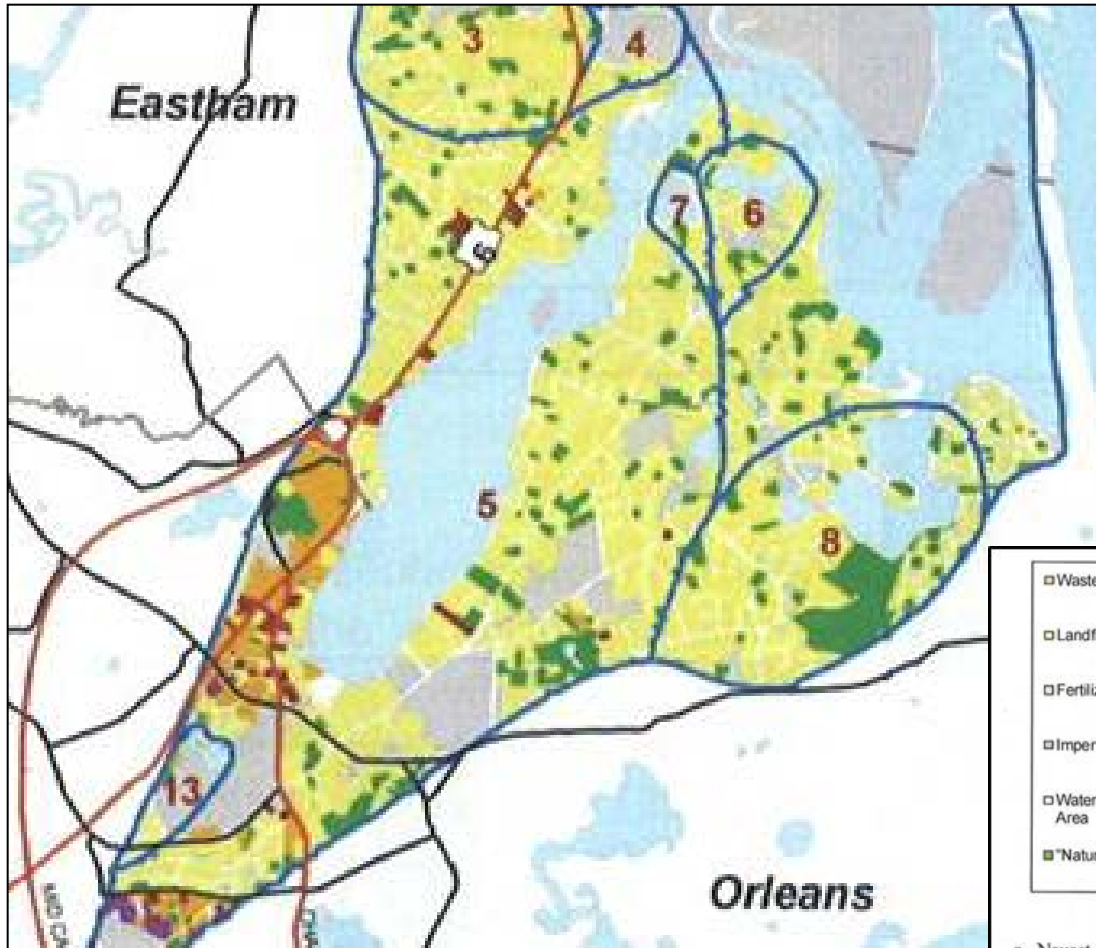
MEP Nitrogen Assumptions and Loadings (continued)

Pleasant Bay watersheds and loads



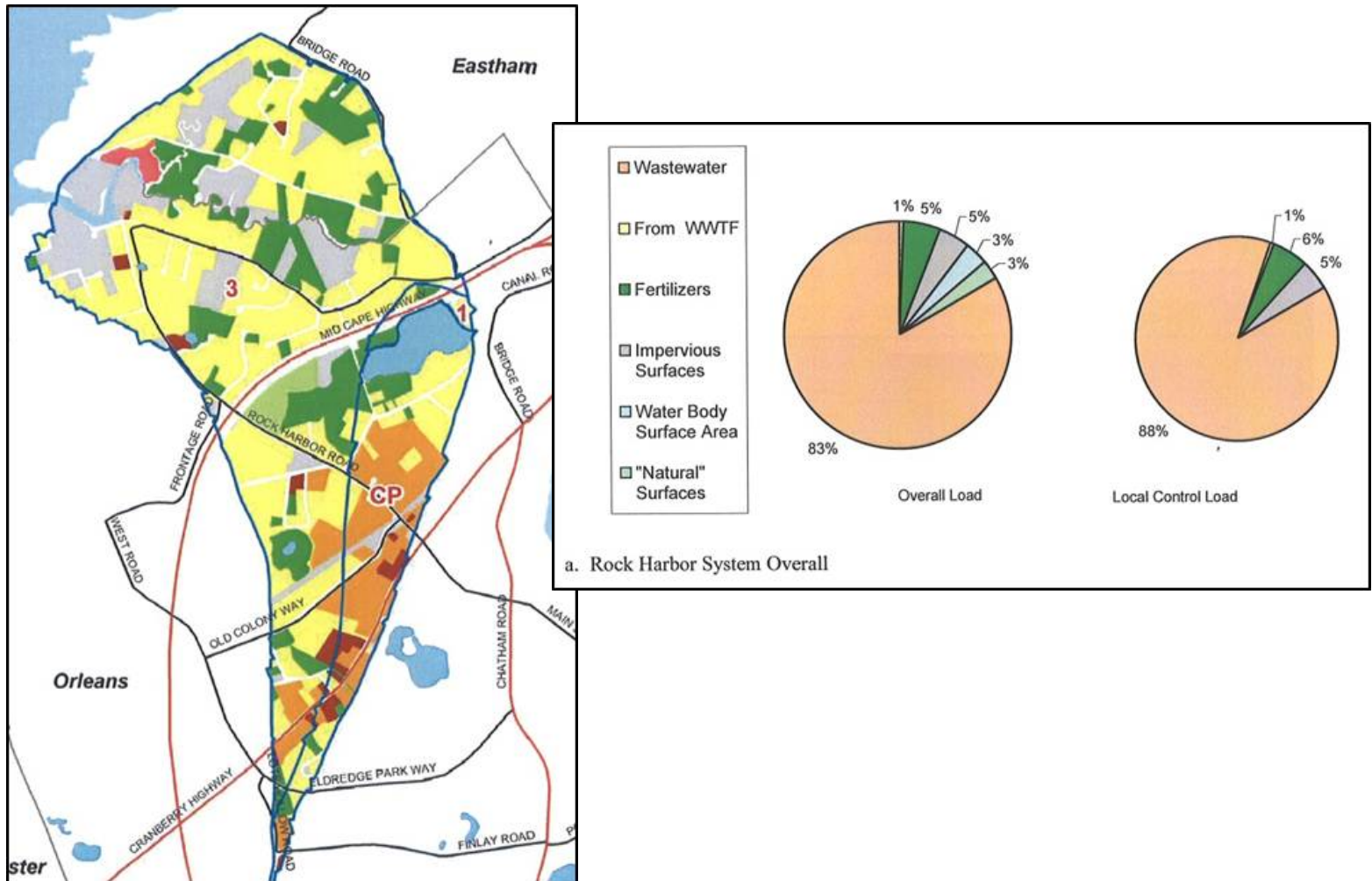
MEP Nitrogen Assumptions and Loadings (continued)

Town Cove/Nauset watersheds and loads



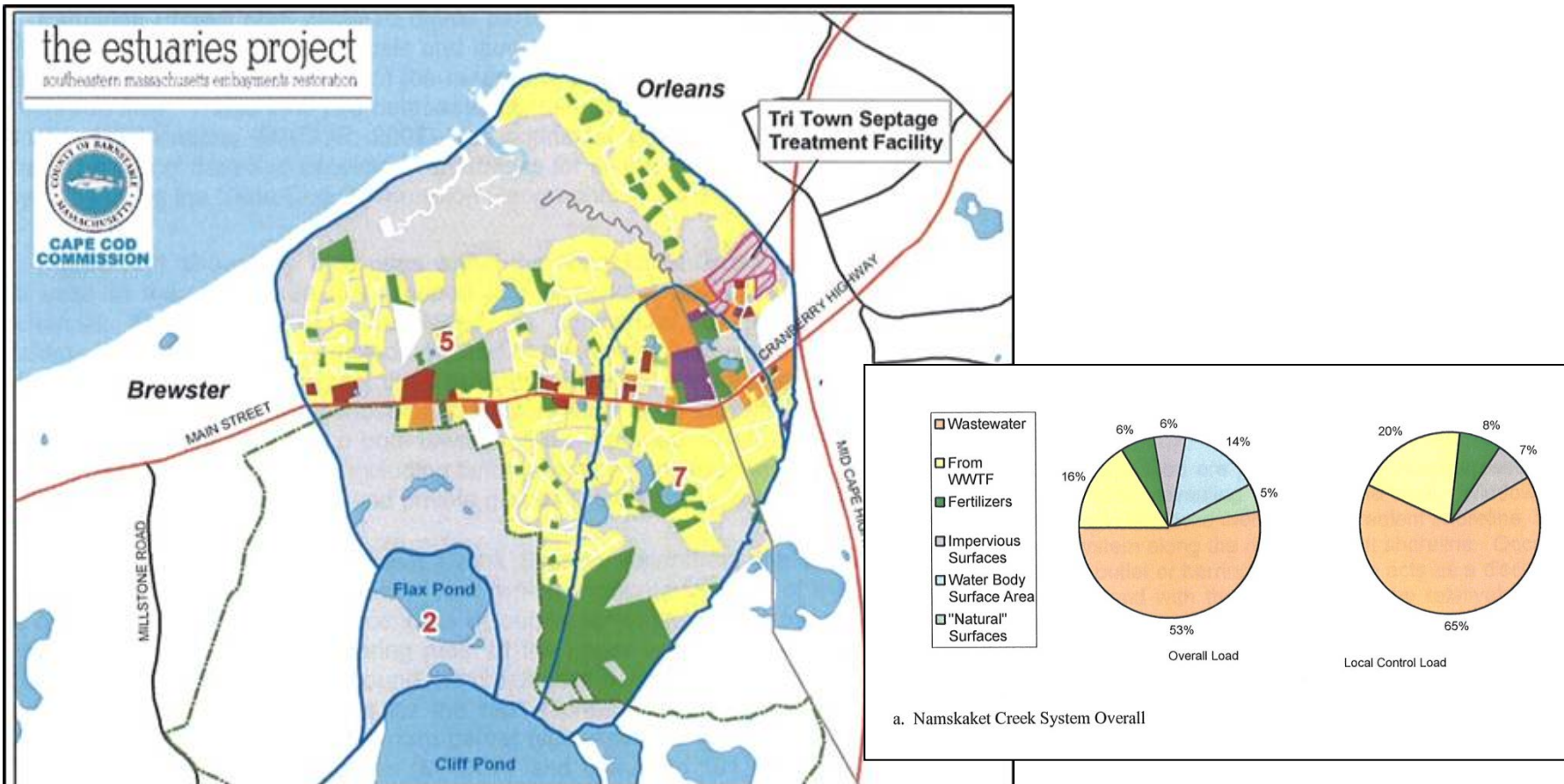
MEP Nitrogen Assumptions and Loadings (continued)

Rock Harbor watersheds and loads

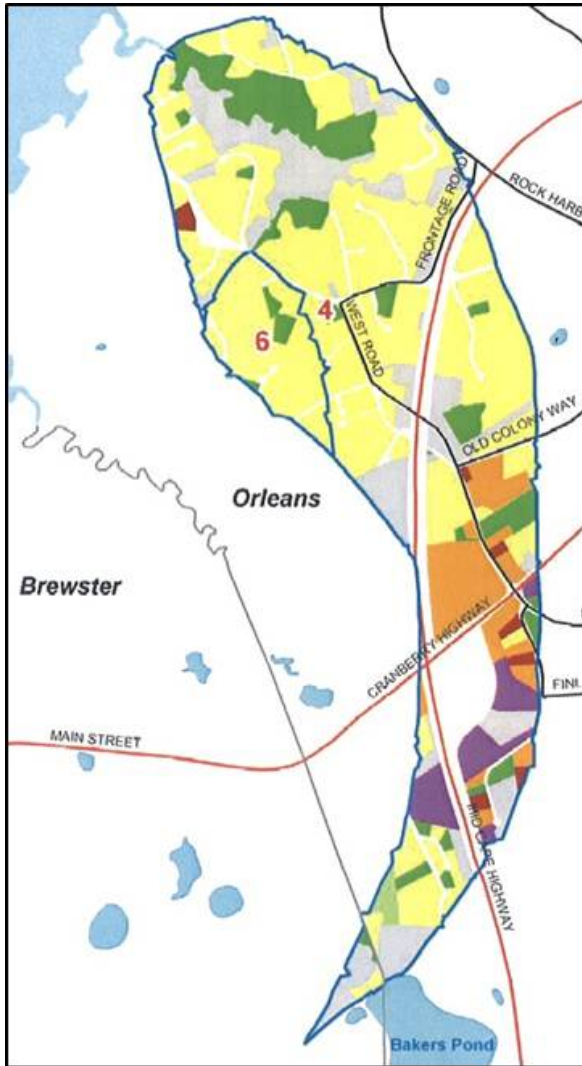


MEP Nitrogen Assumptions and Loadings (continued)

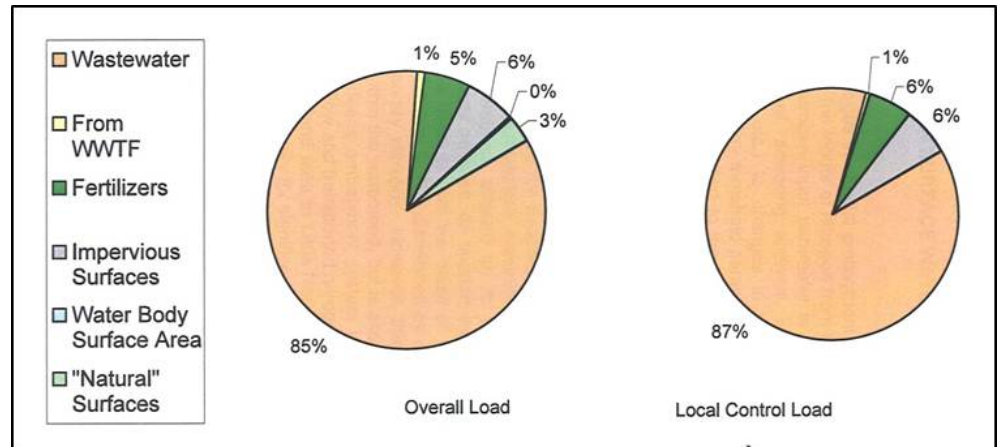
Namskaket Creek watersheds and loads



MEP Nitrogen Assumptions and Loadings (continued)



Little Namskaket Creek watersheds and loads



MEP Nitrogen Assumptions and Loadings (continued)

Main findings

- Stormwater nutrient concentrations are very low
- Stormwater flows are intermittent and can be very large
- Some watersheds are more critical for nitrogen and/or phosphorus removal, and should be prioritized
- Stormwater nitrogen loading has been estimated at 5 to 9% of the total loading to the estuaries



Technologies for Stormwater Nitrogen Removal*

| UNHSC Measured Median Pollutant Removal Efficiencies | | | | | | | | | | | | | | | | | |
|--|--------------------------------------|----------|--------------|---|----------|--------------|---|----------|--------------|--------------------------|----------|--------------|-------------------------------|----------|--------------|---|----------------------------|
| Treatment Unit Description | TSS Total Suspended Solids (mg/l) | | | TPH-D Total Petroleum Hydrocarbons in the Diesel Range (mg/l) | | | NO3-N (DIN) Dissolved Inorganic Nitrogen (mg/l) | | | TZn Total Zinc (mg/l) | | | TP Total Phosphorus (mg/l) | | | Average Annual Peak Flow Reduction | Average Annual Lag Time |
| | Influent | Effluent | % Removal | Influent | Effluent | % Removal | Influent | Effluent | % Removal | Influent | Effluent | % Removal | Influent | Effluent | % Removal | % Reduction | Minutes |
| Conventional Treatment Technologies | | | | | | | | | | | | | | | | | |
| Retention Pond | 55 | 30 | 68% | 710 | 100 | 82% | 0.3 | 0.2 | 33% | 0.05 | 0.01 | 68% | 0.09 | 0.11 | NT | 86 | 455 |
| Detention Pond | 77 | 16 | 79% | 490 | 165 | 74% | 0.3 | 0.2 | 25% | 0.03 | 0.02 | 50% | 0.05 | 0.05 | NT | 93 | 639 |
| Stone (rip-rap) Swale | 30 | 15 | 50% | 580 | 380 | 33% | 0.4 | 0.7 | NT | 0.07 | 0.02 | 64% | - | - | - | 6 | 7 |
| Vegetated Swale | 48 | 16 | 56% | 710 | 207 | 82% | 0.3 | 0.3 | NT | 0.04 | 0.02 | 40% | 0.08 | 0.10 | NT | 52 | 38 |
| Berm Swale | 51 | 23 | 50% | 637 | 61 | 81% | 0.2 | 0.3 | NT | 0.03 | 0.02 | 50% | 0.07 | 0.09 | NT | 16 | 58 |
| Deep Sump Catch Basin | 48 | 34 | 9% | 510 | 440 | 14% | 0.2 | 0.3 | NT | 0.04 | 0.04 | NT | 0.08 | 0.07 | NT | NT | NT |
| Manufactured Treatment Devices | | | | | | | | | | | | | | | | | |
| ADS Infiltration Unit | 49 | BDL | 99% | 766 | BDL | 99% | 0.3 | 0.9 | NT | 0.05 | BDL | 99% | 0.12 | 0.02 | 81% | 87 | 228 |
| StormTech | 87 | 13 | 83% | 750 | 45 | 91% | 0.3 | 0.5 | NT | 0.03 | 0.01 | 67% | 0.07 | 0.03 | 52% | 78 | 235 |
| Aquifer | 28 | 11 | 62% | 573 | 156 | 66% | 0.3 | 0.3 | NT | 0.04 | 0.02 | 43% | 0.07 | 0.05 | 24% | NT | NT |
| Online Hydrodynamic Separators | 41 | 29 | 29% | 774 | 442 | 42% | 0.4 | 0.4 | NT | 0.05 | 0.04 | 26% | 0.09 | 0.11 | NT | NT | NT |
| Offline Hydrodynamic Separators (HDS) | 120 | 21 | 75% | 570 | 180 | 64% | 0.2 | 0.3 | NT | 0.03 | 0.02 | 21% | 0.05 | 0.05 | NT | NT | NT |
| Low Impact Development (LID) | | | | | | | | | | | | | | | | | |
| Surface Sand Filter | 45 | 19 | 51% | 788 | 17 | 98% | 0.3 | 0.4 | NT | 0.06 | 0.01 | 77% | 0.12 | 0.06 | 33% | 69 | 187 |
| Bio I - 48" depth (42" filter depth) | 37 | 1 | 97% | 798 | BDL | 99% | 0.4 | 0.1 | 44% | 0.07 | BDL | 99% | - | - | - | 75 | 266 |
| Bio II - 30" depth (24" filter depth) | 48 | 6 | 87% | 750 | BDL | 99% | 0.2 | 0.2 | NT | 0.04 | 0.02 | 73% | 0.08 | 0.05 | 34% | 79 | 309 |
| Bio III - 30" depth (24" filter depth) | 120 | 8 | 91% | 450 | 163 | 64% | 0.4 | 0.3 | 44% | 0.03 | 0.01 | 75% | 0.03 | 0.05 | NT | 84 | 216 |
| Bio IV - 37" depth (24" filter depth) | 80 | 11 | 83% | 495 | 165 | 65% | 0.3 | 0.2 | 42% | 0.03 | 0.01 | 67% | 0.07 | 0.06 | NT | 95 | 61 |
| Subsurface Gravel Wetlands | 61 | 4 | 96% | 644 | BDL | 99% | 0.3 | 0.1 | 75% | 0.04 | 0.01 | 84% | 0.06 | 0.02 | 58% | 92 | 391 |
| Porous Asphalt | 32 | BDL | 99% | 631 | BDL | 99% | 0.2 | 0.5 | NT | 0.04 | 0.01 | 75% | 0.08 | 0.04 | 57% | 82 | 1,275 |
| Pervious Concrete | 101 | 11 | 85% | 310 | BDL | 99% | 0.3 | 0.5 | NT | 0.03 | 0.01 | 75% | 0.06 | 0.65 | NT | 93 | 1,011 |
| Permeable Interlocking Concrete Pavement | 51 | BDL | 99% | 610 | BDL | 99% | 0.4 | BDL | 99% | 0.05 | BDL | 99% | 0.13 | BDL | 99% | 99 | see pg 16 |
| Tree Filter | 31 | 2 | 91% | 631 | BDL | 99% | 0.2 | 0.2 | 1% | 0.04 | 0.01 | 75% | 0.07 | 0.06 | NT | 31 | 204 |

*BDL indicates a value that is Below Detection Limit of the test method.
NT indicates no treatment.

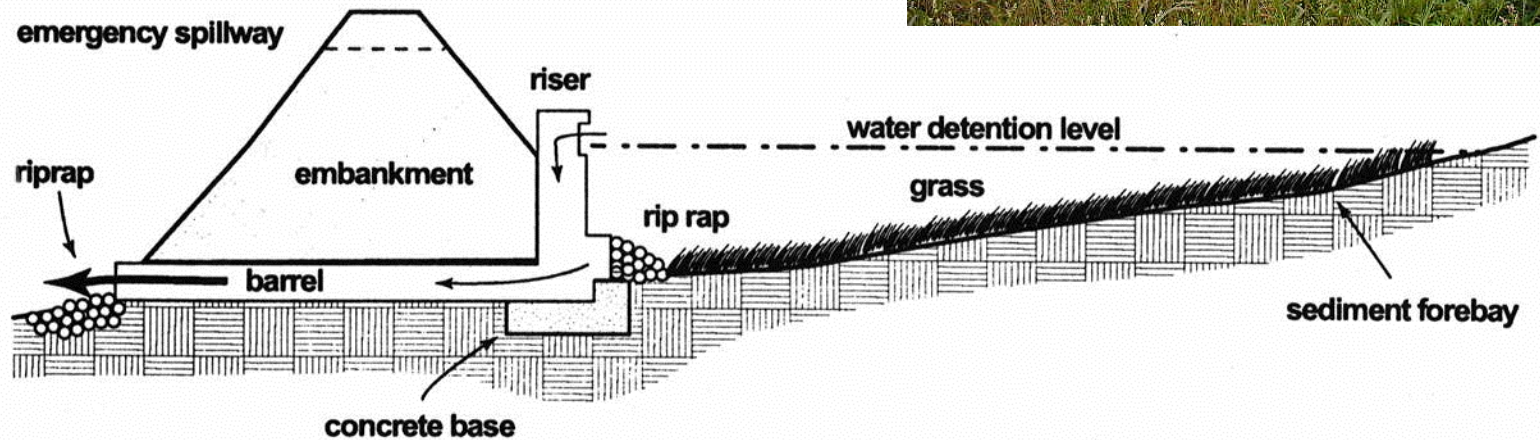


*Table taken from the University of New Hampshire Stormwater Center 2012 Biennial Report

Orleans Preliminary Stormwater Assessment, March 26, 2013

Nitrogen Removal Technologies – Detention Pond

- Nitrogen Removal Rate: 25%*

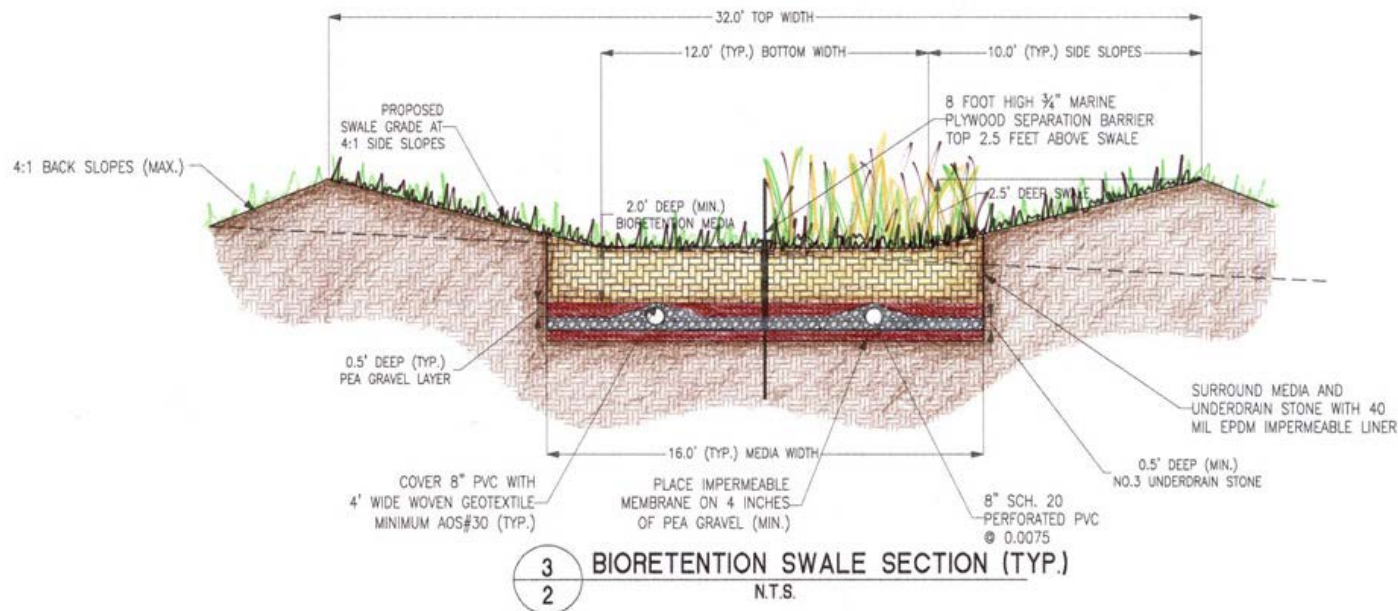


*Per University of New Hampshire Stormwater Center 2012 Biennial Report findings



Nitrogen Removal Technologies – Bioretention

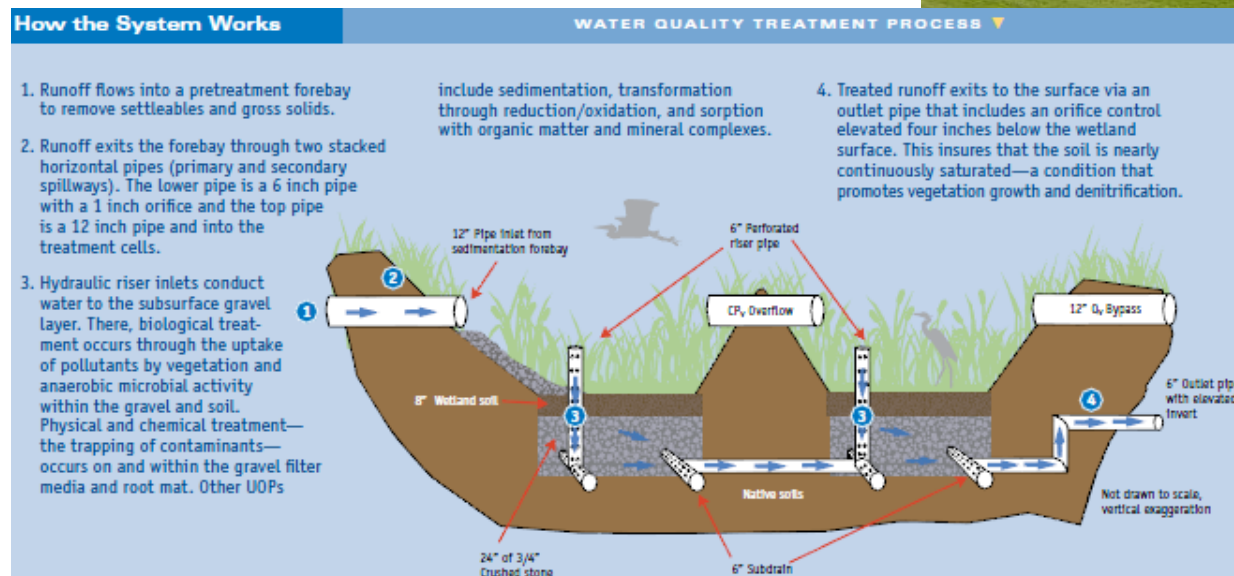
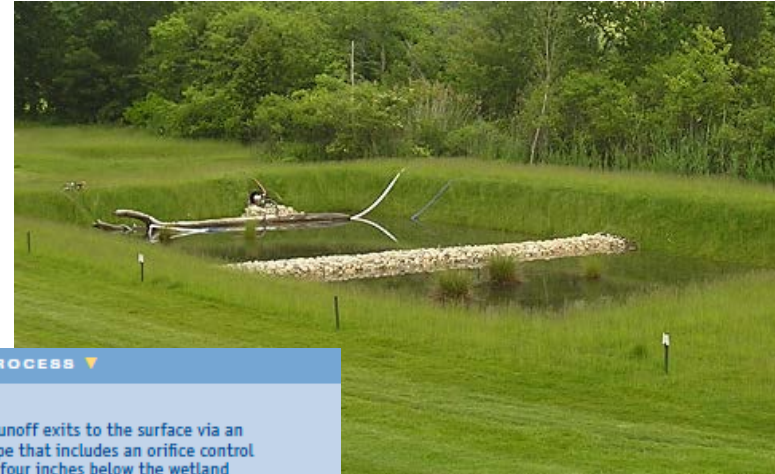
- Nitrogen Removal Rate: 42% to 44%*



*Per University of New Hampshire Stormwater Center 2012 Biennial Report findings. Images taken from Rutgers University and Botany Bay Water Quality Improvement project (AU)

Nitrogen Removal Technologies – Gravel Wetland

- Nitrogen Removal Rate: 75%*



*Per University of New Hampshire Stormwater Center 2012 Biennial Report findings. Images taken from New Hampshire Stormwater Center 2012 Biennial Report.

Nitrogen Removal Technologies – TARP / TAPE

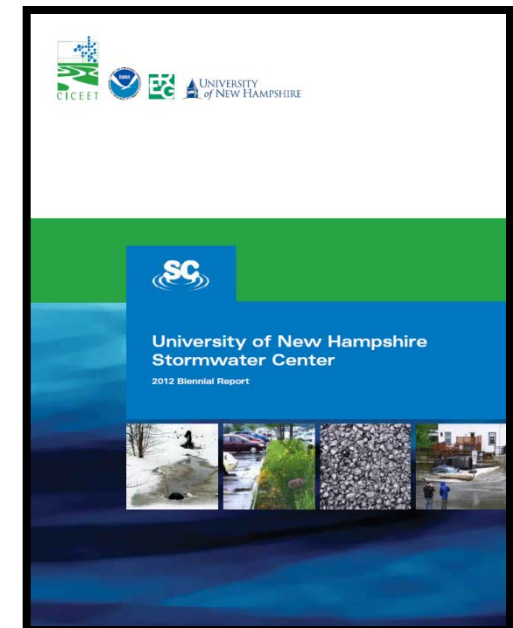
- **TAPE** - The Technology Assessment Protocol Ecology Program
 - Washington State Department of Ecology's process for evaluating and approving emerging stormwater treatment best management practices (BMPs)
- **TARP** – The Technology Acceptance Reciprocity Partnership
 - Endorsed by Massachusetts, California, Maryland, New Jersey, Pennsylvania, and Virginia
 - Process for demonstrating and testing stormwater BMPs



Nitrogen Removal Technologies – University of New Hampshire Stormwater Center

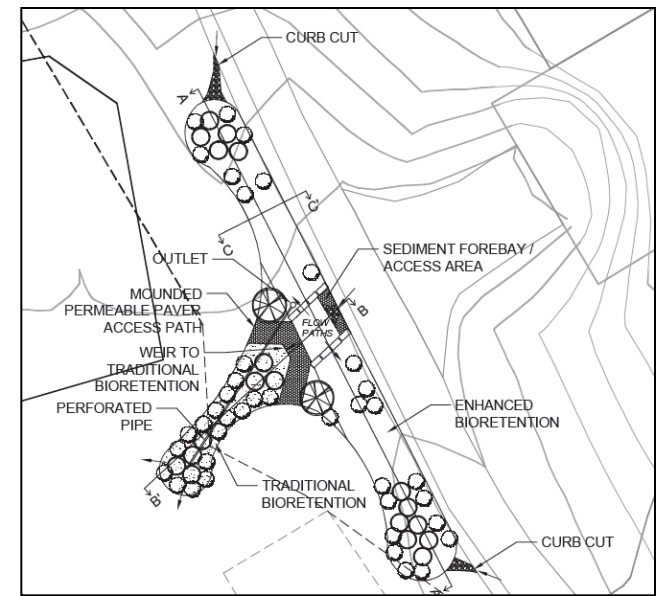
- **Background –**

- Founded in 2002
- Field research facility that performs parallel testing of stormwater management technologies
- Meets all TARP, TAPE, & ETV (*EPA's Environmental Technology Verification Program*)
- 2012 Biennial Report presents findings on stormwater system:
 - Performance
 - Cost
 - Maintenance
 - Education



Nitrogen Removal Technologies – Case Study for 165 Bearses Way BMP

- U.S. Environmental Protection Agency's (EPA) 2012 Green Infrastructure Community Partners Project
- 20% conceptual plan for an enhanced bioretention facility (combining both gravel wetland and bioretention) to treat stormwater runoff
- Model results show a 65% total nitrogen load removal from the site and a 4.1% reduction in volume



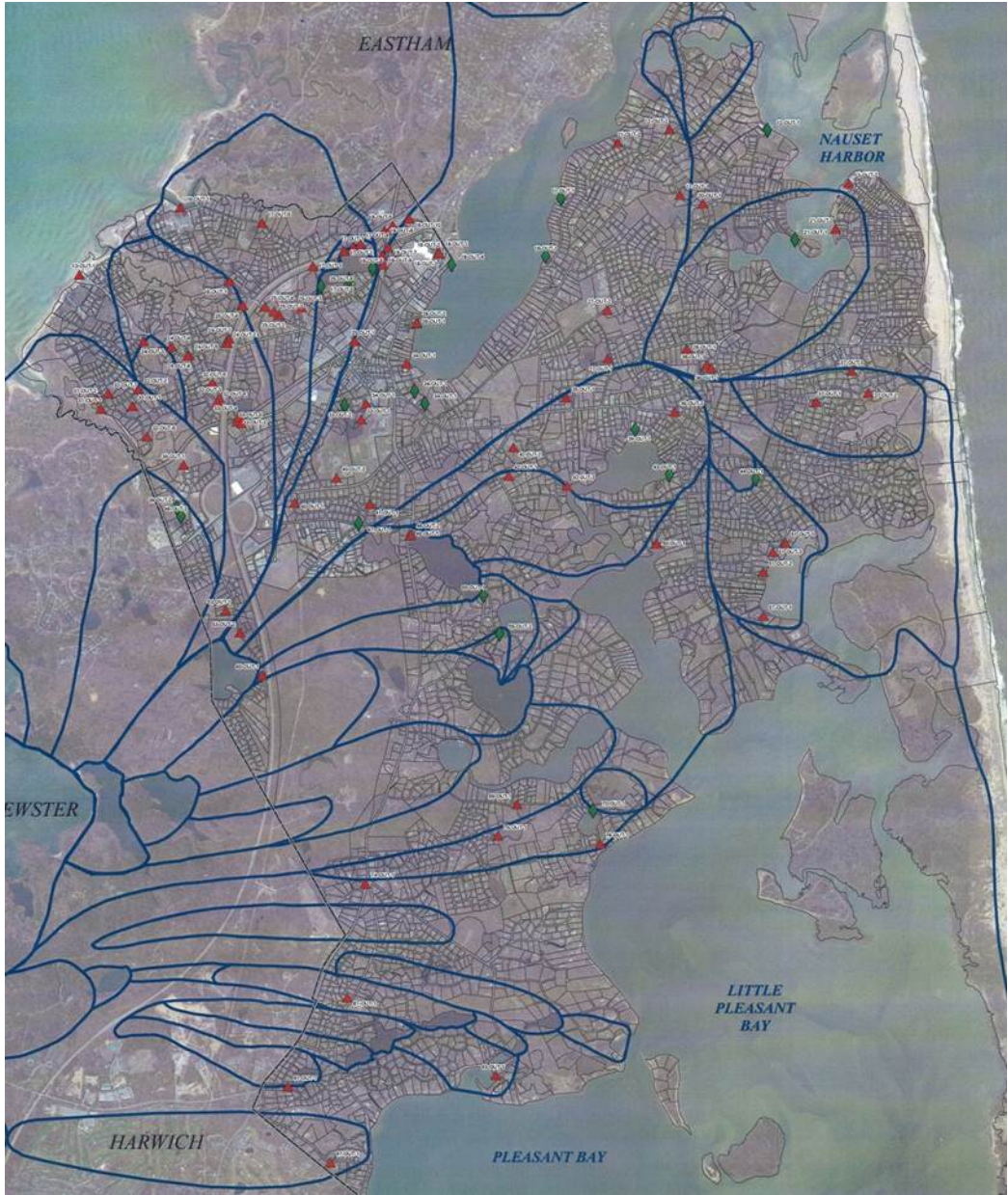
All results and images taken from draft report - *Contract EP-C 11-009 Cape Cod Commission SUSTAIN Model Application to Potential Green Infrastructure Sites*



Nitrogen Removal Technologies – Main Findings

- Significant land areas are typically required
- Costs for the land and treatment facilities can be high
- Facility maintenance is needed
- Facility lifetime is estimated at 20 years
- These technologies are relatively new for areas with porous soils





Stormwater Outfalls and Evaluations



Stormwater Outfalls and Evaluations (continued)

Calculations

- Potential flows from each outfall:
 - 0.5-inch storm
 - 1-inch storm
 - 10-year storm
 - Annual flow
- Potential pollutant loading
 - In kg/day
 - Assume 1.5 mg/L of nitrogen based on MEP work



Stormwater Outfalls and Evaluations (continued)


Data summary and Interpretation

- Summary worksheet for each outfall with:
 - Drainage area description & observations
 - Site photos
 - Data from site visit (pipe dia, material, etc)
 - Mapping
 - Calculated potential flows
 - Calculated pollutant loadings
 - Prioritization
- Tabular summary

GHD

Discharge ID: 51-OUT-3 Date: 2/7/2013
Address: 87 Star Spring Road Weather: Partly sunny, 30°
Drainage Area Description: Residential area with 3/4 acre to 1.0 acre lots

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Discharge Area (Acres) | Surface Area (Acres) | Surface Area Percent (%) | Runoff Volume (cu ft) | | 10 yr Storm Accum. Flow (cfs) | Discharge Area Description | Associated Watersheds | |
|-----------------|---------------|------------------------|----------------------|--------------------------|-----------------------|---------|-------------------------------|----------------------------|--|--|
| | | | | | Impervious (%) | 1" 1/8" | | | | |
| 13 | CM | 0.88 | 0.9% | 34% | 551 | 1,102 | 4 | 0.36 | Discharge into hill side natural, woody with brush draining into Pothole Inlet | |

Initial Assessment: Mitigation Priority (Low, Medium, High) Cleaning Recommendation: Priority (Low, Medium, High, Very High)

Mitigation Recommendations:



Example Worksheets



Discharge ID: 69-OUT-1

Date: 2/26/2013

Address: 100 Namequit Road

Weather: Sunny / Clear, 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Majority of runoff from Namequit Road and some from Little Marsh lane.

Site Photos:



Additional Observations:

Abandoned outfall or old culvert observed near 69-OUT-1

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cts) | Annual Flow (million gallons per year) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|---------------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | |
| 10.5 | CM | 2.23 | 65% | 35% | 1,400 | 2,799 | 7 | 0.92 | Drains down riprap into wetland | |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Example Worksheets



Discharge ID: 55-OUT-1

Date: 2/1/2013

Address: 120 Monument Road

Weather: Sunny / Clear, 40°

Drainage Area Description:

Includes runoff from Monument Road and Dickenson Conservation Area paved parking lot.

Site Photos:



Additional Observations:

2 Outfalls were found and both drain into the same discharge area. Unable to determine which structures lead to each outfall.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|---|-----------------------|
| | | | | | 0.5" | 1" | | | | |
| 12 | CM | 0.72 | 35% | 65% | 852 | 1,703 | 3 | 0.56 | Discharge into brush covered, semi-neutral drainage basin | |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Example Worksheets



Discharge ID: 51-OUT-3

Date: 2/7/2013

Address: 57 Briar Spring Road

Weather: Partly sunny, 30°

Drainage Area Description:
Residential area with 3/4 acre to 1.5 acre lots

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|---|-----------------------|
| | | | | | 0.5" | 1" | | | | |
| 13 | CM | 0.88 | 66% | 34% | 551 | 1,102 | 4 | 0.36 | Discharge into hill side natural, woody with brush draining into Pochet Inlet | |

Initial Assessment:
Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:
Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Example Worksheets



Discharge ID: 34-OUT-3

Date: 1/30/2013

Address: 82 Main Street

Weather: Overcast, 47°

Drainage Area Description:

Residential area off main road. Lot size ranging from 0.25 acre to 2 acres. Drainage area is mostly road runoff from Main St.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|---|-----------------------|
| | | | | | 0.5" | 1" | | | | |
| 30 | Concrete | 1.15 | 0% | 100% | 2,089 | 4,177 | 6 | 1.37 | Drains into swale in natural, woody area leading to marsh then Town Cove water body | |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

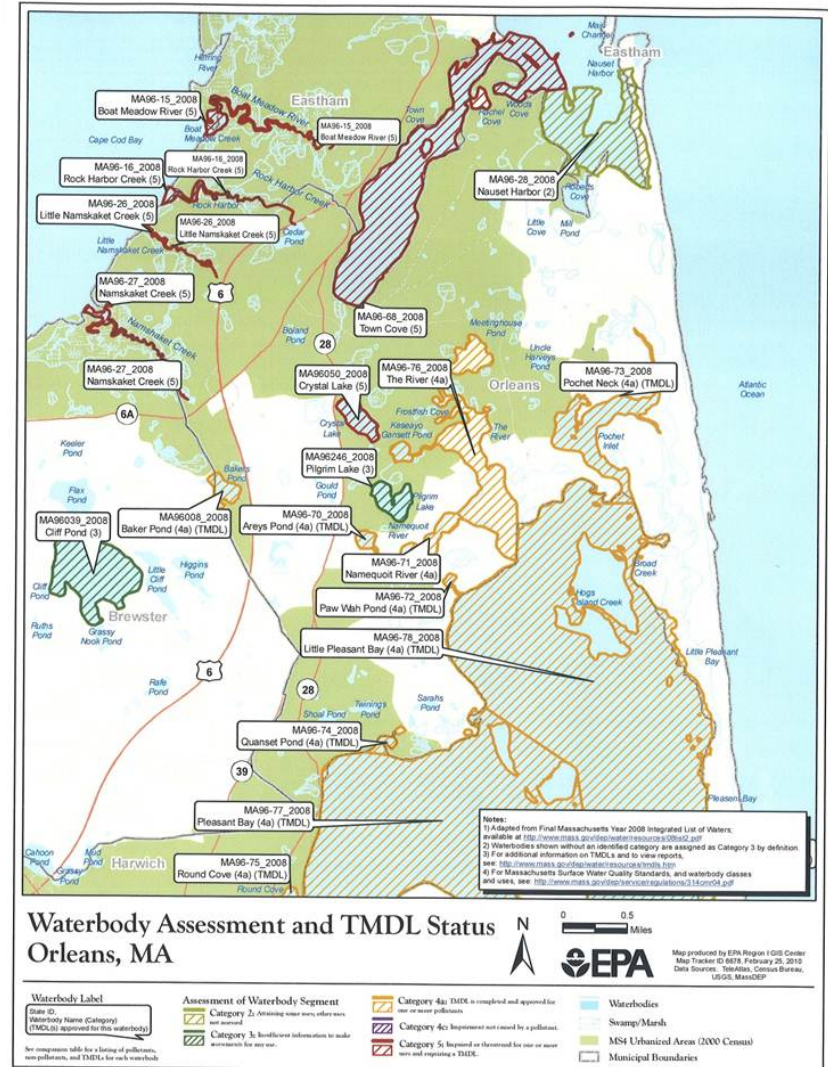
Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Possible Prioritization Criteria

- Surface water discharge vs. groundwater recharge
- Marine water impacts vs. fresh pond water impacts
- Nitrogen or Phosphorus sensitivity of watershed and receiving water
- TMDL status
- Flow size
- Aesthetics: outfall in high visibility location
- Condition of outfall
- Portion of related project
- Cost
- Outside funding availability



Possible Approach for Revised Town Drainage Code

- Require some form of bioretention as part of Site Plan Review process?
- Require a bioretention technology that has proven N removal performance of...30%, 40%, 50%, etc?
- Town Highway Dept. and Buildings and Grounds Dept. has same requirement?

Chapter 88. DRAINAGE AND EROSION AND SEDIMENT CONTROL

§ 88-1. Purpose.

§ 88-2. Applicability.

§ 88-3. Drainage requirements.

§ 88-4. Erosion and sediment control requirements.

§ 88-5. Fines and penalties.

[HISTORY: Adopted 5-13-2008 Annual Town Meeting, Art. 27. Amendments noted where applicable.]

GENERAL REFERENCES

Subdivision rules and regulations — See Ch.192.

§ 88-1. Purpose.

The purpose of this bylaw is to protect, maintain and enhance the public health, safety, environment and general welfare by establishing minimum requirements to control the adverse effects of stormwater runoff and erosion. Through proper management of stormwater, sediment and erosion controls this bylaw safeguards the public health, safety, environment and general welfare of the public. This bylaw serves to protect water and groundwater resources, promote groundwater recharge and prevent flooding.

§ 88-2. Applicability.

The requirements of this bylaw shall apply to existing development, new development, and redevelopment projects to minimize adverse impacts of erosion and stormwater runoff off site and downstream which would be borne by abutters, townspeople and the general public. The Board of Selectmen may delegate from time to time certain duties described in this bylaw to designees who will act on its behalf for the purposes of enforcement.

§ 88-3. Drainage requirements.

- a. Runoff. All runoff from impervious surfaces of a lot shall be recharged on that lot. Runoff shall be diverted towards areas covered with vegetation for surface infiltration.
- b. Stormwater. All stormwater drainage shall be contained on the development site and away from wetland resources. All stormwater shall be treated on site unless there is a public benefit to connecting to another drainage system or allowing stormwater to flow off site. Commercial development shall be required to handle calculated flows from a 25-year storm.



Next Steps

Items to develop

- Prioritization matrix
- Approach and order of magnitude cost of complete assessment
- Fact sheet for public outreach
- General outfall sampling plan

Additional items

-
-
-



Questions and Discussion

**Stormwater Sampling Plan
Town of Orleans, MA
September 24, 2013**

BACKGROUND

The Town of Orleans (Town) is completing a Preliminary Town-wide Stormwater Assessment of its more than 100 stormwater outfalls to marine estuaries, freshwater ponds, and groundwater discharges. The Town's water quality sampling database (data from 1997 to 2009) was reviewed to identify historic stormwater sampling data. The following table summarizes the available stormwater data:

Table 1 Orleans Historic Stormwater Data

| Outfall Location | No. of Samples | Fecal Coliform (MPN/100 mL) | |
|------------------|----------------|-----------------------------|------|
| | | Range | Mean |
| 1 11-OUT-1 | 5 | 2 to 310 | 130 |
| 2 15-OUT-1 | 2 | 164 to 164 | 164 |
| 3 18-OUT-4 | 111 | 0 to 1000 | 193 |
| 4 34-OUT-2 | 20 | 0 to 1000 | 310 |
| 5 34-OUT-3 | 25 | 4 to 1000 | 248 |
| 6 43-OUT-1 | 31 | 0 to 1000 | 366 |
| 7 55-OUT-1 | 13 | 0 to 120 | 18 |

No nutrient data was available.

Stormwater fecal coliform and nutrient water quality values can be highly variable depending on the land use in the recharge area of the outfall and the time when the sample is collected.

SAMPLING PLAN

The following parameters and typical detection limits are recommended for future stormwater sampling in Orleans:

Table 2 Stormwater Parameters, Detectable Limits, and Holding Times

| Parameters | Detection Limits |
|-------------------------------|---|
| Fecal Coliform | 1 Colony Forming Unit per 100 mL (cfu/100mL) |
| Total Kjeldahl Nitrogen (TKN) | 0.3 mg/L |
| Nitrate Nitrogen | 0.1 mg/L |
| Nitrite Nitrogen | 0.1 mg/L |
| Total Phosphorus | 0.01 mg/L |
| Orthophosphate | 0.005 mg/L |
| Total Suspended Solids | 5 mg/L |

Holding times are an important consideration for sampling. The Barnstable County Laboratory is the most economical location for these analyses, and should be consulted regarding when they will receive the samples for analysis. Discussions with them on April 18, 2013 indicated the following:

- The Fecal Coliform analysis needs to be processed within six (6) hours of sampling, and a laboratory reading is needed the next day.
- Therefore samples should be delivered to the lab by 3 p.m. Monday through Thursday, and should not be sampled more than five (5) hours before then.

Ideally, the sample collected would be a flow-averaged composite sample for the whole rain event. This is nearly impossible to obtain because the stormwater does not flow at a constant rate and it is difficult for the sampler to be at the outfall when the storm hits.

The Town should try to obtain a grab sample at each outfall during the early part of the storm (first flush period) when the water quality is expected to be the worst.

Samples at each outfall should be collected during several storms.



Discharge ID: 11-OUT-2
Address: 16 Ruggles Road

1/31/2013
 Sunny

Drainage Area Description:

Seasonal residential with 1/2 acre lots; paved roads. Outfall drains to wooded area leading to Town Cove water body.

Drainage Area:



Site Photos:



Additional Observations:

Neighbors complain that the path to the water is obstructed by vegetation.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|------------------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 7 | 81% | 19% | 2,293 | 4,586 | 28 | 1.51 | 8 | Low lying vegetation, semi-natural | Nauset Harbor - Town Cove |

Initial Assessment:

Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 12-OUT-1

Date: 4/12/2013

Address: 210 Brick Hill Road

Overcast / Rain,

Weather: 44°

Drainage Area Description:

Seasonal residential with average 1 acre lots. Mostly roadrunoff from Brick Hill Road and runoff from some western properties.

Drainage Area

Site Photos:



Additional Observations:

Outfall was recently constructed.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|-----------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE / Concrete | 6.71 | 68% | 32% | 3,840 | 7,680 | 31 | 2.53 | 13 | Swale leading to pond / wetland. Woody, Natural | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:

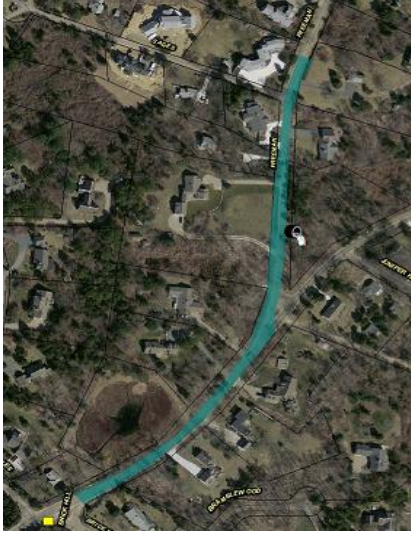


Discharge ID: 12-OUT-2
Address: 4 Freeman Lane
Drainage Area Description:

1/31/2013
 Sunny

Seasonal to year round residential with 1 acre lots; paved roads. Outfall drains to wetland.

Drainage Area:



Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--------------------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 10 | CM | 1 | 0% | 100% | 1,533 | 3,065 | 4 | 1.01 | 5 | Wetland with medium shrubs and trees | Nauset Harbor - Town Cove |

Initial Assessment:

Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:

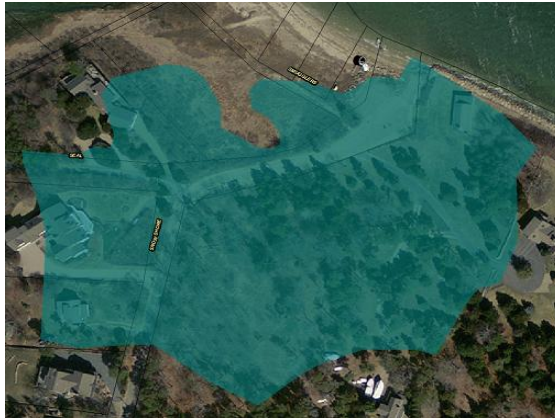


Discharge ID: 13-OUT-1
Address: Smugglers Path

1/31/2013
 Sunny

Drainage Area Description:
 Town landing with a paved public parking lot. Area used primarily as recreational boat ramp.

Drainage Area:



Site Photos:



Additional Observations:

Outfall was not located. Stormdrain structures in parking area were observed to be flooded likely due to high tide. Four Storm-Treat Systems have been installed and it is assumed that the outfall has existing mitigation.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---------------------------------------|------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| - | - | 5 | 87% | 13% | 1,211 | 2,423 | 21 | 0.80 | 4 | Beach, sand leading to Nauset Harbor. | Nauset Harbor - Nauset Marsh |

Initial Assessment:

Priority: (**Low**, Medium, High)

Maintenance Recommendation:

Priority: (Low, **Medium**, High, Very High)

Storm-Treat systems are currently installed. It is recommended that the Town continue to perform routine maintenance on the structures.

Mitigation Recommendations:

None.



Discharge ID: 15-OUT-1

Date: 2/1/2013
Windy /

Address: Skaket Beach

Weather: Overcast, 30°

Drainage Area Description:

Paved road & parking area. Stormwater improvements performed in 2013 including installation of new leaching catch basins, leaching pits, and new septic system and leach field for bath house. Overflow pipe replaces old outfall onto beach.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 2 | 0% | 100% | 3,435 | 6,870 | 10 | 2.26 | 12 | Beach, Sand | None - Cape Cod Bay |

Initial Assessment:

Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 16-OUT-1

Date: 2/8/2013
Overcast / rain
and snow mix,

Address: 60 Rock Harbor Road

Weather: 30°

Drainage Area Description:

Year round residential with average of 1/2 acre to 1 acre lots off main road.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 2 | 60% | 40% | 1,187 | 2,374 | 6 | 0.78 | 4 | Natural low lying shrubs & brush, woody | Rock Harbor |

Initial Assessment:

Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 16-OUT-2

Date: 2/8/2013
Overcast / rain
and snow mix,
Weather: 30°

Address: Bay View Drive

Drainage Area Description:

Seasonal and year round commercial with a majority of the area composed of paved roads and parking.

Drainage Area:

Site Photos:



Additional Observations:

Actual outfall location was not observed. Assumed outfall located at drain manholes. No catch basins were observed and it was assumed that the parking area was included in the drainage area.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| Unk | Unk | 3 | 19% | 81% | 4,318 | 8,635 | 15 | 2.84 | 15 | Rock Harbor Creek water body leading into Cape Cod Bay | Rock Harbor |

Initial Assessment:

Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 17-OUT-1

Date: 2/26/2013

Address: Route 6

Weather: Clear, 40°

Drainage Area Description:

Paved 2 lane highway with surface runoff draining to catch basins leading to outfall.

Drainage Area:

Site Photos:



Additional Observations:

Outfall was partially submerged

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|--------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 0.53 | 0% | 100% | 956 | 1,912 | 3 | 0.63 | 3 | Directly into marsh leading down slope into Cedar Pond | Rock Harbor - Cedar Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 17-OUT-2

Date: 2/26/2013

Address: Route 6

Weather: Clear, 40°

Drainage Area Description:

Paved 2 lane highway with surface runoff draining to catch basins leading to outfall.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|--|--------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 0.26 | 0% | 100% | 479 | 958 | 1 | 0.32 | 2 | Directly into marsh leading down slope into Cedar Pond | Rock Harbor - Cedar Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 17-OUT-3

Date: 2/26/2013

Address: Route 6

Weather: Clear, 40°

Drainage Area Description:

Paved 2 lane highway with surface runoff draining to catch basins leading to outfall.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------------|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 0.40 | 0% | 100% | 732 | 1,464 | 2 | 0.48 | 2 | Into woody marsh near Cedar Pond | Rock Harbor/Cedar Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 17-OUT-4

Date: 2/8/2013
Overcast / rain
and snow mix,

Address: 48 Locust Road

Weather: 30°

Drainage Area Description:

Seasonal to year round residential with between 1/3 acre to 1 1/2 acre lots off medium volume road.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|--------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | CM | 6 | 65% | 35% | 3,801 | 7,601 | 27 | 2.50 | 13 | Discharge into swale into woody area, leading to Cedar Pond | Rock Harbor - Cedar Pond |

Initial Assessment:

Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 17-OUT-5

Date: 2/26/2013

Address: 154 Rock Harbor Road

Weather: Clear, 40°

Drainage Area Description:

Aerial View:

Site Photos:



Additional Observations:

17-OUT-5 was classified as a culvert. There was not significant swale or other drainage structure located.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|--------------------------|----------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| - | - | - | - | - | - | - | - | - | - | - | Rock Harbor |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: *(Low, Medium, High, Very High)*

Mitigation Recommendations:



Discharge ID: 17-OUT-6

Date: 2/8/2013
Overcast / rain
and snow mix,

Address: Route 6 , near Cedar Pond Road

Weather: 30°

Drainage Area Description:

Drainage from Route 6 and adjacent land

Drainage Area:



Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|-------------------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | Concrete | 1 | 70% | 30% | 678 | 1,355 | 6 | 0.45 | 2 | Swale leading to brush / woody area | Rock Harbor |

Initial Assessment:

Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-1

Date: 2/26/2013

Address: 45 Cranberry Highway

Weather: Clear, 40°

Drainage Area Description:

Drainage Area:

Site Photos:



Additional Observations:

Abandoned inlet pipe

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/day) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|---------------------------|----------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 18 | CM | - | - | - | - | - | - | - | - | - | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: *(Low, Medium, High, Very High)*

Mitigation Recommendations:



Discharge ID: 18-OUT-2

Date: 2/26/2013

Address: 45 Cranberry Highway

Weather: Clear, 40°

Drainage Area Description:

Runoff from Route 6A and 28 flows into 18-OUT-2 which drains directly into the Lower Pond basin prior to discharge into 18-OUT-4.

Drainage Area:

Site Photos:



Additional Observations:

Discharge water observed to have surface oils and a redish tint.

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 30-36 | Concrete | - | - | - | - | - | - | - | - | Directly into Lower Pond basin leading to 18-OUT-4 | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-3

Date: 2/26/2013

Address: 45 Cranberry Highway

Weather: Clear, 40°

Drainage Area Description:

Inlet pipe draining Upper and Lower Pond basins into 18-OUT-4 outfall into Town Cove.

Drainage Area:



Site Photos:



Additional Observations:

Unable to locate 18-OUT-3 outfall. Photos of outfall are from Town Cove Stormwater Mitigation Assessment Jeremiah's Gutter, 2005

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/day) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|---------------------------|----------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| - | - | - | - | - | - | - | - | - | - | - | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-4

Date: 2/26/2013

Address: 40 Ellis Road, Eastham

Weather: Clear, 40°

Drainage Area Description:

Discharge area to 18-OUT-4 includes 4000 linear feet from Route 6A and 28, 45 acres from Stop & Shop area and adjacent commercial properties, and 4.6 acres from Old Country Road.

Drainage Area:

Site Photos:



Additional Observations:

Unable to take photos of 18-OUT-4. Photos of outfall are from Town Cove Stormwater Mitigation Assessment Jeremiah's Gutter.

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|--------------------------|-----------------------|---------------------------|-----------------------------|----------------------------------|---------|-------------------|--|--------------------------|----------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 36 | Concrete with flap valve | 59.10 | 36% | 64% | 69,152 | 138,303 | 302 | 45.52 | 233 | Directly into Town Cove | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: *(Low, Medium, High, Very High)*

Currently an existing treatment system consisting of two ponds separated by a filter dam is treating runoff from the Stop & Shop subwater shed. An infiltration facility on the Windmill Property is providing treatment for 85% of the Route 6A and 28 area.

Runoff from the Old County Road water shed is being treated by a biofilter prior to discharge into the 36" outfall pipe 18-OUT-4.

Mitigation Recommendations:



Discharge ID: 18-OUT-UNK

Date: 2/26/2013

Address: 40 Ellis Road, Eastham

Weather: Clear, 40°

Drainage Area Description:

Residential area next to marina. Lot sizes ranging from 1/4 acre to 1 acre.

Drainage Area:



Site Photos:



Additional Observations:

In Eastham.

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|--------------------------|----------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | PVC | - | - | - | - | - | - | - | - | Directly into Town Cove | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-5

Date: 2/26/2013

Address: Route 6

Weather: Clear, 40°

Drainage Area Description:

Route 6 highway. Runoff mostly from impermeable road surface.

Drainage Area:

Site Photos:



Additional Observations:

18-OUT-5 located on North side of Rt. 6.

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 20" & 10" | Concrete | 0.29 | 0% | 100% | 519 | 1,039 | 2 | 0.34 | 2 | UNK | Not included in MEP |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-6

Date: 2/26/2013

Address: Route 6

Weather: Clear, 40°

Drainage Area Description:

Route 6 highway. Runoff mostly from impermeable road surface.

Drainage Area:

Site Photos:



Additional Observations:

Unable to locate outfall 18-OUT-6. Assumed drainage based on marked location.

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 0.47 | 0% | 100% | 848 | 1,695 | 2 | 0.56 | 3 | UNK | Not included in MEP |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-7

Date: 2/8/2013
and snow mix,

Address: 65 Canal Road

Weather: 30°

Drainage Area Description:

Seasonal residential and commercial off medium volume road and near bike path.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 3 | 63% | 37% | 2,255 | 4,510 | 14 | 1.48 | 8 | Enclosed low elevation area, natural, woody & low lying brush & shrubs | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-8

Date: 2/8/2013

Address: 62 Locust Road

Weather: Clear, 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre to 1 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Unclear what stormdrains lead to outfall. Recommend Town to investigate.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|--------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | 1 | 44% | 56% | 618 | 1,236 | 2 | 0.41 | 2 | Marsh leading down slope into Cedar Pond | Rock Harbor - Cedar Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-9

Date: 4/12/2013
Overcast / Rain,

Address: 43 Canal Road

Weather: 40°

Drainage Area Description:

Drainage area includes mostly runoff from Canal Road. Medium traffic road through seasonal residential area.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/day) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|---------------------------|---------------------------------------|--------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 1 | 0% | 100% | 1,479 | 2,958 | 4 | 0.97 | 5 | Natural woody leading into Cedar Pond | Rock Harbor / Cedar Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-10
Address: Route 6 near rotary
Drainage Area Description:

Date: 2/26/2013
Weather: Clear, 40°

Mostly impermeable road runoff with a small grassy median.

Drainage Area:



Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|------------------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 0 | 28% | 72% | 602 | 1,204 | 2 | 0.40 | 2 | Natural woody with low lying brush | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 18-OUT-11

Date: 2/8/2013
Overcast / rain
and snow mix,

Address: 7 Jones Road

Weather: 30°

Drainage Area Description:

Seasonal to year round residential with average of 1/2 acre lots off medium volume road and near bike path.

Drainage Area:



Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 1 | 52% | 48% | 644 | 1,288 | 3 | 0.42 | 2 | Natural, woody & low lying brush & shrubs | Not included in MEP |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 19-OUT-1
Address: 16 Gibson Road
Drainage Area Description:

Date: 2/26/2013
Weather: Clear, 40°

Seasonal to year round residential with average of 1/2 acre to 3/4 acre lots off low volume residential road.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 15 | CM | 3 | 68% | 32% | 1,845 | 3,690 | 14 | 1.21 | 6 | Directly onto beach leading to Town Cove | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 24-OUT-1

Date: 1/30/2013

Address: Skaket Beach Road near Route 6

Weather: Overcast, 47°

Drainage Area Description:
Route 6 and adjacent wooded area

Drainage Area:

Site Photos:



Additional Observations:

Assumed majority of flow coming from Route 6 catch basins

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|----------------------------|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 28 | Concrete | 2 | 84% | 16% | 462 | 924 | 4 | 0.30 | 2 | Drains into stream | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 24-OUT-2

Date: 1/30/2013

Address: 50 Skaket Beach Road

Weather: Overcast, 47°

Drainage Area Description:
Route 6 and adjacent wooded area

Drainage Area:

Site Photos:



Additional Observations:

24-OUT-2 is a culvert.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|--------------------------|----------------------------|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 6 | VC | - | - | - | - | - | - | - | - | Drains into stream | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 24-OUT-3

Date: 2/1/2013

Address: 5 Captain Linnell Road

Weather: Sunny, 30°

Drainage Area Description:

Seasonal residential with average of 1/3 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outfall was mostly submerged.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 8 | CM | 2 | 52% | 48% | 1,596 | 3,191 | 9 | 1.05 | 5 | Direct drainage into natural salt marsh / wetland | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 24-OUT-4

Date: 1/30/2013

Address: 96 Skaket Beach Road

Weather: Overcast, 47°

Drainage Area Description:

Seasonal residential with average of 1 to 2 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Could not reach actual outfall discharge due to brush.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | 4 | 78% | 22% | 1,553 | 3,107 | 18 | 1.02 | 5 | Drains into brush then into salt march/ wetland. | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 24-OUT-5

Date: 1/30/2013

Address: 88 Skaket Beach Road

Weather: Overcast, 47°

Drainage Area Description:

Seasonal residential with average of 1 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 4 | 76% | 24% | 1,947 | 3,894 | 20 | 1.28 | 7 | Drains into woods / brush leading to salt marsh/ wetland. | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 24-OUT-6

Date: 1/30/2013

Address: 88 Skaket Beach Road

Weather: Overcast, 47°

Drainage Area Description:

Seasonal residential with average of 1/2 acre to 1 acre lots.

Drainage Area:



Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 2 | 57% | 43% | 1,457 | 2,914 | 9 | 0.96 | 5 | Drains into woods / brush leading to salt marsh/ wetland. | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: *(Low, Medium, High, Very High)*

Mitigation Recommendations:



Discharge ID: 25-OUT-1 **Date:** 2/8/2013
 On East side of Cape Cod Rail Trail behind 90 Massachusetts and snow mix,
Address: 6A **Weather:** 30°
Drainage Area Description:
 Year round commercial properties and bike trail. Majority of runoff from paved and gravel parking areas and paved roads.

Drainage Area:

Site Photos:



Additional Observations:

An unmarked outfall was located in the Snow's Home and Garden parking area and labeled as 25-OUT-UNK.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 2 | 15% | 85% | 3,088 | 6,177 | 10 | 2.03 | 10 | Semi-natural, wooded with low lying brush | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 25-OUT-2

Date: 1/30/2013

Address: 17 Rock Harbor Road

Weather: Overcast, 47°

Drainage Area Description:

Road runoff from West and East portions of Rock Harbor Road

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 1 | 15% | 85% | 798 | 1,596 | 3 | 0.53 | 3 | Drains down steep slope into natural woods, brush | Rock Harbor |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 25-OUT-3

Date: 1/30/2013

Address: 25 Rock Harbor Road

Weather: Overcast, 47°

Drainage Area Description:

Road runoff from West portion of Rock Harbor Road

Drainage Area:



Site Photos:



Additional Observations:

Outfall almost completely submerged

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 0 | 15% | 85% | 525 | 1,050 | 2 | 0.35 | 2 | Drains down steep slope into natural woods, brush | Rock Harbor |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: *(Low, Medium, High, Very High)*

Mitigation Recommendations:



Discharge ID: 25-OUT-4

Date: 2/8/2013
and snow mix,

Address: Rock Harbor and Skaket Beach intersection

Weather: 30°

Drainage Area Description:

Road runoff at the intersection of Rock Harbor Road and Skaket Beach Road

Drainage Area:

Site Photos:



Additional Observations:

Original concrete outfall had failed and was replaced with a coated corrugated steel section.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | Concrete & CM | 0 | 15% | 85% | 698 | 1,396 | 2 | 0.46 | 2 | Drains down steep slope into natural woods, brush | Nauset Harbor - Nauset Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 25-OUT-5

Date: 2/8/2013
and snow mix,

Address: Behind 7 Cedar Pond Road

Weather: 30°

Drainage Area Description:

Seasonal residential and commercial buildings. Lots range from 1/3 acre to 1 acre. Drainage area mostly includes road runoff from newly paved road and some runoff from adjacent residential properties and woody commercial property.

Drainage Area:

Site Photos:



Additional Observations:

Could not locate outfall discharge. Assumed to be submerged.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|--------------------------|
| | | | | | 0.5" | 1" | | | | | |
| Unk | Unk | 2 | 67% | 33% | 922 | 1,844 | 7 | 0.61 | 3 | Assumed drains directly into Cedar Pond | Rock Harbor - Cedar Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 25-OUT-6

Date: 2/8/2013
and snow mix,

Address: Rock Harbor and Skaket Beach intersection

Weather: 30°

Drainage Area Description:
Road runoff at the intersection of Rock Harbor Road and Skaket Beach Road

Drainage Area:

Site Photos:



Additional Observations:

Observed multiple gaps in the concrete outfall pipe. Outfall pipe was partially submerged under dirt and brush.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | Concrete | 0.37 | 19% | 81% | 541 | 1,083 | 2 | 0.36 | 2 | Drains down steep slope into natural woods, brush | Rock Harbor |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 25-OUT-7
Address: 10 Locust Road

2/8/2013
 Cloudy with light
 snow fall / cover

Drainage Area Description:

Outfall drains directly onto small boulders into swale / stream and continues to flow downhill. Area is natural wooded with a combination of low lying brush, shrubs, and trees.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 24 | Concrete | 5 | 66% | 34% | 3,324 | 6,648 | 25 | 2.19 | 11 | Swale, Natural Woods | Rock Harbor |

Initial Assessment:

Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 26-OUT-1

Date: 2/7/2013
Partly Sunny,

Address: 1 Cottage Street

Weather: 30°

Drainage Area Description:

Seasonal residential and year round commercial properties. Majority of runoff from paved Cottage St. and South Orens Road.

Drainage Area:



Site Photos:



Additional Observations:

Water was observed flowing from perforated holes and it was assumed that the object was 26-OUT-1. Drainage area is assumed to be all impervious and total 1/2 the combined drainage area for outfalls 26-OUT-1,2.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 20 | PVC | 0.77 | 0% | 100% | 1,394 | 2,788 | 0 | 0.92 | 5 | At base of steep hill into marsh flowing directly into Town Cove water body | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 26-OUT-2

Date: 2/7/2013
Partly Sunny,

Address: 1 Cottage Street

Weather: 30°

Drainage Area Description:

Seasonal residential and year round commercial properties. Majority of runoff from paved Cottage St. and South Orleans Road.

Drainage Area:

Site Photos:



Additional Observations:

Outfall is in poor shape with multiple holes rusted through. A dead animal was observed next to the outfall. Drainage area is unknown and is assumed to be all impervious and total 1/2 the combined drainage area for outfalls 26-OUT-1,2.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 13 | CM | 0.77 | 0% | 100% | 1,394 | 2,788 | 0 | 0.92 | 5 | At base of steep hill into marsh swale flowing directly into Town Cove water body | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 27-OUT-1

Date: 1/31/2013

Address: 7 Pine Ridge Lane

Weather: Overcast, 50°

Drainage Area Description:

Seasonal residential with mostly 1/3 acre lots and some 1 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outfall has multiple holes rusted through.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | CM | 5.80 | 71% | 29% | 3,087 | 6,174 | 26 | 2.03 | 10 | Natural woody area leading to wetland / marsh | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 27-OUT-2

Date: 1/31/2013

Address: 94 Hopkins Lane

Weather: Overcast, 50°

Drainage Area Description:

Drainage area includes paved main road residential housing complex. Mostly impermeable land, apartments and paved parking.

Drainage Area:

Site Photos:



Additional Observations:

Outfall was partially submerged

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 14 | CM | 4.45 | 67% | 33% | 2,639 | 5,278 | 21 | 1.74 | 9 | Natural woody area leading to wetland / Hopkins Lane Bog | Rock Harbor |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 28-OUT-1

Date: 1/31/2013

Address: 85 Great Oak Road

Weather: Overcast, 50°

Drainage Area Description:

Seasonal residential area with average 1/2 acre lots. Flow to the outfall also includes water from culvert at road level and stormwater runoff from road surface.

Drainage Area:

Site Photos:



There is an 8" CM culvert located under the road at the top of the hill which drains to the outfall catch basin.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|--------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 17.35 | 71% | 29% | 9,189 | 18,379 | 78 | 6.05 | 31 | Disturbed brush area draining down slope to wetland | Nauset Harbor - Mill Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 28-OUT-UNK

Date: 2/7/2013

Address: 64 Brick Hill Road

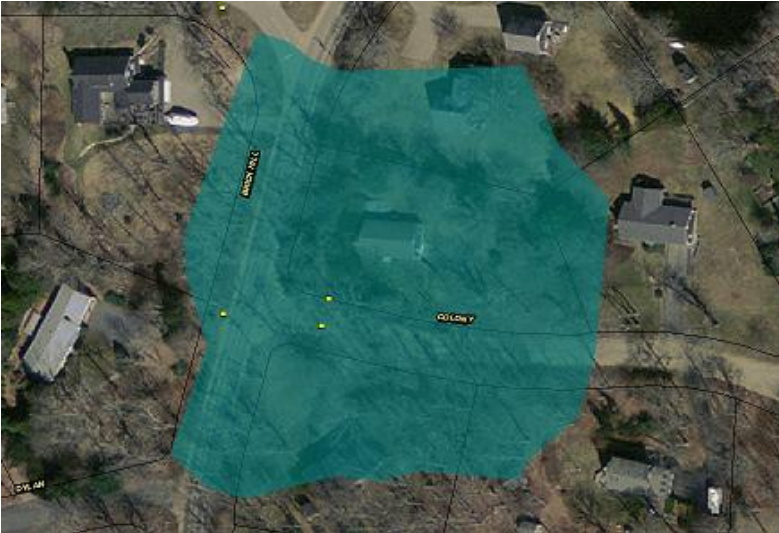
Weather: Partly sunny, 30°

Drainage Area Description:

Seasonal residential area with average 1/2 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outfall could not be located however the pipe was visible from inside the catch basin.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|-----------------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| Unk | CM | 2.11 | 64% | 36% | 1,385 | 2,770 | 7 | 0.91 | 5 | Semi-natural woody drainage basin | Nauset Harbor - Mill Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 31-OUT-1

Date: 2/1/2013

Address: 60 Captain Linnell Road

Weather: Partly sunny, 33°

Drainage Area Description:

Seasonal residential area with average 1/2 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outfall was corrugated metal surrounded by concrete. Outfall was partially submerged.

A pvc pipe was entering the catchbasin from the direction of house No. 60.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | CM / Concrete | 1.23 | 56% | 44% | 986 | 1,972 | 6 | 0.65 | 3 | Directly into wetland then sloping towards tidal marsh and into Namskaket Creek. | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 31-OUT-2

Date: 2/1/2013

Address: 56 Captain Linnell Road

Weather: Partly sunny, 33°

Drainage Area Description:

Seasonal residential area with average 1/2 acre lots. Drainage coming from roadway and culvert located to the East of Captain Linnell Road.

Drainage Area:

Site Photos:



Additional Observations:

Outfall fully submerged. Cleaning recommended.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | CM / Concrete | 5.36 | 73% | 27% | 2,673 | 5,347 | 25 | 1.76 | 9 | Directly into wetland then sloping towards tidal marsh and into Namskaket Creek. | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 32-OUT-1

Date: 2/1/2013

Address: 74 Captain Linnell Road

Weather: Partly sunny, 33°

Drainage Area Description:

Seasonal residential area with average 1/2 acre lots. Drainage area includes mostly roadway and properties to NW of road.

Drainage Area:

Site Photos:



Additional Observations:

Outfall fully submerged. Cleaning recommended.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM / Concrete | 1.20 | 64% | 36% | 793 | 1,585 | 6 | 0.52 | 3 | Directly into natural, woody with low lying brush | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 32-OUT-2

Date: 2/1/2013

Address: 87 Captain Linnell Road

Weather: Partly sunny, 33°

Drainage Area Description:

Seasonal residential area with average 1/2 acre lots. Drainage area includes mostly roadway and properties to NW of road.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 17 | CM / Concrete | 3.20 | 68% | 32% | 1,851 | 3,703 | 15 | 1.22 | 6 | Directly into natural, woody with low lying brush | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 32-OUT-3

Date: 1/30/2013

Address: West Road to west of Route 6 overpass

Weather: Overcast, 47°

Drainage Area Description:

Catch basin located on North side of West Road

Drainage Area:

Site Photos:



Additional Observations:

Possibly includes drainage from Route 6 due to two outfall pipes although not included in calculations.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|---|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 & 17 | Concrete | 0.30 | 48% | 52% | 288 | 576 | 1 | 0.19 | 1 | Directly into natural, woody with low lying brush | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 32-OUT-4

Date: 1/30/2013

Address: West Road to west of Route 6 overpass

Weather: Overcast, 47°

Drainage Area Description:

Catch basin located on North side of West Road

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|---|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 17.5 | Concrete | 0.30 | 48% | 52% | 288 | 576 | 1 | 0.19 | 1 | Directly into natural, woody with low lying brush | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (*Low, Medium, High*)

Cleaning Recommendation:

Priority: (**Low**, *Medium, High, Very High*)

Mitigation Recommendations:



Discharge ID: 32-OUT-5

Date: 2/26/2013

Address: Behind 92 West Road

Weather: Sunny, 40°

Drainage Area Description:

Assumed majority of stormwater coming from portions of West Road, Chase Lane, and Salty Ridge Road.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 14 | Concrete | 0.96 | 38% | 62% | 1,079 | 2,157 | 5 | 0.71 | 4 | Directly into natural, woody with low lying brush | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 32-OUT-6

Date: 2/1/2013

Address: 32 Skymeadow Drive (Cul-de-Sac)

Weather: Partly sunny, 33°

Drainage Area Description:

Residential with average 1 acre lot size. Runoff coming from paved road up to 31 Skymeadow Drive and properties to west of Skymeadow Drive.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 7 | CM | 0.65 | 56% | 44% | 524 | 1,049 | 3 | 0.35 | 2 | Directly into natural, woody bordering tidal marsh | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 32-OUT-7

Date: 2/1/2013

Address: 60 Captain Linnell Road

Weather: Partly sunny, 33°

Drainage Area Description:

Drainage Area:

Site Photos:



Additional Observations:

32-OUT-7 is a culvert draining to 31-OUT-2

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|--------------------------|----------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | - | - | - | - | - | - | - | - | Into 31-OUT-2 | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 33-OUT-1

Date: 1/30/2013

Address: Behind 15B Center Place

Weather: Overcast, 47°

Drainage Area Description:

Seasonal residential development. Extent of drainage area to outfall is unclear.

Drainage Area:

Site Photos:



Additional Observations:

Water was observed to be flowing however the actual outfall could not be reached.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 3.64 | 70% | 30% | 1,969 | 3,937 | 15 | 1.30 | 7 | Direct discharge into swale leading to Bolands Pond | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 33-OUT-2

Date: 1/30/2013

Address: 19 Brewster Cross Road

Weather: Overcast, 47°

Drainage Area Description:

Residential and commercial with majority of runoff from Brewster Cross road and Lower Cape Outreach Council parking lot.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 1.15 | 0% | 100% | 2,085 | 4,170 | 6 | 1.37 | 7 | Swale leading through natural woody into marsh | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 33-OUT-3

Date: 1/30/2013

Address: Intersection of West Road and Old Colony Way

Weather: Overcast, 47°

Drainage Area Description:

Year round commercial. Stormwater runoff from paved roads.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|--|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 0.14 | 0% | 100% | 255 | 511 | 1 | 0.17 | 1 | Retention pond with overflow leading to natural woody area | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 33-OUT-4

Date: 1/30/2013

Address: Intersection of West Road and Old Colony Way

Weather: Overcast, 47°

Drainage Area Description:

Year round commercial. Majority of stormwater runoff from West Road up to the Route 6 overpass.

Drainage Area:



Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 0.43 | 0% | 100% | 782 | 1,565 | 2 | 0.52 | 3 | Natural woody area leading down steep slope into wetland | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 33-OUT-5

Date: 1/30/2013

Address: 89 Old Colony Way

Weather: Overcast, 47°

Drainage Area Description:

Commercial area with mostly roadway runoff contributing to outfall.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | Concrete | 0.83 | 27% | 73% | 1,093 | 2,185 | 4 | 0.72 | 4 | Riprap swale leading down slope into woody drainage area | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 34-OUT-1

Date: 1/30/2013

Address: 39 S. Orleans Road

Weather: Overcast, 47°

Drainage Area Description:

Commercial area with some residential. Lot size ranging from 0.25 acre to 1.5 acre. Drainage area includes Cove Road and adjacent properties and Route 28 up to Row Road.

Drainage Area:

Site Photos:



Additional Observations:

The small clay pipe was the only outfall that could be located. Along the beach was searched for a larger outfall; may have been covered by washed up debris.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 8 | Clay | 3.32 | 56% | 44% | 2,643 | 5,286 | 16 | 1.74 | 9 | Grassy right-of-way leading to road-way surface and then eventually to Town Cove | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 34-OUT-2

Date: 1/30/2013

Address: 10 Academy Place

Weather: Overcast, 47°

Drainage Area Description:

Residential with lot size averaging 1/2 acre. Drainage area includes mostly road runoff from Academy Place and small portion of Main Street.

Drainage Area:

Site Photos:



Additional Observations:

Drainage area is most likely much larger based on the size of the outfall.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 36 | CM | 0.43 | 0% | 100% | 774 | 1,549 | 2 | 0.51 | 3 | Discharge direct into swale leading to marsh then Town Cove water body | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 34-OUT-3

Date: 1/30/2013

Address: 82 Main Street

Weather: Overcast, 47°

Drainage Area Description:

Residential area off main road. Lot size ranging from 0.25 acre to 2 acres. Drainage area is mostly road runoff from Main St.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 30 | Concrete | 1.15 | 0% | 100% | 2,089 | 4,177 | 6 | 1.37 | 7 | Drains into swale in natural, woody area leading to marsh then Town Cove water body | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 34-OUT-4

Date: 1/30/2013

Address: 7 Brewster Cross Road

Weather: Overcast, 47°

Drainage Area Description:

Commercial buildings and residential apartment complex. Drainage area includes parking lot runoff from commercial area.

Drainage Area:

Site Photos:



Additional Observations:

Outfall could not be located and was most likely blocked.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 0.68 | 0% | 100% | 1,240 | 2,480 | 4 | 0.82 | 4 | Drains into swale in natural, woody wetland area | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 35-OUT-1

Date: 2/7/2013

Address: 18 Karen Way

Weather: Partly sunny, 30°

Drainage Area Description:

Seasonal residential with average 3/4 acre to 1 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

35-OUT-1 is a culvert

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/day) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|---------------------------|----------------------------|-----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 18 | CM | - | - | - | - | - | - | - | - | Culvert runs from wetland | Pleasant Bay - Meeting House Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 35-OUT-2

Date: 7/17/2013

Address: Loomis Lane

Weather: Sunny, 85°

Drainage Area Description:
Residential with average 1/2 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outfall could not be located and was most likely covered by brush. Drainage area includes portion on Main Street draining into CB off Loomis Lane.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|---|-----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 0.14 | 24% | 76% | 187 | 374 | 1 | 0.12 | 1 | Directly into swale leading to wetland area | Pleasant Bay - Meeting House Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 36-OUT-1

Date: 2/7/2013

Address: 54 Brick Hill Road

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with average 1/2 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outfall could not be located and was most likely submerged under frozen water.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 4.34 | 69% | 31% | 2,438 | 4,876 | 17 | 1.60 | 8 | Directly into swale leading to wetland area | Nauset Harbor - Mill Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 36-OUT-2

Date: 2/7/2013

Address: 2 Pochet Road

Weather: Partly sunny, 30°

Drainage Area Description:
Residential with average 1/2 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outfall is partially submerged

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|--|-----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 8 | Concrete | 0.64 | 58% | 42% | 481 | 962 | 3 | 0.32 | 2 | Natural, low lying brush draining to wetland | Pleasant Bay - Meeting House Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 36-OUT-3

Date: 2/7/2013

Address: 7 Dylan Way

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with average 3/4 acre lots Road surface runoff from Dylan Road and cul-de-sac.

Drainage Area:

Site Photos:



Unable to locate outfall or any drainage structures.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 1.02 | 64% | 36% | 656 | 1,312 | 3 | 0.43 | 2 | Directly into swale leading to wetland area | Nauset Harbor - Mill Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 36-OUT-4

Date: 2/7/2013

Address: 37 High Tide Lane

Weather: Partly sunny, 30°

Drainage Area Description:

Commercial, Nauset Marine. Includes road runoff from High Tide Lane (asphalt) and Marina parking area (gravel) as well as adjoining properties.

Drainage Area:

Site Photos:



Additional Observations:

Outfall was submerged at time of observation.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------------|-----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 22 | Concrete | 4.79 | 63% | 37% | 3,219 | 6,438 | 18 | 2.12 | 11 | Directly into Meeting House Pond | Pleasant Bay - Meeting House Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 37-OUT-1

Date: 2/7/2013

Address: 9 Samoset Road

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with average 1/2 acre lots. adjoining properties.

Drainage Area:

Site Photos:



Additional Observations:

Outfall was clear however culvert had obstructions (possibly from residents). Catch basin located at 10 Samoset Road drive way was blocked by debris (unsure if private or public catch basin).

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | 0.60 | 0% | 100% | 1,089 | 2,178 | 3 | 0.72 | 4 | Grassy swale leading through residential yard | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 37-OUT-2

Date: 2/7/2013

Address: 35 Countryside Drive

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with average 1 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Outgoing pipe was visible in the catch basin however the outfall could not be located.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | CM | 1.68 | 68% | 32% | 986 | 1,972 | 5 | 0.65 | 3 | Assumed woody, natural draining into marsh | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 37-OUT-3

Date: 2/7/2013

Address: 35 Countryside Drive

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with average 1 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Stormwater drains to leaching catch basin behind house No. 60.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| CB | Concrete | 1.56 | 72% | 28% | 798 | 1,595 | 5 | 0.53 | 3 | Woody, semi natural leaching into ground | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 39-OUT-1

Date: 2/1/2013

Address: 46 Bay Ridge Lane

Windy /

Weather: Overcast, 30°

Drainage Area Description:

Road surface runoff from Overland Road to top of hill and some runoff from adjacent land and Nauset Autobody site.

Drainage Area:

Site Photos:



Additional Observations:

Outfall pipe was collapsed and blocked by fallen trees and rocks. Numerous debris (including plastic flower pots and trash) were observed inside both drainage catch basins leading to the outfall.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | Concrete | 2.21 | 17% | 83% | 3,332 | 6,664 | 11 | 2.19 | 11 | Woody, natural with brush and medium trees bordering wetland | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 39-OUT-2

Date: 7/17/2013

Address: Overland Way - Contractor's Area

Weather: Sunny, 85°

Drainage Area Description:

Road surface runoff from Way, Bay Ridge Lane, and Oak St.

Drainage Area:

Site Photos:



Additional Observations:

Town stated that Contractor extended outfall to discharge into wetlands and possibly pick up drainage from Contractor's site. Actual outfall could not be located.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 2.29 | 56% | 44% | 1,816 | 3,632 | 10 | 1.20 | 6 | Woody, natural with brush and medium trees bordering wetland | Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (**Low**, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 40-OUT-1

Date: 2/7/2013

Address: 59 Nickerson Road

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with 1/2 acre lots. Road stormwater runoff and runoff from property of 64 Nickerson Road (across the street)

Drainage Area:

Site Photos:



Additional Observations:

Water in catch basin was frozen.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--------------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 4 | PVC | 0.90 | 62% | 38% | 630 | 1,261 | 4 | 0.41 | 2 | Woody, semi natural with brush | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 40-OUT-2

Date: 2/7/2013

Address: 46 Eldredge Parkway

Weather: Partly sunny, 30°

Drainage Area Description:

Commercial / Orleans Elementary School. Stormwater runoff from Eldredge Parkway.

Drainage Area:

Site Photos:



Additional Observations:

Manhole cover located in elementary school parking lot. No catch basins were found in the parking lot.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|--------------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|-------------------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 19" high, 25" wide | Concrete | 0.69 | 0% | 100% | 1,252 | 2,504 | 4 | 0.82 | 4 | Woody, natural with low lying brush | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 41-OUT-1

Date: 2/7/2013

Address: 9 Kettle Pond Way

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with 1/2 acre to 1 acre lots. Drainage area includes runoff from Kettle Pond Way, Nickerson Road catch basins, and sloped properties to the west.

Drainage Area:

Site Photos:



Additional Observations:

Unable to confirm if the catch basins on Nickerson Road are connected to 41-OUT-1

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 13 | CM / Concrete | 5.84 | 66% | 34% | 3,570 | 7,139 | 26 | 2.35 | 12 | Directly into wetland | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 42-OUT-1

Date: 2/7/2013

Address: 37 Monument Road

Weather: Partly sunny, 30°

Drainage Area Description:

Residential with 1/3 acre to 2 acre lots. Drainage area includes runoff from Pond Street and Monument Road and sloped properties to the west.

Drainage Area:

Site Photos:



Additional Observations:

Unsure what infrastructure leads to 42-OUT-1. Catch basins on Monument Road appear to be leaching.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 8 | CM | 2.69 | 63% | 37% | 1,796 | 3,592 | 12 | 1.18 | 6 | Drains into woody / brush swale leading to wetland | Pleasant Bay - The River - upper |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 42-OUT-2

Date: 2/7/2013

Address: 19 School Road

Weather: Partly sunny, 30°

Drainage Area Description:

Drainage from paved Town Hall parking lot, School Street, and Orlean Historical Society parking and access roads. Additional runoff from adjacent properties draining onto School Street and portion of River Road.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 13 | CM | 5.31 | 53% | 47% | 4,500 | 9,000 | 26 | 2.96 | 15 | Drains into natural, woody area with brush | Pleasant Bay - Meeting House Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 43-OUT-1

Date: 2/7/2013

Address: 69 Barley Neck Road

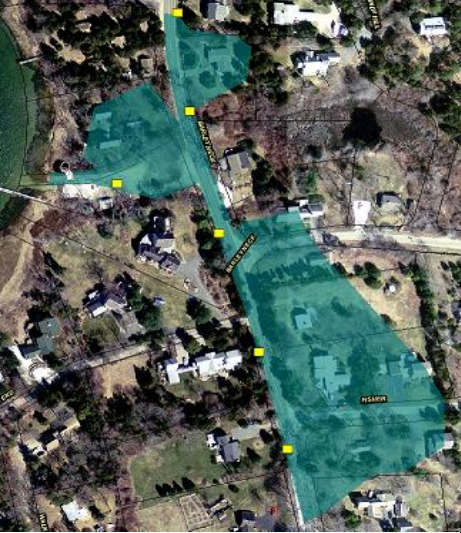
Weather: Partly sunny, 30°

Drainage Area Description:

Residential area off Barley Neck Road. Runoff from Barley Neck road and Shelton Lane (Town Landing road) as well as adjacent residential properties to the North.

Drainage Area:

Site Photos:



Additional Observations:

Observed field of drainage manholes. Catch basin at Shelton Lane leading to 43-OUT-1.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 6 | PVC | 4.50 | 60% | 40% | 3,282 | 6,564 | 21 | 2.16 | 11 | Discharge into wetland / swale running alongside road leading into Meeting Hose Pond | Pleasant Bay - Meeting House Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 44-OUT-1

Date: 2/7/2013

Address: 11 Uncle Harvey's Way

Weather: Partly sunny, 30°

Drainage Area Description:

Residential area with average 3/4 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Resident of House No. 11 Uncle Harvey's Way stated there have been numerous recent algy blooms in Uncle Harvey's Pond. Multiple drain manholes observed on Uncle Harvey's road around curve near house No. 17.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 13 | CM | 2.37 | 69% | 31% | 1,334 | 2,668 | 11 | 0.88 | 5 | Discharge into steep hill side natural, woody with brush draining into Uncle harvey's Pond | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 44-OUT-2

Date: 7/17/2013

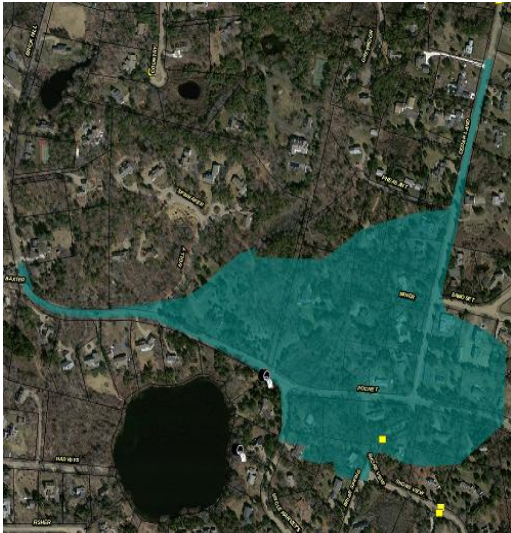
Address: Intersection of Uncle Harvey's Way & Pochet Road

Weather: Sunny, 85°

Drainage Area Description:

Residential area with average 3/4 acre lots and multiple large open space areas.

Drainage Area:



Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|--------|-------------------|--|--------------------------|---|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 10 | CM | 28.88 | 71% | 29% | 15,347 | 30,695 | 132 | 10.10 | 52 | Major roadway runoff draining off Pochet Road into wetland which discharges into culvert leading to Uncle Harvey's Pond | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: *(Low, Medium, High, Very High)*

Mitigation Recommendations:



Discharge ID: 46-OUT-1

Date: 2/1/2013

Address: 18 Bay Ridge Lane

Weather: Windy / Overcast,
30°

Drainage Area Description:

No longer used. Replaced by 46-OUT-2

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|--------------------------|----------------------------|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | - | - | - | - | - | - | - | - | - | Namskaket Creek |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 46-OUT-2

Date: 2/1/2013
Windy /

Address: 18 Bay Ridge Lane

Weather: Overcast, 30°

Drainage Area Description:

Mostly gravel and some paved parking located at North-East of site. Runoff localized to the site and did not appear to include road runoff from Bay Ridge Lane due to level elevation and leaching CB.

Drainage Area:

Site Photos:



Additional Observations:

Outfall appeared to be recent construction. 3 catch basins were located throughout site, one of which was leaching. The other two CBs were assumed to be connected to 46-OUT-2.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 15 | HDPE | 1.97 | 0% | 100% | 3,570 | 7,140 | 9 | 2.35 | 12 | Woody, semi natural leading to Skaket Bog | Namskaket Creek |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: **(Low, Medium, High, Very High)**

Mitigation Recommendations:



Discharge ID: 47-OUT-1

Date: 2/1/2013
Windy /

Address: 69 Finlay Road

Weather: Overcast, 30°

Drainage Area Description:

Residential and commercial area with average 1/2 acre lots. Runoff from Finlay Road and residential properties to North.
Runoff also from Giddiah Hill Road and commercial properties to East of road leading to catch basins at road intersection.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | 3.23 | 46% | 54% | 3,194 | 6,389 | 15 | 2.10 | 11 | Discharge into natural, woody with brush leading to wetland | Nauset Harbor - Town Cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 48-OUT-1

Date: 2/26/2013

Address: 153 S. Orleans Road

Sunny / Clear,
Weather: 40°

Drainage Area Description:

Residential with 0.25 acre to 1.25 acre lots. Drainage included mostly runoff from Route 28 and adjacent properties.

Site Photos:



Additional Observations:

Unable to locate both outfall 48-OUT-2. Drainage area is possibly much larger than assumed area.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 24 | Concrete | 2.84 | 65% | 35% | 1,826 | 3,651 | 10 | 1.20 | 6 | Discharge into natural, woody with brush leading downhill to Crystal Lake. | Pleasant Bay - Crystal Lake |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 50-OUT-1

Date:

Address: 30 Cedar Cove Road / Barley Neck Road

Weather:

Drainage Area Description:

Seasonal residential with average of 1 acre lots.

Drainage Area:

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|--------|-------------------|--|--------------------------|---|-----------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| Unk | Concrete | 17 | 65% | 35% | 10,745 | 21,489 | 51 | 7.07 | 36 | Culvert draining into tidal marsh / The River | Pleasant Bay - Meeting House Pond |

Initial Assessment:

Mitigation Priority: *(Low, Medium, High)*

Cleaning Recommendation:

Priority: *(Low, Medium, High, Very High)*

Mitigation Recommendations:



Discharge ID: 51-OUT-1

Date: 2/7/2013

Address: 65 Briar Spring Road

Weather: Partly sunny, 30°

Drainage Area Description:

Residential area with 3/4 acre to 1.5 acre lots

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| N/A | Asphalt Swale | 2.56 | 67% | 33% | 1,517 | 3,033 | 12 | 1.00 | 5 | Discharge from road to asphalt swale leading through low lying brush then into marsh / channel | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, **Medium**, High, Very High)

Mitigation Recommendations:



Discharge ID: 51-OUT-2

Date: 2/7/2013

Address: Gilman Lane Town Landing

Weather: Partly sunny, 30°

Drainage Area Description:

Residential area with 1/2 acre to 1 1/2 acre lots

Site Photos:



Additional Observations:

Only 2" depth remaining for flow. Site was previous NCRS / USDA Water Resources Restoration Project completed in 2011 which included the installation of 2 pretreatment settling tanks, 5 leaching chambers, and 2 leach fields.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|-------------------------------------|--|
| | | | | | 0.5" | 1" | | | | | |
| 15" | Concrete | 4.61 | 70% | 30% | 2,522 | 5,045 | 21 | 1.66 | 9 | Marsh / beach leading to water body | Pleasant Bay - Pochet Neck / Barley Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 51-OUT-3

Date: 2/7/2013

Address: 57 Briar Spring Road

Weather: Partly sunny, 30°

Drainage Area Description:

Residential area with 3/4 acre to 1.5 acre lots

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 13 | CM | 0.88 | 66% | 34% | 551 | 1,102 | 4 | 0.36 | 2 | Discharge into hill side natural, woody with brush draining into Pochet Inlet | Pleasant Bay - Pochet Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 53-OUT-1

Date: 2/1/2013

Address: 60 Baker's Pond Road

Windy /

Drainage Area Description:

Weather: Overcast, 30°

Site Photos:



Additional Observations:

53-OUT-1 is a culvert

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|----|-------------------|--|--------------------------|----------------------------|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 15 | CM | - | - | - | - | - | - | - | - | - | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 53-OUT-2

Date: 2/1/2013

Address: 94 Baker's Pond Road

Windy /

Drainage Area Description:

Weather: Overcast, 30°

Mostly runoff from Baker's Pond Road and some runoff from adjacent conservation land.

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | 1.25 | 79% | 21% | 480 | 960 | 3 | 0.32 | 2 | Discharge into hill side natural, woody with brush draining into wetland | Nauset Harbor - Town cove |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 53-OUT-3

Date: 2/1/2013

Address: 63 Baker's Pond Road

Weather: Windy / Overcast, 30°

Drainage Area Description:

Residential with average 1 acre to 2 acre lots. Drainage area includes mostly runoff from Baker's Pond Road and some runoff from adjacent properties to the East.

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | 1.20 | 71% | 29% | 625 | 1,249 | 4 | 0.41 | 2 | Discharge into hill side natural, woody with brush draining into wetland | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, **High**, Very High)

Mitigation Recommendations:



Discharge ID: 53-OUT-4

Date: 2/1/2013

Address: 66 Baker's Pond Road

Windy /

Drainage Area Description:

Weather: Overcast, 30°

Residential unpaved road.

Site Photos:



Additional Observations:

Outfall appears to be private and used to prevent washout of private road.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 10 | CM | 0.46 | 33% | 67% | 558 | 1,117 | 1 | 0.37 | 2 | Discharge into hill side natural, woody with brush draining into wetland | Little Namskaket Marsh |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 55-OUT-1

Date: 2/1/2013
Sunny / Clear,

Address: 120 Monument Road

Weather: 40°

Drainage Area Description:

Includes runoff from Monument Road and Dickenson Conservation Area paved parking lot.

Site Photos:



Additional Observations:

Two Outfalls were found and both drain into the same discharge area. Unable to determine which structures lead to each outfall.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | CM | 0.72 | 35% | 65% | 852 | 1,703 | 3 | 0.56 | 3 | Discharge into brush covered, semi-neutral drainage basin | Pleasant Bay - Crystal Lake |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Cleaning Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 55-OUT-2

Date: 2/1/2013

Address: 36 Herring Brook Way

Weather: Sunny / Clear,
40°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Mostly semi natural woody with brush cover.

Drainage Area:

Site Photos:



Additional Observations:

Based on visual observation of StormTreat system it is recommended that maintenance operations be performed. A 6" dia green pvc pipe was observed to be coming up from the drainage catch basin.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|-----------------------------------|--------------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 3.92 | 67% | 33% | 2,379 | 4,759 | 13 | 1.57 | 8 | Runoff leads to StormTreat system | Pleasant Bay - Kescayo Gasset Stream |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, **Very High**)

Mitigation Recommendations:



Discharge ID: 57-OUT-1

Date: 2/7/2013

Address: 204 Barley Neck Road

Weather: Partly sunny, 30°

Drainage Area Description:

Seasonal residential with average 1 acre to 2 acre lots. Mostly natural woody with moderate brush cover.

Site Photos:



Additional Observations:

Unable to locate 57-OUT-1. All catch basins were observed to be leaching and not pipes leading to outfall could be seen. Cul-de-sac was recently paved and its assumed that the outfall was removed.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|--|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 3.72 | 76% | 24% | 1,596 | 3,192 | 15 | 1.05 | 5 | Runoff leads to leaching catch basins at bottom of cul-de-sac | Pleasant Bay - Pochet Neck / Barley Neck |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 60-OUT-1

Date: 2/1/2013
Windy /

Address: 110 Bakers Pond Road

Weather: Overcast, 30°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Mostly natural woody with moderate brush cover. Runoff mostly from road surfaces including Bakers Pond Road and Route 6.

Site Photos:



Additional Observations:

Large concrete outfall brings runoff from Route 6. Smaller CM outfall brings runoff from Baker's Pond Road and adjoining properties.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|---------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 18, 8 | Concrete, CM | 1.87 | 54% | 46% | 1,563 | 3,125 | 7 | 1.03 | 5 | Runoff from Rt. 6 and Baker Pond Road drains to asphalt swale leading to beach near Baker's Pond | Pleasant Bay - Baker Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (**Low**, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 69-OUT-1

Date: 2/26/2013

Address: 100 Namequoit Road

Sunny / Clear,
Weather: 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Majority of runoff from Namequoit Road and some from Little Marsh lane.

Site Photos:



Additional Observations:

Abandoned outfall or old culvert observed near 69-OUT-1

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---------------------------------|--------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 10.5 | CM | 2.23 | 65% | 35% | 1,400 | 2,799 | 7 | 0.92 | 5 | Drains down riprap into wetland | Pleasant Bay - Namequoit River |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 70-OUT-1

Date: 2/26/2013
Sunny / Clear,

Address: 158 Namequoit Road

Weather: 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Majority of runoff from Namequoit Road and adjacent properties

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-----|-------------------|--|--------------------------|--|-----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 8 | HDPE | 0.47 | 51% | 49% | 422 | 844 | 1 | 0.28 | 1 | Discharge down riprap into marsh leading to Paw Wah Pond | Pleasant Bay - Paw Wah Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 74-OUT-1

Date: 2/26/2013
Sunny / Clear,

Address: Intersection of Harwich Road and Rt. 28.

Weather: 40°

Drainage Area Description:

Residential and commercial properties. Drainage area includes mostly road runoff from intersection of Rt. 28, Quanset Road, and Harwich Road.

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| 14 | HDPE | 0.91 | 0% | 100% | 1,653 | 3,306 | 5 | 1.09 | 6 | Woody, natural with medium brush cover | Pleasant Bay |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 75-OUT-1

Date: 2/26/2013
Sunny / Clear,

Address: 24 Ridgewood Road

Weather: 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Majority of runoff from Namequoit Road and adjacent properties

Site Photos:



Additional Observations:

Resident has noticed algal blooms in the past and also stated that the Town had made mention closing 75-OUT-1.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------|---------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 11 | CM | 4.13 | 69% | 31% | 2,357 | 4,715 | 13 | 1.55 | 8 | Directly into wetland | Pleasant Bay - Paw Wah Pond Bog |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 76-OUT-1

Date: 2/26/2013
Sunny / Clear,

Address: 142 Portanimitcut Road

Weather: 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Runoff from Portanimitcut Road and adjacent properties to the North.

Site Photos:



Additional Observations:

Outfall could not be located and was assumed to be submerged at high tide.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|----------------------------|-----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| UNK | UNK | 0.61 | 49% | 51% | 569 | 1,138 | 2 | 0.37 | 2 | Directly into Eli's Creek | Pleasant Bay - Paw Wah Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 80-OUT-1
Address: 47 Forest Way
Drainage Area Description:
 Seasonal residential with average 2 acre lots.

Date: 7/16/2013
Weather: Sunny / Clear, 80°

Site Photos:



Additional Observations:

Resident stated that there used to be frequent algal blooms (10+ years ago) however there have not been any recently.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|------------------------------|-----------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 10 | DI | 6.13 | 70% | 30% | 3,390 | 6,780 | 17 | 2.23 | 11 | Directly Uncle Israel's Pond | Pleasant Bay - Sarah's Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 87-OUT-1

Date: 2/26/2013
Sunny / Clear,

Address: 21 Woodridge Road

Weather: 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre lots. Runoff from Woodridge road.

Site Photos:



Additional Observations:

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-------------------------------|
| | | | | | 0.5" | 1" | | | | | |
| 12 | HDPE | 1.62 | 60% | 40% | 1,177 | 2,354 | 6 | 0.77 | 4 | Woody, natural with high amount of brush cover draining down steep slope | Pleasant Bay - Twining's Pond |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 91-OUT-1

Date: 2/26/2013
Sunny / Clear,

Address: 50 Winslow Drive

Weather: 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre to 1 acre lots. Runoff from Winslow Drive and properties to the West.

Site Photos:



Additional Observations:

OHD cone was found near a swale - unsure whether this was marking the location of an outfall.

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|--|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| N/A | Asphalt | 1.17 | 60% | 40% | 839 | 1,678 | 4 | 0.55 | 3 | Asphalt swale draining into woody, natural with some brush cover draining down steep slope | Pleasant Bay |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Discharge ID: 91-OUT-UNK

Date: 2/26/2013
Sunny / Clear,

Address: 31 Winslow Drive

Weather: 40°

Drainage Area Description:

Seasonal residential with average 1/2 acre to 1.5 acre lots. Runoff from Winslow Drive and adjacent properties.

Site Photos:



Additional Observations:

Asphalt swale leading to dried up culvert / stream

Summary of Existing Conditions:

| Pipe Dia (inch) | Pipe Material | Drainage Area (Acres) | Surface Area Pervious (%) | Surface Area Impervious (%) | Runoff Volume (ft ³) | | 10 yr Storm (cfs) | Annual Flow (million gallons per year) | Nitrogen Loading (kg/yr) | Discharge Area Description | Associated Watersheds |
|-----------------|---------------|-----------------------|---------------------------|-----------------------------|----------------------------------|-------|-------------------|--|--------------------------|---|-----------------------|
| | | | | | 0.5" | 1" | | | | | |
| N/A | Asphalt | 7.46 | 71% | 29% | 3,903 | 7,805 | 23 | 2.57 | 13 | Asphalt swale draining into woody, natural swale / stream | Pleasant Bay |

Initial Assessment:

Mitigation Priority: (Low, Medium, High)

Maintenance Recommendation:

Priority: (Low, Medium, High, Very High)

Mitigation Recommendations:



Project No: 8615148
Client: Town of Orleans, MA
Project Name: Orleans Town-Wide Preliminary Stormwater Assessment
Document Title: Rules for Outfall Prioritization Matrix
Date: 9/24/2013

| No. | Categories | Calculation of Points |
|-----|--|---|
| 1 | Watershed Nitrogen Sensitivity | Very High = MEP threshold % change value between -75% and -100% |
| | | High = MEP threshold % change value between -50% and -75% |
| | | Medium = MEP threshold % change value between -25% and -50% |
| | | Low = MEP threshold % change value between 0% and -25% |
| | | Very Low = MEP threshold % change value > 0% |
| 2 | Phosphorous Sensitivity | High = Greater than 100 µg/l |
| | | Medium = 10 > 100 µg/l |
| | | Low = < 10 µg/l |
| 3 | Impervious Surface Area | High = 75-100% impervious |
| | | Medium = 30-75% impervious |
| | | Low = 0-30% impervious |
| 4 | Average Fecal Coliform Count (Based on Town's Existing Data) | High = 300 > 400 |
| | | Medium = 100 > 300 |
| | | Low = 0 > 100 |
| 5 | Public Benefit / Visibility | High = Located in areas of public access or use |
| | | Medium = Located within visible or slightly obstructed view of public. |
| | | Low = Not located within areas of public access/use; very low visibility. |
| 6 | Discharge Area Impact | High = Discharges directly into water |
| | | Medium = Discharge within visible distance of water (< 25ft) |
| | | Low = Discharge not within visible distance of water |



Project No.: 8615148
 Client: Town of Orleans, MA
 Project Name: Orleans Town-Wide Preliminary Stormwater Assessment
 Document Title: Outfall Prioritization Matrix
 Date: 9/24/2013

Outfall Prioritization based on Public Benefit / Visibility

| Outfall ID | Outfall Street Location | Comments | Descriptive or Quantified Criteria | | | | | | | | | | Criteria for Comparative Rating | | | | | |
|------------|-------------------------|----------|------------------------------------|---|------------------------|---|---------------------------------------|------------------------------------|-----------------------|------------------------------|--|---|---------------------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|
| | | | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility |

Outfalls with High Public Benefit / Visibility

| | | | | | | | | | | | | | | | | | | | |
|----------|--|-----|--------|-----|-----|-----|-----|-------|-------|------|----|------|------------------------|-----------|---------|------|---------|------|------|
| 43-OUT-1 | 69 Barley Neck Road | | | Yes | -83 | No | 366 | 2.16 | 4.50 | 40% | 11 | 2.46 | Nitrogen | Very High | No Data | Med | High | High | High |
| 50-OUT-1 | 30 Cedar Cove Road / Barley Neck Road | | | Yes | -83 | No | 366 | 7.07 | 17.03 | 35% | 36 | 2.13 | Nitrogen | Very High | No Data | Med | High | Med | High |
| 70-OUT-1 | 158 Namequoit Road | | | Yes | -61 | No | NT | 0.28 | 0.47 | 49% | 1 | 3.02 | Nitrogen | High | No Data | Med | No Data | High | Med |
| 11-OUT-1 | 5 Asas Landing | | | Yes | -67 | No | 130 | 1.95 | 7.20 | 23% | 10 | 1.39 | Fecal Coliform | High | No Data | Low | Med | High | Med |
| 44-OUT-2 | Intersection of Uncle Harvey's Way & Pochet Road | (2) | | No | 0 | No | NT | 10.10 | 28.88 | 29% | 52 | 1.79 | Nitrogen | Low | No Data | Low | No Data | High | High |
| 48-OUT-1 | 153 S. Orleans Road | | | No | 0 | No | NT | 1.20 | 2.84 | 35% | 6 | 2.17 | Dissolved Oxygen | Low | Med | Low | No Data | High | Med |
| 55-OUT-1 | 120 Monument Road | | | No | 0 | No | 17 | 0.56 | 0.72 | 65% | 3 | 3.97 | Dissolved Oxygen | Low | Med | Med | No Data | High | Low |
| 60-OUT-1 | 110 Bakers Pond Road | | | No | 0 | No | NT | 1.03 | 1.87 | 46% | 5 | 2.81 | Mercury in Fish Tissue | Low | Low | Med | No Data | High | High |
| 13-OUT-1 | Smugglers Path | | | No | 0 | Yes | NT | 0.80 | 4.95 | 13% | 4 | 0.83 | None | Low | No Data | Low | No Data | High | Low |
| 15-OUT-1 | Skaket Beach | | CCB-17 | No | 0 | No | 164 | 2.26 | 1.89 | 100% | 12 | 6.12 | None | Low | No Data | High | Med | High | Med |
| 55-OUT-2 | 36 Herring Brook Way | | | No | 0 | Yes | NT | 1.57 | 3.92 | 33% | 8 | 2.05 | Nitrogen | Low | No Data | Low | No Data | High | Low |

Outfalls with Medium Public Benefit / Visibility

| | | | | | | | | | | | | | | | | | | | |
|----------|--|-----|-------|-----|-----|-----|-----|------|------|------|----|------|----------------|-----------|---------|------|---------|-----|------|
| 42-OUT-2 | 19 School Road | | | Yes | -83 | No | NT | 2.96 | 5.31 | 47% | 15 | 2.86 | Nitrogen | Very High | No Data | Med | No Data | Med | Low |
| 18-OUT-9 | 43 Canal Road | | | Yes | -67 | No | NT | 0.97 | 0.81 | 100% | 5 | 6.12 | Fecal Coliform | High | High | High | No Data | Med | Med |
| 76-OUT-1 | 142 Portanimitic Road | (9) | | Yes | -61 | No | NT | 0.37 | 0.61 | 51% | 2 | 3.13 | Nitrogen | High | No Data | Med | No Data | Med | High |
| 16-OUT-2 | Bay View Drive | (2) | CCB-9 | Yes | -67 | No | NT | 2.84 | 2.95 | 81% | 15 | 4.94 | Fecal Coliform | High | No Data | Med | No Data | Med | High |
| 17-OUT-5 | 154 Rock Harbor Road | (8) | | No | 0 | | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Med | Low |
| 18-OUT-7 | 65 Canal Road | | | Yes | -67 | No | NT | 1.48 | 3.36 | 37% | 8 | 2.26 | Fecal Coliform | High | No Data | Med | No Data | Med | Low |
| 19-OUT-1 | 16 Gibson Road | | | Yes | -67 | No | NT | 1.21 | 3.20 | 32% | 6 | 1.94 | Fecal Coliform | High | No Data | Med | No Data | Med | Med |
| 25-OUT-1 | On East side of Cape Cod Rail Trail behind 90 Massachusetts 6A | | | Yes | -67 | No | NT | 2.03 | 2.01 | 85% | 10 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 26-OUT-1 | 1 Cottage Street | | | Yes | -67 | No | NT | 0.92 | 0.77 | 100% | 5 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 26-OUT-2 | 1 Cottage Street | | | Yes | -67 | No | NT | 0.92 | 0.77 | 100% | 5 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 33-OUT-1 | Behind 15B Center Place | (9) | | Yes | -67 | No | NT | 1.30 | 3.64 | 30% | 7 | 1.83 | Fecal Coliform | High | No Data | Med | No Data | Med | High |
| 34-OUT-1 | 39 S. Orleans Road | | | Yes | -67 | No | NT | 1.74 | 3.32 | 44% | 9 | 2.68 | Fecal Coliform | High | No Data | Med | No Data | Med | Low |
| 34-OUT-2 | 10 Academy Place | | | Yes | -67 | No | 210 | 0.51 | 0.43 | 100% | 3 | 6.12 | Fecal Coliform | High | No Data | High | Med | Med | High |
| 34-OUT-4 | 7 Brewster Cross Road | (9) | | Yes | -67 | No | NT | 0.82 | 0.68 | 100% | 4 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 41-OUT-1 | 9 Kettle Pond Way | | | Yes | -67 | No | NT | 2.35 | 5.84 | 34% | 12 | 2.06 | Fecal Coliform | High | No Data | Low | No Data | Med | Med |
| 69-OUT-1 | 100 Namequoit Road | | | Yes | -37 | No | NT | 0.92 | 2.23 | 35% | 5 | 2.11 | Nitrogen | Med | No Data | Low | No Data | Med | Med |
| 51-OUT-1 | 65 Briar Spring Road | | | No | 0 | No | NT | 1.00 | 2.56 | 33% | 5 | 2.00 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 51-OUT-2 | Gilman Lane Town Landing | | | No | 0 | Yes | NT | 1.66 | 4.61 | 30% | 9 | 1.84 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 57-OUT-1 | 204 Barley Neck Road | (7) | | No | 0 | No | NT | 1.05 | 3.72 | 24% | 5 | 1.45 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 80-OUT-1 | 47 Forest Way | | | No | 0 | No | NT | 2.23 | 6.13 | 30% | 11 | 1.86 | Nitrogen | Low | No Data | Low | No Data | Med | Med |
| 33-OUT-3 | Intersection of West Road and Old Colony Way | | | No | 67 | No | NT | 0.17 | 0.14 | 100% | 1 | 6.12 | Fecal Coliform | Very Low | No Data | High | No Data | Med | Low |

Outfalls with Low Public Benefit / Visibility

| | | | | | | | | | | | | | | | | | | | |
|----------|-------------------|--|--|-----|-----|----|-----|------|------|-----|----|------|----------|-----------|---------|-----|---------|-----|------|
| 36-OUT-2 | 2 Pochet Road | | | Yes | -83 | No | NT | 0.32 | 0.64 | 42% | 2 | 2.54 | Nitrogen | Very High | No Data | Med | No Data | Low | Low |
| 36-OUT-4 | 37 High Tide Lane | | | Yes | -83 | No | 360 | 2.12 | 4.79 | 37% | 11 | 2.27 | Nitrogen | Very High | No Data | Med | High | Low | High |

| Outfall ID | Outfall Street Location | Comments | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |
|------------|---|--------------|--------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|---------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| 35-OUT-1 | 18 Karen Way | (8) | | Yes | -83 | | | | | | | | Nitrogen | Very High | No Data | N/A | No Data | Low | Low |
| 35-OUT-2 | Loomis Lane | | | Yes | -83 | No | NT | 0.12 | 0.14 | 76% | 1 | 4.62 | Nitrogen | Very High | No Data | High | No Data | Low | Low |
| 17-OUT-3 | Route 6 | | | Yes | -67 | No | NT | 0.48 | 0.40 | 100% | 2 | 6.12 | Fecal Coliform | High | High | High | No Data | Low | Low |
| 75-OUT-1 | 24 Ridgewood Road | | | Yes | -61 | No | NT | 1.55 | 4.13 | 31% | 8 | 1.93 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 11-OUT-2 | 16 Ruggles Road | | | Yes | -67 | No | 64 | 1.51 | 6.54 | 19% | 8 | 1.18 | Fecal Coliform | High | No Data | Low | No Data | Low | Low |
| 12-OUT-1 | 210 Brick Hill Road | | | Yes | -67 | No | NT | 2.53 | 6.71 | 32% | 13 | 1.93 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 12-OUT-2 | 4 Freeman Lane | | | Yes | -67 | No | NT | 1.01 | 0.84 | 100% | 5 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 16-OUT-1 | 60 Rock Harbor Road | | | Yes | -67 | No | NT | 0.78 | 1.62 | 40% | 4 | 2.47 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 17-OUT-6 | Route 6 , near Cedar Pond Road | | | Yes | -67 | No | NT | 0.45 | 1.23 | 30% | 2 | 1.87 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 18-OUT-2 | 45 Cranberry Highway | (12) | | Yes | -67 | No | NT | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 18-OUT-3 | 45 Cranberry Highway | (8) (9) (12) | | Yes | -67 | No | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 18-OUT-4 | 40 Ellis Road, Eastham | | | Yes | -67 | Yes | 192 | 45.52 | 59.10 | 64% | 233 | 3.95 | Fecal Coliform | High | No Data | Med | Med | Low | High |
| 18-OUT-UNK | 40 Ellis Road, Eastham | (11) | | No | | | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 25-OUT-2 | 17 Rock Harbor Road | | | Yes | -67 | No | NT | 0.53 | 0.52 | 85% | 3 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-3 | 25 Rock Harbor Road | | | Yes | -67 | No | NT | 0.35 | 0.34 | 85% | 2 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-4 | Rock Harbor and Skaket Beach intersection | | | Yes | -67 | No | NT | 0.46 | 0.45 | 85% | 2 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-6 | Rock Harbor and Skaket Beach intersection | | | Yes | -67 | No | NT | 0.36 | 0.37 | 81% | 2 | 4.97 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-7 | 10 Locust Road | | | Yes | -67 | No | NT | 2.19 | 5.45 | 34% | 11 | 2.06 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 27-OUT-1 | 7 Pine Ridge Lane | | | Yes | -67 | No | NT | 2.03 | 5.80 | 29% | 10 | 1.80 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 27-OUT-2 | 94 Hopkins Lane | | | Yes | -67 | No | NT | 1.74 | 4.45 | 33% | 9 | 2.00 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 33-OUT-2 | 19 Brewster Cross Road | | | Yes | -67 | No | NT | 1.37 | 1.15 | 100% | 7 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 34-OUT-3 | 82 Main Street | | | Yes | -67 | No | 247 | 1.37 | 1.15 | 100% | 7 | 6.12 | Fecal Coliform | High | No Data | High | Med | Low | Med |
| 37-OUT-1 | 9 Samoset Road | | | Yes | -51 | No | NT | 0.72 | 0.60 | 100% | 4 | 6.12 | Nitrogen | High | No Data | High | No Data | Low | Low |
| 37-OUT-2 | 35 Countryside Drive | | | Yes | -51 | No | NT | 0.65 | 1.68 | 32% | 3 | 1.98 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 37-OUT-3 | 35 Countryside Drive | | | Yes | -51 | No | NT | 0.53 | 1.56 | 28% | 3 | 1.72 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 40-OUT-1 | 59 Nickerson Road | | | Yes | -67 | No | NT | 0.41 | 0.90 | 38% | 2 | 2.35 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 40-OUT-2 | 46 Eldredge Parkway | | | Yes | -67 | No | NT | 0.82 | 0.69 | 100% | 4 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 47-OUT-1 | 69 Finlay Road | | | Yes | -67 | No | NT | 2.10 | 3.23 | 54% | 11 | 3.33 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 53-OUT-2 | 94 Baker's Pond Road | | | Yes | -67 | No | NT | 0.32 | 1.25 | 21% | 2 | 1.29 | Fecal Coliform | High | No Data | Low | No Data | Low | Low |
| 42-OUT-1 | 37 Monument Road | | | Yes | -37 | No | NT | 1.18 | 2.69 | 37% | 6 | 2.25 | Nitrogen | Med | No Data | Low | No Data | Low | Low |
| 74-OUT-1 | Intersection of Harwich Road and Rt. 28. | | | Yes | -28 | No | NT | 1.09 | 0.91 | 100% | 6 | 6.12 | Nitrogen | Med | No Data | High | No Data | Low | Low |
| 91-OUT-1 | 50 Winslow Drive | (9) | | Yes | -28 | No | NT | 0.55 | 1.17 | 40% | 3 | 2.43 | Nitrogen | Med | No Data | Med | No Data | Low | Low |
| 17-OUT-1 | Route 6 | | | No | 0 | No | NT | 0.63 | 0.53 | 100% | 3 | 6.12 | Fecal Coliform | Low | High | High | No Data | Low | Med |
| 17-OUT-2 | Route 6 | | | No | 0 | No | NT | 0.32 | 0.26 | 100% | 2 | 6.12 | Fecal Coliform | Low | High | High | No Data | Low | Med |
| 17-OUT-4 | 48 Locust Road | | | No | 0 | No | NT | 2.50 | 5.92 | 35% | 13 | 2.17 | Fecal Coliform | Low | High | Low | No Data | Low | Low |
| 18-OUT-8 | 62 Locust Road | | | No | 0 | No | NT | 0.41 | 0.61 | 56% | 2 | 3.44 | Fecal Coliform | Low | High | Med | No Data | Low | Med |
| 25-OUT-5 | Behind 7 Cedar Pond Road | (2) | | No | 0 | No | NT | 0.61 | 1.52 | 33% | 3 | 2.04 | Fecal Coliform | Low | High | Med | No Data | Low | Low |
| 28-OUT-1 | 85 Great Oak Road | | | No | 0 | No | NT | 6.05 | 17.35 | 29% | 31 | 1.79 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 28-OUT-UNK | 64 Brick Hill Road | (9) | | No | 0 | No | NT | 0.91 | 2.11 | 36% | 5 | 2.21 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 36-OUT-3 | 7 Dylan Way | (9) | | No | 0 | No | NT | 0.43 | 1.02 | 36% | 2 | 2.17 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 36-OUT-1 | 54 Brick Hill Road | (9) | | No | 0 | No | NT | 1.60 | 4.34 | 31% | 8 | 1.90 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 87-OUT-1 | 21 Woodridge Road | | | No | 0 | No | NT | 0.77 | 1.62 | 40% | 4 | 2.45 | Nitrogen | Low | Med | Med | No Data | Low | Low |
| 18-OUT-10 | Route 6 near rotary | | | No | 0 | No | NT | 0.40 | 0.46 | 72% | 2 | 4.43 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 44-OUT-1 | 11 Uncle Harvey's Way | | | No | 0 | No | NT | 0.88 | 2.37 | 31% | 5 | 1.90 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 51-OUT-3 | 57 Briar Spring Road | | | No | 0 | No | NT | 0.36 | 0.88 | 34% | 2 | 2.10 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 91-OUT-UNK | 31 Winslow Drive | (5) | | Yes | -28 | No | NT | 2.57 | 7.46 | 29% | 13 | 1.77 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 39-OUT-2 | Overland Way - Contractor's Area | | | No | 239 | No | NT | 1.20 | 2.29 | 44% | 6 | 2.68 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 18-OUT-11 | 7 Jones Road | (4) | | No | 0 ⁽⁶⁾ | No | NT | 0.42 | 0.74 | 48% | 2 | 2.92 | None | Very Low | No Data | Med | No Data | Low | Low |
| 18-OUT-5 | Route 6 | (9) | | No | 0 ⁽⁴⁾ | No | NT | 0.34 | 0.29 | 100% | 2 | 6.12 | None | Very Low | No Data | High | No Data | Low | Low |
| 18-OUT-6 | Route 6 | (9) | | No | 0 ⁽⁴⁾ | No | NT | 0.56 | 0.47 | 100% | 3 | 6.12 | None | Very Low | No Data | High | No Data | Low | Low |
| 24-OUT-1 | Skaket Beach Road near Route 6 | | | No | 67 | No | NT | 0.30 | 1.59 | 16% | 2 | 0.98 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Med |

| Outfall ID | Outfall Street Location | Comments | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |
|------------|--|----------|--------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|---------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| 24-OUT-2 | 50 Skaket Beach Road | (8) | | | | | | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 24-OUT-3 | 5 Captain Linnell Road | | | No | 67 | No | NT | 1.05 | 1.83 | 48% | 5 | 2.94 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | High |
| 24-OUT-4 | 96 Skaket Beach Road | (6) | | No | 67 | No | NT | 1.02 | 3.98 | 22% | 5 | 1.32 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 24-OUT-5 | 88 Skaket Beach Road | | | No | 67 | No | NT | 1.28 | 4.38 | 24% | 7 | 1.50 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 24-OUT-6 | 88 Skaket Beach Road | | | No | 67 | No | NT | 0.96 | 1.89 | 43% | 5 | 2.60 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 31-OUT-1 | 60 Captain Linnell Road | | CCB-17 | No | 239 | No | NT | 0.65 | 1.23 | 44% | 3 | 2.71 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 31-OUT-2 | 56 Captain Linnell Road | | CCB-17 | No | 239 | No | NT | 1.76 | 5.36 | 27% | 9 | 1.68 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-1 | 74 Captain Linnell Road | | | No | 239 | No | NT | 0.52 | 1.20 | 36% | 3 | 2.23 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-2 | 87 Captain Linnell Road | | | No | 239 | No | NT | 1.22 | 3.20 | 32% | 6 | 1.95 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-3 | West Road to west of Route 6 overpass | | | No | 67 | No | NT | 0.19 | 0.30 | 52% | 1 | 3.20 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-4 | West Road to west of Route 6 overpass | | | No | 67 | No | NT | 0.19 | 0.30 | 52% | 1 | 3.20 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-5 | Behind 92 West Road | | | No | 67 | No | NT | 0.71 | 0.96 | 62% | 4 | 3.80 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-6 | 32 Skymeadow Drive (Cul-de-Sac) | | | No | 239 | No | NT | 0.35 | 0.65 | 44% | 2 | 2.71 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-7 | 60 Captain Linnell Road | (8) | | No | 239 | | NT | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 33-OUT-4 | Intersection of West Road and Old Colony Way | | | No | 67 | No | NT | 0.52 | 0.43 | 100% | 3 | 6.12 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Low |
| 33-OUT-5 | 89 Old Colony Way | | | No | 67 | No | NT | 0.72 | 0.83 | 73% | 4 | 4.46 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 39-OUT-1 | 46 Bay Ridge Lane | | | No | 239 | No | NT | 2.19 | 2.21 | 83% | 11 | 5.08 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Low |
| 46-OUT-1 | 18 Bay Ridge Lane | (10) | | No | 324 | | | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 46-OUT-2 | 18 Bay Ridge Lane | | | No | 324 | No | NT | 2.35 | 1.97 | 100% | 12 | 6.12 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Med |
| 53-OUT-1 | 60 Baker's Pond Road | (8) | | No | 67 | | NT | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 53-OUT-3 | 63 Baker's Pond Road | | | No | 67 | No | NT | 0.41 | 1.20 | 29% | 2 | 1.76 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 53-OUT-4 | 66 Baker's Pond Road | (3) | | No | 67 | No | NT | 0.37 | 0.46 | 67% | 2 | 4.07 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |

Notes:

- (1) To be completed once Outfall Prioritization Matrix has been finalized
- (2) Outfall was not located
- (3) Private outfall
- (4) Threshold percent change values were not included in MEP reports
- (5) Outfall is an asphalt swale
- (6) Unable to access Outfall. Some data is incomplete.
- (7) Unable to locate Outfall. Assumed Outfall no longer exists.

- (8) Outfall classified as a culvert.
- (9) Unable to locate outfall. Assumed outfall exists.
- (10) Outfall abandoned
- (11) Located outside of Town boundaries
- (12) Outfall drains into 18-OUT-4
- (13) Loading rate for impervious surfaces only
- (14) TMDL needed, existing, or assumed will have a TMDL in near future

- (15) Nitrogen loading based over entire drainage area (pervious & impervious)
- NT = Not Tested



Project No.: 8615148
 Client: Town of Orleans, MA
 Project Name: Orleans Town-Wide Preliminary Stormwater Assessment
 Document Title: Outfall Prioritization Matrix
 Date: 9/24/2013

Outfall Prioritization based on Phosphorous Sensitivity

| Outfall ID | Outfall Street Location | Comments | Descriptive or Quantified Criteria | | | | | | | | | | Criteria for Comparative Rating | | | | | | |
|------------|-------------------------|----------|------------------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|-------------------------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| | | | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL ⁽¹⁴⁾ | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |

Outfalls with High Phosphorous Sensitivity

| | | | | | | | | | | | | | | | | | | | |
|----------|--------------------------|-----|--|-----|-----|----|----|------|------|------|----|------|----------------|------|------|------|---------|-----|-----|
| 18-OUT-9 | 43 Canal Road | | | Yes | -67 | No | NT | 0.97 | 0.81 | 100% | 5 | 6.12 | Fecal Coliform | High | High | High | No Data | Med | Med |
| 17-OUT-3 | Route 6 | | | Yes | -67 | No | NT | 0.48 | 0.40 | 100% | 2 | 6.12 | Fecal Coliform | High | High | High | No Data | Low | Low |
| 17-OUT-1 | Route 6 | | | No | 0 | No | NT | 0.63 | 0.53 | 100% | 3 | 6.12 | Fecal Coliform | Low | High | High | No Data | Low | Med |
| 17-OUT-2 | Route 6 | | | No | 0 | No | NT | 0.32 | 0.26 | 100% | 2 | 6.12 | Fecal Coliform | Low | High | High | No Data | Low | Med |
| 17-OUT-4 | 48 Locust Road | | | No | 0 | No | NT | 2.50 | 5.92 | 35% | 13 | 2.17 | Fecal Coliform | Low | High | Low | No Data | Low | Low |
| 18-OUT-8 | 62 Locust Road | | | No | 0 | No | NT | 0.41 | 0.61 | 56% | 2 | 3.44 | Fecal Coliform | Low | High | Med | No Data | Low | Med |
| 25-OUT-5 | Behind 7 Cedar Pond Road | (2) | | No | 0 | No | NT | 0.61 | 1.52 | 33% | 3 | 2.04 | Fecal Coliform | Low | High | Med | No Data | Low | Low |

Outfalls with Medium Phosphorous Sensitivity

| | | | | | | | | | | | | | | | | | | | |
|----------|---------------------|--|--|----|---|----|----|------|------|-----|---|------|------------------|-----|-----|-----|---------|------|-----|
| 48-OUT-1 | 153 S. Orleans Road | | | No | 0 | No | NT | 1.20 | 2.84 | 35% | 6 | 2.17 | Dissolved Oxygen | Low | Med | Low | No Data | High | Med |
| 55-OUT-1 | 120 Monument Road | | | No | 0 | No | 17 | 0.56 | 0.72 | 65% | 3 | 3.97 | Dissolved Oxygen | Low | Med | Med | No Data | High | Low |
| 87-OUT-1 | 21 Woodridge Road | | | No | 0 | No | NT | 0.77 | 1.62 | 40% | 4 | 2.45 | Nitrogen | Low | Med | Med | No Data | Low | Low |

Outfalls with Low Phosphorous Sensitivity / No Data

| | | | | | | | | | | | | | | | | | | | |
|------------|--|-----|--------|-----|-----|-----|-----|-------|-------|------|----|------|------------------------|-----------|---------|------|---------|------|------|
| 60-OUT-1 | 110 Bakers Pond Road | | | No | 0 | No | NT | 1.03 | 1.87 | 46% | 5 | 2.81 | Mercury in Fish Tissue | Low | Low | Med | No Data | High | High |
| 35-OUT-2 | Loomis Lane | | | Yes | -83 | No | NT | 0.12 | 0.14 | 76% | 1 | 4.62 | Nitrogen | Very High | No Data | High | No Data | Low | Low |
| 39-OUT-2 | Overland Way - Contractor's Area | | | No | 239 | No | NT | 1.20 | 2.29 | 44% | 6 | 2.68 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 44-OUT-2 | Intersection of Uncle Harvey's Way & Pochet Road | (2) | | No | 0 | No | NT | 10.10 | 28.88 | 29% | 52 | 1.79 | Nitrogen | Low | No Data | Low | No Data | High | High |
| 80-OUT-1 | 47 Forest Way | | | No | 0 | No | NT | 2.23 | 6.13 | 30% | 11 | 1.86 | Nitrogen | Low | No Data | Low | No Data | Med | Med |
| 76-OUT-1 | 142 Portanimituc Road | (9) | | Yes | -61 | No | NT | 0.37 | 0.61 | 51% | 2 | 3.13 | Nitrogen | High | No Data | Med | No Data | Med | High |
| 28-OUT-1 | 85 Great Oak Road | | | No | 0 | No | NT | 6.05 | 17.35 | 29% | 31 | 1.79 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 28-OUT-UNK | 64 Brick Hill Road | (9) | | No | 0 | No | NT | 0.91 | 2.11 | 36% | 5 | 2.21 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 70-OUT-1 | 158 Namequoit Road | | | Yes | -61 | No | NT | 0.28 | 0.47 | 49% | 1 | 3.02 | Nitrogen | High | No Data | Med | No Data | High | Med |
| 11-OUT-1 | 5 Asas Landing | | | Yes | -67 | No | 130 | 1.95 | 7.20 | 23% | 10 | 1.39 | Fecal Coliform | High | No Data | Low | Med | High | Med |
| 13-OUT-1 | Smugglers Path | | | No | 0 | Yes | NT | 0.80 | 4.95 | 13% | 4 | 0.83 | None | Low | No Data | Low | No Data | High | Low |
| 15-OUT-1 | Skaket Beach | | CCB-17 | No | 0 | No | 164 | 2.26 | 1.89 | 100% | 12 | 6.12 | None | Low | No Data | High | Med | High | Med |
| 55-OUT-2 | 36 Herring Brook Way | | | No | 0 | Yes | NT | 1.57 | 3.92 | 33% | 8 | 2.05 | Nitrogen | Low | No Data | Low | No Data | High | Low |

| Outfall ID | Outfall Street Location | Comments | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL ⁽¹⁴⁾ | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |
|------------|--|--------------|--------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|-------------------------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| 42-OUT-2 | 19 School Road | | | Yes | -83 | No | NT | 2.96 | 5.31 | 47% | 15 | 2.86 | Nitrogen | Very High | No Data | Med | No Data | Med | Low |
| 43-OUT-1 | 69 Barley Neck Road | | | Yes | -83 | No | 366 | 2.16 | 4.50 | 40% | 11 | 2.46 | Nitrogen | Very High | No Data | Med | High | High | High |
| 50-OUT-1 | 30 Cedar Cove Road / Barley Neck Road | | | Yes | -83 | No | 366 | 7.07 | 17.03 | 35% | 36 | 2.13 | Nitrogen | Very High | No Data | Med | High | Med | High |
| 16-OUT-2 | Bay View Drive | (2) | CCB-9 | Yes | -67 | No | NT | 2.84 | 2.95 | 81% | 15 | 4.94 | Fecal Coliform | High | No Data | Med | No Data | Med | High |
| 17-OUT-5 | 154 Rock Harbor Road | (8) | | No | 0 | | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Med | Low |
| 18-OUT-7 | 65 Canal Road | | | Yes | -67 | No | NT | 1.48 | 3.36 | 37% | 8 | 2.26 | Fecal Coliform | High | No Data | Med | No Data | Med | Low |
| 19-OUT-1 | 16 Gibson Road | | | Yes | -67 | No | NT | 1.21 | 3.20 | 32% | 6 | 1.94 | Fecal Coliform | High | No Data | Med | No Data | Med | Med |
| 25-OUT-1 | On East side of Cape Cod Rail Trail behind 90 Massachusetts 6A | | | Yes | -67 | No | NT | 2.03 | 2.01 | 85% | 10 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 26-OUT-1 | 1 Cottage Street | | | Yes | -67 | No | NT | 0.92 | 0.77 | 100% | 5 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 26-OUT-2 | 1 Cottage Street | | | Yes | -67 | No | NT | 0.92 | 0.77 | 100% | 5 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 33-OUT-1 | Behind 15B Center Place | (9) | | Yes | -67 | No | NT | 1.30 | 3.64 | 30% | 7 | 1.83 | Fecal Coliform | High | No Data | Med | No Data | Med | High |
| 34-OUT-1 | 39 S. Orleans Road | | | Yes | -67 | No | NT | 1.74 | 3.32 | 44% | 9 | 2.68 | Fecal Coliform | High | No Data | Med | No Data | Med | Low |
| 34-OUT-2 | 10 Academy Place | | | Yes | -67 | No | 210 | 0.51 | 0.43 | 100% | 3 | 6.12 | Fecal Coliform | High | No Data | High | Med | Med | High |
| 34-OUT-4 | 7 Brewster Cross Road | (9) | | Yes | -67 | No | NT | 0.82 | 0.68 | 100% | 4 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 41-OUT-1 | 9 Kettle Pond Way | | | Yes | -67 | No | NT | 2.35 | 5.84 | 34% | 12 | 2.06 | Fecal Coliform | High | No Data | Low | No Data | Med | Med |
| 69-OUT-1 | 100 Namequoit Road | | | Yes | -37 | No | NT | 0.92 | 2.23 | 35% | 5 | 2.11 | Nitrogen | Med | No Data | Low | No Data | Med | Med |
| 51-OUT-1 | 65 Briar Spring Road | | | No | 0 | No | NT | 1.00 | 2.56 | 33% | 5 | 2.00 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 51-OUT-2 | Gilman Lane Town Landing | | | No | 0 | Yes | NT | 1.66 | 4.61 | 30% | 9 | 1.84 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 57-OUT-1 | 204 Barley Neck Road | (7) | | No | 0 | No | NT | 1.05 | 3.72 | 24% | 5 | 1.45 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 33-OUT-3 | Intersection of West Road and Old Colony Way | | | No | 67 | No | NT | 0.17 | 0.14 | 100% | 1 | 6.12 | Fecal Coliform | Very Low | No Data | High | No Data | Med | Low |
| 36-OUT-2 | 2 Pochet Road | | | Yes | -83 | No | NT | 0.32 | 0.64 | 42% | 2 | 2.54 | Nitrogen | Very High | No Data | Med | No Data | Low | Low |
| 36-OUT-4 | 37 High Tide Lane | | | Yes | -83 | No | 360 | 2.12 | 4.79 | 37% | 11 | 2.27 | Nitrogen | Very High | No Data | Med | High | Low | High |
| 35-OUT-1 | 18 Karen Way | (8) | | Yes | -83 | | | | | | | | Nitrogen | Very High | No Data | N/A | No Data | Low | Low |
| 75-OUT-1 | 24 Ridgewood Road | | | Yes | -61 | No | NT | 1.55 | 4.13 | 31% | 8 | 1.93 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 11-OUT-2 | 16 Ruggles Road | | | Yes | -67 | No | 64 | 1.51 | 6.54 | 19% | 8 | 1.18 | Fecal Coliform | High | No Data | Low | No Data | Low | Low |
| 12-OUT-1 | 210 Brick Hill Road | | | Yes | -67 | No | NT | 2.53 | 6.71 | 32% | 13 | 1.93 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 12-OUT-2 | 4 Freeman Lane | | | Yes | -67 | No | NT | 1.01 | 0.84 | 100% | 5 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 16-OUT-1 | 60 Rock Harbor Road | | | Yes | -67 | No | NT | 0.78 | 1.62 | 40% | 4 | 2.47 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 17-OUT-6 | Route 6 , near Cedar Pond Road | | | Yes | -67 | No | NT | 0.45 | 1.23 | 30% | 2 | 1.87 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 18-OUT-2 | 45 Cranberry Highway | (12) | | Yes | -67 | No | NT | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 18-OUT-3 | 45 Cranberry Highway | (8) (9) (12) | | Yes | -67 | No | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |

| Outfall ID | Outfall Street Location | Comments | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ¹⁵ | 303d Listing / TMDL ⁽¹⁴⁾ | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |
|------------|---|----------|--------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|-------------------------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| 18-OUT-4 | 40 Ellis Road, Eastham | | | Yes | -67 | Yes | 192 | 45.52 | 59.10 | 64% | 233 | 3.95 | Fecal Coliform | High | No Data | Med | Med | Low | High |
| 18-OUT-UNK | 40 Ellis Road, Eastham | (11) | | No | | | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 25-OUT-2 | 17 Rock Harbor Road | | | Yes | -67 | No | NT | 0.53 | 0.52 | 85% | 3 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-3 | 25 Rock Harbor Road | | | Yes | -67 | No | NT | 0.35 | 0.34 | 85% | 2 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-4 | Rock Harbor and Skaket Beach Intersection | | | Yes | -67 | No | NT | 0.46 | 0.45 | 85% | 2 | 5.20 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-6 | Rock Harbor and Skaket Beach Intersection | | | Yes | -67 | No | NT | 0.36 | 0.37 | 81% | 2 | 4.97 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-7 | 10 Locust Road | | | Yes | -67 | No | NT | 2.19 | 5.45 | 34% | 11 | 2.06 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 27-OUT-1 | 7 Pine Ridge Lane | | | Yes | -67 | No | NT | 2.03 | 5.80 | 29% | 10 | 1.80 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 27-OUT-2 | 94 Hopkins Lane | | | Yes | -67 | No | NT | 1.74 | 4.45 | 33% | 9 | 2.00 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 33-OUT-2 | 19 Brewster Cross Road | | | Yes | -67 | No | NT | 1.37 | 1.15 | 100% | 7 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 34-OUT-3 | 82 Main Street | | | Yes | -67 | No | 247 | 1.37 | 1.15 | 100% | 7 | 6.12 | Fecal Coliform | High | No Data | High | Med | Low | Med |
| 37-OUT-1 | 9 Samoset Road | | | Yes | -51 | No | NT | 0.72 | 0.60 | 100% | 4 | 6.12 | Nitrogen | High | No Data | High | No Data | Low | Low |
| 37-OUT-2 | 35 Countryside Drive | | | Yes | -51 | No | NT | 0.65 | 1.68 | 32% | 3 | 1.98 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 37-OUT-3 | 35 Countryside Drive | | | Yes | -51 | No | NT | 0.53 | 1.56 | 28% | 3 | 1.72 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 40-OUT-1 | 59 Nickerson Road | | | Yes | -67 | No | NT | 0.41 | 0.90 | 38% | 2 | 2.35 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 40-OUT-2 | 46 Eldredge Parkway | | | Yes | -67 | No | NT | 0.82 | 0.69 | 100% | 4 | 6.12 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 47-OUT-1 | 69 Finlay Road | | | Yes | -67 | No | NT | 2.10 | 3.23 | 54% | 11 | 3.33 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 53-OUT-2 | 94 Baker's Pond Road | | | Yes | -67 | No | NT | 0.32 | 1.25 | 21% | 2 | 1.29 | Fecal Coliform | High | No Data | Low | No Data | Low | Low |
| 42-OUT-1 | 37 Monument Road | | | Yes | -37 | No | NT | 1.18 | 2.69 | 37% | 6 | 2.25 | Nitrogen | Med | No Data | Low | No Data | Low | Low |
| 74-OUT-1 | Intersection of Harwich Road and Rt. 28. | | | Yes | -28 | No | NT | 1.09 | 0.91 | 100% | 6 | 6.12 | Nitrogen | Med | No Data | High | No Data | Low | Low |
| 91-OUT-1 | 50 Winslow Drive | (9) | | Yes | -28 | No | NT | 0.55 | 1.17 | 40% | 3 | 2.43 | Nitrogen | Med | No Data | Med | No Data | Low | Low |
| 36-OUT-3 | 7 Dylan Way | (9) | | No | 0 | No | NT | 0.43 | 1.02 | 36% | 2 | 2.17 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 36-OUT-1 | 54 Brick Hill Road | (9) | | No | 0 | No | NT | 1.60 | 4.34 | 31% | 8 | 1.90 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 18-OUT-10 | Route 6 near rotary | | | No | 0 | No | NT | 0.40 | 0.46 | 72% | 2 | 4.43 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 44-OUT-1 | 11 Uncle Harvey's Way | | | No | 0 | No | NT | 0.88 | 2.37 | 31% | 5 | 1.90 | Nitrogen | Low | No Data | Low | No Data | Med | Med |
| 51-OUT-3 | 57 Briar Spring Road | | | No | 0 | No | NT | 0.36 | 0.88 | 34% | 2 | 2.10 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 91-OUT-UNK | 31 Winslow Drive | (5) | | Yes | -28 | No | NT | 2.57 | 7.46 | 29% | 13 | 1.77 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 18-OUT-11 | 7 Jones Road | (4) | | No | 0 ⁽⁴⁾ | No | NT | 0.42 | 0.74 | 48% | 2 | 2.92 | None | Very Low | No Data | Med | No Data | Low | Low |
| 18-OUT-5 | Route 6 | (9) | | No | 0 ⁴ | No | NT | 0.34 | 0.29 | 100% | 2 | 6.12 | None | Very Low | No Data | High | No Data | Low | Low |
| 18-OUT-6 | Route 6 | (9) | | No | 0 ⁴ | No | NT | 0.56 | 0.47 | 100% | 3 | 6.12 | None | Very Low | No Data | High | No Data | Low | Low |
| 24-OUT-1 | Skaket Beach Road near Route 6 | | | No | 67 | No | NT | 0.30 | 1.59 | 16% | 2 | 0.98 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Med |
| 24-OUT-2 | 50 Skaket Beach Road | (8) | | | | | | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 24-OUT-3 | 5 Captian Linnell Road | | | No | 67 | No | NT | 1.05 | 1.83 | 48% | 5 | 2.94 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | High |

| Outfall ID | Outfall Street Location | Comments | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL ⁽¹⁴⁾ | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |
|------------|--|----------|--------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|-------------------------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| 24-OUT-4 | 96 Skaket Beach Road | (6) | | No | 67 | No | NT | 1.02 | 3.98 | 22% | 5 | 1.32 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 24-OUT-5 | 88 Skaket Beach Road | | | No | 67 | No | NT | 1.28 | 4.38 | 24% | 7 | 1.50 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 24-OUT-6 | 88 Skaket Beach Road | | | No | 67 | No | NT | 0.96 | 1.89 | 43% | 5 | 2.60 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 31-OUT-1 | 60 Captain Linnell Road | | CCB-17 | No | 239 | No | NT | 0.65 | 1.23 | 44% | 3 | 2.71 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 31-OUT-2 | 56 Captain Linnell Road | | CCB-17 | No | 239 | No | NT | 1.76 | 5.36 | 27% | 9 | 1.68 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-1 | 74 Captain Linnell Road | | | No | 239 | No | NT | 0.52 | 1.20 | 36% | 3 | 2.23 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-2 | 87 Captain Linnell Road | | | No | 239 | No | NT | 1.22 | 3.20 | 32% | 6 | 1.95 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-3 | West Road to west of Route 6 overpass | | | No | 67 | No | NT | 0.19 | 0.30 | 52% | 1 | 3.20 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-4 | West Road to west of Route 6 overpass | | | No | 67 | No | NT | 0.19 | 0.30 | 52% | 1 | 3.20 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-5 | Behind 92 West Road | | | No | 67 | No | NT | 0.71 | 0.96 | 62% | 4 | 3.80 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-6 | 32 Skymeadow Drive (Cul-de-Sac) | | | No | 239 | No | NT | 0.35 | 0.65 | 44% | 2 | 2.71 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-7 | 60 Captain Linnell Road | (8) | | No | 239 | | NT | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 33-OUT-4 | Intersection of West Road and Old Colony Way | | | No | 67 | No | NT | 0.52 | 0.43 | 100% | 3 | 6.12 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Low |
| 33-OUT-5 | 89 Old Colony Way | | | No | 67 | No | NT | 0.72 | 0.83 | 73% | 4 | 4.46 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 39-OUT-1 | 46 Bay Ridge Lane | | | No | 239 | No | NT | 2.19 | 2.21 | 83% | 11 | 5.08 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Low |
| 46-OUT-1 | 18 Bay Ridge Lane | (10) | | No | 324 | | | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 46-OUT-2 | 18 Bay Ridge Lane | | | No | 324 | No | NT | 2.35 | 1.97 | 100% | 12 | 6.12 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Med |
| 53-OUT-1 | 60 Baker's Pond Road | (8) | | No | 67 | | NT | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 53-OUT-3 | 63 Baker's Pond Road | | | No | 67 | No | NT | 0.41 | 1.20 | 29% | 2 | 1.76 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 53-OUT-4 | 66 Baker's Pond Road | (3) | | No | 67 | No | NT | 0.37 | 0.46 | 67% | 2 | 4.07 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |

Notes:

- (1) To be completed once Outfall Prioritization Matrix has been finalized
- (2) Outfall was not located
- (3) Private outfall
- (4) Threshold percent change values were not included in MEP reports
- (5) Outfall is an asphalt swale
- (6) Unable to access Outfall. Some data is incomplete.
- (7) Unable to locate Outfall. Assumed Outfall no longer exists.

- (8) Outfall classified as a culvert.
- (9) Unable to locate outfall. Assumed outfall exists.
- (10) Outfall abandoned
- (11) Located outside of Town boundaries
- (12) Outfall drains into 18-OUT-4
- (13) Loading rate for impervious surfaces only
- (14) TMDL needed, existing, or assumed will have a TMDL in near future

- (15) Nitrogen loading based over entire drainage area (pervious & impervious)
- NT = Not Tested



Project No.: 8615148
 Client: Town of Orleans, MA
 Project Name: Orleans Town-Wide Preliminary Stormwater Assessment
 Document Title: Outfall Prioritization Matrix
 Date: 9/24/2013

Outfall Prioritization based on Watershed Nitrogen Sensitivity

| Outfall ID | Outfall Street Location | Comments | Descriptive or Quantified Criteria | | | | | | | | | | Criteria for Comparative Rating | | | | | |
|------------|-------------------------|----------|------------------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|---------------------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|
| | | | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility |

Outfalls located within Watershed with Very High Sensitivity to Nitrogen

| | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------------------|-----|--|-----|-----|----|-----|------|-------|-----|----|---|----------|-----------|---------|------|---------|------|------|
| 35-OUT-2 | Loomis Lane | | | Yes | -83 | No | NT | 0.12 | 0.14 | 76% | 1 | 5 | Nitrogen | Very High | No Data | High | No Data | Low | Low |
| 42-OUT-2 | 19 School Road | | | Yes | -83 | No | NT | 2.96 | 5.31 | 47% | 15 | 3 | Nitrogen | Very High | No Data | Med | No Data | Med | Low |
| 43-OUT-1 | 69 Barley Neck Road | | | Yes | -83 | No | 366 | 2.16 | 4.50 | 40% | 11 | 2 | Nitrogen | Very High | No Data | Med | High | High | High |
| 50-OUT-1 | 30 Cedar Cove Road / Barley Neck Road | | | Yes | -83 | No | 366 | 7.07 | 17.03 | 35% | 36 | 2 | Nitrogen | Very High | No Data | Med | High | Med | High |
| 36-OUT-2 | 2 Pochet Road | | | Yes | -83 | No | NT | 0.32 | 0.64 | 42% | 2 | 3 | Nitrogen | Very High | No Data | Med | No Data | Low | Low |
| 36-OUT-4 | 37 High Tide Lane | | | Yes | -83 | No | 360 | 2.12 | 4.79 | 37% | 11 | 2 | Nitrogen | Very High | No Data | Med | High | Low | High |
| 35-OUT-1 | 18 Karen Way | (8) | | Yes | -83 | | | | | | | | Nitrogen | Very High | No Data | N/A | No Data | Low | Low |

Outfalls located within Watershed with High Sensitivity to Nitrogen

| | | | | | | | | | | | | | | | | | | | |
|------------|---|--------------|-------|-----|-----|-----|-----|-------|-------|------|-----|---|----------------|------|---------|------|---------|------|------|
| 18-OUT-9 | 43 Canal Road | | | Yes | -67 | No | NT | 0.97 | 0.81 | 100% | 5 | 6 | Fecal Coliform | High | High | High | No Data | Med | Med |
| 17-OUT-3 | Route 6 | | | Yes | -67 | No | NT | 0.48 | 0.40 | 100% | 2 | 6 | Fecal Coliform | High | High | High | No Data | Low | Low |
| 76-OUT-1 | 142 Portanimitic Road | (9) | | Yes | -61 | No | NT | 0.37 | 0.61 | 51% | 2 | 3 | Nitrogen | High | No Data | Med | No Data | Med | High |
| 70-OUT-1 | 158 Namequoit Road | | | Yes | -61 | No | NT | 0.28 | 0.47 | 49% | 1 | 3 | Nitrogen | High | No Data | Med | No Data | High | Med |
| 11-OUT-1 | 5 Asas Landing | | | Yes | -67 | No | 130 | 1.95 | 7.20 | 23% | 10 | 1 | Nitrogen | High | No Data | Low | Med | High | Med |
| 16-OUT-2 | Bay View Drive | (2) | CCB-9 | Yes | -67 | No | NT | 2.84 | 2.95 | 81% | 15 | 5 | Fecal Coliform | High | No Data | Med | No Data | Med | High |
| 17-OUT-5 | 154 Rock Harbor Road | (8) | | No | 0 | | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Med | Low |
| 18-OUT-7 | 65 Canal Road | | | Yes | -67 | No | NT | 1.48 | 3.36 | 37% | 8 | 2 | Fecal Coliform | High | No Data | Med | No Data | Med | Low |
| 19-OUT-1 | 16 Gibson Road | | | Yes | -67 | No | NT | 1.21 | 3.20 | 32% | 6 | 2 | Fecal Coliform | High | No Data | Med | No Data | Med | Med |
| 25-OUT-1 | On East side of Cape Cod Rail Trail behind 90 Massachusetts | | | Yes | -67 | No | NT | 2.03 | 2.01 | 85% | 10 | 5 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 26-OUT-1 | 1 Cottage Street | | | Yes | -67 | No | NT | 0.92 | 0.77 | 100% | 5 | 6 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 26-OUT-2 | 1 Cottage Street | | | Yes | -67 | No | NT | 0.92 | 0.77 | 100% | 5 | 6 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 33-OUT-1 | Behind 15B Center Place | (9) | | Yes | -67 | No | NT | 1.30 | 3.64 | 30% | 7 | 2 | Fecal Coliform | High | No Data | Med | No Data | Med | High |
| 34-OUT-1 | 39 S. Orleans Road | | | Yes | -67 | No | NT | 1.74 | 3.32 | 44% | 9 | 3 | Fecal Coliform | High | No Data | Med | No Data | Med | Low |
| 34-OUT-2 | 10 Academy Place | | | Yes | -67 | No | 210 | 0.51 | 0.43 | 100% | 3 | 6 | Fecal Coliform | High | No Data | High | Med | Med | High |
| 34-OUT-4 | 7 Brewster Cross Road | (9) | | Yes | -67 | No | NT | 0.82 | 0.68 | 100% | 4 | 6 | Fecal Coliform | High | No Data | High | No Data | Med | Low |
| 41-OUT-1 | 9 Kettle Pond Way | | | Yes | -67 | No | NT | 2.35 | 5.84 | 34% | 12 | 2 | Fecal Coliform | High | No Data | Low | No Data | Med | Med |
| 75-OUT-1 | 24 Ridgewood Road | | | Yes | -61 | No | NT | 1.55 | 4.13 | 31% | 8 | 2 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 11-OUT-2 | 16 Ruggles Road | | | Yes | -67 | No | 64 | 1.51 | 6.54 | 19% | 8 | 1 | Fecal Coliform | High | No Data | Low | No Data | Low | Low |
| 12-OUT-1 | 210 Brick Hill Road | | | Yes | -67 | No | NT | 2.53 | 6.71 | 32% | 13 | 2 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 12-OUT-2 | 4 Freeman Lane | | | Yes | -67 | No | NT | 1.01 | 0.84 | 100% | 5 | 6 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 16-OUT-1 | 60 Rock Harbor Road | | | Yes | -67 | No | NT | 0.78 | 1.62 | 40% | 4 | 2 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 17-OUT-6 | Route 6 , near Cedar Pond Road | | | Yes | -67 | No | NT | 0.45 | 1.23 | 30% | 2 | 2 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 18-OUT-2 | 45 Cranberry Highway | (12) | | Yes | -67 | No | NT | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 18-OUT-3 | 45 Cranberry Highway | (8) (9) (12) | | Yes | -67 | No | NT | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 18-OUT-4 | 40 Ellis Road, Eastham | | | Yes | -67 | Yes | 192 | 45.52 | 59.10 | 64% | 233 | 4 | Fecal Coliform | High | No Data | Med | Med | Low | High |
| 18-OUT-UNK | 40 Ellis Road, Eastham | (11) | | No | | | | | | | | | Fecal Coliform | High | No Data | N/A | No Data | Low | High |
| 25-OUT-2 | 17 Rock Harbor Road | | | Yes | -67 | No | NT | 0.53 | 0.52 | 85% | 3 | 5 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-3 | 25 Rock Harbor Road | | | Yes | -67 | No | NT | 0.35 | 0.34 | 85% | 2 | 5 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-4 | Rock Harbor and Skaket Beach intersection | | | Yes | -67 | No | NT | 0.46 | 0.45 | 85% | 2 | 5 | Fecal Coliform | High | No Data | High | No Data | Low | Low |

| Outfall ID | Outfall Street Location | Comments | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |
|------------|---|----------|--------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|---------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| 25-OUT-6 | Rock Harbor and Skaket Beach intersection | | | Yes | -67 | No | NT | 0.36 | 0.37 | 81% | 2 | 5 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 25-OUT-7 | 10 Locust Road | | | Yes | -67 | No | NT | 2.19 | 5.45 | 34% | 11 | 2 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 27-OUT-1 | 7 Pine Ridge Lane | | | Yes | -67 | No | NT | 2.03 | 5.80 | 29% | 10 | 2 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 27-OUT-2 | 94 Hopkins Lane | | | Yes | -67 | No | NT | 1.74 | 4.45 | 33% | 9 | 2 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 33-OUT-2 | 19 Brewster Cross Road | | | Yes | -67 | No | NT | 1.37 | 1.15 | 100% | 7 | 6 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 34-OUT-3 | 82 Main Street | | | Yes | -67 | No | 247 | 1.37 | 1.15 | 100% | 7 | 6 | Fecal Coliform | High | No Data | High | Med | Low | Med |
| 37-OUT-1 | 9 Samoset Road | | | Yes | -51 | No | NT | 0.72 | 0.60 | 100% | 4 | 6 | Nitrogen | High | No Data | High | No Data | Low | Low |
| 37-OUT-2 | 35 Countryside Drive | | | Yes | -51 | No | NT | 0.65 | 1.68 | 32% | 3 | 2 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 37-OUT-3 | 35 Countryside Drive | | | Yes | -51 | No | NT | 0.53 | 1.56 | 28% | 3 | 2 | Nitrogen | High | No Data | Low | No Data | Low | Low |
| 40-OUT-1 | 59 Nickerson Road | | | Yes | -67 | No | NT | 0.41 | 0.90 | 38% | 2 | 2 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 40-OUT-2 | 46 Eldredge Parkway | | | Yes | -67 | No | NT | 0.82 | 0.69 | 100% | 4 | 6 | Fecal Coliform | High | No Data | High | No Data | Low | Low |
| 47-OUT-1 | 69 Finlay Road | | | Yes | -67 | No | NT | 2.10 | 3.23 | 54% | 11 | 3 | Fecal Coliform | High | No Data | Med | No Data | Low | Low |
| 53-OUT-2 | 94 Baker's Pond Road | | | Yes | -67 | No | NT | 0.32 | 1.25 | 21% | 2 | 1 | Fecal Coliform | High | No Data | Low | No Data | Low | Low |

Outfalls located within Watershed with Medium Sensitivity to Nitrogen

| | | | | | | | | | | | | | | | | | | | |
|----------|--|-----|--|-----|-----|----|----|------|------|------|---|---|----------|-----|---------|------|---------|-----|-----|
| 69-OUT-1 | 100 Namequoit Road | | | Yes | -37 | No | NT | 0.92 | 2.23 | 35% | 5 | 2 | Nitrogen | Med | No Data | Low | No Data | Med | Med |
| 42-OUT-1 | 37 Monument Road | | | Yes | -37 | No | NT | 1.18 | 2.69 | 37% | 6 | 2 | Nitrogen | Med | No Data | Low | No Data | Low | Low |
| 74-OUT-1 | Intersection of Harwich Road and Rt. 28. | | | Yes | -28 | No | NT | 1.09 | 0.91 | 100% | 6 | 6 | Nitrogen | Med | No Data | High | No Data | Low | Low |
| 91-OUT-1 | 50 Winslow Drive | (9) | | Yes | -28 | No | NT | 0.55 | 1.17 | 40% | 3 | 2 | Nitrogen | Med | No Data | Med | No Data | Low | Low |

Outfalls located within Watershed with Low Sensitivity to Nitrogen

| | | | | | | | | | | | | | | | | | | | |
|------------|--|-----|--------|-----|-----|-----|-----|-------|-------|------|----|---|------------------------|-----|---------|------|---------|------|------|
| 17-OUT-1 | Route 6 | | | No | 0 | No | NT | 0.63 | 0.53 | 100% | 3 | 6 | Fecal Coliform | Low | High | High | No Data | Low | Med |
| 17-OUT-2 | Route 6 | | | No | 0 | No | NT | 0.32 | 0.26 | 100% | 2 | 6 | Fecal Coliform | Low | High | High | No Data | Low | Med |
| 17-OUT-4 | 48 Locust Road | | | No | 0 | No | NT | 2.50 | 5.92 | 35% | 13 | 2 | Fecal Coliform | Low | High | Low | No Data | Low | Low |
| 18-OUT-8 | 62 Locust Road | | | No | 0 | No | NT | 0.41 | 0.61 | 56% | 2 | 3 | Fecal Coliform | Low | High | Med | No Data | Low | Med |
| 25-OUT-5 | Behind 7 Cedar Pond Road | (2) | | No | 0 | No | NT | 0.61 | 1.52 | 33% | 3 | 2 | Fecal Coliform | Low | High | Med | No Data | Low | Low |
| 48-OUT-1 | 153 S. Orleans Road | | | No | 0 | No | NT | 1.20 | 2.84 | 35% | 6 | 2 | Dissolved Oxygen | Low | Med | Low | No Data | High | Med |
| 55-OUT-1 | 120 Monument Road | | | No | 0 | No | 17 | 0.56 | 0.72 | 65% | 3 | 4 | Dissolved Oxygen | Low | Med | Med | No Data | High | Low |
| 87-OUT-1 | 21 Woodridge Road | | | No | 0 | No | NT | 0.77 | 1.62 | 40% | 4 | 2 | Nitrogen | Low | Med | Med | No Data | Low | Low |
| 60-OUT-1 | 110 Bakers Pond Road | | | No | 0 | No | NT | 1.03 | 1.87 | 46% | 5 | 3 | Mercury in Fish Tissue | Low | Low | Med | No Data | High | High |
| 28-OUT-1 | 85 Great Oak Road | | | No | 0 | No | NT | 6.05 | 17.35 | 29% | 31 | 2 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 28-OUT-UNK | 64 Brick Hill Road | (9) | | No | 0 | No | NT | 0.91 | 2.11 | 36% | 5 | 2 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 13-OUT-1 | Smugglers Path | | | No | 0 | Yes | NT | 0.80 | 4.95 | 13% | 4 | 1 | None | Low | No Data | Low | No Data | High | Low |
| 15-OUT-1 | Skaket Beach | | CCB-17 | No | 0 | No | 164 | 2.26 | 1.89 | 100% | 12 | 6 | None | Low | No Data | High | Med | High | Med |
| 55-OUT-2 | 36 Herring Brook Way | | | No | 0 | Yes | NT | 1.57 | 3.92 | 33% | 8 | 2 | Nitrogen | Low | No Data | Low | No Data | High | Low |
| 51-OUT-1 | 65 Briar Spring Road | | | No | 0 | No | NT | 1.00 | 2.56 | 33% | 5 | 2 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 51-OUT-2 | Gilman Lane Town Landing | | | No | 0 | Yes | NT | 1.66 | 4.61 | 30% | 9 | 2 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 57-OUT-1 | 204 Barley Neck Road | (7) | | No | 0 | No | NT | 1.05 | 3.72 | 24% | 5 | 1 | Nitrogen | Low | No Data | Low | No Data | Med | Low |
| 36-OUT-3 | 7 Dylan Way | (9) | | No | 0 | No | NT | 0.43 | 1.02 | 36% | 2 | 2 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 36-OUT-1 | 54 Brick Hill Road | (9) | | No | 0 | No | NT | 1.60 | 4.34 | 31% | 8 | 2 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 18-OUT-10 | Route 6 near rotary | | | No | 0 | No | NT | 0.40 | 0.46 | 72% | 2 | 4 | Fecal Coliform | Low | No Data | Med | No Data | Low | Low |
| 44-OUT-1 | 11 Uncle Harvey's Way | | | No | 0 | No | NT | 0.88 | 2.37 | 31% | 5 | 2 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 51-OUT-3 | 57 Briar Spring Road | | | No | 0 | No | NT | 0.36 | 0.88 | 34% | 2 | 2 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 91-OUT-UNK | 31 Winslow Drive | (5) | | Yes | -28 | No | NT | 2.57 | 7.46 | 29% | 13 | 2 | Nitrogen | Low | No Data | Low | No Data | Low | Low |
| 44-OUT-2 | Intersection of Uncle Harvey's Way & Pochet Road | (2) | | No | 0 | No | NT | 10.10 | 28.88 | 29% | 52 | 2 | Nitrogen | Low | No Data | Low | No Data | High | High |
| 80-OUT-1 | 47 Forest Way | | | No | 0 | No | NT | 2.23 | 6.13 | 30% | 11 | 2 | Nitrogen | Low | No Data | Low | No Data | Med | Med |

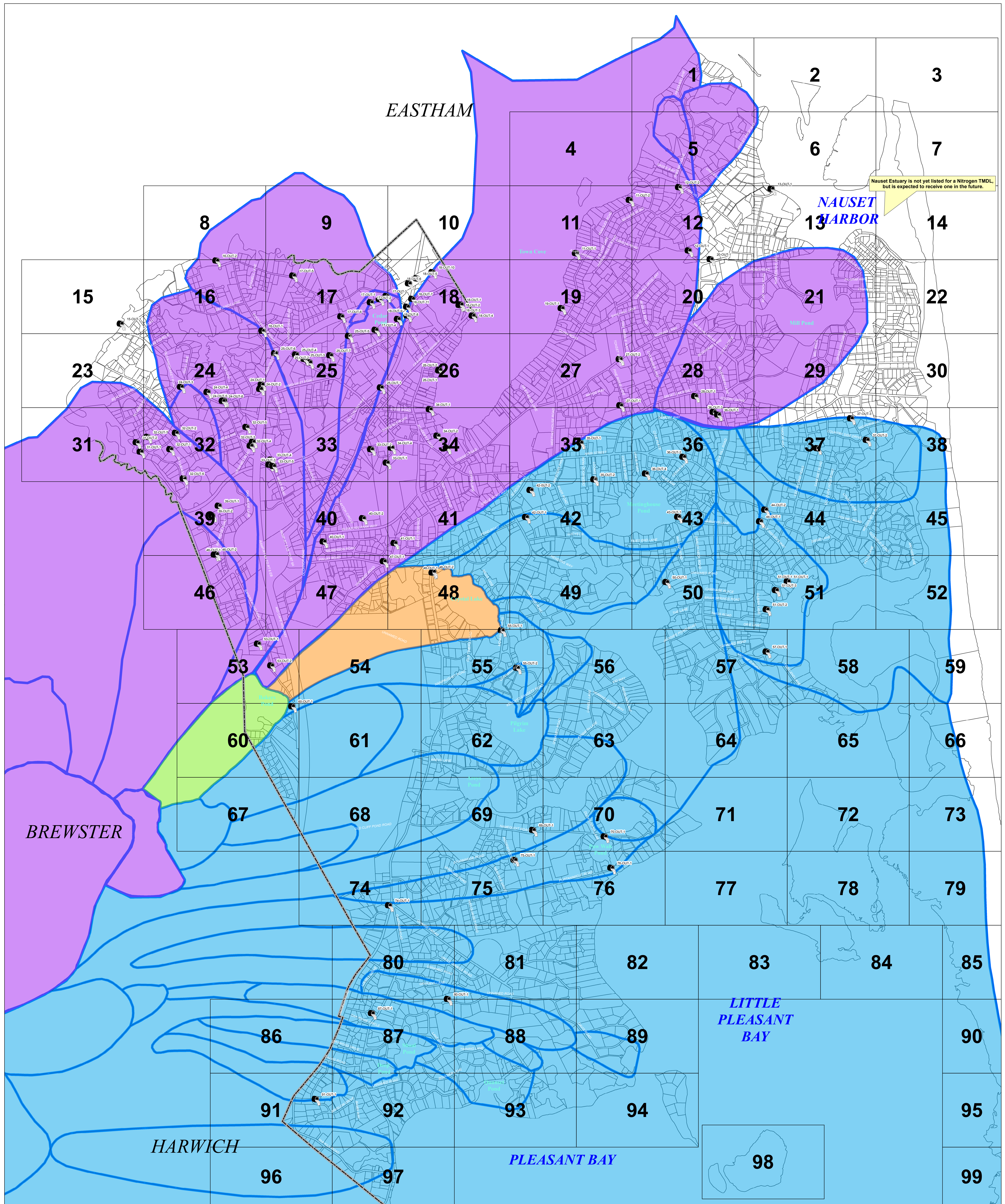
| Outfall ID | Outfall Street Location | Comments | DMF Shellfish Resource # | Located In Nitrogen Sensitive Watershed | MEP Threshold % Change | Preliminary Treatment System Installed? | Avg. Fecal Coliform Count (MPN/100ml) | Annual Flow (million gallons / yr) | Drainage Area (acres) | Impervious Drainage Area (%) | Nitrogen Loading Kg/Yr ⁽¹³⁾ | Nitrogen Loading Kg/Yr/Acre ⁽¹⁵⁾ | 303d Listing / TMDL | MEP Watershed Nitrogen Sensitivity | Phosphorus Sensitivity (Ponds Only) | Impervious Surface Area % | Fecal Coliform Count | Public Benefit / Visibility | Discharge Area Impact |
|--|--|----------|--------------------------|---|------------------------|---|---------------------------------------|-------------------------------------|-----------------------|------------------------------|--|---|---------------------|------------------------------------|-------------------------------------|---------------------------|----------------------|-----------------------------|-----------------------|
| Outfalls located within Watershed with Very Low Sensitivity to Nitrogen | | | | | | | | | | | | | | | | | | | |
| 39-OUT-2 | Overland Way - Contractor's Area | | | No | 239 | No | NT | 1.20 | 2.29 | 44% | 6 | 3 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 33-OUT-3 | Intersection of West Road and Old Colony Way | | | No | 67 | No | NT | 0.17 | 0.14 | 100% | 1 | 6 | Fecal Coliform | Very Low | No Data | High | No Data | Med | Low |
| 18-OUT-11 | 7 Jones Road | (4) | | No | 0 ⁽⁴⁾ | No | NT | 0.42 | 0.74 | 48% | 2 | 3 | None | Very Low | No Data | Med | No Data | Low | Low |
| 18-OUT-5 | Route 6 | (9) | | No | 0 ⁽⁴⁾ | No | NT | 0.34 | 0.29 | 100% | 2 | 6 | None | Very Low | No Data | High | No Data | Low | Low |
| 18-OUT-6 | Route 6 | (9) | | No | 0 ⁽⁴⁾ | No | NT | 0.56 | 0.47 | 100% | 3 | 6 | None | Very Low | No Data | High | No Data | Low | Low |
| 24-OUT-1 | Skaket Beach Road near Route 6 | | | No | 67 | No | NT | 0.30 | 1.59 | 16% | 2 | 1 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Med |
| 24-OUT-2 | 50 Skaket Beach Road | (8) | | | | | | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 24-OUT-3 | 5 Captain Linnell Road | | | No | 67 | No | NT | 1.05 | 1.83 | 48% | 5 | 3 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | High |
| 24-OUT-4 | 96 Skaket Beach Road | (6) | | No | 67 | No | NT | 1.02 | 3.98 | 22% | 5 | 1 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 24-OUT-5 | 88 Skaket Beach Road | | | No | 67 | No | NT | 1.28 | 4.38 | 24% | 7 | 1 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 24-OUT-6 | 88 Skaket Beach Road | | | No | 67 | No | NT | 0.96 | 1.89 | 43% | 5 | 3 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 31-OUT-1 | 60 Captain Linnell Road | | CCB-17 | No | 239 | No | NT | 0.65 | 1.23 | 44% | 3 | 3 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 31-OUT-2 | 56 Captain Linnell Road | | CCB-17 | No | 239 | No | NT | 1.76 | 5.36 | 27% | 9 | 2 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-1 | 74 Captain Linnell Road | | | No | 239 | No | NT | 0.52 | 1.20 | 36% | 3 | 2 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-2 | 87 Captain Linnell Road | | | No | 239 | No | NT | 1.22 | 3.20 | 32% | 6 | 2 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-3 | West Road to west of Route 6 overpass | | | No | 67 | No | NT | 0.19 | 0.30 | 52% | 1 | 3 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-4 | West Road to west of Route 6 overpass | | | No | 67 | No | NT | 0.19 | 0.30 | 52% | 1 | 3 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-5 | Behind 92 West Road | | | No | 67 | No | NT | 0.71 | 0.96 | 62% | 4 | 4 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-6 | 32 Skymeadow Drive (Cul-de-Sac) | | | No | 239 | No | NT | 0.35 | 0.65 | 44% | 2 | 3 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 32-OUT-7 | 60 Captain Linnell Road | (8) | | No | 239 | | NT | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 33-OUT-4 | Intersection of West Road and Old Colony Way | | | No | 67 | No | NT | 0.52 | 0.43 | 100% | 3 | 6 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Low |
| 33-OUT-5 | 89 Old Colony Way | | | No | 67 | No | NT | 0.72 | 0.83 | 73% | 4 | 4 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |
| 39-OUT-1 | 46 Bay Ridge Lane | | | No | 239 | No | NT | 2.19 | 2.21 | 83% | 11 | 5 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Low |
| 46-OUT-1 | 18 Bay Ridge Lane | (10) | | No | 324 | | | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 46-OUT-2 | 18 Bay Ridge Lane | | | No | 324 | No | NT | 2.35 | 1.97 | 100% | 12 | 6 | Fecal Coliform | Very Low | No Data | High | No Data | Low | Med |
| 53-OUT-1 | 60 Baker's Pond Road | (8) | | No | 67 | | NT | | | | | | Fecal Coliform | Very Low | No Data | N/A | No Data | Low | Low |
| 53-OUT-3 | 63 Baker's Pond Road | | | No | 67 | No | NT | 0.41 | 1.20 | 29% | 2 | 2 | Fecal Coliform | Very Low | No Data | Low | No Data | Low | Low |
| 53-OUT-4 | 66 Baker's Pond Road | (3) | | No | 67 | No | NT | 0.37 | 0.46 | 67% | 2 | 4 | Fecal Coliform | Very Low | No Data | Med | No Data | Low | Low |

Notes:

- (1) To be completed once Outfall Prioritization Matrix has been finalized
- (2) Outfall was not located
- (3) Private outfall
- (4) Threshold percent change values were not included in MEP reports
- (5) Outfall is an asphalt swale
- (6) Unable to access Outfall. Some data is incomplete.
- (7) Unable to locate Outfall. Assumed Outfall no longer exists.

- (8) Outfall classified as a culvert.
- (9) Unable to locate outfall. Assumed outfall exists.
- (10) Outfall abandoned
- (11) Located outside of Town boundaries
- (12) Outfall drains into 18-OUT-4
- (13) Loading rate for impervious surfaces only
- (14) TMDL needed, existing, or assumed will have a TMDL in near future

- (15) Nitrogen loading based over entire drainage area (pervious & impervious)
- NT = Not Tested

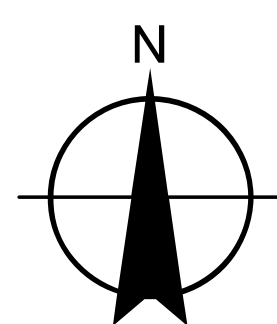


Nauset Estuary is not yet listed for a Nitrogen TMDL, but is expected to receive one in the future.

LEGEND

- Dissolved Oxygen
- Fecal Colliform
- Mercury in Fish Tissue
- Nitrogen
- Outfall
- Assessors Grid

Paper Size ARCH D
 0 0.125 0.25 0.5 Miles



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

TOWN OF ORLEANS, MASSACHUSETTS

Outfall Location Map on Areas Affected by 303D Listings

Job Number 86-15148
 Revision A
 Date 24 Sep 2013

Figure 1