

**Final Report for the MassDEP MS4 Municipal Assistance Grant Program**



**The Buzzards Bay Stormwater Collaborative  
Illicit Discharge Investigation and MS4 Support**



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\* The Massachusetts Maritime Academy is a four year, co-educational, non-profit, Massachusetts University.

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**Partners:** Buzzards Bay National Estuary Program and the municipalities of Bourne, Wareham, Marion, Mattapoisett, Fairhaven, Acushnet, Dartmouth, and Westport.

**Revised funding:** \$46,988.00

Attached is the final report for the FY-022 MADEP funded Stormwater Trailer support to towns and municipalities by the Massachusetts Maritime Academy.

**Per ISA the following Tasks were required:**

*"1. Mapping of storm drain structures requires MMA staff time and Co-op student stipends. Each of the eight municipalities will be budgeted for \$1,150 worth of services from MMA. For each town, this will equate to 10 hours of staff time, 20 hours of Co-op student time, and incidentals such as car mileage. It will total 80 hours of staff time and 160 hours of Co-op student time. Mapping effort will be directed towards locating new discharges, mapping catch basins and manholes, inventorying treatment structures, and determining connectivity between structures. These mapping efforts will be further used to improve catchment delineations and update outfall priorities.*

*2. Deploying the stormwater investigation trailer to eight municipalities will require MMA staff time and MMA Co-op student stipends. Each municipality will fund their own staff time for this task. Each of the eight municipalities will be budgeted \$3375 for the trailer deployment. For each town, this will equate to 45 hours of staff time, 60 hours of Co-op student time, and trailer mileage. It will total 360 hours of staff time and 480 hours of Co-op student time. The deployment will be for one week and include use of the equipment for IDDE and training of local personnel in use of the equipment and tools provided with the stormwater investigation trailer.*

*3. Based on the deployments of the stormwater investigation trailer, some revision may be required to improve workflow and equipment. This budget task is not funded and future grants will be needed for consumable supplies and additional equipment to revise the system.*

*4. Providing procedures, designs, training materials, results, and lessons-learned will be completed as in-kind services from the BBNEP. Another benefit of this project are updates to the Stormwater Collaborative's stormwater GIS.*

*5. This covers the salary for the Principal Investigator to write student contracts, administer and oversee the grant. This task includes supervising the staff, work review, award processing, MMA record keeping, billing, contract closing, and final reporting.*

*6. Administration and indirect cost (26%) cover the MMA administration of the grant and overhead costs and include space to maintain and store the trailer."*

**MassDEP MS4 Municipal Assistance Grant Program 2020-2021**

**The Buzzards Bay Stormwater Collaborative**

**Illicit Discharge Investigation Trailer**



**June 2021**

**Collaborative Partners:** Massachusetts Maritime Academy, Buzzards Bay National Estuary Program and the municipalities of Bourne, Wareham, Marion, Mattapoisett, Fairhaven, Acushnet, Dartmouth, and Westport.

## **MassDEP MS4 Municipal Assistance Grant Program 2020-2021**

This report summarizes the findings from the Buzzards Bay Stormwater Collaborative discharge investigation under the 2021 MassDEP Stormwater Investigation Trailer grant. A vast number of storm drain networks were examined for illicit connections. Each storm drain network is a collection of connected structures that discharge to one point and is referred to by the facility ID of the outfall pipe. Each network is a reflection of the stormwater catchment in which the structures collect stormwater and runoff. The purpose of an IDDE is to detect issues that do not comply with the MS4 permit for stormwater discharges. A report was delivered to each partner town to identify issues recommendations of possible actions to address those issues. Updated maps depicting the inspected networks were also delivered to each town.

Within the networks surveyed, each structure was opened and inspected for evidence of illicit connections. At least one town public works personnel was present and participating for all field work. Any indications of odors, unusual colors, excessive trash or debris, sheens, suds, or structural issues were recorded. Each pipe entering the structure was recorded for size, type, and invert from the rim. Dry weather flow and standing water in the structure were also recorded. Direction to adjacent structures were verified and pipes with no apparent connection were checked with a camera or other method to best determine the situation. In areas with potential for a sewer cross connection the camera was used to inspect the pipe. Additionally, a few water samples were collected and analyzed for various parameters.

### **Field Work**

Fairhaven - April 6 through April 9

Marion - April 12 through April 15

Mattapoisett - April 26 through April 29

Dartmouth - May 3 through May 6

Acushnet – May 10 through May 14

Westport –May 17 through May 20

Wareham – June 7 through June 11

Bourne - June 14 through June 17

### **Accomplishments**

Within the eight Collaborative towns, approximately 130 storm drain systems were completely investigated and an additional 30 systems were partially investigated. The partial investigations were in

catchments with high traffic roads and were curtailed when a police detail was not available. No sewer connections were detected and only a few potential illicit connections or evidence of dumping were observed.

The number of town personnel trained in IDDE procedures was 22 individuals in addition to 10 MMA cadets that were engaged by the project. While out in the field, the public was engaged about 20 times. There was always a positive response to the stormwater work and people seemed genuinely interested in environmental issues. The experience of eight weeks in the field doing investigations has resulted in increased efficiency, better and safer handling of tools to open structures, and improvements in trailer layout and workflow. This resulted in a marked increase in the rate of inspections by the end of the project. Lessons learned in one town were often passed on to personnel in other towns. The final noted accomplishment of this project is the development of new tools and improvement of procedures. A new camera attachment was constructed to permit better viewing in the larger pipes that are typical of storm drain systems, bright flashlights were acquired to better view inside structures, a kit to free difficult manhole covers was added to the trailer, and a revised form was developed along with an enhanced record keeping method to capture the vast amount of information observed in the field.

## **Observations**

The most significant observation is numerous sump pump and yard drain connections to catchbasins. Sump pumps and yard drains are acceptable under the MS4 permit provided that only groundwater is pumped into the storm drain network. However, at least sump pump drain had a washing machine connection. This was addressed by the local board of health. Most sump pump connections were not running so no samples could be collected. Also there were too many in just the observed networks to sample and follow-up on if they were flowing. Probably be the most effective action to address the potential issues with sump pumps is an outreach effort on proper use of sump pumps.

Pet waste was prevalent in some neighborhoods but not others. The procedure for this project identified the specific areas with excessive pet waste. Other catchment observations included: presence of septic or sewer waste disposal, landscaping habits, presence of gravel driveways, and any observation worth noting. A follow-up project using stormwater samples collected for a previous Collaborative grant could be used to determine if there is a correlation between pet waste and stormwater quality. Like the sump pumps, the most effective action for this issue is an outreach campaign.

Most structures observed were well maintained and clean. Some catchbasins required cleaning and made a thorough investigation difficult. Those structures were noted and reported back to the town. Future work will include supplemental inspections of structures with too much debris. The towns with less ability to keep structures clean and meet the MS4 standards are aggressively addressing this issue with additional resources and investment in capital equipment.

Several unexpected conditions were observed during this project. Knowledge base and techniques were developed to address these observations. Some examples of these observations include: cloudy water in a structure due to suspended sediments from a home owner project of stone work in the yard; several piles of wildlife feces from a resident fox in a manhole structure which was initially mistaken for a sewer manhole; a potential domestic water leak from a water main entering the storm network; and

groundwater interflow entering under catchbasin frames from beneath the road pavement after a night of heavy rains.

### Mapping

The data collected was used to update the Buzzards Bay National Estuary Program stormwater GIS. Despite the extensive and detailed mapping of some areas before the investigation, there were opportunities for some corrections and additions while going through the investigation process. Other areas with less mapping available before the inspection, now have a comprehensive map of the stormwater network. The comprehensive GIS mapping developed through IDDE inspections is a critical tool in refining catchment area definitions and ultimately prescribing stormwater solutions.

Example of before and after mapping:



Before

After

**Conclusion:**

All Grant requirements were accomplished. The mapping of storm drains with Student credited CoOp internships (Task 1), deployment to municipalities (Task 2), analysis of future investigations (Task 3) are complete. The Buzzards Bay National Estuary Program support (Task 4) and GIS data base were crucial to this successful completion. Salaries, management, and overhead (Tasks 5 and 6) have been Invoiced to MADEP and this report completes the ISA requirements.