Commonwealth of Massachusetts

STATE RECLAMATION AND MOSQUITO CONTROL BOARD

NORTHEAST MASSACHUSETTS MOSQUITO CONTROL AND WETLANDS MANAGEMENT DISTRICT

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2020 Best Management Practice Plan
Hamilton

FY21 Percentage of assessment allocated to specific measures as prescribed by individual municipalities Best Management Practice (BMP) in the Town of Hamilton

NEMMC is requesting an increase of 6% in the assessment for FY 2021 due to continued increases in operational costs, leasing the facility, purchasing pesticides, vehicle/heavy equipment maintenance and repairs, a cost of living increase, and payroll taxes. The 2019 mosquito season was the worst year in the State of Massachusetts history. This contributed to increased pesticide usage, personnel costs, and equipment upgrades. The District will continue to upgrade its equipment to ensure we are well prepared and operating efficiently, with our primary goal of protecting our subscribing communities from virus. We follow best business practices to reduce mosquito populations on a town wide and regional basis, thus reducing the mosquito virus risk and nuisance to our residents. We look for continued support and understanding from all the communities we serve.

Assessment: As estimated by the Massachusetts Department of Revenue, Division of Local Services, in accordance with Chapter 516 of the General Laws of the Commonwealth. The assessment formula is based on a regional concept, which considers square miles and evaluation. The District offers this breakdown as a general guide to how funds are allocated specific to your community.

FY21 Estimated District Budget for the Town of Hamilton	$ 52,038.00
FY21 State Reclamation and Mosquito Control Board	$ 2,226.00
FY21 Total Estimated Assessment for the Town of Hamilton	$ 54,264.00

-Committed to the principals of mosquito control and wetland management

District Control Measures Specific to Hamilton

General Operational Cost Share

Regional Adult Mosquito Surveillance Program

Regional Vector / Virus Intervention

Surveillance

Ground Larviciding **(BT/BS products only-No methoprene will be used)**

Catch Basin Treatments **(BT/BS products only- No methoprene will be used)**

Manual Ditch Maintenance

Adulticiding **(Virus Intervention ONLY with Board of Health approval)**

Barrier Treatment **(By Board of Health and School Department request only)**

Ditch Maintenance / Wetlands Management

Tire Recycling Program

Property Inspections

Mosquito Habitat Mitigation

Research and Development

Education and Outreach

Social Media

NOTE: Any adulticiding, larviciding or treatment of catch basins for mosquito control on public school property requires a current IPM (Integrated Pest Management) Plan. We are often asked by local Boards of Health and/or athletic directors to treat ball fields and/or parks that may be owned/used by the school departments, and without an IPM plan that includes our materials we may not be able to assist.

2019 Summary of Activities Completed in Hamilton by NEMMC

Date	Activity Completed
1/24/2019	2019 Integrated Pest and Vector Management Plan published to web
2/14/2019	Residential Service Request for Inspection - Cobblers Lane
2/19/2019	2019 Draft Best Management Plans (BMP) e-mailed to BOH
4/3/2019	2019 Final Best Management Plans (BMP) published to web
4/9/2019	Mosquito Habitat Site Inspections (16)
4/19/2019	Mosquito Habitat Site Inspections (13)
4/19/2019	Larviciding- Black Brook Road, Cutler Road (7.57 lbs Vectobac-G)
4/29/2019	Mosquito Habitat Site Inspections (18)
4/29/2019	Larviciding- Porter Lane, Rust Street, Chebacco Road, Gregory Island Rd, Appalousa Road (14.53 lbs Vectobac-G)
5/20/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
5/29/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
6/3/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
6/10/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
6/17/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
6/24/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
7/1/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
7/8/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
7/12/2019	Catch Basin Larvicide Completed (645 total basins)
7/15/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
7/22/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
7/26/2019	School Catch Basin Larvicide Completed
7/29/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
8/5/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
8/12/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
8/19/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
9/4/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
9/9/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
9/16/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
9/18/2019	Hamilton EEE Risk Level Raised to MODERATE by DPH
9/23/2019	Supplemental mosquito trap collected- Asbury Street, Negative test results WNV/EEE
9/23/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
9/30/2019	Weekly Mosquito Trap Collections CDC/Gravid/RB
10/10/2019	NEMMC held Gould Barn BOH/DPH/SRB inclusive Commission meeting to review EEE year

- Hamilton had a total of 0 Residential Service Requests in 2019
- Hamilton had a total of 47 Habitat Site Inspections in 2019

2019 Hamilton Mosquito & Arbovirus Surveillance Summary

There were **no WNV/EEE isolations** in Hamilton in 2019. At the end of 2019, the arboviral risk level for Hamilton remained at MODERATE for EEE and LOW for WNV. Risk Categories are described in Table 2 of the 2019 MDPH Surveillance and Response Plan.

Massachusetts DPH assesses arboviral risk levels based on many factors including but not limited to: mosquito isolations, locations of acquired veterinary and human infections, virus history locally and in bordering states, weather conditions present and predictions, and current mosquito populations and future trends.

- 24 mosquito pools/batches were sent from Hamilton to the MDPH lab for testing in 2019
- 1 supplemental CDC/CO2 Light trap was placed in Hamilton during 2019

Mosquito virus isolation history (WNV/EEE) in Hamilton:

Collection Date	Species	Test Type	Result
8/27/2013	*Culiseta melanura*	WNV	Positive
9/17/2013	*Culiseta melanura*	WNV	Positive
8/14/2012	*Culiseta melanura*	EEE	Positive
8/28/2012	*Culiseta melanura*	EEE	Positive
9/02/2012	*Culiseta melanura*	EEE	Positive
9/02/2012	*Culiseta melanura*	WNV	Positive
9/02/2012	*Coquillettidia perturbans*	EEE	Positive
9/18/2012	*Culiseta melanura*	WNV	Positive
9/16/2009	*Culiseta melanura*	EEE	Positive
9/25/2006	*Culiseta melanura*	EEE	Positive

Mosquito Species- pest/disease list- Hamilton	2018	2019	Change	WNV/EEE +	District Total-2019
Culiseta melanura (red maple swamp/acid bog)	107	84	-22%	NO	2,401
Culex pipiens (container/catch basins/heavy organics)	1	5	400%	NO	1,279
Culex restuans (container/catch basins)	0	8	-	NO	637
Culex salinarius (brackish water/phragmities/roadside ditches)	90	395	339%	NO	13,063
Coquillitidia perturbans (cattail)	1,124	4,767	324%	NO	45,233
Aedes vexans (rainwater/fresh floodwater)	3	2	-33%	NO	968
Aedes japonicus (tree hole/container breeder)	11	7	-36%	NO	835
Aedes sollicitans (salt marsh)	2	0	-100%	NO	207
Aedes cantator (salt marsh)	37	25	-32%	NO	8,566
Aedes canadensis (snowmelt/woodland pool)	5	5	-	NO	1,419

Total Mosquito Collected in Hamilton	**2018**	**2019**	**% change**
Resting Boxes (8)	137	72	-47%
CDC CO2/Light Traps (1)	1,435	5,321	271%
Gravid Traps (1)	16	323	1,919%
Totals	**1,588**	**5,716**	

WNV/EEE bridge vectors/human biters

- Although much of the district saw an increase in both *Ae. vexans* and *Cq. perturbans*, Hamilton had a 33% decrease in *Ae. vexans* collections. This reduction may have attributed to larvicide treatments and excess summer precipitation flooding breeding sites allowing more mosquito larval predators into other habitats. *Cq. perturbans* collections increased by 324% from the 2018 season's precipitation. *Cq. perturbans* larvae are also hard to treat as they attach themselves under soil to submerged roots in their cattail habitat. *Cx. salinarius*, a brackish water mosquito, increased dramatically by 339%, coinciding with converging heavy summer rains and higher tidal events at the fresh marsh/salt marsh interface. *Cx. salinarius* can also breed in cattail/phragmites areas and roadside ditches that are bordering roads treated in winter with de-icing salts or runoff areas near salt storage sheds.

WNV primary vectors/bird biters (*Cx. pipiens/restuans*)

- There was a slight increase in collections of WNV primary vectors from 2018 to 2019 in Hamilton. Early catch basin cleaning and treatments helped to keep *Culex* mosquito populations in check despite frequent rain events that fill man-made containers and leave stagnant water in more locations increasing collections. Our District did have several WNV isolations from mosquitoes in 2019, but no human cases. Hamilton did not have any WNV isolations.

EEE primary vectors/bird biters (*Cs. melanura*)

- Unlike much of the District, Hamilton had a 22% decrease in *Cs. melanura* collections this year. This reduction may have been attributed to early season larvicide events in known *melanura* related wetland habitats. District wide there was a 4% decrease in 2017 due to long-term drought conditions and a rebounding increase of 99% during 2018 from mid to late summer precipitation and another increase of 124% in 2019. Any increases of *Cs. melanura* populations for 2020 will depend on future precipitation and groundwater conditions through the winter in the species hummock/crypt habitat.

With extensive forested wetlands in Hamilton and in surrounding communities, there may be a local focus here for EEE and WNV. There will always be concern for transmission and human infection by EEE/WNV virus in Hamilton and all surrounding municipalities. From July to the first hard frost, Hamilton residents should take necessary precautions to reduce the risk of infection from these viruses, regardless of low mosquito populations and/or aggressiveness of control.

A hard, or killing frost, is defined meteorologically as two consecutive hours of temperatures below 28 degrees Fahrenheit or three hours below 32 degrees. This will occur at different times for different communities, and there may even be variation within communities based on local geography. Although mosquitoes are not

killed until a hard frost occurs, they are extremely unlikely to be active when temperatures fall below 50 degrees in the evening (Page 11 of the 2019 MA Arbovirus Plan listed below).

Refer to the 2019 Massachusetts State Arbovirus Surveillance and Response Plan viewed online at: https://www.mass.gov/lists/arbovirus-surveillance-plan-and-historical-data#response-plan-

Focus of Operations for 2020

Regional control efforts will focus primarily on larval surveillance and treatment, adult mosquito surveillance, virus testing and preemptive virus intervention strategies. Specific to Hamilton, the primary focus of control efforts will be on freshwater larviciding, catch basin treatments and virus intervention for WNV and EEE.

- School IPM program coordinators should confirm all schools are updated for outdoor mosquito control with our District for 2020. Coordinators please call our office or visit the MDAR School IPM website at https://massnrc.org/ipm/schools-daycare/ipm-tools-resources/ipm-plan-maker/make-your-ipm-online/locate-school-plan.asp# for more information.

Regional Control Measures

Regional Adult Mosquito Surveillance Program: CDC/CO2 Light traps are used to sample the adult mosquito population, monitor both short and long term trends and determine population density of bridge vectors (human biters) of WNV and EEE. Gravid traps are designed to collect adult female *Culex* species the primary vectors (bird biters) of WNV.

At least one of these dual function units is placed in a fixed location in each member municipality for a total of 36 deployed throughout the District. Mosquitoes are collected and identified from each trap once per week beginning mid-May until September 31st. The MA DPH may extend testing into October. In the event mosquitoes collected from these traps test positive for EEE or WNV the District will add supplemental CDC CO2/Light traps at specific sites within the municipality.

Supplemental trapping criteria for 2020:

After the 1st positive WNV/EEE primary vector species (bird biters) in any municipality supplemental traps could be placed in locations with these parameters:

- Radius of collection
- Distance from historic trap
- Topography
- Human population density
- Bridge vector potential breeding sites
- Schools/parks/recreation areas
- Site security
- Wetland/wooded/shaded/moist areas

Supplemental mosquito collections may be sent to State Laboratory for additional arbovirus testing.

The District will operate 128 resting boxes at 16 sites. Resting boxes are designed to collect blood fed female *Culiseta melanura* mosquitoes relevant to EEE transmission. Eight resting boxes will be placed at each fixed location and there will be two fixed locations in communities bordering New Hampshire as well as other communities considered to be at risk. The District will collect and identify samples from each trap every week and the specimens will be tested for virus.

In the event *Cs. melanura* mosquitoes collected from resting box sites test positive for EEE the District will deploy supplemental CDC CO2/Light traps in high risk areas.

Virus Testing: Specimens from our trap collections will be sent to The Massachusetts Department of Public Health (MA DPH) to be tested for the presence of encephalitis viruses. Our District mosquito testing results will be available on Fridays of each week. The MA DPH will contact the municipalities BOH officers as well as our District of any positive test results.

Mosquito virus testing criteria for 2020:

Phase I

- June 15th to August 1st
- Primary vectors (bird biters): *Cs. melanura, Cs. morsitans, Cx. pipiens* and *Cx. restuans*
- Other mosquito species may be tested on a case by case basis.

Phase II

- August 1st to October 1st (or October 15th for MA DHP extended season and if temperatures permit)
- Primary vectors (species listed above) + Bridge vectors (bird/mammal biters): *Ae. cinereus, Ae. vexans, Cq. perturbans, Cx. salinarius, Ae. canadensis, Ae. japonicus, Ae. taeniorhynchus, Ps. ferox* and *Ae. sollicitans*
- Other mosquito species may be tested on a case by case basis.

Regional Vector/Virus Intervention: Control efforts will focus on early intervention strategies in municipalities that have shown a greater risk to mosquito borne virus based on events of the previous seasons and surveillance data as prescribed in the District's Integrated Pest and Vector Management Plan (IPVMP). This approach is in the best interest of all member municipalities as focused early intervention strategies seem to demonstrate containment of WNV, and may reduce the risk of EEE exposure to humans and the migration of virus to other municipalities.

Regional Aerial Salt Marsh Larviciding Program: Coastal salt marshes in neighboring communities from Ipswich to the New Hampshire border will be aerially larvicided by helicopter to control salt marsh mosquitoes in accordance with the respective Best Management Practice Plans. Salt marsh mosquitoes are capable of flying up to 25 miles in search of a blood meal and then return to the salt marsh in order to lay eggs. Coastal communities as well as many inland cities and towns receive direct and immediate benefit from the control of salt marsh mosquitoes.

- Aerial bacterial larviciding operations in coastal communities (3 treatments in 2019). These applications provide relief from salt marsh mosquito (*Ae. cantator*/*Ae. sollicitans*) hatches for all municipalities in our District.

Control Measures Specific to Hamilton

Ground Larviciding*: Larviciding sites from the District's data base, including retention ponds, detention basins and areas requested by the local Board of Health will be checked and treated for mosquito larvae as necessary, beginning in March or as snow melt allows, to September 30th and beyond if circumstances warrant and conditions allow.

Catch Basins*: Catch Basin treatments will be coordinated with local DPWs so that each municipality's annual cleaning of basins does not jeopardize the treatment and effectiveness of the bacterial larvicides used to control mosquito larvae in these basins. Since **bacterial products do not work well in uncleaned basins** or ones high in organic matter, only BT/BS (bacterium) products will be used to control mosquito larvae after the basins in Hamilton have been cleaned. Depending on the DPW's cleaning schedule, basins will be checked and treated as necessary beginning May 1st through July 31st.

*Bacterial larviciding products containing only *Bacillus thuringiensis israelensis* (Bti) and/or in combination with *Bacillus sphaericus* (BS) will be used. No methoprene will be used.

Manual Ditch Maintenance: In the course of ground larviciding and catch basin treatments, roadside ditches and culverts will be manually cleared of manageable blockages and debris in order to reduce mosquito breeding habitat and / or potential habitat.

Adulticiding: The District uses a system called Ultra Low Volume (ULV) for ground adulticiding applications. ULV is designed to dispense very small amounts of pesticides over a large area. While this is a cost effective means of reducing mosquito populations on a large scale, it only affects those mosquitoes present at the time of the application and repeated applications are sometimes necessary in some areas to sustain the initial reduction in the mosquito population.

Virus intervention will be at the request of and coordinated through the Board of Health with recommendations from Northeast MA Mosquito Control of specific areas to be targeted. Applications to schools must be in compliance with 333 CMR 14.08.

Per product label, NEMMC will not conduct adulticide applications when temperatures are below 50 F and/or when wind speeds exceed 10 mph.

- ***Residential Pesticide Exemption**:* Residents who request their property be excluded from pesticide applications must comply with the legal process to exempt their property. Pursuant to 333 CMR 13.03, individuals may request exclusion from wide area applications of pesticides by the District for the 2020 calendar year starting January 1st 2020. Requests **must be made to the Department of Agricultural Resources** online, and **will go into effect 14 days** from the date the request is received. All exclusion requests expire on December 31st, 2020. The exclusion request can be accessed from either our districts website or directly from the Department of Agricultural website:

  https://www.mass.gov/how-to/exclusion-from-wide-area-pesticides-application

Barrier Treatment: To reduce the need for repeated ULV applications and provide more sustained relief from mosquitoes in high public use areas, the District can provide barrier treatments to public use areas such as schools, playgrounds, athletic fields, etc., at the request of the Board of health and/or school departments.

Per product label, NEMMC will not conduct barrier applications when temperatures are below 50 F and/or when wind speeds exceed 10 mph and/or when precipitation is predicted within 24 hours of a barrier application.

Barrier applications to schools must be in compliance with 333 CMR 14.08.

Ditch Maintenance / Wetlands Management: The town may petition the District to undertake larger scale ditch maintenance projects, wetland enhancement and restoration projects requiring specialized mechanized equipment and expertise. Petitioned sites will be evaluated and a site specific proposal will be written for acceptable projects. Wetland management projects must have a mosquito remediation component. Wetland management projects may be beyond the scope of any municipality's assessment and may require a separate and additional appropriation.

Tire Recycling Program: Tires have historically been discarded on public and private properties, in both upland and wetland environments. Once a pile is started it can quickly grow into a substantial public health issue and is a known source of mosquito proliferation.

Discarded tires almost always hold water and are a prime location for artificial container breeding mosquito species, most notably *Culex pipiens*, *Culex restuans* and *Aedes japonicus*. *Cx. pipiens* and *Cx. restuans* are considered to be the key vector species of both encephalitis viruses in the District. *Ae. japonicus* is a new species to Massachusetts since 2000, and is thought to have been imported into the United States in used tires. *Ae. japonicus* has also shown to be a competent vector of West Nile virus. Invasive mosquito species are known to travel in containers like tires.

Aedes albopictus, an exotic invasive species, is now established in Central and Southern Massachusetts and has made an appearance in the Northeast District during 2018. This species has the potential for arbovirus transmission and breeds in discarded tires. As in previous seasons, the district will be maintaining tire water sample programs, tire collections and larviciding in order to monitor and control the spread of this species in the district.

Property Inspection: While the District is authorized under the provisions of Chapter 252, section 4 of the General Laws of the Commonwealth to enter upon lands for the purpose of inspection, it is not a regulatory agency. It also is not our intention to impose on any resident or business, but rather to be a resource for information and technology to help property owners prevent or abate mosquitoes to the mutual benefit of the property owner and the community.

The district receives many requests from municipal Boards of Health to inspect abandoned properties. With the increased health risk associated with property abandonment the District will take an aggressive approach to property inspections. In the course of our routine activities in your community, if we discover such properties, we will inspect and report these properties to the Board of Health. We understand that addressing concerns related to such properties is a matter of time and process. In the long term we will offer any support

that may be appropriated to resolve mosquito problems related to such properties and in the short term with the Board of Health's support we will implement the necessary control measures to mitigate the immediate mosquito problem associated with such properties.

Mosquito Habitat Mitigation: The District will represent the town's mosquito control concerns in an advisory capacity relative to proposed development and where prudent as requested by local health officials.

Research and Development: The District will evaluate the efficacy and efficiency of current control methods, investigate new methods, procedures and technologies in mosquito control and wetlands management and evaluate their implications for use in Hamilton.

Education and Outreach: The District will present educational displays and programs on mosquito control and related wetlands management programs at the request of health officials, schools or civic organizations. The District will also monitor and update local schools, daycares etc. regarding IPM plans and current child protection requirements.

The District's Liaison communicates information between participating Boards of Health, school officials, and District personnel to facilitate operational requests in member municipalities. The Liaison will distribute and review the BMPs with all participating Board of Health directors, contact school IPM coordinators who have not updated their IPM plans to include mosquito control products, and will act as the single point of contact during the mosquito season.

Social Media: In the recent past, the District has recognized the need to provide information on our activities in a timelier manner. Social media is proving to be the go to method of disseminating information for many companies and individuals.

The District maintains a valuable website. This site is full of resources, information and provides more timely updates of our activities. We have found that many questions can be answered through our website and we will continue to increase our web presence. Please visit us at www.nemassmosquito.org