Manatee County Mosquito Control District
Pesticide Discharge Management Plan

Mailing Address: Manatee County MCD
2317 2nd Avenue West
Palmetto, FL 34221

Phone: 941-722-3720
941-721-0452

1. Pesticide Discharge Management Team

All persons listed below may be contacted at the above address and listed telephone number.

1. (a) Persons responsible for managing pests:
Mark Latham – Director
Christopher Lesser – Assistant Director

1. (b) Persons responsible for developing and revising the PDMP
Mark Latham – Director
Christopher Lesser – Assistant Director

1. (c) Persons responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements
Mark Latham – Director
Christopher Lesser – Assistant Director

1. (d) Persons responsible for overseeing pesticide applications
Mark Latham – Director
Christopher Lesser – Assistant Director
Dwight Andress – Ground Crew Supervisor
John Gardner - Chief Pilot
Art Shiver – Pilot
Mike Higgins – Pilot
William Koens – Aircraft Mechanic
Brian Harrell – Ground Inspector
Jeffrey Davis – Ground Inspector
Tim French – Ground Inspector
Dean Schneider – Ground Inspector
Wes Thompson – Ground Inspector
Bruce Labadie – Ground Inspector
James Blair – Ground Inspector

Chris Bustle – Ground Inspector
Gail Stout - Biologist
Martin West – Biological Technician
Barbara Bayer - Entomologist
Debra Kinney - Entomologist technician
Thelma Fulwood - Entomologist technician
Jose Ruiz - Entomologist technician
Norma Chavez - Entomologist technician
Andrew Tornello – Building Maintenance Supervisor
Robert Smith – Assistant to BMS
Connie Marburger – Administrative Manager
Lynn Apple - Administrative Specialist
Kim Copeland – Administrative Specialist
Seasonal Employees:

i)
ii)
iii)
iv)
v)

2. Pest Management Area Description

2. (a) Pest Problem

The **pest management area** within Manatee County can best be separated into 3 broad habitat types that can be further sub-divided into more specific mosquito breeding habitats. These 3 broad habitat areas are: Freshwater, Saltwater and Urban habitats.

- Freshwater:
  - **Open fields** are typically found in the eastern and rural areas of Manatee County but "open field" mosquito breeding can be found anywhere within the County. The areas of concern are "low" elevation topography where rainfall or irrigation naturally collects and is able to breeds mosquitoes. Mosquito species of concern in these areas include *Aedes vexans, Psorophora columbiae, Ps. ciliata,* and *Culex nigripalpus.*
  - **Livestock pastures** are areas of eastern Manatee County that are used to raise cattle and other forms of livestock. Areas frequently travelled by heavy livestock become trampled, compacted and depressed and hold rainfall or irrigation water. This water can often times be heavily polluted with high nutrients. Dominant mosquito species are *Culex quinquefasciatus, Culex nigripalpus*, *Ps. columbiae* and *Ps. ciliata.*
  - **Forested Woodlands** are areas that collect rainwater and produce mosquitoes. Dominant mosquito species include *Ps. ferox, Ae. infirmatus,* and *Culex nigripalpus*
  - **Roadside ditches** are located throughout the County and are typically treated (sprayed) after rainfall events for the control of *Ae. vexans, Ps. columbiae, Ps. ciliata,* and *Cx. nigripalpus*.
  - **Disturbed lands (**e.g. Forest Removal, Land Development Construction) **are** areas throughout Manatee County where soils are disturbed and compacted by heavy machinery and often disrupts natural water flow patterns. Typical mosquito species found in such areas include Ae. vexans, *Ps. columbiae, Ps. ciliata,* and *Cx. nigripalpus*.
  - **Tidal Floodplains** are areas located near freshwater estuaries and can produce large numbers of mosquitoes emerging from wetlands located above the daily mean high water level. Typical mosquito species from these areas includes *Ae. sollicitans* and *Ae vexans.*
  - **Irrigation Canals** are typically located amongst active or abandoned agricultural areas where canal distribute water. Occasionally these canals have predatory fish and mosquitoes are not found but on the majority of field inspections find no fish in these habitats and require chemical larviciding to curtail mosquito production. Typical mosquito species using such canals are *Cx. nigripalpus, Cx. quinquefasciatus, Ps. columbiae and Ps. ciliata.*

- **Dredge cells** are land areas that have been dyked and filled with pumped dredged materials from nearby shipping channels/ports. Such disturbed areas can produce tremendous mosquito populations immediately after the pumping begins and long after (decades) after conclusion. Dominate mosquitoes species includes *Aedes sollicitans, Ae. taeniorhynchus* and occasionally *Culex nigripalpus* and *Ps columbiae.*

- Saltwater
  - **Black** (and occasionally red) **mangroves** located proximal to tidal estuaries are known producers of high mosquito populations. The mangrove areas of concern to the Manatee County MCD are only those that are located above the daily mean high water mark or mangroves that are not regularly flushed by a daily exchange of tidal water. Flooding can occur by either saltwater tide or heavy rainfall. Dominant mosquito species from these mangrove areas are *Aedes taeniorhynchus*.
  - **Salt marshes** that are located above the daily mean high water mark and are irregularly flooded by saltwater or heavy rainfall can produce large numbers of mosquitoes. Dominant vegetation is typically *Spartina, Salicornia* and or *Juncus* grasses. Dominant mosquito species from these areas are generally *Aedes sollicitans, Ae. taeniorhynchus*, and occasionally *Culex* or some *Anopholes* species dependent upon saline levels.

- Urban
  - **Domestic containers** are found throughout urban areas of Manatee County and represent a very large source of mosquitoes and mosquito breeding habitat. Approximately 40-50% of all public service requests originate from domestic containers, a term that includes consumer items left outside and inadvertently collects water such as automotive tires, tarps, unkempt boats, children toys, rain gutters, trash, bird baths and similar items that are able to retain water for 7 continuous days or longer. Mosquito species originating from such containers include *Aedes albopictus, Ae aegypti* and *Culex nigripalpus* plus occasionally *Culex quinquefasciatus*.
  - **Storm drains and Catch basins** are generally shallow water habitats that are designed to collect water from impervious surfaces to prevent flooding in areas that could cause economic damage. On occasion, these habitats can breed mosquitoes depending upon drainage patterns, presence of fish, water quality, and rate of water percolation. Mosquito species encountered in such sites include *Aedes vexans, Psorophora columbiae Culex salinarius, Cx. restuans, Cx. nigripalpus*.
  - **Sewage Treatment** are a very large breeding source for *Culex quinquefasciatus*

- **Bromeliad plants** are a significant source for *Wyeomyia vanduzeei* and occasionally *Aedes albopictus* and *Aedes aegypti* larvae.
- **Retention/detention ponds** are designed to collect and hold storm water runoff for extended periods of time for the purpose of environmental health and economic benefits but these habitats can often times be a significant source of mosquito breeding. Mosquito species breeding in such habitats include many species of the Aedes, Culex and Anopheles genera plus *Mansonia titillans* and *Coquillettidia perturbans*

The **primary pests of concern** to the Manatee Control Mosquito Control District are the 40+ genera of mosquitoes located in Manatee County. At various times of the year and under differing environmental conditions, all 40+ genera of mosquitoes found in Manatee County are pests of concern under the purview of this NPDES permit. These 40 mosquitoes species and their distribution within the State of Florida and Manatee County can be seen in the "Florida Mosquito Control Handbook" editors H.T. Evans, C.D. Morris, R.H. Baker and Wm. R. Opp. Additional species distribution maps can be located in "Distribution of Florida Mosquitoes", R.F. Darsie, 2004. Addition species distribution council can be found in "Identification and Geographic Distribution of the Mosquitoes of North America, North Mexico" by R.F. Darsie and R.A. Ward, 2005.

Of these 40+ problematic mosquito species in Manatee County, 14 are of primary concern to the Mosquito Control District. These are: *Aedes taeniorhynchus, Ae. sollicitans, Ae. aegypti, Ae. albopictus, Ae. vexans, Ae. infirmatus, Culex quinquefasciatus, Cx nigripalpus, Psorophora columbiae, Ps. ferox, Ps. ciliatia, Coquillettidia perturbans, Mansonia titillans,* and *Wyeomyia vanduzeei.*

i. *Aedes taeniorhynchus*, the "Black Salt-marsh Mosquito" is a species closely associated with salt water habitats such mangroves and marshes. This is a very aggressive mosquito that bites predominately in crepuscular periods but also during daytime periods as well. Populations tend to be explosive when conditions are appropriate. Such emergences may curtail outdoor activity of residents, and can wreck havoc on the local economy, especially during outdoor events or for businesses located in or near our coastal region. This species has been found to carry Saint Louis Encephalitis (SLE), WNV and EEE.

ii. *Aedes sollicitans*, the "Brown Salt-marsh Mosquito" shares very similar breeding habitats as the Black Salt-marsh Mosquito and populations are equally explosive. The Brown Saltmarsh mosquito tends to be more aggressive in biting behavior and has larger migratory flights, commonly reaching 10 miles or more from natal areas. This is a fairly large mosquito that can be a serious pest. It has been reported to carry EEE in the northeastern US.

iii. *Aedes aegypti,* the "Yellow Fever Mosquito" is a tropical and subtropical species most closely associated with domestically-generated containers as

prime breeding sites. These mosquitoes are aggressive daytime biters and a source of many public complaints. These mosquitoes are associated with urban areas and rarely discovered in rural parts of the County. As the name implies, this species is the primary vector of Yellow Fever in tropical areas but is indicated as the primary vector of Dengue Fever in the US.

iv. *Aedes albopictus*, the "Asian tiger mosquito", is an introduced species of mosquito that was first found in the US in 1985. This species is a container breeding mosquito and shares very similar habitats as the Aedes aegypti with a fair amount of competition occurring between each. This species is commonly associated with the more urbanized areas in the county. However, it can also be an abundant species in the more rural regions of the county, especially in the vicinity of trash piles or tire dumps. It is a fierce daytime biter and a major nuisance mosquito within our service area.

v. *Aedes vexans* is a common freshwater mosquito that has the potential to cause great nuisance based upon aggressive daytime and crepuscular biting and potentially explosive populations. The mosquito has not definitely been documented as a vector of disease but has been implicated as a secondary vector of eastern equine encephalitis and dog heartworm.

vi. *Aedes infirmatus* is another freshwater mosquito that breeds in rain pools found in wooded areas as well as open fields. Biting behavior is similar to Ae. vexans but not quite as aggressive. This species is not known to transmit any mosquito borne diseases.

vii. *Coquillettidia perturbans* is a fairly large mosquito that is often associated with aquatic habitats containing cattails, *Typha* spp. It is generally considered a bridge vector of EEE to mammals, but has also tested positive for WNV in the United States. It commonly takes blood meals from both bird and mammal species (including humans).

viii. *Mansonia titillans* shares the same aquatic habitats as *Cq. perturbans.* The species tends to have large population emergence from August through November and are aggressive biters of humans in crepuscular periods.

ix. *Culex nigripalpus* is a permanent-water mosquito breeder typically found in organic rich waters such as irrigation canals, roadside ditches and flooded fields. These are crepuscular and nocturnal mosquitoes and have a biphasic pattern of host preference for blood meals; winter and spring – avian species are preferred and during the wetter months of summer and fall observes a switch to human preference. In turn this partially explains the enzootic (birds) and epidemic role this species plays in vectoring SLE and WNV to humans. Cx nigripalpus is the most significant species of concern in the spread of mosquito borne diseases in Manatee County and Florida.

x. *Culex quinquefasciatus* is also a permanent-water mosquito breeder typically found in high organic rich and polluted waters such as dairy pastures, sewage processing facilities and catch basins. C*ulex quinquefasciatus* are opportunistic feeders of both mammals and/or birds. In Florida, the species is a primary vector of SLE to humans and likely plays more of a maintenance role of WNV in wild birds.

xi. *Psorophora columbiae*, is a flood-water species typically found breeding in flooded open grassy areas. This species is a strong flyer and aggressively prefers feeding upon humans/mammals during diurnal and crepuscular periods. Population levels can be tremendous subsequent to rainfall and presents a very serious nuisance mosquito during the summer and fall.

xii. *Psorophora ferox*, a flood-water mosquito species found within wooded habitats of Manatee County. It can be a serious pest in many subdivisions that border these areas.

xiii. *Ps. ciliata* is also a floodwater mosquito typically found in open grassy areas. This is a very large mosquito and females feed upon humans/mammals. It is a very aggressive diurnal and crepuscular biter and small populations can generate very large number of public complaints. Bites are very painful.

xiv. *Wyeomyia vanduzeei* is a permanent water breeder breeding exclusively in water that collects in the axial of bromeliad plant leaves. Populations tend to peak in the Spring and early summer and populations tend to generate large number of complaints since there is a close associations with bromeliads and humans. This is an aggressive daytime biter.

Action thresholds: As with any wildlife species, mosquito population levels need to be counted/estimated in order to make scientific-based population-level management decisions. In the case of mosquito management, the primary effort of the MCMCD is to keep population levels as low as possible in order to minimize the risk for mosquito borne diseases, promote economic development and ensure high quality of life for residents and visitors. As such, the populations of mosquitoes need to be counted/estimated and appropriate action thresholds be in place.

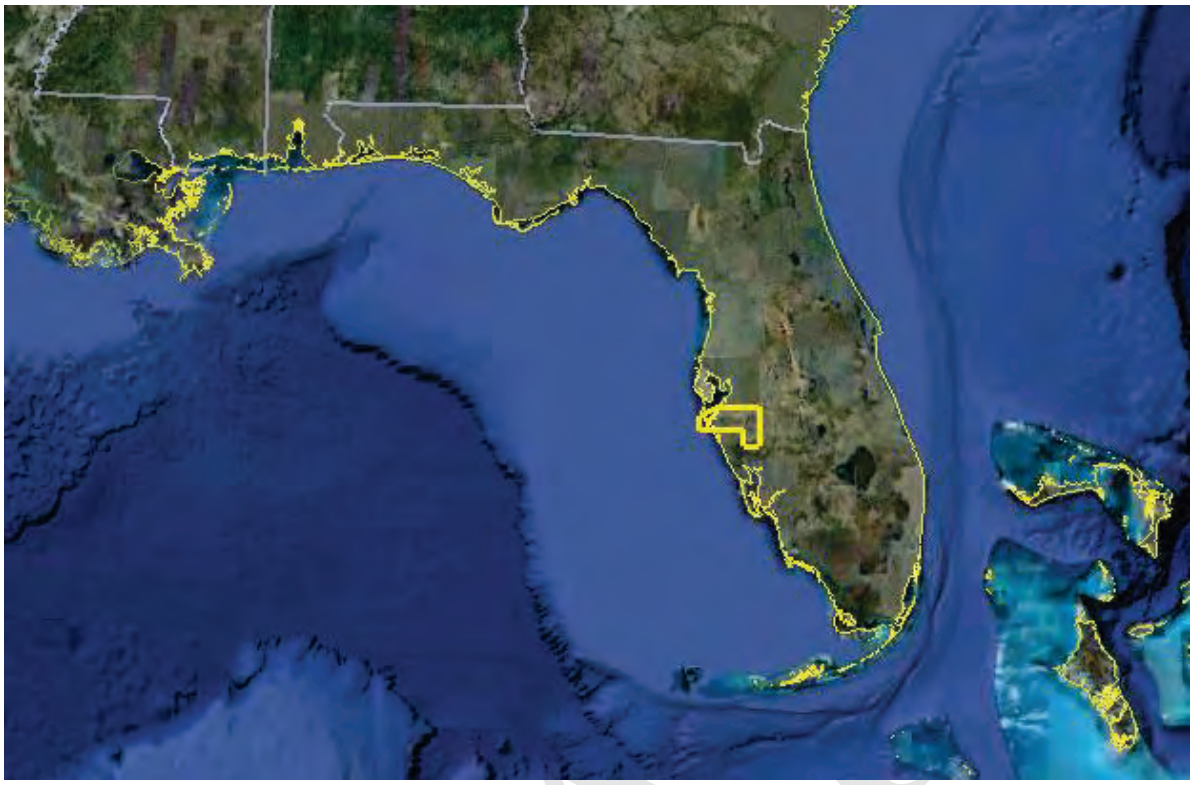
A combination of surveillance techniques is used in Manatee County to estimate adult mosquito population sizes to include 1) daily landing rate counts at 31 sites throughout the County, 2) daily- and 3) weekly-set CDC/CO2 baited light traps at (up to) 53 sites throughout the County, and 4) a small reliance upon public complaints/service requests to assist in our directing surveillance efforts. In addition to adult mosquito surveillance, the Manatee County Mosquito Control District actively monitors larval mosquito populations. Surveillance of larval populations takes place at thousands of locations throughout the County using the standard larval dipping techniques with a 300ml “dipper” for most mosquito species. Other surveillance techniques can also be occasionally employed with unique habitats or specific mosquito species but these are so rarely used that these will not be described here.

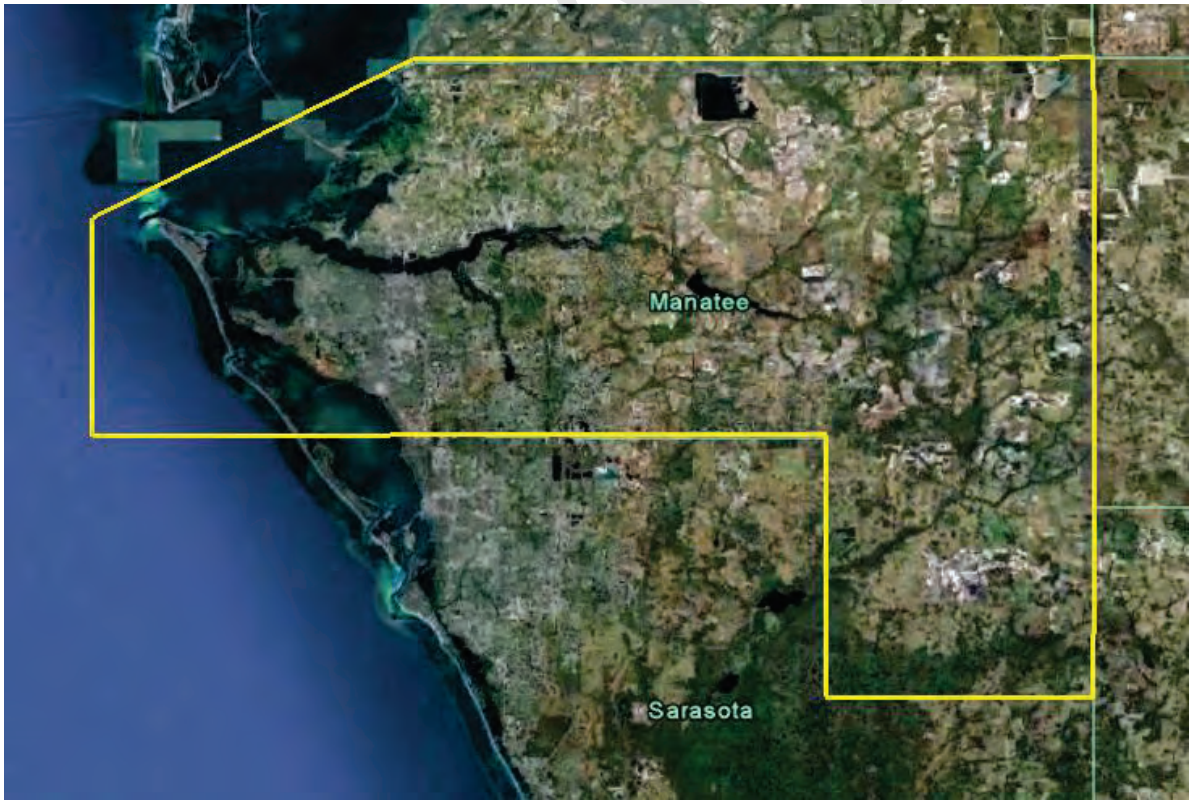
Action Thresholds: Based upon institutional knowledge and experience, a **landing rate** count as low as 0.5 to 1 adult mosquito/minute landing upon a human and attempting a blood meal is enough to justify initiation of aerial or ground based adulticiding. This landing rate extrapolates to 30 to 60 mosquito bites per hour of outdoor activity; a rate that few residents of Manatee County are willing to accommodate. Action thresholds for **CDC light traps** are dependent upon a number of factors to include species type, location of trap, proximity to human populations, density of that population, environmental conditions and disease threat but a conservative action threshold for a single CDC light trap is 500 adult female mosquitoes per trap per night.

Action thresholds for larval surveillance are more difficult to quantify since the translation from "numbers of larvae" to "numbers of pestiferous mosquitoes" is dependent upon many different factors such as mosquito species, migratory patterns, ambient air temperature, proximity of larvae to human populations, current and long-term weather patterns, flood stage of breeding habitat, seasonal host preferences and many other minor factors. These variables aside and generally speaking, larval dip counts of 1-2 mosquitoes in at least 50% of all dips taken is enough to warrant larvicide applications for all mosquito habitats in Manatee County.

2.(b) Location Map

Manatee County is located immediately south of Tampa Bay within the Atlantic Coastal Plain of west-central Florida. Tampa Bay and the Gulf of Mexico form the northern and western aquatic boundaries of the County and the county is also bifurcated by the Manatee and Braden Rivers. Numerous other smaller rivers/creeks/tributaries in Manatee County are considered Waters of the State as well as Waters of the US. Manatee County has a surface area of 720 sq miles and approximately 330,000 residents. Attached below are 2 maps describing Manatee County.




Manatee
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2.(c) List of Pesticides (or Any Degradates) for which water bodies are Impaired

There are no water bodies located in Manatee County that have been impaired by pesticides (or their degradates) used in the County mosquito control program.

3. Control Measure Description

The Manatee County MCD employs a fully inclusive and modern Integrated Pest Management (IPM) program to target mosquito species found within the County. Only mosquitoes that impact public health, domesticated animal health, economic development and/or negatively affect human quality of life are targets of the Manatee County MCD. Mosquito species that do not fall into one of the above 4 classifications are not targets of the District.

The District may employ one of several options when addressing a larval or adult mosquito problem to include: 1) no action, 2) source reduction (prevention), 3) public education, 4) biological control, 5) larviciding and/or 6) adulticiding. When deciding upon an appropriate control measure factors such as efficacy, non-target impacts, cost, public acceptance, pest resistance, weather patterns, and environmental impacts are all evaluated and fully considered when determining the most efficient and effective control strategy. The District performs IPM in full accordance with recommendations made by the American Mosquito Control Association and the Florida Mosquito Control handbook (2005).

The Manatee County Mosquito Control District uses the mosquito control measures listed in the table below:

Control Measure	Description	Applicability	Active Ingredient/ Formulation	Surveillance Method	Threshold	Application Method	Rate Determination
No Action	Larvicide Applications	Rainfall events and other environmental conditions that may dictate a delay in larvicide applications	NA	Dipping	NA	NA	NA
No Action	Larvicide Applications	The volume of rainfall (eg, hurricane) or low human population in area of rainfall may result in a "no action" managerial decision	NA	Digging	NA	NA	NA
No Action	Adulticide Applications	Environmental conditions, adult mosquito activity patterns, possibility of additional emergence may dictate a need to delay adulticide applications	NA	Landing rate counts, light traps counts, public complaints	NA	NA	NA
Source Reduction	Domestic (urban) cleanup	Remove mosquito breeding sources around the home or other areas where domestic mosquitoes may breed	NA	Property checks, larval dip counts, adult landing rate counts	Presence of container breeders	Remove containers; empty containers	NA
Source Reduction - Ditching	Salt marsh Habitats	The District may establish- or clean existing salt marsh ditches to promote drainage and introduce larvivorous fishes for mosquito control	NA	Property checks, larval dip counts	Presence of larvae; appropriate applicability	Hydraulic excavator, crane, manual shovel	NA
Public Education	Provide instruction to the public on	Effective with school-aged children; also presented at	NA	NA	NA	Personal instruction	NA

	topics of mosquito avoidance and source reduction around the home	community events					
Biological Control	Stocking of freshwater Mosquitofish (Gambusia spp) into known breeding habitat	Freshwater and permanent mosquito breeding habitats	NA	Property checks, larval dip counts	Presence of larval mosquitoes	Manual stocking of fish	200 fish/acre
Application of Chemical Larvicides	Application of EPA-approved larvicides in accordance with all FIFRA-label instructions	All mosquito breeding habitats in Manatee County FL	Bti – Vectobac Bs – Vectolex Bti/Bs - Vectomax Spinosad – Natular Temephos – Abate Methoprene – Altosid Surface Oils - BVA	Larval dipping, inspector observations of conducive conditions	1-2 larvae per dip in at least 50% of larval samples (or equivalent)	Hand, truck, helicopter applications	Minimum application rate as required to achieve satisfactory mosquito mortality and within confines of FIFRA chemical label
Application of Chemical Adulticides	Barrier application to vegetation	Applied to vegetation around residential, municipal or commercial areas	Bifenthrin – Warrior Permethrin – Permanone 10EC	Landing rate counts	0.5 to 1.0 adults per minute	Back pack and/or truck sprayers	Minimum application rate as required to achieve satisfactory mosquito mortality and within confines of FIFRA chemical label
Adulticiding	Ground ULV application	Adulticides are applied to the air column from ground-based ULV machinery to target flying mosquitoes	Permethrin – Permanone, Omega Mist-mac or similar Sumithrin - Anvil	Landing rate counts, CDC lighted and baited traps	0.5 to 1.0 adults per minute or 50 adults per trap per night	Truck mounted ULV spray equipment	Minimum application rate as required to achieve satisfactory mosquito mortality and within confines of FIFRA chemical label
Adulticiding	Aerial ULV application	Adulticides are applied to the air column from aerially-based ULV machinery to target flying mosquitoes	Naled – Dibrom or Trumpet Sumithrin – Anvil Permethrin – Permanone or similiar	Landing rate counts, CDC lighted and baited traps	0.5 to 1.0 adults per minute or 50 adults per trap per night	Helicopter mounted ULV spray equipment	Minimum application rate as required to achieve satisfactory mosquito mortality and within confines of FIFRA

4. **Schedules and Procedures**

4(a) Schedules and Procedures – The following schedules and procedures will be followed when making chemical applications in accordance with Water Quality Based Effluent Limitations (WQBEL). When appropriate, Manatee County Mosquito Control District SOP's are referenced and are included as attachments as part of the PDMP.

Control Measure	**Determination of Application Rate**	**Surveillance Method**	**Determination of Frequency of application**	**Spill Prevention Procedures and Schedules**	**Application equipment calibration procedures**	**Application equipment maintenance procedures**	**Environmental Condition Assessment**
Larviciding Liquid and Granular formulations Ground Applications (Truck/Hand Equipment)	Rate efficacy was determined when product was introduced based on comparison of pre-application and post-application larval counts to determine the level of control achieved for a variety of doses.	Larval dips and container inspections conducted after receipt of complaint prior to application	Applications are made when pest threshold levels were exceeded based on surveillance; application frequency is made in accordance with chemical label	All spray equipment is inspected daily for leaks and maintenance; spill kits are held on all spray vehicle; all employees participate in annual spill prevention training; MCMCD SOP titled "Spill Prevention and Containment" is followed.	All spray equipment is calibrated at least 2x/year per MCMCD SOP for Calibration Procedures.	All spray equipment is inspected daily for proper maintenance. All equipment is repaired prior to use if deficiencies are discovered. The MCMCD SOP for Spray Equipment Maintenance procedures should be followed.	On-site weather conditions are evaluated by trained applicators prior to each spray mission to ensure proper chemical applications in accordance with FIFRA-based chemical labels.
Larviciding Liquid and Granular Formulations Aerial Applications	Rate efficacy was determined when product was introduced based on comparison of pre-application and post-application larval counts to determine the level of control achieved for a variety of doses.	Larval dips and container inspections conducted after receipt of complaint prior to application	Applications are made when pest threshold levels were exceeded based on surveillance; application frequency is made in accordance with chemical label	All spray equipment is pre-flight inspected for leaks and proper maintenance. All pilots participate in annual spill prevention training; MCMCD SOP titled "Spill Prevention and Containment" is followed in all aerial spray missions.	All spray equipment is calibrated upon each spray mission by in-flight navigational recording equipment and comparing area sprayed to volume applied yielding an application rate. Additionally, all spray equipment is calibrated when installed upon each helicopter and calibrations are verified on a sometimes daily-basis as different formulations are applied. The MCMCD SOP for Calibration procedures should be followed.	All spray equipment is inspected daily for proper maintenance. All equipment is repaired prior to use if deficiencies are discovered. The MCMCD SOP for Spray Equipment Maintenance procedures should be followed.	On-site weather conditions are evaluated by trained applicators prior to each spray mission to ensure proper chemical applications in accordance with FIFRA-based chemical labels.

Adulticiding Truck Applied Barrier- and ULV- Spray Missions	Rate efficacy was determined when product was introduced based on comparison of pre-application and post-application larval counts to determine the level of control achieved for a variety of doses.	Any combination of landing rate counts and/or light trap counts are used to assess adult mosquito population size and direct spray missions	Applications are made when pest threshold levels were exceeded based on surveillance; application frequency is made in accordance with chemical label	All spray equipment is inspected daily for leaks and maintenance; spill kits are held on all spray vehicles; all employees participate in annual spill prevention training; MCMCD SOP titled "Spill Prevention and Containment" is followed.	All spray equipment is calibrated upon each spray mission by in-flight navigational recording equipment and comparing area sprayed to volume applied yielding an application rate. Additionally, all spray equipment is calibrated when installed upon each helicopter and calibrations are verified on a sometimes daily-basis as different formulations are applied. The MCMCD SOP for Calibration procedures should be followed.	All spray equipment is inspected daily for proper maintenance. All equipment is repaired prior to use if deficiencies are discovered. The MCMCD SOP for Spray Equipment Maintenance procedures should be followed.	On-site weather conditions are evaluated by trained applicators prior to each spray mission to ensure proper chemical applications in accordance with FIFRA-based chemical labels.
Adulticiding Aerial ULV Spray Missions	Rate efficacy was determined when product was introduced based on comparison of pre-application and post-application larval counts to determine the level of control achieved for a variety of doses	Any combination of landing rate counts and/or light trap counts are used to assess adult mosquito population size and direct spray missions	Applications are made when pest threshold levels were exceeded based on surveillance; application frequency is made in accordance with chemical label	All spray equipment is inspected daily for leaks and maintenance; spill kits are held on all spray vehicles; all employees participate in annual spill prevention training; MCMCD SOP titled "Spill Prevention and Containment" is followed.	All spray equipment is calibrated upon each spray mission by in-flight navigational recording equipment and comparing area sprayed to volume applied yielding an application rate. Additionally, all spray equipment is calibrated when installed upon each helicopter and calibrations are verified on a sometimes daily-basis as different formulations are applied. The MCMCD SOP for Calibration procedures should be followed.	All spray equipment is inspected daily for proper maintenance. All equipment is repaired prior to use if deficiencies are discovered. The MCMCD SOP for Spray Equipment Maintenance procedures should be followed.	On-site weather conditions are evaluated by trained applicators prior to each spray mission to ensure proper chemical applications in accordance with FIFRA-based chemical labels.

4. (b) (1) Spill Response and Notification Procedures:

When a spill of pesticide material in excess of reportable quantities is observed, the inspector/applicator will implement procedures described the MCMCD SOP "Chemical Spill Prevention and Containment Procedures". This SOP includes instructions for immediate response and containment actions for any accidental

chemical spill of reportable volumes. In addition, the MCMCD will contact the National Spill Response Center at 800-454-8802 and the State Watch Office at 800-320-0519 to report such spill.

4. (b) (2) Adverse Incident Response Procedures

In the event of an adverse incident discovered by the MCMCD and as defined by the FDEP (this definition is linked to this document), the Director or Assistant Director of the MCMCD will report such findings to the National Pesticide Telecommunications Network at 800-858-7358, the National Spill Response Center at 800-454-8802; and the State Watch Office at 800-320-0519 within 24-hours of becoming aware of the incident. Information provided to the State Watch Office will include:

-District name and mailing address and telephone number ;
-The FLG number (issued by FDEP after NOI is processed)
-The name and telephone number of a contact person, if different than the person providing the 24-hour notice;
-Date and time of the adverse incident and status (ongoing or ceased);
-How and when the District became aware of the adverse incident;
-Description of the location, or address, of the adverse incident including name of water body affected, if any;
-Description of the adverse incident identified and the EPA pesticide registration number for pesticide applied in the area of the adverse incident;
-Description of any steps taken or that will be taken to correct, repair, remedy, cleanup, or otherwise address any adverse effects; and
-Other persons or agencies contacted.

Following the 24-hour report, the District will file an Adverse Incident Written Report within 5 days of the incident (or becoming aware of the incident)

Note: If the 24 hour oral report for an adverse incident was made per SOP, and the incident has been corrected, and the incident did not adversely impact health or the environment, then no written report will be made.

The adverse incident report shall include the following information:

-The information provided in the 24-hour adverse incident notification;
- Date and time the State Watch Office was contacted notifying the State of the adverse incident and any instructions you received from the Office;
- Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc)
-A description of the circumstances of the adverse incident including species affected, estimated number of individual and approximate size of dead or distressed organisms and if the adverse incident has not been corrected, the anticipated duration it is expected to continue;
-Magnitude and scope of the affected area (e.g. aquatic acreage or total stream distance affected);

- Pesticide application rate, intended use site (e.g., banks, above, or direct to water), method of application, and name of pesticide product and active ingredients, and the EPA pesticide registration number;
- Description of the habitat and the circumstances under which the adverse incident occurred (including any available ambient water data for pesticides applied);
- If laboratory tests were performed, indicate what and when test(s) were performed, and provide a summary of the test results within 5 days after they become available;
- If applicable, explain why the adverse incident could not have been caused by exposure to the pesticide;
- Steps taken or planned to reduce, eliminate and prevent recurrence of adverse incidents;

NOTE: *FDEP Rule Definition of Adverse Incident:*

***Adverse Incident** – means an incident that the operator has observed upon inspection or of which otherwise becomes aware, in which:*

(1) A person or non-target organism is likely to have been exposed to a pesticide residue, and

(2) The person or non-target organism suffered a toxic or adverse effect.

(3) An upset, as defined in this appendix, a spill, leak, or any unauthorized discharge to surface or ground water has occurred

The phrase "toxic or adverse effects" includes effects that occur within surface waters of the state on non-target plants, fish or wildlife that are unusual or unexpected (e.g., effects are to organisms not otherwise described on the pesticide product label or otherwise not expected to be present) as a result of exposure to a pesticide residue, and may include:

- *Distressed or dead juvenile and small fishes*
- *Washed up or floating fish*
- *Fish swimming abnormally or erratically*
- *Fish lying lethargically at water surface or in shallow water*
- *Fish that are listless or nonresponsive to disturbance*
- *Stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants*
- *Other dead or visibly distressed non-target aquatic organisms (amphibians, turtles, invertebrates, etc.)*

4. (c) Pesticide Monitoring Schedules and Procedures

This portion of the MCMCD PDMP addresses "post-spray" visual monitoring requirements for adverse incidences as required in *Part IV Monitoring and Corrective Action, Section B, Visual Monitoring Requirements* of the Florida DEP NPDES Permit 62-621.300(8)(e).

The MCMCD commonly makes **direct** and **indirect** applications of chemicals to waters of the State. The application of larvicides is considered to be direct applications since these chemicals are directly applied to water and intended to have kill mosquito larvae within that water. Adulticide applications are considered to be indirect applications since these products are applied to the air column in very small droplets and are designed

to remain aloft and drift for long periods of time and may move up to several miles from the point of release while becoming increasingly diffuse. These droplets then may incidentally deposit in some small quantities into waters of the State where concentrations levels are very small and often undetectable after just a few hours post-application. In either case (direct or indirect applications of chemicals to water of the State), the probability for non-target impacts and adverse incidences is outstandingly low since all chemical applications already adhere to scientifically-vetted FIFRA regulations that already ensures de minimis environmental impacts.

Post-Application Visual Monitoring: Subsequent to most chemical applications, staff of the MCMCD will conduct efficacy evaluation in, and around the treatment area to determine the level of chemical impact upon the target population. Although due to time constraints, logistics, feasibility and safety reasons, not **all** chemical applications are followed with an efficacy evaluation. In compliance with the Post-Application Visual Monitoring requirements of this Permit, in addition to post-application efficacy evaluations, the MCMCD staff will also actively examine the treatment area for adverse environmental impacts and report any discoveries in accordance with the procedures described in Section 4(b)(2). These evaluations will be performed within 24 hours of the application as time and logistics permit.

5. Signature Requirements

This PDMP should be reviewed and appropriately modified no less than once per calendar year by the Director and/or the designated individual responsible for maintaining and updating the plan. Modifications to the PDMP can occur more frequently as needed to address changes in target pests, pest management strategies, the pest management area or any other item described in this PDMP.

An indication of such modifications should be indicated by reviewer's signature and date of review/modification.

Signature: _____

Title: _____

Date: _____

Modifications (provide date and signature of reviewer):