City of KELLER

PUBLIC WORKS

Mosquito Control and Abatement Program

Developed in conjunction with the Tarrant County Public Health Department

Updated: June 28, 2016

Reviewed and Approved by _____/City Manager

1) Introduction

There are 85 species of mosquitoes found in Texas. Genus *Culex* is the mosquito that typically carries the West Nile Virus and St. Louis Encephalitis Virus (SLEV). The most common specie of *Culex* in North Texas is *Culex quinquefasciatus*, which is the primary vector of West Nile Virus. Other species that can carry West Nile Virus are *Culex restuans* and *Culex tarsalis*, which are also found in North Texas. *Aedes is a* genus of mosquitoes associated with carrying and transmitting Zika and Chickungunya viruses.

The city administers a mosquito abatement program each year in cooperation with the Tarrant County Public Health Department. The program's strategy is to reduce the mosquito larvae numbers by public education, source elimination and biological control, and mosquito surveillance.

Public education is an important aspect of the City of Keller mosquito abatement program. Household items that hold water, such as tires, flower pots, buckets, wheelbarrows, pet dishes, rain gutters, decorative bird baths, and swimming pools pose the most risk of developing a breeding site. The city is dedicated in educating the community on a breeding source prevention and elimination methods. The City of Keller representatives are available for participation in public outreach programs. To request a presentation, contact the Public Works Department at 817-743-4080.

Biological control or "biocontrol" is the use of natural enemies to manage mosquito populations. There are several types of biological control, including the direct introduction of parasites, pathogens, and predators to target mosquitoes. The city uses mosquito fish as biocontrol agent, a predatory fish that feeds on mosquito larvae. Additionally, the city utilizes larvicides – the biological insecticides that kill larvae.

The mosquito fish may be introduced to stagnant water bodies that are <u>not</u> connected to the Waters of the US (refer to www.epa.gov for definition) and that are <u>not</u> exposed to chemical treatments.

The city conducts mosquito surveillance with early monitoring every spring and regular monitoring during the mosquito season, which includes trapping and virus testing activities (*refer to sections 5a and 5b for details*).

2) The Mosquito Abatement Plan Requires the Following to be Documented

- **a)** Record of all reports and complaints
- **b)** Mosquito control and abatement measures taken
- **c)** Location, date, and type of treatment application
- **d)** Map of trapping locations
- **e)** Location of WNV positive test mosquito samples
- **f)** Positive human cases of mosquito-borne viruses confirmed by the Tarrant County Public Health Department

3) Mosquito Surveillance Areas

a) Natural Environments

City staff regularly monitors common locations where mosquitoes can breed, including but not limited to creeks, flood plains, ponds, roadside ditches, and retention/detention ponds. Larvicidal treatment and/or mosquito fish is applied to waters that do or may contain mosquito larvae and/or pupae.

b) Man-Made Environments

City staff investigates common man-made areas where mosquitoes can breed, including but not limited to old tires, buckets, unused plastic swimming pools, abandoned swimming pools, flowerpots, pet dishes, rain gutters, bird baths, uncovered boats, plastic toys, wheelbarrows, trash cans, and French drains. Larvicidal treatment and/or mosquito fish is applied to waters that do or may contain mosquito larvae and/or pupae.

4) Larviciding

Larviciding targets larvae and/or pupae in the breeding habitat before they can mature into adult mosquitoes and disperse. Effective larviciding can reduce the number of adult mosquitoes available to breed, create a nuisance, potentially spread disease, and lay eggs which leads to more mosquitoes. Larvicides can be obtained in most home improvement stores.

The city uses BTI Briquets: *Bacillus thuringiensis israelensis* (Bti) is a microbe used in eliminating mosquito larvae. It is a naturally occurring bacterium that produces a crystalline protein toxin (crystal) and a spore. Mosquito larvae of susceptible species ingest a lethal dose of Bti crystals and spores. Toxins are activated in the larval midgut, paralyzing and damaging the digestive system. Larvae become sluggish and die within 24 hours. Bti-based products are not insecticides of contact, meaning they must be ingested to be effective.

Gloves should be used when handling any pesticide. Avoid inhaling briquet dust. Briquets may be applied to dry areas that are known or suspected to become breeding sites when flooded. Ponds and abandoned swimming pools are examples of pre-treatment applications. Briquets may also be used in any containerized standing water. To prevent briquets from being flushed away by moving water, they may be anchored using string tied through the hole in the center or staked in place. When briquets are exposed to water, they begin to release the active ingredient and suppress larval development. Subsequent wetting and drying will not reduce their effectiveness. Re-inspection may be required after each rain event.

Briquets are formulated to release effective levels of larvicide for a period of 30 days or more under typical environmental conditions. The floating action of the briquets will ensure that active material is released at the surface as well as gradually settle to the bottom. It degrades in the environment and therefore is not active outside of the treatment period.

Briquets can be broken into portions for use in smaller locations. Multiple briquets may be required in ponds, abandoned or unused swimming pools, and ditches. Briquets are safe for use in animal watering troughs. Briquets do not need to be used in locations where aquatic life is present as it eats the mosquitoes. Briquets can be broken and used as shown in the following table, dependent upon the surface area of water in the treatment site. One briquet treats 100 square feet of water surface area.

Surface area of water	1 to 5 sq. ft.	5 to 25 sq. ft.	25 to 100 sq.ft	Above 100 sq. ft.
Use Quantity	1/4 Briquet	1/2 Briquet	1 Briquet	1 Briquet

**** Larvicides are available for Keller residents in Town Hall at no charge with one package per household per one year***

****A copy of the Summit BTI larvicide briquet MSDS is on file at the Public Works Department.***

5) Mosquito Surveillance

a) Early Monitoring

1. Begins after 30 days of above freezing temperatures.
2. Early monitoring locations include naturally existing environmental habitats and man-made environments.
3. Additional inspections are conducted in response to phone calls, emails, and alerts from the public.
4. Aerial surveillance is conducted using the latest GIS photo of the City.
5. Items or areas with standing water are emptied. If this is not feasible, larvicidal treatment and/or mosquito fish is applied to prevent the actual or potential larvae growth.
6. It is a violation of the city ordinances to contain standing water on any property that is conducive to the breeding of mosquitoes. (*City code of ordinances Chapter 8 - Health and Sanitation, Article IV.-Nuisances, Sec. 8-430. - Ponds or pools of unwholesome water*). The reported violation(s) are investigated and immediate abatement is required in the event of a confirmed violation.

b) Regular Monitoring

1. Begins when the Tarrant County Public Health Department Mosquito Monitoring Program initiates.
2. Monitoring locations include naturally existing environmental habitats and man-made environments.
3. Additional inspections are conducted in response to phone calls, emails, and alerts from the public.
4. Aerial surveillance is conducted using the latest GIS photo of the City.
5. Items or areas with standing water are emptied. If this is not feasible, larvicidal treatment and/or mosquito fish is applied to prevent the actual or potential larvae growth.
6. It is a violation of the city ordinances to contain standing water on any property that is conducive to the breeding of mosquitoes. (*City code of ordinances Chapter 8 - Health and Sanitation, Article IV.-Nuisances, Sec. 8-430. - Ponds or pools of unwholesome water*). The reported violations are investigated and immediate abatement is required in the event of a confirmed violation.
7. Trapping activities are conducted on city-owned property at static locations with five traps per week. Temporary traps may be utilized on city-owned property as necessary for additional monitoring.
8. Collected samples are delivered to the Tarrant County Public Health Department's lab for West Nile Virus (WNV) and Saint Louis Encephalitis Virus (SLEV) testing. There is no testing for Zika virus, or other viruses that are known to be imported, offered by the Tarrant County Public Health Department at this moment. Presence of imported viruses in local areas are confirmed by a positive human case.

6) Positive Samples and Human Cases of Mosquito-Borne Viruses

a) Positive Samples

1. Tarrant County Public Health Department notifies the city's primary contacts of a positive sample. The following city staff members are to be notified subsequently: Environmental Services Specialist, Director of Public Services and Economic Development, Director of Public Works, Senior Project Engineer, City Manager, and Public Information Officer.
2. The city notifies the public of a positive sample via electronic means and/or available emergency communication system(s).

3. An emergency response to a virus positive mosquito sample is determined at the discretion of the City Manager and upon recommendations from the Director of Public Works and the Tarrant County Public Health Department.

b) Human Cases of Mosquito-Borne Viruses

1. Tarrant County Public Health Department investigates human cases of mosquito-borne viruses. The city notifies the Tarrant County Public Health Department of human cases reported to the city from other sources for verification. Tarrant County Public Health Department notifies the city's primary contacts of a confirmed human case. The following city staff members are to be notified subsequently: Environmental Services Specialist, Director of Public Services and Economic Development, Director of Public Works, Senior Project Engineer, City Manager, and Public Information Officer.
2. The city notifies the public of a confirmed mosquito-borne virus human case via electronic means. Human case locations are protected by Federal law of a Privacy Rule, HIPAA, and are prohibited from being disclosed to public.
3. An emergency response to a confirmed mosquito-borne virus human case is determined at the discretion of the City Manager and upon recommendations from the Director of Public Works and the Tarrant County Public Health Department.

8) Adult Mosquito Control Activities

Targeted ground spraying is conducted at the discretion of the City Manager and upon recommendations from the Director of Public Works and the Tarrant County Public Health Department. Any adult mosquito control activities (ultra-low-volume (ULV) application of insecticide), conducted using truck-mounted and/or backpack application equipment in public areas for nuisance abatement, is provided by a third-party contractor as directed by the City Manager and/or the Director of Public Works. Any adult mosquito control activities (ultra-low volume (ULV) application of insecticide), conducted using aircraft in residential areas for nuisance abatement, may be provided by the Tarrant County Public Health Department and/or the Texas Department of Health State Services upon approval by the Keller City Council.