Mosquito Surveillance and Abatement Policy

1.0 Introduction

Mosquitoes are insects that belong to the order Diptera, or True Flies. Female mosquitoes have modified mouthparts that form a long piercing-sucking proboscis, while male mosquitoes have mouthparts that are incapable of piercing skin. There are over 2,500 different species of mosquitoes that have been identified throughout the world, with approximately 150 species occurring in the United States. The Texas Department of Health and Human Services estimates that there are approximately 88 mosquito species in the State of Texas; however, roughly only 12 of these mosquito species have been implicated in the transmission of serious diseases.

Mosquitoes may be controlled through a variety of different physical, chemical, and biological methods. Physical methods usually involve source reduction, which is simply the physical removal of the specific mosquito breeding habitats of the mosquito species of concern, namely small catchments of water around homes and in storm drain systems. Biological measures mainly center on the use of bacteria that kill mosquito larvae or the use of natural mosquito larvae predators. Chemical control typically involves the application of pesticides to rapidly reduce the adult mosquito population when the human population is at an elevated risk of acquiring a mosquito-borne disease.

Mosquito control pesticides are applied by various means, depending on the type and size of the area being treated. However, pesticides have the potential to impact non-target species, including humans, if not applied according to prescribed methods and quantities. Any consideration for the application of pesticide should be a careful weight of the known risks to the people in the area, potential ecological risks, and potential environmental risks. Used in a targeted and brief manner, community ultra-low volume (ULV) pesticide application can and does reduce a community's risk from infection by arbovirus with minimal to no risk to the human population and minimal risk to the environment.

2.0 Objectives

The City of Kyle Mosquito Surveillance and Abatement Policy was developed to meet several objectives. Specifically, the Policy:

- Provides guidelines and information on mosquito populations, prevalence of diseases, and control strategies;
- Provides a systematic and multi-faceted approach for using mosquito sampling and human disease data to establish Risk Levels;
- Establishes actions that will be undertaken for each Risk Level;
- Provides municipal staff and elected officials with a decision-support system.

The City of Kyle has chosen a multi-faceted approach to protecting the health of Kyle citizens against mosquito borne illnesses:

1. Surveillance and testing for illnesses
2. Mosquito Control through source reduction and pesticides in limited and prescriptive measures
3. Public Education

3.0 Kyle's Mosquito Surveillance Plan

The City of Kyle mosquito surveillance program involves collecting adult mosquito populations to gauge the potential for a disease outbreak and mapping locations. The City of Kyle, in partnership with Hays County, will set out traps around areas of concern to determine the incidence of arbovirus. Hays County monitoring locations change throughout the season and are based on Hays County staff determination and complaints received.

Additionally, the City of Kyle will work with Hays County to place traps for monitoring purposes at selected locations. Traps will also be placed based on the locations of complaints received in the City of Kyle.

The mosquito surveillance program will allow the City to identify potential mosquito breeding grounds and areas of persistent disease. Using this information, the City can target efforts towards habitat disruption, source reduction, larviciding operations, and other control mechanisms.

4.0 Kyle's Mosquito Control Measures

The primary objective of mosquito control is to decrease the risk of mosquito-borne human diseases. This objective should be accomplished by:

- Stressing source reduction as a viable means of control, both by residents and on municipal properties.
- Using larvicide where such activities are likely to be effective.
- Promoting the use of personal mosquito protection measures, especially for the elderly and those individuals with compromised immune systems, through public education and outreach.
- Providing public information so that citizens are informed about the current Risk Level, areas of the City where arbovirus has been located, current municipal control measures, and what can be done by the public to help reduce risks.
- If warranted, implement adult mosquito control measures through targeted ultra-low volume pesticide applications (adulticiding).

To target the most common mosquito-borne disease, West Nile virus, there are two main mosquito control pesticide groups. The first group is larvicide pesticide, that has targeted toxicity to mosquito larvae. This type of application is encouraged

because of the low inherent risk and high level of success in mosquito population control.

The second group is adulticide pesticide, that targets adult mosquitoes. Pyrethrins and pyrethroids will only be applied in a targeted manner using ultra-low volume spraying. These pesticides are typically applied using backpacks for small areas, truck-mounted sprayers for broader applications, or aerial applications to target a wide-spread outbreak of the disease. Due to the measures of risk to the environment and ecological functions, adulticides will only be utilized when multiple human cases of West Nile virus have been identified.

4.1 Larviciding

Bacillus thuringiensis israelensis (Bti) is considered ideal for mosquito management because of its specificity for mosquito larvae and minimal to no toxicity to non-target organisms. Bti is a biological or a naturally occurring bacterium found in soils. Currently, Bti is commercially available in powder, liquid, granular, capsule, and "briquette" formulations.

Agencies applying pesticides directly to waters of the United States, or where deposition may enter waters of the United States, are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Texas Commission on Environmental Quality (TCEQ). This permit is titled "General Permit to Authorize Point Source Discharge of Biological Pesticides and Chemical Pesticides That Leave a Residue in Water". Agencies must comply with all applicable provisions of this permit (see TCEQ General Permit TXG87000). The City of Kyle will comply with all requirements necessary to maintain the City's permit under TXG87000.

4.2 Adulticiding

Adulticiding shall be considered only when there is evidence of arbovirus at a level suggesting a high probability of human infection. In general, finding an isolated arbovirus-positive mosquito pool does not by itself constitute evidence of an imminent threat to human health and does not warrant adulticiding.

Spraying should be conducted around dusk when the weather permits and timed to strike the best balance between impacting the target mosquito during its most active time and minimizing impacts on non-target organisms. The City's spraying activity shall follow CDC guidelines.

4.3 City of Kyle Response Plan

Once a complaint has been received, the City will determine the risk level and the corresponding responses based on the following table and description:

Risk Level	Response	Surveillance	Control Measures
1 - Normal mosquito activity with no evidence of arbovirus/disease detected during the past 3 years in vectors, humans, or other hosts.	Normal	Optional	Use public information to promote source reduction and personal protection
2 - Normal mosquito activity with little or no evidence of arbovirus/disease. *	Enhanced	Strongly encouraged	Public education Source reduction
3 - Arbovirus/disease isolated from mosquitoes collected during trapping activities at a single monitoring site.	Public Health Concern	Increased	Public education Source reduction Bti application** Increase surveillance effort
4 - Multiple mosquito pools collected at different times and locations test positive for arbovirus/diseases. Single human case confirmed with laboratory testing	Public Health Warning	Increased	Public education Source reduction Intensify Bti application
5 - Multiple human cases. Cases must be confirmed by laboratory testing.	Public Health Alert	Increased	Public notification Press releases Medical responses Targeted adulticide application

*Enhanced response level is due to recent historical presence of arbovirus/disease in vectors, humans, or other hosts within the vicinity of Kyle (approximately 100 miles).

**The City will establish a list of selected contractors to apply the pesticides as needed when the response level is at a level of 3 or greater.

5.0 City of Kyle Plan for Public Education Concerning Mosquitoes

Public education is a key component of a successful mosquito control program. The City of Kyle provides information on the City web page concerning West Nile Virus and other mosquito borne illnesses.

Depending on Risk level, the following key information will be conveyed to the public:
• The location of WNV positive mosquito trap locations and current risk level;
• Comprehensive prevention strategies and activities used by the City of Kyle to address the threat of arbovirus;
• The public will be advised to eliminate standing water sites by removing all materials that can hold water for longer than 2-3 days; and
• The public will be informed about the symptoms of West Nile Virus (headache, high fever, muscle pain, weakness, and disorientation).

Techniques used to disseminate information may include any or all of the following:
• Televised public service announcements using Kyle's local cable channel;
• Radio announcements;
• Brochures for public use placed in municipal buildings;
• Postings describing the current risk level placed in municipal buildings;
• Brochures and / or fact sheets to be distributed to community-based organizations, community boards, elected officials, schools, nursing homes, libraries, outdoor activity sites, etc.;
• Presentations to elected officials and / or community groups concerning the current risk level, mosquito population and disease status, and mosquito control activities; and
• Press releases describing West Nile virus and/or other arbovirus response activities.