

City of Brookfield

PERMIT APPLICATION FOR CHEMICAL AQUATIC CONTROL

INTEGRATED MOSQUITO MANAGEMENT PROGRAM - 2018

BACKGROUND SUMMARY

Following two consecutive years of significant rainfall and flooding, the City of Brookfield established a Task Force in the Fall of 1997 to address the issue of mosquito control in response to demands from residents for nuisance relief. A habitat survey was conducted by Clarke Environmental Mosquito Management (CEMM) in 1998 that identified approximately 2,000± acres of mosquito breeding areas consisting primarily of wetlands, floodlands, and surface water located throughout the City. After several months of study and review of available alternatives for mosquito control, the Task Force recommended that the City apply for a permit and provide funding to treat approximately 1,000 acres of publicly owned land with a biolarvicide for the control of nuisance mosquitoes. The Common Council allocated funding in the 1999 City Budget and a permit application was submitted to the Department of Natural Resources (DNR) in the Spring of 1999 with public meetings and hearings conducted relative to the proposed treatment program. The DNR completed an Environmental Assessment and ultimately denied the permit but offered to work with the City on a field study to measure the effectiveness and impacts on non-target species of a larvacide treatment program.

The field study and parameters were established in late 1999 and early 2000 and included as part of a modified permit application that was submitted for 2000 to treat approximately 725 acres. The permit was approved and the study conducted in 2000 (three treatments), 2001 (one treatment) and 2002 (two treatments) with results from the study indicating:

- 90 – 95% product efficacy rate
- Approximately 50 – 60% reduction in the number of adult mosquitoes in the treated versus the non-treated sites.
- No observation or documentation of adverse environmental effects or impacts on non-target species.

Based on these results, and in response to the proliferation of West Nile Virus (WNV) in the United States and specifically the detection of WNV in animals and humans in the southeastern Wisconsin area, the City has implemented a responsible and effective program to address the increase in public concern regarding the potential public health impact of WNV as well as continued nuisance relief. The City's ongoing integrated mosquito management program is detailed below with the following specific objectives for 2018:

- A larvicide program that will treat approximately 1,070± acres of public and/or private (with permission) major wetland/floodland tracts as originally depicted in the 1998 survey of mosquito breeding areas.
- Continuation of the adulticiding program which includes regular treatments of community-wide parks and large group public gathering places as necessary and surveillance program indicates.

PROGRAM SCOPE

The foundation of the City's program is based upon the 1998 comprehensive larval site survey as well as ongoing information/data obtained through the collaborative field study with the DNR. The program follows the recommendations of the Center for Disease Control and Prevention (CDC) for establishing effective and comprehensive integrated mosquito management programs and includes the following elements:

A. SURVEILLANCE

The basis for the City's surveillance program is the 1998 comprehensive larval site survey which provided information to define, map, categorize and determine the total acreage of potential larval development sites within the City. Larval site inspections have been conducted on an ongoing annual basis since 1999 with records maintained on species composition of mosquito populations which have been utilized in control operations. The following is the surveillance methodology that will be used by the City for the 2018 program:

1. Larval Mosquito Surveillance

The City will again be working with CEMM to implement the larval site survey. This will include bi-weekly inspections from May – September of all sites proposed for treatment, as well as other non-treated sites identified in the 1998 aerial survey, to determine larval densities and species identification in order to effectively target vector and pest populations for control. NOTE: The 1998 survey indicated that approximately 30% of the overall sites inspected were breeding Culex mosquitoes which are the primary vector of West Nile Virus (WNV).

In addition, the bi-weekly inspections will also include pre-determined storm water facilities (i.e. catch basins, storm inlets) that were found to be known breeding areas for Culex mosquitoes as part of the Culex habitat assessment conducted in 2003.

2. Adult Mosquito Surveillance

The program will include the operation of four (4) CDC light traps from May – September with collections made twice weekly. Deployment of the traps will address species habitat requirements on a spatial scale. Collections will be sorted by gender and species and used to determine composite species identification as well as to evaluate control program effectiveness and gauge migration of adult mosquitoes from outside of the treatment areas.

3. Virus Surveillance (WNV)

The City, in collaboration with CEMM, will also conduct weekly operation of one Gravid Trap from June – September specifically for the collection of egg-laying Culex mosquitoes. Collections will be immediately field tested for the presence of WNV and sent for laboratory confirmation of field test results.

B. SOURCE REDUCTION

The City will be continuing its ongoing effort to alter or eliminate mosquito larval habitat to prevent breeding wherever practicable. This will include public education and outreach efforts that will encourage residents and businesses to engage in habitat alteration or elimination activities such as the proper disposal of used tires and the cleaning of rain gutters, bird baths, and unused swimming pools or any other types of vessels/containers/areas that will hold water and serve as potential breeding areas. In addition, other habitat alteration or elimination activities performed by the City will include ongoing streambank clearing and restoration, catch basin and/or storm inlet cleaning, and container removal.

C. CHEMICAL CONTROL

Although source reduction activities will continue to be emphasized as an effective and economical method of providing ongoing mosquito control, it is expected that the need for chemical controls will be required for public health reasons when surveillance indicates the presence of potential disease vector and/or infected mosquitoes.

1. Larviciding

The larviciding program conducted by the City will consist primarily of aerial (helicopter) applications over large and/or inaccessible areas (approximately 1,070± acres) with ground treatments as necessary. The program objective will be to control the mosquito population within the breeding habitat before adult populations have had a chance to disperse and to maintain disease vector populations at levels at which the risk of disease transmission is minimal.

The aerial treatments (1 – 3 per summer) will be performed by CEMM and will be applied by helicopter utilizing GPS to assure accuracy in identifying treatment locations. See attached map(s) and chart for proposed treatment areas. Any recommended ground treatments (i.e., catch basins, storm inlets, etc.) will be performed by trained City personnel as necessary.

Based on the variety of mosquito species (including disease vectors) as well as breeding habitat present in the community, the following biolarvicide product will be utilized as seasonal conditions and surveillance data warrants.

VectoLex CG (Bacillus sphaericus)

Description and Application Parameters: Dry, granulated biological control product applied either by aerial or ground application methods to permanent or semi-permanent mosquito breeding habitat.* Typical application rates are

5-10 pounds/acre with average residual of 14-21 days. Particularly effective in breeding sites with high organic content.

Advantages: Extremely low toxicity to non-target organisms as demonstrated in 2000-2002 research study, highly selective, provides 21+ days residual in suitable habitat, effective in habitats high in organic content.

Disadvantages: Must be ingested by larvae, inspection dependent – application must be timed so that larvae are still in feeding instars.

Control operations will be initiated when the inspection threshold of an average of three larvae per dip has been reached.

2. Adulticiding

This method of mosquito control targets adult mosquitoes at their highest feeding and flight activity times (i.e., dawn, dusk) and temporarily reduces the adult population. The City has been conducting an adulticiding program since 1998 on a limited basis within community-wide parks (2) in order to reduce the mosquito nuisance level to the public participating in outdoor recreation activities between May and September. The program consists of a non-residual knockdown application utilizing an Ultra-Low-Volume (ULV) spray where small amounts of insecticide are dispersed by truck mounted equipment. In addition, a residual barrier control treatment is applied with back pack spray equipment. The treatments are applied by trained City Parks Department personnel who hold a current State of Wisconsin pesticide applicator's license. (Category 3.0) This program has been expanded slightly to include regular treatments of the community-wide parks (2-3) and large group public gathering places, as necessary and the surveillance program indicates, for nuisance and potential public health reasons (WNV).

D. RESISTANCE MANAGEMENT

As part of the City's integrated mosquito management program, elements of resistance management recommended by the CDC will be incorporated to include:

1. Annual monitoring of the status of resistance in the target populations to:
 - Provide baseline data for program planning and pesticide selection before the start of control operations.
 - Detect resistance at an early stage so that timely management can be implemented.
 - Continuously monitor the effect of control strategies on resistance.
2. Implementation of options for managing resistance that are appropriate for local conditions. Techniques proposed to be utilized include:

Management by Moderation – preventing onset of resistance by:

- Using dosages no lower than the lowest label rate to avoid genetic selection.

- Using less frequent applications.
- Using chemicals of short environmental persistence.
- Avoiding slow-release formulations.
- Avoiding the use of the same class of insecticide to control both adults and immature stages.
- Leaving certain generations, population segments or areas untreated.
- Establishing high pest mosquito densities or action thresholds prior to insecticide application.

E. BIOLOGICAL CONTROL

Biological control is the use of biological organisms, or their by-products, to control pests and may be another aspect of an integrated mosquito management program. This control element will continue to be evaluated for applicability in the future but will not be utilized in 2018.

F. CONTINUING EDUCATION

Continuing education will be directed toward operational workers to instill or refresh knowledge related to mosquito control. Ongoing training is provided to City employees primarily in safety, applied technology, and the requirements for the regulated certification program administered by the State of Wisconsin.

G. COMMUNITY OUTREACH AND PUBLIC EDUCATION

The City will be continuing its ongoing public education effort to inform and educate residents relative to mosquito biology, personal protection, appropriate source reduction around the home, and the overall integrated mosquito management program. Examples of community outreach and public education include: the distribution of fact sheets, flyers, brochures, etc.; informational articles in City-wide newsletters and brochures; public informational meetings; and the use of the media for announcements and informational articles/features, etc.

PROGRAM COORDINATION WITH OTHER AGENCIES

All aspects of the City's proposed program will be conducted in full compliance and coordination with regulatory agencies including the Wisconsin Department of Natural Resources, Wisconsin Department of Agriculture, Trade and Consumer Protection, and the United States Environmental Protection Agency.

Communication between the City's consultant, the DNR, and the City is key to implementation of a successful program. All resident inquiry/complaint logs, field data sheets, and other documentation directly related to the City's program will be available for review by appropriate parties.

Monthly reports will be provided to the City that will include a season-to-date perspective, larval inspection summary, larval treatment summary, adult population monitoring data, and data interpretation. A comprehensive annual report will be prepared at season's end.