Annex D: Vectorborne Disease Response Plan

June 2017

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1. INTRODUCTION

Vectorborne diseases can cause widespread transmission in all age groups on a global scale. Currently, Oklahoma City experiences a seasonal West Nile Virus (WNV) threat; however, with emergency vectorborne diseases, a comprehensive plan is in place to account for Zika Virus, Dengue, and Chikungunya, and will be updated as new emerging threats arise.

1.1 Vectorborne Population Overview

The Oklahoma City-County Health Department (OCCHD) deploys a trapping program to monitor the mosquito population every season. This process consists of trapping and identifying mosquitoes as well as testing for WNV disease. Trapping is accomplished using the Centers for Disease Control and Prevention's (CDC) Gravid Traps and BG Sentinel Traps. The Gravid Traps are designed to selectively capture female *Culex* mosquitos by utilizing hay and tap water as the attractant; however, other mosquito species are also trapped. BG Sentinel Traps have been purchased for the surveillance of *Aedes* mosquitos, the Zika Virus vector. The morning after collecting trap nets, mosquito genus and species are identified, and WNV vector species are tested.

The table below provides an overview of the populations identified from 2013 – 2016. The majority of mosquitos in the OCCHD's jurisdiction are *Culex* and *Aedes albopictus*. The possibility of an *Aedes aegypti* population cannot be ruled out, although they are less common here than other said vectors.

Mosquito Species per Year				
	2016	**2015**	**2014**	**2013**
Aedes aegypti	0	0	4	1
Aedes albopictus	2129	1025	1872	836
Aedes epacticus	395	1075	604	22
Aedes japonicas	0	0	8	28
Anopholes pseudopunctipennis	7	10	9	30
Anopholes quadrimaculatus	15	11	2	10
Culex erraticus	2732	1466	642	845
Culex quinquefasciatus	11689	8769	1945	1520
Culex tarsalis	34	78	125	8
Culiseta inornata	3	4	22	5
Orthopodomyia signifera	5	6	3	1
Psorophora ciliate	0	4	0	0

1.1.1 Current Local Threat: West Nile Virus (WNV)

1.1.1.1 Hazard Profile

Attachment A to this annex contains the WNV fact sheet. West Nile Virus is a potentially serious illness. The heightened vector activity in the Oklahoma City-County area occurs April through September, and WNV human cases typically occur in the warm summer months. Since the virus was first introduced in 2002, Oklahoma has experience three outbreak seasons: 2003, 2007, and 2012 (OSDH). WNV is primarily spread through the bite of an infected mosquito. It is not spread person-to-person through casual contact. WNV can cause fever (WNV Fever) and severe neurologic disease (WNV Neuroinvasive), such as meningitis, paralysis, or encephalitis. Severe cases are often hospitalized. There is no human vaccine or treatment beyond supportive care.

1.1.1.2 Risk Assessments

The risk of WNV is much greater during the summer months, when the temperatures are high. Historically, peak WNV seasons have been associated with seasons of drought. Typically, the dry spells can help lengthen the mosquito's life cycle, allowing time for disease to multiple in the infected body and move to the salivary glands. When it's dry, mosquitos retreat to cool, damp areas to wait for rain; in that type of hibernation, any infection in their saliva becomes more powerful. After rain, puddles and standing water provide ideal locations for breeding more mosquitos. Female mosquitos lay their eggs one at a time or together in rafts of a hundred or more eggs on the surface in fresh or any stagnant water (OKC HMP).

A WNV Risk Assessment tool is used to quantitatively determine presumed population WNV infection risk. The tool uses environmental data, mosquito number estimates, and presence of disease; maximum daily temperatures are used to determine the disease transmissibility within the mosquito. Mosquito presence in the community is determined by two factors: relative mosquito abundance compared to the previous three-year weekly average and relative number of mosquito complaints compared to the three-year weekly average. Presence of WNV is determined using the estimate of the prevalence within the mosquito population, achieved by Maximum Likelihood Estimate (MLE), which estimates the infection rate of WNV in the mosquitos collected each week. This MLE computation includes statistical variation within counts of positive and negative mosquito test pools. Additionally, human WNV cases are used to aid in the measure of disease presence. If there is a human case of WNV, then there must be mosquitos carrying the disease in the community. These factors are attributed an individual risk number of 1 (low) to 5 (high), and the collective mean represents the weekly WNV risk number. The higher the number, the greater the estimated risk of WNV to the community.

1.1.2 Emerging Infectious Disease Threat: Zika Virus

1.1.2.1 Hazard Profile

Attachment B to this annex contains the Zika Virus fact sheet. Zika Virus is a mild disease, and most people with the virus do not have symptoms. However, the recent rise in the spread of Zika Virus in Brazil has been accompanied by an unprecedented rise in the number of children being born with unusually small heads, identified as microcephaly. In addition, several countries, including Brazil, have reported a steep increase in Guillain-Barré Syndrome, a neurological disorder that could lead to paralysis and death. Evidence is growing that Zika Virus causes both microcephaly and Guillain-Barre Syndrome (WHO, 5 April 2016). A mother already infected with Zika Virus near the time of delivery can pass the virus to her newborn around the time of birth, and a pregnant woman can pass Zika Virus to her fetus during pregnancy. The CDC is currently studying the adverse pregnancy and infant outcomes associated with Zika infection during pregnancy. As of June 2017, there has not documented local transmission of Zika Virus in Oklahoma County, although travel-related cases have been reported in the State of Oklahoma.

1.1.2.2 Risk Assessments

In addition to the mosquito control mechanisms in place for all mosquito-borne diseases, specific attention needs to be applied to the sexual transmission of Zika Virus as well as the risk that Zika may have on pregnant women exposed to the virus. The table below presents the CDC's Risk Categories as outlined in the Zika Action Plan (April 2016).

Zika Risk Category	Definition
0	Preparedness- Vector is present or possible in the state
1	Mosquito Season (*Aedes aegypti* or *Aedes albopictus* mosquito biting activity)- Introduced travel-related, sexually- or other bodily fluids- transmitted cases
2	Confirmed Local Transmission- Single, locally acquired case or cases clustered in a single household/ community in a county or jurisdiction and occurring <2 weeks apart
3	Confirmed Multi-Person Local Transmission- Zika Virus illnesses with onsets occurring at least 2 weeks apart but within an approximately 1-mile diameter

The risk for localized transmission via sexual transmission is possible. The virus could be introduced into the Oklahoma City-County population if infected travelers returning to the area from one of the impacted countries is bit by an *Aedes* mosquito and subsequently transmits it to another individual through sexual contact. The CDC has not ruled out the possibility of *Aedes albopictus* transmitting the Zika Virus, but the *Aedes aegypti* is a more competent vector.

1.1.3 Other Vectorborne Diseases of Consideration: Chikungunya and Dengue

1.1.3.1 Hazard Profile

Fact sheets on Chikungunya and Dengue are located in Attachments C and D, respectively. Both Chikungunya and Dengue are spread by *Aedes aegypti* and *Aedes albopictus* mosquitos, and neither are currently a local transmission risk for the Oklahoma City-County jurisdiction.

1.1.3.2 Risk Assessments

Neither Chikungunya or Dengue are currently at risk for local transmission, but continued surveillance of the vector population during mosquito season as well as vigilance during case investigations are important for identifying changes in local risk. The vector for both of these diseases bites during the day. There is no specific medication for treatment of Chikungunya or Dengue.

1.2 Purpose

The OCCHD developed this strategy to prepare for and reduce the effects of a vectorborne disease outbreak in Oklahoma City and County. The purpose of this plan is to provide the framework for identifying and responding to a vectorborne disease outbreak. This plan is scalable and flexible, but must necessarily prepare for the “worst case” scenario. This plan also outlines the vectorborne mitigation strategies in place.

1.3 Scope

This plan identifies the roles, responsibilities, and activities of the OCCHD and its partners. It addresses specific responsibilities of key partners and assists community leaders in preparing for and responding to a vectorborne disease outbreak by highlighting coordination efforts among multiple agencies. This plan is a continuously evolving document; the OCCHD will review and revise this plan as needed, but at least annually.

2. PLANNING ASSUMPTIONS

The following assumptions were made when discussing and developing this plan:

- Vectorborne disease transmission, especially West Nile Virus, is a seasonal expectation, and severity is unpredictable.
- The CDC's Zika Action Plan is developed and updated as new information is received.
- Strategies for stopping the spread of disease include personal protection, isolation, supportive therapy, mosquito population reduction, and habitat remediation.
- Updates to this plan regarding emerging infectious diseases will be made as needed.

3. CONCEPT OF OPERATIONS

The broad depth, scope, and duration of widespread vectorborne transmission activity will require close coordination of partners at all levels of government (federal, state, regional, county, local, tribal, and municipal).

The Oklahoma State Department of Health (OSDH) fulfills the following roles/ responsibilities:

- The OSDH Public Health Laboratory (PHL) is integral in surveillance activities by providing viral isolation and antigen detection.
- The OSDH PHL coordinates specimen submissions with clinical partners and the CDC laboratory testing capabilities.
- The OSDH Acute Disease Service assigns human cases under investigation in PHIDDO to the OCCHD Epidemiologist to conduct said case investigation.
- The OSDH Acute Disease Service coordinates statewide testing, investigation, and blood bank directions as information becomes available from the WHO, CDC, and CSTE.

The Oklahoma City-County Health Department (OCCHD) strives to fulfill its responsibilities, in part, by developing this Vectorborne Disease Response Plan. As information regarding Zika Virus unfolds, the OCCHD will align screening, surveillance, and testing recommendations from the CDC to its jurisdictional partners. The OCCHD implements a comprehensive approach to communication, prevention, surveillance, and disease abatement of vectorborne diseases.

This approach includes:

- Media Outreach: The media is utilized in prevention efforts when the first positive vector is identified.

- Vector Surveillance: The OCCHD conducts local vector surveillance by trapping, lab species identification, and testing for WNV. Trapping is accomplished using CDC Gravid Traps and BG Sentinel Traps. Trapped mosquitos are brought to the OCCHD's laboratory on a weekly basis and are frozen overnight. The following morning, mosquito genus and species are identified, and WNV vector species are tested. Currently there is no Zika Virus testing capability for the mosquito population.

- Environmental Treatments: The OCCHD Consumer Protection Program identifies and treats areas with stagnant water following a complaint. Larvicide use begins in April, prior to the start of mosquito season in order to minimize the mosquito population before the activity begins to rise. Additionally, the OCCHD has the capacity to apply adulticide via backpack and truck-based sprayers as the environmental and disease risk conditions are met. The application of adulticide is not anticipated; however, legal and logistical considerations have been made if the situation warrants.

- Habitat Remediation: The OCCHD and its partners have resources and coordinated efforts planned for habitat remediation events during the mosquito season. These scenarios include, but are not limited to, conducting maintenance and repair for drainage sites.

- Municipality Partnerships: The two municipality agencies collaborating with the OCCHD are Oklahoma City Storm Water Quality (OKCSWQ) and Edmond Code Enforcement (ECE). OKCSWQ and ECE set, maintain, repair, and pick up mosquito traps at each pre-identified site. OKCSWQ sends the OCCHD weekly reports for each of the trap sites, including information on trap conditions, needed repairs, and weekly mosquito counts. When funding allows, the OCCHD provides larvicide to municipalities to treat areas of stagnant water. In the case of a positive WNV or other vectorborne disease result, the OCCHD coordinates site surveys with the respective municipality. The municipalities conduct windshield surveys around the site and data is collected and graphed, along with test result dates, in order to identify trends and identify the effectiveness of and continued plans for mitigation procedures.

- Human Disease Surveillance: Epidemiologists produce maps using geographic information of cases to identify disease clusters and possible major sources of mosquitos. This data is sent to the OCCHD's Consumer Protection Program for site surveys, environmental treatments, and possible habitat remediation. An epidemiologist also gathers information on travel history and vectorborne disease exposure/ risk factors of the patient. Additionally, the OCCHD epidemiologist

sends out vectorborne disease monitoring reports to partners, providing local, state, and national surveillance data.

3.1 Command, Control, and Management

The OCCHD will be the lead agency in coordinating the public health and medical system response to a vectorborne disease incident in Oklahoma City and County. The OCCHD will coordinate response efforts with the OSDH and other local/ county emergency response organizations. It is essential that a well-defined communication system be established to coordinate resources requests at the community, county, and state levels. Local public health officials will coordinate resource requests with the OSDH Situation Room and the local Emergency Managers in Oklahoma County to ensure effective resource allocation and to allow for timely requests for federal assistance.

3.1.1 Local Response

The Oklahoma County response will be in accordance with this plan. Municipalities in Oklahoma County may enact their own plans, but must work with the OCCHD and the appropriate local (city and/or county) emergency management agencies to coordinate resources and implement policies needed to provide for the safety of our citizens and continuity of operations for key facilities and critical infrastructure. Incident Command will be stood up at the OCCHD in response to localized events requiring such attention.

In the event of widespread local transmission, the OCCHD and partners will initiate interventions and targets appropriately. Based on available epidemiologic, entomologic, and environmental information, the geographic rea for targeted Zika Virus interventions will be identified. The OCCHD has contracts in place for residual and habitat spraying. Truck-based and backpack spraying can be activated to respond to widespread local transmission and locally-acquired Zika Virus cases.

3.1.2 Federal Partners

Federal partners coordinate as necessary with the OCCHD. Specifically, Tinker Air Force Base deploys a trapping program on the base property. Mosquitos are then sent to the United States Air Force School of Aerospace Medicine (USAFSAM) for testing by the Air Force Entomologist (Dr. Reeves). The report is then e-mailed to the Tinker Air Force Base Public Health Office. Personnel from Tinker Public Health are included on the OCCHD's Vectorborne Disease Response Workgroup. At the start of every season, contact is made with Tinker Air Force Base to ensure personnel updates are made to the workgroup site.

3.1.3 Municipalities

As mentioned previously in this section, the two municipality agencies collaborating with the OCCHD are Oklahoma City Storm Water Quality (OKCSWQ) and Edmond Code Enforcement (ECE). The set, maintain, repair, and pick up the traps at each pre-identified site. OKCSWQ sends the OCCHD weekly reports for each of the trap sites, including the trap's condition, needed repairs, and if the trap caught any mosquitos for the week. In

return, the OCCHD provides municipalities with larvicide to treat areas of stagnant water, which are mosquito breeding habitats. With each application of larvicide, the municipalities document the address and date. At the end of the season, the OCCHD utilizes this data to identify the amount of larvicide used in relation to its own mosquito data. In the case of a positive vectorborne disease result, the municipalities receive an email from the OCCHD informing them of the site number, which allows them to remediate the problem through area surveys, eliminate mosquito habitats within one mile of the trap location, as well as educate the community on proper prevention steps.

If West Nile Virus (WNV) human cases exceed the OCCHD's thresholds, personnel will work with municipalities for the course of action, up to and including backpack and truck-based spraying (adulticide).

If a Zika Virus human case is identified, the OCCHD will coordinate habitat assessment 150 years around the premise of the residence.

3.1.4 Oklahoma City-County Health Department (OCCHD)

The OCCHD will:

- Appoint a senior representative from the OCCHD to coordinate mosquito borne response efforts and pre-identify an Incident Commander.

- Ensure coordination with state public health officials so vector control and human surveillance activities can be linked. The OCCHD has developed a Vectorborne Disease Response Workgroup (vectorborne@occhd.org) to share information between state, federal, and local partners.

- Update the Emergency Response Plan, including this Vectorborne Disease Response Plan.

- Prepare a communication plan for vectorborne diseases.

- Plan preparedness and mitigation activities to reduce the likelihood of transmission from mosquitos, including reducing habitat/ potential breeding sites, initiating community clean-up efforts, initiating public information campaigns, using insecticides, etc.

- As stated in Annex B, the Pandemic Flu Plan, the prioritizing of public health services at the OCCHD is covered by the agency's Continuity of Operations Plan (COOP). These services are prioritized to most effectively address the health and safety of the public. The highest priority is to direct efforts towards the emergency response, but efforts should also be directed towards other essential services.

- Conduct necessary planning and exercises in coordination with the OSDH.

- Assist in the education of government officials and other response partners about vectorborne disease surveillance, mitigation, and investigation.

- Coordinate planning for and implementing vectorborne containment strategies and authorities, which is expanded upon below in Section 3.3, Public Health Protection.

3.2 Surveillance and Laboratory Diagnostics

The OCCHD Consumer Protection Program can test mosquito populations for WNV presence.

The OSDH PHL can test submissions from clinicians and hospital systems for an individual's presence or absence of WNV. The OSDH PHL is also a CDC-designated laboratory that performs Zika Virus testing by Emergency Use Authorization using the CDC Zika IgM Antibody Capture (MAC) ELISA and the CDC Trioplex Real-Time RT-PCR Assay. Negative results are reporting within 10 days of receiving a sample. If a sample is positive for Zika Virus, the specimen will be sent to the CDC laboratory for confirmation. OSDH coordinates all testing and will inform the OCCHD of preliminary results prior to the confirmatory testing with the CDC. RT-PCR testing of serum and urine is recommended less than 14 days after symptom onset.

The blood banks also screen for WNV. Currently, if local transmission of Zika Virus occurs, blood banks will freeze acceptance of donations. Communication with blood banks, including the American Red Cross and the Oklahoma Blood Institute, is conducted by the OSDH Epidemiologist.

3.3 Public Health Protection

The Consumer Protection Division of the Oklahoma City-County Health Department (OCCHD) has used larvicide in the past to treat forms of stagnant water in order to prevent mosquito-borne illnesses. The public and municipalities are notified of the presence of WNV found in mosquitos caught in the OCCHD's jurisdiction.

Consumer Protection identifies and treats areas with stagnant water following a complaint. These areas include but are not limited to vacant pools and properties where the inspector cannot contact or identify the owner. In previous years, two types of larvicide have been used to combat resistance in the mosquito population. With every use of larvicide, the inspectors notify the program coordinator of the number used and the address.

In the event of a positive human case of a vector-transmitted disease, the OCCHD traces the location of the infected persons to a territory of one of the inspectors with Consumer Protection. The OCCHD does not disclose the exact address to the inspector, but instead provides an area to survey for stagnant water and flyers to distribute to the community.

The OCCHD also has the ability to use backpack or truck-based spraying if mosquito borne thresholds are exceeded. The OCCHD will work with the affected municipality or county to determine the best course of action.

3.4 Epidemiological Investigation

Throughout mosquito season, OCCHD's epidemiologists collect geographical data and produce GIS maps to identify clusters and possible major sources of mosquitos. In addition to the mapping data, they gather information relating to where and when the infected person could have possibly contracted the virus. During the season, an OCCHD epidemiologist sends out monitoring reports to local, state, and federal partners, providing information on state and national cases, the quantity of local complaints of stagnant water, and the quantity of stagnant water treated with larvicide.

There is a Zika Virus pregnancy registry to track pregnant individuals at risk for the Zika Virus. This is maintained at the OSDH, but information is shared with the OCCHD and Tulsa Health Department (THD). If a pregnant Oklahoma City-County resident tests positive for Zika Virus, the COCHD will be notified during the case investigation.

3.5 Health Systems and Emergency Response

Oklahoma City-County experienced a widespread transmission event of WNV in 2012. Coordination between the OCCHD, OSDH, THD, health systems, and emergency response are routinely practiced and improved upon. The OCCHD is prepared to respond to a vectorborne disease outbreak by standing up ICS and the multi-tiered approach outlined in this plan.

In the event of a widespread Zika Virus transmission event, the OCCHD and partners are prepared to execute a coordinated response to ensure continuity of essential services. ICS will be stood up if/ when local transmission of Zika Virus occurs in Oklahoma City-County.

3.5.1 Coordinated Response Efforts

The OCCHD, in collaboration with regional public health and medical system partners, including the Metropolitan Medical Response System (MMRS), Regional Medical Response System (RMRS), Regional Medical Planning Group (RMPG), Medical Emergency Response Center (MERC), and the Oklahoma Medical Reserve Corps (OKMRC), will:

- Educate healthcare providers about vectorborne disease threats and help involve them in planning their community's response.

- Provide technical assistance to hospitals and healthcare facilities to develop organizational plans for responding to an outbreak, such as addressing staffing issues, medical surge capacity, triage, and infection control.

- Provide guidance, as released by the OSDH and CDC, with specific attention paid to OB/GYN offices in the event of widespread Zika Virus transmission.

As with WNV, the OCCHD maintains close communication with Infection Preventionists at local hospitals to gain critical epidemiological investigation materials related to travel history, possible sources of exposure, and comorbidities of patients.

3.6 Non-Pharmaceutical Interventions

Guided by the latest evaluation of surveillance, laboratory, epidemiologic, and clinical data, the OSDH will identify, recommend, and work with the OCCHD to implement appropriate measures at each phase of the local vectorborne disease activity to minimize mosquito bites and reduce mosquito populations.

3.6.1 Self-Protection

3.6.1.1 Prevention of Mosquito Bites

The most important prevention mechanism is to wear insect repellant containing DEET, dress in long sleeves and pans when possible, drain all standing water around the home/ workplace, and limit time outside during heightened vector activity. For individuals with Zika Virus, the OCCHD, OSDH, and clinical partners will explain the importance of preventing mosquito bites in order to reduce risk of transmission to another person when a mosquito bites the infected individual and then a non-infected individual.

3.6.1.2 Reduction of Sexual Transmission Risk

Per the MMWR Update: Interim Guidance for Prevention of Sexual Transmission of Zika Virus (April 1, 2016), men who have traveled or reside in an area with active Zika Virus transmission and their pregnant sexual partners should consistently and correctly use condoms during sex or abstain from sex for the duration of the pregnancy. This course is the best way to avoid even a minimal risk of sexual transmission of Zika Virus, which could have adverse fetal effects if contracted during pregnancy. Pregnant women should discuss their male sexual partner’s history of travel to areas with active Zika Virus transmission and history of illness consistent with Zika Virus disease with their healthcare provider. Zika Virus can be passed through sex from a person who has Zika Virus to his/her sexual partners. Sexual partners who want to reduce the risk for sexual transmission of Zika Virus should use condoms consistently and correctly during sex or abstain from sex. The Zika Virus can be passed by a person who carries the virus but never develops symptoms. The OSDH, OCCHD, and clinical partners have coordinated screening forms with testing algorithms on them.

For couples interested in conceiving, per CDC guidance, women are advised to wait at least 8 weeks and men are advised to wait at least 6 months after symptoms appear before trying to conceive. For both men and women without symptoms of Zika Virus but who have possible exposure to Zika Virus from recent travel or sexual contact, it is

recommended that they wait at least 8 weeks after their possible exposure before trying to get pregnant.

3.6.1.3 Blood Donation

Blood donation centers screen donors for WNV infection; however, there are currently no mechanisms commercially available to screen donor blood for Zika Virus. The CDC states that a case of local transmission will freeze blood donations in that area. This research is ongoing and will be updated as information evolves.

3.6.2 Habitat Remediation

The OCCHD will coordinate with city/ municipal partners and the general public on proper habitat remediation processes. The OCCHD website contains updated training and education on these steps as well.

3.7 Phased Response

The severity and case count will determine what level of vector response the OCCHD will deploy. The OCCHD has thresholds for both Zika Virus and WNV that will help determine if/ when adulticide activity is appropriate.

Figure 1, found at the end of this document, contains a Phased Response Plan Matrix for WNV.

3.8 Clinical Guidelines

The OCCHD's secure hidden URL webpage will provide up-to-date information for clinical and epidemiological partners.

3.9 Risk Communication

Dissemination and sharing of timely and accurate information with the general public is one of the most important facets during a localized vectorborne transmission event. Advising the public of actions, they can take to minimize their risk of exposure, or actions to take if they have been exposed, can reduce the spread of vectorborne disease. To alert the public of their risk to WNV, a previously mentioned risk assessment tool, called the Skeeter Meter, will be shared weekly. A risk number, category description, and graphic will be presented via all communication avenues each week during the mosquito season.

The OCCHD Public Information Officer (PIO) meets with the City of OKC, OSDH, and other municipality PIOs to streamline messaging and target action plans for the community.

With further regard to risk communication, the OCCHD will:

- Provide education to the public, including local business owners and school systems, about habitat remediation, mosquito bite prevention, and travel advisories to reduce exposure and infection.

- Education public officials and first responders about local threats and surveillance techniques.

- Provide appropriate updates on the event and coordinate with the OSDH to ensure consistent messaging.

- Provide information to the public about steps that should be taken to protect against infection, the transmission status in the community, and mitigation strategies being implemented.

- Establish a call center to answer citizens' questions and provide education about the event, if necessary. Use of the local 2-1-1 system is encouraged, where available.

Figure 1. Phased Response Plan Matrix for WNV

Phase	Condition	Trigger	Recommended Response/ Surveillance	Public Information/ Communication	Control Measures	Rationale
0 –None	No evidence of adult mosquito biting activity or viral activity.	Timeframe outside of 6 weeks of historical mosquito activity time period. No evidence of mosquito or viral activity for past 6 weeks.	Review mosquito control program. Secure surveillance and control resources to enable emergency response.	Standard personal protection methods via Fight the Bite and 3Ds and a P campaign via website and social media.	Maintain source reduction projects. Larvicide applied as applicable. No adulticide to be applied during at this level	Larvicide and source reduction are most efficient in controlling mosquitoes long-term.
1 – Low	Likelihood of human disease transmission is minimal.	Biting adult mosquitos active Mosquito activity expected based on data from prior years. No positive test pools.	Environmental surveillance. Initiate vector surveillance and virus testing.	Initiate community outreach and public education programs- Work with collaborators to address high risk populations.	Initiate integrated vector management program to monitor and reduce vector mosquito abundance.	Preventing larvae from becoming biting adults is still the most efficient means of controlling mosquitoes long-term
2-Moderate	Likelihood of human disease transmission is low to moderate.	Positive WNV mosquito pools. No Positive Human cases.	Map human cases (for internal use only) at census tract level. Continue human and mosquito surveillance.	Situational Reports initiated Work with collaborators to address high risk populations.	Intensify visible activities in community to increase attention to WNV transmission risk	Preventing larvae from becoming biting adults is still the most efficient means of controlling mosquitoes long-term

Phase	Condition	Trigger	Recommended Response/ Surveillance	Public Information/ Communication	Control Measures	Rationale
3- High	Likelihood of human disease transmission and outbreak is moderate to high.	Multiple mosquito trap pools testing positive with WNV. 1-3 Human cases supported by laboratory testing within 2 weeks of reporting.	Continue human and mosquito surveillance.	Situational Reports initiated Work with collaborators to address high risk populations. Press release issued to alert of human transmission.	Intensify visible activities in community to increase attention to WNV transmission risk Application of adulticide as environmental and logistical conditions allow	Targeted adult mosquito controls can reduce the number of disease transmitting mosquitoes while waiting for larvicide and source reduction/eliminatio n methods to reduce future biting adults.
4- Very High	Multiple human cases confirmed.	Greater than 3 confirmed West Nile human cases in areas with ongoing control efforts. Multiple mosquito trap pools testing positive with WNV.	Monitor effectiveness of vector control efforts.	Emphasize urgency of personal protection, including use of repellents, through community leaders and media. Notice of truck based adulticide applications will be released to public with as much lead as possible to protect human health.	Initiate emergency adult mosquito control program repeating adulticide applications as necessary to achieve adequate control. **If conditions exist to warrant a local public health emergency, the City Council will be notified of the potential and a request be made for the Mayor to declare a public health emergency. If public health emergencies are declared at the county or state level, the recommended responses associated with the declaration may be considered as part of the control plan.** Aerial spraying may be initiated by municipalities.	When using adulticides pyrethroids are the most effective and least environmentally threatening. Targeted adult mosquito control can reduce the number of disease transmitting mosquitoes while waiting for larvicide and source reduction/eliminatio n methods to reduce future biting adults. Public perception of action is critical, regardless of effectiveness.