

March 31, 2005

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**HEALTH SERVICES
REGION OF YORK
NEWMARKET**

Dr. K. Helena Jacek
Commissioner of Health Services and
Medical Officer of Health
The Regional Municipality of York
17250 Yonge Street
Newmarket, ON L3Y 6Z1

RE: **WEST NILE VIRUS 2004 UPDATE AND
2005 ACTION PLAN (5.7)**

Dear Dr. Jacek:

This will confirm that at the meeting of Council held on March 29, 2005, Clause 14 of Report No. 10, was approved as follows:

"That the staff report titled "West Nile Virus 2004 Update and 2005 Action Plan", dated March 21, 2005, be received;

And that the Town of Markham continue to support the Region of York, Health Services Department in their activities to control of the West Nile Virus in 2005, in promoting education and reducing, where appropriate, standing water on public property;

And that the Town of Markham continue to work in partnership with the Region of York in 2005, to communicate and distribute information about the West Nile Virus;

And that staff be authorized to continue working with the Region of York Health Services Department by participating in the meetings of the West Nile Virus Control Committee;

And that the Town of Markham website continue to include a link to the Region of York Health Services Department;

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And that the Town of Markham Internet and Intranet sites be updated, when appropriate, with current, factual information about the West Nile Virus and how the general public can protect themselves from exposure;

And that staff erect 20 additional bat houses on Town lands in appropriate locations in an effort to naturally reduce mosquito populations;

And further that, Council approve funding in the amount of \$95,000 to cover the cost of:

- One 150-day employee dedicated to surveillance activities, database production, communications and reduction of standing water on Town property, from April to October 2005, at a cost of up to \$25,000 (including fringe benefits and overhead);
- One 150-day By-Law Enforcement Officer dedicated to enforcement of the Standing Water By-Law, from April to September 2005, at a cost of up to \$20,000 (including fringe benefits and overhead).

Up to \$50,000 for: a high-pressure flusher truck as an enhanced approach to reducing mosquito breeding in those areas without catch basins; installation of bat boxes at appropriate Town-owned properties; additional windmill powered aerators, as warranted; establish a pilot project introducing fathead minnows in storm water management ponds; and, continuation of the catch basin screening initiative."

Yours sincerely,



Sheila Birrell
Town Clerk

Encl.



REPORT TO GENERAL COMMITTEE

TO: Mayor and Members of Council

FROM: Stuart Taylor, Director, Strategic Services

PREPARED BY: Mavis Urquhart, Manager Environmental Leadership

DATE OF MEETING: 2005-Mar-21

SUBJECT: West Nile Virus 2004 Update and 2005 Action Plan

RECOMMENDATION:

THAT the staff report titled "West Nile Virus 2004 Update and 2005 Action Plan", dated March 21, 2005, be received;

AND THAT the Town of Markham continue to support the Region of York, Health Services Department in their activities to control of the West Nile Virus in 2005, in promoting education and reducing, where appropriate, standing water on public property;

AND THAT the Town of Markham continue to work in partnership with the Region of York in 2005, to communicate and distribute information about the West Nile Virus;

AND THAT staff be authorized to continue working with the Region of York Health Services Department by participating in the meetings of the West Nile Virus Control Committee;

AND THAT the Town of Markham website continue to include a link to the Region of York Health Services Department;

AND THAT the Town of Markham Internet and Intranet sites be updated, when appropriate, with current, factual information about the West Nile Virus and how the general public can protect themselves from exposure;

AND THAT staff erect 20 additional bat houses on Town lands in appropriate locations in an effort to naturally reduce mosquito populations;

AND FURTHER THAT, Council approve funding in the amount of \$95,000 to cover the cost of:

- One 150-day employee dedicated to surveillance activities, database production, communications and reduction of standing water on Town property, from April to October 2005, at a cost of up to \$25,000 (including fringe benefits and overhead);

- One 150-day By-Law Enforcement Officer dedicated to enforcement of the Standing Water By-Law, from April to September 2005, at a cost of up to \$20,000 (including fringe benefits and overhead).
- Up to \$50,000 for: a high-pressure flusher truck as an enhanced approach to reducing mosquito breeding in those areas without catch basins; installation of bat boxes at appropriate Town-owned properties; additional windmill powered aerators, as warranted; establish a pilot project introducing fathead minnows in storm water management ponds; and, continuation of the catch basin screening initiative.

PURPOSE:

The purpose of this report is to outline how Town staff provided support to York Region Health Services Department in their activities to control the West Nile Virus in 2004 and to set out a program for continued support in 2005.

EXECUTIVE SUMMARY:

The West Nile Virus (WNV) is a mosquito-borne virus that can cause flu-like symptoms, and in rare instances, encephalitis (inflammation of the brain or membrane protecting the brain) in humans. The WNV is spread to humans by the bite of an infected mosquito. Wild birds are the main host for the virus. Dead crows can be an indicator that the virus has reached the area because they are the most susceptible. It has also been discovered that WNV is fatal among squirrels. The chance of humans becoming seriously ill from WNV is very small. This is because most humans are able to overcome any infection from WNV by the normal response of their immune system.

Preliminary research shows that there is a correlation between ambient temperature and the level of WNV activity within the adult mosquito; in other words, the warmer the weather, the more infectious the mosquito population becomes. Therefore, a hot summer in 2005, unlike the cool summers of 2003 and 2004 could potentially result in a significant increase in the number of human cases of infection. Appendix B to this report shows the WNV 2004 statistics in York Region and the surrounding regions.

Under the *Health Protection and Promotion Act*, responsibility for Health Services falls to the Regional Municipality of York. The Region of York, Health Services Department, Public Health Branch leads health-related initiatives, including the West Nile Virus and has assumed responsibility for the major activities relating to the control of the West Nile Virus.

In April 2004, Markham Council approved a staff report outlining how Markham would support York Region's Health Services Department activities to control the West Nile Virus during 2004 by:

- promoting education and reducing, where appropriate, standing water on public property;
- working in partnership with the Region of York to communicate and distribute information about the West Nile Virus;
- participating in the meetings of the West Nile Virus Control Committee;

- linking the Town of Markham website to the Region of York Health Services Department;
- updating the Town of Markham Internet and Intranet sites, with current factual information about the West Nile Virus and how the general public can protect themselves from exposure; and,
- erecting bird and bat houses in appropriate locations to naturally reduce mosquito populations.

Council approved \$95,000 in funding in 2004, to cover the cost of:

- \$25,000 salary for one 150-day employee dedicated to surveillance activities, database production, communications and reduction of standing water on Town property, from April to September 2004;
- \$20,000 salary for one 150-day By-Law Enforcement Officer dedicated to enforcement of the Standing Water By-Law, from April to September 2004; and,
- \$50,000 for a high-pressure flusher truck to assist in reducing mosquito breeding in areas without catchbasins; bat boxes at appropriate locations on Town-owned properties; and, to pilot fathead minnows and windmill powered aerators in stormwater management ponds within Markham.

Staff were directed to seek reimbursement from the Region of York for the cost of the high-pressure flusher truck and it was requested that the Markham signage/logo be displayed on the truck when being operated for Town purposes. Unfortunately, no funds were available from the Region of York and so reimbursement could not be obtained. However, signs were displayed on the flusher trucks when they were operating for Markham's West Nile program. Windmill-powered aerators were installed in 12 stormwater retention ponds and monitored for their effectiveness and 19 bat boxes were installed. Finally, a catch basin screening program was initiated by staff. The flusher truck, bat box, windmill and catch basin initiatives are all described in more detail in Appendix A to this report.

In this report, staff is seeking Council approval to continue the 2004 West Nile Virus Action Plan in 2005.

DISCUSSION

The following section briefly outlines the responsibilities and involvement of the provincial government, York Region and the Town of Markham in addressing the West Nile Virus:

Provincial Leadership

On March 22, 2003, the Ontario Ministry of Health and Long Term Care released a seven-point action plan to combat WNV, including a public education campaign. The Ministry's approach included:

- Expanded laboratory services to keep testing in Ontario
- Enhanced surveillance
- Extensive public education campaign
- Mosquito control activities
- Establishing a new, early warning system

- Conducting a pilot study to determine human exposure to WNV
- Funding on-going research to discover the best way to fight the WNV

The Ministry also proposed ongoing research, community consultation and consultation with national and international stakeholders to enable the province to have the latest information on mosquito control techniques, surveillance methods and results, and successful education approaches. In addition, the Ministry of the Environment ensured consistency in the pesticide programs implemented by regional health units by coordinating application licenses within the province. Other provincial initiatives included a "Fight the Bite" prevention campaign, posters, media print ads and brochures distributed to Ontario residents.

York Region Health Services Department

Although there are several species of mosquito known to carry WNV, York Region Health Services Department primarily targeted the *Culex* species in its control program in 2004. *Culex* is the most common species of pest mosquito in urban and suburban settings. This species typically lays eggs:

- In tin cans, buckets, discarded tires and other artificial containers that hold stagnant water;
- In untended bird baths, clogged rain gutters and plastic wading pools that hold stagnant water;
- In storm drains and catchbasins in urban areas; and,
- In septic seepage and other foul water sources above, or below ground level.

It is important to understand the habitat of this species because it increases the public's understanding that the spread of WNV is contained mostly within the urban environment. The *Culex* species lives in the suburban and urban environment where there are ready sources of standing, stagnant water. Catchbasins provide a perfect environment for the *Culex* mosquito species to breed. The species that live in natural areas, such as ravines, wetlands, woodlands and floodplains are plentiful but not typically of the *Culex* species and, therefore, need not be considered a threat.

The York Region Health Services Department recommends a multi-jurisdictional approach to dealing with the West Nile Virus. The nine municipalities within York Region are each responsible for the following:

Surveillance Activities

- Reporting dead birds found on municipal property to York Region Health Services
- Directing calls regarding dead birds to Health Connection
- Assisting Health Services in identifying mosquito breeding sites (e.g. catchbasins)

Source Reduction

- Maintaining inventory of mosquito breeding sites
- Working toward eliminating potential mosquito breeding sites on municipal property (e.g. improve drainage in ditches, catch basin maintenance)
- Enforcing Standing Water By-Law

- Initiating enforcement of municipal by-laws (e.g. Property Standards) and/or implementing strategies to eliminate mosquito breeding sites on municipal property

Communication/Education

- Assisting in the distribution of communications developed by the Health Services Department
- Educating Municipal workers on risks of WNV, source reduction strategies and personal protection
- Actively participating in the meetings of the WNV Control Committee, made up of the nine area municipalities in York Region

Update on York Region Activities

Staff at the York Region Health Services Department provided an update on the 2004 WNV Control Activities to Regional Council November 12, 2004 (See Appendix C). This report outlined the steps that had been taken to control WNV in York Region in 2004, which included using pesticides to kill mosquitoes at the larval stage, in all roadside catchbasins within the Region of York. These pesticides included:

- **Methoprene**
Methoprene is used as a larvicide because it artificially stunts the insects' development, making it impossible for larval insects to mature to the adult stages, and thereby, preventing them from multiplying. Methoprene lasts for thirty days in the environment it is deposited.
- **Bacillus Thuringiensis Israelensis (BTI)**
BTI is an invertebrate growth-inhibiting bacterium that is eaten by the mosquito larvae and causes them to die prior to achieving adulthood. Due to its dissipation rate of three or four days, the larvicide BTI was only applied to standing water if complaints were received and larvae was present.

In addition to larviciding, York Region held public information sessions related to the possible use of Malathion as an adulticide. The Medical Officer of Health, under the *Health Protection and Promotion Act*, may make a determination, based on local risk assessment about whether action, including the use of adulticides, is required to reduce the risk of WNV. The Medical Officer of Health indicated that the use of adulticides may be necessary if an outbreak of WNV occurred in humans. This did not occur and adulticiding was not undertaken in 2003, or 2004 within the Region.

York Region Council received and adopted a report dated February 2005 from the Commissioner of Health Services recommending West Nile virus activities for 2005 and requesting 100% funding from the province. According to that report, continued positive WNV results in the bird, mosquito and human population throughout Ontario indicate that the virus is well-established within the province. Since WNV is still considered a newly emerging virus with significant health implications, the Region proposes to continue their surveillance program, educating the public and using mosquito control to limit the spread of

the virus in York Region. In 2004, it was identified that sewage treatment plants could be a potential source of mosquitoes and so this year's surveillance will be expanded to include the monitoring of all sewage treatment facilities.

2004 Review of WNV Control in Markham

The following actions were implemented in 2004 to control WNV in Markham and support of the York Region Health Services Department:

1. Supporting the Region of York Health Services

The Town of Markham supported the Region of York Health Services Department control the WNV by assisting with surveillance activities, including reporting dead birds found on municipal property; directing calls regarding dead birds to the York Region Health Services Department or, the Health Connection line; and assisting York Region Health Services in identifying mosquito breeding sites where action has been taken to reduce, or eliminate standing water (e.g. roadside ditches).

2. Increasing Customer Service related to West Nile Virus control

The 150-day employee was responsible for the following coordination around public property:

- Responding to customer requests for site investigation;
- Improving awareness and education of staff and residents;
- Maintaining a database of action requests;
- Continuous surveillance of potential "hot spots";
- Liaising with the Region of York on the WNV Control Committee; and,
- Coordinating street flushing program or other control measures, which may include contacting the Region of York or their contractor.

Other efforts included:

- Monitoring Stormwater Management Ponds (SWMPs) for mosquito larvae on a bi-weekly basis, mapping SWMPs for the Region and issuing work orders if refuse and standing water was found. A total of 49 SWMPs were monitored with evidence of mosquito larvae in 12 of them at some point over the summer. A database was maintained of members of the community who called the Town with concerns about mosquitoes breeding areas. Surveillance of these locations was provided over the spring and summer in an attempt to reduce, or eliminate, standing water, where appropriate. Approximately 108 calls were received with concerns related to standing water on public property. Each complaint generated an inspection and action based on the inspection that ranged from repairing the area to adding the location to the flusher truck's list;
- Working towards eliminating potential mosquito breeding sites on municipal property by improving drainage in ditches and filling depressions where standing

water may develop and working with railway companies to eliminate standing water on their lands;

- Erecting 19 new bat houses across the Town to reduce the mosquito population;
- Implementing a catch basin screening program in Town Parks and private residential back yard catch basins. This program involved designing a screening mechanism that would fit under the lids of standard catchbasins and identifying the locations of catchbasins in Markham Parks for these installations. This initiative is further described in Appendix A to this report.
- Installing windmill powered aerators in selected Stormwater Retention Ponds throughout Markham. The purpose of these windmills is to provide continuous aeration resulting in improved water quality and hopefully a less conducive environment for mosquito breeding. Monitoring of all ponds began in 2004. We will continue to monitor all the ponds, specifically those with aerators, in 2005 to get more conclusive evidence of their effectiveness. This program is further described in Appendix A.
- A Flusher truck was contracted to flush road side ditches holding water. This initiative is an alternative to applying the larvacide BTI into our ditches. This program is further described in Appendix A.

3. Public Education Information

Communications were developed to improve awareness and education of staff and residents including links on the Markham internet and intranet featuring regular updates, frequently asked questions and links to the Region and the Province. The two key objectives of the communication included, educating staff and residents on the importance of eliminating *culex* mosquito breeding grounds around standing water, including flushing water in pools, swales, birdbaths, old tires, flower pots and rain barrels every five to seven days, and ensuring the public understand the relatively low risk posed by the virus and how to mitigate the risk.

4. Standing Water By-law Enforcement

Markham enacted a Standing Water By-Law in May 2003 requiring that a yard shall be free of:

- Depressions capable of holding standing water for more than five days;
- Debris of any kind capable of holding standing water;
- Excavations on the property capable of holding standing water for more than five days; and,
- A swimming pool, hot tub, wading pool or artificial pond unless it is maintained in good repair and working condition.

In 2004, the By-Law Enforcement & Licensing Division was allocated funding to hire a 150-day contract position to enforce the Standing Water By-law on private lands within the

Town. A Provincial Offences Officer was hired to fill the position and the individual responded to over 100 calls from residents concerned about standing water and the health risk associated with the West Nile Virus. The Officer also fielded numerous general inquiries from the public providing information and advice. The Officer responded to each of the property related calls by completing a site inspection, contacting the property owner/ tenant, and following up with the caller. Each case required the Officer to make several visits to the property; first to assess the situation, and then to make follow up visit to ensure that the matter was resolved.

Overall, results of the 2004 program were positive. As in 2003, the Officer found the majority of property owners unaware of the health risk and were cooperative once they were advised of the necessary action. For 2005, By-Law Enforcement anticipates an equal number of calls and having to deal with similar numbers of unused pools where staff will have to proactively enforce the By-Law. Providing this service requires a dedicated resource. The division requests funding for a 150-day contract position at a cost of up to \$20,000 to provide a program this year.

WNV control program in Markham in 2005

Staff proposes that the 2004 WNV control program be carried on in 2005 and that staff:

- Erect additional bat houses at appropriate locations on Town-owned facilities, to be coordinated by staff;
- Introduce fathead minnows into SWMPs that were known to have mosquito larvae, and monitoring the effectiveness of the minnows. Fathead minnows are natural mosquito predators and are being promoted by the Ministry of Natural Resources. While staff was to proceed with this program in 2004 a supply of these licenses and minnows were difficult to obtain and staff are proposing that the program be undertaken in 2005;
- Continue providing directional flushing by the flusher truck to ensure more substantial and thorough agitation of standing water, particularly in driveway culverts; and,
- Continue to monitor the effectiveness of the 12 windmills installed in 2004.

CONCLUSION

York Region Health Services continues to lead control of WNV in 2005

The Region of York, Health Services Department, Public Health Branch will maintain the lead role in the control of the WNV and will actively promote protection and source reduction through education and outreach. The Town of Markham can support the Region of York, Health Services Department in education, outreach and surveillance activities related to WNV within the community.

Promoting public education and outreach to the community on WNV control and what the public can do to protect themselves is the best first step towards supporting the Region. By providing current and continuously updated information on the Town's website, the community page in the local paper and distributing the flyers provided by the Region, the Town can work with the community to provide a message that reduces fear and promotes a preventative approach.

This report includes a summary of the WNV control program in Markham in 2004 and recommends continuing that role in 2005. Town staff will work co-operatively with the Region of York, Health Services Department to provide support and information to ensure a coordinated approach to preventing WNV. However, the use of larvicide and adulticide will reside with the Region of York, Health Services Department, and Public Health Branch.

FINANCIAL CONSIDERATIONS:

The costs of the recommendations in this report are estimated to be:

- One 150-day employee dedicated to surveillance activities, database production, communications and reduction of standing water on Town property at a cost of up to \$25,000 (including fringe benefits and overhead);
- One 150-day By-Law Enforcement Officer dedicated to enforcement of the Standing Water By-Law at a cost of up to \$20,000 (including fringe benefits and overhead);
- Up to \$50,000 be established for a high-pressure flusher truck as an enhanced approach to reducing mosquito breeding in those areas of Markham without catchbasins; to erect bat boxes at appropriate Town-owned properties; additional windmill powered aerators, as warranted; and to pilot fathead minnows.

Funding for these programs has been incorporated into the 2005 Approved Operating Budget.

BUSINESS UNITS CONSULTED AND AFFECTED:

The following departments may have responsibility for some portion of the WNV control in the Town of Markham:

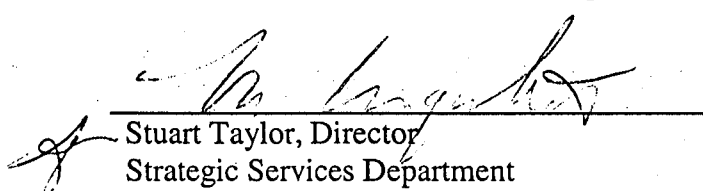
- Corporate Communications
- Operations
- Enforcement and Licensing
- Strategic Services

ATTACHMENTS:

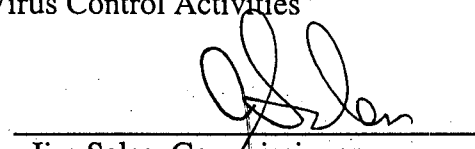
Appendix "A" – Outline of Activities Undertaken in 2004

Appendix "B" – 2004 West Nile Virus Statistics

Appendix "C" – Region of York Report, "2004 West Nile Virus Control Activities"



Stuart Taylor, Director
Strategic Services Department



Jim Sales, Commissioner
Community and Fire Services

APPENDIX "A"

Description of 2004 Town of Markham Approaches to West Nile Prevention

Flusher Truck

The Region of York has identified that open standing water such as that found in many roadside ditches is an excellent breeding site for the *Culex* mosquitoes. In an effort to provide and enhanced approach to WNV control in Markham, a flusher truck was used to agitate the water found to be a concern in roadside ditches. The flusher truck uses a high pressure water flush to effectively disturb standing water in ditches during periods when there was no significant rainfall, thereby reducing the threat of mosquitoes breeding. In 2004, over 33 roads were flushed including roads in Thornhill, Unionville and Markham as well as all the rural roads.

The cost for the Flusher truck in 2004 was \$11,225.37. Staff believes that the flusher truck offers an effective alternative to the use of larvacide and should be continued into 2005

Windmill Powered Aerators

Storm water management ponds provide an important water quality benefit and provide a diverse habitat supporting many species of wildlife including birds, frogs, fish and beneficial insects. These ponds also contribute to the life of the community by providing open spaces for relaxation and walking. Stagnant water can occur in stormwater management ponds if there is not sufficient rain or wind to disturb the water. Aerating windmills work year round to provide a continuous supply of oxygen to standing water. The aerators are installed at the bottom of the stormwater management ponds where air is released into the entire volume of the water. As oxygen supply is maintained, so is water quality, reducing the opportunity for mosquito larvae to survive. By increasing aeration, stagnant water is reduced and so is mosquito breeding. In 2004, 12 windmill powered aerators were installed in 12 of the over 50 stormwater management ponds located in Markham. By installing these windmills in some of our ponds, staff can monitor the effectiveness of this practice in the control of West Nile virus and evaluate whether to expand this innovative program. Preliminary observations indicate that these windmills decrease the amount algae present in the ponds which is a primary food source for mosquito larvae. Further monitoring is planned for the summer of 2005. Additional aerators may be installed in 2005, as warranted.

The 12 Windmill powered aerators that are currently installed at the following stormwater management ponds cost \$31,063.74 in 2004. These windmills may be relocated to other ponds should staff identify ponds that have characteristics that may be better suited for this type of program through our continued observation of Markham's stormwater management ponds.

Pond Name	Location	Ward
Pond Drive	Pond Drive and Southpark Road	2
Beaupre Park	Golden Avenue and Doubtfire Crescent	7
Townson	Behind plaza at 16 th Avenue and Woodbine Avenue	6
Apple Creek	Apple Creek Boulevard and Rodick Road	6

Ashton Meadows Park	East side of Woodbine north of 16 th Avenue	6
Carleton	Carleton Road between Kennedy Road and McCowan Road	3
Roxbury	North east corner of Roxbury Street and 14 th Avenue	7
Raspberry Ridge	Mingay Avenue and Raspberry Ridge	4
Lemsford	South end of Lemsford Avenue	7
Swan Park	South end of Swan Park Road	4
Woodbine	South west corner of Woodbine and Hwy 7	6
Rougebank	Rougebank and Legacy	7

Bat Boxes

Mosquitoes are a source of food to the brown bat which is known to inhabit areas of Markham. In 2004, 19 bat boxes were installed at a cost of \$900, throughout Markham on Town properties to encourage these natural predators of mosquitoes to the area effectively reducing the adult mosquito population.

Location	# of Houses	Area
Settlers Park	2	Thornhill
Pamona Valley Tennis Club	2	Thornhill
Beaupre Park	2	Milliken Mills
Too Good Pond Pavillion	2	Unionville
Operations Yard	1	Unionville
North end of Too Good Pond off of Normandale	2	Unionville
Open space behind Mt. Joy C.C	4	Markham
Rougebank C.C	2	Markham
Milne Park	2	Markham

Staff will be monitoring in 2005 to determine if all of the boxes are occupied. Typically they are occupied within a year of installation and the bats are very effective in reducing the mosquito population. A single bat can catch hundreds of night flying insects in just one hour, consuming from 30 to 50 percent of its body weight in insects each night. On this basis staff are recommending an additional 20 bat boxes be installed on Town property.

Catchbasin Screening Program

In 2004, the Region of York expanded their catchbasin larvaciding program to include catchbasins located in parks and the backyards of private residences. As an alternative to additional lavacide in our park catchbasins, staff designed a special screening device to be placed under the lid of the catchbasin. The purpose of this fine mesh screen is to prevent mosquitoes from accessing the stagnant water at the bottom of the catchbasin to lay their eggs. It also prevents any larvae that may be already developing in the catchbasin from leaving once they have developed into adult mosquitoes. This screen was also offered to residents who had back yard catchbasins and opted not to have them larvacided. In 2004, staff screened 121 catch basins in our parks and 14 residential back yard catch basins. This program was successful and staff recommends that it be continued and possibly expanded in 2005.

APPENDIX "B"

2004 West Nile Virus Statistics

York Region

Location	Human Cases	Positive Birds	Positive Mosquito Pools
Aurora	0	1	0
East Gwillimbury	0	3	1
Georgina	0	1	0
King	0	1	0
Markham	0	2	0
Newmarket	0	1	0
Richmond Hill	1	0	0
Vaughan	0	0	0
Whitchurch-Stouffville	0	2	0
York Region Total	1	11	1

Surrounding Regions

Location	Human Cases	Positive Mosquito Pools	Positive Birds
York Region	1	1	11
Toronto	6	31	18
Peel Region	0	4	16
Halton Region	0	5	13
Durham Region	0	2	8

4

2004 WEST NILE VIRUS CONTROL ACTIVITIES

The Health and Emergency Medical Services Committee recommends the adoption of the recommendation contained in the following report, November 12, 2004, from the Commissioner of Health Services:

1. RECOMMENDATION

It is recommended that:

1. Health and Emergency Medical Services Committee and Regional Council receive this report for information.

2. PURPOSE

The purpose of this report is to provide Health and Emergency Medical Services Committee and Regional Council with a summary of York Region activities related to the control of WNV in 2004.

3. BACKGROUND

WNV is a potentially fatal virus that spreads through a bird-mosquito-bird cycle. Humans can contract the virus through the bite of an infected mosquito. The virus has been detected in mosquitoes and birds throughout Ontario since 2001. Table 1 summarizes WNV detection in York Region from 2001 to 2004.

Table 1
York Region WNV Statistics 2001 to 2004*

	2001	2002	2003	2004
Human Cases**	0	7	2	1***
Birds	1	8	9	11
Mosquito Pools	0	14	6	1

* As of October 31, 2004.

** Only includes lab confirmed cases.

*** York Region resident contracted and died of WNV while visiting in Florida.

Table 2 shows a comparison of human cases of WNV in various jurisdictions from 2002 to 2004. There were no human cases in Ontario in 2001.

Table 2
2002 to 2004* WNV Human Cases**

Region	2002	2003	2004
York Region	7	2	1***
Toronto	127	44	6
Peel Region	38	10	0
Halton Region	56	0	0
Simcoe Region	0	0	0
Durham Region	0	0	0
Ontario	307	89	10
USA	4,156	9,862	1,951

* As of October 31, 2004.

** Only includes lab confirmed cases.

*** York Region resident contracted and died of WNV while visiting in Florida.

In 2001, the York Region Health Services Department, in partnership with area municipalities, initiated WNV control activities through surveillance and public education. In 2003, larvicide was applied in urban areas adding to the control measures targeting the mosquito larval population.

In 2003, Ontario Regulation 199/03 under the *Health Protection and Promotion Act*, was enacted requiring that the local Medical Officer of Health make a determination based on a local risk assessment whether action, including the use of larvicides or adulticides, is required to decrease the risk of WNV. The risk assessment is based on the most current evidence of local activity including WNV in the human population and non-human species.

4. ANALYSIS AND OPTIONS

In 2004, WNV control measures in York Region were continued and enhanced. Attachment 1 compares previous WNV activities with the 2004 WNV activities.

4.1 Education and Communication

In 2004, the public education and awareness campaign continued to focus on two key messages—personal protection (wearing of proper clothing and the use of insect repellents) and the importance of reducing mosquito breeding habitats (removing stagnant water). Information was made available through media releases, the York Region website and pamphlets distributed through various outlets. Media releases were circulated when positive WNV cases in mosquitoes, birds or humans were identified.

Fifteen presentations and three public meetings were provided by Health Protection Division staff to long term care facilities, public groups, companies employing outside workers and businesses. An interactive WNV display was presented at the York

Children's Water Festival and at the grand opening of the Georgina Water Treatment Plant.

The Rapid Risk Factor Surveillance System (RRFSS) survey demonstrated the success of educational initiatives in ensuring residents were aware of WNV. The percentage of York Region residents aged 18 years and older who were asked if they heard about WNV remained constant at 98% in 2003 and 97.9% in 2004.

One disturbing result of the RRFSS survey shows that only 35% of the population sampled in York Region were using insect repellents. Personal protection continues to be the most effective method of ensuring protection against mosquito bites.

4.2 Surveillance

4.2.1 Bird

Bird surveillance has been an integral component of the WNV program for the past four years in Ontario. Crows and blue jays are collected and tested as they are susceptible to WNV and act as an early warning system. In 2004 1,647 birds were collected in York Region, 140 were crows and blue jays that were appropriate for testing, and 11 of these were positive for WNV (*see Attachment 2* for locations of positive birds).

4.2.2 Mosquito

The mosquito surveillance program consisted of three components: (1) responding to stagnant water complaints, (2) adult mosquito trapping, and (3) storm water management ponds survey.

While responding to 562 stagnant water complaints, Health Protection Division staff educated residents about the role of water as a potential breeding source for mosquitoes.

Thirty mosquito traps were set up—25 at "fixed sites" based on past WNV activity in the mosquito population and others as "roaming traps" as positive birds and/or human cases were identified.

During the summer, stagnant water on municipal and regional properties such as storm water management ponds were surveyed. Twenty-five ponds were found to contain larvae and were treated with a biological larvicide—*Bacillus thuringiensis israelensis* (Bti) that targets mosquito larvae and does not impact other insect species or aquatic life.

4.2.3 Human

WNV is diagnosed by blood specimens from patients exhibiting symptoms. York Region Health Services collects weekly statistics on the number of specimens sent for WNV testing from York Region's three local hospitals. In 2004, 66 blood specimens were sent for testing with no positive results for WNV.

As part of the 2004 WNV human surveillance and reporting program, York Region Health Services distributed letters and patient reporting forms to all York Region physicians and hospital infection control practitioners.

4.4 Mosquito Control

In 2004, York Region Health Services contracted the services of a pest control company to provide a larviciding program throughout York Region. Since catch basins have been identified by the Ministry of Health and Long-Term Care (MOHLTC) as primary targets for mosquito control of *Culex pipiens/restuans* (two major vector species of WNV), four rounds of larvicide (methoprene) was applied to public catch basins. Methoprene was also applied in municipal parks and some private rear yard catch basins. Application on private property was conducted upon request and based on a risk assessment.

4.5 Joint Studies

As part of last year's WNV program review it was identified that alternative engineering designs for storm water management ponds (SWMP) or catch basins should be explored in order to make these water retaining structures less attractive to breeding mosquitoes. In 2004 York Region partnered with the Town of Richmond Hill in a catch basins study using specialized traps and with the Town of Markham in a storm water management pond study using windmills. The findings are currently being reviewed to determine the success of these initiatives.

4.6 Comparative Findings

According to MOHLTC staff no jurisdiction in the United States has stopped their mosquito control programs.

Studies in the United States support the effectiveness of larviciding. A Michigan study, *Mosquito Management Programs and West Nile Virus in Michigan 2002*, compared mosquito control activities in five counties and showed a ten-fold increase in the risk of humans contracting WNV in counties with no larviciding activities versus counties with larviciding activities.

In 2002, Chicago had a limited larviciding program. A study, *Factors Impacting Effectiveness of Mosquito Abatement Operations 2002 and 2003*, showed evidence of a large number of back yard catch basins in the areas with clusters of human WNV cases. This study also showed evidence that the areas with the most intense and thorough treatment of catch basins and other culex sites had fewer human cases of WNV than other locations. In 2002, there were 884 human cases of WNV in Chicago and in 2003, with the implementation of an extensive larviciding program, the number of human cases dropped to 53.

In Ontario, confounding factors such as undiagnosed cases and seasonal temperature variations impose limits in evaluating the success of a larviciding program. A study is currently being proposed by Health Canada and MOHTLC to determine the effect of weather on the viral activity.

4.7 Relationship to Vision 2026

The York Region WNV control program supports the Vision 2026 goal of *Responding to the Needs of Our Residents*.

5. FINANCIAL IMPLICATIONS

Table 1 outlines the estimated costs incurred to deliver the 2004 WNV program in addition to several MOHLTC budget adjustments that occurred after York Region's 2004 budget process.

Table 1
Summary of WNV 2004 Expenditures and Funding

	2004 York Region Approved Budget	MOHLTC Budget Adjustments	2004 MOHLTC Revised Budget	Estimated Expenditures to Dec. 31/04
Purchase of Service*	\$1,644,949	(\$ 74,801)	\$1,570,148	\$1,107,852
Advertising/Publicity	150,000	(21,300)	128,700	52,579
GIS/Planning	70,000	(15,400)	54,600	70,000
Supplies & Equipment	123,000	(56,984)	66,016	83,053
Mosquito Speciation**	150,000	(150,000)	-	114,479
Total Expenditures	\$2,137,949	(\$318,485)	\$1,819,464	\$1,427,963
Funding Sources				
100% Provincial Funding	\$ -	\$ -	\$ -	\$ 114,479
50% Provincial Funding	1,068,975	(159,243)	909,732	656,742
Contribution from Reserve	1,068,974	(159,242)	909,732	656,742
Total Funding	\$2,137,949	(\$318,485)	\$1,819,464	\$1,427,963

* Includes cost of larviciding, the pick-up of dead birds and standby contract for adulticiding.

** Funded 100% by MOHLTC.

Table 1 illustrates that the anticipated 2004 year end expenditures are projected to be under spent by \$709,986. This under spending is a result of several factors. The MOHLTC advised York Region Public Health of a reduction of allowable WNV program cost-shared expenditures in the amount of \$318,485. It also advised health units that it would fund 100% of the cost of mosquito speciation (approximately \$114,479 for York Region) in 2004. In addition to these MOHLTC budget adjustments, larviciding costs (purchase of service) were significantly reduced through the Region's tendering process. Further cost reductions were realized as a result of fewer media releases being required in 2004.

6. LOCAL MUNICIPAL IMPACT

The Region and the area municipalities developed a successful working relationship throughout the 2004 WNV season. Monthly meetings were held with representatives from all nine area municipalities to discuss WNV control activities in York Region.

7. CONCLUSION

The efforts of the York Region Health Services Department to control the spread of WNV in the Region have contributed to minimize the impact of WNV on residents throughout the 2004 mosquito season. Continued surveillance, public education and larviciding activities are essential to the continued success of York Region's WNV program.

The Senior Management Group has reviewed this report.

(The attachments referred to in this clause were included in the Agenda for the December 2, 2004 Committee meeting.)