

**POLICY REPORT
PLANNING AND OPERATIONS**

Date: April 6, 2004
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TO: Standing Committee on Planning and Environment

FROM: General Manager of Parks and Recreation, City Engineer and the
Director of Environmental Health of the Vancouver Coastal Health

SUBJECT: West Nile Virus Surveillance and Mosquito Control Procedures for 2004

RECOMMENDATIONS

- A. THAT Council receive the 2003 findings of mosquito monitoring and surveillance for information.***
- B. THAT Council endorse the Regional Policy for a Standardized Preparedness and Management Approach for the West Nile Virus for Health purposes as described in Appendix D, including seeking federal and provincial funding.***
- C. THAT Council approve the proposed mosquito monitoring, surveillance and larval control process for 2004 as described in this report.***
- D. THAT Council allocate \$90,000 for the mosquito monitoring Program to the Park Board operating budget, with an offset of \$50,000 from a grant received from the Provincial Government.***
- E. THAT Council authorize the City Manager to proceed with the implementation of the larval control program, when ordered by the Medical Health Officer with an estimated cost of \$300,000 with the source of funding to be Contingency Revenue.***

CITY MANAGER'S COMMENTS

The City Manager recommends A, B, C, D and E.

POLICY

On May 23, 2003, and after subsequent Standing Committee consideration, Council approved 2003 mosquito monitoring and surveillance and authorized the City Manager to initiate the larvicide treatment program should circumstances warrant.

PURPOSE

The purpose of this document is to report on Vancouver's 2003 Mosquito Surveillance Program and to outline the implementation of Vancouver's response plan to a possible outbreak of West Nile Virus in the years ahead.

BACKGROUND

West Nile Virus is a mosquito-borne virus that was first identified in North America in New York in 1999. Since then, WNV has shown considerable geographic spread in North America, spreading to 45 of 48 continental states and 7 Canadian provinces. In 2003, Washington, Oregon, and Idaho were the only continental states without WNV. WNV also moved into Alberta in 2003, with 15 % of birds tested and 269 humans confirmed positive for the virus. In British Columbia, all of the 1886 birds submitted for testing tested negative for WNV. There were 7 probable and 12 confirmed human cases of WNV reported in British Columbia. All cases acquired their infections while travelling outside of British Columbia. There were no deaths from WNV in BC in 2003.

About West Nile Virus (WNV)

WNV is found in wild birds and spread by mosquitoes. It is transmitted to humans and animals through the bite of an infected mosquito. These mosquitoes are referred to as vectors of the disease. There is no evidence to suggest that WNV can be spread from person to person.

According to the British Columbia Center for Disease Control (BCCDC), most people who become infected will experience no symptoms at all. About 20% of those infected may develop mild flu-like symptoms such as fever, headaches and body aches lasting about one week or less. In rare cases (less than 1%), WNV can result in serious health effects such as meningitis or encephalitis.

About Mosquitoes

There are about 50 species of mosquitoes in British Columbia, of which about 12 species may transmit WNV. Only female mosquitoes bite animals or humans for a blood meal to nourish their eggs. The mosquito may go through its entire life cycle, from egg to adult, in as little as seven days or as long as a month. Eggs may lay dormant for periods of up to two years.

Mosquito Surveillance and Control Plan for the City of Vancouver for 2003

The plan was developed in cooperation with the Vancouver Park Board, Engineering Services and Vancouver Coastal Health (VCH). Based on the Arbovirus Surveillance and Response Guidelines for British Columbia (Appendix A), British Columbia was classified as a Level IIa (WNV detection in a jurisdiction in the previous year or in a neighbouring jurisdiction in the current year) and the 2003 activities for Vancouver were therefore focused on:

- determination of distribution, relative abundance and species of mosquito populations (Parks/City)
- dead bird surveillance (VCH, BCCDC)
- mosquito trapping and testing for WNV (VCH, BCCDC)
- passive surveillance of clinical human cases (BCCDC)
- public education (VCH)
- mosquito source reduction (Parks, City)

DISCUSSION

Surveillance results for 2003

The following is a summary of the results of the 2003 Mosquito Surveillance Program. While several different mosquito species were identified throughout the City, only those species considered vectors (or suspected vectors) of WNV are reported in this document. More detailed information may be found in Appendix B and sampling locations are shown in Appendix C.

1. Larvae

a. Catch basins (Appendix B, Table 1)

Catch basins at 20 locations throughout the city were sampled 3 times in July and August. One WNV vector, *Culex pipiens*, was present in many sampled basins. From July to late August, the percentage of catch basins containing mosquito larvae and/or pupae climbed from 45% to 76%. Due to the extremely dry summer, the number of wet basins available to sample decreased.

Based on the survey conducted, *Culex pipiens* were found in catch basins throughout the entire city. Data did not suggest any geographic differentiation. No mosquito predators were found in the catch basins.

b. Temporary and semi-permanent open water bodies (Appendix B, Table 2)

Temporary and semi-permanent open bodies of standing water on city land were reported to staff by City and Parks personnel or residents, or noted by staff scouting for mosquito habitat.

Bodies of standing water showed variable levels of *Culex pipiens* and *Culex tarsalis* larvae. Natural populations of mosquito predators were rarely found at these locations.

c. Permanent open water bodies (lakes, ponds, ditches) (Appendix B, Table 3)

Civic lands with permanent open bodies of water were identified and checked for potential mosquito habitat in June. These locations were sampled at least 4 times through the summer.

Three vectors species (*Culex pipiens*, *Culex tarsalis*, & *Culiseta inornata*) were present in ponds. Permanent ponds had well established populations of mosquito predators and mosquito populations were usually low. An exception was a swampy area on the south shore of Lost Lagoon in Stanley Park, which developed a high population of *Culex pipiens* late in the summer. Southland ditches were sampled 5 times in 2003. The only species of mosquito larvae found in the Southland ditches were *Culex territans*, which is not a vector species and feeds mostly on amphibians. Areas of some parks that would normally be wet and therefore potential mosquito habitat were dry in this unusual summer.

2. Adults

Adult populations were monitored by the Vancouver Coastal Health Authority. Light traps were set up at four locations in Vancouver throughout the summer to collect adult mosquitoes. These samples were submitted to BCCDC for species ID and WNV testing. In 2003, the 195 adult mosquitoes collected in traps in Vancouver were identified as:

- 147 (75%) *Culex pipiens*
- 31 (16%) *Culex* sp.
- 8 (4%) *Culiseta* sp.
- 7 (4%) *Aedes* sp.
- 2 (1%) *Mansonia (Coquillettidia) perturbans*

Culex pipiens and *Mansonia (Coquillettidia) perturbans* are WNV vectors; the adults identified to genus only may also be vectors.

Park board staff also found large numbers of adult *Aedes vexans*, a WNV vector, in Malkin Park in July and August and a few *Mansonia (Coquillettidia) perturbans* in Stanley Park in July.

3. Dead Crows

Many bird species can also be infected by WNV. Members of the crow family have a high death rate when infected and therefore used as an indicator species. WNV infection in crows usually precedes any human illness. In 2003, of the 314 birds tested for Vancouver, none were infected with WNV. Most dead birds were reported by residents to VCH staff.

Regional Policy Framework

In response to a request from a majority of Greater Vancouver Regional District (GVRD) municipalities, the GVRD, Health Authorities and member Municipalities have developed a regional policy framework that ensures a minimum standardized response to West Nile Virus (Appendix D). The policy framework was considered by the GVRD Board at its March 26 meeting, covers the following aspects: Sustainable Response Planning, Mapping and Inventory, Surveillance, Integrated Management for Larvae Control, Communication, Data Management, Training and Technology.

The GVRD report notes that municipalities are asked to take a significant responsibility for managing a public health issue. The policy includes encouraging the senior levels of government to provide more funding to municipalities to implement the West Nile Virus response plans.

The role of municipalities is to take responsibility for lands and infrastructure under their jurisdiction. On private lands the property owner is responsible for monitoring and treatment, and the Regional Health Authorities will respond to complaints and enforce if necessary.

2004 Mosquito Surveillance and Control Program

The 2004 Mosquito Surveillance and Control Program is based on the results of the 2003 Mosquito Surveillance Program and is guided by the Regional policy framework, while noting that British Columbia is still at the Arbovirus response level IIa (Appendix A).

Monitoring

The 2004 WNV monitoring program will continue larval sampling of catch basins and of open water in parks and on City land:

- Catch basins will be monitored again in 2004 to gain a better understanding of the fluctuations in the populations of *Culex pipiens*.
- Bodies of water on City and Park lands will need to be monitored more thoroughly than was possible with one person in 2003. Many places with potential mosquito habitat were not sampled or were sampled too infrequently to determine if WNV vectors were present. Also, the unusually dry summer weather of 2003 meant that areas of some parks were dry when they would normally be wet. In a wetter summer, many more potential mosquito habitats would be present in parks such as Stanley Park, John Hendry Park, Jericho Park and Everett Crowley Park.
- Permanent water bodies, such as lakes, ponds and ditches will be mapped to be included as a layer on the City's GIS system.

The coordination of the monitoring and potential mosquito control operations would be overseen by the Park Board's Integrated Pest Management (IPM) Coordinator. The program, with an estimated cost of \$90,000, would require:

- 2 inspectors for 5 months - \$40,000
- 2 automobiles for 5 months (including fuel and insurance) - \$10,000
- Supplies - \$10,000
- Backfilling IPM Coordinator's regular duties - \$30,000

Mosquito Control

The mosquito control program is divided into two different components: mosquito habitat modification (source reduction) and mosquito larval population control (larviciding). While the source reduction component of the program began during the summer of 2003 and will continue into 2004, larviciding will only be initiated when ordered by the Medical Health Officer.

1. Mosquito habitat modification on private and public lands

The most effective treatment for mosquito control is the elimination, wherever possible, of standing water. As mosquitoes can breed in extremely small amounts of water, public education on the elimination of standing water on private property is a critical part of effective mosquito control. Vancouver Coastal Health will be the lead agency in providing this education to the public. City and Park Board will assist with information dissemination through Park Board and City facilities and websites. All City and Park Board operations staff have received and will continue to receive training to ensure that unwanted standing water in public lands and works yards are dealt with appropriately.

Temporary and semi-permanent sources of open water in parks and on City land will be inspected to determine the best course of action required to eliminate them. Based on the 2003 surveillance, accumulation of water was often caused by poor drainage. These mosquito populations would be eliminated by correcting the drainage problems, and these activities would be absorbed in the Parks and City operating budgets.

2. Mosquito larval population control

Despite efforts to reduce mosquito breeding sites, there will still be areas where disease vector mosquitoes can breed, and control of mosquito larvae may be necessary. Implementation of larval control measures would be based on the advice of or as an order from the Medical Health Officer. Two larvicides are recommended, *Bacillus thuringiensis* subspecies *israelensis* (*Bti*) and methoprene. *Bti* is a biological pest control agent which is specific to mosquito and other true fly larvae, and is available in granular or spray form. It is active for only about 24 hours and does not harm other aquatic insects or fish. Methoprene is a chemical insect growth regulator. It controls mosquitoes by preventing their development beyond the larval life stage. While methoprene has demonstrated some toxicity towards other freshwater invertebrates, there were no lasting adverse effects on these populations. A slow-release briquette has recently been approved for use in Canada. This formulation, which remains active for 150 days, will eliminate the need for repeated applications during the year.

- Catch basins

Monitoring in 2003 established the main vector mosquito breeding areas as city catch basins. Based on 2003 surveillance, the majority of Vancouver catch basins were probably populated with the vector species *Culex pipiens*. These results are consistent with surveillance reports from Toronto and New York as part of those cities' WNV control programs. Methoprene will be used for larval control in catch basins. For catch basins discharging directly into the river or creeks, a 200-metre buffer zone will be established around the discharge points where no treatment will occur. In the event that treatment is necessary, the 45,000 catch basins present in Vancouver will need to be treated in a matter of weeks. The annual cost of catch basin treatment is estimated to be \$155,000 in materials and \$145,000 to cover the costs associated with the extra staff, vehicles and training necessary to conduct these operations. As part of the regional policy framework municipalities are to be prepared to apply larvicide at relatively short notice. A plan to implement an order has been developed by Engineering and Parks, and will be utilized if required.

- Permanent open water bodies
Monitoring in 2003 also established that there were disease-vector mosquitoes present in natural ponds, lakes, ditches and other bodies of permanent open water in parks and on other City land. However, numbers of larvae were generally low, probably because the populations of mosquito predators also observed in these areas provided some natural control. In the event that continued monitoring shows high populations of vectors in natural ponds and treatment becomes necessary, *Bti* would be used.

ENVIRONMENTAL IMPLICATIONS

The selection and use of pesticide for the mosquito control program is consistent with Vancouver's Integrated Pest Management Policy.

Bti only becomes toxic in the stomachs of mosquito and blackfly larvae. Because of this, it does not affect other insects, honeybees, fish, birds or mammals. The insecticidal toxin in *Bti* biodegrades quickly in the environment through exposure to sunlight and microorganisms.

Methoprene is not persistent in the environment. It degrades rapidly in water, being susceptible to transformation by sunlight and microorganisms.

FINANCIAL IMPLICATIONS

The financial implications of the mosquito surveillance for 2004 are \$90,000 with an offset of \$50,000 from the Provincial Government. Should mosquito abatement operations be necessary in 2004, an estimated cost of \$300,000 would be incurred to cover the costs of materials, staff training, and staff time for application.

CONCLUSION

The West Nile Virus is a potential threat to public health and the program developed jointly by the Vancouver Coastal Health, Engineering Services and Park Board, provides coordinated education and control and is consistent with the GVRD's Regional Policy for a Standardized Preparedness and Management Approach for West Nile Virus for Health Purposes.

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APPENDIX A

Arbovirus Surveillance and Response Guidelines for British Columbia

The 5 Response Levels (0 - III) are associated with increasing risk for arbovirus activity affecting humans. These levels are adapted from guidelines developed by the Canadian National WNV Steering Committee (updated Ottawa, February, 2002). The levels are meant to help decide what surveillance and control activities should take place in an area for a given arbovirus (eg WNV).

LEVEL 0

- No confirmed WNV infection in a bird, animal or mosquito pool and WNV activity is unlikely
- SURVEILLANCE ACTIVITY: passive surveillance of confirmed human cases

LEVEL I

- No confirmed WNV infection in a bird, animal or mosquito pool and WNV activity is possible or the risk is unknown
- SURVEILLANCE ACTIVITY: dead bird surveillance, identify breeding sites/larval habitat for vector mosquitoes, passive surveillance of confirmed human cases

LEVEL IIa

- Based on an assessment of risk following WNV detection in a jurisdiction in the previous year or in a neighbouring jurisdiction in the current year
- SURVEILLANCE ACTIVITY: meteorological surveillance, dead bird surveillance, mammal surveillance, determination of distribution, relative abundance and species of mosquito populations, mosquito trapping and testing for WNV, passive surveillance of suspect and probable human cases
- RESPONSE ACTIVITY: public education, mosquito source reduction, mosquito larviciding

LEVEL IIb

- Based on an assessment of risk following WNV detection within a jurisdiction in the current year
- SURVEILLANCE ACTIVITY: meteorological surveillance, dead bird surveillance, live bird surveillance, mammal surveillance, determination of distribution, relative abundance and species of mosquito populations, mosquito trapping and testing for WNV, passive surveillance of suspect and probable human cases
- RESPONSE ACTIVITY: public education, mosquito source reduction, mosquito larviciding, mosquito adulticiding

LEVEL III

- Detection of a single or multiple human case(s) of WNV infection (with no history of travel to an area with confirmed WNV activity within 21 days of onset of symptoms) in the current year within a jurisdiction
- SURVEILLANCE ACTIVITY: meteorological surveillance, dead bird surveillance, live bird surveillance, mammal surveillance, determination of distribution, relative abundance and species of mosquito populations, mosquito trapping and testing for WNV, active surveillance of clinical and confirmed human cases
- RESPONSE ACTIVITY: public education, mosquito source reduction, mosquito adulticiding

APPENDIX B

**2003 MOSQUITO SURVEILLANCE RESULTS
CITY OF VANCOUVER**

1. Catch Basins

Test sampling was done in June to determine methods. Samples were collected from 20 regular sampling sites on July 15-21, August 8-14, and August 26-29. Up to 6 wet basins were sampled at each site using a 4"x 6" aquarium net inserted through the covering grate and swept through the water in the basin. Five representative basins were also sampled in late September and late October. *Culex pipiens* were present in basins from the start of sampling through late September, but were absent in late October.

Table 1: WNV vector species collected from catch basins at various locations in Vancouver in 2003.

VECTOR SPECIES	LOCATIONS FOUND	OBSERVED DENSITY
<i>Culex pipiens</i>	20 regular sampling sites (Appendix 2, Figure 1)	Low to high, depending on date and location
	VanDusen Gardens	High
	75 th Ave. & Angus St.	High
	Kent St. S.	Low
	E. Boulevard & Maple St.	Medium
	Manitoba Transfer Station Basement Sump	High

Please note that the population estimates reported in Tables 1, 2 and 3 are based on qualitative assessments of the larval density at a specific location in the water body.

2. Temporary and semi-permanent open water bodies

Standing water was sampled with a mosquito dipper at intervals from July to October. Vector larvae were present July to September, but were not found in late October.

Table 2: WNV vector species collected from temporary and semi-permanent open water bodies at various locations in Vancouver in 2003.

VECTOR SPECIES	LOCATIONS FOUND	OBSERVED DENSITY
<i>Culex pipiens</i>	Arbutus Corridor drainage ditch	Medium-High
	Falaise Park surface water	Medium
	Southlands puddles	
	Celtic & Carnarvon	High
	57 th & Carnarvon	Low-Medium
	Stanley Park sprinkler leak	Low
VanDusen puddle in lane (Osler St.)	High	

Table 2 cont' d

VECTOR SPECIES	LOCATIONS FOUND	OBSERVED DENSITY
<i>Culex tarsalis</i>	Southlands puddles	
	Celtic & Carnarvon	Low
	57 th & Carnarvon	Low

3. Permanent open water bodies

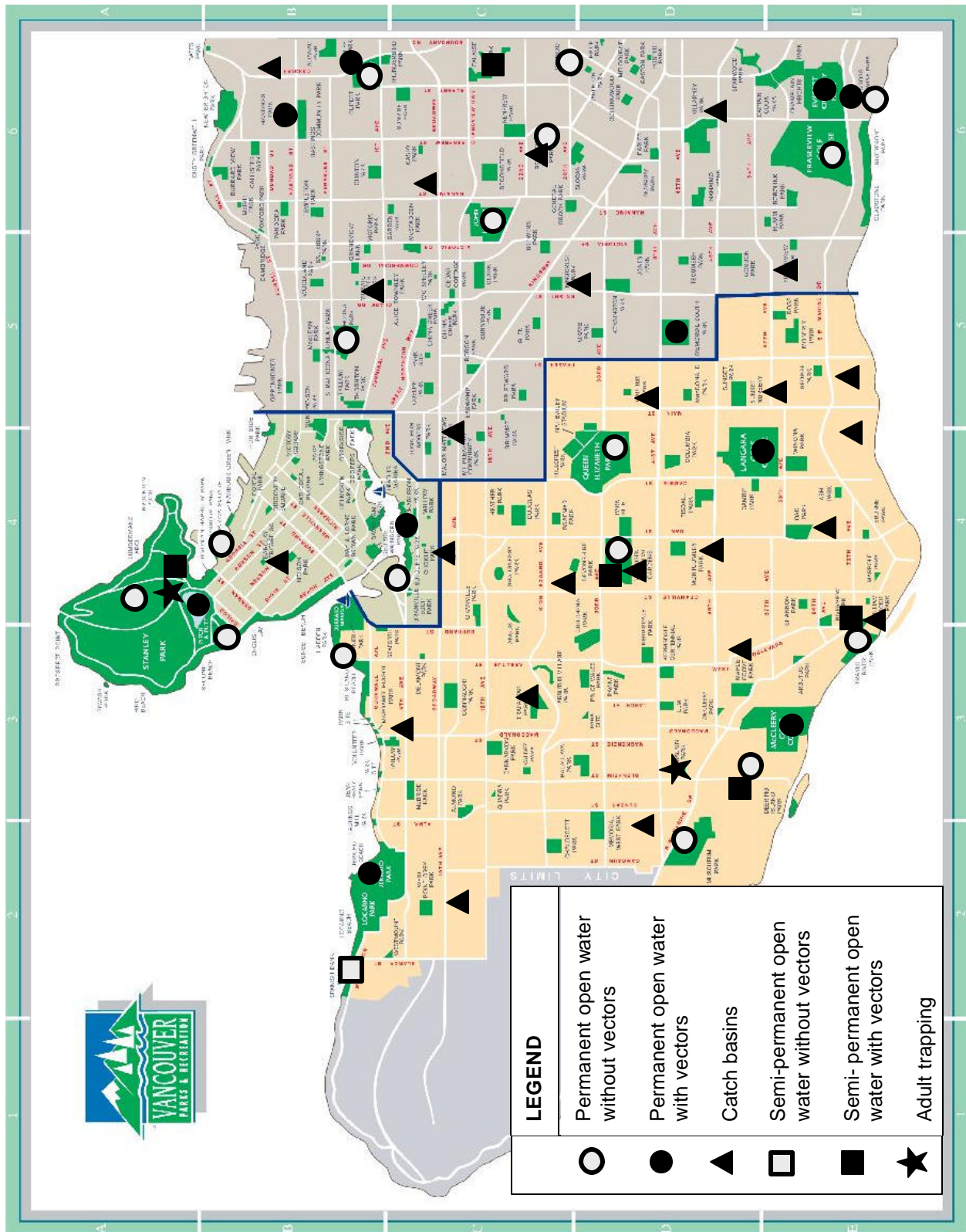
Samples were taken from permanent open bodies of water with a mosquito dipper at intervals from June to October. Vectors were found at different locations throughout this time.

Table 3: WNV vector species collected from ponds and other permanent open water bodies in parks and on City land in 2003.

VECTOR SPECIES	LOCATIONS FOUND	OBSERVED DENSITY
<i>Culex pipiens</i>	Charles Park	Low-Medium
	Charleson Park	Low
	Everett Crowley Park	Low
	Jericho Park	Low
	Kinross Park	Low
	Memorial South Park	Low
	Stanley Park, Lost Lagoon	High
	Langara Golf Course, Hole 4 water hazard	Low
	McCleery Golf Course, Entrance pond,	Low
<i>Culex tarsalis</i>	Charles Park	Low-Medium
	Charleson Park	Low-Medium
	Hastings Park	Low
	Jericho Park	Low-Medium
	Memorial South Park	Low
	Stanley Park, Lost Lagoon	Low
	Langara Golf Course, Hole 13 water hazard	Low
	McCleery Golf Course, Entrance Pond, Hole 7 water hazard	Low
<i>Culiseta inornata</i>	Everett Crowley Park	Low
	Jericho Park	Low

APPENDIX C

Figure 1: Location of catch basin, open water bodies and adult mosquito sampling sites in Vancouver for 2003.



APPENDIX D

**Regional Policy for a Standardized Preparedness and Management Approach
for West Nile Virus for Health Purposes:
Mosquito Surveillance, Education and Larval Control**

Scope

In 2003, the Province of British Columbia announced a comprehensive provincial strategy to address West Nile Virus (WNV). The Province, with leadership provided by the BC Centre for Disease Control, is currently at response level IIa indicating that arbovirus activity is evident in Alberta. The Province expects WNV to arrive in British Columbia in 2004.

In an effort to support the Province in its strategy, the GVRD, through a Working Group of the Regional Engineers Advisory Committee, has developed a standardized approach for both the preparedness and management of mosquitoes for health purposes. The Working Group, representing 12 municipalities as well as the Vancouver Coastal and Fraser Health Authorities, and the University of British Columbia Plant Operations, has prepared the following table outlining the approach, the tasks involved, the jurisdictional responsibilities and the timing required.

This policy is based on the regional/local governments, as land owners, assuming responsibility for the management of mosquitoes on their lands. Mosquito management on private lands is the property owner's responsibility and will be managed by the Regional Health Authorities under the provision of the *Health Act*.

This policy represents the minimal standard for management of larval mosquitoes for health purposes on public land¹. Adult control should be considered only when there is a significant human health risk and only implemented when ordered by a Regional Health Authority. Planning for adult mosquito control will be led by the Regional Health Authorities with the participation of their member municipalities and the GVRD.

This policy can only be effective with significant, continued financial support from the Province.

Task	Responsibility				Timing
	Municipal	GVRD	RHAs	Prov/Fed	
A. Sustainable Response Planning					
1. Each jurisdiction ² should prepare a sustainable WNV response plan for their lands based on this policy.	lead ³	lead	support ⁴	lead	complete by July 2004
2. Each jurisdiction should regularly monitor and evaluate its response plan.	lead	lead	support	lead	ongoing

¹ 'Public land' means any lands owned by a municipality or the GVRD.

² 'Jurisdiction' means municipality, the GVRD, the Fraser and Vancouver Coastal Health Authorities, the Crown Provincial and the Crown Federal or their groupings.

³ 'Lead' means to take responsibility for implementing the task described.

⁴ 'Support' means to provide assistance or input to the lead jurisdiction responsible for implementing the task.

APPENDIX D Cont'd

Task	Responsibility				Timing
	Municipal	GVRD	RHAs	Prov/Fed	
3. The Federal and Provincial governments should be encouraged to provide ongoing financial assistance to local governments in implementing WNV response plans.	support	lead	support	support	ongoing
B. Mapping & Inventory					
1. Each jurisdiction, using <i>Municipal Mosquito Control Guidelines</i> (Ellis, 2001) as a standard, should map and classify mosquito breeding habitat on their lands in a GIS format, as "high, medium, low risk" as appropriate to the vector target, with notes describing the criteria such as natural features, human influences, fisheries values.	lead	lead	support	lead	complete in 2004
2. Mapping of habitat, hot spots, sensitive areas ⁵ , and monitoring & surveillance results by individual jurisdictions should be rolled up and made available to all jurisdictions to assist in providing a larger sub-regional or regional context.	support	lead	support	support	complete in 2004
3. Each jurisdiction should evaluate mosquito breeding habitat on their lands and identify hotspots (areas with high ratings for the target vector) and identify areas that are sensitive to management measures.	lead	lead	support	lead	complete by July 2004
4. Where applicable, each jurisdiction should evaluate catch basins for vector species on their lands.	lead	lead	support	lead	complete by July 2004
C. Surveillance					
1. The Regional Health Authorities are responsible for surveillance activities for detection of WNV in adult mosquitoes and sentinel and Corvid species and humans with assistance from each jurisdiction,	support	support	lead (jointly with PHSA and province)	lead (jointly with RHA); fed support	ongoing

⁵ 'Sensitive areas' include environmentally sensitive locations (eg. wells, apiaries, registered organic farms, watercourses and fish habitat) and/or community areas (eg. schools, permitted adult and child care facilities, hospitals and seniors group homes.)

APPENDIX D Cont'd

Task	Responsibility				Timing
	Municipal	GVRD	RHAs	Prov/Fed	
D. Integrated Management for Larval Control					
1. Each jurisdiction should make adequate preparations for larval control of vector mosquitoes.	lead	lead	order or recommended	lead	ongoing
2. On the order or recommendation of the Regional Health Authority, each jurisdiction should undertake a program of larval control at designated hotspots, including catch basins.	lead	lead	order or recommended	lead	ongoing
3. Each jurisdiction should, over time, consider modification of hot spots by physical or mechanical means to reduce their viability as mosquito breeding habitat (with caution to avoid disruption of sensitive habitats.)	lead	lead	support	lead	ongoing
4. The Regional Health Authorities should facilitate the use of the provincial pest control permit in managing hot spots including catch basins.	support	support	lead	support	complete in April 2004
5. The Regional Health Authorities should ensure that there are appropriate protocols in place to facilitate access for inspection, surveillance, monitoring and control of mosquitoes for health purposes, including private lands.	support	support	lead	support	complete in 2004
E. Communications					
1. The Regional Health Authorities/Province should prepare public messages on: <ul style="list-style-type: none"> private land owners responsibilities general WNV information; strategies for provincial parks; surveillance results; treatment including personal protection, source reduction and adaptive management. 	support	support	lead (jointly with PHSA and Province)	lead (jointly with RHAs); fed support	complete in 2004

APPENDIX D Cont'd

Task	Responsibility				Timing
	Municipal	GVRD	RHAs	Prov/Fed	
2. The GVRD should be requested to utilize its communication and education channels to assist the Regional Health Authorities to deliver the public messages across the Lower Mainland.	support	support and request the FVRD to participate	lead	support	complete in 2004
3. Each jurisdiction may supplement the general regional and provincial communication messages with messaging specific to their needs including, where applicable, private land owners.	support	support	lead	support	ongoing
4. The Mosquito Technical Work Group of REAC (including the Regional Health Authorities) should continue to act as a focus for information sharing and regional policy review.	support	lead	support	support	ongoing
F. Data Management					
1. All jurisdictions should standardize the collection of mosquito management data so that it is complete, current and useful for management and reporting purposes.	lead	lead	support	lead	complete in 2004
G. Training & Technology					
1. Each jurisdiction should ensure that it is informed and trained on standards for data collection and recording.	support	support	support	province lead; fed support	ongoing
2. Each jurisdiction should support the development of a predictive model that will facilitate the efficient management of mosquitoes for WNV.	support	support	lead	support	complete by 2006

Approved at GVRD Board Meeting March 26th, 2004