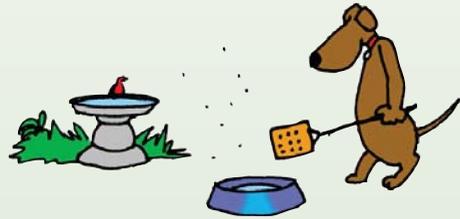


If You Have Questions About a Stormwater Management Facility...

Call the Montgomery County Customer Service Center at 3-1-1 or send an email to AskDEP@montgomerycountymd.gov



Additional Resources...

West Nile Virus:

Montgomery County Dept of Health & Human Services (HHS) 240-777-1755

Fact Sheet: www.montgomerycountymd.gov/content/pio/pdfs/west_nile_virus.pdf

U.S. Centers for Disease Control and Prevention 1-800-CDC-INFO (232-4636)

www.cdc.gov/westnile

Mosquito Control:

American Mosquito Control Association www.mosquito.org

Maryland Department of Agriculture Mosquito Control Section 410-841-5870

www.mda.state.md.us/plants-pests/mosquito_control

Pesticides:

U.S. Environmental Protection Agency www.epa.gov/pesticides/health/mosquitoes

National Pesticide Information Center

1-800-858-7378

E-mail: npic@ace.orst.edu

Website: <http://npic.orst.edu>

Some Facts about Mosquitoes & Stormwater Management Facilities



Stormwater Wetland



Roadway Bioretention Garden

Stormwater facilities that are designed and maintained properly should not promote mosquito breeding.

Learn About Mosquitoes, Where They Breed & What You Can Do to Help Control Mosquitoes on Your Property



Department of Environmental Protection
Montgomery County, Maryland
www.montgomerycountymd.gov/dep

Stormwater Facilities & Mosquitoes

If designed and maintained properly, stormwater facilities should not promote mosquito breeding. Stormwater management is essential to mitigate the adverse effects of human impacts on the environment, including controlling flooding, improving water quality, increasing groundwater recharge, and reducing stream channel erosion. Ensuring that stormwater facilities are properly designed & maintained is the key to limiting mosquito production in these practices. Mosquitoes preferentially breed in small, isolated containers of stagnant water easily found on residential lots, so it is important that we all do our part to eliminate mosquito breeding habitats in our own backyards.



Severe stream erosion from uncontrolled stormwater flows

There are more than 4,000 stormwater facilities in the County, some of which are large, end-of-pipe basins that contain and treat water from large drainage areas. Others are small, landscaped practices located within right of way areas, schools and libraries, and on private property that collect and treat smaller volumes of water close to the source.

Some stormwater management practices will pond water temporarily and some retain water permanently to improve water quality.

Practices that Hold Water Permanently

- **Stormwater management ponds** typically are not preferred breeding habitats for mosquitoes. Wet ponds and stormwater wetlands with aquatic habitats maintain natural predators that control mosquito populations.



Stormwater Wet Pond

Mosquitoes cannot complete their life cycle to become adult mosquitoes if:

- Water is flowing, like in a stream, river, or fountain;
- Predators like fish, frogs, salamanders, dragonflies, and aquatic insects prey on the mosquitoes; or
- Water drains within a week.



Practices that Hold Water Temporarily

- **Dry detention basins, bioretention, and rain gardens** are designed to detain and infiltrate stormwater. Facilities fill up during storm events and then release the water within two to three days. Because these systems are designed to hold water for only short periods of time, these practices should not sustain mosquito populations.



Bioretention



Rain Garden

The County has and will continue to monitor stormwater management facilities for potential mosquito issues.



For more information about Stormwater Facilities in our County, visit: www.montgomerycountymd.gov/stormwater

Mosquito Facts & What You Can Do To Reduce Mosquitoes on Your Property

Mosquito Life Cycle



2-3 days



5-6 days



2-3 days



Adult Asian Tiger

Egg - Mosquito eggs are oval and about 0.635mm long and are either laid singly or as an egg raft in water.

Larva - There are four developmental stages called instars and some species can grow to a 1/2 inch long. Larvae move through the water in a serpentine motion.

Pupa - About the size of a sesame seed. Pupae move in a somersault fashion through the water. They remain at the surface unless they are disturbed.

Adult - Process begins again with a female adult mosquito collecting a blood meal (for protein) to lay her eggs. Adults typically live 2-3 weeks.

Photos: James Gathany (CDC)

Eliminate Breeding Places

Mosquitoes breed in stagnant, standing water. As little as a teaspoon or bottle cap of water standing *for more than a week* is enough for eggs to develop into adult mosquitoes!

What You Can Do to Help:

- ✓ Eliminate all standing water on your property. Check at least once a week.
- ✓ Help your neighbors eliminate standing water.

Prevent Standing Water:



- ✓ Clean out roof gutters and down-spout screens.



- ✓ Flush birdbaths and saucers under potted plants at least once a week.



- ✓ Turn over children's wading pools, buckets, wheelbarrows, canoes, and garbage can lids.



- ✓ Drain water trapped in folds and arrange tarp so water runs off.



- ✓ Fix dripping outdoor water faucets.



- ✓ Get rid of puddles from window air conditioners.

Other Control Methods

If eliminating standing water is not possible, here are some recommended alternatives to control mosquitoes:

- ✓ Add an aerator or fountain to your birdbath or ornamental pond. Mosquitoes do not breed in moving water.
- ✓ Kill mosquito larvae using a recommended larvicide.
- ✓ The **MD Department of Agriculture's Mosquito Control Section** provides treatment for communities on a cost-share basis on public property only. They use control techniques such as breeding source reduction, public education, biological control and insecticide applications.
- ✗ Other methods, such as mechanical traps, bug zappers, and high frequency sound emitters have NOT been known to be effective at controlling mosquitoes.



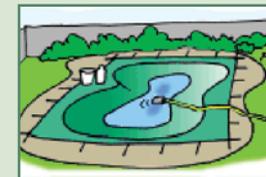
- ✓ Dispose of trash such as plastic bags, bottle caps, open drink cans or bottles, styrofoam cups, or food wrappers.



- ✓ Throw away used tires. If tire swing, drill holes in bottom of tire so water will run out.



- ✓ Check recycle bin if it is left out in the rain. Dump water out of recyclables.



- ✓ Drain water that collects on swimming pool covers.

Larvicides

Larvicides kill mosquito larvae (not pupae or adults). They are a preferred treatment over the use of **adulticides** because of their effectiveness in controlling mosquitoes and in minimizing impacts to the environment and to nontarget organisms. They are also not harmful to animals such as squirrels, raccoons and dogs if they are ingested.

Recommended Larvicides:

- **VectoLex® (Bacillus sphaericus)** is a naturally occurring bacterium found in soil and aquatic environments. It produces a stomach poison (endotoxin) which is specifically toxic to mosquito larva after it is ingested. Because it only targets mosquito larvae, VectoLex® is safe to use in natural water bodies (not drinking water reservoirs) or in water that flows to natural water bodies such as stormwater facilities and storm drains. VectoLex® can only be purchased and applied by a licensed applicator with an aquatic certification.
- **Bacillus thuringiensis var. israelensis (B.t.i.)** is another bacterial larvicide that is most readily available from local stores (i.e. **Mosquito Dunks®**). However, this larvicide kills other aquatic insects in addition to mosquito larvae, so it **should NOT be used in water that flows into natural water bodies**. It can be used in small containers of water around residential properties, private rain gardens, rain barrels (see below), and other areas that do not flow into streams, lakes, or rivers.

A Note About Rain Barrels...

- Rain barrels and cisterns allow homeowners to divert downspout water into a storage tank to reduce runoff and to use for irrigation.
- To prevent mosquito breeding, keep barrels tightly closed, use debris screens to filter the water entering the barrel, and use the collected water within a week.
- If water is not used or drained within a week, a larvicide such as Mosquito Dunks® should be used to control for mosquitoes.



Did you know...

- The Asian Tiger is a non-native mosquito spreading throughout Montgomery County. They are aggressive, only bite during the day, breed only in small containers and travel up to 300 feet from where they hatch.
- Another common mosquito in our County is the native *Culex* which is most active at night.
- Male mosquitoes do not bite. Only females bite!



Culex pipiens