PERVIOUS AND IMPERVIOUS SURFACES ACTIVITY

CITY OF CHAMBLEE
WATER EDUCATION RESOURCES

Follow the instructions to complete the pervious and impervious surfaces activity. Review the attached EPA flyer to learn about the impacts of impervious surfaces on stormwater runoff and ways we can mitigate those impacts. The activity will demonstrate how water is redirected to streams when it comes into contact with impervious surfaces.

Supplies:

Water Bottles (2)

Paint Trays (2)

Sponges (2-6)

Plastic bag (1)

Water

Step 1: **Fill each spray bottle with water. You won't need too much—you can recycle the water if you want to complete the activity multiple times.**

Step 2: **Place half of your sponges in the plastic bag so they're flat and not overlapping.**

Step 3: **Place the sponges in the plastic bag in one paint tray. Arrange the other half of the sponges in the other paint tray so they're situated similarly to the ones in the plastic bag.**

Step 4: **Have participants spray each set of sponges so they can observe how the water is absorbed or rolls off the bag.**

Questions to Discuss:

- **How does the water react differently when sprayed onto each set of sponges? Why?**
- **What does the spray bottle represent? What do the sponges represent?**
- **Can you think of some pervious surfaces (represented by sponges without a bag)? What about impervious surfaces (represented by sponges in the bag)?**
- **How can you help the safety of water entering streams?**

Additional Ideas:

Make it a game! Have one-person man each tray and spray at the same time. Who can get the most absorbed into the sponges the fastest? It's a foregone conclusion, of course, but talk about why the sponges in the plastic bag do not absorb anything.

When you run out of water, simply squeeze the water out into the trays, and pour back into the bottles. Water some plants when you're done!

What Is a Rain Garden?

Rain gardens are beautiful natural landscape features that require less maintenance and fewer chemicals than lawns. Rain gardens capture runoff from impervious areas such as roofs and driveways and allow it to seep slowly into the ground. Most importantly, rain gardens help preserve nearby streams and lakes by reducing the amount of runoff and filtering pollutants.

Why Plant a Rain Garden?

Rain gardens provide for the natural infiltration of rainwater into the soil. This helps to filter out pollutants including fertilizer, pesticides, oil, heavy metals and other chemicals that are carried with the rainwater that washes off your lawn, rooftop and driveway. Rain gardens also reduce peak storm flows, helping to prevent stream bank erosion and lowering the risk for local flooding. By collecting and using rainwater that would otherwise run off your yard, rain gardens allow you to have an attractive landscape with less watering.

How Do Rain Gardens Work?

A rain garden receives runoff water from roofs or other impervious (hard) surfaces such as driveways. The rain garden holds the water on the landscape so that it can be taken in by plants and soak into the ground instead of flowing into a street and down a storm drain or drainage ditch. The plants, mulch and soil in a rain garden combine natural physical, biological and chemical processes to remove pollutants from runoff. Many pollutants will be filtered out and break down in the soil over time.

Water should stand in a rain garden no longer than 24 hours after the rain stops. Mosquitoes cannot complete their breeding cycle in this length of time, so a rain garden should not increase mosquito populations.

Special thanks to Rose Mary Seymour, Ph. D., P.E. of the University of Georgia, College of Agricultural and Environmental Science, Biological and Agricultural Engineering, Griffin Campus, UW-Extension Office, the Pollution Prevention Assistance Division (P2AD), Alfred Vick, ECOs Environmental Designs and Maplewood, Minnesota (for photos).

RAIN GARDENS FOR HOME LANDSCAPES

CLEAN WATER CAMPAIGN
SOLUTIONS TO STORMWATER POLLUTION

40 Courtland Street, NE
Atlanta, Georgia 30303

WWW.CLEANWATERCAMPAIGN.COM

Where Are The Best Places to Locate Rain Gardens?

Rain gardens are best located in natural depressions (low lying areas where water flows naturally). They should be sited at least 10 feet from a house or building. While they should not be next to building foundations, rain gardens near impervious surfaces such as driveways, patios and sidewalks help capture the runoff from these areas.

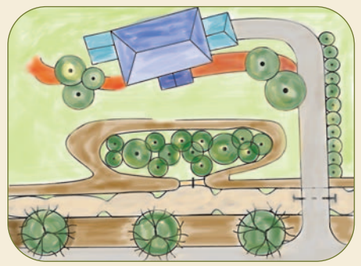
Sites with steep slopes (an elevation change of more than 12 feet down per 100 feet in length) may not be suitable for rain gardens. Further, if you have a septic system, avoid planting a rain garden over the top of the drainfield. It is recommended that a landscape professional be consulted if you plan to build a rain garden larger than 300 square feet.

Where Are Rain Gardens Not Beneficial?

- Rain gardens are not appropriate where the seasonal high water table is within 24 inches of the soil surface because the water table will prevent infiltration.
- Rain gardens should not be placed over a septic system.
- Rain gardens should not be located next to building foundations.

How To Create a Rain Garden

1. Locate a site for a rain garden in a natural depression in the landscape.



2. Determine the size and shape of the rain garden.
   - To calculate the size, consider the area draining to a rain garden, including the roof area or impervious area that drains to the downspout and the area of land between the downspout and the rain garden. The larger the roof or impervious (hard) area and the slower that water infiltrates into the soil, the more area of rain garden needed.
   - An effective rain garden depends on water infiltrating into the soil of the garden. Soils with a lot of clay will infiltrate water very slowly, so the size of a rain garden in clay soils should be 60 percent of the total drainage area. Sandy soils infiltrate water more quickly, so a rain garden in a sandy location does not need to be as large. For sandy soils, the rain garden size should be about 20 percent of the area draining to it. Loamy soils can be sized somewhere between 20 and 60 percent, keeping in mind that the slower the infiltration, the larger the area should be. It is important to know your soil before you start a rain garden project. To test the infiltration of your soil, dig a hole 6-8 in deep in the area that the rain garden will be located. Fill the hole with water. Observe how long it takes for the water to move (infiltrate) into the soil. If any water stays in the hole for 12 hours or longer, then the soil is not suitable for a rain garden.
   - If you determine that your rain garden area needs to be greater than 300 square feet and you wish to plan the site without outside assistance, divide the drainage area between two or more rain gardens, and build each so you can easily manage them both.
   - A rain garden should be curvy in shape and is best situated with the longest length perpendicular to the slope of the land.
   - Use rope to lay out the boundary of the rain garden.
3. Once the rain garden is laid out, you can start digging.
   - Begin by removing soil in the rain garden so that the deepest part is about 8 -10 inches deep.
   - The bottom of the rain garden should be as level as possible so some minor grading may be necessary.
   - The extra soil removed from the rain garden should be used on the downhill side of the garden to create a berm, an earthen dam or barrier that will keep the water in the rain garden. The top of the berm should not be higher than the uphill edge of the rain garden (no more than 12 inches high). The rain garden should be designed to hold no more than 6 inches of water above the ground surface.

4. Mix organic matter into the soil within the rain garden by spreading 2 to 4 inches of compost over the area and mixing the organic matter in with the existing soil.
   - If the soil is acidic (has a low pH), add lime to neutralize the pH of the soil. Contact a local University of Georgia Cooperative Extension Service office for a soil sampling test by calling 770-228-7274 or go online to www.ces.uga.edu.
   - For soils with high clay content, it may be beneficial to remove about 1-2 feet of the soil and replace it with a more porous "rain garden soil." A soil mix suitable for rain gardens is 50-60 percent sand, 20-30 percent topsoil, and 20-30 percent compost. The clay content in the rain garden soil replacement mix should be no more than 10 percent.
5. A shallow swale or corrugated drain pipe should be set up to carry the water from the roof downspout to the rain garden.
   - Make sure that the ground slopes away from the house so that water does not collect around the foundation.
6. Establish a grass or groundcover border along the upper edge of the rain garden to slow down the runoff water as it enters the rain garden, and do the same over the berm to stabilize it as a border of the rain garden.

7. Select and plant drought tolerant, wet tolerant and hardy plants. A mix of ornamental grasses, shrubs and self-seeding perennials are good choices. *See chart of plants.*
8. Once plants are in place, cover the garden with a 3" layer of mulch. Lighter mulches such as pine bark and straw will float in water and may be washed away to the edges of the rain garden. Better mulch choices for a rain garden are more dense materials such as pine straw, wood chips or shredded wood.
9. To maintain your rain garden, remove weeds on a regular basis as the landscape plants grow, and replenish mulch as needed.
   - As the plants in the rain garden mature, there will be less need for mulch and weeding.
   - Rain gardens should be relatively low maintenance if the correct plants are chosen.
10. IMPORTANT NOTE: Plan on providing an "overflow" path for water to take if the rain garden fills and more rain comes. This path should be stabilized with a hardy grass or groundcover.

What Plants Should You Use?

Finding plants for your rain garden is not difficult. Many well-suited plants are available at your nearest landscaping supply store. Here are some suggested plants (common and *scientific* names):

Trees

Trees are effective in rain gardens that are larger than 150 square feet. Plant trees at least eight feet apart.

Bald Cypress	*Taxodium distichum*
Black Gum	*Nyssa sylvatica*
Crape Myrtle	*Lagerstroemia indica*
Fringetree	*Chionanthus virginicus*
Green Ash	*Fraxinus pennsylvanica*
Musclewood/American Hornbeam	*Carpinus caroliniana*
Red Maple	*Acer rubrum*
River Birch	*Betula nigra*
Sweetbay Magnolia	*Magnolia virginiana*
Willow Oak	*Quercus phellos*
Witch Hazel	*Hamamelis virginiana*

Shrubs

American Beautyberry	*Callicarpa americana*
Bottlebrush Buckeye	*Aesculus parviflora*
Buttonbush	*Cephalanthus occidentalis*
Common Winterberry/Winterberry Holly	*Ilex verticillata*
Inkberry	*Ilex glabra*
Oakleaf Hydrangea	*Hydrangea quercifolia*
Rose of Sharon	*Hibiscus syriacus*
Summersweet Clethra	*Clethra alnifolia*
Virginia Sweetspire	*Itea virginica*
Wax Myrtle	*Myrica cerifera*

Perennials, Grasses and Groundcovers

Asters	*Aster spp.*
Blackeyed Susan	*Rudbeckia hirta*
Blue Lobelia	*Lobelia siphilitica*
Broadleaf Uniola/Indian Woodoats	*Chasmanthium latifolium*
Broomsedge	*Andropogon virginicus*
Cardinal Flower	*Lobelia cardinalis*
Cinnamon Fern	*Osmunda cinnamomea*
Clubed Begonia	*Begonia cucullata*
Golden Ragwort	*Packera aurea*
Goldenrod	*Solidago flexicaulis*
Ironweed	*Vernonia noveboracensis*
Joe-Pye Weed	*Eupatorium fistulosum*
Liatris	*Liatris pycnostachya*
Narrowleaf Dragonhead	*Physotegia angustifolia*
New England Aster	*Aster novae-angliae*
Red Columbine	*Aquilegia canadensis*
Royal Fern	*Osmunda regalis*
St. John's Wort	*Hypericum fasciculatum*
Scarlet Rosemallow/Swamp Hibiscus	*Hibiscus coccineus*
Swamp Milkweed	*Asclepias incarnata*
Swamp Sunflower	*Helianthus angustifolius*
Switchgrass	*Panicum virgatum*
Wild Ginger	*Asarum canadense*
Yellow Stargrass	*Hypoxis spp.*

For help in finding a location to purchase native plants, go to the Georgia Native Plant Society's website at www.gnps.org.

An additional list of plants suitable for rain gardens can be obtained through the University of Georgia Cooperative Extension Service. The bulletin, called "A Compilation of Low-Maintenance Plants for Georgia Landscapes" (H-91-009), lists both native and non-native plants that are drought and moisture tolerant. The bulletin can be found at a local extension office or online at www.ces.uga.edu.

ATTENTION!

Fats, Oils and Grease (F.O.G.) are Threatening YOUR Plumbing

What is F.O.G.?

FOG stands for **Fats, Oils and Grease**. It is the number one cause of sewer system blockages in the Metro Atlanta area. FOG sticks to the walls of your plumbing and the sewer system and can build up over time. Eventually, it can completely block your plumbing or the sewer system.

How does F.O.G. affect YOU?

Blockages in your plumbing or the sewer system can result in sewer overflows. FOG related overflows can result in property damage, environmental damage and civil penalties and fines. Residents may be held liable for all damages and clean-up costs for a resident caused sewer back-up.

Where does F.O.G. come from?

Meats | Cooking Oils | Dairy Products
Sauces, Dressings and Marinades

How does F.O.G. get in?

FOG enters the sewer system through **YOUR** plumbing. Common methods of entry include pouring FOG down the kitchen sink or toilet and using a garbage disposal to dispose of food scraps. The garbage disposal does not eliminate FOG; it merely chops it up into smaller pieces. All FOG and food scraps should be thrown in the trash, not down the drain.

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What can YOU do to help?

POUR

Allow FOG to cool. Pour any liquids into a sealable, disposable container and place in trash.

SCRAPE

Use a spatula or a similar utensil to scrape any solid FOG and food particles into the trash.

DRY WIPE

Use a paper towel to dry wipe any remaining FOG residue into the trash. Place used paper towels in trash.

Use a Sink Strainer

Use a sink strainer to catch any food particles that may be left on dishware and place in trash.

www.cleanwatercampaign.com

¡AVISO!

Las Gorduras, Aceites y Grasas (G.A.G.) amenazan SU plomería

¿Qué es G.A.G.?

GAG representa **Gorduras, Aceites y Grasas**. Es la causa número uno de bloqueos en el sistema de alcantarilla en el área metro de Atlanta. GAG se pega en las paredes de su plomería y del sistema de alcantarilla y se acumula con el tiempo. Eventualmente, puede bloquear completamente su plomería o el sistema de alcantarilla.

¿Cómo le afecta el G.A.G. a USTED?

Los bloqueos de su plomería pueden resultar en desbordamientos del sistema de alcantarilla. Los desbordamientos relacionados con GAG pueden resultar en daños de propiedad, daños al medio ambiente, penas civiles y multas. Los residentes pueden ser obligados a pagar los costos de todos los daños y de la limpieza de un bloqueo causado por un residente.

De dónde sale el G.A.G.?

De las carnes | los aceites de cocinar | los productos lácteos las salsas grasosas, los aderezos y los adobos

¿Cómo entra al sistema el G.A.G.?

El GAG entra al sistema de alcantarilla a través de SU plomería. Algunos métodos de entrada al sistema incluyen el echar el GAG al drenaje del fregadero de la cocina o por la taza del baño y el uso de un triturador de basura para deshacerse de los desperdicios de la comida. El triturador de basura no elimina el GAG; simplemente lo corta en pedazos más pequeños. Todo el GAG y los desperdicios de la comida deben ser echados a la basura, no por el drenaje.

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¿Qué puede hacer USTED para ayudar?

Vertir

Permita que se enfríe el GAG. Vierta cualquier líquido en un recipiente desechable que pueda ser sellado, y colóquelo en la basura.

Raspar

Use una espátula o algo similar para raspar cualquier GAG sólido y las partículas de comida a la basura.

Limpiar en seco

Use una toalla de papel para limpiar en seco cualquier residuo del GAG a la basura. Luego coloque la toalla de papel usada a la basura.

Use un tamiz en el fregadero

Use un tamiz en el fregadero para recoger cualquier partícula de comida que quede sobre los platos, y eche la acumulación a la basura.

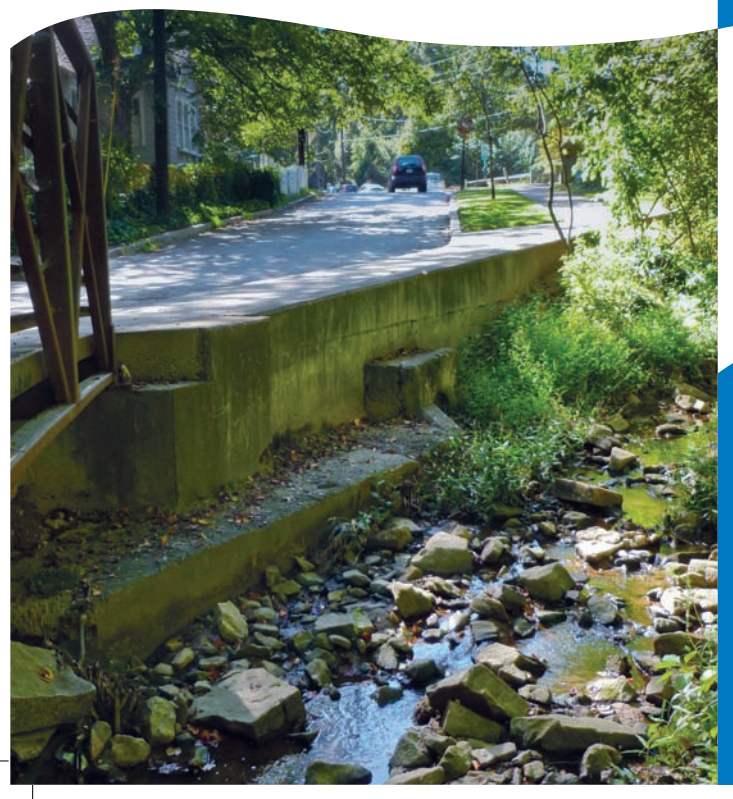
www.cleanwatercampaign.com

Did you know that when it rains it pollutes? It all starts in your neighborhood.

Every time it rains, water runs off the land as stormwater. As it flows over rooftops, lawns, driveways and streets, stormwater picks up pollutants and debris such as dirt, motor oil, fertilizer, litter and pet waste. All of these pollutants are carried by stormwater into storm drains and drainage ditches, which flow untreated into our rivers, lakes and streams.

Stormwater pollution is the biggest threat to our waterways. It harms our ability to use our rivers and lakes for swimming and fishing, makes treating our drinking water more difficult and negatively impacts the environment.

Be the solution to stormwater pollution.



The Clean Water Campaign

The Clean Water Campaign is a collaborative multi-agency education and outreach effort coordinated by the Metropolitan North Georgia Water Planning District for the 15-county Metro Atlanta area. The Clean Water Campaign's mission is to build awareness of water quality problems and solutions.

The Metropolitan North Georgia Water Planning District serves as the water planning organization for the greater metropolitan Atlanta area, which encompasses the following counties and their respective municipalities: Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Fulton, Forsyth, Gwinnett, Hall, Henry, Paulding and Rockdale.

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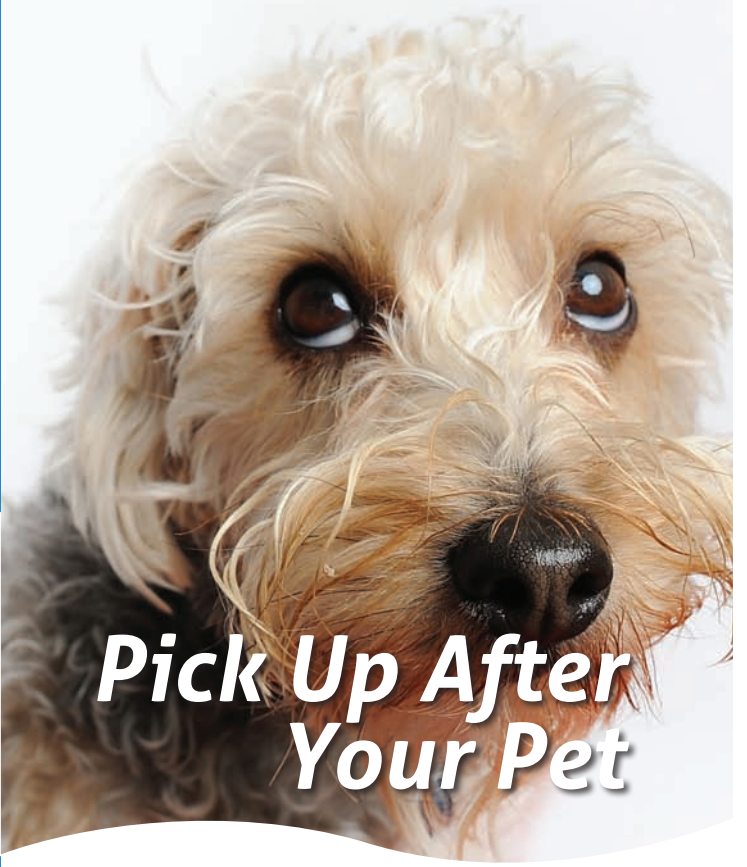
Here's The Scoop...



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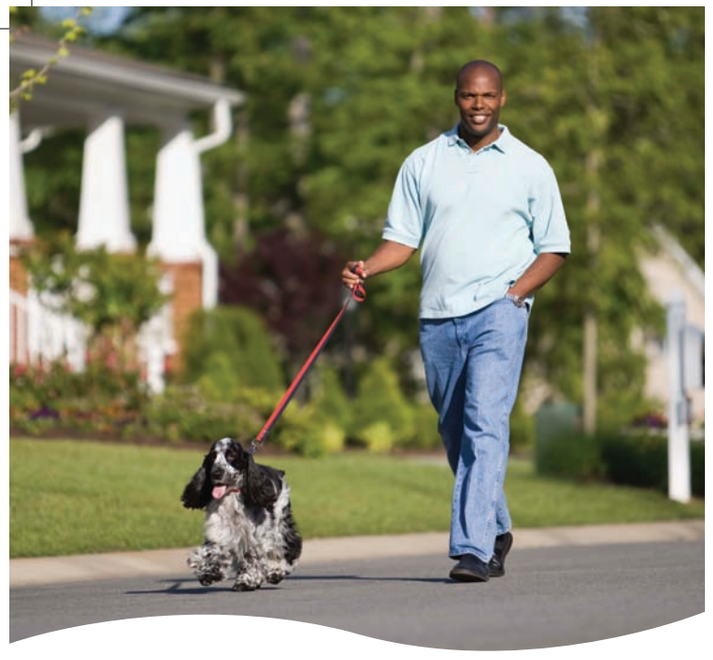
SOLUTIONS TO STORMWATER POLLUTION



What's the problem?

When you fail to clean up after your pet, the poop left on sidewalks and lawns is both unpleasant and a nuisance. But it can become an even bigger problem when it rains and is carried by stormwater into nearby rivers, lakes and streams. It can create a health hazard for people and can "doo" a lot of damage to the environment:

- A single gram of pet waste contains an average of 23 million fecal coliform bacteria, some of which cause diseases in humans.
- Waters that contain high levels of bacteria and other pathogens from animal waste are unfit for human contact.
- As pet waste decays, it uses up oxygen that fish and aquatic life need.
- Pet waste contains nutrients that can cause excessive algae growth in a river or lake, upsetting the natural balance.

Did you know?

According to the American Veterinarian Medical Association, there are 72 million dogs in the United States.* The average dog produces three quarters of a pound of waste a day. That means our pets generate 10 million tons of dog poop a year!

Be the Solution to Water Pollution!

No matter if you live in the big city, small town or rural area, picking up after your pet is part of being a responsible owner. It avoids "unpleasant surprises" for those that follow and prevents your pet's waste from causing water pollution and health hazards. And in most places, it's the law.

It all begins with you. Picking up after your pet helps keep our rivers, lakes and streams healthy for recreation. It protects human health and the plants and animals that depend on clean water.

Doing the right thing is easy! Pick up after your pet every time you take them out. It only takes a minute.

Simply scoop the poop with a plastic bag and TOSS it in the garbage.

*Source: 2007 U.S. Pet Ownership and Demographics Source book by American Veterinarian Medical Association.

Handy Tips

- Put bags in the car or tie them to the leash, so you'll be prepared when you travel with your pet.
- Place bags by the door so you don't forget them.
- Talk to your family and friends about stormwater pollution and picking up after their pets!
- Make use of "pet waste stations" in your neighborhood or local park.

Photo provided by Adrian Danciu

Don't Flush Your Money Down the Drain!

TOILET REBATE PROGRAM

Single-Family Program

Toilet Rebate Eligibility Checklist (ALL must apply):

- Water provider must participate in the rebate program.
- Resident must live in a single-family residential home built in 1993 or earlier.
- Resident must pay water bill directly to water provider (HOA or condo associations are not eligible).
- Must install a WaterSense ultra high efficient toilet (UHET) or high efficiency toilet (HET).

The lower your gallons per flush, the more you can save!

1.1gpf or lower – $100 rebate • 1.28gpf – $50 rebate

Multi-Family Program

Property-owners and landlords may be eligible to participate in the Multi-Family Program

Properties Include: apartments, condominiums, townhome communities

Toilet Rebate Eligibility Checklist (ALL must apply):

- Water provider must participate in the rebate program.
- Property must be built in 1993 or earlier and contain older toilets using 3.5 gallons per flush (gpf) or more.
- Property must have a master-meter residential account.
- After application approval, the Metro Water District will contact property-owner directly forward on their toilet purchase.
- Property can only receive one rebate for the life of the program.

**Please note that dual flush toilets that are 1.1/1.6 gpf are rebated as 1.28gpf*

Metropolitan North Georgia Water Planning District

For more information or to apply online, visit

northgeorgiawater.org/toiletrebate

Email **TRebate@atlantaregional.org** or call **404.463.8645**.

look for WaterSense Meets EPA Criteria

WIPES CLOG PIPES!!

Put wipes in the trash.
Only flush toilet paper and human waste down the toilet.

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