De-icing impacts local water quality

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JBM-HH used some 500 tons of salt and sand to help thaw the road and walkways, according to JBM-HH Directorate of Public Works officials. Although chemicals in de-icers can negatively impact water quality through run off into storm drains and streams, there are precautionary measures to help minimize this impact, according to environmental experts.

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As we enter the cold winter months, many of us are planning ahead for the snowy days to come, especially the icy roads. While counties and cities are preparing their sand and salt trucks for future storms, homeowners are stocking up on de-icing materials for their home driveway and sidewalks. You may be aware that de-icers can be unhealthy for pets and may corrode driveways, cars, and other items made of metal, but have you considered the impact to the environment, including your drinking water? While these de-icers are effective, the improvement in vehicle and pedestrian safety comes at a price.

What are common de-icers and how do they work?

The most common materials used for de-icing home driveways and walkways include abrasives such as sand or cat litter and commercial products that contain chemicals such as sodium chloride, calcium chloride, magnesium chloride, calcium magnesium acetate, potassium acetate and salt. Salt and other chemical de-icers work by lowering the freezing point of water. As the minerals dissolve, they form a liquid layer in the ice that makes the snow and ice easier to remove. Abrasives, on the other hand, only help to break up the ice and provide traction. Unfortunately, while these materials improve our safety on roads and sidewalks, they can negatively impact water quality if they are carried off the surfaces on which they were originally applied and into storm drains and streams.

What are the potential impacts from using de-icers?

When de-icing materials used to melt snow and ice are washed off the road and sidewalks by rain, the resulting runoff, called stormwater, is polluted with chemicals, minerals and sediments from the de-icers. This polluted stormwater can then flow to vegetation alongside roads, streams and ponds, or stormwater inlets, which carry the water to local water bodies. De-icer chemicals can also percolate through the soil to groundwater and contaminate well water in areas that use wells for drinking water supply.

According to the National Cooperative Highway Research Program (NCHRP), sodium chloride, calcium chloride and magnesium chloride de-icers can impact water quality and aquatic life by adding too much chloride and metals. Many metals are toxic to aquatic life, even in low concentrations. Chloride de-icers also often contain phosphates, which can cause algae to grow too quickly, smothering other aquatic organisms. Acetates tend to have a high impact on water quality by adding organic content, which uses up some of the oxygen needed by aquatic organisms. The abrasive de-icers impact water quality by adding sediments and increasing the cloudiness in bodies of water. The sediments from abrasives can clog small spaces and smother underwater habitats that are important to aquatic life.

How can we prevent and reduce these impacts?

Many people are under the impression that more is better when it comes to applying de-icers, but we need to consider these environmental impacts. Fortunately, there are several ways to reduce or prevent these impacts:

Follow the directions on the packaging of the de-icer and use the minimum amount possible. De-icers are meant to break the bond between the ice and the pavement or concrete to make it easier to remove, not to melt it all.

Use a small amount of a de-icer or anti-icer (meant for pretreatment) on roads or sidewalks before or shortly after the start of a snowfall, preventing ice from bonding to the ground in the first place. This method can help reduce the total amount of de-icing material applied. However, it is important to be conservative with how much pretreatment material is applied and when it is applied; avoid applying large amounts of pretreatment chemicals for just a few flurries.

Do some research and use the appropriate de-icer. Certain de-icers work better at different temperatures and in different locations. Choosing the right one can decrease the amount of de-icer needed.

Pick up a snow shovel. Keeping up with shoveling the snow off driveways and sidewalks will help to prevent snow and ice from bonding to the pavement or concrete in the first place.

Shovel snow onto grassy areas where possible. As the snow melts, the runoff will be filtered by the grass and soil before reaching a body of water.

Store de-icers in a covered area and in proper containers to avoid the material from being unintentionally spread to the environment by rain or wind.

Employing these methods can help to balance the need for improving safety during dangerous weather conditions with the need to protect our environment and drinking water quality.

To report conditions that could cause stormwater pollution or to get more involved with stormwater activities at JBM-HH, call the Environmental Management Division at 703-696-8055.