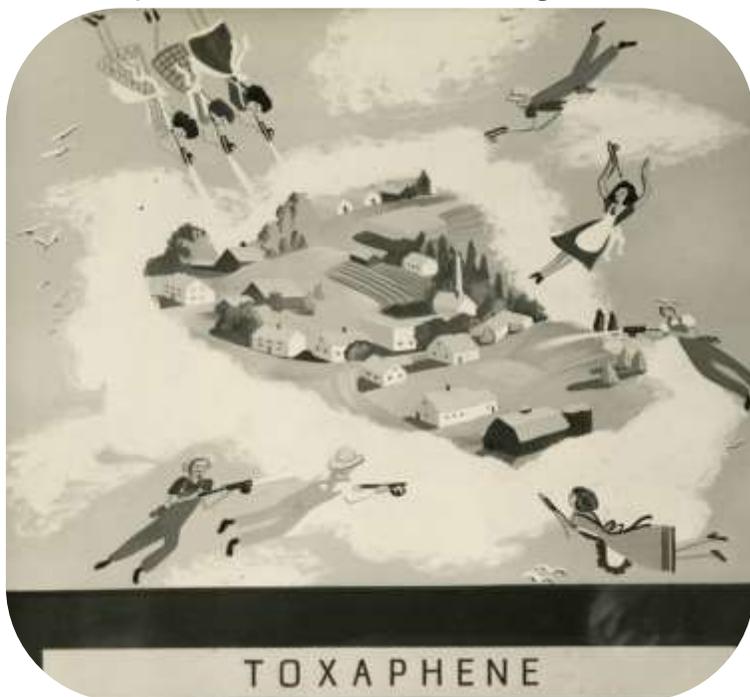




The report is produced by an independent technical advisor to interpret and help the community understand technical information about our Superfund Sites.

Toxaphene at Terry Creek



What is Toxaphene and where did it come from?

In the 1940s, Hercules Powder Company (Hercules, Inc.) began producing a polychloro camphene pesticide they marketed as Toxaphene by taking a chemical called camphene (found in small amounts in turpentine) and mixing it with chlorine gas. In this mixing, some of the chlorine attached to the camphene, but how much chlorine attached was different with every batch. Sometimes, a lot of chlorines would attach, and sometimes, fewer would. So, what Hercules called "Toxaphene" could be any mix of camphenes and chlorine, with 40% to 75% of the weight as chlorine or between 3 and 10 chlorine molecules on each camphene molecule. This means that toxaphene is not just one chemical, but a mix of hundreds of different chemicals, some with more chlorines, some with fewer. In the process of making Toxaphene, Hercules also created a lot of polychloro camphenes with some chlorines attached to them, but not enough to sell as Toxaphene, so they disposed of them. Hercules patented their pesticide in 1951, protecting all ingredients with 40% to 75% of the weight as chlorine or between 3 and 10 chlorine molecules on each camphene molecule as the pesticide's toxic ingredients.

March 2018

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Toxaphene at Terry Creek

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· **This update and more information about Glynn County Superfund Sites at:**

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Why is there Toxaphene around Terry Creek?

When Hercules, Inc. started making Toxaphene, they discovered that it was very toxic to fish and insects, and even said in their patent application that the pesticide was very good at killing insects even when there was only a little of it mixed into water or solvents. Many farmers started using it, especially for cotton fields, and it was carried by the wind and water to areas around the fields. At the same time, Hercules was making so much Toxaphene and so much waste in its Brunswick plant, it was dumping 200-300 pounds of waste polychloro camphene out in the waste water per day, which ran into Terry and Dupree Creeks. There are also pesticide manufacturing wastes in landfill sites around Brunswick, the largest of which is near Altama Elementary School.

Beginning in 1972, the Clean Water Act forced

Hercules to start limiting the amount of pesticide manufacturing wastes they dumped into the waterways of Brunswick. Then, Toxaphene production was completely banned in 1980. However, the pesticide and the manufacturing wastes do not break apart easily, so they can stay in the water and soil for a very long time. As polychloro camphene sits in the environment, some of the chlorines start to come off the camphene. Every time this happens, it becomes a slightly different chemical, until enough chlorine falls off that it's no longer in the 40%-75% range of what Hercules calls "Toxaphene." This does not mean it's safe, and it does not mean it came from some other source of pollution. No matter the name, Toxaphene is still the same type of toxin, it's just lost some of its chlorine.



Hercules 009 Landfill Superfund Site



Hercules Plant Site and Terry Creek

Why is Toxaphene dangerous?

Over time, it became clear that polychloro camphenes are very harmful to wildlife and people. Small amounts in water can kill fish, and what doesn't kill them stays in their bodies, so that when people eat the fish, they also eat the pesticide and the manufacturing wastes. People who eat more polychloro camphenes are more likely to have problems with their immune systems and develop cancers. When scientists found out that Toxaphene was dangerous, they created a way to test for it in soil, water,

and seafood and they set limits on how much was safe for people. This test looked for all of the different polychloro camphenes that were made during the process of making Toxaphene, as well as for the polychloro camphenes that Toxaphene turns into as it loses chlorine. This was called "Total Toxaphene" or "Apparent Toxaphene," and that was how scientists decided what levels of polychloro camphene were dangerous for people to be around or eat.

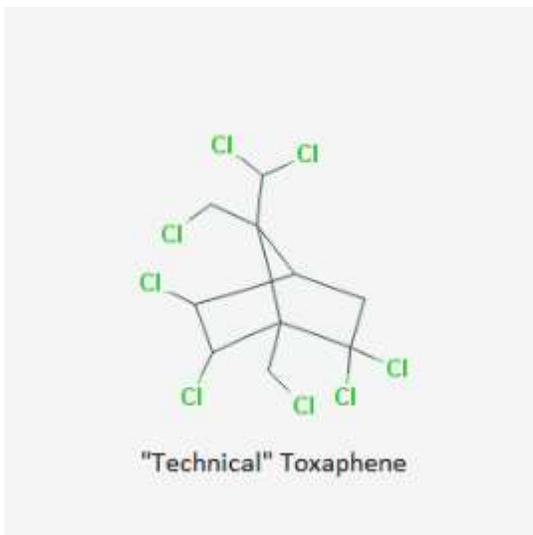
If everything is being tested, are we safe?

Unfortunately, in 1991, a group of scientists that worked for Hercules went to the Georgia Environmental Protection Division (GA EPD) and the U.S. Environmental Protection Agency (EPA) to talk about the test for Toxaphene. These representatives proposed to the agencies that only the original form of Toxaphene, as manufactured, should be measured and considered. This group called themselves the "Toxaphene Task Force." In this meeting and others that followed, they decided that the test they had been using needed to be changed because the results from samples of polychloro camphene manufacturing wastes taken around Brunswick didn't look exactly like the Toxaphene that Hercules made and sold as a pesticide. As the Toxaphene started to lose chlorine from sitting in the environment, the results from the tests started to look a little different. The Toxaphene Task Force decided that the Toxaphene in soil and waste was different and shouldn't be included when they looked at how much Toxaphene was in the soil, water, or seafood. They started using a new test (called Method 8081B) that only measured the polychloro camphene that looked exactly like the Toxaphene Hercules sold as a pesticide.

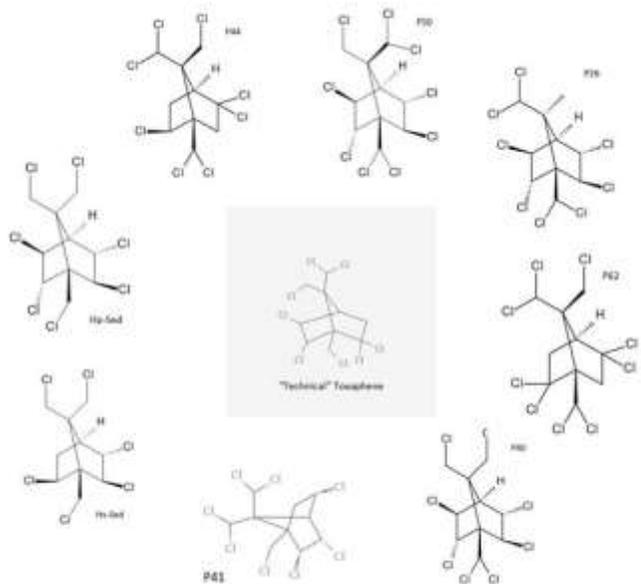
The problem with Method 8081B was that all the limits of acceptable Toxaphene in seafood, soil, and water were created based on "Total Toxaphene," which

included all of the polychloro camphene in the sample. Method 8081B ignored some of the chemicals present, so it showed that the Toxaphene level was "safe" even when it wasn't. After years of complaints, the Inspector General of the EPA decided in 2005 that Method 8081B was not good enough, and a new test was created that looked at all of the polychloro camphene (called Method 8276). Using Method 8276 on old samples showed that Method 8081B had greatly underestimated the level of polychloro camphene that is around Terry Creek.

In one example, Method 8081B had not found any polychloro camphene at all in some fish samples, but when Method 8276 was used on the same samples, there were over 50 times the amount of these chemicals that the EPA sets as safe to eat. This is very dangerous, because it means that people have been told for years that the fish, soil, and water around their homes is safe when it might not be. Unfortunately, samples around Terry Creek are still being tested with Method 8081B. To date, the playground at Altama Elementary School has not been tested with Method 8276. Residents and children around the Hercules Superfund sites could be exposed to more polychloro camphene manufacturing wastes than the Georgia Environmental Protection Division (GA-EPD) and the EPA are telling them, and there is no way to know unless all samples are tested with Method 8276.



Method 8081B





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Why Good Testing is Important

In order to protect the people and wildlife around Terry Creek, the EPA and GA-EPD must have the right information. Right now, they do not, because they are not looking at the total amount of polychloro camphene in the soil, water, and seafood around Terry Creek. We need all locations that may be contaminated with polychloro camphene manufacturing wastes to be tested with Method 8276 so that the EPA and GA-EPD can make good decisions in how to clean up the mess left by Hercules' toxaphene production and keep the people of Brunswick safe.

Quick Facts about Polychloro Camphene:

- Polychloro camphenes are yellowish, waxy solids that smell like turpentine.
- Fish and seafood from contaminated waters are usually where the highest levels of polychloro camphene are found.
- When nursing mothers ingest polychloro camphenes, they can pass through breast milk to infants.
- Polychloro camphene can be carried long distances by the wind.

