

# Baker Water System & DBP's

## **What is the issue?**

Water in the Baker water system contains higher levels of DBP's than allowed by EPA. According to the CDC, if water containing high levels of DBP's are consumed in large volumes over many years the potential for some people to develop certain types of cancer can be increased.

## **What are DBP's?**

DBP is an acronym for disinfection by-products. Disinfection by-products, as their name suggests, are formed during the disinfection process that occurs before water is distributed to customers. The EPA requires all public water systems to disinfect water before it is made available for human consumption in an effort to prevent waterborne diseases. One negative effect of the disinfection process is the potential formation of disinfection by-products.

## **How are DBP's formed?**

In order for DBP's to form, two things must be present in the water: 1) organic matter and 2) chlorine. Chlorine is present in the water because it is introduced during the treatment process as the disinfection agent. Organic matter is naturally present in the water drawn from the Parker Hollow Impoundment. When chlorine is introduced and reacts with organic matter already in the water, DBP's are formed.

## **How did DBP's become an issue in Baker?**

DBP's are an issue in Baker because of the poor water quality in the Parker Hollow Impoundment. Water from the Parker Hollow Impoundment contains high levels of organic matter that has proven very difficult to remove through conventional water treatment processes. When chlorine is introduced to this water containing elevated levels of organic matter, DBP's are formed in the water.

## **Why are DBP's only an issue in Baker and not on any of the PSD's other water systems?**

DBP's are only an issue in Baker because of the poor source water quality coming from the Parker Hollow Impoundment. DBP levels in all other PSD water systems are not an issue because of better source water quality.

## **Why is the water quality poor in Parker Hollow Impoundment?**

There are undoubtedly many contributing factors to the water quality in the Parker Hollow Impoundment. Both surface water and groundwater sources in this area of Hardy County naturally contain high levels of iron and manganese but it is believed that the major contributing factor to the elevated organic matter levels is a result of the many decaying trees in the impoundment.

## **Are the high levels of organic matter the only issue or are there other factors contributing to high DBP levels in Baker?**

While the high levels of organic matter are the *basis* for DBP's being in the water in Baker, another factor that also has an impact on the *amount* of DBP's present is the age of the water in the distribution lines. The longer the amount of time that chlorine has to react with organic matter, the more DBP's are formed. Water age is a problem on Rt. 259 in Baker due to a very limited number of customers on a large, long water main line.

**Our efforts to resolve the DBP problem in Baker: What we've tried to date.**

We have tried many, many potential fixes to the DBP issue in Baker and while we have seen significant improvement nothing has been able to completely fix the problem. We've tried countless operational changes including numerous alterations to chemical feeds, the introduction of new chemical feeds, and many other process additions; we've explored the possibility of alternate water sources; we've even made efforts at preventing organic matter from entering the Parker Hollow Impoundment. Through all of these efforts we have been able to realize significant improvement in DBP levels, some of which are now well below allowable levels, however others remain above limits.

**What the upcoming water project will do.**

We are very optimistic the upcoming water project will provide a solution to the DBP problems in Baker. In short, the project will include the installation of an organics removal system that should remove most of the organic matter in the water coming from the Parker Hollow Impoundment. Early testing has shown the organic removal system to be very effective at removing the majority of organic matter from the raw water. With most of the organic matter removed from the water before chlorine is introduced, it is anticipated that amount of DBP's ultimately formed should be well below allowable limits. In addition, we hope to introduce a chemical feed that should also aid in preventing the formation of DBP's in the distribution system. We are very hopeful these additions will resolve the DPB issues in Baker.