

# MackKaye Harbor Water District

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Over the years customers on our system have approached me with concerns over various aspects of their service and the water they receive. This letter presents the things I have learned in my attempts to respond to these concerns. Issues that can affect everyone are odor and occasional dirty water.

The root cause of both of these problems is stagnation. When the well water sits for a long time, chemical changes take place. For those people connected to the system on Aleck Bay Road, MacKaye Harbor Road and Tralnes Road the problem exists due to our water system's design. Back in the day it was common for water systems to be designed so that a single pipe served to fill a storage tank and to serve customers. Since the well only runs intermittently, the water received by these customers sometimes comes from the direction of the well, and other times comes from the direction of the Tank, meaning that the water in the pipe is moving back and forth. It only progresses steadily along when other users, whose connections are not between the well and the tank, are using water steadily. During the Winter we have many absentee home owners and many services which are not using water. The only real solution to this is to make the well line a straight shot to the tank, and run a separate service line back along MacKaye Harbor and Aleck Bay roads. This would cost in the hundreds of thousands, making the solution worse than the disease!. For these customers a solution may be to install a whole house or point-of-use carbon filter. Such filters are capable of removing both particulates and odor.

This problem is not limited to only these customers however. It can and does affect any customer whose household water system sits for long times without use.

The odor problem is caused by the opportunity to stagnate in combination with sulfur. There is a type of organism which metabolizes sulfur called "sulfur bacteria". One of its byproducts is hydrogen sulfide, which smells like rotten eggs. In stagnant water systems colonies of this organism can occur anywhere, but especially in warm areas like water heaters. The worst problems affect mainly seasonal homes where water is not used at all for long periods, though if your water use is exceedingly moderate or if you are using a portion of your plumbing that sits idle for long periods, it can still happen. The problem, overall is exacerbated by the age of the water in the main, due to this "back and forth" motion during times of low water use. The immediate solution is to turn on all the water fixtures upon arrival at your seasonal home and let them run for ten minutes or so. Even so, you may get a puff of "rotten egg", which clears up right away, when you first turn on your water.

If you consistently have this problem when running warm or hot water, there is a colony living in the bottom of your water heater. The solution to this is to replace a part in your water heater called the electrode, with a special one provided by the manufacturer to discourage sulfur bacteria. (as an ironic side note, the purpose of the electrode is to protect the water heater from electrolytic corrosion).

Dirty water (which comes out black or gray) is also caused by stagnation, this time in combination with dissolved manganese. When water sits in a pipe after leaving the ground, time gives opportunity for the manganese to oxidize causing (of course) manganese oxide. The oxide is insoluble. It falls out of solution as a finely divided black particle suspended in the water. When you run a fixture, voila! Black water. This problem also affects mainly seasonal homes where water is not used at all for long periods, though if your water use is exceedingly moderate *and* if you are using a portion of your plumbing that sits idle for long periods, it can still happen. For customers who have this problem after long periods of absence, the solution to this problem is to turn on all the water fixtures when you first arrive and let them run for ten minutes or so. This should clear things up for the remainder of your residency.

Another problem brought to my attention is corrosion of plumbing fittings. The water alone would not cause this. If the water was exceedingly acidic it might, but the PH of our water is within the normal limits. We are however on well water, and there is a considerable amount of minerals dissolved in the water. This makes the water an excellent conductor of electricity. Based on my experience, the next most likely culprit is electrolysis (specifically electrolytic corrosion) which can and does affect many water utilities wherever they have metal piping.

There are two common causes of electrolytic corrosion.

The first, and most easily detected, is direct contact between dissimilar metals. A brass fitting connected to an iron pipe would be a good example. The solution is replace the brass with plastic or iron.

The second is harder to find. Stray electrical currents traveling through the water and or pipes can cause this problem. In older homes the electrical panel ground was provided by attaching a ground wire to the water piping instead of a ground rod. This was because, back in the day, all water service piping was copper or iron. Since that time the electrical code has changed making dedicated ground rods mandatory.

Another possible source is some electrical fixture or appliance which is in contact with the plumbing. You could drive yourself nuts looking for this, so the easier path is to replace with plastic any metal fittings that are deteriorating.

Finally, water pressure has been an occasional issue. Some customers who draw from the well line on Aleck Bay Road, MacKaye Harbor Road or Tralnes Road have consistently low pressure. This is because the pressure they receive is determined by the elevation difference between the storage tank on Salmon Point and their point of use. Some of these properties may have water pressure as low as 20 psi on average. The customers on Salmon Point, those on Agate Beach and points South receive their water from a pressure tank system on Salmon Point. These customers occasionally see their water pressure fluctuating or remaining low for long periods. This is because the pumps that recharge the system are controlled by a pressure switch which allows the pressure in the tank to vary from 40 psi up to 60 psi. When water use is low the pressure can remain at the low end of the scale for considerable periods of time before the pumps come on to recharge the tank.

If you have a water pressure issue at your property it can be resolved by installing a booster pump and bladder tank between your water meter and the first point of use, similar to those used for wells.

I regret that I can't offer quick and easy solutions, but I hope the above has at least given you an understanding of what's happening!

Regards,

Wayne Haefele  
District Manager