Safe Drinking Water Program

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Does Water Ever Flow Backwards?

It is a logical assumption that because water in a water delivery system is always under pressure, it can only flow in one direction. However, can it flow the opposite way from its intended direction? The answer is yes, and when it does it can sometimes cause disastrous results. Water will always flow toward the point of lowest pressure.

If a main line in Redmond's water system should break, or if a fire occurred and the fire department opened several hydrants, the pressure in the water mains could drop dramatically, causing a reversal of flow. The potential for this reversal of flow is why the City is concerned about the possibility of backflow of contaminants into the water system. If household plumbing, carrying potable water, is connected to other piping carrying another fluid or gas, such as an air conditioner containing chemicals to kill algae, the contaminant could be drawn back into the water mains. A garden hose submerged into a hot tub or swimming pool, or inserted into a car's radiator, to flush out the antifreeze, or attached to an insecticide sprayer, could siphon that material back into the water mains. Incidents such as these have happened all too often and have been documented throughout the country.

This is why state regulations require water systems to have cross connection control programs in place for preventing backflow incidents. The program consists of inspections to identify actual or potential cross connections, elimination of those cross connections where possible, and installation of backflow prevention assemblies where the cross connection cannot be avoided.

Some cross connections are necessary and cannot be eliminated. Examples include the water line connected to a fire sprinkler system, to a solar heating system, or to various water-using industrial equipment. The fire sprinkler system is of concern because the pipe used is not approved for potable water use. The black iron pipe, sometimes with corrosion inhibitors built in, can leach out metals when the water sits stagnant for long periods. In tests performed on the water drawn from the fire lines in several locations in Oregon, Washington & Utah, concentrations of iron, lead, cadmium and other heavy metals were found. Bacterial regrowth will also occur in stagnant water.

Solar heating systems most often use other liquids in the solar collectors. This heated liquid then flows through pipes surrounded by potable water and transfers the heat. Many different liquids are used for the transfer medium, some of which are toxic. If a leak in the piping should occur, the potable water would become contaminated.

Several years ago, ***Redmond High School*** had ethylene glycol antifreeze from an air conditioner backflow into the water piping, sending eight teachers to the hospital. Several incidents have occurred where a car wash cross connected their plumbing and pumped dirty, soapy water through several city blocks. In a town in Arkansans, a worker hooked up a hose to a nearly empty propane tank to flush out the tank. The residual pressure of the propane was greater than the water pressure and several homes exploded and burned.

Cross connection control inspectors can help the water user identify these potential problems and suggest ways to eliminate them or recommend the proper backflow prevention assembly as required by the State of Oregon. The City of Redmond has a program to identify potential cross connections and oversee the installation of backflow assemblies. While our goal is to always provide the public with safe, dependable water, we cannot do it alone, we need your help to keep our water safe throughout the system.

With grateful acknowledgement to BMI(Backflow Management Inc.), 400 NE 97th Ave., Portland, OR 97220, from whose material this information has been adapted.