SAN ANTONIO WATER QUALITY

WATER QUALITY IN THE WATERSHED

Each time we use water, we change its quality by adding substances to it. These materials are such things as municipal sewage, toxic chemicals, automotive oils, fertilizers, detergents and pesticides. Some materials, even in small quantities, can damage water quality to the point that it is unusable. A single quart of motor oil, for example, could pollute as much as 250,000 gallons of water.

When it comes to water pollution, what comes around goes around the watershed. By definition, a watershed is a multi-dimensional (varying sizes) area used to define a region in which all land drains to a particular body of water or common low point. A watershed could be as small as your backyard or as large as any major river basin. Regardless of the size, we now know that water quality and uses can be impacted by land use activities anywhere in the watershed. San Antonio has three main categories of land-users: Urban, Industrial & Agricultural.

Because of these users, agencies in Texas have started a watershed management approach which helps solve the problems cost-effectively, fairly and scientifically. Watershed management is a holistic or complete experience. Instead of focusing attention and resources on one particular water quality problem, managers take a holistic approach. One agency in Texas leading the way in watershed management is the Texas Natural Resource Conservation Commission or TNRCC.

Regulations on animal waste for hog and poultry farms is just one way the TNRCC regulates agriculture land users from potentially damaging the watershed. Agriculture can create serious demands on a water supply and cause several types of pollution. Besides animal wastes, sediment pollution due to excessive tillage and crop fertilizers can enter streams, ponds or lakes after a rainfall.

Densely populated urban areas, which are covered by impervious surfaces like streets, sidewalks, rooftops and buildings, increase the amount and decrease the quality of storm water run-off. The high concentrations of people in these areas tend to produce greater quantities and varieties of pollutants, including nutrients, bacteria and toxic chemicals.

Think about your neighborhood for example. Have you ever considered what happens to the fertilizers and insecticides that wash off your yard during a thunderstorm? When it rains, these types of pollutants are washed into neighborhood gutters and storm drains which are not connected to any wastewater treatment plant and therefore not treated. These urban pollutants flow through the storm drain system and empty directly into our local rivers, creeks and lakes. All rivers and creeks in Bexar County drain to the San Antonio River and eventually drain into the Gulf of Mexico. These pollutants could therefore harm wildlife and fisheries and ruin recreational areas from here to the Texas coast.

POLLUTION

Water pollution is identified in two categories: Point Source and Non-point Source. Point Source Pollution is contamination that comes from a single, clearly identifiable source, such as a pipe which discharges material from a factory into a lake, stream, river, bay or other body of water. Point source pollution could also include storm water runoff that is channeled from a drain directly into a waterway. Point source pollution is relatively easy to identify.

Non-point Source Pollution is more difficult to identify. This is pollution which originates over a broad area resulting from a variety of causes. Examples of non-point source pollution include improper application of pesticides and fertilizers, sediment from construction and petroleum-based products from streets and parking lots. Non-point source pollution usually originates from storm water runoff.

There are six major types of water pollutants that watershed managers recognize:
*Biodegradable wastes
*Plant nutrients
*Heat
*Sediments
*Hazardous and toxic chemicals
*Radioactive wastes

STREAM HEALTH

In addition to water measurement characteristics such as temperature, pH, conductivity, turbidity, dissolved oxygen and hardness (see Chemical section in this book), scientists look at four other areas to gauge overall stream health. They include:

BACTERIA-Bacteria is a good indicator of drinking and recreational water quality. Total bacteria and fecal coliform bacteria are the most widely used “indicator bacteria.” High levels of bacteria are not desirable.

ALGAE-Algae are good water quality indicators. High quality lakes and streams contain sparse to moderate amounts of algae assuring an adequate food supply for fish communities.

PHOSPHATES- Phosphates are chemical compounds that are made from the element phosphorus and are sometimes used in detergents and fertilizers. Urban activities such as washing cars and applying fertilizers can greatly increase phosphate levels.

NUTRIENTS-Urban runoff can also carry nutrients in streams and creeks. With the right quantity and proportion, these nutrients can contribute to an overabundance of plant growth which could “choke” the waterway.

HAZARDOUS WASTE

As mentioned previously, hazardous waste is one of the most common pollutants found in rivers and streams. Have you ever thought about what you pour down the drain? What about your old motor oil or your household chemicals and cleaners? Think about it. What you put down the storm drains could eventually re-enter the water cycle. You could be a source of hazardous pollution. Ways to avoid this are to recycle oil and other petroleum-based chemicals at service stations or recycling centers. Avoid using hazardous chemicals when possible and substitute more environmentally friendly materials. The city of San Antonio schedules four Household Hazardous Waste Collection Days so that individuals can take hazardous wastes to a site for proper disposal.

Why is it so important to keep these hazardous wastes from entering our streams and creeks? They might end up in our drinking water. The San Antonio Water System has a "Wellhead Protection" program that inventories any potential wastes that could affect our production wells and these wells are direct conduits or pathways to the Edward's Aquifer.

WATER QUALITY AND YOU

Public water systems, like San Antonio Water System, are required by law to report every year on the type and quantity of substances that are in the water. This law - the Safe Drinking Water Act (SDWA) - has specific guidelines about what types of substances are tested for in drinking water, as well as methods of testing, and how often testing is conducted.

The Environmental Protection Agency (EPA) administers the SDWA to make sure tap water is safe to drink. Bottled water, on the other hand, is regulated by the Food and Drug Administration (FDA) which limits contaminants for similar protection of public health.

WHAT'S IN OUR POTABLE WATER

The technical term for anything other than water in the water is "contaminant." In this line of thinking, you could consider orange juice as water which has been "contaminated" by the orange pulp, the oil, and the flavorings in the orange-all the things that make orange juice taste so good! The important thing when reading this is not to be alarmed by this use of the word "contaminant."

It's natural for drinking water to contain contaminants. San Antonio's water is well within allowable limits. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

Sources for drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- microbiological contaminants, such as viruses and bacteria which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife
- inorganic contaminants, such as salts and metals which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming
- pesticides and herbicides, which may have a variety of sources such as agriculture, urban stormwater runoff and residential uses
- organic chemical contaminants which are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff and septic systems and
- radioactive contaminants, which can be naturally-occurring or the result of oil and gas production and mining activities.

Contaminants may be found in drinking water that may cause taste, color or odor problems. These types of problems are not necessarily causes for health concerns.

WELL HEAD PROTECTION

A major consequence of rapid urbanization through the San Antonio area, specifically over the sensitive Edwards Aquifer recharge and transition zone, has been the abandonment of many water wells. Abandoned water wells remain at the top of the list of potential groundwater contaminant sources, which can be identified and eliminated. Around the wellhead (or the area draining to a wellhead), uncapped or uncased wells provide a direct conduit to groundwater from activities at the surface. The San Antonio Water System (SAWS) Water Quality Division's abandoned well program aggressively pursues the identification and closure of approximately 70 abandoned wells each year. But a number of these wells are identified and not closed due to the lack of funds from the well owner. Complying with the plugging provisions in Chapter 32 of the Water Code and City Ordinances represents a demonstrable financial burden to these landowners.

SAWS routinely identifies abandoned wells as having the potential to impact public water supplies. In the past decade, SAWS has committed more resources in identifying and pursuing the closure of abandoned wells in the San Antonio region. Additionally, in the past three years the utility has taken a proactive approach in developing and implementing programs designed to protect and understand the water sources in the area.

Many of the abandoned wells that need closing are shallow wells (50-200 feet), near creeks or rivers. They are typically dug only into the gravel layer, and often not properly cased. When refuse collects in them, they pose a contamination hazard to the nearby surface water. Waste material can leach out and flow underground into the stream bed, or be carried there when the creek's water flow exceeds its normal boundaries and enters the well. Five such hand-dug wells were found near the San Antonio River this past year. These wells were being used as septic systems for nearby residents. While proper septic systems have since been established, those wells have yet to be cleaned out or plugged to prevent further misuse. The best way to rectify this ongoing problem is to develop a unique innovative approach that will prevent further degradation and ultimately improve water quality. To accomplish this, SAWS will need to identify a number of parameters such as the condition of the casing in the abandoned well, the lithology of the well bore and the water quality of the well. These vital characteristics can only be identified through a geophysical log survey and the collection of water quality samples. In addition to closing abandoned wells, SAWS will be able to develop a valuable database that will be beneficial to other agencies and the public.