BROOME COUNTY WATER RESOURCES: A FACT SHEET
March 22, 1994
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WHERE IS THE WATER?

Surface water

Broome County's surface water is dominated by the Susquehanna River. Other major rivers such as the Chenango, and Tioughnioga, along with smaller streams, drain into the Susquehanna. In the eastern part of the County, water drains into the West Branch of the Delaware River, in the Delaware River Basin. Together with ponds, lakes, and wetlands throughout the County, these bodies of water form Broome County's surface waters (see map).

Lakes and reservoirs: Broome County has only a few large lakes, ponds and reservoirs. The Whitney Point Reservoir, which covers 1200 surface acres, is the largest lake in the County. Oquaga Lake follows with 134 surface acres. Numerous other smaller lakes and ponds are also scattered throughout the County.

Wetlands: Wetlands are areas that are periodically or permanently flooded. Because of this flooding, soils in wetlands are different than those found in dryer areas and support plant and/or animal species specifically adapted to living in wet conditions. Wetlands include habitats commonly called swamps, bogs, and marshes, but also include ponds and areas adjacent to rivers and streams called floodplains. Federal, state, and in some cases local laws regulate wetlands. A wetland must be at least 12.4 acres in size in order to be protected by New York State. Wetlands smaller than this size may be protected by the State if deemed locally unusual or important. At the federal level, the U.S. Army Corps of Engineers has the jurisdiction to protect smaller wetlands from activities that impact them. The New York State Department of Environmental Conservation (DEC) protects 2,191.66 surface acres, while 13,609.1 surface acres* are listed on the National Wetlands Inventory and are protected by the federal government**.

Groundwater

Water that does not runoff into these surface bodies may seep into pore spaces between soil particles. Plants obtain water near the surface where pore spaces are not yet filled (unsaturated zone). Once pores are filled, subsurface water is then called groundwater (saturated zone). In Broome County, underground water is stored in aquifers, areas of sand, gravel, or fractured rock that hold a large portion of the groundwater.

Aquifers: The NYSDEC classifies aquifers on the basis of their importance as public water supplies, their productivity, and vulnerability to pollution. By definition, *primary* aquifers are highly productive, vulnerable aquifers that are currently being used by a large percentage of residents mainly via public water supplies. The Johnson City, Endwell, Endicott, and Vestal areas are dependent on this type of water source. *Principle* aquifer systems are geologically and hydrologically similar to primary aquifers with the only difference being the population dependency on the resource (see map).

On the national level, aquifers can be defined as *sole source* aquifers by the Environmental Protection Agency (EPA). A federally designated sole source aquifer must supply 50 percent or more of an area's drinking water, and if contaminated, would create a significant hazard to public health, and could not be replaced by another source. Broome County, with the exception of a small portion of the Town of Sanford, is designated a sole source aquifer by the EPA. Designation of the sole source aquifer in Broome County by the EPA ensures that an environmental review will occur when development projects involve federal financial assistance in this area.

The aquifers located beneath the Susquehanna and Chenango Rivers and their surrounding floodplains are known as *unconsolidated* aquifers. These aquifers are characterized as having sand or gravel soils and frequent discharge/recharge with the streams that lie above them.

Broome County has other aquifers called *bedrock* aquifers. *Bedrock* aquifers tend to be hydrologically isolated from large streams and hold water in fractures in the bedrock as opposed to sand or gravel deposits. This type of aquifer is common in rural areas of the County.

The connection between surface and groundwater

The relationship between surface and groundwater is not static, nor are the two types of water bodies always isolated from one another. A single raindrop may run over the surface of a road, flow into a sewer, and end up as surface water in a stream or river. Here it can filter through permeable gravel layers underlying the streambed until it reaches an aquifer. When a stream crosses an aquifer, the drop of water can seep through the gravel and be discharged back into the stream. This type of interchange is common between the Susquehanna and Chenango Rivers, their tributaries, and their river basin aquifers. The same is true for wetlands. Although they occur on or at the surface of the earth, these areas are often considered surface expressions of groundwater, areas where the water table reaches and intersects the surface of the earth. This allows some wetlands to remain saturated during prolonged dry periods since they are being supplied primarily by water below ground.

Because of this interrelationship, pollutants that are discharged to our streams, wetlands, lakes and ponds, may affect groundwater quality as well.

THREATS TO BROOME COUNTY'S WATER RESOURCES

Point source pollution

It is common to think of an industry discharging chemicals into a river, or a large oil spill in the ocean, as examples of water pollution. Pollution from a definite source is called *point (end of pipe) sources* of pollution. In Broome County, combined sewer overflow pipes are one example of point source pollution. During periods of heavy precipitation or snow melt, stormwater flows through public sewer lines to the County's public sewage treatment facilities. This influx displaces actual sewage, which is discharged to the Susquehanna River. Significant environmental problems are caused by point sources, but a second type of water pollution called *non-point source* pollution also poses a serious threat to the quality of Broome County's waters.

Non-point source pollution

The majority of water pollution in Broome County today originates from *non-point sources*. Non-point pollution cannot be traced to one point of discharge; it occurs when water from precipitation or melting snow flows across streets, parking lots, golf courses, farms, construction sites, or individuals' yards and accumulates substances such as oil, fertilizer, heavy metals, and sediments. Pollutants in the water cannot be traced to a single source but can contaminate surface water or groundwater.

Impacts of water pollution

Pollutants from both point and non-point sources can impact negatively on water resources. *Sediment* pollution caused by non-point soil erosion may inhibit aquatic plants and animals' abilities to breathe, feed, or reproduce. Pollution due to excess *nutrients* may cause extensive blooms of algae or plants, leaving little oxygen for fish, causing fish kills. *Low oxygen* may also cause the death of aquatic insect populations, on which migratory or resident birds may depend for food. Humans can also be affected by non-point source pollution. A single quart of motor oil can contaminate thousands of gallons of drinking water.

WATER QUALITY AND QUANTITY IN BROOME COUNTY

Broome County has an abundance of good quality water that provides a reliable supply for residential, industrial, agricultural and municipal needs. **Approximately 70 percent of the population rely on groundwater as its only source of potable water**. The City of Binghamton obtains its water from the Susquehanna River, a surface water source. The City also supplies water to the Town of Binghamton, Village of Port Dickinson, and part of the Town of Dickinson. The DEC has designated the Susquehanna River as Class "A," which indicates that its highest and best use is a source of water supply for human consumption.

Public water supplies are tested on a regular basis for a variety of organic and inorganic substances, as required by NYS law. The NYS Department of Health and the EPA set drinking water standards and guidelines for various contaminants that public water supplies must meet. The Broome County Health Department enforces these regulations.

Regarding groundwater sources, both industrial land uses and local geology render many public and private water supply wells vulnerable to contamination. Because of pollution by organic chemicals, such as *industrial solvents* and other *volatile organic compounds (VOCs)*, a number of public water supply wells in the urban area are now being treated with air strippers. In particular, Endicott, Johnson City, Kirkwood, Conklin and Vestal have all had treatment systems installed on at least one of their wells. VOC levels have, however, decreased greatly in recent years in response to sustained clean-up efforts by state agencies and the enactment of groundwater protection ordinances by local municipalities. Fortunately, in all contamination cases in Broome County, groundwater pollution has been localized, affecting only small areas.

In the outlying areas of Broome County, the most common concerns of residents using private water supplies are overall water quality and the presence of iron, sulfur, calcium, chlorides, sodium and/or manganese. These elements are found naturally in bedrock, the common source of private water supplies. While these *inorganic chemicals* usually do not pose a health risk at normal levels, some people find them to be a nuisance.

Broome County has adopted an aggressively proactive stance with regard to protecting its water supplies, both public and private. Municipalities are given technical assistance and otherwise encouraged to adopt land use controls to protect their wellhead areas, and those on private wells are instructed to test their water annually for a range of common contaminants, such as bacteria.

For more information on Broome County's water resources contact:

Broome County Department of Health, Division of Environmental Health (607) 778-2887

Broome County Environmental Management Council (607) 778-2116

Broome County Soil and Water Conservation District (607) 724-9268

Environmental Protection Agency (EPA)
Niagara Falls Regional Office: (716) 285-8842
Washington, D.C. Headquarters: (202) 260-2090
www.epa.gov

New York State Department of Environmental Conservation (NYSDEC)
Kirkwood Office: (607) 775-2545
www.dec.state.ny.us

U.S. Army Corps of Engineers
Buffalo Office: (716) 879-4330
http://ny.water.usgs.gov

United States Geological Survey
State Representative: (518) 285-5600
www.usgs.gov

*****The Susquehanna, Chenango, and Tioughnioga Rivers are included in the total acreage of federally protected wetlands. The three rivers combined surface acreage totals 3710.73. Therefore the surface acreage of all other federally protected wetlands equals 9,898.37 surface acres. The Federal River and Harbors Act, Section 10 gives the Army Corps of Engineers jurisdiction over navigable waters to the ordinary high water mark of fresh water bodies. A permit from the Army Corps of Engineers is required for all construction activity in navigable waters, which is similar to the requirements for construction near federally protected wetlands, hence their identification as federally protected wetlands.

******Broome County Planning Department's Geographic Information System (GIS) data.