

New York State Envirothon 2020
Current Issue:

“Water Resource Management: Local Control and Local Solutions”

Access to clean and safe drinking water is essential to a healthy and thriving community. If a safe drinking water source is compromised or lost, there would be harmful consequences to human health, the environment, and the economy. These losses can be prevented or mitigated to protect current and future sources. Once source water is polluted, it will remain that way for decades. The potential for contamination and the high cost of treatment and expense of locating or developing alternate sources make it imperative for government entities to adopt and implement effective strategies for long-term protection.

Many factors, including increasing populations and extensive development, put stresses on water supplies. Local governmental planning agencies generally focus on priorities such as land use development, infrastructure needs, and the local economy. Planning for source water protection often receives insufficient attention for addressing periods of drought, water conservation and efficiency, pollution prevention, recharge zones, surface water management and conjunctive use, storm water management, and future water needs. Due to its nature, most communities have no clear understanding of how much water is available.

The task of your team is to use the following scenario to develop a plan to address any threats to the existing water sources and provide information from the impacts of a proposed land and water use change that has wide spread support from the local governmental leaders, economic development agencies, and business advocacy groups.

While there is obvious support for expected economic benefits and job creation from such a project, several different concerns have been raised by groups, individuals and municipalities. Of particular emphasis is the groundwater aquifer which is important to many existing uses – agricultural, residential, urban and natural ecosystems. While the plan addresses protecting the groundwater aquifer there is also the need to address the concerns of the existing users and the proposed beverage manufacturing and bottling facility.

Scenario

The Burpee County Planning board is considering the request from the Bubbly Cola Company for a 750 acre land use conversion from prime agricultural and forest land to industrial and light manufacturing. The Bubbly Cola Company is planning on developing a combined manufacturing and bottling facility with the ability to bottle additional products from 15 nearby breweries. In addition, the Bubbly Cola Company will be applying for permits to withdraw water for its facility from the aquifer under and the stream located on the site. Appendix A contains

information from the Bubbly Cola Company pertinent to the water withdrawal permit.

Existing Water Resources

About 20% of Burpee County is underlain by sand and gravel aquifers; which are located primarily in the river valleys. The remainder of the county is underlain by sedimentary bedrock aquifers. Based on the average rainfall in Burpee County, the typical recharge rate for sand and gravel aquifers is 1,000,000 gallons per day per square mile and for a bedrock aquifer it is 400,000 gallons per day per square mile. During a 30-year drought the typical recharge rate for both types of aquifers would be 68% of the average recharge rate. During an extreme drought the typical recharge rate for both types of aquifers would be 40% of the average recharge rate.

A 1500 acre sand and gravel primary aquifer is present below the site, with varying depth from 80' to 230'. This primary aquifer is the water supply source for the farms, existing businesses and residences in proximity to the site. A private water company has wells in this aquifer and provides water to a neighboring subdivision of about 1,000 homes. There are other individual homes with their own private wells around the perimeter of the site.

A popular trout stream crosses through the middle of the proposed site with 2 intermittent tributaries on site which feed the stream. At times groundwater feeds the stream and its tributaries and at other times the stream contributes to the groundwater.

A 4,000-acre lake, regionally important for swimming, boating, fishing, and permanent and seasonal homes is within 1 mile of the site and is fed by the trout stream, some smaller tributaries, and drainage ways from the site as well as groundwater inflows. The lake is class A waters and the nearby city is exploring using the lake for a water supply.

There is a 50 acre, mostly forested, wetland on the site with an additional 300 acres of forested wetland on the east, adjacent and connected to the proposed site.

The Major River is located 4 miles to the north and 3 miles east of the site. The city to the north uses the river for its water supply. The area of the river to the east has pollution concerns from past industrial uses.

Land Uses

Burpee County is approximately 405,000 acres with a population of 63,000. Within the county are 2 small cities, 14 villages and numerous hamlets. Approximately 45% of the county is under active agricultural production, with corn being the primary crop grown. 50% of the corn grown is irrigated.

The largest city, (population of 20,000) is located 5 miles to the north of the site. Surrounding the city are primarily subdivisions, with a total population of 5,000.

5 miles to the east of the site is a village, with a population of 1,000 which is surrounded by farmland and an increasing number of subdivision developments.

40 dairy farms, 10 horse farms, 5 orchards and rented cropland, hay and corn, occupy the land to the south and west. The farms that border the site include: two 800 cow dairies, farming 1,000 acres each; two 100 cow dairies, farming 200 acres each; a high caliber horse breeding farm of 200 acres; 3 horse boarding operations, 30 acres each; and 3 vegetable growers, 10 acres each.

Facilities

There is an existing county sewer system with a submain near the site. It is very close to capacity. Some of the residences and smaller subdivisions in the aquifer area utilize septic systems.

A wet milling plant is located 50 miles away from the proposed site and is accessible by both the interstate highway and the nearby rail line. Water usage by the milling plant is drawn from a different aquifer than the proposed Bubbly Cola Company site.

Transportation

A north-south interstate highway is located 2 miles west of the site. The remainder of the area has an existing network of state and local roads which are experiencing increasing impacts and delays from commuter and business traffic.

A railroad line is located 5 miles to the east and has freight and passenger service.

Planning Resources

The Burpee County Planning Department maintains an extensive Geographic Information System (GIS). It is part of the planning department's mission to work with citizens on important planning issues. The department's services include preparation of maps and analysis of geographic data.

The NYS GIS Clearinghouse also maintains an extensive library of GIS maps and data that is available to the public.

Additional Concerns

Some of the concerns expressed to date include:

CONCERNED ENTITY	REASON FOR CONCERN
Small Business Owners	Concerned about difficulty expanding due to lack of space in their existing setting, restrictive zoning, increasing land prices and lack of capital
County and Towns	Infrastructure costs needed for increased roads, waste treatment, water supply, schools, law enforcement
Trout Unlimited	Water levels, groundwater recharge; spike in temperature from storm water discharge; access to the trout stream; Water quality of tributaries from storm water discharge from industry
Lake Association	Use of lake water – possible drop in water level; Effect on groundwater – drop in water table and recharge, possible effect on lake's quality and quantity
Farm Bureau – Farmers	Loss of prime farmland; effect on land value; greater competition for corn produced; effects on ground water usage
Nature Conservancy	Loss of wildlife habitat, diversity – projected loss of 800 – 1,000 acres and loss of land for new homes
Hunters	Loss of wildlife and wildlife habitat – projected loss of 800 – 1,000 acres

Appendix A

Figure 1: Approximate water usage for corn production

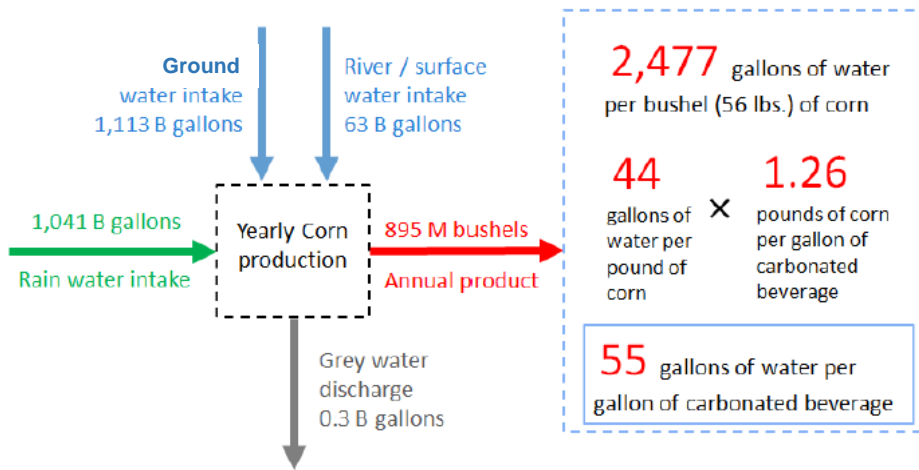
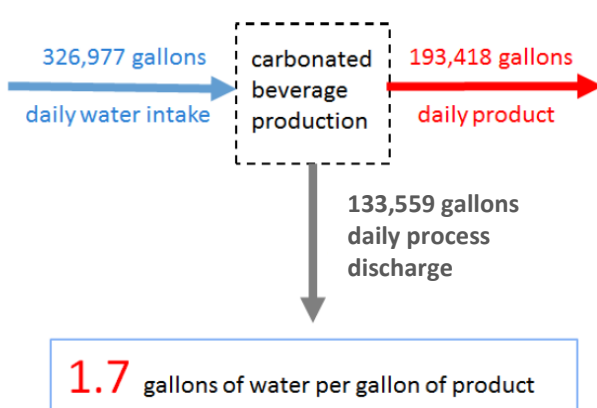
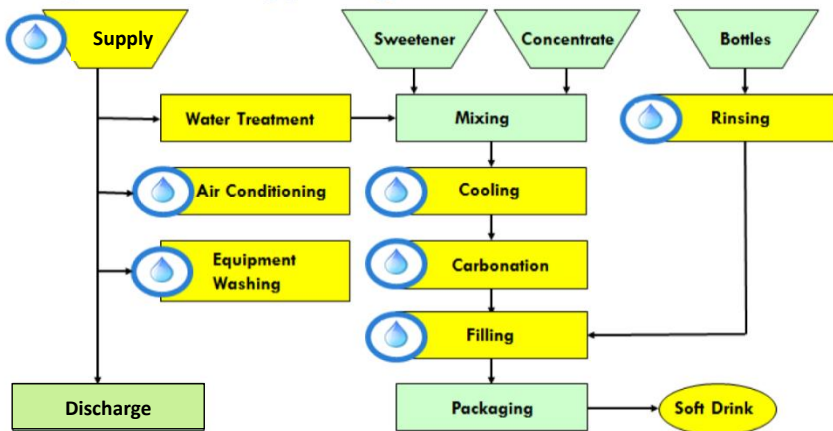


Figure 2: Approximate water usage by beverage manufacturing

Beverage Manufacturing (*Bottling*)



60-70% of the water used at the manufacturing facility is used as an ingredient of the product.
 10-20% of the water used at the bottling facility is for product cooling
 15% of the water used at the bottling facility is for washing equipment
 5% of the water used at the manufacturing and bottling facility is for personal use and consumption