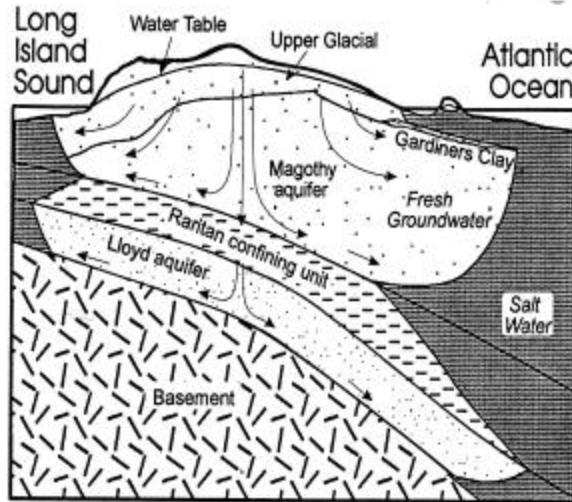


GARDEN CITY **GROUNDWATER**

Nassau County is totally dependent on groundwater for all its water needs. In Nassau County, residents use about 200 million gallons per day (MGD). The Village of Garden City pumps all its groundwater from several wells [from depths ranging from 358 feet to 570 feet] located throughout the Village. The wells are drilled into the Magothy aquifer located beneath Long Island.

Although the village's water comes from an underground aquifer, the ultimate source of the water is associated with the hydrologic cycle. As water returns to the Earth in the form of precipitation, it seeps through the soil or enters recharge basins from impermeable surfaces to replenish the water in the aquifer.



DISTRIBUTION

The Village of Garden City's water distribution system provides water primarily to the industries, residents and businesses within its limits. The Garden City Water System consists of a network of pipes known as water mains ranging from 4 to 24 inches in diameter. The water comes from 10 wells located throughout the village and meets the needs of a population of 25, 000. The water from these wells is stored in 5 storage tanks scattered throughout the village. The village Water Works is located on Cherry Valley Avenue and Eleventh Street. This is the central location for all water department officials and workers. All the wells and tanks are monitored in this location.

As we walk through Garden City, be conscious of the pesticides seeping into the ground from the golf courses and homes. Pollutants also seep into the groundwater from septic tanks, broken pipes, sewage systems dumps, and industrial areas.

RECHARGE

An average of 44 inches of precipitation falls upon the county each year. This amounts to approximately 660 million gallons of precipitation falling to the ground each day! There are currently over 800 recharge basins (like the one next to the H.S.) located throughout Nassau County to collect runoff from pavement and other impervious surfaces. Storm-water travels through storm sewers and enters recharge basins where it re-enters the groundwater system by infiltrating the sediments on the sides and bottom of the basin.

WATER QUALITY **MONITORING AND TREATMENT**

The Environmental Protection Agency requires that municipal water be continually analyzed for contaminants. If the water from a well has contaminants, either the well is shut down or the water is treated. Methods such as Air Stripping, ion exchange treatment, filtration, and blending with fresh water [to dilute contaminant concentration] are all used in treating contaminated drinking water.

Science Walk

By following the numbers on the map of Garden City, corresponding with it's description, this walk gives a brief tour of the village's hydrology. The walk follows Rockaway Blvd and Old Country Rd.

- 1) **Fire Hydrant** – located outside the entrance of the high school. This is one of approximately 800 fire hydrants that are connected to the water mains system in the Garden City Water District. These hydrants are spaced so that a fire hydrant is available to provide water to put out a fire in any building in the village. Each is checked and maintained regularly to ensure proper functioning. Why would some fire hydrants have greater water pressure than others?
- 2) **Recharge Basin** – located behind the GC High School Athletic Fields. Storm water runoff is fed through a system of storm sewers that take water from impervious surfaces such as streets. Once in the recharge basin the water can seep down to the water table making it available for later use. See if you can see where the storm water

entered the basin? Consideration has been given to filling the basin and expanding the playing fields in this area. Why are some recharge basins dry, while others might contain water?

- 3) **Water Tank** – located on Old Country Road. The elevated storage tank that we are visiting is one of 5 storage tanks in the village, holding a total of 5.1 million gallons of water. This particular tank was recently re-painted. It is important that these tanks are maintained to ensure water quality. Although access is not possible, notice the large pipe that runs down the center. Gravity plays a major factor in the flow of water from the tank and maintains the water pressure in the mains. What are the advantages of elevated water tanks? Consider what would happen if water use was greater than the rate of pumping or what would happen if there was an electric outage. Do you see many elevated water tanks in Nassau County?
- 4) **Steamer Fire Hydrant** – located right outside the water tank, this hydrant is designed for hooking up to the tank on a fire engine for greater flow rate. Notice the design. Its position next to the tank gives it one of the greatest flow rates in the district. Is the water that firemen use the same as our drinking water? Is it OK to leave a hydrant open for kids to play in the summer? Why or Why not?

- 5) **Well # 8 and #12** – these wells are located on the Garden City Men’s Club Golf Course. These wells have some storage, but not as much as the elevated tank. There is a small building which acts as a pump station for these wells. Entry to the golf course is prohibited, so they cannot be visited! How does the underground aquifer replenish it’s water supply as it being pumped? What happens during a drought?
- 6) **Sewers** – located along the city streets on Garden City (on your way back to the high school). These serve as drainage during rain, and route the water to recharge basins, lakes, or streams. It is important for storm drains and sewers to remain clear of leaves and debris to avoid flooding. What would the danger be if the street sewers were clogged? Will this water become potable drinking water?
- 7) **Water Fountain** – located inside the Gym Lobby of the high school. Water directed from underground pipes lead to the high school, where it supplies all water needs. Water coming out of this fountain most likely originated from the tank previously visited on this walk. All water entering the building is the same, except this water is cooled. Could the water quality in each individual household or building in the district differ? Why or Why not? Consider what happens to water as it stands in your pipes overnight. Would you be better drinking water that has stood for a long time in your pipes or water that has run until it is cool?



SUMMARY QUESTIONS:

- 1 . What is the ultimate source of Long Island’s (Nassau and Suffolk County) water ?
- 2 . What is the purpose of the large elevated water tank? Is this the only above ground facility?
- 3 . What factors affect the village’s water supply? Does the water table have any effect on the villages water supply?
- 4 . What are some possible local sources of groundwater contamination? Why is this considered a serious problem?

FOR FURTHER STUDY

- Try and keep track of the amount of water you and your family use in one day (rough estimate). When would it change? Why?
- Are there any connections to groundwater contamination and health problems (illness, disease, cancer, etc.)?
- Visit the Garden City Water District for further information

This Science Walk was created for the use of Earth Science students in the Garden City School District.



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Fall 2002

SCIENCE WALK

HYDROLOGY OF GARDEN CITY

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Fall 2002



*The Earth does not belong to us;
we belong to the Earth.*

–Chief Seattle