

Lab T/R 12:20

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Cryptosporidium and New York City Water: Should it be Filtered?

The requirement for filtration was adopted in 1989 when the Surface Water Treatment Rule (SWTR) was first put into effect. New York City has avoided having to filter their water by demonstrating that the source water meets fecal coliform and turbidity standards and that they are doing an adequate job of protecting the watershed by implementing programs designed to lower the impact of agriculture and development on water quality. The question that will answer here is whether this program is effective and why or why not based on the findings from the crypto work sheet associated with this exercise

The New York City Department of Conservation (NYC DEC) has worked to protect the watershed in order to minimize the risk on contamination with crypto and fecal coliform by attempting to protect the water at the source rather than filtering out these pathogens later in water treatment plants. In analyzing this program, we need to first look at how crypto is spread, what the NYC DEC has done to prevent reservoir contamination, and then look at the test results from the worksheet.

Cryptosporidium is spread by fecal matter from animals – in the case of the New York City watershed the major sources are the numerous dairy farms in the watershed and runoff from non-functioning septic systems. The City has worked with farmers to help minimize the potential for agricultural contamination by instituting voluntary programs to help keep the water sources free of manure and other agricultural byproducts

such as fertilizer. This has involved the construction of manure management systems and the purchase of land in the watershed area by the City. The City has also funded projects to fix the non-functioning septic systems and storm run off, and so far has spent \$288 million on these programs according to the Executive Summary

The cryptosporidium worksheet associated with this exercise shows the relative number of oocytes in five different sources: manure, pasture soil, a stream, the reservoir, and the aqueduct that feeds the water treatment plant. As expected, there were plenty of oocytes in the manure – after all, this is the source for contamination in the first place. The pasture soil also had measurable oocyte concentrations, although they tended to be much lower than the manure concentration. In the three water sources tested, there was no detectable oocyte contamination. This suggests that the crypto, which is present in the manure, does not move into the water sources.

New York City had limited the potential for cryptosporidium to enter the watershed through the implementation of watershed protection programs designed to keep storm water, agricultural runoff and failing septic systems from contributing contamination to the water supply. The tests in the worksheet show that crypto is not entering the water supply under normal conditions. In addition, the storm water management systems as well as agricultural protection will keep this contamination potential low even when there is a heavy load on the system (as in storms which contribute lots of extra runoff). This will prevent a disaster like that which occurred in Milwaukee in 1993 when the extra load from heavy rains allowed crypto to enter the water system. As Carol Browner of the US EPA said "By putting in place the mechanisms for protecting New York City's drinking water at the source, by keeping

contamination out of the water supply in the first place, we offer the promise of protecting public health while saving billions of dollars for rate payers." I think that the results of these tests show that the system is safe, and the programs to protect the watershed will keep it that way under circumstances which place stress on it