

Pond Water Sample Testing

09/06/14

pH

The first test performed was a common pH (Potential hydrogen) using an Orion Star A215 pH meter calibrated to 7.0

I tested the sample first in an unfiltered state, then a filtered state. For comparison purposes, I also tested samples obtained from Nestle Pure Life drinking water and Ozarka Natural Spring Water 100%.

The pH of water is a critical parameter affecting the solubility of trace minerals, the ability of the water to form scale or to cause metallic corrosion, and the suitability of the water to sustain living organisms. The pH of any solution is the measure of hydrogen-ion concentration. The higher the pH reading, the more alkaline and oxygen rich the fluid is. The lower the pH reading, the more acidic and oxygen deprived the fluid is. The pH range is 0-14, 7 being neutral. Anything above 7 is alkaline, anything below 7 is considered acidic.

I believe it is correct to say that cancers thrive in an acidic environment, therefore since the human body is 80% water, a balanced, neutral pH is important.

pH Results:

Sample Pre-filtered	Sample Post-filtered	Nestle PureLife	Ozarka Spring
7.58	8.46	6.73	5.43

Observation: The sample had a more neutral pH prior to passing thru the filter, and a more alkaline, oxygen rich pH post-filter.

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Conductivity

The next test I performed was a Conductivity. Conductivity is directly proportional to the concentration of ions dissolved in water and is useful for determining the purity of water.

The conductivity of a substance is defined as “the ability or power to conduct or transmit heat, electricity or sound.” An ion is an atom of an element that has gained or lost an electron which will create a negative or positive charge.

Conductivity Results:

Sample pre-filtered 154.6uS	Sample post-filtered 822uS	Nestle Pure Life 106uS	Ozarka Spring 59.9uS
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Observation: The conductivity of the post-filtered sample was significantly higher

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Total Nitrogen

The next test performed was Total Nitrogen indicating the total nitrogen present in the drinking water. Nitrates and nitrites are Nitrogen-Oxygen chemical units which combine with various organic and inorganic compounds. Once taken into the body, nitrates are converted to nitrites. (The greatest use, and therefore the source, of nitrates is fertilizer.) Babies less than 6 months old who drink water containing excess nitrates (in excess of the EPA’s Maximum Contaminant Level MCL 10mg/L or 10ppm) could become seriously ill, and if untreated, may die. Symptoms include shortness of breath and Blue Baby Syndrome.

Total Nitrogen Results:

Sample pre-filtered 1.92 mg/1	Sample post-filtered 264.42 ug/1 or .026442mg/1 (Ug/1 = 1 microgram)
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Observation: The total nitrogen content was significantly lowered in the post-filtered sample

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Total Organic Carbon

The next test performed was for Total Organic Carbons.

The primary reason for reducing organic carbon in drinking water is not related to the toxicity of the organic carbon compounds themselves but rather the desire to reduce the formation of trihalomethanes (THMs) following chlorination (Young and Singer 1979; Vogt and Regli 1981; Rathbun 1996; and numerous others) and avoid the objectionable color that arises when humic and fulvic acids are present at high levels. (Smith and Davies – Colley 1992; Smith et al 1991.)

Potential harm to humans can arise due to the reaction between humic and fulvic acids and chlorine to form THMs, trichloroacetic acid, dichloroacetic acid, halo ketones and haloacetonitriles (Reckhow and Singer 1990; Rock 1977).

Simple summary: Several studies have shown that dissolved and total organic carbon levels are strongly correlated with water color.

Total Organic Carbon Results:

Blank	-	0.00900mg
Std (25)	-	25.40mg/L
Unfiltered	-	16.18mg/L
Filtered	-	5.481mg/L

Observation: The total organic carbon was significantly lowered in the post-filtered sample.

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TSS/VSS

Total Suspended Solids (TSS) represents the wastewater solids that are retained by a filter. Volatile Suspended Solids (VSS) is a measure of the organic matter in the wastewater solids.

I performed this test by weighing a Whatman 47mm glass microfiber filter (Cat No 1827-047) in a laboratory quality tin, then pouring 50 mls of sample thru the filter while applying a vacuum to draw off the liquid leaving behind any solids. Both samples were then baked in a 230°F oven for one hour. Samples were then placed in a dessicator to cool for 15 minutes before being weighed a second time to determine the TSS amount. (Factor was multiplied by 1,000,000 and divided by 50)

Samples were then placed in a 1000°F oven for 15 minutes, followed by cooling off in dessicator for 15 mins, weighed one final time to determine the VSS.

TSS/VSS Results:

Sample pre-filtered

TSS – 4

VSS – 6

Sample post-filtered

TSS – 2

VSS - 0

Observation: Total suspended solids and Volatile suspended solids were significantly reduced in the post-filtered sample

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