

Report of Eastmorland Chemical Monitoring at Wildcat Park sites

Data Collected:

Eastmorland chemical monitoring October 9, 2009 - three different sites.

	Wildcat Springs		Pond		Silver Creek		Expected Accuracy for test
	Hunter	Graves	Hunter	Graves	Hunter	Graves	
Date	10/9/09	10/9/09	10/9/09	10/9/09	10/9/09	10/9/09	--
Rainfall	10/6/09	10/6/09	10/6/09	10/6/09	10/6/09	10/6/09	--
Weather Condition	Clear	Clear	Clear	Clear	Clear	Clear	--
pH	7.0	7.3	7.6	7.7	7.7	7.8	+ 0.2
Nitrate mg/L	2.0	4.0	0.25	0.25	0.25	0.25	+ 1.0
Conductivity uS/cm	430	400	300	310	310	300	± 10% of std.(1000)

Reference Material:

	Previous chemical monitoring for Silver Creek				Ave Results for Most MO Streams
	10/19/08	2/22/09	6/22/09	9/12/09	
pH	8	8.2	7.5	7.5	7.0 – 8.5
Nitrate mg/L	0.25	0.25	0.25	0.25	<0.25 – 2.0
Conductivity uS/cm	330	400	340	340	150 - 500

Data Quality – Discussion Questions

- Look at each water source – Wildcat Springs, Pond, and Silver Creek. How does Hunter data compare to Graves data for pH? Nitrate? Conductivity?
- Since Hunter and Graves used samples from the same water bottles and used the same testing equipment, would you expect all of the results to be the same? If all results were not the same, were any data points outside the Expected Accuracy range for the test? What would be some of the “variables” responsible for a difference in the results?

Data Interpretation – Discussion Questions

- Compare your results from the Silver Creek water source with the data taken previously by the stream team. How are they the same or how are they different?
- Compare all of your results with the Average Results for Most Missouri Streams. Is your data within the boundaries of the average results?
- Do you have enough information to tell if the waters are drinkable?
- Review the document on the next page for “natural readings” for pH and nitrates (others are included) and some of the possible sources/influences that would cause cautionary readings.

Water Chemistry Reference Table

Use this table as a guide as you interpret your water quality field data. Remember that each aquatic system is different, so this table is only a guide, **not a hard fast rule!**

Provided by Missouri Stream Team Program

WATER PARAMETER TESTED	WHAT IT MEASURES	NATURAL READINGS	CAUTIONARY READINGS (could be a problem)	POSSIBLE SOURCES/ INFLUENCES	REMEDIES
Water Temperature	average amount of heat in the water	0° - 34°C (32° - 93°F)	above 32°C (90°F) above 24°C for smallmouth bass/goggle eye streams (84°C) above 20°C for trout streams (68°C)	<ul style="list-style-type: none"> - thermal discharges (e.g., industrial, waste water treatment plants) - increased turbidity - solar heat (e.g., loss of shade in riparian areas) - heated runoff from impervious surfaces (e.g., asphalt, concrete) 	<ul style="list-style-type: none"> - discharges adhering to limits set in permits/regulations - increased riparian (stream side) shade - decrease impervious surfaces (i.e., revegetate watershed)
Dissolved Oxygen	amount of oxygen dissolved in the water	<p>natural readings: 5 – 15 mg/L (milligrams per liter) or more than 80% dissolved O₂ % saturation in Ozark streams and more than 60% dissolved O₂% saturation in prairie streams or streams with no aeration</p> <p>cautionary readings:</p> <ul style="list-style-type: none"> - below 6 mg/L cold water <i>Standards</i> violation - below 5 mg/L cool and warm water <i>Standards</i> violation - 3 - 5 mg/L (40% - 80%) causes stress resulting in abnormal feeding , reduced reproduction - < 3 mg/L (<40%) results in death in most species - 0 mg/L = anoxic 		<ul style="list-style-type: none"> - atmosphere via aeration (e.g., wind, running water) - photosynthesis by algae and other aquatic plants 	<ul style="list-style-type: none"> - can control quantity of algae by limiting nutrients (N, P) entering the water - reduce water temperature
pH	acid/base of the water	generally 6.5 – 9.0	below 6.5 above 9.0	<ul style="list-style-type: none"> - acid rain - industrial pollution - chemical spills 	<ul style="list-style-type: none"> - pollution controls - pH moderation by addition of acid or basic compounds
Nitrates	organic matter or fertilizer materials in water	0.0 – 2.0 mg/L	consistent readings above 2 mg/L	<ul style="list-style-type: none"> - human sewage - industry output - domestic use of detergents - fertilizer (urban and agricultural) - animal wastes 	<ul style="list-style-type: none"> vegetated riparian zones limit usage of agricultural and yard fertilizers properly maintained septic systems
Phosphates	organic matter or fertilizer materials in water	0.0 – 0.2 mg/L	consistent readings above 0.2 mg/L	<ul style="list-style-type: none"> - animal wastes - fertilizer - domestic use of detergents - industry output 	<ul style="list-style-type: none"> vegetated riparian zones agricultural waste management limit use of agriculture and yard fertilizers
Turbidity	clarity of the water	highly variable measured in Nephelometric Turbidity Units (NTUs)	increasing turbidity measurements in a waterbody over a period of time	<ul style="list-style-type: none"> - sediment, usually from increased surface runoff (e.g., off construction sites, cropland) - excessive algae growth - watercraft traffic 	<ul style="list-style-type: none"> sediment controls riparian zones to reduce nutrients watercraft speed limits