

Name: _____ Period: ____ Date: _____

Environmental Science
#11-1: Water Quality Index (WQI)

Site name	
GPS coordinates (Lat & Long)	
Date & Time of measurements	
Water Temperature	

- I. *Using the class's LabQuest data, complete the following table, putting a star (*) next to any data you personally collected:*

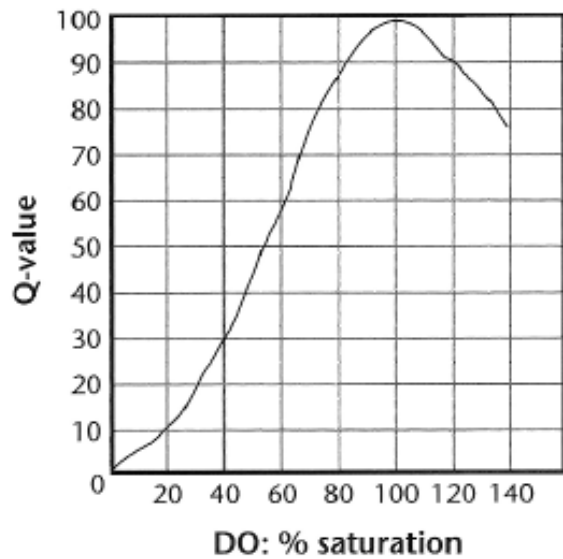
Measurement	Data		Q-Value	Weight	Total Q
Dissolved Oxygen	mg/L	% sat		$\times 0.27 =$	
Nitrates (mg/L)				$\times 0.16 =$	
pH				$\times 0.17 =$	
TDS/Conductivity (mg/L)				$\times 0.11 =$	
Temperature Change (°C)				$\times 0.16 =$	
Turbidity (NTU)				$\times 0.13 =$	
Overall	---		---	1.00	

Water Quality Index Ratings	
90 – 100	Excellent
70 – 90	Good
50 – 70	Average
25 – 50	Fair
0 – 25	Poor

II. *After taking your measurements at the stream, please answer the following questions:*

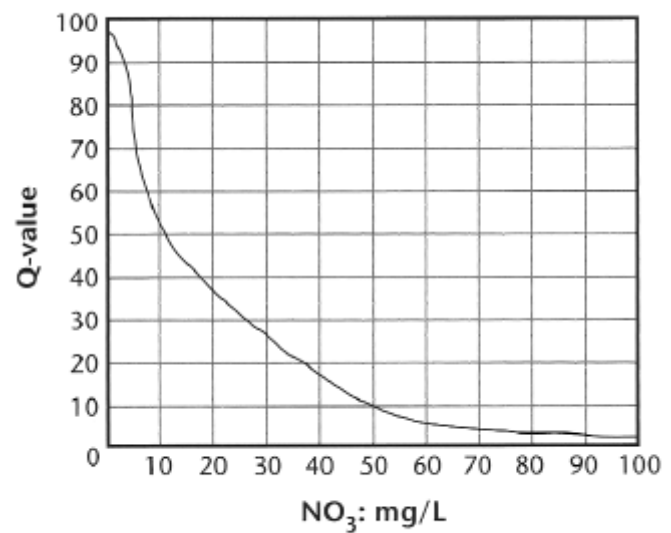
1. Our dissolved oxygen (DO) probe also measures the temperature of the water to calculate the percent (%) saturation of DO. Why do you think this is necessary?
2. Was the nitrate concentration in this stream at a harmful level or not? Explain how you know.
3. What is the optimal pH for a stream? Why do you think so?
4. Why is it important to perform conductivity measurements in mg/L instead of $\mu\text{S}/\text{cm}$?
5. Why is it necessary to perform the temperature measurements outside at the location of the water source instead of in a lab?
6. Why do you think the turbidity sensor is so different from the other probes and sensors we're using?
7. Normally, we're not supposed to take water quality measurements within 24 hours of a "rain event". Why do you think this is?
8. Overall, what was your Water Quality Index (WQI) value? Does this seem accurate? Explain why or why not.
9. For a more accurate test, we can also test for phosphates, biochemical oxygen demand (BOD) and fecal coliform bacteria. Why do you think these tests might also be important?

DO Test Results



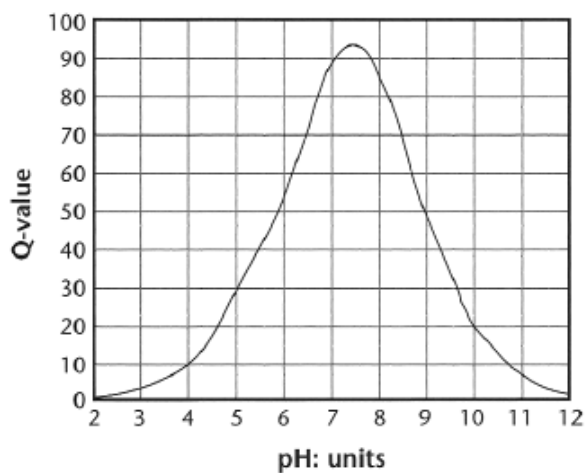
Note: if DO % saturation > 140.0, Q = 50

Nitrate Test Results



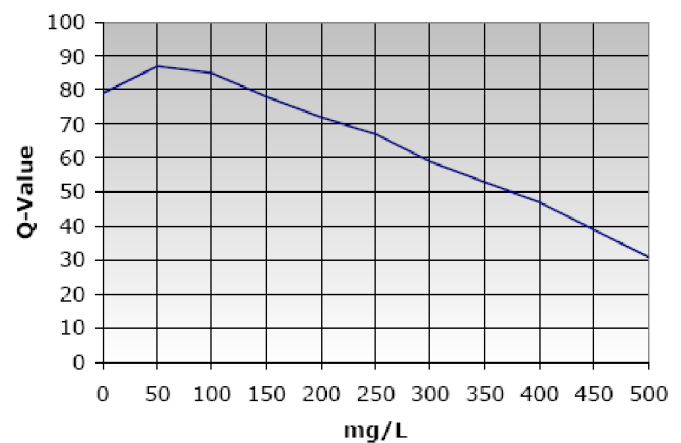
Note: if NO₃ > 100.0, Q = 1.0

pH Test Results



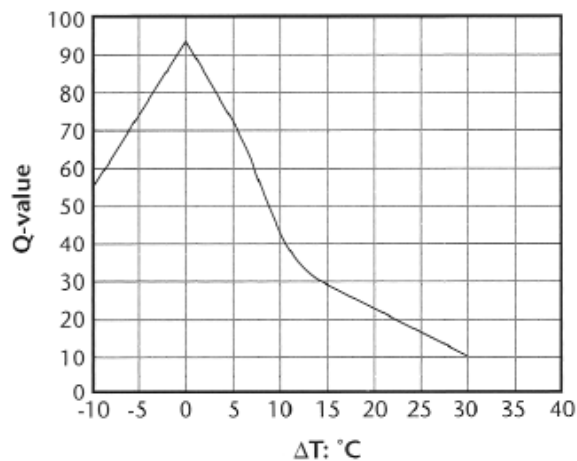
Note: if pH = 2.0, Q = 0.0; if pH > 12.0, Q = 0.0

Total Dissolved Solids

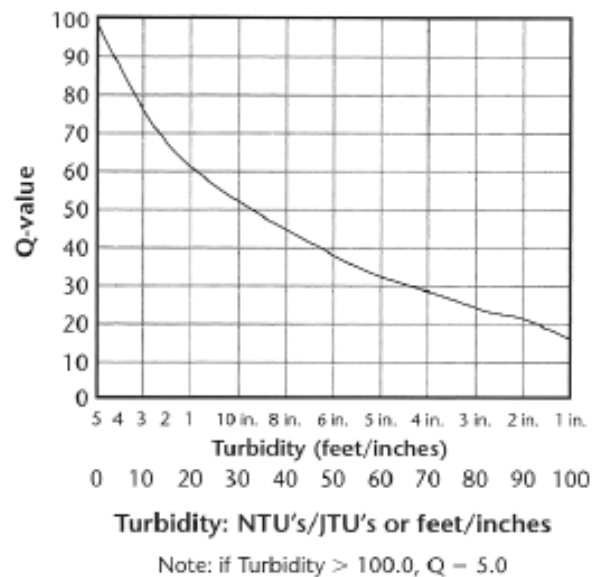


(Note: If TDS level > 500, Q=20)

Temperature Change Test Results



Total Suspended Solids Test Results



Note: if Turbidity > 100.0, Q = 5.0