

**Blackstone River Coalition**  
**Watershed-wide Volunteer Water Quality Monitoring Program**  
**Procedure for Developing 2005 Monitoring Season Report Card**

1. Samples are collected and tested on the second Saturday of the month from April to November. Sites must be sampled at least 6 times out of 8 possible monitoring events. Monthly raw data is color coded by parameter according to guidance provided by MA DEP. See chart below.

Category/Indicator	Units	Excellent <i>green</i>	Good <i>yellow</i>	Fair <i>orange</i>	Poor <i>red</i>
<b>AESTHETICS</b>					
Turbidity	NTU	0-1	greater than 1, less than 5	5 - 50	>50
<b>CHEMICAL</b>					
Dissolved Oxygen	Cold water	>9 mg/l	>6 – 9 mg/l	5 – 6 mg/l	<5 mg/l
	Warm water	>6.5 mg/l	> 5 – 6.5 mg/l	4 – 5 mg/l	<4 mg/l
pH	S.U.	6.5 – 8.5	6.0 – 9.0	5.5 – 6.0	<5.5
Temperature	Cold water	< 15°C (<59°F)	15°C - <20°C (59°F - <68°F)	20°C – 24°C (68°F – 75.5°F)	>24°C (>75.2°F)
	Warm water	< 24°C (<75.2°F)	24°C - <27°C (75.2° - <80.6°F)	27°C – 28.6°C (80.6°F – 83°F)	>28.6°C (>83°F)
<b>NUTRIENTS</b>					
Orthophosphate as P	mg/l	<.025	.025 - <.05	.05 - .1	>.1
Nitrate as N	mg/l	<0.3	0.3 - <.6	0.6 – 0.9	>0.9
<b>FLOW</b>					
Baseflow	cfsm	1.0	0.5 – <1.0	>0.25 - <0.5	≤0.25

*Adapted from: MA DEP's SMART Monitoring Watershed Report Card Criteria, Kimball, Warren.2005.unpublished. DEP, Worcester.*

2. Parameters are grouped into the following four categories: aesthetics, chemical, nutrients and flow
  - aesthetics includes the following measurements: turbidity, water appearance, water odor, presence of trash and a visual assessment of turbidity as well as knowledge of the site
  - chemical includes the following parameters: dissolved oxygen and water temperature
  - nutrients includes the following parameters: nitrate and orthophosphate
  - flow

3. The report card includes an overall grade for each category (for each site monitored)
- aesthetics
    - using best professional judgment all five measurements are assessed to determine an overall grade. If the site experienced one or more no flow events the site receives a red (poor) overall grade. This is the most subjective category.
  - chemical
    - if one or more monitoring event includes a DO grade in the red (poor), the site receives a red (poor) overall grade
    - if one or more monitoring event includes a DO grade in the orange (fair), the site receives an orange (fair) overall grade
    - if one or more monitoring event includes a DO grade in the yellow (good), the site receives a yellow (good) overall grade
    - if every monitoring event results in a DO grade in the green (excellent), the site receives a green (excellent) overall grade
    - if the site experiences one or more no flow events it receives a red (poor) overall grade
  - nutrients
    - averages are calculated for both nitrate (as nitrogen) and orthophosphate (as phosphorous)
    - overall site grades are assigned primarily based on the phosphorous average, due to phosphorous being the limiting nutrient in fresh water.
    - if the average phosphorous grade falls into the orange (fair) or yellow (good) category, but more than one monitoring event has a phosphorous red (poor) rating (excluding wet weather events\*), the site is given an overall grade of red (poor)
  - flow
    - grades are only assessed for sites with staff gages installed and calibrated by Mauri Pelto of Nichols College
    - cubic feet per second (cfs) is determined using rating curve created by Mauri
    - cfs is multiplied by the drainage area to give cfs per square mile
    - grade is assigned based on guidance provided by MA DEP, using lowest cfs per square mile reading. See chart above.
4. Report card includes the following notations
- \*cwf indicates designated cold water fishery, which means cold water standards for DO and water temperature were used
  - <sup>04/05</sup> in the site location column indicates the site experienced no flow conditions during one or more sampling events during the indicated season

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