Assignment 3

You will need to use the data collected from Friday, Feb 28 and Monday, March 2 2020 for questions 2 and beyond of this assignment. The data set is on Canvas site.

All calculation and graphing should be presented in EXCEL. Both Word file (for answering questions) and EXCEL file (for data calculation and graphing) need to be submitted.

1. Using the Lab 3 data, please plot a bar chart showing the average conductivity and the associated standard deviation for water of each of the five tested sites at the Stroubles Creek (see map of lab 3) and then plot two more similar bar charts, one for TDS and one for turbidity. What is your observation for those water quality indicators for the water along the five sites (S1-S5) tested on Friday, Feb 28 2020? What's your observation for those indicators for the water along the five sites (S1-S5) tested on Monday, March 2 2020? Please provide ***graphical*** and ***statistical*** justification for your conclusion.

2. Based on the Lab 3 data, which one of the 5 sites monitored has the highest turbidity on Friday, Feb 28 2020? How about on Monday, March 2 2020? Why do you think this was happening? What does this imply?

3. Based on the Lab 3 data, comparing the conductivity of water at each site tested between the two days, do you observe statistical difference between the two days at site 1? What could happen in the town of Blacksburg between Feb 28 and March 2 2020 that might explain your observation?

4. As you can see from the map showing the 5 tested sites in our lab manual that the Duck Pond is the retention pond where all stormwater runoff of the Town of Blacksburg drains into. After comparing the tested TDS and turbidity in the water of the inlet (site 3) and outlet (site 4) of the Duck Pond, what is your conclusion regarding the effectiveness of the Duck Pond in reducing the input of total dissolved solids (TDS) and suspended solids (as indicated by the turbidity data) to the Stroubles Creek downstream of the Duck Pond? You need to provide graphic as well as statistical justification for your conclusion.

5. Based on the data obtained using **EPA water sampling protocol**, what trend do you observe for the dissolved oxygen levels in the water along the five sampling sites of the Stroubles Creek (see map of lab 4 manual) on Friday, Feb 28 2020? Please provide justification for your conclusion.

6. Use the Lab 4 data from Friday Feb 28 2020, please compare the Modified Winkler Method-determined dissolved oxygen concentrations in the water samples collected using the EPA protocol and the improper protocol. Of the five improper protocols, which one

resulted in DO reading(s) that is the most statistically different from the reading generated from using the EPA protocols? What is your explanation on the cause of this difference?