May 22, 2014

Monitoring Data Analysis for March 27, 2014 – May 5, 2014

Rocky Branch Creek Monitoring Sites

As with the other two monitored watersheds, the Rocky Branch sites showed typical diurnal fluctuations in the DO, water temperature, and pH parameters. The average dissolved oxygen concentration for the monitoring period was above 7 mg/L at each station, with the minimum values at both stations above the 4 mg/L standard recommended by SCDHEC. The pH and DO standards were not violated during this monitoring period. Following storm events, instantaneous turbidity levels were recorded above the 50 NTU SCDHEC standard, but the average turbidity levels were far below this threshold.

The ROCA and ROCB sites recorded 5 and 4 storms, respectively. As with the Kinley Creek sites, the Rocky Branch sites have a very rapid response to storm systems, likely because of their location near the center of the urbanized area of Columbia. During storm events, the Rocky branch sites showed typical responses in turbidity and specific conductivity. During several storm events, the pH dataset showed an increase at the beginning of the storm, followed shortly thereafter by the more typically observed pH decrease. This may be due to the pollutants conveyed to the stream during the first flush of the storm events; as the storms continue, the high acidity runoff causes the typically observed low pH levels.

As noted at the Kinley Creek Sites, this monitoring period included the period of high pollen dispersal. At several points during the sonde deployment, field maintenance was required to remove pollen accumulation from the sensors. After sensor fouling was detected via the City's continuously updating website, field personnel made site visits to correct the observed issues. At the ROCB station, from April 16th to April 18th, the buildup of pollen on the sonde probes caused inaccurate turbidity recordings. This data had to be removed from the dataset.

The Rocky Creek stations observed a high number of illicit discharges during this monitoring period. The ROCA site saw 17 potential illicit discharges during this period, with particularly significant events occurring on April 25th, 28th, 29th, and 30th, as well as May 1st and May 2nd. Several of these events were tracked by Woolpert and City staff after being observed in real-time on the City's website, and the source of several of the particularly severe suspected illicit discharges was discovered to be the Maxcy Gregg pool backwash discharge. The ROCA site still appears to be impacted by other possible illicit discharges, and the source of these other events should be tracked in the future.

The ROCB site also experienced a high number of suspected illicit discharges during this monitoring period, with 9 recorded events. The majority of these events appear to have impacted only the specific conductivity and ammonium readings, and largely occurred overnight. These events were seen on April 1st, 9th, 20th, and 25th, as well as May 1st and 2nd. Many of these events may have the same source, and while these possible illicit discharges are not causing dangerously altered water quality levels in the 5 monitored parameters at the ROCB site, they may be causing much higher levels upstream closer to

the source, before the discharge become diluted by Rocky Branch Creek. Additionally, these potential illicit discharges may contain constituents that threaten the water quality in the creek, but which are not detected by the limited number of monitored parameters. The most striking suspected illicit discharge at this site occurred on April 5th. Similar to the other recorded illicit discharges, this event occurred at night and influenced only the specific conductivity and ammonium readings; however, this event had much more severe impacts. Additional monitoring and sampling of these events may point to the likely source.

City of Columbia, SC Stormwater Management
Partnering for clean waterways

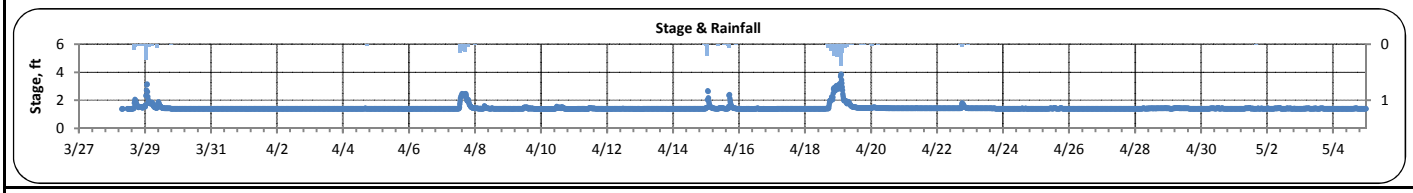
# Continuous Water Quality Monitoring Periodic Report

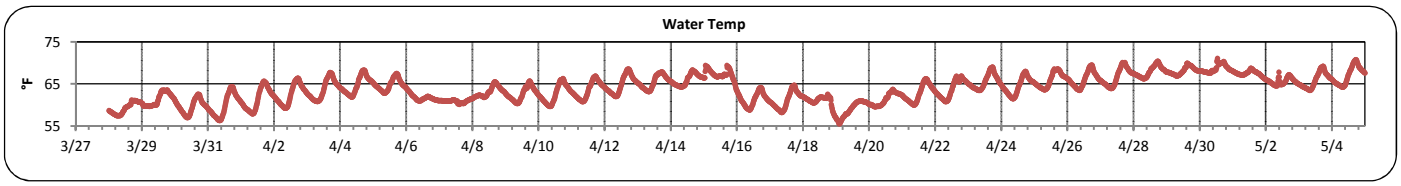
## Rocky Branch A (Mar 27 -- May 5, 2014)

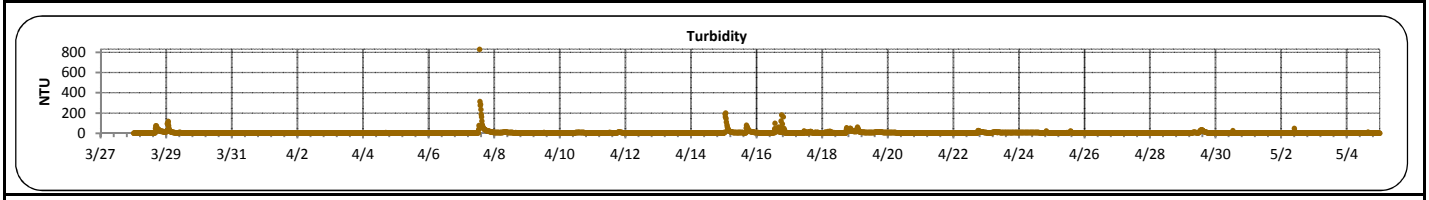
WOOLPERT
DESIGN | GEOSPATIAL | INFRASTRUCTURE

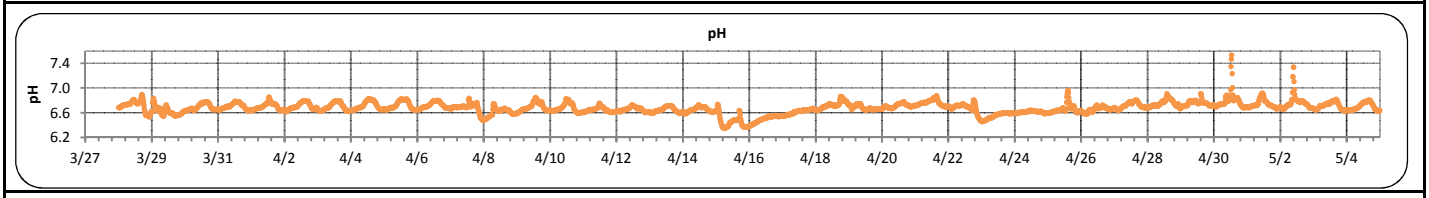
| PARAMETER | DESCRIPTION |
|---|---|
| STREAM NAME: | Rocky Branch |
| LOCATION: | Maxcy Gregg Park |
| ADDRESS: | 1650 Park Circle Columbia, SC 29201 |
| COORDINATES: | 34.995864, -81.021842 |
| TMDL/IMPAIRMENT: | Fecal Coliform |
| NEIGHBORING LANDUSE: | Residential and commercial |
| SPATIAL LOCATION: | Most upstream site |
| TOTAL NO. STORMS OVER 0.1 INCH: | 5 |
| MAX. DAILY RAINFALL: | 1.3 inches |
| TOTAL RAINFALL (FOR PERIOD): | 3.9 inches |

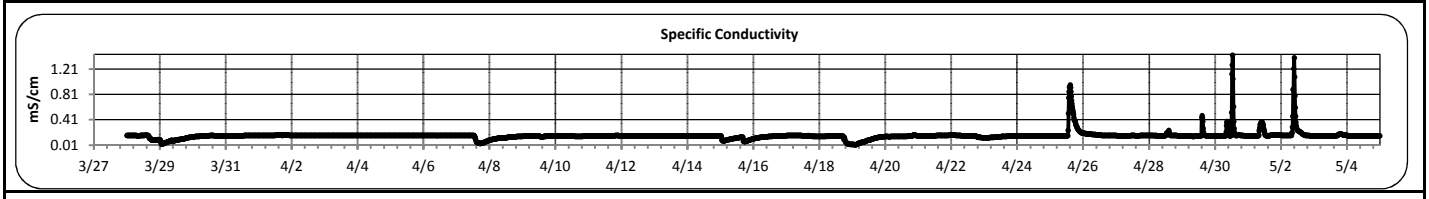
| CONTINUOUS WATER QUALITY PARAMETERS: | SUMMARY STATISTICS | | | | |
|---|---|---|---|---|---|
| | MINIMUM OBSERVED | MAXIMUM OBSERVED | MEDIAN OBSERVED | MEAN OBSERVED | STANDARD DEVIATION |
| STAGE (FT): | 1.4 | 3.9 | 1.4 | 1.4 | 0.2 |
| TEMPERATURE (°F): | 56 | 72 | 64 | 64 | 3 |
| TURBIDITY (NTU): | 2 | 829 | 3 | 7 | 20 |
| pH: | 6.4 | 7.5 | 6.7 | 6.7 | 0.1 |
| SPECIFIC CONDUCTIVITY (mS/cm): | 0.014 | 1.429 | 0.157 | 0.157 | 0.074 |
| DISSOLVED OXYGEN (mg/L): | 5.4 | 10.5 | 7.6 | 7.6 | 0.9 |

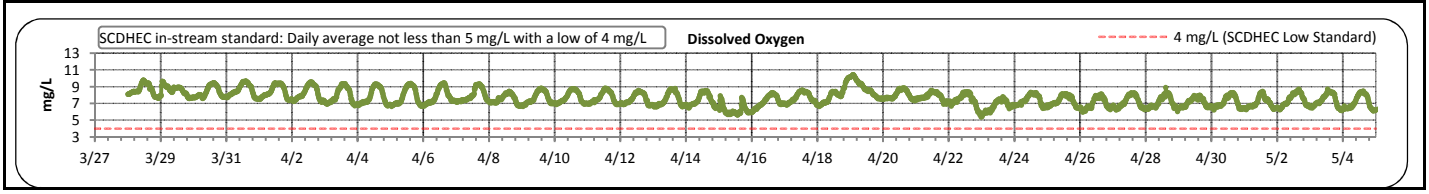



Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

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**Continuous Water Quality**
**Monitoring Periodic Report**

**Rocky Branch A (Mar 27 -- May 5, 2014)**

## Explanation of Statistics:

| | |
|---|---|
| **MINIMUM OBSERVED** | The minimum of the values recorded by the datasonde in 15 minute intervals. |
| **MAXIMUM OBSERVED** | The maximum of the values recorded by the datasonde in 15 minute intervals. |
| **MEDIAN OBSERVED** | The median of all the values recorded by the datasonde in 15 minute intervals. |
| **MEAN OBSERVED** | The average of all the values recorded by the datasonde in 15 minute intervals. |
| **STANDARD DEVIATION** | The standard deviation of all the values recorded by the datasonde in 15 minute intervals. |

## Grab Sample Data:

| Analyte (units) | Sample 1 | | Sample 2 | | Sample 3 | |
|---|---|---|---|---|---|---|
| | 4/28/2014 | | | | | |
| | Time | Result | Time | Result | Time | Result |
| *Escherichia coli (MPN/100mL)* | 14:33 | 794.0 | | | | |
| Total Suspended Solids (mg/L) | | | | | | |
| Total Phosphorus (mg/L) | | | | | | |
| Total Nitrogen (mg/L) | | | | | | |

Note: One sample of *E. coli* was collected to establish baseline conditions for the stream.

Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

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City of Columbia, SC Stormwater Management
Partnering for clean waterways

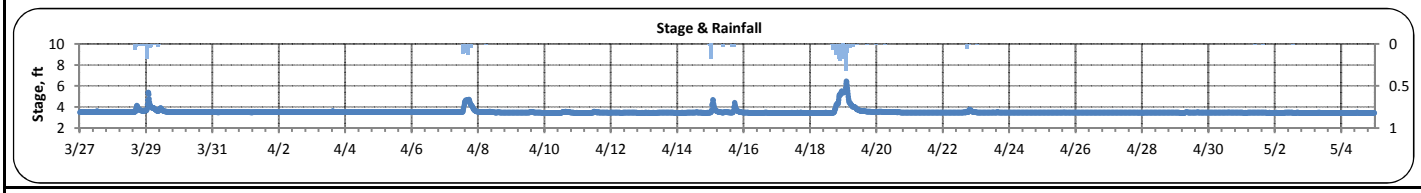
# Continuous Water Quality Monitoring Periodic Report

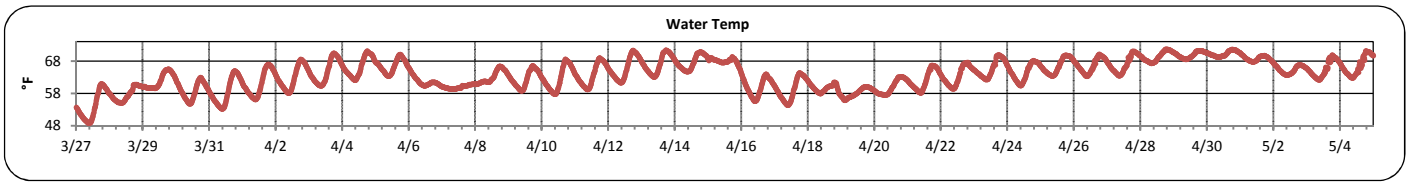
## Rocky Branch B (Mar 27 -- May 5, 2014)

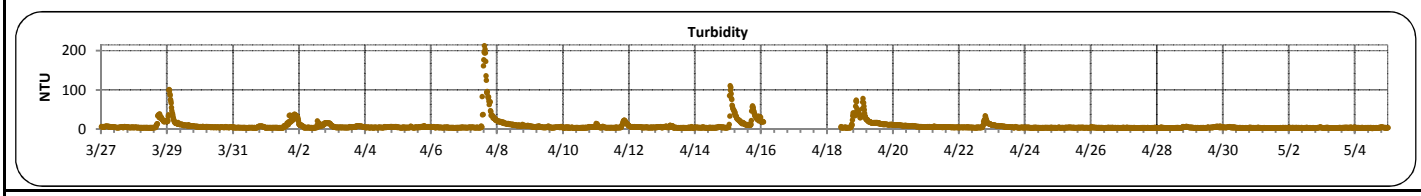
WOOLPERT
DESIGN | GEOSPATIAL | INFRASTRUCTURE

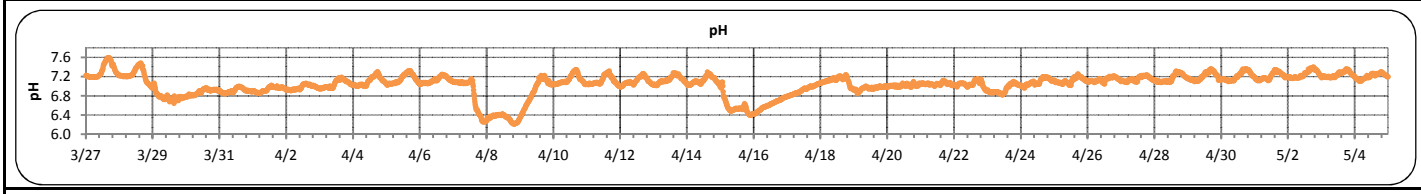
| PARAMETER | DESCRIPTION |
|---|---|
| STREAM NAME: | Rocky Branch |
| LOCATION: | Olympia Ave Crossing |
| ADDRESS: | 510 Heyward St Columbia, SC 29201 |
| COORDINATES: | 33.982578, -81.035036 |
| TMDL/IMPAIRMENT: | Fecal Coliform |
| NEIGHBORING LANDUSE: | Residential and commercial |
| SPATIAL LOCATION: | Most Downstream Site |
| TOTAL NO. STORMS OVER 0.1 INCH: | 4 |
| MAX. DAILY RAINFALL: | 1.1 inches |
| TOTAL RAINFALL (FOR PERIOD): | 3.3 inches |

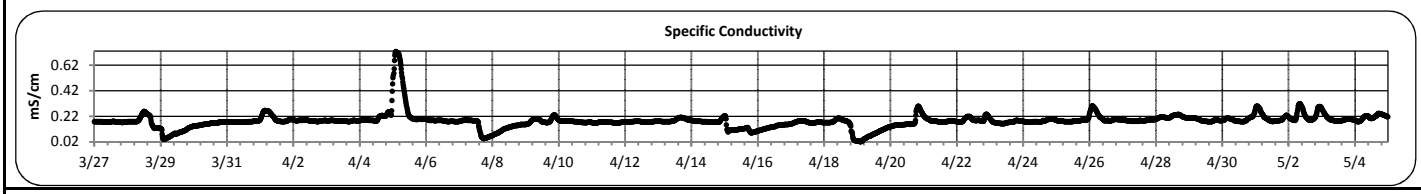
| CONTINUOUS WATER QUALITY PARAMETERS: | SUMMARY STATISTICS | | | | |
|---|---|---|---|---|---|
| | MINIMUM OBSERVED | MAXIMUM OBSERVED | MEDIAN OBSERVED | MEAN OBSERVED | STANDARD DEVIATION |
| STAGE (FT): | 3.4 | 6.4 | 3.5 | 3.5 | 0.2 |
| TEMPERATURE (°F): | 49 | 73 | 64 | 64 | 5 |
| TURBIDITY (NTU): | 2 | 213 | 4 | 8 | 14 |
| pH: | 6.2 | 7.6 | 7.1 | 7.0 | 0.2 |
| SPECIFIC CONDUCTIVITY (mS/cm): | 0.021 | 0.727 | 0.182 | 0.183 | 0.059 |
| DISSOLVED OXYGEN (mg/L): | 5.2 | 12.1 | 8.5 | 8.5 | 1.0 |

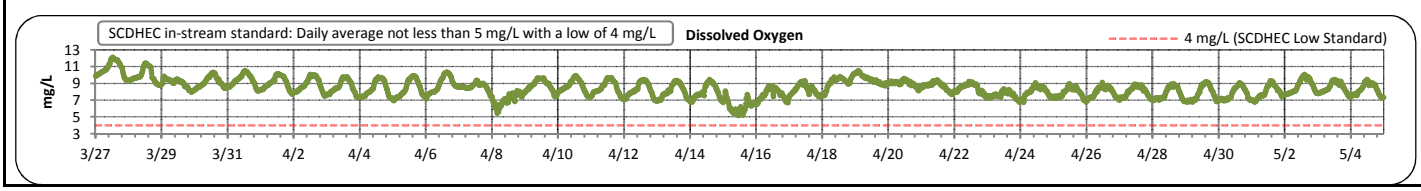



Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

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**Continuous Water Quality**
**Monitoring Periodic Report**

**Rocky Branch B (Mar 27 -- May 5, 2014)**

## Explanation of Statistics:

| | |
|---|---|
| **MINIMUM OBSERVED** | The minimum of the values recorded by the datasonde in 15 minute intervals. |
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| **STANDARD DEVIATION** | The standard deviation of all the values recorded by the datasonde in 15 minute intervals. |

## Sampled Data:

| Analyte (units) | Sample 1 | | Sample 2 | | Sample 3 | |
|---|---|---|---|---|---|---|
| | 4/28/2014 | | | | | |
| | Time | Result | Time | Result | Time | Result |
| *Escherichia coli (MPN/100mL)* | 14:59 | 1,439 | | | | |
| Total Suspended Solids (mg/L) | | | | | | |
| Total Phosphorus (mg/L) | | | | | | |
| Total Nitrogen (mg/L) | | | | | | |

Note: One sample of *E. coli* was collected to establish baseline conditions for the stream.

Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

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