2019
Equipment Check
Centre County Pennsylvania
Senior Environmental Corps

The mission of the Centre County Pennsylvania Senior Environmental Corps (CCPaSEC) is to develop and to support teams of senior citizens who gather and publish data on the quality of water in the streams of Centre County.

Through public outreach, with the assistance of the ClearWater Conservancy, the Centre County Conservation District, Nature Abounds™, and other environmentally concerned organizations, CCPaSEC seeks to keep the public informed of the importance of clean water and how the management of our civil and natural resources affects the quality of streams in the county.

CCPaSEC Quality Control Team
February 2019

CCPaSEC implemented a Quality Assurance Plan in 2011 based on EASI. Nature Abounds™ issued their quality assurance plan at the May 2016 training session that called for PR testing every six months.

CCPaSEC will continue to use our original 2011 plan, though non-compliant, in that our plan calls for our quality team to only conduct a yearly evaluation of our equipment to determine and report the condition and capability of our field equipment. CCPaSEC provides the Percent Recovery (PR) to users of our data on our website.

2019 QC Team:
Rob Fugate, Dan DeLotto, Ralph Locklin, Lou Mayer, Bill Leech, Dave Truesdale, William Smith, Ken Johnson.

Equipment evaluated:
All seven (7) the CCPaSEC teams' field kits were collected for the exercise.

Procedure:
The 2018 CCPaSEC Equipment Check procedure is available on our WEB page:
http://www.ccpasec.org/

All seven field kits were examined by our Quality Team volunteers.

- Physical condition of the equipment.
- Replaced all batteries.
- Repair and maintenance as required.
- Colorimeter Hach DR/850 nitrate, sulfate & phosphate
- Dissolved Oxygen YSI Model 550A
- Velocity Meter "FloWatch"™ (used to determine stream flow)
- Oakton pH/conductivity meter
- Determine percent recovery (PR)

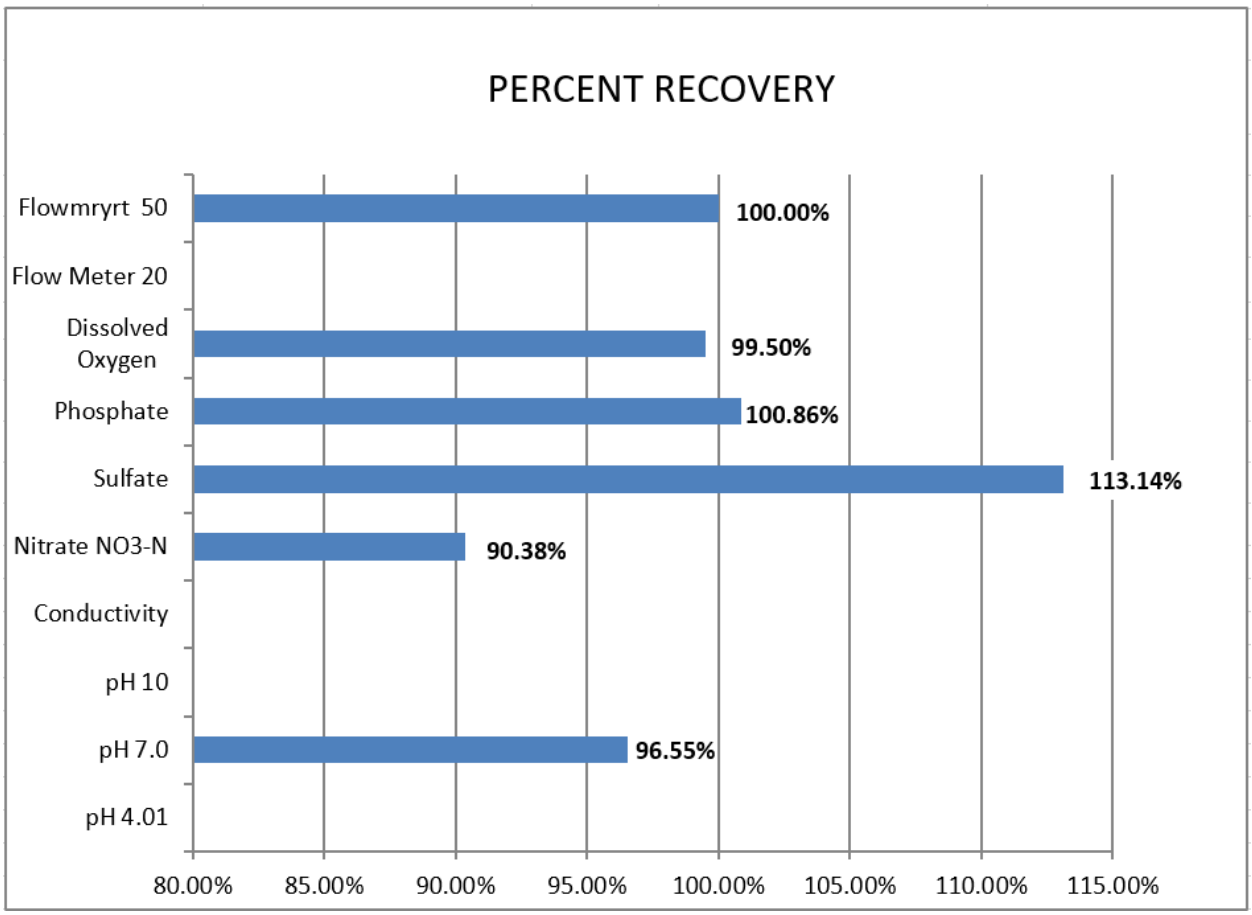
The Nature Abounds QUALITY ASSURANCE PROJECT PLAN, 2013, (QAP) established data quality objectives for measurement data. "Accuracy is the measurement of a sample of known concentration and comparing the known value against the measured value and is expressed as Percent Recovery". Nature Abounds™ set the goal for Percent Recovery to be between 90% and 110%.

The Nature Abounds (QAP) defines Percent Recovery as:

Percent Recovery $PR = \frac{Mean}{Standard} * 100$

The CCPaSEC Quality Assurance Plan established the frequency of the equipment check as once a year. During a Quality Control Session, the quality Team volunteers analyze known standards for pH, conductivity, nitrate, total phosphate, and sulfates (measured in the PaSEC's monitoring protocols) and use the abs mean as the standard for dissolved oxygen, as we do not have a standard.

We did not determine PR for pH for the range of 4.01 or 10.0 this session.



Conclusion: The PR for sulfate exceeded our guidelines. The results indicate our field equipment is limited. We are not using Laboratory certified equipment and we cannot expect Laboratory level results. The percent recovery of our equipment is consistent with previous years. The Nature Abounds QAP states that "If the absolute difference is greater, corrective action will be taken to improve performance.

Other findings:

YSI dissolved oxygen meter for Kit 5 at first, would not calibrate when first turned on. The cal. display for DO exceeded 100% and the temperature reading was over 10 C° too high. Dan DeLotto soaked two new probe tips in distilled water per the instructions and re-placed probe

tip on the Kit 5 and one on our reserve kit YSI meter. Both meters calibrated well and the test readings are included in this report.

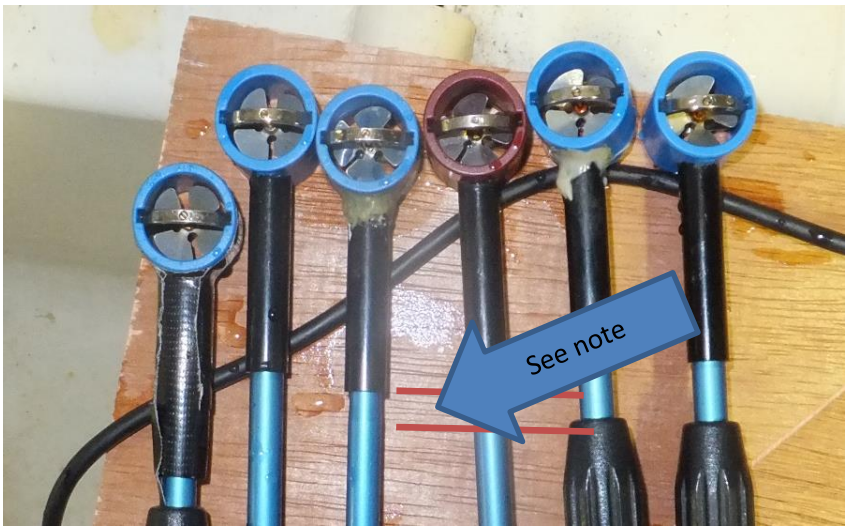
The Oakton meter for Kit 5 would not calibrate. The probe tip was replaced with a newly purchased one provided by Lock Haven University's Dr. Khalequzzaman. (Dr. K).

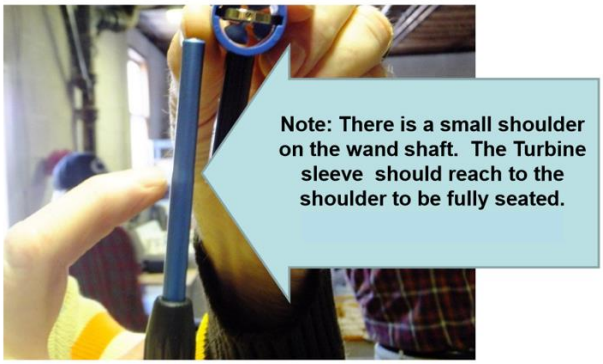
FlowWatch flow velocity meter. Three of the meters had been repaired to fix the small turbine (propeller) to the black tube and one had expose wires in the wand (photos below).

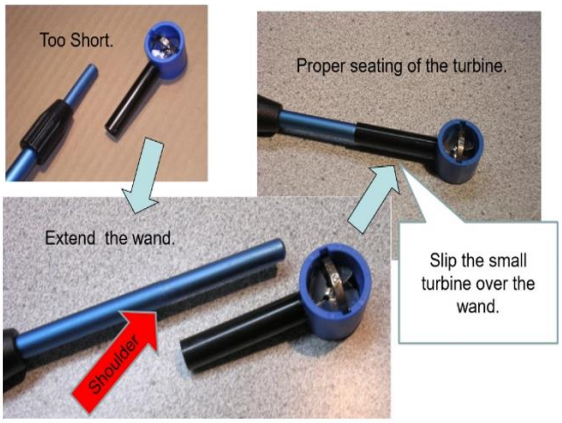
The exposed wires were taped with electrical tape and slid back into the wand. Rob Fugate will attempt to enhance this temporary "fix" at home.

Photo showing the Flowmeter turbine tips and repairs.

Note: The turbine (propeller) could not be seated







All repaired units functioned well however, we observed that some of the epoxy used to repair one (Kit 1) was evident in the black sleeve. Another had foreign material in the sleeve. That material would increase the spacing between the turbine (little propeller) and the magnet pick-up in the wand. Too much material may cause the magnetic pick-up to mis a pulse and cause inaccurate results. We are not presently able to reliably measure actual flow through the turbine.

Please notify Dan DeLotto if a repair or replacement is needed. Permeant repairs should be made with epoxy appropriate for use with plastic by Dan DeLotto or another member of the Quality Team.

A temporary field repair method may use “Gorilla tape” as show in the photo.

Please determine that black sleeve is free of internal debris any time it is removed from the wand.