

Scope of work for Operation of the Tributary Loading Station on the Scioto River and Interpretation of Water Quality Data

Submitted to
Dr. Fang Cheng
Department of Public Utilities
Division of Sewerage and Drainage
The City of Columbus, Ohio

by
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Period Covered by this Request: 1 January 2018 through 31 December 2018

Work to be accomplished:

We request that the City of Columbus provide funds to support the operation of water quality monitoring stations on the Scioto River- one at Chillicothe and one near Piketon, which would be conducted in collaboration with the Division of Sewerage and Drainage (DSD). The water quality information produced by our operation of this station and our analysis of NPDES data in the Scioto watershed through our prior agreements has proven to be highly valuable to DSD.

This year we request a total of \$68,500. That level of funding will permit us to do the following:

- (1) Continue to produce water quality data through our intensive sampling protocol, analysis of suspended sediments and nutrients (including forms of phosphorus and nitrogen as well as other nutrients), computation and characterization of nutrient and suspended sediment concentrations and loads from the Scioto River to the Ohio River as calculated from the Chillicothe station and the Piketon Station, though via slightly less intensive sampling (5 samples per week);
- (2) Upload the Scioto River data to our public data download website and interpret the data as part of an omnibus comparative report on all of the Ohio River and Lake Erie tributaries that comprise the Heidelberg Tributary Loading Program (HTLP);
- (3) Analyze total dissolved solids, alkalinity and hardness in a subset of samples collected at the Chillicothe station during both base flow and storm runoff events as coordinated with DSD personnel;
- (4) Assist OEPA in calculations that compare point-source and nonpoint-source loads of total phosphorus and other nutrients of interest to DSD upstream of the sampling station at Chillicothe.

Work Plan

Our work plan for 2018 is as follows:

1. We will maintain one refrigerated automated ISCO sampler inside the monitoring building at Chillicothe. The sampler will collect one discrete sample every eight hours year-round. Samples will be shipped to us by our cooperator at the Ross County Soil and Water Conservation District weekly (except the last week in December). Heidelberg technicians will visit the site as needed, usually one to two times a year, to perform required maintenance and repairs. We have an excellent rapport with the Ross SWCD, and they occasionally volunteer in ensuring that the station is operational and has minimal “down time”.
2. We will sample at a bridge crossing near Picketon, Ohio using a cooperator at Pike Water. The cooperator will collect one sample a day at a minimum of 5 days a week and then ship the samples to us weekly.
3. As we have done since 1996, we will analyze 500 (\pm about 50) samples each year for the Chillicothe station, the exact number dependent on the number and duration of storm runoff events during the year. We analyzed 510 samples in FY 2017 and 502 samples in FY 2016. We will analyze daily samples and additional samples as needed to accurately characterize storm runoff loads of the analyzed compounds. We will also analyze samples from any additional stations, specifically the Picketon Station, where we anticipate ~250 samples per year. All analyses conform to methods specified in our U.S. EPA-approved QAPP and are certified by Ohio EPA at level 3J. Several of our laboratory technicians (J. Kramer, E. Ewing, B. Merryfield) and research scientists (A. Roerdink, L. Johnson) are certified by Ohio EPA as Level 3 Qualified Data Collectors for chemical water quality assessment. We will analyze all water samples for specific conductance and the concentrations of total phosphorus, dissolved (soluble) reactive phosphorus, nitrate nitrogen, nitrite nitrogen, total Kjeldahl nitrogen, ammonia, chloride, sulfate, dissolved silica, and total suspended solids.
4. We will continue to upload our concentration data and the corresponding flow data (provided by USGS) for each analyzed sample on our tributary data download website on a quarterly basis following QA/QC analysis, and we will make the data available more frequently upon special request. After the end of the water year (30 September), we will calculate the annual loads, unit area loads, flow-weighted mean concentrations and time-weighted mean concentrations for each parameter.
5. We will continue to collaborate with Ohio EPA and DSD personnel in analyzing NPDES data and developing appropriate summaries and interpretive reports of the information.
6. In addition to the above tasks, the NCWQR will analyze a subset of samples collected at the Chillicothe station during 2018 for total dissolved solids, alkalinity and hardness. The number of samples, the timing of sample collections, and the specific analytical methods will be mutually agreed upon by NCWQR and DSD as before.

Budget

The operational costs to monitor water quality at the Chillicothe station, the Piketon station, as well as the estimated costs for other chemical analyses including total dissolved solids, alkalinity, and hardness are shown below. The details are as follows:

Heidelberg proposed budget	
<i>Calendar year 2018</i>	
<i>Station operation</i>	Total
Chillicothe	\$ 40,000
Piketon	\$ 23,500
<i>Optional services (if authorized by DOSD)</i>	
Other chemical analyses	\$ 5,000
Total Request to City of Columbus, not to exceed	\$ 68,500

Budget Notes

1. The costs quoted in station operation do not include any part of USGS program costs. The USGS operates and maintains the hydrological instrumentation that measures river stage and discharge. NCWQR does pay all electrical bills for the station, currently approximately \$100 per month.
2. For the total request, we have quoted a “not to exceed” total dollar amount, as the number of samples to be analyzed is not exactly known at this time.

We look forward to further collaboration with you as we continue to address important water quality issues in the Scioto River.



Laura T. Johnson
Director