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Office of Water Quality Technical Memorandum 2013.03

Subject: New Techniques and Methods Report 1-D5 on Nitrate Sensors

We are pleased to announce the availability of a new U.S. Geological Survey Techniques and Methods Report 1-D5 that provides information about selection and use of UV-photometer nitrate sensors to facilitate the collection of high-quality data across studies, sites, and instrument types. This T&M is intended for use by those actively engaged in use of these sensors to promote better standardization of data-collection activities and to improve data reliability.

While broad in scope, the report provides technical background information such that users can make informed decisions about sensor selection and approaches for sensor deployment. The report also provides general guidelines for maintaining sensor performance in the field including maintenance and calibration protocols, quality-assurance techniques, and data formats and reporting. Although the focus of this report is ultraviolet (UV) nitrate sensors, many of the principles can be applied to other *in situ* optical sensors for water-quality studies.

The recent commercial availability of *in situ* optical sensors, together with new techniques for data collection and analysis, provides the opportunity to monitor a wide range of water-quality constituents on time scales in which environmental conditions actually change. Of particular interest is the application of UV photometers for *in situ* determination of nitrate concentrations in rivers and streams. A variety of currently available nitrate sensors using a UV-photometer differ in several important ways related to instrument design. These differences can affect the accuracy of nitrate concentration measurements in different types of natural waters.

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Distribution: All WMA Employees

Suggested citation:

Pellerin, B.A., Bergamaschi, B.A., Downing, B.D., Saraceno, J.F., Garrett, J.A., and Olsen, L.D., 2013, Optical techniques for the determination of nitrate in environmental waters: Guidelines for instrument selection, operation, deployment, maintenance, quality assurance, and data reporting: U.S. Geological Survey Techniques and Methods 1–D5, 37 p.