



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Office of Groundwater
411 National Center
Reston, Virginia 20192

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Mail Stop 411

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OFFICE OF GROUNDWATER TECHNICAL MEMORANDUM 2015.03

SUBJECT: Policy for Quality Assurance Checks of Steel and Electric Groundwater Level Measurement Tapes

Summary

This Technical Memorandum describes implementation of a USGS nationwide groundwater-level tape calibration program. All Water Science Center steel and electric water-level tapes used for measurement of groundwater levels must be inventoried and added to the Hydrologic Instrumentation Facility database by February 23, 2015.

Background

Nationally-consistent data collection, management, and archival is a hallmark of the U.S. Geological Survey (USGS). In keeping with that standard of national consistency, the Office of Groundwater (OGW), the Water Science Field Team (WSFT), and the Hydrologic Instrumentation Facility (HIF) have been testing methods to quality assure the steel and electric tapes that Water Science Centers (Centers) use for collection of groundwater-level data. Results of that testing indicate that the measurement quality of the tapes can be highly variable (Jelinski and others, in press), but that corrections can be made and utilized in the field to ensure high-quality data collection. Methods have been developed at the HIF that can be used to implement a nationally-consistent tape checking program.

The purpose of this memorandum is to establish policy regarding routine quality-assurance checks of steel and electric tapes used for making groundwater level measurements in the USGS Water Mission Area (WMA), as introduced during the [OGW Webinar](#) Series on December 11, 2014. This memorandum states the policy and provides a description of how the program for routine calibration checks of steel and electric groundwater tapes will work.

Groundwater Tape Quality Assurance Policy

Beginning in 2015, the OGW is implementing a program for routine calibration checks of steel and electric groundwater tapes. Every steel tape used for making groundwater level measurements will be checked by the HIF at least once every six years. Every electric tape used for making groundwater level measurements will be checked by the HIF at least once every two years. Additionally, Centers should inspect their tapes annually and, if warranted based on this inspection,

submit them for an additional calibration check at the HIF. Field wear-and-tear may necessitate an additional inspection and calibration.

As part of this program, every groundwater tape must be registered and tracked in a database maintained by the HIF. Centers will be notified when a tape is due for a calibration check based on the information in the database. The Center will send the tapes selected for a calibration check to the HIF and the HIF will 1) visually inspect the tape for damage, and 2) check each 100 ft length interval of the tape against a NIST-traceable reference tape. In addition, the offset due to the electric tape's water sensor will be measured. All tapes will be returned to the Center along with a calibration report.

All new tapes purchased through the HIF will be checked as part of the HIF's standard QA/QC process. New tapes purchased directly from the manufacturer must be checked by the HIF before use in the field.

Currently there is no charge to the Center for the scheduled tape calibration. The only costs to the Center are to ship the tapes to HIF. The cost of a calibration check requested by a Center outside the normal schedule will be borne by the Center.

How the Tape Checking Program Will Work

Registration of groundwater tapes: The OGW requests that all groundwater tapes in use be registered by February 23, 2015, in a central groundwater tape database that is accessible through the HIF at: <https://1stop.usgs.gov/common/accounts/login.aspx>.

To register a tape, a user will log into the HIF OneStop/Query Portal using their USGS user name and Query Portal password, select the HIF Query Portal from the left-hand menu, select GW Tapes Register/Add New GW Tape from the left hand menu, and enter the following information in the form: Type (either electric or steel), Manufacturer, Model, Manufacturer Serial Number, Tape Length (in feet), Year Purchased, Primary Contact, Secondary Contact, and Office Location. Primary and secondary contacts must be registered users at <http://1stop.usgs.gov>.

Notification that a tape is due for check: When a tape is due for a calibration check, an email will be sent to the primary and secondary contacts listed in the groundwater tape database and to the Center Data Chief. Please respond promptly in order to maintain an efficient workflow at the HIF and minimize the time a tape will be out of service.

Shipping tape(s) to the HIF: To ship a tape for the routine calibration check, the user will log into the Query Portal and select GW Tapes Register/GW Tape – RMA (Return Materials Authorization) to request an RMA for shipping. Shipping costs to the HIF will be paid by the Center; the HIF will pay return shipping costs to the Center.

Return of tape(s) to Center: The tape(s) will be shipped back to the originating office along with a calibration report for each tape. There currently is no charge to the Center for the tape calibration. The goal is that the tapes will be returned to the Center within 3 to 4 weeks of receipt at the HIF warehouse. If a replacement tape is needed during the testing period, please contact the Center or WSFT Groundwater Specialist.

Additional Information

Because of the number of steel and electric tapes in use, electric tapes from any particular Center may not be recalled for up to two years from the start of the program and up to 6 years for steel tapes. As the tape calibration checking program proceeds through full implementation, the HIF, OGW, and WSFT will periodically review the calibration data collected to re-evaluate the policy and program.

For more information on water-level tape calibration, including a list of frequently asked questions, see <http://water.usgs.gov/usgs/ogw/QA/wl-tape-cal.html>.

If you have questions concerning this policy or its implementation, contact Bill Cunningham (wcunning@usgs.gov 703-648-5005) or Rod Sheets (rasheets@usgs.gov 614-430-7710). Questions concerning the groundwater tape database should be directed to Karen Ray at ktray@usgs.gov (228-688-1528). If you have questions about the tape checking program, please contact Janice M. Fulford (jfulford@usgs.gov 228-688-1501) or Blu Dubuisson (jwdubuis@usgs.gov, 228-688-1838).

William L. Cunningham
Chief, Office of Groundwater

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This memorandum does not supersede any other memorandum.

References

Jelinski, J., Clayton, C.S., and Fulford, J.M., in press, Accuracy testing of electric groundwater-level measurement tapes: U.S. Geological Survey Open-File Report 2014-1236.