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## NUCLEAR WASTE MANAGEMENT PROGRAM PROCEDURE

### SP 13-3 FIELD WATER-QUALITY MEASUREMENTS Revision 0

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## 1.0 Purpose and Scope

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This procedure prescribes the Sandia National Laboratories (SNL) Nuclear Waste Management Program (NWMP) process for the collection and measurement of water quality data for the Far-Field activities at the Waste Isolation Pilot Plant (WIPP). The measurements include specific gravity, conductance, pH, and temperature. The objectives of this procedure are to describe the processes needed to attain Quality Assurance (QA) data quality measurements and general field measurements. During some of the operations at the WIPP some water quality measurements such as pH, temperature, and conductance are used as indicators of the changing conditions only and are not used as data. Once a stable condition is indicated further measurements are normally taken as QA data. This procedure will describe guidelines for both types of measurements. All work will be performed in accordance with WIPP procedures WP 10-2, Maintenance Operation Instruction Manual (MOIM), and WP 12 IS.01, Industrial Safety Program, and any applicable Job Hazard Analyses (JHA).

This SP is intended to direct SNL technical personnel.

After the sampled fluids are analyzed they shall be disposed of in accordance with applicable procedures to ensure compliance with WIPP program requirements (WP 02-EM1016 Request for Disposal, WP 02-EM1016, Request to Discharge to Evaporation Ponds).

Acronyms and definitions for terms used in this procedure may be found in the NWMP Glossary located at the Sandia National Laboratories (SNL) NWMP On-line Documents web site.

### Prerequisite actions

Read and apply applicable Material Safety Data Sheets (MSDS) recommendations. See applicable MSDS.

## 2.0 Implementation Actions

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### 2.1 pH Measurements

- 2.1.1 The instrument will be calibrated prior to any measurements and will follow the manufacturer's calibration instructions.
- 2.1.2 If measurements are to be used for quality affecting activities, this calibration will be documented in the project's scientific notebook according to NP 20-2, *Scientific Notebooks*, and submitted to the WIPP Records Center according to NP-17-1, *Records*.
- 2.1.3 To ensure that the sampling container does not contain residue from previous sample, triple rinse the container with the fluid to be sampled.
- 2.1.4 Measurements shall be taken as soon as possible (within several minutes of grabbing the sample).
- 2.1.5 Move the measurement probe around in the sample to make sure that the sample remains homogenous.
- 2.1.6 Wait for the reading to stabilize prior to recording the reading.
- 2.1.7 If the measurements are to be used as QA data they shall be recorded in an appropriate format (scientific notebook, forms, etc.) and submitted to the WIPP Records Center in accordance with NP 17-1, *Records*.
- 2.1.8 Meter calibration will be verified at the end of the day or activity. If the calibration is not consistent, the error will be documented in the project's scientific notebook and all measurements affected will be corrected or noted.

### 2.2 Conductivity Measurements

- 2.2.1 The instrument will be calibrated prior to any measurements and will follow the manufacturer's calibration instructions.
- 2.2.2 If measurements are to be used for quality affecting activities, this calibration will be documented in the project's scientific notebook according to NP 20-2, *Scientific Notebooks*, and submitted to the WIPP Records Center according to NP-17-1, *Records*.
- 2.2.3 To make sure that the sampling container does not contain residue from previous samples, triple rinse the container with the fluid to be sampled.
- 2.2.4 Move the measurement probe around in the sample to make sure that the sample remains homogenous.
- 2.2.5 Do not allow the probe to rest against the side of the container.
- 2.2.6 Wait for the reading to stabilize prior to recording the reading.
- 2.2.7 If the measurements are to be used as QA data they shall be recorded in an appropriate format (scientific notebook, forms, etc.) and submitted to the WIPP Records Center in accordance with NP 17-1, *Records*.
- 2.2.8 Meter calibration will be verified at the end of the day or activity. If the calibration is not consistent, the error will be documented in the project's scientific notebook and all measurements affected will be corrected or noted.

### 2.3 Specific Gravity Measurements

- 2.3.1 The specific gravity is measured with a hydrometer. If the measurements are to be used as QA data the factory certifications shall be placed on file with the WIPP Records Center. Hydrometers are sealed units that rely on the principles of the displacement of mass to provide specific gravity data and therefore do not require recalibration.
- 2.3.2 If measurements are to be used for quality affecting activities, this calibration will be documented in the project's scientific notebook according to NP 20-2, *Scientific*

*Notebooks*, and submitted to the WIPP Records Center according to NP-17-1, *Records*.

- 2.3.3 Use a container that will allow the hydrometer to float completely free, while not touching the bottom of the container (a 1 liter graduated cylinder or similar container).
- 2.3.4 Since hydrometers come in a variety of ranges, if the range of the fluid to be tested is unknown, use a broad range hydrometer to narrow the range.
- 2.3.5 Place the hydrometer in the fluid and allow it to float freely.
- 2.3.6 Allow the hydrometer to come to rest and take the reading at the top of the meniscus.
- 2.3.7 Temperature readings must be taken in conjunction with the specific gravity readings.
- 2.3.8 If the measurements are to be used as QA data they shall be recorded in an appropriate format (scientific notebook, forms, etc.) and submitted to the WIPP Records Center in accordance with NP 17-1, *Records*.

**2.4 Temperature Readings**

- 2.4.1 For the purpose of water quality readings the temperature reading may be taken using uncalibrated digital thermometers (since the accuracy requirements of the temperature readings is well within the accuracy of off-the-shelf digital thermometers).
- 2.4.2 Place the thermometer in the fluid.
- 2.4.3 Allow the temperature reading to stabilize. At times the temperature of the fluid being tested may begin to rise before a stable temperature reading is achieved. If this occurs increase the volume of the fluid.
- 2.4.4 If measurements are to be used for quality affecting activities, this calibration will be documented in the project’s scientific notebook according to NP 20-2, *Scientific Notebooks*, and submitted to the WIPP Records Center according to NP-17-1 *Records*.

**2.5 Safety**

- 2.5.1 All activities shall conform to the WIPP Industrial Safety Program (Procedure WP 12-IS.01). These activities shall also conform to ES&H requirements governed by the WIPP Chemical Hygiene Plan (Procedure 12-IH.01) and the WIPP Industrial Hygiene Program (Procedure WP 12-IH.02).
- 2.5.2 Any applicable JHA(s) shall be reviewed before starting work and will be adhered to during completion of this procedure.

**3.0 Records**

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The following QA records, generated through implementation of this procedure, shall be prepared and submitted to the WIPP Records Center in accordance with NP 17-1 (*Records*):

<u>QA Record</u>	<u>Preparer</u>	<u>Records Submitter</u>
<ul style="list-style-type: none"> <li>• scientific notebook, forms</li> </ul>	PI, Operator	PI, Operator

**4.0 Appendices**

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None

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