Field Testing Water-based Drilling Fluids

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Introduction

This standard is based on API Recommended Practice 13B-1, *Recommended Practice for Field Testing Water-based Drilling Fluids*, Fourth Edition, March 2009.

As with any laboratory procedure requiring the use of potentially hazardous chemicals and equipment, the user is expected to have received proper training and knowledge in the use and disposal of these potentially hazardous materials. The user is responsible for compliance with all applicable local, regional, and national requirements for worker and local health, safety, and environmental liability.

In this standard, quantities expressed in the International System of Units (SI) are also, where practical, expressed in the United States customary (USC) units in parentheses for information. The units do not necessarily represent a direct conversion of SI units to USC units, or USC units to SI units. Consideration has been given to the precision of the instrument making the measurement. For example, thermometers are typically marked in one-degree increments; thus, temperature values have been rounded to the nearest degree.

Calibrating an instrument refers to ensuring the accuracy of the measurement. Accuracy is the degree of conformity of a measurement of a quantity to its actual or true value. Accuracy is related to precision, or reproducibility, of a measurement. Precision is the degree to which further measurements or calculations will show the same or similar results. Precision is characterized in terms of the standard deviation of the measurement. The results of calculations or a measurement can be accurate but not precise, precise but not accurate, neither accurate nor precise, or both accurate and precise. A result is valid if it is both accurate and precise.

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Field Testing Water-based Drilling Fluids

Warning—As with any laboratory procedure requiring the use of potentially hazardous chemicals, the user is expected to have proper knowledge and to have received training in the use and disposal of these chemicals. The user is responsible for compliance with all applicable local, regional, and national requirements for worker and local health, safety, and environmental liability.

1 Scope

This recommended practice provides standard procedures for determining the following characteristics of water-based drilling fluids:

a) drilling fluid density (mud weight);

b) viscosity and gel strength;

c) filtration;

d) water, oil, and solids contents;

e) sand content;

f) methylene blue capacity;

g) pH;

h) alkalinity and lime content;

i) chloride content;

j) total hardness as calcium;

k) low-gravity solids and weighting material concentrations.

Annexes A through K provide additional test methods that may be used for:

— chemical analysis for calcium, magnesium, calcium sulfate, sulfide, carbonate, and potassium;

— determination of shear strength;

— determination of resistivity;

— removal of air;

— drill-pipe corrosion monitoring;

— sampling, inspection, and rejection;

— rig-site sampling;

— calibration and verification of glassware, thermometers, timers, viscometers, retort cup, and drilling fluid balances;

— permeability plugging testing at high temperature and high pressure for two types of equipment;

— Sag testing.