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- (54) **ANALYSIS OF DOWNHOLE OBM-CONTAMINATED FORMATION FLUID**
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- (\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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- (51) **Int. Cl.<sup>7</sup>** ..... **G01V 8/00**
- (52) **U.S. Cl.** ..... **250/269.1**
- (58) **Field of Search** ..... **250/269.1**

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(57) **ABSTRACT**

A method and apparatus is provided for determining a quality of downhole fluid. A series of measurements are taken of at least one parameter of borehole fluid that is indicative of OBM filtrate contamination. By curve-fitting, the series of the measured parameter values are used to create an asymptotic curve indicative of the quality of the downhole fluid. One embodiment determines OBM filtrate fraction in a borehole fluid sample. One embodiment is used when there is significant difference between the coloration of formation fluid and the coloration of OBM filtrate. Another is used when there is little or no difference between the coloration of formation fluid and the coloration of OBM filtrate. Another determines GOR of formation fluid corrected for OBM filtrate contamination. Another determines OD of formation fluid corrected for OBM filtrate contamination. Another determines conditions that would render optical density measurements invalid and sample capture premature. Another predicts the reduction of filtrate fraction for a specific extended pumping time. Another initiates sample capture when computed contamination fraction exhibits stable asymptotic convergence. Another compensates for wavelength-independent scattering. Another compensates for varying pump rate. Another reduces the effect of wavelength-dependent scattering.

**81 Claims, 23 Drawing Sheets**

