MEASUREMENT BY METER

$$V_o = V_m \; C_f \; k \; (1 - BSW/100)$$

WHERE

V_o = VOLUME OF OIL AT ATMOSPHERIC PRESSURE AND TEMPERATURE (GENERALLY 60°F)

V_m = VOLUME OF OIL REGISTERED BY METER(S) SINCE LAST READING AT SEPARATOR PRESSURE AND TEMPERATURE

C_f = MEASURED CORRECTION FACTOR. IT IS OBTAINED BY CALIBRATING THE METER WITH A TANK DURING THE TEST AND INCLUDES BOTH THE METER FACTOR, M, AND THE WEATHERING FACTOR, W_f. $C_f = M \, W_f$

M = METER FACTOR. IT IS TO CORRECT FOR ANY METER NON LINEARITIES.

W_f = WEATHERING FACTOR = VOLUME OF OIL AT ATMOSPHERIC PRESSURE AND 60°F ÷ VOLUME OF OIL AT SEPARATOR CONDITIONS. NOTE: $W_f = (1-Sh)$, WHERE Sh = OIL SHRINKAGE FROM SEPARATOR TO STOCK TANK CONDITIONS = (VOLUME OF OIL AT SEPARATOR CONDITIONS − VOLUME OF OIL AT ATMOSPHERIC PRESSURE AND 60°F) ÷ VOLUME OF OIL AT SEPARATOR CONDITIONS.

k = TEMPERATURE CORRECTION FACTOR FROM ASTM TABLES (k = 1 FOR AN OIL TEMPERATURE OF 60°F).

BSW = BASIC SEDIMENT AND WATER MEASURED USING API FIELD CENTRIFUGE METHOD = PERCENT OF BASIC SEDIMENT AND WATER VOLUME TO TOTAL VOLUME OF OIL AND BSW.

Q_o = CORRECTED OIL FLOW RATE = V_o ÷ TIME TO PRODUCE THE VOLUME, V_o.

MEASUREMENT IN TANK

$$V_o = V_t \; k \; (1 - BSW/100)$$

V_o, k, BSW, AND Q_o - AS ABOVE

V_t = VOLUME OF OIL MEASURED IN TANK AT TANK TEMPERATURE SINCE LAST READING